



COLUMBIA CITY COUNCIL MEETING AGENDA TUESDAY, OCTOBER 19, 2021

The Columbia City Council will conduct a Council Meeting on Tuesday, October 19, 2021 at 2:00 p.m. at the Busby Street Community Center, 1735 Busby Street, Columbia, SC 29203. The meeting will be streamed online at www.columbiasc.gov. Citizens can participate in the meeting in-person or via telephone by dialing **855-925-2801**. When prompted, enter meeting code: **7674**. During the meeting: press *1 to listen; *2 to leave a message; or *3 to request to speak. For additional information visit www.columbiacitysc.igm2.com. You may also register at this site to post comments related to items on the agenda. For questions regarding the meeting, please contact the City Clerk at (803)545-3045 or cityclerk@columbiasc.gov.

The Honorable Mayor Stephen K. Benjamin
The Honorable Sam Davis, District I ▪ The Honorable Tameika Isaac Devine, At-Large
The Honorable Howard E. Duvall, Jr., At-Large ▪ The Honorable Edward H. McDowell, Jr., District II
The Honorable Daniel J. Rickenmann, District IV ▪ The Honorable William Brennan, District III

Prior to entering the meeting please turn all electronic communication devices to the silent, vibrate or off position. All presenters are asked to speak directly into the microphone for recording purposes.

CALL TO ORDER

PLEDGE OF ALLEGIANCE

INVOCATION

ADOPTION OF THE AGENDA

APPROVAL OF MINUTES

1. Council is asked to approve the October 5, 2021 City Council Meeting Minutes.

PRESENTATIONS

2. Resolution No.: R-2021-117 Approving the Honorary Naming of the Intersection of Oak Street and Gervais Street "Simon P. Bouie Square"
3. Columbia Navy Week (October 18-23, 2021) Proclamation - The Honorable Mayor Stephen K. Benjamin



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CITY COUNCIL DISCUSSION / ACTION

4. COVID-19 Update - The Honorable Mayor Stephen K. Benjamin

- *COVID-19 Situational Report - Mr. Harry Tinsley, Emergency Management Director*

CONSENT AGENDA ITEMS 5 THROUGH 18

5. Council is asked to approve a Professional Services Agreement Designating One Columbia as a Local Arts Agency for Fiscal Year 2021/2022 for the purpose of Advising, Amplifying, and Advocating for the Strengthening and Unifying of the Arts and History Community, as requested by the Budget & Program Management Office. Award to One Columbia for Arts and History in the amount of \$52,353.00. The firm is located in Columbia, SC.

Funding Source: Accommodations Tax 5% (2035205-688200). The original budget amount is \$52,353.00.

6. Council is asked to approve a Contract for Official, Umpire and Scorekeeper Services, as requested by the Parks and Recreation Department. Award to Warren Bolden, doing business as HOTEK SPORTS, in an amount not to exceed \$59,310.00. This vendor is located in Columbia, SC.

Funding Source: Recreation Programs - Professional Services (1015106-636600). The original budget amount is \$59,310.00.

7. Council is asked to approve COVID-19 Building Cleaning Services, as requested by the Support Services Division. Award to National Interior Solutions, LLC in the amount of \$142,700.00. This firm is located in Miami, FL.

Funding Source: General Support Services - Coronavirus Services (1011201-638412) \$61,350.00; Support Services Public Building - Coronavirus Services (5511219-638412) \$81,350.00. The original budget amount is \$142,700.00.

8. Council is asked to approve the Renewal of Computer Aided Dispatch Annual Maintenance Software Services, as requested by the Columbia - Richland 911 Communications Center. Award to CentralSquare Software Systems in the amount of \$291,434.76. This firm is located in Columbia, SC.

Funding Source: City Account (1012701-638200) \$145,717.38 and County Account (2082702-638200) \$145,717.38. The original budget amount is \$291,434.76.



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9. Council is asked to approve the Purchase of 180 sets of Globe Bunker Gear, as requested by the Columbia Fire Department. Award to Newton's Fire and Safety Equipment, Inc. using the HGAC Cooperative Contract in the amount of \$460,728.00. This vendor is located in Swepsonville, NC.

Funding Source: Fire Suppression and Safety Clothing and Supplies (1012303-625900) \$230,364.00 & Fire Suppression and Safety Clothing and Supplies (2082301-625900) \$230,364.00. The original budget amount is \$460,728.00.

10. Council is asked to approve the Purchase of 793 Ninety-Five Gallon Recycling Roll Carts for the Solid Waste Division, as requested by Columbia Water. Award to Schaefer Systems International using the HGAC Cooperative Contract in the amount of \$50,285.80. This vendor is located in Charlotte, NC.

Funding Source: Solid Waste Recycling - Roll Carts and Recycle Bins (1014407-627600). The original budget amount is \$50,285.50.

11. Council is asked to approve the Purchase of 1,248 Toter Ninety-Six Gallon Garbage Roll Carts for the Solid Waste Division, as requested by Columbia Water. Award to Wastequip Manufacturing using the Omnia Partners Cooperative Contract in the amount of \$79,136.16. This vendor is located in Charlotte, NC.

Funding Source: Solid Waste Roll Carts - Roll Carts and Recycle Bins (1014401-627600). The original budget amount is \$79,136.16.

12. Council is asked to approve a Contract for Project WM4602; New Water Main Extension along Rocky Point Drive, as requested by Columbia Water. Award to J.W. Brown Construction, LLC in an amount not to exceed \$129,564.00, which includes contingency. This firm is located in Lexington, SC.

Funding Source: Engineering - Water & Sewer Improvements (5529999-WM460201-658650). The original budget amount is \$129,564.00.

This is a Mentor Protégé Program Protégé Only Project. J.W. Brown Construction, LLC is the protégé and will provide waterline installation services at 71.75% (\$77,470.00) of the total contract amount.

The following subcontractors/suppliers will provide additional services/supplies:

Fortiline Waterworks of Lexington, SC will provide water line materials at 23.15% (\$25,000.00) of the total contract amount.



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Capital Concrete Company of Lexington, SC will provide flowable fill at 2.78% (\$3,000.00) of the total contract amount.

Sloan Construction of Duncan, SC will provide asphalt at 2.32% (\$2,500.00) of the total contract amount.

13. Council is asked to approve a Contract for Compost Grinding and Screening Services for the Solid Waste Division, as requested by Columbia Water. Award to Martin Edwards & Associates, Inc. in an amount not to exceed \$159,068.70. This vendor is located in Erwin, NC.

Funding Source: Solid Waste Compost - Special Projects (1014406-638500). The original budget amount is \$159,068.70.

14. Council is asked to approve an Agreement for a Water and Sewer Rate Study, as requested by Columbia Water. Award to Black & Veatch Management Consulting, LLC in the amount of \$148,989.00. The firm is located in Columbia, SC.

Funding Source: Admin Assistant City Manager - Professional Services (5511109-636600). The original budget amount is \$148,989.00.

Black and Veatch Management Consulting, LLC of Columbia, SC will provide a comprehensive water and sewer rate study to develop a 5-year integrated financial plan at 90% (\$134,091.00) of the total contract amount.

The following subconsultant will provide additional services:

Civil Engineering Consulting Services, a Minority Business Enterprise (W) of Columbia, SC will provide financial planning and rate study services at 10% (\$14,898.00) of the total contract amount.

15. Council is asked to approve Instrumentation and Supervisory Control and Data Acquisition (SCADA) System Maintenance, as requested by Columbia Water. Award to CITI, LLC in the amount of \$234,545.00. This firm is located in Charlotte, NC.

Funding Source: Utilities Metro Wastewater Plant - Maintenance and Service Contract (5516208-638200). The original budget amount is \$234,545.00.

16. Council is asked to approve Contract Amendment #10 for Project SS7236; Consent Decree Program Management Services, as requested by Columbia Water. Award to CDM Smith, Inc. in the amount of \$4,200,000.00. This firm is located in Columbia, SC.

Funding Source: Water and Sewer Capital Projects - Capital Project Costs (5529999-SS723622-658650). The original budget amount is \$4,200,000.00.



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CDM Smith, Inc. of Columbia, SC will provide program management for the Clean Water 2020 Program with complying with the Environmental Protection Agency (EPA) Consent Decree and development of Water Information Management System and oversight of subconsultants at 75.00% (\$3,150,000.00) of the amended amount.

The following subconsultants will provide additional services under Contract Amendment #10:

Atlantic South Consulting Services, a Minority Business Enterprise of Charleston, SC, will provide assistance with master specifications at .69% (\$28,800.00) of the amended amount.

Blue Cypress Consulting, LLC, a Minority Business Enterprise of Decatur, GA, will provide review of existing data to evaluate the inspection/cleaning program for Sanitary Sewer Overflows (SSO) at 3.59% (\$150,934.00) of the amended amount.

Comprehensive Business Consultants, a Minority Business Enterprise (W) of Columbia, SC, will provide project management oversight services at 7.74% (\$324,994.00) of the amended amount.

DESA Inc., a Minority Business Enterprise (W) of Columbia, SC, will provide document controls support, public outreach assistance, and project management oversight services at 7.78% (\$326,872.00) of the amended amount.

ELL Enterprises, LLC, a Minority Business Enterprise (W) of Chapin, SC, will provide Computerized Maintenance Management System (CMMS) implementation and business analysis review services at 5.20% (\$218,400.00) of the amended amount.

17. Ordinance No.: 2021-079 Authorizing the City Manager to execute the First Extension Option of the Lease Renewal Agreement with Truist Bank f/k/a Branch Banking and Trust Company (BB&T) for use of 3905 Ensor Avenue (Lutheran Survey Building)

First reading approval was given on October 5, 2021.

18. Ordinance No.: 2021-080 Authorizing the City of Columbia, South Carolina to Execute and Deliver an Equipment Lease Purchase Agreement in the Amount of Not Exceeding \$9,000,000 Between the City and the Lessor Thereof to Defray the Cost of Acquiring Certain Equipment; and Other Matters Relating Thereto

First reading approval was given on October 5, 2021.



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ORDINANCES - FIRST READING

19. Ordinance No.: 2021-082 Amending the 1998 Code of Ordinances of the City of Columbia, South Carolina, to repeal and replace Chapter 11, Licenses, Permits and Miscellaneous Business Regulations, Article II. Business and Professional Licenses
20. Ordinance No.: 2021-086 Authorizing the City Manager to execute a Sixteenth Amendment to Purchase Agreement between the City of Columbia and Bright-Meyers 2001 LLC for the sale of 5.97 +/-acres (Capital City Stadium), Richland County TMS #11204-02-02

RESOLUTIONS

21. Resolution No.: R-2021-107 Adopting the By-Laws of the South Carolina Memorial Park Commission
22. Resolution No.: R-2021-108 A Resolution Approving the Issuance by the Housing Authority of the City of Columbia South Carolina of its Not to Exceed \$22,000,000 Multifamily Housing Revenue Notes (Haven at Palmer Pointe Project), in One or More Series, Pursuant to Section 147(F) of the Internal Revenue Code of 1986, as Amended; Providing Certain Other Matters in Connection Therewith; and Providing an Effective Date
23. Resolution No.: R-2021-109 Approving the Issuance by the Housing Authority of the City of Columbia, South Carolina of its Multifamily Housing Revenue Notes (The Oaks at St. Anna's Park - Oak Terrace) in the Maximum Principal Amount of \$12,000,000, in One or More Series, Pursuant to Section 147(F) of the Internal Revenue Code of 1986, as Amended; Providing Certain Other Matters in Connection Therewith; and Providing an Effective Date
24. Resolution No.: R-2021-110 Approving the Issuance by the Housing Authority of the City of Columbia, South Carolina of Multifamily Housing Revenue Notes (The Oaks at St. Anna's Park - Oak Park) in the Maximum Principal Amount of \$24,000,000, in One Or More Series, Pursuant to Section 147(F) of The Internal Revenue Code of 1986, as Amended; Providing Certain Other Matters in Connection Therewith; and Providing an Effective Date



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25. Resolution No.: R-2021-112 Approving the Issuance by the Housing Authority of the City of Columbia, South Carolina, of its Multifamily Housing Revenue Notes or Bonds (Colonel Bluffs Apartments) in the Maximum Principal Amount of \$26,100,000, in One or More Series, Pursuant to Section 147(F) of the Internal Revenue Code of 1986, as Amended; Providing Certain Other Matters in Connection Therewith; and Providing an Effective Date
 26. Resolution No.: R-2021-113 Adopting the All Natural Hazards Risk Assessment and Mitigation Plan for the Central Midlands Region of South Carolina Update

EVENT RESOLUTION

27. Resolution No.: R-2021-105 CMA Gala Authorizing consumption of beer and wine only within Boyd Plaza adjacent to the Columbia Museum of Art for CMA Gala: Celebrating 30 Americans on Saturday, December 4, 2021
28. Resolution No.: R-2021-116 Authorizing consumption of beer and wine only within Boyd Plaza adjacent to the Columbia Museum of Art for Live on Boyd Plaza on Sunday, November 7, 2021

APPOINTMENTS

29. Accommodations Tax Advisory Committee
30. Citizens Advisory Committee for Community Development
31. Climate Protection Action Committee
32. Richland County Board of Assessment Appeals

CITY COUNCIL COMMITTEE REFERRALS / REPORTS

33. Council is asked to refer objections to the City Center Business Improvement District assessment to the Economic and Community Development Committee for the purpose of scheduling an appeal hearing, as requested by the Legal Department.

PUBLIC INPUT



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EXECUTIVE SESSION

34. Receipt of legal advice related to matters covered by attorney-client privilege pursuant to S.C. Code §30-4-70(a)(2)

*COVID-19
SC Pride Festival Security
Legislative Priorities*

35. Discussion of negotiations incident to proposed contractual arrangements pursuant to S.C. Code §30-4-70(a)(2)

*Riverfront Park Naming Rights Agreement
Convention Center
Municipal Complex*

ADJOURNMENT



COLUMBIA CITY COUNCIL MEETING MINUTES TUESDAY, OCTOBER 5, 2021

The Columbia City Council conducted a meeting on Tuesday, October 5, 2021 at the Busby Street Community Center, 1735 Busby Street, Columbia, SC 29203. The Honorable Mayor Stephen K. Benjamin called the meeting to order at 2:10 p.m. and the following members of Council were present: The Honorable Sam Davis, The Honorable Tameika Isaac Devine, The Honorable Howard E. Duvall, Jr., The Honorable Mayor Pro-Tempore Edward H. McDowell, Jr., The Honorable Daniel J. Rickenmann, and The Honorable William Brennan. Also present were Ms. Teresa Wilson, City Manager and Ms. Erika D. Moore Hammond, City Clerk. This meeting was advertised in accordance with the South Carolina Freedom of Information Act. The minutes are numbered to coincide with the order of the meeting.

PLEDGE OF ALLEGIANCE

INVOCATION

The Honorable Mayor Pro Tempore Edward H. McDowell, Jr. offered the invocation.

ADOPTION OF THE AGENDA

Upon a motion made by Mr. Duvall and seconded by Mr. Davis, Council voted unanimously to adopt the agenda subject to adding the Metastatic Breast Cancer Awareness Day Proclamation to Presentations.

APPROVAL OF MINUTES

1. Council is asked to approve the September 21, 2021 City Council Meeting Minutes.

Upon a motion made by Mr. Davis and seconded by Mr. Duvall, Council voted unanimously to approve the September 21, 2021 City Council Meeting Minutes.

PRESENTATIONS

2. Resolution No.: 2021-103 Approving the Honorary Naming of the corner of Booker Street and Piedmont Avenue "Bible Way Piedmont Lane" – *Approved*

Upon a motion made by Mr. McDowell and seconded by Mr. Duvall, Council voted unanimously to approve Resolution No.: 2021-103 Approving the Honorary Naming of the corner of Booker Street and Piedmont Avenue "Bible Way Piedmont Lane".



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Councilor McDowell said Bible Way is one of our churches that has always been of help to the community. The pastor and members present today represent what it means to be an inclusive community, surrounded by persons who have different needs and a church that is able to meet those needs. We are grateful and thankful for all the church does.

3. 2021 National Fire Prevention Month Proclamation - The Honorable Mayor Stephen K. Benjamin

Mayor Benjamin and the members of City Council proclaimed the month of October 2021 as Fire Prevention Month in the City of Columbia.

4. Domestic Violence Awareness Month – The Honorable Tameika Isaac Devine

Councilor Devine said I want to introduce Dr. Joseph Ray, Acting Director of Counseling & Placement at Allen University, who is shadowing me today. He is participating in the Education Leaders Experience sponsored by Colonial Life and the Center for Educational Partnerships at USC.

Mayor Benjamin and the members of City Council proclaimed the month of October 2021 as Domestic Violence Awareness Month in the City of Columbia.

Ms. Sara Barber, Executive Director for the South Carolina Coalition Against Domestic Violence and Sexual Assault (SCCADVADA) introduced Ms. Ann Kita as the new Executive Director of Sistercare and Ms. Evelyn Figgures as the Director of Shelters of Sistercare.

Councilor Devine thanked Sister Care for their work in the effort to stop domestic violence. We want a community where your services are no longer needed but we know that they are really needed especially in light of COVID-19 with domestic violence numbers increasing in the past two years. Thank you for all you do in light of all the difficulties to shelter people right now. I want to remind everyone that this Saturday we will have the 15th Annual Mayor's Walk Against Domestic Violence. Everyone who signs up to participate virtually will receive a gift bag with a water bottle, hand towel, hand sanitizer, and mask. You can still register and take a walk in one of our amazing city parks or in your neighborhood to bring awareness to domestic violence.



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5. Hotel Trundle Day Proclamation - The Honorable Mayor Stephen K. Benjamin

Mayor Benjamin and the members of City Council proclaimed Tuesday October 5, 2021 as Hotel Trundle Day in the City of Columbia.

Mayor Benjamin said I don't think you will find a business that more accurately represents the spirit of Columbia; the adaptive reuse, the historic preservation, and how you have quickly become a meaningful and indispensable part of our cultural and arts infrastructure. Everywhere I go, I hear about the amazing way that you treat your customers and also the way that you treat your employees, especially during the pandemic. Marcus and Rita, you are amazing. We are thankful for you and hope that God continues to bless you with prosperity as we know you will be a blessing to this community for many more years to come.

Mr. Marcus Munse, Owner of Hotel Trundle said this is a huge honor. Who would have thought five years ago when we said let's take on this venture and develop our own hotel brand that there would be a Hotel Trundle Day. This is really incredible. The support of the community, friends, and family has been absolutely paramount. We couldn't have done it without you all and without the support that we continue to receive. Thank you so much.

6. Metastatic Breast Cancer Awareness Day Proclamation - The Honorable Tameika Isaac-Devine

Councilor Devine said October is Breast Cancer Awareness Month but October 13th is Metastatic Breast Cancer Awareness Day.

Mayor Benjamin and the members of City Council proclaimed the day of October 13, 2021 as Metastatic Breast Cancer Awareness Day in the City of Columbia.

Councilor Devine said I also want to recognize that October is Pregnancy and Infant Loss Awareness Month. I want to recognize all the parents who have lost a child in child birth.

EMERGENCY ORDINANCE

7. Ordinance No: 2021-081 Extension of Emergency Ordinance No.: 2021-078 Related to COVID-19 – *Approved*



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Mayor Benjamin said we continue to see a decline in the number of cases but we are still holding the line on a fairly high number of deaths from COVID-19. There is some anticipation based on the data that there may indeed be another spike after Thanksgiving. I think the most important message we can continue to push to everyone is that we have to get vaccinated. We are seeing a pandemic of the unvaccinated right now. The ability to withstand the effects of COVID-19 go up significantly if in fact you have received one of the vaccines. I want to encourage people again within the sound of my voice to accept and receive the vaccine. We are going to continue to push in the spirit of collaboration and mutual responsibility as we go forward.

Councilor Rickenmann said please get vaccinated. The numbers in the hospitals right now continue to be unvaccinated individuals. We still have high numbers of bed use.

Upon a motion made by Mayor Benjamin and seconded by Mr. Duvall, Council voted unanimously to approve Ordinance No: 2021-081 Extension of Emergency Ordinance No.: 2021-078 Related to COVID-19.

CITY COUNCIL DISCUSSION / ACTION

8. COVID-19 Update - The Honorable Mayor Stephen K. Benjamin

- *COVID-19 Situational Report - Mr. Harry Tinsley, Emergency Management Director*

Mr. Harry Tinsley, Emergency Management Director said current forecast models project a continued downward trend in new COVID-19 cases over the next few weeks. Hospitalizations are also trending down. South Carolina confirmed case count stands at 697,635. Over the past 14-days, our state has seen 33,590 combined cases, down from 54,439. There have been 11,077,472 administered tests to date and 1,248 new confirmed cases. The positivity rate is 8.9% with 16,007 tests. There were 26 new confirmed deaths and one probable death at the last reporting. The state's total deaths due to COVID-19 over the past 14 days are 11,036 confirmed. In Richland County, there were 54,292 confirmed cases. There are 621 confirmed deaths to date. Over the past 14 days, there were 1,575 new confirmed cases, down from 3,128. Richland County is averaging 112 new cases each day, down from 223 at our last meeting. As of September 29th, Richland County's 14 – day recent disease activity incidence rate remains low with a percent positivity rate of 6.4%. The statewide hospitalizations bed utilization rate is 79.41%. As of Oct 5th, there were 1,670 patients currently hospitalized with confirmed or suspected COVID-19. That is down from 2,381 from the last meeting. The Richland County hospitalizations bed utilization rate is 70.3% with 98 patients hospitalized. DHEC reports that 5,057,043 doses of COVID-19 vaccines have been administered in South Carolina. As of October 3rd, approximately 52.7% of South Carolina's population 12



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years of age and older are fully vaccinated and 60.8% have received at least one vaccine. In Richland County, 55.1% have completed their vaccinations and 63.5% residents have received at least one vaccine. According to the CDC's latest reporting on October 4th, 65.5 % of the U.S. population 12 years of age and older have been fully vaccinated, 64.9% have received at least one dose, 83.6% of those 65 and older have been fully vaccinated, and 77.7% of the population 18 years of age and older have received at least one dose. DHEC is partnering with us for clinics scheduled this month to include: Drew Wellness on Wednesday the 6th, Hyatt Park on Wednesday the 13th, MLK Park on Wednesday the 20th, and Melrose Park on Wednesday the 27th. Prisma is our partner for mobile clinics on Saturday the 9th from 9 a.m. to 12 p.m. in the Vista and Tuesday the 19th from 11 a.m. to 1 p.m. in Five Points. We continue to work with our partners on additional clinics to include weekends and after hour opportunities. All clinics are listed at resilient.columbisc.gov.

9. Business License Update - Mr. Jeff Palen, Assistant City Manager / Chief Financial Officer and Ms. Lakesha Y. Shannon, MBL, Business License Administrator

Mr. Jeff Palen, Assistant City Manager / Chief Financial Officer said Act 176 known as the Business License Tax Standardization Act was passed by the General Assembly in September 2020 for the purpose of streamlining the business license process by creating the same process for all taxing jurisdictions across the state. This process is not optional; all cities and towns must update their business license ordinance to comply with the new law which will become effective on January 1, 2022. The act also requires the South Carolina Revenue and Fiscal Affairs Office to host a statewide portal for business licenses renewals. The act standardizes everything from business year periods, renewal dates, application, classification of businesses, and the ability to renew online. City staff along with assistance from the Municipal Association of South Carolina (MASC) has begun a multi-step process to comply and implement Act 176. Steps that we completed include: converted business license year to run from May 1st through April 30st and passed Ordinance 2021-040 on May 18, 2021 which sets the new business year as required by the Act. We also extended business licenses to cover the gap from January 1st through May 1st. The next part of the plan was for staff to review all of our business license tax data for accuracy. The law required that we use the North American Industry Classification System (NAICS) codes to place each business into an appropriate rate class. The current city ordinance utilizes over 150 business codes. The new ordinance will reduce classifications to nine rate classes. Act 176 also mandates that MASC create a new class schedule every odd year to be approved by the Office of Revenue and Fiscal Affairs and then adopted by each municipality. We have also worked on rebalancing to prevent a windfall or a loss. Cities and towns must rebalance their business license tax rates to ensure revenue neutrality during the 2022 business license cycle relative to 2020 revenues. City staff working with MASC staff has finished working on the rebalance of our rate



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schedule utilizing NAICS codes as required by the Act. The target revenue in 2022 was \$10,940,214 and the calculated revenue is \$10,908,888, which is a deficit of \$31,326. The law requires when we set the rates that we would generate the same amount. We do anticipate there will be some differences. The total business count that we looked at from 2022 is 8,592. Of these, 165 businesses would see an increase of \$1,000 or more if they generate the same revenue and 336 businesses would see a decrease of \$1,000 or more if they generate the same revenue. This leaves 8,091 businesses that saw a change of less than \$1,000 with 24 showing a change of zero if they generate the same revenue. The next steps will be to ask Council to repeal and replace our current business license ordinance and class schedule with the new model ordinance and class schedule at the October 19th meeting with second reading on November 9th. The ordinance will take effect on January 1st, 2022. Staff has been working to set up an account with MASC to allow our businesses to renew their annual license online. We anticipate that to take effect on February 1, 2022. After the adoption of the ordinance, staff will begin to notify stakeholders of the change of the business license period, due dates, the new class codes, the new rate schedule, and the ability to renew online through the portal. We will also have this posted on the website so business owners can obtain the information online.

Councilor Duvall said 165 businesses had an increase and 336 had a decrease. Is there any generalization that you can make of that or is it all across the board?

Mr. Jeff Palen, Assistant City Manager / Chief Financial Officer said it is kind of all across the board. We have looked at some other communities as they did theirs and it was very easy to generalize which industry. Unfortunately, with over 150 business codes it is a little harder for us to figure out if there is a general area. There is not just one area that I can pinpoint. Most businesses will fit into classes one through seven based upon their NAICS code. We do have a class eight and a class nine. Class eight is a state mandated classification and class nine are a handful of other industries that don't fit into others. We will be able to compare our rates to other communities because we will be using the same class codes statewide.

Councilor Brennen asked how much time will this uniform approach save a small business when obtaining a business license.

Mr. Jeff Palen, Assistant City Manager / Chief Financial Officer said it is going to depend on the business but with the renewal process going online, it will definitely save time. People use to wait until the last minute to renew their licenses and we would also have long lines getting closer to the deadline so the online portal will help with that. If you are a brand new business you still have to come into the office to go through the process. If you are a business that operates across multiple jurisdictions, this should save a lot of time because everyone's application should be the same.



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10. Clean Water 2020 Update - Mr. Clint Shealy, P.E., Assistant City Manager for Columbia Water and Mr. Bryan Cully, P.E., Program Manager for CDM Smith

Mr. Clint Shealy, P.E., Assistant City Manager for Columbia Water said I want to start off by thanking our staff for their efforts and continuing to provide essential wastewater services throughout a pandemic and what I would only characterize as unprecedented vacancies and staffing shortages. Many thanks to them and the work that they do each day. I also appreciate the program management team led by Brian Cully and CDM Smith. Their continued support and excellent assistance as we walk through this journey together is greatly appreciated.

Mr. Bryan Cully, P.E., Program Manager for CDM Smith said the list of consent decree programs that are required in the consent decree has not changed. All of these have gone in on time to the EPA with only two programs remaining and those are scheduled to go in next year. Once EPA approves, then we have to implement. Some of these programs are fairly straightforward to implement like the training program and some are very complicated and require massive amounts of man hours like the continuing sewer assessment program. I have highlighted three programs, two are the remaining to be submitted and the infrastructure rehabilitation report for the wastewater collections system. The consent decree does have a force majeure clause included. When COVID hit, we did the proper thing and told the EPA this is probably going to be a force majeure event due to COVID but we don't know what the impacts are. We are still waiting to see what happens. In the consent decree you see the programs and the timelines but the consent decree program was meant to evolve or pivot from operation and day-to-day maintenance to more of an infrastructure and capital improvement project delivery. You are seeing our program pivot with the consent decree requirements and the schedules. This has allowed us some time to take those great lessons learned and process improvements that we have done on the wastewater side and bring that over to the drinking water side. The infrastructure rehabilitation reports in the list of programs once approved by the EPA will allow seven years to complete. Assuming we take most of that time, 2028 is when we will be able to write to the EPA and petition to end the consent decree. We always knew that delivering the consent decree was going to be a very long term multi-decade type activity. I am happy to report to you that our initial assessment with the basket of projects still remains on target for the original \$750 million estimated in 2012. In terms of progress, Council has encumbered and approved about \$363 million. The CIP load is on the back end of the delivery so that is all planned. As far as the consultant support, CDM Smith is working alongside Columbia water staff to deliver and you will see our renewal on the next council meeting agenda. That is for the 10th year of the 11-year contract. We are actively managing over 70 projects and most of those are large multimillion dollar projects. We are tracking 120 projects. The renewal for year ten has 25% of the fee going to sub-consultants. All of them are minority or women owned businesses and all of them except one have offices in Columbia. Since 2016, we have constructed 155,000 linear



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feet of large diameter pipe. We have rehabilitated 550,000 linear feet of mainline pipe, that is about 10%. We have rehabilitated 5,500 manholes, we have replaced/rehabilitated 6,700 laterals, we have rehabilitated 11 pump stations and there is another 19 on the drawing board right now bringing us to 30 out of 50 pump stations. We are at over 4.5 million feet of CCTV inspection since 2016. These preventative measures are huge in how you effectively run a system that is implementing asset management. We have done this with in-house and contractor work. Sanitary sewer overflows are very important. We had a huge drop at the very beginning due to implementing a fats, oils, and grease program. To get that curve further down, it will take a lot of effort and costs, large and timely CIP projects, and preventative maintenance. Spending the rest of the \$750 million and getting staff in to do preventative maintenance is the way we drive that the rest of the way down. We do have a water distribution task force that brings together a lot of different areas within Columbia water and within the Columbia municipality for that common cause. We are making a lot of advancements on customer service. Included in that is actually bringing contractors in to help work down that backlog. The city is currently executing its first alternative delivery project in Columbia Water. It is a Construction-Manager-At-Risk (CMAR) contract project. Everything doesn't have to be traditional design bid build. It gives you a lot more flexibility as the owner. I think it's important that we start quantifying some of the actual environmental benefits of these projects that are happening and align the outcomes with some of the other cities environmental goals. We had six pipeline projects that have eliminated pump stations. We have connected them with a gravity pipe. There are six locations now that aren't using power around the clock and we are not going out to do operations and maintenance. The biggest users of power at a municipality is probably the treatment plants. We have a \$25 million aeration improvements project wrapping up that has greatly reduced power consumption. The wastewater treatment plant digester improvements of \$30 million has greatly reduced the amount of biosolids going to the landfill per year by 9,800,000 pounds. Hauling costs are down by 35% and landfill costs are down by 27%. We are seeking beneficial uses of the biogas that is now being produced in larger quantities.

Mayor Benjamin said this is a fantastic report. On so many different fronts we were faced with daunting challenges but it's amazing with the leadership that this council has shown to prioritize infrastructure, water and sewer, and storm water and decide that we were going to stay the course and take advantage of historically low costs of capital to show people that you can do good and do well. When you are making these types of decisions and investments, it is really about posterity but we are seeing the impacts and the benefits right now. It is amazing what you get when you put the right team together and give people the resources they need to do their job and do it well. We need to continue to pay attention to the human infrastructure in investing locally with small minority owned businesses.



We Are Columbia

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Councilor Duvall asked if the solar farm is still on the drawing board for the wastewater treatment plant.

Mr. Clint Shealy, P.E., Assistant City Manager for Columbia Water said yes sir. We are in the review queue for Dominion right now for the solar farm at Metro. We are also doing a feasibility study for one at the Lake Murray Water Treatment Plant that would interconnect with the distribution side rather than the transmission side.

CONSENT AGENDA ITEMS 11 THROUGH 32

Upon a single motion made by Mr. McDowell and seconded by Mr. Duvall, Council voted unanimously to approve **Consent Agenda Items 11** through **32**.

11. Council is asked to approve the purchase of Storage Area Network Support Services, as requested by the Information Technology Department. Award to the Hewlett Packard Enterprise Company, using the SC State Contract in the amount of \$67,941.50. This vendor is located in Roseville, CA. – *Approved*

Funding Source: Information Technology - Maintenance & Service Contract (1011120-638200). The original budget amount is \$67,941.50.

12. Council is asked to approve Contract Amendment #2 for Security Guard Services, as requested by the Columbia Police Department. Award to Security Management of SC, LLC in the amount of \$800,000.00. The firm is located in Columbia, SC. – *Approved*

Funding Source: General Fund (1012402-636600) \$400,000.00 and Water - Sewer (5512703-636600) \$400,000.00. The budget amount for this amendment is \$800,000.00.

13. Council is asked to approve the Purchase of a 2021 CAT Compact Track Loader and Mini Excavator for the Wastewater Maintenance Division, as requested by Columbia Water. Award to Blanchard Machinery using the SC State Contract in the amount of \$108,269.00. This vendor is located in West Columbia, SC. – *Approved*

Funding Source: Utilities Wastewater Maintenance - Machinery & Equipment-Capital (5516205-658300). The original budget amount is \$108,269.00.

14. Council is asked to approve the Purchase of Cured-In-Place Liner Equipment with an Enclosed Trailer for the Wastewater Maintenance Division, as requested by the Fleet Services Division. Award to Schwalm USA, LLC using the HGAC Cooperative Contract in the amount of \$165,247.65. This vendor is located in Greenville, SC. – *Approved*



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Funding Source: Utilities Wastewater Maintenance - Machinery and Equipment - Capital (5516205-658300). The original budget amount is \$165,247.65.

15. Council is asked to approve the Fiscal Year 2021/2022 Purchase of Vehicle Tires, as requested by the Fleet Services Division. Award to Frasier Tire Service, Inc., using the SC State Contract in the amount of \$216,000.00. This vendor is located in Sumter, SC. – *Approved*

Funding Source: Equipment Services Fuel Parts and Repair - Tires and Lubes (6308970-672500). The original budget amount is \$216,000.

16. Council is asked to approve the Purchase of an Elgin Pelican Dual Sweeper for the Solid Waste Division, as requested by the Fleet Services Division. Award to Public Works Equipment using the Sourcewell Cooperative Contract in the amount of \$229,013.00. This vendor is located in Monroe, NC. – *Approved*

Funding Source: Solid Waste Street Sweeping - Auto, Trucks, Heavy Equipment - Capital (5534408-658500). The original budget amount is \$229,013.00.

17. Council is asked to approve the Purchase of FloFoam for the Anerobic Digester at the Metro Wastewater Treatment Plant, as requested by Columbia Water. Award to Polydyne Inc., as a Sole Source in the amount of \$99,735.84. This vendor is located in Riceboro, GA. – *Approved*

Funding Source: Utilities Metro Wastewater Plant - Chemicals (5516208-624800). The original budget amount is \$99,735.84.

18. Council is asked to approve the Purchase and Installation of Custom Storage Racks for the Wastewater Maintenance Division, as requested by Columbia Water. Award to Patterson Pope, as a Sole Source in an amount not to exceed \$134,835.00. This vendor is located in Norcross, GA. – *Approved*

Funding Source: Water and Sewer Capital Projects - Capital Project Costs; Beltline Columbia Storage Canoe - Capital Project Costs (5529999-658650) (SS752801-658650). The original budget amount is \$134,835.00.

19. Council is asked to approve Contract Amendment #1 for SharePoint Hosting Master Services, as requested by Columbia Water. Award to the Bross Group, as a Sole Source in an amount not to exceed \$155,442.37. This vendor is located in Lakewood, CO. – *Approved*



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Funding Source: Engineering Administration - Special Contracts (5511701-638300). The budget amount for this amendment is \$155,442.37.

20. Council is asked to approve the Purchase of Parts, Repairs, Services, Warranties and Extended Coverage on CAT Branded Generators and Engines for the Metro Wastewater Treatment Plant, Lake Murray Water Plant and Wastewater Maintenance Division, as requested by Columbia Water. Award to Blanchard Machinery, as a Sole Source in the amount of \$169,750.00. This vendor is located in West, Columbia, SC. – *Approved*

Funding Source: Utilities Metro Wastewater Plant - Machine and Equipment - Capital (5516208-658300) \$100,000.00; Utilities Lake Murray Water Plant - Maintenance and Service Contract (5516207-638200) \$21,150.00; Utilities Wastewater Maintenance - Maintenance and Service Contracts (5516205-638200) \$48,600.00 The original budget amount \$169,750.00.

21. Council is asked to approve an Agreement for Project SS7592; Project Management Services for an initial term of eight months with the option to renew for two additional one-year periods, as requested by Columbia Water. Award to Michael Baker International in the amount of \$130,240.00. The firm is located in Columbia, SC. – *Approved*

Funding Source: Engineering Wastewater System Improvements - Special Contracts Water/Sewer, Stormwater (5516221-638305). The original budget amount is \$130,240.00.

22. Council is asked to approve a Contract for Project SS7547; Yacht Cove Force Main Replacement, as requested by Columbia Water. Award to Shady Grove Construction, LLC in an amount not to exceed \$169,995.90 which includes contingency. This firm is located in Irmo, SC. – *Approved*

Funding Source: Engineering - Water & Sewer Improvements (5529999-SS754701-658650). The original budget amount is \$217,063.00.

Shady Grove Construction, LLC, a Local Business Enterprise and a Minority Business Enterprise (W), is the prime contractor and will provide waterline installation services at 78.64% (\$121,531.87) of the total contract amount.

The following subcontractors/suppliers will provide additional services/supplies:

Fortiline Waterworks of Atlanta, GA, will provide pipe appurtenances at 15.16% (\$23,428.74) of the total contract amount.

Capital Concrete Company of Lexington, SC, will provide concrete flow fill at 3.24% (\$5,000.00) of the total contract amount.



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Dun-Right Services of Florence, SC, will provide lining services at 2.96% (\$4,581.12) of the total contract amount.

23. Council is asked to approve a Contract for Project SS7546; Mallard Pointe Force Main Replacement, as requested by Columbia Water. Award to Stutts & Williams, LLC in an amount not to exceed \$193,565.90 which includes contingency. This firm is located in Lexington, SC. – *Approved*

Funding Source: Water & Sewer Capital Projects - Capital Projects Costs (5529999-SS754601-658650). The original budget amount is \$193,565.90.

This is a Mentor Protégé Program project. Stutts & Williams, LLC is the mentor and will provide tie-ins, appropriate traffic control, and assist with project execution at 61.22% (\$107,725.00) of the total contract amount. RCG Construction, LLC, a Minority Business Enterprise (W) of Irmo, SC, is the protégé and will provide force main installation services at 20.00% (\$35,194.00) of the total contract amount.

The following subcontractors/suppliers will provide additional services/supplies:

Ferguson Waterworks of Elgin, SC, will provide force main materials at 9.23% (\$16,250.00) of the total contract amount.

Knights Companies of Summerville, SC, will provide flowable fill services at 7.56% (\$13,300.00) of the total contract amount.

Sloan of Columbia, SC, will provide asphalt services at 1.99% (\$3,500.00) of the total contract amount.

24. Council is asked to approve Contract Amendment #3 for Project SS7522; Construction Administration and Inspection Services for Annual Pipe Rehabilitation, as requested by Columbia Water. Award to Brown & Caldwell in the amount of \$205,866.00. This firm is located in Columbia, SC. – *Approved*

Funding Source: Water and Sewer Capital Projects - Capital Project Costs (5529999-SS696619-658650) The original budget amount is \$284,800.00. The budget amount for this amendment is \$205,866.00. The total revised budget amount is \$490,666.00.

This is a Mentor Protégé Program project. Brown & Caldwell is the mentor and will provide engineering services during construction, along with site visits and construction observation at 64.06% (\$314,305.00) of the total revised contract amount. 4D Engineering, a Minority Business Enterprise (W) located in Lexington, SC, is the protégé and will provide engineering services during construction, along with site visits and construction observation at 35.94% (\$176,361.00) of the total revised contract amount.



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25. Council is asked to approve a Professional Services Agreement for the Metro Wastewater Treatment Plant Compliance Personnel Training for an initial term of one year and eight months with the option to renew for three additional one-year periods, as requested by Columbia Water. Award to Brown and Caldwell, in the amount of \$238,000.00. The firm is located in Columbia, SC. – *Approved*

Funding Source: Utilities Metro Wastewater Plant - Professional Services (5516208-636600). The original budget amount is \$238,000.00.

26. Council is asked to approve Contract Amendment #2 for Project SS7581; Wastewater Collection System Manhole Survey, as requested by Columbia Water. Award to Vaughn & Melton Consulting Engineers in an amount not to exceed \$261,500.00. This firm is located in Middlesboro, KY. – *Approved*

Funding Source: Engineering Wastewater Systems Improvement; Special Contracts 5516221-SS758101-638305. The original budget amount was \$424,975.00. The budget amount for this amendment is \$261,500.00. The total revised budget amount is \$686,475.00.

This is a Columbia Disadvantaged Business Enterprise Program (CDBE) project with a 12% CDBE goal. The CDBE goal of this project was met at 12%. Vaughn & Melton is the prime and will provide field work and technical engineering support for surveying and mapping the City's minor sanitary sewer manholes for the project at 88.00% (\$604,098.00) of the total revised contract amount.

The following subconsultants will provide additional services:

Construction Support Services, LLC, a Minority Business Enterprise of Hopkins, SC, will provide surveying and traffic control support services at 8.00% (\$54,918.00) of the total contract value.

Chao & Associates, Inc., a Minority Business Enterprise located in Columbia, SC, will provide surveying and traffic control support services at 4.00% (\$27,459.00) of the total contract value.

27. Council is asked to approve the Purchase of Muffin/Channel/ Auger Monster, Screenings Washer/Honey Monster, and Monster Separation System Products, Repair Services, Parts, Installation, and Routine and Emergency Maintenance for the Metro Wastewater Treatment Plant, as requested by Columbia Water. Award to JWC Environmental Inc., as a Sole Source in an amount not to exceed \$300,000.00. This vendor is located in Costa Mesa, CA. – *Approved*

Funding Source: Utilities Metro Wastewater Plant - Machinery and Equipment - Capital; (5516208-658300). The original budget amount is \$300,000.00.



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28. Council is asked to approve an Agreement for Project SD8478; North Tanglewood Storm Drainage Improvements for an initial term of twenty months with the option to renew for one year, as requested by Columbia Water. Award to Foth Infrastructure & Environment, LLC in the amount of \$401,572.00. The firm is located in West Columbia, SC. – *Approved*

Funding Source: Stormwater Improvement Capital Project Control - North Tanglewood Storm Drainage Improvement - Capital Project Cost (5549999-SD847801-658650). The original budget amount is \$401,572.00.

This is a Mentor Protégé Program project. Foth Infrastructure & Environment, LLC of Columbia, SC is the mentor and will provide project management and quality assurance/quality control services at 46.56% (\$186,972.00) of the total contract amount. CES Group Engineers, LLP, a Minority Business Enterprise (W) of Columbia, SC, is the protégé and will provide drainage design construction administration and construction observation services at 35.13% (\$141,080.00) of the total contract amount.

The following subconsultants will provide additional services:

Chao & Associates, a Minority Business Enterprise of Columbia, SC will provide surveying services at 6.41% (\$25,750.00) of the total contract amount.

F&ME of Columbia, SC will provide geotechnical services at 1.99% (\$8,000.00) of the total contract amount.

Vaughn & Melton of Columbia, SC will provide Subsurface Utility Engineering (SUE) services at 9.91% (\$39,770.00) of the total contract amount.

29. Council is asked to approve Contract Amendment #7 for Project SS7306; Wastewater Collection System Flow Monitoring Services for the final year of the contract, as requested by Columbia Water. Award to Woolpert, Inc. in an amount not to exceed \$420,960.00. This firm is located in Columbia, SC. – *Approved*

Funding Source: Engineering Wastewater Systems Improvement - Special Contracts Water Sewer, Stormwater (5516221-638305). The original budget amount was \$184,560.00. The total amount of all amendments and change orders is \$677,959.00. The budget amount for this amendment is \$420,960.00. The total revised budget amount is \$1,283,479.00.

Woolpert, Inc. of Columbia, SC will provide temporary and permanent flow monitoring services for the project at 100% (420,960.00) of the total revised contract amount.

30. Council is asked to approve Contract Renewals for Fiscal Year 2021/2022. Award to the following vendors in the total amount of \$3,609,312.33. – *Approved*



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Funding Source: Economic Development - Professional Services (5511301-636600) \$55,000.00; Police Administrative Services - Uniforms and Clothing (1012402-624100) \$225,000.00; Utilities Water Distribution and Maintenance - Pipe, Fittings and Hydrants, Etc. (5516203-625700) \$384,375.25; Utilities Water Distribution and Maintenance - Pipe, Fittings, Hydrants, Etc. (5516203-625700) \$66,212.33; Utilities Metro Wastewater Plant - Special Contracts (5516208-638300) \$526,000.00; Utilities Wastewater Maintenance - Special Contracts Water/Sewer, Stormwater (5516205-638305) \$614,000.00; Utilities Wastewater Maintenance - Special Contracts Water/Sewer, Stormwater (5516205-638305) \$1,903,100.00; Utilities Wastewater Maintenance - Special Contracts Water/Sewer, Stormwater (5516205-638305) \$500,000.00.

Contractor/Vendor	Project Description	Contract Year	Amount	Location
Economic Development				
310 LTD	Lead Generation Consulting Services	4 th Year of a 5 Year Contract	\$55,000.00	Richmond, VA
Police Department				
Wright Johnston	Police Uniforms	4 th Year of a 5 Year Contract	\$225,000.00	Columbia, SC
Utility Operations				
Core and Main	Annual Repair Materials Water Distribution	3 rd Year of a 3 Year Contract	\$384,375.25	St. Louis, MO
Hayes Pipe Supply, Inc.	Annual Repair Materials Water Distribution	3 rd Year of a 3 Year Contract	\$66,212.33	Nashville, TN
Waste Management (BID001-15-16)	Screenings Grit and Sludge Hauling and Container Rental	7 th Year of a 7 Year Contract	\$526,000.00	Elgin, SC
Waste Management (BID002-15-16)	Screenings Grit and Sludge Landfill Disposal	7 th Year of a 7 Year Contract	\$614,000.00	Elgin, SC
DS Utilities	Sanitary Sewer Easement Maintenance	3 rd Year of a 4 Year Contract	\$1,903,100.00	Little Mountain, SC
Dukes Root Control	Sanitary Sewer Root Control	4 th Year of a 4 Year Contract	\$500,000.00	Syracuse, NY
			Total: \$3,609,312.33	

31. Council is asked to approve the Purchase of Water and Wastewater Chemicals for the Columbia Canal Water Treatment Plant, Lake Murray Water Treatment Plant, and Metro Wastewater Treatment Plant, as requested by Columbia Water. Award to the following vendors in the total amount of \$4,329,398.00. – *Approved*

Funding Source: Utilities Columbia Canal Water Treatment Plant - Chemicals (5516206-624800) \$1,341,680.00; Utilities Lake Murray Water Plant - Chemicals (5516207-624800) \$1,754,493.00; Utilities Metro Wastewater Plant - Chemicals (5516208-624800) \$1,233,225.00. The total budget amount is \$4,329,398.00.



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Columbia Canal Water Treatment Plant		
Vendor/Location	Description	Requested Amount
Cabot Norit Americas, Inc. - Marshall, TX	Activated Carbon (Powdered)	\$80,000.00
Carus, LLC - Peru, IL	Blended Phosphate/ Corrosion Inhibitor	\$100,000.00
Chemtrade Chemicals US, LLC - Parsippany, NJ	Aluminum Sulfate	\$368,500.00
International Dioxide - North Kingstown, RI	Sodium Chlorite	\$450,000.00
JCI Jones Chemicals - Sarasota, FL	Chlorine	\$85,000.00
Polydyne, Inc. - Riceboro, GA	Liquid Polymer	\$21,880.00
Polytec, Inc. - Mooresville, NC	Liquid Lime (Calcium Hydroxide)	\$100,000.00
Tanner Industries, Inc. - Southampton, PA	Anhydrous Ammonia	\$76,900.00
Univar USA Inc. - Downers Grove, IL	Fluoride/Fluorosilicic Acid/Liquid	\$59,400.00
Total: \$1,341,680.00		

Lake Murray Water Treatment Plant		
Vendor/Location	Description	Requested Amount
Cabot Norit Americas, Inc. - Marshall, TX	Activated Carbon (Powdered)	\$710,773.00
Carus, LLC - Peru, IL	Blended Phosphate /Corrosion Inhibitor	\$62,100.00
Chemtrade Chemicals US, LLC - Parsippany, NJ	Aluminum Sulfate	\$418,300.00
JCI Jones Chemicals - Sarasota, FL	Chlorine	\$121,700.00
Polydyne, Inc. - Riceboro, GA	Liquid Polymer	\$23,620.00
Polytec, Inc. - Mooresville, NC	Liquid Lime (Calcium Hydroxide)	\$170,000.00
Tanner Industries, Inc. - Southampton, PA	Anhydrous Ammonia	\$57,000.00
Univar USA Inc. - Downers Grove, IL	Fluoride/Fluorosilicic Acid/Liquid	\$56,000.00
Univar USA Inc. - Downers Grove, IL	Sodium Hydroxide/Caustic	\$135,000.00
Total: \$ 1,754,493.00		

Metro Wastewater Treatment Plant		
Vendor/Location	Description	Requested Amount
JCI Jones Chemicals - Sarasota, FL	Sodium Hypochlorite	\$464,400.00
Polydyne, Inc. - Riceboro, GA	Liquid Polymer	\$631,800.00
Southern Ionics, Inc. - West Point, MS	Sodium Bisulfite	\$137,025.00
Total: \$1,233,225.00		



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32. ZONING TEXT AMENDMENT for revisions to new City of Columbia Zoning Map effective August 30, 2021 in conjunction with the newly adopted Unified Development Ordinance to account for recently annexed and rezoned parcels. - *First reading was given on September 21, 2021 – Approved on second reading.*

Ordinance No: 2021-071 Amending the Official Zoning Map for the City of Columbia, Chapter 17, Unified Development Ordinance of the 1998 Code of Ordinances of the City of Columbia, South Carolina – Approved on second reading.

Proposal: Revise new City of Columbia Zoning Map effective August 30, 2021 in conjunction with the newly adopted Unified Development Ordinance to account for recently annexed and rezoned parcels.

Applicant: Rachel Bailey, Zoning Administrator

Staff Recommendation: Approval

PC Recommendation: 08/02/2021; Approval (5-0)

ORDINANCES - FIRST READING

33. Ordinance No.: 2021-079 Authorizing the City Manager to execute the First Extension Option of the Lease Renewal Agreement with Truist Bank f/k/a Branch Banking and Trust Company (BB&T) for use of 3905 Ensor Avenue (Lutheran Survey Building) – *Approved on first reading.*

Upon a motion made by Mayor Benjamin and seconded by Mr. McDowell, Council voted unanimously to give first reading approval to Ordinance No.: 2021-079 Authorizing the City Manager to execute the First Extension Option of the Lease Renewal Agreement with Truist Bank f/k/a Branch Banking and Trust Company (BB&T) for use of 3905 Ensor Avenue (Lutheran Survey Building).

34. Ordinance No.: 2021-080 Authorizing the City of Columbia, South Carolina to Execute and Deliver an Equipment Lease Purchase Agreement in the Amount of Not Exceeding \$9,000,000 Between the City and the Lessor Thereof to Defray the Cost of Acquiring Certain Equipment; and Other Matters Relating Thereto – *Approved on first reading.*



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Upon a motion made by Mr. Duvall and seconded by Ms. Devine, Council voted unanimously to give first reading approval to Ordinance No.: 2021-080 Authorizing the City of Columbia, South Carolina to Execute and Deliver an Equipment Lease Purchase Agreement in the Amount of Not Exceeding \$9,000,000 Between the City and the Lessor Thereof to Defray the Cost of Acquiring Certain Equipment; and Other Matters Relating Thereto.

APPOINTMENTS

35. Board of Zoning Appeals – *Approved*

Upon a motion made by Mr. Duvall and seconded by Ms. Devine, Council voted unanimously to appoint Sherard Duvall to the Board of Zoning Appeals for a term of three years. Mr. Rickenmann, Mr. McDowell, Mr. Duvall, Ms. Devine, Mr. Davis, and Mayor Benjamin voted aye. Mr. Brennan was absent for the vote.

36. Citizens Advisory Committee for Community Development – *Approved*

Upon a motion made by Mr. Rickenmann and seconded by Mayor Benjamin, Council voted unanimously to appoint William Baker and Julie Tuttle to the Citizens Advisory Committee for Community Development for a term of four years.

37. Citizens Advisory Council to the Columbia Police Department – *Approved*

Upon a motion made by Mayor Benjamin and seconded by Ms. Devine, Council voted unanimously to reappoint Seth Stoughton, Reverend W. Andrew Waldo, Robert "Bob" Wynn Jr., and Kimberly Castell and appoint Carlotta Stackhouse, Nyeem Al-Tariq McDaniels, Tracy Meyers, Patricia W. Brown, David J. Cochrane, and Robert D. Griffin to the Citizens Advisory Council to CPD for a term of three years.

38. Columbia Museum of Art – *Approved*

Upon a motion made by Mr. Rickenmann and seconded by Mr. Duvall, Council voted unanimously to appoint Earl Ellis to the Columbia Museum of Art Commission for a term of five years.

39. Columbia Prepares Advisory Committee – *Approved*



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Upon a motion made by Mr. Rickenmann and seconded by Mr. Brennan, Council voted unanimously to appoint J. Scott Jailette, Jennifer Diaby, Amy Husman, and Jean Harris to the Columbia Prepares Advisory Committee for a term of two years.

40. Hospitality Tax Advisory Committee – *Approved*

Councilor Duvall said the Hospitality Tax Advisory Committee has not had a function for the last two funding rounds. I will like to make a motion to extend the entire committee by a year and have Ashley adjust the time and give the remembers an extension of one year but keep the stagger in for next year so we do not start appointing again.

Upon a motion made by Mr. Duvall and seconded by Mayor Benjamin, Council voted unanimously to extend the terms of current Hospitality Tax Advisory Committee members for one year.

CITY COUNCIL COMMITTEE REFERRALS / REPORTS

Councilor Brennan said the Arts and Historic Committee met. We had a wonderful presentation on Amplify Columbia by Lee Snelgrove of One Columbia. We look forward to working with staff to bring general ideas forward to discuss with Council the local arts agency assignee, the future path of the arts community, and leveraging federal and state grants through an official authority that can team with us.

Upon a motion made by Mr. Davis and seconded by Mayor Benjamin, Council voted unanimously to refer a review of code enforcement policies to the Public Safety Committee.

Upon a motion made by Ms. Devine and seconded by Mayor Benjamin, Council voted unanimously to refer a discussion of the disposal of yard and leaf debris to the Environment and Infrastructure Committee.

PUBLIC INPUT

No comments were received at this time.

EXECUTIVE SESSION

Upon a motion made by Mr. Duvall and seconded by Mr. Davis, Council voted unanimously to enter into Executive Session at 4:04 p.m. for the discussion of **Items 41 and 42**.



We Are Columbia

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41. Receipt of legal advice related to matters covered by attorney-client privilege pursuant to S.C. Code §30-4-70(a)(2)

COVID-19

42. Discussion of negotiations incident to proposed contractual arrangements pursuant to S.C. Code §30-4-70(a)(2)

*Capital City Stadium Purchase and Sales Agreement
Riverfront Park Naming Rights Agreement*

Mayor Benjamin left the meeting at 4:48 p.m.

ADJOURNMENT

The meeting was adjourned at 4:57 p.m.

Respectfully submitted:

Erika D. Moore Hammond, CMC
City Clerk

RESOLUTION NO.: R-2021-117*Approving the Honorary Naming of the Intersection of
Oak Street and Gervais Street "Simon P. Bouie Square"*

WHEREAS, Simon P. Bouie is a native of Columbia, South Carolina; and,

WHEREAS, Mr. Bouie is a graduate of Booker T. Washington High School and Allen University, receiving his graduate education from Atlanta University School of Social Work and the Turner Seminary at the Interdenominational Theological Center in Atlanta, Georgia, and having previously served as chaplain at Crafts Farrow State Hospital and as the First African- American chaplain at the Warwick School for Boys in Warwick, New York, and having served as the fifty-first pastor of Mother Bethel A.M.E. Church, retiring as pastor of the historic Zion A.M.E. Church in Philadelphia, Pennsylvania; and,

WHEREAS, in March 1960, Mr. Bouie and a close friend were arrested and charged with trespassing as they attempted to desegregate a lunch counter at Eckerd's Drugstore in downtown Columbia, ultimately obtaining exoneration when the United States Supreme Court ruled in their favor in the landmark decision entitled *Bouie v. Columbia*; and,

WHEREAS, Mr. Bouie has been recognized with many outstanding awards, including the New York State Most Distinguished Award, the Long Island Alpha Phi Alpha Fraternity Award, the African Methodist Episcopal Church Distinguished Award and the New York Annual Conference Outstanding Award; and,

WHEREAS, Mr. Bouie is an activist and public servant deeply involved in the work of the community he serves, including his membership in the NAACP, One Hundred Black Men, Alpha Phi Alpha Fraternity, PUSH and the YMCA; NOW, THEREFORE,

BE IT RESOLVED this 19th day of October, 2021, that the Mayor and City Council of the City of Columbia hereby approve the honorary naming of the intersection of Oak Street and Gervais Street "Simon P. Bouie Square." The design and color of the honorary signs shall be subject to the approval of the Director of Public Works.

Requested by:

Mayor Benjamin _____

Mayor

Approved by:

City Manager

ATTEST:

Approved as to form:



City Attorney

City Clerk

Introduced: 10/19/2021

Final Reading: 10/19/2021

APPLICATION



We Are Columbia

HONORARY STREET/FACILITY AND SITE NAMING

Please see submission checklist for materials necessary for application**SUBMISSION MATERIALS MUST ACCOMPANY APPLICATION**Application form and materials are **DUE AT 4:00 p.m.** thirty (30) days prior to ceremony.

Is the designation: ☒ Street Naming Topper
 (sign will be posted above standard city street signs)
☐ Facility and site naming

Checklist: ☒ Application
☒ Council Member Sponsor
☒ Letter(s) of Support

Steve Benjamin
 Applicant Signature*

Stephen.Benjamin@Columbiasc.gov
 E-mail Address

Stephen K. Benjamin
 Print Name

1737 Main St. Columbia, SC 29201
 Mailing Address

803-545-3075
 Phone Number

10/05/2021
 Date

Check and initial acknowledging application requirements.

- ☒ SKB Signage wording cannot exceed twenty-six characters
- ☒ SKB Any changes to initial request must be made no more than 20 days prior to ceremony in writing
- ☒ SKB Signage wording and resolution will be finalized 15 days prior to ceremony
- ☒ SKB Applicant must provide letter(s) of support from neighborhood association, institution or business(s) impacted by the proposed honorary street, facility or site naming

APPLICATION



HONORARY STREET/FACILITY AND SITE NAMING

1. Name of individual or organization to be honored:

Simon P. Bowie

2. Name of street, facility or site proposed for designation:

Please list the intersecting street and block number. No more than two signs are permitted per designation.

1100 Oak Street

2300 Gervais Street

3. Attach sheet describing the significant contribution(s) this individual or organization has made in the community:
4. Location, date and time of unveiling ceremony:

TBD

5. Council Member Sponsor:

Name: Mayor Stephen K. Benjamin

FOR STAFF USE:

Council Member Sponsor: ☒ Approved ☐ Rejected

Public Works: ☐ Approved ☐ Rejected

Review Type: ☐ Staff ☐ Council _____ Council Date

Belton, Chanique J

Subject: FW: [EXTERNAL] Fwd: Simon P. Bouie Square, the corner of Gervais and Oak--let's move on this as soon as possible

From: Wilson, Teresa B <Teresa.Wilson@columbiasc.gov>

Sent: Thursday, October 14, 2021 11:09 AM

To: Belton, Chanique J <Chanique.Belton@columbiasc.gov>

Subject: Fwd: [EXTERNAL] Fwd: Simon P. Bouie Square, the corner of Gervais and Oak--let's move on this as soon as possible

Sent from my iPhone

Begin forwarded message:

----- Forwarded message -----

From: **Donaldson, Bobby** <DONALDBJ@mailbox.sc.edu>

Date: Wed, Oct 13, 2021 at 11:26 PM

Subject: Simon P. Bouie Square, the corner of Gervais and Oak--let's move on this as soon as possible

To: Benjamin, Stephen K (Steve) <Stephen.Benjamin@columbiasc.gov>, Steve Benjamin <stephenkbenjamin@gmail.com>

CC: Sam Johnson <samuelpatrickjohnson@gmail.com>

A native of Columbia, South Carolina, Dr. Simon P. Bouie is a proud graduate of Booker T. Washington High School and Allen University. He received his graduate education from Atlanta University School of Social Work and the Turner Seminary at the Interdenominational Theological Center in Atlanta, Georgia. Previously, he served as a chaplain at Crafts Farrow State Hospital in Columbia, South Carolina and as the first African American chaplain at the Warwick School for Boys in Warwick, New York.

Dr. Bouie served as pastor in South Carolina, New York and Philadelphia, where he was the fifty-first pastor of Mother Bethel A.M.E. Church. He retired as pastor of the historic Zion A.M.E. Church in Philadelphia, Pennsylvania.

In March 1960, Reverend Bouie and his close friend Talmadge Neal were arrested and charged with trespassing as they attempted to desegregate a lunch counter at Eckerd's Drugstore in downtown Columbia. Ultimately, the two students were vindicated when

the United States Supreme Court ruled in their favor in June 1964 in a landmark decision entitled *Bouie v. Columbia*.

Throughout Reverend Bouie's career, he has been recognized with many outstanding awards, including the New York State Most Distinguished Award, the Long Island Alpha Phi Alpha Fraternity Award, the African Methodist Episcopal Church Distinguished Award and the New York Annual Conference Outstanding Award.

As an activist and public servant, Reverend Bouie is deeply involved in the work of the community he serves. His memberships include the NAACP, One Hundred Black Men, Alpha Phi Alpha Fraternity, PUSH, and the YMCA.

He was married to the late Mrs. Willie Omia Jamison Bouie, a native of Sharon, South Carolina and a graduate of Claflin College. They have two sons, Harold and Eric, and three grandchildren, Yu, Shasha and Harold, Jr.



Center for Civil Rights History and Research
Ernest F. Hollings Special Collections Library

October 15, 2021

The Honorable Stephen K. Benjamin
1737 Main Street
Columbia, SC 29201

Dear Mayor Benjamin and Members of the Columbia City Council:

As the director of the Center for Civil Rights History and Research at the University of South Carolina and as one of the founding members of the Columbia SC 63: Our Story Matters Initiative, I am very pleased to submit a letter supporting the honorary renaming of the southeast corner of Gervais and Oak streets as the "Rev. Simon P. Bouie Square." From the inception of the Civil Rights Center and the Columbia SC 63 project, Rev. Bouie has been an energetic and invaluable contributor. Below you will find his professional credentials, his notable honors, and a summary of his vital role in combatting discrimination and injustice in our nation.

Born in Columbia, South Carolina in October 1939, Dr. Simon P. Bouie is a proud graduate of Waverly Elementary School, Booker T. Washington High School, and Allen University. He received his graduate education from Atlanta University School of Social Work and the Turner Seminary at the Interdenominational Theological Center in Atlanta, Georgia. Previously, he served as a chaplain at Crafts Farrow State Hospital in Columbia, South Carolina and as the first African American chaplain at the Warwick School for Boys in Warwick, New York.

Dr. Bouie served as a pastor in South Carolina, New York and Philadelphia, where he was the fifty-first pastor of Mother Bethel A.M.E. Church. He retired as pastor of the historic Zion A.M.E. Church in Philadelphia, Pennsylvania.

In March 1960, Reverend Bouie and his close friend Talmadge Neal were arrested and charged with trespassing as they attempted to desegregate a lunch counter at the Eckerd's Drugstore in downtown Columbia. Ultimately, the two students were vindicated when the United States Supreme Court ruled in their favor in June 1964 in a landmark decision entitled *Bouie v. Columbia*.

At the former site of the Eckerd's Drugstore, 1530 Main Street, a South Carolina Historical Marker reads:

On March 14, 1960, African American college students Simon Bouie of Allen University and Talmadge Neal of Benedict College led a protest march to the Eckerd's luncheonette. The pair, inspired by student sit-ins in Greensboro, North Carolina, were jailed and convicted for refusing to leave their seats after being denied service due to their race. In *Bouie v. Columbia* (1964), the United States Supreme Court overturned the students' convictions. The sit-in demonstration was part of broader protest movements against racial segregation in Columbia and the nation.

Throughout Reverend Bouie's career, he has been recognized with many outstanding awards, including the New York State Most Distinguished Award, the Long Island Alpha Phi Alpha Fraternity Award, the African Methodist Episcopal Church Distinguished Award, the New York Annual Conference Outstanding Award, and the Key to the City of Columbia, South Carolina.

As an activist and public servant, Reverend Bouie is deeply involved in the work of the community he serves. His memberships include the NAACP, One Hundred Black Men, Alpha Phi Alpha Fraternity, PUSH, and the YMCA.

He was married to the late Mrs. Willie Omia Jamison Bouie, a native of Sharon, South Carolina, a graduate of Claflin College, and a participant in a demonstration at the South Carolina Statehouse that led to the landmark United States Supreme Court decision, *Edwards v. South Carolina*. They have two sons, Harold and Eric, and three grandchildren, Yu, Shasha and Harold, Jr.

Given Reverend Bouie's exemplary professional record, his pivotal role in transforming our city, and the location of his extant family home at 1112 Oak Street in the Historic Waverly community, I strongly recommend that Columbia city leaders recognize Reverend Bouie by designating the corner of Gervais and Oak Streets as the Simon P. Bouie Square.

Best regards,



Bobby J. Donaldson, Ph.D.
Associate Professor, Department of History
Director, Center for Civil Rights History & Research



We Are Columbia

**City of Columbia
A Proclamation**

WHEREAS, the City of Columbia is honored to have the presence of the United States Navy in our community, and

WHEREAS, the State of South Carolina is home for more than 5,800 active-duty enlisted Sailors and naval officers, 776 Navy Reservists, and 13,091 active-duty and Reserve retirees, and

WHEREAS, the United States Navy is instrumental in ensuring the safety and security of \$41.4 billion in annual exports from the State of South Carolina, and

WHEREAS, the citizens of Columbia take great pride in supporting our namesake vessel, USS Columbia, and

WHEREAS, the Columbia Navy Week hosts special events and programs for the state to increase the community's knowledge and understanding of their Navy and its global mission, and

WHEREAS, Columbia Navy Week includes publicly-available events throughout the City.

NOW, THEREFORE, I Mayor Stephen K. Benjamin, along with my fellow members of Columbia City Council, do hereby proclaim the occasion of the aforesaid events to be

Columbia Navy Week

in the City of Columbia.

Stephen K. Benjamin
Mayor

Sam Davis
District I, Council Member

Tameika Isaac Devine
At-Large, Council Member

Howard E. Duvall, Jr.
At-Large, Council Member

Edward H. McDowell, Jr.
District II, Council Member

Daniel J. Rickenmann
District IV, Council Member

Will Brennan
District III, Council Member

AGREEMENT FOR PROFESSIONAL SERVICES

THIS AGREEMENT is entered into by and between The City of Columbia (hereinafter called the "City") and One Columbia for Arts and History (hereinafter called the "Contractor") to provide the services herein described.

For and in consideration of the mutual covenants and promises contained herein, the parties agree as follows:

1. CONTRACT FOR SERVICES

The City hereby engages the Contractor and the Contractor hereby agrees to perform the services hereafter set forth.

2. SCOPE OF SERVICES AND TIME OF PERFORMANCE

The City designates the Contractor as the official Local Arts Agency for the City for the term of this Agreement and for the benefit of the Contractor to pursue eligible grants. The Contractor shall in a satisfactory and proper manner as determined by the City perform tasks necessary to complete the projects as outlined in Appendix A, attached hereto. The Contractor has specialized knowledge to complete the projects without any training from the City and shall perform the tasks in the order and in the manner that he or she determines is most effective and efficient without any City control over the details of Contractor's performance.

The Term of this Agreement commenced on September 1, 2021 and shall expire on June 30, 2022.

3. METHOD OF PAYMENT

It is agreed that in no event will the total compensation to be paid hereunder exceed Fifty-Two Thousand Three Hundred Fifty-Three Dollars and No/100 (\$52,353.00).

Payment shall be made for work performed every four (4) weeks and no later than by Thursday of the following week after the fourth week.

4. FINDINGS CONFIDENTIAL

All of the reports, information, data, records or documents of any kind, prepared or assembled by the Contractor under this Contract are confidential and the Contractor agrees that they shall not be made available to any individual or organization without the prior written approval of the City.

5. ACCESS TO RECORDS

The Contractor shall make available for examination all of its records with respect to all matters covered by this contract and shall maintain such records for a period not less than three (3) years after receipt of final payment under this Contract.

6. COPYRIGHT

No reports or other documents produced in whole or in part under this Contract shall be the subject of an application for copyright by or on behalf of the Contractor.

7. AMENDMENTS

The parties may amend this Agreement at any time provided that such amendments are executed in writing, signed by a duly authorized representative of both parties, and approved, where applicable, by the City's governing body.

The City may, in its discretion, amend this Agreement to conform with federal, state, or local governmental guidelines, policies and available funding amounts, or for other reasons. If such amendments result in a change in the funding, the scope of services, or schedule of, the activities to be undertaken as part of the Agreement, such modifications will be incorporated only by written amendment signed by both parties.

8. ASSIGN ABILITY/SUBCONTRACTING

The Contractor shall not assign or subcontract any interest in this Agreement and shall not transfer any interest in the same without the prior written consent of the City. The Contractor shall be as fully responsible to the City for the acts and omission of its sub-contractors, as it is for the acts and omissions of persons directly employed by the Contractor.

The Contractor shall furnish and cause each of its subcontractors to furnish all information and reports required hereunder.

9. INDEPENDENT CONTRACTOR

Nothing contained in this agreement is intended to, or shall be construed in any manner, as creating or establishing the relationship of employer/employee between the parties. The Contractor shall at all times remain an independent contractor with respect to the services to be performed under this agreement. The City shall be exempt from payment of all unemployment compensation, FICA, retirement, life and/or medical insurance and workers' compensation insurance.

10. TERMINATION OF CONTRACT FOR CAUSE

If, through any cause, the Contractor shall fail to fulfill in a timely and proper manner these obligations under this Contract, or if the Contractor shall violate any of the covenants, agreements, or stipulations of this Contract, the City shall thereupon have the right to terminate this Contract by giving written notice to the Contractor of such termination and specifying the effective date thereof, at least five (5) days before the effective date of such termination. In such event, all finished or unfinished documents, data studies, surveys and reports prepared under this Contract shall become the property of the City.

Notwithstanding the above, the Contractor shall not be relieved of liability to the City for damages sustained by the City by virtue of any breach of the Contract by the Contractor and the

City may withhold any payments to the Contractor until such time as the exact amount of damages due to the City from the Contractor is determined.

11. TERMINATION FOR CONVENIENCE OF THE CITY

The City may terminate this Contract at any time by giving written notice to the Contractor of such termination and specifying the effective date thereof, at least seven (7) days before the effective date of such termination. In that event, all finished or unfinished documents and other material as described in Paragraph 5 above shall, at the option of the City, become its property.

12. INTEREST OF CONTRACTOR

The Contractor covenants that it presently has no interest and shall not acquire any interest, direct or indirect, which would conflict in any manner or degree with the performance of services required to be performed under this Contract or which is adverse to the interests of the City of Columbia. The Contractor further covenants that in the performance of this Contract no person having such interest shall be employed.

The Contractor is expected to make its services available to other entities but agrees to refrain from representing other entities in matters where the position of the City conflicts with that of the other entity. The City may at its discretion, waive this provision. The Contractor has provided a list of all of its clients with whom there may be potential conflicts with the City. This list shall be supplemented throughout the duration of this contract.

13. EQUAL EMPLOYMENT OPPORTUNITY

In carrying out the program, the Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The Contractor shall take affirmative action to insure that applicants for employment, without regard to their race, creed, color, religion, ancestry, sex, sexual orientation, gender identity, national origin, disability or other handicap, age, marital status, or status with regard to public assistance. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor shall post in conspicuous places, available to employees and applicants for employment, notices to be provided by the government setting forth the provisions of this nondiscrimination clause. The Contractor will incorporate these requirements in all subcontracts for program work.

14. SEVERABILITY

If any provision of this Agreement is held invalid, the remainder of this Agreement shall not be affected thereby if such remainder would then continue to conform to the terms and requirements of Applicable law.

15. COMPLIANCE WITH LOCAL LAWS

The Contractor shall comply with all applicable laws, ordinances, and codes of the state and local government in performing the work provided under this Contract.

16. PERSONNEL

All of the services required hereunder shall be performed by the Contractor and all personnel engaged in the work will be fully qualified and shall be authorized or permitted under state and local law to perform the services identified in Appendix A, Scope of Services.

The Contractor represents that he/she has, or will secure at his/her own expense, all personnel required in performing the services under the Contract.

I 7. GOVERNING LAW

This Agreement shall be interpreted, construed, and enforced in accordance with the Jaws of South Carolina. Any dispute arising between any of the parties hereto regarding the subject matter of this Agreement shall be subject to the exclusive jurisdiction of the federal and state courts within the State of South Carolina.

IN WITNESS WHEREOF, the City and the Contractor have entered into this Agreement as of the date of the last signature below.

WITNESSES TO CONTRACTOR:

ONEColumbia

By: _____
Name: _____
Title: _____
Date: _____

WITNESSES TO CITY:

CITY OF COLUMBIA, SOUTH CAROLINA

By: _____
Name: Teresa B. Wilson
Title: City Manager
Date: _____

APPROVED AS TO FORM

T. A. Knox

10/8/2021

Legal Department City of Columbia, SC

APPENDIX A – DELIVERABLES



August 26, 2021

City of Columbia
Attn: City Manager Teresa Wilson
1737 Main Street
Columbia, SC 29201

Deliverables September 1, 2021 to June 30, 2022

One Columbia will advise, amplify and advocate for strengthening and unifying the arts and history community by supporting arts and historic preservation tourism, promoting collaboration, coordinating advertisements, celebrating the role of arts and history in this community, and will continue to serve in the role of an office of cultural affairs for the City of Columbia.

Deliverables include:

- Amplify information about cultural events, activities and opportunities reaching citizens and tourists via multiple promotional methods
- Developing arts audiences through programs that engage the community, demonstrate the breadth of arts activities and provide access to new cultural experiences
- Conduct public art initiatives for commissioning new works of public art on the City's behalf and maintain a directory of the Midlands' public art
- Encourage development of busking and street performance as a method for making Columbia more livable and a creative destination for tourists
- Facilitate inclusive thematic celebrations of Columbia's creativity and history through partnerships among arts organizations
- Provide meeting space and other services for artists and arts organizations
- Maintain and share information about the impact of the arts and culture sector
- Report on activities and deliverables within 30 days of the end of the fiscal year

One Columbia for Arts & Culture is very grateful for your recognition of the enduring value of the arts and historic preservation in advancing Columbia's standing as a vibrant and livable community where creativity and preservation can be fostered to the benefit of residents and visitors alike. With your support, we will continue to utilize artistic expression and creativity in ways that solve problems, create economic incentives and make Columbia a vibrant and unique place to live and work. Thank you for this opportunity.

Sincerely,

R. Lee Snelgrove
Executive Director
One Columbia for Arts & Culture

215 Taylor Street
Columbia, South Carolina 29201

803.254.6008
onecolumbia.org





CONTRACT FOR SERVICES

This Contract is being awarded using the BID002-21-22-KSB Officials, Umpires and Scorekeepers.

PURPOSE – This Contract is entered into as of the date of the last signature affixed hereto, by and between the City of Columbia, South Carolina (hereinafter referred to as the “City”) and HOTEPS SPORTS with legal address and principal place of business at 2123 Barhamville Road, Columbia SC 29204 (hereinafter referred to as the “Contractor”), for the purchase of the services of Officials, Umpires and Scorekeepers.

For and in consideration of the mutual covenants and promises contained herein, the parties agree as follows:

1. **SCOPE and SCHEDULE OF SERVICES** – Upon written notification by the City to proceed, the Contractor shall provide the services fully described in Exhibit A, attached hereto. The Contractor shall complete all services under this AGREEMENT within the timeframes set forth in Exhibit A.
2. **SUPPLEMENTAL OR ADDITIONAL SERVICES** – The City may require supplemental or additional services of the Contractor or recommended by the Contractor and approved by the City in writing.

The Contractor must obtain written approval from the City for any supplemental or additional services prior to the services being delivered. If the Contractor fails to obtain prior written approval to deliver the services, the City is under no obligation to compensate the Contractor for the services received.

3. **TERM OF CONTRACT / DELIVERY:** The initial contract term is anticipated to begin August 2021. The term shall be for one (1) year, with the option to renew for one (1) additional year. All prices will remain in effect throughout the term of any potentially awarded contract.
4. **SCHEDULE FOR DELIVERY OF SERVICES** – The Contractor shall deliver any and all services under this Contract under the direction of the Parks & Recreation Department.

5. COMPENSATION – (See Exhibit A)

- A. The compensation to be paid by the City to the Contractor under this Agreement, to Public Works Equipment shall not exceed Fifty-Nine Thousand, Three Hundred Ten Dollars and Zero Cents, (\$59,310.00).
- B. The Contractor shall be paid upon submission of properly certified invoices to the City of Columbia Accounting Division, P.O. Box 147, Columbia, S.C. 29217. At the prices stipulated on the contract at the time the order is placed, after delivery and acceptance the of services, less deductions if any, as provided, invoices shall contain the Contract Number and Purchase Order Number. The City of Columbia will not pay invoices submitted from a third party. Invoices shall be submitted by the company shown on the Purchase Order.

Failure of the Contractor to follow these invoice requirements will result in the delay of payment of the invoice.

6. SPECIFIC TERMS AND CONDITIONS PURSUANT TO BID002-21-22-KSB OFFICIALS, UMPIRES AND SCOREKEEPERS

Contractor agrees, under the terms as outlined in the Scope and Schedule of Services and at his/her/their own proper cost and expense, to furnish all the materials, supplies, equipment, labor, insurance and any other accessories, items and/or services necessary to complete the said project.

As applicable, the following additional Contract Documents combined with this contractual agreement, comprises the Contract between the Owner and Contractor and are incorporated by reference to this agreement:

1. This Contract
2. BID002-21-22-KSB Officials, Umpires and Scorekeepers.
3. All applicable bonds, insurance and other applicable documents
4. Any modifications, including Change Orders, duly delivered after execution of Contract.

MISCELLANEOUS

- A. ~~Nothing in this Agreement shall be construed to give any rights or benefits to anyone other than the City and the Contractor.~~
- B. The Contractor shall be responsible for delivery of all the services required by this Agreement. The Contractor does not act as the City's agent or employee.

City of Columbia and HOTEK SPORTS

- C. The Contractor will not assign or sublet its obligations to provide the services required by this Agreement without the written consent of the City. The Contractor shall be as fully responsible to the City for the acts and omission of its Subcontractors, as it is for the acts and omissions of persons directly employed by the Contractor.

The Contractor shall furnish and its Subcontractors shall furnish all information and reports required hereunder.

- D. In the event there are any disagreements between the City and the Contractor with regard to any of the requirements, specifications or interpretation of this Agreement, the Contractor agrees to defer to the reasonable interpretations of the City as, from time to time, may be made by the City. Ambiguities in the terms of this Agreement, if any, shall not be construed against the City.

- E. This Agreement shall be construed in accordance with the laws and City of Columbia Code of Ordinances and those of the State of South Carolina. The Contractor agrees to subject itself to the jurisdiction and venue of the courts of Richland or Lexington County, State of South Carolina as to all matters and disputes arising or to arise under this Agreement and the performance thereof. The City may seek attorney's fees and the Contractor agrees to pay such fees as awarded by the Court or other body. No attorney's fees may be sought by, nor will be paid to, the Contractor.

- F. This Agreement represents the entire agreement between the City and the Contractor and supersedes all prior communications, negotiations, representations or agreements, either written or oral. The parties may amend this Agreement at any time provided that such Amendments are executed in writing, signed by a duly authorized representative of both organizations, and approved, where applicable, by the City's governing body.

The City may, in its discretion, amend this Agreement to conform with federal, state, or local governmental guidelines, policies and available funding amounts, or for other reasons. If such Amendments result in a change in the funding, the schedule of services, and the activities to be undertaken as part of the Agreement; such modifications will be incorporated only by written amendment signed by both the City and the Contractor.

- G. The failure of either the Contractor or the City to insist upon the strict performance of any provision of this Agreement shall not be deemed to be a waiver of the right to insist upon strict performance of such provision or of any other provision of this Agreement at any time. Partial payment by the City shall not be construed as a waiver. Waiver of any breach of this Agreement shall not constitute waiver of a subsequent breach.

- H. In the event any provision of this Agreement is determined to be void or unenforceable, all other provisions shall remain in full force and effect.

- I. This Agreement is subject to City Council approval.
- J. The Contractor acknowledges, for itself and its Subcontractor, that it is subject to the provisions of the 1991 Ethics Reform Act (8-13-100, et seq, South Carolina Code of Laws, 1976, as amended). Under this Act, “A person may not, directly or indirectly, give, offer, or promise anything of value to a public official, public member, or public employee with intent to:
 - 1. influence the discharge of a public official’s, public member’s, or public employee’s official responsibilities;
 - 2. influence a public official, public member, or public employee to commit, aid in committing, collude in, or allow fraud on a governmental entity; or,
 - 3. induce a public official, public member, or public employee to perform or fail to perform an act in violation of the public official’s, public member’s, or public employee’s official responsibilities.

“Anything of value” includes, but is not limited to, lodging, transportation, entertainment, food, meals, beverages, money, gifts, honorariums, discounts and interest-free loans.

- K. In carrying out the service, the Contractor shall not discriminate against any employee or applicant for employment because of that employee or applicant’s age, sex, gender, gender identity or expression, sexual orientation, race, religion, creed, color, disability, national origin, veteran or military status, political affiliation, or any other characteristic protected by federal, state, or local laws (“protected characteristic”). The Contractor shall take affirmative steps to ensure equal employment opportunities for all applicants for employment, without regard to their protected characteristics. For the purpose of this Non-Discrimination in Contracting Policy, the term “sex” includes medical needs and / or lactation needs arising from pregnancy, childbirth, or related medical conditions pursuant to the South Carolina Pregnancy Accommodations Act, 2018 S.C. Act No. 244. This Non-Discrimination in Contracting Policy extends to all aspects of the Contractor operations, including, but not limited to the Contractor employment practices (including selection, hiring, assignment, re-assignment, training, promotion, transfer, compensation, layoff, leave of absence, return from layoff or leave of absence, discipline, and termination); selection of volunteers and vendors, and provision of services. The Contractor shall post in conspicuous places, available to employees and applicants for employment, notices to be provided by the government setting forth the provisions of this Non-Discrimination in Contracting Policy. The

City of Columbia and HOTEK SPORTS

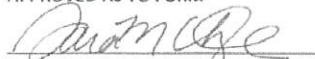
Contractor shall incorporate the provisions of this Non-Discrimination in Contracting Policy in all subcontracts for service work.

- L. This Agreement shall be binding upon the respondent and upon its successors and assignees. This Agreement shall be binding upon the City in accordance with its terms and provisions.
- M. All of the reports, information, data, records or documents of any kind, prepared or assembled by the Contractor under this Agreement are matters of public record, but the Contractor agrees that they shall only be made available to any individual or organization by the City and the Contractor shall not make them available to any individual or organization without the prior written approval of the City.

Witness the parties' respective hands and seals on the date first written above.

CITY OF COLUMBIA, SOUTH CAROLINA

APPROVED AS TO FORM


Legal Department City of Columbia, SC
9/24/2021

Witness

Teresa Wilson, City Manager

Date: _____

HOTEK SPORTS

 SIGN HERE

WARREN M. BOLDEN
Print

Warren M. Bolden
Signature

Date: 9/29/2021

City of Columbia and HOTEK SPORTS

List of Exhibits

Exhibit A – BID Response

Event Number	BID002-21-22-KSB	Organization	City of Columbia, SC
Event Title	Officials, Umpires and Scorekeepers	Workgroup	Purchasing
Event Description		Event Owner	Kimberly Brown
Event Type	IFBs	Email	kimberly.brown@columbiasc.gov
Issue Date	7/9/2021 02:22:08 PM (ET)	Phone	
Close Date	8/24/2021 02:00:00 PM (ET)	Fax	

Responding Supplier	City	State	Response Submitted	Lines Responded	Response Total
HOTEP SPORTS	Columbia	SC	8/23/2021 10:11:40 AM (ET)	1	\$59,310.00

Please note: Lines Responded and Response Total only includes responses to specification. No alternate response data is included.

Contract Amendment #1**Bid015-20-21-ASH****National Interior Solutions, Limited Liability Corporation****September 23, 2021**

Description of Change: Request change in Agreement for services between the City of Columbia (City) and National Interior Solutions, Limited Liability Corporation (Vendor) for the following:

- Add funding in the amount of \$142,700.00 (R212591) for COVID-19 building cleaning services during the term of July 1, 2021 – June 30, 2022.
- Add two IT department locations at 1136 Washington Street and 1401 Main Street for biweekly deep cleaning services.
- Change the 911 Center cleaning services from biweekly to weekly at \$84.00 per week.
- Extra funding provided for emergency events.

All other provisions of the Agreement, except as herein modified or changed, remain in full force and effect.

This Change is Acceptable:**Name of Firm**

National Interior Solutions, Limited Liability Corporation

Naz Sensi

Print Name

[Signature]

Signature

09/29/21

Date

City of Columbia

Office of the City Manager

Teresa Wilson, City Manager

Signature

Date

Witness

APPROVED AS TO FORM*[Signature]*

Legal Department City of Columbia, SC

9/29/2021



Quote

Jul 1, 2021

BILL TO

City of Columbia Accounting Division

P.O. Box 147

Columbia, SC 29217

Accountspayable@columbiasc.gov

FROM

National Interior Solutions, LLC

500 NW 2nd Ave, #10655

Miami, FL 33101

support@natinteriors.com

+1 8572848431

INVOICE ITEMS

AMOUNT

Disinfection Services

\$6,371.00

1 unit x \$6,371.00/unit

Disinfection Services - 911 Center (weekly)

\$84.00

1 unit x \$84.00/unit

\$6,455.00

MESSAGE

Contract BID015-20-21-ASH



National Interior Solutions, LLC
 500 Northwest 2nd Avenue
 Miami, Florida 33101
 United States
 info@natinteriors.com
 Phone: +17867632959

Price Quote: #0000340
 Issued on: Sep 7, 2021
 Expiry Date: Oct 6, 2021

BILL TO

City of Columbia Accounting Division
 P.O. Box 147
 Columbia, SC 29217
 Accountspayable@columbiasc.gov

Product or Service	Price	Quantity	Line Total
Disinfection Services - 1136 Washington Biweekly - Additional floor cost	\$165.00	1	\$165.00
	Subtotal		\$165.00
	Total Price:		\$165.00



National Interior Solutions, LLC
 500 Northwest 2nd Avenue
 Miami, Florida 33101
 United States
 info@natinteriors.com
 Phone: +17867632959

Price Quote: #0000341
 Issued on: Sep 7, 2021
 Expiry Date: Oct 6, 2021

BILL TO

City of Columbia Accounting Division
 P.O. Box 147
 Columbia, SC 29217
 Accountspayable@columbiasc.gov

Product or Service	Price	Quantity	Line Total
Disinfection Services - 1401 Main Street Biweekly - Additional floor cost	\$120.00	1	\$120.00
	Subtotal		\$120.00
	Total Price:		\$120.00



National Interior Solutions, LLC
500 Northwest 2nd Avenue
Miami, Florida 33101
United States
info@natinteriors.com
Phone: +17867632959

Estimate

Issued on: Sep 9, 2021

BILL TO

City of Columbia Accounting Division

P.O. Box 147

Columbia, SC 29217

Accountspayable@columbiasc.gov

Product or Service	Price	Quantity
Disinfection Services - Emergency Call	\$350.00*	1

* \$350 is a minimum service call price. Total pricing may change depending on the size and quantity of locations.

Renewal Order prepared by:

Todd Long

todd.long@centralsquare.com

Renewal Order #: Q-61125

Start Date: December 1, 2021

End Date: November 30, 2022

Billing Frequency: Yearly

Renewal Order prepared for:

Jacquelyn Richburg, Telecommunications Director
Columbia-Richland 911 Communications Center (CRCC)2020 Hampton St.
Columbia, SC 29202
(803) 988-8006

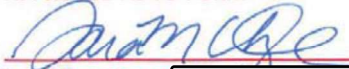
Thank you for your continued business. We at CentralSquare appreciate and value our relationship and look forward to serving you in the future. CentralSquare provides software that powers over 8,000 communities. More information about all of our products can be found at www.centralsquare.com.

WHAT SOFTWARE IS INCLUDED?

PRODUCT NAME	QUANTITY	UNIT PRICE	TOTAL
Administrator Client SWL	1	0.00 USD	1,441.64 USD
Advanced Timers-Flight Following Module	1	0.00 USD	1,441.64 USD
ANI/ALI Interface License (Positron)	1	0.00 USD	2,594.93 USD
Archive & Reporting Server License (Replication)	1	0.00 USD	5,334.03 USD
AVL Interface (New Custom)	1	0.00 USD	12,974.68 USD
CA Arcserve High Availability for Enterprise OS Servers, Includes 3 Years Support/Maintenance - Production, Hot Standby and Disaster Recovery Servers	1	0.00 USD	5,310.19 USD
CAD Mapping Support Fees	1	0.00 USD	635.04 USD
Closed Record Download RMS Data Transfer Interface (Firehouse RMS for CFD)	1	0.00 USD	4,324.90 USD

MORE INFORMATION AT CENTRALSQUARE.COM

APPROVED AS TO FORM


Legal Department

10/6/2021

Packet Pg. 54

Renewal Order prepared by:

Todd Long

todd.long@centralsquare.com

Closed Record Download RMS Data Transfer Interface (visionAir RMS to CPD)	1	0.00 USD	4,324.90 USD
Closed Record Download RMS Data Transfer Interface (Zoll)	1	0.00 USD	4,324.90 USD
Controlling Dispatcher Module (included in base CAD)	1	0.00 USD	0.00 USD
Custom MDC Interface License (Motorola PMDS-RCSO)	1	0.00 USD	12,109.69 USD
Custom MDC Interface License (VisionAir Mobile - CPD)	1	0.00 USD	32,292.53 USD
Dispatch Rules Module (included in base CAD)	1	0.00 USD	0.00 USD
Dispatcher/Call Taker Client SWL	1	0.00 USD	69,198.29 USD
Dispatcher/Call Taker SWL's (Remote backup-disaster site)	1	0.00 USD	5,189.88 USD
DR ANI/ALI Interface License (Positron)	1	0.00 USD	2,594.93 USD
DR AVL Interface (New Custom)	1	0.00 USD	12,974.68 USD
DR Custom MDC Interface License (Motorola PMDS-RCSO)	1	0.00 USD	5,766.53 USD
DR Custom MDC Interface License (VisionAir Mobile - CPD)	1	0.00 USD	5,766.53 USD
DR Interface Manager License	1	0.00 USD	1,441.64 USD
DR Paging Interface License	1	0.00 USD	2,594.93 USD
Event Playback Module	1	0.00 USD	2,162.45 USD

Renewal Order prepared by:

Todd Long

todd.long@centralsquare.com

File Attachments Module for Disaster Recovery Environment for CAD & Mobile	1	0.00 USD	648.73 USD
File Attachments Module for Production Environment (CAD & Mobile)	1	0.00 USD	2,162.45 USD
File Attachments Module for Test/Training Environment for CAD & Mobile	1	0.00 USD	648.73 USD
Geofile Cross Reference Module (point in polygon)	1	0.00 USD	2,811.19 USD
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Remote Back-up Server SWL	1	0.00 USD	2,883.26 USD
Snapshot Module	1	0.00 USD	720.81 USD

Renewal Order prepared by:

Todd Long

todd.long@centralsquare.com

SOP Module	1	0.00 USD	2,162.45 USD
Standard EMS Integration	1	0.00 USD	3,184.31 USD
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VisiCAD Primary Server Multi Agency License	1	0.00 USD	8,649.79 USD
VisiNet Browser	1	0.00 USD	7,208.16 USD
VisiNet Browser Reports Module (included in new sales)	1	0.00 USD	0.00 USD

WHAT SERVICES ARE INCLUDED?

DESCRIPTION	TOTAL
Escrow Fee Recurring	\$950.00 USD
Renewal Order Total:	291,434.76 USD

MORE INFORMATION AT CENTRALSQUARE.COM

Renewal Order prepared by:

Todd Long

todd.long@centralsquare.com

Billing Information

Fees will be payable within 30 days of invoicing.

Please note that the Unit Price shown above has been rounded to the nearest two decimal places for display purposes only. The actual price may include as many as five decimal places. For example, an actual price of \$21.37656 will be shown as a Unit Price of \$21.38. The Total for this quote has been calculated using the actual prices for the product and/or service, rather than the Unit Price displayed above.

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CITY OF COLUMBIA

Columbia – Richland 9-1-1 Communications

1800 Laurel St | Columbia, South Carolina 29201
Phone: 803-988-8005 Fax: 803-255-8139

October 1, 2021

TO: Henry Simons, Assistant City Manager

FROM: Jacquelyn Richburg, 911 Interim Director

RE: 2021/2022 Central Square Software Systems Annual aintenance
Renewal Agreement

Please find attached for your review and approval in reference to the renewal of the contract agreement between the City of Columbia and Central Square Software Systems. The renewal of this contract will further extend the Computer Aided Dispatch (CAD) system services provided by Central Square.

This agreement will continue service through November 30, 2022 and is jointly funded (50/50 split) with Richland County:

City Account 1012701	Object Code 638200	\$145,717.38
County Account 2082702	Object Code 638200	\$145,717.38

Total Cost: \$291,434.76

Thank you for your consideration on this matter,

Jacquelyn Richburg, Interim Director

JR/dj

Reviewed & Approved 10/04/2021



Renewal Order prepared by:

Todd Long

todd.long@centralsquare.com

Renewal Order #: Q-61125

Start Date: December 1, 2021

End Date: November 30, 2022

Billing Frequency: Yearly

Renewal Order prepared for:

Jacquelyn Richburg, Telecommunications Director
Columbia-Richland 911 Communications Center (CRCC)2020 Hampton St.
Columbia, SC 29202
(803) 988-8006

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WHAT SOFTWARE IS INCLUDED?

PRODUCT NAME	QUANTITY	UNIT PRICE	TOTAL
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Closed Record Download RMS Data Transfer Interface (Firehouse RMS for CFD)	1	0.00 USD	4,324.90 USD

MORE INFORMATION AT CENTRALSQUARE.COM



Renewal Order prepared by:

Todd Long

todd.long@centralsquare.com

Closed Record Download RMS Data Transfer Interface (visionAir RMS to CPD)	1	0.00 USD	4,324.90 USD
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DR Paging Interface License	1	0.00 USD	2,594.93 USD
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MORE INFORMATION AT CENTRALSQUARE.COM



Renewal Order prepared by:
 Todd Long
 todd.long@centralsquare.com

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Renewal Order prepared by:
 Todd Long
 todd.long@centralsquare.com

SOP Module	1	0.00 USD	2,162.45 USD
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WHAT SERVICES ARE INCLUDED?

DESCRIPTION

TOTAL

Escrow Fee Recurring

\$950.00 USD

Renewal Order Total:

291,434.76 USD

MORE INFORMATION AT CENTRALSQUARE.COM



Renewal Order prepared by:

Todd Long

todd.long@centralsquare.com

Billing Information

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MORE INFORMATION AT CENTRALSQUARE.COM



CITY OF COLUMBIA

Columbia – Richland 9-1-1

Communications

1800 Laurel St | Columbia, South Carolina 29201

Phone: 803-988-8005 Fax: 803-255-8139

October 13, 2021

TO: Teresa B. Wilson, City Manager

FROM: Jacquelyn Richburg, 911 Interim Director

RE: 2021/2022 Central Square Software Systems Annual
Maintenance Renewal Agreement

Please find attached for your review and approval in reference to the renewal of the contract agreement between the City of Columbia and Central Square Software Systems. This agreement has been reviewed by ACM Simons as well as the City of Columbia's Legal department; the renewal of this contract will further extend the Computer Aided Dispatch (CAD) system services provided by Central Square. This agreement will continue service through November 30, 2022 and is jointly funded (50/50 split) with Richland County:

City Account 1012701	Object Code 638200	\$145,717.38
County Account 2082702	Object Code 638200	\$145,717.38

Total Cost: \$291,434.76

Thank you for your consideration on this matter,
Jacquelyn Richburg, Interim Director

Signature: _____

Review Date: _____

JR/dj

Kelly, Ebony I

From: Jacobs, Dominique M
Sent: Monday, October 4, 2021 4:32 PM
To: Kelly, Ebony I
Cc: Richburg, Jacquelyn E; Navarro Jr., Felipe D
Subject: Centralsquare Service Agreement Renewal
Attachments: Central Square Memo to Mr. Simons.doc; Columbia-Richland 911 Communications Center, SC - Dec 2021 Renewal.pdf

Good Afternoon Ebony,

I hope this has been a productive Monday for you, we are in the process of renewing our service agreement with Centralsquare Software Systems so that we will be able to continue to assist the citizens of Columbia in their time of need. I have attached a memo as well as the quote given to us by Centralsquare to this email for Mr. Simons' review and approval. The legal department is also reviewing this agreement at this time as well, once we have received approval from ACM Simons and the legal department we will submit it to Mrs. Wilson for her approval as well. If there is anything additional that you or Mr. Simons may require please do not hesitate to reach out.

Thank you

**Dominique Jacobs, Administrative Coordinator**

Columbia-Richland Communications
1800 Laurel St, Columbia, SC, 29201
P: 803-988-8005
F: 803-255-8139



Reviewed & Approved 10/04/2021



CITY OF COLUMBIA

Columbia – Richland 9-1-1 Communications

1800 Laurel St | Columbia, South Carolina 29201
Phone: 803-988-8005 Fax: 803-255-8139

October 1, 2021

TO: Henry Simons, Assistant City Manager

FROM: Jacquelyn Richburg, 911 Interim Director

RE: 2021/2022 Central Square Software Systems Annual Maintenance
Renewal Agreement

Please find attached for your review and approval in reference to the renewal of the contract agreement between the City of Columbia and Central Square Software Systems. The renewal of this contract will further extend the Computer Aided Dispatch (CAD) system services provided by Central Square.

This agreement will continue service through November 30, 2022 and is jointly funded (50/50 split) with Richland County:

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County Account 2082702	Object Code 638200	\$145,717.38

Total Cost: \$291,434.76

Thank you for your consideration on this matter,

Jacquelyn Richburg, Interim Director

JR/dj

Reviewed & Approved 10/04/2021



Renewal Order prepared by:
Todd Long
todd.long@centralsquare.com

Renewal Order #: Q-61125
Start Date: December 1, 2021
End Date: November 30, 2022
Billing Frequency: Yearly

Renewal Order prepared for:
Jacquelyn Richburg, Telecommunications Director
Columbia-Richland 911 Communications Center (CRCC)
2020 Hampton St.
Columbia, SC 29202
(803) 988-8006

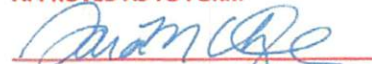
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WHAT SOFTWARE IS INCLUDED?

PRODUCT NAME	QUANTITY	UNIT PRICE	TOTAL
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Closed Record Download RMS Data Transfer Interface (Firehouse RMS for CFD)	1	0.00 USD	4,324.90 USD

MORE INFORMATION AT CENTRALSQUARE.COM

APPROVED AS TO FORM


Legal Department City of Columbia, SC

10/6/2021

Packet Pg. 68



Renewal Order prepared by:
 Todd Long
 todd.long@centralsquare.com

Closed Record Download RMS Data Transfer Interface (visionAir RMS to CPD)	1	0.00 USD	4,324.90 USD
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MORE INFORMATION AT CENTRALSQUARE.COM



Renewal Order prepared by:
 Todd Long
 todd.long@centralsquare.com

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MORE INFORMATION AT CENTRALSQUARE.COM



Renewal Order prepared by:
 Todd Long
 todd.long@centralsquare.com

SOP Module	1	0.00 USD	2,162.45 USD
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VisiNet Browser Reports Module (included in new sales)	1	0.00 USD	0.00 USD

WHAT SERVICES ARE INCLUDED?

DESCRIPTION	TOTAL
Escrow Fee Recurring	\$950.00 USD
Renewal Order Total:	291,434.76 USD

MORE INFORMATION AT CENTRALSQUARE.COM



Renewal Order prepared by:
Todd Long
todd.long@centralsquare.com

Billing Information

Fees will be payable within 30 days of invoicing.

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Teresa Wilson, City Manager

10/14/2021
Date

MORE INFORMATION AT CENTRALSQUARE.COM



CONTRACT FOR GOODS

This Contract is being awarded using the H-GAC Contract #EE08-19

PURPOSE – This Contract is entered into as of the date of the last signature affixed hereto, by and between the City of Columbia, South Carolina (hereinafter referred to as the “City”) and Newton’s Fire & Safety Equipment, Inc. with legal address and principal place of business at PO Box 13 – 2724 Swepsonville-Saxapahaw Rd., Swepsonville, NC 27359 (hereinafter referred to as the “Contractor”), for the purchase of G-Xcel Agility Black Gold Bunker Gear.

For and in consideration of the mutual covenants and promises contained herein, the parties agree as follows:

1. **SCOPE and SCHEDULE OF PURCHASE** – Upon written notification by the City to proceed, the Contractor shall provide the goods fully described in Exhibit A, attached hereto. The Contractor shall complete all sales under this AGREEMENT within the timeframes set forth in Exhibit A.
2. **SUPPLEMENTAL OR ADDITIONAL GOODS** – The City may require supplemental or additional goods of the Contractor or recommended by the Contractor and approved by the City in writing.

The Contractor must obtain written approval from the City for any supplemental or additional goods prior to the goods being delivered. If the Contractor fails to obtain prior written approval to deliver the goods, the City is under no obligation to compensate the Contractor for the goods received.

3. **TERM OF CONTRACT** – The term of this CONTRACT is effective as of the latter date of the execution of this CONTRACT as shown by the signatures of the parties below, upon issuance of a Notice to Proceed; receipt of a valid Purchase Order from the City of Columbia; and approval of City Council, if applicable. This agreement is valid through June 30, 2022.
4. **DELIVERY:** All items shall be delivered FOB Destination.

City of Columbia and Newton's Fire & Safety
Equipment, Inc.

5. **SCHEDULE FOR DELIVERY OF GOODS** – The Contractor shall deliver any and all goods under this Contract under the direction of the Fire Department.
6. **COMPENSATION** – (See Exhibit A)
 - A. The compensation to be paid by the City to the Contractor under this Agreement, to Public Works Equipment shall not exceed Four Hundred Sixty Thousand, Seven Hundred Twenty-Eight Dollars and Zero Cents, (\$460,728.00).
 - B. The Contractor shall be paid upon submission of properly certified invoices to the City of Columbia Accounting Division, P.O. Box 147, Columbia, S.C. 29217. At the prices stipulated on the contract at the time the order is placed, after delivery and acceptance the of goods, less deductions if any, as provided, invoices shall contain the Contract Number and Purchase Order Number. The City of Columbia will not pay invoices submitted from a third party. Invoices shall be submitted by the company shown on the Purchase Order.

Failure of the Contractor to follow these invoice requirements will result in the delay of payment of the invoice.
7. **SPECIFIC TERMS AND CONDITIONS PURSUANT TO H-GAC Contract #EE08-19**
Contractor agrees, under the terms as outlined in the Scope and Schedule of Purchase and at his/her/their own proper cost and expense, to furnish all the materials, supplies, equipment, labor, insurance and any other accessories, items and/or services necessary to complete the said project.

As applicable, the following additional Contract Documents combined with this contractual agreement, comprises the Contract between the Owner and Contractor and are incorporated by reference to this agreement:

1. This Contract
2. H-GAC Contract #EE08-19

MISCELLANEOUS

- A. Nothing in this Agreement shall be construed to give any rights or benefits to anyone other than the City and the Contractor.
- B. The Contractor shall be responsible for delivery of all the goods required by this Agreement. The Contractor does not act as the City's agent or employee.

City of Columbia and Newton's Fire & Safety
Equipment, Inc.

- C. The Contractor will not assign or sublet its obligations to provide the goods required by this Agreement without the written consent of the City. The Contractor shall be as fully responsible to the City for the acts and omission of its Subcontractors, as it is for the acts and omissions of persons directly employed by the Contractor.

The Contractor shall furnish and its Subcontractors shall furnish all information and reports required hereunder.

- D. In the event there are any disagreements between the City and the Contractor with regard to any of the requirements, specifications or interpretation of this Agreement, the Contractor agrees to defer to the reasonable interpretations of the City as, from time to time, may be made by the City. Ambiguities in the terms of this Agreement, if any, shall not be construed against the City.
- E. This Agreement shall be construed in accordance with the laws and City of Columbia Code of Ordinances and those of the State of South Carolina. The Contractor agrees to subject itself to the jurisdiction and venue of the courts of Richland or Lexington County, State of South Carolina as to all matters and disputes arising or to arise under this Agreement and the performance thereof. The City may seek attorney's fees and the Contractor agrees to pay such fees as awarded by the Court or other body. No attorney's fees may be sought by, nor will be paid to, the Contractor.
- F. This Agreement represents the entire agreement between the City and the Contractor and supersedes all prior communications, negotiations, representations or agreements, either written or oral. The parties may amend this Agreement at any time provided that such Amendments are executed in writing, signed by a duly authorized representative of both organizations, and approved, where applicable, by the City's governing body.

The City may, in its discretion, amend this Agreement to conform with federal, state, or local governmental guidelines, policies and available funding amounts, or for other reasons. If such Amendments result in a change in the funding, the schedule of goods, the activities to be undertaken as part of the Agreement, such modifications will be incorporated only by written amendment signed by both the City and the Contractor.

- G. The failure of either the Contractor or the City to insist upon the strict performance of any provision of this Agreement shall not be deemed to be a waiver of the right to insist upon strict performance of such provision or of any other provision of this Agreement at any time. Partial payment by the City shall not be construed as a waiver. Waiver of any breach of this Agreement shall not constitute waiver of a subsequent breach.

City of Columbia and Newton's Fire & Safety
Equipment, Inc.

- H. In the event any provision of this Agreement is determined to be void or unenforceable, all other provisions shall remain in full force and effect.
- I. This Agreement is subject to City Council approval.
- J. The Contractor acknowledges, for itself and its Subcontractor, that it is subject to the provisions of the 1991 Ethics Reform Act (8-13-100, et seq, South Carolina Code of Laws, 1976, as amended). Under this Act, "A person may not, directly or indirectly, give, offer, or promise anything of value to a public official, public member, or public employee with intent to:
1. influence the discharge of a public official's, public member's, or public employee's official responsibilities;
 2. influence a public official, public member, or public employee to commit, aid in committing, collude in, or allow fraud on a governmental entity; or,
 3. induce a public official, public member, or public employee to perform or fail to perform an act in violation of the public official's, public member's, or public employee's official responsibilities.
- "Anything of value" includes, but is not limited to, lodging, transportation, entertainment, food, meals, beverages, money, gifts, honorariums, discounts and interest-free loans.
- K. In carrying out the service, the Contractor shall not discriminate against any employee or applicant for employment because of that employee or applicant's age, sex, gender, gender identity or expression, sexual orientation, race, religion, creed, color, disability, national origin, veteran or military status, political affiliation, or any other characteristic protected by federal, state, or local laws ("protected characteristic"). The Contractor shall take affirmative steps to ensure equal employment opportunities for all applicants for employment, without regard to their protected characteristics. For the purpose of this Non-Discrimination in Contracting Policy, the term "sex" includes medical needs and / or lactation needs arising from pregnancy, childbirth, or related medical conditions pursuant to the South Carolina Pregnancy Accommodations Act, 2018 S.C. Act No. 244. This Non-Discrimination in Contracting Policy extends to all aspects of the Contractor operations, including, but not limited to the Contractor employment practices (including selection, hiring, assignment, re-assignment, training, promotion, transfer, compensation, layoff, leave of absence, return from layoff or leave of absence, discipline, and termination); selection of volunteers and vendors, and

City of Columbia and Newton's Fire & Safety
Equipment, Inc.

provision of services. The Contractor shall post in conspicuous places, available to employees and applicants for employment, notices to be provided by the government setting forth the provisions of this Non-Discrimination in Contracting Policy. The Contractor shall incorporate the provisions of this Non-Discrimination in Contracting Policy in all subcontracts for service work.

- L. This Agreement shall be binding upon the respondent and upon its successors and assignees. This Agreement shall be binding upon the City in accordance with its terms and provisions.
- M. All of the reports, information, data, records or documents of any kind, prepared or assembled by the Contractor under this Agreement are matters of public record, but the Contractor agrees that they shall only be made available to any individual or organization by the City and the Contractor shall not make them available to any individual or organization without the prior written approval of the City.

Witness the parties' respective hands and seals on the date first written above.

CITY OF COLUMBIA, SOUTH CAROLINA

		Date: _____
Witness	Teresa Wilson, City Manager	

Newton's Fire & Safety Equipment, Inc.

		Date: _____
Print	Signature	

APPROVED AS TO FORM

Angeline M. Parlicek
Legal Department City of Columbia, SC
9-29-2021 #21010565

City of Columbia and Newton's Fire & Safety
Equipment, Inc.

List of Exhibits

Exhibit A – Quote

PO Box 13 ~ 2724 Swepsonville-Saxapahaw Rd.
Swepsonville, NC 27359
Toll Free: **800-672-5918** Fax: (336) 578-1982

Quotation

Date: August 4, 2021
Quote #: 0
Purchased/Requested By: Chief Williams
Salesperson: Seth Newton
County: Richland
Payment Terms: NET/30
FOB: Destination

BILL TO: City of Columbia

SHIP TO: Columbia Fire Dept
1901 Harden St
Columbia, SC 29204

Quantity	Units	Item No.	Item Description	Unit Price	Extd. Price
180	D5745G		Globe G-Xcel AgilityBlack Gold Coat per Spec	\$ 1,325.00	\$ 238,500.00
180	F5745G		Globe GPS Agility Black Gold Pant per Spec	\$ 1,045.00	\$ 188,100.00

**Pricing Based on HGAC Contract # EE08-19

*Freight Free

Sales Total: \$		426,600.00
Estimated Freight:		
8.00%	Sales Tax: \$	34,128.00
Total: \$		460,728.00



CONTRACT FOR GOODS

This Contract is being awarded using the HGAC Contract #RC01-21

PURPOSE – This Contract is entered into as of the date of the last signature affixed hereto, by and between the City of Columbia, South Carolina (hereinafter referred to as the “City”) and Schaefer Systems International, Inc. with legal address and principal place of business at 10021 Westlake Drive, Charlotte, NC 28273 (hereinafter referred to as the “Contractor”), for the purchase of 95 Gallon Bar Cart.

For and in consideration of the mutual covenants and promises contained herein, the parties agree as follows:

1. **SCOPE and SCHEDULE OF PURCHASE** – Upon written notification by the City to proceed, the Contractor shall provide the goods fully described in Exhibit A, attached hereto. The Contractor shall complete all sales under this AGREEMENT within the timeframes set forth in Exhibit A.
2. **SUPPLEMENTAL OR ADDITIONAL GOODS** – The City may require supplemental or additional goods of the Contractor or recommended by the Contractor and approved by the City in writing.

The Contractor must obtain written approval from the City for any supplemental or additional goods prior to the goods being delivered. If the Contractor fails to obtain prior written approval to deliver the goods, the City is under no obligation to compensate the Contractor for the goods received.

3. **TERM OF CONTRACT** – The term of this CONTRACT is effective as of the latter date of the execution of this CONTRACT as shown by the signatures of the parties below, upon issuance of a Notice to Proceed; receipt of a valid Purchase Order from the City of Columbia; and approval of City Council, if applicable. This agreement is valid through June 30, 2022.
4. **DELIVERY:** All items shall be delivered FOB Destination.

City of Columbia and Schaefer Systems
International, Inc.

5. **SCHEDULE FOR DELIVERY OF GOODS** – The Contractor shall deliver any and all goods under this Contract under the direction of the Solid Waste Division.

6. **COMPENSATION** – (See Exhibit A)

A. The compensation to be paid by the City to the Contractor under this Agreement, to Public Works Equipment shall not exceed Fifty Thousand, Two Hundred Eighty-Five Dollars and Eighty Cents, (\$50,285.80).

B. The Contractor shall be paid upon submission of properly certified invoices to the City of Columbia Accounting Division, P.O. Box 147, Columbia, S.C. 29217. At the prices stipulated on the contract at the time the order is placed, after delivery and acceptance the of goods, less deductions if any, as provided, invoices shall contain the Contract Number and Purchase Order Number. The City of Columbia will not pay invoices submitted from a third party. Invoices shall be submitted by the company shown on the Purchase Order.

Failure of the Contractor to follow these invoice requirements will result in the delay of payment of the invoice.

7. **SPECIFIC TERMS AND CONDITIONS PURSUANT TO HGAC Contract #RC01-21**
Contractor agrees, under the terms as outlined in the Scope and Schedule of Purchase and at his/her/their own proper cost and expense, to furnish all the materials, supplies, equipment, labor, insurance and any other accessories, items and/or services necessary to complete the said project.

As applicable, the following additional Contract Documents combined with this contractual agreement, comprises the Contract between the Owner and Contractor and are incorporated by reference to this agreement:

1. This Contract
2. HGAC Contract #RC01-21

MISCELLANEOUS

A. Nothing in this Agreement shall be construed to give any rights or benefits to anyone other than the City and the Contractor.

B. The Contractor shall be responsible for delivery of all the goods required by this Agreement. The Contractor does not act as the City's agent or employee.

City of Columbia and Schaefer Systems
International, Inc.

- C. The Contractor will not assign or sublet its obligations to provide the goods required by this Agreement without the written consent of the City. The Contractor shall be as fully responsible to the City for the acts and omission of its Subcontractors, as it is for the acts and omissions of persons directly employed by the Contractor.

The Contractor shall furnish and its Subcontractors shall furnish all information and reports required hereunder.

- D. In the event there are any disagreements between the City and the Contractor with regard to any of the requirements, specifications or interpretation of this Agreement, the Contractor agrees to defer to the reasonable interpretations of the City as, from time to time, may be made by the City. Ambiguities in the terms of this Agreement, if any, shall not be construed against the City.
- E. This Agreement shall be construed in accordance with the laws and City of Columbia Code of Ordinances and those of the State of South Carolina. The Contractor agrees to subject itself to the jurisdiction and venue of the courts of Richland or Lexington County, State of South Carolina as to all matters and disputes arising or to arise under this Agreement and the performance thereof. The City may seek attorney's fees and the Contractor agrees to pay such fees as awarded by the Court or other body. No attorney's fees may be sought by, nor will be paid to, the Contractor.
- F. This Agreement represents the entire agreement between the City and the Contractor and supersedes all prior communications, negotiations, representations or agreements, either written or oral. The parties may amend this Agreement at any time provided that such Amendments are executed in writing, signed by a duly authorized representative of both organizations, and approved, where applicable, by the City's governing body.

The City may, in its discretion, amend this Agreement to conform with federal, state, or local governmental guidelines, policies and available funding amounts, or for other reasons. If such Amendments result in a change in the funding, the schedule of goods, the activities to be undertaken as part of the Agreement, such modifications will be incorporated only by written amendment signed by both the City and the Contractor.

- G. The failure of either the Contractor or the City to insist upon the strict performance of any provision of this Agreement shall not be deemed to be a waiver of the right to insist upon strict performance of such provision or of any other provision of this Agreement at any time. Partial payment by the City shall not be construed as a waiver. Waiver of any breach of this Agreement shall not constitute waiver of a subsequent breach.

- H. In the event any provision of this Agreement is determined to be void or unenforceable, all other provisions shall remain in full force and effect.
- I. This Agreement is subject to City Council approval.
- J. The Contractor acknowledges, for itself and its Subcontractor, that it is subject to the provisions of the 1991 Ethics Reform Act (8-13-100, et seq, South Carolina Code of Laws, 1976, as amended). Under this Act, “A person may not, directly or indirectly, give, offer, or promise anything of value to a public official, public member, or public employee with intent to:
1. influence the discharge of a public official’s, public member’s, or public employee’s official responsibilities;
 2. influence a public official, public member, or public employee to commit, aid in committing, collude in, or allow fraud on a governmental entity; or,
 3. induce a public official, public member, or public employee to perform or fail to perform an act in violation of the public official’s, public member’s, or public employee’s official responsibilities.
- “Anything of value” includes, but is not limited to, lodging, transportation, entertainment, food, meals, beverages, money, gifts, honorariums, discounts and interest-free loans.
- K. In carrying out the service, the Contractor shall not discriminate against any employee or applicant for employment because of that employee or applicant’s age, sex, gender, gender identity or expression, sexual orientation, race, religion, creed, color, disability, national origin, veteran or military status, political affiliation, or any other characteristic protected by federal, state, or local laws (“protected characteristic”). The Contractor shall take affirmative steps to ensure equal employment opportunities for all applicants for employment, without regard to their protected characteristics. For the purpose of this Non-Discrimination in Contracting Policy, the term “sex” includes medical needs and / or lactation needs arising from pregnancy, childbirth, or related medical conditions pursuant to the South Carolina Pregnancy Accommodations Act, 2018 S.C. Act No. 244. This Non-Discrimination in Contracting Policy extends to all aspects of the Contractor operations, including, but not limited to the Contractor employment practices (including selection, hiring, assignment, re-assignment, training, promotion, transfer, compensation, layoff, leave of absence, return from layoff or leave of absence, discipline, and termination); selection of volunteers and vendors, and

City of Columbia and Schaefer Systems
International, Inc.

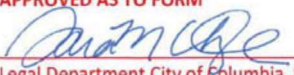
- provision of services. The Contractor shall post in conspicuous places, available to employees and applicants for employment, notices to be provided by the government setting forth the provisions of this Non-Discrimination in Contracting Policy. The Contractor shall incorporate the provisions of this Non-Discrimination in Contracting Policy in all subcontracts for service work.
- L. This Agreement shall be binding upon the respondent and upon its successors and assignees. This Agreement shall be binding upon the City in accordance with its terms and provisions.
- M. All of the reports, information, data, records or documents of any kind, prepared or assembled by the Contractor under this Agreement are matters of public record, but the Contractor agrees that they shall only be made available to any individual or organization by the City and the Contractor shall not make them available to any individual or organization without the prior written approval of the City.

Witness the parties' respective hands and seals on the date first written above.

CITY OF COLUMBIA, SOUTH CAROLINA

		Date: _____
Witness	Teresa Wilson, City Manager	

Schaefer Systems International, Inc.

APPROVED AS TO FORM

 Legal Department City of Columbia, SC
 9/30/2021

		Date: _____
Print	Signature	

List of Exhibits

Exhibit A – Quote

Schaefer Systems International, Inc.

10021 Westlake Drive
Charlotte, NC 28273
USA
Phone: (704) 944-4500



QUOTATION: HGAC CONTRACT #RC01-21

Quote #:	019221-1	Requested by:	Samantha Yager
Date:	10/8/2021		
Quote Expiration:	10/31/2021	Bill to:	City of Columbia
Terms:	Net30		Attn: Accounting
FOB:	PPA		PO Box 147
Lead Time:	16-18 weeks		Columbia, SC 29202-0147
			USA
		Ship to:	City of Columbia
			2910 Colonial Dr.
			Attn: John Hooks
			803-545-3800
			Columbia, SC 29203-6812
			USA

Line	Quantity	Item number	Description	Unit price	Net amount
1	793	95Q.0R0	USD95Q 95 GALLON BAR CART: - BLUE BODY AND LID - 10" PLASTIC WHEELS & RFID TAG - CITY OF COLUMBIA, SC LET'S RECYCLE BODY HOT STAMP - RECYCLABLES ONLY LID HOT STAMP Body: BL1 Lid: LIDBL1	\$57.81	\$45,843.33
2	1	FREIGHT	ESTIMATED FREIGHT, ACTUAL FREIGHT CHARGES WILL BE APPLIED ONCE INVOICED	\$775.00	\$775.00
Sales tax (Applicable sales tax will be added unless a valid Tax Exemption certificate is on file)					\$3,667.47
Total					\$50,285.80

Agreed and accepted by:



Brett Belda
Vice President, Sales

10/8/2021

Date

Name & Title

Date

All sale transactions are subject to Schaefer Systems International, Inc. – Standard Terms and Conditions of Sale in effect at the time of sale, published on our website www.ssi-schaefer.us/General_Terms_and_Conditions_for_the_Sale_of_Goods_and_Services.

* Assembly is required for wheels and axles unless assembly and distribution is being completed by Schaefer

* Orders with custom hot stamps are non-cancelable



CONTRACT FOR GOODS

This Contract is being awarded using the OMNIA Partners Contract #171717

PURPOSE – This Contract is entered into as of the date of the last signature affixed hereto, by and between the City of Columbia, South Carolina (hereinafter referred to as the “City”) and Wastequip Manufacturing with legal address and principal place of business at PO Box 603008, Charlotte, NC 28260 (hereinafter referred to as the “Contractor”), for the purchase of Toter 96 Gallon Carts.

For and in consideration of the mutual covenants and promises contained herein, the parties agree as follows:

1. **SCOPE and SCHEDULE OF PURCHASE** – Upon written notification by the City to proceed, the Contractor shall provide the goods fully described in Exhibit A, attached hereto. The Contractor shall complete all sales under this AGREEMENT within the timeframes set forth in Exhibit A.
2. **SUPPLEMENTAL OR ADDITIONAL GOODS** – The City may require supplemental or additional goods of the Contractor or recommended by the Contractor and approved by the City in writing.

The Contractor must obtain written approval from the City for any supplemental or additional goods prior to the goods being delivered. If the Contractor fails to obtain prior written approval to deliver the goods, the City is under no obligation to compensate the Contractor for the goods received.

3. **TERM OF CONTRACT** – The term of this CONTRACT is effective as of the latter date of the execution of this CONTRACT as shown by the signatures of the parties below, upon issuance of a Notice to Proceed; receipt of a valid Purchase Order from the City of Columbia; and approval of City Council, if applicable. This agreement is valid through June 30, 2022.
4. **DELIVERY:** All items shall be delivered FOB Destination.
5. **SCHEDULE FOR DELIVERY OF GOODS** – The Contractor shall deliver any and all goods under this Contract under the direction of the Solid Waste Division.

6. **COMPENSATION** – (See Exhibit A)

- A. The compensation to be paid by the City to the Contractor under this Agreement, to Public Works Equipment shall not exceed Seventy-Nine, One Hundred Thirty-Six Dollars and Sixteen Cents, (\$79,136.16).
- B. The Contractor shall be paid upon submission of properly certified invoices to the City of Columbia Accounting Division, P.O. Box 147, Columbia, S.C. 29217. At the prices stipulated on the contract at the time the order is placed, after delivery and acceptance the of goods, less deductions if any, as provided, invoices shall contain the Contract Number and Purchase Order Number. The City of Columbia will not pay invoices submitted from a third party. Invoices shall be submitted by the company shown on the Purchase Order.

Failure of the Contractor to follow these invoice requirements will result in the delay of payment of the invoice.

7. **SPECIFIC TERMS AND CONDITIONS PURSUANT TO OMNIA Partners Contract #171717**

Contractor agrees, under the terms as outlined in the Scope and Schedule of Purchase and at his/her/their own proper cost and expense, to furnish all the materials, supplies, equipment, labor, insurance and any other accessories, items and/or services necessary to complete the said project.

As applicable, the following additional Contract Documents combined with this contractual agreement, comprises the Contract between the Owner and Contractor and are incorporated by reference to this agreement:

- 1. This Contract
- 2. OMNIA Partners Contract #171717

MISCELLANEOUS

- A. Nothing in this Agreement shall be construed to give any rights or benefits to anyone other than the City and the Contractor.
- B. The Contractor shall be responsible for delivery of all the goods required by this Agreement. The Contractor does not act as the City's agent or employee.

City of Columbia and Wastequip Manufacturing

- C. The Contractor will not assign or sublet its obligations to provide the goods required by this Agreement without the written consent of the City. The Contractor shall be as fully responsible to the City for the acts and omission of its Subcontractors, as it is for the acts and omissions of persons directly employed by the Contractor.

The Contractor shall furnish and its Subcontractors shall furnish all information and reports required hereunder.

- D. In the event there are any disagreements between the City and the Contractor with regard to any of the requirements, specifications or interpretation of this Agreement, the Contractor agrees to defer to the reasonable interpretations of the City as, from time to time, may be made by the City. Ambiguities in the terms of this Agreement, if any, shall not be construed against the City.
- E. This Agreement shall be construed in accordance with the laws and City of Columbia Code of Ordinances and those of the State of South Carolina. The Contractor agrees to subject itself to the jurisdiction and venue of the courts of Richland or Lexington County, State of South Carolina as to all matters and disputes arising or to arise under this Agreement and the performance thereof. The City may seek attorney's fees and the Contractor agrees to pay such fees as awarded by the Court or other body. No attorney's fees may be sought by, nor will be paid to, the Contractor.
- F. This Agreement represents the entire agreement between the City and the Contractor and supersedes all prior communications, negotiations, representations or agreements, either written or oral. The parties may amend this Agreement at any time provided that such Amendments are executed in writing, signed by a duly authorized representative of both organizations, and approved, where applicable, by the City's governing body.

The City may, in its discretion, amend this Agreement to conform with federal, state, or local governmental guidelines, policies and available funding amounts, or for other reasons. If such Amendments result in a change in the funding, the schedule of goods, the activities to be undertaken as part of the Agreement, such modifications will be incorporated only by written amendment signed by both the City and the Contractor.

- G. The failure of either the Contractor or the City to insist upon the strict performance of any provision of this Agreement shall not be deemed to be a waiver of the right to insist upon strict performance of such provision or of any other provision of this Agreement at any time. Partial payment by the City shall not be construed as a waiver. Waiver of any breach of this Agreement shall not constitute waiver of a subsequent breach.
- H. In the event any provision of this Agreement is determined to be void or unenforceable, all other provisions shall remain in full force and effect.

City of Columbia and Wastequip Manufacturing

- I. This Agreement is subject to City Council approval.
- J. The Contractor acknowledges, for itself and its Subcontractor, that it is subject to the provisions of the 1991 Ethics Reform Act (8-13-100, et seq, South Carolina Code of Laws, 1976, as amended). Under this Act, “A person may not, directly or indirectly, give, offer, or promise anything of value to a public official, public member, or public employee with intent to:
 - 1. influence the discharge of a public official’s, public member’s, or public employee’s official responsibilities;
 - 2. influence a public official, public member, or public employee to commit, aid in committing, collude in, or allow fraud on a governmental entity; or,
 - 3. induce a public official, public member, or public employee to perform or fail to perform an act in violation of the public official’s, public member’s, or public employee’s official responsibilities.

“Anything of value” includes, but is not limited to, lodging, transportation, entertainment, food, meals, beverages, money, gifts, honorariums, discounts and interest-free loans.

- K. In carrying out the service, the Contractor shall not discriminate against any employee or applicant for employment because of that employee or applicant’s age, sex, gender, gender identity or expression, sexual orientation, race, religion, creed, color, disability, national origin, veteran or military status, political affiliation, or any other characteristic protected by federal, state, or local laws (“protected characteristic”). The Contractor shall take affirmative steps to ensure equal employment opportunities for all applicants for employment, without regard to their protected characteristics. For the purpose of this Non-Discrimination in Contracting Policy, the term “sex” includes medical needs and / or lactation needs arising from pregnancy, childbirth, or related medical conditions pursuant to the South Carolina Pregnancy Accommodations Act, 2018 S.C. Act No. 244. This Non-Discrimination in Contracting Policy extends to all aspects of the Contractor operations, including, but not limited to the Contractor employment practices (including selection, hiring, assignment, re-assignment, training, promotion, transfer, compensation, layoff, leave of absence, return from layoff or leave of absence, discipline, and termination); selection of volunteers and vendors, and provision of services. The Contractor shall post in conspicuous places, available to employees and applicants for employment, notices to be provided by the government setting forth the provisions of this Non-Discrimination in Contracting Policy. The

City of Columbia and Wastequip Manufacturing

Contractor shall incorporate the provisions of this Non-Discrimination in Contracting Policy in all subcontracts for service work.

- L. This Agreement shall be binding upon the respondent and upon its successors and assignees. This Agreement shall be binding upon the City in accordance with its terms and provisions.
- M. All of the reports, information, data, records or documents of any kind, prepared or assembled by the Contractor under this Agreement are matters of public record, but the Contractor agrees that they shall only be made available to any individual or organization by the City and the Contractor shall not make them available to any individual or organization without the prior written approval of the City.

Witness the parties' respective hands and seals on the date first written above.

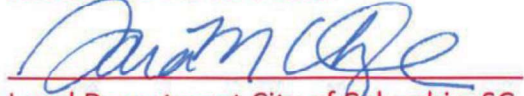
CITY OF COLUMBIA, SOUTH CAROLINA

_____	_____	Date: _____
Witness	Teresa Wilson, City Manager	

Wastequip Manufacturing

_____	_____	Date: _____
Print	Signature	

APPROVED AS TO FORM



Legal Department City of Columbia, SC

10/01/2021

City of Columbia and Wastequip Manufacturing

List of Exhibits

Exhibit A – Quote

Sell To:

Contact Name	Samantha Yager	Ship To Name	City of Columbia SC
Bill To Name	City of Columbia SC	Ship To	2910 Colonial Dr
Bill To	2910 Colonial Dr		Columbia, SC 29203-6812
	Columbia, SC 29203-6812		USA
	USA	Customer Job	NJPA Contract No. 041217-WQI
Email	samantha.yager@columbiasc.gov	Reference	
Phone	(803) 545-3803		

Quote Information

Salesperson	Reilly Baxter	Created Date	10/4/2021
Salesperson Email	rbaxter@wastequip.com	Expiration Date	10/22/2021
Salesperson Phone	(704) 302-7271	Quote Number	WQ-10209388
			Please Reference Quote Number on all Purchase Orders

Product	Product Description	Description	Selected Option	Quantity	Sales Price	Total Price
**Plastics - 79296	Model 79296 - Toter 96 Gallon EVR II Universal/Nestable Cart	No body stamp Custom lid insert B0021 Property of City of Columbia SC	---Body Color - (940) Green ---Lid Color - (940) Green ---Wheels - 10in Sunburst ---Lid Insert - Read from Street (Existing) ---Customer Serial Number Hot Stamped on Front of Cart Body in White ---2/3 Assembled with Lid (down), Stop Bar and Axle Factory Installed ---Warranty - 12 Yrs Cart Body, All other components 10 Yrs	1,248.00	\$56.50	\$70,512.00

Payment Terms	Net 30 Days if credit has been established	Subtotal	\$70,512.00
Shipping Terms	FOB Origin	Shipping	\$2,983.20
		Tax	\$5,640.96
		Grand Total	\$79,136.16

Additional Information

Additional Terms Our Quote is a good faith estimate, based on our understanding of your needs. Subject to our acceptance, your Order is an offer to purchase our Products and services in accordance with the Wastequip Terms & Conditions of Sale ("WQ T&C") located at: <https://www.wastequip.com/terms-conditions-of-sale>, as of the date set forth in Section 1(b) of the WQ T&C, which are made a part of this Quote. These WQ T&Cs may be updated from time to time and are available by hard copy upon request.

Additional Information Pricing is based on your anticipated Order prior to the expiration of this Quote, including product specifications, quantities and timing, accepted delivery within 45 days of Order acceptance by Toter. Any differences to your Order may result in different pricing, freight or other costs. Due to volatility in petrochemical, steel and related Product material markets, actual prices and freight, are subject to change. We reserve the right, by providing notice to you at any time before beginning Product manufacturing, to increase the price of the Product(s) to reflect any increase in the cost to us which is due to any factor beyond our control (such as, without limitation, any increase in the costs of labor, materials, or other costs of manufacture or supply). Unless otherwise stated, materials and container sizes indicated on sales literature, invoices, price lists, quotations and delivery tickets are nominal sizes and representations – actual volume, Products and materials



841 Meacham Rd, Statesville, NC, 28677

PHONE: 800-424-0422 FAX: 833-930-1124

WQ-10209388

11.b

are subject to manufacturing and commercial variation and Wastequip's practices, and may vary from nominal sizes and materials. All prices are in US dollars; this Quote may not include all applicable taxes, brokerage fees or duties. If customer is not tax exempt, final tax calculations are subject to change.

Special Contract
Information

Please Note: Pricing and Product offerings is based on the OMNIA Partners, Public Sector (subsidiaries National IPA and U.S. Communities) agreement through Toter's Contract No. 171717 as awarded by the City of Tucson on 02-01-2018. Per the terms of this contract, pricing and products are evaluated every three (3) months for price adjustments based on current market conditions, at any time without prior notice, and after City of Tucson approval. The current pricing is effective 8-1-2021 through 10-31-2021. Toter, LLC Product Warranties, Disclaimers, Limitation of Liability and Remedies, and Limited Warranty Provisions apply to all purchases thereunder.

Signatures

Accepted By: _____

Company Name: _____

Date: _____

Purchase Order: _____

Please Reference Quote Number on all Purchase Orders

CONTRACT

City of Columbia, South Carolina

WM4602 (MPP Protégé Only)

New Water Main Extension along Rocky Point Drive

BID007-21-22-LAG

This Contract is made by and between the City of Columbia, Columbia, South Carolina, hereinafter called Owner, and **J.W. Brown Construction, LLC**, with legal address and principal place of business at **207 Garden Gate Way, Lexington, SC 29072**, hereinafter called Contractor. Owner and Contractor in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1. WORK.

1.1 Contractor shall perform the Work as specified or indicated in the Contract Documents.

ARTICLE 2. ENGINEER.

2.1 The Project has been designed by the **City of Columbia**.

ARTICLE 3. CONTRACT TIME.

3.1 The Contract Time shall be **sixty (60)** consecutive calendar days from the commencement date as defined in the Notice to Proceed (NTP) to fully complete the amount of work herein contemplated. There shall be an additional **one hundred eighty (180)** consecutive calendar days added after the construction period for contract closeout such as providing as built drawings, testing, invoicing, etc.

3.2 Contractor agrees that the Work shall be prosecuted regularly, diligently and uninterruptedly and at such rate of progress as will insure full completion thereof within the Contract Time stated above. It is expressly understood and agreed, by and between Contractor and Owner that the Contract Time is reasonable for the completion of the Work, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality.

ARTICLE 4. CONTRACT PRICE.

4.1 Owner will pay Contractor for performance of the Work in accordance with the Contract Documents at the contract price agreed upon on the Contractor's Bid Form attached to this Contract which establishes the contract value as **One Hundred Seven Thousand Nine Hundred Seventy Dollars and Zero Cents (\$107,970.00)**. This contract also provides for an additional contingency in the amount of **Twenty-One Thousand Five Hundred Ninety-Four Dollars and Zero Cents (\$21,594.00)** to be administered, if necessary, at the discretion of the City for unforeseen costs that are within the pre-determined Scope of Work for this Contract.

ARTICLE 5. APPLICATIONS FOR PAYMENT

5.1 Contractor shall submit Applications for Payment in accordance with Part 15 General Specifications of the City's Engineering Regulations. Applications for Payment will be processed as provided in the Conditions of the Contract.

ARTICLE 6. PROGRESS AND FINAL PAYMENTS

6.1 Owner will make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment, monthly during construction as provided below. All progress payments will be on the basis of the progress of the Work measured by the schedule of values provided for in the General Specifications.

6.2 Upon final inspection and acceptance of the Work, in accordance with Part 15 General Specifications, Owner will pay the remainder of the Contract Price.

ARTICLE 7. LIQUIDATED DAMAGES

7.1 Owner and Contractor recognize that time is of the essence of this Contract and that Owner will suffer financial loss if the Work is not completed within the Contract Time (and specific milestones). They also recognize the delays, expense and difficulties involved in proving, in a legal proceeding, the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty) Contractor shall pay Owner Two Hundred Fifty Dollars and Zero Cents (\$250.00) per day for each calendar day of delay until the Work is complete as determined for both periods of substantial completion and final completion.

7.2 Liquidated damages will be assessed for the above listed amounts for each and every day the Work remains incomplete beyond the date of Substantial Completion and the date of Final Completion, either date being independent of the other.

ARTICLE 8. ASSURANCE

8.1 Contractor has familiarized himself with the nature and extent of the Contract Documents, Work, locality, and with all local conditions and Federal, State and local laws, ordinances, rules and regulations that in any manner may affect cost, progress or performance of the Work.

8.2 Contractor has studied carefully all reports of investigations and tests of subsurface and latent physical conditions at the site or otherwise affecting cost, progress or performance of the Work that were relied upon by Engineer in the preparation of the Drawings and Specifications and which have been identified in Contract Documents.

8.3 Contractor has made or caused to be made examinations, investigations and tests and studies of such reports and related data [in addition to those referred to in the above paragraph] as Contractor deems necessary for the performance of the Work at the Contract Price within the Contract Time and in accordance with the other terms and conditions of the Contract Documents; and no additional examinations, investigations, tests, reports or similar data are or will be required for such purposes.

8.4 Contractor has correlated the results of all such observations, examinations, investigations, tests, reports and data with the terms and conditions of the Contract Documents.

8.5 Contractor has given Engineer written notice of any conflict, error or discrepancy that Contractor has discovered in the Contract Documents and the written resolution thereof by Engineer is acceptable to Contractor.

8.6 Contractor agrees that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance of the Work.

ARTICLE 9. CONTRACT DOCUMENTS.

9.1 Contractor agrees, under the terms as stated in the Specifications and Contract Documents and at his/its/their own proper cost and expense, to furnish all the materials, supplies, machinery, equipment, tools superintendence, labor, insurance, and other accessories and services necessary to complete the said project in accordance with the conditions and prices stated in the Proposal, the Instructions to Bidders, the General Conditions of the Contract or General Specifications, the construction specifications, provisions of the Contract Documents, the plans, which include all maps, plats, blue prints, and other drawings and printed or written explanatory matter thereof.

9.2 The Contract Documents that comprise the Contract between Owner and Contractor are attached hereto and made a part hereof and consist of the following:

9.2.1 Invitation For Bid.

9.2.2 Instructions To Bidders.

9.2.3 Bidder's Response including Bid Form.

9.2.4 This Contract.

9.2.5 Performance and Payment Bond.

9.2.6 Part 15 "General Specifications", Part 16 "Specifications for Water Distribution System, Materials and Construction", Part 18 "Specifications for Roadway Improvements, Materials and Construction", Part 20 "Specifications for Sodding, Fertilizing and Seeding" all of the City of Columbia's Engineering Regulations.

9.2.7 Permits.

9.2.8 Special Provisions.

9.2.9 Drawings, numbered 1 through 6, inclusive and dated 6/14/2021.

9.2.10 Addenda number 1 to 2, inclusive.

9.2.11 Any modification, including Change Orders, duly delivered after execution of Contract.

9.2.12 The Mentor Protégé Program (MPP) Guidelines and the Mentor Protégé Program Protégé Only Implementation Plan.

ARTICLE 10. TERMINATION

The City shall, at its sole option and discretion, have the right to terminate this contract for any reason whatsoever by providing the Contractor with a notice of termination to be sent by registered mail, return receipt requested. Whenever the Contractor is terminated for convenience under this clause or is wrongfully terminated under any other clause of this contract, the Contractor shall only be entitled to the actual direct costs of all labor and material expended on the job prior to the effective date of the termination plus 15% or the Contractor shall be entitled to be paid a pro-rate percentage of the total contract price which is equal to its percent of completion, whichever of the two methods provides the lowest sum to be paid to the Contractor. In no event shall the Contractor be entitled to anticipatory profit or damages for any termination under this clause. In no event shall the Contractor be entitled to assert a claim in quantum meruit or any other measure of damages other than that stated herein.

ARTICLE 11. MISCELLANEOUS

11.1 Terms used in this Contract that are defined in Part 15 General Specifications shall have the meanings assigned in the Conditions of the Contract.

11.2 Neither Owner nor Contractor shall, without the prior written consent of the other, assign or sublet in whole or in part any interest under any of the Contract Documents; and, specifically but without limitation, Contractor shall not assign any monies due or to become due without the prior written consent of Owner. In case Contractor assigns all or any part of any monies due or to become due under this Contract, the instrument of assignment shall contain a clause substantially to the effect that it is agreed that the right of the assignee in and to any monies due or to become due to Contractor shall be subject to prior claims of all persons, firms and corporations for services rendered or materials supplied for the performance of the Work called for in this Contract.

11.3 Owner and Contractor each binds himself, his partners, successors, assigns and legal representatives in respect to all covenants, Contracts and obligations contained in the Contract Documents.

11.4 The Contract Documents constitute the entire Contract between Owner and Contractor and may only be altered, amended or repealed by a Modification.

11.5 This Contract does not commit the City of Columbia to pay for any pre-bid costs. Any costs associated with IFB preparation, pre-bid conferences and any other activity prior to award of a contract shall be at the bidder's expense. Rooms, meals, travel, telephone, data processing, administrative and clerical costs associated with the project shall be at the bidder's expense.

This Contract is subject to the final approval of Council and shall become effective on the date listed on the subsequent Notice to Proceed (NTP) and City of Columbia Purchase Order. The Contractor shall not perform work on or incur any costs associated with this contract prior to the commencement date listed on the Notice to Proceed and the City issued purchase order for work outlined herein. The City assumes no liability for any expenses incurred prior to the issuance of the NTP and purchase order.

Space Intentionally Left Blank

Contractor

BY

(CORPORATE SEAL)

Attest

Address for giving notices:

Date: _____

Owner

City of Columbia, SC

BY

Teresa Wilson, City Manager

Attest

Address for giving notices:

Department of Procurement and Contracts1800 Main Street, 2nd FloorColumbia, SC 29201

Date: _____

Note: If Contractor is a corporation, an affidavit giving the principal the right to sign the Contract must accompany the executed Contract.

APPROVED AS TO FORM



Legal Department City of Columbia, SC

Grajales, Leydi Y

From: Hardy, Erica
Sent: Wednesday, September 22, 2021 9:10 AM
To: Grice, Latisha A
Cc: Germany, Latonya B; Bolling, Andrea R; Bryan, Frances E; Lindler, Melissa L; Nelly, Juliet M
Subject: RE: Bid Analysis / Compliance Review - BID007-21-22-LAG – New Water Main Extension along Rocky Point Drive (WM4602) MPP Protégé Only

Letter of Recommendation:

After reviewing the bid analysis for WM4602 New Water Main Extension along Rocky Point Drive, the apparent lowest bidder is J.W. Brown Construction, LLC at \$107,970.00. It is recommended that the City Council accept the proposed bid and a 20% contingency for a total cost of \$129,564.00.

Please let me know if you have any questions or need additional information.

Sincerely,



Erica (Glover) Hardy
Civil Engineer Specialist

Columbia Water
 Department of Engineering

PO Box 147 | Columbia, SC 29217

Erica.Hardy@ColumbiaSC.gov

Phone: (803) 545-3288

Cell: (803) 626-8552

ColumbiaSCWater.Net

ColumbiaSC.Net

From: Grice, Latisha A
Sent: Tuesday, September 14, 2021 12:09 PM
To: Hardy, Erica <Erica.Hardy@columbiasc.gov>; Nelly, Juliet M <Juliet.Nelly@columbiasc.gov>
Cc: Germany, Latonya B <Latonya.Germany@columbiasc.gov>
Subject: Bid Analysis / Compliance Review - BID007-21-22-LAG – New Water Main Extension along Rocky Point Drive (WM4602) MPP Protégé Only

Greetings,

To: Compliance: Please see the attached documents for Bid007-21-22-LAG for project compliance evaluation.

To: Project Manager: Please review Bid Analysis and submit a Letter of Recommendation of contractor for Council's Review. Please include the contractor's base amount, contingency and total within your recommendation.

Please let me know if you have any questions.

Thank you & have a great day!

--Latisha



Latisha A. Grice, MPA
Bid Coordinator
Department of Procurement and Contracts
1800 Main Street 2nd F., Columbia, SC 29201
Office: 803-545-3469
Fax: 803-758-1013

latisha.grice@columbiasc.gov

www.columbiasc.gov

Not everything that is faced can be changed, but nothing can be changed until it is faced.

-- James Baldwin



CITY OF COLUMBIA
INTER-OFFICE MEMORANDUM

TO: Latonya B. Germany, Program Compliance
Specialist

FROM: Latisha A. Grice, Bid Coordinator
Department of Procurement and Contracts

DATE: September 21, 2021

SUBJECT: PROJECT: BID007-21-22-LAG – New Water Main Extension along Rocky Point Drive (WM4602) MPP Protégé Only

Bids for this project were opened publicly at 10:30 a.m., September 14, 2021 by COC Procurement & Contracts via TeleCom Services.

Bids submitted for the referenced project were in participation with the Mentor Protégé Program (MPP) Protégé Only. The apparent responsive low bidder is **J.W. Brown Construction, LLC. of Lexington, SC at \$107,970.00.**

Please review for Mentor Protégé Program Protégé Only compliance and return your approval as soon as possible. Also, please verify the percentages listed on the Business Information Record and check for consistency to the noted dollar amount.

Please indicate your approval with your signature below and return to me when you have completed your review.

Thank You.

Review Approved: *Latonya B Germany*
Latonya Germany, Compliance Specialist

DATE: September 21, 2021



CITY OF COLUMBIA

Office of Business Opportunities Compliance
1401 Main Street 4th Floor | Columbia, South Carolina 29201
Phone: 803-545-4185

MENTOR PROTÉGÉ PROGRAM Implementation Plan- Protégé Project

Project Type: Protégé Only

Date: 9-14-2021 Protégé Amount: \$ 77,470.⁰⁰
 Project Name: New Water Main Extension Along Rocky Point Drive Protege % of Total Contract: 71.75 %
 Project #: WM4602 Mentor Amount (If Applicable): _____
 Protégé (Prime): J.W. Brown Construction LLC Mentor % of Total Contract (If Applicable): _____
 Mentor: LMU Duration of the Project: _____
 Project Contract Amount: \$ 107,970.⁰⁰

Statement of Commitment: For Protégé Only, the Mentor-Protégé Team may work together with the Protégé receiving a minimum of 51% of the contract. The Protégé is committed to providing an adequate amount of resources and effort to execute the plan below.

A completed Business Information Records (BIR) form is required, and will be reviewed along with this Implementation Plan. The information recorded in the BIR must be consistent with the Implementation Plan.

1. What skills has the Protégé learned from their Mentor that will be utilized on this project?

Better understanding of bid process, contracts, and Planning Process to start construction on job

2. How does the work performed in this project relate to the goals identified in your MPP Team Agreement and Business Plan?

It relates to our team plan, leadership practice, guidance of mentor to better the company helping growth by being protégé.



CITY OF COLUMBIA

Office of Business Opportunities Compliance
1401 Main Street 4th Floor | Columbia, South Carolina 29201
Phone: 803-545-4185

3. Please include any subcontractors that will be utilized.

4. What is the anticipated duration (in months) of each major phase of the project?

6. What service will the Mentor be providing on this project? (if applicable)

Leadership
Job Management

7. List bonding capacity and insurance coverage, etc.

Bonding \$ 350,000.⁰⁰
Insurance \$ 7,000,000.⁰⁰

8. Do you currently have your WL or WP License (if applicable)?

Yes WL4 BT4 G122480



CITY OF COLUMBIA

Office of Business Opportunities Compliance
1401 Main Street 4th Floor | Columbia, South Carolina 29201
Phone: 803-545-4185

9. Other Comments.

IMPLEMENTATION PLAN SIGNATURE SHEET

MPP participants acknowledge that any change orders/contract amendments to this project will require a completed Implementation Plan Addendum for each change order/contract amendment made to the project.

IN WITNESS WHEREOF, the parties hereto have caused these presents to be executed by their proper officials thereunto duly authorized as of the dates below indicated:

EXECUTED by J.W. Brown Const., LLC (Protégé Firm) this 14th day of September 2021
Corporate SEAL

By: John W. Brown
Title: President
Firm Name: J.W. Brown Construction, LLC

ATTEST:
By: Cheryl K. Goulee
Title: Office Manager

If Applicable:
EXECUTED by _____ (Mentor Firm) this _____ day of _____ 20____
Corporate SEAL

By: _____
Title: _____
Firm Name: _____

ATTEST:
By: _____
Title: _____



CITY OF COLUMBIA

Office of Business Opportunities Compliance
1401 Main Street 4th Floor | Columbia, South Carolina 29201
Phone: 803-545-4185

RECOMMENDED FOR APPROVAL:

EXECUTED by the Office of Business Opportunities - Compliance on this 21 day of
September, 2021.

By: *Latonya B Germany*

Title: Program Compliance Specialist

Business Information Record for Subconsultants/Subcontractors

The Bidder shall list all subcontractors and vendors, who will be providing subcontracting services, furnishing materials, etc. for this project. The list shall be submitted in the format provided below. Any proposed changes from the list shall be submitted in writing to the Owner prior to initiation of any action, with the reason for proposed changes.

MUST BE TYPED AND REFLECT ONLY THOSE PROVIDING A SERVICE "NO LINE STRIKE THROUGH"

Business Name (as shown on W9 or SAM.gov) / DUNS # & CAGE #	City of Columbia Vendor Number (REQUIRED)	Services and/or Materials Provided	Cost of Services and/or Material (\$ Value)	Percentage of Total Contract	MBE, WBE, SBE, DBE, LBE, CDBE (Indicate all that apply)	Minority Association Code (If applicable - Use 2 letter Code See Key Below)
087818689						
Fortiline 221 Laurel Rd. Lexington, SC 29013		materials	\$25,000. ⁰⁰	23.15%		
Capital Concrete P.O. Box 2494 Lexington, SC 29091		flowable fill	\$3,500. ⁰⁰	2.78%		
Sloan Construction Duncan, SC 29334		asphalt	\$2,500. ⁰⁰	2.32%		
				%		
				%		
				%		

Key: Minority/Women Owned Business Enterprise Association Code

AF - Asian American Female
BM - African American Male
HM - Hispanic American Male

AM - Asian American Male
FB - Non-Minority Female Owned
NF - Native American Female

BF - African American Female
HF - Hispanic American Female
NM - Native American Male

COMBINED TOTAL SUB AMOUNT: \$ 30,500.⁰⁰

TOTAL CONTRACT AMOUNT: \$ 107,970.⁰⁰

I certify this information is true, correct, complete and active.

Business Name: J.W. Brown Construction LLC

Representative Name/Title: John Brown / President

Date: 9-14-21

Event Number	BID007-21-22-LAG Addendum 2	Organization	City of Columbia, SC
Event Title	New Water Main Extension along Rocky Po	Workgroup	Purchasing
Event Description	All City of Columbia Procurement Contracts	Event Owner	Latisha Grice
Event Type	IFBs	Email	latisha.grice@columbiasc.gov
Issue Date	8/25/2021 09:08:35 AM (ET)	Phone	
Close Date	9/14/2021 10:30:00 AM (ET)	Fax	

Responding Supplier	City	State	Response Submitted	Lines Responded	Response Total
J.W.Brown construction , LLC	Lexington	SC	9/14/2021 10:11:40 AM (ET)	1	\$107,970.00
Smoak Construction	Little Mountain	SC	9/13/2021 09:12:47 PM (ET)	1	\$119,878.50
LG Utility Contractors	Lugoff	SC	9/14/2021 08:46:26 AM (ET)	1	\$142,275.00

Please note: Lines Responded and Response Total only includes responses to specification. No alternate response data is included.

City of Columbia and Martin Edwards & Associates, Inc.
Compost Grinding & Screening Services

CONTRACT FOR SERVICES

This Contract is being awarded under procurement method BID039-20-21-LTD.

PURPOSE – This Contract is entered into as of the date of the last signature affixed hereto, by and between the City of Columbia, South Carolina (hereinafter referred to as the “City”) and Martin Edwards & Associates, Inc., with legal address and principal place of business at P.O. Box 35, Erwin, NC 28339 (hereinafter referred to as the “Contractor”), to provide compost grinding and screening services.

For and in consideration of the mutual covenants and promises contained herein, the parties agree as follows:

1. **SCOPE OF SERVICES** – Upon written notification by the City to proceed, the Contractor shall provide the services more fully described in Exhibit A, attached hereto. The Contractor shall perform any and all incidental services not specifically set forth in Exhibit A, which are necessary to fully complete the scope of services described herein.
2. **SUPPLEMENTAL OR ADDITIONAL SERVICES** – The City may require supplemental or additional services of the Contractor or recommended by the Contractor and approved by the City in writing.

The Contractor must obtain written approval from the City for any supplemental or additional services prior to the work being performed. If the Contractor fails to obtain prior written approval to perform the work, the City is under no obligation to compensate the Contractor for services performed.

3. **TERM OF CONTRACT** – The term of the Contract is the date of the execution of this Award or a Notice to Proceed and a valid Purchase Order from the City of Columbia. The initial term shall begin October 2021 until June 30, 2022, with an option to renew two (2) additional one-year periods. All price will remain in effect throughout term of any potentially awarded contract.

The decision whether to extend the Contract, upon written request, shall be the sole and exclusive discretion of the City and neither party shall be under any obligation to agree to an extension of the initial term or any additional term. All terms and conditions stated in the solicitation remain in effect.

Assurance: The Contractor agrees that the solicitation and all subsequent Contract

City of Columbia and Martin Edwards & Associates, Inc.
Compost Grinding & Screening Services

Document(s) are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for the successful performance of the services specified herein.

4. **SCHEDULE FOR COMPLETION OF SERVICES** – The Contractor shall complete any and all services performed under this Contract under the direction of the Solid Waste Division.

5. **COMPENSATION**

- A. The compensation to be paid by the City to the Contractor under this Agreement, for Compost Grinding and Screening Services, shall not exceed One Hundred Fifty-Nine Thousand Sixty-Eight Dollars and Seventy Cents (\$159,068.70).
- B. The Contractor shall be paid upon submission of properly certified invoices to the City of Columbia Accounting Division, P.O. Box 147, Columbia, S.C. 29217. At the prices stipulated on the contract at the time the order is placed, after delivery and acceptance of goods, less deductions if any, as provided, invoices shall contain the Contract Number and Purchase Order Number. The City of Columbia will not pay invoices submitted from a third party. Invoices shall be submitted by the company shown on the Purchase Order.

Failure of the Contractor to follow these invoice requirements will result in the delay of payment of the invoice.

6. **SPECIFIC TERMS AND CONDITIONS PURSUANT TO BID039-20-21-LTD**

Contractor agrees, under the terms as outlined in the Scope of Services and at his/her/their own proper cost and expense, to furnish all the materials, supplies, equipment, labor, insurance and any other accessories, items and/or services necessary to complete the said project.

As applicable, the following additional Contract Documents combined with this contractual agreement, comprises the Contract between the Owner and Contractor and are incorporated by reference to this agreement:

1. Original Solicitation
2. All Exhibits, Appendices, Schedules and other attachments to the solicitation.
3. Bidder's Response
4. This Contract

City of Columbia and Martin Edwards & Associates, Inc.
Compost Grinding & Screening Services

5. Any modifications, including Change Orders, duly delivered after execution of the Contract.

7. MISCELLANEOUS

- A. Nothing in this Agreement shall be construed to give any rights or benefits to anyone other than the City and the Contractor.
- B. The Contractor shall be responsible for performance of all services required by this Agreement. The Contractor does not act as the City's agent or employee.
- C. The Contractor will not assign or sublet its obligations to perform the services required by this Agreement without the written consent of the City. The Contractor shall be as fully responsible to the City for the acts and omission of its Subcontractors, as it is for the acts and omissions of persons directly employed by the Contractor.

The Contractor shall furnish and its Subcontractors shall furnish all information and reports required hereunder.

- D. In the event there are any disagreements between the City and the Contractor with regard to any of the requirements, specifications or interpretation of this Agreement, the Contractor agrees to defer to the reasonable interpretations of the City as, from time to time, may be made by the City. Ambiguities in the terms of this Agreement, if any, shall not be construed against the City.
- E. This Agreement shall be construed in accordance with the laws and City of Columbia Code of Ordinances and those of the State of South Carolina. The Contractor agrees to subject itself to the jurisdiction and venue of the courts of Richland or Lexington County, State of South Carolina as to all matters and disputes arising or to arise under this Agreement and the performance thereof. The City may seek attorney's fees and the Contractor agrees to pay such fees as awarded by the Court or other body. No attorney's fees may be sought by, nor will be paid to, the Contractor.
- F. This Agreement represents the entire agreement between the City and the Contractor and supersedes all prior communications, negotiations, representations or agreements, either written or oral. The parties may amend this Agreement at any time provided that such Amendments are executed in writing, signed by a duly authorized representative of both organizations, and approved, where applicable, by the City's governing body.

The City may, in its discretion, amend this Agreement to conform with federal, state, or local governmental guidelines, policies and available funding amounts, or for other

City of Columbia and Martin Edwards & Associates, Inc.
Compost Grinding & Screening Services

reasons. If such Amendments result in a change in the funding, the scope of services, or schedule of, the activities to be undertaken as part of the Agreement, such modifications will be incorporated only by written amendment signed by both the City and the Contractor.

- G. The failure of either the Contractor or the City to insist upon the strict performance of any provision of this Agreement shall not be deemed to be a waiver of the right to insist upon strict performance of such provision or of any other provision of this Agreement at any time. Partial payment by the City shall not be construed as a waiver. Waiver of any breach of this Agreement shall not constitute waiver of a subsequent breach.
- H. In the event any provision of this Agreement is determined to be void or unenforceable, all other provisions shall remain in full force and effect.
- I. This Agreement is subject to City Council approval.
- J. The Contractor acknowledges, for itself and its Subcontractor, that it is subject to the provisions of the 1991 Ethics Reform Act (8-13-100, et seq, South Carolina Code of Laws, 1976, as amended). Under this Act, “A person may not, directly or indirectly, give, offer, or promise anything of value to a public official, public member, or public employee with intent to:
 - 1. influence the discharge of a public official’s, public member’s, or public employee’s official responsibilities;
 - 2. influence a public official, public member, or public employee to commit, aid in committing, collude in, or allow fraud on a governmental entity; or,
 - 3. induce a public official, public member, or public employee to perform or fail to perform an act in violation of the public official’s, public member’s, or public employee’s official responsibilities.

“Anything of value” includes, but is not limited to, lodging, transportation, entertainment, food, meals, beverages, money, gifts, honorariums, discounts and interest-free loans.

- K. In carrying out the service, the Contractor shall not discriminate against any employee or applicant for employment because of that employee or applicant’s age, sex, gender, gender identity or expression, sexual orientation, race, religion, creed, color, disability, national origin, veteran or military status, political affiliation, or any other characteristic protected by federal, state, or local laws (“protected characteristic”). The Contractor shall take affirmative steps to ensure equal employment opportunities for all applicants for

City of Columbia and Martin Edwards & Associates, Inc.
Compost Grinding & Screening Services

employment, without regard to their protected characteristics. For the purpose of this Non-Discrimination in Contracting Policy, the term “sex” includes medical needs and / or lactation needs arising from pregnancy, childbirth, or related medical conditions pursuant to the South Carolina Pregnancy Accommodations Act, 2018 S.C. Act No. 244. This Non-Discrimination in Contracting Policy extends to all aspects of the Contractor operations, including, but not limited to the Contractor employment practices (including selection, hiring, assignment, re-assignment, training, promotion, transfer, compensation, layoff, leave of absence, return from layoff or leave of absence, discipline, and termination); selection of volunteers and vendors, and provision of services. The Contractor shall post in conspicuous places, available to employees and applicants for employment, notices to be provided by the government setting forth the provisions of this Non-Discrimination in Contracting Policy. The Contractor shall incorporate the provisions of this Non-Discrimination in Contracting Policy in all subcontracts for service work.

- L. This Agreement shall be binding upon the respondent and upon its successors and assignees. This Agreement shall be binding upon the City in accordance with its terms and provisions.

- M. All of the reports, information, data, records or documents of any kind, prepared or assembled by the Contractor under this Agreement are matters of public record, but that the Contractor agrees that they shall only be made available to any individual or organization by the City and the Contractor shall not make them available to any individual or organization without the prior written approval of the City.

Witness the parties’ respective hands and seals on the date first written above.

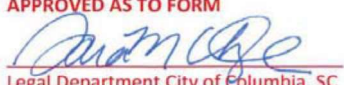
CITY OF COLUMBIA, SOUTH CAROLINA

Witness

Teresa Wilson, City Manager

Date: _____

CONTRACTOR

APPROVED AS TO FORM

Legal Department City of Columbia, SC
9/8/2021

Print

Signature

Date: _____

City of Columbia and Martin Edwards & Associates, Inc.
Compost Grinding & Screening Services

List of Exhibits

Exhibit A – Scope of Services

Exhibit B – Business Information Statement for Contractor

Exhibit C - Signed Organizational Conflict of Interest Statement

EXHIBIT A**STATEMENT of SERVICES**

The Contractor shall perform compost grinding services to grind up to five (5) windrows of material, and shall perform compost screening services to screen up to three (3) windrow of compost from the City of Columbia Landfill located at 123 Humane Lane, Columbia, SC 29209.

1. The Contractor must use a 3-inch screen for all grind material.
2. The Contractor will move material away from grinding operations.
3. The Contract will place aside stumps and large logs that will be ground separately.
4. The Contractor may be required to work with end-user contractor.
5. Windrows to be grounded will be numbered 1 through 5 onsite.
6. The material must be screened to $\frac{3}{4}$ of an inch.
7. The Contractor must contain contaminants that may be in each windrow. Generally, fencing is used.
8. The City of Columbia will haul off contaminants from screening.
9. Windrows to be screened will be labeled A, B, and C onsite.
10. The Contractor shall provide price per cubic yard to grind and screen the additional materials as needed if funding is available.

EXHIBIT B

APPENDIX - PRIME BUSINESS INFORMATION STATEMENT

Note: Form to be completed by the PRIME Vendor, Contractor or Consultant Only and submitted with your bid, proposal or response.

Offeror/Respondent's Business Name: Martin Edwards + Associates Inc.

Headquarters Address: 10335 Ramsay St.
Linden, NC 28356

Local Office Address,
if applicable: _____

Phone No.: 910-694-2058 Fax No.: 910-892-6219

Email address: adunn@mailmea.com

Tax ID No. (Soc. Sec. No., if Sole Proprietor): 26-1521093

DUNS Number: 80-8633684

Select One: ☒ Corporation ☐ Sole Proprietor ☐ Partnership

*Have you (as a Sole Proprietor), your business or anyone on the proposed team bidding on this project, ever been debarred or suspended? Yes ☐ or No ☒

*Are you (as a Sole Proprietor), your business or anyone on the proposed team bidding currently involved in any litigation with the City? Yes ☐ or No ☒

(On a separate sheet or letter, please provide an explanation for any/all "Yes" responses).

*Note: Failure to fully disclose this information may automatically deem the Bidder/Offeror/Respondent non-responsive. All "Yes" responses are subject to further review by the City and may result in your bid/response being deemed non-responsive or bidder/Offeror deemed non-responsive.

Business Contact Person to respond authoritatively to any questions about this statement:

Name/Title: Beverly Gurkin / President

Phone Number: 910-694-2058

Form Completed by: Beverly A. Gurkin
Authorized Signature

7/7/21
Date

EXHIBIT C

APPENDIX - ORGANIZATIONAL CONFLICT OF INTEREST STATEMENT

The City is respectfully requesting information to ensure that any actual or potential Conflicts of Interest (COIs) are properly recorded, reviewed and addressed in a manner as deemed appropriate by the City. It is our goal to protect the integrity of the procurement process and to ensure that no unfair competitive advantages exists or existed during any stage of the process. The City, in its sole discretion, will take the steps required to neutralize, mitigate or to perform any other action to resolve any potential or actual conflict of interest if discovered during this discovery phase.

Some examples of COIs in an organization may include, but are not limited to the following:

- Unfair Advantage: Assisting or preparing the organization in crafting written specifications, scopes of work or statements of qualifications and subsequently responding to the solicitation.
- Potentially biased or impaired objectivity: Assisting the organization with evaluating or assessing the performance of products or services of other potential bidders and also submitting a response to the solicitation.
- Unequal access to information not shared with other potential bidders or respondents: Gaining access or pre-solicitation access to non-public information prior to official release (i.e. budget/funding information, procurement information, proposed evaluation criteria, prior award info obtained from the organization through non-FOIA means, etc.).

I, Beverly Gurkin (Offeror/Consultant), on behalf of myself and my company, and my subcontractors, if applicable, certify the following, under penalty of perjury, that to the best of my knowledge and belief:

1. No circumstances currently exist that create a Conflict of Interest in my performing the services required by the Solicitation to which I am responding or the Agreement to be signed if I am the successful Offeror in response to this Solicitation, and
2. I understand and acknowledge that my failure to disclose any affiliation or relationship that creates or may create a Conflict of Interest shall be deemed a material misrepresentation and sufficient reason for Offeror and Offeror's company to be disqualified, suspended, and/or excluded from participating in this and any future solicitation and procurements as well as removal from the City of Columbia vendor database. It may further result in termination of any contractual relationship with the City of Columbia and may be grounds for disciplinary action, up to and including debarment by the City, fines, penalties, imprisonment, or civil suit to be brought against Offeror or Offeror's company.
3. That to my knowledge, no employee or official of the City, nor any public agency or official affected by this Solicitation or the Agreement to be signed if I am the successful Offeror, has any pecuniary interest in the business of the Offeror's company or Offeror's Subcontractor(s), nor does Offeror or Offeror's Subcontractors have any interest that

would conflict in any manner or degree with the performance related to this Solicitation or Agreement.

4. I warrant that I and my Subcontractor(s), if any, have not employed or retained any company or person other than a bona fide employee working solely for the Offeror's company or Subcontractor(s) in order to solicit or secure an agreement with the City of Columbia, as related to this Solicitation or any resulting Agreement, and that I and my Subcontractor(s), if any, have not paid or agreed to pay any person, company, corporation, individual, or firm other than a bona fide employee working solely for the Offeror's company or Offeror's Subcontractor(s) any fee, commission, percentage, gift, or other consideration contingent upon or resulting from the award of any Agreement.
5. I warrant and represent that my offer identifies and explains below any unfair competitive advantage I or my company or Subcontractors may have in competing for the Agreement to result from this Solicitation and any actual or potential conflicts of interest that may arise from my participation in this Solicitation or my receipt of an award. I acknowledge that the City intends by this statement to identify any and all potential conflicts of interest and unfair competitive advantages held by any Offeror, to prevent the existence of conflicting roles that might bias a consultant's judgment, and prevent one Offeror or company from having an unfair competitive advantage over other Offerors. The City, in its sole discretion, has the authority and responsibility to determine whether or not a conflict of interest or unfair competitive advantage exists, after a review of the relevant facts. I acknowledge and understand that if I or my company has an unfair competitive advantage or a conflict of interest; the City may withhold the award of this Agreement. Before withholding award on these grounds, an Offeror will be notified of the concerns and provided a reasonable opportunity to respond. Efforts to avoid or mitigate such concerns, including restrictions on future activities, may be considered.
6. I have complied with the following:

"No questions (including Compliance Program related questions) may be directed to or contacts made with the Mayor, other members of City or County Council, the City Manager, other City staff not identified in this solicitation as points of contacts during the period of time that this solicitation is made public until the final selection is made, except as otherwise provided for herein. Violation of this prohibition may disqualify the contractor and/or consulting firm from further consideration. All questions must be directed to the Procurement/Contracting Officer for this solicitation, listed on the cover page."

List any Actual or Potential Conflicts of Interest below or check the box below to certify that none exists. Failure to fully disclose information may result in penalties and/or sanctions as outlined in #2 above.

Please check only one box below.

- ☐ ☒ **No known actual or potential Conflicts of Interest are subject to disclosure.**

- ☐ ☐ **All identified actual or potential Conflicts of Interest and/or Unfair Competitive advantage(s) are stated below and submitted for further review by the City of Columbia, SC.**

7. I warrant that should I become aware of an actual or potential conflict of interest involving my company or Subcontractors, if any, in performing the services under the Agreement or responding to this Solicitation, I will notify the City immediately. I also warrant that should I become aware of any competitive advantage that my company or Subcontractors have in responding to this Solicitation or providing services under an Agreement related to this Solicitation, I will immediately notify the City of the discovery of a possible competitive advantage. I understand and acknowledge that this obligation to inform the City of the discovery of a conflict of interest or competitive advantage is a continuing obligation and extends throughout the Term of the Agreement for this procurement.
8. By signing this statement, I certify for myself and on behalf of my company and any of my Subcontractors that I have and will comply with, and have not, and will not, induce a person to violate Title 8, Chapter 13 of the South Carolina Code of Laws, as amended (Ethics Act). I acknowledge and understand that the City may rescind any Agreement and recover all amounts expended as a result of any action taken in violation of this provision. If I or my company or Subcontractors participate, directly or indirectly, in the evaluation or award of public Agreements, including without limitation, change orders, or task orders regarding a public Agreement, I shall, if required by law to file such a statement, provide the statement required by Section 8-13-1150 to the Purchasing Agent at the same time the law required the statement to be filed.
9. **Has anyone in your company been privy to any information regarding this solicitation prior to the release date of the solicitation? If so, please explain.**

NO

10. Prior to the solicitation release date, has anyone in your company attended any meetings, either internally or externally, where the above referenced solicitation was discussed either in whole or in part?

NO

Company Name: Martin Edwards + Associates Inc.

By: Beverly A. Gurkin

Print Name: Beverly Gurkin

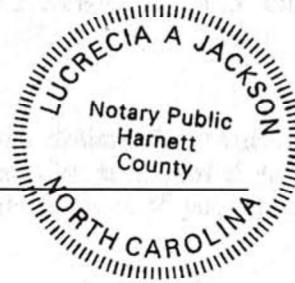
Title: President

Date: 7/7/21

Subscribed and sworn to before me

this 7th day of July, 2021

Lucrecia A. Jackson
(Notary Public)



My commission expires 10-25-2022

Event Number	BID039-20-21-LTD Addendum 1	Organization	City of Columbia, SC
Event Title	Compost Grinding & Screening Services	Workgroup	Purchasing
Event Description		Event Owner	LaToyia Davis
Event Type	IFBs	Email	latoyia.davis@columbiasc.gov
Issue Date	6/24/2021 05:01:24 PM (ET)	Phone	
Close Date	7/8/2021 03:00:00 PM (ET)	Fax	

Responding Supplier	City	State	Response Submitted	Lines Responded	Response Total
Martin Edwards & Associates Inc.	Linden	NC	7/8/2021 01:36:32 PM (ET)	1	\$159,068.70
MW Collins Inc.	Cobbtown	GA	7/8/2021 01:37:25 PM (ET)	1	\$261,850.00
DS Utilities Inc	Little Mountain	SC	7/8/2021 11:23:09 AM (ET)	1	\$363,600.00

Please note: Lines Responded and Response Total only includes responses to specification. No alternate response data is included.

Official Bid Tabulation

Black & Veatch Management Consulting, LLC
Water and Sewer Rate Study



AGREEMENT FOR PROFESSIONAL SERVICES

This Agreement is being awarded under procurement method RFP016-20-21-NMJ Water and Sewer Rate Study.

1. **PURPOSE** – This Agreement is entered into as of the date of the last signature affixed hereto, by and between the City of Columbia, South Carolina (hereinafter referred to as the "City") and Black & Veatch Management Consulting, LLC, (hereinafter referred to as the "Consultant"), to provide a comprehensive cost of service and rate study for the water and sewer utilities for the City of Columbia, SC.

For and in consideration of the mutual covenants and promises contained herein, the parties agree as follows:

2. **SCOPE OF SERVICES** – Upon written notification by the City to proceed, the Consultant shall provide the scope of services more fully described in Exhibit A, attached hereto. The Consultant shall perform any and all incidental services not specifically set forth in Exhibit A, which are necessary to fully complete the scope of services described in Exhibit A.
3. **SUPPLEMENTAL OR ADDITIONAL SERVICES** – The City may require supplemental or additional services of the Consultant or recommended by the Consultant and approved by the City in writing.

The Consultant must obtain written approval from the City for any supplemental or additional services prior to the work being performed. If the Consultant fails to obtain prior written approval to perform the work, the City is under no obligation to compensate the Consultant for services performed.

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4. **TERM OF AGREEMENT** – The term of the Agreement is the date of the execution of a *Notice to Proceed and a valid Purchase Order from the City of Columbia* for an initial term of eight (8) months with the option to renew or continue with work for three (3) additional one-year periods at the mutual pleasure of both parties.

The decision whether to extend the Agreement, upon written request, shall be the sole and exclusive discretion of the City and neither party shall be under any obligation to agree to an extension of the initial term or any additional term. The determination to extend the initial term and any subsequent extension periods may be made no later than 90 days prior to the end date of each period.

5. **SCHEDULE FOR COMPLETION OF SERVICES** – The Consultant shall complete any and all services performed under this Agreement within the timeframes as outlined in Exhibit A, attached hereto.

6. **COMPENSATION** – (See Exhibit B)

A. The total compensation to be paid by the City to the Consultant under this Agreement shall not exceed One Hundred Forty-Eight Thousand, Nine Hundred Eight-Nine Dollars and No/100 (\$148,989.00).

B. The Consultant shall submit invoices no more frequently than monthly for services rendered during each phase of the Project. Each invoice submitted must describe the services for which payment is requested, show payment calculations and specify the person(s) rendering such service(s). Consultant must invoice monthly regardless of work being completed during that period. If no work is completed, a zero balance invoice should be submitted. **Each invoice must also clearly identify any portion of the fee invoiced for subcontracted services, including any such services that are specified in the Summary of Proposed Subconsultants shown on Exhibit C hereto.** Each invoice shall bear the signature of the Consultant, whose signature shall

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certify that the information contained in the invoice is true and accurate and that the invoice amount is currently due and owing. The City will not pay interest or penalty on any past due amount.

C. Invoicing Procedure

Failure of the Consultant to follow these invoice requirements will result in the delay of payment of the invoice.

D. Prompt Payment to Subconsultants and Material Suppliers (Use Prompt Payment Affidavit)

1. The Consultant is required to pay all Subconsultants and material suppliers for all work that the Subconsultant has satisfactorily completed, no later than twenty (20) calendar days after the Consultant has received payment from the City.
2. In addition, all retainage amounts received from the City by the Consultant must be paid by the Consultant to the Subconsultant no later than fourteen (14) calendar days after the Subconsultant has, in the opinion of the City, or designee, satisfactorily completed its portion of the Work.
3. A delay in or postponement of payment to the Subconsultant or material supplier requires good cause and prior written approval of the City or designee.
4. The Consultant is required to include, in each Subcontract, a clause requiring the use of appropriate arbitration mechanisms or other method to resolve all payment disputes.
5. The City will not pay the Consultant for subsequent work performed unless and until the Consultant ensures that the Subconsultants have been promptly paid for the work they have performed under all previous

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payment requests, as evidenced by the filing of City lien waivers, canceled checks (if requested), and the Consultant's sworn statement that it has complied with the prompt payment requirements. The Consultant must submit a Prompt Payment Affidavit, Subconsultant list that identifies each Subconsultant (both Disadvantaged Business Enterprises (DBEs) and non-DBEs) including Subcontract values and the date and amount of the last payment to such Subconsultant(s). That documentation must be provided with every payment request submitted to the City, except for the first payment request.

6. Failure to comply with these prompt payment requirements is a breach of this Agreement. The City reserves the right to pursue any and all remedies permitted under law for breach of contract, including, but not limited to, Consultant debarment.

E. Affirmative Action Procurement and Contracting Goals:

It is the goal of the City of Columbia, SC to maximize opportunities for historically Disadvantaged Business Enterprises (DBEs) including, but not limited to, Small Business Enterprises (SBEs), Minority Business Enterprises (MBEs), and Women-Owned Business Enterprises (WBEs). The City has implemented an overall citywide 15% goal to encourage socially and economically disadvantaged business participation. This goal extends to bidders, contractors, Subconsultants and suppliers on its procurement and contracting offerings.

Additional information on the City's affirmative action goals and objectives may be obtained by contacting the following office: City of Columbia Office of Business Opportunities, 1401 Main Street, 4th Floor, Columbia, SC 29201, (803) 545-3950.

The City's success in tracking the amount of business received by SBE, MBE and WBE firms (whether as a prime Consultant or Subconsultant) is dependent

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upon the business community partnering with the City in this important endeavor.

The Consultant must comply with the affirmative action terms and conditions as outlined herein. The Consultant, shall in the performance of the Agreement, make constructive efforts to assist the City in complying with best practices in contracting as it relates to meeting affirmative action objectives

F. Subcontracting Goals

Under this Agreement, the subcontracting goals are as follows:

SB Goals	<u>N/A</u>	%
MBE	<u>N/A</u>	%
WBE	<u>10.00</u>	%
LSA	<u>N/A</u>	%

The Consultant will ensure Subconsultant performance during the period of performance, and optional periods as applicable. Achievement of these goals are expected during the life of the Agreement, including any extensions thereof.

7. **MENTOR-PROTÉGÉ PROGRAM** (<http://www.columbiasc.net/business-outreach/>) - **Non-Applicable** – The City of Columbia encourages, where economically feasible, establishment of mentor-protégé relationships to ensure contracting opportunities for all businesses, including minority / women / small business enterprises. The Mentor-Protégé Program (MPP) helps develop private sector business relationships and enhances the contracting capabilities of minority-owned business enterprises (MBE), women-owned business enterprises (WBE), and small business enterprises (SBE). In order to provide opportunities for growth and to encourage hands-on business relationships, certain capital improvement projects may be designated by the City of Columbia as Mentor-Protégé Program projects. The City of Columbia has determined that participation in the City's Mentor-Protégé Program is required for this project.

The Consultant must comply with Mentor-Protégé Program Guidelines. The

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Consultant agrees that the Mentor Protégé Program does not create any third-party beneficiary status or contractual rights and/or duties between the City and the Protégé and that the City is not a party to the Implementation Plan. The Consultant agrees that it has or will enter into a separate contractual Agreement with the Protégé to which the City is not a party.

8. INDEMNIFICATION & INSURANCE

- A. The Consultant shall procure and shall maintain during the life of this Agreement, whether such operation be by itself or by a Subconsultant or anyone directly or indirectly employed by either of them, such insurance as required by statute, ordinance, or this Agreement, to adequately protect the City from any claims or damages including bodily injury or death, which may arise during performance and operations under this Agreement.

Each insurance policy required by these instructions shall be endorsed to state that coverage shall not be suspended, voided, OR cancelled by either party, reduced in coverage or in limits, unless thirty (30) days prior written notice, by certified mail, return receipt requested, has been given to the City.

Workers Compensation Insurance: The Consultant shall procure and shall maintain during the life of this Agreement, Workers Compensation Insurance for all employees to be engaged in work on the project under this Agreement, and in case any work is subcontracted, the Consultant shall require the Subconsultant similarly to provide Worker Compensation Insurance for all of the latter employees to be engaged in such work unless such employees are covered by the protection afforded by the Consultants Worker Compensation Insurance. The Consultant shall not permit any person who is not protected by Workers Compensation Insurance or a properly approved Self-Insured Workers Compensation Program to perform any activity related to this Agreement.

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General Liability: The Consultant shall provide to the City evidence of General Liability insurance in an amount not less than One Million Dollars and no/100 (\$1,000,000) per occurrence, and Two Million Dollars and no/100 (\$2,000,000) dollars aggregate in accordance with the current Code of Ordinances, City of Columbia, South Carolina, which can be located at www.columbiasc.net.

Professional Liability: Professional Liability Insurance in an amount not less than One Million Dollars and No/100 (\$1,000,000.00) per claim, and Two Million Dollars and No/100 (\$2,000,000.00) Aggregate.

Automobile Liability Insurance: Five Hundred Thousand Dollars and No/100 (\$500,000.00) combined single limit per accident for bodily injury and property damage.

- B. The Consultant shall furnish the City with a certificate showing satisfactory proof of carriage of the insurance required hereunder and such insurance shall be approved by the City prior to the Consultant and any Subconsultant of the Consultant commencing any services under this Agreement and this insurance shall remain in effect throughout the term of this Agreement, and any extensions of service. Insurance shall remain in effect for the duration of the project and for a period of one (1) year after completion. The City of Columbia shall be the Certificate Holder and shall be named as an *Additional Insured, except for Worker's Compensation and Professional Liability*.
- C. The Consultant shall indemnify, defend, hold harmless and reimburse the City, its agents, and employees from and against any and all losses, liabilities, expenses, and all claims for damages to the extent caused by the negligence of the Consultant, it's Subconsultants, officers, agents and employees in the performance of any of the obligations under the Agreement. Losses, liabilities, expenses and claims for damages shall include, civil and criminal fines and penalties, bodily injury, death, personal injury, or injury to real or personal property, defense costs, legal fees and costs, and attorney's fees for an appeal.

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The Consultant will also agree to promptly notify the City of any civil or criminal actions filed against the Consultant or of any notice of violation from any federal or state agency, or of any claim as soon as practical as relates to the services provided under this Agreement. The City, upon receipt of such notice, shall have the right at its election to defend any and all actions or suits or to join in defense.

9. **PERMITS & LICENSES**

- A. The Consultant shall be responsible for obtaining any approvals, permits and/or licenses as may be required of the Consultant in performing the services required under this Agreement. The Consultant shall be responsible for any costs relating to same.
- B. The Consultant shall be responsible for identifying the necessity for and providing any applications and supporting documentation to the City for any approvals and/or permits required of the City in order for the Consultant to perform the services required under this Agreement. Such approvals and/or permits may include, but not be limited to, South Carolina Department of Health and Environmental Control (SCDHEC) Construction Permits, SCDHEC Stormwater Management for Construction Sites Permits, SCDHEC Water Resources Permits, Corps of Engineers Permits, City/County/ South Carolina Department of Health and Environmental Control (SCDOT) Encroachment Permits, encroachment permits for other utility rights-of-way and railroad right-of-way encroachment permits/agreements. The City shall obtain the approvals and/or permits identified by the Consultant and pay any costs relating to same.
- C. The Consultant shall answer questions and consult with the City and/or appropriate authorities as necessary to assist the City's efforts in obtaining required permits/approvals.

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- D. The Consultant shall procure a City of Columbia business license while performing services under this Agreement.

10. **DUTIES UPON TERMINATION** – At termination of this Agreement, the Consultant shall immediately provide the City with all records and data in any format the Consultant is capable of producing and at no cost to the City, which were generated, created or received by the Consultant in performance of the services required by this Agreement or as the City may deem necessary to perform the required services by the City or the Consultant's successor. All records shall be free from any proprietary claims or interest. The Consultant agrees to fully cooperate with the City and any successor to ensure an effective transition to continuously provide the required services.

11. **INTEREST OF CONSULTANT** – The Consultant covenants that Consultant presently has no interest and shall not acquire any interest, direct or indirect, which would conflict in any manner or degree with the performance of services required to be performed under this Agreement or which is adverse to the interests of the City. The Consultant further covenants that in the performance of this Agreement no person having such interest shall be employed.

The Consultant is expected to make Consultant 's services available to other entities but agrees to refrain from representing other entities in matters where the position of the City conflicts with that of the other entity. The City may at its discretion, waive this provision. The Consultant has provided a list of all of its clients with whom there may be potential conflicts with the City. This list shall be supplemented throughout the duration of this Agreement.

12. **TERMINATION OF AGREEMENT** – The City may terminate this Agreement at any time upon any of the following grounds:

- A. Failure by the City to appropriate funds for the performance of any of the services required in this Agreement in any annual budget;

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- B. The Consultant fails to perform any of the services required in this Agreement and does not correct such deficiency within fifteen (15) days after being notified by the City of such deficiency;
- C. Force Majeure;
- D. The City, at its sole option and discretion, has the right to terminate this Agreement for any reason whatsoever. A termination for default under this Agreement, if wrongfully made, shall be treated as a termination for convenience under this clause;
- E. Upon expiration of the term of this Agreement; and
- F. By mutual agreement.

Notice of termination shall be sent by registered mail, return receipt requested. In the event of termination, the Consultant shall only be entitled to the actual direct costs of all labor and material expended on the services required under this Agreement prior to the effective date of the termination or the Consultant shall be entitled to be paid a pro-rata percentage of the total Agreement price which is equal to its percent of completion, whichever of the two methods provides the lowest sum to be paid to the Consultant. In no event shall the Consultant be entitled to anticipatory profit or damages for any termination under this Agreement. In no event shall the Consultant be entitled to assert a claim in quantum meruit or any other measure of damages other than that stated herein.

13. **OWNERSHIP OF PROJECT** - All data, documents or other information of any description generated by or used by the Consultant or any Subconsultant retained by the Consultant and related to the services required by this Agreement shall be the property of the City and shall not be used by the Consultant for any purpose whatsoever except to perform the services required by this Agreement.

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14. **OWNERSHIP OF PROJECT DOCUMENTS** - All data, documents or other information of any description generated by or used by the Consultant or any Subconsultant retained by the Consultant and related to the services required by this Agreement shall be the property of the City and shall not be used by the Consultant for any purpose whatsoever except to perform the services required by this Agreement.
15. **NOTICE** - All notices and communications in connection with this Agreement will be addressed to the following:

City of Columbia

Name: Office of Procurement and Contracts
Title: Purchasing Agent
Address: 1800 Main Street
Second Floor
Columbia, SC 29201
Phone: (803) 545-3470
Fax: (803) 758-1013
Email: procurement@columbiasc.gov

Black & Veatch Management Consulting, LLC

Name: Robert Chambers
Title: Project Manager
Address: 1411 Gervais St., Suite 125
Columbia, SC 29201
Phone: (407) 419-3574
Email: ChambersR@bv.com

16. **CONSENT DECREE - Non-Applicable**

- A. The services performed by the Consultant pursuant to this Agreement are required in whole or in part to satisfy the terms of the Consent Decree entered by the United States District Court for the District of South Carolina on May 21, 2014, in the case captioned *The United States of America and State of South Carolina by and through the Department of Health and Environmental Control v. City of Columbia*, Civil Action No. 3:13-2429-TLW (the "Consent Decree"), a copy of which has been provided to the Consultant by the City and is incorporated by reference herein. The Consultant shall perform the services pursuant to this Agreement in conformity with the terms of the Consent Decree as required by Paragraph 5 therein.

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- B. In addition to the requirements above, the Consultant shall comply with the document retention requirements of Paragraph 68 of the Consent Decree which includes, but is not limited to, the obligation to preserve all non-identical copies of all documents, records, or other information (including documents, records, or other information in electronic form) in the Consultant's possession or control that relate in any manner to the Consultant's performance under this Agreement ("Preserved Documents"). Upon the Consultant's performance of all services required under this Agreement, the Consultant shall provide the City with all Preserved Documents. In addition to the requirements above, the Consultant shall provide the City with all Preserved Documents upon termination of this Agreement.
- C. Upon the occurrence of a force majeure event as defined in Paragraph 55 of the Consent Decree, the Consultant shall provide notice to the City's Director of Utilities and Engineering in person, by phone, or by electronic mail within twenty-four (24) hours of when the Consultant first knew or should have known that the event might cause a delay. Within three (3) days thereafter, the Consultant shall provide written notice in accordance with Section XII above to include the following information: an explanation and description of the reasons for the delay; the anticipated duration of the delay; all actions taken or to be taken in an effort to prevent or minimize the delay; a schedule for implementation of any measures to be taken in an effort to prevent or mitigate the delay or the effect of the delay; and the Consultant's rationale for attributing such delay to a force majeure event. The Consultant shall include with any notice all available documentation supporting the claim that the delay was attributable to a force majeure event.
- D. The Consultant shall reimburse the City the amount of any stipulated penalties imposed on the City pursuant to Paragraph 47 of the Consent Decree if the Consultant neglects, fails, or refuses to meet the deadlines set forth in Exhibit B attached hereto. The Consultant agrees that any failure to meet such deadlines will result in the City's failure to meet the deadlines set forth in the Consent

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Decree except in the event of force majeure notice by the Consultant that results in the extension of said deadline by the U.S. Environmental Protection Agency under the Consent Decree. The City reserves all other remedies available for the Consultant's failure to perform pursuant to the Agreement.

- E. The Consultant shall perform the services pursuant to this Agreement using sound Engineering practices as set forth in Paragraph 9 of the Consent Decree.

17. MISCELLANEOUS

- A. Nothing in this Agreement shall be construed to give any rights or benefits to anyone other than the City and the Consultant.
- B. The Consultant shall be responsible for performance of all services required by this Agreement. The Consultant does not act as the City's agent or employee.
- C. The Consultant will not assign or sublet its obligations to perform the services required by this Agreement without the written consent of the City. The Consultant shall be as fully responsible to the City for the acts and omission of its Subconsultants, as it is for the acts and omissions of persons directly employed by the Consultant.

The Consultant shall furnish and its Subconsultants shall furnish all information and reports required hereunder.

- D. In the event there are any disagreements between the City and the Consultant with regard to any of the requirements, specifications or interpretation of this Agreement, the Consultant agrees to defer to the reasonable interpretations of the City as, from time to time, may be made by the City. Ambiguities in the terms of this Agreement, if any, shall not be construed against the City.
- E. This Agreement shall be construed in accordance with the laws and City of Columbia Code of Ordinances and those of the State of South Carolina. The

Black & Veatch Management Consulting, LLC
Water and Sewer Rate Study

Consultant agrees to subject itself to the jurisdiction and venue of the courts of Richland or Lexington County, State of South Carolina as to all matters and disputes arising or to arise under this Agreement and the performance thereof. The City may seek attorney's fees and the Consultant agrees to pay such fees as awarded by the Court or other body. No attorney's fees may be sought by, nor will be paid to, the Consultant.

- F. This Agreement represents the entire agreement between the City and the Consultant and supersedes all prior communications, negotiations, representations or agreements, either written or oral. The parties may amend this Agreement at any time provided that such Amendments are executed in writing, signed by a duly authorized representative of both organizations, and approved, where applicable, by the City's governing body.

The City may, in its discretion, amend this Agreement to conform with federal, state, or local governmental guidelines, policies and available funding amounts, or for other reasons. If such Amendments result in a change in the funding, the scope of services, or schedule of, the activities to be undertaken as part of the Agreement, such modifications will be incorporated only by written amendment signed by both the City and the Consultant.

- G. The failure of either the Consultant or the City to insist upon the strict performance of any provision of this Agreement shall not be deemed to be a waiver of the right to insist upon strict performance of such provision or of any other provision of this Agreement at any time. Partial payment by the City shall not be construed as a waiver. Waiver of any breach of this Agreement shall not constitute waiver of a subsequent breach.
- H. In the event any provision of this Agreement is determined to be void or unenforceable, all other provisions shall remain in full force and effect.
- I. This Agreement is subject to City Council approval.

Black & Veatch Management Consulting, LLC
Water and Sewer Rate Study

- J. The Consultant acknowledges, for itself and its Subconsultants, that it is subject to the provisions of the 1991 Ethics Reform Act (8-13-100, et seq, South Carolina Code of Laws, 1976, as amended). Under this Act, "A person may not, directly or indirectly, give, offer, or promise anything of value to a public official, public member, or public employee with intent to:
1. influence the discharge of a public official's, public member's, or public employee's official responsibilities;
 2. influence a public official, public member, or public employee to commit, aid in committing, collude in, or allow fraud on a governmental entity; or,
 3. induce a public official, public member, or public employee to perform or fail to perform an act in violation of the public official's, public member's, or public employee's official responsibilities.
- "Anything of value" includes, but is not limited to, lodging, transportation, entertainment, food, meals, beverages, money, gifts, honorariums, discounts and interest-free loans.
- K. In carrying out the service, the Consultant shall not discriminate against any employee or applicant for employment because of that employee or applicant's age, sex, gender, gender identity or expression, sexual orientation, race, religion, creed, color, disability, national origin, veteran or military status, political affiliation, or any other characteristic protected by federal, state, or local laws ("protected characteristic"). The Consultant shall take affirmative steps to ensure equal employment opportunities for all applicants for employment, without regard to their protected characteristics. For the purpose of this Non-Discrimination in Contracting Policy, the term "sex" includes medical needs and / or lactation needs arising from pregnancy, childbirth, or related medical conditions pursuant to the South Carolina Pregnancy

Black & Veatch Management Consulting, LLC
Water and Sewer Rate Study

- Accommodations Act, 2018 S.C. Act No. 244. This Non-Discrimination in Contracting Policy extends to all aspects of the Consultant's operations, including, but not limited to the Consultant's employment practices (including selection, hiring, assignment, re-assignment, training, promotion, transfer, compensation, layoff, leave of absence, return from layoff or leave of absence, discipline, and termination); selection of volunteers and vendors, and provision of services. The Consultant shall post in conspicuous places, available to employees and applicants for employment, notices to be provided by the government setting forth the provisions of this Non-Discrimination in Contracting Policy. The Consultant shall incorporate the provisions of this Non-Discrimination in Contracting Policy in all subcontracts for service work.
- L. This Agreement shall be binding upon the respondent and upon its successors and assignees. This Agreement shall be binding upon the City in accordance with its terms and provisions.
- M. All of the reports, information, data, records or documents of any kind, prepared or assembled by the Consultant under this Agreement are matters of public record, but that the Consultant agrees that they shall only be made available to any individual or organization by the City and the Consultant shall not make them available to any individual or organization without the prior written approval of the City.
- N. Every exhibit, schedule and appendix attached to this Agreement and referred to herein is hereby incorporated into this Agreement by reference unless this Agreement expressly provides otherwise. This Agreement, exhibits and other documents include, but are not limited to the Conflict of Interest Statement, Non-collusion Affidavit, Business Information Record for Subconsultants /Subcontractors, Local Business Enterprise, and Mentor Protégé Implementation forms are incorporated by reference in this Agreement and set forth the entire understanding between the parties hereto regarding the subject matter hereof.

Black & Veatch Management Consulting, LLC
Water and Sewer Rate Study

Witness the parties' respective hands and seals on the date first written below.

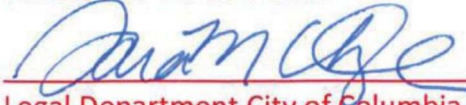
CITY OF COLUMBIA, SOUTH CAROLINA

Witness

Teresa Wilson, City Manager

Date: _____

APPROVED AS TO FORM



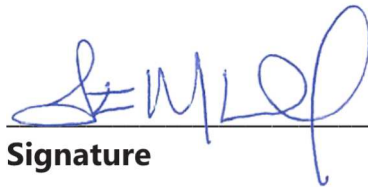
Legal Department City of Columbia, SC
9/22/2021

BLACK & VEATCH MANAGEMENT CONSULTING, LLC

Steve Uhlmansiek,
Associate Vice President

Print: Name/Title

Signature



Date: 9/23/2021



Attest



Signature

Date: 9/23/2021

Reviewed
by Legal
KAR
9-23-21

PM (R.
Chambers)
9/23/2021 RSC

Black & Veatch Management Consulting, LLC
Water and Sewer Rate Study

List of Exhibits

Exhibit A – Scope of Services/Schedule for Completion of Services

Exhibit B – Compensation

Exhibit C – Business Information Statement for Subconsultants/Subcontractors

Exhibit A



CITY OF COLUMBIA

PROPOSAL FOR

Water and Sewer Rate Study

RFP016-20-21-NMJ | AUGUST 25, 2021

**BLACK & VEATCH**

Black & Veatch Management Consulting, LLC

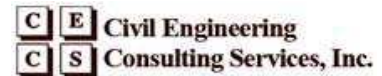
Black & Veatch Management Consulting, LLC (Black & Veatch or BV) is a wholly-owned Black & Veatch Holding Company subsidiary and provides strategic business advisory and planning, digital strategy & processes, and infrastructure modernization services.

Our globally recognized subject matter experts and senior-level analysts combine advanced analytics and practical business sense with extensive financial analysis, rate setting expertise, and engineering capabilities to deliver solutions that work best for your customers, your organization, your assets, and your stakeholders.

We have provided repeat services to many of our clients for many years and, in some instances, decades, which is a testament to the trusted partnerships built by Black & Veatch with many clients.

Civil Engineering Consulting Services (CECS), Incorporated

Founded in Columbia, SC in 1993, CECS is a local and diversified engineering and consulting firm providing a variety of Engineering Services, including Roadway Design, Bridge Design, Hydraulics/Hydrology, Geotechnical, Project Management, Traffic Studies/Signal Design, Environmental Services, Subsurface Utility Engineering, Utility Coordination, and Construction Management/Monitoring and Inspection. As a local South Carolina firm that has built relationships for over 25 years with local counties, municipalities, and SCDOT. CECS has provided project development, design services, and project management services, to name a few, to many municipalities in South Carolina.



Black & Veatch will serve as the prime contractor and be responsible for executing and delivering all the services requested in the RFP. *We have partnered with CECS to harness our collective experience to meet your project's objectives.* In this proposal, our collective team is referenced as "The Black & Veatch Team."

We welcome the opportunity to discuss our qualifications and invite you to contact our Project Manager, Mr. Robert Chambers, at +1 407-419-3574 or ChambersR@bv.com. We appreciate your consideration of our proposal, and we look forward to continuing our partnership with the City on this important effort.

Very truly yours,

Deepa Poduvál
Vice President



PRIMARY CONTACT

Mr. Robert Chambers

1411 Gervais Street, Suite
125 Columbia, SC 29201



+1 407-419-3574



ChambersR@bv.com

08-010-2040-DUNS

www.bv.com

C Executive Summary

The City of Columbia (City) maintains a dynamic Water and Sewer System (Columbia Water) with significant annual operating and capital requirements. Fiscal Year (FY) 2021 served to be a challenging and complex year due to the impact of the COVID 19 pandemic. Still, Columbia Water demonstrated resiliency in maintaining the level of service provided to customers, providing support for customers impacted by the pandemic, and maintaining its organizational structure and capacity to deliver services through these challenging times.

The resiliency demonstrated by the City and Columbia Water is a culmination of dedicated focus and the prioritization and balancing of objectives to maintain its financial integrity. Columbia Water's success is embedded in establishing credibility with its stakeholders and the willingness of the City Council, Utility Executives, and staff to take difficult but needed actions, such as timely revenue increases, to preserve the integrity of the utility. The City is in the process

We understand South Carolina and have provided these services to Client in South Carolina including BJWSA, SC; Renewable Water Resources, SC; Charleston, SC; Woodruff Roebuck, SC; and Myrtle Beach, SC.

Rate Setting Balance Multiple Objectives



FIGURE 1. Financial Resiliency Drivers

of implementing significant service requirements, and the appropriate diligence of these service requirements has allowed Columbia Water to continue to increase its footprint within the region. The customer base of Columbia Water is informed and engaged in the utility's activities, and the City Council, Utility Executives, and staff have stayed connected and responsive to the needs of the customer base.

As illustrated in Figure 1, the City must continue to maintain the integrated long-term plan to sustainably address the requirements of the Utility System over the next five years.

As Columbia Water continues to balance these competing objectives, *the annual*

*Rate Study completed by Columbia Water serves as **ONE** of the critical resources in assuring and balancing the revenue, resource adequacy, capacity, reliability, and regulatory needs of the utility.* Black & Veatch understands the importance of the Rate Study and the complex issues that the City must consider having successfully facilitated the review and approval of past Columbia Water financial plans and rate increases.

We stand ready and responsive to serve the residents of Columbia, South Carolina. *We believe that Black & Veatch is best qualified and prepared to serve the City for these reasons.*

The proposal detailed herein seeks to outline Black & Veatch’s approach, experienced project team, and our long-standing dedication to serving the City as a trusted business partner.

STUDY UNDERSTANDING

Figure 2 illustrates the City’s key drivers and desired outcomes of the comprehensive study:



FIGURE 2. Key Drivers and Desired Outcomes

The Black & Veatch team brings in-depth knowledge and expertise to help the City develop a pragmatic and actionable integrated financial plan.

OUR TEAM EXPERTISE

The Black & Veatch management consulting team of over 200 professionals provides integrated

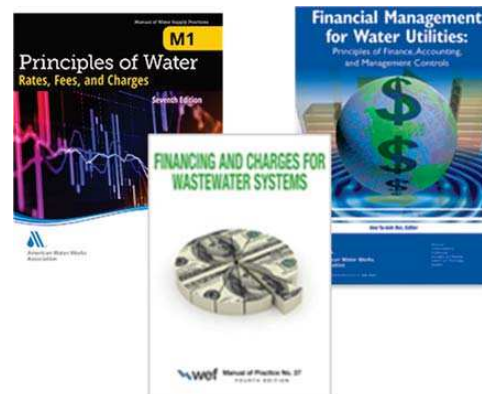
strategy, financial, business process, and technology solutions to water and sewer utilities nationwide.

Many of our project team members proposed for this engagement have worked together seamlessly in executing other financial planning, cost of service, and rate design projects.

Members of Management Consulting have actively participated in preparing the following AWWA and WEF Manuals and books, as shown in Table 1.

TABLE 1. Contributions Of Team Members to Industry Publications as Authors or Editors

M1 Principles of Water Rates, Fees and Charges	M54 Developing Rates for Small Systems
M26 Water Rates and Related Charges	M5 Utility Management
M29 Water Utility Capital Financing	WEF Manual of Operating Practices 27
M35 Revenue Requirements	User-Fee Funded Stormwater Programs
M34 Water Rate Structures and Pricing	Financial Management for Water Utilities, 2012

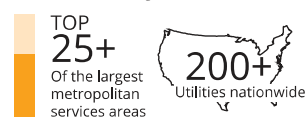


BENEFITS OF THE BLACK & VEATCH TEAM



UNMATCHED EXPERIENCE

Financial and management services for:



DECADES EXPERIENCE

Assisting clients with debt financing

Our experience helps us solve challenges and we will share how others have addressed issues and overcome barriers.



IN-DEPTH EXPERTISE AND RELIABILITY

170+
Management Consultants
Specializing from Financial to
operational to technology
services



TRUST

Serving clients for years
because of our trustworthiness

Our deep bench of professionals means we will always be able to staff your requests with qualified professionals.



STERLING REPUTATION ON WALL STREET



VALUE

Financial institutions and
rating agencies value our
independent evaluations due
to our extensive involvement

LAST 6 YEARS

We have been involved
with every major water
Merger & Acquisition



These relationships mean that Black & Veatch can give you meaningful insights to help maximize financing opportunities.



EXTENSIVE KNOWLEDGE AND LONGEVITY

100+
YEARS

We've learned
what matters
most to
clients



TOP 10



Continuous
ranking by the
Engineering
News Record
shows we
understand and
know water



With our understanding of your organization and a long history of utility financial engagements, we can give the best solutions in the industry.



THOUGHT LEADERSHIP

As we help shape the water industry, we have
professionals involved in all areas

Past Chair of AWWA's Finance,
Accounting and Management
Controls Committee



A member of EPA's
Environmental Financial
Advisory Board

Editor of Journal
AWWA's Money
Matters



Editors and co-authors of industry standards
including: AWWA's M1, M29, and M54 manuals;
Financing, Accounting, and Management Controls
for Water Utility book; WEF's MoP 27 and User-Fee
Funded Stormwater Programs

We can offer you the most innovative approaches in the industry.

FIGURE 3. Benefits of the Black & Veatch Team

STUDY APPROACH AND SERVICES

To address the diverse objectives of the Study within the timeline that is necessary, we propose a structured framework that includes – (i) Financial Planning, (ii) Cost of Service Analysis, (iii) Rate Design Analysis, and (iv) Financial Model development.

Our proposed framework will facilitate effective task execution and delivery of work products *based on our first-hand lessons learned through our extensive utility rate studies and rate development*

proceedings and facilitation. We have structured a work plan with tasks and sub-tasks consistent with the scope elements that the City has requested in the RFP.

Our **Project Manager** will closely manage the project milestones and schedule, collaborate with the City staff, and facilitate the cohesive execution of the project tasks. Our **Project Director** will ensure the overall quality of execution, provide timely quality assurance and quality control reviews of deliverables, and thought leadership.

OUR EXPERIENCE

Our approach to integrated financial planning balances and integrates multiple facets, including utility needs; customer service level needs and requirements; and external stakeholder expectations.

Table 2 illustrates the integrated approach we have used at several utilities, including Columbia, SC; Atlanta, GA; Wilmington, DE; and Clayton, NC; to building long-term financial resilience.

The Black & Veatch team brings multi-dimensional expertise and experience to this study. Table 2 highlights examples of the approach and value our team has brought forth in providing tangible benefits.

TABLE 2. BV EXPERIENCE AND EXPERTISE HIGHLIGHTS

EXAMPLE #1: FINANCIAL PLAN AND EQUITABLE COST RECOVERY	
Key Issue	Diligent delineation of costs between the water and wastewater utilities and further between “wholesale” and “retail” customer groups is fundamental to determining the appropriate cost responsibility of each customer class.
Our Approach	We applied technical due diligence efforts that aligned with industry cost of service guidelines and principles to address the following: - Establish financial requirements, - Delineate functional costs based on system characteristics;

	■ Develop customer class costs aligned with demands the classes place on the system; ■ Determine the cost associated with providing specific services; and ■ Assess a cost-based outside services differential, which aligns with the service and demand requirements of customers served. We then further enhance equity by carefully structuring the fixed and variable rates and, where necessary, phasing-in of rates to mitigate bill impact.
Tangible Benefits	At the City of Atlanta, GA, we performed a retail and wholesale rate and cost of service analysis based on industry-accepted guidelines. Our engagement involved developing a financial plan; extensive functional cost delineations; service demand analysis; and asset utilization of each contributing municipality. The City serves three outside retail water jurisdictions, two outside retail sewer jurisdictions, three wholesale water customers, and five wholesale sewer customers. Upon completing the analysis, the City received a sound and defensible cost allocation that aligned the nature of service with the cost to provide service given the dynamic mix of customers served by the City.
EXAMPLE #2: LARGE USE CUSTOMER RATES & TRUE-UP	
Key Issue	We understand that establishing wholesale pricing structure and the associated budget-true-up processes have significant implications for inter-governmental relationships, equity in cost recovery, and financial stability.
Our Approach	We have not only established wholesale pricing structure for both water and sewer utilities but have supported clients with contract negotiations, implementing annual wholesale fee estimation and fiscal year-end reconciliation true-up process and cost model, generation of true-up reports, contract agreement review support, and expert witness support.
Tangible Benefits	Since 2010, we have been continuously providing to the City of Wilmington, DE, wholesale sewage treatment budget and true-up reconciliation analysis, budget and true-up report and supporting documentation package for the wholesale treatment services the City provides to New Castle County. In addition, for Wilmington, we have developed and delivered a user-friendly MS-Excel-based Budget/True-up Model that maintains a multi-year history of budget and true-up information.

EXAMPLE #3: FINANCIAL PLANNING MODEL	
Key Issue	How can the financial planning tool balance planning concerns, financial planning metrics and guidelines, and utility system operating and funding needs?
Our Approach	At project initiation, we collaborated with the client team to define the key financial model requirements. We garnered participation and support to identify the financial model's key components, inputs, and outputs.
Tangible Benefits	At the Town of Clayton, NC, we worked with the Town staff to develop a Financial Planning tool utilized by the Town as a part of the Town's annual operating and capital budgeting process. The Town has assigned a specific Financial Model team that works with Black & Veatch to update the model annually and run specific planning and funding scenarios to determine the feasibility of certain town initiatives, projects, and activities. The Town received dynamic planning tools that they utilize as a standard part of the Town's operating practices.

In Black & Veatch's experience, the City's annual operating and capital budgeting process coupled with the approval of Water and Sewer Rates is an iterative process that requires a high-level of responsiveness and focus. Black & Veatch has always facilitated project team calls, sought and retain affirmations from Department Directors related to project information and assumptions, and be responsive to unexpected circumstances. This diligence has allowed the project team to present cohesive and consistent Financial Plans as a part of the City's annual budgeting process.

D Experience, Qualifications and Technical Competence

D-1 QUALIFICATIONS AND EXPERIENCE OF THE FIRM

Our Services

Black & Veatch's diverse management consulting service offerings span financial, business process, and technology solutions for the entire utility sector – *Water, Sewer, Stormwater, Oil & Gas, Telecom, and Financial Markets*.

Many of our experienced professionals possess cross-functional skills, including strategic planning, asset management, financial planning/cost of service analysis, business process/workflow analysis, implementation services, and business case evaluation services. Figure 4 provides a summary of the wide range of services we offer to utilities.



FIGURE 4. OUR CORE SERVICES TO UTILITIES

THE BLACK & VEATCH VALUE PROPOSITION

The Black & Veatch Team has a distinctive offering that we believe will balance City's diverse objectives and maintain a sustainable path to utility resilience. Figure 5 summarizes the key features of our offering, and the paragraphs below describe our team's value proposition for the City.

Unmatched Rate and Cost of Service Expertise Embodied in a Multi-Dimensional Team

The Black & Veatch Team brings proven expertise with conducting cost-of-service studies and achieving successful financial plan and rate approvals, gained through our work with hundreds of municipal utilities. Regulatory bodies recognize members of our team as subject matter experts in the areas of financial planning, rate-setting; affordability; and customer information systems, to name a few. *Black & Veatch has provided financial, rate setting, and operations management services for over 100 years. The proposed Black & Veatch team maintains about*

170 collective years of providing rate, financial, and other planning services to municipalities across the United States.

Table 3 provides the collective years of experience of the project team.

When we say that we have "done this before," we literally mean that we have conducted more than 5,000 financial evaluations, including cost of service studies over the past decade. *During this time, we have been involved with programs touching over 30 million customers, 4.6 billion gallons per day (BGD) of treated potable water, and 5.6 BGD of treated wastewater in the US alone* – a clear testimony to the trust that clients place in our ability. We serve clients of all sizes, ranging from small communities struggling with funding operating and capital needs to large, complex systems facing long-term regulatory mandates, affordability issues, and challenges related to managing existing water resources.

TABLE 3. Collective Years Of Experience

Name	Years of Experience
Project Director	32
Project Manager	21
Technical Advisor	22
Quality Assurance Lead	35
Senior Consultant	10
Financial Analyst	3
Planning Specialist [CECS]	40
Planning Analyst [CECS]	7
Total Years	170

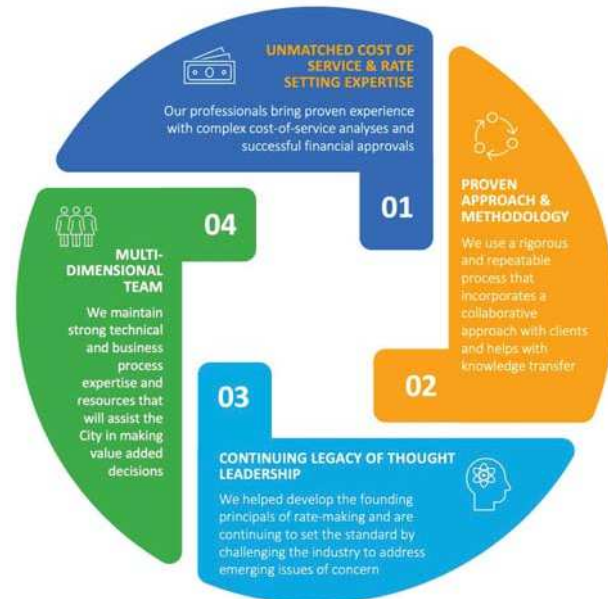


FIGURE 5. The Black & Veatch Team Value Proposition

A map of the United States showing the locations of Black & Veatch clients and the Top 50 Metropolitan Statistical Areas (MSAs). The map uses a light gray background for the United States, with state boundaries outlined in white. Black & Veatch Client locations are marked with dark blue circles, and Top 50 MSA Areas are marked with light blue circles. The map includes labels for major cities and states.

Legend:

- Black & Veatch Client (Dark Blue Circle)
- Top 50 MSA Area (Light Blue Circle)

Client Locations (Dark Blue Circles):

- San Jose
- San Francisco
- Los Angeles
- San Diego
- Phoenix
- Las Vegas
- Riverside
- San Antonio
- Dallas
- Arlington
- Wichita
- Kansas City
- St. Louis
- Omaha
- Minneapolis
- Chicago
- Milwaukee
- Cincinnati
- Louisville
- Indianapolis
- Birmingham
- Oklahoma City
- Memphis
- Houston
- New Orleans
- Tampa
- Miami
- Atlanta
- Charlotte
- Raleigh
- Virginia Beach
- Washington D.C.
- Baltimore
- Pittsburgh
- Philadelphia
- Cleveland
- Detroit
- Buffalo
- Hartford
- Providence
- Boston
- New York

Top 50 MSA Areas (Light Blue Circles):

- Seattle
- Portland
- Sacramento
- Salt Lake City
- Denver
- San Francisco
- San Jose
- Los Angeles
- San Diego
- Phoenix
- Las Vegas
- Riverside
- San Antonio
- Dallas
- Arlington
- Wichita
- Kansas City
- St. Louis
- Omaha
- Minneapolis
- Chicago
- Milwaukee
- Cincinnati
- Louisville
- Indianapolis
- Birmingham
- Oklahoma City
- Memphis
- Houston
- New Orleans
- Tampa
- Miami
- Atlanta
- Charlotte
- Raleigh
- Virginia Beach
- Washington D.C.
- Baltimore
- Pittsburgh
- Philadelphia
- Cleveland
- Detroit
- Buffalo
- Hartford
- Providence
- Boston
- New York

A Continuing Tradition of Thought Leadership

Key members of the Black & Veatch Team that are designated to serve the City study have contributed to the rate-making and financial guidelines for the water and wastewater utility industry in these diverse roles:

- Management Controls (FAMC)
Committee;

- Two Subcommittee Chairs on AWWA's Strategic Practices Committee (Regionalization) and Rates & Charges (Publications) Committee;
- Primary Authors and Co-authors for the Water Environment Federation (WEF) Manual of Practice 27 updates and WEF's User Fee-Funded Stormwater Program special publication;
- Editor of the update to AWWA's M29 Water Capital Financing;
- Assigned Authors of the eighth edition update to AWWA's M1 Rates and Charges Manual

The box to the right illustrates Black & Veatch's commitment to industry thought leadership. Our team members have actively participated in the preparation of AWWA and WEF financial and rate setting manuals, which provide the defensible industry guidelines, best financial practices, and principles pertinent to financial planning, cost of service analysis, and rate development.

Black & Veatch hosts many seminars and roundtables and shares insights into leading practices for the utility sector through our presence at industry events.

At Black & Veatch, thought leadership means a strong dedication to research. It's a vital element of our culture and central to our commitment to clients. Our best effort, intellect, and resources are focused on dozens of advanced research initiatives. We strive for innovation that works on paper and off, with smart ideas translating into practical applications. Our goals in research are always focused on increased water quality and delivery and more economical, sustainable, efficient operations for you.

Proven Approach and Methodology

The Black & Veatch Team brings direct expertise that has supported the City in maintaining a sustainable path toward long-term financial resilience. We do so by integrating:

- i. long-term financial planning (to address operating, capital, & performance needs);
- ii. sound utility functional cost allocations and defensible cost of service analysis;
- iii. pragmatic rate design to mitigate customer impact and support economic development; and
- iv. recommendations for continuous efficiency improvements and strengthening the governance framework.

THOUGHT LEADERSHIP



Black & Veatch has a long legacy of leading the industry in the development of rate-setting and financial principles and guidelines.

- Authorship and Editorial Review - every AWWA M-1 Manual edition
- Authorship and Editorial Review - every AWWA M-29 Manual edition
- Authorship and Editorial Review - every AWWA M-54 Manual edition
- Authorship and Editorial Review - every edition of WEF's Financing for Charges for Wastewater Systems, Manual of Practice 27
- Authorship and Editorial Review of WEF's User-Fee Funded Stormwater Program
- Editor of AWWA's Finance Management for Water Utilities
- Past Chair of AWWA Finance, Accounting, and Management Controls committee
- On AWWA Rates & Charges Subcommittees for:
 - Cost Allocations
 - Rate Design
 - Publications (Co-Chair)
- On AWWA Strategic Management Practices Subcommittee for Regionalization
- Coordinating Editor for Journal AWWA's Money Matters

Our proven approach is rigorous, repeatable, and tested through the legislative processes and budgetary formats within the City by retaining City Council approvals of financial plans supported by Black & Veatch.

The City's management team's technical and financial due diligence has allowed the City to maintain its financial resilience while releasing potential rate burden to the existing customer even through the COVID-19 pandemic. To achieve resiliency of this nature, a systematic approach with trusted participants is critical. Black & Veatch understands the importance of these partnerships as a part of the City's business processes.

In our experience, unless you can tell a compelling story and effectively engage with diverse stakeholders to understand, address concerns, and go forward in a coordinated manner, you will not reach a successful rate approval. Given the current regulatory requirement associated with the Clean Water 2020 Program and the continued development of the evolution of the City's service area, it is fundamental that the City continue to engage stakeholders and retain support and coordination. Black & Veatch understands and has worked with the City through simple action steps, collaborative multi-stakeholder efforts, and complex business case decisions to make compelling cases to attain approvals for financial plans, business cases, and rate-setting efforts.

These collective efforts and City's dedication have allowed the City to maintain its financial resilience to implement necessary operating and capital programs.

D-2 PROJECT TEAM MEMBER QUALIFICATIONS

Black & Veatch has assembled an experienced and highly qualified team of professionals who have served the City, understand the operations, legislative aspects, and stakeholders within the City, and are committed to serving the City and its residents to deliver the agreed-upon scope of work. Our people are the most important part of our organization, and we have carefully selected a team of experts that will be responsive, diligent, and available in serving the City.

Black & Veatch offers a dedicated project team that understands the City's system, continues to serve the City and its residents through the COVID-19 pandemic, and strives to be an extension of City staff.

Based on our experience in providing financial planning services, operations reviews, and stakeholder engagement services, we've selected a team specifically for this project that includes the following critical attributes:

- **Exceptional Project Management and Thought Leadership** to serve the City in addressing complex financial planning needs, to diligence economic development opportunities, appropriately assess issues around intra-

generational growth (large users) and service extensions practices in South Carolina, and collectively work with City staff to address and acknowledge the affordability concerns of existing customers;

- **Synergistic Team that Understands South Carolina** and, as a team, have supported numerous municipalities in South Carolina within the past 24 months to achieve financial and rate-setting objectives similar to the challenges faced by the City. Most of the proposed project team members have previously worked together on specific engagements in South Carolina, including; City of Columbia, Charleston Water System; Beaufort Jasper Water and Sewer Authority; City of Myrtle Beach, Renewables Water Resources, and Woodruff Roebuck, to name a few. Figure 7 provide an outline of financial planning project in the Carolinas over the past 24 months;
- **Proven Ability to Develop Support and Consensus** to get buy-in support from the City's internal and external stakeholders.



FIGURE 7. Carolinas Financial Consulting Project Map Over The Last 24 Months

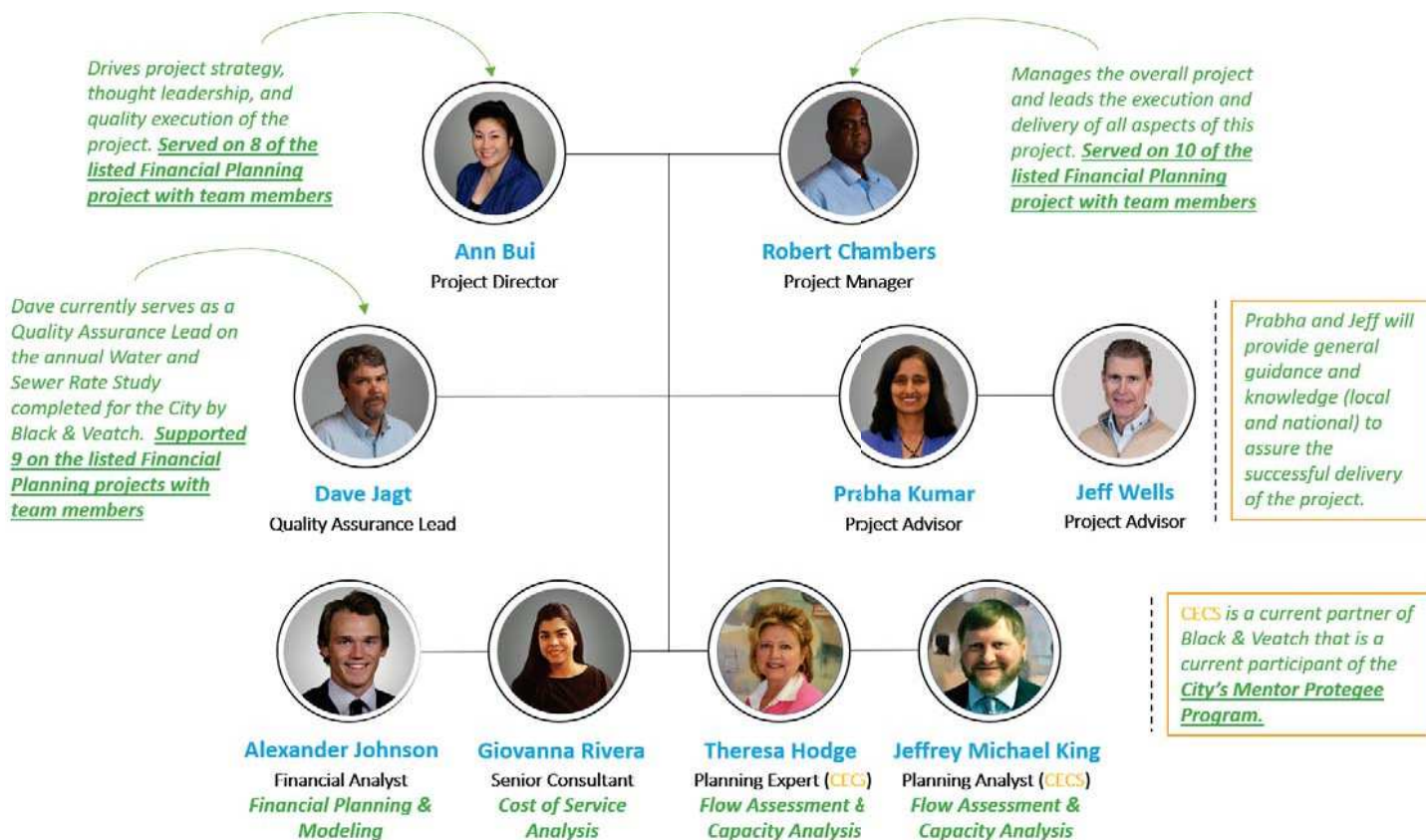


FIGURE 8. Team Organization

D-3 PROJECT TEAM AVAILABILITY

Black & Veatch remains committed to providing the necessary staff and ensuring their availability to serve the City in completing the scope of work detailed herein and any other activities or requests that may be presented. Black & Veatch understand that the City is going through a period of growth and the expansion of water and sewer services. As such, the demands on existing City staff to serve existing customers and maintain adequate levels of services are compounded. Black & Veatch aspires to be an extension of City staff to complement the daily tasks and activities related to the financial planning and organization of Columbia Water.

For these reasons, we truly understand and appreciate the criticality of making the Black & Veatch team available, being responsive to any request, and truly complimenting the activities performed daily by City staff.

Black & Veatch maintains a project workload forecast tool populated by all staff weekly to outline workload and probability over the following six months. Additionally, Black & Veatch maintains a dedicated resource management team to secure the appropriate staff of all projects and support the well-being of all staff through all engagement and work activities. The combination of these structural resources and framework will

allow Black & Veatch to service the City appropriately.

Table 4 illustrates the project team's availability, by project team member, over the estimated engagement period.

TABLE 4. Project Team Availability

Name	Availability (%)
Project Director	30%
Project Manager	45%
Technical Advisor [Kumar]	20%
Technical Advisor [Wells]	15%
Quality Assurance Lead	30%
Senior Consultant	55%
Financial Analyst	65%
Planning Specialist [CECS]	25%
Planning Analyst [CECS]	25%

Note:

[1]. The Availability (%) represents the amount of time over the project schedule that the project team member has to serve on this project.

D-4 PROJECT TEAM EXPERIENCE MATRIX

In support of the project team qualification and experience presented herein, Table 5 summarizes the past projects that the proposed team members have served on as a collective team.

TABLE 5. PROJECT TEAM EXPERIENCE

Projects	Project Director  Ann	Project Manager  Robert	Project Advisor  Prabha	Project Advisor  Jeff	Quality Assurance  Dave	Financial Analyst  Alex	Senior Consultant  Giovanna	Theresa Hodge  CECS 1	Jeffrey King  CECS 2
Columbia, SC (Rate Study)	●	●	●	●	●	●	●		
Atlanta, GA (Rate Study)	●	●			●				
BJWSA, SC (Rate Study & Financial Model)	●	●	●	●		●	●		
ReWa, SC (Financial Plan)	●	●		●	●				●
Clayton, NC (Rate Study & Financial Model)	●	●	●		●	●	●		
WRWD, SC (Rate Study)	●	●		●	●				●
Charleston, SC (Rate Study & Financial Model)	●			●		●	●		●
Athens, GA (Rate Study & Financial Model)	●	●			●				
Greensboro, NC (Financial Plan)		●	●						
North Miami, FL (Rate Study)	●	●	●		●				
Harford County, MD (Rate Study)		●	●						
Wilmington, DE (Rate Study)		●	●		●		●		

Note:

[1]. Black & Veatch partner of CECS in City's Mentor Protegee Program where both firms, as a team, have served the City on a total of 13 Engineering and Consulting projects. This project is the first Financial Consulting project that Black & Veatch and CECS are pursuing together.

Resumes

Detailed resumes for our key team members are included in Appendix-A. Upon request by the City, we will provide additional project detail for any of our team members to demonstrate our capabilities.

E Proposed Project Approach, Availability, and Schedule

SERVING THROUGH UNPRECEDENTED TIMES

The COVID 19 pandemic has highlighted the criticality of a water utility's financial and operational resilience in providing mission critical services. In these unprecedented times, the City has been diligent in managing its needs and continues to explore ways to align the dynamic and ever-evolving economic, environmental, political, and social contexts with the needs and requirements of existing customers and stakeholders.

PROJECT UNDERSTANDING

Columbia Water has demonstrated a sound measure of financial resiliency through the COVID 19 pandemic. Over the past seven years, the City staff, the City Council, and other financial planning partners have wrestled with balancing the critical operations, maintenance, resource adequacy, and financial needs of Columbia Water in developing a financial planning framework that allowed the utility to preserve through the COVID 19 pandemic. As such, Columbia Water did not raise utility water and sewer rates, complete any furlough or staff reductions, and provide support services to existing customers to

maintain water and sewer services at no additional cost to customers.

This financial resilience was achieved through the commitment and willingness of the City Staff and City Council to make timely critical decisions to provide the resources to maintain existing water and sewer services. One example is the continued willingness of the City to address the revenue needs of Columbia Water by implementing needed annual revenue increases. Figure 9 provides an outline of the proposed level of revenue increases of the last eight years and the proposed FY 2022 revenue increase.



FIGURE 9. Proposed Columbia Water Revenue Increases

The City currently is home to 410,000 people. It is becoming an increasingly attractive location for large industries, spurring the economic development engine within the City and allowing Columbia Water to increase its footprint and contribution across the region. Compounding the need for additional services by new customers while maintaining existing services through the Clean Water 2020 Program creates a dilemma for Columbia Water to grow existing services and the institutional capacity in a sustainable manner.

The City has an extremely knowledgeable customer base that holds the Columbia Water staff and other City Stakeholders accountable for efficiently providing the appropriate utility services.

The competing nature and balancing of the City's existing operating imperatives require thorough planning, diligent financial management, and the ability to dissect and prioritize the value-added financial objectives to provide utility services to customers at the lowest possible cost. The annual Rate Study completed by Columbia Water serves as **ONE** of the critical resources in assuring and balancing the revenue, resource adequacy, capacity, reliability, and regulatory needs of the utility.

Figure 10 provides an outline of considerations and desired outcomes that Columbia Water continues to research and prioritize.

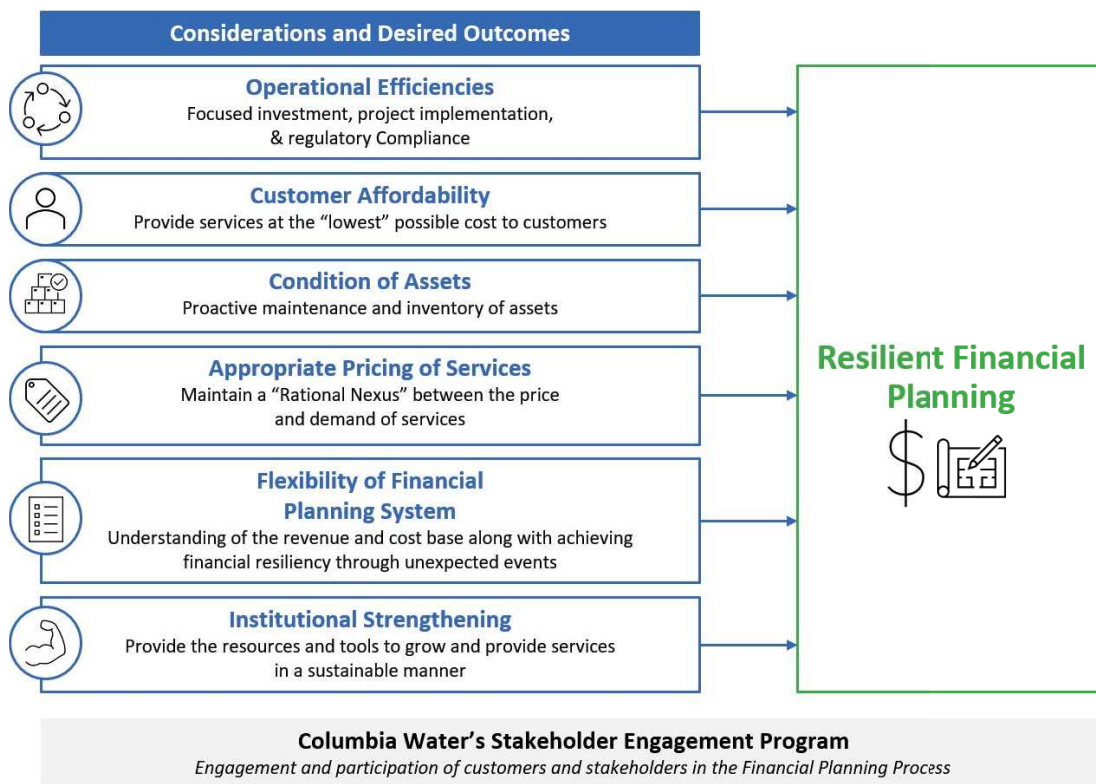


FIGURE 10. Financial Planning Consideration and Desired Outcomes

Study Objectives

The Black & Veatch team understands that the success of the Study detailed herein is embedded in understanding and aligning the objectives and desired outcomes. Table 6 illustrates the Study objectives with the desired outcomes.

TABLE 6. Study Objectives and Desired Outcomes

	OBJECTIVES	DESIRED OUTCOMES
1	Maintain a robust Financial Planning Process	A resilient financial roadmap to meet Utility System revenue requirements and utility fund financial policies.
2	Determine the appropriate apportionment of cost by Utility System	Balancing of project priorities, system needs, and service demand requirements. Achieve equity in cost recovery by service class and Utility System.
3	Appropriately price utility services to existing and new customers	A simple and easy to understand pricing framework that recognizes the service requirement of existing and new customers Revenue stability through the effective balancing of fixed charge and volumetric charge revenues and the full recovery of all system revenue requirements
4	Develop a dynamic financial planning model/tool	A dynamic financial model/tool that supports Columbia Water in understanding the financial requirements of the utility system.
5	Continued deployment of focused stakeholder engagement	Continued focus on providing City staff and Columbia Water the necessary resources to support the engaged stakeholder and meet the service requirements.

PROJECT TEAM ORGANIZATION, AVAILABILITY, & EXECUTION MANAGEMENT

The project team reflects the expertise and experience that is critical to serving and achieving the stated objectives of the Study. Our team is composed of an experienced Project Manager that has been performing project management services for over 14 years. Additionally, our Project Director, Ann Bui, is a recognized industry thought leader that has driven the standard of care related to rate and financial consulting for water utilities. Together, Ann and Robert maintain a strong reputation for mobilizing our teams and supporting utilities in South Carolina and the United States, and solving complex challenges. Black & Veatch maintain an office at 1141 Gervais Street, Columbia, SC, 29201, which is a 10-minute walk from

the City offices and all the resources in our Columbia office and nationally will be available to the City.

Black & Veatch maintains strict internal quality control procedures on all engagements. These procedures ensure that study tasks are properly executed. At the project initiation for any project tasked under this contract, the Black & Veatch team will agree upon the deliverables and the major tasks to be completed. Each task, deliverable, milestone, and significant project event, as understood by Black & Veatch, will be documented and will require the approval of the appropriate Utility staff. Figure 11 illustrates our approach to executing and managing the Study.

Specific attention will be given to clearly and outlining the procedures and tasks:

- Define all roles and responsibilities and the procedures for project communications among the Black & Veatch team and the City staff.
- Establish requirements for the format, delivery, and approval of the Project Report and presentation materials specified by the City.
- Assign the appropriate staff to complete the services detailed in the scope of work.
- Utilize accounting system triggers that post notices to the project manager regarding completing the project budget and schedule.
- Empower the project manager to assign and administer all the tools necessary to complete

all deliverables, ensure client satisfaction, and monitor all facets of all engagements tasked under this contract.

- Outline a clear and coordinated task execution approach that is innovative and aligned with the project goals and objectives established for a particular engagement.

Black & Veatch philosophically views quality assurance/control as an essential and multi-faceted task. Our process incorporates “lessons learned” from past performances on projects throughout Black & Veatch. Black & Veatch is firmly committed to providing high-quality work that creates value to the City.

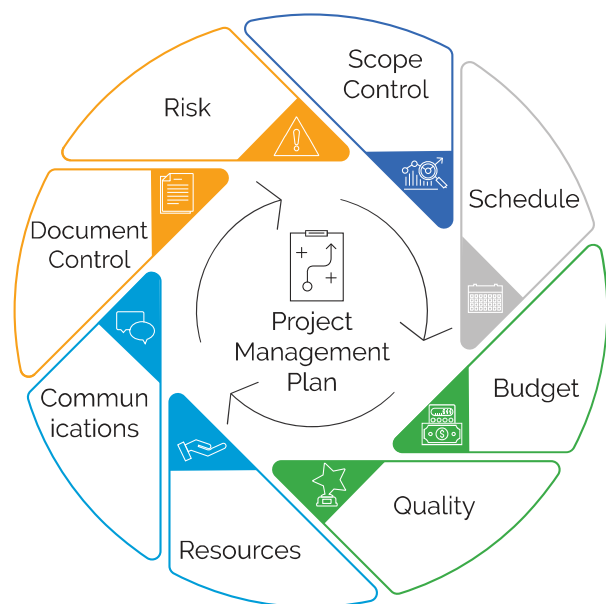


FIGURE 11. Project Management Approach

STUDY APPROACH

Figure 12 illustrates the key features of the project approach that we have defined for this Rate Study, and they are as follows:

Rigorous and Repeatable Methodology

In performing the services requested in this study, the Black & Veatch team will utilize the following principles and analytical approach:

- Use Industry accepted and defensible cost allocation and rate-setting principles based on the AWWA M-1 Manual of Practice and WEF M-27 Manual of Practice;
- Reflect the City's specific financial practices and policies, including policies on capital program financing, debt service, and reserve requirements, and the incorporation of industry financial best-practice principles and metrics; and
- Develop a balanced series of revenue adjustments, as required, for the water and sewer systems, defensible cost allocations, practical phased approach to rate change recommendations that balance revenue adequacy, equity of cost recovery, bill impact, and ease of understanding and administration.

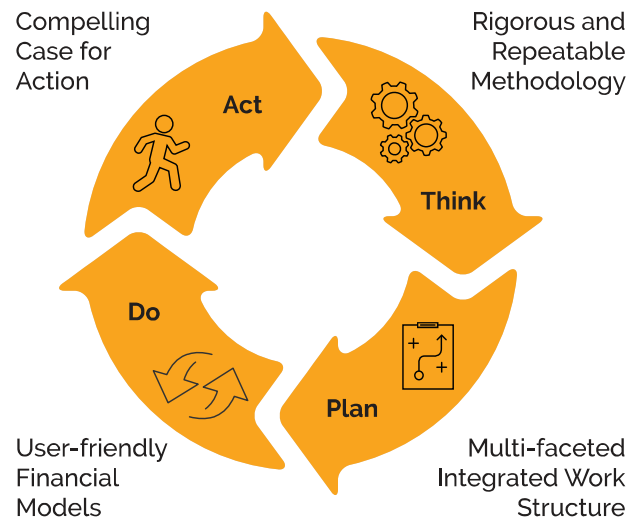


FIGURE 12. Features of Project Approach

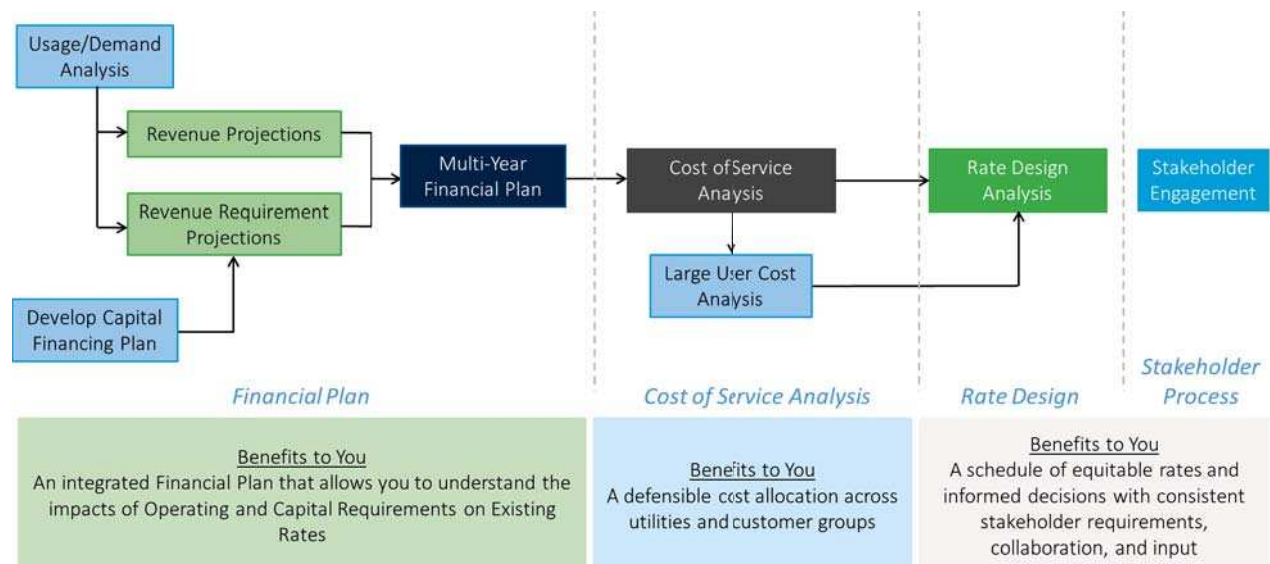


FIGURE 13. Features of Project Approach

Multi-Faceted Integrated Work Structure

We have defined an integrated work structure as illustrated in Figure 13 to fulfill the diverse study objectives and requirements described in the Project Summary Section.

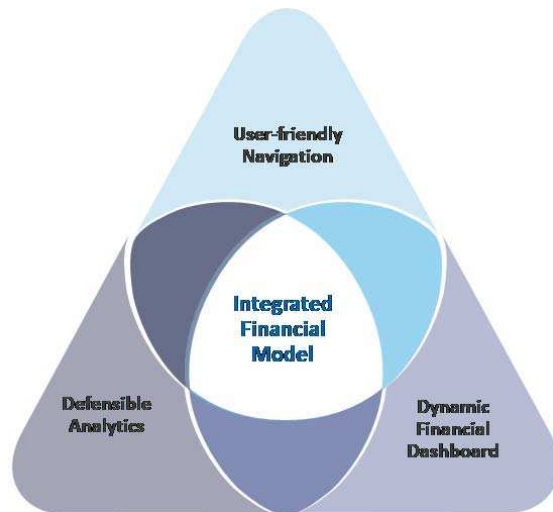


FIGURE 14. Financial Modeling Functional Design

Robust Financial Modeling

The Black & Veatch team will use a user-friendly Financial Planning, Cost of Service, and Rate Design Model. Figure 14 summarizes our functional design approach to financial modeling.

Our proprietary MS-Excel based financial model includes key features such as the following:

- Visually intuitive user interface and navigation.
- Logical organization of data flow in the model.
- Centralized data inputs for all key assumptions
- Functionalization of costs and calculation methodologies based on industry principles.
- Ability to run and save multiple cash flow scenarios resulting from changes to key financial assumptions and parameters.
- As illustrated in Figure 16, a functional design is easy to navigate and use on an ongoing basis.

Upon completing the scope of work detailed herein, the Black & Veatch Integrated Financial Model will be delivered to the City at no charge. No additional licensing or other fees will be assessed to the City.

Compelling Case for Action

To facilitate buy-in from both the decision-makers and the utility's customers, the Black & Veatch team is adept at conducting a multi-level stakeholder engagement. Our process includes presentations and discussions with the administration, briefing sessions with councils, boards, and commissions, executive committee presentations, and public open houses.

As illustrated in Figure 15, we emphasize the "Four E's" in our communication – (i) Evaluate needs; Educate stakeholders on issues/solutions; Engage to solicit feedback/ ideas; and Embrace their input, to the extent practical, in final solutions. We have used this proven approach in many utilities, including the City of Atlanta, GA, Beaufort Jasper Water and Sewer Authority, SC, Renewable Water Resources, SC,



FIGURE 15. Our “Four E’s Principles”

and Harford County, MD successful study outcomes. Early in the study, we will collaborate with City staff to understand each stakeholder group’s characteristics and communication style/need.

SCOPE OF SERVICES

Aligned with the integrated work structure illustrated in Figure 13 and the specific tasks requested in the RFP, we have delineated distinct yet inter-related “Focus Areas” to assist the City with its various technical and financial services. The tasks we expect to perform for each focus area are discussed herein.

Project Management and Data Collection

Project management includes general project coordination, staff direction, budget/scope/schedule management, and billing/invoicing activities.

Project Initiation

A project kick-off meeting will be held to affirm the study objectives, confirm policies that apply to this Study, and discuss any key constraints and expectations of the project team. Additionally, Black & Veatch will facilitate to project introduction meeting with the City Council.

Data Collection

Provide an initial request for financial and operational data and other pertinent informational needs before the project initiation meeting. This list will include typical data such as historical customer account and usage/flow data, adopted operating and capital budgets, financial policies, financial reports, detailed fixed asset records, debt service schedules, and pertinent reports. After the initial meeting with staff, Black & Veatch will submit requests for additional data, as necessary.

INTEGRATED FINANCIAL PLANNING

The primary purpose of this task is to develop a 5-year integrated financial plan.

For the scope of work detailed herein, the planning period is defined as FY 2023 through FY 2027. Figure 16 presents a summary of the sequence of key subtasks.

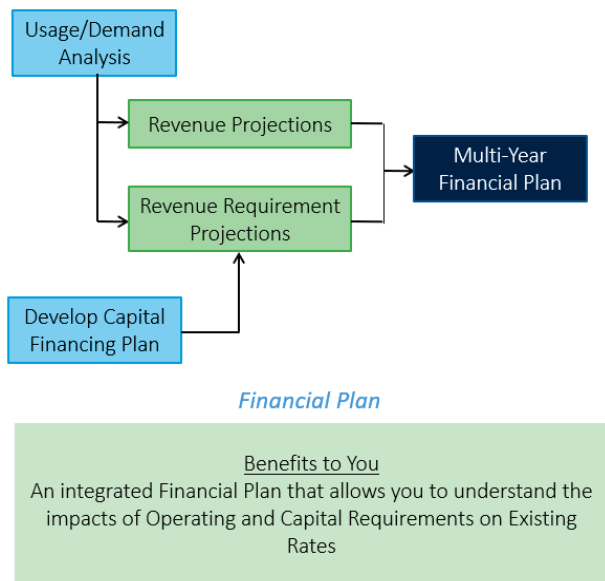


FIGURE 16. Financial Planning Process

Review of Columbia Water Policies and Procedures

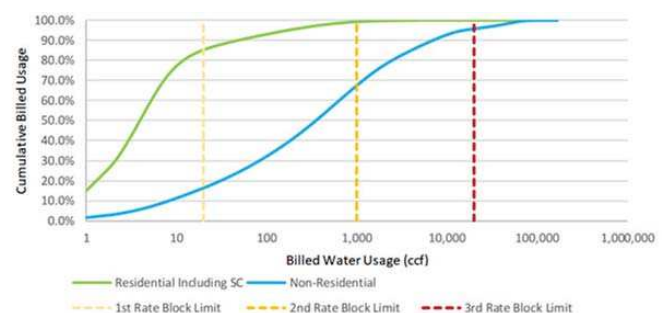
This task will include reviewing the existing Utility System financial, operating, and capital-related policies, including any applicable policies on service requirements, debt service coverage requirements, and other such policies.

Water & Sewer System Forecast of Operating Revenues

This task focuses on reviewing the existing sources of operating revenues and project total annual revenues from existing water and sewer rates. Key subtasks include:

- Review of historical and current year revenue performance to establish a base year understanding of revenue performance for the water and sewer system;

- Project accounts by meter size and by customer classes, for the study period, to project meter charge (fixed component) revenues;
- Bill Tabulation Analysis determines the distribution of billed water usage and sewer flow across the customer classes (including large use/special service customers) and respective usage blocks to project volumetric revenues under existing rates. Additionally, Black & Veatch will review historical water demand and weather trends to assess the acceptability of historical and future anticipated water demand trends. Based on our experience working with the City, the distribution of billed flow during certain months of the year can be impacted drastically by shifts in weather patterns. Figure 17 provides an example of a typical billed volume distribution;
- Project fixed charge and volumetric charge revenues under existing rates considering the impact of the ongoing pandemic;



Validation Criteria: Billed volume distribution analysis by customer class will be reviewed to identify any potential errors in customer classification

FIGURE 17. Billed Volume Distribution Analysis

- Reconcile the revenue contribution of large and special service customer to verify the actual revenue contribution reconciles with the budgeted revenue contributions; and
- Project other operating service revenues (sewer expansion fee, tap fees, meter service charges, hydrant rental fees, etc.) are important for determining the net level of future revenues to be generated from water and sewer user rates and charges.

Forecast of Annual Revenue Requirements

Black & Veatch will project the annual revenue requirements (costs) for the water and sewer system for the study period, as follows:

- Project Operation and Maintenance Expenditures based on the adopted budgets and historical actual spend trends. Projections will recognize potential inflation in costs levels, the addition of new system facilities, any anticipated changes in operations and staffing, and other factors and spending obligations that may influence future expense levels. In addition, specific emphasis will be placed on understanding the cost to treat potable water by treatment source over the forecast period.
- Determine Debt Service on existing bond issues and other sources of debt and project magnitude of cash financing to support the City's

Capital Improvement Program (CIP) for the study period.

- Determine the appropriate level of water and sewer reserve account(s) funding that the City must incur annually.
- Project the magnitude of cash financing to support the projected CIP for the study period.
- Project Debt service coverage, fund balance requirements, and applicable transfers. Applicable bond ordinance requirements will be reviewed along with any relevant utility policies.
- Project any other routine capital and other operating expenditures as deemed necessary and appropriate.

Black & Veatch understands the Rate Study will be conducted during the City's annual operating and capital budgeting cycle. The initial budgets and forecast of cost will be adjusted and prioritized through the budgeting process. As such, Black & Veatch is committed to appropriately representing these costs by working closely with City staff to check, document, and appropriately represent these costs through the City's operating and capital budgeting cycle.

Capital Improvement Program (CIP) Revenue Requirements

This task focuses on reviewing the existing water and sewer CIP schedule to understand the types of projects, associated costs, and project timing. Black & Veatch understands that

Columbia Water's CIP is driven by the requirements of the Clean Water 2020 program. We will work with City staff to understand the nature of the proposed CIP projects and appropriately outline a financing plan that allows the utility to meet the requirements of the Clean Water 2020 program. Finally, we will collaborate with the City staff to affirm the planned sources of financing for the CIP. The projected financing of the CIP will be an integral component of the revenue requirement projections. Figure 18 provides an example of output from the capital financing plan analysis.

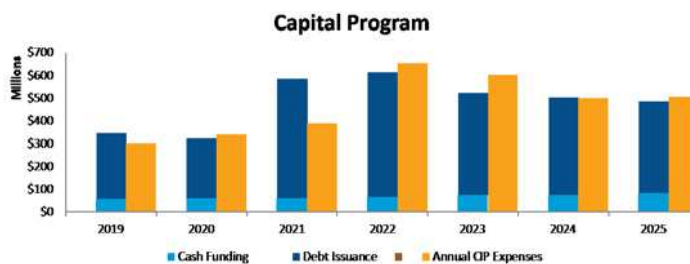


FIGURE 18. Capital Program Financing Plan

Multi-Year Financial Plan

Black & Veatch will develop specific financial plans (cash flow analysis) for Columbia Water (water and sewer) for the study period showing the application of revenues under existing rate levels and revenue requirements (costs). The financial plan will reflect the revenue requirement projections based on the cash flow analyses. We will estimate the magnitude of annual revenue adjustments needed to meet projected annual revenue requirements.

The financial plan will reflect phase-in strategies to maintain revenue adequacy

to meet increasing costs, mitigate rate volatility, meet existing funding and financing requirements, and maintain Columbia Water's pathway of financial resilience. The net revenue requirements estimated for FY 2023 (or an alternative Test Year as determined by the City) will reflect the annual revenue requirements estimated for the Test Year less any miscellaneous revenues estimated for that year.

COST-OF-SERVICE ANALYSIS

This task aims to determine customer class cost of service responsibility for the water and sewer system. The allocation analysis enables Black & Veatch to establish a reasonable nexus between costs incurred in providing service and the rates and charges designed to recover the costs of providing service. Figure 19 indicates the sequence of the key subtasks.

The key subtasks include the following:

- Determination of functional costs for the water and sewer utilities and allocating each functional cost to cost-causative elements (Base/Extra Capacity for Water and Volume and Strength parameters for sewer).
- Development of Units of Service associated with each cost-causative element of the retail customer classes and wholesale customers, and sewer service requirements (flow and constituent loadings). Understanding the nature of the service requirements of the water and sewer system is

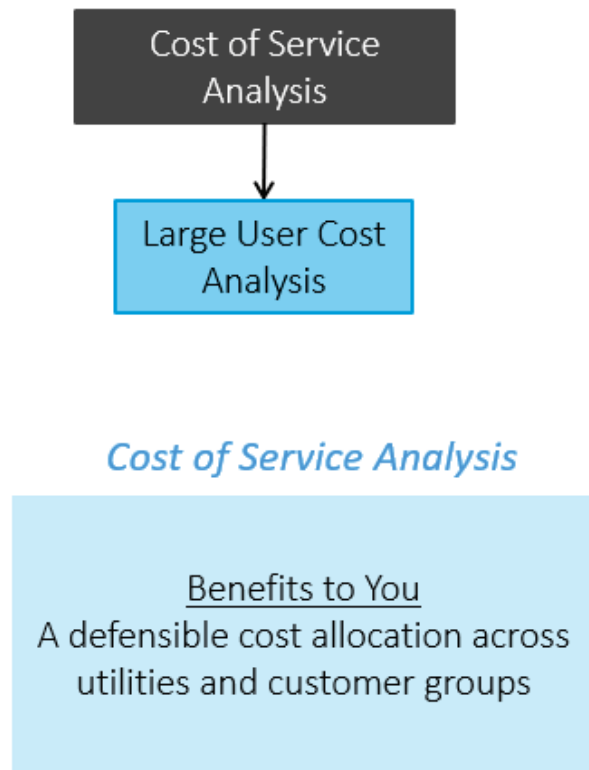


FIGURE 19. COS Analysis Process

fundamental to understanding the services class burden.

- Allocation of costs to cost-causative components based on system and customer characteristics, and development of Unit Cost for each cost-causative component for the defined Test Year.
- Appropriate allocation of cost and service requirements to existing large use customers by capturing the shift in usage requirements as their usage stabilizes on the system.
- Distribution of Test Year Cost-of-Service to Customer Classes by applying the unit cost of cost-causative components to each class's corresponding service demands.

- Comparison of Customer Class cost of service with the existing revenues to determine the extent of alignment and adjustments needed. This comparison will help determine the degree of cost recovery currently being achieved within each customer class and identify the level of rate adjustments needed to align and balance the customer class revenues with the customer class allocated costs.

At the completion of the cost of service analysis, Columbia Water will understand the service class cost responsibility and how these costs compare to the existing revenues generated by the service class.

RATE DESIGN ANALYSIS

Black & Veatch will consider the policies, pricing objectives, and practical limitations of design water and sewer rates for the City in developing water and sewer rate schedules. This task aims to develop fair and equitable water and sewer rates that are simple and easy to understand for existing customers. Figure 20 provides an outline of the rate design process.

The key activities include the following:

- Based on the analysis completed herein, we will affirm the reasonable nexus between the cost incurred in providing the service and the rates and charges developed to price the service.
- Work to appropriately align the fixed and variable components

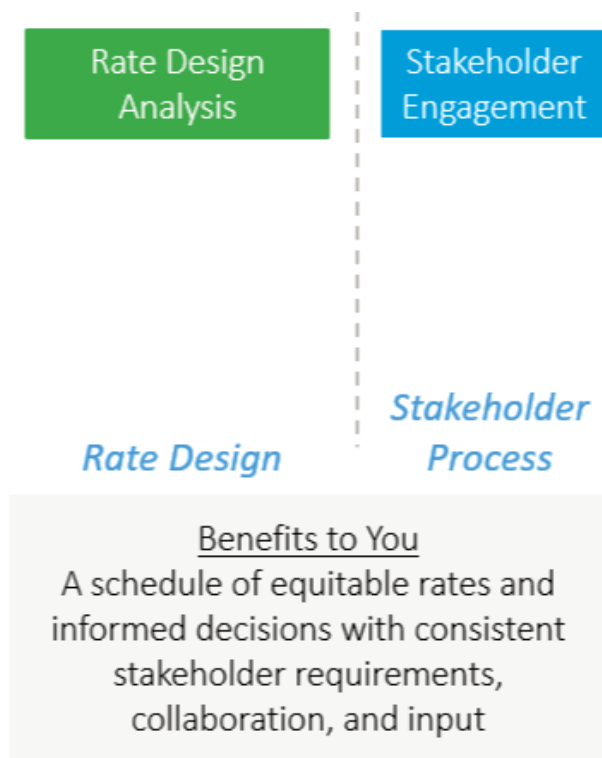


FIGURE 20. Rate Design Process

costs determined in Cost of Service Analysis with the fixed and variable component revenues generated by customer class.

- Assess the applicability of the existing water and sewer rates from a policy and operating perspective to meet established rate setting objectives. *The City recently implemented an additional commercial/industrial water usage block to account for the usage requirement of existing and future anticipated large users that meet a specified usage characteristic and promote economic development with the City.* As such, Black & Veatch will work with City staff to diligence the performance of the commercial/industrial water usage block and propose adjustments as needed.

- Design the proposed water and sewer rates.
- Perform existing and proposed water and sewer bill impacts across the service classes maintained by the City and complete a bill comparison with neighboring utilities.

Black & Veatch envisions this process as an interactive dialogue and exchange to thoroughly assess the social and economic benefits to existing customers served by Columbia Water. Additionally, Black & Veatch will support the City with stakeholder proceedings to inform applicable stakeholders of the Rate Study results.

INTEGRATED FINANCIAL MODEL

Black & Veatch has developed numerous financial planning and economic models used for various financial planning purposes by public and privately held utilities nationally. As a part of the analysis defined herein, the Black & Veatch team will customize our existing financial planning tool based on the financial modeling requirements outlined in the RFP. The model will be prepared and transferred to the City at no additional cost and will be delivered to the City for its internal use, without any restrictions on accessing all the model's functionality.

Financial Model Attributes

Black & Veatch's approach to developing financial and rate models is based on customizing our base model to

the City’s unique characteristics, customers, the flow of funds, billing data, and financial planning goals and objectives through proven calculation methodologies and industry principles. Our integrated financial planning model will be tailored to offer the following key features:

- Visually intuitive user interface and icon-based navigation throughout and between modules
- Logical organization of information and data flow based on the required analyses
- A consistent layout on each tab
- Centralized data inputs and assumptions
- User dashboard to assess financial results, track performance through established performance indicators, and perform scenario analysis for various capital and other investments

Key Measure:

- Debt Service Coverage Ratio
 - Less than 1.0 = Insufficient
 - Between 1.0 to 1.25 = Adequate
 - Between 1.26 to 1.50 = Good
 - Greater than 1.50 = Strong

Note:
1. Standard & Poor’s Rating Direct

Key Measure:

- Liquidity Ratio
 - Less than 30 Days = Low
 - Between 30 to 60 Days = Adequate
 - Between 60 to 120 Days = Good
 - Greater than 120 Days = Strong

Note:
1. Standard & Poor’s Rating Direct

- A summary of the baseline and actual performance of key credit agency rating metrics
- Functionalization of costs and methodologies based on industry standards
- Dynamic rate design module for rate structure adjustments and calculations
- Long-range scenario planning features facilitate concurrent manipulation of financial variables, such as the CIP and financing assumptions. In addition, our financial planning tools allow users to compare multiple financial planning scenarios
- Ability to present a quick graphical view of financial performance based on key performance indicators desired by the Utility

Figure 22 illustrates the user interface and icon-based navigation capabilities of the integrated financial model.

FIGURE 21. Key Financial Metrics

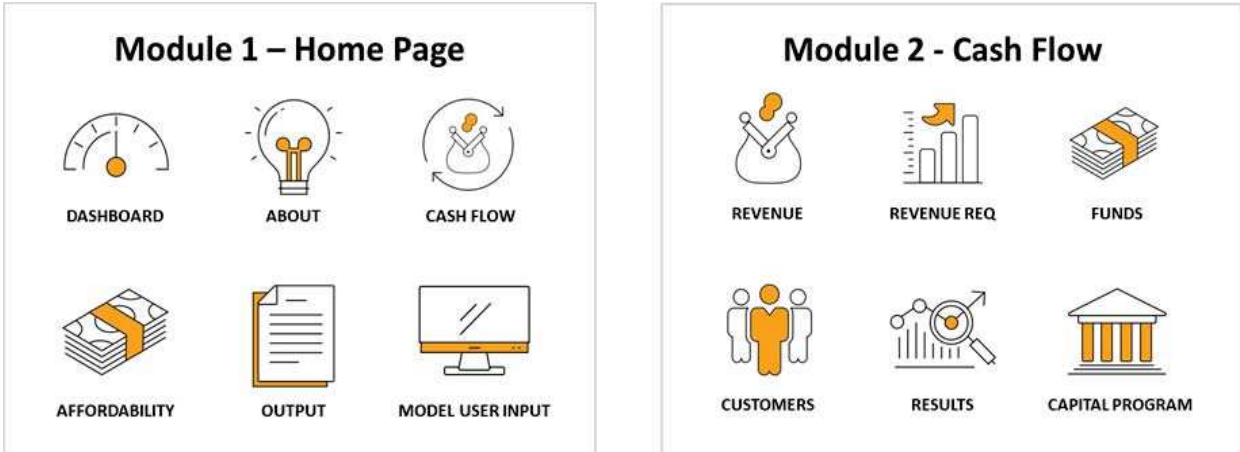


FIGURE 22. Visually Intuitive User Interface And Icon-Based Navigation Throughout and Between Modules

Figures 23 & 24 provide screenshots of the specific sections of the Integrated Financial Planning Model dashboard.

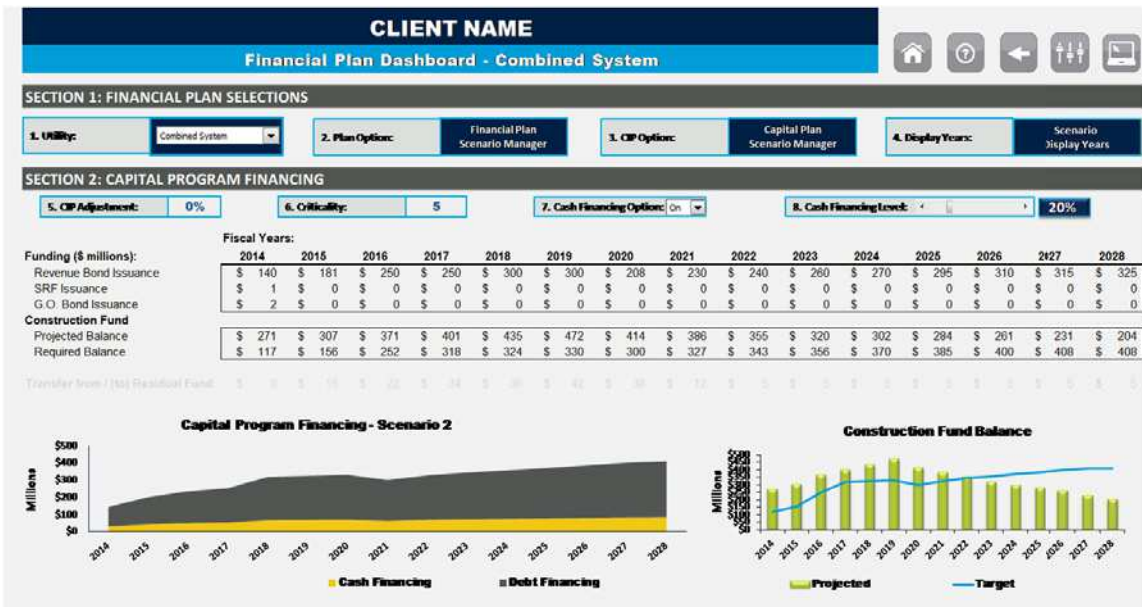


FIGURE 23. Term Financial Planning Model User Interface

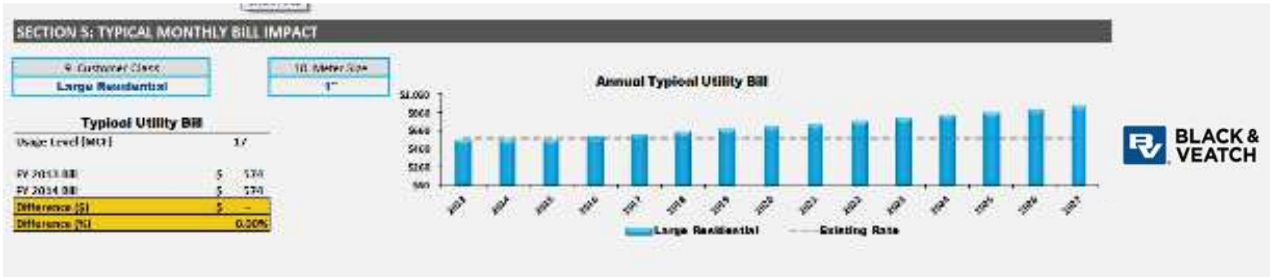


FIGURE 24. Dashboard Provides a Visual Forecast of KPIs And Assumptions

SERVICE TAP BUSINESS CASE EVALUATION

The primary purpose of this study is to determine the effort, resources, and cost to establish a water and sewer service tap, along with establishing a business case to determine the feasibility of fulfilling certain water and sewer service taps. A “service tap” is defined as establishing a connection into an existing water and/or sewer service line that currently serves existing customers.

Project Initiation Meeting

During this task, Black & Veatch will meet with the City staff to review and discuss project goals and objectives, data requirements, and the project schedule. Black & Veatch will submit an information request prior to the meeting, and additional information requirements will be outlined during the meeting. Black & Veatch will schedule and facilitate one meeting to initiate the project.

Review of Policies, Procedures, & Standing Orders

As a part of the information request submitted for the project, Black & Veatch will review and document the general characteristics of all new water and sewer system taps established by the City over the last five years, as detailed in the information request. Black & Veatch will review the existing policies, procedures, standing orders, and workflows necessary for the City to initiate and establish a water and

sewer service tap. This review will be critical in understanding the governance and legislative aspects associated with establishing a water and sewer service tap which will support the Black & Veatch team in aligning the project objectives with the policies and procedures maintained by the City.

Development of Process Maps to Establish Water and Sewer Service Taps

Black & Veatch will facilitate a meeting with the City staff to understand the City staff’s activities, resources, and effort across the “Water and Sewer Service Tap Value Chain.” The Water and Sewer Service Tap Value Chain describes all the activities, decisions, resources, and efforts dedicated by the City through establishing a water and sewer service tap from initiation to commissioning.

The Black & Veatch team will document the people, processes, and tools associated with a new customer establishing a water and/or sewer service tap. In addition, all activities, decision controls, approval milestones, and time requirements will be documented.

At the completion of this task, the Black & Veatch will develop a process map by utility system (water and sewer) that outlines the process and time necessary to establish a water and sewer system tap from initiation to commissioning.

Determine the Cost to Establish a Water and Sewer Service Tap

Upon completing the process maps by utility system, the Black & Veatch team will work with City staff to document the cost of providing the related services along the Water and Sewer Service Value Chain. The activities and efforts by staff, departments, special groups, Columbia Water, and the City will be documented to understand the total cost of establishing a water and sewer service tap.

Specific focus will be dedicated to understanding the cost categories listed below:

- Cost of labor (per hour);
- Cost of materials, tools, and equipment;
- Any support services cost (by Columbia Water and City); and
- Any additional costs associated with establishing the water and sewer tap.

After this task, the Black & Veatch team will understand the cost to establish a water and sewer tap.

Develop the Business Case Associated with Establishing a Water and Sewer Service Tap

As a part of developing the business case to determine the feasibility of establishing any water and sewer tap, Black & Veatch will undertake a holistic approach to assessing the feasibility of a water and sewer tap. Upon requesting a water and sewer system connection,

certain one-time and ongoing costs are incurred to establish and maintain a water and sewer tap. In addition, each water and sewer tap supports a specific number of equivalent service units that generate revenues on the system. As such, the Black & Veatch team will aggregate the known and measurable cost to establish and maintain the tap on an annual basis and the anticipated revenue associated with the equivalent service units to develop a cash flow analysis that will constitute the business case.

In addition, one-time costs (all initiation/installment costs) and ongoing costs (operating & maintenance, debt service, and other expenditure costs) will be segmented and detailed to track and assess certain financial metrics associated with the upfront cost commitment to establish the water and sewer tap.

Financial metrics such as Net Present Value, Payback, the Rate of Return will be assessed as a basis to evaluate the business case associated with establishing the heresaid water and sewer taps.

Finally, the Black & Veatch team will provide City staff with a business case module in Microsoft Excel that will provide the City with the opportunity to run and assess the business case associated with establishing a water and sewer tap at will.

At the completion of this task, the City will maintain a framework to assess the business case associated with

establishing certain water and sewer system taps.

PROJECT MEETINGS

Black & Veatch anticipates a total of 7 in-person meetings and 6 virtual meetings during the Study to discuss study assumptions and findings and help finalize the key recommendations/actions. The meetings necessary to support the scope of services are:

Financial Plan, Cost of Service, & Rate Design Meeting:

- Project Kick-off meeting (virtual);
- City Council project introduction meeting (in-person);
- Financial Plan results meeting (in-person);
- Cost of Service Results and Initial Rate Design Meeting (virtual);
- Financial Water and Sewer Results and City Council Meeting (in-person); and
- Stakeholder Facilitation Meeting (virtual).

Service Extension Business Case Meetings:

- Project Kick-off meeting (virtual);
- Process Maps Meetings & Interview (in-person);
- Review of the Water and Sewer Service Tap Cost (virtual); and
- Final Project Results and Business Case Module Delivery (in-person).

Black & Veatch will support the City with additional meetings, workshops, and presentations as deemed appropriate by the City.

PROJECT DELIVERABLES

Provide below is a summary of the project deliverables associated with the scope of work detailed herein:

1. Financial Plan, Cost of Service, & Rate Study
 - A. Project Report; and
 - B. Financial Model.
2. Service Tap Business Case Evaluation Study
 - A. Service Tap Business Case Evaluation Memorandum; and
 - B. Service Tap Business Case Evaluation Module.

Black & Veatch commits that each deliverable is prepared with a discussion on the study objectives and approach, summary findings for the study period with appropriate illustrations and details, and the key recommendations.

PROJECT SCHEDULE

Black & Veatch believes that the proposed project schedule presented meets the scope of services outlined in the RFP to complete the Water and Sewer Rate Study; however, it can be adjusted to meet any specific needs as they may change during the project. A tentative work schedule for this engagement is shown in Figure 26. This schedule is not meant to be definitive; it can be adjusted accordingly based on

any additional needs or requirements. Black & Veatch estimates this scope of services to be complete the Water and Sewer Rate Study will take four (4) months upon receipt of an official notice to proceed. In addition, the estimated schedule to complete the Water and Sewer Impact Fee Study is three (3) months, and the Water and Sewer

Service Tap Business Case Evaluation is three (3). Both projects can be undertaken concurrently with the Water and Sewer Rate Study.

Black & Veatch believes that we can meet this proposed schedule, assuming we receive access to the City's staff and data promptly.

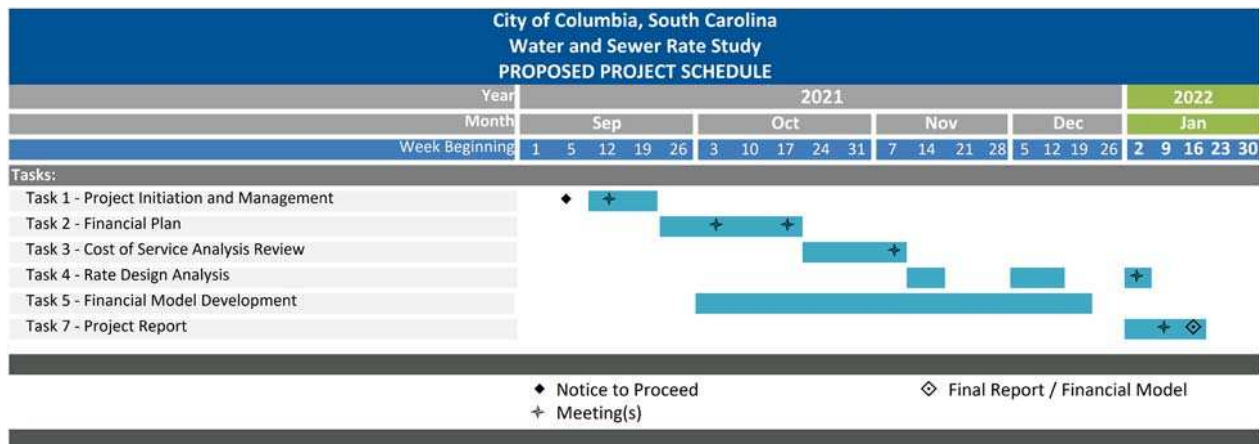


FIGURE 25. Project Schedule

	<u>Line</u>	<u>Task/Description</u>	<u>Fee/Estimate</u>
	1	Project Initiation, Data Collection, & Review	\$ 4,724
	2	Revenue Requirements:	
		- Forecast of Revenues under Existing Rates	
		- Customer Usage & Flow Projections	
		- Water, Sewer, & Recycled Water Revenue Projections	
		- Miscellaneous Revenue Projections	
		- Determination of Revenue Requirements	
		- Annual Revenue Requirement Projections	
		- CIP and Other Expenditures	
		- Adequacy of Revenue under Existing Rates	
		Total Revenue Requirements	\$ 32,979
	3	Cost of Service Allocations:	
		- Functionalization of Cost	
		- Development of Units of Service	
		- Development of Unit Cost of Service	
		- Distribution of Cost to Customer Classes	
		Total Cost of Service Allocations	\$ 25,448
	4	User Rate Charge Analysis	\$ 7,900
	5	Review of City's Financial Planning Model	
	6	Water and Sewer Service Tap Business Case Evaluation	\$ 30,428
	7	Reports and Deliverables:	
		- Financial Plan, Cost of Service, & Rate Design Meetings	
		- Project Report; and	\$ 12,654
		- Financial Model	
		- Service Tap Business Case Meetings	
		- Service Tap Business Case Evaluation Memorandum; and	\$ 6,080
		- Service Tap Business Case Evaluation Module.	
	8	Meetings and Presentations:	
		- Financial Plan, Cost of Service, & Rate Design Meetings	\$ 10,492
		- Service Tap Business Case Meetings	\$ 12,284
	9	Expenses	\$ 6,000
	10	Total Project Fee	\$ 148,989

Appendix: Business Information Record for Subconsultants/Subcontractors

The Bidder shall list all subcontractors and vendors, who will be providing subcontracting services, furnishing materials, etc. for this project. The list shall be submitted in the format provided below. Any proposed changes from the list shall be submitted in writing to the Owner prior to initiation of any action, with the reason for proposed changes.

MUST BE TYPED AND REFLECT ONLY THOSE PROVIDING A SERVICE "NO LINE STRIKE THROUGH"

Business Name (as shown on W9 or SAM.gov) / DUNS # & CAGE # (If Applicable)	City of Columbia Vendor number	Services and/or Materials Provided	Cost of Services and/or Material (\$ Value)	Percentage of Total Contract	MBE, WBE, SBE, DBE, LBE, CDBE (indicate all that apply)	Minority Association Code (If applicable - Use 2 letter Code - See Key Below)
Civil Engineering Consulting Services, Inc. 2000 Park St., Suite 201 Columbia, SC 29201 DUNS: 960785772 CAGE Code: 4L6V7	V013460	Billing Information Analysis, Utility System Capacity Analysis, Data Collection and Review	Not Applicable	10 %	WBE, DBE	FB
		Preparation of Project Deliverables		%		
				%		
				%		
				%		
				%		

Key: Minority/Women Owned Business Enterprise Association Code

AF – Asian American Female **AM** – Asian American Male **BF** – African American Female
BM – African American Male **FB** – Non-Minority Female Owned **HM** – **HF** – Hispanic American Female
 Hispanic American Male **NF** – Native American Female **NM** – Native American Male

COMBINED TOTAL SUB AMOUNT \$14,898

TOTAL CONTRACT AMOUNT: \$ 148,989

I certify this information is true, correct, complete and active.

Business Name: - Black & Veatch Management Consulting, LLC

Representative Name/Title: Steve Uhlmansiek Associate Vice President

Date: May 18 2021

Contract Amendment #3

Bid007-17-18-LAT

CITI, Limited Liability Corporation

August 25, 2021

Description of Change: Request change in Agreement for services between the City of Columbia (City) and CITI, Limited Liability Corporation (Vendor) for the following:

- Add funding in the amount of \$234,545.00 (R211067) for instrumentation and SCADA systems maintenance services for the Metro WWTP. during the term of July 1, 2021 – June 30, 2022.

All other provisions of the Agreement, except as herein modified or changed, remain in full force and effect.

This Change is Acceptable:**Name of Firm**

CITI, Limited Liability Corporation

MARCO VARELA

Print Name



Signature

9/22/2021

Date

City of Columbia

Office of the City Manager

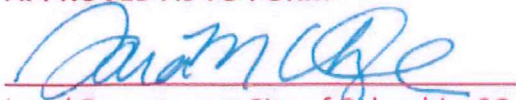
Teresa Wilson, City Manager

Signature

Date

Witness

APPROVED AS TO FORM



Legal Department City of Columbia, SC
9/9/2021

SS723622 Consent Decree Program Management Services

ENRFQ003-13-14

CDM Smith, Inc.

October 12, 2021

Description of Change: Request change in Agreement for Engineering Services between the City of Columbia (City) and CDM Smith, Inc. (Engineer) executed August 21, 2012 (Agreement) to extend the Agreement from July 1, 2021 to June 30, 2022, accept increased hourly billing rates, and to increase funding for consent decree compliance and infrastructure improvements, as outlined in the attachment appended hereto.

All other provisions of the Agreement, except as herein modified or changed, remain in full force and effect.

Current and Proposed Change and Basis for Payment:

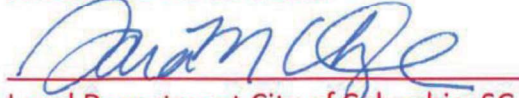
Original Contract Amount (Term September 4, 2012 to June 30, 2013; Purchase Order# P130982):	\$3,462,300.00
Amendment #1 (Cost Increase/Addition; Time Extension July 1, 2013 to June 30, 2014; Purchase Order# P130982):	\$4,740,000.00
Amendment #2 (Cost Increase/Addition; Time Extension July 1, 2014 to June 30, 2015; Purchase Order# P130982):	\$5,400,000.00
Amendment #3 (Cost Increase/Addition; Time Extension July 1, 2015 to June 30, 2016; Purchase Order# P130982):	\$5,400,000.00
Amendment #4 (Cost Increase/Addition; Time Extension July 1, 2016 to June 30, 2017; Purchase Order# P130982):	\$5,300,000.00
Amendment #5 (Cost Increase/Addition; Time Extension July 1, 2017 to June 30, 2018; Purchase Order# P130982 and P167473):	\$5,300,000.00
Amendment #6 (Cost Increase/Addition; Time Extension July 1, 2018 to June 30, 2019; Purchase Order# P173566):	\$5,000,000.00
Amendment #7 (No Cost Change; Time Extension June 30, 2019 to June 30, 2020; Purchase Order# P173566):	\$00.00
Amendment #8 (Cost Increase/Addition; Purchase Order# P173566 and P180896):	\$4,700,000.00
Amendment #9 (Cost Increase/Addition; Time Extension July 1, 2020 to June 30, 2021; Purchase Order# P186590):	\$4,500,000.00
Current Contract Amount:	\$43,802,300.00
This Change Amendment #10 (Cost Increase/Addition; Time Extension July 1, 2021 to June 30, 2022; Requisition# R212810):	\$4,200,000.00
Revised Contract Amount:	\$48,002,300.00

This Change is Acceptable:**Name of Firm**

CDM Smith, Inc.

City of Columbia

Office of the City Manager

Print NameTeresa Wilson, City Manager_____
Signature_____
Signature_____
Date_____
Date_____
Witness**APPROVED AS TO FORM**

Legal Department City of Columbia, SC

10/13/2021

SS 723622 – CONSENT DECREE PROGRAM MANAGEMENT SERVICES FY 21-22

AMENDMENT No. 10 - TO AGREEMENT SS 7236

BETWEEN OWNER AND ENGINEER

This Amendment No. 10 to the Agreement between CDM Smith Inc. (CDM Smith) (“ENGINEER”) and City of Columbia, South Carolina (“OWNER”) dated August 21st, 2012, (“the Agreement”) is made as of the date last written below.

WHEREAS, ENGINEER and OWNER entered into the Agreement for the Consent Decree Compliance Program and Infrastructure Improvements Program (Program Management Services), and

WHEREAS, the parties desire to amend the Agreement so as to amend the scope of work, time periods of performance and payment, and payment for services rendered by ENGINEER; and

WHEREAS, the Agreement provides that any amendments shall be valid only when expressed in writing and signed by parties.

NOW THEREFORE, in consideration of the mutual understandings and agreements contained herein, the parties agree to amend the Agreement as follows:

1. ☐ The Basic Services of ENGINEER as described in the Agreement are amended and supplemented as follows:

The Scope of Services agreed to in Year 1 of the contract, and as amended in contract years 2 through 9, will be authorized and renewed for Year 10 of the contract.

2. ☐ The time periods for the performance of ENGINEER’s services as set forth in the Agreement are amended and supplemented as follows:

This Amendment No. 10 for Year 10 services are intended to fund efforts from July 1, 2021 to June 30, 2022.

3. ☐ The payment for services rendered by ENGINEER shall be as set forth below:

The total compensation for Year 10 services shall not exceed Four Million, Two Hundred Thousand and No/100 Dollars (\$4,200,000) (non-inclusive of previous fees) without written authorization.

ENGINEER will submit monthly invoices for services rendered in accordance with original Contract for the work performed under this Amendment No.10 for contract Year 10 services based on the billing rates listed below and the terms contained in the original contract authorization.

• ☐ Rates

- ☐ Officer - \$235
- ☐ Principal / Associate - \$215
- ☐ Senior Professional - \$195
- ☐ Professional IV - \$175
- ☐ Professional III - \$165
- ☐ Professional II - \$150
- ☐ Professional I - \$130
- ☐ Designer / Junior Professional- \$110
- ☐ Senior Support Services - \$135
- ☐ Senior Resident Project Representative - \$135
- ☐ Resident Project Representative - \$95
- ☐ GIS Specialist - \$105

- ☐ Project Administration - \$95
- ☐ Intern - \$60

4. ☐ Except as herein modified, all terms and conditions of the Agreement shall remain in force and effect.

- ☐ A Subconsultant Information Form for Year 10 is attached as Exhibit A to this amendment.

IN WITNESS WHEREOF, the parties hereto have executed this Amendment No. 10 as of the date of the last signature hereto.

ENGINEER, CDM Smith Inc.

Name & Title

DATE: _____

Witness

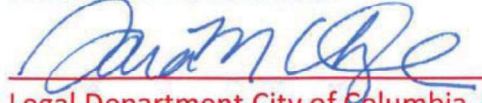
OWNER, City of Columbia, South Carolina

Name & Title

DATE: _____

Witness

APPROVED AS TO FORM



Legal Department City of Columbia, SC
10/13/2021

Current and Proposed Change and Basis for Payment:

Original Contract Amount (Term September 4, 2012 to June 30, 2013; Purchase Order# P130982):	\$3,462,300.00
Amendment #1 (Cost Increase/Addition; Time Extension July 1, 2013 to June 30, 2014; Purchase Order# P130982):	\$4,740,000.00
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Current Contract Amount:	\$43,802,300.00
This Change Amendment #10 (Cost Increase/Addition; Time Extension July 1, 2021 to June 30, 2022; Requisition# R212810):	\$4,200,000.00
Revised Contract Amount:	\$48,002,300.00

PROJECT SS7236

		CURRENT AMENDMENT (AMENDMENT #10)		TOTAL CONTRACT AMOUNTS		
COMPANY NAME		PERCENTAGE	\$ AMOUNT	PERCENTAGE	\$ AMOUNT	TYPE
MAIN CONSULTANT	CDM SMITH, INC OF COLUMBIA	75.00%	\$ 3,150,000.00	73.86%	\$ 35,454,295.00	
SUBCONSULTANTS	Atlantic South Consulting, LLC	0.69%	\$ 28,800.00	2.87%	\$1,375,388.00	M
	Blue Cypress Consulting, LLC	3.59%	\$ 150,934.00	0.52%	\$247,582.00	M
	Comprehensive Business Consultants	7.74%	\$ 324,994.00	5.05%	\$2,425,664.00	W
	DESA, Inc.	7.78%	\$ 326,872.00	5.70%	\$2,738,036.00	W
	ELL Enterprises, LLC	5.20%	\$ 218,400.00	1.76%	\$845,000.00	W
	Bross Group, LLC		\$ -	0.64%	\$305,511.00	
	Carper Consulting		\$ -	1.09%	\$525,300.00	W
	Civil Engineering Consulting Services, Inc.		\$ -	2.08%	\$999,776.00	W
	F&ME Consultants, Inc.		\$ -	0.35%	\$170,000.00	
	Grice Consulting Group, LLC		\$ -	3.09%	\$1,481,020.00	M
	LPA Group of Columbia, SC		\$ -	2.71%	\$1,299,230.00	
	Power Engineering of Hailey, ID		\$ -	0.28%	\$135,498.00	
TOTAL:		100.00%	\$ 4,200,000.00	100.00%	\$48,002,300.00	

Minority
Woman

ORDINANCE NO.: 2021-079

Authorizing the City Manager to execute the First Extension Option of the Lease Renewal Agreement with Truist Bank f/k/a Branch Banking and Trust Company (BB&T) for use of 3905 Ensor Avenue (Lutheran Survey Building)

BE IT ORDAINED by the Mayor and City Council this _____ day of _____, 2021, that pursuant to the previous Lease Renewal Agreement that provided for City Council approval of any extension beyond November 28, 2021, the City Manager is authorized to execute the attached First Extension Option of the Lease Renewal Agreement (Ordinance 2018-041) with Truist Bank f/k/a Branch Banking and Trust Company (BB&T) for 3905 Ensor Avenue (Lutheran Survey Building). The First Extension Option will terminate on November 28, 2022, unless otherwise extended by City Council.

Requested by:

Assistant City Manager Palen

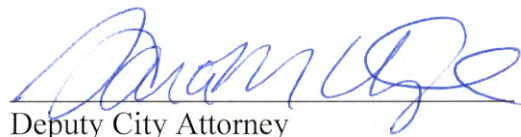
Mayor

Approved by:

City Manager

Approved as to form:

ATTEST:



Deputy City Attorney

City Clerk

Introduced:

Final Reading:



101 North Cherry Street, Suite 710
Winston-Salem, NC 27101
Office: 336.703.5699
tanya.trivette@truist.com

17.b

Tanya N Trivette
SR Real Estate Associate

September 22, 2021

City of Columbia
1136 Washington Street
Columbia, SC 29201
Attn: Jason Alonso

VIA UPS

Re: Lease with Truist Bank ("Truist")
3905 Ensor Avenue
Columbia, SC

Dear Jason:

Please allow this letter to serve as notice that Truist is exercising the first of two (2) additional renewal periods of one (1) year each by written mutual agreement within thirty (30) days prior to the expiration of the current term.

The term of the first extension option shall commence on November 29, 2021 and shall terminate on November 28, 2022.

As stated in the Lease Renewal Agreement dated September 4, 2018, Page 1, Section 1, rent will be \$450.00 per month.

Thank you for your consideration of this matter. We look forward to our continued tenancy and successful business relationship with you.

Should you have any questions or need to discuss further, please contact Aaron Steger at (804) 923-8747 or by e-mail at aaron.w.steger@truist.com.

Sincerely,

Tanya N. Trivette
Senior Real Estate Associate
Support Services, Real Estate

APPROVED AS TO FORM

**Legal Department City of Columbia, SC
9/24/2021**

AGREED AND ACCEPTED:

By: _____
Name: _____
Title: _____
Date: _____

ORDINANCE NO.: 2021-080

AUTHORIZING THE CITY OF COLUMBIA, SOUTH CAROLINA TO EXECUTE AND DELIVER AN EQUIPMENT LEASE PURCHASE AGREEMENT IN THE AMOUNT OF NOT EXCEEDING \$9,000,000 BETWEEN THE CITY AND THE LESSOR THEREOF TO DEFRAY THE COST OF ACQUIRING CERTAIN EQUIPMENT; AND OTHER MATTERS RELATING THERETO

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF COLUMBIA, SOUTH CAROLINA, AS FOLLOWS:

Section 1. Findings and Determinations. The City Council (the "Council") of the City of Columbia, South Carolina (the "City"), hereby finds and determines:

(a) The City is an incorporated municipality located in Lexington County and Richland County, South Carolina, and as such possesses all powers granted to municipalities by the Constitution and laws of this State.

(b) Section 5-7-40 of the Code of Laws of South Carolina 1976, as amended (the "S.C. Code"), empowers all municipalities to own and possess real and personal property and such municipalities may lease any such property.

(c) The City desires to enter into a lease purchase agreement (the "Lease Agreement") with a bank or other financial institution selected by the City Manager and Assistant City Manager for Finance and Economic Services for the purpose of financing the acquisition of the equipment set forth on Exhibit A hereto (the "Equipment").

(d) The Lease Agreement will not constitute a "financing agreement" and the Equipment will not constitute an "asset" as such terms are defined in Section 11-27-110 of the S.C. Code. Thus, the amount of the Lease Agreement will not be included when calculating the City's constitutional debt limit under Article X, Section 14 of the Constitution of the State of South Carolina.

(e) The Lease Agreement will be subject to annual appropriation by the Council.

(f) It is in the best interest of the City to acquire the Equipment by entering into the Lease Agreement. The Lease Agreement will enable the City to purchase the Equipment which will provide service necessary and useful to the operations of the City government.

Section 2. Approval of Lease/Purchase Financing; Delegation of Authority to Determine Certain Matters Relating to the Lease/Purchase Financing. The Equipment described in Exhibit A shall be acquired pursuant to a lease purchase financing which is hereby approved in a principal amount of not exceeding \$9,000,000. The Request for Proposals in the form set forth as Exhibit B hereto and the distribution thereof to various banks and other financial institutions in the City and other locations as the City Manager and Assistant City Manager for Finance and Economic Services determined, is hereby ratified and approved. Without further authorization, the Council hereby delegates to the Mayor and the City Manager and the Assistant City Manager for Finance and Economic Services, or any two of them acting together, the authority to: (a) determine the principal amount of the Lease Agreement, if less than authorized by this Ordinance; (b) determine the payment schedule under the Lease Agreement; (c) determine the final payment date under the Lease Agreement; (d) determine the terms relating to any prepayment of the Lease Agreement; (e) determine the date and time for receipt of bids under the Request for Proposals; (f) accept, as well as negotiate, with any responsible bidder under the terms of the Request for Proposals and award the sale of the lease purchase financing to the bidder (the "Bidder") submitting the proposal determined to be the most advantageous to the City in accordance with the terms of the Request for Proposals; and (g) make changes to the quantity, cost or description of the Equipment set forth in Exhibit A attached hereto.

Section 3. Approval of Lease Agreement. Without further authorization, the Mayor, the City Manager and the Assistant City Manager for Finance and Economic Services, or any of them acting alone (each, an "Authorized Person"), is authorized to approve the form, terms and provisions of the Lease Agreement proposed by the Bidder, and to execute, acknowledge and deliver the Lease Agreement in the name and on behalf of the City. The Lease Agreement is to be in the form as shall be approved by any Authorized Person, the Authorized Person's execution thereof to constitute conclusive evidence of such approval.

Section 4. Execution of Documents; Ratification of Certain Actions. The Mayor, City Manager, Assistant City Manager for Finance and Economic Services, City Clerk and City Attorney are fully empowered and authorized to take such further actions and to execute and deliver such additional documents as may be reasonably requested by the Bidder to effect the delivery of the Lease Agreement, including any project fund or acquisition fund agreement, in accordance with the terms and conditions therein set forth and the transactions contemplated hereby and thereby, and the actions of such officers in executing and delivering any of such documents, in such form as any Authorized Person shall approve, is hereby fully authorized.

Section 5. Federal Tax Covenant. The City, as lessee under the Lease Agreement, agrees and covenants that it will not take any action which will, or fail to take any action which failure will, cause interest components of the payments to be made under the Lease Agreement to become includable in the gross income of the Bidder or its successors or assignees for federal income tax purposes pursuant to the provisions of the Internal Revenue Code of 1986, as amended ("Code") and regulations promulgated thereunder in effect on the date of the execution and delivery of the Lease Agreement; and that it will comply with all applicable provisions of Section 103 and Sections 141 through 150 of the Code, and any regulations promulgated thereunder, to maintain the exclusion from gross income for federal income tax purposes of the interest portion of the payments to be made under the Lease Agreement; and to that end the City shall:

- (a) comply with the applicable provisions of Section 103 and Sections 141 through 150 of the Code and any regulations promulgated thereunder so long as the Lease Agreement is outstanding;
- (b) establish such funds, make such calculations and pay such amounts in the manner and at the times required in order to comply with the requirements of the Code relating to required rebates of certain amounts to the United States; and
- (c) make such reports of such information at the times and places required by the Code.

The City will timely file Form 8038-G in accordance with the applicable regulations of the Internal Revenue Service.

The City Manager and Assistant City Manager for Finance and Economic Services of the City, or any one of them acting alone, are hereby authorized to adopt or modify written procedures for and on behalf of the City to ensure the City's compliance with federal tax matters relating to the Lease Agreement.

This Ordinance shall constitute the City's declaration of official intent pursuant to Regulation §1.150-2 of the Code to reimburse the City from a portion of the proceeds of the Lease Agreement or other tax-exempt bonds issued by the City for such purposes (the "Reimbursement Bonds") for expenditures it anticipates incurring (the "Expenditures") with respect to the Equipment prior to the issuance of the Reimbursement Bonds. The Expenditures which are reimbursed are limited to Expenditures which are: (a) properly chargeable to a capital account (or would be so chargeable with a proper election or with the application of the definition of placed in service under Regulation §1.150-2 of the Code) under general federal income tax principles; or (2) certain *de minimis* or preliminary expenditures satisfying the requirements of Regulation §1.150-2(f) of the Code. The source of funds for the Expenditures with respect to the acquisition of the Equipment will be the City's general fund. To be eligible for reimbursement of the Expenditures, the reimbursement allocation must be made not later than 18 months after the later of (a) the date on which the Expenditures were paid; or (b) the date such project was placed in service, but in no event more than three (3) years after the original Expenditures.

Section 6. Filings with Central Repository. In compliance with Section 11-1-85 of the S.C. Code, the City covenants that it will file or cause to be filed with a central repository for further availability in the secondary bond market when requested; (a) a copy of the annual audit of the City within thirty (30) days of the City's receipt thereof; and (b) within thirty (30) days of the occurrence thereof, relevant information of an event which, in the opinion of the City, adversely affects more than five percent (5%) of the City's revenue or its tax base.

Section 7. Severability. All ordinances, resolutions and parts thereof, procedural or otherwise, in conflict herewith or the proceedings authorizing the execution of the Lease Agreement are, to the extent of such conflict, hereby repealed.

Section 8. Effective Date. This Ordinance shall be effective upon its enactment by the Council.

[Execution page follows]

This Ordinance shall be forthwith codified in the Code of City Ordinances in the manner required by law.

Requested by:

Assistant City Manager Gentry

Mayor

Approved by:

City Manager

Approved as to form:

ATTEST:



Deputy City Attorney

City Clerk

Introduced:

Final Reading:

EXHIBIT AEquipment

Acquisition, replacement and installation of certain rolling stock and other equipment, including but not limited to the following: purchase of new cars, trucks and other vehicles and equipment for various departments of the City, including but not limited to the police, fire, public works and parks departments of the City, and purchase and installation of computers, software, equipment and systems for various departments of the City.

EXHIBIT BForm of Request for Proposals

REQUEST FOR PROPOSALS

City of Columbia, South Carolina Equipment Lease Purchase Financing, 2021

Response Due: _____, 2021
12:00 Noon, South Carolina Time

NOT BANK QUALIFIED

The City of Columbia, South Carolina (the "City"), is requesting proposals from various banks and financial institutions for a not exceeding \$9,000,000 tax-exempt lease purchase financing to defray the costs of acquiring certain equipment as described herein. The City invites interested parties to submit a proposal to finance the equipment by specifying a rate of interest and other conditions for such financing.

Mailed or Hand Delivered Proposals: Each mailed or hand delivered proposal shall be enclosed in a sealed envelope marked "Proposal for 2021 Equipment Lease Purchase" and should be mailed or delivered to:

Janice L. Alonso
Finance Director
City of Columbia
1136 Washington Street
Columbia, SC 29201

E-Mail Proposals: Electronic proposals may be e-mailed to the attention of Ms. Janice L. Alonso, Finance Director, at Janice.Alonso@columbiasc.gov, with a copy to Burr & Forman LLP d/b/a Burr Forman McNair ("Burr Forman McNair"), Special Counsel to the City, to the attention of Michael J. Seezen, Esq. at mseezen@burr.com.

PROPOSALS MAY BE DELIVERED BY HAND, BY MAIL, OR BY E-MAIL, BUT NO PROPOSAL SHALL BE CONSIDERED WHICH IS NOT ACTUALLY RECEIVED BY THE CITY AT THE PLACE, DATE AND TIME APPOINTED. THE CITY SHALL NOT BE RESPONSIBLE FOR ANY FAILURE, MISDIRECTION, DELAY OR ERROR RESULTING FROM THE SELECTION BY ANY BIDDER OF ANY PARTICULAR MEANS OF DELIVERY OF PROPOSALS.

Please note that this Request for Proposals is also being sent to a number of other institutions as well and that the City, in its sole discretion, reserves the right to select the proposal determined to be the most advantageous to the City. The selection process will be heavily weighted toward lowest financing costs; however, lowest financing cost is not the only factor that may be considered by the City. The City reserves the right to reject any or all bid proposals as well as negotiate with the lowest responsible bidder.

I. Terms and Conditions

- (a) Amount to be Financed: Not exceeding \$9,000,000. The City retains the option to reduce the total amount to be financed by up to 10%. A bid for less than the total principal amount contemplated by this Request for Proposals will not be considered.
- (b) Funding Options. Bidders may submit proposals on either or both of the following two basis:

1. Fully-Funded. Proceeds of the financing will be fully funded at closing, and deposited to an account held for the benefit of the City (the "Acquisition Account"). Interest will accrue on the full principal amount of the financing from the date of closing. If a bidder requires that the Acquisition Account be held by the bidder or its designee, the bidder must so indicate on its proposal (including any fees required thereunder). Otherwise, the City retains the right to designate a bank to act as custodian of the Acquisition Account. Interest earnings in the Acquisition Account must accrue to the City.

2. Draw-Down. Proceeds of the financing will be advanced to the City on an as-needed basis, during the first twenty-four (24) months after the execution of the financing. Interest will accrue from the respective dates of each advance.

- (c) Payments/Interest Rate: The final payment of principal and interest shall be due on or before _____. Payments of principal and interest shall be made monthly, commencing on the later of _____, 2021; or the first day of the month following the first advance (if applicable), in approximately equal amounts until maturity (in either case, payments of principal and interest may be made without penalty or interest on the first business day following the day such payments are actually due).

Bidders shall submit a bid consisting of a single fixed rate of interest per annum for the total principal amount of the Lease Agreement (as defined herein) which is to bear until maturity or prior redemption and should be expressed as a percentage interest rate of one one-hundredth (1/100th) of a percent. Unless otherwise designated by a bidder, interest will be calculated based on a 360-day year comprised of twelve 30-day months.

Bids containing rates of interest which may adjust upon the occurrence of specified events, including changes in the Code (as defined herein), changes in the bidder's capital requirements or cost of capital, or for any other reason (other than the loss of tax exemption due solely to the

actions or inactions of the City), will be rejected.

- (d) Guarantee of Interest Rate: The interest rate, costs and other terms of the bid submitted must be guaranteed from the date of your proposal to the closing date (expected to be on or about _____, 2021).
- (e) Equipment/Form of Lease Agreement: See attached Exhibit A for a description of the general categories and types of equipment proposed to be financed. At the request of a bidder, the City agrees to provide more detailed information regarding the equipment proposed to be financed to such bidder prior to the date and time that responses are due; however, the City reserves the right to add, delete or modify equipment from such list any time prior to the purchase thereof from the proceeds of the Lease Agreement, as may be necessary or desirable to suit the City's capital needs, for so long as such equipment continues to be described within the categories set forth in Exhibit A hereto.

The successful bidder's proposed form of equipment lease purchase agreement ("Lease Agreement") should be provided to the City's Special Counsel within three (3) business days of the award of the successful proposal.
- (f) Non-appropriation: A non-appropriation provision acceptable to the City must be included in the Lease Agreement. Any and all amounts due including, but not limited to, scheduled lease payments, reimbursements, penalties or fees under the Lease Agreement or any Acquisition Account (as defined below) must be subject to annual appropriation by the City.
- (g) Non-substitution: A non-substitution provision is not permitted to be included in the Lease Agreement.
- (h) Deficiency Judgment: No deficiency judgment can be assessed or imposed against the City nor will the full faith, credit and taxing power of the City be pledged to the payment of the Lease Agreement.
- (i) Title: Title to the equipment will be in the name of the City subject to the bidder's rights under the Lease Agreement. The successful bidder shall be responsible for taking all actions it deems necessary to impose its lien upon or perfect any security interest in the equipment.

Unencumbered title to the equipment must be provided to the City, and the bidder's lien on the equipment must be released, on the date of final payment, whether upon maturity or prior redemption of the Lease Agreement. The Lease Agreement must allow the City to dispose of certain of the equipment in its sole discretion prior to the termination of the Lease

Agreement provided the value of the remaining items of equipment is not less than the outstanding principal balance of the Lease Agreement at the time of such disposition.

- (j) Payments for Equipment; Investments: Payments from the Acquisition Account or amounts advanced by the successful bidder, as applicable, may be made either to the City as reimbursement for prior expenditures or directly to the equipment vendor for payment of the equipment as directed by the City, up to twenty-four (24) months following the execution of the financing. Without limitation of the foregoing, payments therefrom must be made available upon request of the City for periodic partial payments to equipment vendors for the manufacture and/or assembly of equipment prior to delivery and acceptance of such equipment by the City. All funds invested or deposited in the Acquisition Account shall at all times be invested or deposited, as applicable, in a manner which satisfied the requirements of the laws of the State of South Carolina relating to investment or deposit of public funds, including, without limitation, Section 6-5-10 or Section 6-5-15 of the Code of Laws of South Carolina 1976, as amended, as applicable.
- (k) Costs of Issuance: All costs relating to the preparation of the Lease Agreement and fees of Special Counsel will be paid by the City. Any fees and costs of the bidder (including its legal expenses) to be paid by the City must be stated in the response to this Request for Proposals and will be treated as additional interest for purposes of evaluating bids. The Lease Agreement must allow the City to pay its legal fees and costs related to execution and delivery of the Lease Agreement out of the proceeds of the Lease Agreement.
- (l) Insurance: The City is self-insured for property, casualty and general liability risks. The equipment will be insured in a similar manner.
- (m) Closing: The City expects to accept the successful proposal on _____, 2021, and close the transaction on _____, 2021.
- (n) Prepayment: Unless otherwise specifically provided in a bidder's proposal and agreed to by the City, the Lease Agreement will be subject to prepayment at the option of the City in whole or in part at any time without any prepayment penalty.
- (o) Lease Agreement Not Designated as Qualified Tax-Exempt Obligation: The City has not designated the Lease Agreement as a "qualified tax-exempt obligation" for purposes of Section 265 of the Internal Revenue Code, as amended (the "Code"), relating to the ability of financial

institutions to deduct from income for federal income tax purposes interest expense that is allocable to carrying and acquiring tax-exempt obligations.

II. Proposal Requirements

- (a) The proposal must be in writing. It is preferred that a bidder's proposal not be subject to further credit or underwriting approval.
- (b) No proposal may be modified by a bidder after it has been submitted.
- (c) Proposals should include: the name, address, telephone number of your institution; the primary contact; and identity of legal counsel, if any.
- (d) Proposals must be accompanied with a list of all requirements and conditions associated with the proposal.
- (e) Proposals must indicate a single interest rate for the lease term and it is requested that proposals include an amortization schedule showing annual payment amounts for the term of the financing.
- (f) Proposals must provide full disclosure of all financing costs, including any closing, legal, and tax opinion charges.
- (g) Any prepayment penalty or other fee requirements should be detailed in the proposal.

III. Evaluation of Proposals and Award

The Lease Agreement will be awarded to the bidder that provides the most advantageous proposal as determined by the City in its sole and absolute discretion. After the proposals are received, they will be evaluated by the officials of the City based on various factors, including, but not limited to, the interest rate, proposed form of Lease Agreement, redemption terms, prepayment penalties or limitations; additional credit or underwriting approval, legal or other additional costs of the proposer to be paid by the City or factored into the interest rate, additional covenants and terms, if any, and other conditions set forth therein. The City reserves the right to reject any and all proposals or to waive irregularities in any proposal. The City expects to accept the successful proposal by the close of business on _____, 2021.

IV. Legal Opinion. The execution and delivery of the Lease Agreement is subject to the approving opinion of the Burr & Forman LLP d/b/a Burr Forman McNair ("Burr Forman McNair"), Special Counsel, and the City's attorney, Teresa A. Knox, Esq.

V. Tax Exemption and Other Tax Matters. The Code, and the Treasury Regulations promulgated thereunder, include provisions that relate to tax exempt obligations, such as the Lease Agreement, including, among other things, permitted uses and investment of the proceeds of the Lease

Agreement and the rebate of certain net arbitrage earnings from the investment of such proceeds to the United States Treasury. Noncompliance with these requirements may result in interest paid under the Lease Agreement becoming subject to federal income taxation retroactive to the date of issuance of the Lease Agreement. The City has covenanted to comply with the requirements of the Code to the extent required to maintain the exclusion of interest on the Lease Agreement from gross income for federal tax purposes. Failure of the City to comply with these covenants could cause the interest on the Lease Agreement to be taxable retroactively to its date of issuance.

The Code imposes an alternative minimum tax on a taxpayer's alternative minimum taxable income. Interest on the Lease Agreement is not an item of tax preference for purposes of the federal alternative minimum tax.

The accrual or receipt of interest on the Lease Agreement may affect the federal income tax liability of the recipient. The extent of these other tax consequences will depend upon the recipient's particular tax status or other items of income or deduction. Prospective purchasers of the Lease Agreement should be aware that ownership of the Lease Agreement may result in collateral federal income tax consequences to certain taxpayers, including, without limitation, financial institutions, property and casualty insurance companies, individual recipients of Social Security or Railroad Retirement benefits, certain S corporations with "excess net passive income," foreign corporations subject to the branch profits tax, life insurance companies and taxpayers otherwise entitled to claim the earned income credit and taxpayers who may be deemed to have incurred or continued indebtedness to purchase or carry or have paid or incurred certain expenses allocable to the Lease Agreement. Special Counsel will not express any opinion as to such collateral tax consequences. Prospective purchasers of the Lease Agreement should consult their tax advisors as to collateral federal income tax consequences.

Special Counsel has not undertaken to determine (or to inform any person) whether any action taken (or not taken) or event occurring (or not occurring) after the date of issuance of the Lease Agreement may affect the tax status of interest on the Lease Agreement. In rendering its opinion, Special Counsel will rely upon certificates and representations of the City with respect to certain material facts solely within the knowledge of the City relating to the application of the proceeds of the Lease Agreement.

VI. Investment Letter. The lessor will be required to execute an Investment Letter to the City in substantially the form attached hereto as Exhibit B and incorporated herein by reference.

VII. Additional Information. If you should have any questions regarding the Request for Proposals, you should contact:

Janice L. Alonso
Finance Director
Phone: 803.545.3409
E-Mail: Janice.Alonso@columbiasc.gov

Michael J. Seezen, Esq.
Burr Forman McNair
Phone: 803.753.3257
E-Mail: mseezen@burr.com

Bidders are encouraged to submit any questions or requests for further information to the

City at least two days prior to the date proposals are due (_____, 2021), in order to ensure sufficient time for the City to review and respond to such questions or requests.

No questions may be directed to or contacts made with the Mayor, other members of City Council or any City staff not identified in this Request for Proposals as points of contacts during the period of time that this Request for Proposals is made public until the final selection is made, except as otherwise provided for herein. Violation of this prohibition may disqualify the bidder from further consideration.

/s/ Jeffery M. Palen

City of Columbia, South Carolina
Assistant City Manager for Finance and
Economic Services

_____, 2021

EXHIBIT AEquipment

Acquisition, replacement and installation of certain rolling stock and other equipment, including but not limited to the following: purchase of new cars, trucks and other vehicles and equipment for various departments of the City, including but not limited to the police, fire, public works and parks departments of the City, and purchase and installation of computers, software, equipment and systems for various departments of the City.

EXHIBIT AForm of Investment Letter

_____, 2021

City of Columbia, South Carolina
Columbia, South Carolina

Teresa A. Knox, Esq.
City Attorney, City of Columbia
Columbia, South Carolina

Burr & Forman LLP d/b/a Burr Forman McNair
Columbia, South Carolina

RE: City of Columbia, South Carolina
[Lease Agreement], 2021, \$ _____

This letter is provided by _____ (the "Lessor") in connection with the execution and delivery of a [Lease Agreement] dated as of _____, 2021 (the "Agreement") between the Lessor and City of Columbia, South Carolina (the "City"). All capitalized terms used herein, but not defined herein, shall have the respective meanings set forth in the Agreement. The undersigned, an authorized representative of the Lessor, hereby represents to you that:

1. The Lessor has sufficient knowledge and experience in financial and business matters, including purchase and ownership of municipal and other obligations, to be able to evaluate the risks and merits of the investment represented by the Agreement.
2. The Lessor has authority to enter into the Agreement and to execute this letter and any other instruments and documents required to be executed by the Lessor in connection with the Agreement.
3. The undersigned is a duly appointed, qualified and acting representative of the Lessor and is authorized to cause the Lessor to make the certifications, representations and warranties contained herein by execution of this letter on behalf of the Lessor.
4. The Lessor understands that no official statement, prospectus, offering circular, or other comprehensive offering statement containing material information with respect to the City and the Agreement is being provided with respect to the Agreement. In due diligence, the Lessor has made its own inquiry and analysis with respect to the City, the Agreement, the [Lease Payments] and the security therefor, and other material factors affecting the security for and payments to be made under the Agreement.

5. The Lessor acknowledges that it (a) has either been supplied with or has access to information, including financial statements and other financial information, regarding the City, to which a reasonable investor would attach significance in making investment decisions; and (b) has had the opportunity to ask questions and receive answers from knowledgeable individuals concerning the City, the Agreement, the Acquisition Payments and the security therefor, so that as a reasonable investor, it has been able to make its decision to enter into the Agreement.

6. The Lessor is primarily entering into the Agreement for its own account (or for that of its consolidated taxpayer group) and not with a current view to resale or other distribution thereof, and the Lessor does not currently contemplate the division of the Agreement nor the resale or other disposition of the Agreement, or any part thereof, except as permitted by law and subject to applicable securities laws and regulations thereunder.

7. The undersigned acknowledges that the Lessor will file any UCC financing statements or otherwise take any actions necessary in order to perfect the Lessor's security interest in any collateral in connection with the Agreement.

8. Lessor understands that the scope of engagement of Teresa A. Knox, Esq., as City Attorney, with respect to the Agreement has been limited to the matters set forth in his opinion.

9. The undersigned understands that the scope of engagement of Burr & Forman LLP d/b/a Burr Forman McNair, as Special Counsel for the City with respect to the Agreement, has been limited to matters set forth in their opinion.

[LESSOR]

By: _____

Its: _____

Class Description for Purchase	Dept Desc	Estimated Replacement Cost
Compact Auto	Business License	21,846
Compact Auto	Business License	21,846
Utility Vehicle	Community Development	24,978
Intermediate Auto	Emergency Communications/311	26,998
3/4 Ton P/U	Fleet-Fleet Services	26,453
1 Ton P/U	Gen Serv - Sup.Serv	43,713
Intermediate Auto	Gen Serv - Sup.Serv	21,846
1/2 Ton P/U	Planning & Development Services	26,453
1/2 Ton P/U	Planning & Development Services	23,846
	General Government Total	237,979
Intermediate Auto	Fire-Administration	21,846
Utility Vehicle	Fire-Administration	43,713
1 Ton P/U	Fire-Logistics	45,000
3/4 Ton P/U	Fire-Suppression	38,182
Ladder Truck	Fire-Suppression	1,232,431
Heavy Rescue	Fire-Suppression	350,000
1 Ton P/U	Fire-Suppression	45,000
Fire Hazmat	Fire-Suppression	720,000
Van New Ppe Position	Fire-Training	50,000
Add Air Compressor	Fire-Training	90,500
Station Generator	Fire-Suppression	20,116
	Fire Department	2,656,788
2 3/4 Ton P/Us	Parks-Buildings & Grounds	52,906
2 1/2 Ton P/Us	Parks-Buildings & Grounds	50,728
Utility Vehicle	Parks-Park Rangers	25,585
Bus	Parks-Recreation Programs	95,000
Van	Parks-Recreation Programs	27,875
Utility Vehicle	Parks-Recreation Programs	24,978
	Parks & Recreation	277,072
3/4 Ton P/U	Police -Code Enforcement	28,452
3 1/2 Ton P/Us	Police -Code Enforcement	85,356
3 Intermediate Investigations Autos - Unmarked	Police-Investigations	55,686
1/2 Ton P/U	Police -Code Enforcement	31,306
2 Utility Vehicles/ Police Full Size Auto	Police-Investigations	100,168
Full Size Auto	Police-Investigations	18,562
4 Intermediate Police Autos	Police-Operations	138,200
37 Full Size Police Autos	Police-Operations	1,853,108
Full Size Police Auto	Police-Special Operations	18,562
Intermediate Police Auto	Police-Special Operations	34,550
2 Utility Vehicles	Police-Special Operations	114,534
Intermediate Police Auto	Police-Special Operations	34,897
Full Size Police Auto	Police-Special Operations	50,084
Utility Vehicle	Police-Special Operations	45,932
	Police	2,609,397
Bucket Truck	Traffic-Operations	146,682
Brush Chipper - Trailer Mounted	Forestry-Hazard Elimination	40,742
Bucket Truck	Forestry-Hazard Elimination	114,282
Single Axle Dump	Forestry-Horticulture	126,398
Rear Loader	Solid Waste-Rollcarts	185,000
1/2 Ton P/U	Solid Waste-Trash Collection	25,364
Side Loader	Solid Waste-Rollcarts	325,000
Trash Truck	Solid Waste-Trash Collection	91,324
Trash Truck	Solid Waste-Trash Collection	91,324
2 Side Loaders	Solid Waste-Rollcarts	650,000
Clamshell Loader	Solid Waste-Trash Collection	275,000
Claws, Trash Collection	Solid Waste-Trash Collection	150,000
2 Trash Trucks	Streets-Street and Sidewalk Re	182,648
	Public Works	2,403,764
Fleet Replacements	Total - All General Fund Departments	8,185,000
Information Technology	Infrastructure, Security, network equipment, laptops, desktops, tablets	815,000
	Total Estimated	9,000,000

ORDINANCE NO.: 2021-082

*Amending the 1998 Code of Ordinances of the City of Columbia, South Carolina,
to repeal and replace Chapter 11, Licenses, Permits and Miscellaneous Business Regulations,
Article II. Business and Professional Licenses*

BE IT ORDAINED by the Mayor and City Council of the City of Columbia, South Carolina this _____ day of _____, 2021 that the City of Columbia, South Carolina Chapter 11, Licenses, Permits and Miscellaneous Business Regulations, Article II, Business and Professional Licenses is hereby repealed in its entirety and replaced with Chapter 11, Licenses, Permits and Miscellaneous Business Regulations reflected in the attached "Article II, Business and Professional Licenses" which is incorporated herein by reference and available for inspection by contacting the City Clerk, City Hall, 3rd Floor, 1737 Main Street, Columbia, South Carolina, 29201; (803) 545-3045; cityclerk@columbiasc.net, or the Business License Division, 1136 Washington Street, Columbia, South Carolina, 29201; (803) 545-3345 or viewed online at <https://columbiasc.gov/business-licensing>.

This ordinance is effective as of May 1, 2022

Requested by:

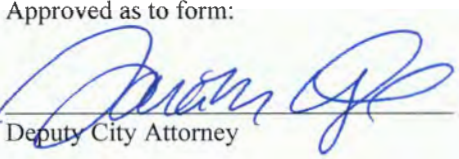
Assistant City Manager Gentry

Mayor

Approved by:

City Manager

Approved as to form:


Deputy City Attorney

ATTEST:

City Clerk

Introduced:

Final Reading:

Article II. Business and Professional Licenses

Section 11-31. License Required.

Every person engaged or intending to engage in any business, calling, occupation, profession, or activity engaged in with the object of gain, benefit, or advantage, in whole or in part within the limits of the City of Columbia, South Carolina, is required to pay an annual license tax for the privilege of doing business and obtain a business license as herein provided.

Section 11-32. Definitions.

The following words, terms, and phrases, when used in this Article, shall have the meaning ascribed herein. Defined terms are not capitalized when used in this ordinance unless the context otherwise requires.

Business means any business, calling, occupation, profession, or activity engaged in with the object of gain, benefit, or advantage, either directly or indirectly.

Charitable Organization means an organization that is determined by the Internal Revenue Service to be exempt from Federal income taxes under 26 U.S.C. Section 501(c)(3), (4), (6), (7), (8), (10) or (19).

Charitable Purpose means a benevolent, philanthropic, patriotic, or eleemosynary purpose that does not result in personal gain to a sponsor, organizer, officer, director, trustee, or person with ultimate control of the organization.

Classification means that division of businesses by NAICS codes subject to the same license rate as determined by a calculated index of ability to pay based on national averages, benefits, equalization of tax burden, relationships of services, or other basis deemed appropriate by the Council.

Council means the City Council of the City of Columbia.

Domicile means a principal place from which the trade or business of a licensee is conducted, directed, or managed. For purposes of this ordinance, a licensee may be deemed to have more than one domicile.

Gross Income means the gross receipts or gross revenue of a business, received or accrued, for one calendar or fiscal year collected or to be collected from business done within the Municipality. If the licensee has a domicile within the Municipality, business done within the Municipality shall include all gross receipts or revenue received or accrued by such licensee. If the licensee does not have a domicile within the Municipality, business done within the Municipality shall include only gross receipts or revenue received or accrued within the Municipality. In all cases, if the licensee pays a business license tax to another county or municipality, then the licensee's gross income for the purpose of computing the tax within the Municipality must be reduced by the amount of revenues or receipts taxed in the other county or municipality and fully reported to the Municipality. Gross income for business license tax purposes shall not include taxes collected for a governmental entity, escrow funds, or funds that are the property of a third party. The value of bartered goods or trade-in merchandise shall be included in gross income. The gross receipts or gross revenues for business license purposes may be verified by inspection of returns and reports filed with the Internal Revenue Service, the South Carolina Department of Revenue, the South Carolina Department of Insurance, or other government agencies. In calculating gross income for certain businesses, the following rules shall apply:

- (a) Gross income for agents shall be calculated on gross commissions received or retained, unless otherwise specified. If commissions are divided with other brokers or agents, then only the amount retained by the broker or agent is considered gross income.
- (b) Except as specifically required by S.C. Code § 38-7-20, gross income for insurance companies shall be calculated on gross premiums written.
- (c) Gross income for manufacturers of goods or materials with a location in the Municipality shall be calculated on the lesser of (i) gross revenues or receipts received or accrued from business done at the location, (ii) the amount of income allocated and apportioned to that location by the business for purposes of the business's state income tax return, or (iii) the amount of expenses attributable to the location as a cost center of the business. Licensees reporting gross income under this provision shall have the burden to establish the amount and method of calculation by satisfactory records and proof. Manufacturers include those taxpayers reporting a manufacturing principal business activity code on their federal income tax returns.

License Official means a person designated to administer this Article. Notwithstanding the designation of a primary license official, the Municipality may designate one or more alternate license officials to administer particular types

of business licenses, including without limitation for business licenses issued to businesses subject to business license taxes under Article 20, Chapter 9, Title 58, and Chapters 7 and 45, Title 38, of the South Carolina Code.

Licensee means the business, the person applying for the license on behalf of the business, an agent or legal representative of the business, a person who receives any part of the net profit of the business, or a person who owns or exercises control of the business.

Municipality means the City of Columbia, South Carolina.

NAICS means the North American Industry Classification System for the United States published under the auspices of the Federal Office of Management and Budget.

Person means any individual, firm, partnership, limited liability partnership, limited liability company, cooperative non-profit membership, corporation, joint venture, association, estate, trust, business trust, receiver, syndicate, holding company, or other group or combination acting as a unit, in the singular or plural, and the agent or employee having charge or control of a business in the absence of the principal.

Section 11-33. Purpose and Duration.

The business license required by this Article is for the purpose of providing such regulation as may be required for the business subject thereto and for the purpose of raising revenue for the general fund through a privilege tax. The license year ending on April 30, 2022, shall commence on January 1, 2021 and shall run for a 16-month period. Except as set forth below for business licenses issued to contractors with respect to specific construction projects, each yearly license shall be issued for the twelve-month period of May 1 to April 30. A business license issued for a construction contract may, at the request of the licensee, be stated to expire at the completion of the construction project; *provided*, any such business license may require that the licensee file, by each April 30 during the continuation of the construction project, a statement of compliance, including but not limited to a revised estimate of the value of the contract. If any revised estimate of the final value of such project exceeds the amount for which the business license was issued, the licensee shall be required to pay a license fee at the then-prevailing rate on the excess amount. The provisions of this Article and the rates herein shall remain in effect from year to year as amended by the Council.

Section 11-34. Business License Tax, Refund.

- (a) The required business license tax shall be paid for each business subject hereto according to the applicable rate classification on or before the due date of the 30th day of April in each year, except for those businesses in Rate Class 8 for which a different due date is specified. Late payments shall be subject to penalties as set forth in Section 12 hereof, except that admitted insurance companies may pay before June 1 without penalty.
- (b) A separate license shall be required for each place of business and for each classification or business conducted at one place. If gross income cannot be separated for classifications at one location, the business license tax shall be computed on the combined gross income for the classification requiring the highest rate. The business license tax must be computed based on the licensee's gross income for the calendar year preceding the due date, for the licensee's twelve-month fiscal year preceding the due date, or on a twelve-month projected income based on the monthly average for a business in operation for less than one year. The business license tax for a new business must be computed on the estimated probable gross income for the balance of the license year. A business license related to construction contract projects may be issued on a per-project basis, at the option of the taxpayer. No refund shall be made for a business that is discontinued.
- (c) A licensee that submits a payment greater than the amount owed may request a refund. To be considered, a refund request must be submitted in writing to the Municipality before the June 1 immediately following the April 30 on which the payment was due and must be supported by adequate documentation supporting the refund request. The Municipality shall approve or deny the refund request, and if approved shall issue the refund to the business, within thirty days after receipt of the request.

Section 11-35. Registration Required.

- (a) The owner, agent, or legal representative of every business subject to this Article, whether listed in the classification index or not, shall register the business and make application for a business license on or before the due date of each year; *provided*, a new business shall be required to have a business license prior to operation within the Municipality, and an annexed business shall be required to have a business license within thirty (30) days of the annexation. A license for a bar (NAICS 722410) must be issued in the name of the individual who has been issued the corresponding state alcohol, beer, or wine permit or license and will have actual control and management of the business.

- (b) Application shall be on the then-current standard business license application as established and provided by the Director of the South Carolina Revenue and Fiscal Affairs Office and shall be accompanied by all information about the applicant, the licensee, and the business deemed appropriate to carry out the purpose of this Article by the license official. Applicants may be required to submit copies of portions of state and federal income tax returns reflecting gross receipts and gross revenue figures.
- (c) The applicant shall certify under oath that the information given in the application is true, that the gross income is accurately reported (or estimated for a new business) without any unauthorized deductions, and that all assessments, personal property taxes on business property, and other monies due and payable to the Municipality have been paid.
- (d) The Municipality shall allow application, reporting, calculation, and payment of business license taxes through the business license tax portal hosted and managed by the South Carolina Revenue and Fiscal Affairs Office, subject to the availability and capability thereof. Any limitations in portal availability or capability do not relieve the applicant or Licensee from existing business license or business license tax obligations.

Section 11-36. Deductions, Exemptions, and Charitable Organizations.

- (a) No deductions from gross income shall be made except income earned outside of the Municipality on which a license tax is paid by the business to some other municipality or county and fully reported to the Municipality, taxes collected for a governmental entity, or income which cannot be included for computation of the tax pursuant to state or federal law. Properly apportioned income from business in interstate commerce shall be included in the calculation of gross income and is not exempted. The applicant shall have the burden to establish the right to exempt income by satisfactory records and proof.
- (b) No person shall be exempt from the requirements of the ordinance by reason of the lack of an established place of business within the Municipality, unless exempted by state or federal law. The license official shall determine the appropriate classification for each business in accordance with the latest issue of NAICS. No person shall be exempt from this ordinance by reason of the payment of any other tax, unless exempted by state law, and no person shall be relieved of liability for payment of any other tax or fee by reason of application of this ordinance.
- (c) Wholesalers are exempt from business license taxes unless they maintain warehouses or distribution establishments within the Municipality. A wholesale transaction involves a sale to an individual who will resell the goods and includes delivery of the goods to the reseller. It does not include a sale of goods to a user or consumer.
- (d) A charitable organization shall be exempt from the business license tax on its gross income unless it is deemed a business subject to a business license tax on all or part of its gross income as provided in this section. A charitable organization, or any affiliate of a charitable organization, that reports income from for-profit activities or unrelated business income for federal income tax purposes to the Internal Revenue Service shall be deemed a business subject to a business license tax on the part of its gross income from such for-profit activities or unrelated business income.
- (e) A charitable organization shall be deemed a business subject to a business license tax on its total gross income if (1) any net proceeds of operation, after necessary expenses of operation, inure to the benefit of any individual or any entity that is not itself a charitable organization as defined in this ordinance, or (2) any net proceeds of operation, after necessary expenses of operation, are used for a purpose other than a charitable purpose as defined in this ordinance. Excess benefits or compensation in any form beyond fair market value to a sponsor, organizer, officer, director, trustee, or person with ultimate control of the organization shall not be deemed a necessary expense of operation.

Section 11-37. False Application Unlawful.

It shall be unlawful for any person subject to the provisions of this ordinance to make a false application for a business license or to give or file, or direct the giving or filing of, any false information with respect to the license or tax required by this ordinance.

Section 11-38. Display and Transfer.

- (a) All persons shall display the license issued to them on the original form provided by the license official in a conspicuous place in the business establishment at the address shown on the license. A transient or non-

resident shall carry the license upon his person or in a vehicle used in the business readily available for inspection by any authorized agent of the Municipality.

- (b) A change of address must be reported to the license official within ten (10) days after removal of the business to a new location and the license will be valid at the new address upon written notification by the license official and compliance with zoning and building codes. Failure to obtain the approval of the license official for a change of address shall invalidate the license and subject the licensee to prosecution for doing business without a license. A business license shall not be transferable, and a transfer of controlling interest shall be considered a termination of the old business and the establishment of a new business requiring a new business license, based on old business income.

Section 11-39. Administration of Ordinance.

The license official shall administer the provisions of this Article, collect business license taxes, issue licenses, make or initiate investigations and audits to ensure compliance, initiate denial or suspension and revocation procedures, report violations to the municipal attorney, assist in prosecution of violators, produce forms, undertake reasonable procedures relating to the administration of this Article, and perform such other duties as may be duly assigned.

Section 11-40. Inspection and Audits.

- (a) For the purpose of enforcing the provisions of this Article, the license official or other authorized agent of the Municipality is empowered to enter upon the premises of any person subject to this Article to make inspections and to examine and audit books and records. It shall be unlawful for any such person to fail or refuse to make available the necessary books and records. In the event an audit or inspection reveals that the licensee has filed false information, the costs of the audit shall be added to the correct business license tax and late penalties in addition to other penalties provided herein. Each day of failure to pay the proper amount of business license tax shall constitute a separate offense.
- (b) The license official shall have the authority to make inspections and conduct audits of businesses to ensure compliance with the Article. Financial information obtained by inspections and audits shall not be deemed public records, and the license official shall not release the amount of business license taxes paid or the reported gross income of any person by name without written permission of the licensee, except as authorized by this Article, state or federal law, or proper judicial order. Statistics compiled by classifications are public records.

Section 11-41. Assessments, Payment under Protest, Appeal.

- (a) Assessments, payments under protest, and appeals of assessment shall be allowed and conducted by the Municipality pursuant to the provisions of S.C. Code § 6-1-410, as amended. In preparing an assessment, the license official may examine such records of the business or any other available records as may be appropriate and conduct such investigations and statistical surveys as the license official may deem appropriate to assess a business license tax and penalties as provided herein.
- (b) The license official shall establish a uniform local procedure consistent with S.C. Code § 6-1-410 for hearing an application for adjustment of assessment and issuing a notice of final assessment; provided that for particular types of business licenses, including without limitation for business licenses issued to businesses subject to business license taxes under Article 20, Chapter 9, Title 58, and Chapters 7 and 45, Title 38, of the South Carolina Code, the Municipality, by separate ordinance, may establish a different procedure and may delegate one or more rights, duties, and functions hereunder to the Municipal Association of South Carolina.

Section 11-42. Delinquent License Taxes, Partial Payment.

- (a) For non-payment of all or any part of the correct business license tax, the license official shall impose and collect a late penalty of five (5%) percent of the unpaid tax for each month or portion thereof after the due date until paid. Penalties shall not be waived. If any business license tax remains unpaid for sixty (60) days after its due date, the license official shall report it to the municipal attorney for appropriate legal action.
- (b) Partial payment may be accepted by the license official to toll imposition of penalties on the portion paid; *provided*, however, no business license shall be issued or renewed until the full amount of the tax due, with penalties, has been paid.

Section 11-43. Notices.

The license official may, but shall not be required to, mail written notices that business license taxes are due. If notices are not mailed, there shall be published a notice of the due date in a newspaper of general circulation within the

Municipality three (3) times prior to the due date in each year. Failure to receive notice shall not constitute a defense to prosecution for failure to pay the tax due or grounds for waiver of penalties.

Section 11-44. Denial of License.

The license official may deny a license to an applicant when the license official determines:

- (a) The application is incomplete or contains a misrepresentation, false or misleading statement, or evasion or suppression of a material fact;
 - (b) The activity for which a license is sought is unlawful or constitutes a public nuisance *per se* or *per accidens*;
 - (c) The applicant, licensee, prior licensee, or the person in control of the business has been convicted within the previous ten years of an offense under a law or ordinance regulating business, a crime involving dishonest conduct or moral turpitude related to a business or a subject of a business, or an unlawful sale of merchandise or prohibited goods;
 - (d) The applicant, licensee, prior licensee, or the person in control of the business has engaged in an unlawful activity or nuisance related to the business or to a similar business in the Municipality or in another jurisdiction;
 - (e) The applicant, licensee, prior licensee, or the person in control of the business is delinquent in the payment to the Municipality of any tax or fee;
 - (f) A licensee has actual knowledge or notice, or based on the circumstances reasonably should have knowledge or notice, that any person or employee of the licensee has committed a crime of moral turpitude on the business premises, or has permitted any person or employee of the licensee to engage in the unlawful sale of merchandise or prohibited goods on the business premises and has not taken remedial measures necessary to correct such activity; or
 - (g) The license for the business or for a similar business of the licensee in the Municipality or another jurisdiction has been denied, suspended, or revoked in the previous license year.
- A decision of the license official shall be subject to appeal as herein provided. Denial shall be written with reasons stated.

Section 11-45. Suspension or Revocation of License.

When the license official determines:

- (a) A license has been mistakenly or improperly issued or issued contrary to law;
- (b) A licensee has breached any condition upon which the license was issued or has failed to comply with the provisions of this ordinance;
- (c) A licensee has obtained a license through a fraud, misrepresentation, a false or misleading statement, or evasion or suppression of a material fact in the license application;
- (d) A licensee has been convicted within the previous ten years of an offense under a law or ordinance regulating business, a crime involving dishonest conduct or moral turpitude related to a business or a subject of a business, or an unlawful sale of merchandise or prohibited goods;
- (e) A licensee has engaged in an unlawful activity or nuisance related to the business; or
- (f) A licensee is delinquent in the payment to the Municipality of any tax or fee,

the license official may give written notice to the licensee or the person in control of the business within the Municipality by personal service or mail that the license is suspended pending a single hearing before Council or its designee for the purpose of determining whether the suspension should be upheld and the license should be revoked.

The written notice of suspension and proposed revocation shall state the time and place at which the hearing is to be held, and shall contain a brief statement of the reasons for the suspension and proposed revocation and a copy of the applicable provisions of this ordinance.

Section 11-46. Appeals to Council or its Designee.

- (a) Except with respect to appeals of assessments under Section 11 hereof, which are governed by S.C. Code § 6-1-410, any person aggrieved by a determination, denial, or suspension and proposed revocation of a business license by the license official may appeal the decision to the Council or its designee by written

request stating the reasons for appeal, filed with the license official within ten (10) days after service by mail or personal service of the notice of determination, denial, or suspension and proposed revocation.

- (b) A hearing on an appeal from a license denial or other determination of the license official and a hearing on a suspension and proposed revocation shall be held by the Council or its designee within ten (10) business days after receipt of a request for appeal or service of a notice of suspension and proposed revocation. The hearing shall be held upon written notice at a regular or special meeting of the Council, or, if by designee of the Council, at a hearing to be scheduled by the designee. The hearing may be continued to another date by agreement of all parties. At the hearing, all parties shall have the right to be represented by counsel, to present testimony and evidence, and to cross-examine witnesses. The proceedings shall be recorded and transcribed at the expense of the party so requesting. The rules of evidence and procedure prescribed by Council or its designee shall govern the hearing. Following the hearing, the Council by majority vote of its members present, or the designee of Council if the hearing is held by the designee, shall render a written decision based on findings of fact and conclusions on application of the standards herein. The written decision shall be served, by personal service or by mail, upon all parties or their representatives and shall constitute the final decision of the Municipality.
- (c) Timely appeal of a decision of Council or its designee does not effectuate a stay of that decision. The decision of the Council or its designee shall be binding and enforceable unless overturned by an applicable appellate court after a due and timely appeal.
- (d) For business licenses issued to businesses subject to business license taxes under Article 20, Chapter 9, Title 58, and Chapters 7 and 45, Title 38, of the South Carolina Code, the Municipality may establish a different procedure by ordinance.

Section 11-47. Consent, franchise, or license required for use of streets.

- (a) It shall be unlawful for any person to construct, install, maintain, or operate in, on, above, or under any street or public place under control of the Municipality any line, pipe, cable, pole, structure, or facility for utilities, communications, cablevision, or other purposes without a consent agreement or franchise agreement issued by the Council by ordinance that prescribes the term, fees, and conditions for use.
- (b) The annual fee for use of streets or public places authorized by a consent agreement or franchise agreement shall be set by the ordinance approving the agreement and shall be consistent with limits set by state law. Existing franchise agreements shall continue in effect until expiration dates in the agreements. Franchise and consent fees shall not be in lieu of or be credited against business license taxes unless specifically provided by the franchise or consent agreement.

Section 11-48. Confidentiality.

Except in accordance with proper judicial order or as otherwise provided by law, no official or employee of the Municipality may divulge or make known in any manner the amount of income or any financial particulars set forth or disclosed in any report or return required under this Article. Nothing in this section shall be construed to prohibit the publication of statistics so classified as to prevent the identification of particular reports or returns. Any license data may be shared with other public officials or employees in the performance of their duties, whether or not those duties relate to enforcement of this Article.

Section 11-49. Violations.

Any person violating any provision of this Article shall be deemed guilty of an offense and shall be subject to a fine of up to \$500.00 or imprisonment for not more than thirty (30) days or both, upon conviction. Each day of violation shall be considered a separate offense. Punishment for violation shall not relieve the offender of liability for delinquent taxes, penalties, and costs provided for in this Article.

Section 11-50. Severability.

A determination that any portion of this Article is invalid or unenforceable shall not affect the remaining portions. To the extent of any conflict between the provisions of this Article and the provisions of the South Carolina Business License Tax Standardization Act, as codified at S.C. Code §§ 6-1-400 *et seq.*, the standardization act shall control.

Section 11-51. Classification and Rates.

- (a) The business license tax for each class of businesses subject to this Article shall be computed in accordance with the current business license rate schedule, designated as Appendix A to this Article, which may be amended from time to time by the Council.

- (b) The current business license class schedule is attached hereto as Appendix B. Hereafter, no later than December 31 of each odd year, the Municipality shall adopt, by ordinance, the latest standardized business license class schedule as recommended by the Municipal Association of South Carolina and adopted by the Director of the South Carolina Revenue and Fiscal Affairs Office. Upon adoption by the Municipality, the revised business license class schedule shall then be appended to this Article as a replacement Appendix B.
- (c) The classifications included in each rate class are listed with NAICS codes, by sector, sub-sector, group, or industry. The business license class schedule (Appendix B) is a tool for classification and not a limitation on businesses subject to a business license tax. The classification in the most recent version of the business license class schedule adopted by the Council that most specifically identifies the subject business shall be applied to the business. The license official shall have the authority to make the determination of the classification most specifically applicable to a subject business.
- (d) A copy of the class schedule and rate schedule shall be filed in the office of the municipal clerk.

APPENDIX A: BUSINESS LICENSE RATE SCHEDULE

RATE CLASS	INCOME: \$0 - \$2,000	INCOME OVER \$2,000
	BASE RATE	RATE PER \$1,000 OR FRACTION THEREOF
1	\$ 60.00	\$ 0.90
2	\$ 65.00	\$ 1.00
3	\$ 70.00	\$ 1.10
4	\$ 75.00	\$ 1.20
5	\$ 80.00	\$ 1.30
6	\$ 85.00	\$ 1.40
7	\$ 90.00	\$ 1.50
8.1	\$ 60.00	\$ 0.53
8.2	Set by state statute	
8.3	MASC Telecommunications	
8.4	MASC Insurance	
8.51	\$12.50 + \$12.50 per machine	
8.52	\$12.50 + \$180.00 per machine	
9.10	\$ 200.00	\$ 1.00
9.20	\$ 200.00	\$ 3.00
9.30	\$ 100.00	\$ 0.40
9.41	\$ 50.00	\$ 3.00

NON-RESIDENT RATES

Unless otherwise specifically provided, all taxes and rates shall be doubled for nonresidents and itinerants having no fixed principal place of business within the Municipality.

DECLINING RATES

Declining Rates apply in all Classes for gross income in excess of \$1,000,000, unless otherwise specifically provided for in this ordinance.

<u>Gross Income in \$ Millions</u>	<u>Percent of Class Rate for each additional \$1,000</u>
0 - 1	100%
1 - 2	90%
2 - 3	80%
3 - 4	70%
4 - 5	60%
OVER 5	50%

CLASS 8 RATES

Each NAICS number designates a separate subclassification. The businesses in this section are treated as separate and individual subclasses due to provisions of state law, regulatory requirements, service burdens, tax equalization considerations, and other factors that are deemed sufficient to require individually determined rates. In accordance with state law, the Municipality also may provide for reasonable subclassifications for rates, described by an NAICS sector, subsector, or industry, that are based on particularized considerations as needed for economic stimulus or for the enhanced or disproportionate demands on municipal services or infrastructure.

Non-resident rates do not apply except where indicated.

8.1 NAICS 230000 – Contractors, Construction, All Types [Non-resident rates apply].

Resident rates, for contractors having a permanent place of business within the Municipality:

Minimum on first \$2,000.....	\$ 60.00 PLUS
Each additional 1,000.....	\$ 0.53

Non-resident rates apply to contractors that do not have a permanent place of business within the Municipality. A trailer at the construction site or structure in which the contractor temporarily resides is not a permanent place of business under this ordinance.

No contractor shall be issued a business license until all state and municipal qualification examination and trade license requirements have been met. Each contractor shall post a sign in plain view on each job identifying the contractor with the job.

Sub-contractors shall be licensed on the same basis as general or prime contractors for the same job. No deductions shall be made by a general or prime contractor for value of work performed by a sub-contractor.

No contractor shall be issued a business license until all performance and indemnity bonds required by the Building Code have been filed and approved. Zoning permits must be obtained when required by the Zoning Ordinance.

Each prime contractor shall file with the License Official a list of sub-contractors furnishing labor or materials for each project.

For licenses issued on a per-job basis, the total tax for the full amount of the contract shall be paid prior to commencement of work and shall entitle the contractor to complete the job without regard to the normal license expiration date. An amended report shall be filed for each new job and the appropriate additional license fee per \$1,000 of the contract amount shall be paid prior to commencement of new work. Only one base tax shall be paid in a license year. Licensees holding a per-job license shall file, by each April 30 during the continuation of the construction project, a statement of compliance, including but not limited to a revised estimate of the value of the contract. If any revised estimate of the final value of such project exceeds the amount for which the business license was issued, the licensee shall be required to pay a license fee at the then-prevailing rate on the excess amount.

8.2 NAICS 482 – Railroad Companies (See S.C. Code § 12-23-210).

8.3 NAICS 517311, 517312 – Telephone Companies.

With respect to “retail telecommunications services” as defined in S. C. Code § 58-9-2200, the Municipality participates in a collections program administered by the Municipal Association of South Carolina. The Municipality has approved participation in the collections program by separate ordinance (the “Telecommunications Collections Ordinance”). The rates, terms, conditions, dates, penalties, appeals process, and other details of the business license applicable to retail telecommunications services are set forth in the Telecommunications Collections Ordinance.

8.4 NAICS 5241 and 5242 – Insurance Companies and Brokers:

Independent agents, brokers, and their employees are subject to a business license tax based on their natural class. With respect to insurers subject to license fees and taxes under Chapter 7 of Title 38 and to brokers under Chapter 45 of Title 38, the Municipality participates in a collections program administered by the Municipal Association of South Carolina. The Municipality has approved participation in the collections program by separate ordinance (the “Insurers

and Brokers Collections Ordinance”). The rates, terms, conditions, dates, penalties, appeals process, and other details of the business license applicable to insurers and brokers are set forth in the Insurers and Brokers Collections Ordinance.

8.51 NAICS 713120 – Amusement Machines, coin operated (except gambling). Music machines, juke boxes, kiddy rides, video games, pin tables with levers, and other amusement machines with or without free play feature licensed by SC Department of Revenue pursuant to S.C. Code §12-21-2720(A)(1) and (A)(2) [Type I and Type II].

For operation of all machines (not on gross income), pursuant to S.C. Code §12-21-2746:

Per Machine \$12.50 PLUS
Business license.....\$12.50

Distributors that sell or lease machines and are not licensed by the state as an operator pursuant to §12-21-2728 are not subject to Subclass 8.51.

8.52 NAICS 713290 – Amusement Machines, coin operated, non-payout. Amusement machines of the non-payout type or in-line pin game licensed by SC Department of Revenue pursuant to S.C. Code §12-21-2720(A)(3) [Type III].

For operation of all machines (not on gross income), pursuant to S.C. Code §12-21-2720(B):

Per Machine \$180.00 PLUS
Business license.....\$12.50

Distributors that sell or lease machines and are not licensed by the state as an operator pursuant to §12-21-2728 are not subject to Subclass 8.52.

CLASS 9 RATES

9.1 NAICS 423930 – Junk or Scrap Dealers [Non-resident rates apply].

Minimum on first \$2,000..... \$200.00 PLUS
Per \$1,000, or fraction, over \$2,000 \$1.00

9.2 NAICS 522298 – Pawn Brokers [All Types].

Minimum on first \$2,000..... \$200.00 PLUS
Per \$1,000, or fraction, over \$2,000 \$3.00

9.3 NAICS 4411, 4412 – Automotive, Motor Vehicles, Boats, Farm Machinery or Retail.

(except auto supply stores - see 4413)

Minimum on first \$2,000..... \$100.00 PLUS
Per \$1,000, or fraction, over \$2,000 \$0.40

One sales lot not more than 400 feet from the main showroom may be operated under this license provided that proceeds from sales at the lot are included in gross receipts at the main office when both are operated under the same name and ownership.

Gross receipts for this classification shall include value of trade-ins. Dealer transfers or internal repairs on resale items shall not be included in gross income.

NAICS 454390 – Peddlers, Solicitors, Canvassers, Door-To-Door Sales.

Direct retail sales of merchandise. [Non-resident rates apply]

9.41 Regular activities [more than two sale periods of more than three days each per year]

Minimum on first \$2,000 \$50.00 PLUS

Per \$1,000, or fraction, over \$2,000.....\$3.00

Business License Class Schedule by NAICS Code

Appendix B

NAICS Sector/Subsector	Industry Sector	Class
11	Agriculture, forestry, hunting and fishing	2.00
21	Mining	4.00
31	Manufacturing	2.00
32	Manufacturing	2.00
33	Manufacturing	2.00
42	Wholesale trade	1.00
44	Retail trade	1.00
45	Retail trade	1.00
48	Transportation and warehousing	2.00
49	Transportation and warehousing	2.00
51	Information	4.00
52	Finance and insurance	7.00
53	Real estate and rental and leasing	7.00
54	Professional, scientific, and technical services	5.00
55	Management of companies	7.00
56	Administrative and support and waste management and remediation services	4.00
61	Educational services	4.00
62	Health care and social assistance	4.00
71	Arts, entertainment, and recreation	3.00
721	Accommodation	3.00
722	Food services and drinking places	1.00
81	Other services	5.00
23	Construction	8.10
482	Rail Transportation	8.20
517311	Wired Telecommunications Carriers	8.30
517312	Wireless Telecommunications Carriers (except Satellite)	8.30
5241	Insurance Carriers	8.40
5242	Insurance Brokers for non-admitted Insurance Carriers	8.40
713120	Amusement Parks and Arcades (per machine)	8.51

713290	Nonpayout Amusement Machines (per machine)	8.52
423930	Recyclable Material Merchant Wholesalers (Junk)	9.10
522298	Pawnshops	9.20
4411	Automobile Dealers	9.30
4412	Other Motor Vehicle Dealers	9.30
454390	Other Direct Selling Establishments (Regular Peddlers)	9.41

***This appendix will be updated every odd year based on the latest available IRS statistics.**

ORDINANCE NO.: 2021-086

*Authorizing the City Manager to execute a Sixteenth Amendment to Purchase Agreement
between the City of Columbia and Bright-Meyers 2001 LLC for the sale
of 5.97 +/- acres (Capital City Stadium), Richland County TMS #11204-02-02*

BE IT ORDAINED by the Mayor and City Council this _____ day of _____, 2021,
that the City Manager is authorized to execute the attached Sixteenth Amendment to Purchase Agreement,
or on a form approved by the City Attorney, between the City of Columbia and Bright-Meyers 2001 LLC
for the sale of 5.97 acres +/- (Capital City Stadium), Richland County TMS #11204-02-02.

Requested by:

Assistant City Manager Gentry

Mayor

Approved by:

City Manager

Approved as to form:

ATTEST:


Deputy City Attorney

City Clerk

Introduced:

Final Reading:

LEGAL DEPARTMENT DRAFT

SIXTEENTH AMENDMENT TO PURCHASE AGREEMENT

This Sixteenth Amendment to Purchase Agreement (the "Sixteenth Amendment") is made and entered into by and between the City of Columbia, hereinafter referred to as "Seller", and Ballpark, LLC, a South Carolina limited liability company, as assignee of Bright-Meyers Assembly Street, LLC, hereinafter referred to as "Buyer" effective as of the Amendment Effective Date (as hereinafter defined).

W I T N E S E T H:

WHEREAS, Seller and Bright-Meyers 2001 LLC entered into a Purchase Agreement effective August 27, 2012 (as amended, the "Agreement"), which gives Buyer the exclusive right to purchase the property ("Property") described in the Agreement under the terms and conditions of the Agreement; and

WHEREAS, pursuant to that certain Assignment of Purchase Agreement dated October 15, 2018 Bright Meyers 2001 LLC assigned its rights and obligations under the Agreement to its affiliate, Bright-Meyers Assembly Street, LLC, a Tennessee limited liability company; and

WHEREAS, pursuant to that certain Assignment of Contract dated January 29, 2019 Bright-Meyers Assembly Street, LLC assigned its rights and obligations under the Agreement to Ballpark, LLC; and

WHEREAS, the Agreement was most recently further modified, amended and clarified by that certain Fifteenth Amendment to Purchase Agreement effective August 5, 2021; and

WHEREAS, Seller and Buyer mutually desire to further modify and amend said Agreement.

NOW, THEREFORE, IT IS HEREBY AGREED, that for and in consideration of the sum of Ten and No/100 (\$10.00) Dollars, the receipt and sufficiency of which is hereby acknowledged, the Agreement is amended as follows:

1. Paragraph 14 of the Agreement is amended to provide that the Closing shall take place not later than sixty (60) days following the date on which the U. S. Army Corps of Engineers, Charleston District issues a permit to Buyer pursuant to Section 404 of the Clean Water Act (33 U.S.C. 1344) for the Rocky Branch and Rocky Branch Watershed Improvements to be made by Buyer pursuant to Section 24 of the Agreement (the "404 Permit"). Notwithstanding anything stated herein to the contrary, and without regard to the issuance or timing of issuance of the 404 Permit, in no event shall the Closing occur later than May 1, 2022.

2. The "Amendment Effective Date" is the date on which this Amendment is signed by both parties hereto.

Except as modified and amended hereby, all the terms, covenants and conditions of said Purchase Agreement and subsequent Amendments shall continue and remain in full force and effect insofar as they do not conflict with the terms of this Sixteenth Amendment. In the event that the language of the Agreement or a prior Amendment is contrary to the language of this Amendment, the language of this Amendment shall control regarding that provision.

IN WITNESS WHEREOF, the parties have caused this Sixteenth Amendment to Purchase Agreement to be executed and effective as of the date of the last signature herein below.

WITNESSES:

SELLER: CITY OF COLUMBIA

BY: _____
Teresa B. Wilson
ITS: City Manager

Date: _____

BUYER: BALLPARK, LLC

BY: _____

Name: _____

ITS: _____

Date: _____

RESOLUTION NO.: R-2021-107*Adopting the By-Laws of the South Carolina Memorial Park Commission*

BE IT RESOLVED by the Mayor and City Council this _____ day of _____, 2021 that the attached By-Laws of the South Carolina Memorial Park Commission are hereby adopted.

Requested by:

Councilmember Duvall_____
Mayor

Approved by:

City Manager

Approved as to form:

ATTEST:



Deputy City Attorney

City Clerk

Introduced:

Final Reading:



BY-LAWS South Carolina Memorial Park Commission

Article I: The South Carolina Memorial Park Commission

Section 1. The official name of this organization shall be the South Carolina Memorial Park Commission (hereinafter "Commission.")

Article II: Mission and Purpose Objectives

Section 1. The mission of the South Carolina Memorial Park Commission is to facilitate and govern the usage of Columbia's Memorial Park, to provide guidelines for the approval and placement of monuments within the Park and encourage observances of military significance and memorial services for the veterans and citizens of South Carolina.

Section 2. The purpose of the Commission is to recommend and oversee the development and implementation of veteran-focused monuments, programs and projects utilizing Memorial Park located within the City of Columbia.

Article III: Authority

Section 1. —The Commission shall advise the City of Columbia City Council on the necessary steps to develop and implement programs and projects that it deems necessary to accomplish the mission as stated in Article II, Section 1, hereof.

Section 2. The Commission shall inform the residents of the City of Columbia of its actions and engage citizens to ensure responsiveness to public needs.

Section 3. The Commission may only act and communicate its actions in the manner authorized by these By-Laws.

Article IV: Membership

Section 1. The Commission shall consist of not less than seven (7) nor more than ten (10) Appointees who shall be members of the community initially appointed by Council and thereafter, appointed by qualified members of the Commission as approved by Council.

- Section 2. The term of any Appointee shall be three years (unless the Appointee is finishing the term of a previous appointee per Article IV, Section 3). At the completion of their first term, an Appointee may be eligible for reappointment for a second three-year term at the discretion of City Council. The Staff Assistant to the Commission will maintain a calendar of the terms of all Appointees.
- Section 3. Any mid-term vacancy on the Commission shall be filled by City Council. Any Appointees appointed to fill a vacant Commission seat with fewer than 18 months remaining on the term may be eligible for reappointment to a maximum of two full three-year terms at the discretion of City Council. Any Appointees appointed to fill a vacant Commission seat with greater than 18 months remaining on the term may be eligible for reappointment to a maximum of one full three-year term at the discretion of City Council.
- Section 4. The Commission may select non-voting Advisory Members to the Commission from local governments, veteran-focused nonprofits, other organizations, and members of the public as deemed appropriate and recommend their appointment by approval of Council. Select City staff may also serve as Advisory Members to Commission. There is no limit to the number of Advisory Members selected by Commission and there are no term limits associated with their role. Advisory Members serve the Commission at the recommendation of the Commission and approval of City Council.
- Section 5. Appointees and Advisory Members may at any time, for any reason or no reason, tender their written resignation to the Chairperson.

Article V: Officers

- Section 1. The Officers of the Commission shall consist of three elected members from the Commission: Chairperson, Vice-Chairperson, and Secretary.
- Section 2. Annually, the Commission shall elect by a majority vote a Chairperson, Vice-Chairperson, and Secretary whose offices will begin immediately. While candidates for these three offices must be members of the Commission, nominations may be made by either Appointees or non-voting Advisory Members.
- Section 3.——The Chairperson shall preside at all Commission meetings and at work sessions and other special meetings called by the Commission. The Chairperson shall call work sessions and special meetings when required, and shall transmit reports, plans, and recommendations to the appropriate governing authority, and in general, shall act as spokesperson for Commission. The Chairperson may appoint others to attend such meetings to represent Commission.
- Section 4. The Vice-Chairperson shall serve as Chairperson in the absence or the inability of the Chairperson.
- Section 5. The Secretary shall work with the Staff Assistant to the Commission to maintain term calendars and assist with parliamentary procedures.

- Section 6. In the absence of both the Chairperson and Vice-Chairperson from a meeting of Commission, the Secretary will act as a temporary Chairperson for that meeting and will proceed with the order of business. so long as a Commission quorum is present.
- Section 7. The City of Columbia Parks and Recreation Department's Administrative Assistant - Lead shall serve as the Staff Assistant to Commission. The Staff Assistant shall keep minutes and records of Commission, prepare with the Chairperson the agenda for regular and special meetings, provide notice of meetings, attend to Commission correspondence, maintain meeting calendars and Appointee term calendars, maintain Appointee attendance records, and perform other duties assigned by the Chairperson.

Article VI: Meetings

- Section 1. Each year at the first quarterly meeting, the Commission shall approve the annual meeting schedule with one regular meeting being held each quarter.
- Section 2. All meetings of Commission shall be open to the public and all records of Commission shall be public record, provided, nonetheless, that Commission may utilize executive sessions. Executive sessions will be limited to Appointees and the Staff Assistant to the Commission. Meeting minutes will be uploaded to the Commission website for public access in a timely manner by the Staff Assistant to the Commission.
- Section 3. Special meetings of the Commission may be called at any time by the Chairperson, provided that notice of at least twenty-four (24) hours shall have been given to each member.
- Section 4. For the purposes of all Commission business, the presence of a majority of the voting members of the Commission shall constitute a quorum. A quorum shall be present before any Commission business is transacted.
- Section 5. Items of business to be discussed at the scheduled meeting shall appear on the agenda. Business that is not identified on the agenda may be considered under Other Business.
- Section 6. The Chairperson, subject to these By-Laws, shall decide all points of procedure unless otherwise directed by a simple majority of the present Commission members.
- Section 7. Should any Appointee of the Commission or its ad -hoc committees be financially or closely associated, either personally or professionally, with any issue that comes before Commission, said Appointee shall identify themselves to the assembled group and consider recusing themselves from participating in discussing and/or voting upon the issue. An Appointee or Advisory Member of the Commission may raise the question of conflict of interest of another member regarding any issue before the Commission. Upon full disclosure of the conflict of interest and consideration of the best interest of the Commission and its mission, a majority of Commission members will vote to determine whether the affected Appointee must recuse themselves from any discussion and/or voting.

Article VII: Committees

Section 1 The Commission may establish committees as it deems necessary to accomplish the purposes as stated in Article II, Section 2, hereof. The chair of any such committee shall be a Commission Appointee. Ad -hoc committees shall report to the Chairperson and may not take action except as authorized by the Commission per these By-Laws.

Article VIII: Attendance

Section 1. Attendance of Appointees is expected at all scheduled meetings. Attendance Appointees at all work sessions, special meetings, etc. is highly encouraged. Appointees should alert the Chairperson in writing if they require an excused absence from an upcoming meeting. Attendance of Advisory Members at all scheduled meetings, work sessions, special meetings, etc. is highly encouraged.

Section 2. The minutes of Commission meetings shall record Appointees present and absent.

Section 3. The Commission may recommend the removal of any Appointee who has two consecutive unexcused absences from scheduled meetings or accumulates a total of three or more unexcused absences from scheduled meetings in any calendar year. The affected Appointee must be informed of the initiation of recommendation of removal in writing by the Chairperson at least forty-eight (48) hours prior to the time the vote is taken. Any approved Commission removal recommendation will then be forwarded for approval by City Council. Upon approval of City Council, the term of the Appointee will be ended.

Article IX: Amendment

Section 1. These By-Laws may be amended at any regular meeting of the Commission where a quorum is present by an affirmative vote provided that such amendment shall have first been presented to all members in writing at least forty-eight (48) hours prior to the time the vote is taken. All amendments must be approved by City Council.

Memorandum



TO: Teresa Wilson, City Manager

FROM: Cindi Herrera, Chief Development Officer

CC: Ivory Mathews; Missy Gentry; Erica Hammond

DATE: October 11, 2021

RE: **Haven at Palmer Pointe**

This memo serves to provide an overview of the Haven at Palmer Pointe senior housing.

The Haven at Palmer Pointe is the replacement of the Marion Street Highrise Public Housing community and is located at 1135 Carter Street at the corner of Two Notch Road and Carter Street. The project is a public-private partnership between Columbia Housing and Brinshore Development (Northbrook, Illinois). M.B. Kahn Construction Company (Columbia) will serve as the General Contractor with 30% participation of Women and Minority owned sub-contractors.

Palmer Pointe will consist of a total 150 total units, 144 one-bedroom units and 6 two-bedroom units and 4,200 square feet of commercial space. All residential units will have project based rental assistance. The building is three stories on Carter Street side and four stories to the rear parking area. Amenities in the building include a large community room and serving kitchen, exercise room, computer lab, library and various game and meeting rooms. Outdoor amenities include gazebo, pickle ball court and raised gardens. The commercial space is designed to attract medical offices and/or other support services for the seniors and surrounding neighbors.

The project will be financed with Tax Exempt Bonds, Federal and State Low Income Housing Tax Credits and a private mortgage from Chase Bank. Total development costs are \$31,588,139.

The owner of the project is Palmer Pointe, LLC, a South Carolina limited liability company whose sole member is South Carolina Affordable Housing Initiative, Inc., a non-profit instrumentality of Columbia Housing. The Richman Group is the federal tax credit investor and Sugarcreek Capital is the state credit investor. The project will be managed by a third-party private property management company, Southern Development and Management Company.

Columbia Housing is requesting City Council to approve the issuance of Multi-Family Housing Revenue Bonds not to exceed \$22 million dollars to support the construction financing of the project. The TEFRA (Tax Equity and Fiscal Responsibility Act) Public Hearing was held on August 25, 2021. No public comments were received.

This project will provide much needed affordable housing in our community replacing the loss of the former Marion Street Highrise units. The project will provide "priority housing" through the project based rental assistance which will reach residents with incomes below 30% of area median income, making a significant impact on the affordable housing shortage in our community.

RESOLUTION NO. R-2021-108

A Resolution Approving the Issuance by The Housing Authority of the City of Columbia South Carolina of its Not to Exceed \$22,000,000 Multifamily Housing Revenue Notes (Haven at Palmer Pointe Project), In One or More Series, Pursuant to Section 147(F) of the Internal Revenue Code of 1986, as Amended; Providing Certain Other Matters in Connection Therewith; and Providing an Effective Date

WHEREAS, Palmer Pointe, LLC, a South Carolina limited liability company, or its successors or assigns (the "Sponsor"), has represented to the City Council (the "City Council") of the City of Columbia, South Carolina (the "City") that it desires to finance the costs of acquisition, construction and equipping of an approximately 150-unit new multifamily housing development and ancillary facilities, including but not limited to parking facilities and recreational areas, to be located at 1135 Carter Street, Columbia, SC 29204 (the "Project"); and,

WHEREAS, the Sponsor has further represented to the City Council that substantial cost savings would be recognized by financing the Project through a plan of financing consisting of the issuance by the Housing Authority of the City of Columbia, South Carolina (the "Issuer") of its multifamily housing revenue notes or bonds, in one or more series, in the aggregate principal amount not to exceed Twenty Two Million and No/100 (\$22,000,000) Dollars (the "Notes") to finance the Project; and,

WHEREAS, the Sponsor has further represented to the City Council that a portion of the proceeds of the Notes would be used for the purpose of (a) financing the cost of the land acquisition, construction and equipment of the Project and (b) paying a portion of the costs of financing, including certain reserves, capitalized interest and costs of issuance of the Notes; and,

WHEREAS, Section 147(f) of the Internal Revenue Code of 1986, as amended, including the U.S. Treasury Regulations promulgated thereunder (collectively, the "Code"), requires as a condition of exclusion from gross income for federal income tax purposes of the interest on private activity bonds, that the issuance of private activity bonds, as defined in Section 141(a) of the Code, such as the Notes, be approved, after a public hearing following reasonable public notice, by the governmental unit on behalf of which such bonds are to be issued and having jurisdiction over the area in which the bonds financed property is located (the "147(f) Approval"); and,

WHEREAS, the City Council constitutes the elected legislative body of the City and the Sponsor has represented to the City Council that it is the applicable elected representative required to provide the 147(f) Approval with respect to the issuance of the Notes for the purpose of financing the Project; and,

WHEREAS, the Sponsor has requested the City Council, pursuant to Section 147(f) of the Code, to provide the 147(f) Approval and to thereby approve the issuance by the Issuer of the Notes for the purpose of providing funds to the Sponsor to finance the Project; and,

WHEREAS, on August 16, 2021, the Sponsor published in *The State*, a newspaper of general circulation in the City, a notice of public hearing to be held by the Issuer on August 25, 2021, at 9:30 a.m. or as soon thereafter as such matters may be heard by means of a telephonic meeting to consider the issuance by the Issuer of the Notes and the nature of the Project to be financed with a portion of the proceeds of the Notes; and,

WHEREAS, notice of the public hearing was duly published as indicated by the copy of the notice as it appeared in *The State* attached hereto as Exhibit A; and,

LEGAL DEPARTMENT DRAFT

WHEREAS, the public hearing was duly held by the Issuer on August 25, 2021, during which public hearing members of the public were afforded the opportunity to express their views on the issuance by the Issuer of the Notes and the use of a portion of the proceeds thereof to finance the Project as indicated by the Certificate as to Telephonic Public Hearing attached hereto as Exhibit B.

NOW, THEREFORE, BE IT RESOLVED by the Mayor and Members of the City Council of the City of Columbia, South Carolina, in Council duly assembled:

Section 1. The issuance by the Issuer of the Notes in an aggregate amount not to exceed \$22,000,000 for the purpose of providing funds to the Sponsor to finance the Project is hereby approved pursuant to and in accordance with Section 147(f) of the Code.

Section 2. A hearing open to the public, and conducted telephonically due to the COVID-19 pandemic, pursuant to Internal Revenue Service Rev. Proc. 2020-21 as extended by Rev. Proc. 2020-49, was held on August 25, 2021, for which the Sponsor has represented to the City Council that due and reasonable public notice, being published in *The State* as described above, was given by or on behalf of the Sponsor in accordance with the provisions of applicable law and procedures established therefor.

Section 3. Such approval by the City Council shall not be construed as (i) an endorsement of the creditworthiness of the Issuer, the Sponsor or the financial viability of the Project, (ii) a recommendation to any prospective purchaser to purchase the Notes, (iii) an evaluation of the likelihood of the repayment of the debt service on the Notes, or (iv) approval of any building or other regulatory permits relating to the Project, and the City Council shall not be construed by reason of its adoption of this Resolution to make any such endorsement, finding or recommendation, to have waived any rights of the City, or to have caused the City to be estopped from asserting any rights or responsibilities it may have in such regard. Further, the Notes shall not constitute an indebtedness of the State of South Carolina, the City or any political subdivision thereof, but shall be payable solely from revenues of the Sponsor pledged to the payment of the Notes. The approval by the City Council of the issuance of the Notes by the Issuer to finance the Project shall not be construed to obligate the City to incur any liability, pecuniary or otherwise, in connection with either the issuance of the Notes of the acquisition, construction or equipping of the Project.

Section 4. This Resolution shall take effect immediately upon its adoption.

Section 5. That the provisions of this Resolution are hereby declared to be separable, and if any section, phrase or provision shall, for any reason, be declared to be invalid, such declaration shall not affect the validity of the remainder of the sections, phrases or provisions of this Resolution.

Section 6. That all ordinances, resolutions or orders or parts thereof in conflict with the provisions of the Resolution are, to the extent of such conflict, hereby superseded.

[signature page follows]

LEGAL DEPARTMENT DRAFT

Adopted in a meeting duly assembled this ____ day of _____, 2021.

Requested by:

Assistant City Manager Gentry

Mayor

Approved by:

City Manager

Approved as to form:

ATTEST:



Deputy City Attorney

City Clerk

Introduced:

Final Reading:

LEGAL DEPARTMENT DRAFT

EXHIBIT A

AFFIDAVIT OF PUBLICATION OF NOTICE OF TELEPHONIC PUBLIC HEARING

LEGAL DEPARTMENT DRAFT

EXHIBIT B

CERTIFICATE OF TELEPHONIC PUBLIC HEARING

LEGAL DEPARTMENT DRAFT

Memorandum



TO: Teresa Wilson, City Manager

FROM: Cindi Herrera, Chief Development Officer

CC: Ivory Mathews; Missy Gentry; Erica Hammond

DATE: October 11, 2021

RE: **Oaks at St. Anna's Park – Oak Terrace Senior Housing**

This memo serves to provide an overview of the Oaks at St. Anna's Park – Oak Terrace Senior Housing Development.

Oaks at St. Anna's Park is the redevelopment of the former Gonzales Gardens Public Housing community located on Forest Drive across from MUSC Hospital (formerly Providence). The redevelopment project consists of two components, Oak Terrace Senior Housing and Oak Park Family Housing. The project is a public-private partnership between Columbia Housing and a joint venture of Mungo Construction (Columbia, SC) and NixDevCo (Washington DC). Mungo Construction will serve as the General Contractor with 30% participation of Women and Minority owned sub-contractors.

Oak Terrace is three-story building located on the corner of Forest Drive and Ontario Street and will anchor the new development. Oak Terrace will contain 95 modern, 836 square feet, one-bedroom apartments for households age 62 and older. Apartment units will include stove, refrigerator, dishwasher, microwave, and in-unit washer and dryer. Amenities in the building include a large community room and serving kitchen, exercise room, computer lab, library and game rooms.

The project will be financed with Tax Exempt Bonds, Federal and State Low Income Housing Tax Credits and a private mortgage from Citi-Bank. Total development costs are \$22,062,583.

The owner of the project is SCAHI Oak Terrace, LLC, a South Carolina limited liability company whose sole member is South Carolina Affordable Housing Initiative, Inc., a non-profit instrumentality of Columbia Housing. Hudson Capital is the federal tax credit investor and Sugarcreek Capital is the state credit investor. The project will be managed by a third-party private property management company, Southern Development and Management Company.

Columbia Housing is requesting City Council to approve the issuance of Multi-Family Housing Revenue Bonds not to exceed \$12 million dollars to support the construction financing of the project. The TEFRA (Tax Equity and Fiscal Responsibility Act) Public Hearing was held on August 25, 2021. No public comments were received.

This project will provide much needed affordable housing in our community replacing the loss of the former Gonzales Gardens units. The project will provide "priority housing" through the project based rental assistance which will reach residents with incomes below 30% of area median income, making a significant impact on the affordable housing shortage in our community.

RESOLUTION NO. R-2021-109

Approving the Issuance by the Housing Authority of the City of Columbia, South Carolina of its Multifamily Housing Revenue Notes (The Oaks at St. Anna's Park - Oak Terrace) in the Maximum Principal Amount of \$12,000,000, In One or More Series, Pursuant to Section 147(F) of the Internal Revenue Code of 1986, As Amended; Providing Certain Other Matters in Connection Therewith; and Providing an Effective Date

WHEREAS, SCAHI St. Anna's Terrace, LLC, a South Carolina limited liability company, or its successors or assigns (the "Sponsor"), has represented to the City Council (the "City Council") of the City of Columbia, South Carolina (the "City") that it desires to finance the costs of acquisition and construction of an approximately 95-unit new multifamily housing development and ancillary facilities, including but not limited to parking facilities and recreational areas, to be located at 1515 Garden Plaza in Columbia, South Carolina (the "Project"); and,

WHEREAS, the Sponsor has further represented to the City Council that substantial cost savings would be recognized by financing the Project through a plan of financing consisting of the issuance by the Housing Authority of the City of Columbia, South Carolina (the "Issuer") of its multifamily housing revenue notes or bonds, in one or more series, in the maximum principal amount of Twelve Million and No/100 (\$12,000,000.00) Dollars (the "Notes") to finance the Project; and,

WHEREAS, the Sponsor has further represented to the City Council that a portion of the proceeds of the Notes would be used for the purpose of (a) financing the cost of the land acquisition, construction, and equipping of the Project and (b) paying a portion of the costs of financing, including certain reserves, capitalized interest, and costs of issuance of the Notes; and,

WHEREAS, Section 147(f) of the Internal Revenue Code of 1986, as amended, including the U.S. Treasury Regulations promulgated thereunder (collectively, the "Code"), requires as a condition of exclusion from gross income for federal income tax purposes of the interest on private activity bonds, that the issuance of private activity bonds, as defined in Section 141(a) of the Code, such as the Notes be approved, after a public hearing following reasonable public notice, by the governmental unit on behalf of which such bonds are to be issued and having jurisdiction over the area in which the bond financed property is located (the "147(f) Approval"); and,

WHEREAS, the City Council constitutes the elected legislative body of the City and the Sponsor has represented to the City Council that it is the applicable elected representative required to provide the 147(f) Approval with respect to the issuance of the Notes for the purpose of financing the Project; and,

WHEREAS, the Sponsor has requested the City Council, pursuant to Section 147(f) of the Code, to provide the 147(f) Approval and to thereby approve the issuance by the Issuer of the Notes for the purpose of providing funds to the Sponsor to finance the Project; and,

WHEREAS, on August 18, 2021, the Sponsor published in *The State*, a newspaper of general circulation in the City, a notice of public hearing to be held by the Issuer on August 25, 2021, at 10:00 a.m. or as soon thereafter as such matters may be heard by means of a telephonic meeting to consider the issuance by the Issuer of the Notes and the nature of the Project to be financed with a portion of the proceeds of the Notes; and,

WHEREAS, notice of the public hearing was duly published as indicated by the copy of the notice as it appeared in *The State* attached hereto as Exhibit A; and,

LEGAL DEPARTMENT DRAFT

WHEREAS, the public hearing was duly held by the Issuer on August 25, 2021, during which public hearing members of the public were afforded the opportunity to express their views on the issuance by the Issuer of the Notes and the use of a portion of the proceeds thereof to finance the Project as indicated by the Certificate as to Telephonic Public Hearing attached hereto as Exhibit B;

NOW, THEREFORE, BE IT RESOLVED by the Mayor and Members of the City Council of the City of Columbia, South Carolina, in Council duly assembled:

Section 1. The issuance by the Issuer of the Notes in the maximum principal amount of \$12,000,000 for the purpose of providing funds to the Sponsor to finance the Project is hereby approved pursuant to and in accordance with Section 147(f) of the Code.

Section 2. A hearing open to the public, and conducted telephonically due to the COVID-19 pandemic, pursuant to Internal Revenue Service Rev. Proc. 2020-21 as extended by Rev. Proc. 2020-49 and Rev. Proc. 2021-39, was held on August 25, 2021, for which the Sponsor has represented to the City Council that due and reasonable public notice, being published in *The State* as described above, was given by or on behalf of the Sponsor in accordance with the provisions of applicable law and procedures established therefor.

Section 3. Such approval by the City Council shall not be construed as (i) an endorsement of the creditworthiness of the Issuer, the Sponsor, or the financial viability of the Project, (ii) a recommendation to any prospective purchaser to purchase the Notes, (iii) an evaluation of the likelihood of the repayment of the debt service on the Notes, or (iv) approval of any building or other regulatory permits relating to the Project, and the City Council shall not be construed by reason of its adoption of this Resolution to make any such endorsement, finding, or recommendation, to have waived any rights of the City, or to have caused the City to be estopped from asserting any rights or responsibilities it may have in such regard. Further, the Notes shall not constitute an indebtedness of the State of South Carolina, the City, or any political subdivision thereof, but shall be payable solely from revenues of the Sponsor pledged to the payment of the Notes. The approval by the City Council of the issuance of the Notes by the Issuer to finance the Project shall not be construed to obligate the City to incur any liability, pecuniary or otherwise, in connection with either the issuance of the Notes or the acquisition, construction, or equipping of the Project.

Section 4. This Resolution shall take effect immediately upon its adoption.

Section 5. That the provisions of this Resolution are hereby declared to be separable, and if any section, phrase or provision shall, for any reason, be declared to be invalid, such declaration shall not affect the validity of the remainder of the sections, phrases or provisions of this Resolution.

Section 6. That all resolutions or parts thereof in conflict with the provisions of the Resolution are, to the extent of such conflict, hereby superseded.

[signature page follows]

LEGAL DEPARTMENT DRAFT

DONE AND RATIFIED this ____ day of _____, 2021

Requested by:

Assistant City Manager Gentry

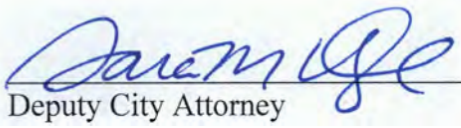
Mayor

Approved by:

City Manager

Approved as to form:

ATTEST:


Deputy City Attorney

Introduced:

Final Reading:

LEGAL DEPARTMENT DRAFT

EXHIBIT A

AFFIDAVIT OF PUBLICATION OF NOTICE OF TELEPHONIC PUBLIC HEARING

LEGAL DEPARTMENT DRAFT

EXHIBIT B

CERTIFICATE OF TELEPHONIC PUBLIC HEARING

LEGAL DEPARTMENT DRAFT

Memorandum



TO: Teresa Wilson, City Manager

FROM: Cindi Herrera, Chief Development Officer

CC: Ivory Mathews; Missy Gentry; Erica Hammond

DATE: October 11, 2021

RE: **Oaks at St. Anna's Park – Oak Park Family Housing**

This memo serves to provide an overview of the Oaks at St. Anna's Park – Oak Park Family Housing.

Oaks at St. Anna's Park is the redevelopment of the former Gonzales Gardens Public Housing community located on Forest Drive across from MUSC Hospital (formerly Providence). The redevelopment project consists of two components, Oak Terrace Senior Housing and Oak Park Family Housing. The project is a public-private partnership between Columbia Housing and a joint venture of Mungo Construction (Columbia, SC) and NixDevCo (Washington DC). Mungo Construction will serve as the General Contractor with 30% participation of Women and Minority owned sub-contractors.

Oak Park will consist of a total 190 townhome style housing units. Oak Park will contain 96 two-bedroom and 75 three-bedroom affordable units ranging 1,017 to 1,324 square feet. All affordable units will have project based rental assistance. The project will also include 19 market rate units, 11 two-bedroom units and 8 three-bedroom units. Townhomes will include stove, refrigerator, dishwasher, microwave, and in-unit washer and dryer.

The project will be financed with Tax Exempt Bonds, Federal and State Low Income Housing Tax Credits and a private mortgage from Citi-Bank. Total development costs are \$47,795,584.

The owner of the project is SCAHI Oak Park, LLC, a South Carolina limited liability company whose sole member is South Carolina Affordable Housing Initiative, Inc., a non-profit instrumentality of Columbia Housing. Hudson Capital is the federal tax credit investor and Sugarcreek Capital is the state credit investor. The project will be managed by a third-party private property management company, Southern Development and Management Company.

Columbia Housing is requesting City Council to approve the issuance of Multi-Family Housing Revenue Bonds not to exceed \$24 million dollars to support the construction financing of the project. The TEFRA (Tax Equity and Fiscal Responsibility Act) Public Hearing was held on August 25, 2021. No public comments were received.

This project will provide much needed affordable housing in our community replacing the loss of the former Gonzales Gardens units. The project will provide "priority housing" through the project based rental assistance which will reach residents with incomes below 30% of area median income, making a significant impact on the affordable housing shortage in our community.

RESOLUTION NO. R-2021-110

Approving The Issuance by the Housing Authority of the City of Columbia, South Carolina of Multifamily Housing Revenue Notes (The Oaks at St. Anna's Park - Oak Park) in the Maximum Principal Amount of \$24,000,000, In One Or More Series, Pursuant to Section 147(F) Of The Internal Revenue Code of 1986, as Amended; Providing Certain Other Matters in Connection Therewith; and Providing an Effective Date

WHEREAS, SCAHI St. Anna's Park, LLC, a South Carolina limited liability company, or its successors or assigns (the "Sponsor"), has represented to the City Council (the "City Council") of the City of Columbia, South Carolina (the "City") that it desires to finance the costs of the acquisition and construction of an approximately 190-unit new multifamily housing development and ancillary facilities, to be located at located at 1515 Garden Plaza (the "Site") in the City of Columbia, South Carolina (the "Project"); and,

WHEREAS, the Sponsor has further represented to the City Council that substantial cost savings would be recognized by financing the Project through a plan of financing consisting of the issuance by the Housing Authority of the City of Columbia, South Carolina (the "Issuer") of its multifamily housing revenue notes or bonds, in one or more series, in the maximum principal amount of Twenty-Four Million and No/100 (\$24,000,000.00) Dollars (the "Notes") to finance the Project; and,

WHEREAS, the Sponsor has further represented to the City Council that a portion of the proceeds of the Notes would be used for the purpose of (a) financing the cost of the land acquisition, construction, and equipping of the Project and (b) paying a portion of the costs of financing, including certain reserves, capitalized interest, and costs of issuance of the Notes; and,

WHEREAS, Section 147(f) of the Internal Revenue Code of 1986, as amended, including the U.S. Treasury Regulations promulgated thereunder (collectively, the "Code"), requires as a condition of exclusion from gross income for federal income tax purposes of the interest on private activity bonds, that the issuance of private activity bonds, as defined in Section 141(a) of the Code, such as the Notes be approved, after a public hearing following reasonable public notice, by the governmental unit on behalf of which such bonds are to be issued and having jurisdiction over the area in which the bond financed property is located (the "147(f) Approval"); and,

WHEREAS, the City Council constitutes the elected legislative body of the City and the Sponsor has represented to the City Council that it is the applicable elected representative required to provide the 147(f) Approval with respect to the issuance of the Notes for the purpose of financing the Project; and,

WHEREAS, the Sponsor has requested the City Council, pursuant to Section 147(f) of the Code, to provide the 147(f) Approval and to thereby approve the issuance by the Issuer of the Notes for the purpose of providing funds to the Sponsor to finance the Project; and,

WHEREAS, on August 18, 2021, the Sponsor published in *The State*, a newspaper of general circulation in the City, a notice of public hearing to be held by the Issuer on August 25, 2021, at 10:30 a.m. or as soon thereafter as such matters may be heard by means of a telephonic meeting to consider the issuance by the Issuer of the Notes and the nature of the Project to be financed with a portion of the proceeds of the Notes; and,

WHEREAS, notice of the public hearing was duly published as indicated by the copy of the notice as it appeared in *The State* attached hereto as Exhibit A; and,

LEGAL DEPARTMENT DRAFT

WHEREAS, the public hearing was duly held by the Issuer on August 25, 2021, during which public hearing members of the public were afforded the opportunity to express their views on the issuance by the Issuer of the Notes and the use of a portion of the proceeds thereof to finance the Project as indicated by the Certificate as to Telephonic Public Hearing attached hereto as Exhibit B.

NOW, THEREFORE, BE IT RESOLVED by the Mayor and Members of the City Council of the City of Columbia, South Carolina, in Council duly assembled:

Section 1. The issuance by the Issuer of the Notes in the maximum principal amount of \$24,000,000 for the purpose of providing funds to the Sponsor to finance the Project is hereby approved pursuant to and in accordance with Section 147(f) of the Code.

Section 2. A hearing open to the public, and conducted telephonically due to the COVID-19 pandemic, pursuant to Internal Revenue Service Rev. Proc. 2020-21 as extended by Rev. Proc. 2020-49 and Rev. Proc. 2021-39, was held on August 25, 2021, for which the Sponsor has represented to the City Council that due and reasonable public notice, being published in *The State* as described above, was given by or on behalf of the Sponsor in accordance with the provisions of applicable law and procedures established therefor.

Section 3. Such approval by the City Council shall not be construed as (i) an endorsement of the creditworthiness of the Issuer, the Sponsor or the financial viability of the Project, (ii) a recommendation to any prospective purchaser to purchase the Notes, (iii) an evaluation of the likelihood of the repayment of the debt service on the Notes, or (iv) approval of any building or other regulatory permits relating to the Project, and the City Council shall not be construed by reason of its adoption of this Resolution to make any such endorsement, finding or recommendation, to have waived any rights of the City, or to have caused the City to be estopped from asserting any rights or responsibilities it may have in such regard. Further, the Notes shall not constitute an indebtedness of the State of South Carolina, the City or any political subdivision thereof, but shall be payable solely from revenues of the Sponsor pledged to the payment of the Notes. The approval by the City Council of the issuance of the Notes by the Issuer to finance the Project shall not be construed to obligate the City to incur any liability, pecuniary or otherwise, in connection with either the issuance of the Notes or the acquisition, construction or equipping of the Project.

Section 4. This Resolution shall take effect immediately upon its adoption.

Section 5. That the provisions of this Resolution are hereby declared to be separable, and if any section, phrase or provision shall, for any reason, be declared to be invalid, such declaration shall not affect the validity of the remainder of the sections, phrases or provisions of this Resolution.

Section 6. That all resolutions or parts thereof in conflict with the provisions of the Resolution are, to the extent of such conflict, hereby superseded.

[signature page follows]

LEGAL DEPARTMENT DRAFT

DONE AND RATIFIED this ____ day of _____, 2021

Requested by:

Assistant City Manager Gentry

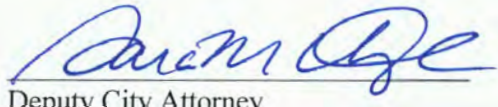
Mayor

Approved by:

City Manager

Approved as to form:

ATTEST:



Deputy City Attorney

City Clerk

Introduced:

Final Reading:

LEGAL DEPARTMENT DRAFT

EXHIBIT A

AFFIDAVIT OF PUBLICATION OF NOTICE OF TELEPHONIC PUBLIC HEARING

LEGAL DEPARTMENT DRAFT

EXHIBIT B

CERTIFICATE OF TELEPHONIC PUBLIC HEARING

LEGAL DEPARTMENT DRAFT

Memorandum



TO: Teresa Wilson, City Manager
FROM: Cindi Herrera, Chief Development Officer
CC: Ivory Mathews; Missy Gentry; Erica Hammond
DATE: October 11, 2021
RE: **Colonel Bluffs Apartments**

This memo serves to provide an overview of Colonel Bluffs apartments.

Colonel Bluffs Apartments is a new construction 288-unit affordable housing community located at 300 Clemson Road. The project will include 72 one-bedroom units of 765 square feet; 144 two-bedroom units of 890 square feet and 72 three-bedroom units of 1198 square feet. All 288 units in the project will be rent restricted to households below 60% of area median income.

Apartment amenities include stove, refrigerator, microwave, dishwasher, garbage disposal and washer/dryer hookups. Community amenities will include a large community room, business center, fitness center, central laundry room, playground and a swimming pool.

The project will be financed with Tax Exempt Bonds, Federal and State Low Income Housing Tax Credits and a private mortgage. Total development costs are \$49,564,829.

The owner of the project is Colonel Creek SC, LLC, a South Carolina limited liability company whose managing member is Fitch Irick SC, LLC, a partnership of three individuals, Hollis Fitch, Charlie Irick and Jay Bernstein. This partnership has extensive experience in developing affordable housing throughout South Carolina and recently completed Killian Terrace at 508 Longtown Road in Columbia.

Columbia Housing is requesting City Council to approve the issuance of Multi-Family Housing Revenue Bonds not to exceed \$26.1 million dollars to support the construction financing of the project. The TEFRA (Tax Equity and Fiscal Responsibility Act) Public Hearing was held on October 5, 2021. No public comments were received.

This affordable community is located in a high growth area of the city that has minimal affordable housing. This project will offer residents working in the area an opportunity to live closer to their employment and reduce commute times. This project will also offer affordable housing to lower paying individuals and make a significant impact on the shortage of workforce affordable housing in our community.

RESOLUTION NO. R-2021-112

Approving the Issuance by The Housing Authority of the City of Columbia, South Carolina, of Its Multifamily Housing Revenue Notes or Bonds (Colonel Bluffs Apartments) in the Maximum Principal Amount of \$26,100,000, in One or More Series, Pursuant to Section 147(F) of The Internal Revenue Code of 1986, as Amended; Providing Certain Other Matters in Connection Therewith; and Providing an Effective Date

WHEREAS, Colonel Bluffs SC LLC, a South Carolina limited liability company, or its successors or assigns (the “Sponsor”), has represented to the City Council (the “City Council”) of the City of Columbia, South Carolina (the “City”) that it desires to finance the costs of construction of approximately 288-unit new multifamily housing development and ancillary facilities, to be located at 230 Ashcroft Circle in the City of Columbia, South Carolina (the “Project”); and,

WHEREAS, the Sponsor has further represented to the City Council that substantial cost savings would be recognized by financing the Project through a plan of financing consisting of the issuance by the Housing Authority of the City of Columbia, South Carolina (the “Issuer”) of its multifamily housing revenue notes or bonds, in one or more series, in the maximum principal amount of Twenty-Six Million One Hundred Thousand and No/100 (\$26,100,000.00) Dollars (the “Bonds”) to finance the Project; and,

WHEREAS, the Sponsor has further represented to the City Council that a portion of the proceeds of the Bonds would be used for the purpose of (a) financing the cost of the land acquisition, construction, and equipping of the Project and (b) paying a portion of the costs of financing, including certain reserves, capitalized interest, and costs of issuance of the Bonds; and,

WHEREAS, Section 147(f) of the Internal Revenue Code of 1986, as amended, including the U.S. Treasury Regulations promulgated thereunder (collectively, the “Code”), requires as a condition of exclusion from gross income for federal income tax purposes of the interest on private activity bonds, that the issuance of private activity bonds, as defined in Section 141(a) of the Code, such as the Bonds be approved, after a public hearing following reasonable public notice, by the governmental unit on behalf of which such bonds are to be issued and having jurisdiction over the area in which the bond financed property is located (the “147(f) Approval”); and,

WHEREAS, the City Council constitutes the elected legislative body of the City and the Sponsor has represented to the City Council that it is the applicable elected representative required to provide the 147(f) Approval with respect to the issuance of the Bonds for the purpose of financing the Project; and,

WHEREAS, the Sponsor has requested the City Council, pursuant to Section 147(f) of the Code, to provide the 147(f) Approval and to thereby approve the issuance by the Issuer of the Bonds for the purpose of providing funds to the Sponsor to finance the Project; and,

WHEREAS, on September 22, 2021, the Sponsor published in *The State*, a newspaper of general circulation in the City, a notice of public hearing to be held by the Issuer on October 5, 2021, at 2:30 p.m. or as soon thereafter as such matters may be heard by means of a telephonic meeting to consider the issuance by the Issuer of the Bonds and the nature of the Project to be financed with a portion of the proceeds of the Bonds; and,

WHEREAS, notice of the public hearing was duly published as indicated by the copy of the notice as it appeared in *The State* attached hereto as Exhibit A; and,

LEGAL DEPARTMENT DRAFT

WHEREAS, the public hearing was duly held by the Issuer on October 5, 2021, during which public hearing members of the public were afforded the opportunity to express their views on the issuance by the Issuer of the Bonds and the use of a portion of the proceeds thereof to finance the Project as indicated by the Certificate as to Telephonic Public Hearing attached hereto as Exhibit B.

NOW, THEREFORE, BE IT RESOLVED by the Mayor and Members of the City Council of the City of Columbia, South Carolina, in Council duly assembled:

Section 1. The issuance by the Issuer of the Bonds in the maximum principal amount of \$26,100,000 for the purpose of providing funds to the Sponsor to finance the Project is hereby approved pursuant to and in accordance with Section 147(f) of the Code.

Section 2. A hearing open to the public, and conducted telephonically due to the COVID-19 pandemic, pursuant to Internal Revenue Service Rev. Proc. 2020-21, as extended by Rev. Proc. 2021-39, was held on October 5, 2021, for which the Sponsor has represented to the City Council that due and reasonable public notice, being published in *The State* as described above, was given by or on behalf of the Sponsor in accordance with the provisions of applicable law and procedures established therefor.

Section 3. Such approval by the City Council shall not be construed as (i) an endorsement of the creditworthiness of the Issuer, the Sponsor, or the financial viability of the Project, (ii) a recommendation to any prospective purchaser to purchase the Bonds, (iii) an evaluation of the likelihood of the repayment of the debt service on the Bonds, or (iv) approval of any building or other regulatory permits relating to the Project, and the City Council shall not be construed by reason of its adoption of this Resolution to make any such endorsement, finding, or recommendation, to have waived any rights of the City, or to have caused the City to be estopped from asserting any rights or responsibilities it may have in such regard. Further, the Bonds shall not constitute an indebtedness of the State of South Carolina, the City, or any political subdivision thereof, but shall be payable solely from revenues of the Sponsor pledged to the payment of the Bonds. The approval by the City Council of the issuance of the Bonds by the Issuer to finance the Project shall not be construed to obligate the City to incur any liability, pecuniary or otherwise, in connection with either the issuance of the Bonds of the acquisition, construction or equipping of the Project.

Section 4. This Resolution shall take effect immediately upon its adoption.

Section 5. That the provisions of this Resolution are hereby declared to be separable, and if any section, phrase or provision shall, for any reason, be declared to be invalid, such declaration shall not affect the validity of the remainder of the sections, phrases or provisions of this Resolution.

Section 6. That all resolutions or parts thereof in conflict with the provisions of the Resolution are, to the extent of such conflict, hereby superseded.

[signature page follows]

LEGAL DEPARTMENT DRAFT

DONE AND RATIFIED this ____ day of _____, 2021

Requested by:

Assistant City Manager Gentry

Mayor

Approved by:

City Manager

Approved as to form:

ATTEST:

Deputy City Attorney

City Clerk

APPROVED AS TO FORM

Legal Department City of Columbia, SC
10/8/2021

Introduced:

Final Reading:

LEGAL DEPARTMENT DRAFT

EXHIBIT A

AFFIDAVIT OF PUBLICATION OF NOTICE OF TELEPHONIC PUBLIC HEARING

LEGAL DEPARTMENT DRAFT

EXHIBIT B

CERTIFICATE OF TELEPHONIC PUBLIC HEARING

LEGAL DEPARTMENT DRAFT

RESOLUTION NO.: R-2021-113*Adopting the All Natural Hazards Risk Assessment and Mitigation Plan for the
Central Midlands Region of South Carolina Update*

WHEREAS, the City of Columbia, South Carolina ("Columbia") recognizes the threat that natural hazards pose to people and property; and,

WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and,

WHEREAS, an adopted all hazards mitigation plan is required as a condition of future grant funding of mitigation projects; and,

WHEREAS, Columbia participated jointly in the planning process with the other units of government in the Central Midlands region of South Carolina to prepare an all hazards mitigation plan; and,

WHEREAS, Columbia is aware that revision and updating of the plan is critical for active and effective hazard mitigation and that Columbia will monitor and record hazard related data and events that can be used to update the all natural hazards mitigation plan; NOW, THEREFORE,

BE IT RESOLVED, that the City of Columbia, South Carolina, hereby adopts the update to the All Natural Hazards Risk Assessment and Mitigation Plan for the Central Midlands Region in its entirety as an official plan and will undertake annual recording of hazard events, their impact duration and cause.

BE IT FURTHER RESOLVED, that the Central Midlands Council of Governments, accepting the All Natural Hazards Risk Assessment and Mitigation Plan from the Central Midlands Regional Risk Assessment and Hazard Mitigation Committee, will submit on behalf of the participating counties and municipalities the adopted All Natural Hazards Plan to the Federal Emergency Management Agency officials for final review and approval.

Requested by:

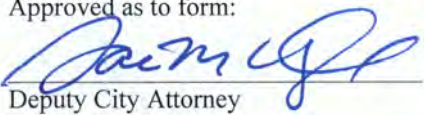
Assistant City Manager Palen

Mayor

Approved by:

City Manager

Approved as to form:


Deputy City Attorney

ATTEST:

City Clerk

Introduced:

Final Reading:

LEGAL DEPARTMENT DRAFT

Central Midlands Hazard Mitigation Plan

2021 Update



*An All-Natural Hazard Event Analysis and Mitigation Management
Document for Eligible Organizations within the South Carolina
Counties of Fairfield, Lexington, Newberry, and Richland.*

Participating Jurisdictions & Agencies

Fairfield County

Town of Winnsboro
 Town of Ridgeway
 Mid-County Water Company

Lexington County

City of West Columbia
 City of Cayce
 Town of Batesburg-Leesville
 Town of Chapin
 Town of Irmo
 Town of Lexington
 Town of Pine Ridge
 Town of South Congaree
 Town of Swansea

Newberry County

City of Newberry
 Town of Whitmire

Richland County

City of Columbia
 City of Forest Acres
 Town of Arcadia Lakes
 Town of Eastover
 Town of Blythewood

Developed by



Disaster Metrics

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List of Commonly Utilized Acronyms

CMCOG	Central Midlands Council of Governments
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
GIS	Geographic Information System
HMGP	Hazard Mitigation Grant Program
HMP	Hazard Mitigation Plan
NFIP	National Flood Insurance Program
NWS	National Weather Service
SCEMD	South Carolina Emergency Management Agency

Useful Definitions

Natural Hazard	A source of harm or difficulty created by a meteorological, environmental, or geological event.
Community Assets	People, structures, facilities, and systems that have value to the community.
Impacts	Consequences or effects of a hazard on the community and its assets.
Risk	Potential for damage, loss, or other impacts created by the interaction of natural hazards with community assets.
Vulnerability	Characteristics of community assets that make them susceptible to impacts from a given hazard.
Hazard Mitigation	A sustainable action or structure that reduces or eliminates long-term risk to life and property

Executive Summary

Natural hazards, such as flooding, tornadoes and winter weather, threaten the Central Midlands Region of South Carolina. These natural events endanger the health and safety of residents and property, jeopardize the economic vitality of the region, and imperil environmental quality. Minimizing or neutralizing the impacts of these events before they occur is a cost-effective method of saving lives, protecting property, and fomenting economic development in areas of high-hazard risk and vulnerability.

The Central Midlands Council of Governments (CMCOG), in close collaboration with local stakeholders, initiated a hazard mitigation planning process in 2004 to improve awareness, increase community resilience, and minimize vulnerabilities to natural hazards. This plan represents an update of the 2016 *"Central Midlands Hazard Mitigation Plan"* and includes new hazard and vulnerability assessments, recommendations for new strategies, as well as a status update of past hazard mitigation actions. In addition to natural hazard information and analysis requirements, this plan update includes non-natural hazard information, such as that of chemical hazards.

This Hazard Mitigation Plan is designed to be a general emergency management and planning document to aid decision makers and the general public in:

- 1) Describing the natural hazards that have historically had the most impact in each county
- 2) Assessing vulnerable populations and assets within each county
- 3) Assessing risk and severity of consequences within each county
- 4) Identifying and evaluating goals, actions and projects that reduce the impacts of identified hazards
- 5) Devising an action plan for prioritizing, implementing, and administering recommended mitigation actions and projects
- 6) Monitoring and evaluating progress of the plan recommendations
- 7) Understanding the process which participating organizations could use to incorporate plan recommendations into local plans and capital improvements programs
- 8) Ensuring continued public involvement in the ongoing mitigation planning process

1. Introduction and Purpose

1.1 Introduction

As part of the Disaster Mitigation Act of 2000, the Federal Emergency Management Agency (FEMA) requires all counties to create and maintain a Hazard Mitigation Plan (from now on referred as the *HMP*). A HMP includes an assessment of the historical impacts of natural hazards, used to determine high risk areas and identify vulnerabilities. Based on this assessment, organizations identify and prioritize mitigation actions for reducing risk and protecting their constituents from the impacts of natural hazards. Demographic and economic information is tied to these assessments to make the most effective emergency management decisions.

A FEMA approved and locally adopted HMP is a requirement to solicit federal grant funds under the Hazard Mitigation Assistance (HMA) program. ***Mitigation strategies listed in this HMP are eligible for the Hazard Mitigation Grant Program (HMGP), the Building Resilient Infrastructure and Communities (BRIC) grant, and the Flood Mitigation Assistance (FMA) grant.*** It is crucial for organizations to participate in the hazard mitigation planning process not only as a planning exercise, but as an important instrument for securing financial resources to safeguard the lives and properties of their constituents.

This document presents a comprehensive five-year update of the 2016 *Central Midlands Hazard Mitigation Plan*. The HMP provides distinct hazard, vulnerability, and mitigation information for each participating organization and incorporates new data sources and analyses across the entire planning time period, going beyond the addition of new information for the period between plan updates. In addition, the COVID-19 pandemic prompted multiple organizations to request the addition of non-natural hazard data and mitigation strategies to supplement the utility of the HMP in their emergency management activities.

The Central Midlands Council of Governments (CMCOG) is the designated lead agency to coordinate jurisdictions, compile information, and develop the HMP for the region. The CMCOG is a South Carolina state agency that provides a regional forum for local governments in the Central Midlands region of Fairfield, Lexington, Newberry, Richland counties and offers technical assistance and planning services in the area. This HMP covers the Central Midlands region of South Carolina, which comprises the counties of Fairfield, Lexington, Newberry and Richland along with their constituent municipalities (Figure 1).



Figure 1 - Central Midlands Region Assessed in the HMP.

2. Plan Objectives and Process

The HMP is primarily intended for use by planners and emergency management officials to support the reduction or elimination of risk, and safeguard life and property. It consolidates disparate information sources into a single document, provides an extensive list of hazard mitigation activities, and identifies at-risk areas, infrastructure and vulnerabilities.

The objectives of the HMP are as follows:

- 1) Coordinate regional resources and personnel to raise natural hazard awareness, collect the most up-to-date information on their impacts, and recommend relevant mitigation strategies.
- 2) Utilize state-of-the-art scientific techniques to analyze natural hazard impacts, estimate the degree to risk and vulnerability
- 3) Provide an easy-to-read document that supports evidence-based planning and decision making.

2.1 Reading this Plan

The initial chapters of the HMP provide an administrative background on the creation and utilization of the plan. This is followed by general physical and socioeconomic characteristics of the region. Subsequent sections are county-specific, containing the local hazard, vulnerability and capability assessments. Each county-specific section ends with a list of mitigation strategies provided by participating organizations. Methodology, historical hazard data, and supplemental plan administration information and tools are found in the Appendices.

The digital version of the HMP is hyperlinked, allowing readers to skip to sections of interest.

2.2 Planning Methodology

The CMCOG assembled local planning committees for each of the four participating counties (i.e. Fairfield, Lexington, Newberry, and Richland) in the Central Midlands region. Each committee consisted of jurisdictional representatives, county emergency managers, and other organizations that participate in emergency management activities. These planning committees were essential in coordinating and communicating with local stakeholders.

**This section addresses
FEMA HMP requirement
201.6(c)(1) and 201.6(d)(3)**

The CMCOG worked with each planning committee to discuss general emergency management priorities, compile updates on natural hazard activities since the 2016 plan update, and identify new mitigation strategies. Organizations were contacted by phone, virtually, or in person if they were unable to attend a county committee meeting. Table 1 presents all outreach activity by the CMCOG in the development of this plan update. Mitigation strategies and other stakeholder requirements were finalized through individual correspondence, with a final meeting held for each county to discuss strategies between stakeholders and present updated a natural hazard analyses.

Table 1 - Stakeholder meetings and outreach efforts by CMCOG staff for plan update.

Meeting or Presentation	Dates
SCMD Coordination Calls	8/Jan/2020, 21/Oct/2020
Regional Committee Kickoff #1	29/Jul/2020
Regional Committee Kickoff #2	5/Aug/2020
FC Committee Mitigation Workshop	13/Oct/2020
LC Committee Mitigation Workshop	15/Oct/2020
NC Committee Mitigation Workshop	20/Oct/2020
RC Committee Mitigation Workshop	22/Oct/2020
Lexington County EMD Coordination Meeting	29/Oct/2020
Town of Chapin Coordination Calls	6/Nov/2020; 16/Nov/2020
City of Cayce Coordination Calls	16/Dec/2020; 5/Mar/2021

Meeting or Presentation	Dates
Town of Winnsboro Coordination Call	16/Dec/2020
Northside (FC+NC) Committee Spring Update	16/Mar/2021
LC Committee Spring Update	18/Mar/2021
NC County Coordination Call	23/March/2021
RC Committee Spring Update	25/Mar/2021
County Emergency Manager Meeting	10/September/2021

Public input was integrated into the HMP through a public opinion survey and a public comment period. Due to the COVID-19 pandemic, there was an extended survey response period from October 2020 to February 2021. The CMCOG hosted the survey on its website, coordinating with other stakeholders to increase its distribution (Figure 2). The online survey asked respondents which natural hazards they perceived as priorities, and which were their preferred mitigation actions. Respondents were recruited via the planning committees, and the survey publicized through stakeholder home pages and social media. A total of 276 Central Midlands region residents completed the survey, the results of which were shared with the county committees and incorporated into the natural hazard risk assessments for each county in the region. A copy of the survey results can be found in [Appendix II](#) of this HMP.

**This section addresses
FEMA HMP requirements
201.6(b) & 201.6(c)(4)**

A public comment period will be established for the final draft of the HMP from X to Y. This period will be advertised on local newspapers, and stakeholder agency websites and social media. Due to safety concerns surrounding the COVID-19 pandemic, the draft HMP will be shared and open for comment on X, 2021 during a virtual public meeting. A digital copy of the HMP will be shared on the CMCOG website, and stakeholder agency websites and social media. A physical copy of the draft HMP will be made available in the CMCOG building. Copies of the advertisements will be included in [Appendix VI](#). Comments received will be integrated into the final draft of the plan before adoption by local government stakeholders.

While neighboring local governments and regional councils of government maintain their own county-specific or regional HMP's (e.g. Orangeburg County Hazard Mitigation Plan, Santee-Lynches Hazard Mitigation Plan), CMCOG will provide them access to the draft plan and solicit their input. This includes the following local and regional councils of governments:

- Santee-Lynches Council of Governments
- Aiken County
- Calhoun County
- Chester County
- Greenwood County
- Laurens County
- Lancaster County
- Orangeburg County
- Union County

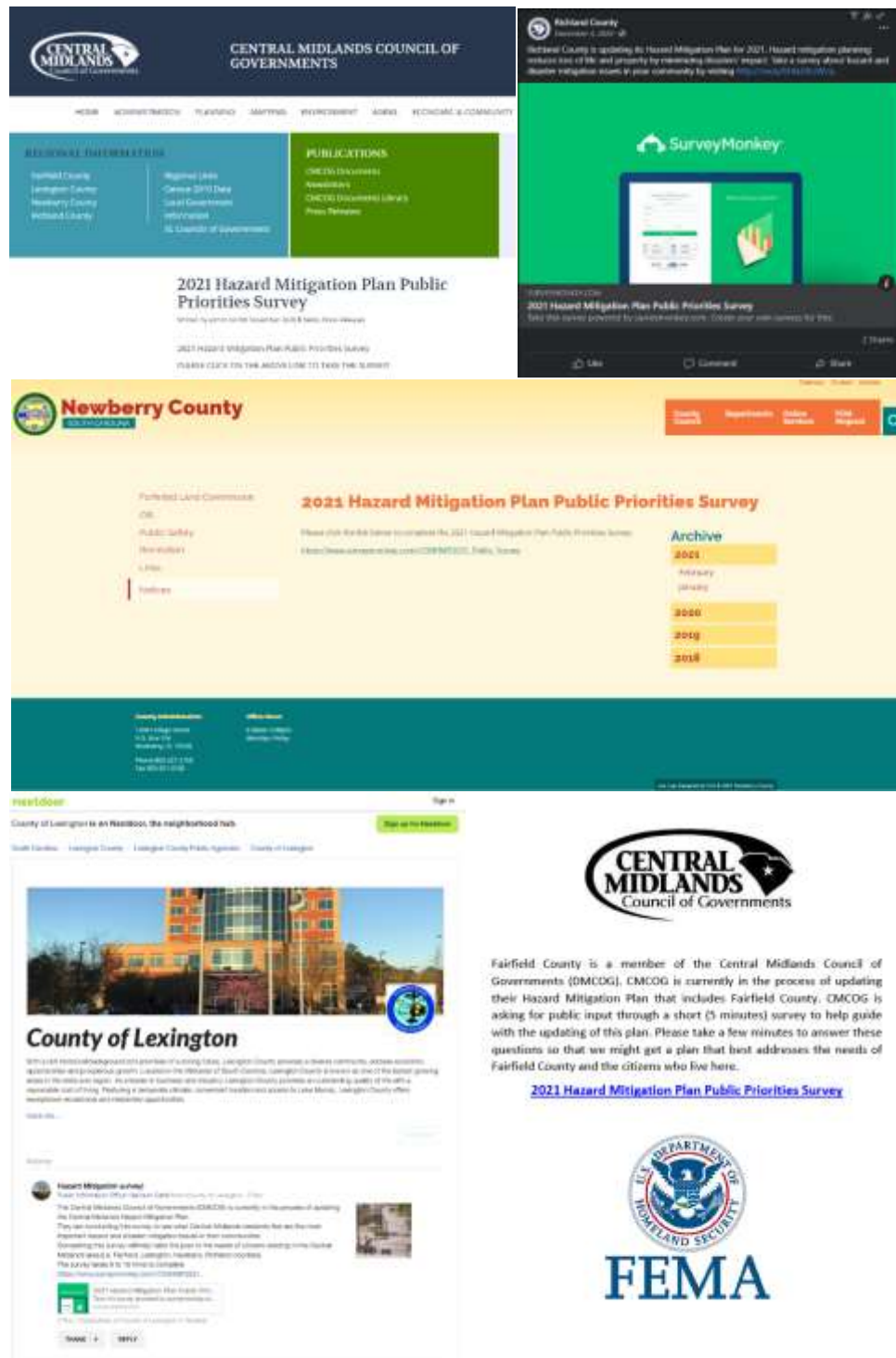


Figure 2 - Screenshot of HMP Public Survey Announcement posted on CMCOG and participating County web pages.

2.3 Stakeholders Involved

Table 2 presents participating stakeholders in the hazard mitigation planning process of the 2021 HMP update. Due to the COVID-19 pandemic, public interactions were fully transitioned to virtual and socially distanced methods beginning on March 2020.

**This section addresses
FEMA HMP requirement**

Table 2 - Stakeholders Contacted during the Planning Process.

State and Federal Agencies	
Agency	Name & Title
SCEMD	Charlotte Foster (Hazard Mitigation Specialist) Lindsey McCoy (Hazard Mitigation Planning Coordinator)
CMCOG	Gregory Sprouse (Director of Research, Planning, and Development) Guillermo Espinosa (Senior Planner)
Fairfield County	
Agency	Name & Title
Fairfield County Emergency Management Department	Brad Douglas (Director)
Fairfield County	Chris Clauson (Community Development Director)
Mid – County Water Company	Herb Rentz (Manager)
Town of Winnsboro	Cyndi Gawronski (Grants Administrator)
Town of Ridgeway	Vivian Case (Town Clerk)
Lexington County	
Agency	Name & Title
Lexington County Emergency Preparedness Division	Wendy Jeffcoat (Director of Emergency Management), Chase Woods (Assistant Emergency Manager)
City of West Columbia	Wayne Shuler (Director of Planning & Zoning)
City of Cayce	Wade Luther (Planning Director) Robert Hawks (GIS Analyst) Monique Ocean (GIS Analyst/Technician)
Town of Batesburg – Leesville	Ted Luckadoo (Town Manager) Jay Hendrix (Assistant Town Manager) Josh Frye (Fire Chief)
Town of Gilbert	Fred Taylor (Zoning Administrator)
Town of Chapin	Ian Ashford (Zoning Administrator)
Town of Springdale	
Town of Irmo	Whitt Cline (Public Services Director)
Town of Lexington	Britt Poole (Town Manager) Wesley Crosby (Assistant Town Administrator)
Town of Swansea	Jerald Sanders (Mayor)
Newberry County	
Agency	Name & Title
Newberry County Emergency Preparedness Agency	Tommy Long (Director)
Newberry County	Anne Peters (Planning and Zoning Director)
City of Newberry	Matt Dewitt (City Manager)
Town of Whitmire	Billy Hollingsworth (Town Supervisor)
Richland County	
Agency	Name & Title
Richland County Emergency Services Department	Michael Kalec (Emergency Manager), Clayton Voignier (Planning Director)
Richland County	Harry Tinsley (Emergency Management Director)
City of Columbia	Missy Caughman (Budget Director) John Fellows (Planning Administrator)
City of Forest Acres	Shaun Greenwood (City Manager)
Town of Arcadia Lakes	Mark Huguley (Mayor)
Town of Blythewood	Carroll Williamson (Town Administrator)
Town of Eastover	Philip Gunter (Mayor)

CMCOG also reached out to private entities and other stakeholders with a mission-critical interest in hazard mitigation planning (e.g. colleges, utilities). Jurisdictions which did not send representatives to the

2021 HMP update planning process, but were participants of the 2016 HMP, were encouraged to collaborate in regional hazard mitigation activities with their respective County emergency management agencies. Local government jurisdictions with limited staff capacity to managed mitigation planning activities, and therefore not including their information in this HMP update, were also encouraged to do the same.

2.4 Procedure for Stakeholder Input

Stakeholders have multiple opportunities and methods to provide input in the HMP throughout the hazard mitigation planning process:

This section addresses FEMA HMP requirement 201.6(b)(2)

- Stakeholders share their mitigation goals and strategies as part of the HMP participation requirements. These goals are meant to reflect their hazard mitigation priorities by utilizing a Benefit Cost Analysis (BCA) methodology to determine project effectiveness and plausibility. A template for providing mitigation goals is provided in [Appendix VIII – A](#). Stakeholders provide a “Capabilities Assessments”, which are reports of their available facilities and personnel resources dedicated to hazard mitigation and disaster relief. These reports include mitigation plans and actions currently in effect for a particular jurisdiction.
- Stakeholders may share their recommendations at the various county committee meetings held as part of the plan update process. Changes requested to their provided information will be reflected in the final draft. Requested changes to the plan document as a whole will be taken under consideration and discussed with planning committees where appropriate.
- Stakeholders have opportunities to comment on plan drafts before submittal for approval by FEMA and before approval by their jurisdiction.
- An amendment process is required after plan approval, whereas FEMA must review major changes before they become an official part of the plan. Requested and approved alterations of the plan will be reflected in the planning timeline.

2.5 Plan Adoption Procedure

The HMP is submitted to participating organizations for adoption by formal resolution. Copies of plan adoption resolutions for each jurisdiction are located in [Appendix IV](#). A template letter for plan adoption may be found in [Appendix VIII – B](#) of this document.

This section addresses FEMA HMP requirement 201.6(c)(5)

2.6 Plan Update Procedure

Emergency management and hazard mitigation are a continuous process. According to the Disaster Mitigation Act of 2000, regional planning for hazard mitigation must incorporate a method and schedule of monitoring, evaluating, and updating hazard mitigation processes and results within a five-year cycle. The HMP shall be a working document and reflect changes to demographics, economy and progress on mitigation goals on an ongoing basis. The CMCOG’s regional planning team will coordinate with, but not restricted to, established committees to monitor local efforts and achievements in hazard mitigation.

This section addresses FEMA HMP requirement 201.6(d)(1)

Procedures for yearly monitoring and evaluation, citizen participation and updating the HMP are as follows:

A. Monitoring

CMCOG will coordinate with county emergency managers and communicate update requests regarding the status of mitigation actions to every participating jurisdiction annually. Reporting periods will track changes to mitigation actions on a fiscal year basis. A sample form to be used by a regional planning team and county risk assessment and hazard mitigation committees to undertake the annual evaluation process is provided in [Appendix VIII - C](#).

B. Evaluation

The CMCOG will compile action updates and revise the HMP accordingly. In addition, the CMCOG will highlight mitigation success stories on its website, through social media, and other outreach efforts. The updates will also address the following points:

- Evaluating the goals and objectives to ensure they address current and expected conditions.
- Determining if the nature or magnitude of risk has changed.
- Evaluating whether the current resources are adequate for implementing action plans.
- Documenting any implementation problems such as technical, political, legal or coordination issues with other agencies.
- Documenting agency and other partner participation in reacting to hazard events.
- Documenting progress toward involving new local governments in the regional plan as participating jurisdictions.

If there are significant updates, a digital copy of the annually revised HMP will be made available to each of the implementing agencies, the SCEMD, the South Carolina Adjutant General, and FEMA. Moreover, a notice of availability for the revised HMP will be published in a newspaper of general circulation in each county in the region.

C. Citizen Participation

The following procedure is recommended for all participating jurisdictions to ensure that the public has an opportunity to make meaningful input in the planning process:

1. After preparation of a draft annual revision, a notice of review shall be published in a newspaper of general circulation either as a legal or a display ad. The CMCOG will utilize social media to further publicize the revision. Every jurisdiction is encouraged to also utilize their social media capabilities.
2. The general public shall be able to review the annual revision for a period of not less than 14 working days prior to its adoption by resolution of a participating organization. The time, date and place of the governing body as well as the proposed action on the adoption shall be advertised either in the measures specified in this paragraph or in an optional additional article or legal notice.
3. During the preparation of the comprehensive five-year revision of the HMP, the public shall be offered an opportunity to attend the meetings of the county committee to give input and also to comment on the action plan of each local jurisdiction prior to its inclusion in the regional plan. A digital copy of the draft plan update shall be made available to share on the CMCOG website.
4. Notices of the time, date, and place of meeting for adopting the HMP by resolution shall be published as an article of general interest news or as a legal notice in a newspaper of

general circulation not less than 14 working days prior to passage of the adopting resolution.

Local jurisdictions are encouraged to take additional measures to involve the public in the planning and evaluation process but should consider the above listed measures as minimum steps to afford the public an opportunity to be involved in the document preparation and update process.

D. The Comprehensive Update

The HMP will be updated every five years. For the Central Midlands Region, this means that the next comprehensive revision will be completed in 2026. The update shall reflect changes in data and analysis techniques critical to making hazard mitigation decisions and evaluated according to items listed under section 3.5 B (*Evaluation*). CMCOG will initiate the process and coordinate with emergency management agencies to form committees, coordinate data collection and analysis, develop the HMP document, and facilitate public input.

2.7 Incorporating this Plan into Local Jurisdiction Plans

Much of the information in the HMP may be used by participating jurisdictions when updating their comprehensive plans. State law identifies a minimum of nine elements for inclusion in a comprehensive plan. Below are examples of those different elements present in this plan and how that information could be integrated into other plans:

**This section addresses
FEMA HMP requirement
201.6(c)(4)(ii)**

- **Population:** information such as population estimates and the location of vulnerable populations within jurisdictions can help emergency services agencies plan for potential needs.
- **Natural Resources:** accurately depicting flood hazard areas is critical information for land use planners, as it helps guide future development out of flood prone areas.
- **Housing:** having an understanding of the number of structures and property values is important to determine vulnerability in the event of a natural hazard. This information could be combined with the location of flood prone areas to determine potential risk to those structures.
- **Community Facilities:** the critical facilities identified in this document provide a list of infrastructure in place important for disaster relief efforts.
- **Transportation:** the transportation system information plays an important role in planning evacuations prior to natural hazard events and in providing access to emergency services before and after an event.
- **Land use:** analyzing the location of the hazard events, particularly the flood prone zones, can help jurisdictions identify areas of higher risk.
- **Resilience:** the Disaster Relief and Resilience Act of 2020 amended Section 6-29-510 (D) of the SC Local Government Comprehensive Planning Enabling Act to require the development of a separate resiliency element for the Comprehensive Plan. Per the requirements of the act, the element should consider the impacts of flooding, high water, and natural hazards on individuals, communities, institutions, businesses, economic development, public infrastructure and facilities, and public health, safety and welfare. The element should also promote, resilient planning, design and development, be coordinated with adjacent jurisdictions and agencies, and be coordinated with the other elements and integrated into the goals and strategies.

All units of local government adopt comprehensive plans pursuant to the procedures outlined in state planning legislation. If they wish to add elements from this plan to their comprehensive plans, either through amendments or during updates required by state law every five years after adoption, then they must abide the process outlined by state law:

- The planning commission duly established, appointed and elected must undertake a comprehensive revision of the HMP that should from this time forward include a natural hazards assessment and mitigation element. This 2021 update to the Central Midlands Hazard Mitigation Plan should serve as the basis for the natural hazard mitigation and resiliency element, and any subsequent mitigation implementation documents for the comprehensive plan.
- After preparation, the revision must be advertised to the public by legal notice at least 15 days before the public hearing. The planning commission shall adopt the HMP revision by resolution and then submit the document to the governing council, which must hold two readings before adopting by ordinance. The procedure for preparation and revision of comprehensive plans is the same for counties, except that three readings must be held prior to county council adoption by ordinance.
- Zoning and land development ordinances are the principal tools for implementing a comprehensive plan. Zoning ordinances implement land use policies by guiding the location of development. The land development ordinances set standards for how that development occurs, particularly the installation of facilities such as water, sewer and roads. Zoning and land development ordinances must be prepared by the appropriate planning commission and then submitted to the public for a 15-day review and comment period prior to the recommendation of the planning commission to the governing council. Amendments are processed in the same manner. It bears repeating, county councils must have three readings to implement an ordinance or ordinance change.
- Many of the action items in this document require capital improvements to facilities. Capital improvement plans are prepared by planning commissions working with government staffs. Upon preparation of a draft, the document is submitted to the governing council as a working document. It is usually not formally adopted but is a reference tool for budgeting and prioritizing.
- Taxation and spending issues are usually incorporated into the budget cycle. These vary annually by jurisdiction, but usually involve a suggestion of spending priorities by municipal and county departments. These items are reviewed with the administrator, who then works with the finance director regarding revenue sources and budget estimates for the coming year(s). A budget is then fashioned and presented to the council finance committee for reworking prior to presentation to the entire council. This budget is advertised for a 15-day public comment period and then adopted after two readings, if a municipality, or three readings if a county. The inclusion of hazard related items would arise from department input and from the government's capital improvements budget and program, if one has been developed and properly updated.

Examples of documents which integrated information and recommended actions from the 2016 Update of the Central Midlands Hazard Mitigation Plan:

- Comprehensive Plans
 - City of Forest Acres 2018 Comprehensive Plan
- Other Plans
 - Richland County Community Development Block Grant Mitigation (CDBG-MIT) Action Plan 2020As

3. Regional Physical, Demographic and Economic Characteristics for the Central Midlands

3.1 Physical Setting and Location

The Central Midlands region, located near the geographical center of the State, is comprised of the four-county area of Fairfield, Lexington, Newberry, and Richland. The region is 76 miles wide and 64 miles long, covering an approximate area of 2,885 square miles and accounting for nine percent of the State's total area (Table 3).

Table 3 - Area extent of the four counties comprising the Central Midlands region.

County	Area – in Acres	Area – in Square Miles
Fairfield	453,996	709.37
Lexington	484,672	757.30
Newberry	413,966	646.82
Richland	493,513	771.11
Total	1,846,147	2884.60

The Central Midlands region is located approximately equidistant between the Blue Ridge Mountains and the Atlantic Coast. It boasts a diverse geomorphological regime, falling within two broad physiographic provinces: the Southern Piedmont and the Atlantic Coastal Plain. In the Midlands, the Coastal Plain can be further divided into the Carolina-Georgia Sandhills and the Southern Coastal Plain.

The Southern Piedmont has gently undulating to rolling land surfaces that are bisected by numerous streams, typically with dendritic drainage patterns. The Piedmont terrain in the Midlands has gently to moderately steep slopes. The elevations range from 300 feet above Mean Sea Level (MSL) near the Coastal Plain to 810 feet above MSL at the top of Little Mountain in Newberry County. The uppermost portions of Lexington and Richland Counties and all of Fairfield and Newberry Counties are within the Southern Piedmont area.

The remainder of the region, with the exception of the southernmost portion of Richland County, is considered Carolina-Georgia Sandhills. This area is characterized by excessively drained sand with gentle to moderate slopes. The elevations range from approximately 250 to 300 feet above MSL. The lowest portion of Richland County is considered Southern Coastal Plain. Elevations normally occur in the 100 to 270 feet range; the lowest occurring in the Congaree Swamp with an elevation of 80 feet above MSL. The topography is gently sloping.

Climate in the Central Midlands is humid and subtropical, with long, hot summers and short, mild winters. On average, temperatures range in Columbia from 32°F to 55°F degrees in January and from 70°F to 92°F in July. The state receives, on average, 49 inches of precipitation annually, mostly as rain.

3.2 Hydrologic Features

The Central Midlands region is bisected north-to-south by the Broad and Congaree Rivers (Figure 3). Meeting west of the capitol city of Columbia, the rivers run for approximately 103 miles and delineate much of the county boundaries. They are considered significant drivers of economic development and tourism.

Other rivers of significant impact in the region are the Saluda, Enoree, Wateree, and North Fork of the Edisto Rivers. The Saluda River feeds into Lake Murray, a man-made freshwater reservoir that covers approximately 50,000 acres of land. Located on the northwest fringe of the Columbia urban area, it provides up to 207 MW of hydroelectric power to the region and is an important potable water source.

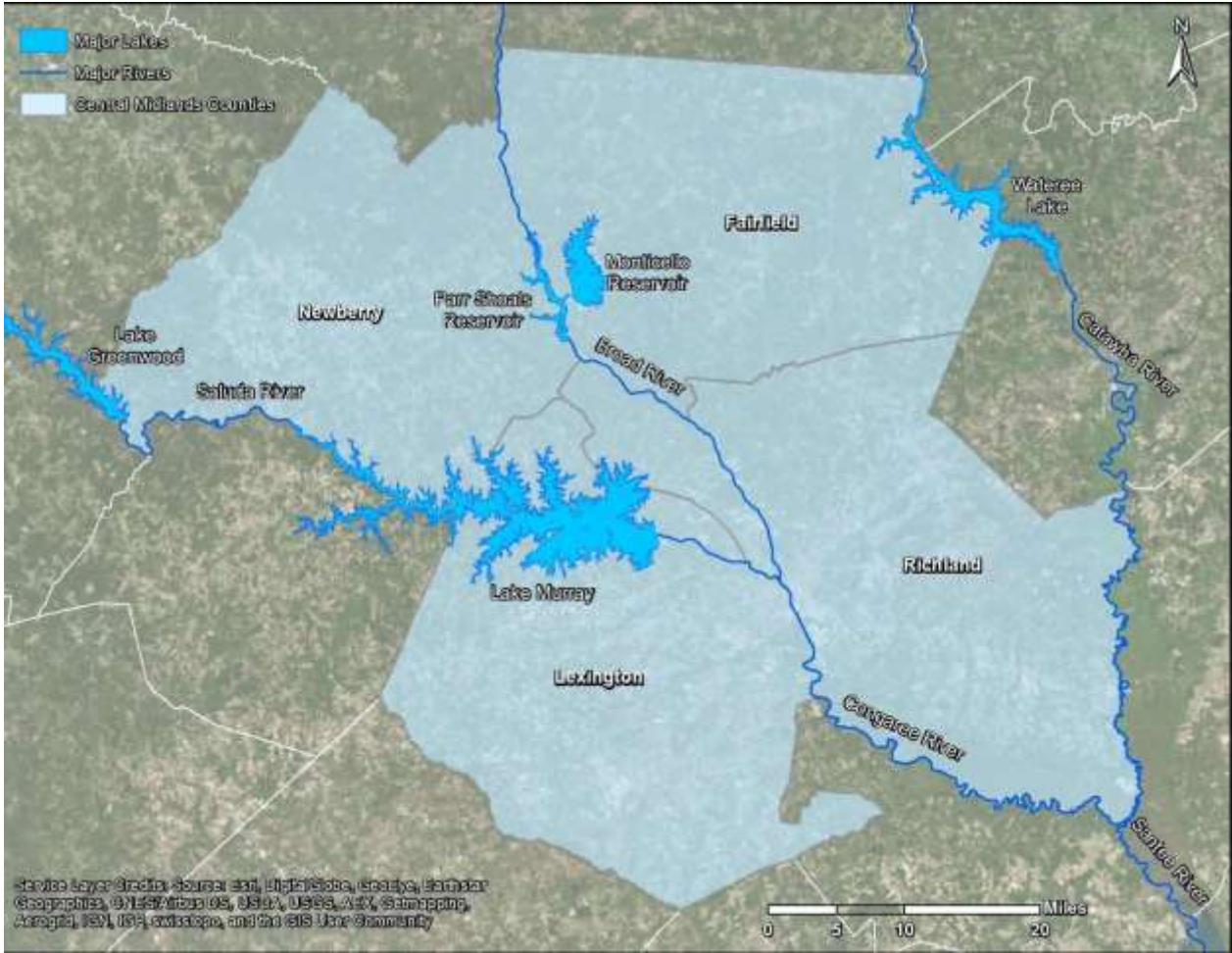


Figure 3 - Major rivers in the Central Midlands region.

Additional lakes include Lake Greenwood, the southeastern tip of which touches the western extremity of Newberry County. Lake Wateree, another reservoir, was created on the eastern edge of Fairfield County by damming the Wateree River. Lake Monticello has been constructed on a tributary to the Broad River in western Fairfield County, serving as a reservoir to the V.C. Summer Nuclear Power Plant.

3.3 Land Use and Land Cover

Land Use and Land Cover (LULC) is the typical term utilized to bundle landscape classifications. *Land cover* refers to the natural physiographic and ecological features present in a landscape. It is typically defined as the unaltered biophysical cover on the earth's surface¹. *Land use*, in contrast, refers to the utilization and possible alteration of land cover for various socioeconomic purposes². Land cover guides the kind of land use that is environmentally and economically feasible in an area, but socio-economic and political factors tend to determine what kind of land use takes place³.

LULC classifications, such as forest land cover or urban land use, can have significant impacts on hazard mitigation planning. For example, large areas of impervious surfaces, typically related with urban land use, can increase flooding risk by decreasing the rate of water infiltration⁴. On the other hand, forest land

¹ (Gregorio & Jansen, 1998)

² (Eurostat, 2001)

³ (Turner et al., 1995)

⁴ (Alberti et al., 2007)

cover can help with reducing flooding risk by serving as a buffer between urbanized areas⁵. Certain LULC compositions, along with other geographical features, may significantly impact the implementation of emergency management and natural hazard mitigation actions.

Table 4 shows the distribution of LULC classes for each county, utilizing the U.S. Department of Agriculture National Land Cover Database (NLCD) classification system⁶. According to this 2016 dataset, the Central Midlands region is considered mostly forested (51.8%). Fairfield County is the single most heavily forested county in the state, with approximately 616.3 mi² (86.9%) of the county area considered forested or some type of vegetative cover. A relatively small proportion of the Central Midlands region is dedicated to urban land use (13.9%); with Lexington and Richland counties more urbanized than Fairfield and Newberry counties. Please refer to the US EPA for more information on the NLCD classification system⁷.

There are extensive federal land holdings in the region. Ft. Jackson, encompassing approximately 82 mi² lies within the City of Columbia jurisdictional boundaries. The Enoree Division of the Sumter National Forest in Newberry and Fairfield Counties comprise 88.4 mi² in Newberry County and 17.3 mi² in Fairfield County. Important state owned recreational areas in the region are the 0.5 mi² Dreher Island Recreational Area on Lake Murray in Newberry County, the 2.2 mi² Sesquicentennial State Park, the 34.6 mi² Congaree Swamp National Park, and the 3.4 mi² Harbison State Forest.

Table 4 - Land Use and Land Cover Distribution in the Region. Source: NLCD 2016.

Land Use and Land Cover Type	County Land Use and Land Cover Area (Square Miles/Percentage)									
	Fairfield		Lexington		Newberry		Richland		Region Totals	
Open Water	25.9	3.7%	60.1	7.9%	17.3	2.7%	16.3	2.1%	119.6	4.1%
Urban; Open Space	25.4	3.6%	73.0	9.6%	29.9	4.6%	66.7	8.6%	195.1	6.8%
Urban; Low Intensity	5.8	0.8%	56.6	7.5%	9.6	1.5%	61.1	7.9%	133.0	4.6%
Urban; Med. Intensity	1.3	0.2%	21.6	2.8%	2.1	0.3%	30.1	3.9%	55.1	1.9%
Urban; High Intensity	0.9	0.1%	6.8	0.9%	0.7	0.1%	9.6	1.2%	18.0	0.6%
Barren Land	2.0	0.3%	5.3	0.7%	1.2	0.2%	2.7	0.3%	11.1	0.4%
Deciduous Forest	61.7	8.7%	36.0	4.7%	46.3	7.2%	35.0	4.5%	178.9	6.2%
Evergreen Forest	351.5	49.5%	168.7	22.3%	268.4	41.5%	185.1	24.0%	973.6	33.7%
Mixed Forest	104.2	14.7%	59.0	7.8%	101.4	15.7%	78.2	10.1%	342.8	11.9%
Shrub/Scrub	35.3	5.0%	50.6	6.7%	31.3	4.8%	16.2	2.1%	133.4	4.6%
Grassland/Herbaceous	48.5	6.8%	47.4	6.3%	29.1	4.5%	58.1	7.5%	183.1	6.3%
Pasture/Hay	31.3	4.4%	71.9	9.5%	80.1	12.4%	23.7	3.1%	207.1	7.2%
Cultivated Crops	0.8	0.1%	43.8	5.8%	12.2	1.9%	35.1	4.6%	91.8	3.2%
Woody Wetlands	14.6	2.1%	55.1	7.3%	16.7	2.6%	147.3	19.1%	233.8	8.1%
Emergent Herbaceous Wetlands	0.5	0.1%	1.8	0.2%	0.6	0.1%	6.1	0.8%	9.1	0.3%

The spatial distribution of LULC classes has a significant impact on ecosystem and human behavior (Figure 4). For example, urban settlements in the region tend to congregate near water sources. The negative impacts of urban land use on water sources (e.g. increased sedimentation and pollution) increase the closer a development is to water. Roads and highways fragment forest ecosystems, which have been shown to be significant factor in habitat disruption.

⁵ (Zhang & Schilling, 2006).

⁶ (Homer, Fry, & Barnes, 2012)

⁷ (Dewitz, J., National Land Cover Database (NLCD) 2016, 2019)

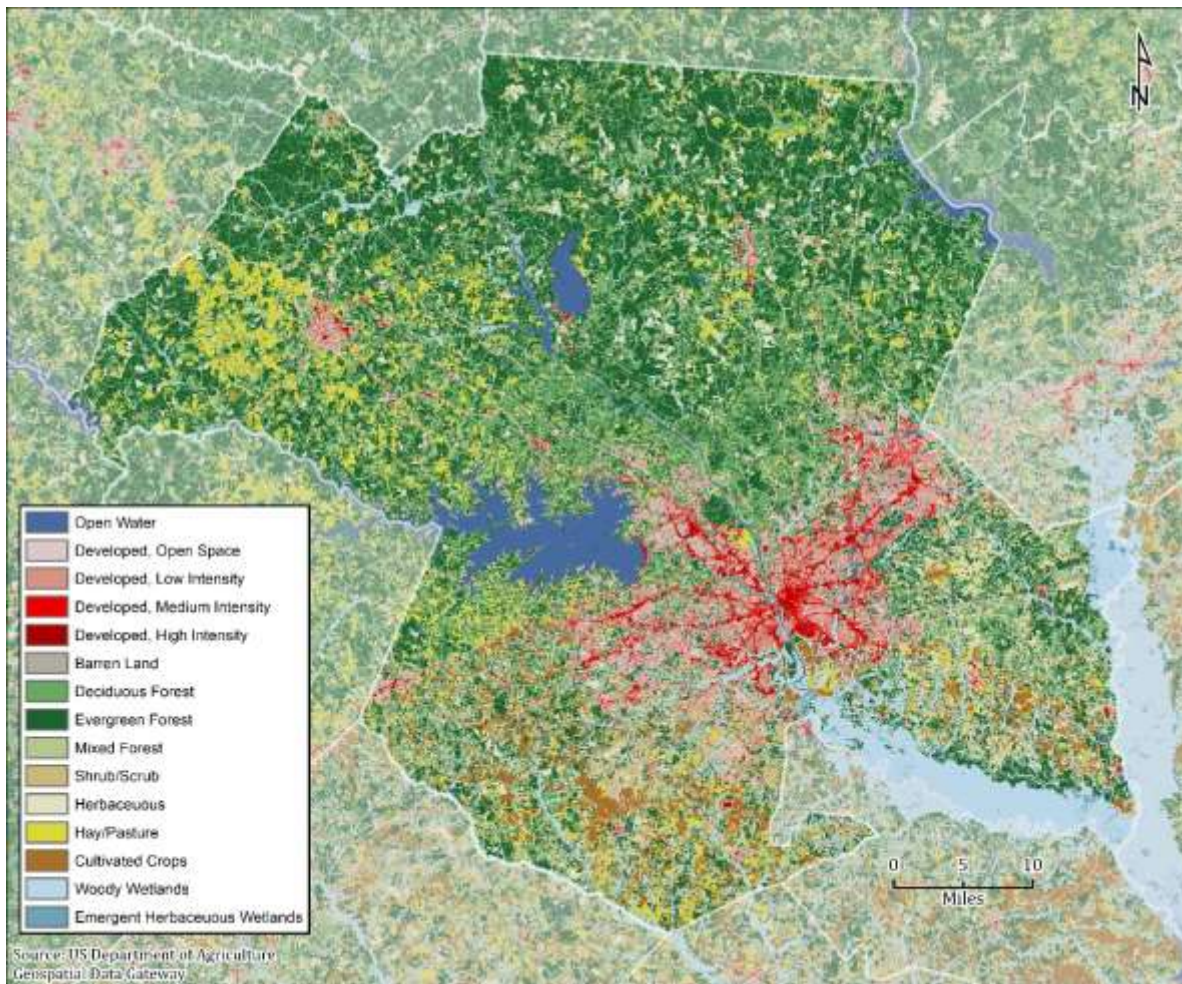


Figure 4 - Land Use and Land Cover Distribution Map for the Central Midlands Region. Source: NLCD 2016.

3.4 Demographic and Economic Trends⁸

A) Population Distribution Estimates

The Central Midlands region represents a mayor population center within the state. According to U.S. Census Bureau 2018 American Community Survey (ACS) 5yr estimates, the regional population is around 755,359, a 4.2% increase from the 2014 ACS 5yr estimate data utilized in the 2016 HMP. Around 15% of the state population resides in the Central Midlands, a continuing trend since the 2010.

The population distribution tends to be similar to the state-wide distribution. As seen from the population pyramids (Figure 5 and Figure 6), which illustrates age and gender distributions, the region has higher teenage and young adult population (from the 15 to 34 year old cohorts), which makes up 30.4% in the

⁸ This section portrays demographic, housing and economic information for the Central Midlands region. Unless otherwise noted, these data were acquired from the U.S. Census Bureau American Community Survey (ACS). In contrast with the decennial census, the ACS is a rolling survey that samples 5% of the population every year. While the margin of error for the yearly ACS is higher than in a decennial census, the Census Bureau utilizes these data to generate five year estimates. The population data for the region utilized in this HMP comes from the 2013 - 2018 ACS five year estimates to better correspond with the natural hazard data time periods

region's population (compared to 26.8% state-wide). The region has a slightly lower elderly population (65 years old and over cohorts) of 12.0% (compared to 14.7% for the state).

County specific distributions and trends are fairly similar (Table 5). Richland County is the most populous county in the region. The estimated population for the county is 408,263, or 8.2% of State population. Lexington County continues to experience steady population growth. At an estimated population of 286,316 residents, Lexington County currently has 5.7% of the State population. Populations in Lexington and Richland counties showed a net population increase of 5.6% and 3.6%, respectively, during the time period of 2014 to 2018.

Newberry County, with 38,068 residents, had a slight population increase of 1.2% in the time period of 2014 to 2018. In contrast, with 22,172 residents, Fairfield County continues a slow, but currently steady, trend of population decrease of 2.9% in the same time period. Fairfield County and Newberry County currently host 0.5% and 0.8% of the State population, respectively. The racial composition of the Central Midlands region is estimated at around 56% White, 34% Black or African American, 5% Hispanic or Latino and 2% Asian, with other groups such as American Indians making up 2% or less of the total regional population. This is a continuing trend from the 2014 5yr estimates.

But county-specific distributions, as seen in Table 5, display variations to this trend. Lexington and Newberry Counties have primarily White populations, and also have proportionally higher Hispanic populations than the rest of the region. Richland and Fairfield Counties have majority Black or African American populations. Asian populations are currently concentrated between Lexington and Richland Counties. Other minorities are evenly spread out throughout all counties, in proportion to their estimated population. As some of these county estimates meet Title VI Limited English Proficiency communication requirements, this is an important rubric to account where it relates to communicating hazard mitigation actions to residents.

Table 5 - Central Midlands region estimated population demographic distribution. Source: Census ACS 2018 5yr estimates.

Race	Fairfield County		Lexington County		Newberry County		Richland County	
Hispanic or Latino	471	2.1%	16,998	5.9%	2,797	7.3%	20,733	5.1%
White alone	8,629	38.0%	215,302	75.2%	22,808	59.9%	174,911	42.8%
Black or African American	12,710	56.0%	41,302	14.4%	11,997	31.5%	188,510	46.2%
American Indian and Alaska Native	58	0.3%	742	0.3%	162	0.4%	660	0.2%
Asian	74	0.3%	5,019	1.8%	61	0.2%	11,416	2.8%
Native Hawaiian and Other Pacific Islander	0	0.0%	275	0.1%	9	0.0%	477	0.1%
Some other race	0	0.0%	363	0.1%	66	0.2%	1,267	0.3%
Two or more races	770	3.4%	6,315	2.2%	168	0.4%	10,289	2.5%
Total Population	22,712		286,316		38,068		408,263	

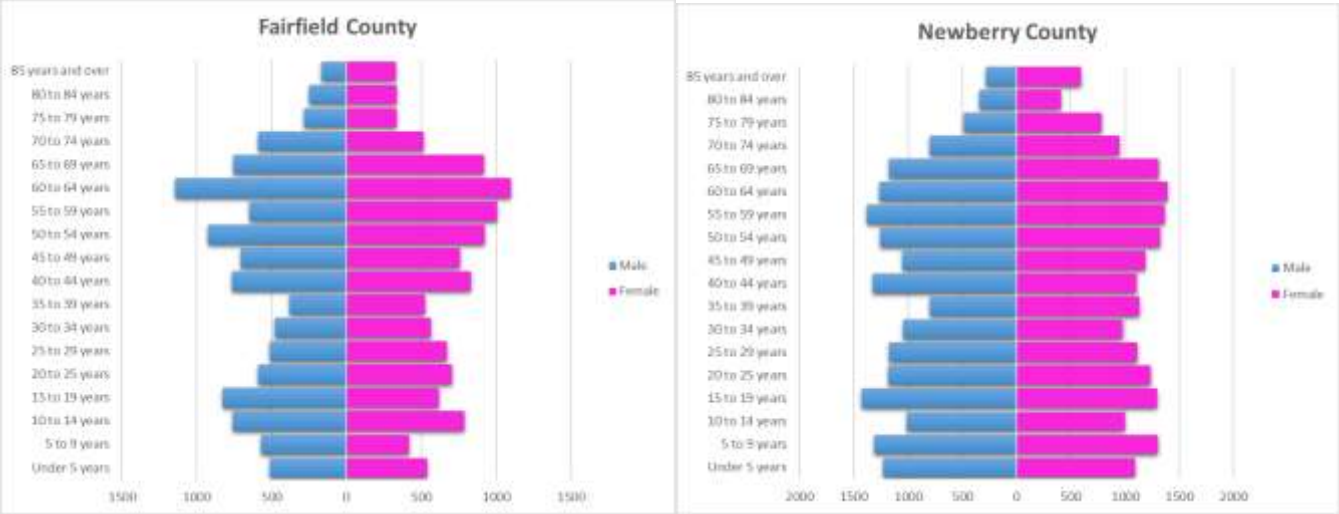


Figure 5 - Population Estimates for Fairfield and Newberry Counties. Source: Census ACS 2018 5yr Estimates.

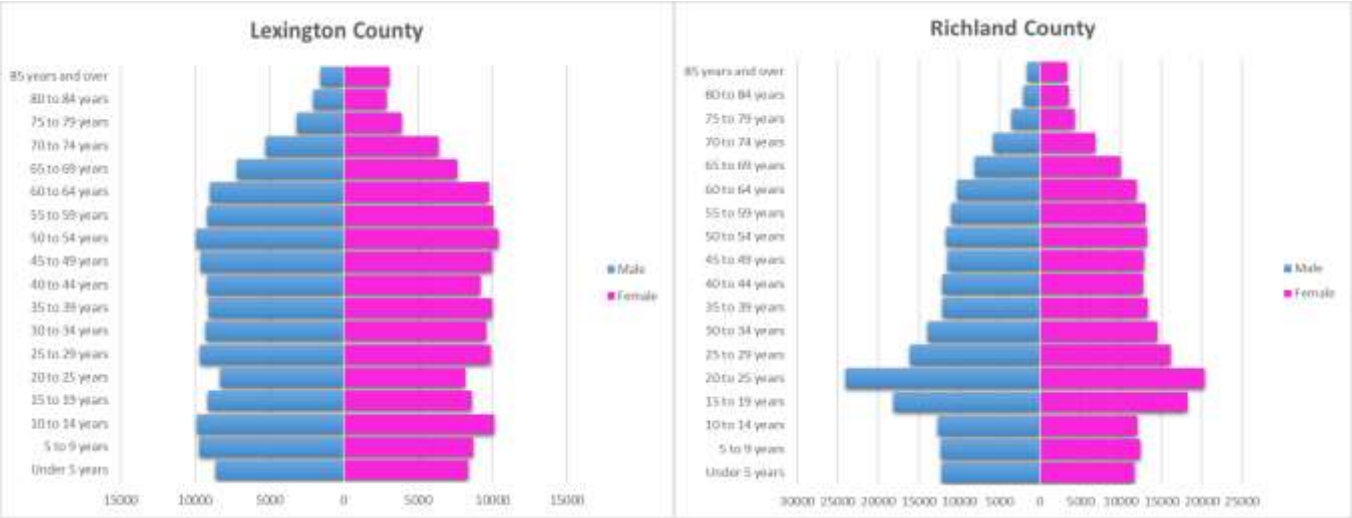


Figure 6 - Population Estimates for Lexington and Richland Counties. Source: Census ACS 2018 5yr Estimates.

B) Education

The region has several public and private higher education institutions, such as Piedmont Technical College (with over 700 students in Newberry County), Midlands Technical College (over 10,000 students in the region) and Benedict College (over 16,000 students). The University of South Carolina system is a significant influence in the Columbia metro area, and has over 30,000 students throughout the state.

The educational attainment of residents in the region has steadily increased in the past decades. The percentage of residents with less than 9th grade education has decreased from 9.1% to 4.0%. About 84% of residents have a high school degree or higher (State average: 85.0%, Table 6). Females in the region tend to have a higher proportion of graduate or professional degrees than males.

County-specific distributions show differences in education attainment, but general steady improvement since the 2014 ACS 5y estimates. Fairfield and Newberry Counties have a higher proportion of residents with less than 9th grade education (5.5% and 6.6%, respectively), compared to Lexington and Richland Counties (3.5% and 2.7%, respectively). Lexington and Richland Counties also have a larger proportion of higher education attainment (bachelor's degree or higher) than Fairfield and Newberry Counties, and higher than the South Carolina estimates, as shown in Table 6.

Table 6 - Central Midlands Region Education Attainment Estimates for population 25 y/o and older.

Source: Census ACS 2018 5yr estimates.

Education Attainment	Fairfield County	Lexington County	Newberry County	Richland County	South Carolina
Less than 9 th Grade	5.5%	3.5%	6.6%	2.7%	4.2%
High School Graduate or Higher	82.5%	89.6%	81.0%	91.1%	87.1%
Bachelor's Degree or Higher	17.0%	30.1%	17.1%	37.7%	27.4%

C) Economic and Employment Information

According to U.S. Census Bureau ACS 2018 5yr estimates, regional household income has been steadily increasing since the 2014 ACS 5yr estimates (Table 7), the data utilized in the 2016 HMP update. Income generally kept up or ahead of the cumulative inflation rate in the time period from 2014 to 2018 (i.e. 6.1%), with Newberry County being the biggest exception. This effectively reduced the spending power of Newberry County residents in that time period. Neither County's income kept up with statewide income trends, ranging from 16% to 28% lower than South Carolina median, mean, or per capita income. Lexington and Richland County, in contrast, was 3% to 14% higher than statewide income trends.

Table 7 - Median, Mean, and Per Capita Income for Central Midlands counties and South Carolina, including percent change since the 2014 ACS. Source: U.S. Census Bureau 2018 ACS 5yr estimates.

Income	Fairfield County	Lexington County	Newberry County	Richland County	South Carolina
Median*	\$36,294 (+0.2%)	\$59,593 (+9.1%)	\$42,765 (+1.9%)	\$53,922 (+9.7%)	\$51,015 (+11.7%)
Mean*	\$54,010 (+8.7%)	\$76,343 (+10.6%)	\$57,692 (+3.3%)	\$73,371 (+10.1%)	\$70,093 (+12.7%)
Per Capita*	\$22,527 (+6.8%)	\$30,316 (+10.9%)	\$23,344 (+5.4%)	\$29,010 (10.7%)	\$27,986 (+13.5%)

The Columbia metro area is the largest urban complex in the region and hosts the state capital, which contributes to the higher socioeconomic status in Richland and Lexington Counties. Table 8 shows the civilian workforce of 16 years and older according to U.S. Census 2018 5yr ACS estimates. According to these estimates, Richland County had a labor force of 209,230 people, followed by Lexington County with 147,214, Newberry County at 17,729 and Fairfield County at 9,361. Fairfield and Newberry Counties experienced small decreases in total civilian labor force since the 2014 ACS (-11.4% and -1.3%, respectively), while Lexington and Richland Counties experienced small increases (+3.6% and +4.2%, respectively).

According to U.S. Census 2018 ACS 5yr estimates, Fairfield County had the highest civilian unemployment rate at 7.9%, followed by Newberry and Richland Counties, with 7.2% and 6.8% unemployment, respectively. Lexington County experienced the lowest unemployment rate in the State, with 5.7% compared to the statewide 6.4% unemployment rate. The same dataset shows that South Carolina has an estimated 16% of its population living in poverty. Lexington County's poverty rate was 12.7%, while Fairfield County had the highest rate at 22.9%. Newberry and Richland Counties fall in between these extremes, at 18.7% and 16.3%, respectively.

Table 8 shows county workforce estimates according to 2018 ACS 5yr estimates, including comparisons to 2014 ACS data used in the 2016 HMP. Since, the regional workforce has increased by about 24,500 people, or a 6.8% increase. Regionally, *Production, Transportation, and Material Moving* occupations experienced the most growth (i.e. +22.6%), followed by *Management, Business, Science and Art* occupations (i.e. +7.7%), then *Service* occupations (i.e. +5.5%), then *Natural Resource, Construction, and Maintenance* occupations (i.e. +1.3%), with *Sales and Office* occupations had a slight workforce reduction (i.e. -0.4%).

Table 8 - Civilian Employed Population Over 16 years of Age for the Region, including percent change since the 2014 ACS.
Source: Census ACS 2018 5yr estimates.

Occupations	Fairfield County		Lexington County		Newberry County		Richland County	
Management, business, science, and arts	2,101	(-10.1%)	51,945	(10.2%)	3,948	(-8.3%)	75,650	(7.4%)
Service	1,903	(10.8%)	20,992	(4.0%)	3,131	(17.2%)	36,588	(5.0%)
Sales and office	1,907	(11.4%)	32,900	(-4.5%)	3,399	(-5.9%)	48,316	(2.3%)
Natural resources, construction, and maintenance	874	(-33.0%)	14,349	(0.5%)	2,213	(-4.2%)	11,255	(6.1%)
Production, transportation, and material moving	1,841	(-9.9%)	18,666	(23.4%)	3,768	(12.2%)	23,173	(26.3%)
Total Employed	8,626	(-3.0%)	138,852	(6.6%)	16,459	(2.3%)	194,982	(7.9%)

D) Population Projections

Population projections provide stakeholders with demographic trends in their particular jurisdictions, guiding planning and policy decisions. Values in this section were provided by CMCOG, which created its own set of population projections for the region. Information on the methodology of this dataset can be found in the "Central Midlands Region Population Projection Report 2020-2050"⁹. Table 9 shows population projections by county in five-year intervals up to the year 2050.

The Census Bureau ACS 2018 5yr estimates show a population estimate related to the analysis period of this Plan update. The projections were made with data from the decennial Census. As the decennial Census is meant to be a population wide survey, and not an estimate like the ACS, it more accurately reflects actual population values and projections. Projections are still "best guess" assumptions, reflecting past observations from the previous decennial Census and their accuracy depending on how future events unfold. Figure 7 presents the geographic distribution of this population growth by Census tract.

According to this report, Lexington County is expected to experience the greatest percentage of growth (39.6%) over the next 25 years. This is followed by Richland County (30.1%), Newberry County (15.0%) and Fairfield County (6.8%). The Central Midlands region is projected to have a population increase of 35.1%, adding around 475,000 people to the region, totaling nearly 1,365,000 residents by the year 2050. Figure 7 shows 2050 population projection maps for all counties in the Central Midlands region.

⁹ (CMCOG, 2018)

Table 9 – County Population Counts, Estimates, and Projections. Source: Census ACS 2018 5yr Estimates, CMCOG.

County	2018 ACS Estimates	2025 Projection	2030 Projection	2035 Projection	2040 Projection	2045 Projection	2050 Projection
Fairfield	22,347	25,085	25,321	25,576	25,865	26,501	26,924
Lexington	298,750	350,852	386,044	424,979	468,910	520,278	581,135
Newberry	38,440	42,663	44,362	45,984	47,401	48,822	50,251
Richland	415,759	494,141	532,702	571,854	613,854	658,841	706,818
Total	775,296	887,681	988,429	1,068,393	1,156,030	1,254,442	1,365,128

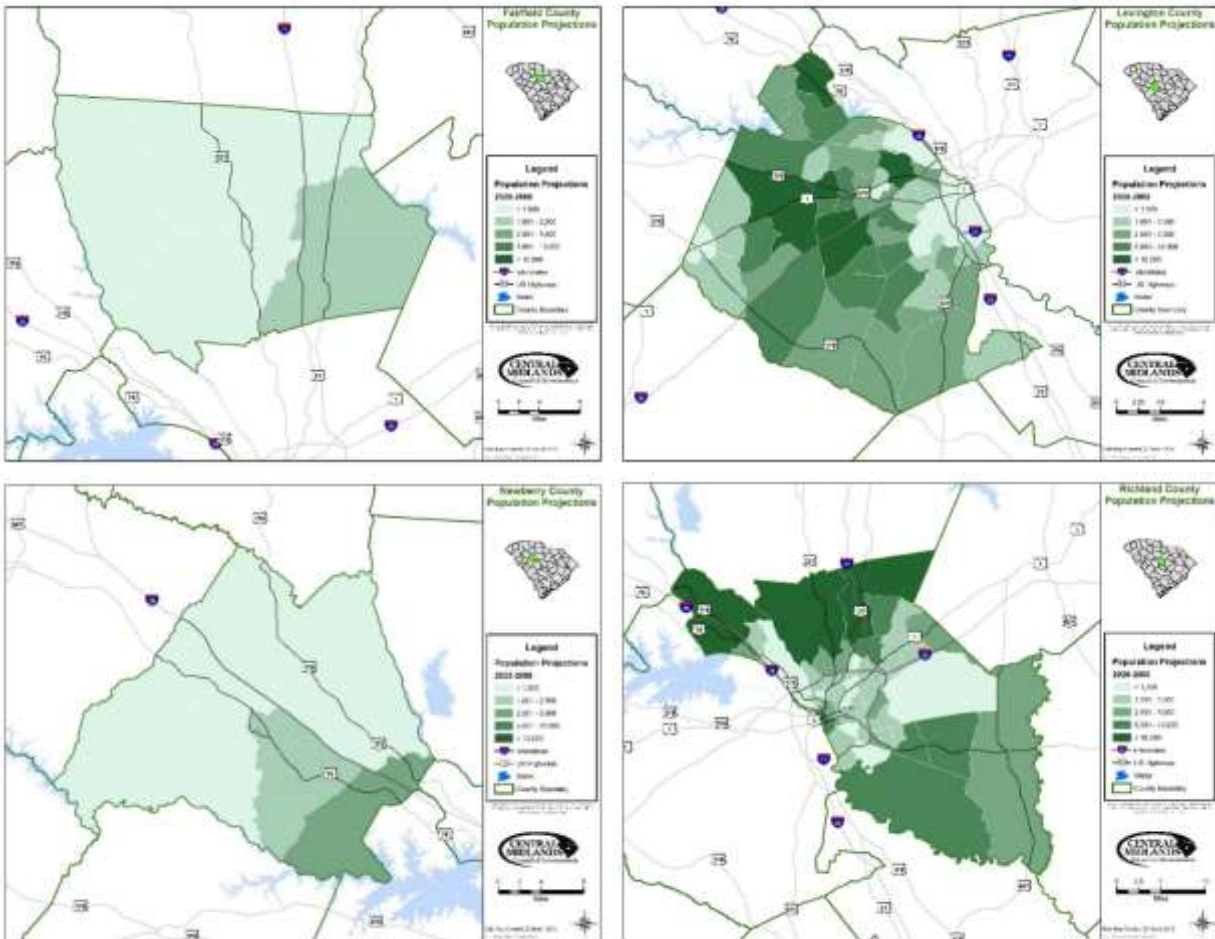


Figure 7 - 2050 Population Projection Estimates by Census Tract. Source: CMCOG.

4. Fairfield County

4.1 Historical Hazard Assessment for Fairfield County

This section addresses
FEMA HMP requirement
201.6(c)(2)(i)

Summary of Historic Impacts

Fairfield County experiences an array of natural hazards. Prior to the 2015 flash flood disaster, tornadoes posed the highest risk to Fairfield County. Flood damage used to rank low. Heat and drought pose serious threats to the county that are difficult to capture in loss figures or maps since their impacts tend to be vastly underreported (lack of data, secondary and/or prolonged effects on agriculture, public health, etc.). The most frequent hazards in Fairfield County are cold and thunderstorms (incl. lightning, hail, and wind). While thunderstorm, lightning, wind and hail damage is non-catastrophic, their cumulative impact and high frequency is still significant (around \$12.75 million, 38 people injured/killed, 26%). When overlaying the risk from all hazards, western and central Fairfield County exhibits the highest level of risk (Figure 8).

In the future, the frequency and possible damage from thunderstorms and other meteorological and hydrological hazards is very likely to increase. Based on climate projections, it is anticipated that the number of cold days and perhaps also winter storms will decrease (Table 10).

Table 10 - Summary of natural hazards and their impacts on Fairfield County since 1960 (adj. to 2019 USD).

	Direct Losses (Property and Crop)	Total USDA Crop Indemnity Payout****	Direct Injuries and Fatalities	# Of Loss- Causing Events	Frequency	Recurrence Interval (in years)	Future Changes
Flooding	\$2,244,852	n/av	0	27	5%	0.19	▲
Hurricane	\$12,679,061	n/av	0	8	0.9%	1.1	▲
Tornadoes	\$5,464,397	n/av	27	14	1.8%	0.56	▲
Thunderstorm	\$1,729,127**	\$8,594	2	127	26%	0.04	▲
Lightning	\$325,420	n/av	11	41	1.1*	<0.05 days*	▲
Wind	\$5,217,611	n/av	12	164	7.2%	0.14	▲
Hail	\$5,461,144	n/av	13	54	2.4%	0.41	▲
Fog	n/av	n/av	n/av	n/av	0.06%*	17 days*	◄►
Winter Storm	\$21,703,596***	n/av	13	87	0.77%	1.3	▼
Cold*****	\$14,852,528	\$1,420	4	41	60%	0.02	▼
Heat	\$12,746,647	\$3,197	1	8	20%	0.05	▲
Drought	\$16,069,921	\$20,531	0	16	.58%	1.7	▲
Wildfire	\$419,611	n/av	0	4	0.04%*	11 days*	▲
Earthquake	0	n/av	0	0	<0.05%	20	◄►
TOTAL	\$84,061,387	\$33,742	79	550			

*daily frequency/recurrence calculations instead of years

**coastal storms combined with thunderstorms/severe storms

***no 2004 ice storm losses reported by NWS

****hazards with n/av have no event records that resulted in USDA Crop Indemnity Payouts

*****cold hazard totals already included in winter storm totals

▲ indicates that future increase in occurrence and/or impacts is likely

▼ indicates that future decrease in occurrence and/or impacts is likely

◄► indicates that either no change in future occurrence or impacts is expected or that a determination of future changes cannot be made.

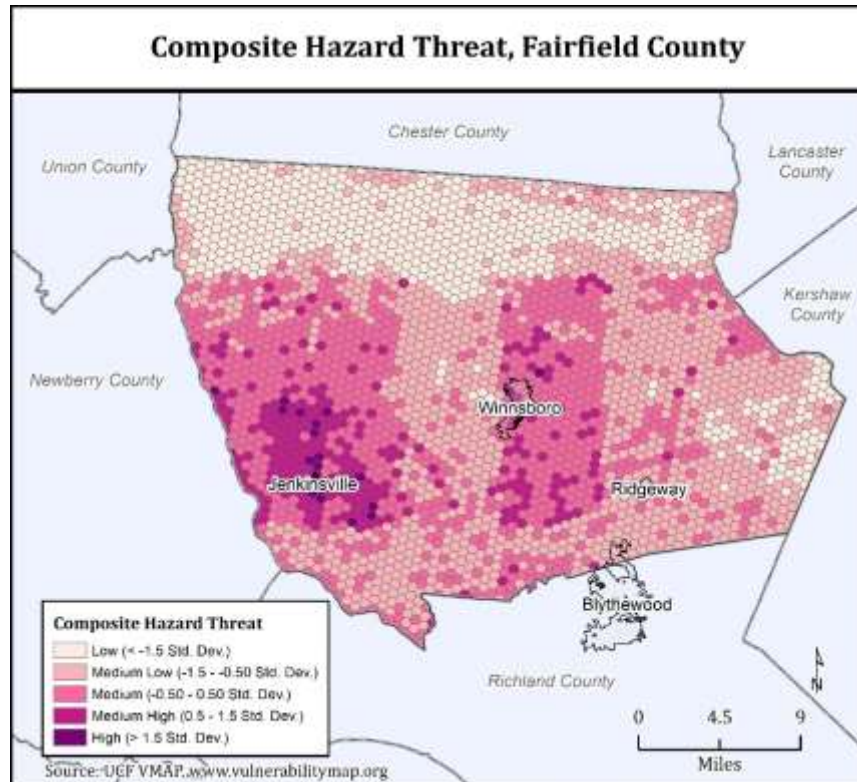


Figure 8 - Comprehensive risk profile of Fairfield County.

A) Flooding

What to expect: Flood damage in Fairfield County is mostly the result of localized heavy precipitation leading to flooding along smaller creeks and tributaries to the Broad and Catawba Rivers as well as flash flooding due to ponding and/or inadequate drainage (Table 11). Virtually every building in Fairfield County is at some risk from flash flooding due to drainage issues and ponding. While most buildings are not at risk from flood waters reaching first floor levels, many homes may, however, experience flooded crawl spaces, driveways, etc. or experience secondary problems such as mold issues. In addition, the 2015 floods revealed a high risk from small pond dam failures—particularly when simultaneous and cascading dam failures occur in the same watershed.

Geographic Extent: Flooding in Fairfield County is not restricted to the 100-year and 500-year floodplains (Figure 10). Based on past occurrences, Fairfield County is very susceptible to flash flooding in low-lying areas and areas downstream from small dams. The Flash Flood Potential Index identifies areas north of Jenkinsville, east of Winnsboro, and north of Ridgeway as having a higher risk of flash flooding (Figure 11).

Prior to the record-breaking event of October 2015, statistics for Fairfield County were as following:

Number of Loss-Causing Events:	27
Frequency of Occurrence:	5%
Recurrence Interval:	69 days
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	2008 - 2018
Loss Events on Record:	1960 - 2019
Flood-related Presidential Disaster Declarations:	DR-4241 (2015)
Total Losses:	\$2,244,852

Total Fatalities:	0
Deadliest Event:	n/av
Most Property Damage:	\$546,700 (October 4, 2015)
Most Crop Damage:	\$546,700 (October 4, 2015)
Highest USDA Crop Indemnity Payout:	n/av*

*No flooding events caused a USDA Crop Indemnity Payout

October 1-5, 2015 (DR-4241)^{10*}:

Over a five-day period, an upper low-pressure system combined with the remnants of Hurricane Joaquin streamed tropical moisture into South Carolina (Figure 9). Fairfield County experienced a record-setting 5-day rainfall total of up to 14.5 inches in Longtown¹¹. This record rainfall caused catastrophic flash flooding and countless road and bridge closures. Fairfield County received both individual and public assistance funding through FEMA. Overall damage estimates range from \$1 billion¹² to \$12 billion¹³ for the entire impact area in South Carolina. Richland County received both individual and public assistance funding through FEMA.



Figure 9 - Total rainfall amounts for the 2015 flood event. Source: NWS.

^{10*} Note: The historic record for all hazards in this plan covers the time period from 1960 through 2014. An exception is flooding. Given the catastrophic, and record-setting devastation from the 2015 floods, an event narrative was included since many of the proposed flood mitigation actions in this plan are an outgrowth of this recent disaster.

¹¹ NWS, 2015. Historic rainfall and flooding, October 2015. Available at <http://www.weather.gov/cae/HistoricFloodingOct2015.html>

¹² NOAA National Centers for Environmental Information, 2016. Billion-Dollar Weather and Climate Disasters. Available at <http://www.ncdc.noaa.gov/billions/events>

¹³ Burris, Roddie. SC Floods' Damage: \$12 billion, Economists say. *The State* [Online], Columbia, SC, December 1, 2015 Available at <http://www.thestate.com/news/local/article47471060.html>

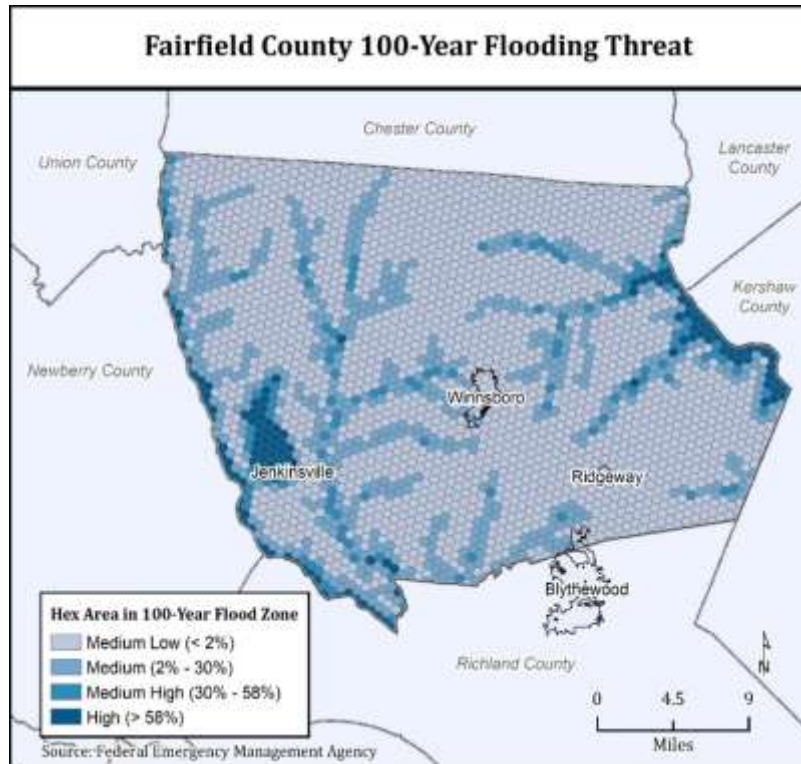


Figure 10 - Flood threat in Fairfield County.

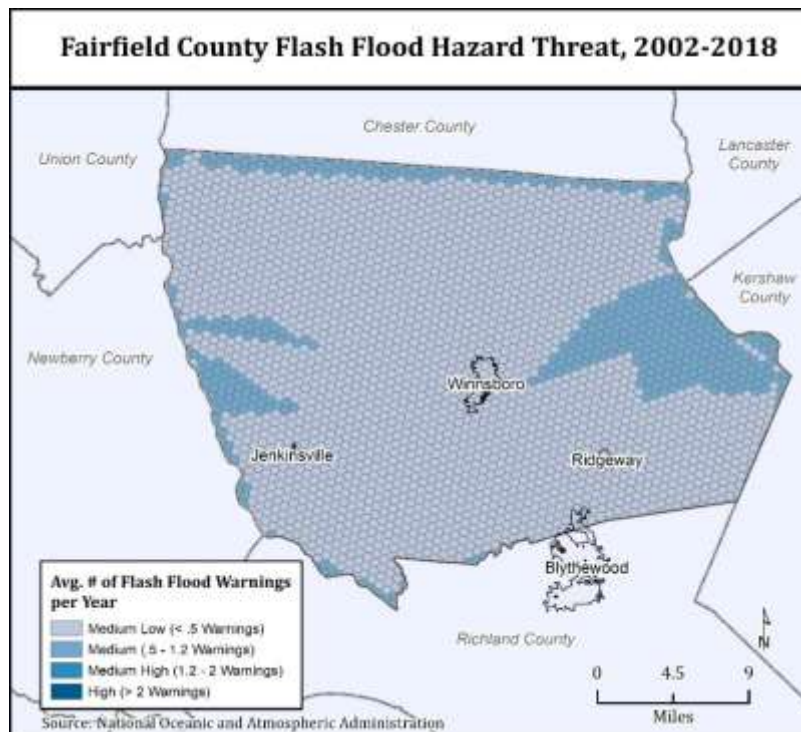


Figure 11 - Flash flood threat in Fairfield County.

Table 11 - Record of loss-causing flood events in Fairfield County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag.* (in.)	Location	Description
3/1/1964	3/31/1964	0	0	\$909	\$909		Statewide	Flooding
3/1/1966	3/5/1966	0	0	\$8,694	\$8,694		Statewide	Flooding
12/14/1972	12/17/1972	0	0	\$1,409	\$1,409		Northern 2/3rds of SC	Heavy Rains & Flooding
2/3/1973	2/3/1973	0	0	\$6,344	\$6	1-3"	Statewide	Flooding
6/8/1973	6/25/1973	0	0	\$10,063	\$1,006,347		Southern & Central SC	Heavy Rains & Flooding
6/16/1973	6/22/1973	0	0	\$1,006	\$101		Central, Northern, & Eastern SC	Heavy Rains & Flash Flooding
3/12/1975	3/18/1975	0	0	\$5,236	\$524		Statewide	Heavy Rains & Flooding
7/13/1975	7/18/1975	0	0	\$669	\$66,903		Eastern & Central SC	Rain & Flooding
10/17/1975	10/17/1975	0	0	\$1,853	\$0		Northwestern SC	Rains & Flash Flooding
10/9/1976	10/19/1976	0	0	\$49,506	\$49,506		Statewide	Flood
1/25/1978	1/26/1978	0	0	\$43,204	\$4	2-4"	Statewide	Wind & Flash Flood
1/26/1978	1/31/1978	0	0	\$4,320	\$0		Statewide	Flooding
3/15/1980	3/31/1980	0	0	\$3,419	\$3,419		Statewide	Flood
8/8/1980	8/8/1980	0	0	\$3,419	\$342		Statewide	Wind & Flood
1/1/1982	1/14/1982	0	0	\$610	\$61		Along Saluda, Broad, Congaree, Wateree, Lynches, & PeeDee Rivers	Flooding
4/27/1982	4/27/1982	0	0	\$707	\$0		Central, Northeastern, & Eastern SC	Lightning & Flooding
3/17/1983	3/17/1983	0	0	\$28,282	\$2,828		Statewide	Flooding, Severe Storm, & Wind
12/6/1983	12/6/1983	0	0	\$3,336	\$33		Western, Northern, & Central SC	Wind & Flood
2/27/1984	2/27/1984	0	0	\$2,711	\$27		Statewide	Rain, Wind, & Flood
7/26/1984	7/26/1984	0	0	\$2,711	\$27		Statewide	Rain, Wind, & Flood
11/22/1985	11/22/1985	0	0	\$201	\$0		SCZ003	Flash Flooding
8/7/1988	8/7/1988	0	0	\$110	\$0		Winnsboro	Urban Flooding
1/1/1993	1/31/1993	0	0	\$19,494	\$389,893		Statewide	Flooding
8/26/2008	8/26/2008	0	0	\$6,018	\$0		Winnsboro	The remnants of Tropical Storm Fay moved through the area and produced severe weather and flooding.
12/25/2009	12/25/2009	0	0	\$12,080	\$0	2-5"	Mitford	Heavy rain from a Gulf Flow across the Midlands and Pee Dee region causing considerable areal flooding and some flash flooding.
10/4/2015	10/4/2015	0	0	\$546,700	\$546,700		Salem XRDS	Flash Flooding
12/30/2015	12/30/2015	0	0	\$4374	\$0		Winnsboro	Flash Flooding

*No magnitude information indicates flood height or rainfall amounts were unavailable.

B) Hurricanes & Tropical Cyclones

What to expect: Every property and person is at risk from hurricane-force winds and associated heavy rainfall and tornadoes in Fairfield County. Hurricane and tropical storms affect Fairfield County about every year. The county is at risk from hurricane-force winds as experienced during Hurricane Hugo as well as associated heavy rainfall, flash flooding, and tornadoes (Figure 12, Table 12). While direct wind damage to property is unlikely, property and infrastructure damage due to falling trees as well as power outages are highly likely.

Geographic Extent: Based on past occurrences, the entire county is susceptible to the impacts of tropical cyclones. It is important to note that the frequency and impact calculations below exclude the damage from wind, lightning, and tornadoes because they are reported separately.

Tropical cyclone statistics for Fairfield County are as following:

Number of Loss-Causing Events:	8
Frequency of Occurrence:	0.9%
Recurrence Interval:	1.11 years
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Hurricane-related Presidential Disaster Declarations:	DR-843 (1989) DR-1566 (2004) DR-4286 (2016) DR-4346 (2017)
Total Losses:	\$12,679,061
Total Fatalities:	0
Deadliest Event:	N/A
Most Property Damage:	\$1,044,978 (September 22, 1989)
Most Crop Damage:	\$10,449,777 (September 22, 1989)
Highest USDA Crop Indemnity Payout:	n/av*

*No hurricane/tropical storm events caused a USDA Crop Indemnity Payout

Hurricane Hugo (September 22, 1989; DR-843): Hurricane Hugo was the most damaging hurricane in South Carolina's history. It made landfall north of the Charleston Harbor as a Category 4 storm with a storm surge of 15-20 feet. Due to its rapid forward motion, relatively large size, hurricane force winds affected inland counties including Fairfield County. The county experienced high winds and excessive rain that led to widespread damage to properties and infrastructure due to falling trees. Many areas lost power for several days.

Tropical Storm Frances (September 7, 2004; DR-1566): The storm system caused high winds and caused a widespread tornado outbreak. The high winds uprooted trees and caused power outages and damaged properties—particularly mobile homes.

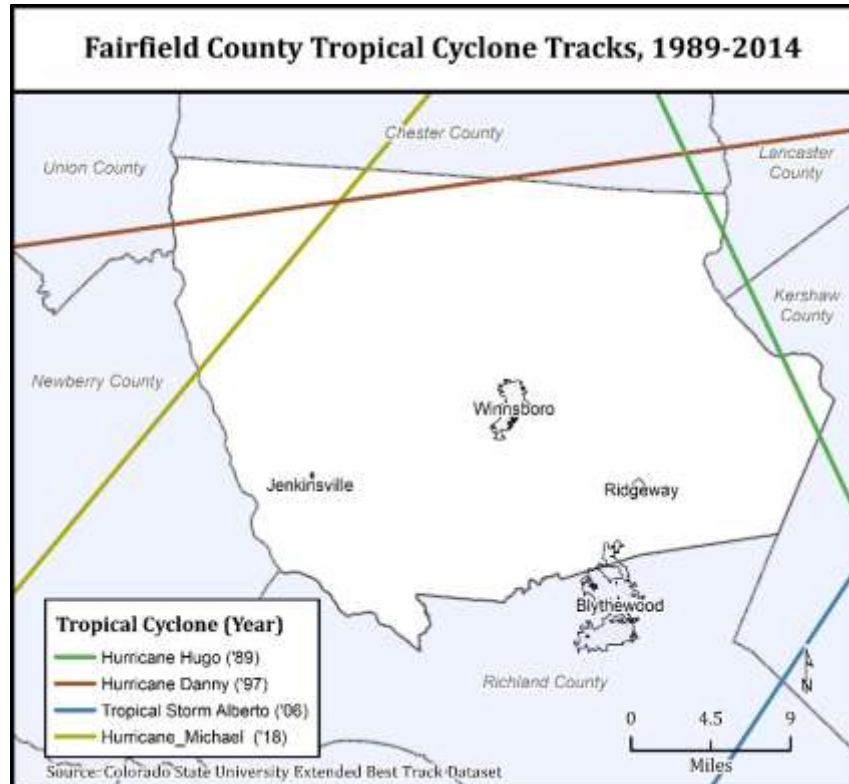


Figure 12 – Historical tropical cyclone tracks in Fairfield County.

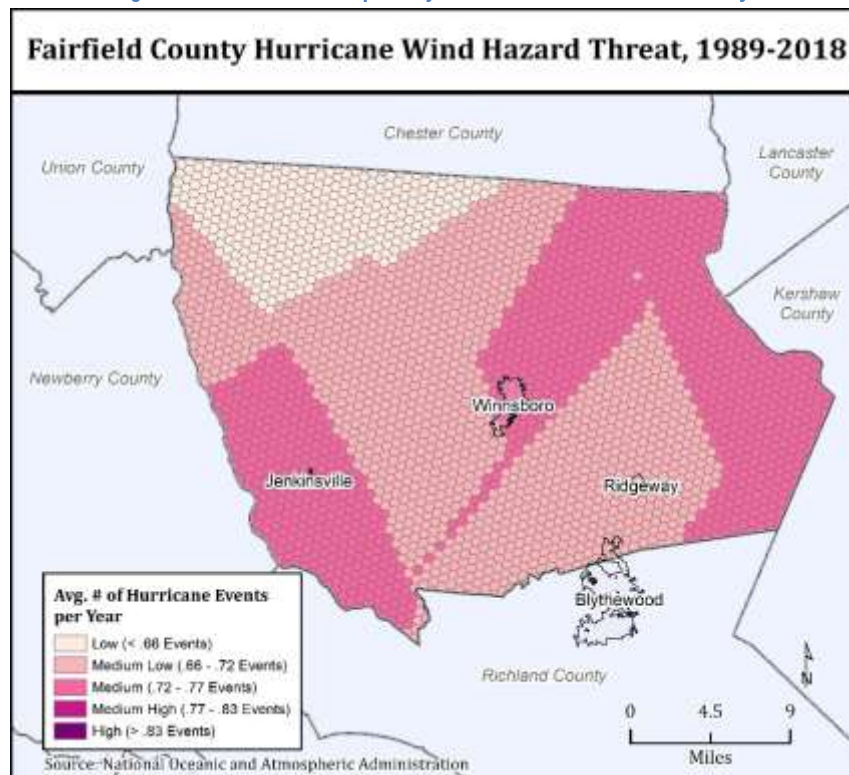


Figure 13 - Hurricane wind threat in Fairfield County.

Table 12 - Record of loss-causing tropical cyclone events in Fairfield County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag.	Location	Description
8/29/1964	8/31/1964	0	0	\$9,087	\$9,087	TS	Statewide	Tropical Storm Cleo
9/12/1964	9/13/1964	0	0	\$909	\$909	TS	Statewide	Tropical Storm Dora
6/7/1968	6/8/1968	0	0	\$809	\$81	TS	Statewide	Tropical Storm Abby
6/20/1972	6/21/1972	0	0	\$674	\$6739	TD	Statewide	Tropical Depression Agnes
9/4/1979	9/5/1979	0	0	\$776,005	\$0	TS	East & Central SC	Hurricane David
8/28/1988	8/28/1988	0	0	\$3,319	\$3,319	TS	Eastern & Central SC	Tropical Storm Chris
9/22/1989	9/22/1989	0	0	\$1,044,978	\$10,449,777	Cat. 1	Eastern Portions of SC	Hurricane Hugo
8/24/1995	8/28/1995	0	0	\$369,762	\$3,697	TS	Statewide	Tropical Storm Jerry

C) Tornadoes

What to expect: Every property and person is at risk from tornadoes in Fairfield County, though the western-most and northeastern areas of the county has traditionally experienced more tornado warnings (Figure 15). Low magnitude tornadoes are not uncommon in Fairfield County with twisters occurring every six months. The area has experienced intense (EF3 and higher) tornadoes affecting densely populated areas (Figure 14). Fairfield County is not only at risk from tornadoes spawned by severe thunderstorms but also from outbreaks associated with tropical systems as seen during Tropical Storm Frances.

Geographic Extent: Based on past occurrences, the entire county is susceptible to tornadoes. Tornado statistics for Fairfield County are as following:

Number of Loss-Causing Events:	14
Frequency of Occurrence:	1.8%
Recurrence Interval:	0.56 years
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Severe weather-related Presidential Disaster Declarations:	DR-700 (1984)
Total Losses:	\$5,464,397
Total Fatalities:	3
Deadliest Event:	2 fatalities (March 28, 1984)
Most Property Damage:	\$2,078,557 (March 28, 1984)
Most Crop Damage:	\$2,078,557 (March 28, 1994)
Highest USDA Crop Indemnity Payout:	n/av

*No tornado events caused a USDA Crop Indemnity Payout

March 28-29, 1984 (DR-700): The Carolinas Outbreak of March 28, 1984, was one of the deadliest, most destructive tornado outbreaks in the history of the two Carolinas. The weather situation that produced this outbreak had strong parallels to the 1925 Tri-State Tornado Outbreak in that the tornadoes tracked along with the center of a strong low-pressure system. The statistics of this outbreak were staggering and perhaps unprecedented in the history of North or South Carolina. The final count showed 24 individual tornadoes touched down: 11 in North Carolina, 11 in South Carolina, and 2 in Georgia. The human impact included 57 fatalities, (42 in North Carolina, 15 in South Carolina, none in Georgia) and 1,248 injuries (799 in North Carolina, 448 in South Carolina, and 1 in Georgia)¹⁴.

¹⁴ NWS Wilmington, 2014. Carolinas Tornado Outbreak: March 28, 1984. Available at <http://www.weather.gov/ilm/C CarolinasOutbreak>

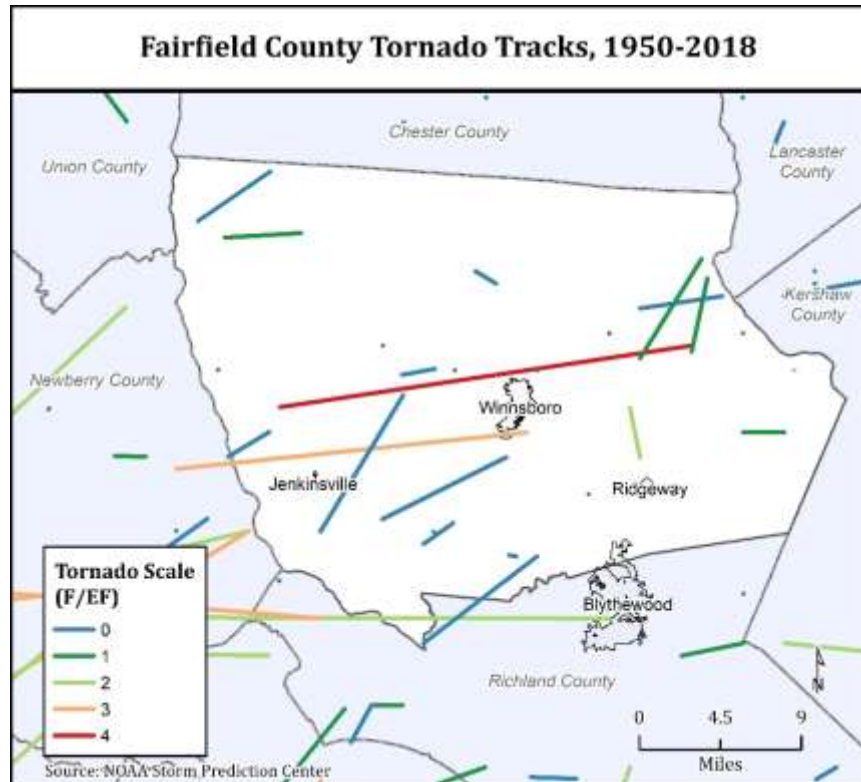


Figure 14 – Historical Tornado Tracks in Fairfield County.

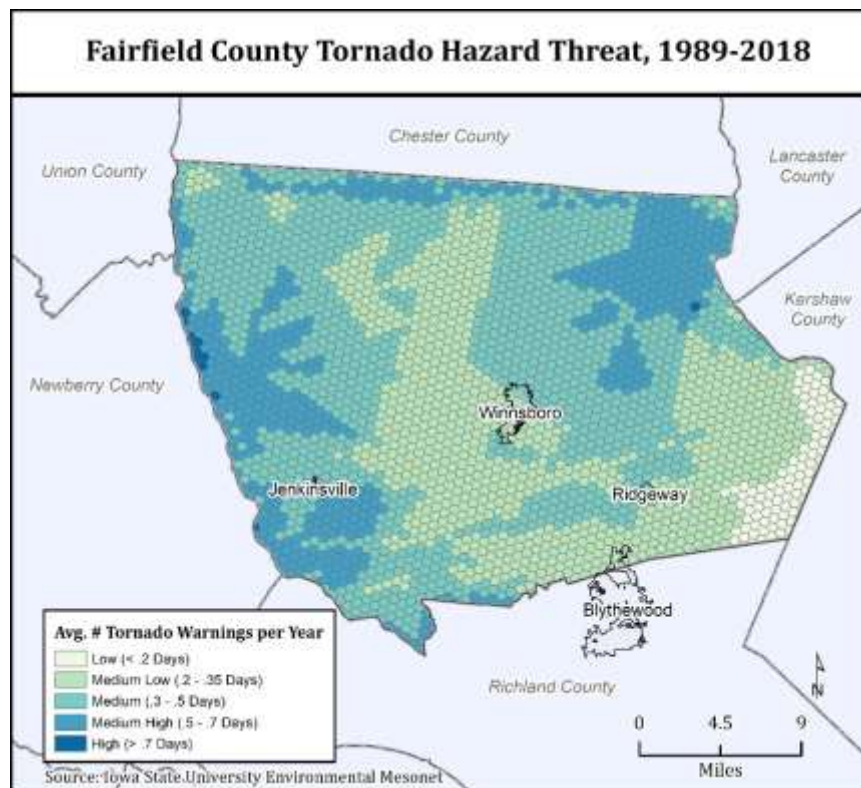


Figure 15 - Tornado risk in Fairfield County.

Table 13 - Record of loss-causing tornado events in Fairfield County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag.	Location	Description
3/6/1983	3/6/1983	0	0	\$1,301	\$130	F1	Fairfield Co.	
3/28/1984	3/28/1984	5	0	\$311,784	\$311,785	F3	Null	
3/28/1984	3/28/1984	0	6	\$2,078,557	\$2,078,557	F4	Null	
5/4/1993	5/4/1993	0	0	\$8,967	\$90	F0	Fairfield Co.	
1/6/1995	1/6/1995	0	0	\$170,049	\$0	F1	Ridgeway	
3/16/1996	3/16/1996	0	0	\$3,303	\$0	F0	Ridgeway	An F0 tornado touched down near I-77 and Hwy 34 causing damage to a roof on a home and taking down trees.
8/12/2004	8/12/2004	0	0	\$411,574	\$0	F1	Longtown	
9/27/2004	9/27/2004	13	1	\$0	\$0	F2	Ridgeway	
6/11/2007	6/11/2007	0	0	\$43,746	\$0	EF0	White oak	Pulse storms produced penny to golf ball size hail across much of the CWA and covered the ground in portions of Lancaster County. Downburst winds also took down some trees and power lines. An EF0 tornado touched down in the White Oak area of Fairfield County with one large tree crushing two vehicles.
8/26/2008	8/26/2008	0	0	\$6,018	\$0	EF0	Shelton	The remnants of Tropical Storm Fay moved through the area and produced severe weather and flooding.
5/4/2009	5/4/2009	0	0	\$4,832	\$0	EF0	Lebanon	Cluster thunderstorms produced large hail and strong winds over portions of the Midlands. A supercell moved in from the foothills across the north Midlands and produced a couple of small tornadoes.
3/28/2010	3/28/2010	0	0	\$0	\$4,754	EF0	Rion	Several supercell thunderstorms moved through the CSRA and Midlands and spawned several tornadoes. Many homes were damaged in Lexington County with several others in Edgefield County. Numerous trees were also taken down.
5/3/2010	5/3/2010	0	0	\$5,942	\$11,885	EF1	Shelton	An isolated storm produced an EF1 tornado in Northwestern Fairfield County. Many trees were taken down and minor damage was done to a home.
4/28/2013	4/28/2013	0	0	\$11,125	\$0	EF0	Ridgeway	A small tornado briefly touched down in Fairfield County just northeast of Ridgeway taking down trees and damaging a few homes and cars.

D) Thunderstorms

What to expect: Every property and person is at risk from severe thunderstorms in Fairfield County. Severe thunderstorms are a common occurrence in Fairfield County with 5 to 13 severe thunderstorm warnings issued annually by the local NWS forecast office (Figure 16). The Midlands see on average up to 12 days per year with rainfall amounts of 1 inch or more, 30 days per year with rainfall between ½ inch and 1 inch, and about 70 days per year with rainfall amounts of less than ½ inch¹⁵. Prior to the 2015 flash flood disaster, the daily rainfall record stood at 7.77 inches (July 10, 1959). Thunderstorms are complex and associated with different hazards: lightning, wind, rain, and/or hail. To understand the full impact of severe thunderstorms, the impacts of thunderstorms, wind, hail, and lightning should be considered jointly (Table 14).

Geographic Extent: Based on past occurrences, the entire county is susceptible to thunderstorms. The central region of Fairfield County is more likely to experience thunderstorm warnings, as well as the northern border of the county.

¹⁵ SCDNR, n/d. South Carolina Climate. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/cli_sc_climate.php

It is important to note that the frequency and impact calculations below exclude damage from wind, lightning, and hail since they are reported separately—although in a meteorological sense they are tied together. Thunderstorm statistics for Fairfield County are as following:

Number of Loss-Causing Events:	127
Frequency of Occurrence:	26.17%
Recurrence Interval:	0.04 years
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	\$1,729,127*
Total Fatalities:	0
Deadliest Event:	n/a
Most Property Damage:	\$65,501 (June 10, 1982)
Most Crop Damage:	\$503,174 (June 8, 1973)
Highest USDA Crop Indemnity Payout:	\$3,318 (May 1, 2013)

*Damage is split equally by hazard type

March 28-29, 1984 (DR-700): see Tornado section

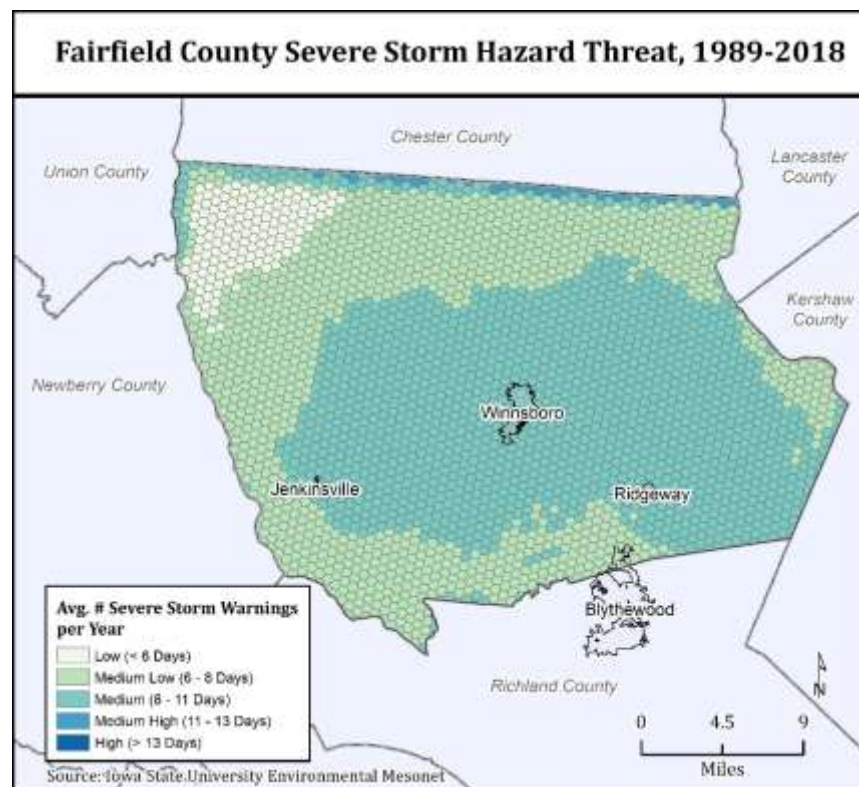


Figure 16 - Severe storm threat in Fairfield County.

Table 14 - Record of loss-causing thunderstorm events in Fairfield County since 1960 (adj. to 2019 USD).

Begin Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)	Location	Description
2/24/1961	2/24/1961	0	0	\$1,131	\$0	0.08"	Western & Central SC	Wind & Rain
7/18/1964	7/19/1964	0	0	\$38,183	\$0	4.18"	Winnsboro	Rainstorm
9/30/1964	10/1/1964	0	0	\$15,273	\$15,273	0.46"	Midlands &	Rainstorm

Begin Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)	Location	Description
							Central Plains	
10/4/1964	10/6/1964	0	0	\$83,007	\$83,007	3.56"	Statewide	Rainstorm
10/15/1964	10/16/1964	0	0	\$0	\$8,300	4.85"	Statewide	Rainstorm
6/8/1965	6/16/1965	0	0	\$0	\$81,689	4.95"	Statewide	Locally Heavy Rains
2/13/1966	2/13/1966	0	0	\$794	\$0	0.87"	Statewide	Wind & Rain
8/20/1967	8/25/1967	0	0	\$77,042	\$770	3.69"	Statewide	Rain
1/9/1968	1/13/1968	0	0	\$116,359	\$12		Northern 2/3rds SC	Rain, Sleet, & Freezing Rain
3/15/1971	3/15/1971	0	0	\$635	\$0	0.42"	Statewide	Thunderstorms & High Wind
6/8/1973	6/25/1973	0	0	\$10,063	\$1,006,347		Southern & Central SC	Heavy Rain
1/25/1975	1/25/1975	0	0	\$478	\$0	2.54"	Statewide	Squall Line
7/14/1975	7/14/1975	0	0	\$64	\$6	3.35"	Western & Central SC	Wind & Rain
3/31/1977	3/31/1977	0	0	\$42	\$0	0.38"	Statewide	High Winds & Heavy Rains
9/7/1977	9/7/1977	0	0	\$1,627	\$16	0.02"	Mountains of Northwestern SC	Heavy Rain
9/7/1977	9/7/1977	0	0	\$424	\$42	0.02"	Statewide	Thunderstorms, High Winds, & Heavy Rain
10/1/1977	10/1/1977	0	0	\$150	\$0	-	Northwestern SC	Thunderstorms & High Wind
12/5/1977	12/5/1977	0	0	\$42	\$0	0.19"	Statewide	Thunderstorm
4/13/1978	4/13/1978	0	0	\$1,296	\$0	1.06"	Northeastern SC	Severe Thunderstorm
6/10/1982	6/10/1982	1	0	\$327,505	\$327,505		Western, Eastern, Northern, & Central SC	Severe Squall Line, Wind, & Rain
12/3/1983	12/4/1983	0	0	\$4,570	\$457	1.11"	Western & Central SC	Wind & Heavy Rain
12/28/1983	12/28/1983	0	0	\$7,427	\$0	0.65"	Central	Severe Storm & Wind
7/25/1984	7/25/1984	0	0	\$124,713	\$1,247		Central SC	Heavy Thunderstorms, Wind, & Heavy Rain
8/6/1988	8/6/1988	0	0	\$109,533	\$0	0.05"	Winnsboro	Severe Storm & Wind
2/21/1989	2/21/1989	0	0	\$19,091	\$0	1.26"	Central & Eastern SC	Thunderstorm
6/16/1989	6/16/1989	0	0	\$104,498	\$0		Fairfield Co.	Thunderstorm Winds
7/30/2002	7/30/2002	0	0	\$10,527	\$0	-	Blair	Severe Storm, Thunderstorm, & Wind
6/24/2015	6/24/2015	0	0	\$131,208	\$0		Central SC	Severe Storm & Wind
4/7/2015	4/7/2015	0	0	\$6,560	\$0		Strother	Sheriff reported trees down near the Broad River Bridge on SC Hwy 34.
6/1/2015	6/1/2015	2	0	\$0	\$0		Mitford	DOT reported several trees down in Mitford along Hwy 200.
6/24/2015	6/24/2015	0	0	\$131,208	\$0		Ft. Wagener	EM reported that a turkey farm on Ashford Ferry Road had 3 barns severely damaged.
6/24/2015	6/24/2015	0	0	\$4,374	\$0		Anderson Quarry	Sheriff reported trees down on Landis and Kennedy Roads.
6/30/2015	6/30/2015	0	0	\$547	\$0		Ridgeway	Highway Patrol reported a tree down at the Peach Road exit ramp off I-77 southbound.
7/2/2015	7/2/2015	0	0	\$3,280	\$0		Flint Hill	Dispatch reported trees down along

Begin Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)	Location	Description
								White Oak Church Road.
7/2/2015	7/2/2015	0	0	\$3,280	\$0		Flint Hill	Dispatch reported trees down along Old River Road.
7/2/2015	7/2/2015	0	0	\$2,187	\$0		Winnsboro Mills	Dispatch reported trees down along 9th Street in Winnsboro Mills.
7/19/2015	7/19/2015	0	0	\$10,934	\$0		Salem XRDS	Highway Patrol reported numerous trees down on Highway 215 and many side roads in the northwest part of the county and around Blair.
7/19/2015	7/19/2015	0	0	\$547	\$0		Woodward	Highway Patrol reported a tree down on Lewis Store Road near Old Douglas Road near the community of Blackstock.
8/6/2015	8/6/2015	0	0	\$2,187	\$0		Winnsboro	DOT reported several trees down in Winnsboro.
9/4/2015	9/4/2015	0	0	\$3,280	\$0		Douglass	Dispatch reported trees down on Old Douglass Road.
9/4/2015	9/4/2015	0	0	\$2,187	\$0		Adger	Highway Patrol reported trees down on Old Airport Road.

Notes: Hail, lightning, and wind damage are listed in their respective sections. Post 1989, only hail, wind, and lightning were reported by the NCEI (formerly NCDC)

E) Lightning

What to expect: Every property and person is at risk from lightning in Fairfield County. Lightning occurs very frequently in Fairfield County averaging a strike per day. While Fairfield County does not experience a thunderstorm every day, the fact that a single thunderstorm produces hundreds of lightning strikes—each of which is counted in the statistic below—results in high frequency and recurrence figures. Similar to the pattern of thunderstorm risk, most lightning strikes (cloud-to-ground) occur in the eastern part of the county (Figure 17). House fires and personal harm are common with lightning.

Geographic Extent: Based on past occurrences, the entire county is susceptible to lightning strikes. There appears to be a higher propensity for severe weather and therefore lightning strikes in the eastern part of the county.

Lightning statistics for Fairfield County are as following:

Number of Loss-Causing Events:	41
Frequency of Occurrence:	1.1%
Daily Recurrence Interval:	0.95 days
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2018
Total Losses:	\$325,420
Total Fatalities:	2
Deadliest Event:	1 fatality (several instances)
Most Property Damage:	\$65,501 (June 10, 1982)
Most Crop Damage:	\$65,501 (June 10, 1982)
Highest USDA Crop Indemnity Payout:	n/av*

*No lightning events caused a USDA Crop Indemnity Payout

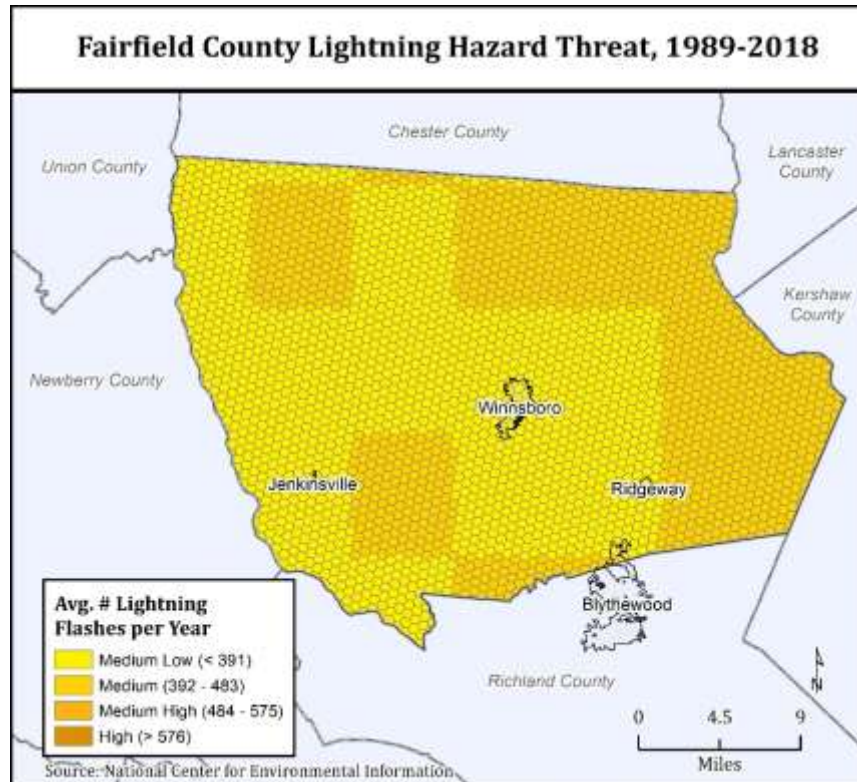


Figure 17 - Lightning threat in Fairfield County.

Table 15 - Record of loss-causing lightning events in Fairfield County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
7/12/1962	7/12/1962	2	1	\$0	\$0	Winnsboro	Electrical
7/19/1965	7/19/1965	0	0	\$894	\$89	Statewide	Lightning & Wind
8/27/1965	8/27/1965	0	0	\$894	\$0	Statewide	Severe Lightning
5/11/1973	5/11/1973	1	0	\$1,824	\$1,824	Northern SC from Spartanburg County eastward to Horry County	Wind, Rain, & Electrical
5/20/1973	5/20/1973	0	0	\$1,390	\$13,897	Northern & Northeastern SC	Wind, Rain, & Electrical
5/28/1973	5/29/1973	1	0	\$1,081	\$1,081	Western & Northern SC	Wind & Electrical
8/4/1973	8/4/1973	0	0	\$162	\$16	Midlands & Southern SC	Wind & Electrical
8/29/1973	8/29/1973	0	0	\$146	\$15	Northwestern & Midlands SC	Wind, Rain, & Electrical
12/13/1973	12/13/1973	0	0	\$11	\$108	Northern & Western SC	Lightning
3/21/1974	3/21/1974	1	0	\$5,714	\$571	Statewide	High Wind & Electrical
3/29/1974	3/29/1974	0	0	\$6,258	\$6,258	Northern, Eastern, & Central SC	Wind & Electrical
4/8/1974	4/8/1974	0	0	\$7,301	\$7	Northern, Western, & Central SC	Wind & Electrical
4/8/1974	4/8/1974	0	0	\$105	\$0	Central SC	Wind & Electrical
8/4/1974	8/4/1974	0	0	\$0	\$188	Northeastern SC	Rain & Lightning
8/13/1974	8/13/1974	0	0	\$1,195	\$119	Central SC	Lightning & Wind
3/7/1975	3/7/1975	0	0	\$688	\$0	Northwestern, Central, & Northeastern SC	Lightning & Wind
3/24/1975	3/24/1975	1	0	\$5,236	\$52	Statewide	Lightning & Wind

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
5/10/1975	5/10/1975	0	0	\$13,381	\$133,806	York to Bamberg & Spartanburg to Oconee & Anderson	Hail, Wind, & Lightning
5/15/1975	5/15/1975	0	0	\$5,236	\$52	Statewide	Lightning & Wind
6/15/1975	6/15/1975	0	0	\$708	\$708	Northern & Central SC	Lightning & Wind
6/18/1975	6/18/1975	0	0	\$52	\$5,236	Statewide	Lightning & Wind
6/19/1975	6/19/1975	0	0	\$892	\$892	Northern & Western SC	Lightning & Wind
7/4/1975	7/4/1975	0	0	\$6,881	\$68,814	Northern & Central SC	Lightning & Wind
7/24/1975	7/24/1975	0	0	\$688	\$0	Western, Central, & Northern SC	Lightning
8/27/1975	8/27/1975	0	0	\$6,338	\$63	Northern, Northeastern, & Central SC	Lightning, High Winds, & Thunderstorms
6/29/1976	6/29/1976	0	0	\$12,652	\$13	Northwestern & Northern SC	Lightning
7/26/1976	7/27/1976	0	0	\$1,752	\$175	Northwestern SC	Lightning, Wind, & Rain
7/29/1976	7/29/1976	0	0	\$1,752	\$18	Northwestern SC	Lightning, Wind, & Rain
10/9/1976	10/9/1976	0	0	\$6,326	\$63	Central & Eastern SC	Lightning & Wind
6/6/1977	6/6/1977	0	0	\$465	\$4,648	Statewide	Lightning & Wind
7/14/1977	7/14/1977	0	0	\$4,648	\$46	Statewide	Lightning & Wind
5/12/1979	5/12/1979	2	1	\$0	\$0	Monticello & Fairfield County	Lightning
4/26/1982	4/27/1982	0	0	\$29	\$29	Statewide	Thunderstorm, Wind, Lightning
4/27/1982	4/27/1982	0	0	\$707	\$0	Central, Northeastern, & Eastern SC	Lightning & Flooding
6/10/1982	6/10/1982	0	0	\$327,505	\$327,505	Western, Northern, Central, & Eastern SC	Lightning, Rain, & Wind
7/25/1983	7/25/1983	0	0	\$2,828	\$28	Statewide	Lightning & Wind
8/21/1983	8/21/1983	0	0	\$2,602	\$260	Northern Half of SC	Lightning & Wind
8/23/1983	8/23/1983	0	0	\$3,717	\$0	Northern & Central SC	Lightning & Wind
6/20/1984	6/20/1984	0	0	\$2,711	\$271	Statewide	Rain, Lightning, & Wind
7/25/1984	7/25/1984	0	0	\$124,713	\$1,247	Central SC	Rain, Lightning, & Wind
7/19/1993	7/19/1993	4	0	\$0	\$0	Winnsboro	Lightning
4/7/2015	4/7/2015	0	0	\$6,560	\$0	Strother	Sheriff reported trees down near the Broad River Bridge on SC Hwy 34.
6/1/2015	6/1/2015	2	0	\$0	\$0	Mitford	DOT reported several trees down in Mitford along Hwy 200.
6/24/2015	6/24/2015	0	0	\$131,208	\$0	Ft. Wagener	EM reported that a turkey farm on Ashford Ferry Road had 3 barns severely damaged.
6/24/2015	6/24/2015	0	0	\$4,374	\$0	Anderson Quarry	Sheriff reported trees down on Landis and Kennedy Roads.
6/30/2015	6/30/2015	0	0	\$547	\$0	Ridgeway	Highway Patrol reported a tree down at the Peach Road exit ramp off of I-77 southbound.
7/2/2015	7/2/2015	0	0	\$3,280	\$0	Flint Hill	Dispatch reported trees down along White Oak Church Road.
7/2/2015	7/2/2015	0	0	\$3,280	\$0	Flint Hill	Dispatch reported trees down along Old River Road.
7/2/2015	7/2/2015	0	0	\$2,187	\$0	Winnsboro Mills	Dispatch reported trees down along 9th Street in Winnsboro Mills.
7/19/2015	7/19/2015	0	0	\$10,934	\$0	Salem XRDS	Highway Patrol reported numerous

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
							trees down on Highway 215 and many side roads in the northwest part of the county and around Blair.
7/19/2015	7/19/2015	0	0	\$547	\$0	Woodward	Highway Patrol reported a tree down on Lewis Store Road near Old Douglas Road near the community of Blackstock.
8/6/2015	8/6/2015	0	0	\$2,187	\$0	Winnsboro	DOT reported several trees down in Winnsboro.
9/4/2015	9/4/2015	0	0	\$3,280	\$0	Douglass	Dispatch reported trees down on Old Douglass Road.
9/4/2015	9/4/2015	0	0	\$2,187	\$0	Adger	Highway Patrol reported trees down on Old Airport Road.
10/8/2016	10/8/2016	0	0	\$15,907	\$0	Fairfield	Lightning
9/11/2017	9/11/2017	0	0	\$104	\$104	Fairfield	Large pine tree snapped off on Old Camden Rd and Forest Hills Dr.

Note: No lightning damage has been reported by NCEI (formerly NCDC) since 1993.

F) Wind

What to expect: Every property and person is at risk from wind in Fairfield County. The county frequently experiences high wind events with gust of 50 knots (58mph) or more (Table 16). Wind gust of 65 knots (75 mph) have been recorded. On average, severe winds occur every 2 months. Due to concurrence of high wind with severe thunderstorms, the spatial distribution of wind events within the county is like the thunderstorm risk. High winds cause largely property damage and power outages due to falling tree or tree limbs.

Geographic Extent: Based on past occurrences, the entire county is susceptible to wind damage. There appears to be a higher propensity for severe weather and therefore wind damage in the central and southern part of the county.

Wind statistics for Fairfield County are as following:

Number of Loss-Causing Events:	164
Frequency of Occurrence:	7.2%
Recurrence Interval:	0.14 years
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	\$5,217,611
Total Fatalities:	2
Deadliest Event:	2 Fatalities (March 28, 1984)
Most Property Damage:	\$2,078,557 (March 28, 1984)
Most Crop Damage:	\$2,078,557 (March 28, 1984)
Highest USDA Crop Indemnity Payout:	n/av*

* No wind events caused a USDA Crop Indemnity Payout

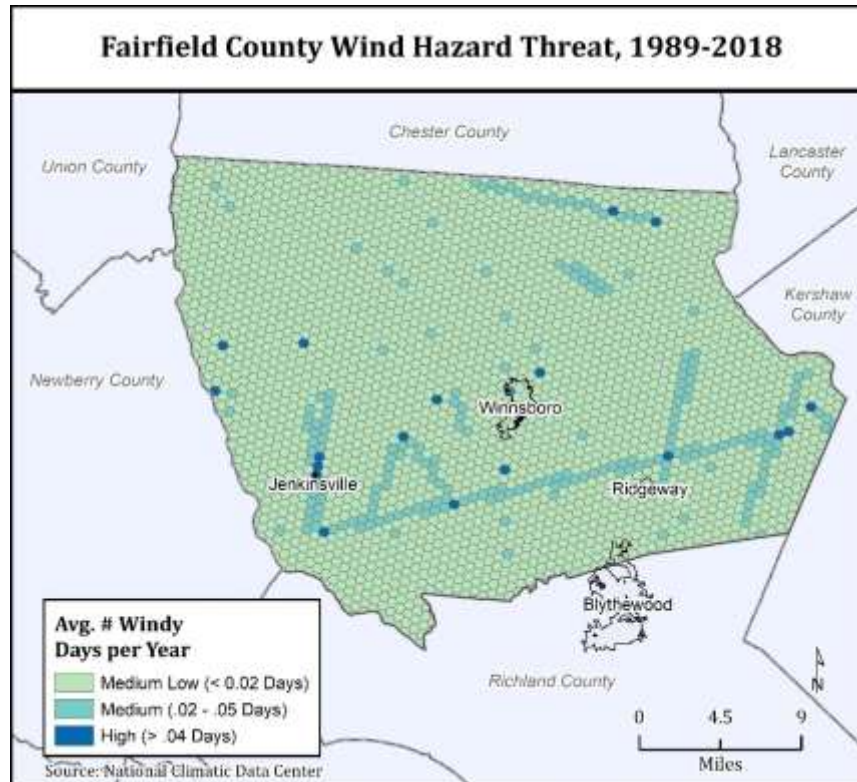


Figure 18 - Wind threat in Fairfield County.

Table 16 - Record of loss-causing wind events in Fairfield County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (kts)*	Location	Description
2/25/1961	2/25/1961	0	0	\$860	\$0		Statewide	
11/23/1961	11/23/1961	0	0	\$860	\$0		Statewide	
1/20/1964	1/20/1964	0	0	\$830	\$0		Most of SC	
11/21/1973	11/21/1973	0	0	\$784	\$0		Western, Central, Northern, & Eastern SC	Squall Line & Windstorm
11/20/1974	11/20/1974	0	0	\$1,143	\$0		Western SC	
5/10/1975	5/10/1975	0	0	\$13,381	\$133,806		York to Bamberg & Spartanburg to Oconee & Anderson	
12/31/1975	12/31/1975	0	0	\$478	\$0		Statewide	
2/18/1976	2/18/1976	0	0	\$1,600	\$160		Northwestern SC	
3/18/1977	3/18/1977	0	0	\$42	\$42		Statewide	
4/4/1977	4/4/1977	0	0	\$424	\$42		Statewide	
2/25/1980	2/25/1980	0	0	\$3,122	\$0		Statewide	
3/16/1981	3/16/1981	0	0	\$2,830	\$2		Statewide	
6/10/1982	6/10/1982	1	0	\$327,505	\$327,505		Western, Northern, Central, & Eastern SC	
3/8/1984	3/8/1984	0	0	\$247	\$24		Statewide	
3/28/1984	3/29/1984	25	6	\$6,235,671	\$6,235,671		Statewide	
7/25/1984	7/25/1984	0	0	\$124,713	\$1,247		Central SC	Rain, Wind, & Lightning

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (kts)*	Location	Description
7/27/1986	7/27/1986	0	0	\$1,080	\$0	0	Winnsboro	
2/27/1988	2/27/1988	0	0	\$21	\$0		Statewide	
5/16/1988	5/16/1988	0	0	\$100	\$100	0	Winnsboro	
5/23/1988	5/23/1988	1	0	\$1,000	\$0	0	Mitford	
5/23/1988	5/23/1988	1	0	\$0	\$0	0	Fairfield	
8/6/1988	8/6/1988	0	0	\$109,533	\$0	0	Winnsboro	Severe Storms & Wind
11/5/1988	11/5/1988	0	0	\$322	\$0		Western, Northern, & Northeastern SC	High Wind
1/3/1989	1/3/1989	0	0	\$2,075	\$2		Statewide	
4/4/1989	4/4/1989	0	0	\$9,545	\$0	0	Fairfield County	
5/5/1989	5/5/1989	0	0	\$9,545	\$0		Fairfield County	
6/16/1989	6/16/1989	0	0	\$954	\$0	0	Winnsboro	
6/16/1989	6/16/1989	0	0	\$104,498	\$0	0	Fairfield County	Thunderstorm Winds
1/29/1990	1/29/1990	0	0	\$90,564	\$0		Blair	
1/6/1995	1/6/1995	0	0	\$15,534	\$0	0	Ridgeway	Thunderstorm Winds
6/9/1995	6/9/1995	0	0	\$7,767	\$0	0	Fairfield	
5/26/1997	5/26/1997	0	0	\$4,425	\$0	50	Winnsboro	Sheriff reports a severe thunderstorm knocked down trees and powerlines in Longtown.
7/30/2002	7/30/2002	0	0	\$10,527	\$0	55	Blair	Highway Patrol reported a tree fell onto a tractor trailer.
8/7/2008	8/7/2008	0	0	\$13,195	\$0	55	Mitford	Fairfield Electric Company reported many trees and several powerlines down with outages from southeast of Blackstock to Mitford.
8/7/2008	8/7/2008	0	0	\$10,995	\$0	55	Longtown	Fairfield Electric Company reported several trees and a few powerlines down with outages from the Lake Wateree area to near Lugoff.
10/24/2008	10/24/2008	0	0	\$109,562	\$10,995		Fairfield	Broadcast media outlets reported trees and powerlines down in several areas of the county. A couple of homes had trees on them in the Winnsboro area. A storm survey found a barn and outbuilding at 7711 Newberry Road, about 6 miles west of Winnsboro, had roof damage. The barn may also have sustained structural damage from the persistent wind event as it appeared to be tilted a couple of inches from center.
12/11/2008	12/11/2008	0	0	\$1,100	\$0	50	Shelton	DOT reported a couple of trees down on Hwy 51.
1/7/2009	1/7/2009	0	0	\$19,617	\$0		Fairfield	EOC reported several trees and powerlines down around the county.
6/10/2009	6/10/2009	0	0	\$2,207	\$0	50	Salem	Electric company reported a couple of trees down on Pearson Road near Blair.
7/22/2009	7/22/2009	0	0	\$1,103	\$0	50	Stover	County Official reported a tree down on Hwy 901 at the count line.
12/9/2009	12/9/2009	0	0	\$7,724	\$0	55	Winnsboro	Sheriff reported trees down around the county, especially in the northern portions.
1/25/2010	1/25/2010	0	0	\$3,257	\$0	55	Winnsboro	Sheriff reported trees down along Hwy 321S and Old River Rd.

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (kts)*	Location	Description
6/29/2010	6/29/2010	0	0	\$10,857	\$0	50	Woodward	DOT reported trees down on Highways 32 and 52.
7/11/2010	7/11/2010	0	0	\$10,857	\$0	65	Salem	Sheriff reported numerous trees down at the intersection of Hwys 215 and 34.
7/13/2010	7/13/2010	0	0	\$2,171	\$0	50	Mitford	Sheriff reported a couple of trees down near Wateree Road and US 21.
7/23/2010	7/23/2010	0	0			50	Jenkinsville	Isolated severe thunderstorms took down trees in near the tri- county line area of Fairfield, Richland, and Lexington counties. Sheriff reported a couple trees down near the intersection of Hwys 213 and 215.
7/26/2010	7/26/2010	0	0	\$2,171	\$0	55	Ft Wagener	Public reported a couple of trees down on Ashford Ferry rd.
8/6/2010	8/6/2010	0	0	\$6,514	\$0	55	Monticello	Fairfield Electric reported power outages on Hwy 213 from trees down on powerlines.
8/12/2010	8/12/2010	0	0	\$1,086	\$0	50	Ft Wagener	Mr. Coleman reported a couple of trees down on Fort Wagner Rd.
11/30/2010	11/30/2010	0	0	\$2,171	\$0	50	Adger	Sheriff reported a couple of trees down just north of Winnsboro on Hwy 321.
11/30/2010	11/30/2010	0	0	\$5,428	\$0	50	Adger	Sheriff reported trees down along Smallstown Rd and Old Chester Rd.
2/28/2011	2/28/2011	0	0	\$3,157	\$0	55	Mitford	Sheriff and Emergency Manager reported several trees down in the Mitford area.
2/28/2011	2/28/2011	0	0	\$3,157	\$0	55	Winnsboro	Sheriff and Emergency Manager reported several trees down in Winnsboro.
4/5/2011	4/5/2011	0	0	\$18,944	\$0	60	Mt Rehovah	Highway Patrol reported trees down southeast of Ridgeway at Centerville Rd and Hwy 34 on up to Longtown and Lake Wateree.
5/3/2011	5/3/2011	0	0	\$2,105	\$0	55	Woodward	DOT reported trees down in northwest Fairfield County on several county roads.
5/3/2011	5/3/2011	0	0	\$2,105	\$0	55	Jenkinsville	DOT reported several trees down in the Jenkinsville area.
5/27/2011	5/27/2011	0	0	\$2,105	\$0	55	Ridgeway	Sheriff reported trees down along Macedonia Church Road.
6/2/2011	6/2/2011	0	0	\$4,210	\$0	55	Rock Hill	Sheriff reported several trees down near Hwy 215 and Glens Bridge Rd.
6/15/2011	6/15/2011	0	0	\$10,524	\$0	60	Monticello	EM reported many trees down in the western part of Fairfield County.
6/21/2011	6/21/2011	0	0	\$3,157	\$0	55	Gaydens	Highway Patrol reported trees down on I-77 near mile marker 48.
6/21/2011	6/21/2011	0	0	\$4,210	\$0	55	Simpson	Sheriff reported trees down at the intersection of US 321 and Broom Mill Rd.
6/21/2011	6/21/2011	0	0	\$12,629	\$0	55	Rock Hill	Dispatch center reported numerous trees down in the southwestern corner of the county.
6/21/2011	6/21/2011	0	0	\$12,629	\$0	60	Ridgeway	State official reported numerous trees down across southeastern Fairfield County.
7/13/2011	7/13/2011	0	0	\$2,105	\$0	55	Winnsboro	Highway Patrol reported trees down near Winnsboro along Hwy 200.
8/14/2011	8/14/2011	0	0	\$8,420	\$0	55	Jenkinsville	Dominion Energy and DOT reported a few trees and powerlines down with power outages near Lake Monticello and Hwy 215.
3/2/2012	3/2/2012	0	0	\$20,622	\$0	50	Blackjack	Dispatch reported several trees and powerlines down from just west of Winnsboro, in Winnsboro, and areas east of Winnsboro.

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (kts)*	Location	Description
3/3/2012	3/3/2012	0	0	\$6,187	\$0	55	Rock Hill	Dispatch reported trees down around the Jenkinsville area.
3/3/2012	3/3/2012	0	0	\$4,124	\$0	55	Ridgeway	Dispatch reported a several trees down on Hwy 34 and Hwy 69.
7/1/2012	7/1/2012	0	0	\$4,124	\$0	55	Ridgeway	Police reported trees in the roadway at West Ruff St and South Means St.
7/10/2012	7/10/2012	0	0	\$4,124	\$0	55	Simpson	Highway Patrol reported powerlines down at the intersection of Syrup Mill Rd and Peach Rd.
7/24/2012	7/24/2012	0	0	\$2,062	\$0	55	White Oak	Highway Patrol reported trees down near White Oak.
7/24/2012	7/24/2012	0	0	\$4,124	\$0	50	Winnsboro	Public reported large limbs down and power outages in Winnsboro.
8/3/2012	8/3/2012	0	0	\$2,062	\$0	55	Bucklick	EM reported trees down on River Rd at Taylor Creek Bridge.
8/3/2012	8/3/2012	0	0	\$30,933	\$0	55	Winnsboro	County dispatch reported numerous trees down in Winnsboro and a tree on a home.
1/30/2013	1/30/2013	0	0	\$4,065	\$0	50	Monticello	DOT reported several trees down along Hwy SC215 in western Fairfield County.
5/21/2013	5/21/2013	0	0	\$1,016	\$0	50	Crosbyville	DOT reported a couple of trees down on Hwy 215 near Coal Branch Rd.
6/13/2013	6/13/2013	0	0	\$6,097	\$0	60	Bucklick	Sheriff reported trees and powerlines down at the intersection of Wateree Rd and Shangri-la Dr.
6/26/2013	6/26/2013	0	0	\$2,032	\$0	55	Stover	SC Highway Patrol reported trees down on Heritage Rd near Hwy 901.
6/26/2013	6/26/2013	0	0	\$2,032	\$0	55	Mitford	SC Highway Patrol reported trees down on Wateree Rd between Debutary Rd and Woodside Dr.
8/1/2013	8/1/2013	0	0	\$3,049	\$0	50	Bucklick	Fairfield Electric COOP reported large limbs down on powerlines along Timberlane Circle causing power outages.
1/11/2014	1/11/2014	0	0	\$1,000	\$0	50	Camp Welfare	Sheriff reported a couple of trees down near I-77 and Hwy 200.
4/30/2014	4/30/2014	0	0	\$0	\$50	34	Fairfield	Fairfield County Airport recorded a gust to 39mph.
5/23/2014	5/23/2014	0	0	\$12,000	\$0	60	Winnsboro	Sheriff reported numerous trees and powerlines down in the Winnsboro area.
6/5/2014	6/5/2014	0	0	\$8,000	\$0	50	Longtown	Public reported a portable car port was blown 50 feet. They also reported half inch hail.
6/8/2014	6/8/2014	0	0	\$1,000	\$0	50	Mitford	Highway Patrol reported a tree down at the intersection of State Route 200 and Edward Circle.
6/8/2014	6/8/2014	0	0	\$1,000	\$0	50	Longtown	Public reported several large branches down along with numerous small branches. Dime to nickel size hail was also observed along Bird Island Road on Lake Wateree.
6/17/2014	6/17/2014	0	0	\$4,000	\$0	50	Stover	Public reported trees and large branches down on Heritage Road.
7/9/2014	7/9/2014	0	0	\$4,000	\$0	50	Woodward	DOT reported several trees down on secondary roads south of Blackstock.
9/3/2014	9/3/2014	0	0	\$1,000	\$0	50	Rion	Winnsboro Police Dept. reported a tree down on a powerline near Jackson Creek Road and Hwy 269.
4/7/2015	4/7/2015	0	0	\$6,560	\$0	55	Strother	A line of severe thunderstorms moved through the Midlands of SC and produced some large hail and wind damage...mainly trees taken down.

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (kts)*	Location	Description
6/1/2015	6/1/2015	2	0	\$0	\$0	55	Mitford	Scattered thunderstorms developed over the Midlands and some produced large hail and wind damage to trees.
6/24/2015	6/24/2015	0	0	\$4,374	\$0	55	Anderson Quarry	Thunderstorms produce large hail and damaging winds across portions of the Midlands. One storm severely damaged a few barns at a turkey farm in Fairfield County.
6/24/2015	6/24/2015	0	0	\$131,208	\$0	75	Ft. Wagener	Thunderstorms produce large hail and damaging winds across portions of the Midlands. One storm severely damaged a few barns at a turkey farm in Fairfield County.
6/30/2015	6/30/2015	0	0	\$547	\$0	55	Ridgeway	Thunderstorms moved through the NWS Columbia forecast area taking down trees and powerlines. Some large hail also was reported. Some trees fell on homes and vehicles
7/2/2015	7/2/2015	0	0	\$3,280	\$0	55	Flint Hill	Scattered thunderstorms produced wind damage and some hail in the Midlands.
7/2/2015	7/2/2015	0	0	\$3,280	\$0	50	Flint Hill	Scattered thunderstorms produced wind damage and some hail in the Midlands.
7/2/2015	7/2/2015	0	0	\$2,187	\$0	50	Winnsboro Mills	Scattered thunderstorms produced wind damage and some hail in the Midlands.
7/19/2015	7/19/2015	0	0	\$10,934	\$0	60	Salem XRDS	Scattered thunderstorms produced strong winds that took down trees and powerlines around the Midlands.
7/19/2015	7/19/2015	0	0	\$547	\$0	50	Woodward	Scattered thunderstorms produced strong winds that took down trees and powerlines around the Midlands.
8/6/2015	8/6/2015	0	0	\$2,187	\$0	50	Winnsboro	Scattered thunderstorms produced wind damage that took down trees and powerlines causing some power outages.
9/4/2015	9/4/2015	0	0	\$3,280	\$0	50	Douglass	Scattered thunderstorms moved though the Midlands and produced some large hail, wind damage, and very intense rains that produced flash flooding.
9/4/2015	9/4/2015	0	0	\$2,187	\$0	50	Adger	Scattered thunderstorms moved though the Midlands and produced some large hail, wind damage, and very intense rains that produced flash flooding.
10/8/2016	10/8/2016	0	0	\$15,907	\$0	43	Fairfield	Wind Gusts and Heavy Rains
9/11/2017	9/11/2017	0	0	\$104	\$104	46	Fairfield	Wind Gusts

*No magnitude information indicates wind speed data were unavailable.

Note: No damage-causing wind events recorded in Fairfield County past 2017

G) Hail

What to expect: Every property and person is at risk from hail in Fairfield County. Hail occurs at least every five months in Fairfield County. Hail events occur mostly during spring thunderstorms from March through May. Thus far no damage has been reported for hailstones larger than 1.75" (Figure 20). It appears that crop damage from hail events is severely underreported.

Geographic Extent: Based on past occurrences, the entire county is susceptible to hail damage.

Hail statistics for Fairfield County are as following:

Number of Loss-Causing Events:	54
Frequency of Occurrence:	2.4%
Recurrence Interval:	0.41 years
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	\$5,461,144
Total Fatalities:	2
Deadliest Event:	2 Fatalities (March 28, 1984)
Most Property Damage:	\$2,078,557 (March 28, 1984)
Most Crop Damage:	\$2,078,557 (March 28, 1984)
Highest USDA Crop Indemnity Payout:	n/av*

* No hail events caused a USDA Crop Indemnity Payout

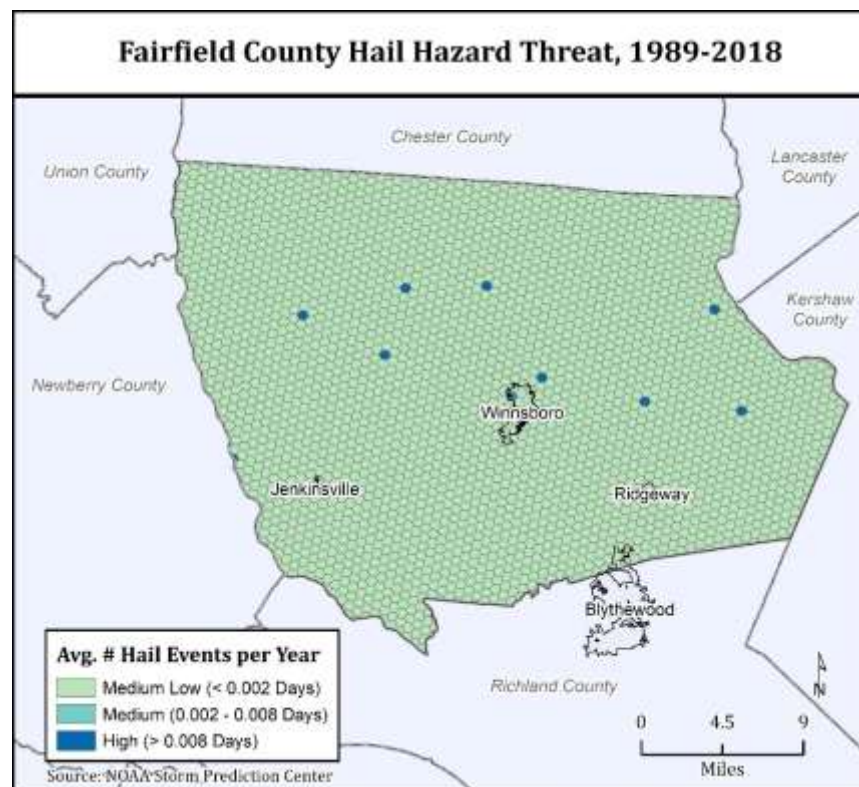


Figure 19 - Hail threat (occurrence) in Fairfield County.

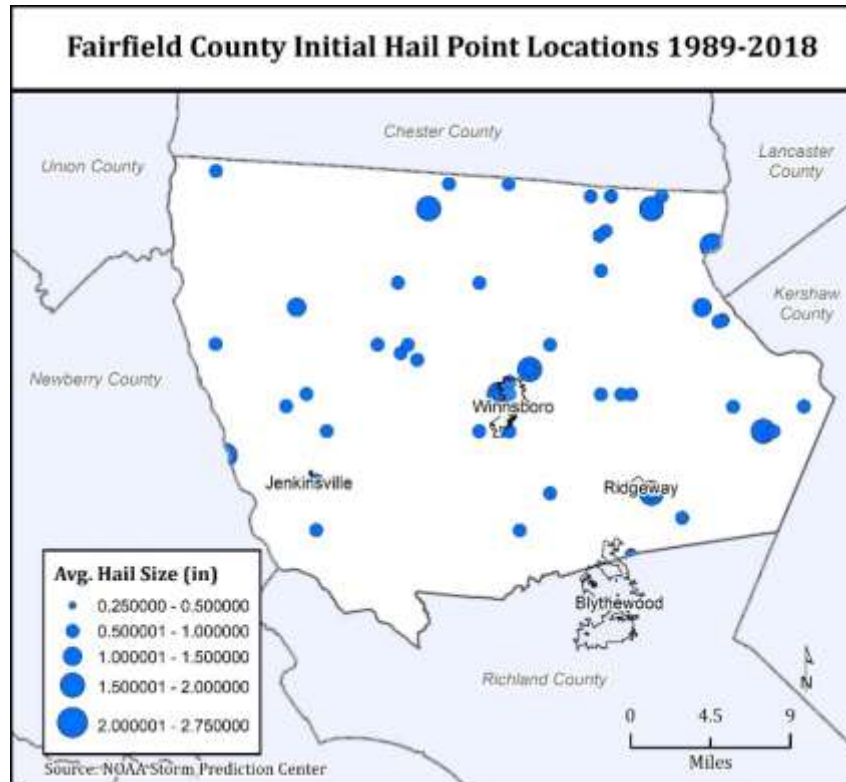


Figure 20 - Risk of large hail events in Fairfield County.

Table 17 - Record of loss-causing hail events in Fairfield County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
2/18/1960	2/18/1960	0	0	\$1,251	\$0		Central & Northern SC	Hail & Wind
4/12/1962	4/12/1962	0	0	\$1,716	\$0	0.75	Central SC	Hail & Wind
5/16/1963	5/16/1963	0	0	\$0	\$23,525		Northern SC	Hail & Wind
6/11/1963	6/11/1963	0	0	\$0	\$92,055		Statewide	Hail
4/7/1965	4/7/1965	0	0	\$4,571	\$0		Owensville, Greenville to St. Matthews, & Calhoun Counties	Hail
7/1/1965	7/31/1965	0	0	\$894	\$0		Statewide	Hail, Severe Storms, Thunderstorms, & Wind
7/19/1965	7/19/1965	0	0	\$894	\$89		Statewide	Hail, Lightning, & Wind
5/11/1973	5/11/1973	1	0	\$1,824	\$1,824		Northern SC from Spartanburg eastward to Horry Counties	Hail, Lightning, Severe Storms, Thunderstorms, & Wind
5/20/1973	5/20/1973	0	0	\$1,390	\$13,897		Northern & Northeastern SC	Hail, lightning, severe storm, thunderstorm, wind
5/28/1973	5/29/1973	1	0	\$1,081	\$1,081		Western & Northern SC	Hail, Lightning, & Wind
12/13/1973	12/13/1973	0	0	\$11	\$108		Northern & Western SC	Hail & Lightning
3/29/1974	3/29/1974	0	0	\$6,258	\$6,258		Northern, Eastern, & Central SC	Hail, Lightning, & Wind
3/30/1974	3/30/1974	0	0	\$0	\$202		Northwestern SC	Hail & Wind
7/16/1974	7/16/1974	0	0	\$1,011	\$1,011		Central & Southern SC	Hail & Wind
3/7/1975	3/7/1975	0	0	\$688	\$0		Northwestern, Central, & Northeastern SC	Hail, Lightning, & Wind

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
3/24/1975	3/24/1975	1	0	\$5,236	\$52		Statewide	Hail, Lightning, & Wind
5/10/1975	5/10/1975	0	0	\$13,381	\$133,806	1	York to Bamberg & Spartanburg to Oconee & Anderson	Hail, Lightning, & Wind
6/5/1975	6/5/1975	0	0	\$1,853	\$185		Northwestern SC	Hail & Wind
6/15/1975	6/15/1975	0	0	\$708	\$708		Northern & Central SC	Hail, Lightning, & Wind
6/18/1975	6/18/1975	0	0	\$52	\$5,236		Statewide	Hail, Lightning, & Wind
6/19/1975	6/19/1975	0	0	\$892	\$892		Northern & Western SC	Hail, Lightning, & Wind
7/4/1975	7/4/1975	0	0	\$6,881	\$68,814		Northern & Central SC	Hail, Lightning, & Wind
6/6/1977	6/6/1977	0	0	\$465	\$4,648		Statewide	Hail, Lightning, & Wind
4/18/1978	4/18/1978	0	0	\$1,420	\$14,196		Northeastern SC	Hail
5/24/1978	5/24/1978	0	0	\$14	\$1,420		Northwestern & Northeastern SC	Hail, Severe Storms, & Thunderstorms
4/26/1982	4/27/1982	0	0	\$29	\$29		Statewide	Hail, Lightning, Severe Storms, Wind, & Thunderstorms
5/16/1982	5/16/1982	0	0	\$537	\$54		Northern & Eastern SC	Hail, Severe Storms, & Thunderstorms
5/17/1982	5/17/1982	0	0	\$37	\$373		Northern, Central, & Southern SC	Hail, Severe Storms, Wind, & Thunderstorms
6/10/1982	6/10/1982	1	0	\$327,505	\$327,505		Western, Northern, Central, & Eastern SC	Hail, Lightning, Severe Storms, Wind, & Thunderstorms
3/28/1984	3/28/1984	25	6	\$6,235,671	\$6,235,671		New Hope Eastward	Hail & Tornado
3/28/1984	3/28/1984	5	0	\$623,567	\$623,567		Winnsboro to Kershaw County	Hail, Tornado, & Wind
4/14/1984	4/14/1984	0	0	\$445	\$445		Northern & Central SC	Hail & Wind
6/20/1984	6/20/1984	0	0	\$2,711	\$271		Statewide	Hail, Lightning, Severe Storms, Wind, & Thunderstorms
7/25/1984	7/25/1984	0	0	\$124,713	\$1,247		Central SC	Hail, Lightning, Severe Storms, Wind, & Thunderstorms
2/11/1985	2/12/1985	0	0	\$2,618	\$3		Statewide	Hail, Winter Weather, Severe Storms, Wind, & Thunderstorms
6/4/1985	6/4/1985	0	0	\$634	\$634		North-Central & Central SC	Hail
6/6/1985	6/6/1985	0	0	\$1,505	\$1,505		Central & Northeastern SC	Hail & Wind
6/7/1985	6/7/1985	0	0	\$2,618	\$262		Statewide	Hail & Wind
6/24/1986	6/24/1986	0	0	\$0	\$1,182	0.75	Winnsboro	Hail
6/24/1986	6/24/1986	0	0	\$0	\$1,182	0.75	Fairfield County	Hail
7/8/1986	7/8/1986	0	0	\$118	\$11,823	0.75	Winnsboro	Hail
4/11/1988	4/11/1988	0	0	\$4	\$0		SCZ003-004-005-006 East & Lower Piedmont & Midlands	Hail
5/16/1988	5/16/1988	0	0	\$110	\$110		Winnsboro	Hail
5/10/1995	5/10/1995	0	0	\$1,700	\$0	0.75	Winnsboro	Hail
5/15/1995	5/15/1995	0	0	\$1,700	\$0	1	Southwestern Region of Fairfield County	Hail
4/9/2011	4/9/2011	0	0	\$46,084	\$11,521	1.75	Bucklick	Supercell thunderstorms rolled across the upper Midlands and Pee Dee region and produced large hail

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
								up to the size of baseballs. The insurance industry estimates \$45 million in damage across the state.
4/9/2011	4/9/2011	0	0	\$34,563	\$11,521	1.75	Longtown	Supercell thunderstorms rolled across the upper Midlands and Pee Dee region and produced large hail up to the size of baseballs. The insurance industry estimates \$45 million in damages across the state.
4/9/2011	4/9/2011	0	0	\$5,761	\$0	1	Bucklick	Supercell thunderstorms rolled across the upper Midlands and Pee Dee region and produced large hail up to the size of baseballs. The insurance industry estimates \$45 million in damages across the state.
3/2/2012	3/2/2012	0	0	\$5,644	\$0	1	Monticello	A squall line pushed through the Midlands, CSRA, and Pee Dee region taking down trees and powerlines. An EF0 also occurred in Northern Richland County.
7/1/2012	7/1/2012	0	0	\$11,288	\$11,288	1	Camp Welfare	Many severe thunderstorms developed over the Midlands and CSRA producing large hail and wind damage. Hail sizes were mostly golf ball to tennis ball size. The SC Insurance News Service reported home and auto claims of around 7 million dollars.
7/1/2012	7/1/2012	0	0	\$5,644	\$5,644	1	Stover	Many severe thunderstorms developed over the Midlands and CSRA producing large hail and wind damage. Hail sizes were mostly golf ball to tennis ball size. The SC Insurance News Service reported home and auto claims of around 7 million dollars.
7/1/2012	7/1/2012	0	0	\$33,863	\$0	1	Flint Hill	Many severe thunderstorms developed over the Midlands and CSRA producing large hail and wind damage. Hail sizes were mostly golf ball to tennis ball size. The SC Insurance News Service reported home and auto claims of around 7 million dollars.
7/1/2012	7/1/2012	0	0	\$45,150	\$0	1	Winnsboro	Many severe thunderstorms developed over the Midlands and CSRA producing large hail and wind damage. Hail sizes were mostly golf ball to tennis ball size. The SC Insurance News Service reported home and auto claims of around 7 million dollars.
4/11/2013	4/11/2013	0	0	\$13,349	\$0	1	Crosbyville	Severe Pulse Thunderstorms developed ahead of a cold front and produced some wind damage and 1 inch hail over areas of the Midlands, CSRA, and Pee Dee.

*No magnitude information indicates hailstone sizes were unavailable.

H) Fog

What to expect: Fog does not cause direct property damage or injuries. But indirectly, the personal safety of boaters, motorists, and other travelers is at risk due to poor visibility during fog conditions. Fog is common in Fairfield County and occurs most frequently during the fall and spring months. On average, the county experiences at least 6 days¹⁶ with some periods of fog (or haze). The number of fogs days varies considerably ranging from an average of 6 days of fog per year in the northern half of the county up to 30 days in the southern portion of the country (Figure 21). There is no explicit record of property damage or fatalities associated with fog as reported by SHEL DUSTM or NCDC's Storm Data. This is likely because most damage from fog is indirect (e.g., traffic accidents).

Geographic Extent: Based on past occurrences, the entire county is susceptible to fog. Southern Fairfield County experiences significantly larger number of days with reduced visibility.

Fog statistics for Fairfield County are as following:

Number of Loss-Causing Events:	n/av (largely motorist accidents)
Frequency of Occurrence:	0.06%
Recurrence Interval:	17 days
Expected changes to frequency and recurrence interval in the future:	Not enough information available to make assumptions about future changes
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	n/av
Total Fatalities:	n/av
Deadliest Event:	n/av
Most Property Damage:	n/av
Most Crop Damage:	n/av
Highest USDA Crop Indemnity Payout:	n/av*

*No hail events caused a USDA Crop Indemnity Payout

¹⁶ A "fog day" has reduced visibility due to fog, haze, or smoke at any time of the day as indicated by NWS station data.

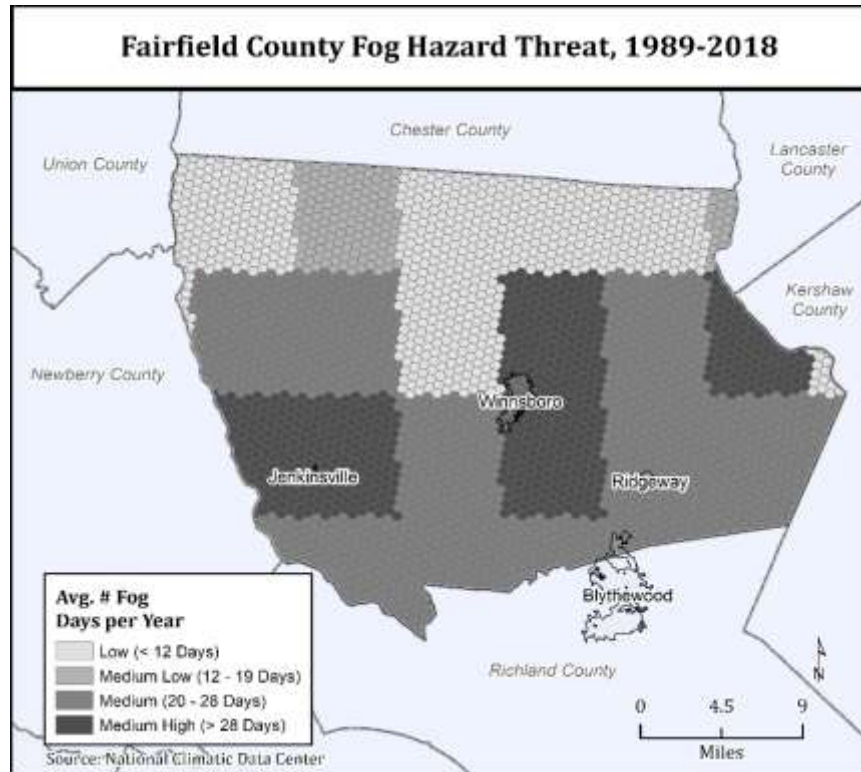


Figure 21 - Fog threat in Fairfield County.

I) Winter & Ice Storms

What to expect: Every property and person is at risk from winter weather in Fairfield County. Ice storms and winter weather occur every year—on average around 1 day per year (Figure 22). Snow accumulations of 2 inches and more are rare, though the area has seen significant snow accumulations in the past (Table 18). The highest daily snowfall amount was 14 inches (February 10, 1973)¹⁷.

More damaging than snow events are ice storms, which tend to occur frequently in this area. Ice accumulations of an inch or more are possible but even thin coatings of ice cause havoc. Falling trees lead to power outages, road closures, and damage to homes and other properties. In addition, winter weather tends to adversely affect agriculture more than any other hazard. It appears that crop damage from winter weather events is severely underreported.

Geographic Extent: The entire county is susceptible to damage from winter weather.

Winter weather statistics for Fairfield County are as following:

Number of Loss-Causing Events:	87
Frequency of Occurrence:	0.77%
Recurrence Interval:	1.3 years
Expected changes to frequency and recurrence interval in the future:	Decreased likelihood of occurrence and shortening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Winter weather-related Presidential Disaster Declarations:	DR-1313 (2000) DR-1509 (2004)
Total Losses:	\$21,703,596

¹⁷ SCDNR. South Carolina record minimum temperatures and date. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/data/min_temp_table.php

Total Fatalities:	5
Deadliest Event:	1 Fatality (several instances)
Most Property Damage:	\$634,436 (February 9, 1973)
Most Crop Damage:	\$7,512,160 (February 17, 1969)
Highest USDA Crop Indemnity Payout:	n/av*

*No winter weather events caused a USDA Crop Indemnity Payout

January 22, 2000 (DR-1313): A severe winter storm resulted in widespread power outages. Thirty-eight counties in South Carolina were designated for federal assistance including Fairfield County.

January 26-30, 2004 (DR-1509): An ice storm began over the North Midlands of South Carolina on Sunday night and gradually spread south into the Central Midlands on Monday. The storm continued into Tuesday but was mainly freezing drizzle during that time. Ice accumulations of 1/2 to 3/4 of an inch occurred which brought numerous trees and powerlines down. The heaviest ice accumulations occurred in Lancaster, Chesterfield, Fairfield, Newberry, Saluda, McCormick, Orangeburg, and Clarendon counties. Over 250,000 homes, businesses, and schools were without power for several days. Sleet also fell in Lancaster and Chesterfield counties and accumulated up to 2 inches. Six people were injured in traffic related accidents and there were no deaths. Damage estimates from SCEMD were \$28.5 million.

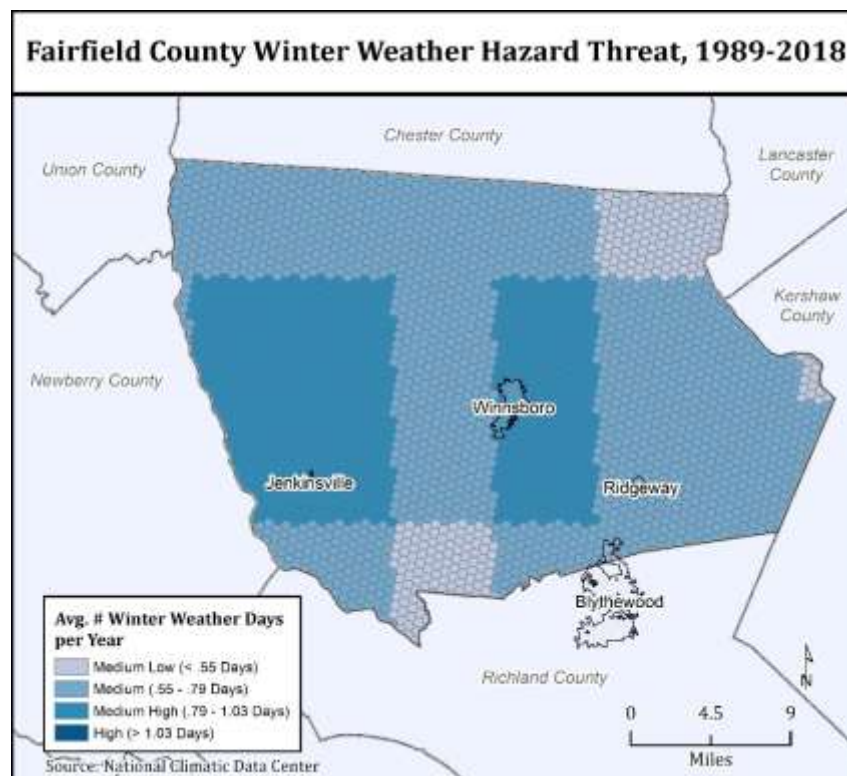


Figure 22 – Winter weather threat in Fairfield County.

Table 18 - Record of loss-causing winter weather events in Fairfield County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
3/2/1960	3/2/1960	0	0.06	\$24,320	\$0	Trace	Northern SC	Snow & Ice
3/9/1960	3/11/1960	0	0	\$12,507	\$0	3.3"	Northern & Central Sections of SC	Snow, Sleet, & Ice
1/25/1961	1/26/1961	0	0	\$9,421	\$942	0.5:	Statewide	Ice Storm
2/3/1961	2/4/1961	0	0	\$942	\$0	0.5"	Statewide	Glaze
1/1/1962	1/1/1962	0	0	\$2,384	\$0	-	Northern Counties from	Ice & Snow

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
							Anderson to York	
12/31/1963	1/1/1964	0.57	0	\$92,055	\$9,206	-	Statewide	Ice
1/12/1964	1/13/1964	0.86	0	\$1,990	\$0	-	Northern & Western SC	Ice
3/30/1964	3/31/1964	0	0	\$0	\$908,676	1.0"	Statewide	Killing Freeze
1/26/1966	1/27/1966	0	0.03	\$114,266	\$0	-	Central & Northern SC	Ice & Snow
1/29/1966	1/30/1966	0	0.15	\$0	\$86,941	1.3"	Statewide	Severe Cold, Ice, & Snow
3/29/1966	3/29/1966	0	0	\$17,388	\$0	0.8"	Inland SC	Frost
3/17/1967	3/19/1967	0	0	\$0	\$2,155,310	-	Northern Part of SC	Cold Wave
1/9/1968	1/13/1968	0	0	\$116,359	\$12	-	Northern 2/3rds of SC	Rain, Sleet, Snow, & Freezing Rain
2/15/1969	2/17/1969	0	0	\$75,122	\$7,512,160	1.7"	Statewide	Snow, Sleet, & Freezing Rain
11/1/1969	11/1/1969	0.08	0.04	\$14,123	\$14	2"	Central SC	Wind & Snow
1/8/1970	1/9/1970	0	0	\$726	\$7	3"	Statewide	Severe Freeze
11/24/1970	11/25/1970	0	0	\$7	\$7	12"	Statewide	Severe Freeze
1/8/1971	1/9/1971	0	0	\$2,461	\$2,461	0.5"	Northwestern SC	Freezing Rain
3/25/1971	3/25/1971	0.67	0.39	\$177,747	\$178	0.62"	Northwestern SC	Snowstorm
12/3/1971	12/3/1971	0	0	\$69,553	\$69,553	1"	Statewide	Rain, Sleet, Snow, Winds, & Freezing Rain
4/1/1972	4/30/1972	0	0	\$0	\$352,265	1.47"	Statewide	Cold Spell
1/7/1973	1/8/1973	0	0	\$63,444	\$634,436	0.5"	Statewide	Snow & Ice
2/9/1973	2/10/1973	0	0.2	\$634,436	\$634	Trace	Statewide	Snowstorm
4/11/1973	4/12/1973	0	0	\$0	\$162,134	5.5"	Northwestern & Northern SC	Frost & Freeze
12/17/1973	12/17/1973	0	0	\$3,648	\$36	0.22"	North-Central SC	Heavy Snow
12/20/1973	12/20/1973	0	0	\$224	\$0	3"	Northwestern SC	Freezing Rain
10/3/1974	10/4/1974	0	0	\$6,739	\$0	Trace	Western, Northern, & Central SC	Frost & Freeze
2/3/1975	2/4/1975	0	0	\$13,381	\$1,338	0.12"	Northwestern & Northern SC	Ice Storm
3/2/1975	3/3/1975	0	0	\$0	\$5,236	-	Statewide	Low Temperatures
1/1/1977	1/31/1977	0	0	\$465	\$465	-	Statewide	Unusual Cold Weather
1/1/1977	1/31/1977	0	0	\$465	\$465	1.41"	Statewide	Unusual Cold Weather
1/13/1978	1/13/1978	0	0	\$1,656	\$0	0.2"	Northwestern SC	Snow, Sleet, & Freezing Rain
3/2/1978	3/3/1978	0	0	\$1,529	\$0	0.4"	Northwestern SC	Snow & Freezing Rain
2/6/1979	2/6/1979	0	0	\$594,937	\$595	0.1"	Northwestern & Central SC	Snow, Sleet, & Ice
2/17/1979	2/18/1979	0	0	\$38,800	\$388	0.03"	Statewide	Snow, Sleet, & Freezing Rain
1/30/1980	1/31/1980	0	0	\$828	\$828	0.8"	Northern Half of SC	Freezing Rain
2/5/1980	2/6/1980	0	0	\$34,186	\$342	0.6"	All of SC except South Coastal Region	Snowstorm over most of State except Ice Storm near Beaches North Coastal Area
3/1/1980	3/2/1980	0	0	\$3,419	\$3,419	Trace	Statewide	Snow, Freezing Rain, Drizzle, & Sleet

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
12/23/1980	12/23/1980	0	0	\$71	\$0	Trace	Northwestern & Central SC	Freezing Rain
2/1/1981	2/1/1981	0	0	\$79	\$0	Trace	Northern SC	Freezing Rain & Sleet
1/11/1982	1/11/1982	0.09	0	\$292	\$292	0.5"	Statewide	Hard Freeze
1/12/1982	1/12/1982	0	0	\$4,796	\$473	0.62"	Statewide except Coastal Plains Region	Snow, Sleet, & Freezing Rain
2/26/1982	2/27/1982	0	0	\$2,919	\$0	8"	Statewide	Snow, Sleet, & Glaze
3/27/1982	3/27/1982	0	0	\$0	\$291,907	0.29"	Statewide	Extreme Cold
4/7/1982	4/7/1982	0	0	\$0	\$3,356,923	0.25"	Statewide except Southern Region	Frost & Freeze
4/23/1982	4/24/1982	0	0	\$0	\$29	-	Statewide	Frost & Freeze
1/21/1983	1/21/1983	0	0	\$2,828	\$28	1.25"	Statewide	Freezing Rain, Sleet, & Snow
3/24/1983	3/24/1983	0	0	\$283	\$3	0.72"	Statewide	Winter Storm, Wind, & Snow
4/17/1983	4/18/1983	0	0	\$0	\$2,828,209	1.22"	Statewide	Extreme Cold
12/22/1983	12/22/1983	0	0	\$1,084	\$0	0.02"	Northwestern & North-Central SC	Freezing Rain
12/25/1983	12/25/1983	0	0.59	\$28,282	\$28,282	0.57"	Statewide	Extreme Cold
12/30/1983	12/31/1983	0	0.04	\$2,828	\$283		Statewide	Extreme Cold
1/13/1984	1/13/1984	0	0	\$4,454	\$445		Northern Half of SC	Freezing Rain & Glaze
2/6/1984	2/6/1984	0	0	\$693	\$0		Northern SC	Snow
1/17/1985	1/17/1985	0	0	\$67	\$0		Northern SC	Freezing Rain
1/20/1985	1/24/1985	0	0.33	\$26,179	\$2,618		Statewide	Extreme Cold & Snow
1/28/1985	1/28/1985	0	0	\$669	\$0		Northern SC	Snow & Sleet
2/11/1985	2/12/1985	0	0	\$2,618	\$3		Statewide	Wind, Snow, Hail, & Thunderstorms
3/19/1985	3/19/1985	0	0	\$0	\$2,618		Statewide	Frost & Freeze
12/26/1985	12/26/1985	0	0	\$262	\$26		Statewide	Cold
1/26/1986	1/27/1986	0	0	\$2,570	\$26		Statewide	Cold
3/22/1986	3/23/1986	0	0	\$0	\$2,570		Statewide	Cold
4/23/1986	4/24/1986	0	0	\$0	\$2,570		Statewide	Frost & Freeze
1/22/1987	1/22/1987	0	0	\$600	\$60		Northwestern SC	Heavy Snow & Sleet
1/26/1987	1/26/1987	0	0	\$5,185	\$518		Central, Northern, & Northeastern SC	Ice Storm
2/16/1987	2/16/1987	0	0	\$6,003	\$600		Northwestern, North-Central, & Northeastern SC	Ice Storm
4/1/1987	4/1/1987	0	0	\$0	\$2,925		Statewide except the Immediate Coast	Freeze
10/1/1987	10/31/1987	0	0	\$0	\$248		Statewide	Cold Weather
1/7/1988	1/11/1988	0	0	\$23,811	\$0		Statewide	Snow, Ice, & Sleet
3/14/1988	3/17/1988	0	0	\$238	\$0		Statewide	Low Temperature
4/20/1988	4/20/1988	0	0	\$0	\$58		SCZ002-003-004 Foothills, East Piedmont, & Lower Piedmont	Frost
1/14/1989	1/14/1989	0	0	\$8	\$0		SCZ001-002-003 Northwestern SC	Freezing Drizzle

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
2/23/1989	2/23/1989	0	0	\$2,272	\$0		Statewide	Heavy Snow
4/12/1989	4/12/1989	0	0	\$5,500	\$0		Northwestern SC	Freeze
5/8/1989	5/8/1989	0	0	\$0	\$8,708		Northwestern SC	Frost
12/20/1989	12/20/1989	0	1	\$0	\$0		Fairfield County	Extreme Cold
12/22/1989	12/25/1989	0	1	\$29,027	\$0		SCZ001-002-003-004-005-006 Mountains, Foothills, Piedmont, & Midlands	Extreme Cold
3/21/1990	3/21/1990	0	0	\$0	\$215,524		Statewide	Freeze
2/25/1991	2/25/1991	0	1	\$0	\$0		Fairfield County	Cold (F77?)
4/3/1992	4/3/1992	0	0	\$0	\$710,440		SCZ003-004 Piedmont	Freeze
4/3/1992	4/3/1992	0	0	\$0	\$71,044		Piedmont	Freeze
12/27/1992	12/28/1992	0	0	\$32,985	\$32,985		Foothills, East & Lower Piedmont, & North Midlands	Ice Storm
3/13/1993	3/13/1993	0	0	\$14,945	\$14,945		SCZ003	High Winds & Cold
2/11/1994	2/11/1994	0	0	\$46,018	\$0		SCZ001>022	Ice Storm
2/17/2003	2/17/2003	6	0	\$0	\$0		Fairfield	Severe Freeze
1/18/2007	1/18/2007	0	0	\$6,249	\$0		Fairfield	Severe Freeze
1/30/2010	1/30/2010	0	0	\$11,885	\$0		Northern SC	Freezing Rain

*No magnitude information indicates snowfall amounts or ice thickness were unavailable.

Note: Note that damage from cold temperatures is reported in the section on temperature extremes. No winter weather damage has been reported by NCEI (formerly NCDC) since 2010.

J) Temperature Extremes

What to expect: Fairfield County experiences between 51 and 69 days per year when temperatures fall below freezing at any given time of the day, which is generally during nighttime hours in the winter months (Figure 23). The record minimum temperature for Fairfield County was set on February 14, 1899, with -3 degrees Fahrenheit¹⁸. Most record minimum temperatures in South Carolina date back to 1985 or 1899. The record minimum temperature for the state is -19 degrees, set in Greenville County in 1985. Property damage tends to be restricted to busted water pipes and motor vehicle accidents. However, periods of frost and freeze cause significant damage to agricultural production.

Geographic Extent: Based on past occurrences, the entire county is susceptible to cold weather temperatures. However, here is a north-south gradient in regard to the number of days with below freezing temperatures with more cold days in northern Fairfield County except for the south-central region (Figure 23).

Cold weather statistics for Fairfield County are as following:

Number of Loss-Causing Events:	41
Frequency of Occurrence:	60%
Recurrence Interval:	0.02 years
Expected changes to frequency and recurrence interval in the future:	Decreased likelihood of occurrence and lengthening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019

¹⁸ SCDNR. South Carolina record minimum temperatures and date. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/data/min_temp_table.php

Total Losses:	\$14,852,528
Total Fatalities:	4
Deadliest Event:	1 fatality (several instances)
Most Property Damage:	\$29,027 (December 22, 1989)
Most Crop Damage:	\$3,359,923 (April 7, 1982)
Highest USDA Crop Indemnity Payout:	\$1,420 (April 1, 2012)

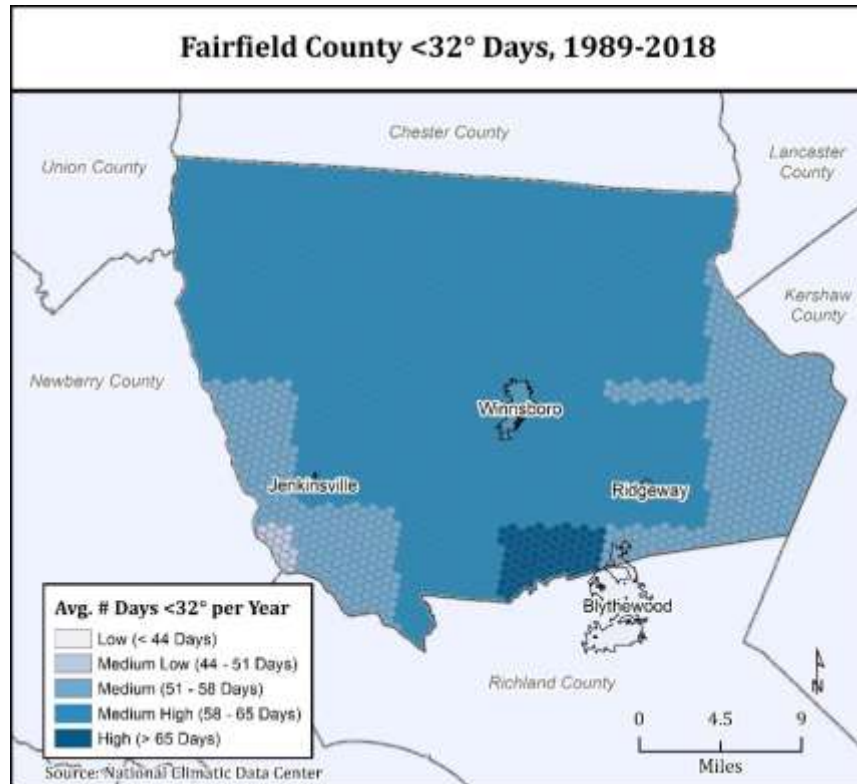


Figure 23 - Cold weather threat in Fairfield County.

Table 19 - Record of loss-causing cold weather events in Fairfield County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
3/30/1964	3/31/1964	0	0	\$0	\$908,676	Statewide	Killing freeze
1/29/1966	1/30/1966	0	0	\$0	\$86,941	Statewide	Severe Cold, Ice, & Snow
3/17/1967	3/19/1967	0	0	\$0	\$2,155,310	Northern SC	Cold wave
1/8/1970	1/9/1970	0	0	\$726	\$7	Statewide	Severe Freeze
11/24/1970	11/25/1970	0	0	\$7	\$7	Statewide	Severe freeze
4/1/1972	4/30/1972	0	0	\$0	\$352,265	Statewide	Cold Spell
4/11/1973	4/12/1973	0	0	\$0	\$162,134	Northwestern & Northern SC	Frost & Freeze
4/11/1973	4/12/1973	0	0	\$0	\$162,134	Northwestern & Northern SC	Frost & Freeze
10/3/1974	10/4/1974	0	0	\$6,739	\$0	Western, Northern, & Central SC	Frost & Freeze
10/3/1974	10/4/1974	0	0	\$6,739	\$0	Western, Northern, & Central SC	Frost & Freeze
3/2/1975	3/3/1975	0	0	\$0	\$5,236	Statewide	Low Temperatures
1/1/1977	1/31/1977	0	0	\$465	\$465	Statewide	Unusual Cold Weather
1/1/1977	1/31/1977	0	0	\$465	\$465	Statewide	Unusual Cold Weather

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
1/11/1982	1/11/1982	0	0	\$292	\$292	Statewide	Hard Freeze
3/27/1982	3/27/1982	0	0	\$0	\$291,907	Statewide	Extreme Cold
4/7/1982	4/7/1982	0	0	\$0	\$3,356,923	Statewide except Southern Regions	Frost & Freeze
4/7/1982	4/7/1982	0	0	\$0	\$3,356,923	Statewide except Southern Regions	Frost & Freeze
4/23/1982	4/24/1982	0	0	\$0	\$29	Statewide	Frost & Freeze
4/23/1982	4/24/1982	0	0	\$0	\$29	Statewide	Frost & Freeze
4/17/1983	4/18/1983	0	0	\$0	\$2,828,209	Statewide	Extreme Cold
12/25/1983	12/25/1983	0	1	\$28,282	\$28,282	Statewide	Extreme Cold
12/30/1983	12/31/1983	0	0	\$2,828	\$283	Statewide	Extreme Cold
1/20/1985	1/24/1985	0	1	\$26,179	\$2,618	Statewide	Extreme Cold & Snow
3/19/1985	3/19/1985	0	0	\$0	\$2,618	Statewide	Frost & Freeze
3/19/1985	3/19/1985	0	0	\$0	\$2,618	Statewide	Frost & Freeze
12/26/1985	12/26/1985	0	0	\$262	\$26	Statewide	Cold
1/26/1986	1/27/1986	0	0	\$2,570	\$26	Statewide	Cold
3/22/1986	3/23/1986	0	0	\$0	\$2,570	Statewide	Cold
4/23/1986	4/24/1986	0	0	\$0	\$2,570	Statewide	Frost & Freeze
4/23/1986	4/24/1986	0	0	\$0	\$2,570	Statewide	Frost & Freeze
4/1/1987	4/1/1987	0	0	\$0	\$2,925	Statewide except the Immediate Coast	Freeze
10/1/1987	10/31/1987	0	0	\$0	\$248	Statewide	Cold Weather
3/14/1988	3/17/1988	0	0	\$238	\$0	Statewide	Low Temperature
4/12/1989	4/12/1989	0	0	\$5,500	\$0	Northwestern SC	Freeze
12/20/1989	12/20/1989	0	1	\$0	\$0	Fairfield County	Extreme Cold
12/22/1989	12/25/1989	0	1	\$29,027	\$0	SCZ001-002-003-004-005-006 Mountains, Foothills, Piedmont, & Midlands	Extreme Cold
3/21/1990	3/21/1990	0	0	\$0	\$215,524	Statewide	Freeze
2/25/1991	2/25/1991	0	1	\$0	\$0	Fairfield County	Cold
4/3/1992	4/3/1992	0	0	\$0	\$710,440	SCZ003-004 Piedmont	Freeze
4/3/1992	4/3/1992	0	0	\$0	\$71,044	Piedmont	Freeze
3/13/1993	3/13/1993	0	0	\$14,945	\$14,945	SCZ003	High Winds & Cold

What to expect: Hot weather is common in Fairfield County during the late spring, summer and early fall months. On average, there are 18 to 24 days above 95 degrees any given year (Figure 24). Fairfield County experiences periods of above 100-degree temperatures in the months of May, June, July, August, September, and October. The hottest temperature recorded in Fairfield County was 108°F (July 22, 1926). Hot weather is a high-risk event to public health due to the possibility of heat exhaustion and heat stroke. The number of high temperature days and duration of heat waves are expected to increase.

Geographic Extent: The entire county is susceptible to hot temperatures. However, southwestern Fairfield County experiences more days of above 95 degrees (Figure 24).

According to South Carolina's State Climatology Office, summer maximum temperatures in Fairfield County have increased from 72.8°F (1971-2000) to 73.4°F (1981-2010) and the mean temperature has increased from 61.4°F (1971-2000) to 62.1°F (1981-2010)¹⁹.

Hot weather statistics for Fairfield County are as following:

Number of Loss-Causing Events:	8
Frequency of Occurrence:	20%
Recurrence Interval:	18 Days
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	\$12,746,647
Total Fatalities:	1
Deadliest Event:	1 fatality (June 22, 1996)
Most Property Damage:	\$5,146,441 (August 1, 1993)
Most Crop Damage:	\$5,146,441 (July 1, 1993)
Highest USDA Crop Indemnity Payout:	\$1,752 (July 1, 2011)

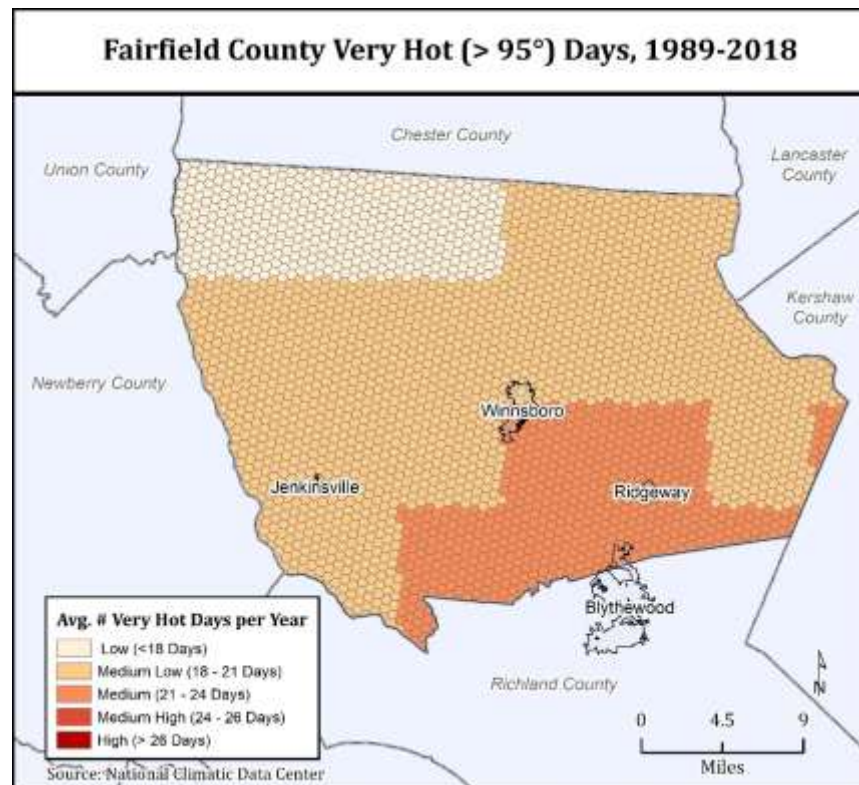


Figure 24 - Hot weather threat in Fairfield County.

¹⁹ SCDNR, n/d. South Carolina County Weather Atlas. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/cli_county_statistics.php

Table 20 - Record of loss-causing hot weather events in Fairfield County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
2/1/1976	2/29/1976	0	0	\$495	\$4,951	Statewide	Heat
7/1/1977	7/31/1977	0	0	\$4,648	\$464,834	Statewide	Drought & Heat
10/1/1978	10/31/1978	0	0	\$432	\$4,320	Statewide	Drought & Heat
6/1/1985	6/7/1985	0	0	\$0	\$261,793	Statewide	Heat
6/1/1993	6/30/1993	0	0	\$0	\$1,949,409	Statewide	Heat
7/1/1993	7/31/1993	0	0	\$10,292,881	\$0	Statewide	Drought & Heat
8/1/1993	8/31/1993	0	0	\$0	\$10,292,881	Statewide	Drought & Heat
6/22/1996	6/22/1996	0	1	\$0	\$0	SCZ021	Heat

Note: No new damage-causing extreme heat events in Fairfield County since 1996

K) Wildfires

What to expect: On average, wildfires occur frequently—every 11 days—in Fairfield County with wildfires occurring all over the county, with a slightly higher concentration in the southern half of the county (Figure 25). Instances of recorded property and crop damage are rare (Table 21). The largest wildfire was about 141 acres.

Geographic Extent: The entire county is susceptible to wildfire. The risk of wildfire including the propensity for large wildfires is spread randomly across the county with a somewhat higher occurrence rate in southern Fairfield County (Figure 25 & Figure 26). The number of wildfire events and the size of wildfires are expected to increase.

Wildfire statistics for Fairfield County are as following:

Number of Loss-Causing Events:	4
Daily Frequency of Occurrence:	0.04%
Recurrence Interval:	11 days
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	2005 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	\$419,611
Total Fatalities:	0
Deadliest Event:	n/a
Most Property Damage:	\$86,941 (March 15, 1966)
Most Crop Damage:	\$261,793 (March 1, 1985)
Highest USDA Crop Indemnity Payout:	n/av*

*No wildfire events caused a USDA Crop Indemnity Payout

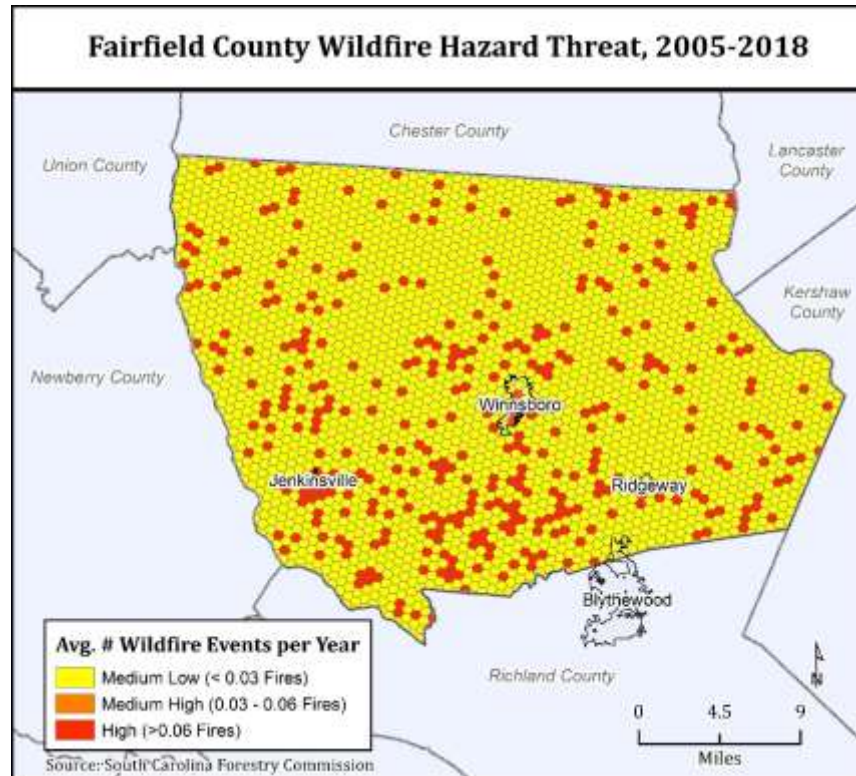


Figure 25 - Wildfire threat in Fairfield County based on average number of wildfires per year.

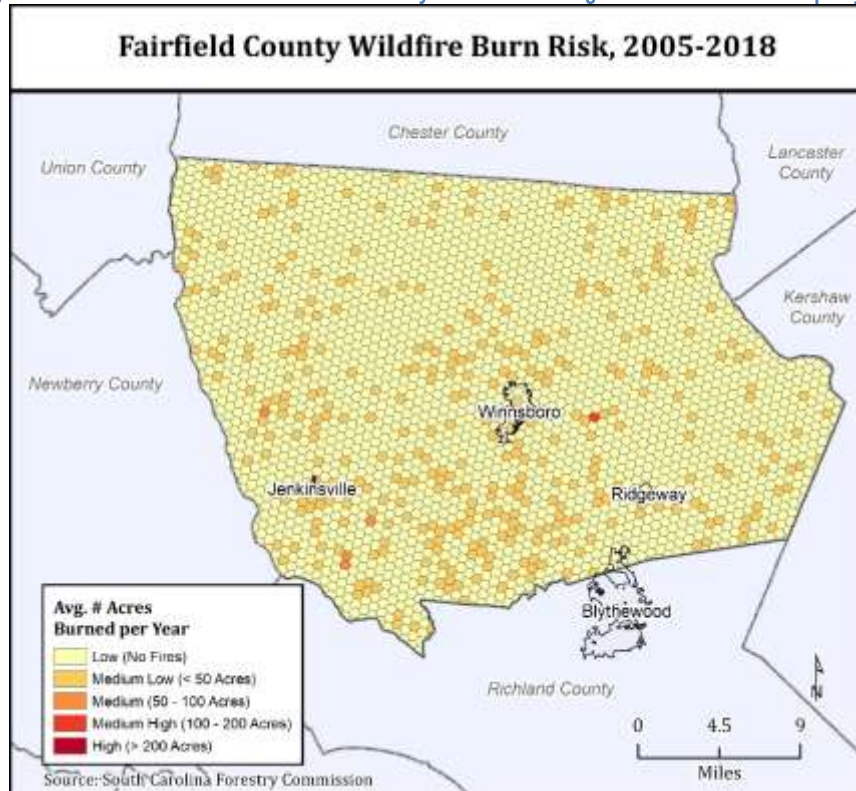


Figure 26 - Risk of large wildfires in Fairfield County.

Table 21 - Record of loss-causing wildfire events in Fairfield County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
3/15/1966	3/31/1966	0	0	\$86,941	\$0	Statewide	Forest Fires
3/1/1985	3/21/1985	0	0	\$26,179	\$261,793	Statewide	Fire
4/1/1985	4/30/1985	0	0	\$262	\$26,179	Statewide	Fire
12/28/1988	12/28/1988	0	0	\$0	\$18,255	Piedmont	Forest Fires

L) Droughts

What to expect: Fairfield County sees drought conditions (i.e., weeks of moderate to extreme drought according to the Palmer Drought Severity Index) on average of 15 to 22 weeks a year (Figure 27). Multi-year, severe droughts are possible in Fairfield County as seen from 1998 through 2002. The County experienced its driest year in 1954 with only 25.53 inches of rainfall (annual average: 45.16 inches)²⁰. Droughts are detrimental to agricultural production (incl. forestry and water supply). Agricultural crops (especially corn, cotton, and soybean) are stressed by drought conditions and irrigation systems are not common in South Carolina. Droughts may also affect tourism and freshwater fisheries. The number of droughts days and the duration of drought events are expected to increase.

Geographic Extent: The entire county is susceptible to drought, but the western half of Fairfield County tends to experience more weeks in drought conditions. It is important to note that southwestern Fairfield County has on average more hot weather days than the rest of the county (Figure 27).

The most damaging droughts occurred in 1954, 1986, and 1998-2002. The latest severely impacted economic sectors such as agriculture, forestry, tourism, power generation, public water supplies, and freshwater fisheries²¹. Less severe droughts were reported in 1988, 1990, 1993, and 1995. Unfortunately, the record on losses, particularly agricultural losses is sparse—not because of a lack of losses but because of shortcomings in tracking drought losses. The current tally of about \$16 million in direct losses is most likely a vast underestimation and possibly exceeds \$100 million.

Drought statistics for Fairfield County are as following:

Number of Loss-Causing Events:	16
Frequency of Occurrence:	0.58%
Recurrence Interval:	1.7 years
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	\$16,069,921
Total Fatalities:	0
Deadliest Event:	n/a
Most Property Damage:	\$5,146,441 (July 1, 1993)
Most Crop Damage:	\$5,146,441 (August 1, 1993)
Highest USDA Crop Indemnity Payout:	\$11,766 (June 1, 2015)

²⁰ SCDNR, n/d. South Carolina County Weather Atlas. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/cli_county_statistics.php

²¹ SCDNR, n/d. South Carolina Climate. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/cli_sc_climate.php

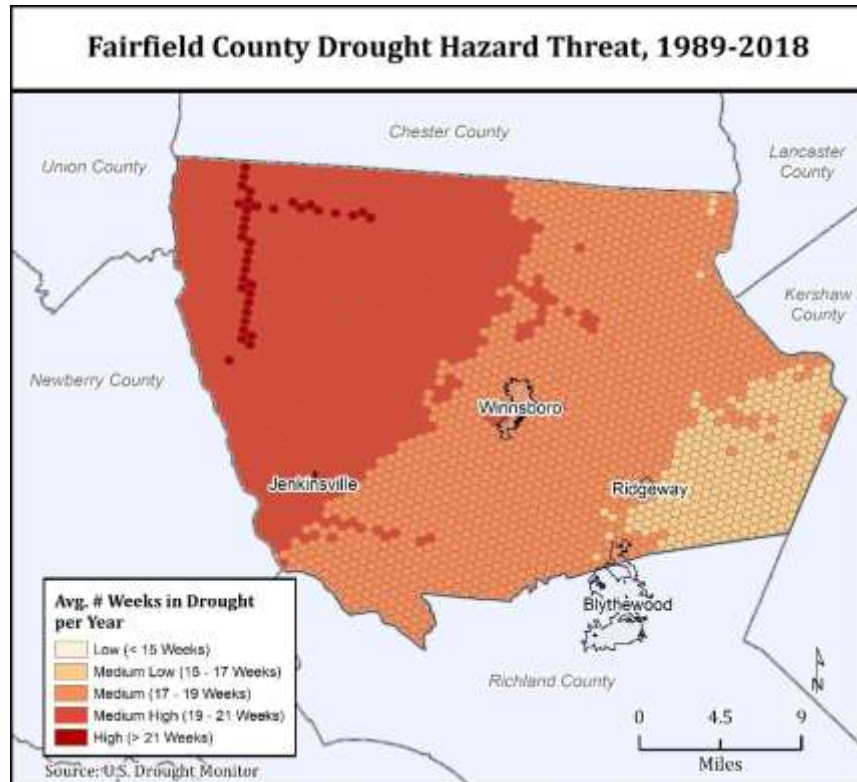


Figure 27 - Drought hazard threat in Fairfield County.

Table 22 - Record of loss-causing drought events in Fairfield County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag.*	Location	Description
7/1/1977	7/31/1977	0	0	\$4,648	\$464,834	Moderate	Statewide	Drought & Heat
4/1/1978	4/13/1978	0	0	\$43	\$4,320	Mild	Statewide	Drought
10/1/1978	10/31/1978	0	0	\$432	\$4,320	Mild	Statewide	Drought & Heat
6/1/1984	6/20/1984	0	0	\$0	\$2,711	Moderate	Statewide	Drought
4/1/1986	4/30/1986	0	0	\$0	\$303	Moderate	SCZ001-002-003-004-005-006-007	Drought
5/1/1986	5/31/1986	0	0	\$0	\$2,570	Severe	Statewide	Drought
6/1/1986	6/30/1986	0	0	\$2,570	\$25,702	Severe	Statewide	Drought
7/1/1986	7/31/1986	0	0	\$257,016	\$2,570,161	Extreme	Statewide	Drought
2/1/1988	2/28/1988	0	0	\$24	\$2,381	Mild	Statewide	Drought
6/1/1988	6/30/1988	0	0	\$2,381	\$23,811	Mild	Statewide	Drought
7/1/1988	7/31/1988	0	0	\$238	\$2,381	Moderate	Statewide	Drought
8/1/1988	8/31/1988	0	0	\$3	\$3,222	Moderate	SCZ001-002-003-004-006-008	Drought
7/1/1993	7/31/1993	0	0	\$10,292,881	\$0	Moderate	Statewide	Drought & Heat
8/1/1993	8/31/1993	0	0	\$0	\$10,292,881	Severe	Statewide	Drought & Heat
5/1/1994	5/31/1994	0	0	\$0	\$1,900,740	Moderate	Statewide	Drought
5/1/1995	5/31/1995	0	0	\$0	\$739,343	Mild	Statewide	Drought

*Based on historic Palmer Drought Severity Index categories.

Note: While droughts occurred since 1995, the NCEI (formerly NCDC) did not report any losses. The occurrence of drought is reflected in Figure 51.

M) Earthquakes

What to expect: Fairfield County has a much lower earthquake risk than coastal counties in South Carolina and experiences only low magnitude earthquakes. Since 1900, the strongest earthquake had a magnitude of 2.6 (Figure 28). There is only a 2% chance that Fairfield County could experience shaking of up to 2m/s with a higher shaking potential in the southwestern of the county (Figure 29).

Geographic Extent: The entire county is susceptible to earthquakes.

Number of Loss-Causing Events:	0
Frequency of Occurrence:	<0.05%
Recurrence Interval:	20 years
Expected changes to frequency and recurrence interval in the future:	No changes
Frequency Year Range:	1900 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	\$0
Total Fatalities:	0
Deadliest Event:	n/a
Most Property Damage:	n/a
Most Crop Damage:	n/a
Highest USDA Crop Indemnity Payout:	n/av*

*No wildfire events caused a USDA Crop Indemnity Payout

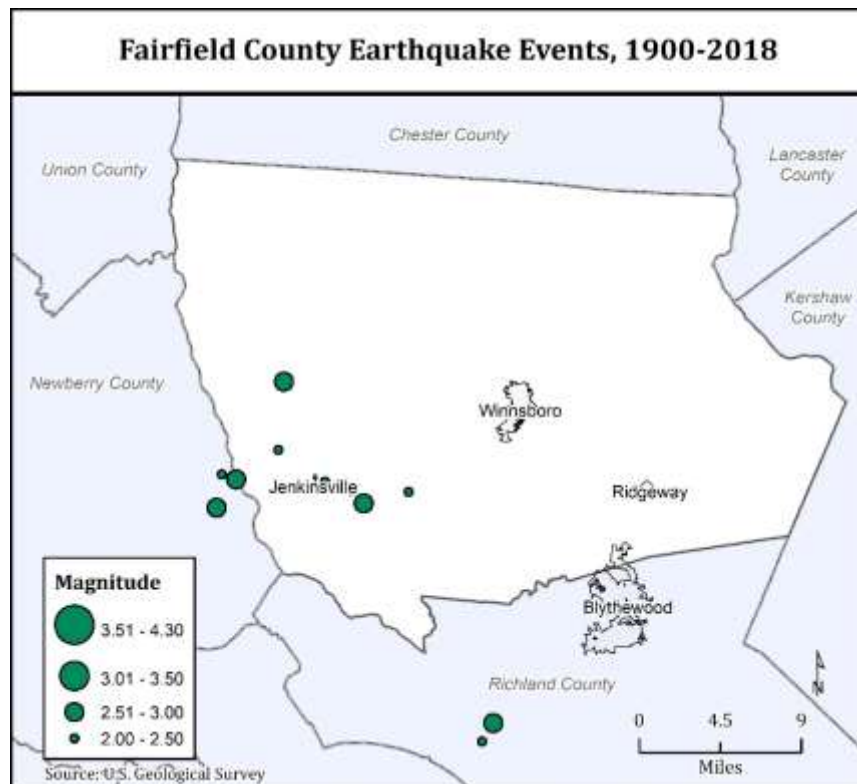


Figure 28 - Earthquake History in Fairfield County.

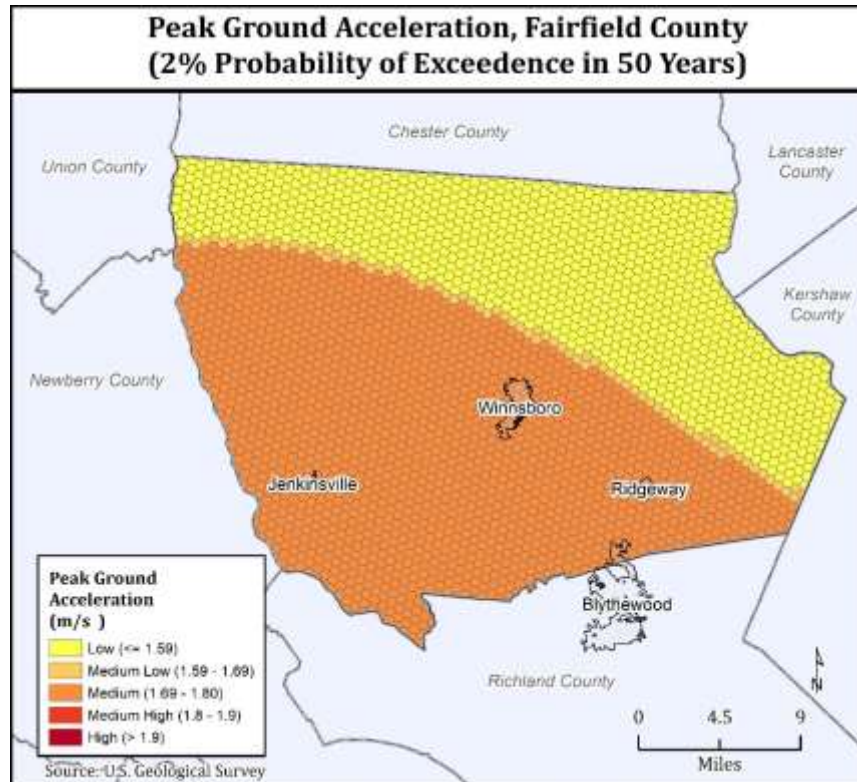


Figure 29 - Risk of shaking due to earthquakes in Fairfield County.

4.2 Hazard Vulnerability Assessment for Fairfield County

Vulnerability is generally defined as the potential for loss. Understanding which populations and what assets are likely to be impacted by hazard events is critical for developing sound mitigation planning activities and projects. This assessment draws on three vulnerability indicators that are combined and averaged into a *Composite Vulnerability* measure that is then later overlaid with a hazard and the potential severity of consequence:

This section addresses
FEMA HMP requirement
201.6(c)(2)(i)

- Community lifeline and critical infrastructure assets (*INF*) provide a representation of what is at risk (*INF*).
- Areas with socially vulnerable residents provide an idea of who has a lower capacity to absorb shocks and stresses (*SoVI*), and
- Population density (*POP*) provides a representation of how many people are at risk and support a utilitarian approach to serving the greatest number of peoples.

$$VUL = \frac{(SoVI) + (INF) + (POP)}{3} \quad (2)$$

Community lifelines and critical infrastructure²² assets such as transportation facilities, communication facilities, water and wastewater facilities, power facilities, and more. These facilities are those that all other infrastructure lifelines are dependent on. Socially vulnerable populations were derived from the Social Vulnerability Index first developed by Cutter (2003)²³ and later refined by scholars at the University of

²² <https://www.fema.gov/lifelines>

²³ <https://onlinelibrary.wiley.com/doi/abs/10.1111/1540-6237.8402002>

Central Florida²⁴. Understanding where populations reside who have a lower ability to prepare for, respond to, and recover from disaster events can help decision makers distribute scarce resources before, during, or after disasters.

Overall, Fairfield County's vulnerability is mostly medium low to medium with a few areas in the area around the Town of Winnsboro and western portions of the county exhibiting medium high vulnerability.

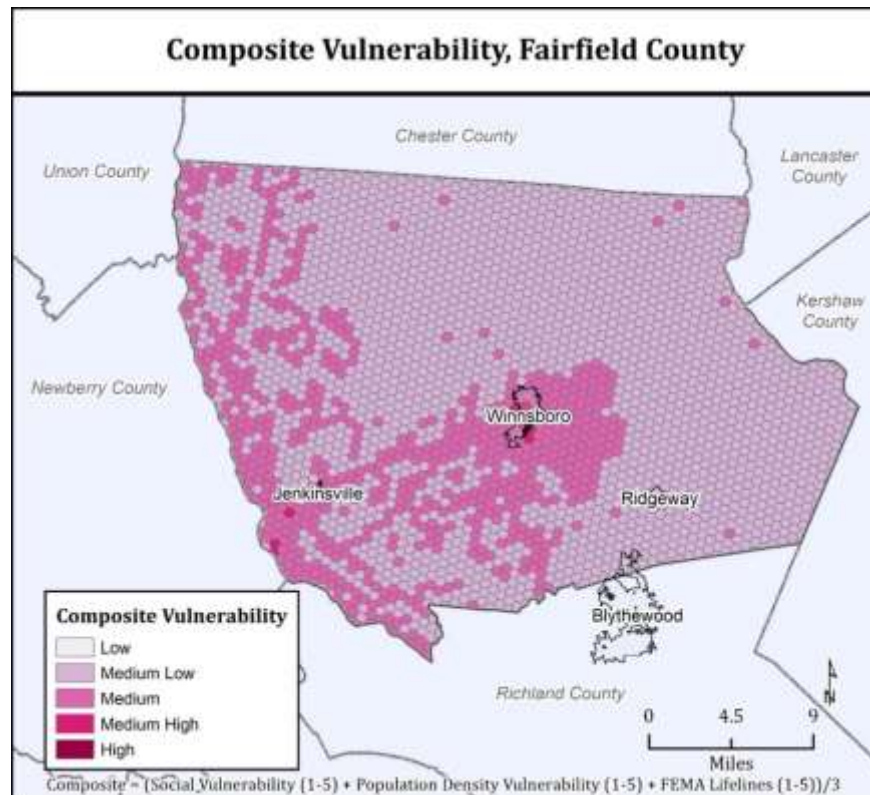


Figure 30 - Fairfield County's Composite Hazard Vulnerability

Please see the Risk Assessment Methodology for a more detailed description of the approach.

A) Assets at Risk

Fairfield County is home to a little over 22,300 residents (2019 US Census) and has an approximate building stock of 11,635 buildings with a replacement value of about \$2,243 million (in \$2019 according to HAZUS-MH 2.4) (Table 24). Since 2010, Fairfield County lost 6.7% of its population which has reduced the exposure to natural hazards compared to the previous plan. See Section 3.4 for more information on development changes in the county.

There are 62 critical facilities in Fairfield County such as an Emergency Operation Center, hospital, administrative buildings as well as numerous law enforcement, fire/EMS, school facilities, and a nuclear power plant (Table 23). Most of the critical infrastructure is located in the City of Winnsboro and surrounding areas, as well as the area west of the Town of Jenkinsville (Figure 31). More information on the vulnerability assessment for each critical facility can be found in Appendix Input Scores for Severity of Consequence Calculations.

²⁴ www.vulnerabilitymap.org

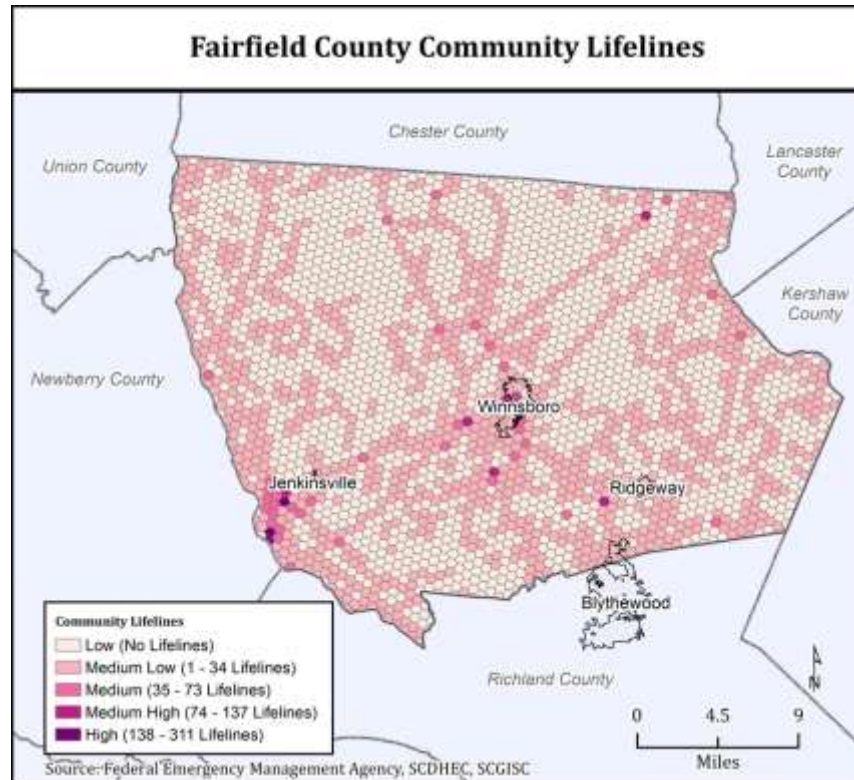


Figure 31 - Distribution of community lifelines and critical facilities in Fairfield County.

Assets at risk (Table 23) were assessed using FEMA's Lifeline²⁵ with the understanding that

- Lifelines enable the continuous operation of critical government and business functions and is essential to human health and safety or economic security.
- Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function.
- FEMA has developed a construct for objectives-based response that prioritizes the rapid stabilization of Community Lifelines after a disaster.
- The integrated network of assets, services, and capabilities that provide lifeline services are used day-to-day to support the recurring needs of the community and enable all other aspects of society to function.
- When disrupted, decisive intervention (e.g., rapid re-establishment or employment of contingency response solutions) is required to stabilize the incident.

Table 23 - Critical Infrastructure Included in Fairfield County's Hazard Risk Assessment.

FEMA Lifeline	Variable	Critical	Count
Safety and Security	Law Enforcement	Yes	3
Safety and Security	Prisons		1
Safety and Security	Fire/EMS	Yes	18
Safety and Security	Govt Services - Courthouses		1
Safety and Security	Local EOCs	Yes	1
Safety and Security	Community Safety - Convention Centers/Fairgrounds		0
Safety and Security	Public Schools		9

²⁵ <https://www.fema.gov/lifelines>

FEMA Lifeline	Variable	Critical	Count
Safety and Security	Private Schools		1
Safety and Security	Colleges and Universities		0
Safety and Security	Mobile Home Parks		1
Safety and Security	Places of Worship		44
Safety and Security	Nursing Homes		2
Food, Water, Shelter	Food Stores		6
Food, Water, Shelter	Nutrition Sites – Supplemental Meal Sites		11
Food, Water, Shelter	Water Treatment Plants and Water Supply Intake	Yes	2
Food, Water, Shelter	Shelter		17
Health and Medical	Hospitals	Yes	1
	Other Medical		24
Energy	Transmission Lines (1/10-mile road segments) and Substations		4,880
	Substations	Yes	30
	Electric power generation	Yes	4
Energy	Gas Stations		19
Communications	Infrastructure		20
Communications	Banks and Finance		13
Transportation	Non-State Highway/Roadway (1/10-mile road segments)		4,717
Transportation	Railway (1/10-mile road segments)		783
Transportation	Aviation	Yes	2
Hazardous Materials	Toxic Release Inventory Sites		9
Hazardous Materials	Superfund Sites		0
Hazardous Materials	Solid Waste	Yes	1

Building exposure exceeds more than \$2.2 billion in value with residential buildings accounting for more than \$1.8 alone (Table 24).

Table 24 - Building stock values by occupancy type in Fairfield County. Source: HAZUS 4.2.

Building Type	Total Replacement Value (in \$2019 Millions)
Residential	\$1,856
Commercial	\$204
Industrial	\$59
Agricultural	\$3
Religious	\$84
Government	\$13
Education	\$26
Total	\$2,244

B) Social Vulnerability and Population Density

Social vulnerability, a concept focused on understanding an area's capacity to prepare for, respond to, and rebound from disaster events²⁶, has a long conceptual and theoretical history in social and disaster science fields.²⁷ Socially vulnerable populations have fewer resources to aid in preparation for disasters, often bear the brunt of disaster impacts, and take longer to bounce back from disaster events. Empirical measures of social vulnerability enable decision makers and emergency managers to understand where vulnerable populations reside and how that vulnerability is manifest across a landscape. Here, 29 indicators of social vulnerability, collected from www.vulnerabilitymap.org, were used to create a tract level SoVI for the county. SoVI scores were categorized from (0 – no data to 5 – high social vulnerability) using a standard deviation classification scheme (Figure 32).

In Fairfield County, highly vulnerable populations live mostly in the center and western third of the county (Figure 32). The Town of Winnsboro is also the most densely populated area within Fairfield County (Figure 33).

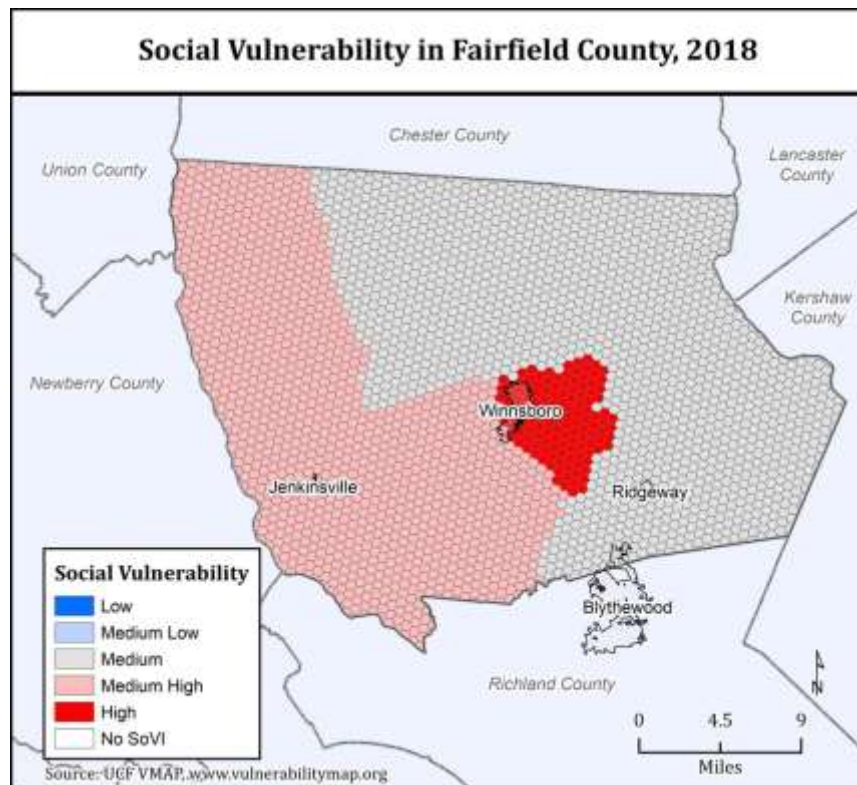


Figure 32 - Socially vulnerable tracts in Fairfield County.

²⁶ <https://doi.org/10.1177/0002716205285515>

²⁷ <https://unu.edu/publications/books/measuring-vulnerability-to-natural-hazards-towards-disaster-resilient-societies-second-edition.html#overview>

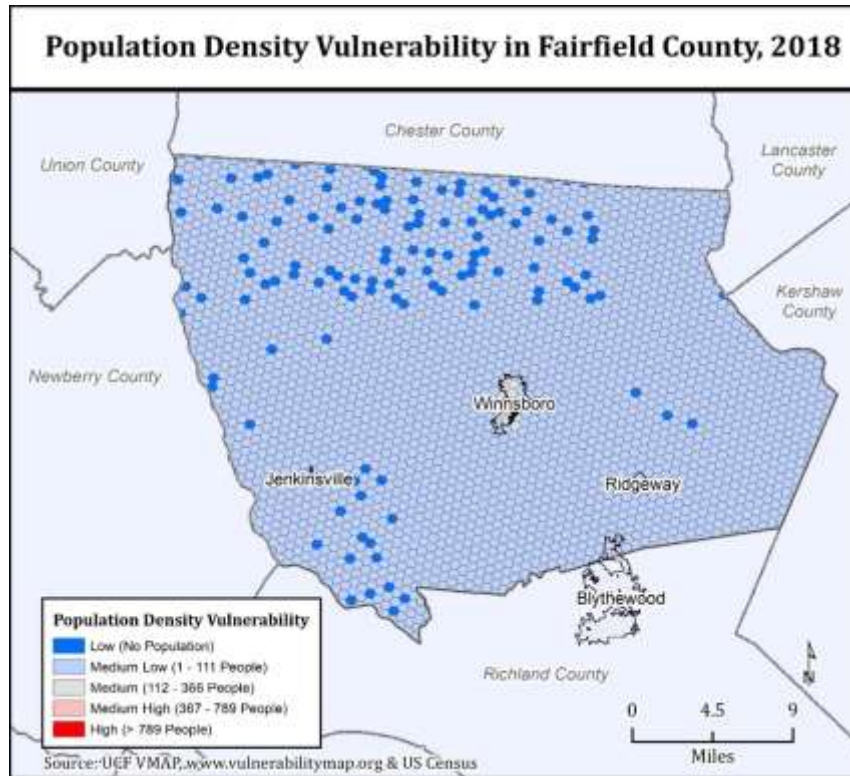


Figure 33 - Fairfield County's Population Distribution.

4.3 Severity of Consequence Assessment for Fairfield County

Every hazard is unique in terms of its past impacts and future potential for impacts. In this Plan, this is captured as the Severity of Consequence (CON). This universal accounting of hazard risk for Fairfield County considers historical impacts (*HISTCON*), hazard frequencies, future climate impacts, as well as the current high priority hazards of the county, and those likely to cause continued losses if not mitigated. See [Appendix I](#) for more information on this calculation and its component variables.

For Fairfield County, the hazards with the highest severity of consequence were the following (Table 25):

1. Heat
2. Drought
3. Tornado
4. Hurricane and tropical storms
5. Wind

Table 25 - Fairfield County Severity of Consequence Scores by Hazard.

Hazard	Historical Score (1-5)	Climate Sensitivity Score (1-5)	Severity/Frequency Score (1-5)	Priority Score (1-5)	Severity of Consequences (CON) Score (4-20)	Standardized CON Score (1-5)
Drought	2.67	5	3.11	4.43	15.21	4.36
Earthquake	1.00	3	1	2.71	7.71	1.99
Extreme Cold	3.68	1	1.5	3.29	9.47	2.55
Flash Flood	1.24	5	2.1	2.14	10.48	2.87
Flooding	1.00	5	1	1	8	2.08
Fog	1.00	1	1	1.57	4.57	1

Hazard	Historical Score (1-5)	Climate Sensitivity Score (1-5)	Severity/Frequency Score (1-5)	Priority Score (1-5)	Severity of Consequences (CON) Score (4-20)	Standardized CON Score (1-5)
Hail	3.69	3	1.31	2.14	10.14	2.76
Heat	2.81	5	5	4.43	17.24	5
Hurricane/ Tropical Storm	1.70	5	2.71	3.29	12.7	3.57
Lightning	2.67	3	1.02	2.14	8.83	2.34
Severe Storm/ Thunderstorm	2.84	5	1.04	1.57	10.45	2.86
Tornado	4.41	3	2.36	3.86	13.63	3.86
Wildfire	1.08	5	1.18	1.57	8.83	2.34
Wind	5.00	3	1.11	3.29	12.4	3.47
Winter Weather	2.40	1	1.21	5	9.61	2.59

4.4 Risk Assessment for Fairfield County

The following sections discuss the hazard-specific risks for each hazard affecting Fairfield County. As described in the Risk Assessment Methodology section, a hazard's risk is the product of the *Hazard Threat (THR)*, *Vulnerability (VUL)*, and *Severity of Consequence (CON)*. All calculations are completed at the unit of analysis, which in this Plan is a 0.25-mile hexagon.

$$RISK_{HAZ} = (THR_{HAZ})(VUL)(CON_{HAZ}) \quad (1)$$

A) Flooding

The vulnerability to riverine flooding is most pronounced in 1000-year floodplains (0.1% annual chance of occurrence) in central and western Fairfield County due to the presence of vulnerable populations (Figure 34). Exposure in the 1000-year floodplain is largely limited to residential buildings with only one critical facility located inside the 1000-year floodplain (Figure 35). It is important to note that the determination of infrastructure inside or outside the 1000-year floodplain was solely based on location and did not take elevation into account. Therefore, being located inside the 1000-year floodplain does not carry an implication regarding requirements for the National Flood Insurance Program.

According to the HAZUS model using a 1,000-year flood scenario (0.1% annual chance of occurrence) (Figure 36), the total economic loss estimated for the flood is \$21.96 million, which represents 3.32 % of the total replacement value of the scenario buildings. The total building-related losses were \$14.83 million or 68% percent of all building-related losses as two residential buildings would be at least moderately damaged. Nearly all building-related losses resulted from residential damage at \$11.15 million, with residential occupancies making up 59.36% of the total loss. 32% of the estimated economic losses were related to the business interruption of the region.

Most of the damage would occur east and south of Winnsboro, near the towns of Ridgeway and Blythewood (Figure 36). There would also be moderate damage throughout the county following the 1000-year flood plains, with mild economic losses incurred. It is expected that none of the critical infrastructure would receive any damage. The modelled flood's impact area overlaps only around Winnsboro, the county's most vulnerable population, resulting in moderate damage and economic loss northwest of Winnsboro. All of these estimates were derived using HAZUS-MH 4.2.

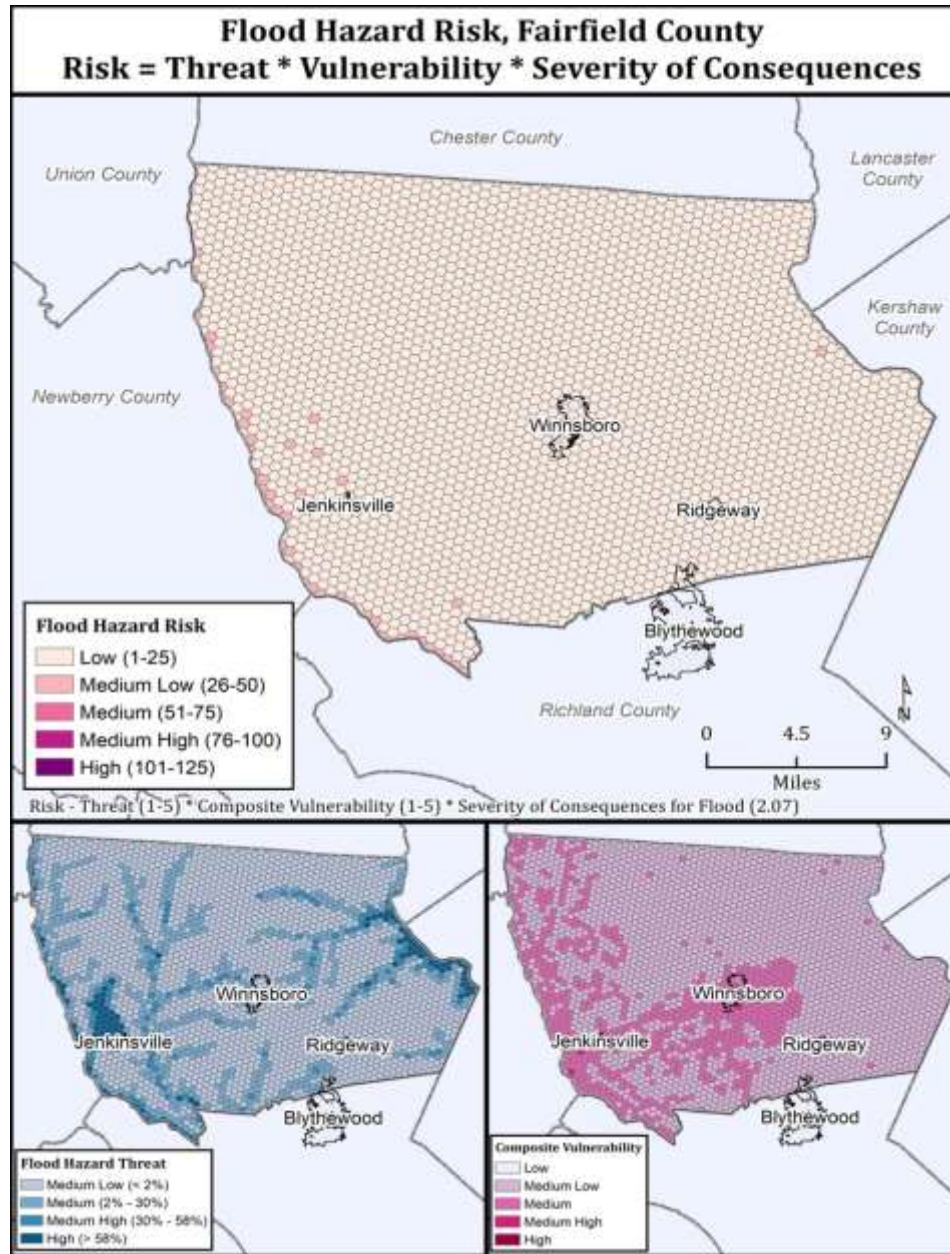


Figure 34 - Risk of a 1000-year flood event in Fairfield County.

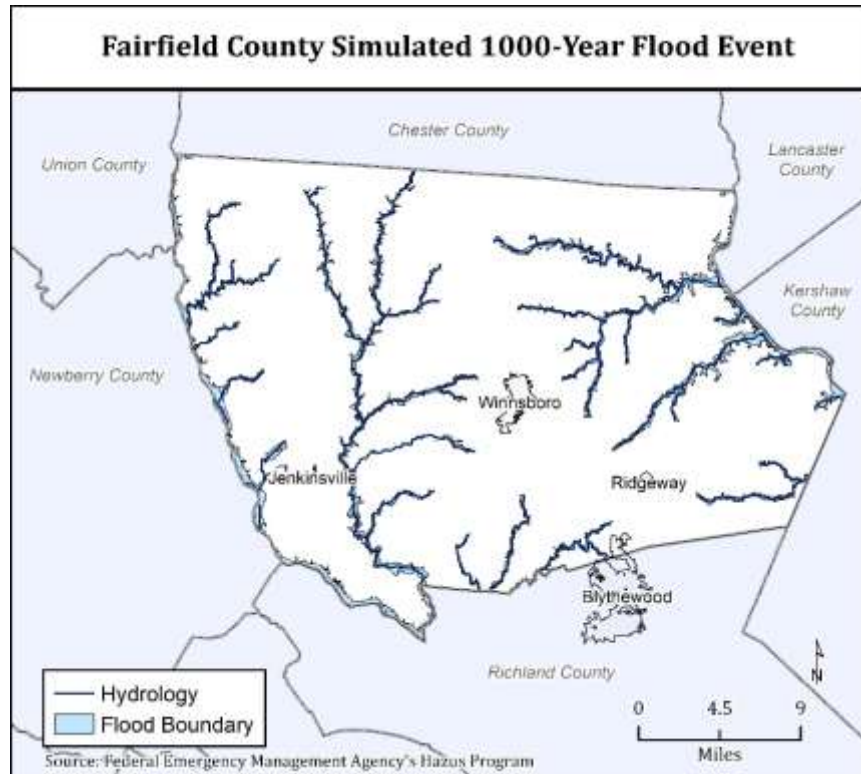


Figure 35 - Modelled 1,000-year flood event in Fairfield County.

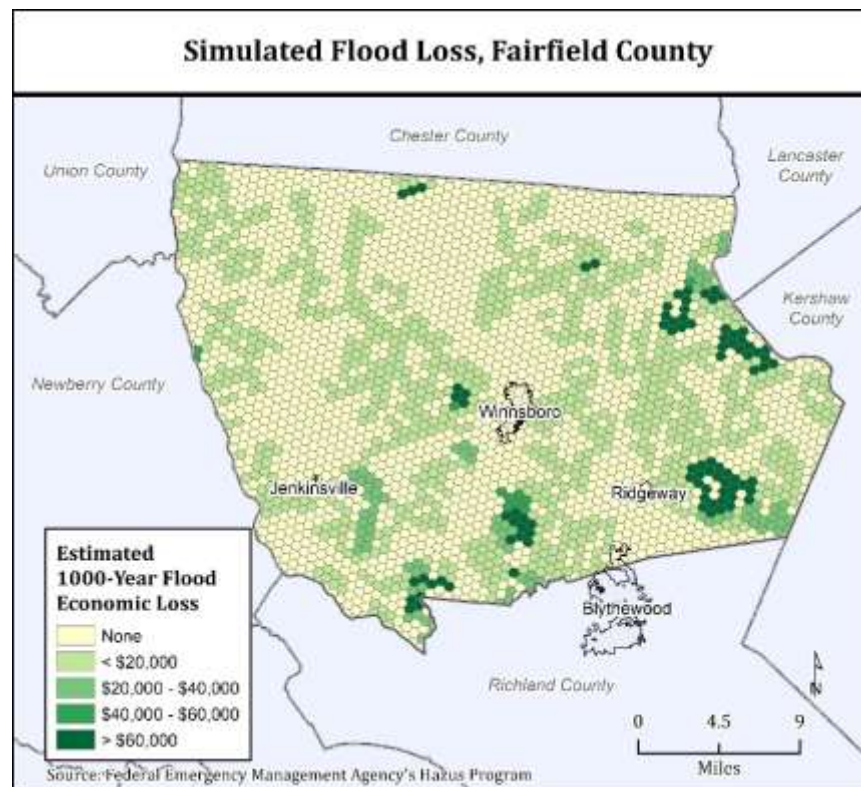


Figure 36 - Damage from a modelled 1,000-year flood event in Fairfield County.

Flash flooding in Fairfield County has a similar risk profile to riverine flooding, where most of the county has a low risk, with only some areas near the westernmost edge of the county that overlaps with higher medium vulnerability having medium-low risk (Figure 37). There is also an area east of the Town of Winnsboro that has slightly higher risk due to overlap, but it is on the outside edge of the vulnerability area (Figure 37).

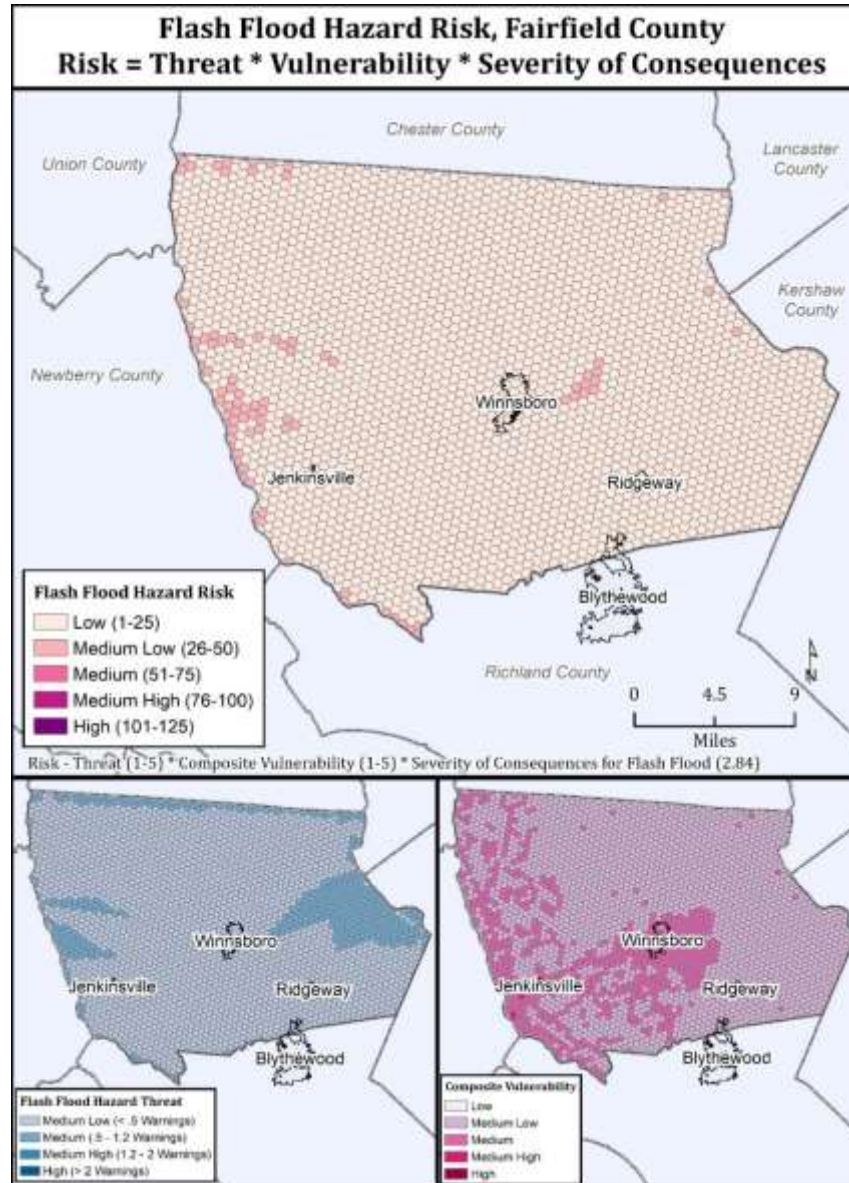


Figure 37 – Risk of flash flooding in Fairfield County.

B) Hurricanes & Tropical Cyclones

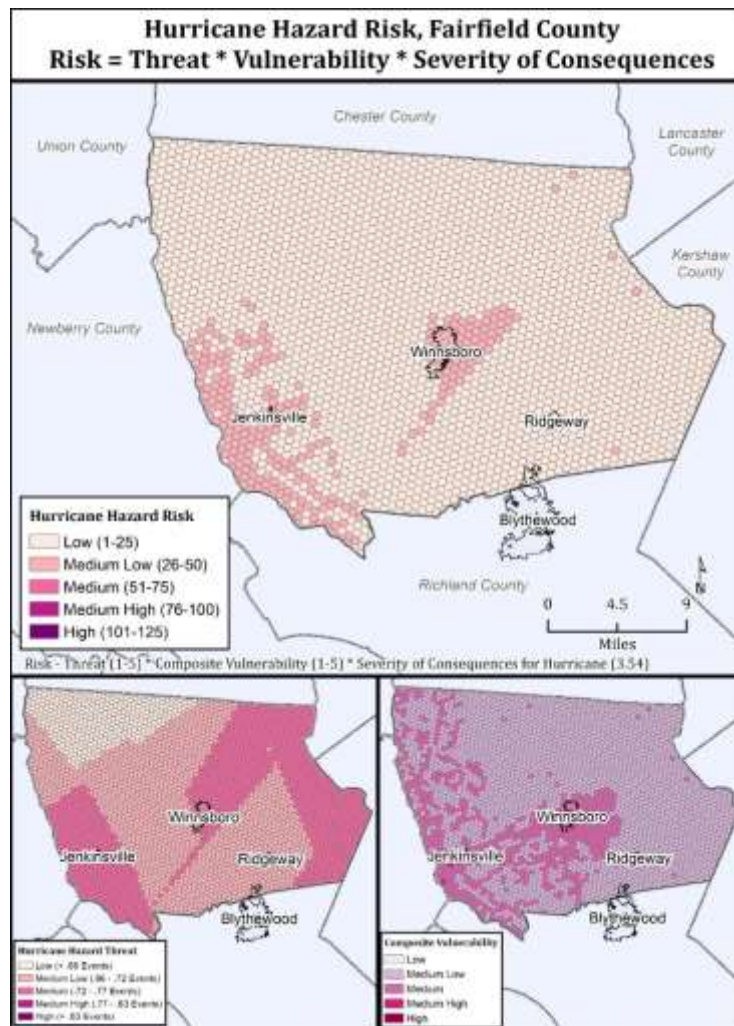


Figure 38 - Risk of tropical cyclones in Fairfield County.

The central and western portions of Fairfield County exhibit a higher vulnerability to tropical storms than the eastern or northern regions (Figure 38). These areas are characterized by high vulnerability and an annual average occurrence of 0.7 tropical storms per year. Much of the county's critical infrastructure is located in areas of higher vulnerability (Figure 39).

For a 1,000-year hurricane event, Fairfield County is expected to see wind speeds between 96 and 110 miles per hour (Category 2) (Figure 40). Such wind speeds are probable with a fast-moving, major hurricane that has a similar track to Hurricane Hugo. About 80% of the county's infrastructure would not experience any damage. About 330 buildings (or over 3% of the building stock) would be at least moderately damaged with an estimated property damage of \$50 million (nearly all of it residential) with most of the damage occurring in, around, and south Winnsboro and Ridgeway, as well as along the county border with Kershaw County (Figure 39). It is expected that none of the critical infrastructure will receive any significant damage and all critical infrastructure should be operable within a day. The modelled storm's most catastrophic impact area does not overlap with the county's most vulnerable populations. All estimates were derived using HAZUS-MH 2.2.

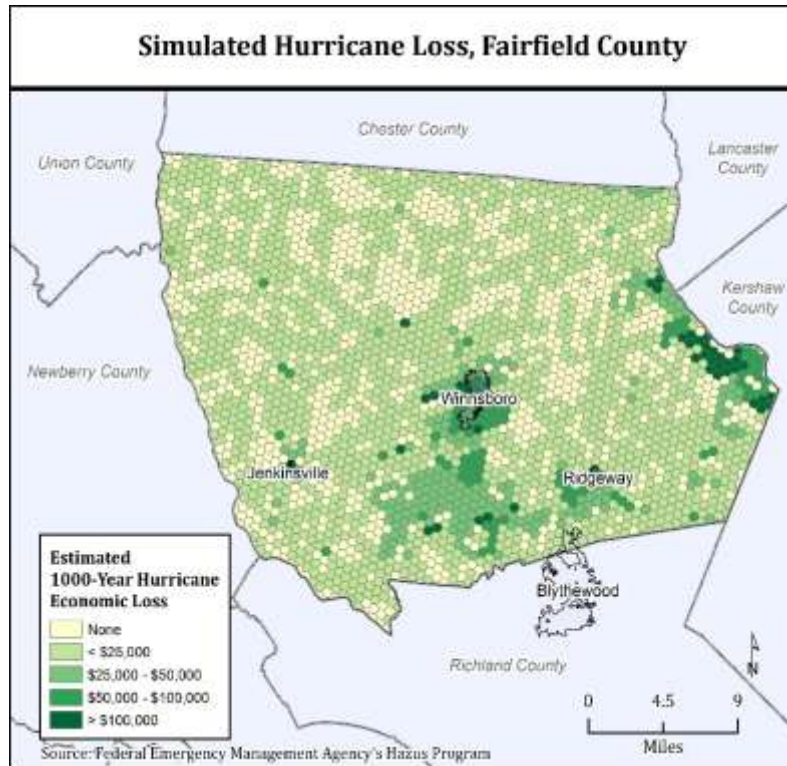


Figure 39 - Wind Speeds from a modelled 1,000-year hurricane event in Fairfield County.

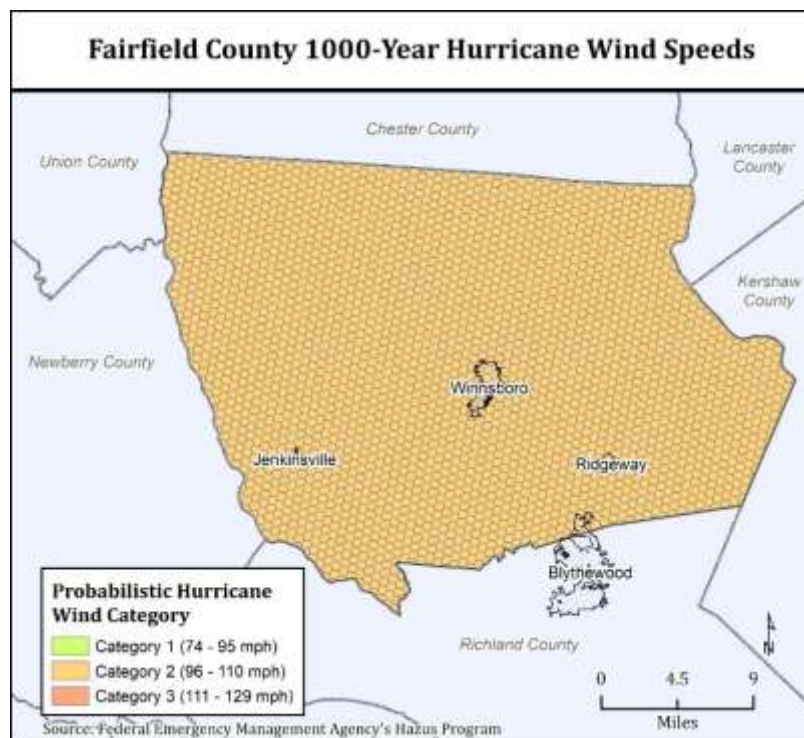


Figure 40 - Damage from a modelled 1,000-year hurricane event in Fairfield County.

C) Tornadoes

The central and western part of Fairfield County exhibits high vulnerability to tornadoes (Figure 41). In these areas, medium to medium high vulnerability coincides with more than 0.5 tornado warning per year, resulting in an overall tornado hazard risk near Winnsboro and Jenkinsville of 26-50 (Figure 41).

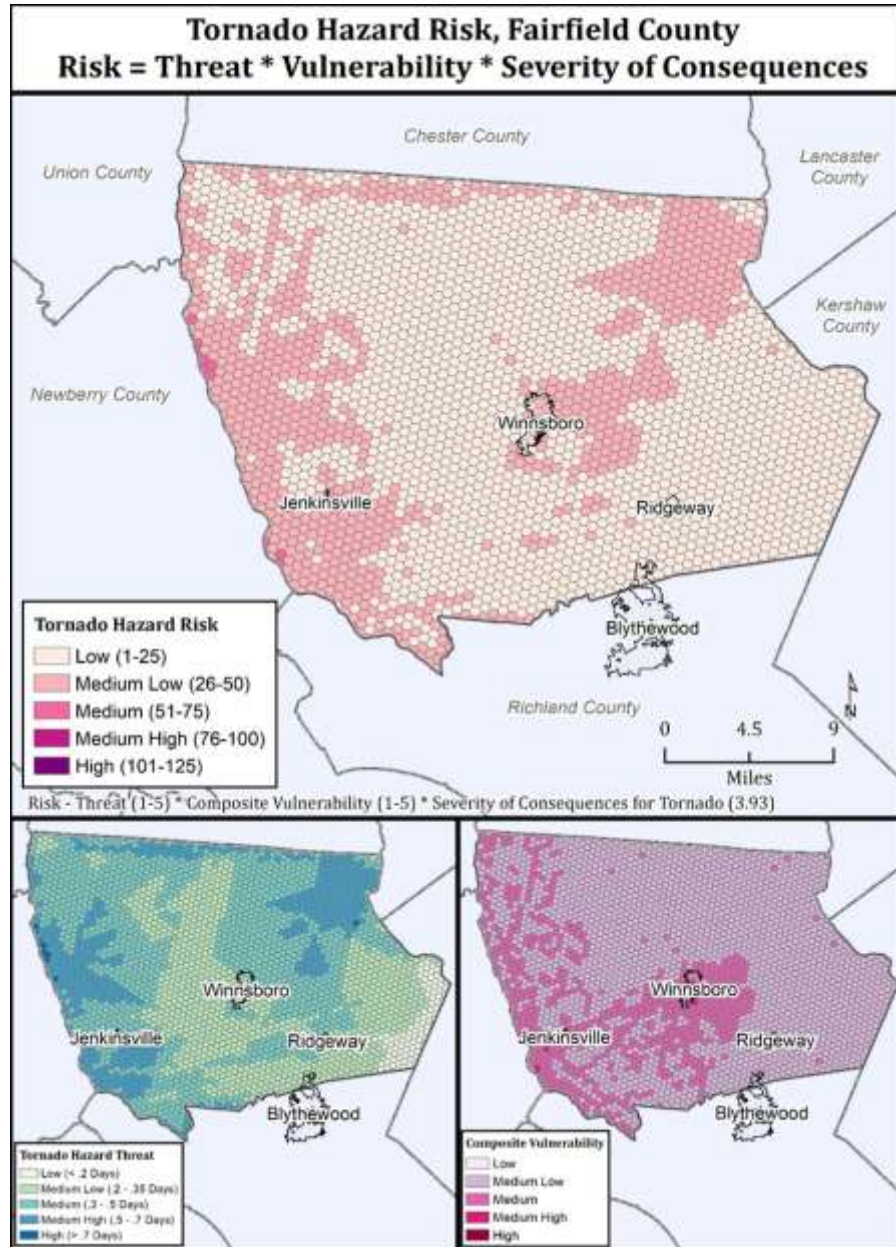


Figure 41 – Risk of tornadoes in Fairfield County.

D) Thunderstorms

The central portion of Fairfield County exhibit higher vulnerability to severe thunderstorms, particularly around the Towns of Winnsboro and Jenkinsville (Figure 42). In these areas, higher vulnerability coincides with up to 11 severe storm warnings per year.

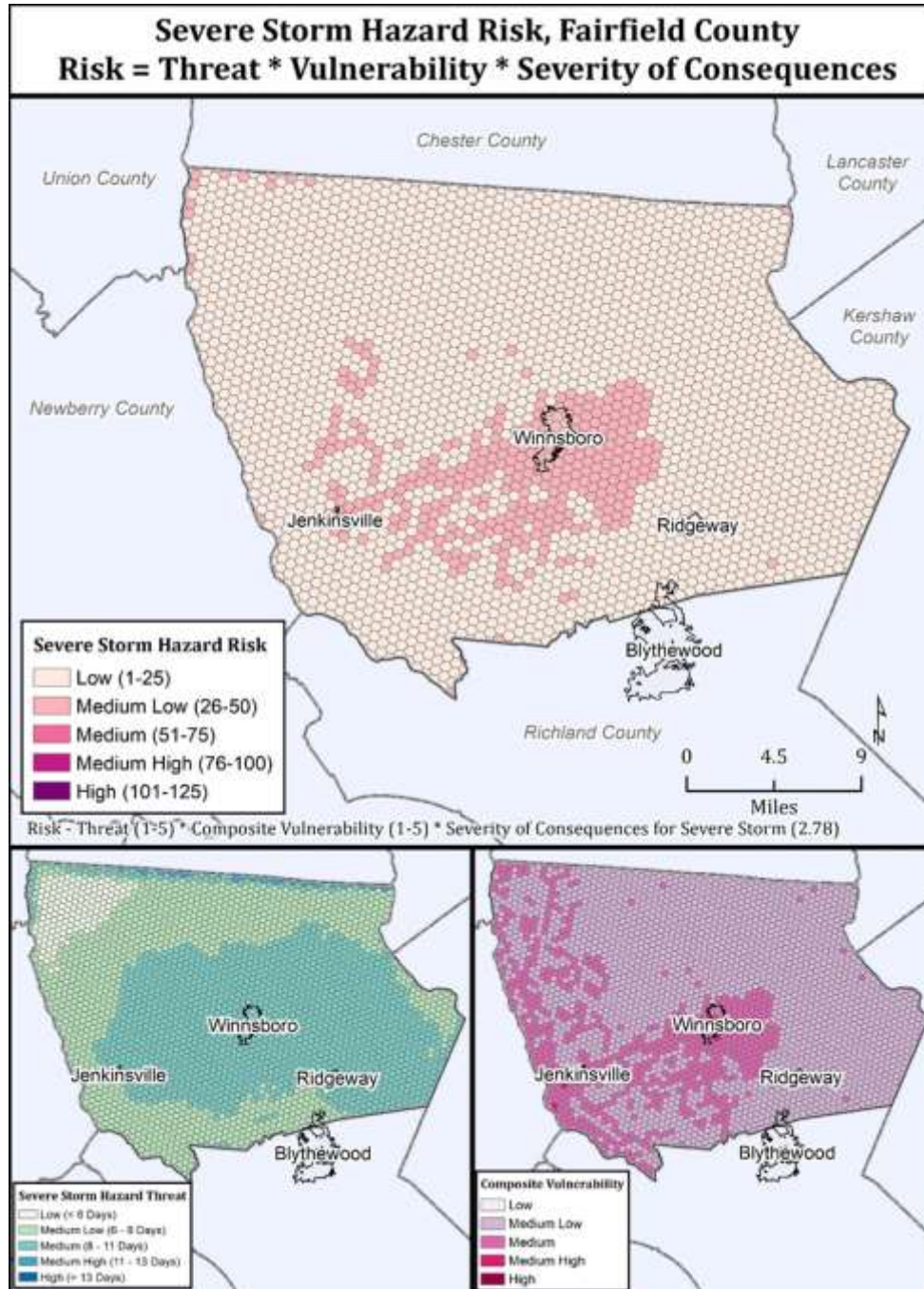


Figure 42 – Risk of severe thunderstorms in Fairfield County.

E) Lightning

The highest vulnerability to lightning exists in central and western Fairfield County, while the highest lightning hazard threat exists in the eastern portions of the county (Figure 43). There is little overlap between the hazard threat and vulnerability except for a region between Jenkinsville and Winnsboro. This results in a very low lightning hazard risk score for the entire county.

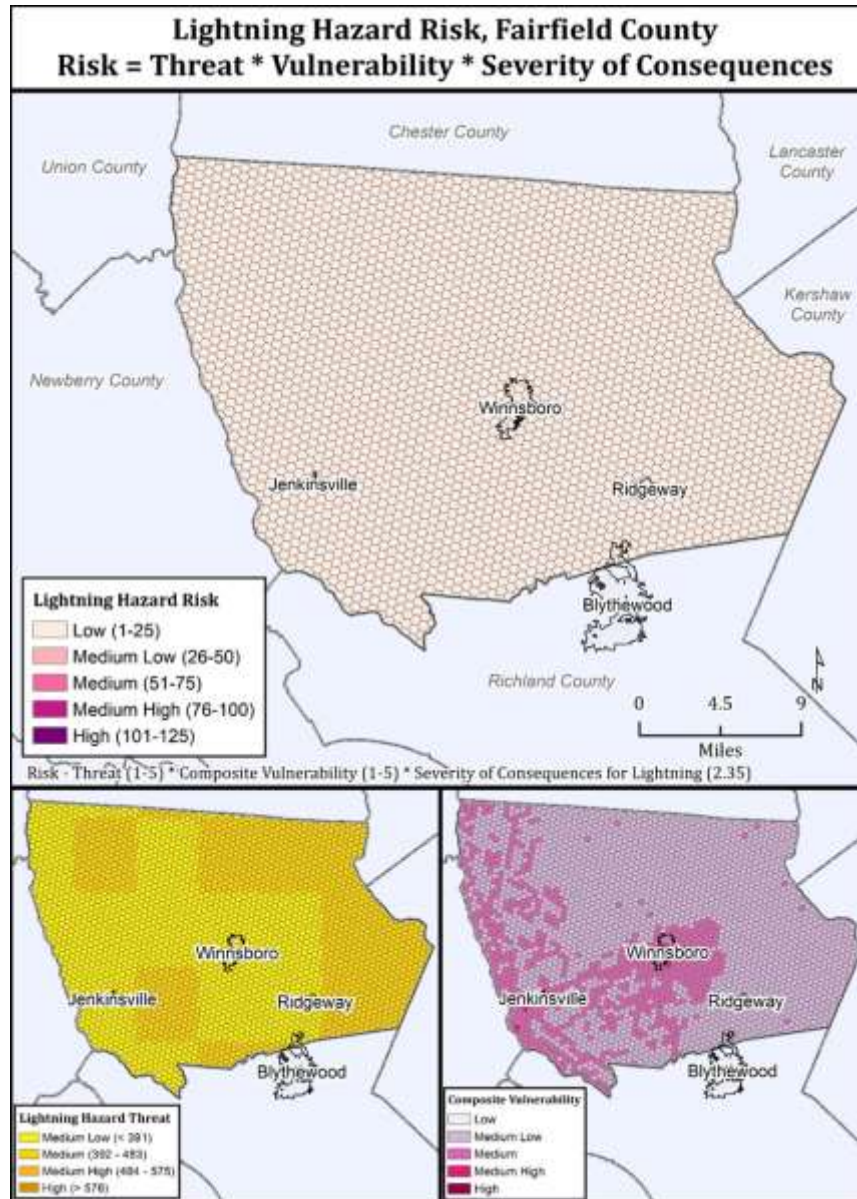


Figure 43 – Risk of lightning in Fairfield County.

F) Wind

The highest vulnerability to the high wind hazards exists in the central and western portions of the county in, around, and between the Towns of Winnsboro and Jenkinsville (Figure 44). The wind hazard threat is low for most of the county, with regions of medium (.02 - .05) and high (.05+) spanning the southern third of Fairfield County (Figure 44). This creates an overlap of vulnerability and wind hazard threat around the Town of Jenkinsville and in between Jenkinsville and Winnsboro (Figure 44).

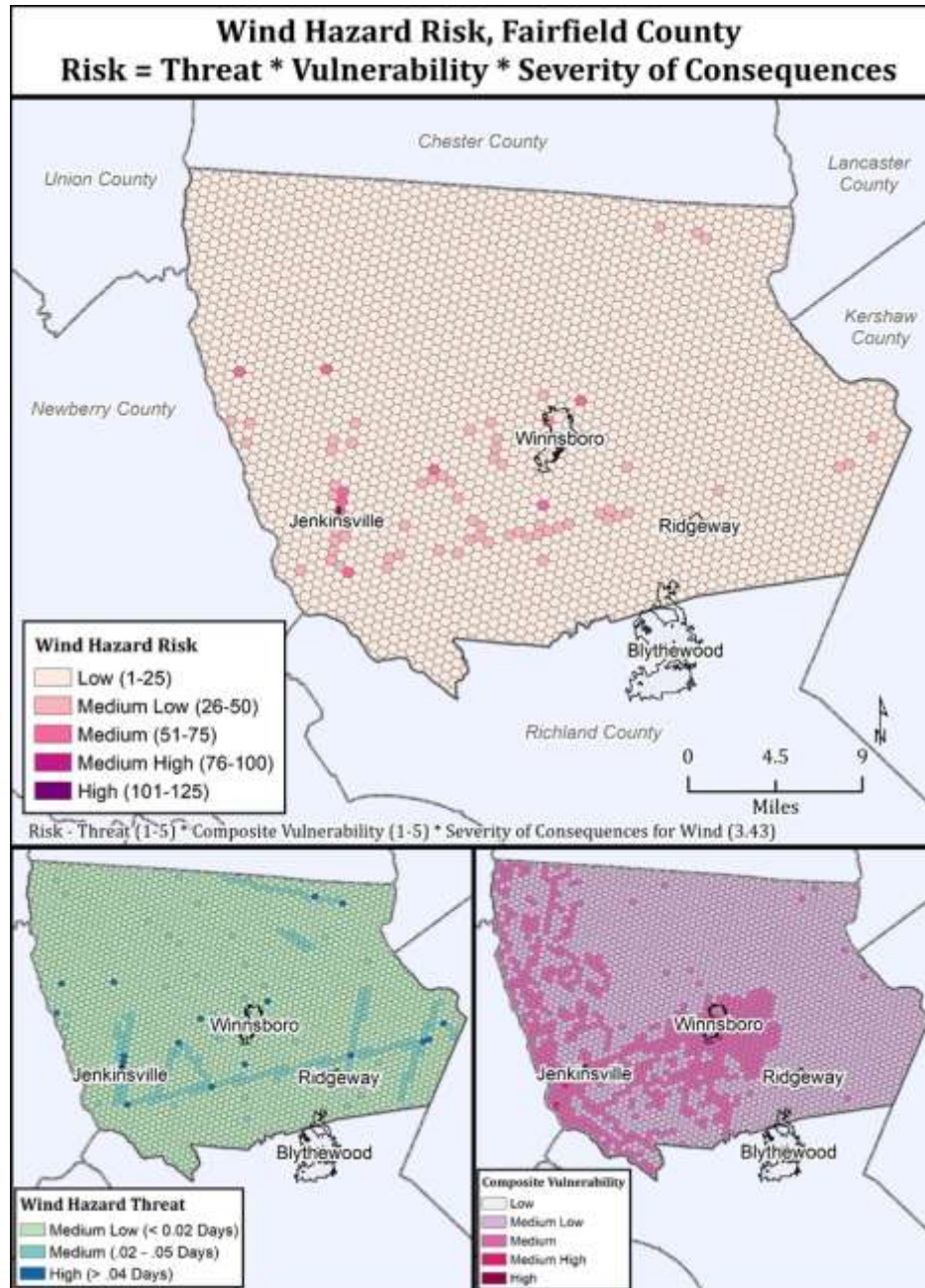


Figure 44 – Risk of high wind in Fairfield County.

G) Hail

Areas of medium low risk to hail exist above Winnsboro the hail hazard threat is much higher than the surrounding area at a hail event every 2.9 years (Figure 45). This does not overlap with any area that experiences higher than medium low vulnerability, resulting in a county-wide overall low hail hazard except for a select few areas in the northern half of Fairfield County (Figure 45).

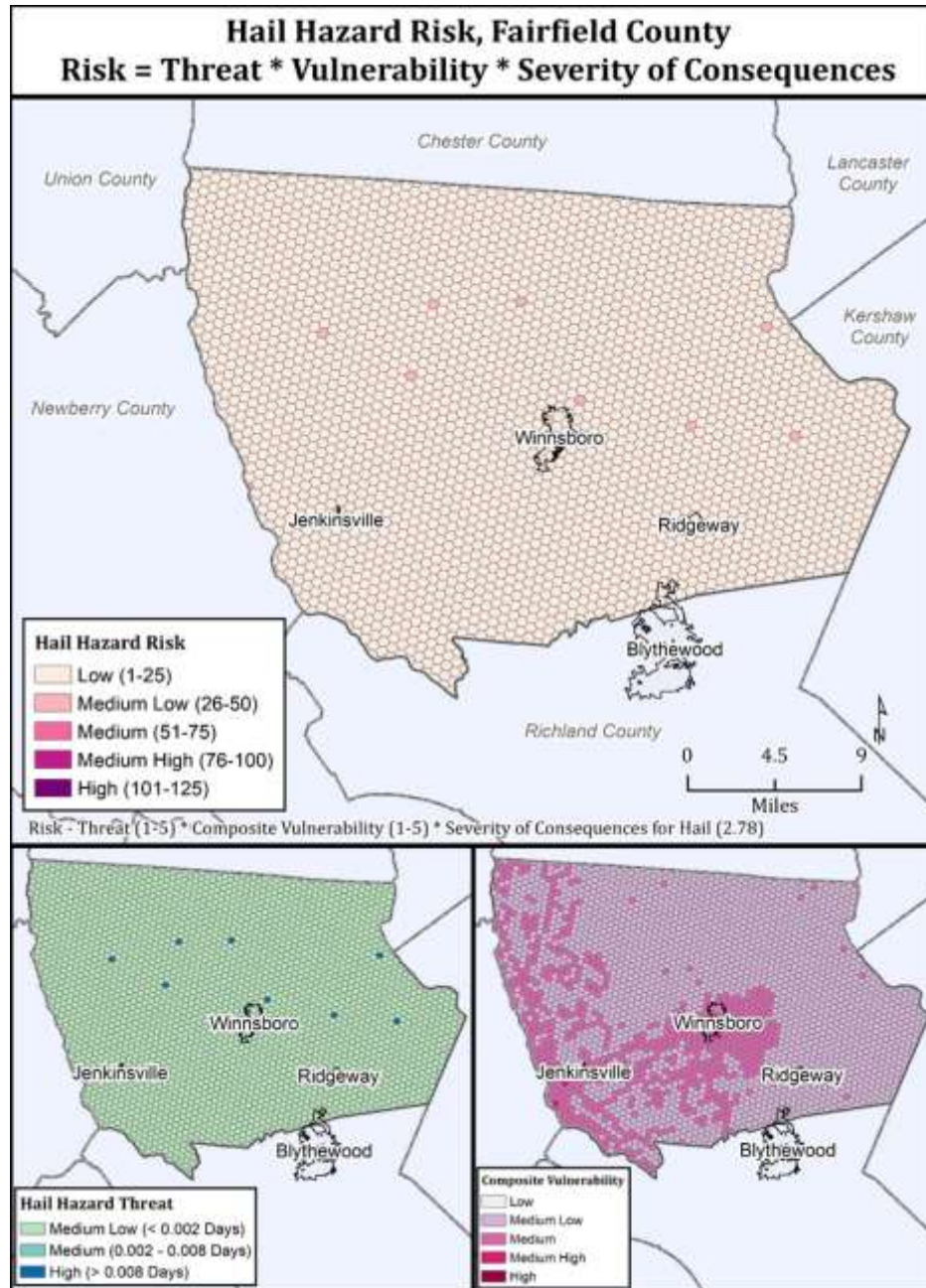


Figure 45 – Risk of hail in Fairfield County.

H) Fog

The southern half of Fairfield County experiences a much higher level of fog hazard threat compared to the northern half, with up to 28 days of fog a year around the Towns of Winnsboro and Jenkinsville (Figure 46). While this area coincides with the central and western regions of vulnerability in the county, the fog hazard does not create any imminent risk, leading to most of the county having low fog risk, with some areas in Winnsboro and Jenkinsville experiencing medium low risk (Figure 46).

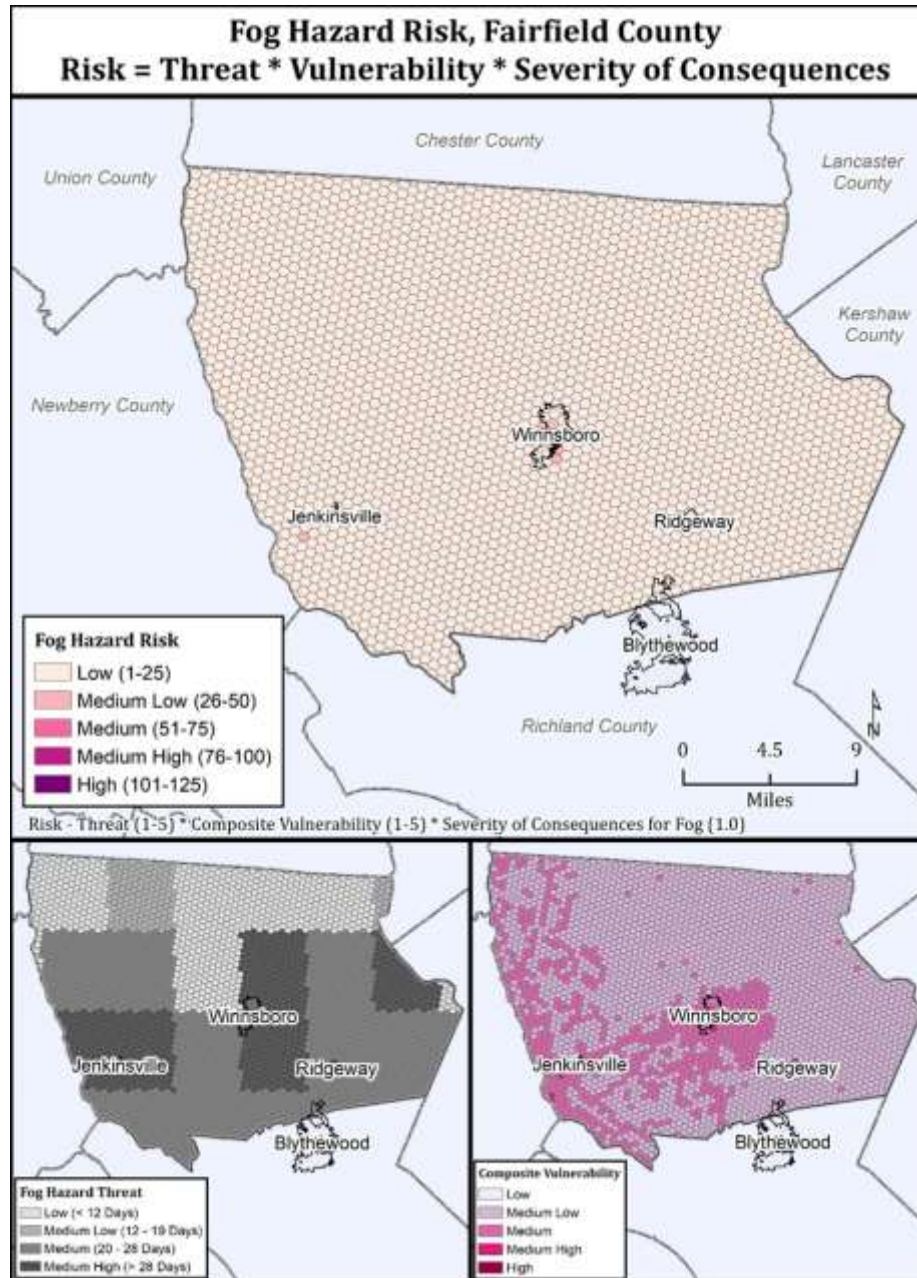


Figure 46 – Risk of fog in Fairfield County.

I) Winter Weather & Ice Storms

Large clusters of medium low hazard risk, i.e., high vulnerability along with frequent days of winter weather, exist in central Fairfield County around Winnsboro as well as in the western-central part of the county around and above Jenkinsville (Figure 47).

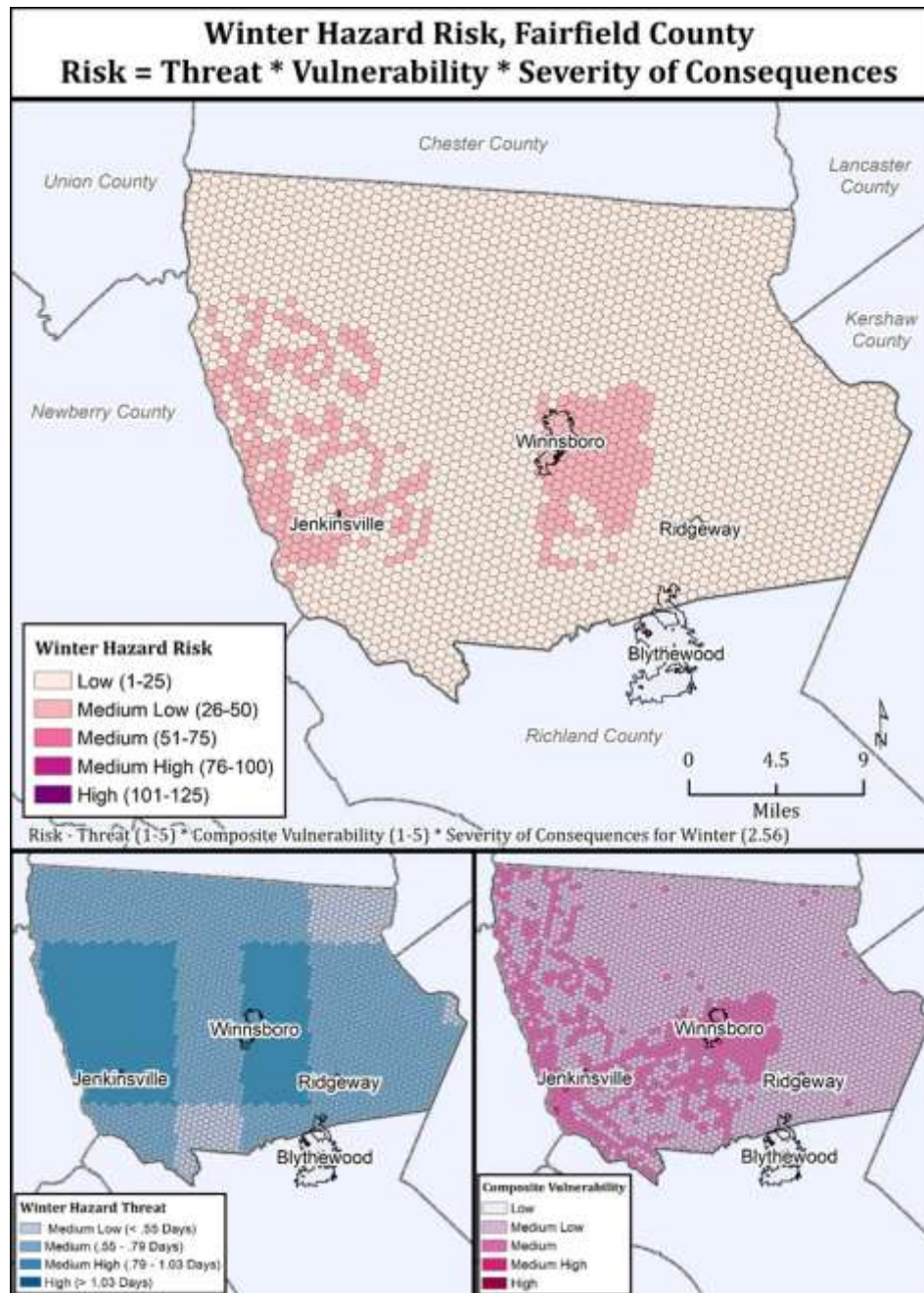


Figure 47 – Risk of winter weather in Fairfield County.

J) Temperature Extremes

The northern and central part of Fairfield has a medium level of cold hazard threat with the south-central region near Blythewood having upwards of 58 days a year of temperatures below 32°F (Figure 48). This large central area of medium cold threat overlaps with much of the vulnerability areas within Winnsboro and in the northwest corner of the county, resulting in medium low cold hazard risk clusters (Figure 48).

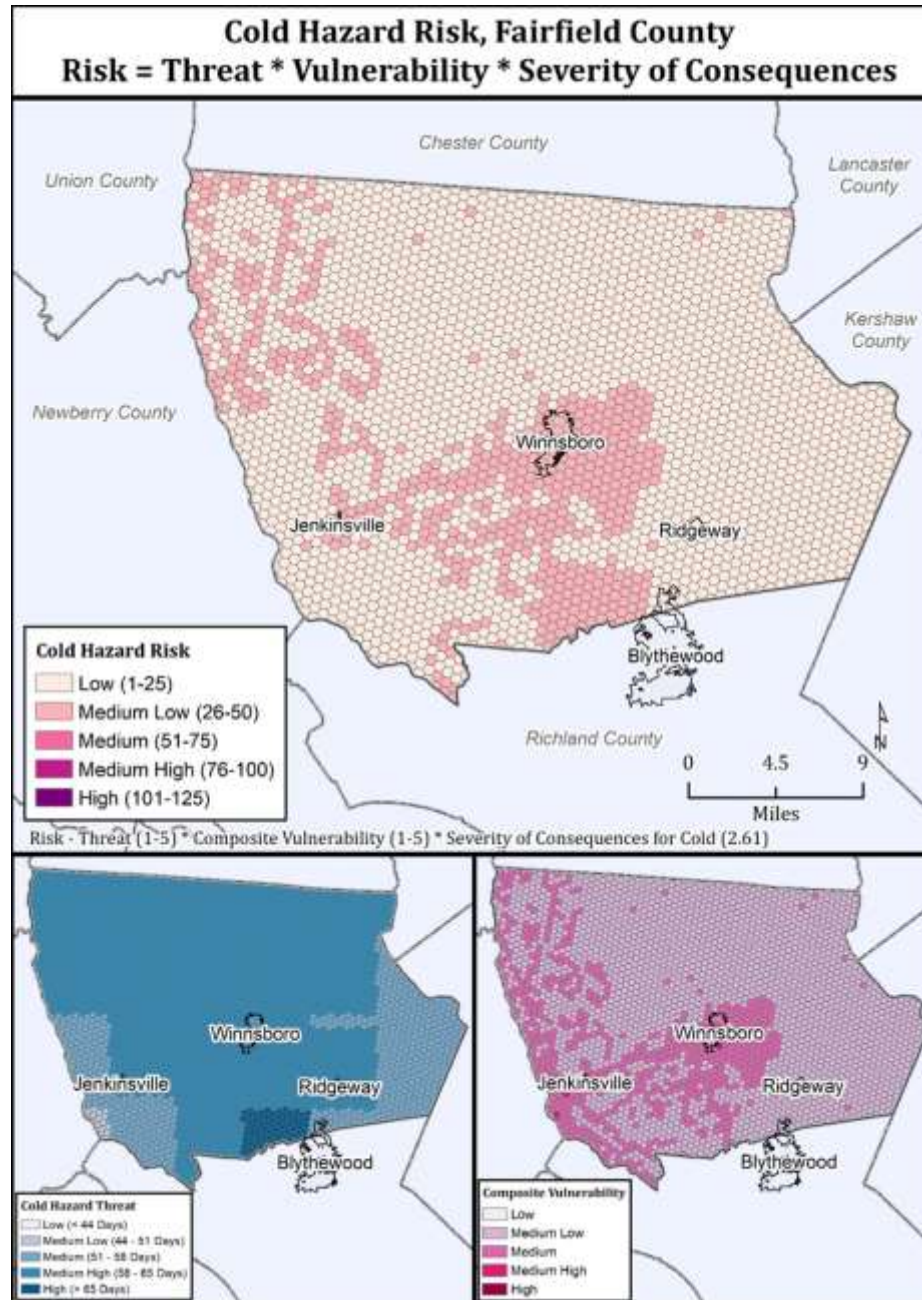


Figure 48 - Risk of cold weather in Fairfield County.

Most of Fairfield County experiences at least 18 days of hot weather except for the northwest corner of the county, which experiences less than 18 per year (Figure 49). The south-central portion of the county above and around Ridgeway experiences more days of hot weather (between 21 and 24) (Figure 49).

When combined with the vulnerability map, medium heat hazard risk scores are apparent in the southern half of the county surrounding Jenkinsville, Winnsboro, and Ridgeway (Figure 49).

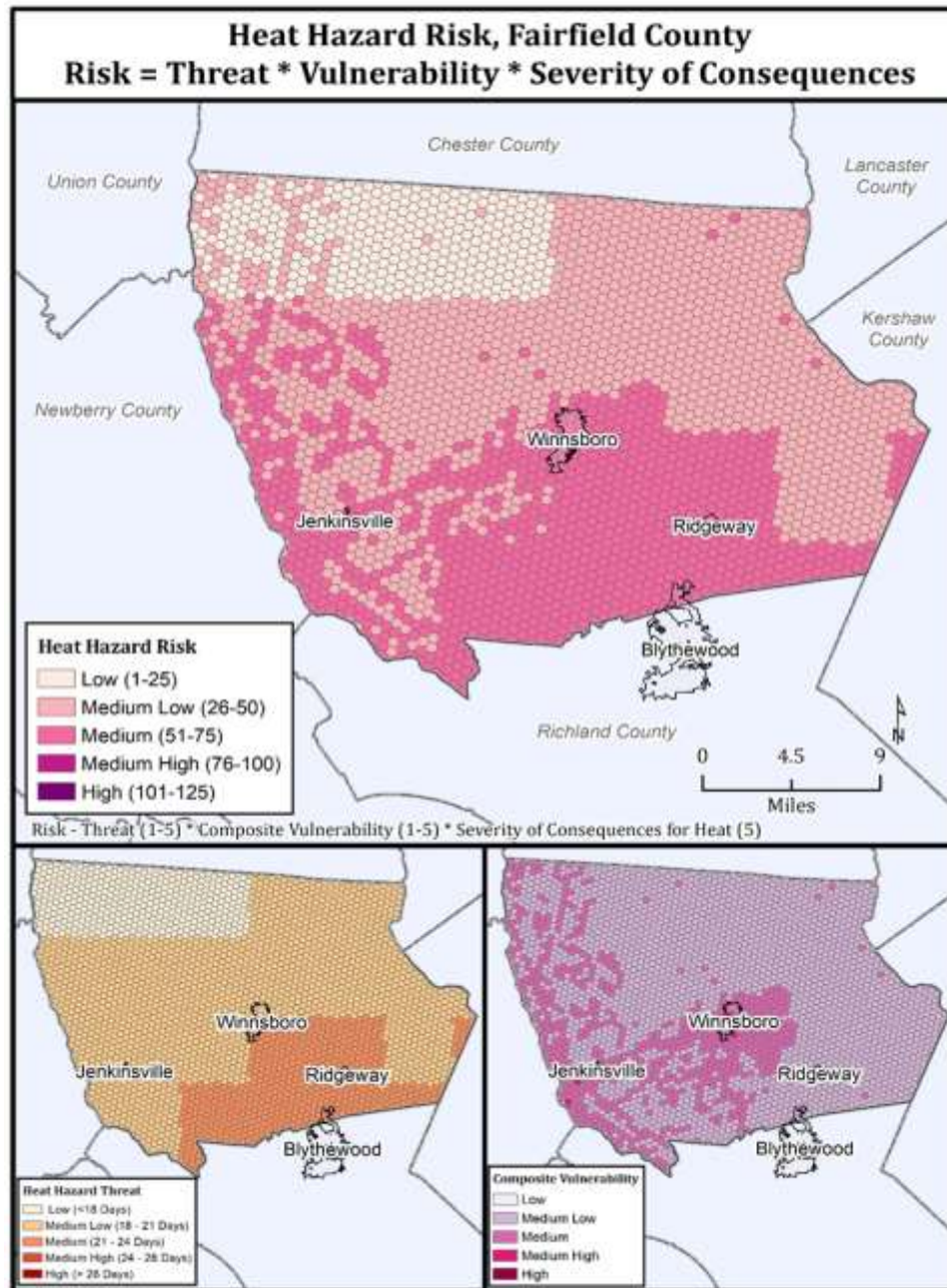


Figure 49 – Risk of hot weather in Fairfield County.

K) Wildfires

While regions of high wildfire threat exist all around Fairfield County, there is not one concentrated area of high risk besides a slight grouping in between the Towns of Jenkinsville, Winnsboro, and Ridgeway (Figure 50). Due to the sporadic distribution of wildfire threats, when overlaid with the vulnerability map, only a few regions in the western, central, and southern areas of the county have medium low risk of wildfires, while the rest of Fairfield County has a low-risk score (Figure 50).

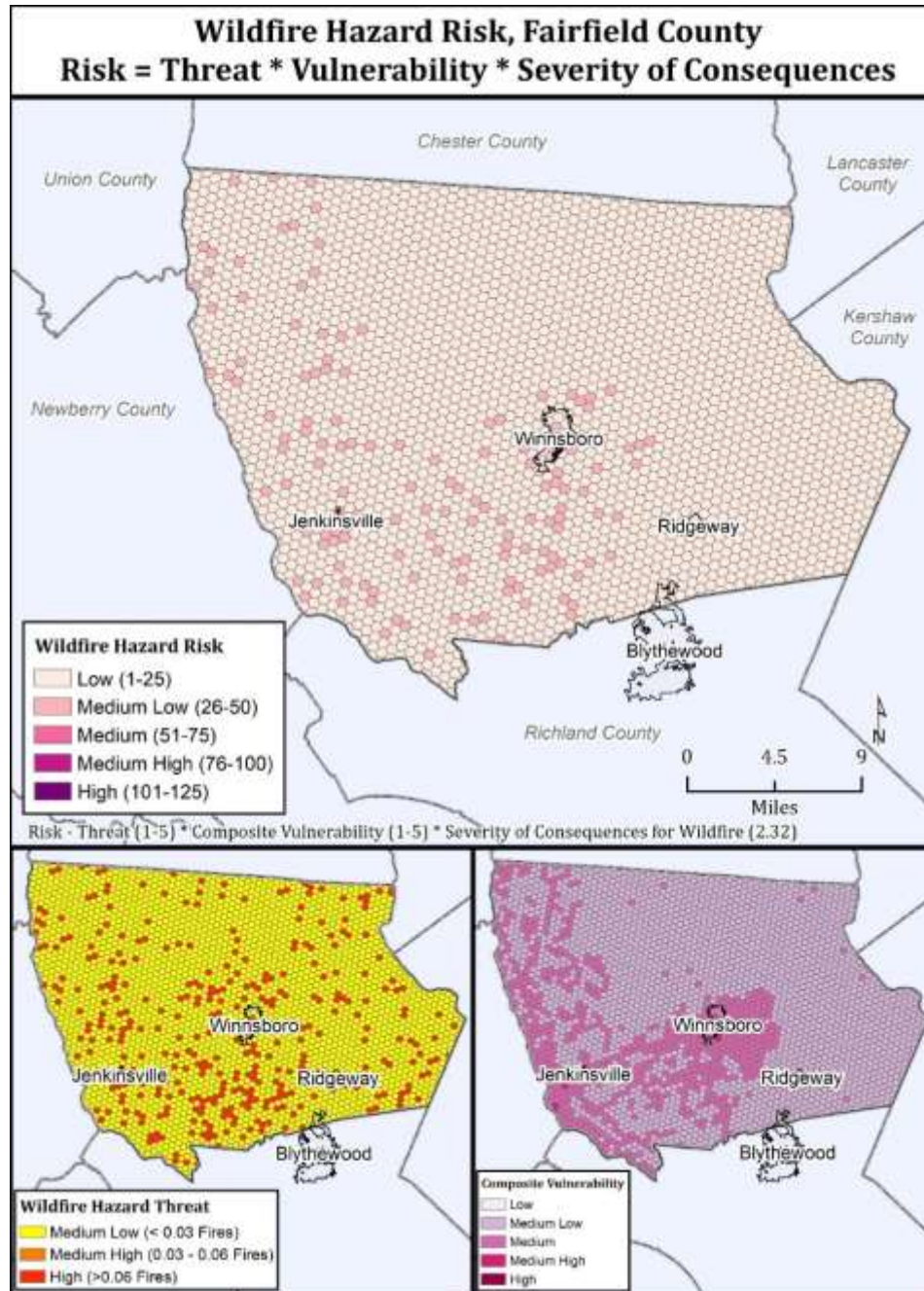


Figure 50 – Risk of wildfires in Fairfield County.

L) Droughts

Northwestern and western Fairfield County is at medium risk to droughts because medium social vulnerability coincides with more than between 19 and 22 weeks of high drought threat per year (Figure 51). While the rest of the county experiences a medium level of drought threat ranging from 15 to 19 weeks, it mostly does not coincide with higher levels of social vulnerability except for the town of Winnsboro (Figure 51).

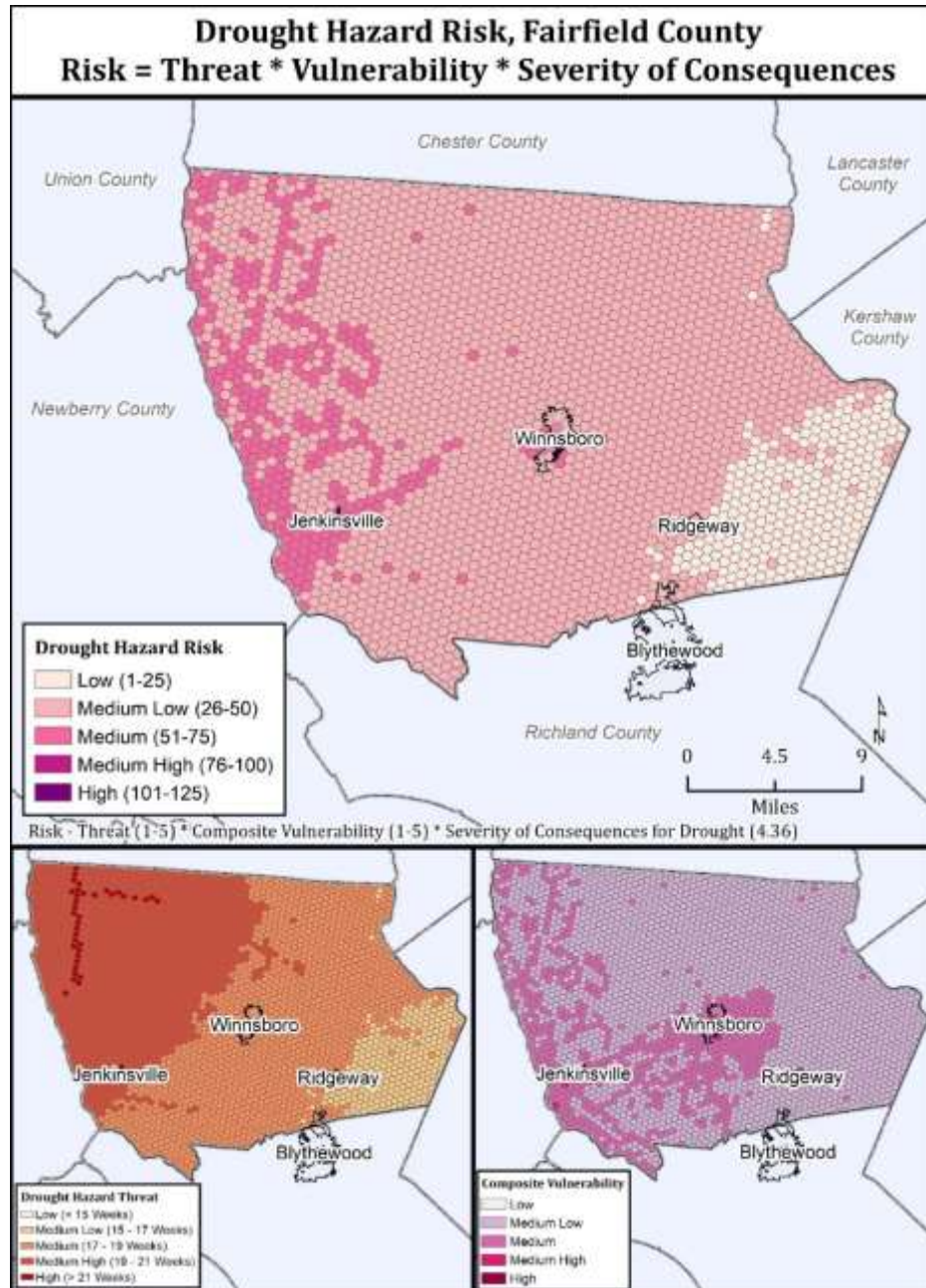
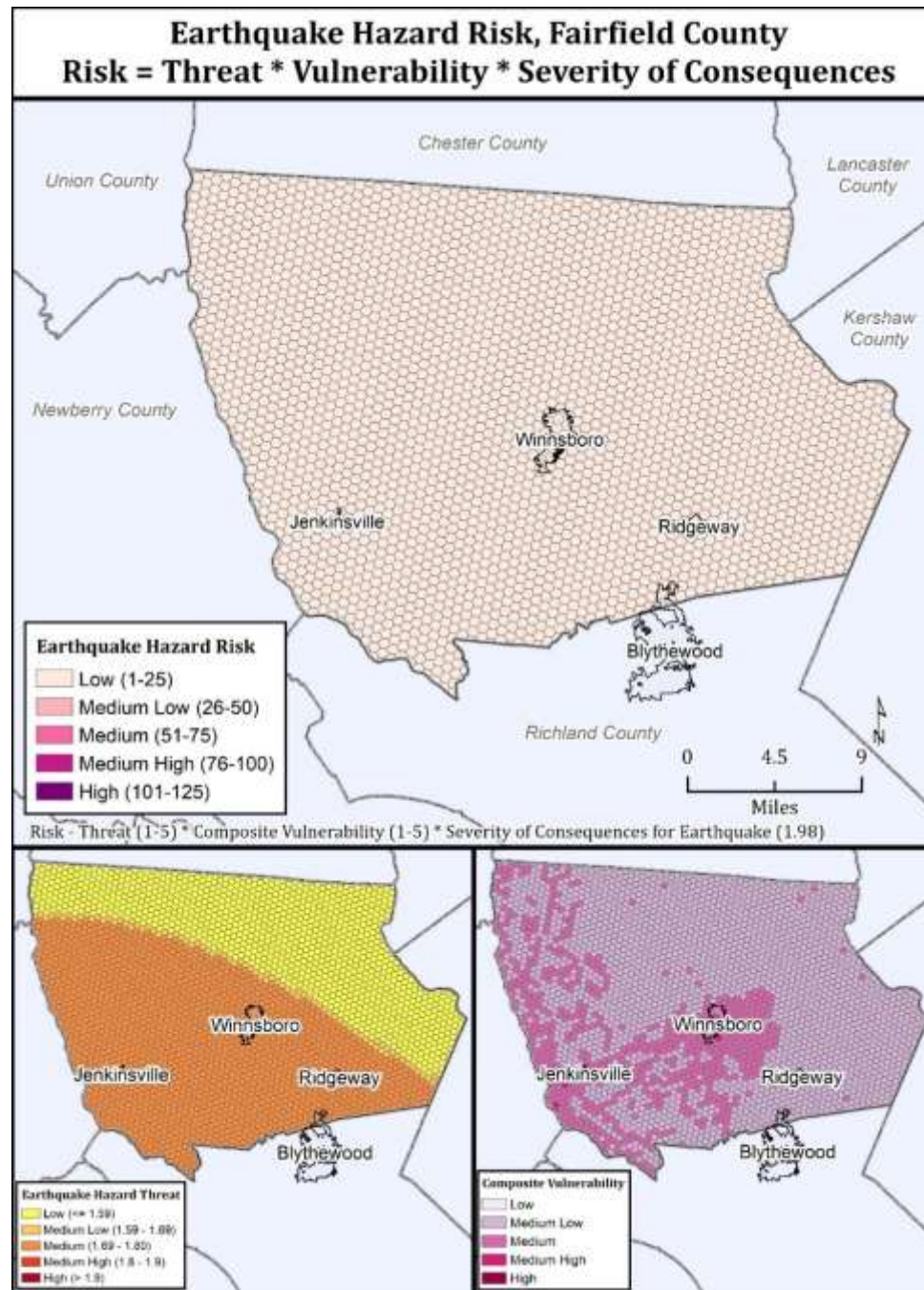


Figure 51 – Risk of droughts in Fairfield County.

M) Earthquakes

While the entire southwestern portion of Fairfield County, as well as parts of the central region of the county, experiences medium levels of earthquake hazard threat and overlap with areas with higher levels of social vulnerability, the infrequent nature of the earthquakes causes the entire county to experience the same low levels of earthquake hazard risk (Figure 52).

Figure 52 – Risk of earthquakes in Fairfield County.



According to the South Carolina Geological Survey, the worst case scenario for Fairfield County is a combination of the 1886 Charleston and the 1913 Union earthquake, which would equate to an intensity

category VIII (severe)²⁸. If the 1886 Charleston earthquake were to occur today (Figure 54), about 82% of buildings would survive undamaged in Fairfield County. Over 752 buildings would be damaged moderately (over 6% of the county's building stock) with an estimated property damage of \$37 million (nearly all of it residential: 66%). Most of the damage would occur in western Fairfield County (Figure 53). Nearly all the critical infrastructure would be operational within a day. The modelled earthquake's most devastating impact area encompasses large segments of Fairfield County's most vulnerable population. All estimates were derived using HAZUS-MH 2.2.

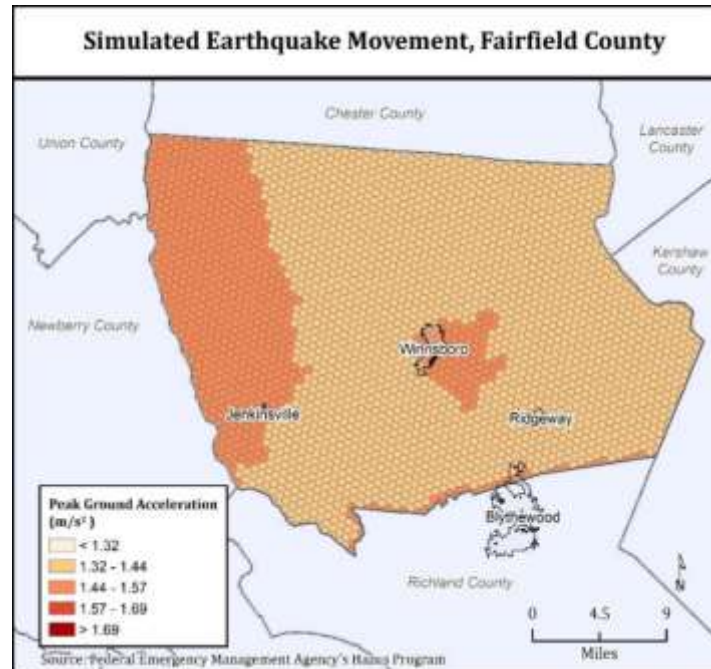


Figure 53 - Peak ground acceleration in Fairfield County from a modelled 6.8 earthquake.

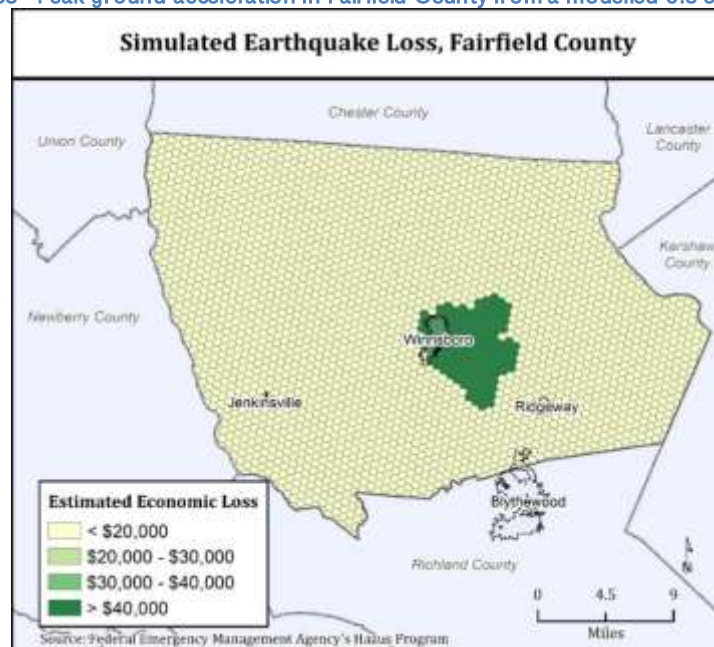


Figure 54 - Damage in Fairfield County from a modelled 6.8 earthquake.

²⁸ SCGS, Projected Earthquake Intensities for South Carolina, Educational Series #7a. Available at <http://www.dnr.sc.gov/geology/images/Equake%20intens1-pg.pdf>

4.5 Fairfield County Risk Assessment Summary

As detailed in the *Risk Assessment Methodology* section of the Plan, the information generated by the hazard threat assessment, the vulnerability assessment and the severity of consequence assessment provide the input for the overall risk assessment for Fairfield County (Equation 1).

This section addresses
FEMA HMP requirement
201.6(c)(2)(ii)

When overlaying local hazard threats, vulnerabilities, and severity of consequences, Fairfield County exhibits largely medium-low to medium risk levels. However, western and central portions of Fairfield County show substantial areas of medium-high risk levels with pockets of high-risk areas in and around the Town of Winnsboro (Figure 55).

$$RISK_{HAZ} = (THR_{HAZ})(VUL)(CON_{HAZ}) \quad (1)$$

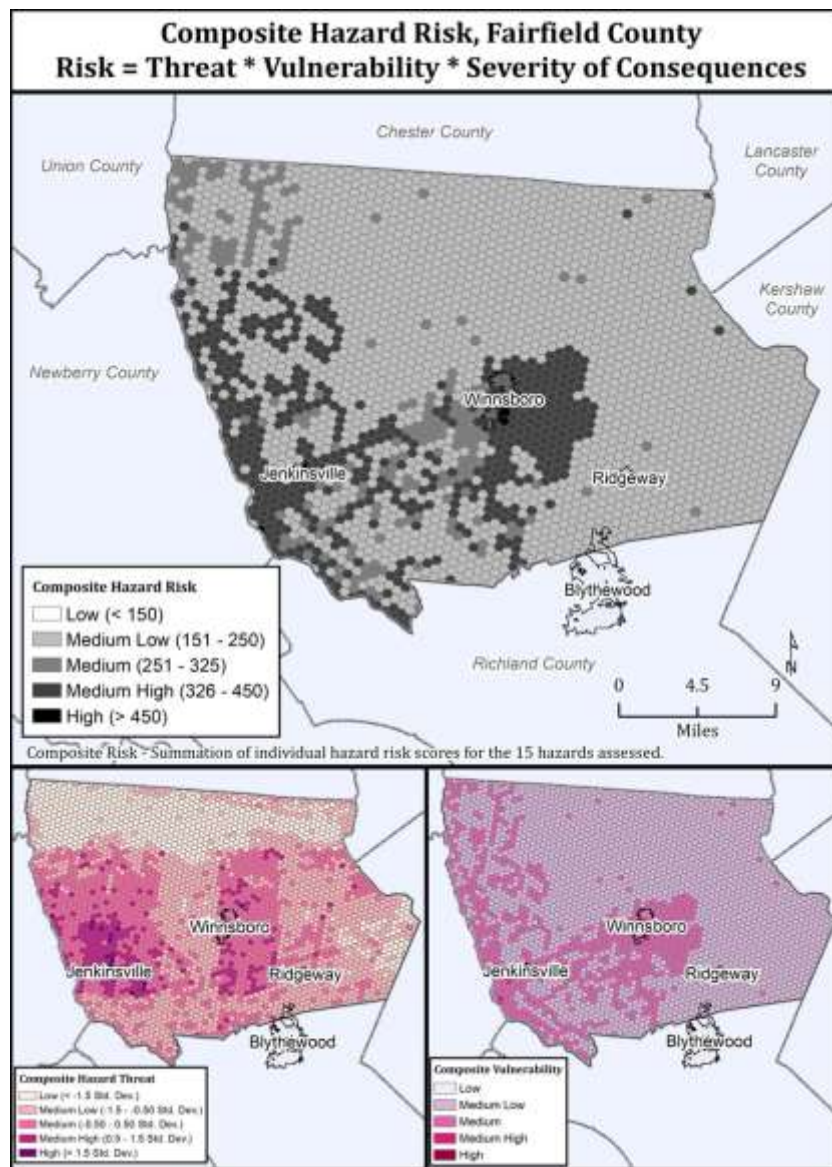


Figure 55 – Overall composite risk map of Fairfield County considering all hazard threats, vulnerabilities, and severity of consequences.

In terms of risk assessment by hazard type, Table 26 summarizes the assessment criteria and rating values.

Categories of Risk by Hazard Type

While the composite risk map (Figure 55) shows the spatial distribution of various risk levels across Fairfield County, the information contained in Table 27 summarizes the numerous input metrics to quantify the overall risk for each hazard. Overall risk for each hazard is expressed in qualitative terms as detailed in Table 26. The high-risk hazards in Lexington County are heat, drought, tornadoes, winter weather, and extreme cold (Table 27).

Table 26 - Assessment criteria and values.

Geographical Extent	Vulnerability	Severity of Consequence	Future Climate Impacts	Probability of Future Occurrence	Historical Damage	Magnitude and Severity	Overall Risk Rating
Isolated	Low	Minor	Unlikely to worsen	Infrequent	Minor	Low	Low
Scattered	Medium	Moderate	Somewhat likely to worsen	Occasional	Major	Medium	Medium
Widespread	High	Severe	Likely to worsen	Likely	Extensive	High	High

The effectiveness and acceptance of hazard mitigation strategies depends on a community's risk awareness and risk perception. Therefore, we are including the survey results conducted by the CMCOG in October 2020 revealing the perceived mitigation priorities by residents of the Central Midlands region. The survey gauged hazard awareness, preparedness and impacts of residents in the Central Midlands region (see Appendix II for more information). The perceived risk highlights the overlaps and/or discrepancies between the objective risk (as developed in the hazard and vulnerability assessments) and subjective risk (as expressed by Central Midlands' residents).

The spatial risk assessment as well as the risk posed by an individual hazard form the basis for the development of mitigation strategies and prioritization (see Fairfield County Mitigation Strategies in Section 4.8).

Table 27 - Overall risk assessment for Fairfield County.

Perceived Risk	Hazard	Geographic Extent of Hazard Threat (THR)	Vulnerability (VUL)	Severity of Consequence (CON)	Severity of Consequence (CON) subcomponents				Overall Risk
					Future Climate Impacts		Historical Impacts	Priority Hazards ²⁹	
Less Important	Winter Weather	Widespread	High	Moderate	Unlikely to worsen	↔	Major	High	High
More Important	Extreme Heat	Isolated	Low	Severe	Likely to worsen	↑↑	Major	High	High
More Important	Droughts	Widespread	High	Severe	Likely to worsen	↑↑	Major	High	High
Somewhat Important	Tornadoes	Widespread	High	Severe	Somewhat likely to worsen	↑	Extensive	High	High
Somewhat Important	Tropical Cyclones	Scattered	Medium	Severe	Likely to worsen	↑↑	Minor	Medium	Medium
More Important	Wind	Isolated	Low	Moderate	Somewhat likely to worsen	↑	Extensive	Medium	Low
Somewhat Important	Extreme Cold	Widespread	High	Moderate	Unlikely to worsen	↔	Extensive	Medium	High
Least Important	Earthquakes	Scattered	Medium	Moderate	Somewhat likely to worsen	↑	Minor	Medium	Low
Least Important	Flash Floods	Isolated	Low	Moderate	Likely to worsen	↑↑	Minor	Low	Medium
Somewhat Important	Lightning	Widespread	Medium	Moderate	Somewhat likely to worsen	↑	Major	Low	Medium
Less Important	Hail	Isolated	Low	Moderate	Somewhat likely to worsen	↑	Extensive	Low	Low
Somewhat Important	Thunderstorms	Widespread	Medium	Moderate	Likely to worsen	↑↑	Major	Low	Medium
Somewhat Important	Fog	Widespread	High	Minor	Unlikely to worsen	↔	Minor	Low	Low
Less Important	Wildfires	Isolated	Low	Moderate	Likely to worsen	↑↑	Minor	Low	Medium
Least Important	Riverine Floods	Isolated	Medium	Moderate	Likely to worsen	↑↑	Minor	Low	Low

²⁹ CMCOG 2016 Hazard Mitigation Plan - <http://www.centralmidlands.org/pdf/CMHMP%202016%20-%20Final.pdf>

Another important aspect of the risk assessment is identifying currently available resources that a jurisdiction must respond to and mitigate natural hazard events. Table 28 identifies emergency services and adopted ordinances available to each municipality in Fairfield County.

**This section addresses
FEMA HMP requirement
201.6(c)(3)**

Table 28 - Services and Development Related Ordinances in Fairfield County.

Name of Jurisdiction	Fire Service	Police Service	Emergency Medical Service	Adopted Zoning Ordinance	Adopted Comprehensive Land Development Regulations	Adopted Building Codes	Participates in National Flood Insurance Program
Fairfield County	Volunteers serve Unincorp. County	Sheriff's Department	County Provides Countywide Service	Yes	Yes	Yes	Yes
Winnsboro	Provides own fire service	Provides own Police serv.	Provided by County	Yes	Yes	Yes	No
Ridgeway	Provided by County system	Provided by County system	Provided by County	Yes	Yes	Yes	Yes

The National Flood Insurance Program (NFIP) aims to reduce the impact of flooding on private and public structures (FEMA, 2016). Actions taken towards reducing flood hazard risk provide a compounding discount on flood insurance to residents in flood prone areas. The program tracks Repetitive Loss Properties (RLP) and Severe Repetitive Loss Properties (SRLP), which are properties that have made multiple flood insurance claims. This information is valuable to planners as it aids in allocating flood mitigation strategies.

As of July 2021, Fairfield County as well as the Towns of Winnsboro and Ridgeway participate in the NFIP. The County has designated Special Flood Hazard Areas (SFHA). There are no RLP or SRLP claims in the area.

Neither Fairfield County nor the Towns of Winnsboro and Ridgeway participate in the Community Rating System (CRS), and therefore residents do not receive a discount in flood insurance premiums inside or outside the Special Flood Hazard Areas. The County reduces flood hazard risk with a combination of public outreach efforts, flood mitigation planning, enforcing zoning and building codes, and requiring buildings to be elevated in flood zones.

Capability Changes since the 2016 HMP

- Mid-County Water Company
 - Provides volunteers across four volunteer firefighter stations in Fairfield County.
 - Adopted Fairfield County 2018 Building Codes, which mitigate earthquake and hurricane hazards.
 - Adopted Fairfield County 2018 Floodplain Ordinances
- Ridgeway
 - Started participating in the NFIP.
 - Fairfield County now provides police service.

4.6 Fairfield County Mitigation Goals and Objectives

The following are general hazard mitigation goals and objectives utilized by stakeholders. These serve as broad mission statements and help guide planners in making decisions that safeguard the life and property of Fairfield County citizens.

**This section addresses
FEMA HMP requirement
201.6(c)(3)(i)**

1. Develop better data for the community relating to type, impact, location, and cost of the natural disaster mitigation strategies occurring in the area.
2. Increase the community's capacity to initiate and sustain emergency response operations during and after a natural disaster, thereby mitigating effects of hazardous events.
3. Enhance existing, or design new, policies and/or programs in the community to reduce the potential damaging effects of hazards without hindering other community goals or impeding hazard mitigation programming in the county.
4. Protect the most vulnerable populations, buildings, and critical facilities in the town through the implementation of cost-effective, environmentally sound, and technically feasible mitigation projects.
5. Protect the public health, safety, and welfare by increasing public awareness and understanding of hazards and by fostering both individual and public responsibility in the mitigation of risks through available techniques that minimize vulnerability to those hazards.
6. Increase understanding of all residents in the community about the natural hazards threatening local areas and techniques available to minimize vulnerability to those hazards.
7. Maintain the economic vitality of the community in the face of natural disasters.
8. Promote the security of homes, institutions, and places of employment throughout the community that are considered vulnerable to natural disasters.
9. Promote that the availability and function of community infrastructure will not be significantly disrupted by a natural disaster.
10. Inventory, map and assess all flood plain structures and properties that are or may be repetitive loss properties.

4.7 Fairfield County Federally-Supported Mitigation Portfolio

Since 2000, Fairfield County has only received federal mitigation dollars to support hazard mitigation planning. Fairfield County is in need of technical assistance and capacity to apply for federally-funded hazard mitigation projects to reduce disaster impacts on its residents.

Table 29 - Fairfield County portfolio of federally-supported hazard mitigation projects.

Mitigation Category	HMGP	PDM	FMA	Amount	Mitigation Category	HMGP	PDM	FMA	Amount
Property Acquisition and Structure Demolition (200.x)					Soil Stabilization (300.x, 301.x)				
Property Acquisition and Structure Relocation (201.x)					Wildfire Mitigation (205.1/2, 300.2, 300.8, 304.1)				
Structure Elevation (202.x)					Post-Disaster Code Enforcement (104.1), Professional Education (101.1)				
Wet Floodproofing (203.x)					Advance Assistance (904.1)				
Mitigation Reconstruction (207.x)					5 Percent Initiative Projects				
Dry Floodproofing (204.x)					Aquifer and Storage Recovery (403.6)				
Generators (601.x, 602.x)					Flood Diversion and Storage (403.5, 403.8)				
Localized Flood Risk Reduction Projects (403.1-403.4, 404.1, 405.1)					Floodplain and Stream Restoration (303.1-303.3)				
Non-localized Flood Risk Reduction Projects (500.x, 501.1)					Green Infrastructure (403.7)				

Mitigation Category	HMGP	PDM	FMA	Amount	Mitigation Category	HMGP	PDM	FMA	Amount
Wind Retrofitting of Existing Buildings (205.7, 205.8)					Miscellaneous/Other (100.1, 106.1, 800.1)				
Non-structural Retrofitting of Existing Buildings and Facilities (205.3, 205.4)					Hazard Mitigation Planning		x		\$228,761
Safe Room Construction (206.x)					Technical Assistance (701.x)				
Infrastructure Retrofit (400.x-402.x)					Management Costs (700.x)				
Feasibility and Design Studies (103.x) Applied R&D (105.1)					Warning Systems (600.1)				

Note: Hazard mitigation planning costs have been generally shared with Lexington, Newberry, and Fairfield counties as part of planning activities supported by the Central Midlands Council of Governments. Project costs for multi-county projects (e.g., planning) were reported as is and no county-share was calculated.

This section addresses FEMA HMP requirements 201.6(c)(3)(ii), 201.6(c)(3)(iii), and 201.6(c)(3)(iv)

4.8 Fairfield County Mitigation Strategies

Table 30 - Unincorporated Fairfield County Mitigation Strategies.

Unincorporated Fairfield County								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Clear public lands as needed near critical facilities	Forest Fires/ Wildfire	Fairfield County/school districts/towns	1	2, 4, 5 & 7	Public Works Operating Budgets	<\$250,000	Ongoing	Ongoing
Conduct detailed assessments of wildfire risk for critical facilities	Forest Fires/ Wildfire	Fairfield County/school district/ towns.	1	2, 4, 5 & 7	Emer. Manage. Services Operating Budget	<\$250,000	Ongoing	Ongoing
Maintain cleared fire breaks to protect critical facilities	Forest Fires/ Wildfire	Fairfield County Public Works	1	2, 4, 5 & 7	Public Works Operating Budget	<\$250,000	Ongoing	Ongoing
Use GIS capacity to map, record all hazards	Forest Fires/ Wildfire	Fairfield County Planning Dept./ assessor	1	2, 4, 5 & 7	Capital Improve. Budget	<\$250,000	Ongoing	Ongoing
Replace vulnerable exterior building surfaces with hail resistant surfaces	Thunderstorms (Hail, Wind, Lightning)	Fairfield County/school district/ towns	2	2, 4, 5 & 7	Capital Improve. Budget	\$250,000 to \$750,000	Deferred due to funding	Deferred
Install surge protectors in critical facilities	Thunderstorms (Hail, Wind, Lightning)	Fairfield County/ school district/ towns	1	2, 4, 5 & 7	Capital Improve. Budget	\$250,000 to \$750,000	Deferred due to funding	Deferred
Adopt procedures for suspension of operations	Thunderstorms (Hail, Wind, Lightning)	Fairfield County/School District/ towns	3	2, 4, 5 & 7	Operating Budgets	<\$250,000	Ongoing	Ongoing
Clear power and utility easements of debris	Thunderstorms (Hail, Wind, Lightning)	Fairfield County/ towns/ water comp.	1	2, 4, 5 & 7	Capital Improve. Budgets	<\$250,000	Ongoing	Ongoing
Enforce zoning to restrict development in flood-plains	Flooding	Fairfield County/ towns in county	1	2, 4 & 7	Operating Budget	<\$250,000	Ongoing	Ongoing
Declare May of each year to be Flood Awareness Month	Flooding	Fairfield County Council	2	2, 4 & 7	Operating Budget	<\$250,000	Ongoing	Ongoing
Coordinate with other local gov'ts in county to	Flooding	Fairfield County/ towns in county	3	2, 3 & 4	Capital Improve. Budgets	<\$250,000	Ongoing	Ongoing

Unincorporated Fairfield County								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
make stream channel improvement								
Replace structurally obsolete bridges	Flooding	Fairfield County/SCDOT	2	2, 4, 5 & 7	Capital Improve. Budgets	\$750,000>	Deferred due to funding	Deferred
Identify & contact all repetitive loss properties	Flooding	Fairfield County/towns in county	1	5	Operating Budgets	<\$250,000		
Ensure that the FEMA Elevation Certificate is properly completed before issuance on property in flood areas	Flooding	Fairfield County/towns in county	1	5	Operating Budgets	<\$250,000	Ongoing	Ongoing
Undertake Planning to participate in Community Rating System	Flooding	Fairfield County/towns in county	1	5	Operating Budgets	<\$250,000	Ongoing	Ongoing
Maintain status in the NFIP	Flooding	Fairfield County	1	2, 4, 5, 7 & 10	Operating Budget	<\$250,000	Ongoing	Ongoing
Use bus transit system for emergency shelter, evacuation & communication capacity	Winter Snow & Ice Storms	Fairfield County Transit System	1	2 & 4	Capital Improve. Budget	<\$250,000	Ongoing	Ongoing
Establish mutual aid agreements with Winnsboro Ridgeway	Winter Snow & Ice Storms	Fairfield County/towns in county	1	2 & 7	Operating Budgets	<\$250,000	Ongoing	Ongoing
Install standby elec. power for sewer & water plants & pumps (portable generators & pumps)	Winter Snow & Ice Storms	Town of Winnsboro/ Water company. in county	1	2, 4 & 5	Capital Improve. Budget	\$750,000>	Deferred due to funding	Deferred
"Harden" utility services to critical facilities	Tornados	Fairfield County	1	2, 4 & 7	Capital Improve. Budget	\$250,000 to \$750,000	Deferred due to funding	Deferred
Conduct engineering strength studies of critical facilities	Tornados	Fairfield County/towns in county	2	2, 4 & 7	Capital Improve. Budgets	\$250,000 to \$750,000	Deferred due to funding	Deferred
Install safe rooms in critical facilities especially those in areas of vulnerable populations	Tornados	Fairfield County/school district/towns in county	1	2, 4 & 7	Operating Budgets	\$250,000 to \$750,000	Deferred due to funding	Deferred
Emergency response chain saw project and	Tornadoes	Fairfield County/Dominion	1	2, 4 & 7	Operating Budgets	<\$250,000	Ongoing	Ongoing

Unincorporated Fairfield County								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
other efforts to remove debris		Energy Coops/ water company						
Develop Portable Water Treatment Facilities	Hurricanes	Rural Water Companies in Fairfield County	2	2, 4, 5 & 7	Capital Improve. Budgets	\$250,000 to \$750,000	Ongoing	Ongoing
Replace water storage tanks and pumps as needed	Hurricanes	Rural Water Companies in Fairfield County	2	2, 4, 5 & 7	Capital Improve. Budgets	\$250,000 to \$750,000	Ongoing	Ongoing
Provide mobile backup generators for critical facilities	Hurricanes	Fairfield County/ towns in county	1	2, 4, 5 & 7	Capital Improve. Budgets	\$250,000 to \$750,000	Ongoing	Ongoing
Publicize National Hurricane Awareness Week annually	Hurricanes	Fairfield County/ towns in county	1	4	Operating Budgets	<\$250,000	Removed due to goals being removed	
Conduct earthquake impact analysis on critical facilities in southwestern Fairfield County	Earthquake	Fairfield County	1	2, 4 & 5	Operating Budget	<\$250,000	Deferred due to funding	Deferred
Work with Dominion Energy to ensure that the Summer Facility can withstand earthquakes	Earthquake	Fairfield County and Dominion Energy	1	2, 4 & 5	Operating Budgets	<\$250,000	Ongoing	Ongoing
Ensure that warning siren system is working to ensure rapid evacuation from the Summer Fac.	Earthquake	Fairfield County and Dominion Energy	1	2, 4 & 5	Operating Budgets	<\$250,000	Ongoing	Ongoing
Ensure that evacuation routes are clearly marked and open	Earthquake	Fairfield County and Dominion Energy	1	2, 4 & 5	Operating Budgets	<\$250,000	Ongoing	Ongoing
Develop and publicize water conservation practices to respond to drought declarations	Drought	Fairfield County	1	5	Operating Budget	<\$250,000	Ongoing	Ongoing
Amend state drought legislation to stiffen penalties & clarify laws	Drought	SC General Assembly	3	1, 5 & 6	Operating Budget	<\$250,000	Ongoing	Ongoing

Mitigation Action Update for Fairfield County since the 2016 HMP

- In 2018, adopted new flood plain ordinances, and new building codes to mitigate impacts from earthquakes, and thunderstorms

Table 31 - Town of Winnsboro Mitigation Strategies.

Town of Winnsboro								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Provide portable pumps to keep utility systems in operating	Winter Snow & Ice Storms	Town of Winnsboro	1	2, 4 & 7	Capital Improve. Budget	<\$250,000	Deferred due to funding	Deferred
Cover regulator stations	Winter Snow & Ice Storms	Town of Winnsboro	1	2, 4 & 7	Capital Improve. Budget	<\$250,000	Deferred due to funding	Deferred
Install standby elec. power for sewer & water plants & pumps (portable generators & pumps)	Winter Snow & Ice Storms	Town of Winnsboro	1	2, 4 & 5	Capital Improve. Budget, BRIC grants	<\$250,000	Deferred due to funding	Deferred
Harden utility services to critical facilities	Tornados	Town of Winnsboro	1	2, 4 & 7	Capital Improve. Budget	<\$250,000	Deferred due to funding	Deferred
Install barricades and fencing for all regulator stations	Tornados	Town of Winnsboro	1	2, 4 & 7	Capital Improve. Budget	<\$250,000	Deferred due to funding	Deferred
Emergency response chain saw project and other efforts to remove debris	Tornados	Town of Winnsboro	1	2, 4 & 7	Capital Improve. Budget	<\$250,000	Deferred due to funding	Deferred
Install safe rooms in critical facilities	Tornados	Town of Winnsboro /Fairfield County/ School District	2	2, 4 & 7	Capital Improve. Budget	<\$250,000	Deferred due to funding	Deferred
Construct drainage dikes around sewer pump stations	Hurricanes	Town of Winnsboro	2	2, 4, 5 & 7	Capital Improve. Budget	\$250,000 to \$750,000	Deferred due to funding	Deferred
Construct cover for water reservoir	Hurricanes	Town of Winnsboro	2	2, 4, 5 & 7	Capital Improve. Budget	\$250,000 to \$750,000	Deferred due to funding	Deferred
Construct holding pond at water treatment plant	Hurricanes	Town of Winnsboro	1	2, 4, 5 & 7	Capital Improve. Budget	\$250,000 to \$750,000	Deferred due to funding	Deferred
Publicize National Hurricane Awareness Week	Hurricanes	Town of Winnsboro	2	6	Operating Budget	<\$250,000	Removed due to goals being removed	
Provide a dry chemical standby fire suppression system	Hurricanes	Town of Winnsboro	2	2, 4, 5 & 7	Capital Improve. Budget	<\$250,000	Deferred due to funding	Deferred
Replace storm damaged water storage tanks and pumps as needed	Hurricanes	Town of Winnsboro	2	2, 4, 5 & 7	Capital Improve. Budget	\$250,000 to \$750,000	Ongoing	Ongoing
Install surge protectors in	Thunder-	Town of	1	2, 4, 5 & 7	Capital Improve.	<\$250,000	Deferred due to funding	Deferred

Town of Winnsboro								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
critical facilities	storms (Hail, Wind, Lightning)	Winnsboro			Budget			
Adopt procedure for suspension of operations during storms	Thunder- storms (Hail, Wind, Lightning)	Town of Winnsboro	2	2, 4, 5 & 7	Operating Budget	<\$250,000	Deferred	Deferred
Clear power line and utility easements of debris	Thunder- storms (Hail and Wind)	Town of Winnsboro	1	2, 4, 5 & 7	Capital Improve. Budget	<\$250,000	Ongoing	Ongoing
Remove taller trees near critical facilities	Thunder- storms (Hail and Wind)	Town of Winnsboro	2	2, 4, 5 & 7	Capital Improve. Budget	<\$250,000	Ongoing	Ongoing
Acquire portable disinfection equipment	Thunder- storms (Hail and Wind)	Town of Winnsboro	2	2, 4, 5 & 7	Capital Improve. Budget	<\$250,000	Deferred due to funding	Deferred
Acquire and install collapsible water pipes	Earthquake	Town of Winnsboro	1	2, 4 & 5	Capital Improve. Budget	\$250,000 to \$750,000	Deferred due to funding	Deferred
Acquire tanker truck for water division	Earthquake	Town of Winnsboro	1	2, 4 & 5	Capital Improve. Budget	\$250,000 to \$750,000	Deferred due to funding	Deferred
Ensure that evacuation routes are marked and open to ensure rapid evacuation from Summer Nuclear Facility	Earthquake	Town of Winnsboro/Domi nion Energy	1	2, 4 & 5	Operating Budgets	<\$250,000	Ongoing	Ongoing
Enhance GIS capacity to map all parcels and structures in flood areas	Flooding	Town of Winnsboro/ Fairfield County	2	10	Operating Budget	\$250,000 to \$750,000	Deferred due to funding	Deferred
Ensure that the FEMA Elevation Certificate is properly completed before issuance on property in flood areas	Flooding	Town of Winnsboro	1	10	Operating Budgets	<\$250,000	Ongoing	Ongoing
Develop and publicize water conservation practices to respond to drought declarations	Drought	Town of Winnsboro	1	5	Operating Budget	<\$250,000	Ongoing	Ongoing
Amend state drought	Drought	SC General	3	5	Operating	<\$250,000	Deferred	Deferred

Town of Winnsboro								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
legislation to stiffen penalties & clarify laws		Assembly			Budget			
Add to the town's surface water supply	Drought	Town of Winnsboro	2	2, 4 & 7	Capital Budgets of Public Works Programs	\$250,000 to \$750,000	Deferred due to funding	Deferred
Institute a drought water storage program for water emergencies	Drought	Town of Winnsboro	1	2, 4 & 7	Capital Budgets of Public Works Programs	<\$250,000	Deferred due to funding	Deferred

Mitigation Action Update for Town of Winnsboro since the 2016 HMP

- No natural hazard mitigation strategy implemented since the 2016 HMP update.
- Higher priority to apply for mobile generators in critical facilities.

Table 32 - Town of Ridgeway Mitigation Strategies.

Town of Ridgeway								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Clear power line and utility easements of debris	Thunder-storms (Hail, Wind, Lightning)	Fairfield Elec. COOP/Dominion Energy	1	2, 4 & 7	Public Works Operating Budgets	<\$250,000	Ongoing	Ongoing
Remove taller trees near critical facilities	Thunder-storms (Hail, Wind, Lightning)	Town of Ridgeway/ Fairfield Electric COOP/Dominion Energy	2	2, 4 & 7	Public Works Operating Budget	<\$250,000	Ongoing	Ongoing
Enforce town zoning to restrict development in flood-plains	Flooding	Town of Ridgeway	1	2, 4 & 7	Operating Budget	<\$250,000	Ongoing	Ongoing
Declare May of each year to be Flood Awareness Month	Flooding	Ridgeway Town Council	2	6	Operating Budget	<\$250,000	Ongoing	Ongoing
Coordinate with Fairfield County's GIS system to track all structures and demolition permits in flood area	Flooding	Town of Ridgeway	2	10	Operating Budget	<\$250,000	Ongoing	Ongoing
Coordinate with other	Flooding	Town of Ridgeway/	3	2, 4 & 7	Capital	<\$250,000	Ongoing	Ongoing

Town of Ridgeway								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
local gov'ts in county to make stream channel improvement		Fairfield County/Dominion Energy			Improve. Budgets			
Identify & contact all repetitive loss properties	Flooding	Town of Ridgeway	1	10	Operating Budgets	<\$250,000	Ongoing	Ongoing
Ensure that the FEMA Elevation Certificate is properly completed before issuance on property in flood areas	Flooding	Town of Ridgeway	1	2, 4 & 7	Operating Budgets	<\$250,000	Ongoing	Ongoing
Undertake Planning to participate in Community Rating System	Flooding	Town of Ridgeway	1	10	Operating Budgets	<\$250,000	Ongoing	Ongoing
Replace structurally obsolete bridges	Flooding	Fairfield County/SCDOT	2	2, 4 & 7	Capital Improve. Budgets	\$750,000>	Deferred due to funding	Deferred
Power line and utility R-O-W easement clearance	Winter Snow & Ice Storms	Fairfield Electric COOP/Town of Winnsboro/Dominion Energy	1	2, 4 & 7	Electric utility providers	<\$250,000	Ongoing	Ongoing
Debris removal and road clearance work	Winter Snow & Ice Storms	Fairfield Electric COOP/ S. C. DOT/Fairfield County/Dominion Energy	1	2, 4 & 7	Town A. Lakes/ County Public Works Operating Budget	<\$250,000	Ongoing	Ongoing
Procure and use elec. generators for vulnerable citizens of Ridgeway	Winter Snow & Ice Storms	Town of Ridgeway	1	2, 4 & 7	Capital Improve Budgets	\$250,000 to \$750,000	Deferred due to funding	Deferred
Increased generating capacity at water plants and key pump stations	Hurricanes	Town of Winnsboro	2	2, 4 & 7	Capital Improve. Budgets	\$250,000 to \$750,000	Deferred due to funding	Deferred
Continue to enforce International Building and Fire Codes with Fairfield County	Hurricanes	Town Ridgeway/Fairfield County	2	2 & 4	Operating Budgets	<\$250,000	Ongoing	Ongoing
Cooperate with the County's Emergency Response Plans for	Hurricane	Town of Ridgeway/ Fairfield County	2	2 & 4	Operating Budgets	<\$250,000	Ongoing	Ongoing

Town of Ridgeway								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Severe Weather								
Harden utility services identified as critical	Tornados	Town of Ridgeway/ Fairfield County/Town of Winnsboro	1	2, 4 & 7	Capital Improve. Budget	\$250,000 to \$750,000	Deferred due to funding	Deferred
Emergency response chain saw project and other efforts to remove debris	Tornados	Town Ridgeway/ Fairfield Electric COOP Dominion Energy	1	2, 4 & 7	Capital Improve. Budget	<\$250,000	Ongoing	Ongoing
Establish GIS mapping of all hazard events by location, effect, and time	Tornados	Town of Ridgeway/ Fairfield County	3	10	Operating Budgets of town and county	\$250,000 to \$750,000	Ongoing	Ongoing
Work with S.C. DHEC to ensure that the major lakes & ponds in town may withstand future earthquakes	Earthquake	Town of Ridgeway / S.C. DHEC	1	4	Operating Budget	\$250,000 to \$750,000	Ongoing	Ongoing
Develop speakers bureau about earthquake and other natural disaster threats to the town	Earthquake	Town of Ridgeway/ Fairfield County	1	5	Operating Budgets	\$250,000 to \$750,000	Ongoing	Ongoing
Develop and publicize water conservation practices to respond to drought declarations	Drought	Town of Ridgeway	1	5	Operating Budget	<\$250,000	Ongoing	Ongoing
Amend state drought legislation to stiffen penalties & clarify laws	Drought	SC General Assembly	3	5	Operating Budget	<\$250,000	Ongoing	Ongoing

Mitigation Action Update for the Town of Ridgeway since the 2016 HMP

- No natural hazard mitigation activities implemented, or changes provided to their mitigation strategy list for this plan update.

Table 33 - Mid-County Water Company Mitigation Strategies.

Mid-County Water Company								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Install standby generators at each well on the system	Tornados	MCWC	2	2, 3 & 6	Capital improvement budget	\$200,000	Ongoing: Two generators on hand w/ transfer station	2020
Improve and maintain road system to wells	Tornados	Fairfield County /SCDOT /MCWC	1	2, 3 & 6	Capital improvement budget	\$5,000	Ongoing: Adding rock to road	2018
Develop back-up mobile water treatment facilities	Hurricanes	MCWC	2	2, 3 & 6	Capital improvement budget	\$200,000	Deferred	2020
Replace water storage tanks and wells as needed	Hurricanes	MCWC	2	2, 3 & 6	Capital improvement budget	\$250,000	Ongoing: Three tanks cleaned and painted	2018
Clear powerline and utility easements of debris	Thunderstorms, hail, wind and lightning	Dominion Energy/ Electric Co-op/ SCDOT/ MCWC	1	2, 3 & 6	Public Works/ MCWC	\$5,000	Ongoing	2018
Fire break, tree & brush thinning controlled burning by permit	Forest fire/ wild fires	Fairfield County/ MCWC/Electric Co-op/Dominion Energy	2	2, 3 & 6	Operating budgets	\$5,000	Ongoing	2018
Fencing/ security of wells and facilities	Forest fire/ wild fires	MCWC	2	2, 3 & 6	Operating budget	\$35,000	Ongoing	2018
Powerline and road R-O-W clearance to wells	Winter snow and ice storms	Dominion Energy/ Co-op/ SCDOT/ MCWC	1	2, 3 & 6	Operating budgets	\$25,000	Ongoing	2018
Develop back-up pump facilities to move water through system	Winter snow and ice storms	MCWC	1	2, 3 & 6	Capital improvement budget	\$75,000	Deferred	2020
Amend state drought plan to stiffen penalties for violators	Drought	SC General Assembly/ MCWC	3	4 & 5	Operating budgets	\$1000	Ongoing	2018
Build new clear well with storage	Drought	MCWC	2	2, 3 & 6	Capital improvement	\$300,000	Ongoing	2025

Mid-County Water Company								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
tanks					budget			
Publicize water conservation practices	Drought	MCWC	1	4 & 5	Operating budgets	\$5,000	Ongoing	2016
Replace main line at Little River and 213	Flooding	MCWC	1	2, 3 & 6	Capital improvement budget	\$150,000	Deferred	2025
Replace water lines at bridges, over passes and creeks	Flooding	MCWC	1	2, 3 & 6	Capital improvement budget	\$50,000	New	2025
Connect District 1 & 2	Drought	MCWC	1	2, 3 & 4	Capital improvement budget	\$500,000	New	2025

Mitigation Action Update for Mid-County Water Company since the 2016 HMP

- The strategy "Replace water storage tanks and wells as needed" has continued to be implemented without FEMA funding sources.
- In 2018, adopted new building codes to mitigate impacts from earthquakes, and thunderstorms
- In 2018, adopted new flood plain ordinances
- New cost estimates provided for the following strategies:
 - Connect District 1 & 2
 - Replace water lines at bridges, overpasses, and creeks
 - Develop back-up pump facilities to move water through system

5. Lexington County

5.1 Historical Hazard Assessment for Lexington County

This section addresses
FEMA HMP requirement
201.6(c)(2)(i)

Summary of Historic Impacts

Lexington County experiences an array of natural hazards (Table 34). Prior to the 2015 flash flood disaster, heat and drought along with winter storms posed the highest risk to Lexington County. Flood damage used to rank low—behind tornado damage and more alike to lightning—although flash flooding is a very frequent occurrence (every 1.1 years). Heat and drought pose serious threats to the county that are difficult to capture in loss figures or maps since their impacts tend to be vastly underreported (lack of data, secondary and/or prolonged effects on agriculture, public health, etc.). The most frequent hazard in Lexington County is cold weather, followed by thunderstorms (incl. lightning, hail, and wind). While thunderstorm, lightning, wind and hail damage is non-catastrophic, their cumulative impact and high frequency is significant (over \$10.5 million, 41 people injured/killed, 28%). When overlaying the risk from all hazards, southeastern and west-central Lexington County exhibits the highest level of risk (Figure 56).

In the future, the frequency and possible damage from thunderstorms and other meteorological and hydrological hazards is very likely to increase. Based on climate projections, it is anticipated that the number of cold days and perhaps also winter storms will decrease.

Table 34 - Summary of natural hazards and their impacts on Lexington County since 1960 (adj. to 2019 USD).

	Direct Losses (Property and Crop)	Total USDA Crop Indemnity Payout****	Direct Injuries and Fatalities	# Of Loss-Causing Events	Frequency	Recurrence Interval (in years)	Future Changes
Flooding	\$22,775,681	n/av	6	82	0.91%	1.1	▲
Hurricane	\$1,303,327	\$3,274	0	9	0.97%	1.03	▲
Tornadoes	\$13,629,963	n/av	57	15	1.6%	0.64	▲
Thunderstorm**	\$2,973,783	\$939,215	12	277	28%	0.04	▲
Lightning	\$2,590,182	n/av	13	61	1.3%*	0.8 days*	▲
Wind	\$3,945,983	\$43,966	15	314	18%	0.06	▲
Hail	\$1,006,180	\$312,585	1	75	7.2%	0.14	▲
Fog	n/av	n/av	n/av	n/av	0.08%*	12 days*	◄►
Winter Storm	\$18,273,648***	n/av	3	32	0.73%	1.36	▼
Cold*****	\$11,682,003	\$2,353,903	1	35	51%	0.02	▼
Heat	\$12,746,647	\$428,736	0	7	24%	0.04	▲
Drought	\$16,069,921	\$1,697,410	0	16	0.4%	2.5	▲
Wildfire	\$401,355	n/av	0	3	0.1*	5.38 days*	▲
Earthquake	0	n/av	0	0	0.01%	119	◄►
TOTAL	\$95,716,669	\$5,779,089	107	918			

*daily frequency/recurrence calculations instead of years

**coastal storms combined with thunderstorms/severe storms

***no 2004 ice storm losses reported by NWS

****hazards with n/av have no event records that resulted in USDA Crop Indemnity Payouts

*****cold hazard totals already included in winter storm totals

▲ indicates that future increase in occurrence and/or impacts is likely

▼ indicates that future decrease in occurrence and/or impacts is likely

◄► indicates that either no change in future occurrence or impacts is expected or that a determination of future changes cannot be made.

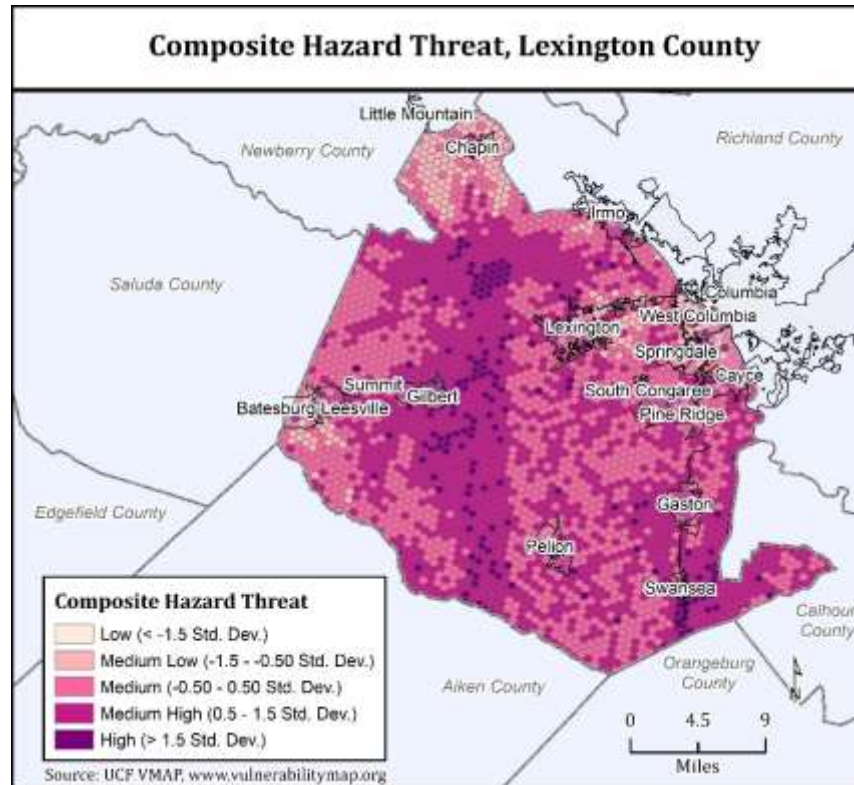


Figure 56 - Comprehensive risk profile of Lexington County.

A) Flooding

What to expect: Flood damage in Lexington County is mostly the result of localized heavy precipitation leading to flooding along smaller creeks and tributaries to the Broad, Congaree and Saluda Rivers as well as flash flooding due ponding and/or inadequate drainage (Table 35). Virtually every building in Lexington County is at some risk from flash flooding due to drainage issues and ponding. While most buildings are not at risk from flood waters reaching first floor levels, many homes may, however, experience flooded crawl spaces, driveways, etc. or experience secondary problems such as mold issues. In addition, the 2015 floods revealed a high risk from small pond dam failures—particularly when simultaneous and cascading dam failures occur in the same watershed.

Geographic Extent: Flooding in Lexington County is not restricted to the 100-year and 500-year floodplains (Figure 58). Based on its history, Lexington County is very susceptible to flash flooding in low-lying areas and areas downstream from small dams. The Flash Flood Potential Index identifies areas in northeastern Lexington County as at high risk from flash flooding (Figure 59). During the 2015 event, problems also arose from backwater flooding along Saluda River tributaries when water was released from the Lake Murray Dam.

Prior to the record-breaking floods of October 2015, statistics for Lexington County were as following:

Number of Loss-Causing Events:	82
Frequency of Occurrence:	0.91%
Recurrence Interval:	1.1 years
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	2008 - 2018
Loss Events on Record:	1960 - 2019
Flood-related Presidential Disaster Declarations:	DR-4241 (2015)
Total Losses:	\$22,775,681
Total Fatalities:	2
Deadliest Event:	1 fatality (several instances)
Most Property Damage:	\$5,467,002 (October 4 and October 10, 2015)
Most Crop Damage:	\$1,093,400 (October 10, 2015)
Highest USDA Crop Indemnity Payout:	n/av*

*No flooding events caused a USDA Crop Indemnity Payout

October 1-5, 2015 (DR-4241)^{30*}:

Over a five-day period, an upper low-pressure system combined with the remnants of Hurricane Joaquin streamed tropical moisture into South Carolina (Figure 57). Lexington County experienced a record-setting 5-day rainfall total of up to 17.21 inches in some places³¹. This record rainfall caused catastrophic flash flooding, dam breaches and failures (see section on Dams Failures) along with backwater flooding along the Saluda River due to emergency water release from the Lake Murray Dam. The last time the dam's spillway was opened was in 1969. Large areas of the City of Columbia were without drinking water due a breach in a diversions supply canal shutting down schools and economic activities in the city. According to NCDRC's Storm Data, direct damage to property is estimated at about \$27 million and nearly \$1 million in crop damage. Two fatalities occurred. Overall damage estimates range from \$1 billion³² to \$12 billion³³ for the entire impact area in South Carolina. Lexington County received both individual and public assistance funding through FEMA.

^{30*} Note: The historic record for all hazards in this plan covers the time period from 1960 through 2014. An exception is flooding. Given the catastrophic, and record-setting devastation from the 2015 floods, an event narrative was included since many of the proposed flood mitigation actions in this plan are an outgrowth of this recent disaster.

³¹ NWS, 2015. Historic rainfall and flooding, October 2015. Available at <http://www.weather.gov/cae/HistoricFloodingOct2015.html>

³² NOAA National Centers for Environmental Information, 2016. Billion-Dollar Weather and Climate Disasters. Available at <http://www.ncdc.noaa.gov/billions/events>

³³ Burris, Roddie. SC Floods' Damage: \$12 billion, Economists say. *The State* [Online], Columbia, SC, December 1, 2015 Available at <http://www.thestate.com/news/local/article47471060.html>



Figure 57 - Total rainfall amounts for the 2015 flood event. Source: NWS.

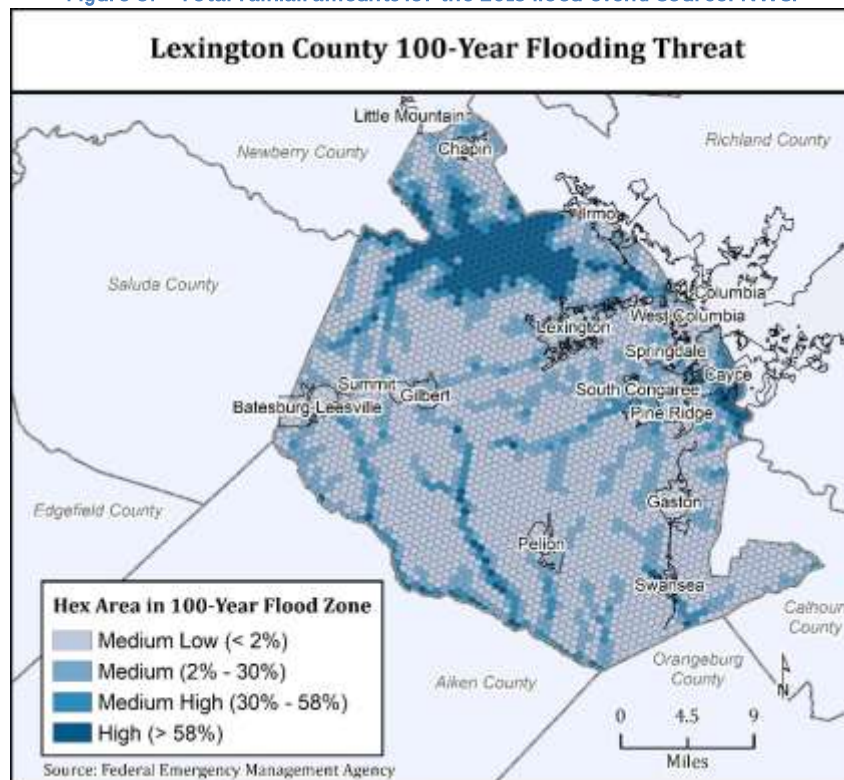


Figure 58 - Flood threat in Lexington County.

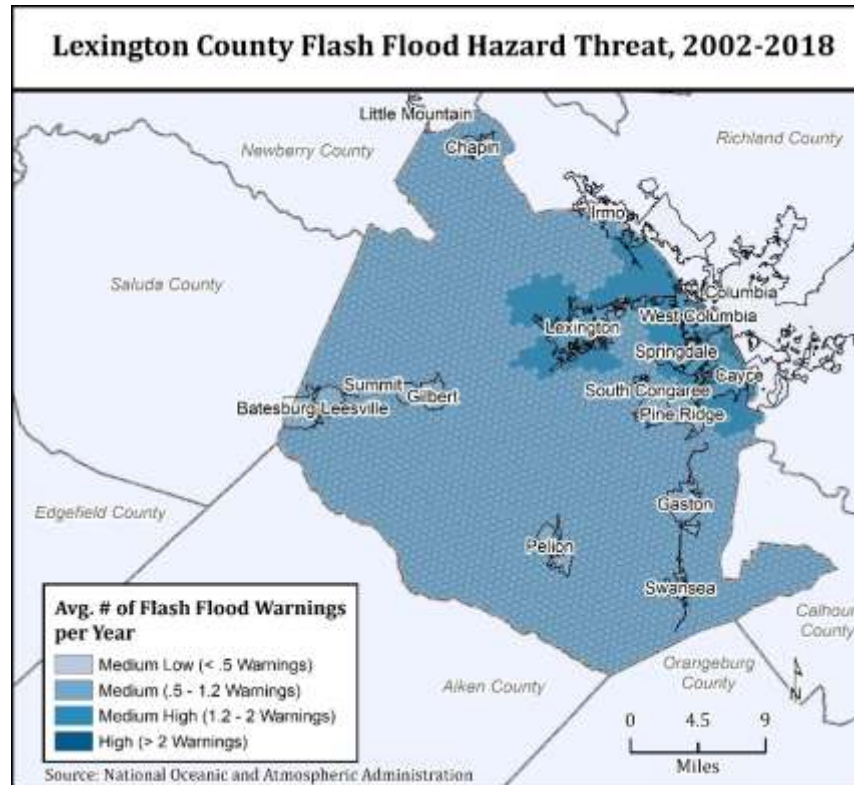


Figure 59 - Flash flood threat in Lexington County.

Table 35 - Record of loss-causing flood events in Lexington County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
3/1/1964	3/31/1964	0	0	\$909	\$909		Statewide	Flooding
3/1/1966	3/5/1966	0	0	\$8,694	\$8,694		Statewide	Flooding
2/3/1973	2/3/1973	0	0	\$6,344	\$6		Statewide	Flooding
3/15/1973	3/31/1973	0	0	\$1,824	\$18		Pee Dee, Edisto, & Congaree River Basins	Flooding due to Heavy Rains
6/8/1973	6/25/1973	0	0	\$10,063	\$1,006,347		Southern & Central SC	Heavy Rain & Flooding
6/16/1973	6/22/1973	0	0	\$1,006	\$101		Central, Northern, & Eastern SC	Heavy Rain & Flash Flooding
3/12/1975	3/18/1975	0	0	\$5,236	\$524		Statewide	Heavy Rains & Flooding
7/13/1975	7/18/1975	0	0	\$669	\$66,903		Eastern & Central SC	Rains & Flooding
7/4/1976	7/5/1976	0	0	\$1,139	\$11,386		Central SC, Lexington, & Richland Counties	Flash flooding
10/9/1976	10/19/1976	0	0	\$49,506	\$49,506		Statewide	Flood
1/25/1978	1/26/1978	0	0	\$43,204	\$4		Statewide	Wind & Flash Flood
1/26/1978	1/31/1978	0	0	\$4,320	\$0		Statewide	Flooding
3/15/1980	3/31/1980	0	0	\$3,419	\$3,419		Statewide	Flood
8/8/1980	8/8/1980	0	0	\$3,419	\$342		Statewide	Wind & Flood
1/1/1982	1/14/1982	0	0	\$610	\$61		Along Saluda,	Flooding

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
							Broad, Congaree, Wateree, Lynches, & Pee Dee Rivers	
4/27/1982	4/27/1982	0	0	\$707	\$0		Central, Northeastern, & Eastern SC	Lightning & Flooding
3/17/1983	3/17/1983	0	1	\$28,282	\$2,828		Statewide	Wind, Rain, Flooding, & Beach Erosion
12/6/1983	12/6/1983	0	0	\$3,336	\$33		Western, Northern, & Central SC	Flood & Wind
2/27/1984	2/27/1984	0	0	\$2,711	\$27		Statewide	Rain, Wind, & Flood
6/21/1984	6/21/1984	3	0	\$62,357	\$6,236		Columbia	Rain, Flood, & Lightning
7/26/1984	7/26/1984	0	0	\$2,711	\$27		Statewide	Wind, Rain, & Flood
8/2/1984	8/2/1984	0	0	\$4,300	\$0		Southern, Central, & Eastern SC	Lightning, Rain, & Flood
8/18/1986	8/19/1986	0	1	\$118,227	\$118		Lexington & West Columbia	Flash Flooding
9/7/1987	9/7/1987	1	0	\$114,064	\$0		Irmo & St. Andrews	Flood
6/19/1989	6/19/1989	0	0	\$10,450	\$0		Batesburg	Urban Flood
6/19/1989	6/19/1989	0	0	\$10,450	\$0		Irmo	Flash Flood
1/1/1993	1/31/1993	0	0	\$19,494	\$389,893		Statewide	Flooding
6/27/1994	6/28/1994	2	0	\$874,340	\$0		Lexington	Flash Floods
3/7/1996	3/7/1996	0	0	\$16,517	\$0		Countywide	Flash Flood
8/25/2008	8/25/2008	0	0	\$24,073	\$0	2-4"	Irmo	Sheriff and public reported flash flooding across several roads with water up to 3 feet deep closing roadways. Some vehicles were stalled but no occupants were trapped. Spotters reported 2 to 4 inches of rain within a 1-to-2-hour period from the remnants of Tropical Storm Fay
12/25/2009	12/25/2009	0	0	\$9,664	\$0	2-5"	Irmo	Many road closures and widespread flooding along streams reported by Emergency Management and a small earthen dam breach on Bush River Rd in the St. Andrews/Whitehall area.
5/7/2013	5/9/2013	0	0	\$5,562	\$0	2-4"	Green Hill	NWS survey found the amphitheater and Riverwalk flooding in West Columbia and Cayce along the Congaree River. The water level was almost 5 and a half feet above flood stage.
8/1/2013	8/1/2013	0	0	\$4,450	\$0		Clubhouse	Highway Patrol reported flash flooding on Springhill Road near Hwy 1, and Walter Taylor and Cannon Place roads were also closed due to flooding.
8/1/2013	8/1/2013	0	0	\$4,450	\$0		Gilbert	Highway Patrol reported Wire Road closed between Juniper Springs and Taylor Street in Gilbert. Other rural roads that were closed included Martin Smith, Sarah Ann, and Neely Wingard due to high water covering the roads.
6/4/2015	6/4/2015	0	0	\$2,187	\$0		Red Bank	Heavy rains produced around 2 to 5 inches of rain over portions of the Midlands causing flash flooding that closed many roads and washouts on

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
								several country roads.
6/4/2015	6/4/2015	0	0	\$2,187	\$0		Gilbert	Same as above
6/4/2015	6/4/2015	0	0	\$2,187	\$0		Barr	Same as above
6/4/2015	6/4/2015	0	0	\$2,187	\$0		Springdale	Same as above
6/4/2015	6/4/2015	0	0	\$2,187	\$0		Springdale	Same as above
7/5/2015	7/5/2015	0	0	\$13,121	\$0		Irmo	Thunderstorms trained across portions of northern Lexington and Northwestern Richland counties causing rainfalls of 2 to 3 inches in an hour which resulted in flash flooding in the Irmo area.
9/5/2015	9/5/2015	0	0	\$15,308	\$0		Irmo	Scattered thunderstorms moved through the Midlands and produced some large hail, wind damage, and very intense rains that produced flash flooding.
9/5/2015	9/5/2015	0	0	\$8,747	\$0		Irmo	Same as above
10/3/2015	10/3/2015	0	0	\$5,467	\$0		Arthur	Heavy rain in the Midlands...Pee Dee produced flash flooding in across the area. Numerous dams were breached along with numerous bridge and roadways flooded and damaged.
10/4/2015	10/4/2015	0	0	\$5,467,002	\$54,670		Dixiana	Same as above
10/4/2015	10/4/2015	0	0	\$3,280,201	\$54,670		Irmo	Same as above
10/4/2015	10/4/2015	0	0	\$546,700	\$54,670		Springdale	Same as above
10/4/2015	10/4/2015	0	0	\$546,700	\$54,670		Springdale	Same as above
10/4/2015	10/4/2015	0	0	\$546,700	\$16,401		Lexington	Same as above
10/4/2015	10/4/2015	0	0	\$328,020	\$5,467		Arthur	Same as above
10/4/2015	10/4/2015	0	0	\$546,700	\$0		Lexington	Same as above
10/4/2015	10/4/2015	0	0	\$109,340	\$0		Lexington	Same as above
10/4/2015	10/4/2015	0	0	\$82,005	\$0		Lexington	Same as above
10/4/2015	10/4/2015	0	0	\$21,868	\$0		Columbia Metro	Same as above
10/10/2015	10/10/2015	0	0	\$5,467,002	\$1,093,400		Clubhouse XRDS	Heavy rain falling onto already saturated grounds led to flash flooding. Many roads that had reopened after the previous event were closed again.
10/10/2015	10/10/2015	0	0	\$109,340	\$109,340		Pooles XRDS	Same as above
10/10/2015	10/10/2015	0	0	\$54,670	\$109,340		Barr	Same as above
10/10/2015	10/10/2015	0	0	\$54,670	\$109,340		Pooles XRDS	Same as above
10/10/2015	10/10/2015	0	0	\$54,670	\$109,340		Pelion Corporate ARP	Same as above
10/10/2015	10/10/2015	0	0	\$546,700	\$54,670		Barr	Same as above
10/10/2015	10/10/2015	0	0	\$109,340	\$54,670		Summit	Same as above
10/10/2015	10/10/2015	0	0	\$109,340	\$54,670		Barr	Same as above
10/10/2015	10/10/2015	0	0	\$109,340	\$54,670		Murray	Same as above
10/10/2015	10/10/2015	0	0	\$109,340	\$54,670		Gilbert	Same as above

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
12/30/2015	12/30/2015	0	0	\$2,187	\$0		Providence	Strong to Severe Thunderstorms produced wind damage along with heavy rainfall as cells trained over the same area.
9/2/2016	9/2/2016	0	0	\$5,302	\$0		Irmo	Tropical Storm Hermine impacted the region, especially on the 2nd with heavy rain and strong gusty winds.
9/2/2016	9/2/2016	0	0	\$5,302	\$0		Irmo	Same as above
9/2/2016	9/2/2016	0	0	\$5,302	\$0		Swansea	Same as above
9/12/2016	9/12/2016	0	0	\$106	\$106		Arthur	Scattered thunderstorms developed along a stalled front over the area. An isolated severe thunderstorm produced wind damage. These thunderstorms also produced locally heavy rain and flooding.
9/12/2016	9/12/2016	0	0	\$106	\$106		Springdale	Same as above
9/12/2016	9/12/2016	0	0	\$106	\$106		Happy Town	Same as above
10/8/2016	10/8/2016	0	0	\$5,302	\$0		Happy Town	Hurricane Matthew impacted the region on the night of Friday, October 7th and during much of the day on Saturday, October 8th. Tropical Storm force wind gusts were observed across most of the SC Midlands and Central Savannah River Area. Heavy rain also occurred but was mainly confined to the eastern Midlands and parts of the lower Central Savannah River Area and resulted in flash flooding.
10/8/2016	10/8/2016	0	0	\$2,121	\$0		Pelion	Same as above
5/22/2017	5/22/2017	0	0	\$5,195	\$104		Green Hill	A moist and unstable environment ahead of an approaching cold front allowed scattered showers and thunderstorms to develop, some of which produced locally heavy rain along with wind damage and small hail.
6/15/2017	6/15/2017	0	0	\$104	\$104		Dixiana	An upper disturbance combined with atmospheric instability and moisture to produce scattered severe thunderstorms producing wind damage, along with locally heavy rain with slow moving and training storms
6/11/2018	6/11/2018	0	0	\$103	\$103		Green Hill	Strong daytime heating, and surface boundaries, produced scattered severe thunderstorms in the afternoon and evening.
10/11/2018	10/11/2018	0	0	\$51,602	\$103		Irmo	Rain, Winds, & Flash Flooding
10/11/2018	10/11/2018	0	0	\$25,801	\$103		Irmo	Rain, Winds, & Flash Flooding
10/11/2018	10/11/2018	0	0	\$10,320	\$103		Irmo	Rain, Winds, & Flash Flooding
12/13/2019	12/13/2019	0	0	\$100	\$100		Kinsler	A band of showers and thunderstorms produced very heavy rain and led to some flooding.
12/13/2019	12/13/2019	0	0	\$100	\$10		St. Andrews	Same as above
12/13/2019	12/13/2019	0	0	\$100	\$10		Irmo	Same as above
12/13/2019	12/13/2019	0	0	\$100	\$10		Lexington	Same as above

*No magnitude information indicates flood height or rainfall amounts were unavailable.

Dam Failures

There are 113, largely privately owned, dams in Lexington County. The vast majority of these dams are small pond/recreational pond dams.

Lake Murray/Saluda Dam: The dam is located on the Saluda River, approximately 10 miles west of the City of Columbia, near the towns of Irmo, Lexington and Chapin. The Saluda River drains about 2,420 square miles above the dam and into Lake Murray to power the hydroelectric plant. State Highway, SC Route 6, runs atop of the dam. The dam is a 7,800 ft long earthen fill dam with additional steel sheet pile wall, a backup dam and emergency spillway with six Tainter gates. The backup dam was added during a seismic remediation project in 2005. The spillway gates are opened "when the reservoir level reaches or is predicted to exceed an elevation of 358.5'. At a flood elevation of 368.5', the spillway capacity is approximately 154,000 ft³/s. Under Probable Maximum Flood (PMF) conditions, the spillway is rated to pass 197,000 ft³/s with the reservoir at El. 374.4'"³⁴. During normal operation times, the plant has a total discharge of 18,000 ft³/s at full load. The dam's operating range lies between an elevation of 352.5' and 356.5' with a maximum operation pool elevation of 358.5' (full pool).

What to expect: Lexington County is at risk from dam failures of all categories, i.e., low hazard to high hazard dams. There has been one recorded failure of a small pond dam in the past (Table 35) and 4 dam failures during the 2015 flood disaster alone (Table 36).

Geographic Extent: Based on past occurrences, areas downstream from small pond dams are very susceptible to the effects of dam failures, particularly if dams are poorly maintained, have been weakened and/or not repaired after the 2015 floods, or show structural deficiencies.

Likelihood of Future Occurrences: A return rate for dam failures cannot be calculated. Based on past occurrences though, it is highly likely to expect future failure of small pond dams. The Lake Murray dam is not at risk from failure caused by natural hazards.

Table 36 - List of failed dams in Lexington County during the 2015 floods. Source: DHEC.

Dam Name	Class
Old Mill Pond Dam	C1 (High Hazard)
Gibson's Pond Dam	C2 (Significant Hazard)
Barr Lake Dam	C2 (Significant Hazard)
Thelma & John Culler Dam	C3 (Low Hazard)

B) Hurricanes & Tropical Cyclones

What to expect: Every property and person is at risk from hurricane-force winds and associated heavy rainfall and tornadoes in Lexington County with a slightly higher risk in southern and western Lexington County (Figure 61). Hurricane and tropical cyclones affect Lexington County every year. The county is at risk from hurricane-force winds as experienced during Hurricane Hugo as well as associated heavy rainfall, flash flooding, and tornadoes (Figure 60 & Table 37). While direct wind damage to property is unlikely, property and infrastructure damage due to falling trees as well as power outages are likely.

Geographic Extent: Based on past occurrences, the entire county is susceptible to the impacts of tropical cyclones.

³⁴ DOMINION ENERGY, 2008. Saluda Hydro Project Relicense. Attachment 3b Finale Schedule A response. Available at <http://www.thestate.com/news/local/article53937070.html>

It is important to note that the frequency and impact calculations below exclude the damage from wind, lightning, and tornadoes because they are reported separately. Tropical cyclone statistics for Lexington County are as following:

Number of Loss-Causing Events:	9
Frequency of Occurrence:	0.97%
Recurrence Interval:	1.03 year
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Hurricane-related Presidential Disaster Declarations:	DR-1299 (1999) DR-1566 (2004) DR-4346 (2017)
Total Losses:	\$1,303,327
Total Fatalities:	0
Deadliest Event:	n/a
Most Property Damage:	\$776,005 (September 4, 1979)
Most Crop Damage:	\$104,498 (June 22, 1989)
Highest USDA Crop Indemnity Payout:	\$1,680 (September 1, 1989)

Hurricane Floyd (September 9, 1999; DR-1299): Lexington County received no direct damage from the storm but hosted large number of evacuees from the coast. Hurricane Floyd revealed significant weaknesses in South Carolina's coastal evacuation plan caused by the "sudden" convergence of evacuees onto roads without a reversal of I-26 in place for many hours. This led to massive gridlock on the interstate and adjacent roads without adequate support for stranded motorists.

Tropical Storm Frances (September 7, 2004; DR-1566): The storm system caused high winds and caused a widespread tornado outbreak. The high winds uprooted trees and caused power outages and damaged properties—particularly mobile homes.

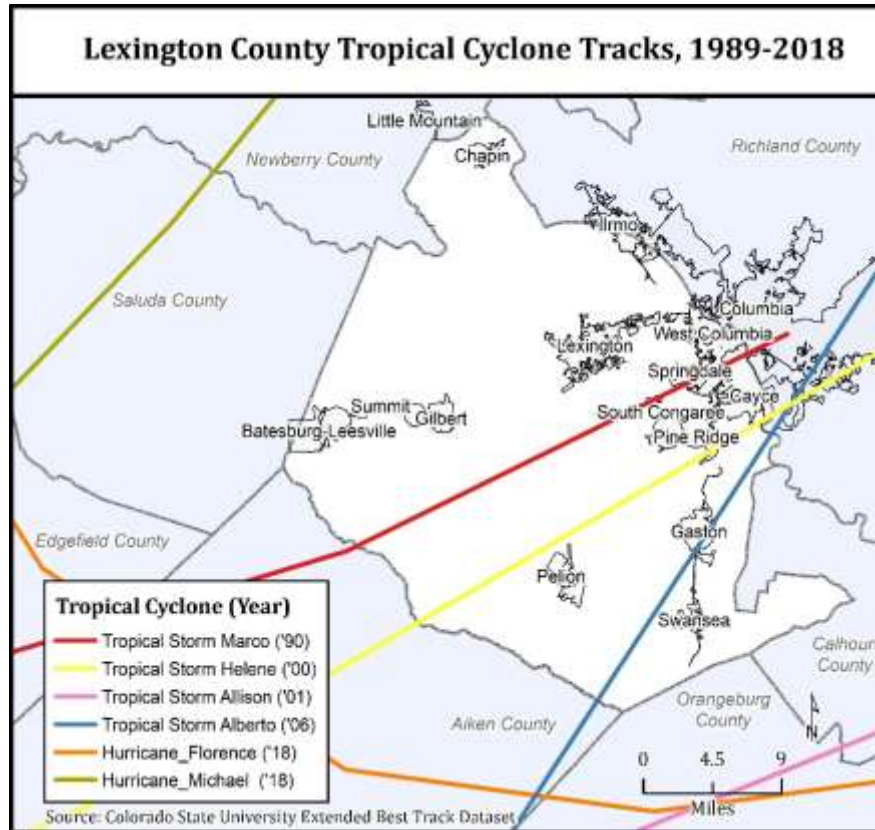


Figure 60 – Historical tropical cyclone tracks in Lexington County.

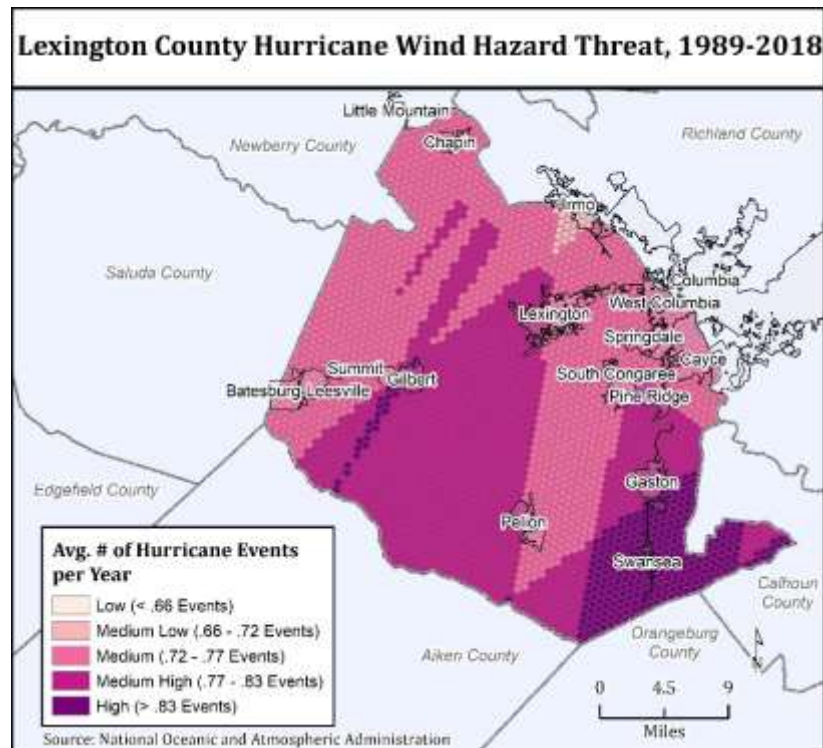


Figure 61 - Hurricane wind threat in Lexington County.

Table 37 - Record of loss-causing tropical cyclone events in Lexington County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag.	Location	Description
8/29/1964	8/31/1964	0	0	\$9,087	\$9,087	TS	Statewide	Tropical Storm Cleo
9/12/1964	9/13/1964	0	0	\$909	\$909	TS	Statewide	Tropical Storm Dora
6/7/1968	6/8/1968	0	0	\$809	\$81	TS	Statewide	Tropical Storm Abby
6/20/1972	6/21/1972	0	0	\$674	\$6,739	TD	Statewide	Tropical Depression Agnes
9/4/1979	9/5/1979	0	0	\$776,005	\$0	Cat. 1	Eastern & Central SC	Hurricane David
9/4/1987	9/7/1987	0	0	\$0	\$4,074	TS	Eastern SC	Tropical Depression Nine
8/28/1988	8/28/1988	0	0	\$3,319	\$3,319	TS	Eastern & Central SC	Tropical Storm Chris
9/22/1989	9/22/1989	0	0	\$10,450	\$104,498	Cat. 4	Eastern Portions	Hurricane Hugo
8/24/1995	8/29/1995	0	0	\$369,671	\$3,697	TS	Statewide	Tropical Storm Jerry

C) Tornadoes

What to expect: Every property and person is at risk from tornadoes in Lexington County, with a higher risk in the northern third of the county (Figure 63). Low magnitude tornadoes are not uncommon in Lexington County with twisters occurring roughly twice a year. The area has experienced more intense (EF3) tornadoes affecting densely populated areas (Figure 62). This does not mean that stronger tornadoes are impossible. Neighboring counties have experienced EF4s. Lexington County is at risk from tornadoes spawned by severe thunderstorms and from outbreaks associated with tropical systems (as seen during Tropical Storm Frances).

Geographic Extent: Based on past occurrences, the entire county is susceptible to tornadoes.

Tornado statistics for Lexington County are as following:

Number of Loss-Causing Events:	15
Frequency of Occurrence:	1.6%
Recurrence Interval:	0.64 years
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	\$13,629,963
Total Fatalities:	1
Deadliest Event:	1 fatality (July 23, 1997)
Most Property Damage:	\$8,743,404 (August 16, 1994)
Most Crop Damage:	\$40,367 (July 23, 1997)
Highest USDA Crop Indemnity Payout:	n/av*

*No tornado events caused a USDA Crop Indemnity Payout

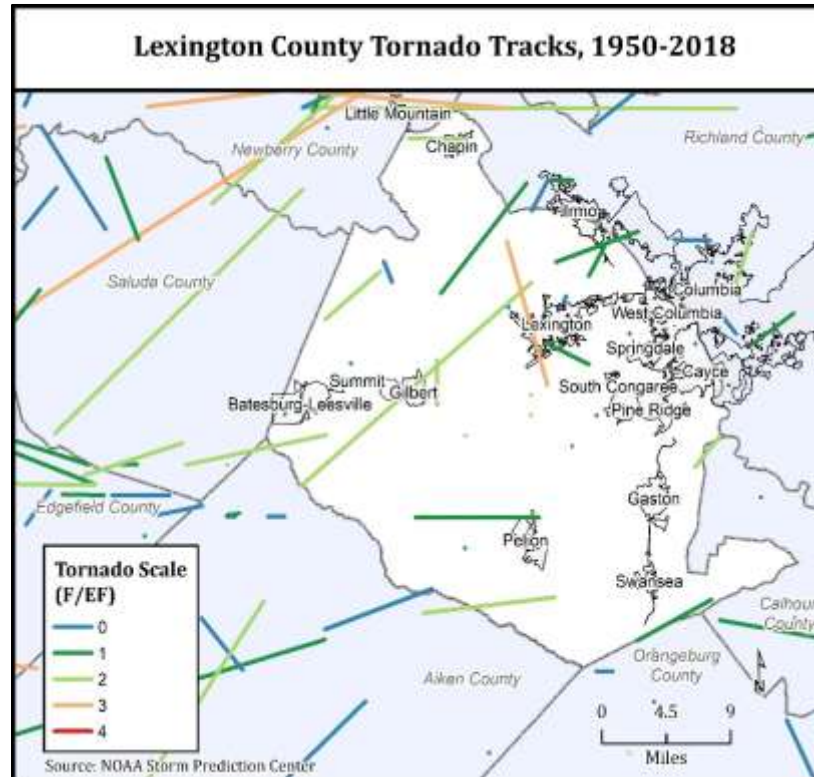


Figure 62 - Historical tornado tracks in Lexington County.

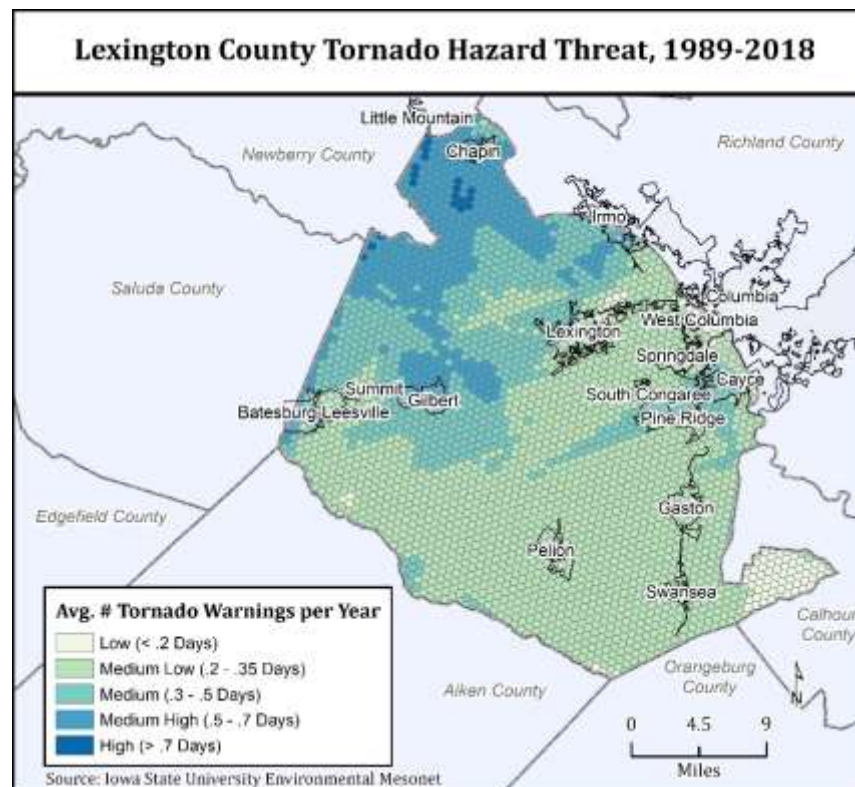


Figure 63 – Tornado threat in Lexington County.

Table 38 - Record of loss-causing tornado events in Lexington County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag.	Location	Description
9/28/1963	9/28/1963	0	0	\$423	\$0	F1	Lexington Co.	Tornado
1/10/1972	1/10/1972	3	0	\$309,993	\$0	F1	Lexington Co.	Tornado
12/13/1973	12/13/1973	0	0	\$1,459	\$146	F1	Lexington & Newberry Co.'s	Tornado
2/22/1974	2/22/1974	0	0	\$262,834	\$0	F1	Lexington Co.	Tornado
2/11/1981	2/11/1981	0	0	\$713	\$0	F1	Lexington Co.	Tornado
2/21/1989	2/21/1989	0	0	\$104,498	\$0	F0	Lexington	A tornado ripped the roof off a home and business, destroyed a mobile home, and damaged another mobile home.
2/22/1993	2/22/1993	2	0	\$896,728	\$0	F3	Lexington	A tornado clipped off or uprooted numerous trees along a 0.5-mile-path. Roof of a house was lifted and set back down, a mobile home destroyed, another overturned, and severely damaged, roof blown off a garage, shed picked up and destroyed, and four chicken houses damaged.
8/16/1994	8/16/1994	40	0	\$8,743,404	\$0	F3	Lexington	Lake Murray, Tornado touched down near intersection of SC311 and SC244 3 miles south-southeast of Lexington. Major damage occurred to the Glassmaster factory at the intersection of SC6 and Interstate 20. The tornado from that point was mostly on the ground as it moved through east and north central Lexington. Outside of Lexington, the tornado passed near the Rikard Nursing home. The storm became more intense with another area of severe damage in the Secret Cove area along the south Lake Murray shore. The tornado apparently dissipated over Lake Murray although strong winds were noted in the Old Forbes Road area on the northern shore of Lake Murray. Approximately 200 homes were damaged, many businesses, several churches and public buildings were also damaged. Five electric substations were damaged in Lexington County with 15,000 customers without electrical power. Forty people were injured. The tornado was observed by many people from the time it first struck near SC602 until it dissipated over Lake Murray.
8/16/1994	8/16/1994	4	0	\$0	\$0	F0	Edmund	Tornado observed as it touched down and damaged trees and home in southeast Edmund. It lifted and moved across Edmund Fire Station, then touched down and damaged pine forest immediately north of Edmund.
1/14/1995	1/14/1995	0	0	\$85,024	\$0	F1	Pelion	Tornado on ground continuously for one mile with several touchdowns over another mile. Damage included heavy timber damage.
11/2/1995	11/2/1995	0	0	\$382,610	\$0		Gaston	Three mobile homes, two frame homes, and one shed destroyed.
7/23/1997	7/23/1997	6	1	\$1,480,652	\$40,367	F2	Gaston	An F2 tornado producing winds to 150 mph killed a 32-year-old female and injured 6 others. Two homes were destroyed, and 9 others had major damage. Two apartments were destroyed (duplex). Seven mobile homes were destroyed and 94 had minor damage. Numerous trees were down, and two crop fields had areas of destroyed crops.

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag.	Location	Description
3/28/2010	3/28/2010	1	0	\$1,188,477	\$11,885	EF2	Ridge RD XRDS	An EF2 with max winds of 125mph touched down near Ridge Road and continued northeast to Lake Murray. Around 40 homes had some form of damage with numerous trees and powerlines down. Several vehicles were also damaged and there was one minor injury. One horse was killed when a portion of a barn collapsed.
2/24/2012	2/24/2012	0	0	\$67,725	\$0	EF1	Fairview XRDS	NWS storm survey found the tornado in Aiken County crossed into Lexington County and took down many trees and did minor damage to a couple of homes.
2/3/2016	2/3/2016	0	0	\$53,024	\$0	EF)	Dixiana	Survey determined that an EF0 tornado touched down near the rail freight automobile storage yard then crossed hwy. 321 and headed northeast down Dixiana Road before lifting near Grace Chapel Church.

D) Thunderstorms

What to expect: Every property and person is at risk from severe thunderstorms in Lexington County. Severe thunderstorms are a common occurrence in Lexington County with 7 to 13 severe thunderstorm warnings issued annually by the local NWS forecast office (Figure 64). The Midlands see on average up to 12 days per year with rainfall amounts of 1 inch or more, 30 days per year with rainfall between 1/2 inch and 1 inch, and about 70 days per year with rainfall amounts of less than 1/2 inch³⁵. Prior to the 2015 flash flood disaster, the daily rainfall record stood at 7.1 inches (September 4, 1998). During the October 2015 flood, 21.5 inches of rain fell over several days. Thunderstorms are complex and associated with different hazards: lightning, wind, rain, and/or hail. To understand the full impact of severe thunderstorms, the impacts of thunderstorms, wind, hail, and lightning should be considered jointly (Table 39).

Geographic Extent: Based on past occurrences, the entire county is susceptible to thunderstorms. There appears to be a higher risk to severe weather in the eastern half of Lexington County.

It is important to note that the frequency and impact calculations below exclude the damage from wind, lightning, and hail since they are reported separately—although in a meteorological sense they are tied together. Thunderstorm statistics for Lexington County are as following:

Number of Loss-Causing Events:	288
Frequency of Occurrence:	28%
Recurrence Interval:	0.04 years
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	\$2,973,783
Total Fatalities:	4
Deadliest Event:	2 fatalities (June 13, 1965)
Most Property Damage:	\$226,732 (June 1, 1995)
Most Crop Damage:	\$670,898 (June 10, 1982)
Highest USDA Crop Indemnity Payout:	\$163,419 (July 1, 2003)

³⁵ SCDNR, n/d. South Carolina Climate. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/cli_sc_climate.php

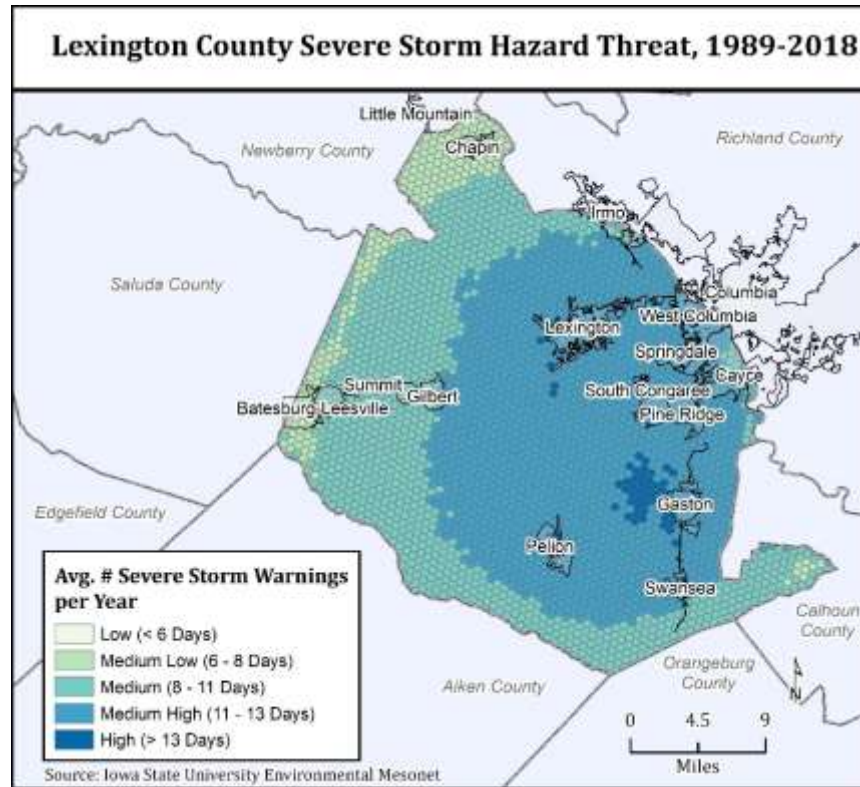


Figure 64 - Severe storm risk in Lexington County.

Table 39 - Record of loss-causing thunderstorm events in Lexington County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
7/14/1960	7/14/1960	0	0	\$219	\$0	0.13"	Columbia & Vicinity	Thunderstorm
2/24/1961	2/24/1961	0	0	\$1,238	\$0	2.95"	Western & Central SC	Wind & Rain
9/30/1964	10/1/1964	0	0	\$16,720	\$16,720	2.93"	Midlands & Central Plains of SC	Rainstorm
10/4/1964	10/6/1964	0	0	\$90,868	\$90,868	3.27"	Statewide	Rainstorm
10/15/1964	10/16/1964	0	0	\$0	\$9,087	5.18"	Statewide	Rainstorm
6/8/1965	6/16/1965	0	0	\$0	\$89,425	10.70"	Statewide	Locally Heavy Rains
6/13/1965	6/13/1965	1	2	\$0	\$0	0.10"	Near Batesburg	Heavy Rain
8/18/1965	8/18/1965	0	0	\$20,568	\$0		Columbia & Vicinity, Richland, & Lexington Counties	Heavy Thunder shower & Lightning
9/2/1965	9/2/1965	0	0	\$2,057	\$0	5.06"	Columbia & Vicinity, Richland, & Lexington Counties	Heavy Rain
2/13/1966	2/13/1966	0	0	\$869	\$0	0.51"	Statewide	Wind & Rain
8/20/1967	8/25/1967	0	0	\$84,338	\$843	5.65"	Statewide	Rain
1/9/1968	1/13/1968	0	0	\$116,359	\$12		Northern 2/3rds of SC	Rain, Sleet, & Freezing Rain
3/15/1971	3/15/1971	0	0	\$696	\$0	0.42"	Statewide	Thunderstorms & High Winds
9/4/1972	9/4/1972	0	0	\$30,999	\$0	0.03"	Countywide	Thunderstorm & High Winds
6/8/1973	6/25/1973	0	0	\$10,063	\$1,006,347		Southern & Central SC	Heavy Rain
8/4/1973	8/4/1973	0	0	\$162	\$16		Midlands & Southern SC	Rain, Wind, & Electrical

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
8/29/1973	8/29/1973	0	0	\$146	\$15		Northwestern & Midlands of SC	Rain, Wind, & Electrical
3/12/1974	3/12/1974	0	0	\$202	\$0	0.06"	Western & Central SC	Thunderstorm
5/12/1974	5/12/1974	0	0	\$13,833	\$13,833		Central, Southern, & Eastern SC	Lightning, Heavy Rain, & High Wind
1/25/1975	1/25/1975	0	0	\$524	\$0	0.50"	Statewide	Squall Line
3/14/1975	3/14/1975	0	0	\$2,409	\$0		Newberry & Lexington County	Wind, Rain, & Lightning
7/14/1975	7/14/1975	0	0	\$71	\$7	3.02"	Central & Northern SC	Wind & Rain
6/16/1976	6/16/1976	0	0	\$1,139	\$114	3.58"	Central SC, Lexington, & Richland Counties	Thunderstorms & Heavy Rains
6/16/1976	6/17/1976	0	0	\$1,139	\$114	4.06"	Central SC, Lexington, & Richland Counties	Thunderstorms & Heavy Rains
3/31/1977	3/31/1977	0	0	\$46	\$0	0.17"	Statewide	High Winds & Heavy Rains
9/7/1977	9/7/1977	0	0	\$465	\$46	0.27"	Statewide	Thunderstorms, High Winds, & Heavy Rain
12/5/1977	12/5/1977	0	0	\$46	\$0	0.86"	Statewide	Thunderstorm
8/21/1979	8/21/1979	0	0	\$8,924	\$0	0.04"	St. Andrews area, Richland, & Lexington Counties	Severe Thunderstorm
7/10/1980	7/10/1980	1	0	\$52,418	\$5,242	0.23"	Lexington, Richland, & Sumter Counties	Severe Storms & Thunderstorm Winds
7/16/1981	7/16/1981	0	0	\$35,637	\$0		Greenwood, Newberry, Lexington, & Richland Counties	Wind, Lightning, & Rain
4/17/1982	4/17/1982	0	0	\$0	\$671	0.65"	Columbia	High Winds & Thunderstorms
6/10/1982	6/10/1982	1	0	\$327,505	\$327,505		Western, Northern, Central, & Eastern SC	Lightning, Rain, & Wind
12/3/1983	12/4/1983	0	0	\$5,004	\$500	2.01"	Western & Central SC	Wind & Heavy Rain
12/28/1983	12/28/1983	0	0	\$8,131	\$0	0.40"	Central SC	Severe Storms & Thunderstorm Winds
7/25/1984	7/25/1984	0	0	\$124,713	\$1,247		Central SC	Rain, Lightning, & Wind
2/21/1989	2/21/1989	0	0	\$104,498	\$0	0.20"	Gilbert & Redbank	Thunderstorm Winds
5/5/1989	5/5/1989	0	0	\$104,498	\$0		Batesburg-Leesville	Thunderstorm Winds
5/5/1989	5/5/1989	0	0	\$104,498	\$0		Chapin	Thunderstorm Winds
1/6/1995	1/6/1995	0	0	\$340,098	\$0		Irmo & St. Andrews	Thunderstorms winds
7/29/2002	7/29/2002	0	0	\$108,041	\$0	1.26"	Columbia Airport	Severe Storms & Thunderstorm Winds
2/22/2003	2/22/2003	0	0	\$2,817	\$0	0.48"	Batesburg to Swansea	Severe Storms & Thunderstorm Winds
7/30/2003	7/30/2003	0	0	\$5,634	\$0	0.13"	Pelion	Severe Storms & Thunderstorm Winds
7/9/2008	7/9/2008	0	0	\$144,441	\$0		Lexington	Thunderstorm Wind & Heavy Rain
7/21/2008	7/21/2008	0	0	\$180,551	\$0		Batesburg	Thunderstorm Wind
8/2/2008	8/2/2008	0	0	\$144,441	\$0		Lexington	Thunderstorm Wind
4/6/2011	4/6/2011	0	0	\$138,253	\$0		Leesville	Thunderstorm Wind
7/21/2013	7/21/2013	0	0	\$2,225	\$0	1.95"	(CAE) Columbia Metro	Heavy Rain
8/12/2014	8/12/2014	0	0	\$6,568	\$0	0.10"	Irmo	Heavy Rain

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
4/7/2015	4/7/2015	0	0	\$39,362	\$0		Batesburg	Thunderstorm Winds
4/7/2015	4/7/2015	0	0	\$4,374	\$0		South Congaree	Thunderstorm Winds
4/19/2015	4/19/2015	0	0	\$19,681	\$0		Barr	A line of severe thunderstorms took down trees and powerlines with some trees falling on homes, vehicles, and other structures.
4/19/2015	4/19/2015	0	0	\$17,494	\$0		Congaree	Same as above
4/19/2015	4/19/2015	0	0	\$15,308	\$0		Summit	Same as above
4/19/2015	4/19/2015	0	0	\$5,467	\$0		Clubhouse XRDS	Same as above
5/11/2015	5/11/2015	0	0	\$3,280	\$0		Kinsler	Severe thunderstorms rolled through the Midlands and produced damaging winds and some large hail. Most wind damage was to trees and powerlines.
5/11/2015	5/11/2015	0	0	\$2,187	\$0		Happy Town	Same as above
5/11/2015	5/11/2015	0	0	\$2,187	\$0		Pelion	Same as above
5/18/2015	5/18/2015	0	0	\$2,187	\$0		Leesville	Thunderstorm Winds
6/1/2015	6/1/2015	0	0	\$2,187	\$0		Arthur	Thunderstorm Winds
6/20/2015	6/20/2015	0	0	\$3,280	\$0		Leesville	Severe Storms
6/22/2015	6/22/2015	0	0	\$3,280	\$0		Gaston	Thunderstorm Winds
6/22/2015	6/22/2015	0	0	\$3,280	\$0		Gilbert	Thunderstorm Winds
6/24/2015	6/24/2015	0	0	\$4,374	\$0		Leesville	Thunderstorm Winds
6/27/2015	6/27/2015	0	0	\$4,374	\$0		Congaree	A line of thunderstorms moved through the Midlands and produced wind damage and hail. Most of the wind damage was to trees and powerlines.
6/27/2015	6/27/2015	0	0	\$3,280	\$0		Irmo	Same as above
6/27/2015	6/27/2015	0	0	\$3,280	\$0		Providence	Same as above
6/27/2015	6/27/2015	0	0	\$2,187	\$0		Lexington	Same as above
6/27/2015	6/27/2015	0	0	\$2,187	\$0		Springdale	Same as above
6/30/2015	6/30/2015	0	0	\$3,280	\$0		Springdale	Thunderstorm Winds
6/30/2015	6/30/2015	0	0	\$2,187	\$0		Barr	Thunderstorm Winds
6/30/2015	6/30/2015	0	0	\$2,187	\$0		Arthur	Thunderstorm Winds
7/2/2015	7/2/2015	0	0	\$3,280	\$0		Dixiana	Thunderstorm Winds
7/18/2015	7/18/2015	0	0	\$8,747	\$0		Gaston Lexington Co. Airports	A squall line of thunderstorms moved south through the Midlands and produced wind damage taking down trees and powerlines.

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
7/18/2015	7/18/2015	0	0	\$4,374	\$0		Batesburg Airports	Same as above
7/18/2015	7/18/2015	0	0	\$3,280	\$0		Batesburg Airports	Same as above
8/6/2015	8/6/2015	0	0	\$3,280	\$0		Gaston Lexington Co. Airports	Thunderstorm Winds
8/6/2015	8/6/2015	0	0	\$3,280	\$0		Swansea	Thunderstorm Winds
8/6/2015	8/6/2015	0	0	\$3,280	\$0		Arthur	Thunderstorm Winds
8/6/2015	8/6/2015	0	0	\$1,093	\$0		Pelion	Thunderstorm Winds
9/4/2015	9/5/2015	0	0	\$4,374	\$0	1.91"	(CAE) Columbia Metro	Heavy Rain & Thunderstorm Winds
2/3/2016	2/3/2016	0	0	\$26,512	\$0		Samaria	Thunderstorm Winds
4/1/2016	4/1/2016	0	0	\$530	\$0		(CAE) Columbia Metro	Thunderstorm Winds
4/7/2016	4/7/2016	0	0	\$265,122	\$0		Syrup	Heavy Thunderstorm Winds
6/15/2017	6/16/2017	0	0	\$104	\$104	3.25"	(CAE) Columbia Metro	Heavy Rain & Thunderstorm Winds
6/15/2017	6/15/2017	0	0	\$104	\$104		(CAE) Columbia Metro	Heavy Rain & Thunderstorm Winds
7/7/2017	7/7/2017	0	0	\$104	\$104		(CAE) Columbia Metro	Thunderstorm Winds
7/24/2017	7/24/2017	0	0	\$104	\$104	2.71"	Barr	Heavy Rain & Thunderstorm Winds
3/1/2018	3/1/2018	0	0	\$103	\$103		(CAE) Columbia Metro	Heavy Rain & Thunderstorm Winds
4/15/2018	4/15/2018	0	0	\$103	\$103		Pelion Corporate ARP	Thunderstorms
6/20/2018	6/20/2018	0	0	\$103	\$103		(CAE) Columbia Metro	Thunderstorms
2/12/2019	2/12/2019	0	0	\$10	\$10		(CAE) Columbia Metro	Rain & Thunderstorms
4/8/2019	4/8/2019	0	0	\$100	\$100		(CAE) Columbia Metro	Rain & Thunderstorm Winds
5/11/2019	5/11/2019	0	0	\$100	\$100		(CAE) Columbia Metro	Rain & Thunderstorms
6/20/2019	6/20/2019	0	0	\$100	\$100		(CAE) Columbia Metro	Thunderstorm Winds
7/18/2019	7/18/2019	0	0	\$10	\$10		(CAE) Columbia Metro	Severe Thunderstorms
7/18/2019	7/18/2019	0	0	\$10	\$10		South Congaree	Severe Thunderstorms

*No magnitude information indicates rainfall amounts were unavailable.

E) Lightning

What to expect: Every property and person is at risk from lightning in Lexington County. Lightning occurs very frequently in Lexington County averaging several strikes per day. While the County does not experience a thunderstorm every day, the fact that a single thunderstorm produces hundreds of lightning strikes—each of which is counted in the statistic below—results in high frequency and recurrence figures. Like the pattern of thunderstorm risk, most lightning strikes (cloud-to-ground) occur in the southeastern part of the county (Figure 65). House fires and personal harm are common with lightning.

Geographic Extent: Based on past occurrences, the entire county is susceptible to lightning strikes. There appears to be a higher risk to severe weather and therefore lightning strikes in the southeastern part of the county.

Lightning statistics for Lexington County are as following:

Number of Loss-Causing Events:	61
Daily Frequency of Occurrence:	1.3%
Daily Recurrence Interval:	0.8 days
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	\$2,590,182
Total Fatalities:	3
Deadliest Event:	1 fatality (several instances)
Most Property Damage:	\$1,028,935 (June 27, 2004)
Most Crop Damage:	\$65,501 (June 10, 1982)
Highest USDA Crop Indemnity Payout:	n/av*

*No lightning events caused a USDA Crop Indemnity Payout

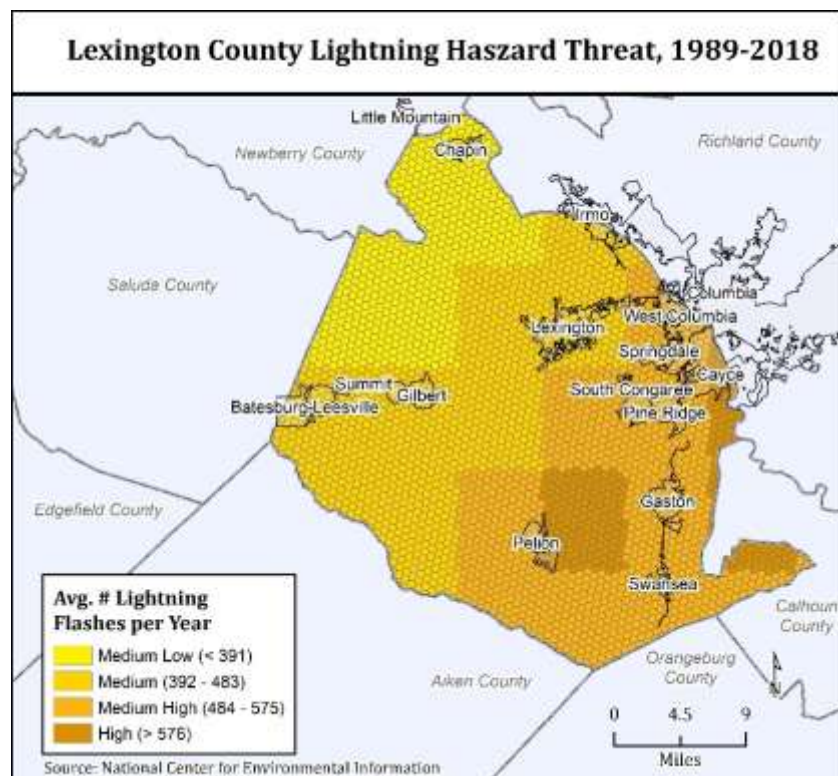


Figure 65 - Lightning threat in Lexington County.

Table 40 - Record of loss-causing lightning events in Lexington County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
9/5/1961	9/5/1961	2	0	\$0	\$0	Swansea	Lightning
7/19/1965	7/19/1965	0	0	\$894	\$89	Statewide	Lightning & Wind
8/18/1965	8/18/1965	0	0	\$20,568	\$0	Columbia & Vicinity, Richland & Lexington Counties	Heavy Thundershower & Lightning
8/27/1965	8/27/1965	0	0	\$894	\$0	Statewide	Severe Lightning
7/15/1966	7/15/1966	0	0	\$19,996	\$0	Columbia, Richland & Lexington Counties	Wind & Electrical

Start Date	End Date	Inj.	Fat .	Property Damage	Crop Damage	Location	Description
9/4/1966	9/4/1966	0	1	\$400	\$0	Gilbert & Lexington County	Lightning
8/19/1967	8/19/1967	0	0	\$38,796	\$0	Lexington County	Lightning
5/28/1973	5/29/1973	0.11	0	\$1,081	\$1,081	Western & Northern SC	Wind & Electrical
8/4/1973	8/4/1973	0	0	\$162	\$16	Midlands & Southern SC	Rain, Wind, & Electrical
8/29/1973	8/29/1973	0	0	\$146	\$15	Northwestern & Midlands SC	Rain, Wind, & Electrical
12/13/1973	12/13/1973	0	0	\$11	\$108	Northern & Western SC	Lightning
3/21/1974	3/21/1974	0.15	0	\$5,714	\$571	Statewide	High Winds & Electrical
3/29/1974	3/29/1974	0	0	\$6,258	\$6,258	Northern, Eastern, & Central SC	Wind & Electrical
4/8/1974	4/8/1974	0	0	\$7,301	\$7	Central, Western, & Northern SC	Wind & Electrical
4/8/1974	4/8/1974	0	0	\$105	\$0	Central SC	Wind & Electrical
5/12/1974	5/12/1974	0	0	\$13,833	\$13,833	Central, Southern, & Eastern SC	Lightning, Heavy Rain, & High Wind
5/19/1974	5/19/1974	0	0	\$876	\$88	Northwestern & Southern SC	High Wind & Lightning
8/13/1974	8/13/1974	0	0	\$1,195	\$119	Central SC	Wind & Electrical
8/28/1974	8/28/1974	0	0	\$26,283	\$2,628	Lexington, Cayce, & West Columbia	Wind & Electrical
3/7/1975	3/7/1975	0	0	\$688	\$0	Northwestern, Central, & Northeastern SC	Wind & Electrical
3/14/1975	3/14/1975	0	0	\$2,409	\$0	Newberry & Lexington County	Wind, Rain, & Lightning
3/24/1975	3/24/1975	0.3	0	\$5,236	\$52	Statewide	Wind & Electrical
5/10/1975	5/10/1975	0	0	\$13,381	\$133,806	York to Bamberg & Spartanburg to Oconee & Anderson	Wind & Electrical
5/15/1975	5/15/1975	0	0	\$5,236	\$52	Statewide	Wind & Electrical
6/15/1975	6/15/1975	0	0	\$708	\$708	Northern & Central SC	Wind & Electrical
6/18/1975	6/18/1975	0	0	\$52	\$5,236	Statewide	Wind & Electrical
6/19/1975	6/19/1975	0	0	\$892	\$892	Northern & Western SC	Wind & Electrical
7/4/1975	7/4/1975	0	0	\$6,881	\$68,814	Northern & Central SC	Wind & Electrical
7/24/1975	7/24/1975	0	0	\$688	\$0	Western, Central, & Northern SC	Lightning
8/27/1975	8/27/1975	0.05	0	\$6,338	\$63	Northern, Northeastern, & Central SC	Lightning, High Winds, & Thunderstorms
10/9/1976	10/9/1976	0	0	\$6,326	\$63	Central & Eastern SC	Wind & Electrical
6/6/1977	6/6/1977	0.02	0	\$465	\$4,648	Statewide	Wind & Electrical
7/14/1977	7/14/1977	0	0	\$4,648	\$46	Statewide	Wind & Electrical
4/20/1981	4/20/1981	0	0	\$204	\$20	Orangeburg Co. Union Co. Clarendon Co. Calhoun Co. Lexington Co. Dorchester Co. Beaufort Co.	Thunderstorm Wind & Lightning

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
5/31/1981	5/31/1981	0	0	\$14,255	\$0	Pelion	Lightning
7/16/1981	7/16/1981	0.5	0	\$35,637	\$0	Greenwood Co., Newberry Co., Lexington Co., & Richland Co.	Lighting, Wind, & Rain
4/26/1982	4/27/1982	0	0	\$29	\$29	Statewide	Thunderstorm Wind & Lightning
4/27/1982	4/27/1982	0	0	\$707	\$0	Central, Northeastern, & Eastern SC	Lightning
6/10/1982	6/10/1982	0.2	0	\$327,505	\$327,505	Western, Northern, Central, & Eastern SC	Lightning, Rain, & Wind
7/25/1983	7/25/1983	0	0	\$2,828	\$28	Statewide	Wind & Electrical
8/23/1983	8/23/1983	0	0	\$3,717	\$0	Northern & Central SC	Wind & Electrical
8/31/1983	8/31/1983	0	0	\$1,301	\$0	Lake Murray Area	Wind & Electrical
6/20/1984	6/20/1984	0	0	\$2,711	\$271	Statewide	Rain, Lightning, & Wind
6/21/1984	6/21/1984	3	0	\$62,357	\$6,236	Columbia	Rain, Flood, & Lightning
7/13/1984	7/13/1984	0	0	\$6,236	\$0	Columbia, Western Columbia, & Cayce	Lightning
7/25/1984	7/25/1984	0	0	\$124,713	\$1,247	Central SC	Rain, Lightning, & Wind
8/2/1984	8/2/1984	0	0	\$4,300	\$0	Southern, Central, & Eastern SC	Rain, Flood, & Lightning
5/28/1986	5/28/1986	0	0	\$5,911	\$0	Lexington County & Richland County	Lightning
8/2/1986	8/2/1986	0	0	\$11,823	\$0	Western Columbia	Lightning
8/6/1990	8/6/1990	1	0	\$0	\$0	Edmund	Lightning
7/19/1993	7/19/1993	4	0	\$0	\$0	Gaston	Lightning
6/10/1996	6/10/1996	0	0	\$495,515	\$0	Lexington	Lightning
5/27/2000	5/27/2000	0	0	\$112,872	\$0	Lexington	Lightning
6/18/2003	6/18/2003	0	0	\$77,465	\$0	Western Columbia	Lightning struck a home setting on fire & destroying it.
6/8/2004	6/8/2004	1	1	\$0	\$0	Lexington	Lightning struck a tree and branched off to hit a man and a woman. The man was killed, and the woman had a slight injury.
6/27/2004	6/27/2004	0	0	\$1,028,935	\$0	Irmo	Severe Lightning
8/13/2005	8/13/2005	0	0	\$212,313	\$0	Columbia Airports	Lightning
7/26/2010	7/26/2010	0	0	\$142,617	\$0	Lexington	Lightning
7/26/2010	7/26/2010	0	0	\$23,770	\$0	Irmo	Lightning
7/13/2011	7/13/2011	0	0	\$32,259	\$0	Batesburg	Lightning
6/27/2015	6/27/2015	0	1	\$0	\$0	(CAE) Columbia Metro	One woman died from injuries sustained from a lightning strike at Columbia Metropolitan Airport while she deplaned.

F) Wind

What to expect: Every property and person is at risk from wind in Lexington County. The county frequently experiences high wind events with gust of 50 knots (58mph) or more (Figure 66 & Table 41). Wind gust of 80 knots (92 mph) have been recorded. On average, severe winds occur monthly. Due to concurrence of high wind with severe thunderstorms, the spatial distribution of wind events within the

county is like the thunderstorm risk. High winds cause largely property damage and power outages due to falling tree or tree limbs.

Geographic Extent: Based on past occurrences, the entire county is susceptible to wind damage. There appears to be a higher propensity for severe weather and therefore wind damage in the east-central part of the county.

Wind statistics for Lexington County are as following:

Number of Loss-Causing Events:	314
Frequency of Occurrence:	18%
Recurrence Interval:	0.06 years
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	\$3,945,983
Total Fatalities:	2
Deadliest Event:	1 fatality (several instances)
Most Property Damage:	\$795,365 (October 8, 2016)
Most Crop Damage:	\$65,501 (June 10, 1982)
Highest USDA Crop Indemnity Payout:	\$23,777 (January 1, 1989)

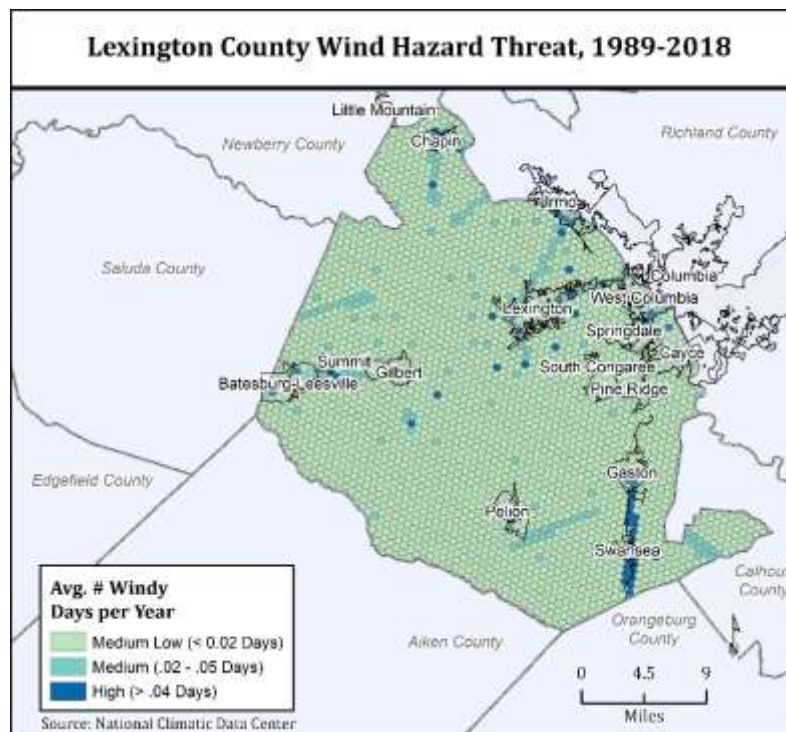


Figure 66 - Wind threat in Lexington County.

Table 41 - Record of loss-causing wind events in Lexington County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag.(kts)*	Location	Description
5/30/1967	5/30/1967	3	0	\$387,956	\$0		Lexington Co.	Wind
5/10/1975	5/10/1975	0	0	\$13,381	\$133,806		York to Bamberg & Spartanburg to Oconee &	Wind & Lightning

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag.(kts)*	Location	Description
							Anderson	
6/10/1982	6/10/1982	1	0	\$327,505	\$327,505		Western, Northern, Central, & Eastern SC	Lightning, Rain, & Wind
10/13/1982	10/13/1982	0	0	\$13,428	\$0		Chapin	Thunderstorm Winds
7/25/1984	7/25/1984	0	0	\$124,713	\$1,247		Central SC	Lightning, Rain, & Wind
7/2/1986	7/2/1986	1	0	\$0	\$1,182	0	Chapin	Winds blew a tree on a car, injuring one person.
10/13/1986	10/13/1986	0	0	\$1,182	\$0		Southern Congaree	Thunderstorm Winds
7/11/1987	7/11/1987	0	0	\$0	\$114		Columbia Airport	Thunderstorm Winds
7/29/1987	7/29/1987	0	0	\$114	\$0		Congaree	Thunderstorm Winds
7/29/1987	7/29/1987	0	0	\$11,406	\$0		Cayce	Thunderstorm Winds
4/6/1988	4/6/1988	0	0	\$110	\$110		20 miles NW of Columbia	Thunderstorm Winds
4/15/1988	4/15/1988	0	0	\$110	\$0		Lexington Co.	Thunderstorm Winds
5/23/1988	5/23/1988	0	0	\$110	\$0		Leesville-Batesburg	Thunderstorm Winds
5/23/1988	5/23/1988	0	0	\$110	\$0		Lexington	Thunderstorm Winds
5/23/1988	5/23/1988	0	0	\$110	\$0		Lexington	Thunderstorm Winds
5/23/1988	5/23/1988	0	0	\$1,095	\$10,953		Lexington	Thunderstorm Winds
6/9/1988	6/9/1988	0	0	\$1,095	\$0		Batesburg	Thunderstorm Winds
6/9/1988	6/9/1988	0	0	\$1,095	\$0		Cayce	Thunderstorm Winds
7/16/1988	7/16/1988	0	0	\$10,953	\$0		Western Columbia	Thunderstorm Winds
7/29/1988	7/29/1988	0	0	\$1,095	\$0		Swansea	Thunderstorm Winds
7/31/1988	7/31/1988	0	0	\$10,953	\$0		Lexington	Thunderstorm Winds
2/21/1989	2/21/1989	1	0	\$10,450	\$0		Western Columbia	Thunderstorm Winds
2/21/1989	2/21/1989	0	0	\$104,498	\$0		Gilbert & Redbank	Thunderstorm Winds
2/21/1989	2/21/1989	1	0	\$20,900	\$0	0	Central & Eastern SC	Thunderstorm Winds
4/4/1989	4/4/1989	0	0	\$1,045	\$0		Lexington	Thunderstorm Winds
5/5/1989	5/5/1989	0	0	\$104,498	\$0		Batesburg-Leesville	Thunderstorm Winds
5/5/1989	5/5/1989	0	0	\$104,498	\$0		Chapin	Thunderstorm Winds
2/22/1993	2/22/1993	0	0	\$8,967	\$0		Leesville to Gilbert	Thunderstorm Winds
3/13/1993	3/13/1994	0	0	\$112,091	\$11,209		SCZ006	High Winds & Cold
5/15/1994	5/15/1994	0	0	\$437	\$0		Irmo	Thunderstorm Winds
1/6/1995	1/6/1995	0	0	\$340,098	\$0	0	Irmo & St.	Thunderstorm Wind
6/12/1995	6/12/1995	0	0	\$8,502	\$0	0	Swansea	Thunderstorm wind
11/7/1995	11/7/1995	2	0	\$0	\$0	0	Irmo	Thunderstorm wind

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag.(kts)*	Location	Description
2/21/1997	2/21/1997	0	0	\$8,073	\$0	50	Chapin	Severe thunderstorms took down trees and power lines in Irmo, Chapin, and West Columbia as a squall line moved through the area. A gustnado briefly touched down at the Barnyard flea market and did minor damage to a building.
7/16/1997	7/16/1997	0	0	\$8,073	\$80,773	70	Pelion	Thunderstorm wind
5/8/1998	5/8/1998	2	0	\$23,849	\$0	50	Lexington	Thunderstorm wind
8/30/1998	8/30/1998	0	1	\$19,079	\$0	55	Swansea	Thunderstorm wind
5/6/1999	5/6/1999	6	0	\$0	\$0	60	Batesburg	The May 6th event caused widespread damage. According to the SC insurance industry 6.5 million in damage occurred across the state most of it in the Midlands. Sheriff reported trees down throughout county and damage to homes and buildings, including Airport high school where several students and faculty were injured by flying debris.
6/22/2000	6/22/2000	1	0	\$0	\$0	60	Chapin	Sheriff reported trees down.
7/29/2002	7/29/2002	0	0	\$108,041	\$0	55	Columbia Airport	A microburst developed right over the Columbia and produced wind gusts of 60-70mph causing significant damage to several hangers and a few planes.
2/22/2003	2/22/2003	0	0	\$2,817	\$0	55	Batesburg	Sheriff and SKYWARN spotters AF4VN and KE4LHS reported a shed destroyed in Batesburg and trees down in eastern portions of the county from Swansea to Chapin.
7/30/2003	7/30/2003	0	0	\$5,634	\$0	50	Pelion	NWS COOP observer reported portions of roofs blown off utility buildings into nearby fields. Numerous large tree branches were strewn around.
6/24/2007	6/24/2007	0	0	\$3,750	\$0	50	Lexington	Storm survey found a large tree down and a roof peeled off half of a mobile home. A funnel cloud was reported but damage was due to a microburst.
9/12/2007	9/12/2007	0	0	\$24,994	\$0	55	Gaston	A microburst moved across a field through a mobile home community and took down a couple of trees, did minor damage to the skirting around a dozen mobile homes, and lifted a carport off its foundation and rolled it about 40 yards. The carport was open in the front and closed on the sides and back.
7/9/2008	7/9/2008	0	0	\$144,441	\$0	80	Lexington	Sheriff dispatch reported numerous trees down and large limbs down across the town. Several homes were damaged. NWS survey reported that the damage was due to a wet microburst which produced winds estimated to be around 90 mph.
7/21/2008	7/21/2008	0	0	\$180,551	\$0	60	Batesburg	Reported large trees down in Batesburg and power poles down in Leesville. Significant damage also occurred at Wiz's southern convenience store and Oswald Lumber company.

Start Date	End Date	Inj	Fat	Property Damage	Crop Damage	Mag.(kts)*	Location	Description
7/28/2008	7/28/2008	0	0	\$6,018	\$0	60	Lexington	Spotter reported trees down and shingles blown off a house near Platt Springs Rd and White Knoll High School.
8/2/2008	8/2/2008	0	0	\$144,441	\$0	60	Lexington	Two large trees fell on a home pretty much destroying it. One person was trapped inside but was not injured.
8/6/2008	8/6/2008	0	0	\$2,407	\$0	50	Swansea	Aiken Electric reported large branches and a couple of power lines down in the Swansea area which produced some minor power outages.
8/6/2008	8/6/2008	0	0	\$7,222	\$0	55	Gaston	WIS TV reported trees and power lines down in Gaston and the surrounding area.
10/24/2008	10/24/2008	0	0	\$481,469	\$24,073	55	Lexington	A combination of strong onshore flow and a strong jet extending from south southwest to the north northeast into the CSRA/Midlands produced high winds that took down trees and powerlines, damaged boats and docks on lakes, and did property damage.
12/11/2008	12/11/2008	0	0	\$2,407	\$0	50	Gaston	DOT reported several trees down in the Gaston area.
12/11/2008	12/11/2008	0	0	\$3,611	\$0	50	Barr	DOT reported several trees down on Longs Pond Rd.
12/11/2008	12/11/2008	0	0	\$14,444	\$0	60	Lexington	Emergency manager reported trees down and a mobile home overturned. There were no injuries.
6/10/2009	6/10/2009	0	0	\$18,120	\$0	50	Leesville	Public reported several trees down in Leesville with one through a home.
6/11/2009	6/11/2009	0	0	\$2,416	\$0	50	West Columbia	West Columbia police reported power lines down on several roads.
6/18/2009	6/18/2009	0	0	\$4,832	\$0	55	Chapin	NWS employee reported several trees down from Chapin to Ballentine to Irmo.
6/18/2009	6/18/2009	0	0	\$14,496	\$0	55	Lexington	EM reported scattered trees down throughout the county.
6/18/2009	6/18/2009	0	0	\$9,664	\$0	60	Gaston	Sheriff reported numerous trees down from Gaston to Swansea.
7/1/2009	7/1/2009	0	0	\$72,478	\$0	78	Lexington	NWS storm survey indicated a microburst affect 2 neighborhoods 1 to 2 miles west northwest of Lexington. Winds were estimated to have ranged from 80 to 90 mph. The Westbrook and Martins Grove neighborhoods were hit the hardest. Several homes sustained damage.
7/30/2009	7/30/2009	0	0	\$1,208	\$0	55	Samaria	Hill View truck stop reported a couple of trees down at i-20 and Fairview Rd.
7/30/2009	7/30/2009	0	0	\$1,208	\$0	50	Pelion Corporate Airport	DOT reported a couple of trees down on old Charleston Hwy (sc32-625) near the Lexington County airport.
7/31/2009	7/31/2009	0	0	\$3,624	\$0	55	Batesburg	DOT reported several trees down in Batesburg.
7/31/2009	7/31/2009	0	0	\$2,416	\$0	55	Gilbert	Public reported several trees down just northeast of Gilbert on Hwy 604.
7/31/2009	7/31/2009	0	0	\$1,208	\$0	50	Swansea	DOT reported a couple of trees down on Hwy 321 near the Orangeburg County line.
7/31/2009	7/31/2009	0	0	\$1,208	\$0	50	Springdale	DOT reported a couple of trees down on Platt Springs Rd.

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag.(kts)*	Location	Description
8/5/2009	8/5/2009	0	0	\$1,208	\$0	50	Gaston	Winds blew over an 80-pound sign at the country gas mart. Hail was also reported but the size was unknown.
8/11/2009	8/11/2009	0	0	\$9,664	\$0	55	Chapin	Sheriff reported trees and power lines down from Chapin to Irmo.
12/9/2009	12/9/2009	0	0	\$2,416	\$0	50	Lexington	Sheriff and off duty employee reported trees down at the intersection of Hwy 378 and mineral springs road.
1/25/2010	1/25/2010	0	0	\$5,942	\$0	55	Lexington	Sheriff reported power lines down near Beechwood and Old Cherokee Rds.
6/28/2010	6/28/2010	0	0	\$7,131	\$0	50	Lexington	Sheriff reported trees down around the 1500 block of Old Orangeburg Rd.
6/28/2010	6/28/2010	0	0	\$7,131	\$0	50	Red bank	Sheriff reported power lines down at the intersection of Old Orangeburg and Bluefield Rds.
6/29/2010	6/29/2010	0	0	\$2,377	\$0	55	Chapin	Police department reported power lines down on Chapin Rd.
6/29/2010	6/29/2010	0	0	\$9,508	\$0	60	Irmo	NWS employee reported trees down on the northeastern side of Irmo.
6/29/2010	6/29/2010	0	0	\$9,508	\$0	60	Irmo	NWS employee reported trees down just east of Irmo east of i-20.
6/29/2010	6/29/2010	0	0	\$30,900	\$0	55	Red Bank	Sheriff reported trees down on a home southwest of Red Bank.
7/11/2010	7/11/2010	0	0	\$11,885	\$0	65	Batesburg	EM reported numerous trees down at Hwy 178 and Fairview Rd and also at I-20 exit 39.
7/22/2010	7/22/2010	0	0	\$3,565	\$0	55	Irmo	NWS employee reported several trees down on Hollingshed Rd and Lykes Ln northeast of the Irmo area.
7/26/2010	7/26/2010	0	0	\$8,685	\$0	65	Irmo	Highway Patrol reported many trees down on Charing Rd and US76.
7/26/2010	7/26/2010	0	0	\$28,523	\$0	70	Irmo	NWS employee reported many trees down in Irmo from an intense wet microburst. Minor roof damage also occurred to several structures including homes and businesses.
7/26/2010	7/26/2010	0	0	\$14,262	\$0	70	Irmo	Police reported many trees down in and east of the Irmo area into Richland County.
7/26/2010	7/26/2010	0	0	\$4,754	\$0	55	Lexington	Highway Patrol reported trees down near Barr and Rawl Rd.
7/26/2010	7/26/2010	0	0	\$9,508	\$0	60	Irmo	DOT reported several trees down subdivisions just south of Irmo.
7/26/2010	7/26/2010	0	0	\$1,188	\$0	55	Lexington	Public reported a tree and large limbs down.
7/26/2010	7/26/2010	0	0	\$1,188	\$0	50	Irmo	Sheriff reported a tree down at Bush River and Langsdale Rds.
7/27/2010	7/27/2010	0	0	\$2,377	\$0	50	Irmo	EM reported power lines down on Foxglove Rd.
8/17/2010	8/17/2010	0	0	\$594	\$0	50	Lexington	Tree down on Cherokee Tr near Northwood Dr.
8/17/2010	8/17/2010	0	0	\$2,377	\$0	55	Providence	Trees down on Beechwoods Dr near hallmark Dr.
10/14/2010	10/14/2010	0	0	\$4,754	\$0	50	Lexington	NWS employee reported two trees down and minor damage to a home.
10/14/2010	10/14/2010	0	0	\$594	\$0	50	Gaston	Public reported a tree down and nickel size hail.
11/16/2010	11/16/2010	0	0	\$3,565	\$0	55	Lexington	NWS employee reported trees down on Mineral Springs Rd.

Start Date	End Date	Inj	Fat	Property Damage	Crop Damage	Mag.(kts)*	Location	Description
11/30/2010	11/30/2010	0	0	\$4,754	\$0	50	Leesville	Highway Patrol reported several trees down.
11/30/2010	11/30/2010	0	0	\$594	\$0	50	Edmund	Highway Patrol reported a tree down near the intersection of Meadowfield and Fish Hatchery Rds.
2/28/2011	2/28/2011	0	0	\$1,152	\$0	50	Chapin	DOT found a couple of trees down near Gardenia and Archway Cts west of Chapin.
2/28/2011	2/28/2011	0	0	\$16,130	\$0	50	West Columbia	Public reported roof partially torn off a building and damage to a car.
3/19/2011	3/19/2011	0	0	\$9,217	\$0	50	Pelion	COOP reported the side of a building and part of the roof were torn off by strong winds and large branches were down.
3/19/2011	3/19/2011	0	0	\$2,304	\$0	50	Swansea	DOT reported a few trees down on US 321 from Swansea to Woodford.
4/5/2011	4/5/2011	0	0	\$27,651	\$0	60	Chapin	Highway Patrol reported numerous trees down from Chapin to Irmo.
4/5/2011	4/5/2011	0	0	\$25,346	\$0	65	Gaston	Sheriff reported numerous trees and power lines down from Gaston to Swansea.
4/6/2011	4/6/2011	0	0	\$138,253	\$0	65	Leesville	Local police reported several trees down on 4 homes and power lines down as well.
4/6/2011	4/6/2011	0	0	\$69,127	\$0	65	Lexington	EM reported many trees down around the city, some on a couple of homes.
5/10/2011	5/10/2011	0	0	\$9,217	\$0	55	Chapin	Public reported trees and power lines down at Chapin Elementary School.
5/13/2011	5/13/2011	0	0	\$2,304	\$0	55	Samaria	Sheriff reported trees down and across Quattlebaum Rd near i-20.
5/13/2011	5/13/2011	0	0	\$4,608	\$0	55	Arthur	NWS employee reported trees down off Mineral Springs Rd near Lexington.
5/27/2011	5/27/2011	0	0	\$576	\$0	55	Pelion	Sheriff dispatch reported one tree down on Tindall Rd in Pelion.
6/2/2011	6/2/2011	0	0	\$6,913	\$0	55	Providence	Highway Patrol reported several trees down at Pilgram Church and Cherokee Rds.
6/2/2011	6/2/2011	0	0	\$43,780	\$0	65	Providence	Public reported pontoon boats damaged, trees down, and a sea wall damaged along Power Point Ln at Lake Murray.
6/2/2011	6/2/2011	0	0	\$5,761	\$0	55	Arthur	Highway Patrol reported trees down on Old Barnwell Rd near US 1.
6/2/2011	6/2/2011	0	0	\$13,825	\$0	60	Happy Town	Highway Patrol reported trees down near I-26 and Hwy 378. Highway sign also destroyed.
6/2/2011	6/2/2011	0	0	\$576	\$0	50	Arthur	Highway Patrol reported a tree in the road near I-20 and Dooley Rd.
6/2/2011	6/2/2011	0	0	\$576	\$0	50	Dixiana	Highway Patrol reported a tree in the road near US 321 and Glenn Rd.
6/2/2011	6/2/2011	0	0	\$576	\$0	50	Edmund	Highway patrol reported a tree in the roadway near pleasant view road and SC 6.
6/2/2011	6/2/2011	0	0	\$576	\$0	50	Swansea	Highway Patrol reported a tree in the roadway near SC 6 and Sardis Church Rd.
6/5/2011	6/5/2011	0	0	\$3,456	\$0	55	Pelion Corporate Airport	Sheriff reported power lines down in the roadway along Pond Branch and Caulks Ferry Rds.

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag.(kts)*	Location	Description
6/5/2011	6/5/2011	0	0	\$3,456	\$0	55	Pelion Corporate Airport	Sheriff reported trees in the roadway at Caulks Ferry and Water Tank Rds.
6/15/2011	6/15/2011	0	0	\$2,304	\$0	55	Chapin	Sheriff reported a few trees down around the Chapin community.
6/15/2011	6/15/2011	0	0	\$6,913	\$0	55	Lexington	Sheriff reported several trees and power lines down around Lexington.
6/18/2011	6/18/2011	0	0	\$3,456	\$0	55	Irmo	Sheriff reported trees down near Morningside Dr and Beatty Rd in West Columbia.
6/20/2011	6/20/2011	0	0	\$5,761	\$0	50	Clubhouse Rd	Public reported a roof partially torn off a barn and several large tree branches down in the yard.
6/21/2011	6/21/2011	0	0	\$2,304	\$0	55	Providence	Sheriff reported trees down at the intersection of Beechcreek Rd and County Lake Dr.
6/23/2011	6/23/2011	0	0	\$2,304	\$0	55	Cayce	NWS employee reported trees down along I-26 near mile marker 116.
7/13/2011	7/13/2011	0	0	\$3,456	\$0	55	Barr	Highway Patrol reported trees down on Kyzer Rd near Platt Springs Rd.
7/13/2011	7/13/2011	0	0	\$2,304	\$0	55	Batesburg	Highway Patrol reported several trees down near Batesburg.
8/9/2011	8/9/2011	0	0	\$2,304	\$0	55	Chapin	Highway Patrol reported trees down along I-26 near the 89-mile marker on the west bound side.
9/25/2011	9/25/2011	0	0	\$20,738	\$0	55	Lexington	Highway Patrol reported trees down in the greater Lexington and Red Bank areas.
10/13/2011	10/13/2011	0	0	\$4,608	\$0	55	Arthur	Highway Patrol reported trees down along Corley Mill Rd near Hwy 378.
3/3/2012	3/3/2012	0	0	\$9,030	\$0	55	Lexington	Sheriff reported trees down along the 1500 block of Corley Mill Rd.
3/3/2012	3/3/2012	0	0	\$3,386	\$0	50	Barr	Sheriff reported trees down on Calks Ferry Rd near Pond Branch Rd.
3/3/2012	3/3/2012	0	0	\$3,386	\$0	50	Irmo	Sheriff reported trees down at Beatty Rd and Morningside Dr.
3/24/2012	3/24/2012	0	0	\$1,129	\$0	50	Providence	Highway Patrol reported a tree down in the road in the 300 block of Maxie rd.
3/24/2012	3/24/2012	0	0	\$564	\$0	50	Providence	Highway Patrol reported power lines down at the intersection of St. Peters Church Rd and Hwy 378.
4/3/2012	4/3/2012	0	0	\$3,386	\$0	50	Ridge Rd	Sheriff reported trees down at the intersection of Ansel Caughman Rd and Union Church Rd.
5/17/2012	5/17/2012	0	0	\$5,664	\$0	60	Pelion Corporate Airport	Pelion COOP observer reported shingles ripped off her roof by strong winds.
6/12/2012	6/12/2012	0	0	\$1,129	\$0	50	Ridge Rd	Highway Patrol reported a couple of trees down near the intersection of Cedar Grove Rd and Hwy 378.
7/1/2012	7/1/2012	0	0	\$2,258	\$0	55	Lexington	Sheriff reported a couple of trees down on Old Chapin Rd in Governors Grant.
7/1/2012	7/1/2012	0	0	\$564	\$0	55	Lexington	Sheriff reported a tree in the road on Pilgrim Church Rd off of North Lake Rd.
7/1/2012	7/1/2012	0	0	\$2,258	\$0	55	Chapin	Highway Patrol reported trees down along I-26 near mile markers 98 and 99.
7/1/2012	7/1/2012	0	0	\$3,386	\$0	55	Chapin	Police reported trees down on St. Peter Church Rd.

Start Date	End Date	Inj	Fat	Property Damage	Crop Damage	Mag.(kts)*	Location	Description
7/3/2012	7/3/2012	0	0	\$4,515	\$0	60	Pelion	Power company reported trees down on power lines near Pelion.
7/5/2012	7/5/2012	0	0	\$2,258	\$0	50	Swansea	Post office reported a couple of trees down in Swansea.
7/10/2012	7/10/2012	0	0	\$2,258	\$0	55	Batesburg Airport	Highway patrol reported trees in the road at SC-245 and US-178.
7/10/2012	7/10/2012	0	0	\$2,258	\$0	55	Ella	Highway Patrol reported trees in the road at Lester Keisler Rd and Campground Rd.
7/10/2012	7/10/2012	0	0	\$2,258	\$0	55	Syrup	Highway Patrol reported trees in the road at Island Trail Rd and Indian Fork Rd.
7/27/2012	7/27/2012	0	0	\$2,258	\$0	55	Pooles Rd	Highway Patrol reported trees down along Hwy 178 and Johnson King Rd and Mack Edisto Rd.
7/27/2012	7/27/2012	0	0	\$564	\$0	50	Arthur	Highway Patrol reported a tree down along I-26 in the westbound direction at mile marker 61.
8/9/2012	8/9/2012	0	0	\$2,258	\$0	55	Arthur	Sheriff reported trees down on Mineral Springs Rd at Shoal Creek Rd.
1/30/2013	1/30/2013	0	0	\$6,675	\$0	50	Ella	Dominion Energy reported several trees and power lines down along the south shore of Lake Murray.
1/30/2013	1/30/2013	0	0	\$8,900	\$0	50	Providence	Dominion Energy reported several trees and power lines down along the south shore of Lake Murray.
1/30/2013	1/30/2013	0	0	\$3,337	\$0	50	Irmo	Sheriff reported a few trees down along College St.
3/18/2013	3/18/2013	0	0	\$6,675	\$0	55	Lexington	NWS employee reported several trees down around the Lexington area.
3/18/2013	3/18/2013	0	0	\$11,125	\$0	60	Springdale	Highway Patrol reported trees down on Kitty Hawk Dr.
4/19/2013	4/19/2013	0	0	\$4,450	\$0	50	Gilbert	Highway Patrol reported trees down at the intersection of Crout Pl and Old Charleston Rd.
4/19/2013	4/19/2013	0	0	\$4,450	\$0	50	Providence	DOT reported trees on Old Cherokee and Wise Ferry Rds.
6/13/2013	6/13/2013	0	0	\$556	\$0	50	Arthur	Sheriff reported a tree down near the intersection of Cromer Rd and Oak drive.
6/18/2013	6/18/2013	0	0	\$4,450	\$0	55	Ella	Public reported trees down on Smallwood Rd and on Dreher Island Rd.
6/25/2013	6/25/2013	0	0	\$2,225	\$0	55	Irmo	Highway Patrol reported power lines down on Mill Stream Rd at Corley Mill Rd.
6/25/2013	6/25/2013	0	0	\$1,112	\$0	55	Arthur	A social media report had a large tree down completely blocking the Millstream Rd halfway between Hope Ferry Rd and Corley Mill Rd.
7/17/2013	7/17/2013	0	0	\$2,225	\$0	50	Kathwood	Sheriff reported trees down on Wilkinson at Poplar St.
7/17/2013	7/17/2013	0	0	\$2,225	\$0	50	Cayce	Sheriff reported trees down at Indigo Ave. and 9th St.
7/17/2013	7/17/2013	0	0	\$3,337	\$0	55	Springdale	Highway patrol reported trees down at the 2200 block of Durham Dr.
7/27/2013	7/27/2013	0	0	\$2,225	\$0	50	Chapin	Highway Patrol reported a couple of trees down on roads in the Chapin area.

Start Date	End Date	Inj	Fat	Property Damage	Crop Damage	Mag.(kts)*	Location	Description
8/1/2013	8/1/2013	0	0	\$13,349	\$0	55	Leesville	Electric company reported power outages near Leesville from large limbs and trees down on power lines.
8/1/2013	8/1/2013	0	0	\$2,225	\$0	55	Leesville	Highway Patrol reported a couple trees down near the intersection of Pond Rd and Lewis Waters Rd.
8/1/2013	8/1/2013	0	0	\$3,337	\$0	55	Samaria	Highway Patrol reported trees down at the intersection of Quattlebaum and Two Notch Rds.
8/1/2013	8/1/2013	0	0	\$2,225	\$0	55	Gilbert	Highway Patrol reported trees down at Exit 44 on I-20.
1/11/2014	1/11/2014	0	0	\$1,095	\$0	50	Swansea	Highway Patrol reported a couple of trees down along I-26 near the Lexington/Calhoun County line.
5/27/2014	5/27/2014	0	0	\$19,705	\$0	55	Cayce	TV station reported a large tree down on a car in the Edenwood neighborhood of Cayce.
5/27/2014	5/27/2014	0	0	\$26,273	\$0	55	Cayce	Several TV stations reported multiple trees down on Sandy Ln in Cayce. One fell on a home causing damage.
5/27/2014	5/27/2014	0	0	\$6,568	\$0	55	Cayce	Sheriff reported several trees down on Cayce Riverwalk closing the walk.
6/19/2014	6/19/2014	0	0	\$4,379	\$0	55	Ella	Sheriff reported power lines down on Lakeview Ln.
6/19/2014	6/19/2014	0	0	\$6,568	\$0	55	Syrup	Highway Patrol reported trees down on Hill Haven and Jake Meetze Rds.
8/8/2014	8/8/2014	0	0	\$547	\$0	56	Edmund	Public reported a 64mph wind gust, a tree down, and 3/4-inch hail.
8/12/2014	8/12/2014	0	0	\$6,568	\$0	55	Irmo	Sheriff reported trees and power lines down at the intersection of Coldstream Dr and Brent Ford Rd.
8/18/2014	8/18/2014	0	0	\$6,568	\$0	55	Batesburg Airport	DOT reported trees down at Brodie Rd and South Lee St, and at Hwy 178 and SC 245 just south of Batesburg-Leesville. Some trees were also on power lines.
11/24/2014	11/24/2014	0	0	\$3,284	\$0	55	Irmo	Public reported trees down in the Coatsworth subdivision off St. Andrews Rd.
1/4/2015	1/4/2015	2	0	\$26,242	\$0	40	Lexington	Sheriff reported a tree fell on a mobile home near I-20 and Hwy 378 on Meetze road killing one occupant and injuring two others.
4/7/2015	4/7/2015	0	0	\$39,362	\$0	55	Batesburg	Sheriff reported trees fell on a house and parked vehicle on Madera Road between Hwys 391 and 178.
4/7/2015	4/7/2015	0	0	\$4,374	\$0	55	South Congaree	Sheriff reported trees down at the intersection of Pine Ridge Road and Fish Hatchery Road.
4/19/2015	4/19/2015	0	0	\$19,681	\$0	55	Barr	EM reported trees down on the southwestern side of Red Bank. Some fell on outbuildings destroying them.
4/19/2015	4/19/2015	0	0	\$17,494	\$0	60	Summit	Public reported broken utility poles, downed powerlines, and uprooted trees.
4/19/2015	4/19/2015	0	0	\$15,308	\$0	55	Congaree	WLTX TV station reported trees down on Ramblin Road in South Congaree, including one that fell on a boat.
4/19/2015	4/19/2015	0	0	\$5,467	\$0	55	Clubhouse XRDS	Highway Patrol reported trees down in Lexington on Calks Ferry Road and US1 at Spring Hill Road.

Start Date	End Date	Inj	Fat	Property Damage	Crop Damage	Mag.(kts)*	Location	Description
5/11/2015	5/11/2015	0	0	\$3,280	\$0	55	Kinsler	Dispatch reported multiple trees down near Fish Hatchery Road.
5/11/2015	5/11/2015	0	0	\$2,187	\$0	55	Pelion	Public reported trees down on Fish Hatchery Road just NNE of Pelion.
5/11/2015	5/11/2015	0	0	\$2,187	\$0	55	Happy Town	Public reported trees and debris blocking the roadway on North Lucas Drive in West Columbia.
5/18/2015	5/18/2015	0	0	\$2,187	\$0	50	Leesville	Public reported a few trees down just ENE of Batesburg-Leesville near Clover and Saber roads.
6/1/2015	6/1/2015	0	0	\$2,187	\$0	55	Arthur	SC Highway Patrol reported several trees down on Bradley Drive south of US 1.
6/20/2015	6/20/2015	0	0	\$3,280	\$0	55	Leesville	Highway Patrol reported trees down at Dog Leg Road and Tom Addy Road in Leesville.
6/22/2015	6/22/2015	0	0	\$3,280	\$0	55	Gilbert	DOT reported trees down along Juniper Spring Road near Two Notch Road. Large limbs were also down in Gilbert.
6/22/2015	6/22/2015	0	0	\$3,280	\$0	50	Gaston	Sheriff reported several trees down at Blackville Road and Meadowfield Road.
6/24/2015	6/24/2015	0	0	\$4,374	\$0	55	Leesville	Batesburg-Leesville police reported trees down on Sussex Road and Lee Street.
6/27/2015	6/27/2015	0	0	\$4,374	\$0	55	Congaree	Highway Patrol reported trees down on Ramblin Road and Elnora Drive.
6/27/2015	6/27/2015	0	0	\$3,280	\$0	55	Providence	Highway Patrol reported trees down near the intersection of Beechcreek Road and Cherokee Road.
6/27/2015	6/27/2015	0	0	\$3,280	\$0	50	Irmo	Highway Patrol reported trees down near Windward Point and River Road.
6/27/2015	6/27/2015	0	0	\$2,187	\$0	50	Lexington	Highway Patrol reported trees down at the intersection of US 378 and Woodvine Drive.
6/27/2015	6/27/2015	0	0	\$2,187	\$0	55	Springdale	Highway Patrol reported trees down on Rainblow Drive near Wilton Road.
6/30/2015	6/30/2015	0	0	\$3,280	\$0	55	Springdale	Highway Patrol reported trees down at the intersection of Kitty Hawk Drive and Durham Drive. One tree fell on a home and another on a couple of vehicles.
6/30/2015	6/30/2015	0	0	\$2,187	\$0	55	Arthur	Sheriff reported trees down on Woodberry Road at the US 1 intersection.
6/30/2015	6/30/2015	0	0	\$2,187	\$0	55	Barr	Sheriff reported trees down along Longs Point Road at the intersection of I-20.
7/2/2015	7/2/2015	0	0	\$3,280	\$0	50	Dixiana	Highway Patrol reported trees down near the intersection of Gardners Terrace Road and Hwy 321.
7/18/2015	7/18/2015	0	0	\$8,747	\$0	55	Gaston Lexington Co. Airports	Highway Patrol reported trees down near the intersection of Gardners Terrace Road and Hwy 321.
7/18/2015	7/18/2015	0	0	\$4,374	\$0	55	Batesburg Airports	Highway Patrol reported trees down near the intersection of Gardners Terrace Road and Hwy 321.
7/18/2015	7/18/2015	0	0	\$3,280	\$0	55	Batesburg Airports	Highway Patrol reported trees down on Kestrel Drive and Fairview Road.
8/6/2015	8/6/2015	0	0	\$3,280	\$0	55	Swansea	Highway Patrol reported trees down on

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag.(kts)*	Location	Description
								Kestrel Drive and Fairview Road.
8/6/2015	8/6/2015	0	0	\$3,280	\$0	50	Gaston Lexington Co. Airports	Highway Patrol reported trees down at Pine Plain Road and Gus Sturkie Road.
8/6/2015	8/6/2015	0	0	\$3,280	\$0	50	Arthur	Highway Patrol reported trees down at Pine Plain Road and Gus Sturkie Road.
8/6/2015	8/6/2015	0	0	\$1,093	\$0	50	Pelion	SKYWARN spotter reported two trees on U.S. 178 south of Pelion.
2/3/2016	2/3/2016	0	0	\$26,512	\$0	61	Samaria	NWS Storm Survey confirmed microburst with 70 mph wind. Vehicle trailer blown over, power lines down, wind damage to tractor trailer truck hoods. Damage to an outbuilding with roof blown off.
4/1/2016	4/1/2016	0	0	\$530	\$0	44	(CAE) Columbia Metro	The ASOS at Columbia Metro Airport reported a wind gust of 51 mph.
4/7/2016	4/7/2016	0	0	\$265,122	\$0	78	Syrup	A Squall Line developed ahead of an approaching cold front. The squall line moved across the Central Savannah River Area and then northeast across the Midlands during the early morning hours. The strong winds damaged numerous trees including trees and limbs on homes along the northern shore of Lake Murray.
10/8/2016	10/8/2016	0	0	\$795,365	\$0	52	Lexington	Tropical Storm force wind gusts were observed across most of the SC Midlands and Central Savannah River Area as a result of Hurricane Matthew.
6/15/2017	6/15/2017	0	0	\$104	\$104	47	(CAE) Columbia Metro	An upper disturbance combined with atmospheric instability and moisture to produce scattered severe thunderstorms producing wind damage, along with locally heavy rain with slow moving and training storms
7/7/2017	7/7/2017	0	0	\$104	\$104	39	(CAE) Columbia Metro	ASOS unit at Columbia Metropolitan Airport measured a wind gust of 45 MPH, associated with a thunderstorm.
9/11/2017	9/11/2017	0	0	\$104	\$104	44	Lexington	ASOS unit at Columbia SC Metropolitan Airport measured a peak wind gust of 51 MPH at 4:42 pm EDT (1542 EST).
3/1/2018	3/1/2018	0	0	\$103	\$103	46	(CAE) Columbia Metro	ASOS unit measured a peak wind gust of 53 MPH at Columbia Metropolitan Airport at 336 pm EST.
4/15/2018	4/15/2018	0	0	\$103	\$103	50	Pelion Corporate Airports	RCWINDS mesonet site at Lexington Co airport near Pelion measured a 57-mph wind gust.
6/20/2018	6/20/2018	0	0	\$103	\$103	44	(CAE) Columbia Metro	The ASOS unit at Columbia Metropolitan Airport in West Columbia measured a 44 knot (51 mph) peak wind gust at 1639 EDT (1539 EST).
2/12/2019	2/12/2019	0	0	\$10	\$10	47	(CAE) Columbia Metro	ASOS unit at Columbia Metropolitan Airport measure a peak wind gust of 54 MPH at 1734 EST.
4/8/2019	4/8/2019	0	0	\$100	\$100	38	(CAE) Columbia Metro	ASOS at Columbia Metropolitan Airport measured a peak wind gust of 44 MPH at 2144Z or 1744 EDT (1644 EST).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag.(kts)*	Location	Description
5/11/2019	5/11/2019	0	0	\$100	\$100	35	(CAE) Columbia Metro	ASOS unit at Columbia Metropolitan Airport measured a peak wind gust of 40 mph.
6/20/2019	6/20/2019	0	0	\$100	\$100	49	(CAE) Columbia Metro	ASOS unit at Columbia Metropolitan Airport measured a peak wind gust of 49 knots (57 mph) at 1626 EDT (1526 EST).
7/18/2019	7/18/2019	0	0	\$10	\$10	42	(CAE) Columbia Metro	A 42 knot (48 MPH) wind gust was measured at Columbia Metropolitan Airport.
7/18/2019	7/18/2019	0	0	\$10	\$10	39	South Congaree	RCWINDS gage measured a 45-mph wind gust.

*No magnitude information indicates wind speeds were unavailable.

G) Hail

What to expect: Every property and person is at risk from hail in Lexington County. Hail is common in Lexington County and occurs at least every two months (Figure 67). Hail events occur mostly during spring thunderstorms from March through May. The county has seen hailstones of up to 2.5" in diameter (Figure 68) mostly in the central and southern parts of the county. It appears that crop damage from hail events is severely underreported.

Geographic Extent: Based on past occurrences, the entire county is susceptible to hail damage.

Hail statistics for Lexington County are as following:

Number of Loss-Causing Events:	75
Frequency of Occurrence:	7.2%
Recurrence Interval:	0.14 years
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	\$1,006,180
Total Fatalities:	0
Deadliest Event:	n/a
Most Property Damage:	\$73,369 (July 1, 2012)
Most Crop Damage:	\$92,055 (June 11, 1963)
Highest USDA Crop Indemnity Payout:	\$72,446 (May 1, 2001)

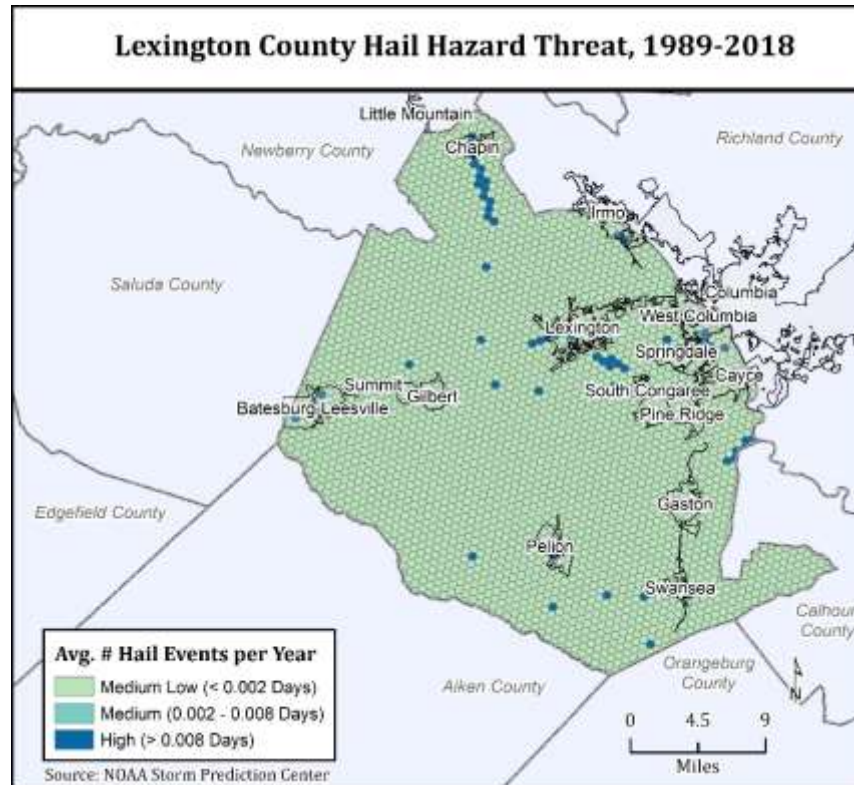


Figure 67 - Hail threat (occurrence) in Lexington County.

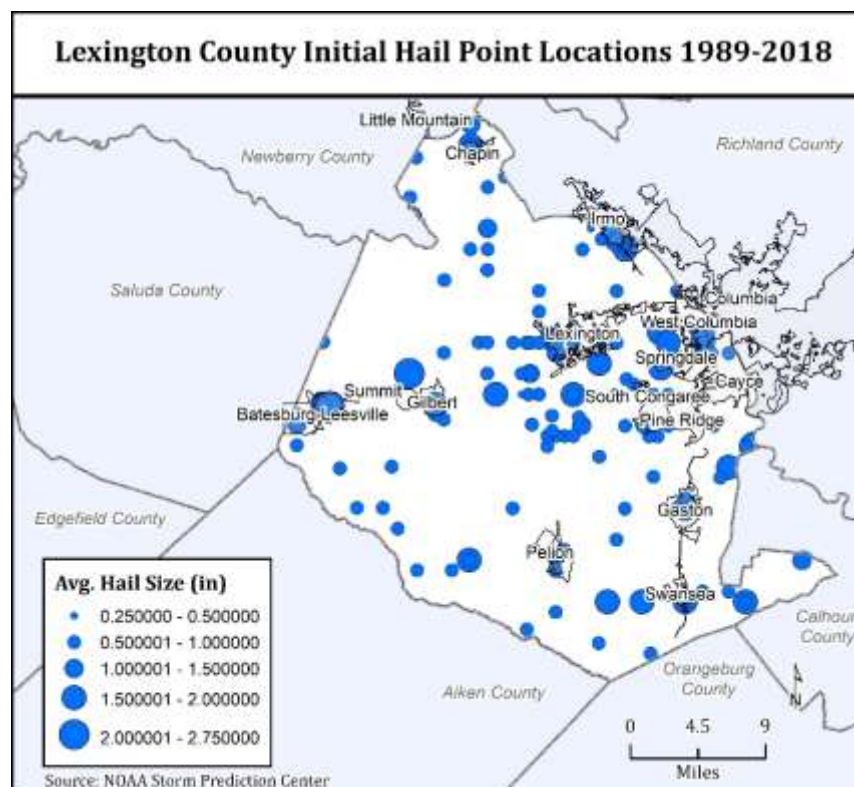


Figure 68 - Risk of large hail events in Lexington County.

Table 42 - Record of loss-causing hail events in Lexington County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
2/18/1960	2/18/1960	0	0	\$1,251	\$0		Central & Northern SC	Windstorms & Hail
7/1/1960	7/1/1960	0	0	\$219	\$0		Columbia area	Wind & Hail
4/12/1962	4/12/1962	0	0	\$1,716	\$0		Central SC	Wind & Hail
6/11/1963	6/11/1963	0	0	\$0	\$92,055		Statewide	Hailstorms
4/7/1965	4/7/1965	0	0	\$4,571	\$0	1	Owensville, Greenville County to St. Matthews, & Calhoun County	Hail
7/1/1965	7/31/1965	0	0	\$894	\$0		Statewide	Wind, Heavy Rain, & Hail
7/19/1965	7/19/1965	0	0	\$894	\$89		Statewide	Hail, Lightning, & Wind
5/28/1973	5/29/1973	1	0	\$1,081	\$1,081		Western & Northern SC	Hail, Wind, & Electrical
12/13/1973	12/13/1973	0	0	\$11	\$108		Northern & Western SC	Hail & Lightning
3/29/1974	3/29/1974	0	0	\$6,258	\$6,258		Northern, Eastern, & Central SC	Wind, Hail, & Electrical
5/19/1974	5/19/1974	0	0	\$876	\$88		Northwestern & Southern SC	Hail, High Wind, & Lightning
7/16/1974	7/16/1974	0	0	\$1,011	\$1,011		Central & Southern SC	Wind & Hail
7/21/1974	7/21/1974	0	0	\$52,567	\$5,257		Charleston, Lexington, Richland, Georgetown, & Horry Counties	Wind, Hail, & Rain
3/7/1975	3/7/1975	0	0	\$688	\$0		Northwestern, Central, & Northeastern SC	Hail, Lightning, & Wind
3/24/1975	3/24/1975	1	0	\$5,236	\$52		Statewide	Hail, Lightning, & Wind
5/10/1975	5/10/1975	0	0	\$13,381	\$133,806	1	York to Bamberg & Spartanburg to Oconee & Anderson	Hail, Lightning, & Wind
6/15/1975	6/15/1975	0	0	\$708	\$708		Northern & Central SC	Hail, Lightning, & Wind
6/18/1975	6/18/1975	0	0	\$52	\$5,236		Statewide	Hail, Lightning, & Wind
6/19/1975	6/19/1975	0	0	\$892	\$892		Northern & Western SC	Hail, Lightning, & Wind
7/4/1975	7/4/1975	0	0	\$6,881	\$68,814		Northern & Central SC	Hail, Lightning, & Wind
9/5/1975	9/5/1975	0	0	\$2,190	\$2,190		Northwestern & Central SC	Thunderstorm, Wind, & Hail
6/6/1977	6/6/1977	0	0	\$465	\$4,648		Statewide	Hail, Lightning, & Wind
4/20/1981	4/20/1981	0	0	\$204	\$20		Orangeburg Co. Union Co. Clarendon Co. Calhoun Co. Lexington Co. Dorchester Co.	Thunderstorm Wind, Hail, & Lightning

Start Date	End Date	Inj	Fat	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
							Beaufort Co.	
2/17/1982	2/17/1982	0	0	\$67	\$0		Lexington & Lee Counties	Hail & Strong Winds
4/26/1982	4/27/1982	0	0	\$29	\$29		Statewide	Thunderstorm, Wind, Lightning, & Hail
5/17/1982	5/17/1982	0	0	\$37	\$373	1.75	Northern, Central, & Southern SC	Thunderstorms, High Winds, & Hail
6/10/1982	6/10/1982	1	0	\$327,505	\$327,505		Western, Northern, Central, & Eastern SC	Hail, Lightning, Wind, & Rain
8/31/1983	8/31/1983	0	0	\$1,301	\$0	0.75	Lake Murray Area	Hail, Lightning, & Wind
3/28/1984	3/28/1984	0	0	\$62,357	\$6,236		Cayce, Irmo, & Columbia	Hail
4/14/1984	4/14/1984	0	0	\$445	\$445		Northern & Central SC	Hail & Wind
5/2/1984	5/2/1984	0	0	\$1,247	\$0		Near Batesburg	Hail
5/6/1984	5/6/1984	0	0	\$0	\$624	1	Chapin & White Rock	Hail
6/20/1984	6/20/1984	0	0	\$2,711	\$271		Statewide	Rain, Hail, Lighting, & Wind
7/25/1984	7/25/1984	0	0	\$124,713	\$1,247	1.75	Central SC	Rain, Hail, Lighting, & Wind
10/30/1984	10/30/1984	0	0	\$12,471	\$0	0.75	Columbia	Wind & Hail
2/11/1985	2/12/1985	0	0	\$2,618	\$3		Statewide	Wind, Snow, Hail, & Thunderstorms
6/4/1985	6/4/1985	0	0	\$634	\$634		North-Central & Central SC	Hail
6/7/1985	6/7/1985	0	0	\$2,618	\$262	2	Statewide	Wind & Hail
8/25/1985	8/25/1985	0	0	\$120	\$0	1	Pelion	Hail
10/3/1985	10/3/1985	0	0	\$1,204	\$0		Cayce	Wind & Hail
7/2/1986	7/2/1986	0	0	\$11,823	\$11,823		Chapin	Hail
4/16/1987	4/16/1987	0	0	\$11,406	\$1,141		Lexington County	Hail
6/3/1987	6/3/1987	0	0	\$114	\$114		Lexington County	Hail
8/30/1987	8/30/1987	0	0	\$11,406	\$0	0.75	Cayce	Hail
4/11/1988	4/11/1988	0	0	\$4	\$0		SCZ003-004-005-006 East & Lower Piedmont, North, & South Midland	Small Hail
4/12/1988	4/12/1988	0	0	\$7	\$0		SCZ004-006 Lower Piedmont & South Midlands	Small Hail
5/17/1988	5/17/1988	0	0	\$110	\$110	0.75	Gilbert	Hail
5/17/1988	5/17/1988	0	0	\$110	\$110	0.75	6 miles west of Lexington	Hail
5/17/1988	5/17/1988	0	0	\$110	\$1,095	0.75	Columbia Airport	Hail
5/23/1988	5/23/1988	0	0	\$110	\$0	0.75	Lexington	Hail

Start Date	End Date	Inj	Fat	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
5/5/1989	5/5/1989	0	0	\$10,450	\$0	2.5	Shore Lake Murray	Hail
7/27/1989	7/27/1989	0	0	\$105	\$0		Chapin	Thunderstorm Wind & Hail
3/13/1991	3/13/1991	0	0	\$9,514	\$0	2.5	Gaston	Hail
4/24/1995	4/24/1995	0	0	\$3,401	\$0	1	West Columbia	Hail
4/24/1995	4/24/1995	0	0	\$3,401	\$0	1	I-20 & SC378 & West Columbia	Hail
6/12/1995	6/12/1995	0	0	\$1,700	\$0	0.75	West Columbia	Hail
4/28/2011	4/28/2011	0	0	\$4,608	\$2,304	1	Gilbert	Wind & Hail
8/9/2011	8/9/2011	0	0	\$1,152	\$0	1.5	Chapin	Wind & Hail
7/1/2012	7/1/2012	0	0	\$73,369	\$16,931	1.75	Chapin	Wind & Hail
7/1/2012	7/1/2012	0	0	\$33,863	\$33,863	1	Edmund	Wind & Hail
7/1/2012	7/1/2012	0	0	\$33,863	\$11,288	2	Happy Town	Wind & Hail
7/1/2012	7/1/2012	0	0	\$33,863	\$22,575	1.75	Leesville	Wind & Hail
7/1/2012	7/1/2012	0	0	\$22,575	\$22,575	2	Gilbert	Wind & Hail
7/1/2012	7/1/2012	0	0	\$22,575	\$11,288	1.75	Red Bank	Wind & Hail
7/1/2012	7/1/2012	0	0	\$22,575	\$16,931	2	Arthur	Wind & Hail
7/1/2012	7/1/2012	0	0	\$16,931	\$16,931	1.75	Gilbert	Wind & Hail
7/1/2012	7/1/2012	0	0	\$5,644	\$5,644	1	Gilbert	Wind & Hail
7/1/2012	7/1/2012	0	0	\$5,644	\$5,644	1.75	Edmund	Wind & Hail
7/31/2016	7/31/2016	0	0	\$0	\$11	.25	Swansea	Pea-sized Hail
5/22/2017	5/22/2017	0	0	\$104	\$104	.25	Happy Town	Pea-sized Hail
5/28/2017	5/28/2017	0	0	\$104	\$104	.25	Pelion	Strong Wind & Hail
7/23/2018	7/23/2018	0	0	\$103	\$103	.25	Barr	Pea-sized Hail
7/23/2018	7/23/2018	0	0	\$103	\$103	.25	Barr	Pea-sized Hail
2/12/2019	2/12/2019	0	0	\$10	\$10	.25	Irmo	Pea-sized Hail
7/31/2019	7/31/2019	0	0	\$10	\$10	.25	South Congaree	Pea-sized Hail

*No magnitude information indicates hailstone sizes were unavailable.

H) Fog

What to expect: Fog does not cause direct property damage or injuries. But indirectly, the personal safety of boaters, motorists, and other travelers is at risk due to poor visibility during fog conditions. Fog is very common in Lexington County and occurs most frequently during the fall and spring months. On average, the county experiences at least 21 days³⁶ with some periods of fog (or haze). The number of fogs days varies considerably ranging from an average of 21 days of fog per year in the western part of the county up to greater than 35 days in the east central portion of the country, south of Pineridge (Figure 69). There is no explicit record of property damage or fatalities associated with fog as reported by

³⁶ A "fog day" has reduced visibility due to fog, haze, or smoke at any time of the day as indicated by NWS station data.

SHELDUS™ or NCDC's Storm Data. This is likely since most damage from fog is indirect (e.g., traffic accidents).

Geographic Extent: Based on past occurrences, the entire county is susceptible to fog. Eastern Lexington County, particularly southeastern, experiences significantly larger number of days with reduced visibility compared to Batesburg or Chapin areas.

Fog statistics for Lexington County are as following:

Number of Events:	21 to 35 days of fog per year
Number of Loss-Causing Events:	n/av (largely motorist accidents)
Daily Frequency of Occurrence:	0.08%
Daily Recurrence Interval:	12 days
Expected changes to frequency and recurrence interval in the future:	Not enough information available to make assumptions about future changes
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	n/av
Total Fatalities:	n/av
Deadliest Event:	n/av
Most Property Damage:	n/av
Most Crop Damage:	n/av
Highest USDA Crop Indemnity Payout:	n/av*

*No fog events caused a USDA Crop Indemnity Payout

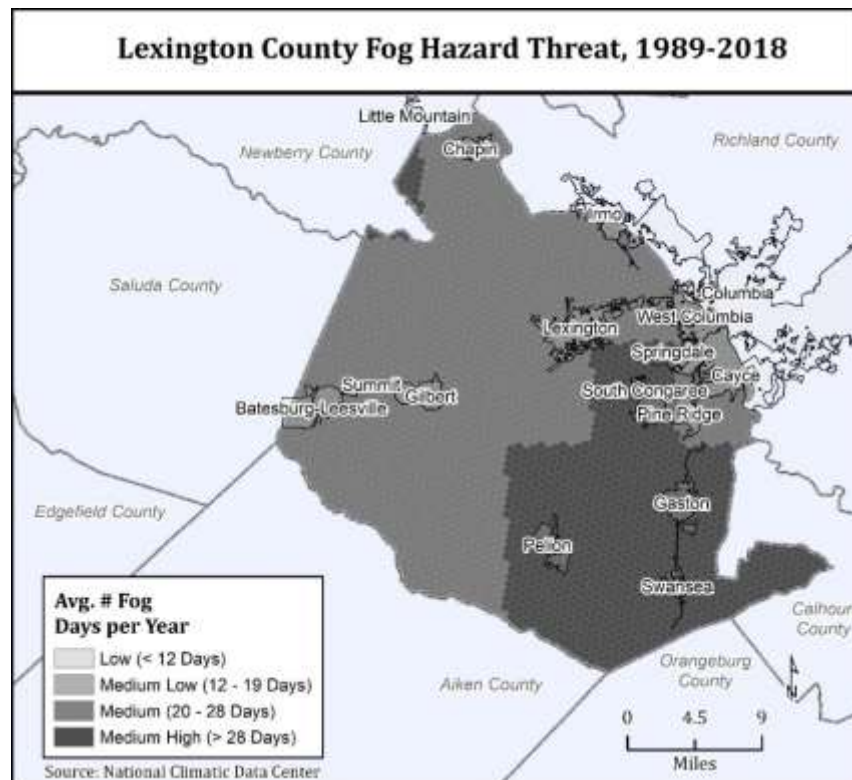


Figure 69 - Fog threat in Lexington County.

I) Winter Snow & Ice Storms

What to expect: Every property and person is at risk from winter weather in Lexington County. Ice storms and winter weather occur nearly every year and a half—on average at least 1 day per year in most of Lexington County (Figure 70). Snow accumulations of 2 inches and more are uncommon, though the area has seen significant snow accumulations in the past (Table 43). Record snowfall of 16 inches occurred in 1973, and in 2010 8.6 inches were recorded in the City of Columbia³⁷. The highest daily snowfall amount was 12.3 inches (February 10, 1973)³⁸.

More damaging than snow events are ice storms, which tend to occur frequently in this area. Ice accumulations of 3/4 of an inch or more are possible but even thin coatings of ice cause havoc. Falling trees lead to power outages, road closures, and damage to homes and other properties. In addition, winter weather tends to adversely affect agriculture more than any other hazard. It appears that crop damage from winter weather events is severely underreported.

Geographic Extent: The entire county is susceptible to damage from winter weather. The western half of Lexington County tends to experience one or two additional winter weather days (Figure 70).

Winter weather statistics for Lexington County are as following:

Number of Loss-Causing Events:	58
Frequency of Occurrence:	0.73%
Recurrence Interval:	1.4 years
Expected changes to frequency and recurrence interval in the future:	Decreased likelihood of occurrence and lengthening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Winter weather-related Presidential Disaster Declarations:	DR-1313 (2000) DR-1509 (2004) DR-4166 (2014)
Total Losses:	\$18,273,648
Total Fatalities:	3
Deadliest Event:	1 fatality (several instances)
Most Property Damage:	\$634,436 (February 9, 1973)
Most Crop Damage:	\$7,512,160 (February 15, 1969)
Highest USDA Crop Indemnity Payout:	n/av*

*No winter weather events caused a USDA Crop Indemnity Payout

January 22, 2000 (DR-1313): A severe winter storm resulted in widespread power outages. Thirty-eight counties in South Carolina were designated for federal assistance including Lexington County.

January 26-30, 2004 (DR-1509): An ice storm began over the North Midlands of South Carolina on Sunday night and gradually spread south into the Central Midlands on Monday. The storm continued into Tuesday but was mainly freezing drizzle during that time. Ice accumulations of 1/2 to 3/4 of an inch occurred which brought numerous trees and powerlines down. The heaviest ice accumulations occurred in Lancaster, Chesterfield, Fairfield, Newberry, Saluda, McCormick, Orangeburg, and Clarendon counties. Over 250,000 homes, businesses, and schools were without power for several days. Sleet also fell in Lancaster and Chesterfield counties and accumulated up to 2 inches. Six people were injured in traffic related accidents and there were no deaths. Damage estimates from SCEMD were \$28.5 million.

³⁷ NWS Columbia Forecast Office, 2010. February snowfall and the record books. Available at http://www.weather.gov/cae/Snowfall_Total_Records_cor.html

³⁸ SCDNR. South Carolina record minimum temperatures and date. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/data/min_temp_table.php

February 2014 (DR-4166): Two separate winter storm systems impacted the eastern half of the State including Lexington County from February 11th through February 13th. The first system brought snow and sleet to much of the Northern Midlands and the Pee Dee Regions. The second, and more severe system, impacted the entire Southeast. Areas across the Northern portions of South saw significant snowfall. Across the central portions of the State, there was a transition zone in which there was just enough warm air aloft to melt some of the snow, but also enough cold air near the surface to completely refreeze the melted snow into ice pellets. Many areas reported a few inches of ice pellets, with minimal amounts of freezing rain mixed in. The most significant impact was felt across the Central Savannah River Area of Eastern Georgia, and across the Southern and Eastern Midlands of South Carolina with all of the rain falling as Freezing Rain, with many areas receiving between one half of an inch to as much as an inch of ice on every surface. Significant tree and powerline damage occurred across this region. About \$220 million were obligated as public assistance for this disaster.

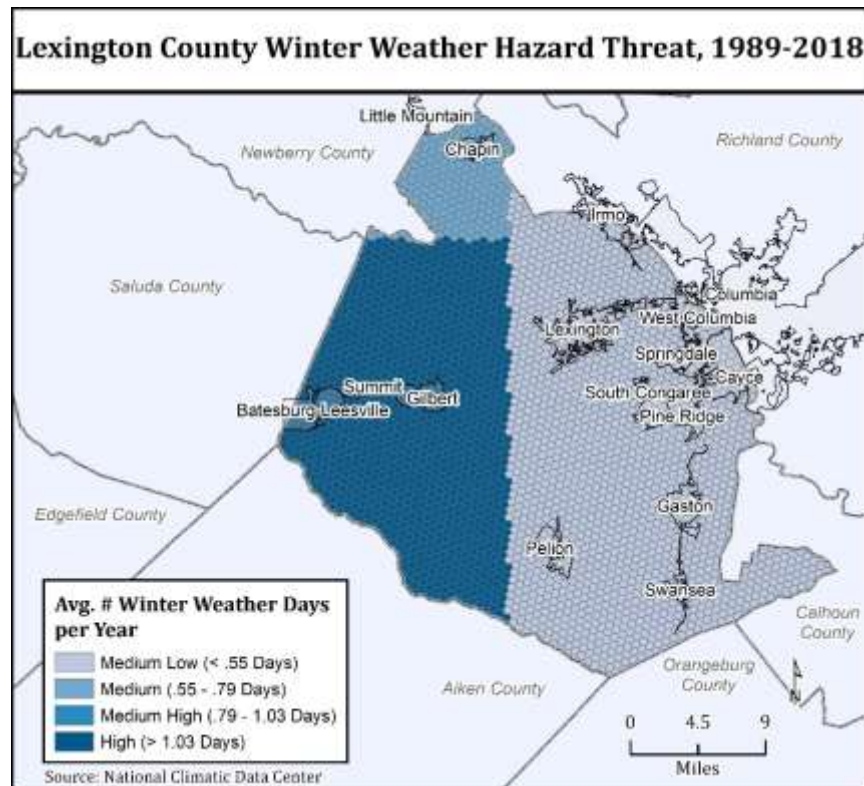


Figure 70 - Winter weather threat in Lexington County.

Table 43 - Record of loss-causing winter storm events in Lexington County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
3/9/1960	3/11/1960	0	0	\$12,507	\$0	3.2"	Northern & Central SC	Snow, Sleet, & Ice
1/25/1961	1/26/1961	0	0	\$9,421	\$942	1.4"	Statewide	Ice Storm
2/3/1961	2/4/1961	0	0	\$942	\$0	0.9"	Statewide	Glaze
12/31/1963	1/1/1964	1	0	\$92,055	\$9,206	1.15"	Statewide	Ice
3/30/1964	3/31/1964	0	0	\$0	\$908,676	1.0"	Statewide	Killing Freeze
1/26/1966	1/27/1966	0	0	\$114,266	\$0	0.4"	Central & Northern SC	Ice & Snow
1/29/1966	1/30/1966	0	1	\$0	\$86,941	3.9"	Statewide	Severe Cold, Ice, & Snow
3/29/1966	3/29/1966	0	0	\$17,388	\$0	0.8"	Inland SC	Frost
1/9/1968	1/13/1968	0	0	\$116,359	\$12	-	Northern 2/3rds of SC	Rain, Sleet, Snow, &

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
								Freezing Rain
2/15/1969	2/17/1969	0	0	\$75,122	\$7,512,160	2.16"	Statewide	Snow, Sleet, & Freezing Rain
11/1/1969	11/1/1969	0	0	\$14,123	\$14	2.2"	Central SC	Wind & Snow
1/8/1970	1/9/1970	0	0	\$726	\$7	16"	Statewide	Severe Freeze
11/24/1970	11/25/1970	0	0	\$7	\$7	Traces	Statewide	Severe Freeze
12/3/1971	12/3/1971	0	0	\$69,553	\$69,553	5.5"	Statewide	Snow, Sleet, Rain, Freezing Rain, & Wind
4/1/1972	4/30/1972	0	0	\$0	\$352,265	3.0"	Statewide	Cold Spell
1/7/1973	1/8/1973	0	0	\$63,444	\$634,436	4.1"	Statewide	Snow & Ice
2/9/1973	2/10/1973	0	1	\$634,436	\$634	0.4"	Statewide	Snowstorm
2/26/1974	2/26/1974	0	0	\$0	\$2,628	-	Batesburg	Hard Freeze
10/3/1974	10/4/1974	0	0	\$6,739	\$0	0.8"	Western, Northern, & Central SC	Frost & Freeze
3/2/1975	3/3/1975	0	0	\$0	\$5,236	1.5"	Statewide	Low Temperatures
1/1/1977	1/31/1977	0	0	\$465	\$465	0.4"	Statewide	Unusual Cold Weather
1/1/1977	1/31/1977	0	0	\$465	\$465	0.35"	Statewide	Unusual Cold Weather
2/6/1979	2/6/1979	0	0	\$594,937	\$595	0.18"	Northwestern & Central SC	Snow, Sleet, & Ice
2/17/1979	2/18/1979	0	0	\$38,800	\$388	Traces	Statewide	Snow, Sleet, & Freezing Rain
2/5/1980	2/6/1980	0	0	\$34,186	\$342	4.3"	All of SC except South Coastal Region	Snowstorm over most of State except Ice Storm near Beaches North Coastal Area
3/1/1980	3/2/1980	0	0	\$3,419	\$3,419	-	Statewide	Snow, Freezing Rain, Drizzle, & Sleet
12/23/1980	12/23/1980	0	0	\$71	\$0	0.2"	Northwestern & Central SC	Freezing Rain
1/11/1982	1/11/1982		0	\$292	\$292	0.49"	Statewide	Hard Freeze
1/12/1982	1/12/1982	0	0	\$4,796	\$473	4.5"	All but Coastal Plains Region	Snow, Sleet, & Freezing Rain
2/26/1982	2/27/1982	0	0	\$2,919	\$0		Statewide	Snow, Sleet, & Glaze
3/27/1982	3/27/1982	0	0	\$0	\$291,907		Statewide	Extreme Cold
4/7/1982	4/7/1982	0	0	\$0	\$3,356,923		Statewide except Southern Region	Frost & Freeze
4/23/1982	4/24/1982	0	0	\$0	\$29		Statewide	Frost & Freeze
1/21/1983	1/21/1983	0	0	\$2,828	\$28		Statewide	Freezing Rain, Sleet, & Snow
3/24/1983	3/24/1983	0	0	\$283	\$3		Statewide	Winter Storm, Wind, & Snow
4/17/1983	4/18/1983	0	0	\$0	\$2,828,209		Statewide	Extreme Cold
12/22/1983	12/22/1983	0	0	\$1,084	\$0		Northwestern & North-Central SC	Freezing Rain
12/25/1983	12/25/1983	0	1	\$28,282	\$28,282		Statewide	Extreme Cold
12/30/1983	12/31/1983	0	0	\$2,828	\$283		Statewide	Extreme Cold
1/13/1984	1/13/1984	0	0	\$4,454	\$445		Northern Half of SC	Freezing Rain & Glaze
1/20/1985	1/24/1985	0	1	\$26,179	\$2,618		Statewide	Extreme Cold & Snow

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
2/11/1985	2/12/1985	0	0	\$2,618	\$3		Statewide	Wind, Snow, Hail, & Thunderstorms
3/19/1985	3/19/1985	0	0	\$0	\$2,618		Statewide	Frost & Freeze
12/26/1985	12/26/1985	0	0	\$262	\$26		Statewide	Cold
1/26/1986	1/27/1986	0	0	\$2,570	\$26		Statewide	Cold
3/22/1986	3/23/1986	0	0	\$0	\$2,570		Statewide	Cold
4/23/1986	4/24/1986	0	0	\$0	\$2,570		Statewide	Frost & Freeze
4/1/1987	4/1/1987	0	0	\$0	\$2,925		Statewide except the Immediate Coast	Freeze
10/1/1987	10/31/1987	0	0	\$0	\$248		Statewide	Cold Weather
1/7/1988	1/11/1988	0	0	\$23,811	\$0		Statewide	Snow, Ice, & Sleet
1/15/1988	1/15/1988	0	0	\$391	\$0		Northeastern SC	Heavy Snow
3/14/1988	3/17/1988	0	0	\$238	\$0		Statewide	Low Temperature
2/19/1989	2/19/1989	0	1	\$0	\$0		Lexington County	Extreme Cold
2/23/1989	2/23/1989	0	0	\$2,272	\$0		Statewide	Heavy Snow
12/22/1989	12/25/1989	0	0	\$29,027	\$0		SCZ001-002-003-004-005-006 Mountains, Foothills, Piedmont, & Midlands	Extreme Cold
3/21/1990	3/21/1990	0	0	\$0	\$215,524		Statewide	Freeze
3/13/1993	3/13/1993	0	0	\$112,091	\$11,209		SCZ006	High Winds & Cold
11/1/2014	11/1/2014	0	0	\$13,136	\$0	5"	Lexington	Snow

*No magnitude information indicates snowfall amounts or ice thickness were unavailable.

J) Temperature Extremes

What to expect: Lexington County experiences between 41 and 58 days per year when temperatures fall below freezing at any given time of the day, which is generally during nighttime hours in the winter months (Figure 71). The record minimum temperature for Lexington County was set on February 14, 1899, with -4 degrees Fahrenheit³⁹. Most record minimum temperatures in South Carolina date back to 1985 or 1899. The record minimum temperature for the state is -19 degrees, set in Greenville County in 1985. Property damage tends to be restricted to busted water pipes and motor vehicle accidents. However, periods of frost and freeze cause significant damage to agricultural production.

Geographic Extent: Based on past occurrences, the entire county is susceptible to cold weather temperatures.

Cold weather statistics for Lexington County are as following:

Number of Loss-Causing Events:	35
Frequency of Occurrence:	51.37%
Recurrence Interval:	0.02 years
Expected changes to frequency and recurrence interval in the future:	Decreased likelihood of occurrence and lengthening of return periods
Frequency Year Range:	1989 - 2018

³⁹ SCDNR. South Carolina record minimum temperatures and date. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/data/min_temp_table.php

Loss Events on Record:	1960 - 2019
Total Losses:	\$11,682,003
Total Fatalities:	2
Deadliest Event:	1 fatality (several instances)
Most Property Damage:	\$112,091 (March 13, 1993)
Most Crop Damage:	\$3,356,923 (April 7, 1982)
Highest USDA Crop Indemnity Payout:	\$466,466 (January 1, 1990)

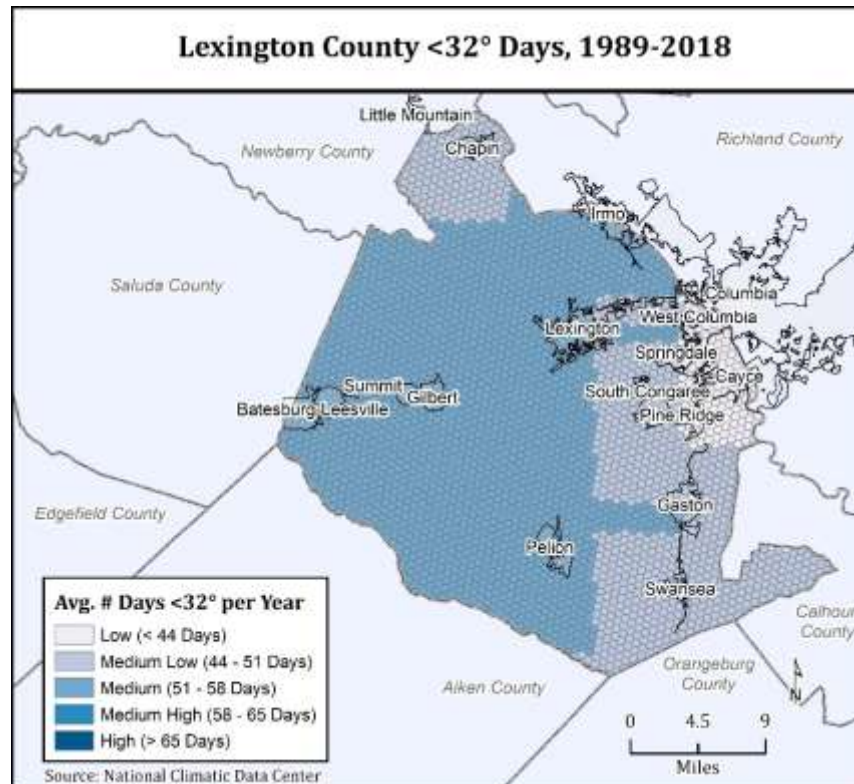


Figure 71 - Cold weather threat in Lexington County.

Table 44 - Record of loss-causing cold weather events in Lexington County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
3/30/1964	3/31/1964	0	0	\$0	\$908,676	Statewide	Killing freeze
1/29/1966	1/30/1966	0	0	\$0	\$86,941	Statewide	Severe Cold, Ice, & Snow
1/8/1970	1/9/1970	0	0	\$726	\$7	Statewide	Severe Freeze
11/24/1970	11/25/1970	0	0	\$7	\$7	Statewide	Severe freeze
4/1/1972	4/30/1972	0	0	\$0	\$352,265	Statewide	Cold Spell
2/26/1974	2/26/1974	0	0	\$0	\$2,628	Batesburg	Hard Freeze
10/3/1974	10/4/1974	0	0	\$6,739	\$0	Western, Northern, & Central SC	Frost & Freeze
10/3/1974	10/4/1974	0	0	\$6,739	\$0	Western, Northern, & Central SC	Frost & Freeze
3/2/1975	3/3/1975	0	0	\$0	\$5,236	Statewide	Low Temperatures
1/1/1977	1/31/1977	0	0	\$465	\$465	Statewide	Unusual Cold Weather
1/1/1977	1/31/1977	0	0	\$465	\$465	Statewide	Unusual Cold Weather

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
1/11/1982	1/11/1982	0	0	\$292	\$292	Statewide	Hard Freeze
3/27/1982	3/27/1982	0	0	\$0	\$291,907	Statewide	Extreme Cold
4/7/1982	4/7/1982	0	0	\$0	\$3,356,923	Statewide except Southern Regions	Frost & Freeze
4/7/1982	4/7/1982	0	0	\$0	\$3,356,923	Statewide except Southern Regions	Frost & Freeze
4/23/1982	4/24/1982	0	0	\$0	\$29	Statewide	Frost & Freeze
4/23/1982	4/24/1982	0	0	\$0	\$29	Statewide	Frost Freeze
4/17/1983	4/18/1983	0	0	\$0	\$2,828,209	Statewide	Extreme Cold
12/25/1983	12/25/1983	0	1	\$28,282	\$28,282	Statewide	Extreme Cold
12/30/1983	12/31/1983	0	0	\$2,828	\$283	Statewide	Extreme Cold
1/20/1985	1/24/1985	0	1	\$26,179	\$2,618	Statewide	Extreme Cold & Snow
3/19/1985	3/19/1985	0	0	\$0	\$2,618	Statewide	Frost & Freeze
3/19/1985	3/19/1985	0	0	\$0	\$2,618	Statewide	Frost & Freeze
12/26/1985	12/26/1985	0	0	\$262	\$26	Statewide	Cold
1/26/1986	1/27/1986	0	0	\$2,570	\$26	Statewide	Cold
3/22/1986	3/23/1986	0	0	\$0	\$2,570	Statewide	Cold
4/23/1986	4/24/1986	0	0	\$0	\$2,570	Statewide	Frost & Freeze
4/23/1986	4/24/1986	0	0	\$0	\$2,570	Statewide	Frost & Freeze
4/1/1987	4/1/1987	0	0	\$0	\$2,925	Statewide except the Immediate Coast	Freeze
10/1/1987	10/31/1987	0	0	\$0	\$248	Statewide	Cold Weather
3/14/1988	3/17/1988	0	0	\$238	\$0	Statewide	Low Temperature
2/19/1989	2/19/1989	0	1	\$0	\$0	Lexington County	Extreme Cold
12/22/1989	12/25/1989	0	0	\$29,027	\$0	SCZ001-002-003-004-005-006 Mountains, Foothills, Piedmont, & Midlands	Extreme Cold
3/21/1990	3/21/1990	0	0	\$0	\$215,524	Statewide	Freeze
3/13/1993	3/13/1993	0	0	\$112,091	\$11,209	SCZ006	High winds & Cold

What to expect: Hot weather is common in Lexington County during the late spring, summer and early fall months. On average, there are 20 to 29 days of above 95 degrees in any given year (Figure 72). Lexington County will experience periods of above 100-degree temperatures in the months of May, June, July, August, September, and October. The hottest temperature on record for Lexington County was measured at the Columbia Metro Airport at 109°F (June 28, 2012). Heat events are a high-risk event to public health due to the possibility of heat exhaustion and heat stroke. The number of high temperature days and the duration of heat waves are expected to increase.

Geographic Extent: The entire county is susceptible to hot temperatures. However, central and southern parts of the county experience more days above 95 degrees.

Top 10 warmest average June temperature records on record (Columbia, SC)⁴⁰

1. 83.7 degrees set in 2010
2. 83.7 degrees set in 1952
3. 83.3 degrees set in 2011
4. 83.0 degrees set in 2016
5. 82.8 degrees set in 2018
6. 82.6 degrees set in 2015
7. 82.3 degrees set in 1998
8. 82.3 degrees set in 1943
9. 82.0 degrees set in 2014
10. 82.0 degrees set in 1986

June years with the most days of 100 degrees or higher (Columbia, SC)

1. June 1952 - 10 days
2. June 2015 - 6 days
3. June 1956 - 6 days
4. June 2010 - 5 days
5. June 1998 - 5 days
6. June 1954 - 5 days
7. June 1950 - 5 days
8. June 2016 - 4 days
9. June 1948 - 4 days
10. June 1944 - 4 days

Hot weather statistics for Lexington County are as following:

Number of Loss-Causing Events:	7
Frequency of Occurrence:	24%
Recurrence Interval:	0.04 years
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	\$12,746,647
Total Fatalities:	0
Deadliest Event:	n/a
Most Property Damage:	\$5,146,441 million (July 1993)
Most Crop Damage:	\$5,146,441 (August 1993)
Highest USDA Crop Indemnity Payout:	\$45,352 (August 2011)

⁴⁰ NWS Weather Forecast Office Columbia, SC, 2018. NOWDATA - NOAA Online Weather Data. Available at <https://w2.weather.gov/climate/xmacis.php?wfo=cae>

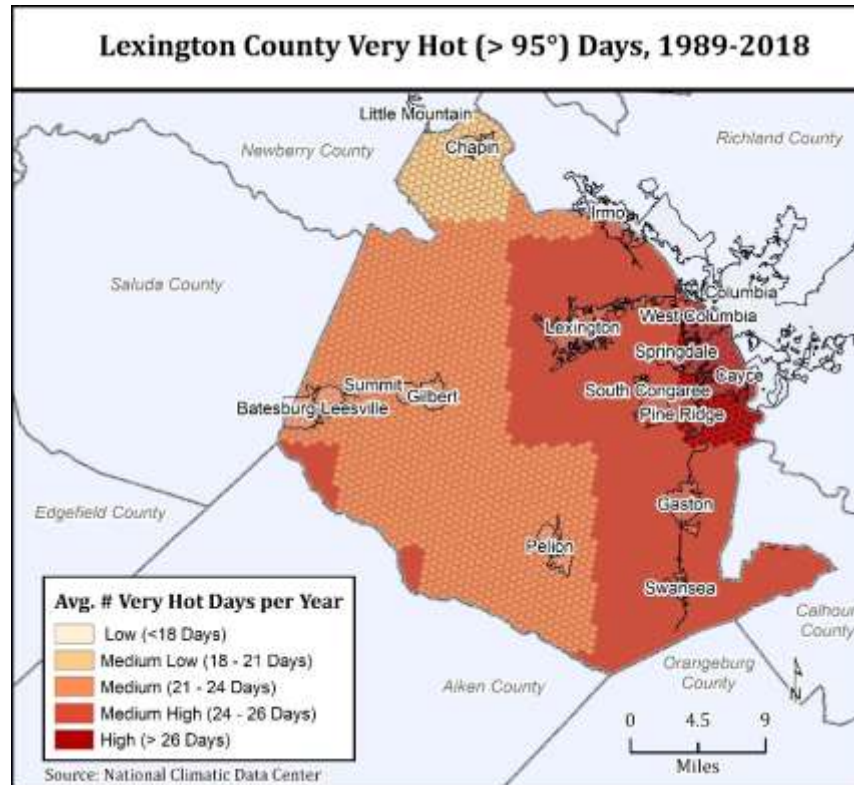


Figure 72 - Hot weather threat in Lexington County.

Table 45 - Record of loss-causing hot weather events in Lexington County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
2/1/1976	2/29/1976	0	0	\$495	\$4,951	Statewide	Heat
7/1/1977	7/31/1977	0	0	\$4,648	\$464,834	Statewide	Drought & Heat
10/1/1978	10/31/1978	0	0	\$432	\$4,320	Statewide	Drought & Heat
6/1/1993	6/30/1993	0	0	\$0	\$261,793	Statewide	Heat
8/1/1993	8/31/1993	0	0	\$0	\$1,949,409	Statewide	Drought & Heat
6/1/1985	6/7/1985	0	0	\$10,292,881	\$0	Statewide	Heat
7/1/1993	7/31/1993	0	0	\$0	\$10,292,881	Statewide	Drought & Heat

K) Wildfires

What to expect: On average, wildfires occur frequently—every 5 days—in Lexington County with most of the wildfires occurring in central and southern Lexington County, in and near population centers (Figure 73). Instances of recorded property and crop damage are rare (

Table 46). However, the number of wildfire incidents has decreased significantly due to a change in the outdoor burning ordinance in 2007 (Figure 74). The largest wildfire was about 180 acres. The number of wildfire events and the size of wildfires are expected to increase.

Geographic Extent: The entire county is susceptible to wildfire. The risk of wildfire including the propensity for large wildfires is highest in southern and south-central Lexington County (Figure 75). Wildfire statistics for Lexington County are as following:

Number of Loss-Causing Events:	3
Daily Frequency of Occurrence:	0.1%
Daily Recurrence Interval:	5.38 days
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	2005 - 2018
Loss Events on Record:	1966 - 1985
Total Losses:	\$401,335
Total Fatalities:	0
Deadliest Event:	n/a
Most Property Damage:	\$86,941 (March 1966)
Most Crop Damage:	\$261,793 (March 1985)
Highest USDA Crop Indemnity Payout:	n/av*

*No wildfire events caused a USDA Crop Indemnity Payout

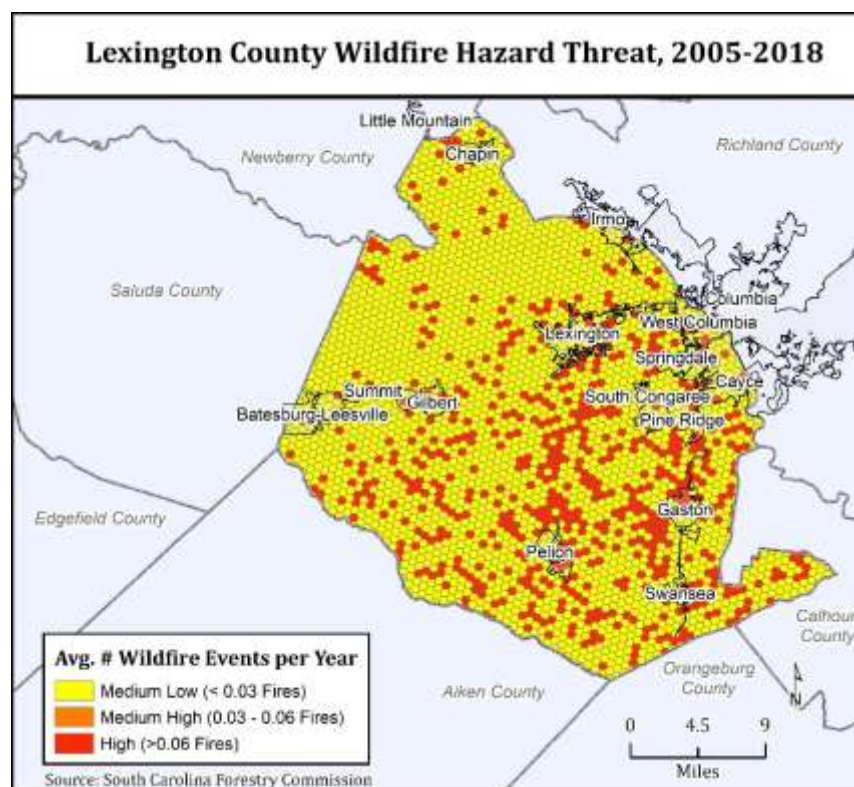


Figure 73 - Wildfire threat in Lexington County based on average number of wildfires per year.

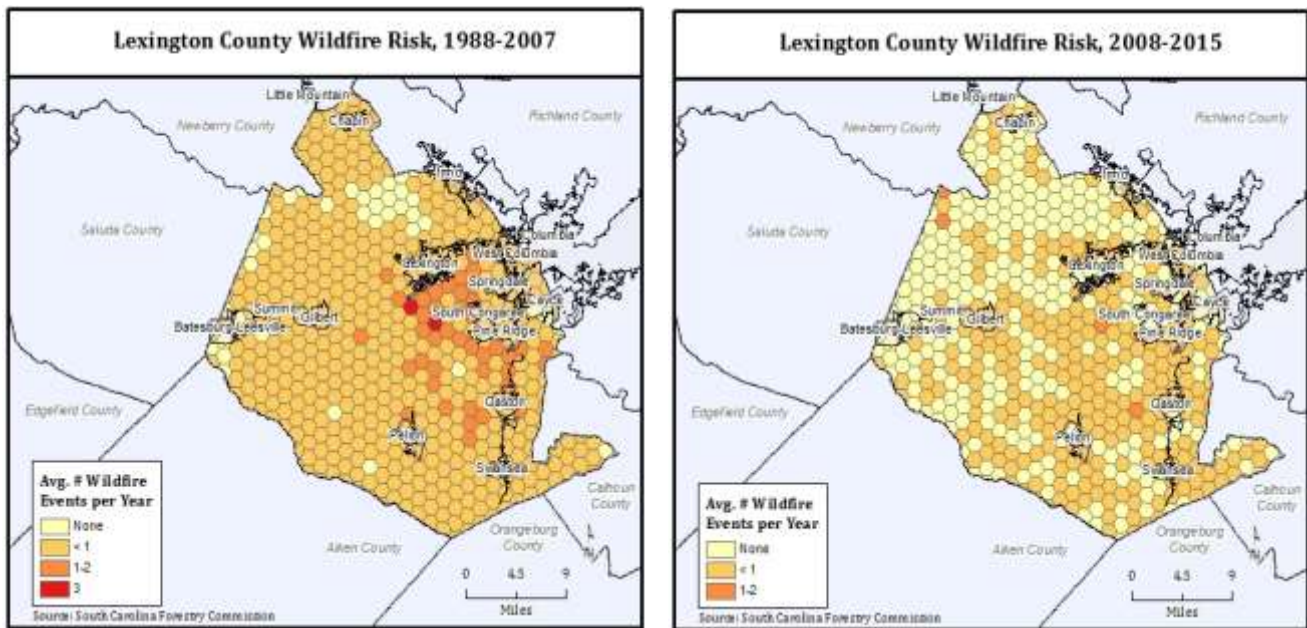


Figure 74 - Effect of changes in burn ordinance on wildfire occurrence in Lexington County.

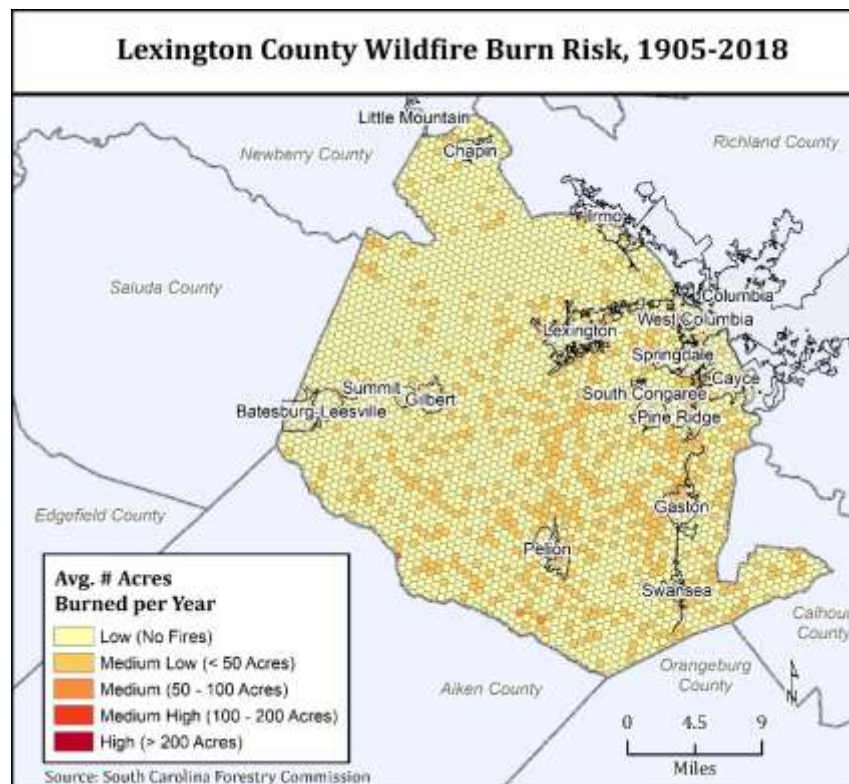


Figure 75 - Wildfire burn risk in Lexington County.

Table 46 - Record of loss-causing wildfire events in Lexington County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
3/15/1966	3/31/1966	0	0	\$79,420	\$0	Statewide	Forest fires
3/1/1985	3/21/1985	0	0	\$23,914	\$239,146	Statewide	Fire
4/1/1985	4/30/1985	0	0	\$239	\$23,914	Statewide	Fire

L) Droughts

What to expect: Lexington County sees drought conditions, i.e., weeks of moderate to extreme drought according to the Palmer Drought Severity Index, on average for 15 to 19 weeks a year (Figure 76). Multi-year, severe droughts are possible in Lexington County as seen from 1998 through 2002. Lexington County experienced its driest year in 1954 with only 27.39 inches of rainfall (annual average: 46.98 inches)⁴¹. Droughts are detrimental to agricultural production (incl. forestry and water supply). Agricultural crops (especially corn, cotton, and soybean) are easily stressed by drought conditions and irrigation systems are not common in South Carolina. Droughts also affect tourism and freshwater fisheries. The number of droughts days and the duration of drought events are expected to increase.

Geographic Extent: The entire county is susceptible to drought, but the western half of Lexington County tends to experience more weeks in drought conditions. It is important to note that southwestern Lexington County has on average more hot weather days than the rest of the county (Figure 76).

The most damaging droughts occurred in 1954, 1986, and 1998-2002. The latest severely impacted economic sectors such as agriculture, forestry, tourism, power generation, public water supplies, and freshwater fisheries⁴². Less severe droughts were reported in 1988, 1990, 1993, and 1995. Unfortunately, the record on losses, particularly agricultural losses is sparse—not because of a lack of losses but because of shortcomings in tracking drought losses. The current tally of about \$16 million in direct losses is most likely a vast underestimation and possibly exceeds \$100 million.

Drought statistics for Lexington County are as following:

Number of Loss-Causing Events:	16
Frequency of Occurrence:	0.4%
Recurrence Interval:	2.5 weeks
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	\$16,069,921
Total Fatalities:	0
Deadliest Event:	n/a
Most Property Damage:	\$5,146,441 (July 1993)
Most Crop Damage:	\$5,146,441 (August 1993)
Highest USDA Crop Indemnity Payout:	\$111,959 (June 2019)

⁴¹ SCDNR, n/d. South Carolina County Weather Atlas. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/cli_county_statistics.php

⁴² SCDNR, n/d. South Carolina Climate. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/cli_sc_climate.php

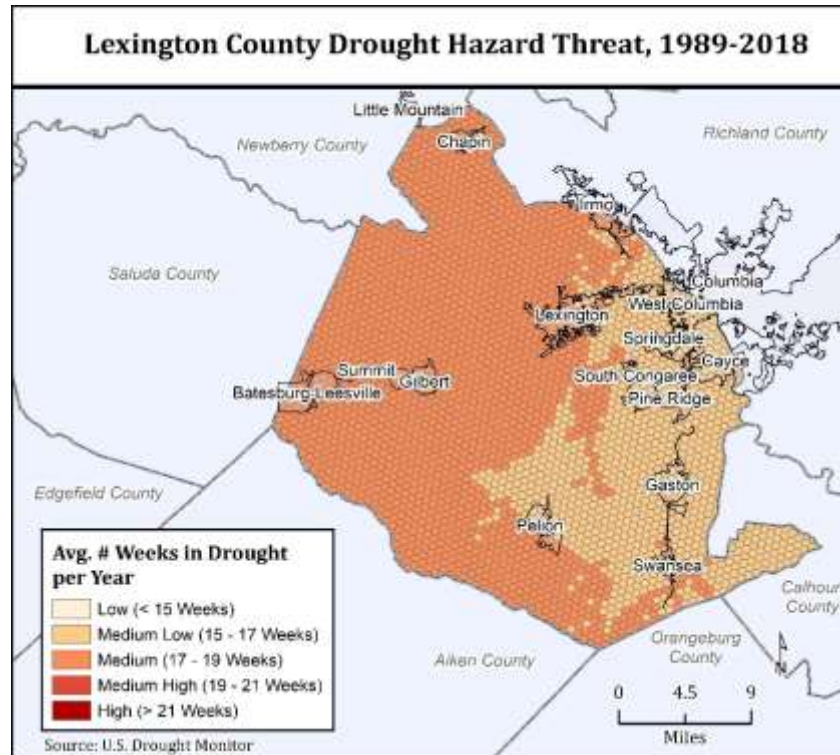


Figure 76 - Drought risk in Lexington County.

Table 47 - Record of loss-causing drought events in Lexington County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag.*	Location	Description
7/1/1977	7/31/1977	0	0	\$4,648	\$464,834	Moderate	Statewide	Drought & Heat
4/1/1978	4/13/1978	0	0	\$43	\$4,320	Mild	Statewide	Dry Weather
10/1/1978	10/31/1978	0	0	\$432	\$4,320	Moderate	Statewide	Drought & Heat
6/1/1984	6/20/1984	0	0	\$0	\$2,711	Moderate	Statewide	Drought
4/1/1986	4/30/1986	0	0	\$0	\$303	Mild	SCZ001-002-003-004-005-006-007	Drought
5/1/1986	5/31/1986	0	0	\$0	\$2,570	Moderate	Statewide	Drought
6/1/1986	6/30/1986	0	0	\$2,570	\$25,702	Severe	Statewide	Drought
7/1/1986	7/31/1986	0	0	\$257,016	\$2,570,161	Severe	Statewide	Drought
2/1/1988	2/28/1988	0	0	\$24	\$2,381	Extreme	Statewide	Drought
6/1/1988	6/30/1988	0	0	\$2,381	\$23,811	Mild	Statewide	Drought
7/1/1988	7/31/1988	0	0	\$238	\$2,381	Mild	Statewide	Drought
8/1/1988	8/31/1988	0	0	\$3	\$3,222	Moderate	Northwestern, West-Central, Central, & Southern SC	Drought
7/1/1993	7/31/1993	0	0	\$10,292,881	\$0	Mild	Statewide	Drought & Heat
8/1/1993	8/31/1993	0	0	\$0	\$10,292,881	Moderate	Statewide	Drought & Heat
5/1/1994	5/31/1994	0	0	\$0	\$1,900,740	Moderate	Statewide	Drought
5/1/1995	5/31/1995	0	0	\$0	\$739,343	Moderate	Statewide	Drought

*Based on historic Palmer Drought Severity Index categories.

Note: While droughts occurred since 1995, the NCEI (formerly NCDC) did not report any losses. The occurrence of drought is reflected in Figure 117.

M) Earthquakes

What to expect: Lexington County has a much lower earthquake risk than coastal counties in South Carolina and no earthquakes have occurred since 1900 (Figure 77). There is only a 2% chance that Lexington County could experience shaking between 1.5 m/s up to 2m/s with a slightly higher shaking potential in the southeastern parts of the county (Figure 78).

Geographic Extent: The entire county is susceptible to earthquakes.

Earthquake statistics for Lexington County are as following:

Number of Loss-Causing Events:	0
Frequency of Occurrence:	0.01%
Recurrence Interval:	119 years
Expected changes to frequency and recurrence interval in the future:	No changes
Frequency Year Range:	1900 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	\$0
Total Fatalities:	0
Deadliest Event:	n/a
Most Property Damage:	n/a
Most Crop Damage:	n/a
Highest USDA Crop Indemnity Payout:	n/av*

*No earthquake events caused a USDA Crop Indemnity Payout

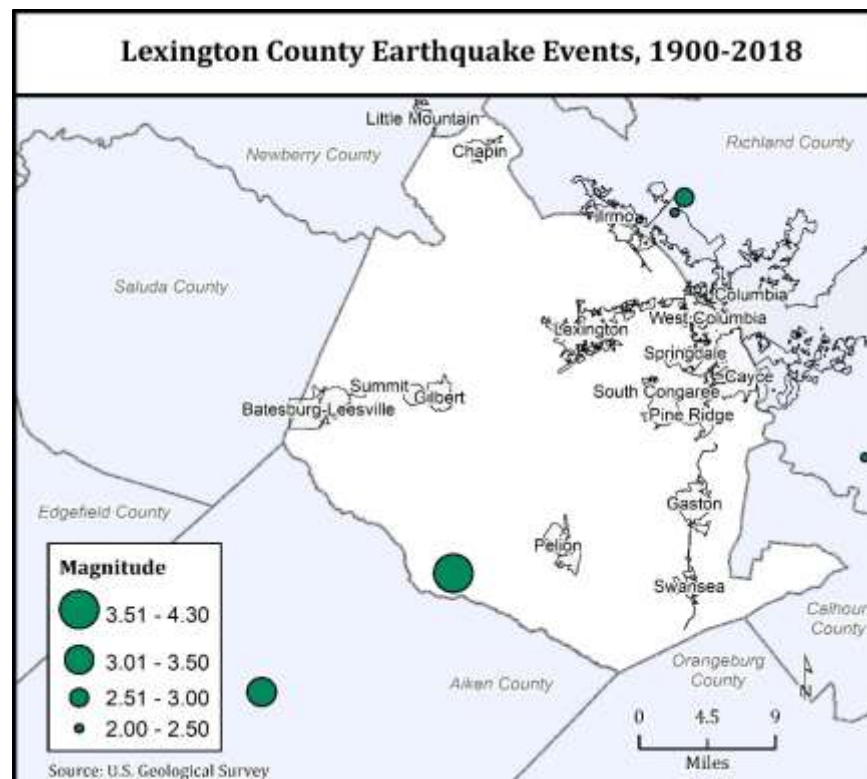


Figure 77 - Historical earthquake events in Lexington County.

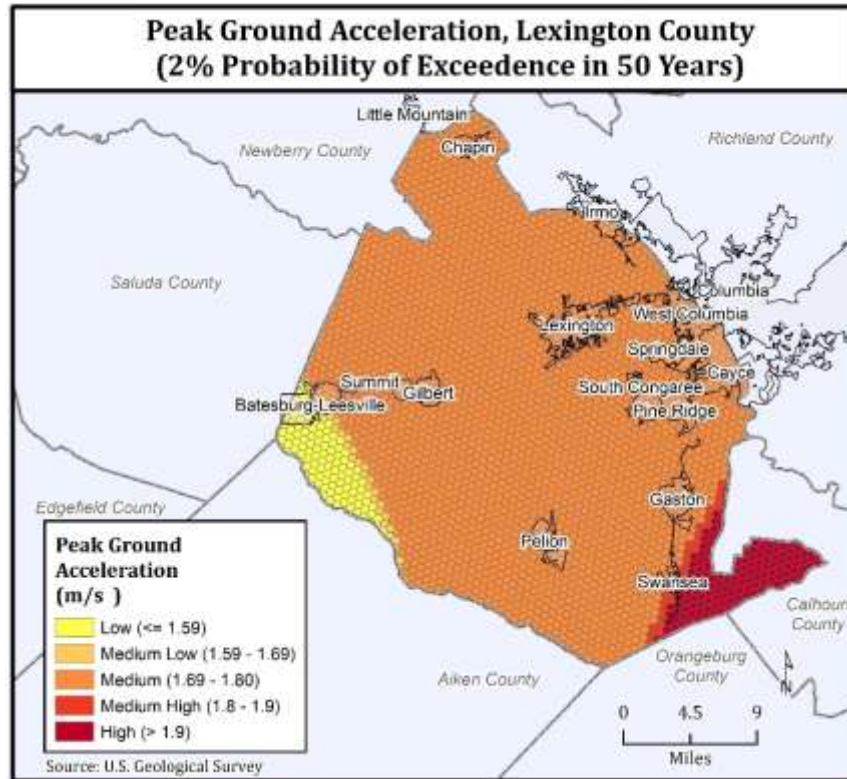


Figure 78 - Risk of shaking due to earthquakes in Lexington County.

5.2 Hazard Vulnerability Assessment for Lexington County

This section addresses
FEMA HMP requirement
201.6(c)(2)(i)

Vulnerability is generally defined as the potential for loss. Understanding which populations and what assets are likely to be impacted by hazard events is critical for developing sound mitigation planning activities and projects. This assessment draws on three vulnerability indicators that are combined and averaged into a *Composite Vulnerability* measure that is then later overlaid with a hazard and the potential severity of consequence:

- Community lifeline and critical infrastructure assets (*INF*) provide a representation of what is at risk (*INF*).
- Areas with socially vulnerable residents provide an idea of who has a lower capacity to absorb shocks and stresses (*SoVI*), and
- Population density (*POP*) provides a representation of how many people are at risk and support a utilitarian approach to serving the greatest number of peoples.

$$VUL = \frac{(SoVI) + (INF) + (POP)}{3} \quad (2)$$

Community lifelines and critical infrastructure⁴³ assets such as transportation facilities, communication facilities, water and wastewater facilities, power facilities, and more. These facilities are those that all other infrastructure lifelines are dependent on. Socially vulnerable populations were derived from the Social

⁴³ <https://www.fema.gov/lifelines>

Vulnerability Index first developed by Cutter (2003)⁴⁴ and later refined by scholars at the University of Central Florida⁴⁵. Understanding where populations reside who have a lower ability to prepare for, respond to, and recover from disaster events can help decision makers distribute scarce resources before, during, or after disasters.

Overall, Lexington County's vulnerability is mostly medium low to medium with a few areas in the area around the Town of Batesburg-Leesville and western portions of the county near Columbia exhibiting medium high vulnerability.

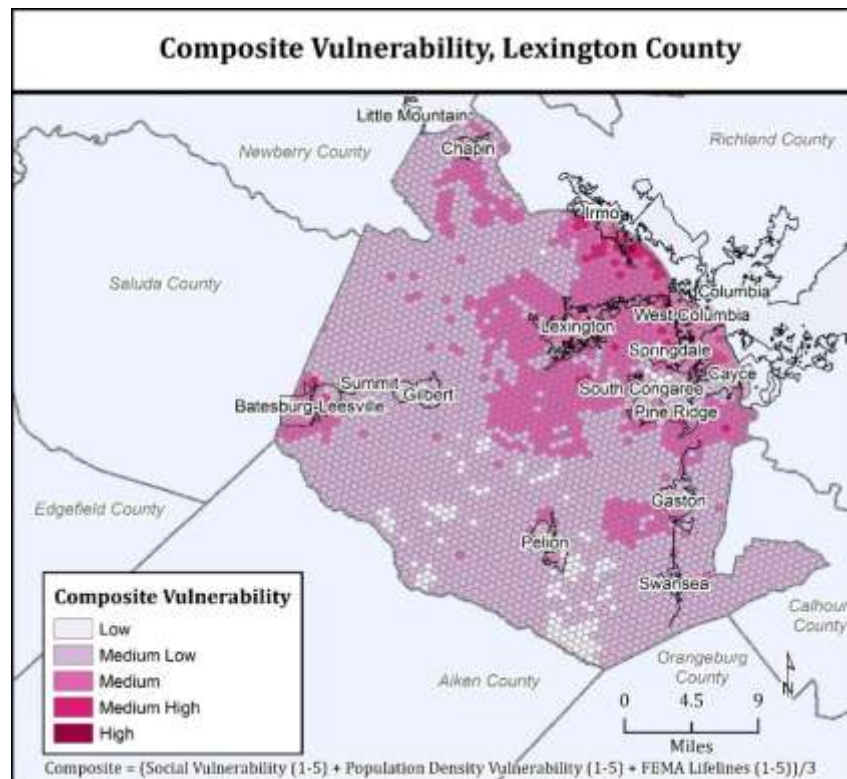


Figure 79 - Lexington County's Composite Hazard Vulnerability.

Please see the Risk Assessment Methodology for a more detailed description of the approach.

A) Assets at Risk

Lexington County has a little over 298,000 residents (2019 US Census) and has an approximate building stock of 111,532 buildings with a replacement value of about \$29,894 million (in \$2019 according to HAZUS-MH 2.4) (Table 49). Since 2010, Lexington County's population has increased by 13.8%, which has the effect of increasing composite vulnerability to hazards as population density and social vulnerability is likely to increase. See Section 3.4 for more information on development changes in the county.

There are 199 critical facilities in Lexington County such as an Emergency Operation Center, three hospitals, administrative buildings as well as numerous law enforcement, fire/EMS, and school facilities (Table 48). Most of the critical infrastructure is located in the Towns of Irmo, Lexington, Springdale, and the City of West Columbia, as well as the surrounding areas (Figure 80). More information on the vulnerability assessment for each critical facility can be found in Appendix I.

⁴⁴ <https://onlinelibrary.wiley.com/doi/abs/10.1111/1540-6237.8402002>

⁴⁵ www.vulnerabilitymap.org

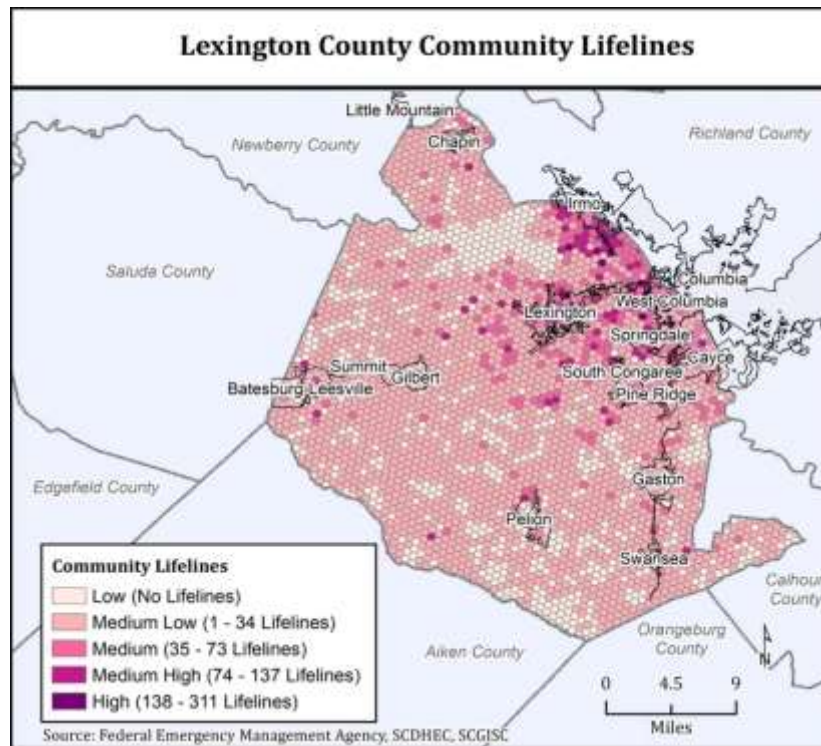


Figure 80 - Distribution of community lifelines and critical facilities in Lexington County.

Assets at risk (Table 48) were assessed using FEMA's Lifeline⁴⁶ with the understanding that

- Lifelines enable the continuous operation of critical government and business functions and is essential to human health and safety or economic security.
- Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function.
- FEMA has developed a construct for objectives-based response that prioritizes the rapid stabilization of Community Lifelines after a disaster.
- The integrated network of assets, services, and capabilities that provide lifeline services are used day-to-day to support the recurring needs of the community and enable all other aspects of society to function.
- When disrupted, decisive intervention (e.g., rapid re-establishment or employment of contingency response solutions) is required to stabilize the incident.

Table 48 - Critical Infrastructure Included in Lexington County's Hazard Risk Assessment.

FEMA Lifeline	Variable	Critical	Count
Safety and Security	Law Enforcement	Yes	17
Safety and Security	Prisons		1
Safety and Security	Fire/EMS	Yes	51
Safety and Security	Govt Services - Courthouses		1
Safety and Security	Local EOCs	Yes	1
Safety and Security	Community Safety - Convention Centers/Fairgrounds		1
Safety and Security	Public Schools		71

⁴⁶ <https://www.fema.gov/lifelines>

FEMA Lifeline	Variable	Critical	Count
Safety and Security	Private Schools		11
Safety and Security	Colleges and Universities		3
Safety and Security	Mobile Home Parks		135
Safety and Security	Places of Worship		312
Safety and Security	Nursing Homes		9
Food, Water, Shelter	Food Stores		152
Food, Water, Shelter	Nutrition Sites – Supplemental Meal Sites		68
Food, Water, Shelter	Water Treatment Plants and Water Supply Intake	Yes	12
Food, Water, Shelter	Shelter		47
Health and Medical	Hospitals	Yes	3
	Other Medical		345
Energy	Transmission Lines (1/10-mile road segments) and Substations		5,612
	Substations	Yes	90
	Electric power generation	Yes	9
Energy	Gas Stations		185
Communications	Infrastructure		73
Communications	Banks and Finance		129
Transportation	Non-State Highway/Roadway (1/10-mile road segments)		33,204
Transportation	Railway (1/10-mile road segments)		1,236
Transportation	Aviation	Yes	11
Hazardous Materials	Toxic Release Inventory Sites		61
Hazardous Materials	Superfund Sites		3
Hazardous Materials	Solid Waste	Yes	5

Building exposure exceeds more than \$29 billion in value with residential buildings accounting for more than \$24 billion alone (Table 49).

Table 49 - Building stock values by occupancy type in Lexington County. Source: HAZUS 4.2.

Building Type	Total Replacement Value (in \$2019 Millions)
Residential	\$24,353
Commercial	\$3,571
Industrial	\$1,073
Agricultural	\$71
Religious	\$476
Government	\$133
Education	\$217
Total	\$29,894

B) Social Vulnerability and Population Density

Social vulnerability, a concept focused on understanding an area's capacity to prepare for, respond to, and rebound from disaster events⁴⁷, has a long conceptual and theoretical history in social and disaster science fields.⁴⁸ Socially vulnerable populations have fewer resources to aid in preparation for disasters, often bear the brunt of disaster impacts, and take longer to bounce back from disaster events. Empirical measures of social vulnerability enable decision makers and emergency managers to understand where vulnerable populations reside and how that vulnerability is manifest across a landscape. Here, 29 indicators of social vulnerability, collected from www.vulnerabilitymap.org, were used to create a tract level SoVI for the county. SoVI scores were categorized from (0 – no data to 5 – high social vulnerability) using a standard deviation classification scheme (Figure 218).

In Lexington County, highly vulnerable populations live mostly in the eastern portion of the county near the City of Columbia, as well as in the far western portion of the county in and around the Town of Batesburg-Leesville (Figure 81). The City of West Columbia is also the most densely populated area in Lexington County (Figure 82).

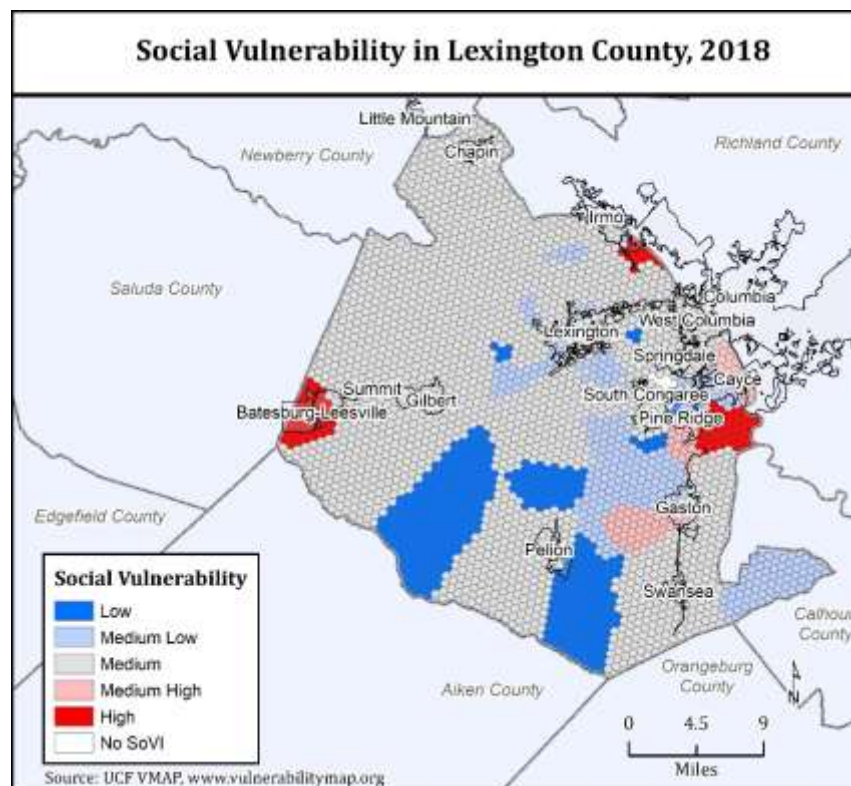


Figure 81 - Socially vulnerable tracts in Lexington County.

⁴⁷ <https://doi.org/10.1177/0002716205285515>

⁴⁸ <https://unu.edu/publications/books/measuring-vulnerability-to-natural-hazards-towards-disaster-resilient-societies-second-edition.html#overview>

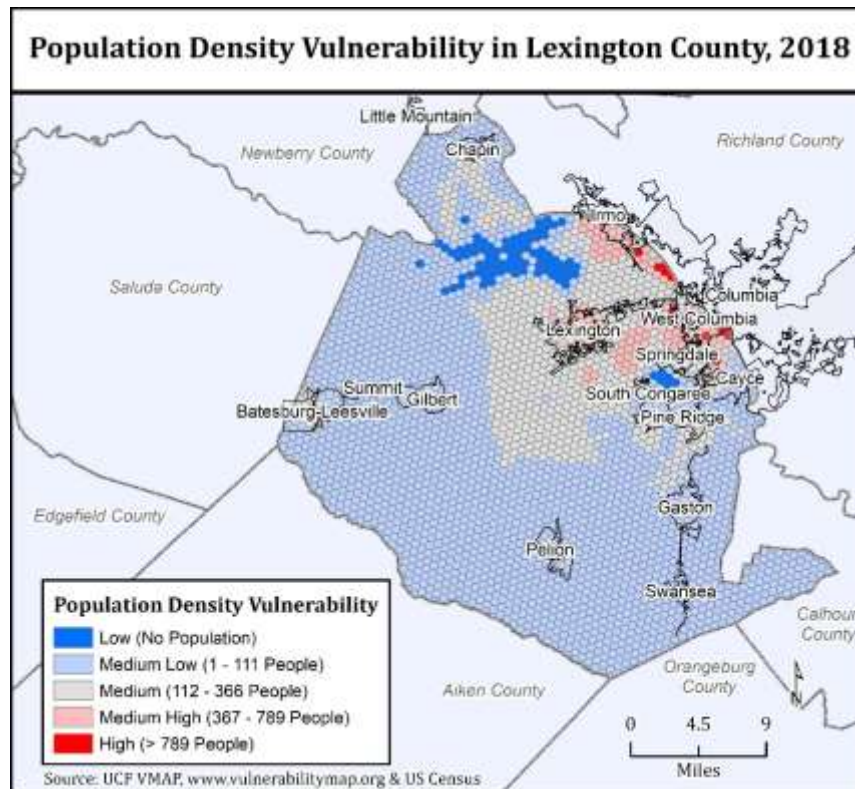


Figure 82 - Lexington County's Population Distribution.

5.3 Severity of Consequence Assessment for Lexington County

Every hazard is unique in terms of its past impacts and future potential for impacts. In this Plan, this is captured as the Severity of Consequence (CON). This universal accounting of hazard risk for Lexington County considers historical impacts (*HISTCON*), hazard frequencies, future climate impacts, as well as the current high priority hazards of the county, and those likely to cause continued losses if not mitigated (See [Appendix I](#) for more information on this calculation and its component variables).

For Lexington County, the hazards with the highest severity of consequence are the following (Table 50):

1. Tornado
2. Heat
3. Drought
4. Flash Flood
5. Severe Thunderstorms

Table 50 - Lexington County Severity of Consequence Scores by Hazard.

Hazard	Historical Score (1-5)	Climate Sensitivity Score (1-5)	Severity/Frequency Score (1-5)	Priority Score (1-5)	Severity of Consequences (CON) Score (4-20)	Standardized CON Score (1-5)
Drought	1.81	5	2.96	4.43	14.20	4.14
Earthquake	1.00	3	1.00	2.71	7.71	2.02
Extreme Cold	2.99	1	1.92	3.29	9.20	2.51
Flash Flood	4.23	5	2.18	2.14	13.55	3.93
Flooding	1.17	5	1.35	2.14	9.66	2.66
Fog	1.00	1	1.00	1.57	4.57	1.00
Hail	1.54	3	1.05	2.14	7.73	2.03
Heat	1.60	5	4.52	4.43	15.55	4.58
Hurricane/ Tropical Storm	1.17	5	1.58	3.29	11.04	3.11
Lightning	3.81	3	1.18	2.14	10.13	2.81
Severe Storm/ Thunderstorm	5.00	5	1.05	1.57	12.62	3.63
Tornado	4.97	3	5.00	3.86	16.83	5.00
Wildfire	1.03	5	1.17	1.00	8.20	2.18
Wind	4.84	3	1.05	3.29	12.18	3.48
Winter Weather	1.43	1	1.21	5.00	8.64	2.33

5.4 Risk Assessment for Lexington County

The following sections discuss the hazard-specific risks for each hazard affecting Lexington County. As described in the Risk Assessment Methodology section, a hazard's risk is the product of the *Hazard Threat (THR)*, *Vulnerability (VUL)*, and *Severity of Consequence (CON)*. All calculations are completed at the unit of analysis, which in this Plan is a 0.25-mile hexagon.

$$RISK_{HAZ} = (THR_{HAZ})(VUL)(CON_{HAZ}) \quad (1)$$

A) Flooding

The vulnerability to riverine flooding is most pronounced in 1000-year floodplains (0.1% annual chance of occurrence) in northeastern Lexington County near Irmo, West Columbia, and Columbia, due to the presence of vulnerable populations (Figure 83 & Figure 34). There is also a higher level of vulnerability to floods in the western edge of the county around Batesburg-Leesville for the same reason. Exposure in the 1000-year floodplain is largely limited to residential buildings with only one critical infrastructure facility located inside the 1000-year floodplain (Figure 83). It is important to note that the determination of infrastructure inside or outside the 1000-year floodplain was solely based on location and did not take elevation into account. Therefore, being located inside the 1000-year floodplain does not carry an implication regarding requirements for the National Flood Insurance Program.

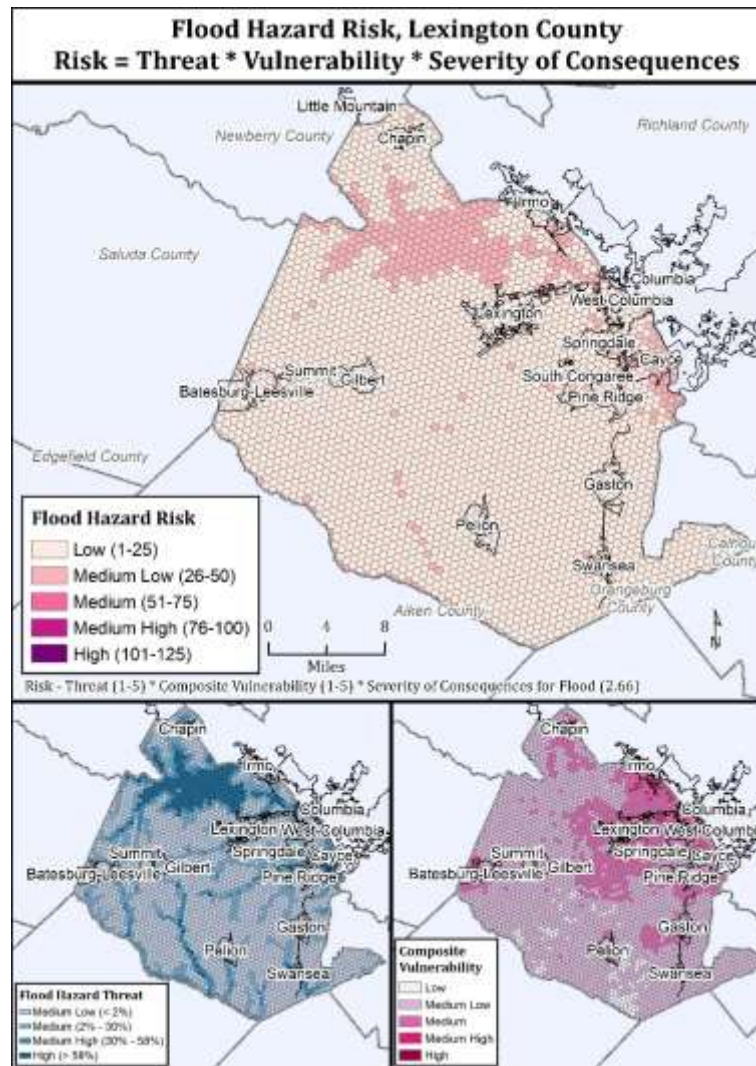


Figure 83 - Risk of riverine floods in Lexington County.

According to the HAZUS model using a 1,000-year flood scenario (0.1% annual chance of occurrence) (Figure 85), the total economic loss estimated for the flood is \$702.97 million, which represents 11.1% of the total replacement value of the scenario buildings. The total building-related losses were calculated at \$544.94 million or 77.5% percent of all building-related losses. A majority building-related losses resulted from residential damage at \$336.21 million, with residential occupancies making up 61.7% of the total loss. 22.5% of the estimated economic losses were related to the business interruption of the region.

Most of the damage would occur in the northeastern corner of the county, near the towns of Irmo and Ridgeway, with some minor damages around Springdale and Cayce (Figure 36). There would also be moderate damage throughout the county following the 1000-year flood plains, with mild economic losses incurred. It is expected that the one critical infrastructure facility, the County Emergency Operations Center, would receive at least moderate damage. The modelled flood's impact area overlaps in and around Irmo and Lexington, the county's most vulnerable populations, resulting in moderate to high damage and economic loss in that region (Figure 83 and Figure 85). All of these estimates were derived using HAZUS-MH 4.2.

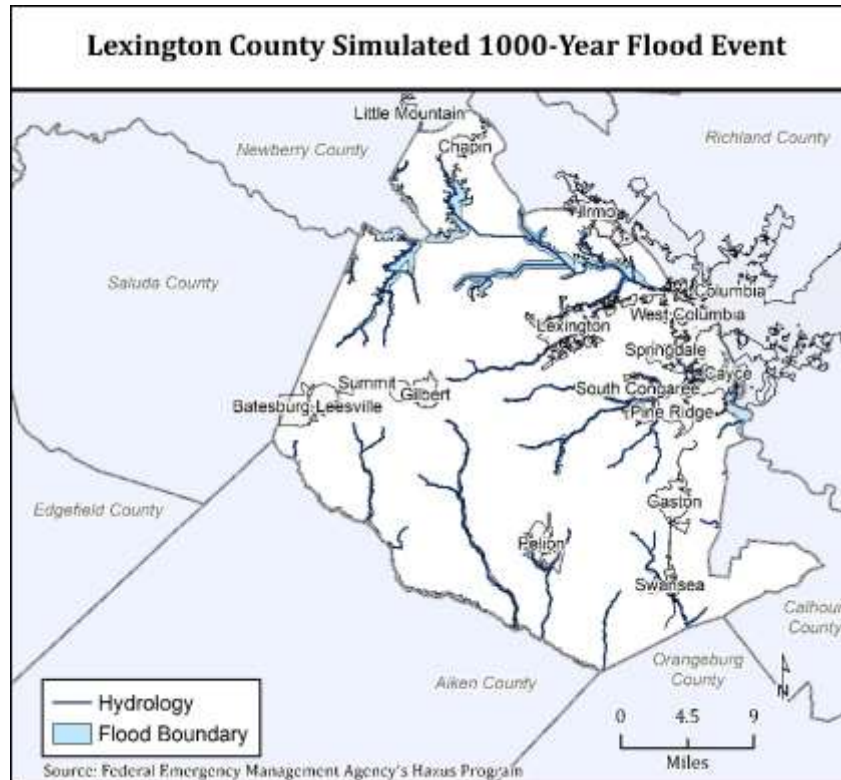


Figure 84 - Modelled 1,000-year flood event in Lexington County.

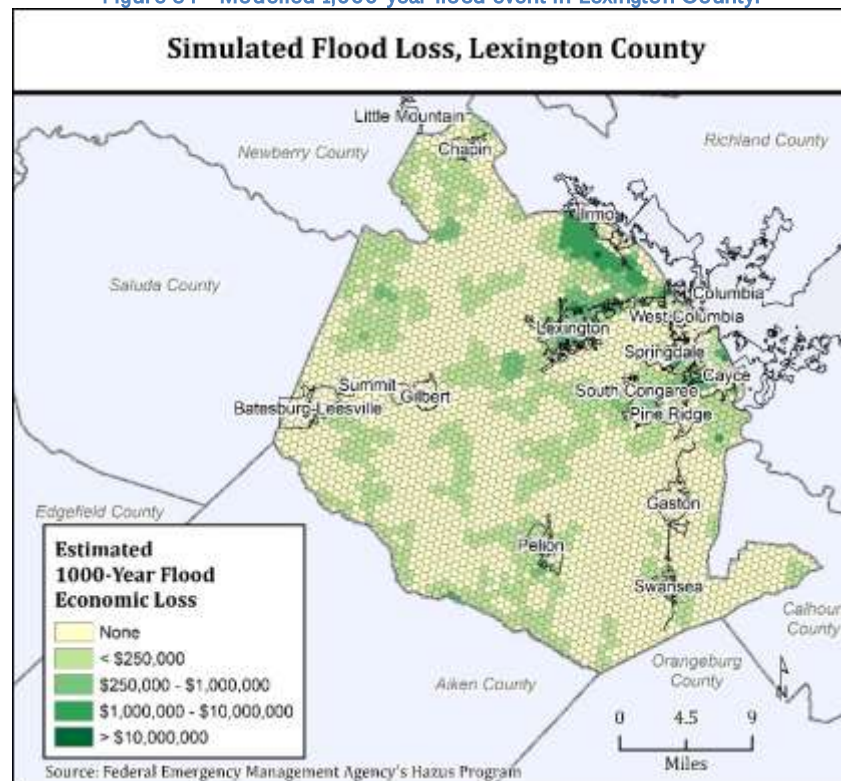


Figure 85 - Damage from a modelled 1,000-year flood event in Lexington County.

The flash flood hazard risk in Lexington County is similar to the riverine flood risk but has a higher geographical impact to include all of the area in and around the Towns of Lexington, Irmo, Springdale,

Gaston, Chapin, and Batesburg-Leesville, as well as the Cities of West Columbia and Cayce (Figure 86). These areas all experience at least a medium-low level of risk, with certain areas south of Irmo and in West Columbia experiencing medium and even up to medium-high (Figure 86).

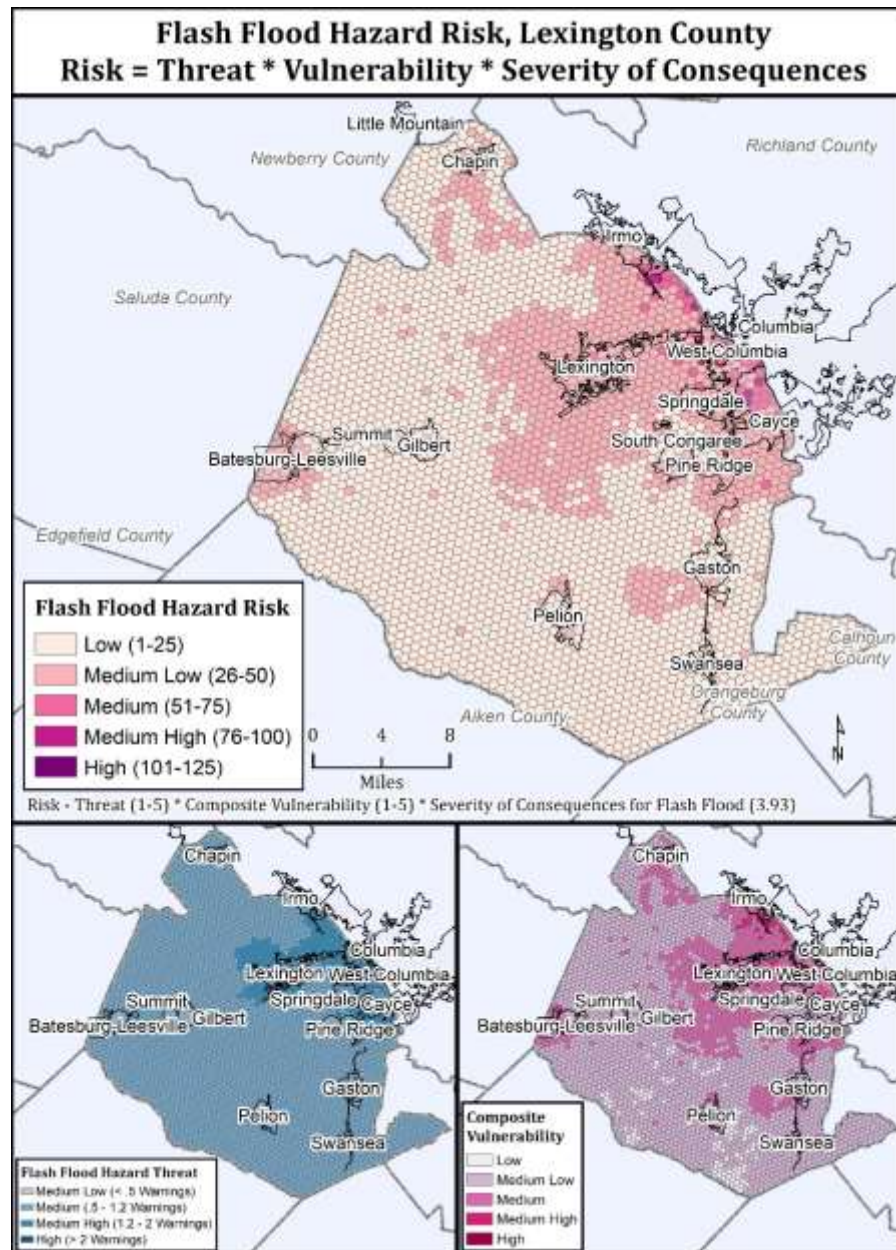


Figure 86 - Risk of flash flooding in Lexington County.

B) Hurricanes & Tropical Cyclones

Northeastern Lexington County exhibits a higher vulnerability to tropical storms due to higher levels of social vulnerability, while southeastern Lexington County exhibits higher vulnerability to a higher hurricane hazard threat (Figure 87). Only about 10% of critical infrastructure, building stock, and population are in this high vulnerability area (Figure 87).

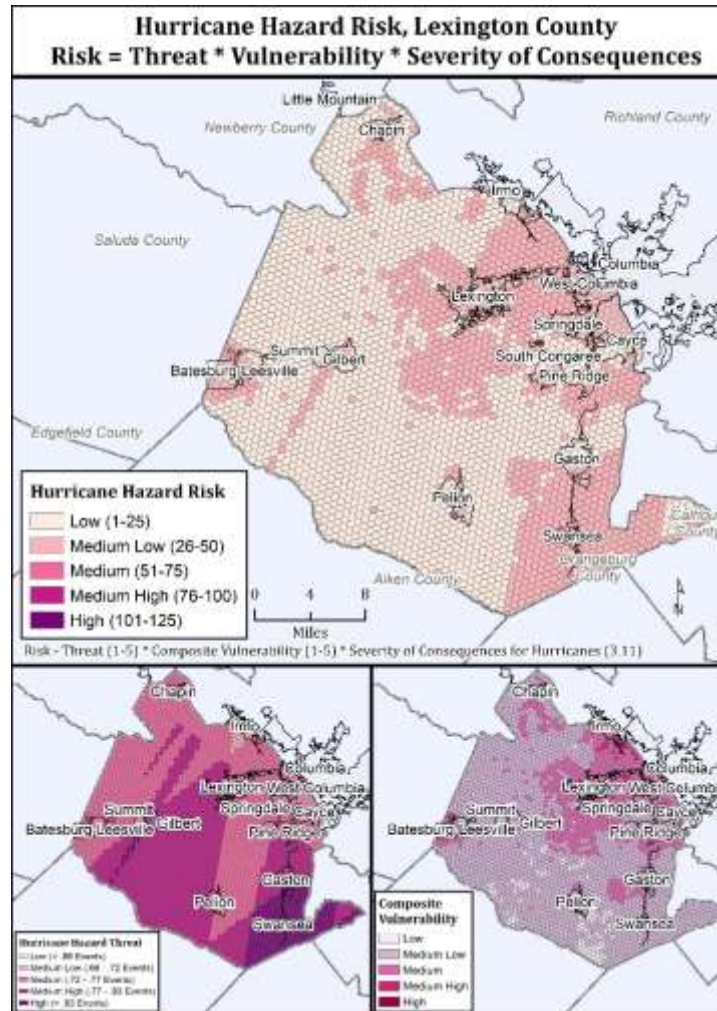


Figure 87 - Risk of tropical storms in Lexington County.

For a 1,000-year hurricane event, Lexington County is expected to see wind speeds between 96 and up to 129 miles per hour in the southeastern corner of the county (Category 3) (Figure 88). Such wind speeds are probable with a fast-moving, major hurricane that has a similar track to Hurricane Hugo. About 75% of the county's infrastructure would not experience any damage. Over 6,000 buildings (or 6% of the building stock) would be at least moderately damaged with an estimated property damage of \$946 million (nearly all of it residential) with most of the damage occurring in the northeastern region of the county (Figure 130). The total building-related economic losses for this event would be \$1.1 billion. All the critical infrastructure facilities should be operable within a day. The modelled storm's most catastrophic impact area contains some of the county's most vulnerable populations such as Irmo and Lexington. All estimates were derived using HAZUS-MH 2.2.

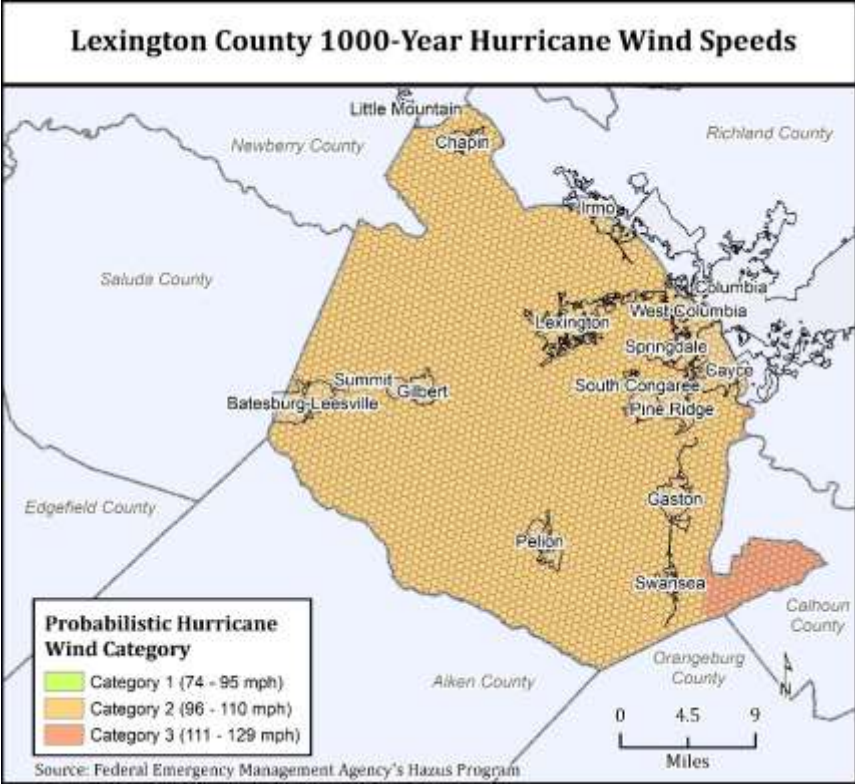


Figure 88 - Hurricane wind speeds using a 1,000-year storm event in Lexington County.

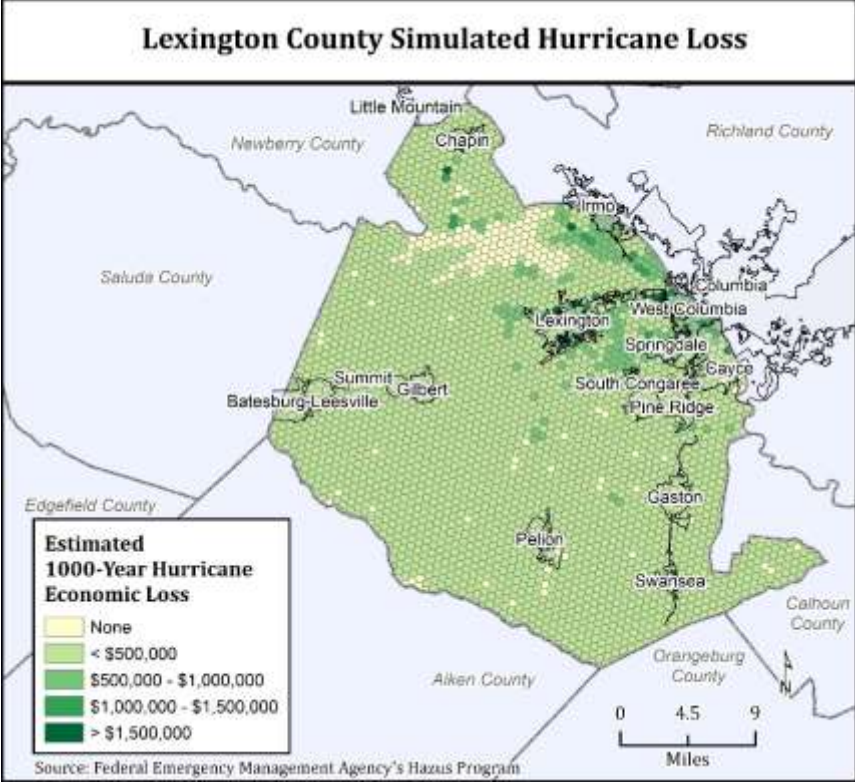


Figure 89 - Damage from a modelled 1,000-year hurricane event in Lexington County.

C) Tornadoes

Areas of high risk to tornadoes, i.e., a medium to high tornado hazard threat (more than 0.5 warnings per year) along with high composite vulnerability, are limited in Lexington County except for the Batesburg-Leesville, Chapin, and Irmo areas (Figure 90). This is due to few areas of overlap between the two variables, as tornado warnings are more common in the northwest portion of the county, while vulnerability is high in the northeast (Figure 90).

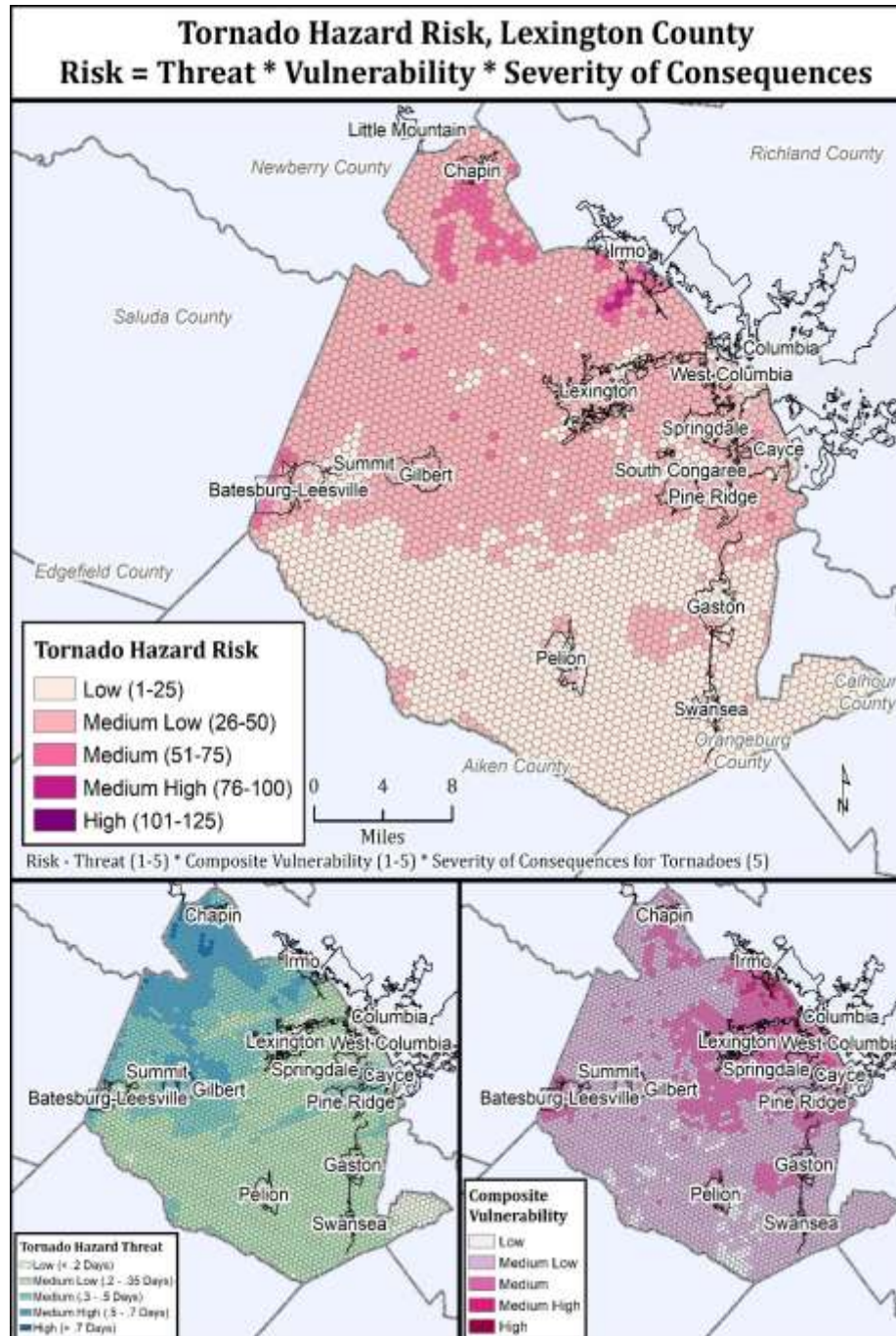


Figure 90 - Risk of tornadoes in Lexington County.

D) Thunderstorms

The severe storm hazard threat for Lexington County is for the mainly medium to medium-high, with some clusters of high threat near the towns of Gaston and Lexington and the northwestern edge of the county having less overall severe storm threat (Figure 91). When mapped over the composite vulnerability map, it reveals that there is medium levels of severe storm risk outside of Gaston, Lexington, and south of Irmo, but no areas overlap to create a risk higher than medium (Figure 91).

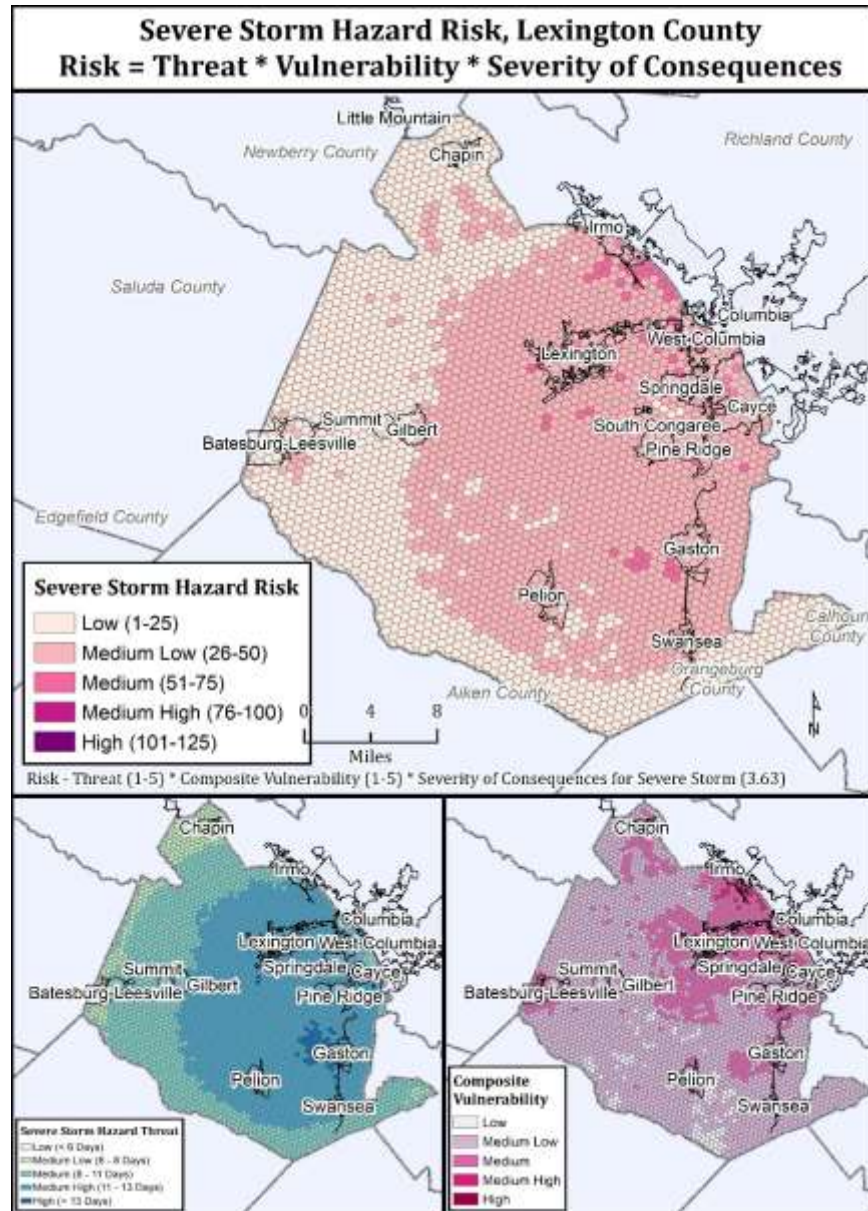


Figure 91 - Risk of severe thunderstorms in Lexington County.

E) Lightning

The lightning hazard threat in Lexington County follows a north to south gradient of increasing threat, with the area between Gaston and Pelion experiencing a high threat level (Figure 92). When overlaid with the northeast, central, and west-central composite vulnerability distribution, there is little overlap, resulting in most of Lexington County having a low lightning hazard risk, while the areas that were identified in each component map earlier have medium-low levels of lightning risk (Figure 92).

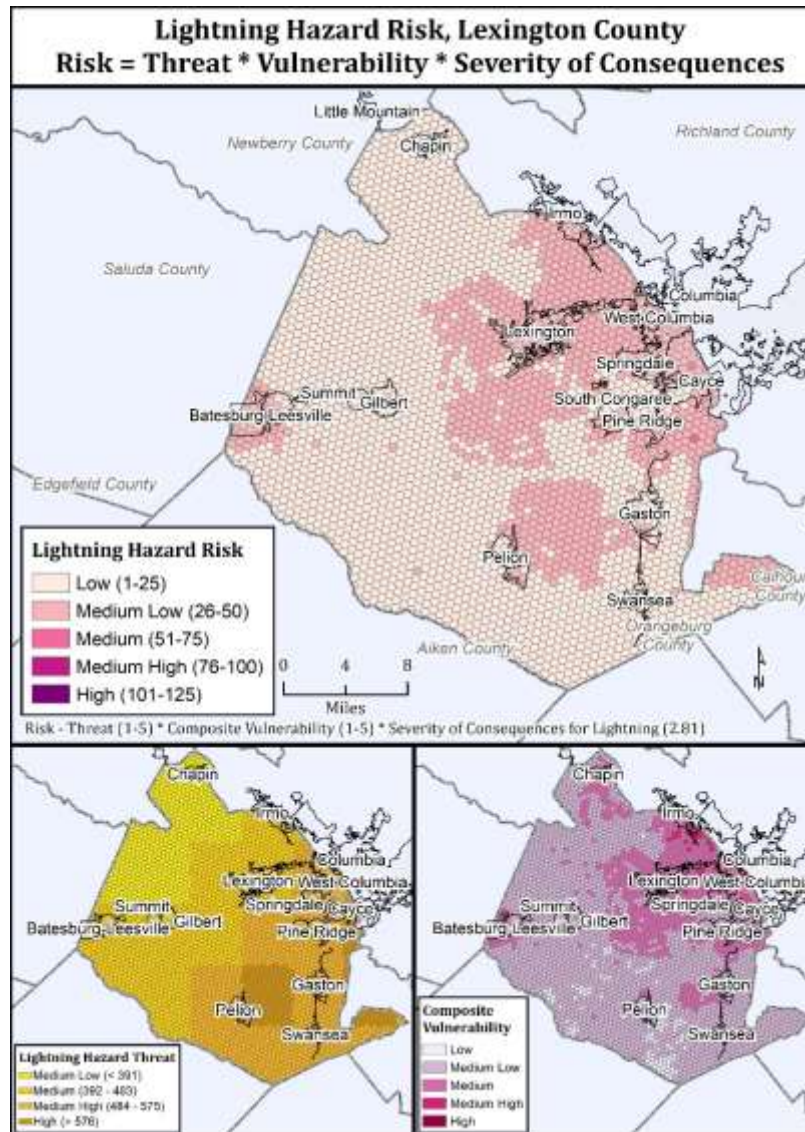


Figure 92 - Risk of lightning in Lexington County.

F) Wind

Like the other hazards, Lexington County has the highest composite vulnerabilities to the northeast by Irmo and West Columbia, as well as Batesburg-Leesville, Gaston, and Central Lexington County (Figure 93). While the wind hazard threat for Lexington County is overall low, there are sporadic tracts of area that experience high threat between Gaston and Swansea, as well as near Irmo and Chapin (Figure 93). These tracts coincide with regions of higher vulnerability in Lexington County resulting in streaks of area with medium-low to medium wind hazard risk (Figure 93).

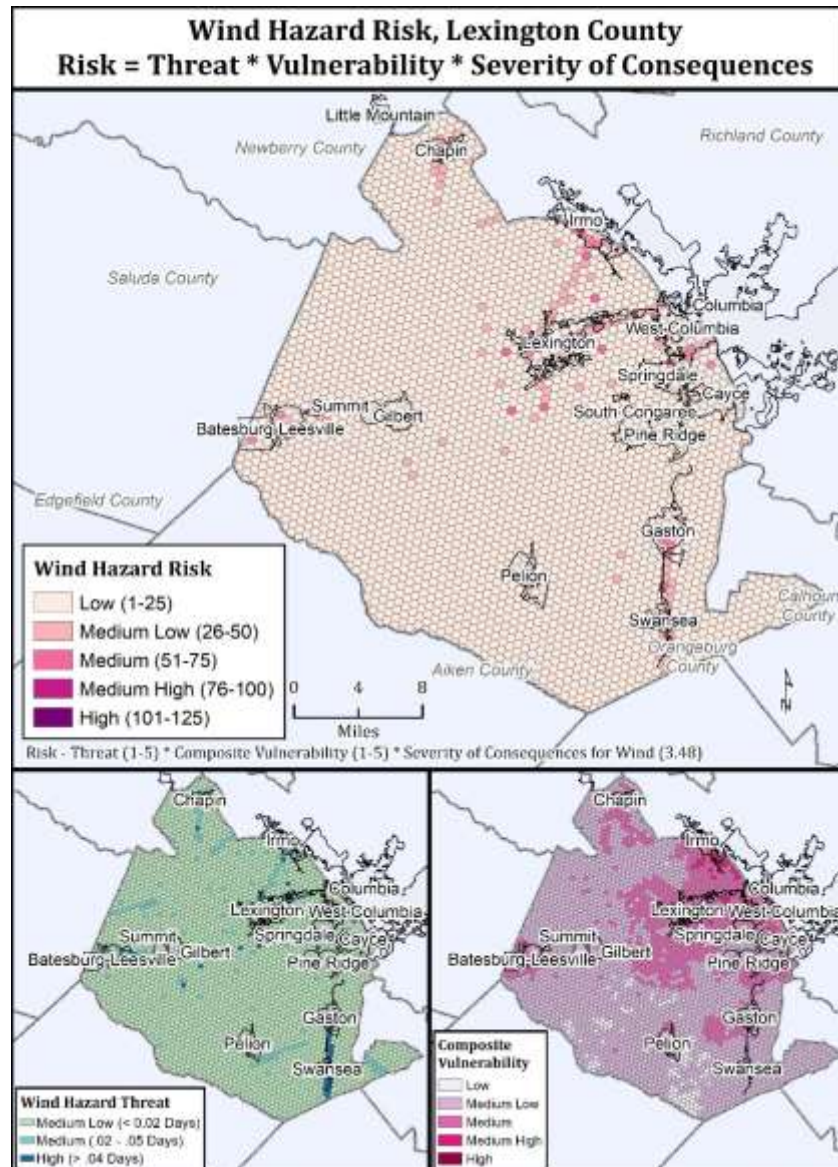


Figure 93 - Risk of high winds in Lexington County.

G) Hail

There are small pockets of high hail hazard threats that are distributed across the county such as near the Towns of Batesburg-Leesville, Chapin, and Lexington (Figure 94). These areas exhibit a high occurrence of hail events per year (more than 2 events) along with medium composite vulnerability. When combined, these areas result in medium-low hail hazard risk scores below Chapin, Lexington, and West Columbia (Figure 94).

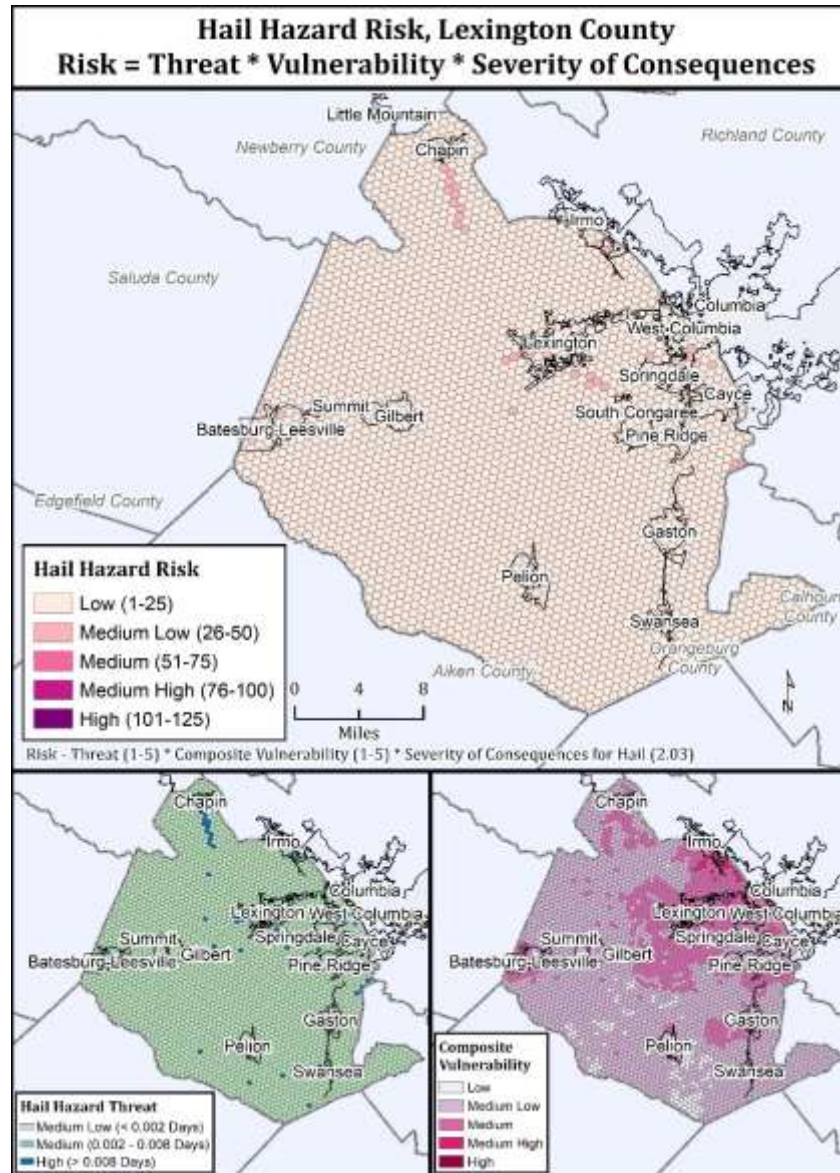


Figure 94 - Risk of hail in Lexington County.

H) Fog

The highest fog hazard threat amounts occur in southeastern Lexington County. Completely enveloping the Towns of Pelion, Gaston, Swansea, and Springdale (Figure 95). These areas have more than 28 days of fog per year and coincide with areas of high composite vulnerability in Gaston, Pelion, and Springdale (Figure 95). While there is substantial overlap, since fog hazards do not create any recorded direct damages, the entire county has a very low fog hazard risk score, with no area rating higher (Figure 95).

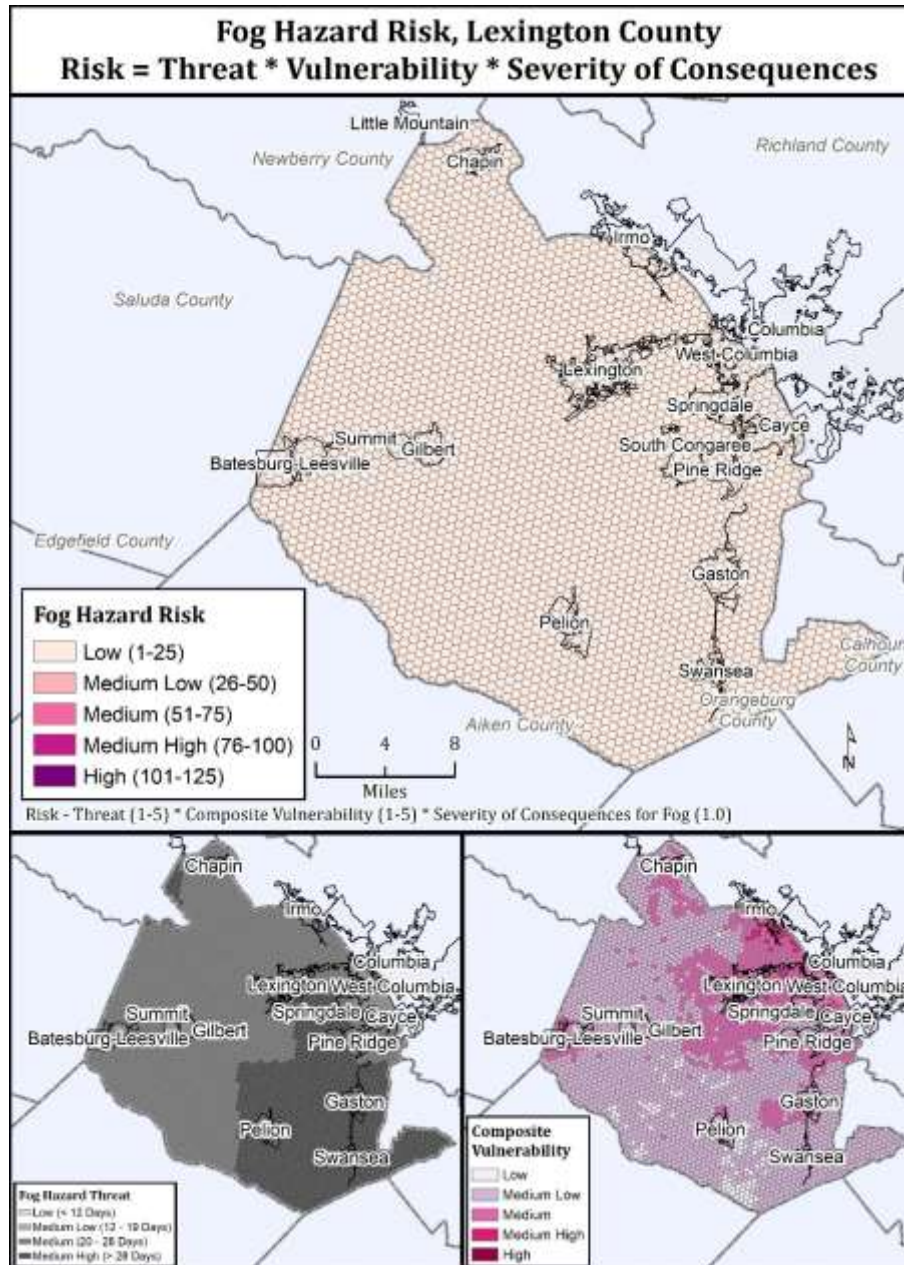


Figure 95 - Risk of fog in Lexington County.

I) Winter Weather & Ice Storms

The winter weather hazard threat in Lexington County has a distinct distribution, with very low levels in the entire eastern half of the county, but high levels in the western half of the county (Figure 96). When compared with the composite vulnerability scores for Lexington County, there is a medium-low winter weather hazard risk in and around Batesburg-Leesville and between Gilbert and Lexington, with the rest of the county receiving a low-risk score (Figure 96).

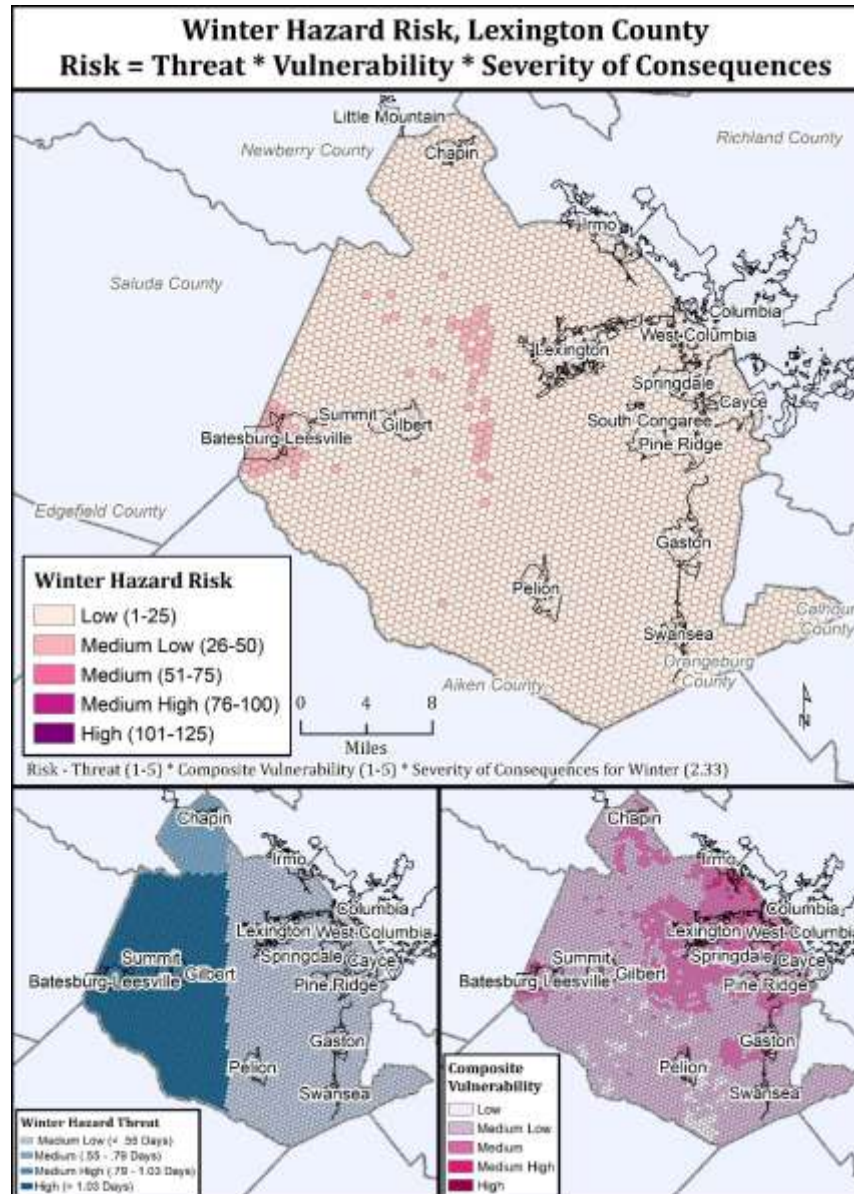
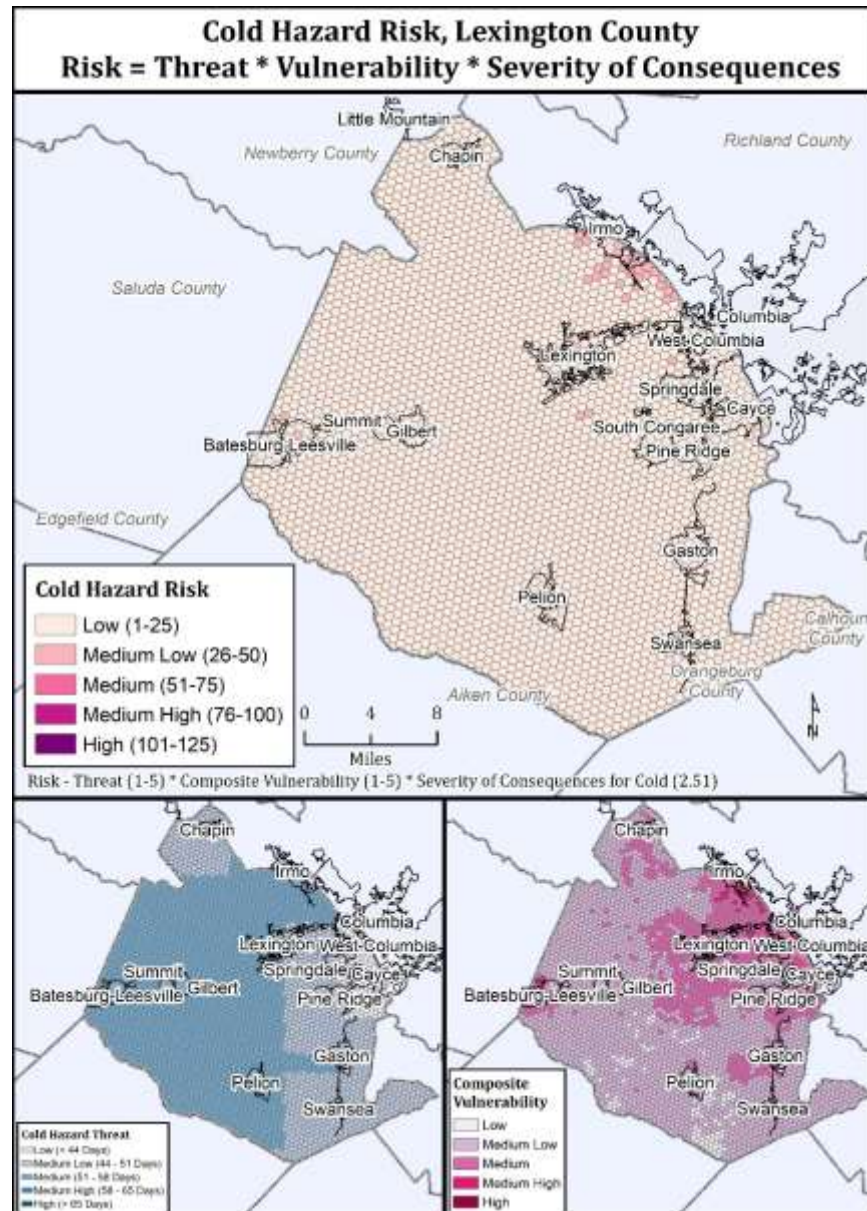


Figure 96 - Risk of winter weather in Lexington County.

J) Temperature Extremes

There are not many areas where higher levels of composite vulnerability and a high occurrence of cold weather threat overlap in Lexington County (Figure 97). While the western and central thirds of Lexington County experience the most days per year below 32°F (51 – 58 days) as well as a region including Irmo, it is the eastern portion of the county that has the highest composite vulnerability (Figure 97). This results in very few areas with higher than low cold hazard risk scores, including the area around Irmo and below Lexington (Figure 97).



The western third of Lexington County including Swansea, West Columbia, and Irmo experiences a medium-high, and in some areas high, heat hazard threat levels or 24 to 26+ days of heat a year (Figure 98). This results in medium heat hazard risk scores in the entire west-central region including Lexington, Irmo, Gaston, Pine Ridge, and West Columbia when combined with their high levels of composite

vulnerability (Figure 98). The rest of the county excluding Chapin experiences at least a medium-low risk score.

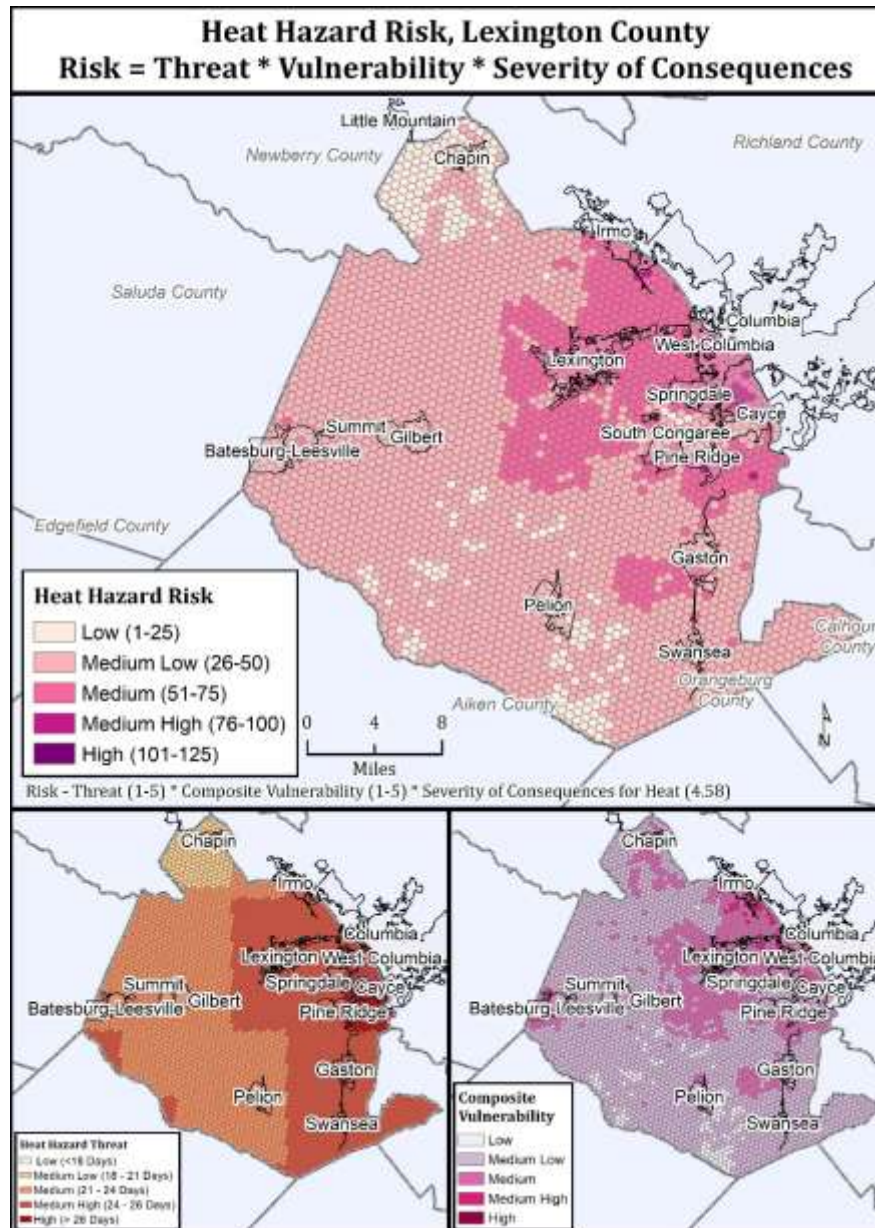


Figure 98 - Risk of hot weather in Lexington County.

K) Wildfires

While high areas of wildfire hazard threats exist in the entire county, there is a distinctly higher concentration of them in the middle and bottom thirds of the county, with a noticeable cluster between Pelion and Lexington (Figure 99). This overlaps with some areas of higher composite vulnerability to create several pockets of medium-low wildfire hazard risk score areas around Lexington and Pine Ridge, with the rest of the county scoring low on the scale (Figure 99).

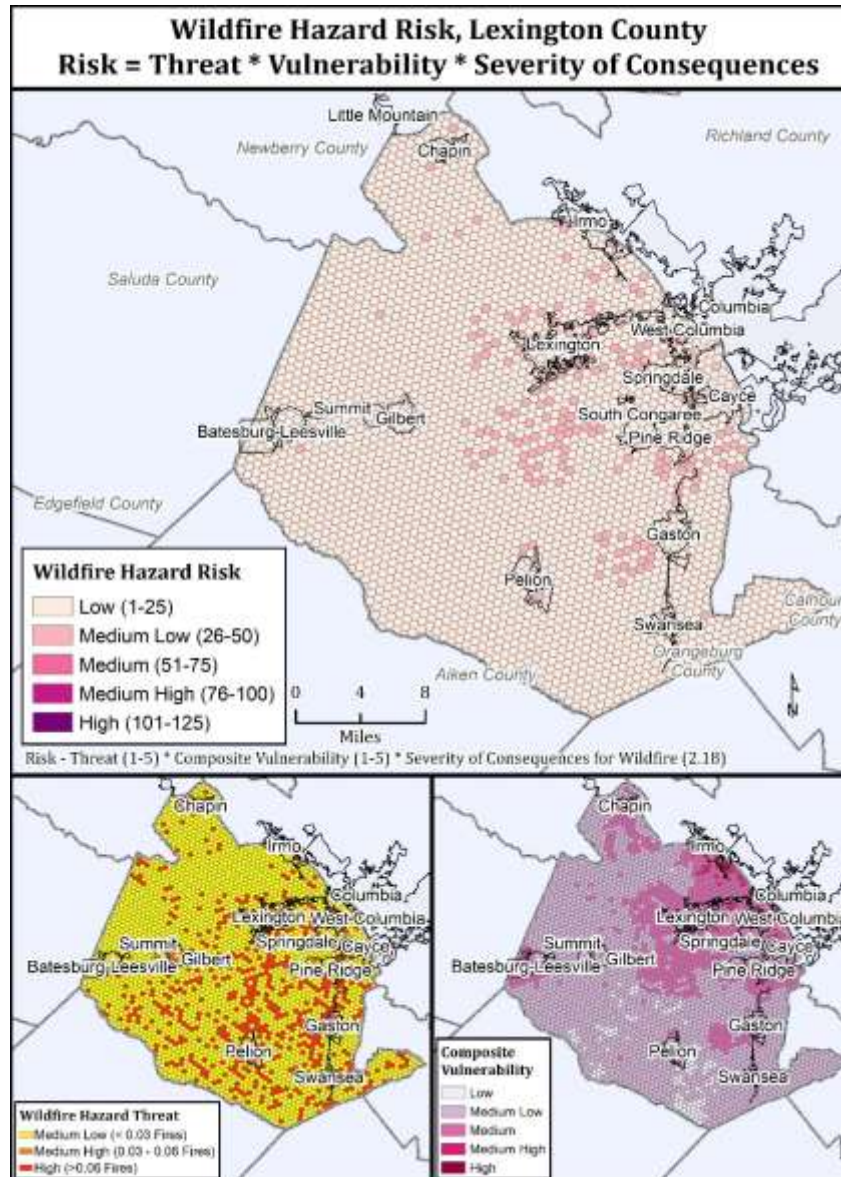


Figure 99 - Risk of wildfires in Lexington County.

L) Droughts

There are four distinct regions of higher than low drought hazard risk scores in Lexington County: in and around the Towns of Irmo, Chapin, Lexington, and Batesburg-Leesville (Figure 100). This is due to the regions in Lexington County with higher drought hazard threat levels (17+ weeks) curving mostly around areas with higher composite vulnerability except for the four towns mentioned earlier (Figure 100). The only area that has a medium drought hazard risk score is south of Irmo, due to medium drought threat and high composite vulnerability (Figure 100).

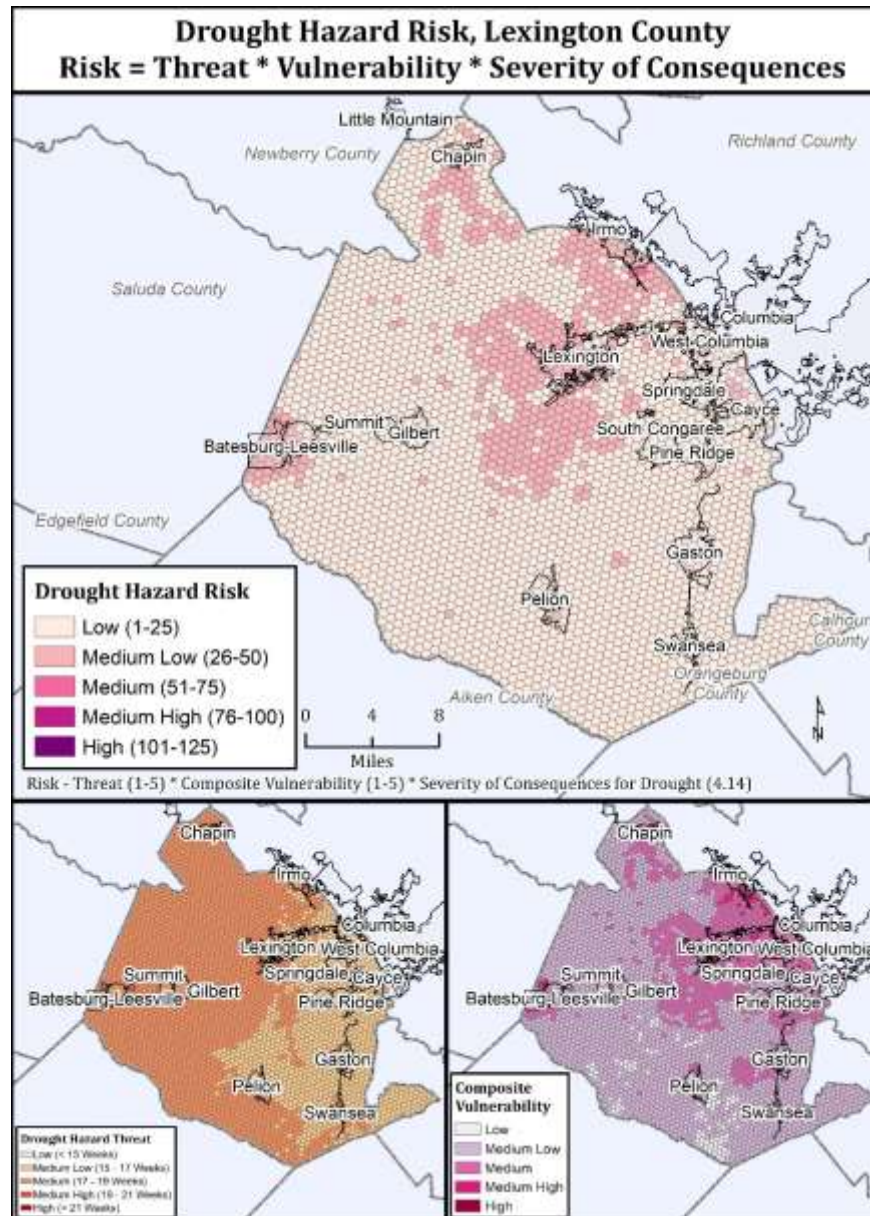


Figure 100 - Risk of drought in Lexington County.

M) Earthquakes

Most of Lexington County experiences at least medium earthquake hazard threat levels, with the extreme west-central region near Batesburg-Leesville having a medium-low level and the southeastern tip of the county near Swansea having a high threat level (Figure 101). While much of the medium hazard threat overlaps with higher composite vulnerability areas, earthquakes happen infrequently enough to result in most of the county scoring low on the earthquake hazard risk scale, with very few areas having a higher score (Figure 101).

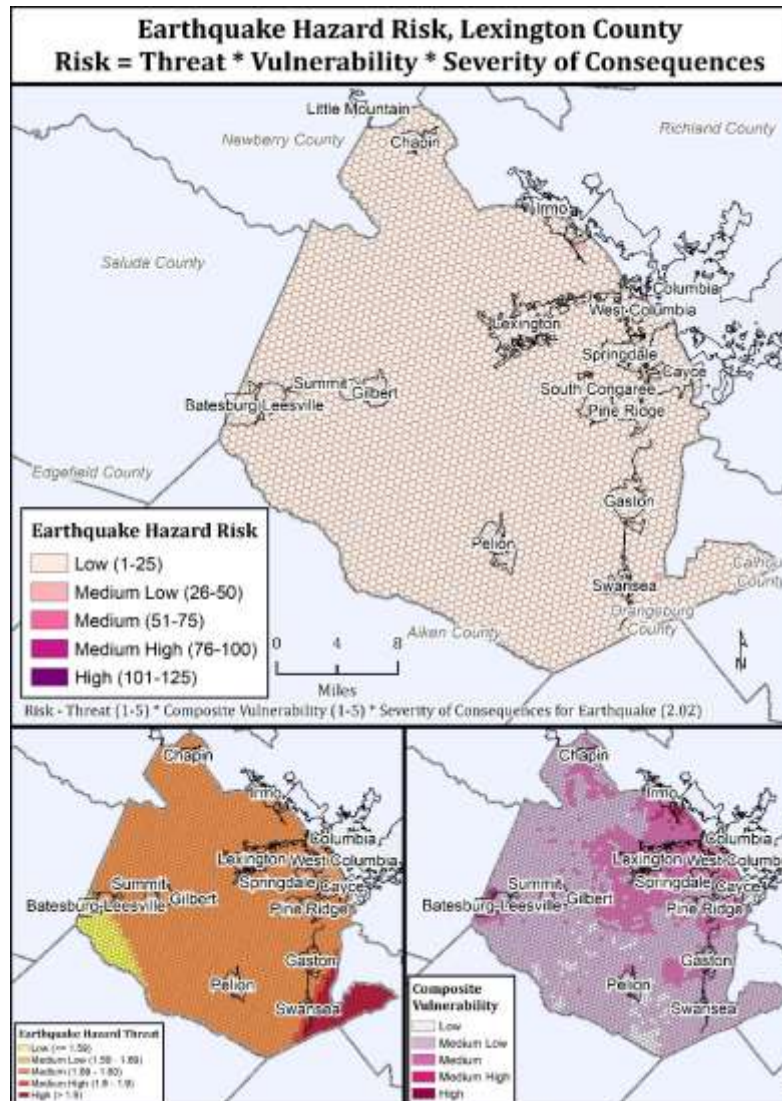


Figure 101 - Risk of earthquakes in Lexington County.

According to the South Carolina Geological Survey, the worst-case scenario for Lexington County is a combination of the 1886 Charleston and the 1913 Union earthquake, which would equate to an intensity category VIII (severe)⁴⁹. If the 1886 Charleston earthquake were to occur today (Figure 103), about 80% of buildings would survive undamaged in Lexington County. About 6,829 buildings would be damaged moderately (6% of the county's building stock) with an estimated property damage of \$459 million (60% of it stemming from residential). Most of the damage would occur in northeastern Lexington County

⁴⁹ SCGS, Projected Earthquake Intensities for South Carolina, Educational Series #7a. Available at <http://www.dnr.sc.gov/geology/images/Equake%20intens1-pg.pdf>

around Irmo, Lexington, and West Columbia (Figure 103). All of the critical infrastructure would be at least 50% operational within a day. The modelled earthquake's most devastating impact area would encompass some of Lexington County's most vulnerable population, with peak ground acceleration exceeding 1.69 m/s^2 in areas around West Columbia and Swansea (Figure 102). All estimates were derived using HAZUS-MH 2.2.

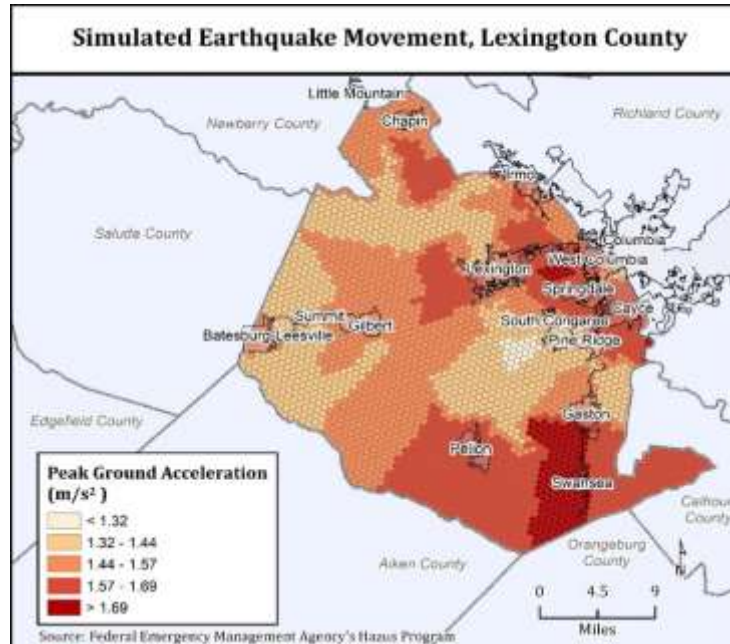


Figure 102 - Peak ground acceleration in Lexington County from a modelled 6.8 earthquake.

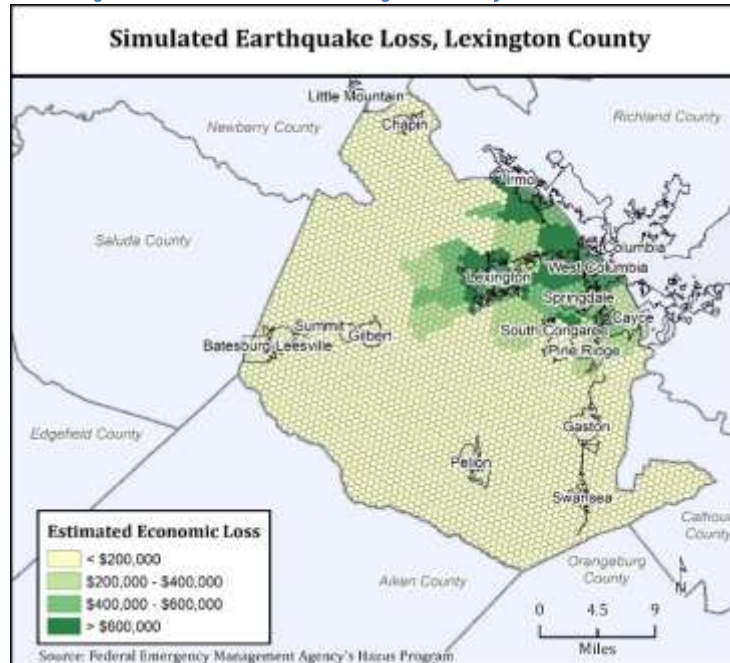


Figure 103 - Damage in Lexington County from a modelled 6.8 earthquake.

Lexington County Risk Assessment Summary

This section addresses
FEMA HMP requirement
201.6(c)(2)(ii)

As detailed in the *Risk Assessment Methodology* section of the Plan, the information generated by the hazard threat assessment, the vulnerability assessment and the severity of consequence assessment provide the input for the overall risk assessment for Lexington County (Equation 2).

When overlaying local hazard threats, vulnerabilities, and severity of consequences, Lexington County has an overall medium level of composite hazard risk (Figure 104). There are a few areas in southwestern Lexington County with low composite risk, due to low composite vulnerability in those areas (Figure 104). There are also areas of medium-high and high levels of composite risk in and around Batesburg-Leesville, Irmo, Lexington, West Columbia, and Cayce (Figure 104).

$$RISK_{HAZ} = (THR_{HAZ})(VUL)(CON_{HAZ}) \quad (2)$$

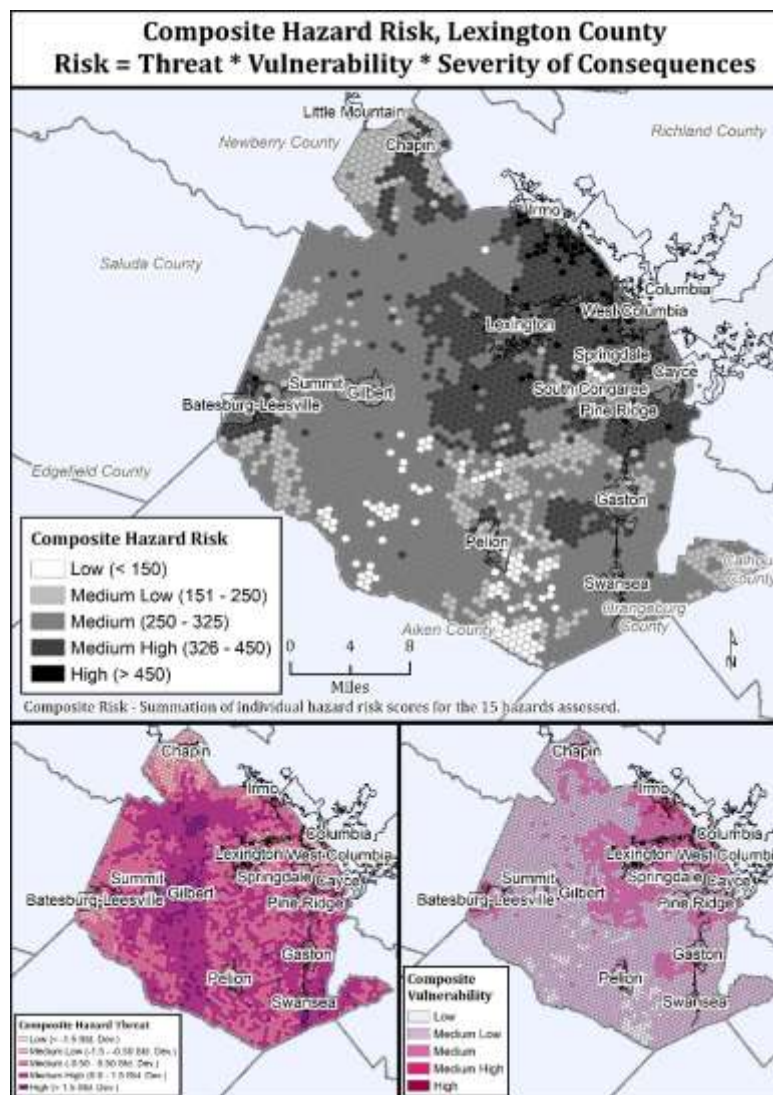


Figure 104 - Overall composite risk map of Lexington County considering all hazard threats, vulnerabilities, and severity of consequences.

In terms of risk assessment by hazard type, Table 51 summarizes the assessment criteria and rating values.

Categories of Risk by Hazard Type

While the composite risk map (Figure 104) shows the spatial distribution of various risk levels across Lexington County, Table 52 breaks down the overall risk for each hazard assessed in this Plan. The information contained in Table 52 summarizes the numerous input metrics to quantify the overall risk for each hazard. Overall risk for each hazard is expressed in qualitative terms as detailed in Table 51. The high-risk hazards in Lexington County are hurricanes and tropical storms, tornadoes, heat, flash floods, and severe thunderstorms (Table 52).

Table 51 - Assessment criteria and values.

Geographical Extent	Vulnerability	Severity of Consequence	Future Climate Impacts	Probability of Future Occurrence	Historical Damage	Magnitude and Severity	Overall Risk Rating
Isolated	Low	Minor	Unlikely to worsen	Infrequent	Minor	Low	Low
Scattered	Medium	Moderate	Somewhat likely to worsen	Occasional	Major	Medium	Medium
Widespread	High	Severe	Likely to worsen	Likely	Extensive	High	High

The effectiveness and acceptance of hazard mitigation strategies depends on a community's risk awareness and risk perception. Therefore, we are including the survey results conducted by the CMCOG in October 2020 revealing the perceived mitigation priorities by residents of the Central Midlands region. The survey gauged hazard awareness, preparedness and impacts of residents in the Central Midlands region (see Appendix I for more information). The perceived risk highlights the overlaps and/or discrepancies between the objective risk (as developed in the hazard and vulnerability assessments) and subjective risk (as expressed by Central Midlands' residents).

The spatial risk assessment as well as the risk posed by an individual hazard form the basis for the development of mitigation strategies and prioritization (see Lexington County Mitigation Strategies in [Section 5.8](#)).

Table 52 - Overall risk assessment for Lexington County.

Perceived Risk	Hazard	Geographic Extent of Hazard Threat (THR)	Vulnerability (VUL)	Severity of Consequence (CON)	Severity of Consequence (CON) subcomponents				Overall Risk
					Future Climate Impacts		Historical Impacts	Priority Hazards ⁵⁰	
Less Important	Winter Weather	Scattered	Medium	Moderate	Unlikely to worsen	↔	Minor	High	Medium
Somewhat Important	Extreme Heat	Widespread	High	Severe	Likely to worsen	↑↑	Minor	High	High
Somewhat Important	Droughts	Widespread	Medium	Severe	Likely to worsen	↑↑	Minor	High	Medium
Somewhat Important	Tornadoes	Isolated	Low	Severe	Somewhat likely to worsen	↑	Extensive	High	High
Somewhat Important	Tropical Storms	Widespread	High	Moderate	Likely to worsen	↑↑	Minor	Medium	High
Somewhat Important	Wind	Isolated	Low	Moderate	Somewhat likely to worsen	↑	Extensive	Medium	Medium
Less Important	Extreme Cold	Widespread	Medium	Moderate	Unlikely to worsen	↔	Major	Medium	Low
Least Important	Earthquakes	Widespread	High	Moderate	Somewhat likely to worsen	↑	Minor	Medium	Low
Somewhat Important	Flash Floods	Widespread	High	Severe	Likely to worsen	↑↑	Extensive	Low	High
Somewhat Important	Lightning	Widespread	Medium	Moderate	Somewhat likely to worsen	↑	Extensive	Low	Medium
Less Important	Hail	Isolated	Low	Moderate	Somewhat likely to worsen	↑	Minor	Low	Low
Somewhat Important	Thunderstorms	Widespread	Medium	Severe	Likely to worsen	↑↑	Extensive	Low	High
Less Important	Fog	Widespread	High	Minor	Unlikely to worsen	↔	Minor	Low	Low
Least Important	Wildfires	Isolated	Low	Moderate	Likely to worsen	↑↑	Minor	Low	Medium
Somewhat Important	Riverine Floods	Scattered	Low	Moderate	Likely to worsen	↑↑	Minor	Low	Medium

⁵⁰ CMCOG 2016 Hazard Mitigation Plan - <http://www.centralmidlands.org/pdf/CMHMP%202016%20-%20Final.pdf>

An important aspect of risk assessment is identifying available resources that a jurisdiction has to respond to and mitigate natural hazard events. Table 53 identifies emergency services and adopted ordinances available to each municipality in Lexington County.

**This section addresses
FEMA HMP requirement
201.6(c)(3)**

Table 53 - Services and Development Related Ordinances in Lexington County.

Name of Jurisdiction	Fire Service	Police Service	Emergency Medical Service	Adopted Zoning Ordinance	Adopted Comprehensive Land Development Regulations	Adopted Building Codes	Participates in National Flood Insurance Program
Lexington County	Provided by County Fire Service from stations throughout the county	Provided by County Sheriff's Department	EMS provided by Lex. County countywide	Yes	Yes	Yes	Yes
Lexington	Provided by County Fire Service	Provides own police protection	"	Yes	Yes	Yes	Yes
West Columbia	Provided by the city fire department	Provides own police protection	"	Yes	Yes	Yes	Yes
Cayce	Provided by the city fire department	Provides own police protection	"	Yes	Yes	Yes	Yes
Irmo	Provided by Irmo-Chapin Fire Distr.	Provides own police protection	"	Yes	Yes	Yes	Yes
Chapin	Provided by Irmo-Chapin Fire District	Provides own police protection	"	Yes	Currently on the 10 year Update Cycle	Yes	Yes
Gilbert	Provided by County Fire Service	Provided by County Sheriff's Department	"	Yes	Yes	Yes	Yes
Springdale	Provided by County Fire Service	Provides own police protection	"	Yes	Yes	Yes	Yes
Batesburg-Leesville	Provided by County Fire Service	Provides own police protection	"	Yes	Yes	Yes	Yes

The National Flood Insurance Program (NFIP) aims to reduce the impact of flooding on private and public structures (FEMA, 2016). Actions taken towards reducing flood hazard risk provide a compounding discount on flood insurance to residents in flood prone areas. The program tracks Repetitive Loss Properties (RLP) and Severe Repetitive Loss Properties (SRLP), which are properties that have made multiple flood insurance claims. This information is valuable to planners as it aids in allocating flood mitigation strategies.

Table 68 - Number of Lexington County Repetitive Loss Properties.

Building Type	Number of Properties
Residential	10

Table 68 shows the number and building type of RLP and SRLP in Lexington County. The County participates in both the NFIP and Community Rating System (CRS). The County also has a designated Special Flood Hazard Area (SFHA). Through public outreach efforts, flood mitigation planning and enforcing zoning and building codes, Lexington County residents are provided with an automatic 10% discount on flood insurance premiums.

Capability Changes since the 2016 HMP

- Town of Chapin
 - Currently undergoing a Land Development Regulation update, including flooding mitigation strategies.

5.5 Lexington County Mitigation Goals and Objectives

The following are general hazard mitigation goals and objectives utilized by stakeholders. These serve as broad mission statements and help guide planners in making decisions that safeguard the life and property of Lexington County citizens.

**This section addresses
FEMA HMP requirement
201.6(c)(3)(i)**

1. Develop better data for the community relating to type, impact, location, and cost of the natural disaster mitigation strategies occurring in the area.
2. Increase the community's capacity to initiate and sustain emergency response operations during and after a natural disaster, thereby mitigating effects of hazardous events.
3. Enhance existing, or design new, policies and/or programs in the community to reduce the potential damaging effects of hazards without hindering other community goals or impeding hazard mitigation programming in the county.
4. Protect the most vulnerable populations, buildings, and critical facilities in the town through the implementation of cost-effective, environmentally sound, and technically feasible mitigation projects.
5. Protect the public health, safety, and welfare by increasing public awareness and understanding of hazards and by fostering both individual and public responsibility in the mitigation of risks through available techniques that minimize vulnerability to those hazards.
6. Increase understanding of all residents in the community about the natural hazards threatening local areas and techniques available to minimize vulnerability to those hazards.
7. Maintain the economic vitality of the community in the face of natural disasters.
8. Promote the security of homes, institutions, and places of employment throughout the community that are considered vulnerable to natural disasters.
9. Promote that the availability and function of community infrastructure will not be significantly disrupted by a natural disaster.
10. Inventory, map and assess all flood plain structures and properties that are or may be repetitive loss properties.

5.6 Lexington County Federally-Supported Mitigation Portfolio

Since 2000, Lexington County has largely received federal mitigation dollars post-disaster, i.e. after a declared disaster through the Hazard Mitigation Grant Program. Funds for pro-active mitigation have been limited to hazard mitigation planning.

Table 54: Lexington County portfolio of federally-supported hazard mitigation projects.

Mitigation Category	HMGP	PDM	FMA	Amount	Mitigation Category	HMGP	PDM	FMA	Amount
Property Acquisition and Structure Demolition (200.x)					Soil Stabilization (300.x, 301.x)	x			\$16,916
Property Acquisition and Structure Relocation (201.x)					Wildfire Mitigation (205.1/2, 300.2, 300.8, 304.1)				
Structure Elevation (202.x)					Post-Disaster Code Enforcement (104.1), Professional Education (101.1)				
Wet Floodproofing (203.x)					Advance Assistance (904.1)				
Mitigation Reconstruction (207.x)					5 Percent Initiative Projects				
Dry Floodproofing (204.x)					Aquifer and Storage Recovery (403.6)				
Generators (601.x, 602.x)	x			\$585,000	Flood Diversion and Storage (403.5, 403.8)				
Localized Flood Risk Reduction Projects (403.1-403.4, 404.1, 405.1)					Floodplain and Stream Restoration (303.1-303.3)				
Non-localized Flood Risk					Green Infrastructure (403.7)				

Mitigation Category	HMGP	PDM	FMA	Amount	Mitigation Category	HMGP	PDM	FMA	Amount
Reduction Projects (500.x, 501.1)									
Wind Retrofitting of Existing Buildings (205.7, 205.8)					Miscellaneous/Other (100.1, 106.1, 800.1)	x			\$112,861
Non-structural Retrofitting of Existing Buildings and Facilities (205.3, 205.4)					Hazard Mitigation Planning	x	x	x	\$322,692
Safe Room Construction (206.x)					Technical Assistance (701.x)				
Infrastructure Retrofit (400.x-402.x)					Management Costs (700.x)	x			\$194,392
Feasibility and Design Studies (103.x) Applied R&D (105.1)					Warning Systems (600.1)	x			\$535,451

Note: Hazard mitigation planning costs have been generally shared with Fairfield, Lexington, and Newberry counties as part of planning activities as supported by the Central Midlands Council of Governments. Project costs for multi-county projects (e.g., planning) were reported as is and no county-share was calculated.

This section addresses FEMA
HMP requirement
s201.6(c)(3)(ii), 201.6(c)(3)(iii),
and 201.6(c)(3)(iv)

5.7 Lexington County Mitigation Strategies

Table 55 - Unincorporated Lexington County Mitigation Strategies.

Unincorporated Lexington County								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Improved suppression response (tankers, dry chemicals)	Forest Fire/Wildfires	Lexington County	1	2 & 7	Capital Improve. Budget	\$250,000 to \$750,000	Ongoing	Ongoing
Regulate open burning by permit (Red flag alerts)	Forest Fire/Wildfires	Lexington County		3 & 8	Operating budget	<\$250,000	Ongoing	Ongoing
Fire Code enforcement/inspections	Forest Fire/Wildfires	Lexington County	1	2 & 5	Operating budgets	<\$250,000	Ongoing	Ongoing
Construct dry hydrant program in rural areas of county	Forest Fire/Wildfires	Lexington County	1	2, 3 & 7	Capital Improve. Budgets or Grants	\$250,000 to \$750,000	Ongoing	Ongoing
Use GIS capacity to map, record wildfires, all hazard events	Forest Fire/Wildfires	Lexington County	1	10	Operating Budget	<\$250,000	Duplicate Action	
Enforce county zoning & stormwater ordinances to restrict development in flood-plains	Flooding	Lexington County	1	2 & 5	Operating Budget	<\$250,000	Ongoing	Ongoing
Declare May of each year to be Flood Awareness Month	Flooding	Lexington County	2	2 & 5	Operating Budget	<\$250,000	Ongoing	Ongoing
Coordinate with other local gov'ts in county to make stream channel imp.	Flooding	Lexington County/ municipalities in county	3	2 & 7	Capital Improve. Budgets	<\$250,000	Ongoing	Ongoing
Replace structurally obsolete bridges	Flooding	Lexington County/ towns/ SCDOT	2	2 & 7	Capital Improve. Budgets	\$750,000>	Deferred due to funding	Ongoing
Identify & contact all repetitive loss properties	Flooding	Lexington County/ towns in county	1	5 & 10	Operating Budgets	<\$250,000	Ongoing	Ongoing
Ensure that the FEMA Elevation Certificate is properly completed before issuance on property in flood areas	Flooding	Lexington County/ towns in county	1	2, 5 & 10	Operating Budgets	<\$250,000	Ongoing	Ongoing
Undertake Planning to improve Community Rating System Ranking	Flooding	Lexington County/ towns in county	1	2, 5 & 10	Operating Budgets	<\$250,000	Ongoing	Ongoing
Maintain status in the NFIP	Flooding	Lexington County	1	2, 4, 5, 7 & 10	Operating Budget	<\$250,000	Ongoing	Ongoing
Power line easement clearance	Winter Snow & Ice Storms	Lexington County/ Dominion Energy Elect. Coops.	1	2 & 7	Electric utility providers	<\$250,000	Ongoing	Ongoing

Unincorporated Lexington County								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Debris removal and road clearance work	Winter Snow & Ice Storms	Lexington County Public Works and S. C. DOT	1	2 & 7	Lexington County Public Works & SCDOT Operating Budgets	<\$250,000	Ongoing	Ongoing
Use bus and van transit system for emergency shelters, evacuation & communication capacity	Winter Snow & Ice Storms	Central Midlands Transit System/ DART system, etc.	1	4 & 7	CMRTA and DART budgets	<\$250,000	Ongoing	Ongoing
Procure and use elec. generators at critical facilities	Winter Snow & Ice Storms	Lexington County/ school dist. cities/ recreation comm.	1	2 & 7	Capital Improve. budgets or operating budgets if rental	\$250,000 to \$750,000	Ongoing	Ongoing
Install surge protectors in critical facilities	Thunderstorms (Hail, Wind, Lightning)	Lexington County & School Districts & cities	1	2 & 7	Capital Improve. Budgets	\$250,000 to \$750,000	Ongoing	Ongoing
Adopt procedure to suspend operations in elec. storms	Thunderstorms (Hail, Wind, Lightning)	Lexington County	2	2, 4 & 5	Operating Budget	<\$250,000	Ongoing	Ongoing
Clear power line and utility easements of debris	Thunderstorms (Hail, Wind, Lightning)	Dominion Energy/ Elec. Coops	1	2 & 7	Public Works Operating Budgets	<\$250,000	Ongoing	Ongoing
Remove taller trees near critical facilities	Thunderstorms (Hail, Wind, Lightning)	Lexington County & Coops Dominion Energy	2	2 & 7	Public Works Operating Budget	<\$250,000	Ongoing	Ongoing
Develop portable water treatment facilities	Hurricanes	Lexington Joint Municip./ City Utilities/Columbia	2	2 & 7	Capital Improve. Budget	\$250,000 to \$750,000	Ongoing	Ongoing
Replace water storage tanks and pumps as needed	Hurricanes	Water providers in county	2	2 & 7	Capital Improve. Budgets	\$250,000 to \$750,000	Ongoing	Ongoing
Add capacity at solid waste disposal facilities serving the county to handle more debris	Hurricanes	Lexington County and solid waste contractors	2	2 & 7	Capital Improve. Budgets	\$250,000 to \$750,000	Ongoing	Ongoing
"Harden" utility services especially in highly vulnerable areas	Tornados	Lexington County	1	2 & 7	Capital Improve. Budget	\$250,000 to \$750,000	Deferred due to funding	Deferred
Conduct engineering strength studies of critical facilities	Tornados	Lexington County	1	2 & 4	Capital Improve. Budget	\$250,000 to \$750,000	Ongoing	Ongoing
Emergency response chain	Tornados	Lexington County/	1	2 & 7	Capital Improve.	<\$250,000	Ongoing	Ongoing

Unincorporated Lexington County								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
saw project and other efforts to remove debris		Dominion Energy/Elect. Coops SCDOT & towns in county			Budgets			
Install safe rooms in critical facilities especially those with vulnerable populations	Tornados	Lexington County	2	2 & 7	Capital Improve. Budget	\$250,000 to \$750,000	Ongoing	Ongoing
Establish GIS mapping of all hazard events by location, effect, and time	Tornados	Lexington County, West Columbia/Cayce & other municip.	3	10	Capital Improve. Budgets	<\$250,000	Ongoing	Ongoing
Conduct earthquake impact analysis on critical facilities in Lexington County	Earthquake	Lexington County/ City of West Columbia/Cayce	1	2 & 4	Public Works Depts. Capital Budgets	<\$250,000	Ongoing	Ongoing
Work with Dominion Energy to ensure that the Lake Murray Dam withstands future events	Earthquake	Lexington County and Dominion Energy	1	2 & 4	Operating Budget	<\$250,000	Ongoing	Ongoing
Ensure that warning system works for rapid evacuation from lands downstream of Lake Dam	Earthquake causing dam failure	Dominion Energy	1	2 & 4	Operating Budget	<\$250,000	Ongoing	Ongoing
Develop clearly marked and explained evacuation routes for dam failure	Earthquake causing dam failure	Lexington County/ City of West Columbia/Cayce & Dominion Energy	1	2 & 4	Operating Budgets	<\$250,000	Ongoing	Ongoing
Develop speakers bureau about earthquake and other natural disaster threats to the county	Earthquake	Lexington County/ Dominion Energy towns cities	1	2, 4 & 5	Operating Budget	<\$250,000	Ongoing	Ongoing
Implement Emergency Notification System to affected earthquake area	Earthquake	Lexington County	2	2 & 4	Capital Budget	<\$250,000	Ongoing	Ongoing
Develop and publicize water conservation practices to respond to drought declarations	Drought	Lexington County/ Towns in County	1	5	Operating Budget	<\$250,000	Ongoing	Ongoing
Amend state drought legislation to stiffen penalties & clarify laws	Drought	S. C. General Assembly	3	5	Operating Budget	<\$250,000	No action, this is not a local issue	
Develop and publicize water conservation practices to respond to drought	Drought	Lexington County/ Towns in County	1	5	Operating Budget	<\$250,000	Ongoing	Ongoing

Unincorporated Lexington County								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
declarations								
Add to surface water reservoirs and resources in the county	Drought	Lexington County/ Towns in County	2	2 & 4	Capital Budgets	\$750,000>	Ongoing	Ongoing

Mitigation Action Update for the Lexington County since the 2016 HMP

- No natural hazard mitigation activities implemented, or changes provided to their mitigation strategy list.

Table 56 - City of West Columbia Mitigation Strategies.

City of West Columbia								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Improve early warning system in the city for wind events	Tornado	City of West Columbia	1	2 & 7	CIP		Remove, service is provided by others	Removed
Install safe rooms in critical facilities, especially those with vulnerable populations	Tornado	City of West Columbia	2	2 & 4	CIP		Deferred due to funding	2025
"Harden" utility services especially in highly vulnerable areas	Tornado	City of West Columbia, Dominion Energy	1	2, 7 & 8	CIP		Deferred due to funding	2025
Conduct engineering strength studies of critical facilities	Tornado	City of West Columbia, Lexington County	1	2 & 9	Operating budget		Deferred due to funding	2025
Emergency response chainsaws and other efforts to remove debris	Tornado	City of West Columbia, Lexington County, Dominion Energy, SCDOT	1	2 & 7	Operating budget	\$1,500 per year	As needed	Ongoing
Identify and contact all repetitive loss properties	Flooding	City of West Columbia	2	4, 5, 6, 7, 8 & 10	Operating budget		Deferred due to funding	2025
Ensure that FEMA elevation certificate is properly completed before issuance of permit on property in flood area	Flooding	City of West Columbia	1	5, 6 & 8	Operating budget		Ongoing	Ongoing

City of West Columbia								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Undertake planning to participate in the Community Rating System	Flooding	City of West Columbia	3	5, 6 & 8	Operating budget		Deferred	2025
Maintain status in the NFIP	Flooding	City of West Columbia	1	2, 4, 5, 7 & 10	Operating budget		Ongoing	Ongoing
Power line easement clearance	Winter Snow and Ice Storms	Dominion Energy	1	2 & 7	Operating budget		Ongoing	Ongoing
Debris removal and road clearance work	Winter Snow and Ice Storms	City of West Columbia	2	2 & 7	Operating budget		As needed	Ongoing
Procure and use electric generators at critical facilities	Winter Snow and Ice Storms	City of West Columbia, Lexington County, School District	3	2, 7 & 9	CIP		Completed	Completed
Remove taller trees near critical facilities	Thunderstorms (hail, wind, lightning)	City of West Columbia, Dominion Energy	2	2, 7 & 9	Operating budget		Completed	Completed
Install surge protectors in critical facilities	Thunderstorms (hail, wind, lightning)	City of West Columbia, Dominion Energy, School District	3	2, 4, 7 & 9	CIP		Partially completed	2025
Adopt procedures to suspend operations during lightning storms	Thunderstorms (hail, wind, lightning)	City of West Columbia	3	2, 4, 7 & 9	Operating budget		Deferred	2020
Replace water storage tanks and pumps as needed	Hurricane	City of West Columbia	1	2, 4, 5 & 7	CIP		Deferred due to funding	Ongoing
Provided mobile backup generators for critical facilities	Hurricane	City of West Columbia, Lexington County, School District	2	2, 4, 7 & 9	CIP or operating budget if rentals		Completed	Completed
Publicize National Hurricane Awareness week annually	Hurricane	City of West Columbia	3	4, 5 & 6	Operating budget		Ongoing	Ongoing

Table 57 - City of Cayce Mitigation Strategies.

City of Cayce								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Extend warning siren system for Lake Murray Dam to Cayce	Flooding	Dominion Energy	1	4 & 5	Capital Improve. Budget	\$250,000 to \$750,000	Joined Countywide alert system	Deferred
Enforce city zoning to restrict development in flood-plains	Flooding	City of Cayce	1	4 & 5	Operating Budget	< \$250,000	Ongoing	Ongoing
Declare May of each year to be Flood Awareness Month	Flooding	City of Cayce	2	5	Operating Budget	< \$250,000	Deferred due to funding	Deferred
Use Cayce's GIS system to track all structures and demolition permits in flood areas	Flooding	City of Cayce	2	10	Operating Budget	< \$250,000	Ongoing	Ongoing
Coordinate with other local gov'ts in county to make stream channel improvement	Flooding	Cayce/ W. Cola. Lexington County	3	2, 4 & 7	Capital Improve. Budgets	< \$250,000	Ongoing	Ongoing
Identify & contact all repetitive loss properties	Flooding	City of Cayce	1	5	Operating Budget	< \$250,000	Ongoing	Ongoing
Ensure that the FEMA Elevation Certificate is properly completed before issuance on property in flood areas	Flooding	City of Cayce	1	5	Operating Budget	< \$250,000	Ongoing	Ongoing
Undertake Planning to participate in Community Rating System	Flooding	City of Cayce	1	5	Operating Budgets	< \$250,000	Deferred due to funding	Ongoing
Procure and use elec. generators at designated critical facilities	Flooding	City of Cayce/ Lex. County. School District	3	2 & 9	Capital Improve. budgets or operating budgets if rentals	\$250,000 to \$750,000	Ongoing as funding permits	Ongoing
Conduct information meetings in flood prone areas informing citizens of the hazards or flooding and what they can do to prepare	Flooding	City of Cayce	2	2 & 7	Operating budget	< \$250,000	Deferred due to funding	Ongoing

City of Cayce								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Maintain status in the NFIP	Flooding	City of Cayce	1	2, 4, 5, 7 & 10	Operating Budget	<\$250,000	Ongoing	Ongoing
Clear public lands as needed near critical facilities	Forest Fires/ Wild Fire	City of Cayce/ Lexington County/School districts	1	2, 4, 5 & 7	Public Works Operating Budgets	<\$250,000	Ongoing	Ongoing
Conduct detailed assessments of wild fire risks for critical facilities	Forest Fires/ Wild Fire	City of Cayce	1	2, 4, 5 & 7	Cayce Public Works Dept. Capital Budget	<\$250,000	Deferred due to funding	Deferred
Use GIS capacity to map, record all fire events	Forest Fires/ Wild Fire	City of Cayce	1	2, 4, 5 & 7	Capital Improve. Budget	<\$250,000	Ongoing	Ongoing
Improve early warning system in Cayce for wind events	Tornados	City of Cayce	1	2 & 7	Capital Improve. Budget	<\$250,000	Joined Countywide alert system	Ongoing
Install safe rooms in critical facilities especially those with vulnerable populations	Tornados	City of Cayce	2	2 & 7	Capital Improve. Budget	\$250,000 to \$750,000	Deferred due to funding	Ongoing
"Harden" utility services especially in highly vulnerable areas	Tornados	City of Cayce/ Dominion Energy	1	2 & 7	Capital Improve. Budgets	\$250,000 to \$750,000	Deferred due to funding	Ongoing
Conduct engineering strength studies of critical facilities	Tornados	Cayce/ Lexington County/ School district	1	2 & 4	Capital Improve. Budgets	<\$250,000	Deferred due to funding	Ongoing
Emergency response chain saw project and other efforts to remove debris	Tornados	Cayce/ Lexington County/ Dominion Energy/Elect./ SCDOT	1	2 & 7	Capital Improve. Budgets	<\$250,000	Deferred due to funding	Deferred
Debris removal and road clearance work	Winter Snow & Ice Storms	City of Cayce Public Works and SCDOT	1	2 & 7	Cayce Public Works & SCDOT Operating Budgets	<\$250,000	Ongoing	Ongoing
Procure and use elec. generators at critical facilities	Winter Snow & Ice Storms	Cayce/ County/ School district	3	2 & 7	Capital Improve. budgets or operating budget if rental	\$250,000 to \$750,000	Ongoing and now codified (see Action Update)	Ongoing
Remove taller trees near critical facilities	Thunder-storms (Hail, Wind, Lightning)	City of Cayce & Dominion Energy	2	2 & 7	Public Works Operating Budget	<\$250,000	Removed from plan	Removed from plan
Install surge protectors in critical facilities	Thunder-storms (Hail, Wind, Lightning)	City of Cayce & Lexington School Dist. 2/ Lexington County	1	2, 4 & 7	Capital Improve. Budgets	\$250,000 to \$750,000	Ongoing and now codified (see Action Update)	Ongoing
Adopt procedure to suspend operations during lightning storms	Thunder-storms (Hail, Wind, Lightning)	City of Cayce	2	2 & 4	Operating Budget	<\$250,000	Deferred due to funding	Deferred

City of Cayce								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Develop and publicize water conservation practices to respond to drought declarations	Drought	City of Cayce	1	5	Operating Budget	<\$250,000	Implemented through Utilities website	Ongoing
Amend state drought legislation to stiffen penalties & clarify laws	Drought	SC General Assembly	3	1, 5 & 6	Operating Budget	<\$250,000	Deferred	Deferred
Brush clearing equipment, including a skid steer and lift	Wildfire	City of Cayce Utilities	2	2 & 7	Public Works Operating Budget	\$70,000	New	Deferred

Mitigation Action Update for City of Cayce since the 2016 HMP:

- Joined the Lexington County "Code RED" emergency alert system
- City of Cayce Utilities now publicizes water conservation information through their webpage
- Lightning arresters are being installed throughout most critical facilities
- City of Cayce coordinates with lumber companies to harvest trees near critical facilities and collects a portion of the revenue.
 - The action "Remove taller trees near critical facilities" is now considered redundant due to the inclusion of the "Clear public lands as needed near critical facilities" action. The former has been removed from the list.

Table 58 - Town of Lexington Mitigation Strategies.

Town of Lexington								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Plan to improve early warning notification system (sirens, etc.) =	Tornados	Town of Lexington/ Lexington County	1	2, 4, 5 & 7	Operating Budgets	<\$250,000	Deferred due to funding	Deferred
Improve EMS, Fire, Police training for hazard resp.	Tornados	Town of Lexington/ Lexington County	1	2, 4, 5 & 7	Operating Budgets	<\$250,000	Ongoing	Ongoing
Conduct engineering strength studies of critical facilities	Tornados	Town of Lexington	1	2, 4, 5 & 7	Capital Improve. Budget	\$250,000 to \$750,000	Deferred due to funding	Ongoing
Emergency response chain saw project and other efforts to remove debris	Tornados	Town of Lexington/ Lexington County	1	2, 4, 5 & 7	Capital Improve. Budgets	<\$250,000	Deferred due to funding	Deferred
Install safe rooms in critical facilities especially those serv. vulnerable populations	Tornados	Town of Lexington	1	2, 4, 5 & 7	Operating. Budget	\$250,000 to \$750,000	Deferred due to funding	Deferred

Town of Lexington								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Use identified public buildings as emergency shelters	Hurricanes	Town of Lexington	2	2, 4, 5 & 7	Operating Budget	<\$250,000	Ongoing	Ongoing
Rebuild public buildings damaged by hurricane event	Hurricanes	Town of Lexington	2	2, 4 & 7	Capital Improve. Budget	\$250,000 to \$750,000	Deferred due to funding	Deferred
Power line easement clearance	Winter Snow & Ice Storms	Town of Lexington/ Lexington County/ Dominion Energy	1	2, 4 & 7	Capital Improve. Budgets	<\$250,000	Ongoing	Ongoing
Debris removal and road clearance work	Winter Snow & Ice Storms	Town of Lexington/ Lexington County Public Works/ S. C. DOT	1	2, 4 & 7	Rich. County Public Works & SCDOT Operating Budgets	<\$250,000	Ongoing	Ongoing
Procure and use elec. generators at critical facilities	Winter Snow & Ice Storms	Town of Lexington	1	2, 4 & 7	Capital Improve. Budgets	\$250,000 to \$750,000	Deferred due to funding	Ongoing
Identify all critical facilities in 100-year floodplains & plan to lower flood insurance premiums	Flooding	Town of Lexington	2	2, 4 & 10	Operating Budget	<\$250,000	Deferred due to funding	Ongoing
Flood proof town critical facilities where needed	Flooding	Town of Lexington	2	2, 4 & 10	Capital Budget	\$250,000 to \$750,000	Deferred due to funding	Ongoing
Coordinate with local gov'ts in county to make critical stream channel improvement to lower flood levels	Flooding	Town of Lexington/ Lexington County Public Works/ S. C. DOT	3	2, 4 & 7	Capital Improve. Budgets	<\$250,000	Ongoing	Ongoing
Maintain status in the NFIP	Flooding	Town of Lexington	1	2, 4, 5, 7 & 10	Operating Budget	<\$250,000	Ongoing	Ongoing
Create clear zones near critical facilities to lessen threat from forest/wildfires	Forest Fire/Wildfires	Town of Lexington/ Lexington County Public Works/ S. C. DOT	1	2, 4 & 7	Capital Improve. Budget	<\$250,000	Ongoing	Ongoing
Use GIS capacity to map, record wildfires, all hazard events	Forest Fire/Wildfires	Town of Lexington/ Lexington County Public Works/ S. C. DOT	1	2, 4 & 10	Operating Budgets	<\$250,000	Ongoing	Ongoing
Develop and publicize water conservation practices to respond to drought declarations	Drought	Town of Lexington	1	5	Operating Budget	<\$250,000	Ongoing	Ongoing

Town of Lexington								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Amend state drought legislation to stiffen penalties & clarify laws	Drought	S. C. General Assembly	3	5	Operating Budget	<\$250,000	Deferred	Deferred

Mitigation Action Update for the Town of Lexington since the 2016 HMP

- No natural hazard mitigation activities implemented, or changes provided to their mitigation strategy list.

Table 59 - Town of Irmo Mitigation Strategies.

Town of Irmo								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Enforce town zoning & stormwater ordinances to restrict flood development	Flooding	Town of Irmo	1	2 & 5	Operating Budgets	<\$250,000	Ongoing	Ongoing
Declare May of each year to be Flood Awareness Month	Flooding	Town of Irmo Council	2	2 & 5	Operating Budget	<\$250,000	Deferred due to funding	Deferred
Coordinate with other local gov'ts in counties to make stream channel imp.	Flooding	Town of Irmo/ Lexington & Rich. Counties	3	2 & 7	Capital Improve. Budgets	<\$250,000	Ongoing	Ongoing
Identify & contact any repetitive loss properties	Flooding	Town of Irmo	1	5 & 10	Operating Budgets	<\$250,000	Ongoing	Ongoing
Ensure that the FEMA Elevation Certificate is properly completed before issuance on property in flood areas	Flooding	Town of Irmo	1	2, 5 & 10	Operating Budget	<\$250,000	Ongoing	Ongoing
Undertake Planning to improve Community Rating System Ranking	Flooding	Town of Irmo	1	2, 5 & 10	Operating Budget	<\$250,000	Deferred due to funding	Deferred
Maintain status in the NFIP	Flooding	Town of Irmo	1	2, 4, 5, 7 & 10	Operating Budget	<\$250,000	Ongoing	Ongoing
Emergency response chain saw project and other efforts to remove debris	Tornados	Town of Irmo/ Counties Dominion Energy/Elect. Coops SCDOT	1	2 & 7	Capital Improve. Budgets	<\$250,000	Deferred due to funding	Deferred
Establish GIS mapping of all hazard events by location, effect, and time	Tornados	Town of Irmo & Lexington & Rich. Counties	3	10	Capital Improve. Budgets	<\$250,000	Ongoing	Ongoing
Install surge protectors in critical	Thunder-	Lexington/Rich.	1	2 & 7	Capital Improve.	<\$250,000	Deferred due	Deferred

Town of Irmo								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
facilities	storms (Hail, Wind, Lightning)	Counties & School Districts			Budgets		to funding	
Adopt procedure to suspend operations in elec. storms	Thunderstorms (Hail, Wind, Lightning)	Town of Irmo/ Counties	2	2, 4 & 5	Operating Budget	<\$250,000	Deferred	Deferred
Clear power line and utility easements of debris	Thunderstorms (Hail, Wind, Lightning)	Dominion Energy/ Elec. Coops	1	2 & 7	Public Works Operating Budgets	<\$250,000	Ongoing	Ongoing
Remove taller trees near critical facilities	Thunderstorms (Hail, Wind, Lightning)	Town of Irmo/ Lexington/Richland Counties & Coops Dominion Energy	2	2 & 7	Public Works Operating Budget	<\$250,000	Ongoing	Ongoing
Procure and use elec. generators at critical facilities.	Winter Snow & Ice Storms	Lexington County/ school dist. cities/ recreation comm.	1	2 & 7	Capital Improve. budgets or operating budget if rental	\$250,000 to \$750,000	Deferred due to funding	Deferred
Continue to enforce International Building and Fire Codes	Hurricanes	Town of Irmo/ Lexington & Rich. Counties	2	2 & 4	Operating Budget	<\$250,000	Ongoing	Ongoing
Cooperate with the two County's Emergency Response Plans for Severe Weather	Hurricanes	Town of Irmo/ Rich. & Lexington Counties	2	2, 4 & 7	Operating Budgets	<\$250,000	Ongoing	Ongoing
Develop and publicize water conservation practices to respond to drought declarations	Drought	Town of Irmo	1	5	Operating Budget	<\$250,000	Ongoing	Ongoing
Amend state drought legislation to stiffen penalties & clarify laws	Drought	S. C. General Assembly	3	5	Operating Budget	<\$250,000	Deferred	Deferred

Mitigation Action Update for the Town of Irmo since the 2016 HMP

- No natural hazard mitigation activities implemented, or changes provided to their mitigation strategy list.

Table 60 - Town of Chapin Mitigation Strategies.

Town of Chapin								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Install surge protectors in critical facilities	Thunder-storms (Hail, Wind, Lightning)	Facility Owner	2	2, 4, 7, 8 & 9	Facility Owner	Unknown	Deferred due to funding	3 – 5 Years
Adopt procedure to suspend operations in elec. storms	Thunder-storms (Hail, Wind, Lightning)	Town Admin	1	2, 3, 5 & 6	Town Admin	None	Ongoing	1 Year
Clear power line and utility easements of debris	Thunder-storms (Hail, Wind, Lightning)	Dominion Energy and MCEC	1	4, 7, 8 & 9	Dominion Energy and MCEC	Unknown	Ongoing (Conducted Fall 2015)	3 – 5 Years
Remove taller trees near critical facilities	Thunder-storms (Hail, Wind, Lightning)	Facility Owner	2	4, 7, 8 & 9	Facility Owner	Unknown	Ongoing	3 – 5 Years
Encourage elec. utilities to place new electric lines below ground	Thunder-storms (Hail, Wind, Lightning)	Dominion Energy and MCEC	3	4, 7, 8 & 9	Dominion Energy and MCEC	Unknown	Deferred due to funding	7 - 10 Years
"Harden" utility services especially in highly vulnerable areas	Tornados	Dominion Energy and MCEC	2	4, 7, 8 & 9	Dominion Energy and MCEC	Unknown	Deferred due to funding	7 - 10 Years
Conduct engineering strength studies of critical facilities	Tornados	Facility Owner	3	1, 3, 4, 5, 6 & 9	Facility Owner	Unknown	Deferred due to funding	7 - 10 Years
Emergency response chain saw project and other efforts to remove debris	Tornados	Town Admin	3	4, 7, 8 & 9	Town Admin	Unknown	Deferred due to funding	7 - 10 Years
Install safe rooms in critical facilities especially those with vulnerable populations	Tornados	Facility Owner	2	4, 7, 8 & 9	Facility Owner	Unknown	Deferred due to funding	3 – 5 Years

Town of Chapin								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Establish GIS mapping of all hazard events by location, effect, and time	All Hazards	CMCOG	2	1, 2, 3, 5, 6 & 10	HMGP Grant Funds	Unknown	Deferred due to funding	3 – 5 Years
Improved suppression response (tankers, dry chemicals)	Forest Fire/Wildfires	Lexington County	2	4, 7, 8 & 9	Lexington County	Unknown	Deferred due to funding	3 – 5 Years
Fire Code enforcement/inspection	Forest Fire/Wildfires	Lexington County	1	4, 7, 8 & 9	Lexington County	Unknown	Ongoing	1 Year
Ensure that Chapin's Drought Manage. Ordinance is up-to-date and enforced	Drought/ Heat Wave	Utilities	1	1, 2, 3, 5 & 6	Utilities	None	Ongoing	1 Year
Monitor water use and impose restrictions as needed	Drought/ Heat Wave	Utilities and City of Columbia	1	1, 2, 3, 5 & 6	Utilities and City of Columbia	None	Ongoing	1 Year
Develop portable water treatment facilities	Hurricanes	Utilities	3	4, 7, 8 & 9	Utilities	Unknown	Deferred due to funding	7 - 10 Years
Replace water storage tanks and pumps as needed	Hurricanes	Utilities and City of Columbia	2	4, 7, 8 & 9	Utilities and City of Columbia	Unknown	Deferred due to funding	3 – 5 Years
Add capacity at solid waste disposal facilities serving the county to handle more debris	Hurricanes	Lexington County	2	4, 7, 8 & 9	Lexington County	Unknown	Deferred due to funding	3 – 5 Years
Prepare Emergency Operations Plan to Link with Lexington County's Plan	Hurricanes	Town Admin	2	1, 2, 3, 5 & 6	Town Admin	Unknown	Ongoing	3 – 5 Years
Debris removal and road clearance work	Winter Snow & Ice Storms	Lexington County and SCDOT	1	4, 7, 8 & 9	Lexington County and SCDOT	Unknown	Ongoing	1 Year
Procure and use elec. generators at critical facilities	Winter Snow & Ice Storms	Facility Owner	2	4, 7, 8 & 9	Facility Owner	Unknown	Deferred due to funding	3 – 5 Years

Town of Chapin								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Conduct earthquake impact analysis on critical facilities in Lexington County	Earthquake	Lexington County	2	1, 2, 3 & 9	Lexington County	Unknown	Deferred due to funding	3 – 5 Years
Develop speakers bureau about earthquake and other natural disaster threats to the town	Earthquake	Town Admin	2	1, 2, 3, 5 & 6	Town Admin	Unknown	Deferred due to funding	3 – 5 Years
Implement "Reverse 911" Alert to affected earthquake areas	Earthquake	Lexington County	2	1, 2, 3, 5 & 6	Lexington County	Unknown	Deferred due to funding	3 – 5 Years
Maintain status in the NFIP	Flooding	Town Admin	1	1, 2, 3, 5 & 6	Town Admin	None	Ongoing	1 Year
Develop and publicize water conservation practices to respond to drought declarations	Drought	Utilities and City of Columbia	1	2, 3, 5 & 6	Utilities and City of Columbia	Unknown	Deferred due to funding	1 Year
Amend state drought legislation to stiffen penalties & clarify laws	Drought	SC Legislators	2	2, 3, 5 & 6	SC Legislators	Unknown	Ongoing	3 – 5 Years
Install alternate power supply at Priority 1 Pump Stations (13)	Flooding, Tornadoes, Hurricane	Utilities	1	2, 4, 7, 8 & 9	Capital Improvement Funds / Grant Opportunities	\$75,000/site (parts & labor)	New (8 of 13 installed)	1 – 2 Years
Install alternate power supply at Priority 2 Pump Stations (15)	Flooding, Tornadoes, Hurricane	Utilities	2	2, 4, 7, 8 & 9	Capital Improvement Funds / Grant Opportunities	\$50,000/site (parts & labor)	New	3-5 Years
Install alternate power supply at Priority 2 Pump Stations (36)	Flooding, Tornadoes, Hurricane	Utilities	3	2, 4, 7, 8 & 9	Capital Improvement Funds / Grant Opportunities	\$25,000/site (parts & labor)	New	5-7 Years
Install bypass pump at Priority 1 Pump Stations (13)	Flooding, Tornadoes, Hurricane	Utilities	1	2, 4, 7, 8 & 9	Capital Improvement Funds / Grant Opportunities	\$75,000/site (parts & labor)	New	1 – 2 Years
Install bypass pump at Priority 2 Pump Stations (15)	Flooding, Tornadoes, Hurricane	Utilities	2	2, 4, 7, 8 & 9	Capital Improvement Funds / Grant Opportunities	\$50,000/site (parts & labor)	New	3-5 Years

Town of Chapin								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Install bypass pump at Priority 3 Pump Stations (36)	Flooding, Tornadoes, Hurricane	Utilities	3	2, 4, 7, 8 & 9	Capital Improvement Funds / Grant Opportunities	\$25,000/site (parts & labor)	New	5-7 Years
Purchase mobile vacuum pumping truck	Flooding, Tornadoes, Hurricane	Utilities	1	2, 4, 7, 8 & 9	Operating Funds / Grant Opportunities	\$150,000	New	1 – 2 Years
Implement CMOM	Flooding, Tornadoes, Hurricane	Utilities	2	1, 2, 3 & 9	Operating Funds / Grant Opportunities	\$300,000	New	3-5 Years
Conduct Inflow and Infiltration (I/I) Study	Flooding, Tornadoes, Hurricane	Utilities	2	1, 2, 3, 8 & 9	Operating Funds / Grant Opportunities	\$500,000	New	3-5 Years
Relocate Pump Stations out of Hazard Zones (3 Sites)	Flooding	Utilities	1	2, 4, 5, 7, 8, 9 & 10	Capital Improvement Funds / Grant Opportunities	\$600,000 (\$200,000 per site)	New	3 – 5 Years
Install Perimeter Fencing Around Pump Stations (15 sites)	Tornadoes, Hurricane	Utilities	2	2, 4, 7, 8 & 9	Capital Improvement Funds / Grant Opportunities	\$30,000 (\$2,000 per site)	New	3-5 Years
Geolocate All Utility Infrastructure	All Hazards	Utilities	3	1, 2, 3, 9 & 10	Operating Funds / Grant Opportunities	\$150,000	New	2-3 Years
Install Telemetry Systems at Pump Stations (64 Units)	All Hazards	Utilities	1	1, 2, 4, 7, 8 & 9	Capital Improvement Funds / Grant Opportunities	\$82,000 Total (\$2,000/unit with 41 Units Remaining)	New (29 Units Installed)	1 – 2 Years
Construct Additional Elevated Water Tank	All Hazards	Utilities	3	2, 4, 7, 8 & 9	Capital Improvement Funds/Grant Opportunities/Infrastructure Loans	\$1,500,000	New	7-10 Years
Upgrade Wells (5 Wells)	All Hazards	Utilities	2	2, 4, 7, 8 & 9	Capital Improvement Funds / Grant Opportunities	\$100,000 (\$20,000 each site)	New	3-5 Years

Town of Chapin								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Install Generators at Wells (5 Wells)	All Hazards	Utilities	2	2, 4, 7, 8 & 9	Capital Improvement Funds / Grant Opportunities	\$100,000 (\$20,000 each site)	New	3-5 Years
Lay Interconnecting Water Lines to Newberry County Water Supply	All Hazards	Utilities	3	2, 4, 7, 8 & 9	Capital Improvement Funds/Grant Opportunities/Infrastructure Loans	\$1,250,000 (25,000 Lf at \$50/Lf)	New	5-7 Years
Construct a Water Treatment Plant	All Hazards	Utilities	3	2, 4, 7, 8 & 9	Capital Improvement Funds/Grant Opportunities/Infrastructure Loans	\$5,000,000	New	7-10 Years
Upgrade Wastewater Treatment Plant(WWTP) to Handle Increase Flow	Flooding, Tornadoes, Hurricane	Utilities	1	2, 4, 7, 8 & 9	Capital Improvement Funds/Grant Opportunities/Infrastructure Loans	\$12,000,000	New	1 – 2 Years
Install Backup Generator at WWTP	Flooding, Tornadoes, Hurricane	Utilities	1	2, 4, 7, 8 & 9	Capital Improvement Funds / Grant Opportunities	\$150,000	New	1 – 2 Years
Install 18" Parallel Effluent Line to Handle Emergency Flow (~25,000 Linear Feet)	Flooding, Tornadoes, Hurricane	Utilities	2	2, 4, 7, 8 & 9	Capital Improvement Funds/Grant Opportunities/Infrastructure Loans	\$1,250,000 (~25,000 Lf at \$50/Lf)	New	3-5 Years
Install 18" Force Main Sewer Interceptor Line to Relieve Pressure During Emergency Events (~17,000 Lf)	Flooding, Tornadoes, Hurricane	Utilities	1	2, 4, 7, 8 & 9	Capital Improvement Funds/Grant Opportunities/Infrastructure Loans	\$850,000 (~17,000 Lf at \$50/Lf)	New	1 – 2 Years
Retention ponds for stormwater management	Flooding, Hurricanes	Utilities	1	2, 4, 7, 8 & 9	Capital Improvement Funds/Grant Opportunities/Infrastructure Loans	\$250,000>	New	Deferred

Mitigation Action Update for the Town of Chapin since the 2016 HMP

- Increased priority in pursuing opportunities related to stormwater management (e.g. retention ponds, debris clearance).

- In process of linking Emergency Operations to the Lexington County Plan.
- Increased emergency management coordination with Newberry and Richland Counties.
- Built a new wastewater treatment site

Table 61 - Town of Batesburg-Leesville Mitigation Strategies.

Town of Batesburg-Leesville								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Improve early warning system in city for wind events	Tornados	Town of Batesburg-Leesville	1	1, 2, 3, 7 & 8	Capital Improve. Budget	<\$250,000	Deferred due to funding	Deferred
Install safe rooms in critical facilities especially those with vulnerable populations	Tornados	Town of Batesburg-Leesville / Lexington School Dist. 3	2	1, 2, 3, 7 & 8	Capital Improve. Budgets	\$250,000 to \$750,000	Deferred due to funding	Ongoing
"Harden" utility services especially in highly vulnerable areas	Tornados	Town of Batesburg-Leesville/Lexington County	1	1, 2, 3, 6, 7 & 8	Capital Improve. Budgets	\$250,000 to \$750,000	Deferred due to funding	Ongoing
Emergency response chain saw project and other efforts to remove debris	Tornados	Town of Batesburg-Leesville /Public Works/ Lex. County/ Dominion Energy SCDOT	1	1, 2, 3, 6, 7 & 8	Capital Improve. Budgets	<\$250,000	Deferred due to funding	Deferred
Replace water storage tanks and pumps as needed	Hurricanes	Town of Batesburg-Leesville	2	1, 2, 3, 6, 7 & 8	Capital Improve. Budget	\$250,000 to \$750,000	Deferred due to funding	Ongoing
Provide mobile backup generators for critical facilities	Hurricanes	Town of Batesburg-Leesville /School Dist. 3	1	1, 2, 3, 6, 7 & 8	Capital Improve. Budgets	\$250,000 to \$750,000	Deferred due to funding	Ongoing
Publicize National Hurricane Awareness Week annually	Hurricanes	Batesburg-Leesville Town Council	1	2, 4, 6 & 8	Operating Budget	<\$250,000	Deferred due to funding	Ongoing
Power line easement clearance	Winter Snow & Ice Storms	Town of Batesburg-Leesville /Dominion Energy	1	1, 2, 3, 6, 7 & 8	Capital Improve. Budgets	<\$250,000	Ongoing	Ongoing
Debris removal and road clearance work	Winter Snow & Ice Storms	Bates-Leesville Public Works/ SCDOT	1	1, 2, 3, 6, 7 & 8	Bates.-Lees. Town Public Works & SCDOT Operating Budgets	<\$250,000	Ongoing	Ongoing
Procure and use elec. generators at critical facilities	Winter Snow & Ice Storms	Town of Batesburg-Leesville /County/ School Dist. 3/ recreation comm.	3	1, 2, 3, 6, 7 & 8	Capital Improve. budgets or operating budgets if	\$250,000 to \$750,000	Deferred due to funding	Ongoing

Town of Batesburg-Leesville								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
					rental			
Install surge protectors in critical facilities	Thunderstorms (Hail, Wind, Lightning)	Town of Batesburg-Leesville/Lexington County/School Dist. 3	1	1, 2, 3, 4, & 8	Capital Improve. Budgets	\$250,000 to \$750,000	Deferred due to funding	Ongoing
Adopt procedure to suspend operations during lightning storms	Thunderstorms (Hail, Wind, Lightning)	Town of Batesburg-Leesville	2	1, 2, 3, 6, 7 & 8	Operating Budget	<\$250,000	Deferred due to funding	Deferred
Identify & contact all repetitive loss properties	Flooding	Town of Batesburg-Leesville	1	1, 2, 3, 6, 7, 8, 9 & 10	Operating Budget	<\$250,000	Deferred due to funding	Ongoing
Ensure that the FEMA Elevation Certificate is properly completed before issuance on property in flood areas	Flooding	Town of Batesburg-Leesville	1	1, 2, 3, 6, 7, 8, 9 & 10	Operating Budget	<\$250,000	Ongoing	Ongoing
Undertake Planning to participate in Community Rating System	Flooding	Town of Batesburg-Leesville	1	1, 2, 3, 6, 7, 8, 9 & 10	Operating Budget	<\$250,000	Deferred due to funding	Ongoing
Procure and use elec. generators at designated critical facilities	Flooding	Town of Batesburg-Leesville/Lexington County School Dist. 3	3	1, 2, 3, 7 & 8	Capital Improve. budgets or operating budgets if rentals	\$250,000 to \$750,000	Deferred due to funding	Ongoing
Maintain status in the NFIP	Flooding	Town of Batesburg-Leesville	1	2, 4, 5, 7 & 10	Operating Budget	<\$250,000	Ongoing	Ongoing
Ensure that Bates-Leesville has an up-to-date and enforced Drought Management Ordinance	Drought/Heat Wave	Town of Batesburg-Leesville	1	1, 2, 3, 7, 8, 9 & 10	Operating Budget	<\$250,000	Deferred due to funding	Ongoing
Monitor water use and impose restrictions as needed	Drought/Heat Wave	Town of Batesburg-Leesville	1	1, 2, 3, 4, 7 & 8	Operating Budget	<\$250,000	Ongoing	Ongoing

Mitigation Action Update for the Town of Batesburg-Leesville since the 2016 HMP

- No natural hazard mitigation activities implemented, or changes provided to their mitigation strategy list.

6. Newberry County

This section addresses
FEMA HMP requirement
201.6(c)(2)(i)

6.1 Historical Hazard Assessment for Newberry County

Summary of Historic Impacts

Newberry County experiences an array of natural hazards. Prior to the 2015 flash flood disaster, tornadoes posed the highest risk to Newberry County. Flood damage used to rank low. Heat and drought pose serious threats to the county that are difficult to capture in loss figures or maps since their impacts tend to be vastly underreported (lack of data, secondary and/or prolonged effects on agriculture, public health, etc.). The most frequent hazard in Newberry County are cold weather events. While only being the second most frequent hazard, thunderstorms, including lightning, wind and hail damage, have a cumulative impact and high frequency is still significant (around \$13 million, 27 people injured/killed, 24%). When overlaying the risk from all hazards, eastern and southern Newberry County exhibits the highest level of risk (Figure 105).

In the future, the frequency and possible damage from thunderstorms and other meteorological and hydrological hazards is very likely to increase. Based on climate projections, it is anticipated that the number of cold days and perhaps also winter storms will decrease.

Table 62 - Summary of natural hazards and their impacts on Newberry County since 1960 (adj. to 2019 USD).

	Direct Losses (Property and Crop)	Total USDA Crop Indemnity Payout****	Direct Injuries and Fatalities	# Of Loss-Causing Events	Frequency	Recurrence Interval (in years)	Future Changes
Flooding	\$2,657,440	n/av	3	31	0.27%	3.7	▲
Hurricane	\$1,177,667	n/av	0	6	0.77%	1.3	▲
Tornadoes	\$12,165,168	n/av	41	20	2.3%	0.43	▲
Thunderstorm	\$1,878,311**	\$128,253	1	159	24%	0.04	▲
Lightning	\$622,637	n/av	2	48	0.89%*	1.1 days	▲
Wind	\$1,175,198	\$248	1	198	8.9%	0.11	▲
Hail	\$9,415,634	n/av	23	59	2.6%	0.39	▲
Fog	n/av	n/av	n/av	n/av	0.04%*	25 days	◄►
Winter Storm	\$21,804,963***	\$26,648	8	81	0.77%	1.3	▼
Cold*****	\$14,822,637	\$8,166	1	38	59%	0.02	▼
Heat	\$12,746,647	\$355,711	0	7	21%	0.05	▲
Drought	\$16,069,921	\$597,233	0	16	0.46%	2.2	▲
Wildfire	\$401,355	n/av	0	3	0.04%*	24 days	▲
Earthquake	0	n/av	0	0	0.03%	40	◄►
TOTAL	\$80,114,941	\$1,116,258	78	628			

*daily frequency/recurrence calculations instead of years

**coastal storms combined with thunderstorms/severe storms

***no 2004 ice storm losses reported by NWS

****hazards with n/av have no event records that resulted in USDA Crop Indemnity Payouts

*****cold hazard totals already included in winter storm totals

▲ indicates that future increase in occurrence and/or impacts is likely

▼ indicates that future decrease in occurrence and/or impacts is likely

◄► indicates that either no change in future occurrence or impacts is expected or that a determination of future changes cannot be made.

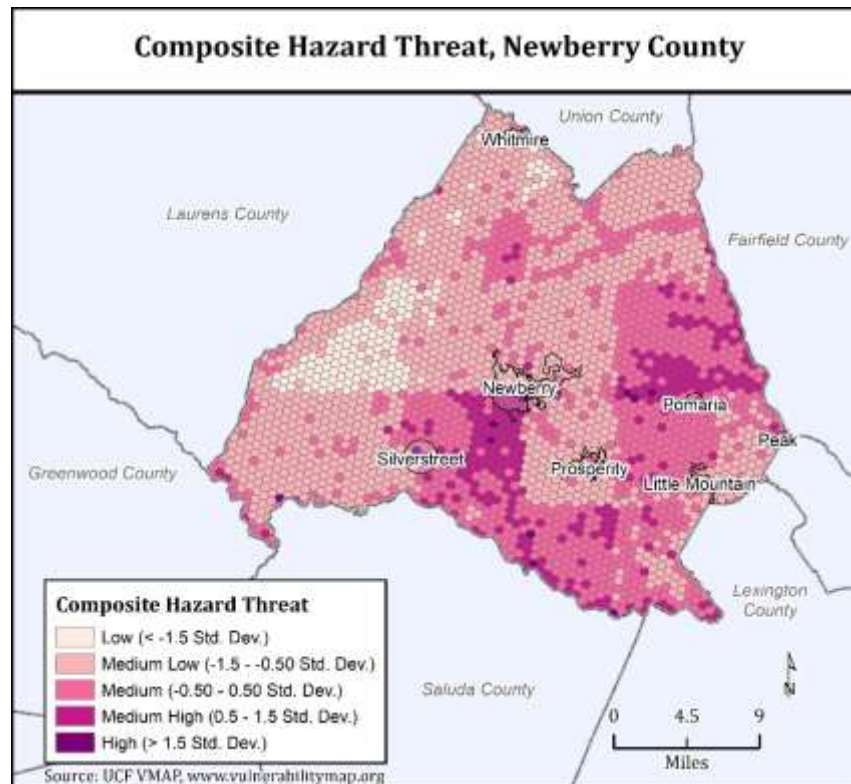


Figure 105 - Comprehensive risk profile of Newberry County.

A) Flooding

What to expect: Flood damage in Newberry County is mostly the result of localized heavy precipitation leading to flooding along smaller creeks and tributaries to the Broad and Saluda Rivers as well as flash flooding due to ponding and/or inadequate drainage (Table 63). Virtually every building in Newberry County is at some risk from flash flooding due to drainage issues and ponding. While most buildings are not at risk from flood waters reaching first floor levels, many homes may, however, experience flooded crawl spaces, driveways, etc. or experience secondary problems such as mold issues. In addition, the 2015 floods revealed a high risk from small pond dam failures—particularly when simultaneous and cascading dam failures occur in the same watershed.

Geographic Extent: Flooding in Newberry County is not restricted to the 100-year and 500-year floodplains (Figure 107). The Flash Flood Potential Index identifies the northern half and southeastern quarter of Newberry County as having a high potential for flash flooding (Figure 108). Based on past occurrences, the County is very susceptible to flash flooding in low-lying areas and areas downstream from small dams.

Prior to the record-breaking floods of October 2015, statistics for Newberry County were as following:

Number of Loss-Causing Events:	31
Frequency of Occurrence:	0.27%
Recurrence Interval:	3.7 years
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	2008 - 2018
Loss Events on Record:	1960 - 2019
Flood-related Presidential Disaster Declarations:	DR-4241 (2015) DR-4479 (2020)
Total Losses:	\$2,657,440

Total Fatalities:	2
Deadliest Event:	2 Fatalities (August 18, 1986)
Most Property Damage:	\$1,182,274 (August 18, 1986)
Most Crop Damage:	\$335,449 (June 8, 1973)
Highest USDA Crop Indemnity Payout:	n/av*

*No flooding events caused a USDA Crop Indemnity Payout

October 1-5, 2015 (DR-4241)^{51*}:

Over a five-day period, an upper low-pressure system combined with the remnants of Hurricane Joaquin streamed tropical moisture into South Carolina (Figure 106) leading to countless road and bridge closures. Newberry County experienced a record-setting 5-day rainfall total of 12.76 inches in Little Mountain⁵². Overall damage estimates range from \$1 billion⁵³ to \$12 billion⁵⁴ for the entire impact area in South Carolina. The County received both individual and public assistance funding through FEMA.

February 6-13, 2020 (DR-4479):

A slow-moving low-pressure system moved throughout the southeastern region and over South Carolina for a seven-day stretch. The storm released over five inches of rain across the Carolinas, especially the western regions.



Figure 106 - Total rainfall amounts for the 2015 flood event. Source: NWS.

^{51*} Note: The historic record for all hazards in this plan covers the time period from 1960 through 2020

⁵² NWS, 2015. Historic rainfall and flooding, October 2015. Available at <http://www.weather.gov/cae/HistoricFloodingOct2015.html>

⁵³ NOAA National Centers for Environmental Information, 2016. Billion-Dollar Weather and Climate Disasters. Available at <http://www.ncdc.noaa.gov/billions/events>

⁵⁴ Burris, Roddie. SC Floods' Damage: \$12 billion, Economists say. *The State* [Online], Columbia, SC, December 1, 2015 Available at <http://www.thestate.com/news/local/article47471060.html>

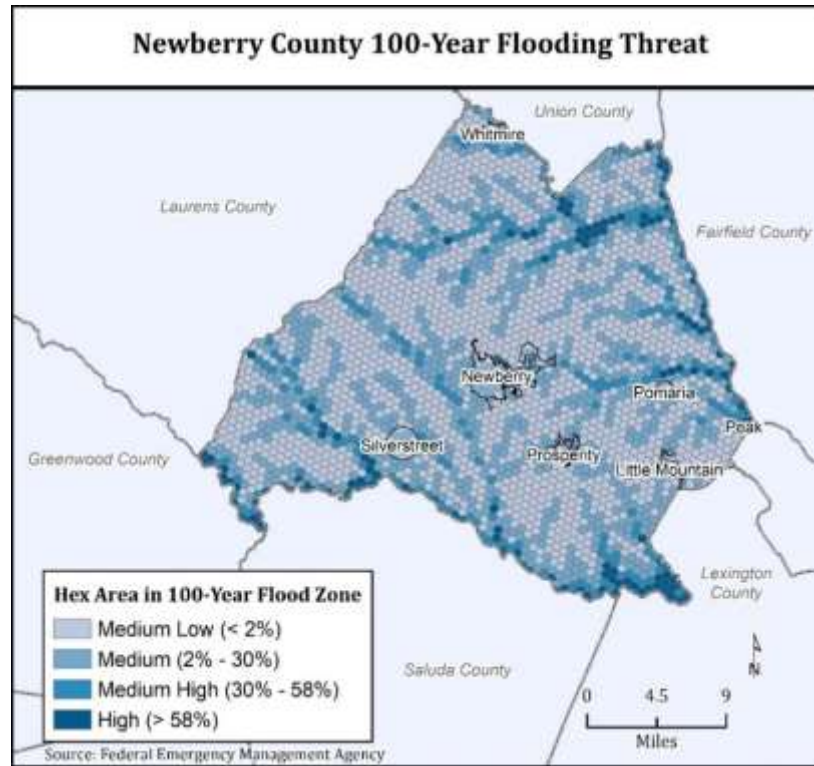


Figure 107 - Flood threat in Newberry County.

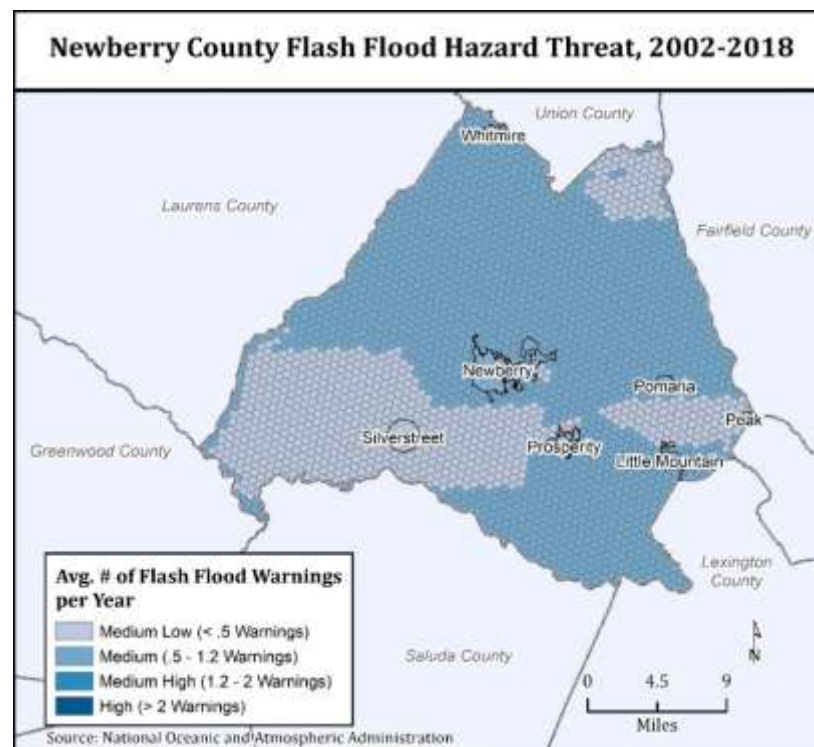


Figure 108 - Flash flood risk in Newberry County.

Table 63 - Record of loss-causing flood events in Newberry County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
3/1/1964	3/31/1964	0	0	\$909	\$909		Statewide	Flooding
3/1/1966	3/5/1966	0	0	\$8,694	\$8,694		Statewide	Flooding
12/14/1972	12/17/1972	0	0	\$1,409	\$1,409		Northern 2/3rds of SC	Heavy Rains & flooding
2/3/1973	2/3/1973	0	0	\$6,344	\$6		Statewide	Flooding
6/8/1973	6/25/1973	0	0	\$10,063	\$1,006,347		Southern & Central SC	Heavy Rain & Flooding
6/16/1973	6/22/1973	0	0	\$1,006	\$101		Central, Northern, & Eastern SC	Heavy Rain & Flash Flooding
3/12/1975	3/18/1975	0	0	\$5,236	\$524		Statewide	Heavy Rains & Flooding
7/13/1975	7/18/1975	0	0	\$669	\$66,903		Eastern & Central SC	Rains & Flooding
10/17/1975	10/17/1975	0	0	\$1,853	\$0		Northwestern SC	Rain and Flash Flooding
10/9/1976	10/19/1976	0	0	\$49,506	\$49,506		Statewide	Flood
1/25/1978	1/26/1978	0	0	\$43,204	\$4		Statewide	Wind & Flash Flood
1/26/1978	1/31/1978	0	0	\$4,320	\$0		Statewide	Flooding
3/15/1980	3/31/1980	0	0	\$3,419	\$3,419		Statewide	Flood
8/8/1980	8/8/1980	0	0	\$3,419	\$342		Statewide	Wind & Flood
1/1/1982	1/14/1982	0	0	\$610	\$61		Along Saluda, Broad, Congaree, Wateree, Lynches, and PeeDee Rivers	Flooding
3/17/1983	3/17/1983	0	0	\$28,282	\$2,828		Statewide	Wind, Rain, Flooding, & Beach Erosion
8/23/1983	8/23/1983	0	0	\$13,010	\$0		Newberry	Flash Flooding, Wind, & Lightning
12/6/1983	12/6/1983	0	0	\$3,336	\$33		Western, Northern, & Central SC	Flood & Wind
2/27/1984	2/27/1984	0	0	\$2,711	\$27		Statewide	Rain, Wind, & Flood
7/26/1984	7/26/1984	0	0	\$2,711	\$27		Statewide	Wind, Rain, & Flood
8/2/1984	8/2/1984	0	0	\$4,300	\$0		Southern, Central, & Eastern SC	Lightning, Rain, & Flood
8/18/1986	8/18/1986	1	2	\$1,182,274	\$11,823		Newberry	Flash Flooding
1/1/1993	1/31/1993	0	0	\$19,494	\$389,893		Statewide	Flooding
8/26/2008	8/26/2008	0	0	\$24,073	\$0	2-3'	Newberry	Sheriff departments widespread flooding along secondary roads where streams overflowed. The fire department reported the highway 34 bridge closed from flooding at the county line. Columbia police reported several roads under 2 to 3 feet of water. Lexington reported a couple of secondary road closures from flooding. Newberry reported four roads closed due to flooding from Scotts Creek.
5/6/2013	5/8/2013	0	0	\$3,337	\$0	4'	Chappells	River Gage on Saluda River at Chappells went around 4 and a half feet above flood causing minor flooding of low-lying areas along the river.
5/6/2013	5/8/2013	0	0	\$3,337	\$0	2'	Whitmire	Heavy rains caused the Enoree River to go about 2 feet above flood stage and cause minor flooding of low-lying areas along the river.

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
9/13/2014	9/13/2014	0	0	\$8,758	\$0	1-2'	Deadfall XRDS	Public reported flash flooding along the Saluda River on many secondary roads in the Silverstreet area with some roads closed due to 1 to 2 feet of water on them.
6/3/2015	6/4/2015	0	0	\$2,187	\$0		Trinity	Dispatch reported flash flooding closing the intersection of Island Ford Road and Sandy Creek Road. Several streams were out of their banks flooding areas alongside several other roads.
10/4/2015	10/4/2015	0	0	\$273,350	\$0		Pomaria	Highway 176 bridge across Cannons Creek damaged and partially collapsed due to flood waters.
12/30/2015	12/30/2015	0	0	\$10,934	\$0		Boyds	County Sheriff reported two home evacuations due to flash flooding near Scott Creek on the south side of the town of Newberry.
12/30/2015	12/30/2015	0	0	\$3,280	\$0		Vaughansville	County Dispatch reported roadway closure due to flooding at Pineland Road at Herrington Drive.

*No magnitude information indicates flood height or rainfall amounts were unavailable.

B) Hurricanes & Tropical Cyclones

What to expect: Every property and person is at risk from hurricane-force winds and associated heavy rainfall and tornadoes in Newberry County with a reduction gradient from southeast to northwest from medium to medium-low risk (Figure 110). Hurricane and tropical cyclones affect Newberry County every 1.3 years. The county is at risk from hurricane-force winds as experienced during Hurricane Hugo as well as associated heavy rainfall, flash flooding, and tornadoes (Figure 110

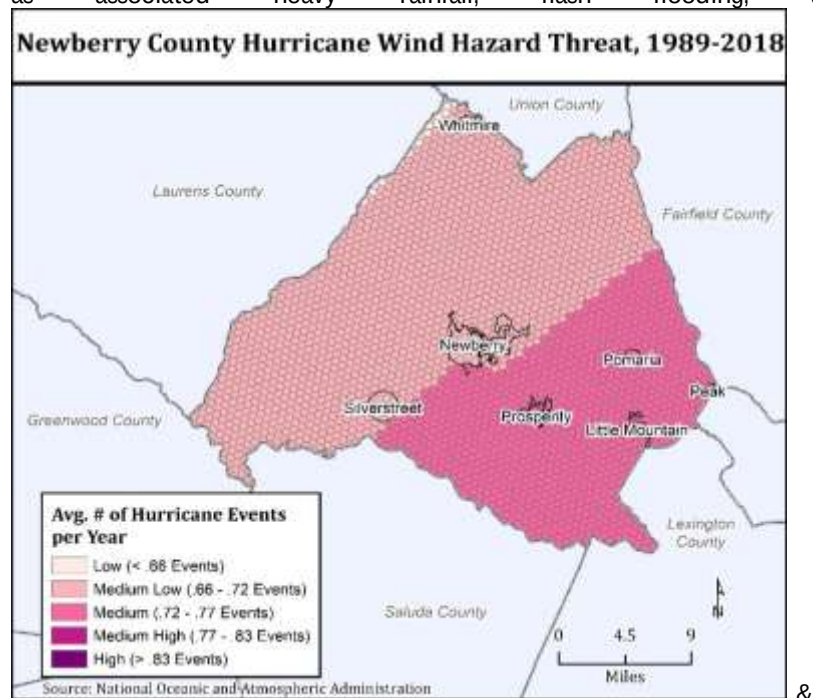


Table 64). While direct wind damage to property is unlikely, property and infrastructure damage due to falling trees as well as power outages are highly likely.

Geographic Extent: Based on past occurrences, the entire county is susceptible to the impacts of tropical cyclones.

It is important to note that the frequency and impact calculations below exclude the damage from wind, lightning, and tornadoes because they are reported separately.

Tropical cyclone statistics for Newberry County are as following:

Number of Loss-Causing Events:	6
Frequency of Occurrence:	0.77%
Recurrence Interval:	1.3 years
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Hurricane-related Presidential Disaster Declarations:	DR-1566 (2004) DR-4346 (2017)
Total Losses:	\$1,177,667
Total Fatalities:	0
Deadliest Event:	n/a
Most Property Damage:	\$776,005 (September 4, 1979)
Most Crop Damage:	\$9,087 (August 29, 1964)
Highest USDA Crop Indemnity Payout:	n/av*

*No hurricane/tropical storm events caused a USDA Crop Indemnity Payout

Tropical Storm Frances (September 7, 2004; DR-1566): The storm system caused high winds and caused a widespread tornado outbreak. The high winds uprooted trees and caused power outages and damaged properties—particularly mobile homes.

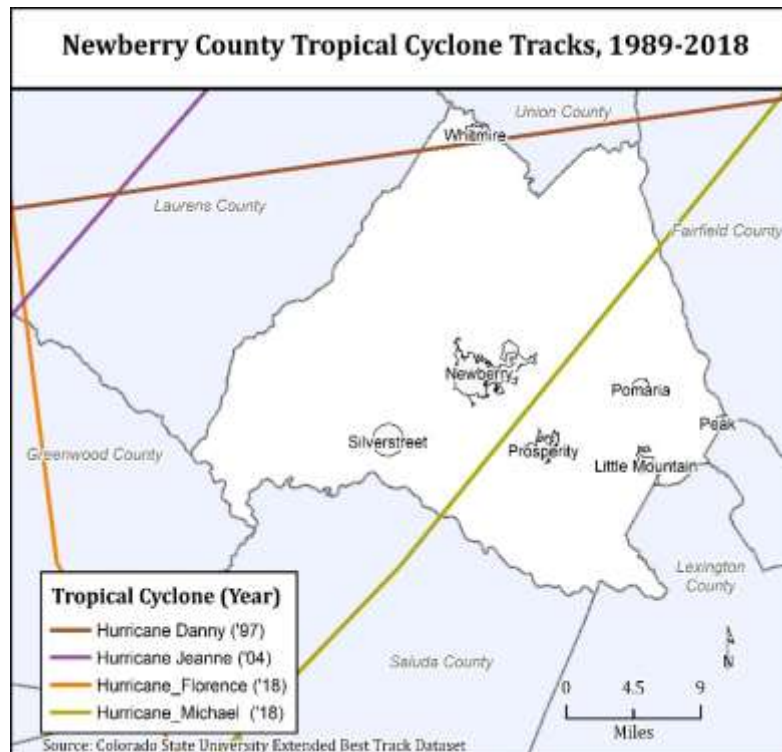


Figure 109 - Historical tropical cyclone tracks in Newberry County.

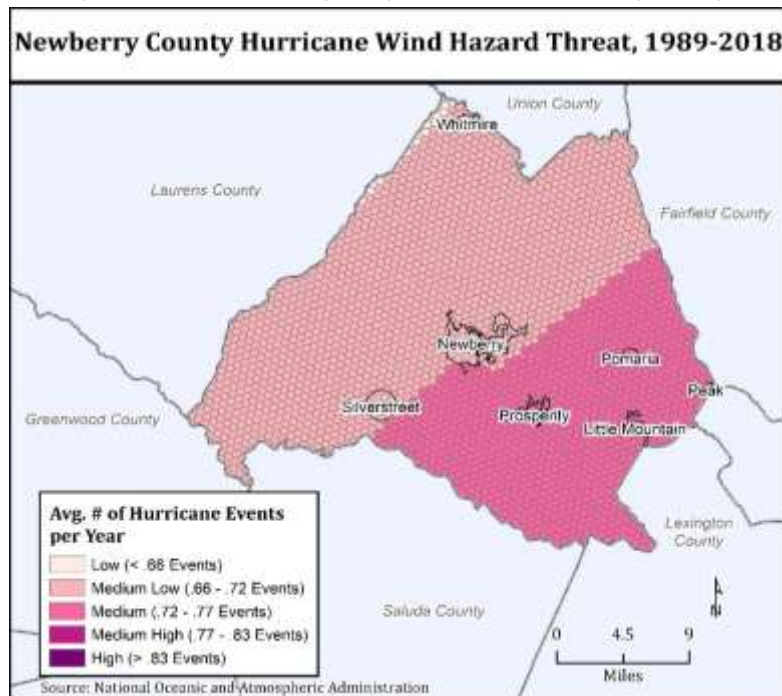


Figure 110 - Hurricane wind threat in Newberry County.

Table 64 - Record of loss-causing tropical cyclone events in Newberry County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag.	Location	Description
8/29/1964	8/31/1964	0	0	\$9,087	\$9,087	TS	Statewide	Tropical Storm Cleo
9/12/1964	9/13/1964	0	0	\$909	\$909	TS	Statewide	Tropical Storm Dora
6/7/1968	6/8/1968	0	0	\$809	\$81	TS	Statewide	Tropical Storm Abby
6/20/1972	6/21/1972	0	0	\$674	\$6,739	TD	Statewide	Tropical Depression Agnes
9/4/1979	9/5/1979	0	0	\$776,005	\$0	Cat. 1	Eastern & Central SC	Hurricane David
8/24/1995	8/28/1995	0	0	\$369,671	\$3,697	TS	Statewide	Tropical Storm Jerry

C) Tornadoes

What to expect: Every property and person is at risk from tornadoes in Newberry County. Low magnitude tornadoes are not uncommon in Newberry County, occurring about twice a year. The area has experienced several intense (EF3) tornadoes affecting densely populated areas (Figure 111). This does not mean that even stronger tornadoes are impossible. Neighboring counties have experienced EF4s. Newberry County is not only at risk from tornadoes spawned by severe thunderstorms but also from outbreaks associated with tropical systems as seen during Tropical Storm Frances.

Geographic Extent: Based on past occurrences, the entire county is susceptible to tornadoes.

Tornado statistics for Newberry County are as following:

Number of Loss-Causing Events:	20
Frequency of Occurrence:	2.3%
Recurrence Interval:	0.43 years

Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Severe weather-related Presidential Disaster Declarations:	DR-700 (1984) DR-4479 (2020)
Total Losses:	\$12,165,168
Total Fatalities:	2
Deadliest Event:	1 fatality (several instances)
Most Property Damage:	\$6,235,671 (March 28, 1984)
Most Crop Damage:	\$623,567 (March 28, 1984)
Highest USDA Crop Indemnity Payout:	n/av*

*No tornado events caused a USDA Crop Indemnity Payout

March 28-29, 1984 (DR-700): The Carolinas Outbreak of March 28, 1984, was one of the deadliest, most destructive tornado outbreaks in the history of the two Carolinas. The weather situation that produced this outbreak had strong parallels to the 1925 Tri-State Tornado Outbreak in that the tornadoes tracked along with the center of a strong low-pressure system. The statistics of this outbreak were staggering and perhaps unprecedented in the history of North or South Carolina. The final count showed 24 individual tornadoes touched down: 11 in North Carolina, 11 in South Carolina, and 2 in Georgia. The human impact included 57 fatalities, (42 in North Carolina, 15 in South Carolina, none in Georgia) and 1,248 injuries (799 in North Carolina, 448 in South Carolina, and 1 in Georgia). In Newberry, F2 and F3 tornadoes between 5:00 and 5:40 p.m. Downtown Newberry, SC "looked like a war zone"⁵⁵.

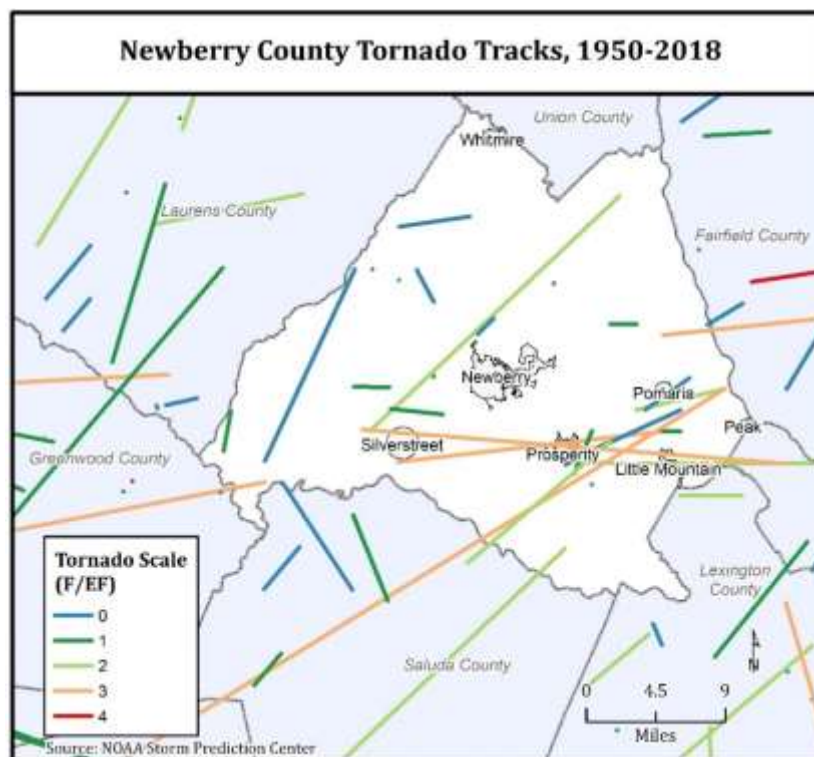


Figure 111 - Tornado threat in Newberry County.

⁵⁵ NWS Wilmington, 2014. Carolinas Tornado Outbreak: March 28, 1984. Available at <http://www.weather.gov/ilm/CarolinasOutbreak>

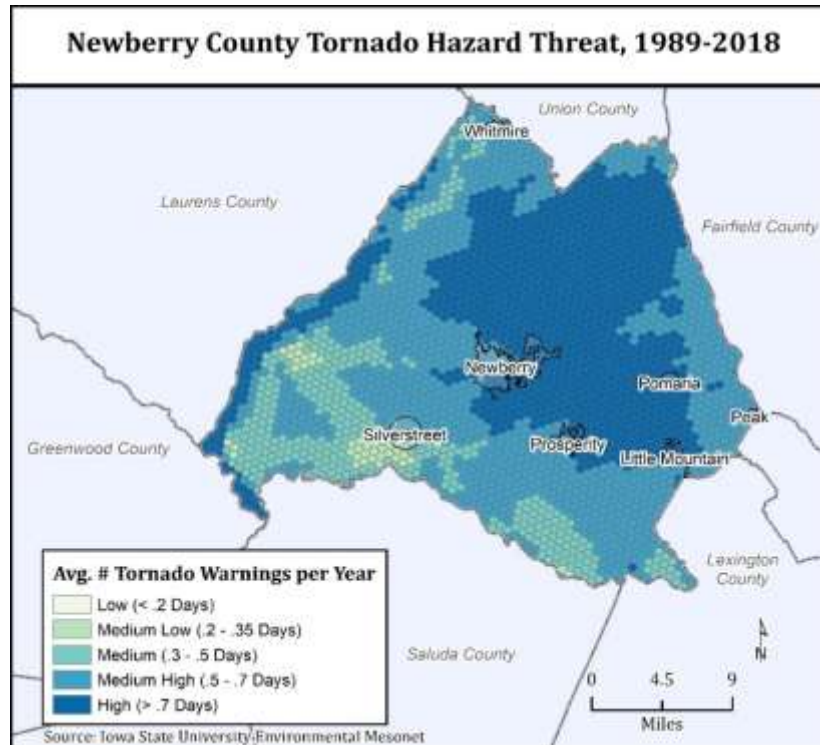


Figure 112 - Tornado risk in Newberry County.

Table 65 - Record of loss-causing tornado events in Newberry County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat .	Property Damage	Crop Damage	Mag.	Location	Description
3/30/1960	3/30/1960	0	0	\$43,776	\$0	F2	Newberry Co.	Tornado
4/18/1969	4/18/1969	0	0	\$3,531	\$353	F1	Newberry	Rain, Hail, & Tornado
12/13/1973	12/13/1973	0	1	\$2,918,406	\$29,184	F3	Newberry	Tornado
12/13/1973	12/13/1973	13	0	\$1,459,203	\$14,592	F3	Newberry	Tornado
12/13/1973	12/13/1973	0	0	\$1,459	\$146	F2	Newberry	Tornado
5/15/1975	5/15/1975	0	0	\$24,085	\$0	F1	Newberry	Tornadoes
3/28/1984	3/28/1984	38	1	\$12,471,342	\$1,247,134	F2	Newberry	Tornado
3/28/1984	3/28/1984	5	0	\$623,567	\$623,567	F2	Newberry	Tornado
5/23/1988	5/23/1988	0	0	\$0	\$110	F0	Newberry	Tornado
11/22/1992	11/22/1992	0	0	\$461,786	\$461,786	F3	Newberry	Tornado
11/22/1992	11/22/1992	2	1	\$230,893	\$230,893	F2	Newberry	Tornado
1/14/1995	1/14/1995	0	0	\$1,700	\$0	F3	Prosperity	Tornado touched down in wooded area near Highways 202/434.
11/11/2002	11/11/2002	0	0	\$23,049	\$0	F2	Pomaria	An F1 tornado blew down an 80 ft long farm shed, took down many trees, and did minor damage to a couple of homes. The path ran from Central School rd. (SC hwy 320), across SC hwy 202 to SC hwy 514
7/3/2005	7/3/2005	0	0	\$19,904	\$1,327	F1	Newberry	Storm Survey found an F1 tornado completely destroyed a modular building and took down trees and powerlines at

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag.	Location	Description
								SC121 and Belfast Road. A wheat field was also laid flat by the tornado.
4/26/2006	4/26/2006	0	0	\$89,984	\$0	F0	Prosperity	A supercell produced an F0 tornado that fell trees on a home severely damaging it. The twister also took down other trees along its path, some across railroad tracks and others across hwy 202 near I-20.
3/15/2008	3/15/2008	2	0	\$0	\$0	EF3	Trinity	NWS Storm Survey found an EF3 tornado touched down near Silverstreet and continued east through Prosperity then crossed into Richland County where it dissipated. Many homes in Prosperity were heavily damaged. Numerous trees and powerlines were down. There were 2 injuries.
4/4/2008	4/4/2008	0	0	\$12,037	\$0	EF0	Cromer XRDS	Storm survey found trees down on roads, on 1 home, and mobile home. Both the home and mobile home also had wind damage to the roof and exterior walls. The tornado originated in Laurens county and came out of Joanna.
12/11/2008	12/11/2008	0	0	\$4,815	\$0	EF0	Kibler	Storm survey found several trees down along the path of the tornado as it traveled along Berley Road and Peak Road. No damage occurred in the town of Pomeria as the twister moved just east of its location.
2/28/2011	2/28/2011	0	0	\$138,253	\$0	EF1	Trinity	Storm Survey with Sheriff found numerous trees down from a microburst and an EF1 tornado from the northwest to northeastern side of Silverstreet. One mobile home was destroyed, one was severely damaged, and there were no injuries.
6/10/2012	6/10/2012	0	0	\$6,773	\$0	EF0	Newberry Airports	Sheriff conducted a damage survey of the trees down from just east of the airport to I-26.

D) Thunderstorms

What to expect: Every property and person is at risk from severe thunderstorms in Newberry County. Severe thunderstorms are a common occurrence in Newberry County with 5 to 11 severe thunderstorm warnings issued annually by the local NWS forecast office (Figure 113). The Midlands see on average up to 12 days per year with rainfall amounts of 1 inch or more, 30 days per year with rainfall between 1/2 inch and 1 inch, and about 70 days per year with rainfall amounts of less than 1/2 inch⁵⁶. Prior to the 2015 flash flood disaster, the daily rainfall record stood at 10.42 inches (August 18, 1986). Thunderstorms are complex and associated with different hazards: lightning, wind, rain, and/or hail. To understand the full impact of severe thunderstorms, the impacts of thunderstorms, wind, hail, and lightning should be considered jointly (Table 66).

Geographic Extent: Based on past occurrences, the entire county is susceptible to thunderstorms. There is an east to west gradient with the eastern half of Newberry County experiencing significantly more thunderstorm warnings.

⁵⁶ SCDNR, n/d. South Carolina Climate. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/cli_sc_climate.php

It is important to note that the frequency and impact calculations below exclude the damage from wind, lightning, and hail since they are reported separately—although in a meteorological sense they are tied together.

Thunderstorm statistics for Newberry County are as following:

Number of Loss-Causing Events:	159
Frequency of Occurrence:	24%
Recurrence Interval:	0.04 years
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Severe weather-related Presidential Disaster Declarations:	DR-700 (1984) DR-4479 (2020)
Total Losses:	\$1,878,311
Total Fatalities:	0
Deadliest Event:	n/a
Most Property Damage:	\$131,002 (June 10, 1982)
Most Crop Damage:	\$670,898 (June 7, 1973)
Highest USDA Crop Indemnity Payout:	\$72,051 (October 2015)

March 28-29, 1984 (DR-700) & February 6-13, 2020 (DR-4479): see Tornado section

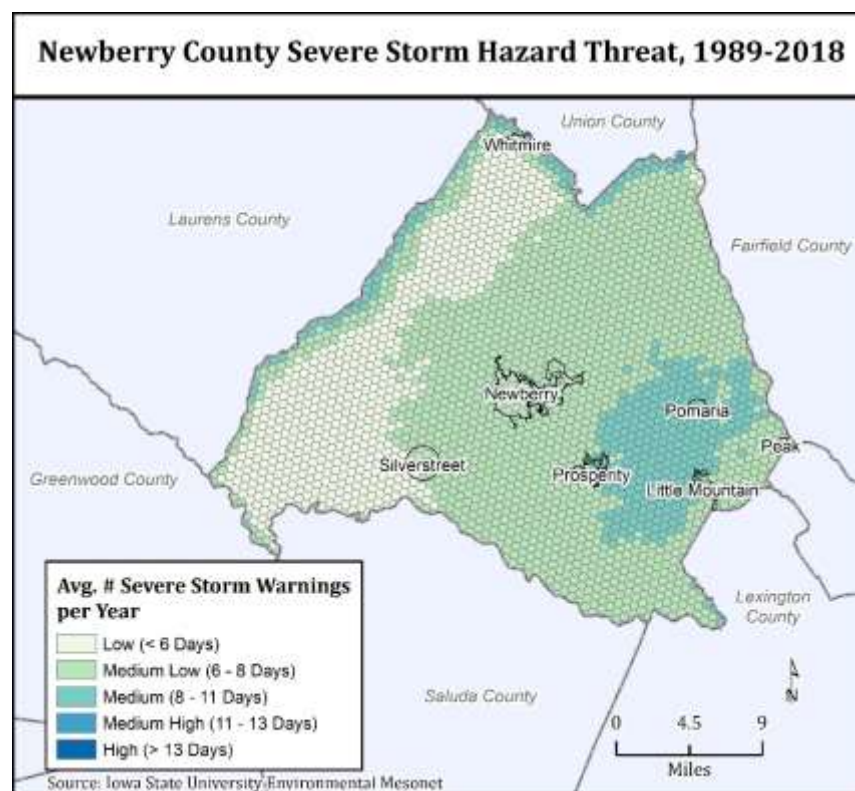


Figure 113 - Severe storm threat in Newberry County.

Table 66 - Record of loss-causing thunderstorm events in Newberry County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)	Location	Description
2/24/1961	2/24/1961	0	0	\$1,238	\$0	0.97"	Western & Central SC	Wind & Rain

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)	Location	Description
9/30/1964	10/1/1964	0	0	\$16,720	\$16,720	0.50"	Midlands & Central Plains of SC	Rainstorms
10/4/1964	10/6/1964	0	0	\$90,868	\$90,868	5.78"	Statewide	Rainstorm
10/15/1964	10/16/1964	0	0	\$0	\$9,087	5.17"	Statewide	Rainstorm
6/8/1965	6/16/1965	0	0	\$0	\$89,425	7.96"	Statewide	Locally Heavy Rains
2/13/1966	2/13/1966	0	0	\$869	\$0	1.18"	Statewide	Wind & Rain
8/20/1967	8/25/1967	0	0	\$84,338	\$843	10.18"	Statewide	Rain
1/9/1968	1/13/1968	0	0	\$116,359	\$12		Northern 2/3rds of SC	Rain, Sleet, & Freezing Rain
3/15/1971	3/15/1971	0	0	\$696	\$0	0.24"	Statewide	Thunderstorms & High Winds
6/8/1973	6/25/1973	0	0	\$10,063	\$1,006,347		Southern & Central SC	Heavy Rain
3/12/1974	3/12/1974	0	0	\$202	\$0	0.34"	Western & Central SC	Thunderstorm
1/25/1975	1/25/1975	0	0	\$524	\$0	1.93"	Statewide	Squall Line
7/14/1975	7/14/1975	0	0	\$71	\$7	0.58"	Northern & Central SC	Wind & Rain
3/31/1977	3/31/1977	0	0	\$46	\$0	0.43"	Statewide	High Winds & Heavy Rains
9/7/1977	9/7/1977	0	0	\$1,782	\$18	0.27"	Mountains of Northwestern SC	Heavy Rain
9/7/1977	9/7/1977	0	0	\$465	\$46	0.27"	Statewide	Thunderstorms, High Winds, & Heavy Rain
10/1/1977	10/1/1977	0	0	\$164	\$0	-	Northwestern	Thunderstorm & High Winds
12/5/1977	12/5/1977	0	0	\$46	\$0	0.25"	Statewide	Thunderstorm
4/13/1978	4/13/1978	0	0	\$1,420	\$0	0.82"	Northeastern SC	Severe Thunderstorm
6/10/1982	6/10/1982	1	0	\$327,505	\$327,505		Western, Northern, Eastern, & Central SC	Rain, Lightning, Wind, & Hail
12/3/1983	12/4/1983	0	0	\$5,004	\$500	2.82"	Western & Central SC	Wind & Heavy Rain
12/28/1983	12/28/1983	0	0	\$8,131	\$0	0.76"	Central SC	Severe Storm & Wind
7/25/1984	7/25/1984	0	0	\$124,713	\$1,247		Central SC	Rain, Lightning, Wind, & Hail
2/21/1989	2/21/1989	0	0	\$20,900	\$0	1.43"	Eastern & Central SC	Thunderstorm
4/4/1989	4/4/1989	0	0	\$104,498	\$0		Newberry Co.	Thunderstorm Winds
5/5/1989	5/5/1989	0	0	\$104,498	\$0		Lake Murray Area	Thunderstorm Winds
6/16/1989	6/16/1989	0	0	\$104,498	\$0		Newberry Co.	Thunderstorm Winds
6/24/2015	6/24/2015	0	0	\$0	\$3,280		Newberry Airports	Farmer reported part of his cornfield was flatted by a microburst.
6/24/2015	6/24/2015	0	0	\$4,374	\$0		Hope Station	Sheriff reported trees down on Hwy 213 and US 176 near Pomeria.
6/24/2015	6/24/2015	0	0	\$1,093	\$0		Hope Station	Sheriff reported two trees down near Peak.
7/2/2015	7/2/2015	0	0	\$2,187	\$0		Jalapa	Highway Patrol reported trees down along Lalapa Road

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)	Location	Description
								between I-26 and Hwy 76.
7/2/2015	7/2/2015	0	0	\$2,187	\$0		Whitmire Oxners Airports	Highway Patrol reported trees down near the intersection of Hwy 176 and SC 121.
7/2/2015	7/2/2015	0	0	\$2,187	\$0		Glymphville	Highway Patrol reported trees down near the intersection of Mt. Pleasant Road and Ringer Road.
7/2/2015	7/2/2015	0	0	\$1,093	\$0		Brickhouse XRDS	Highway Patrol reported trees down along I-26 near MM 63.
7/13/2015	7/13/2015	0	0	\$3,280	\$0		Deadfall XRDS	Sheriff reported trees down on Hwy 176 and Hwy 34.
7/13/2015	7/13/2015	0	0	\$2,187	\$0		Whitmire	Sheriff reported trees down on Hwy 121 and Subertown Road.
7/18/2015	7/18/2015	0	0	\$15,308	\$0		Silverstreet	Dispatch reported multiple trees and powerlines down around the county from Chappells to Silverstreet to Prosperity.
7/18/2015	7/18/2015	0	0	\$1,093	\$0		Bush River	Dispatch reported a couple of trees down near Belmont Church Road.
7/19/2015	7/19/2015	0	0	\$13,121	\$0		Keitts XRDS	SOCIAL MEDIA reported large trees down and tin roof off a home was pulled back on Keitts Crossroads, SC Hwy 34, and U.S. 176.
7/19/2015	7/19/2015	0	0	\$1,093	\$0		Newberry	Dispatch reported trees down on Evans Street and McDowell Street in Newberry.
7/19/2015	7/19/2015	0	0	\$547	\$0		Keitts XRDS	Dispatch reported a tree down on U.S. 176 at Big Pine Road.
7/19/2015	7/19/2015	0	0	\$547	\$0		Newberry Airports	Dispatch reported a tree down on I-26 at MM 73.
8/6/2015	8/6/2015	0	0	\$4,374	\$0		Prosperity	Sheriff reported trees and powerlines down on Highway 76 between Little Mountain and Prosperity.
8/6/2015	8/6/2015	0	0	\$2,187	\$0		Kinards	Newberry Electric COOP reported powerlines down with outages in the Kinards area.
9/4/2015	9/4/2015	0	0	\$13,121	\$0		Newberry	Sheriff reported multiple trees and powerlines down around Newberry College.
9/4/2015	9/4/2015	0	0	\$4,374	\$0		Jalapa	Highway Patrol reported trees down at 262 Jalapa Road.

E) Lightning

What to expect: Every property and person is at risk from lightning in Newberry County. Lightning occurs very frequently in the County, averaging a strike per day. While the county does not experience a thunderstorm every day, a single thunderstorm produces hundreds of lightning strikes—each of which is counted in the statistic below—resulting in high frequency and recurrence figures. House fires and personal harm are common with lightning.

Geographic Extent: Based on past occurrences, the entire county is susceptible to lightning strikes. While there may be a distribution of severe storms throughout the county that cause lightning strikes, the lightning strike threat is uniform across the entire county (Figure 114).

Lightning statistics for Newberry County are as following:

Number of Loss-Causing Events:	48
Daily Frequency of Occurrence:	0.89%
Recurrence Interval:	1.1 days
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	\$622,637
Total Fatalities:	0
Deadliest Event:	n/av
Most Property Damage:	\$114,063 (July 24, 1987)
Most Crop Damage:	\$65,501 (June 10, 1982)
Highest USDA Crop Indemnity Payout:	n/av*

*No lightning events caused a USDA Crop Indemnity Payout

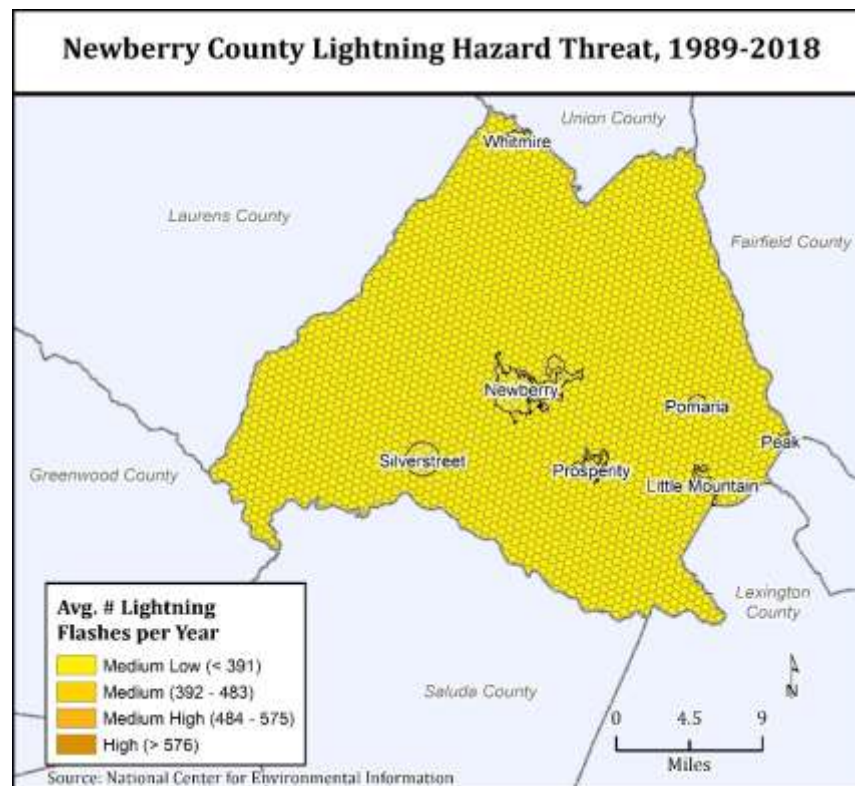


Figure 114 - Lightning threat in Newberry County.

Table 67 - Record of loss-causing lightning events in Newberry County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
7/16/1961	7/16/1961	1	0	\$0	\$0	Prosperity	Lightning
7/19/1965	7/19/1965	0	0	\$894	\$89	Statewide	Hail, Lightning, & Wind
8/27/1965	8/27/1965	0	0	\$894	\$0	Statewide	Severe Lightning
4/13/1966	4/13/1966	0	0	\$3,999	\$0	Newberry & Newberry County	Rain, Wind, Hail, & Electrical
6/9/1969	6/9/1969	0	0	\$11,769	\$0	Oconee, Pickens, & Newberry Counties	Thunderstorms, Lightning, & Wind

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
5/20/1973	5/20/1973	0	0	\$1,390	\$13,897	Northern & Northeastern SC	Rain, Wind, Hail, & Electrical
5/28/1973	5/29/1973	0.11	0	\$1,081	\$1,081	Western & Northern SC	Hail, Wind, & Electrical
8/29/1973	8/29/1973	0	0	\$146	\$15	Northwestern & Midlands SC	Wind, Rain, & Electrical
12/13/1973	12/13/1973	0	0	\$11	\$108	Northern & Western SC	Hail & Lightning
3/21/1974	3/21/1974	0.15	0	\$5,714	\$571	Statewide	High Winds & Electrical
3/29/1974	3/29/1974	0	0	\$6,258	\$6,258	Northern, Eastern, & Central SC	Hail, Wind, & Electrical
4/8/1974	4/8/1974	0	0	\$7,301	\$7	Northern, Western, & Central SC	Wind & Electrical
4/8/1974	4/8/1974	0	0	\$105	\$0	Central SC	Wind & Electrical
5/19/1974	5/19/1974	0	0	\$876	\$88	Northwestern & Southern SC	Hail, High Wind, & Lightning
8/4/1974	8/4/1974	0	0	\$0	\$188	Northeastern SC	Rain & Lightning
8/13/1974	8/13/1974	0	0	\$1,195	\$119	Central SC	Wind & Lightning
3/7/1975	3/7/1975	0	0	\$688	\$0	Northwestern, Northeastern & Central SC	Wind, Lightning, & Hail
3/24/1975	3/24/1975	0.3	0	\$5,236	\$52	Statewide	Wind, Lightning, & Hail
5/10/1975	5/10/1975	0	0	\$13,381	\$133,806	York to Bamberg & Spartanburg to Oconee & Anderson	Wind, Lightning, & Hail
5/15/1975	5/15/1975	0	0	\$5,236	\$52	Statewide	Wind & Lightning
6/15/1975	6/15/1975	0	0	\$708	\$708	Northern & Central SC	Wind, Lightning, & Hail
6/18/1975	6/18/1975	0	0	\$52	\$5,236	Statewide	Wind, Lightning, & Hail
6/19/1975	6/19/1975	0	0	\$892	\$892	Northern & Western SC	Wind, Lightning, & Hail
7/4/1975	7/4/1975	0	0	\$6,881	\$68,814	Northern & Central SC	Wind, Lightning, & Hail
7/24/1975	7/24/1975	0	0	\$688	\$0	Western, Central, & Northern SC	Lightning
8/27/1975	8/27/1975	0	0	\$6,338	\$63	Northern, Northeastern, & Central SC	Lightning, High Wind, & Thunderstorms
6/29/1976	6/29/1976	0	0	\$12,652	\$13	Northwestern & Northern SC	Lightning
7/26/1976	7/27/1976	0	0	\$1,752	\$175	Northwestern SC	Lightning, Wind, & Rain
7/29/1976	7/29/1976	0	0	\$1,752	\$18	Northwestern SC	Lightning, Wind, & Rain
10/9/1976	10/9/1976	0	0	\$6,326	\$63	Eastern & Central SC	Wind & Lightning
6/6/1977	6/6/1977	0	0	\$465	\$4,648	Statewide	Wind, Lightning, & Hail
7/8/1977	7/8/1977	0	0	\$21,382	\$2,138	Hartford & Silverstreet areas of Newberry County	Wind, Lightning, & Hail
7/14/1977	7/14/1977	0	0	\$4,648	\$46	Statewide	Wind & Lightning
7/16/1981	7/16/1981	1	0	\$35,637	\$0	Greenwood Co., Newberry Co., Lexington Co., & Richland Co.	Lightning, Wind, & Rain
4/26/1982	4/27/1982	0	0	\$29	\$29	Statewide	Thunderstorm, Wind, Lightning, & Hail
6/10/1982	6/10/1982	1	0	\$327,505	\$327,505	Western, Northern, Eastern, & Central SC	Hail, Lightning, Rain, & Wind
7/24/1983	7/24/1983	0	0	\$4,337	\$434	Central & Eastern SC	Thunderstorm, Winds, Hail, & Lightning

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
7/25/1983	7/25/1983	0	0	\$2,828	\$28	Statewide	Wind & Lightning
8/23/1983	8/23/1983	0	0	\$13,010	\$0	Newberry	Flash Flooding, Wind, & Lightning
8/23/1983	8/23/1983	0	0	\$3,717	\$0	North & Central SC	Wind & Lightning
6/20/1984	6/20/1984	0	0	\$2,711	\$271	Statewide	Rain, Hail, Lighting, & Wind
7/25/1984	7/25/1984	0	0	\$124,713	\$1,247	Central SC	Rain, Hail, Lighting, & Wind
8/2/1984	8/2/1984	0	0	\$4,300	\$0	Southern, Eastern, & Central SC	Lightning, Rain, & Flood
9/3/1984	9/3/1984	0	0	\$4,157	\$0	Clinton, Greenwood, & Newberry	Lightning & Wind
7/24/1987	7/24/1987	0	0	\$114,064	\$0	Newberry	Lightning
8/18/1995	8/18/1995	0	0	\$110,532	\$0	Newberry	Lightning
4/7/2015	4/7/2015	0	0	\$39,362	\$0	Monetta	Sheriff reported a barn struck by lightning in Whitmire burnt to the ground.
3/1/2019	3/1/2019	0	0	\$2,000	\$10	Newberry	Lightning strike to a home on Main St in Newberry caused chimney damage. No injuries. Time estimated.

F) Wind

What to expect: Every property and person is at risk from wind in Newberry County. The county frequently experiences high wind events with gust of 50 knots (58mph) or more (Figure 115 & Table 68). Wind gust of 80 knots (92 mph) have been recorded. On average, severe winds occur monthly. Due to concurrence of high wind with severe thunderstorms, the spatial distribution of wind events within the county is similar to the thunderstorm risk. High winds cause largely property damage and power outages due to falling tree or tree limbs.

Geographic Extent: Based on past occurrences, the entire county is susceptible to wind damage. There appears to be a higher likelihood of severe weather and therefore wind damage in the central and southern part of the county.

Wind statistics for Newberry County are as following:

Number of Loss-Causing Events:	198
Frequency of Occurrence:	8.9%
Recurrence Interval:	0.11 years
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	\$1,175,198
Total Fatalities:	0
Deadliest Event:	n/a
Most Property Damage:	\$65,501 (June 10, 1982)
Most Crop Damage:	\$65,501 (June 10, 1982)
Highest USDA Crop Indemnity Payout:	\$248 (April 2013)

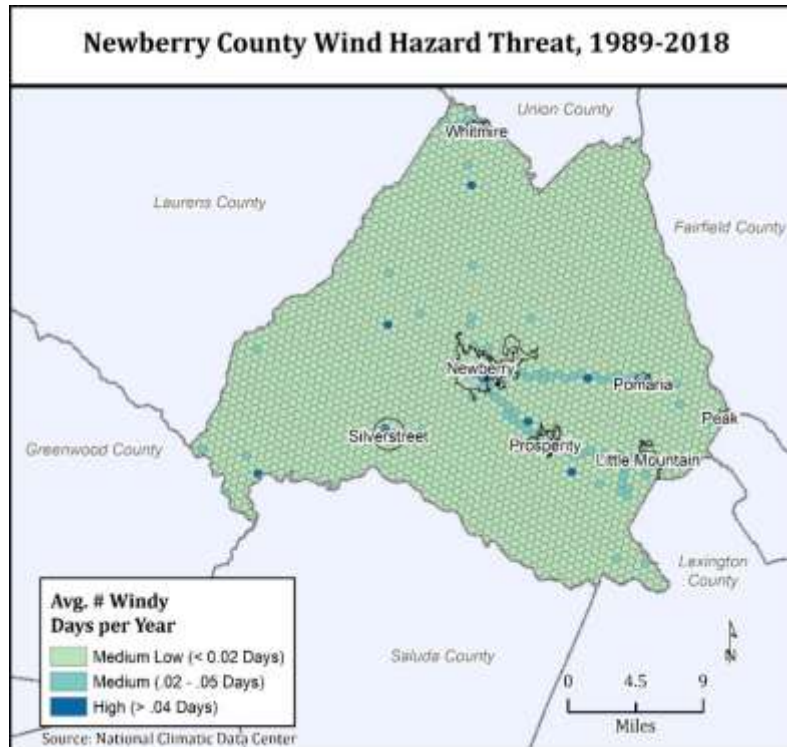


Figure 115 - Wind threat in Newberry County.

Table 68 - Record of loss-causing wind events in Newberry County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat .	Property Damage	Crop Damage	Mag. (kts)*	Location	Description
5/10/1975	5/10/1975	0	0	\$13,381	\$133,806	0	York to Bamberg and Spartanburg to Oconee and Anderson	Hail, Wind, & Lightning
6/10/1982	6/10/1982	1	0	\$327,505	\$327,505	0	Western, Northern, Eastern, & Central SC	Hail, Lightning, Rain, & Wind
7/25/1984	7/25/1984	0	0	\$124,713	\$1,247	0	Central SC	Rain, Hail, Lightning, & Wind
6/1/1987	6/1/1987	0	0	\$1,141	\$0	0	Newberry County	Thunderstorm Winds
5/23/1988	5/23/1988	0	0	\$1,095	\$0	0	Jalapa	Thunderstorm Winds
5/23/1988	5/23/1988	0	0	\$1,095	\$0	0	Whitmire	Thunderstorm Winds
4/4/1989	4/4/1989	0	0	\$104,498	\$0	0	Newberry County	Thunderstorm Winds
5/5/1989	5/5/1989	0	0	\$104,498	\$0	0	Lake Murray area	Thunderstorm Winds
5/5/1989	5/5/1989	0	0	\$10,450	\$0	0	Newberry County	Thunderstorm Winds
6/16/1989	6/16/1989	0	0	\$104,498	\$0	0	Newberry County	Thunderstorm Winds
1/6/1995	1/6/1995	0	0	\$1,700	\$0	0	Eastern region of Newberry County	Thunderstorm Winds
6/28/1995	6/28/1995	0	0	\$8,502	\$0	0	Belfort & Newberry	Trees and power lines down in Newberry and Belfort.
8/17/2005	8/17/2005	0	0	\$99,522	\$0	60	Newberry	Sheriff reported trees down on 3 homes.
8/26/2008	8/26/2008	0	0	\$6,018	\$0	50	Newberry	Sheriff reported power outages in Newberry with street flooding and some trees down in Prosperity.
6/10/2009	6/10/2009	0	0	\$0	\$361	50	Pomaria	Electric company reported a couple of trees down on New Hope Road.

Start Date	End Date	Inj.	Fat .	Property Damage	Crop Damage	Mag. (kts)*	Location	Description
6/11/2009	6/11/2009	0	0	\$0	\$361	55	Browns	Sheriff reported trees and power lines down on Hwy 176.
6/11/2009	6/11/2009	0	0	\$60,184	\$12,037	50	Prosperity	Sheriff reported a shed destroyed and large limbs on the highway.
6/18/2009	6/18/2009	0	0	\$36,239	\$0	55	Chappells	Sheriff reported trees down on Sumpit Road and Milner Road.
6/18/2009	6/18/2009	0	0	\$2,416	\$0	55	Pomaria	SKYWARN spotters reported trees down in Pomeria.
7/31/2009	7/31/2009	0	0	\$6,040	\$0	50	Prosperity	EM reported a tree down on power lines in Prosperity.
9/9/2009	9/9/2009	0	0	\$4,832	\$0	65	Boysds	Sheriff reported numerous trees and power lines down on Bush River Road about 2 miles southeast of Newberry.
12/9/2009	12/9/2009	0	0	\$4,832	\$0	60	Mudlick	Surveyor reported numerous trees down at Hwy 56 and Little River. The damage extended northwest along the river for about a mile.
12/9/2009	12/9/2009	0	0	\$4,832	\$0	55	Whitmire	Sheriff reported trees and power lines down.
6/29/2010	6/29/2010	0	0	\$1,208	\$0	55	Little Mountain	Sheriff reported trees down I-26 near exit 82 and in the Prosperity area of Lake Murray.
11/16/2010	11/16/2010	0	0	\$16,912	\$0	50	Newberry	Sheriff reported trees down on Hwy 76 and Beaver Dam Creek Road.
11/30/2010	11/30/2010	0	0	\$6,040	\$0	50	Prosperity	Public reported trees and power lines down in Prosperity.
2/28/2011	2/28/2011	0	0	\$6,040	\$0	60	Trinity	Sheriff reported trees down on Island Ford Road and verified by storm survey as a microburst.
2/28/2011	2/28/2011	0	0	\$9,508	\$0	80	Silverstreet	An intense microburst ripped the roof off an industrial building, took many trees down, some on homes, and destroyed several outbuildings.
3/19/2011	3/19/2011	0	0	\$2,377	\$0	55	Silverstreet	Sheriff reported a couple of trees down, one on a vehicle.
4/5/2011	4/5/2011	0	0	\$2,377	\$0	55	Whitmire	Sheriff reported trees down on Clinton Hwy.
4/5/2011	4/5/2011	0	0	\$4,754	\$0	55	Newberry Airport	Sheriff reported trees down along Hwy 121.
5/26/2011	5/26/2011	0	0	\$86,408	\$0	55	Browns	Sheriff reported trees down along Dusty Road off HWY 219 blocking the roadway.
6/5/2011	6/5/2011	0	0	\$4,608	\$0	50	Bush River	Highway Patrol reported a tree down on Bush River Road.
6/5/2011	6/5/2011	0	0	\$18,434	\$0	55	Bush River	Sheriff reported trees down in the Bush River Road area.
6/15/2011	6/15/2011	0	0	\$4,608	\$0	60	Whitmire	Fire dept. reported trees and powerlines from Whitmire to I-26.
6/15/2011	6/15/2011	0	0	\$2,304	\$0	60	Newberry Airport	EM reported power lines and numerous trees down...some on vehicles...across the eastern half of the county including Whitmire...Newberry...and Prosperity.
6/18/2011	6/18/2011	0	0	\$2,304	\$0	60	Newberry	Dispatch reported numerous trees down countywide, including the city of Newberry.
6/18/2011	6/18/2011	0	0	\$3,456	\$0	50	Mudlick	Highway Patrol reported a tree down in the roadway near SC 56 and Brehmer Road
6/18/2011	6/18/2011	0	0	\$576	\$0	50	Macedonia	Highway Patrol reported a tree down in the road near the intersection of Seagull Lane and Osprey Point at Lake Murray.
6/21/2011	6/21/2011	0	0	\$43,780	\$0	55	Trinity	Sheriff reported trees down at the intersection of Island Ford and Belfast Roads.
6/21/2011	6/21/2011	0	0	\$13,825	\$0	60	Kibler	Sheriff reported numerous trees down on I-26 between mile markers 80 and 85.
7/13/2011	7/13/2011	0	0	\$11,521	\$0	55	Chappells	Highway Patrol and SKYWARN spotter reported several trees down in Chappells, two on homes causing minor and moderate damage.

Start Date	End Date	Inj.	Fat .	Property Damage	Crop Damage	Mag. (kts)*	Location	Description
8/9/2011	8/9/2011	0	0	\$576	\$0	55	Peak	Sheriff reported trees down on Mayer Road off Hwy 176.
8/11/2011	8/11/2011	0	0	\$576	\$0	55	Maybinton	SCEMD reported several trees down on Maybinton Road.
8/13/2011	8/13/2011	0	0	\$6,913	\$0	55	Spearman	Sheriff reported trees and power lines down near the intersection of Stoney Battery Road and Spearman Road.
8/20/2011	8/20/2011	0	0	\$3,456	\$0	50	Eison xrds	Highway Patrol reported a couple of trees down on Hwy 66 two miles west of the elementary school.
3/3/2012	3/3/2012	0	0	\$38,020	\$0	60	Helena	Dispatch reported trees and powerlines down from Newberry to Pomeria.
5/15/2012	5/15/2012	0	0	\$4,608	\$0	50	Taylors	Highway Patrol reported trees down near the intersection of Bachman Chapel Road and I-26.
5/15/2012	5/15/2012	0	0	\$2,304	\$0	55	Silverstreet	Highway Patrol reported trees down in Silverstreet and along Hwy 34, Werts Road, and Deadfall Road
5/17/2012	5/17/2012	0	0	\$13,825	\$0	60	Browns	Sheriff dispatch reported many trees down along Mount Bethel Garmany Road, one of which fell on a home.
5/17/2012	5/17/2012	0	0	\$1,152	\$0	55	Cromer	Sheriff dispatch reported trees down near Beth Eden and Seymore roads.
5/17/2012	5/17/2012	0	0	\$11,288	\$0	55	Newberry	Sheriff dispatch reported trees down near Smith and Radio roads.
6/10/2012	6/10/2012	0	0	\$9,030	\$0	60	Newberry	DOT reported a tree on a home in Newberry along with other trees down along Hillbrook Lane
6/10/2012	6/10/2012	0	0	\$2,258	\$0	55	Newberry	Sheriff reported a tree down on Glenn St.
7/3/2012	7/3/2012	0	0	\$22,575	\$0	55	Macedonia	Sheriff reported tree on house along with small hail.
7/5/2012	7/5/2012	0	0	\$9,030	\$0	50	Silverstreet	Sheriff reported several trees down at SC121 and Elisha Church Road.
7/5/2012	7/5/2012	0	0	\$6,773	\$0	50	Spearman	Sheriff reported several trees down at Greentree Road and Trinith Church Road.
7/5/2012	7/5/2012	0	0	\$18,060	\$0	50	Silverstreet	Sheriff reported several trees down at the intersection of SC121 and SC34.
7/10/2012	7/10/2012	0	0	\$564	\$0	55	Cromer	Highway Patrol and DOT reported a few trees down in the Jalapa area.
7/10/2012	7/10/2012	0	0	\$5,644	\$0	55	Bush River	Highway Patrol reported trees in the road at Beaver Dam Creek Road and Bush River Road.
7/27/2012	7/27/2012	0	0	\$3,386	\$0	50	Helena	Highway Patrol reported a tree down at Brown Chapel Road and Brown Chapel Drive.
7/27/2012	7/27/2012	0	0	\$3,386	\$0	50	Newberry	Sheriff Dispatch reported a tree down in the town of Newberry.
7/30/2012	7/30/2012	0	0	\$3,386	\$0	55	Prosperity	Sheriff reported trees 220eme on McNeary St. near Arbor Knoll.
8/9/2012	8/9/2012	0	0	\$4,515	\$0	50	Chappells	Sheriff reported a tree down on a house in Chappells. Considerable roof damage occurred with no injuries.
8/9/2012	8/9/2012	0	0	\$2,258	\$0	55	Chappells	Sheriff reported trees and power lines down at SC Hwy 34 and Old Landfill Road.
1/30/2013	1/30/2013	0	0	\$564	\$0	50	Newberry	Dispatch reported trees down county wide with power outages in Newberry.
1/30/2013	1/30/2013	0	0	\$564	\$0	50	Pomaria	Sheriff reported several trees down in the Pomaria area.
4/11/2013	4/11/2013	0	0	\$3,386	\$0	55	Keitts	Public reported trees down near the intersection of Mt. Pleasant Road and Hwy 34.
5/21/2013	5/21/2013	0	0	\$45,150	\$0	60	Prosperity	Sheriff reported numerous trees and power lines down in Prosperity. One tree fell on a car and another on a home causing significant damage.
5/21/2013	5/21/2013	0	0	\$2,258	\$0	55	New Hope	Newberry Electric reported a couple of trees down on power lines in the Rawl Road area.

Start Date	End Date	Inj.	Fat .	Property Damage	Crop Damage	Mag. (kts)*	Location	Description
6/26/2013	6/26/2013	0	0	\$8,900	\$0	55	Newberry Airport	Sheriff reported power lines down on Bush River Road.
6/26/2013	6/26/2013	0	0	\$4,450	\$0	50	Newberry	Sheriff reported a tree fell on power lines and a large limb caught fire.
6/26/2013	6/26/2013	0	0	\$3,337	\$0	50	Keitts	Sheriff reported a large tree down on Graham 221emetry Road.
6/26/2013	6/26/2013	0	0	\$38,936	\$0	55	Newberry Airport	Sheriff reported trees down on Folk Road near Old Whitmire Road.
6/26/2013	6/26/2013	0	0	\$6,675	\$0	55	Newberry	COOP observer reported trees down on Belfast Road and a roof partially torn off a shop behind a home.
8/1/2013	8/1/2013	0	0	\$3,337	\$0	55	Hope Station	Highway Patrol reported trees down on Parr Road.
8/1/2013	8/1/2013	0	0	\$2,225	\$0	50	Macedonia	Sheriff reported a large tree down at the intersection of Hamms Landing Road and Macedonia Church Road.
1/11/2014	1/11/2014	0	0	\$2,225	\$0	50	Chappells	Sheriff Dispatch reported a couple of trees down near Chappells.
1/11/2014	1/11/2014	0	0	\$2,225	\$0	50	Whitmire	Sheriff reported a couple of trees down near Whitmire.
1/11/2014	1/11/2014	0	0	\$556	\$0	50	Little Mountain	Sheriff reported a couple of trees down in Little Mountain.
1/11/2014	1/11/2014	0	0	\$3,337	\$0	50	Southeastern Newberry	Sheriff reported a couple of trees down between Newberry and Prosperity near Colony Church Road.
6/19/2014	6/19/2014	0	0	\$1,112	\$0	55	Mudlick	Highway Patrol reported trees down on Davenport Farm Lane at SC 56 near Kinards.
6/19/2014	6/19/2014	0	0	\$1,095	\$0	55	Mudlick	Highway Patrol reported trees down at Belfast and Brehmer Roads.
6/19/2014	6/19/2014	0	0	\$1,095	\$0	55	Trinity	Highway Patrol reported trees down on Green Tree Road.
6/19/2014	6/19/2014	0	0	\$1,095	\$0	55	Southeastern Newberry	Highway Patrol reported trees down on Hwy 395.
6/19/2014	6/19/2014	0	0	\$1,095	\$0	55	Stockman	Highway Patrol reported trees down on Morris Road.
7/9/2014	7/9/2014	0	0	\$16,420	\$0	55	Newberry Airport	Newberry Electric COOP reported trees and power lines down near the Newberry Country Club.
6/24/2015	6/24/2015	0	0	\$0	\$3,280	55	Newberry Airport	Farmer reported part of his cornfield was flatted by a microburst.
6/24/2015	6/24/2015	0	0	\$4,374	\$0	55	Hope Station	Sheriff reported trees down on Hwy 213 and US 176 near Pomeria.
6/24/2015	6/24/2015	0	0	\$1,093	\$0	50	Hope Station	Sheriff reported two trees down near Peak.
7/2/2015	7/2/2015	0	0	\$2,187	\$0	50	Glymphville	Highway Patrol reported trees down near the intersection of Mt. Pleasant Road and Ringer Road.
7/2/2015	7/2/2015	0	0	\$2,187	\$0	55	Whitmire Oxners Airport	Highway Patrol reported trees down near the intersection of Hwy 176 and SC 121.
7/2/2015	7/2/2015	0	0	\$2,187	\$0	55	Jalapa	Highway Patrol reported trees down along Lalapa Road between I-26 and Hwy 76.
7/2/2015	7/2/2015	0	0	\$1,093	\$0	50	Brickhouse XRDS	Highway Patrol reported trees down along I-26 near MM 63.
7/13/2015	7/13/2015	0	0	\$3,280	\$0	55	Deadfall XRDS	Sheriff reported trees down on Hwy 176 and Hwy 34.
7/13/2015	7/13/2015	0	0	\$2,187	\$0	55	Whitmire	Sheriff reported trees down on Hwy 121 and Subertown Road.
7/18/2015	7/18/2015	0	0	\$15,308	\$0	55	Silverstreet	Dispatch reported multiple trees and powerlines down around the county from Chappells to Silverstreet to Prosperity.
7/18/2015	7/18/2015	0	0	\$1,093	\$0	55	Bush River	Dispatch reported a couple of trees down near Belmont Church Road.
7/19/2015	7/19/2015	0	0	\$13,121	\$0	55	Keitts XRDS	SOCIAL MEDIA reported large trees down and tin roof off a home was pulled back on Keitts

Start Date	End Date	Inj.	Fat .	Property Damage	Crop Damage	Mag. (kts)*	Location	Description
								Crossroads, SC Hwy 34, and U.S. 176.
7/19/2015	7/19/2015	0	0	\$1,093	\$0	55	Newberry	Dispatch reported trees down on Evans Street and McDowell Street in Newberry.
7/19/2015	7/19/2015	0	0	\$547	\$0	55	Keitts XRDS	Dispatch reported a tree down on U.S. 176 at Big Pine Road.
7/19/2015	7/19/2015	0	0	\$547	\$0	55	Newberry Airport	Dispatch reported a tree down on I-26 at MM 73.
8/6/2015	8/6/2015	0	0	\$4,374	\$0	55	Little Mountain	Sheriff reported trees and powerlines down on Highway 76 between Little Mountain and Prosperity.
8/6/2015	8/6/2015	0	0	\$2,187	\$0	55	Kinards	Newberry Electric COOP reported powerlines down with outages in the Kinards area.
9/4/2015	9/4/2015	0	0	\$13,121	\$0	55	Newberry	Sheriff reported multiple trees and powerlines down around Newberry College.
9/4/2015	9/4/2015	0	0	\$4,374	\$0	50	Jalapa	Highway Patrol reported trees down at 262 Jalapa Road.
10/8/2016	10/8/2016	0	0	\$1,060	\$0	39	Newberry	Portions of SC Hwy 39 reported closed in northern Newberry County due to trees down across the roadway.

*No magnitude information indicates wind speeds were unavailable.

G) Hail

What to expect: Every property and person is at risk from hail in Newberry County. Hail occurs at least every four months in Newberry County (Figure 116). Hail events occur mostly during spring thunderstorms from March through May. Thus far no damage has been reported for hailstones larger than 1.75" although the county has seen events with hailstones of 2.75" in size (Figure 117, Table 69). It appears that crop damage from hail events is severely underreported.

Geographic Extent: Based on past occurrences, the entire county is susceptible to hail damage.

Hail statistics for Newberry County are as following:

Number of Loss-Causing Events:	59
Frequency of Occurrence:	2.6%
Recurrence Interval:	0.39 years
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	\$9,415,634
Total Fatalities:	1
Deadliest Event:	1 Fatality (March 28, 1984)
Most Property Damage:	\$6,235,671 (March 28, 1984)
Most Crop Damage:	\$623,567 (March 28, 1984)
Highest USDA Crop Indemnity Payout:	n/av*

*No hail events caused a USDA Crop Indemnity Payout

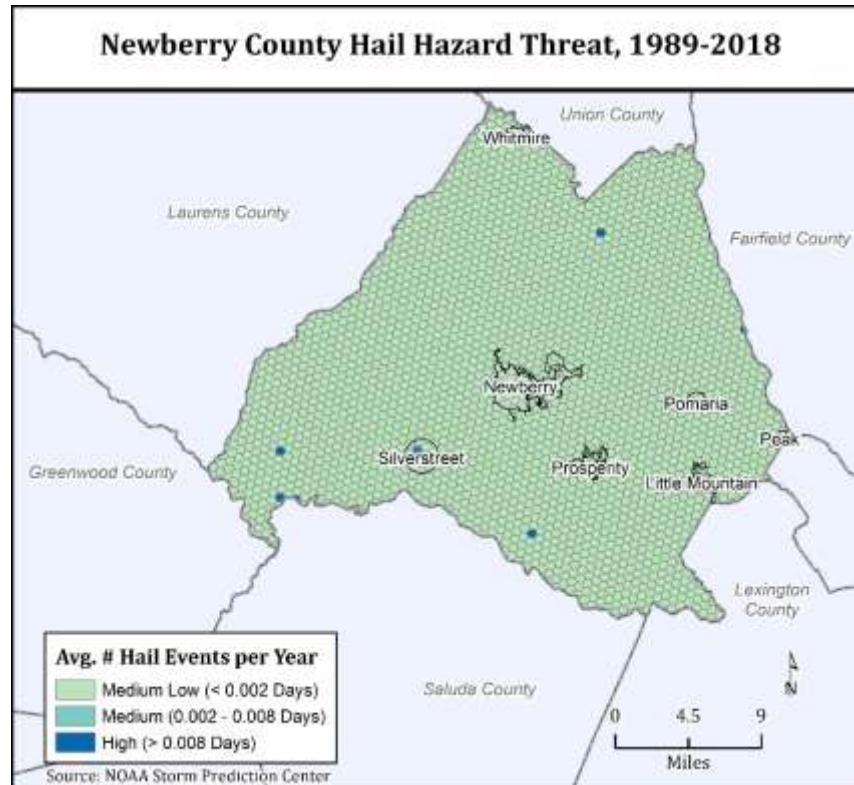


Figure 116 - Hail threat (occurrence) in Newberry County.

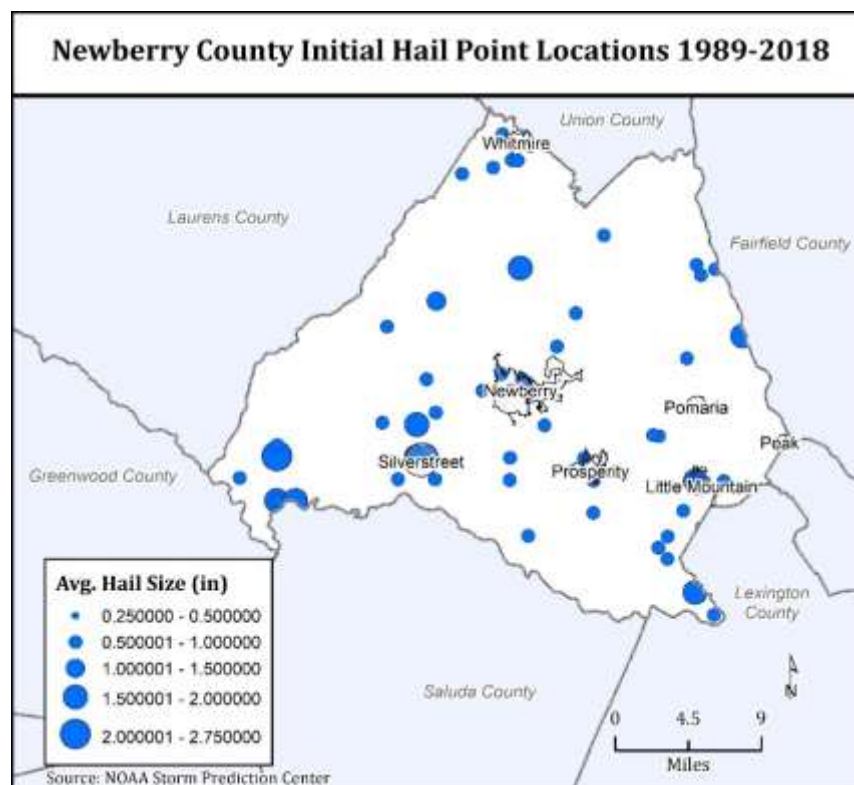


Figure 117 - Risk of large hail events in Newberry County.

Table 69 - Record of loss-causing hail events in Newberry County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
2/18/1960	2/18/1960	0	0	\$1,251	\$0		Northern & Central SC	Windstorms & Hail
3/30/1960	3/30/1960	0	0	\$43,776	\$0	1.75	2 Miles Southwest of Pomaria	Tornado & Hail
8/8/1960	8/8/1960	0	0	\$438	\$0		Newberry County	Wind & Hail
4/12/1962	4/12/1962	0	0	\$1,716	\$0		Central SC	Hail & wind
5/16/1963	5/16/1963	0	0	\$0	\$23,525		Northern SC	Windstorms & Hail
6/11/1963	6/11/1963	0	0	\$0	\$92,055		Statewide	Hailstorms
4/7/1965	4/7/1965	0	0	\$4,571	\$0		Owensville, Greenville County to St. Matthews, & Calhoun County	Hail
7/1/1965	7/31/1965	0	0	\$894	\$0		Statewide	Wind, Heavy Rain, & Hail
7/19/1965	7/19/1965	0	0	\$894	\$89		Statewide	Hail, Lightning, & Wind
4/13/1966	4/13/1966	0	0	\$3,999	\$0		Newberry County	Rain, Hail, Wind, & Electrical
7/16/1970	7/16/1970	0	0	\$3,340	\$334	1.5	Newberry County	Thunderstorm, High Winds, & Hail
5/20/1973	5/20/1973	0	0	\$1,390	\$13,897		Northern & Northeastern SC	Rain, Hail, Wind, & Electrical
5/28/1973	5/29/1973	1	0	\$1,081	\$1,081		Western & Northern SC	Hail, Wind, & Electrical
12/13/1973	12/13/1973	0	1	\$2,918,406	\$29,184	1.75	1 Mile South of Silverstreet, East of Prosperity to North of Little Mountain	Tornado & Hail
12/13/1973	12/13/1973	0	0	\$11	\$108	1.75	Northern & Western SC	Hail & Lightning
3/29/1974	3/29/1974	0	0	\$6,258	\$6,258		Northern, Eastern, & Central SC	Hail, Wind, & Electrical
3/30/1974	3/30/1974	0	0	\$0	\$202		Northwestern SC	High Winds & Hail
5/19/1974	5/19/1974	0	0	\$876	\$88		Northwestern & Southern SC	Hail, High Wind, & Lightning
7/16/1974	7/16/1974	0	0	\$1,011	\$1,011		Southern & Central SC	Wind & Hail
3/7/1975	3/7/1975	0	0	\$688	\$0		Northwestern, Northeastern, & Central SC	Hail, Lightning, & Wind
3/24/1975	3/24/1975	1	0	\$5,236	\$52		Statewide	Hail, Lightning, & Wind
5/10/1975	5/10/1975	0	0	\$13,381	\$133,806	1	York to Bamberg & Spartanburg to Oconee & Anderson	Hail, Lightning, & Wind
6/5/1975	6/5/1975	0	0	\$1,853	\$185		Northwestern SC	Wind & Hail
6/15/1975	6/15/1975	0	0	\$708	\$708		Northern & Central SC	Hail, Lightning, & Wind
6/18/1975	6/18/1975	0	0	\$52	\$5,236		Statewide	Hail, Lightning, & Wind
6/19/1975	6/19/1975	0	0	\$892	\$892		Northern & Western SC	Hail, Lightning, & Wind
7/4/1975	7/4/1975	0	0	\$6,881	\$68,814		Northern & Central SC	Hail, Lightning, & Wind
6/6/1977	6/6/1977	0	0	\$465	\$4,648		Statewide	Hail, Lightning, & Wind
7/8/1977	7/8/1977	0	0	\$21,382	\$2,138		Hartfird & Silverstreet areas of Newberry County	Hail, Lightning, & Wind

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
4/18/1978	4/18/1978	0	0	\$1,420	\$14,196		Northeastern SC	Hail
5/24/1978	5/24/1978	0	0	\$14	\$1,420		Northwestern & Northeastern SC	Thunderstorm Hail
4/26/1982	4/27/1982	0	0	\$29	\$29		Statewide	Thunderstorm, Wind, Lightning, & Hail
5/16/1982	5/16/1982	0	0	\$537	\$54		Northern & Eastern SC	Heavy Rain, Hail, & Thunderstorms
5/17/1982	5/17/1982	0	0	\$37	\$373		Northern, Central, & Southern SC	Thunderstorms, High Winds, & Hail
6/10/1982	6/10/1982	1	0	\$327,505	\$327,505		Western, Northern, Central, & Eastern SC	Hail, Lightning, Rain, & Wind
7/24/1983	7/24/1983	0	0	\$4,337	\$434		Central & Eastern SC	Thunderstorm, Winds, Hail, & Lightning
3/28/1984	3/28/1984	38	1	\$12,471,342	\$1,247,134	1	Newberry Co.	Tornado & Hail
3/28/1984	3/28/1984	5	0	\$623,567	\$623,567	1	Newberry Co.	Tornado & Hail
4/14/1984	4/14/1984	0	0	\$445	\$445		Northern & Central SC	Hail & Wind
6/20/1984	6/20/1984	0	0	\$2,711	\$271		Statewide	Hail, Lightning, Rain, & Wind
7/25/1984	7/25/1984	0	0	\$124,713	\$1,247		Central SC	Hail, Lightning, Rain, & Wind
2/11/1985	2/12/1985	0	0	\$2,618	\$3		Statewide	Wind, Snow, Hail, & Thunderstorms
6/4/1985	6/4/1985	0	0	\$634	\$634		North-Central & Central SC	Hail
6/7/1985	6/7/1985	0	0	\$2,618	\$262		Statewide	Hail & Wind
4/11/1988	4/11/1988	0	0	\$4	\$0		SCZ003-004-005-006 East & Lower Piedmont, Northern & Southern Midlands	Small Hail
4/12/1988	4/12/1988	0	0	\$7	\$0		SCZ004-006 Lower Piedmont & Southern Midlands	Small Hail
5/17/1988	5/17/1988	0	0	\$110	\$110	0.75	Whitmire	Hail
5/23/1988	5/23/1988	0	0	\$1,095	\$110	0.75	Silverstreet	Hail
9/4/2015	9/4/2015	0	0	\$4,374	\$0	1.25	Jalapa	Public reported nickel to quarter size hail with a few pieces up to half dollar size near Jalapa off US 76.
3/1/2017	3/1/2017	0	0	\$10	\$10	0.75	Whitmire	Dime size hail reported at a gas station in Whitmire.
3/1/2017	3/1/2017	0	0	\$10	\$10	0.88	Whitmire	Nickel and pea size hail reported in Whitmire.
3/1/2017	3/1/2017	0	0	\$10	\$10	0.88	Eison XRDS	Hail up to nickel size, along with estimated wind gusts up to 30 mph, reported at Old Airport Road in Whitmire.
3/1/2019	3/1/2019	0	0	\$10	\$10	0.25	Deadfall XRDS	Public report of small hail between Newberry and Saluda River Resort. Time and location estimated.
4/8/2019	4/8/2019	0	0	\$100	\$100	0.25	Mudlick	Pea size hail covered the ground.
4/8/2019	4/8/2019	0	0	\$100	\$100	0.88	Mudlick	Nickel sized hail reported by the public along Sandy Run Creek Road near Roberta Hall Road. The hail lasted around 5 minutes.
4/8/2019	4/8/2019	0	0	\$100	\$100	0.75	Mudlick	Dime size hail lasted about 5 minutes and covered the ground, on Brehmer Road.

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
8/1/2019	8/1/2019	0	0	\$10	\$10	0.88	Keitts XRDS	EM reported nickel size hail near US Hwy 176 and SC 34.
8/17/2019	8/17/2019	0	0	\$10	\$10	0.75	Jalapa	Public reported penny size hail near Boyd Road and Jalapa Road. Time estimated.
8/19/2019	8/19/2019	0	0	\$10	\$10	0.25	Hope Station	Pea size hail reported in Pomaria.

*No magnitude information indicates hailstone sizes were unavailable.

H) Fog

What to expect: Fog does not cause direct property damage or injuries. But indirectly, the personal safety of boaters, motorists, and other travelers is at risk due to poor visibility during fog conditions. Fog is common in Newberry County and occurs most frequently during the fall and spring months. On average, the county experiences at least 6 days⁵⁷ with some periods of fog (or haze). The number of fog days varies considerably ranging from an average of 6 days of fog per year in northern Newberry County up to 30 days in the southeastern portion of the country, around Little Mountain (Figure 118). There is no record of property damage or fatalities associated with fog as reported by SHELDUSTM or NCDC's Storm Data. This is likely because most damage from fog is indirect (e.g., traffic accidents).

Geographic Extent: Based on past occurrences, the entire county is susceptible to fog. Southeastern Newberry County experiences significantly larger number of days with reduced visibility compared to Whitmire or Silverstreet areas.

Fog statistics for Newberry County are as following:

Number of Loss-Causing Events:	n/av (largely motorist accidents)
Daily Frequency of Occurrence:	0.04%
Daily Recurrence Interval:	25 days
Expected changes to frequency and recurrence interval in the future:	Not enough information available to make assumptions about future changes
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	n/av
Total Fatalities:	n/av
Deadliest Event:	n/av
Most Property Damage:	n/av
Most Crop Damage:	n/av
Highest USDA Crop Indemnity Payout:	n/av

⁵⁷ A "fog day" has reduced visibility due to fog, haze, or smoke at any time of the day as indicated by NWS station data.

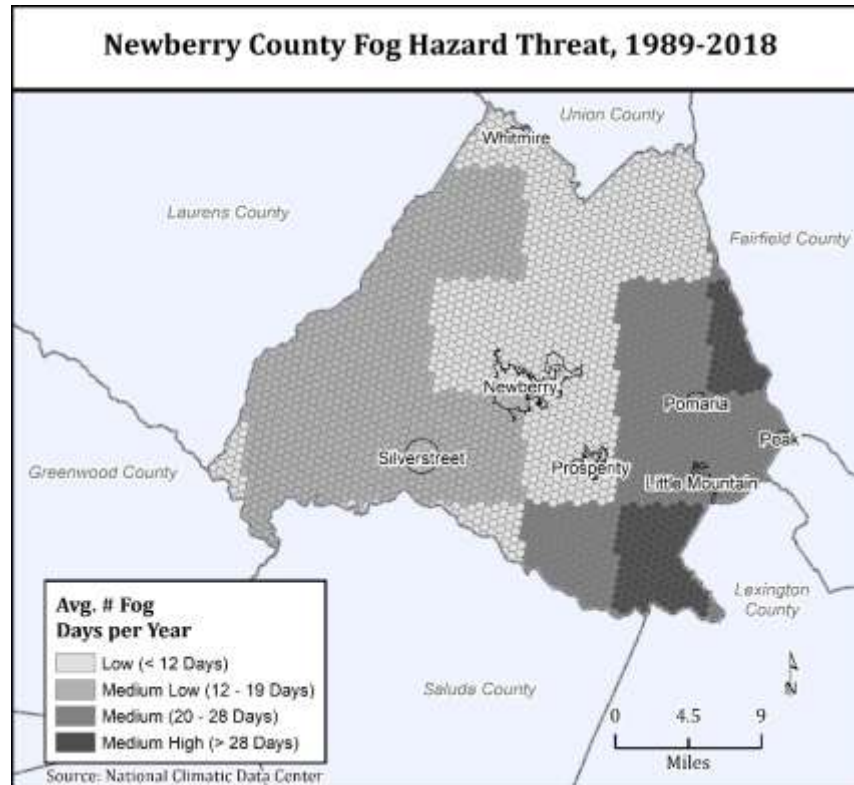


Figure 118 - Fog threat in Newberry County.

I) Winter Weather & Ice Storms

What to expect: Every property and person is at risk from winter weather in Newberry County. Ice storms and winter weather occur every year—on average at least one day per 15 months (Figure 119). Snow accumulations of 2 inches and more are uncommon and becoming less frequent, though the area has seen significant snow accumulations in the past (Table 70). The highest daily snowfall amount was 11 inches (February 26, 1914)⁵⁸.

More damaging than snow events are ice storms, which tend to occur frequently in this area. Ice accumulations of 1.5 inches and more are possible but even thin coatings of ice cause havoc. Falling trees lead to power outages, road closures, and damage to homes and other properties. In addition, winter weather tends to adversely affect agriculture more than any other hazard. It appears that crop damage from winter weather events is severely underreported.

Geographic Extent: The entire county is susceptible to damage from winter weather.

Winter weather statistics for Newberry County are as following:

Number of Loss-Causing Events:	81
Frequency of Occurrence:	0.77%
Recurrence Interval:	1.3 year
Expected changes to frequency and recurrence interval in the future:	Decreased likelihood of occurrence and lengthening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019

⁵⁸ SCDNR. South Carolina record minimum temperatures and date. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/data/min_temp_table.php

Winter weather-related Presidential Disaster Declarations:	DR-1313 (2000) DR-1509 (2004)
Total Losses:	\$21,804,963
Total Fatalities:	2
Deadliest Event:	1 fatality (several instances)
Most Property Damage:	\$634,436 (February 9, 1973)
Most Crop Damage:	\$7,512,160 (February 15, 1969)
Highest USDA Crop Indemnity Payout:	\$15,686 (April 2012)

January 22, 2000 (DR-1313): A severe winter storm resulted in widespread power outages. Thirty-eight counties in South Carolina were designated for federal assistance including Newberry County.

January 26-30, 2004 (DR-1509): An ice storm began over the North Midlands of South Carolina on Sunday night and gradually spread south into the Central Midlands on Monday. The storm continued into Tuesday, mainly freezing drizzle during that time. Ice accumulations of 1/2 to 3/4 inches occurred, bringing down numerous trees and powerlines. The heaviest ice accumulations occurred in Lancaster, Chesterfield, Fairfield, Newberry, Saluda, McCormick, Orangeburg, and Clarendon counties. Over 250,000 homes, businesses, and schools were without power for several days. Sleet fell in Lancaster and Chesterfield counties and accumulated up to 2 inches. Six people were injured in traffic related accidents and there were no deaths. Damage estimates from SCEMD were \$28.5 million.

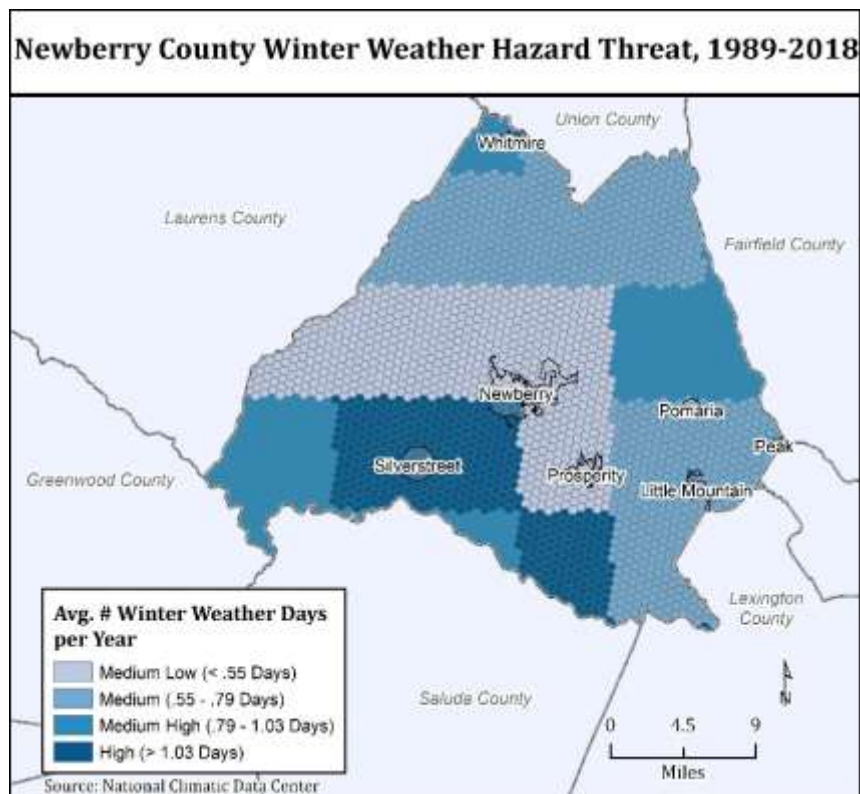


Figure 119 - Winter weather threat in Newberry County.

Table 70 - Record of loss-causing winter weather events in Newberry County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
3/2/1960	3/2/1960	0	0	\$24,320	\$0	Trace	Northern SC	Snow & Ice
3/9/1960	3/11/1960	0	0	\$12,507	\$0	6.5"	Northern & Central SC	Snow, Sleet, & Ice
1/25/1961	1/26/1961	0	0	\$9,421	\$942	1.3"	Statewide	Ice Storm
2/3/1961	2/4/1961	0	0	\$942	\$0	0.5"	Statewide	Glaze
1/1/1962	1/1/1962	0	0	\$2,384	\$0	0.5"	Northern Counties from Anderson to York	Snow & Ice
12/31/1963	1/1/1964	1	0	\$92,055	\$9,206	0.89"	Statewide	Ice
3/30/1964	3/31/1964	0	0	\$0	\$908,676	2.5"	Statewide	Killing Freeze
1/26/1966	1/27/1966	0	0	\$114,266	\$0	2.2"	Northern & Central SC	Snow & Ice
1/29/1966	1/30/1966	0	0	\$0	\$86,941	0.5"	Statewide	Severe Cold, Ice, & Snow
3/29/1966	3/29/1966	0	0	\$17,388	\$0	4"	Inland SC	Frost
3/17/1967	3/19/1967	0	0	\$0	\$2,155,310	-	Northern SC	Cold Wave
1/9/1968	1/13/1968	0	0	\$116,359	\$12	0.98"	Northern 2/3rds of SC	Rain, Sleet, Snow, & Freezing Rain
2/15/1969	2/17/1969	0	0	\$75,122	\$7,512,160	5"	Statewide	Snow, Sleet, & Freezing Rain
11/1/1969	11/1/1969	0	0	\$14,123	\$14	2"	Central SC	Wind & Snow
1/8/1970	1/9/1970	0	0	\$726	\$7	2.4"	Statewide	Severe Freeze
11/24/1970	11/25/1970	0	0	\$7	\$7	5.5"	Statewide	Severe Freeze
1/8/1971	1/9/1971	0	0	\$2,461	\$2,461	Trace	Northwestern SC	Freezing Rain
3/25/1971	3/25/1971	1	1	\$177,747	\$178	-	Northern Half of SC	Snowstorm
12/3/1971	12/3/1971	0	0	\$69,553	\$69,553	1.95"	Statewide	Snow, Sleet, Rain, Freezing Rain, & Wind
4/1/1972	4/30/1972	0	0	\$0	\$352,265	1.35"	Statewide	Cold Spell
1/7/1973	1/8/1973	0	0	\$63,444	\$634,436	.69"	Statewide	Snow & Ice
2/9/1973	2/10/1973	0	1	\$634,436	\$634	0.5"	Statewide	Snowstorm
4/11/1973	4/12/1973	0	0	\$0	\$162,134	5.5"	Northern & Northwestern SC	Frost & Freeze
12/17/1973	12/17/1973	0	0	\$3,648	\$36	0.54"	North-Central SC	Heavy Snow
12/20/1973	12/20/1973	0	0	\$224	\$0	2.8"	Northwestern SC	Freezing Rain
10/3/1974	10/4/1974	0	0	\$6,739	\$0	4.5"	Western, Northern, & Central SC	Frost & Freeze
2/3/1975	2/4/1975	0	0	\$13,381	\$1,338	0.14"	Northwestern & Northern SC	Ice Storm
3/2/1975	3/3/1975	0	0	\$0	\$5,236	Trace	Statewide	Low Temperatures
1/1/1977	1/31/1977	0	0	\$465	\$465	-	Statewide	Unusual Cold Weather
1/1/1977	1/31/1977	0	0	\$465	\$465	0.8"	Statewide	Unusual Cold Weather
1/13/1978	1/13/1978	0	0	\$1,656	\$0	1.12"	Northwestern SC	Snow, Sleet, & Freezing Rain
3/2/1978	3/3/1978	0	0	\$1,529	\$0	4"	Northwestern SC	Snow & Freezing Rain
2/6/1979	2/6/1979	0	0	\$594,937	\$595	0.12"	Northwestern & Central SC	Snow, Sleet, & Ice
2/17/1979	2/18/1979	0	0	\$38,800	\$388	2"	Statewide	Snow, Sleet, & Freezing Rain
1/30/1980	1/31/1980	0	0	\$828	\$828	0.71"	Northern Half of SC	Freezing Rain

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)	Location	Description
2/5/1980	2/6/1980	0	0	\$34,186	\$342	0.22"	All of SC except Southern Coastal Region	Snowstorm over most of State except Ice Storm near Beaches North Coastal Area
3/1/1980	3/2/1980	0	0	\$3,419	\$3,419	1.3"	Statewide	Snow, Freezing Rain, Drizzle, & Sleet
12/23/1980	12/23/1980	0	0	\$71	\$0	0.11"	Northwestern & Central SC	Freezing Rain
2/1/1981	2/1/1981	0	0	\$79	\$0	0.83"	Northern SC	Freezing Rain & Sleet
1/11/1982	1/11/1982	0	0	\$292	\$292	-	Statewide	Hard Freeze
1/12/1982	1/12/1982	0	0	\$4,796	\$473	8"	Statewide except Coastal Plains Region	Snow, Sleet, & Freezing Rain
2/26/1982	2/27/1982	0	0	\$2,919	\$0	0.45"	Statewide	Snow, Sleet, & Glaze
3/27/1982	3/27/1982	0	0	\$0	\$291,907	1.2"	Statewide	Extreme Cold
4/7/1982	4/7/1982	0	0	\$0	\$3,356,923	-	Statewide except Southern Region	Frost & Freeze
4/23/1982	4/24/1982	0	0	\$0	\$29	-	Statewide	Frost & Freeze
1/21/1983	1/21/1983	0	0	\$2,828	\$28	-	Statewide	Freezing Rain, Sleet, & Snow
3/24/1983	3/24/1983	0	0	\$283	\$3		Statewide	Winter Storm, Wind, & Snow
4/17/1983	4/18/1983	0	0	\$0	\$2,828,209	1.58"	Statewide	Extreme Cold
12/25/1983	12/25/1983	0	1	\$28,282	\$28,282	1.2"	Statewide	Extreme Cold
12/30/1983	12/31/1983	0	0	\$2,828	\$283	0.75"	Statewide	Extreme Cold
1/13/1984	1/13/1984	0	0	\$4,454	\$445	-	Northern Half of SC	Freezing Rain & Glaze
2/6/1984	2/6/1984	0	0	\$693	\$0	0.33"	Northern SC	Snow
1/17/1985	1/17/1985	0	0	\$67	\$0	1.5"	Northern SC	Freezing rain
1/20/1985	1/24/1985	0	1	\$26,179	\$2,618	Trace	Statewide	Extreme Cold & Snow
1/28/1985	1/28/1985	0	0	\$669	\$0	-	Northern SC	Snow & Sleet
2/11/1985	2/12/1985	0	0	\$2,618	\$3	-	Statewide	Wind, Snow, Hail, & Thunderstorms
3/19/1985	3/19/1985	0	0	\$0	\$2,618	-	Statewide	Frost & Freeze
12/26/1985	12/26/1985	0	0	\$262	\$26	-	Statewide	Cold
1/26/1986	1/27/1986	0	0	\$2,570	\$26	-	Statewide	Cold
3/22/1986	3/23/1986	0	0	\$0	\$2,570	-	Statewide	Cold
4/23/1986	4/24/1986	0	0	\$0	\$2,570	-	Statewide	Frost & Freeze
1/22/1987	1/22/1987	0	0	\$600	\$60	-	Northwestern SC	Heavy Snow & Sleet
1/26/1987	1/26/1987	0	0	\$5,185	\$518	-	Central, Northern, & Northeastern SC	Ice Storm
2/16/1987	2/16/1987	0	0	\$6,003	\$600	-	Northwestern, North-Central, & Northeastern SC	Ice Storm
4/1/1987	4/1/1987	0	0	\$0	\$2,925	-	Statewide except the Immediate Coastal Region	Freeze
10/1/1987	10/31/1987	0	0	\$0	\$248	-	Statewide	Cold Weather
1/7/1988	1/11/1988	0	0	\$23,811	\$0	-	Statewide	Snow, Ice, & Sleet
3/14/1988	3/17/1988	0	0	\$238	\$0	-	Statewide	Low Temperature
4/20/1988	4/20/1988	0	0	\$0	\$58	-	SCZ002-003-004 Foothills, Eastern Piedmont, & Lower Piedmont	Frost

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
2/23/1989	2/23/1989	0	0	\$2,272	\$0	-	Statewide	Heavy Snow
4/12/1989	4/12/1989	0	0	\$5,500	\$0	-	Northwestern SC	Freeze
12/22/1989	12/25/1989	0	0	\$29,027	\$0	-	SCZ001-002-003-004-005-006 Mountains, Foothills, Piedmont, & Midlands	Extreme Cold
3/21/1990	3/21/1990	0	0	\$0	\$215,524	-	Statewide	Freeze
4/3/1992	4/3/1992	0	0	\$0	\$710,440	-	Piedmont	Freeze
4/3/1992	4/3/1992	0	0	\$0	\$71,044	-	Piedmont	Freeze
12/27/1992	12/28/1992	0	0	\$32,985	\$32,985	-	Foothills, Eastern & Lower Piedmont, & Northern Midlands	Ice Storm
3/13/1993	3/13/1993	0	0	\$64,052	\$64,052	-	SCZ001-002-004	Heavy Snow
2/11/1994	2/11/1994	0	0	\$46,018	\$0	-	Statewide	Ice Storm
2/17/2003	2/17/2003	4	0	\$0	\$0	1.5"	Newberry	An ice storm produced 1/4 - 1/2" of freezing rain on trees, highways, and other structures.
1/18/2007	1/18/2007	0	0	\$6,249	\$0	0.25"	Newberry	Ice accumulations of 1/4 occurred on trees and other structures. There were some branches down and a few power outages. No accumulation was observed on roadways as ground temperatures were above freezing.
1/30/2010	1/30/2010	0	0	\$11,885	\$0	1.5"	Newberry	EM reported 1 - 2 inches of sleet fell over northern Newberry County around Whitmire with a 1/4 to a 1/2 inch of ice over the remainder of the county. Many trees and powerlines were taken down and there were many accidents.

*No magnitude information indicates snowfall amounts or ice thickness were unavailable.

J) Temperature Extremes

What to expect: Newberry County experiences between 49 and 73 or more days per year when temperatures fall below freezing at any given time of the day, which is generally during nighttime hours in the winter months (Figure 120). The record minimum temperature for Newberry County was set on February 14, 1899, with -8 degrees Fahrenheit⁵⁹. Most record minimum temperatures in South Carolina date back to 1985 or 1899. Property damage tends to be restricted to busted water pipes and motor vehicle accidents. However, periods of frost and freeze cause significant damage to agricultural production.

Geographic Extent: Based on past occurrences, the entire county is susceptible to cold weather temperatures. There is a distinct southeastern to northeastern gradient in Newberry County with the southern areas experiences less days with freezing temperature.

Cold weather statistics for Newberry County are as following:

Number of Loss-Causing Events:	38
Frequency of Occurrence:	59%
Recurrence Interval:	0.02 years

⁵⁹ SCDNR. South Carolina record minimum temperatures and date. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/data/min_temp_table.php

Expected changes to frequency and recurrence interval in the future:	Decreased likelihood of occurrence and lengthening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	\$14,822,637
Total Fatalities:	1
Deadliest Event:	1 Fatality (December 25, 1985)
Most Property Damage:	\$29,027 (December 22, 1989)
Most Crop Damage:	\$3,356,923 (April 7, 1982)
Highest USDA Crop Indemnity Payout:	\$466,466 (1990)

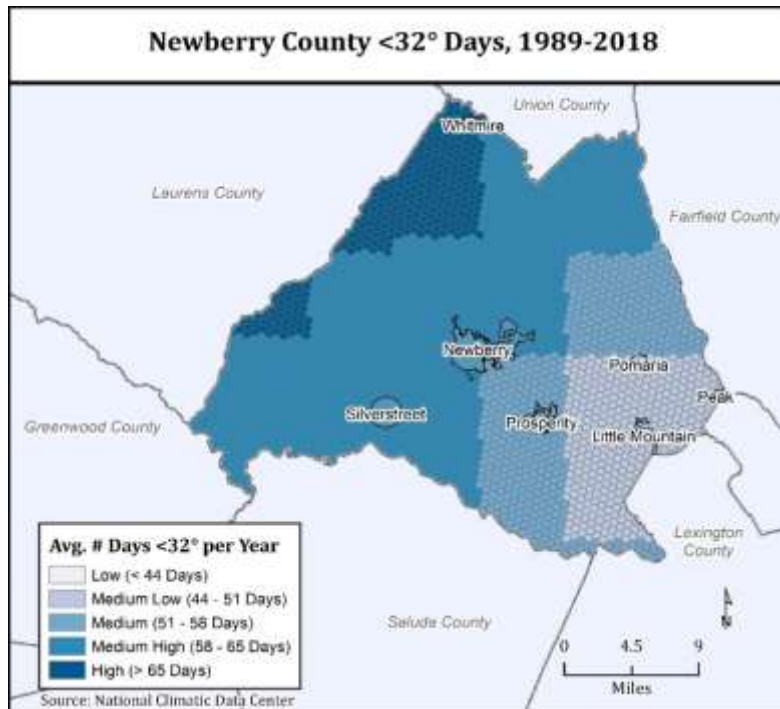


Figure 120 - Cold weather threat in Newberry County.

Table 71 - Record of loss-causing cold weather events in Newberry County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
3/30/1964	3/31/1964	0	0	\$0	\$908,676	Statewide	Killing Freeze
1/29/1966	1/30/1966	0	0	\$0	\$86,941	Statewide	Severe Cold, Ice, & Snow
3/17/1967	3/19/1967	0	0	\$0	\$2,155,310	Northern SC	Cold Wave
1/8/1970	1/9/1970	0	0	\$726	\$7	Statewide	Severe Freeze
11/24/1970	11/25/1970	0	0	\$7	\$7	Statewide	Severe Freeze
4/1/1972	4/30/1972	0	0	\$0	\$352,265	Statewide	Cold Spell
4/11/1973	4/12/1973	0	0	\$0	\$162,134	Northwestern & Northern SC	Frost & Freeze
4/11/1973	4/12/1973	0	0	\$0	\$162,134	Northwestern & Northern SC	Frost & Freeze
10/3/1974	10/4/1974	0	0	\$6,739	\$0	Western, Northern, & Central SC	Frost & Freeze
10/3/1974	10/4/1974	0	0	\$6,739	\$0	Western, Northern, & Central SC	Frost & Freeze

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
3/2/1975	3/3/1975	0	0	\$0	\$5,236	Statewide	Low Temperatures
1/1/1977	1/31/1977	0	0	\$465	\$465	Statewide	Unusual Cold Weather
1/1/1977	1/31/1977	0	0	\$465	\$465	Statewide	Unusual Cold Weather
1/11/1982	1/11/1982	0	0	\$292	\$292	Statewide	Hard Freeze
3/27/1982	3/27/1982	0	0	\$0	\$291,907	Statewide	Extreme Cold
4/7/1982	4/7/1982	0	0	\$0	\$3,356,923	Statewide except Southern Region	Frost & Freeze
4/7/1982	4/7/1982	0	0	\$0	\$3,356,923	Statewide except Southern Region	Frost & Freeze
4/23/1982	4/24/1982	0	0	\$0	\$29	Statewide	Frost Freeze
4/23/1982	4/24/1982	0	0	\$0	\$29	Statewide	Frost Freeze
4/17/1983	4/18/1983	0	0	\$0	\$2,828,209	Statewide	Extreme Cold
12/25/1983	12/25/1983	0	1	\$28,282	\$28,282	Statewide	Extreme Cold
12/30/1983	12/31/1983	0	0	\$2,828	\$283	Statewide	Extreme Cold
1/20/1985	1/24/1985	0	1	\$26,179	\$2,618	Statewide	Extreme Cold & Snow
3/19/1985	3/19/1985	0	0	\$0	\$2,618	Statewide	Frost & Freeze
3/19/1985	3/19/1985	0	0	\$0	\$2,618	Statewide	Frost & Freeze
12/26/1985	12/26/1985	0	0	\$262	\$26	Statewide	Cold
1/26/1986	1/27/1986	0	0	\$2,570	\$26	Statewide	Cold
3/22/1986	3/23/1986	0	0	\$0	\$2,570	Statewide	Cold
4/23/1986	4/24/1986	0	0	\$0	\$2,570	Statewide	Frost & Freeze
4/23/1986	4/24/1986	0	0	\$0	\$2,570	Statewide	Frost & Freeze
4/1/1987	4/1/1987	0	0	\$0	\$2,925	Statewide except the Immediate Coastal Region	Freeze
10/1/1987	10/31/1987	0	0	\$0	\$248	Statewide	Cold Weather
3/14/1988	3/17/1988	0	0	\$238	\$0	Statewide	Low Temperature
4/12/1989	4/12/1989	0	0	\$5,500	\$0	Northwestern SC	Freeze
12/22/1989	12/25/1989	0	0	\$29,027	\$0	SCZ001-002-003-004-005-006 Mountains, Foothills, & Piedmont and Midlands	Extreme Cold
3/21/1990	3/21/1990	0	0	\$0	\$215,524	Statewide	Freeze
4/3/1992	4/3/1992	0	0	\$0	\$710,440	Piedmont	Freeze
4/3/1992	4/3/1992	0	0	\$0	\$71,044	Piedmont	Freeze

What to expect: Hot weather is common in Newberry County during the late spring, summer and early fall months. On average, there are 18 to 24 days of above 95 degrees in any given year (Figure 121). Newberry County will experience periods of above 100-degree temperatures in the months of May, June, July, August, September, and October. The hottest temperature recorded in Newberry County was 108°F (July 21, 1952). Heat events are a high-risk event to public health due to the possibility of heat exhaustion and heat stroke. The number of high temperature days and the duration of heat waves are expected to increase.

Geographic Extent: The entire county is susceptible to hot temperatures. However, the southwestern parts of the county experience more days of above 95 degrees (Figure 121).

According to South Carolina's State Climatology Office, summer maximum temperatures in Newberry County have slightly decreased from 74.1°F (1971-2000) to 73.8°F (1981-2010) but due to a warming climate, the mean temperature has increased from 61.4°F (1971-2000) to 62.1°F (1981-2010)⁶⁰.

Hot weather statistics for Newberry County are as following:

Number of Loss-Causing Events:	7
Frequency of Occurrence:	21%
Recurrence Interval:	0.05 years
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	\$12,746,647
Total Fatalities:	0
Deadliest Event:	n/a
Most Property Damage:	\$5,146,441 (July 1, 1993)
Most Crop Damage:	\$5,146,441 (August 1, 1993)
Highest USDA Crop Indemnity Payout:	\$138,839 (May 2015)

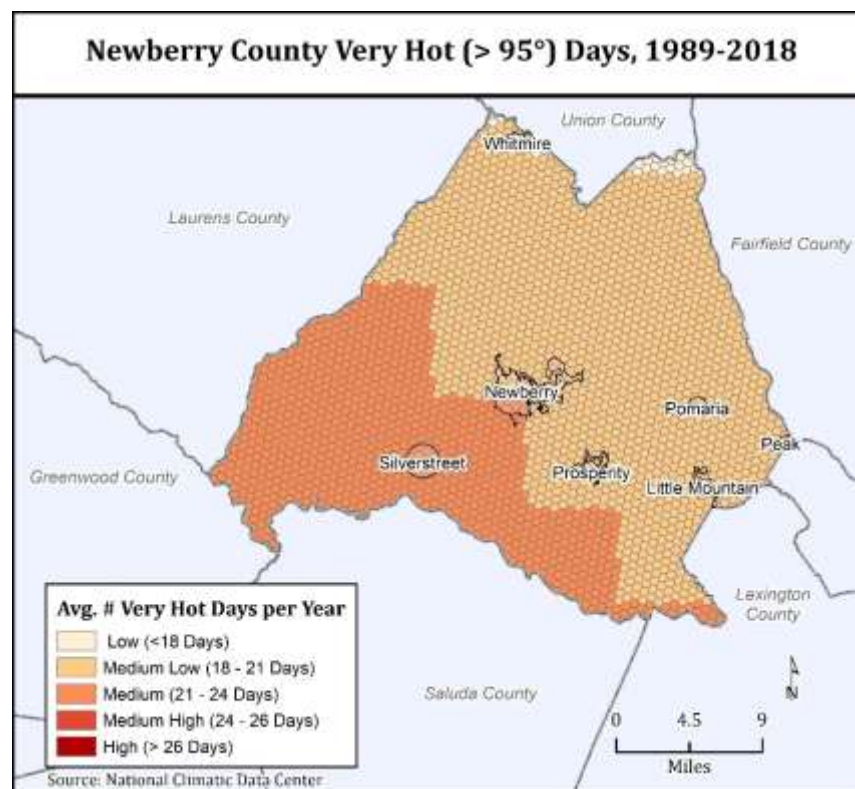


Figure 121 - Hot weather threat in Newberry County.

⁶⁰ SCDNR, n/d. South Carolina County Weather Atlas. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/cli_county_statistics.php

Table 72 - Record of loss-causing hot weather events in Newberry County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
2/1/1976	2/29/1976	0	0	\$495	\$4,951	Statewide	Heat
7/1/1977	7/31/1977	0	0	\$4,648	\$464,834	Statewide	Drought & Heat
10/1/1978	10/31/1978	0	0	\$432	\$4,320	Statewide	Drought & Heat
6/1/1985	6/7/1985	0	0	\$0	\$261,793	Statewide	Heat
6/1/1993	6/30/1993	0	0	\$0	\$1,949,409	Statewide	Heat
7/1/1993	7/31/1993	0	0	\$10,292,881	\$0	Statewide	Drought & Heat
8/1/1993	8/31/1993	0	0	\$0	\$10,292,881	Statewide	Drought & Heat

K) Wildfires

What to expect: On average, wildfires occur frequently—every 24 days—in Newberry County but damage to life and property is limited (Table 73). The largest wildfire was about 300 acres. The number of wildfire events and the size of wildfires are expected to increase.

Geographic Extent: The entire county is susceptible to wildfire. The risk of wildfire including the propensity for large wildfires is spread randomly across the county (Figure 162 & Figure 163) without any spatial concentration (e.g., near population centers).

Wildfire statistics for Newberry County are as following:

Number of Loss-Causing Events:	3
Daily Frequency of Occurrence:	0.04%
Recurrence Interval:	24 days
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	2005 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	\$401,355
Total Fatalities:	0
Deadliest Event:	n/a
Most Property Damage:	\$86,941 (March 15, 1966)
Most Crop Damage:	\$261,793 (March 1, 1985)
Highest USDA Crop Indemnity Payout:	n/av*

*No wildfire events caused a USDA Crop Indemnity Payout

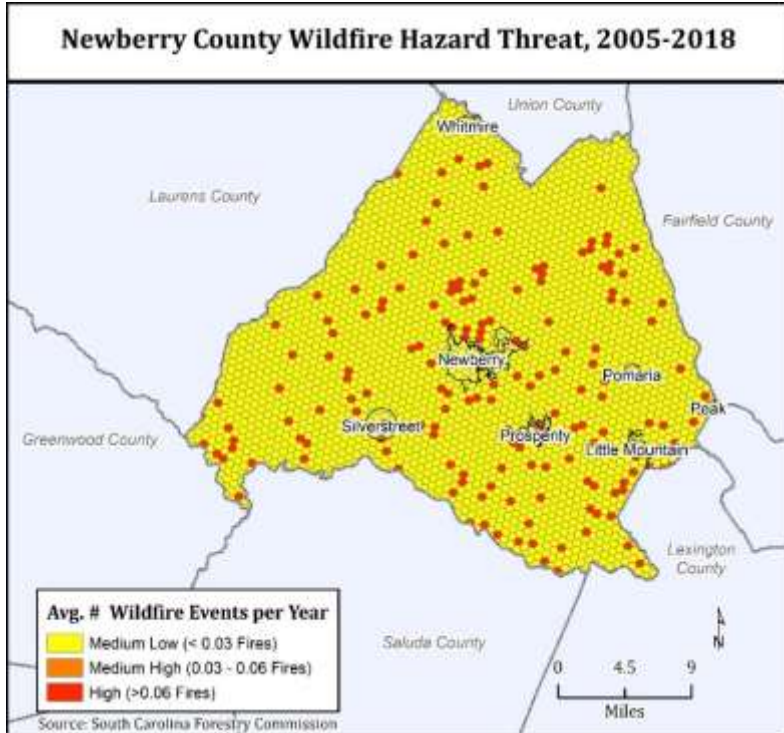


Figure 122 - Wildfire threat in Newberry County based on average number of wildfires per year.

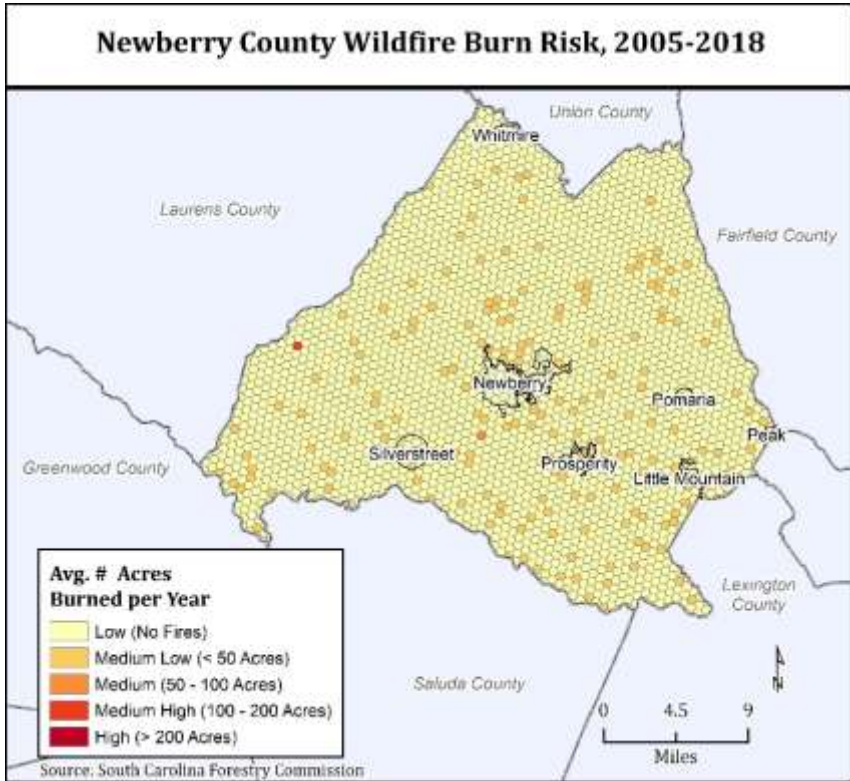


Figure 123 - Risk of large wildfires in Newberry County.

Table 73 - Record of loss-causing wildfire events in Newberry County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
------------	----------	------	------	-----------------	-------------	----------	-------------

3/15/1966	3/31/1966	0	0	\$86,941	\$0	Statewide	Forest Fires
3/1/1985	3/21/1985	0	0	\$26,179	\$261,793	Statewide	Fire
4/1/1985	4/30/1985	0	0	\$262	\$26,179	Statewide	Fire

L) Droughts

What to expect: Newberry County sees drought conditions, i.e., weeks of moderate to extreme drought according to the Palmer Drought Severity Index, on average at least 18 weeks, with many areas experiencing longer periods up to 23 weeks (Figure 124). Multi-year, severe droughts are possible in the County as seen from 1998 through 2002. The County experienced its driest year in 1925 with only 24.4 inches of rainfall (annual average: 47.34 inches)⁶¹. Droughts are detrimental to agricultural production incl. forestry and water supply. Agricultural crops, especially corn, cotton, and soybean are easily stressed by drought conditions and irrigation systems are not common in South Carolina. Severe droughts also affect tourism and freshwater fisheries. The number of droughts days and the duration of drought events are expected to increase.

Geographic Extent: The entire county is susceptible to drought, but the central Newberry tends to experience more weeks in drought conditions.

The most damaging droughts occurred in 1954, 1986, and 1998-2002. The latest severely impacted economic sectors such as agriculture, forestry, tourism, power generation, public water supplies, and freshwater fisheries⁶² (Table 74). Less severe droughts were reported in 1988, 1990, 1993, and 1995. Unfortunately, the record on losses, particularly agricultural losses is sparse—not because of a lack of losses but because of shortcomings in tracking drought losses. The current tally of around \$16 million in direct losses is most likely a vast underestimation and possibly exceeds \$100 million.

Drought statistics for Newberry County are as following:

Number of Loss-Causing Events:	16
Frequency of Occurrence:	0.46%
Recurrence Interval:	2.2 years
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	\$16,069,921
Total Fatalities:	0
Deadliest Event:	n/a
Most Property Damage:	\$5,146,441 (July 1, 1993)
Most Crop Damage:	\$5,146,441 (August 1, 1993)
Highest USDA Crop Indemnity Payout:	\$127,686 (May 2015)

⁶¹ SCDNR, n/d. South Carolina County Weather Atlas. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/cli_county_statistics.php

⁶² SCDNR, n/d. South Carolina Climate. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/cli_sc_climate.php

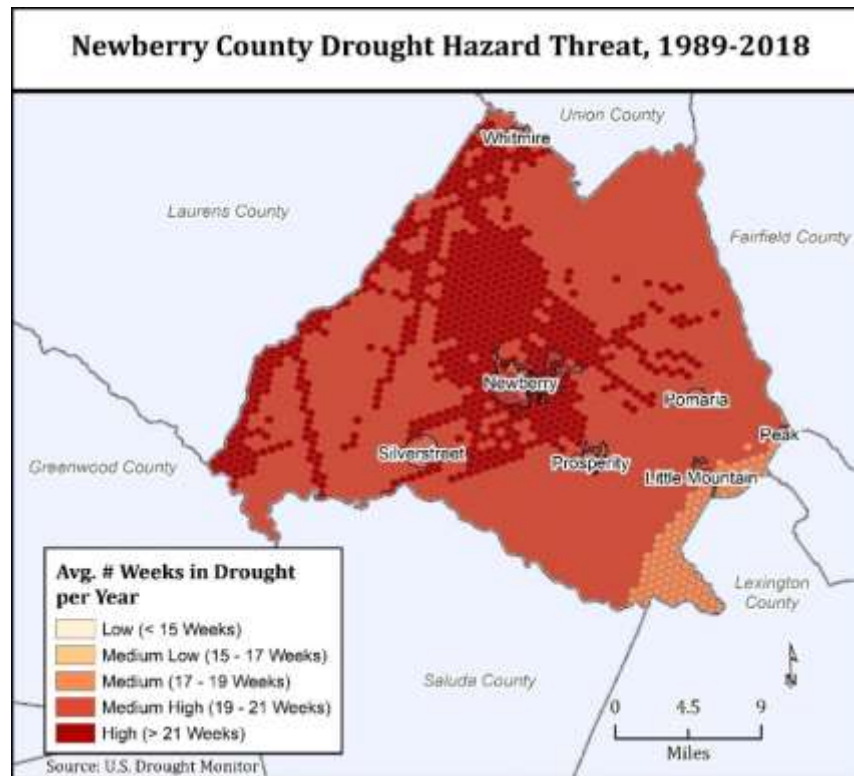


Figure 124 - Drought threat in Newberry County.

Table 74 - Record of loss-causing drought events in Newberry County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag.*	Location	Description
7/1/1977	7/31/1977	0	0	\$4,648	\$464,834	Moderate	Statewide	Drought & Heat
4/1/1978	4/13/1978	0	0	\$43	\$4,320	Mild	Statewide	Drought
10/1/1978	10/31/1978	0	0	\$432	\$4,320	Mild	Statewide	Drought & Heat
6/1/1984	6/20/1984	0	0	\$0	\$2,711	Moderate	Statewide	Drought
4/1/1986	4/30/1986	0	0	\$0	\$303	Moderate	Statewide	Drought
5/1/1986	5/31/1986	0	0	\$0	\$2,570	Moderate	Statewide	Drought
6/1/1986	6/30/1986	0	0	\$2,570	\$25,702	Severe	Statewide	Drought
7/1/1986	7/31/1986	0	0	\$257,016	\$2,570,161	Extreme	Statewide	Drought
2/1/1988	2/28/1988	0	0	\$24	\$2,381	Moderate	Statewide	Drought
6/1/1988	6/30/1988	0	0	\$2,381	\$23,811	Moderate	Statewide	Drought
7/1/1988	7/31/1988	0	0	\$238	\$2,381	Severe	Statewide	Drought
8/1/1988	8/31/1988	0	0	\$3	\$3,222	Moderate	Statewide	Drought
7/1/1993	7/31/1993	0	0	\$10,292,881	\$0	Moderate	Statewide	Drought & Heat
8/1/1993	8/31/1993	0	0	\$0	\$10,292,881	Severe	Statewide	Drought & Heat
5/1/1994	5/31/1994	0	0	\$0	\$1,900,740	Moderate	Statewide	Drought
5/1/1995	5/31/1995	0	0	\$0	\$739,343	Mild	Statewide	Drought

*Based on historic Palmer Drought Severity Index categories.

Note: While droughts occurred since 1995, the NCEI (formerly NCDC) did not report any losses. The occurrence of drought is reflected in Figure 182.

M) Earthquakes

What to expect: Newberry County has a much lower earthquake risk than coastal counties in South Carolina and experiences only low magnitude earthquakes. Since 1900, the strongest earthquake had a magnitude of 2.9 (Figure 125). There is only a 2% chance that Newberry County could experience shaking of up to 1.8 m/s with a higher shaking potential in the eastern half of the county (Figure 126).

Geographic Extent: The entire county is susceptible to earthquakes.

Earthquake statistics for Newberry County are as following:

Number of Loss-Causing Events:	0
Frequency of Occurrence:	0.03%
Recurrence Interval:	40 years
Expected changes to frequency and recurrence interval in the future:	No changes
Frequency Year Range:	1900 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	\$0
Total Fatalities:	0
Deadliest Event:	n/a
Most Property Damage:	n/a
Most Crop Damage:	n/a
Highest USDA Crop Indemnity Payout:	n/av*

*No earthquake events caused a USDA Crop Indemnity Payout

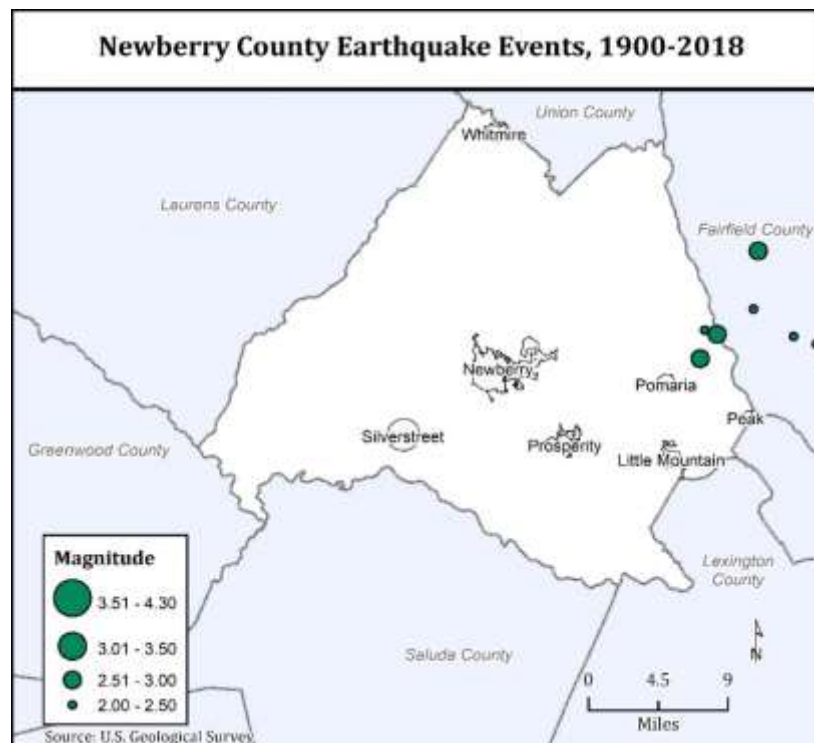


Figure 125 - Earthquake threat in Newberry County.

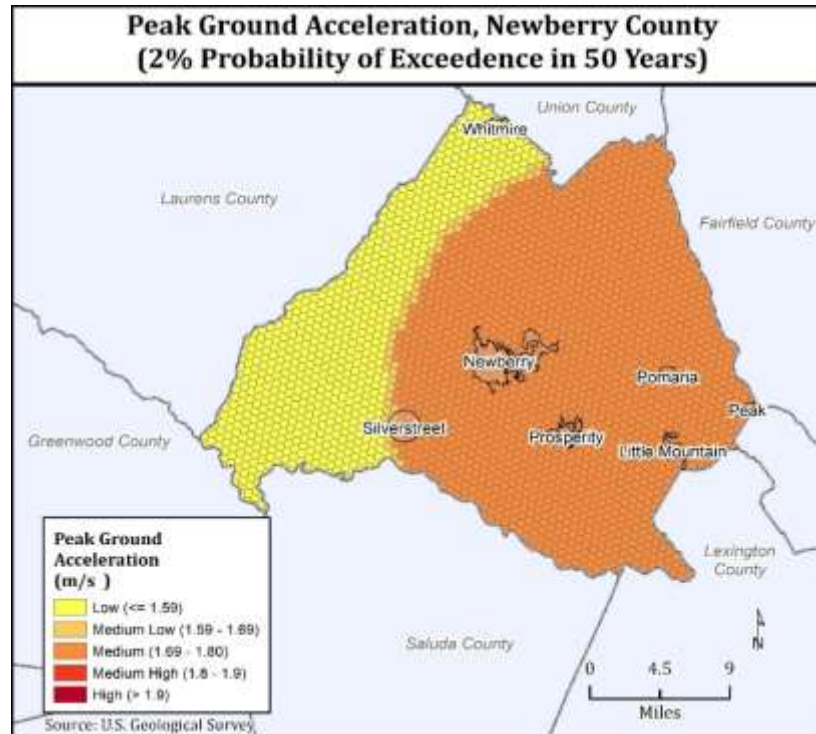


Figure 126 - Threat of shaking due to earthquakes in Newberry County.

6.2 Hazard Vulnerability Assessment for Newberry County

This section addresses
FEMA HMP requirement
201.6(c)(2)(i)

Vulnerability is generally defined as the potential for loss. Understanding which populations and what assets are likely to be impacted by hazard events is critical for developing sound mitigation planning activities and projects. This assessment draws on three vulnerability indicators that are combined and averaged into a *Composite Vulnerability* measure that is then later overlayed with a hazard and the potential severity of consequence:

- Community lifeline and critical infrastructure assets (*INF*) provide a representation of what is at risk (*INF*).
- Areas with socially vulnerable residents provide an idea of who has a lower capacity to absorb shocks and stresses (*SoVI*), and
- Population density (*POP*) provides a representation of how many people are at risk and support a utilitarian approach to serving the greatest number of peoples.

$$VUL = \frac{(SoVI) + (INF) + (POP)}{3} \quad (2)$$

Community lifelines and critical infrastructure⁶³ assets such as transportation facilities, communication facilities, water and wastewater facilities, power facilities, and more. These facilities are those that all other infrastructure lifelines are dependent on. Socially vulnerable populations were derived from the Social Vulnerability Index first developed by Cutter (2003)⁶⁴ and later refined by scholars at the University of

⁶³ <https://www.fema.gov/lifelines>

⁶⁴ <https://onlinelibrary.wiley.com/doi/abs/10.1111/1540-6237.8402002>

Central Florida⁶⁵. Understanding where populations reside who have a lower ability to prepare for, respond to, and recover from disaster events can help decision makers distribute scarce resources before, during, or after disasters.

Most of Newberry County experiences a base level of medium-low composite vulnerability, with a slight north to south gradient of low vulnerability to infrequent medium vulnerability areas (Figure 127). There is also a significant cluster in central Newberry County in and around the City of Newberry, as well as the region just north of it (Figure 127). There are a few areas that even experiences medium-high levels of composite vulnerability in this area, clustered mostly in the City of Newberry itself (Figure 127).

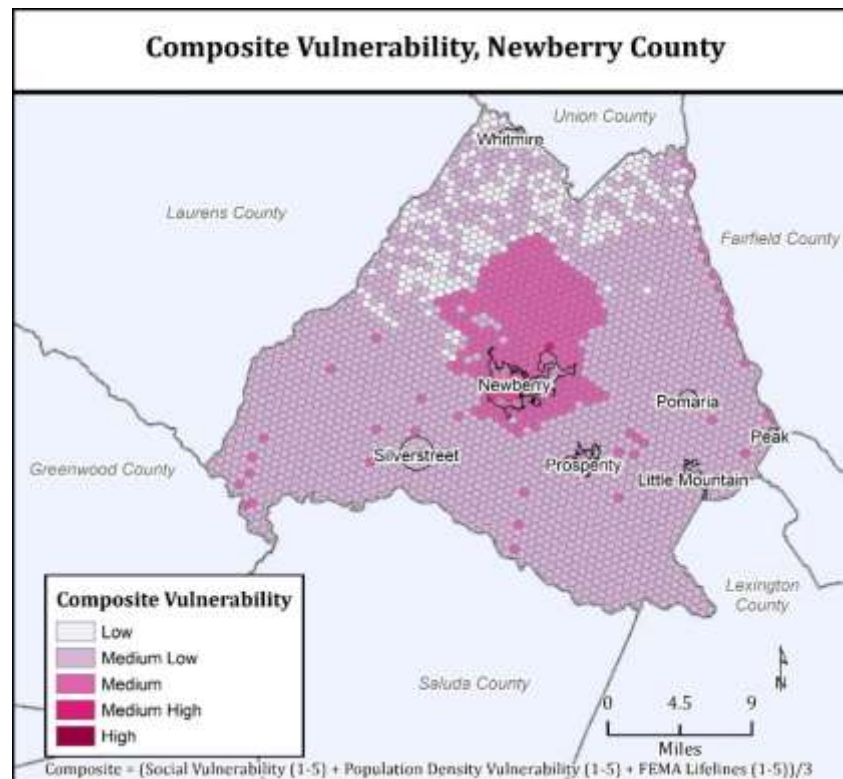


Figure 127 - Newberry County's Composite Hazard Vulnerability.

Please see the Risk Assessment Methodology for a more detailed description of the approach.

A) Assets at Risk

Newberry County has about 38,500 residents (2019 US Census) and has an approximate building stock of 18,516 buildings with a replacement value of about \$4,009 million (in \$2019 according to HAZUS-MH 2.4) (Table 49). Since 2010, Newberry County's population has increased by 2.5%, which has the effect of slightly increasing composite vulnerability to hazards. See Section 3.4 for more information on development changes in the county.

There are 106 critical facilities in Newberry County such as an Emergency Operation Center, a hospital, administrative buildings as well as numerous law enforcement, fire/EMS, and school facilities (Table 75). Almost all the county's critical infrastructure is in and around the City of Newberry, with some scattered clusters near Prosperity and Peak as well (Figure 128). More information on the vulnerability assessment for each critical facility can be found in Appendix II.

⁶⁵ www.vulnerabilitymap.org

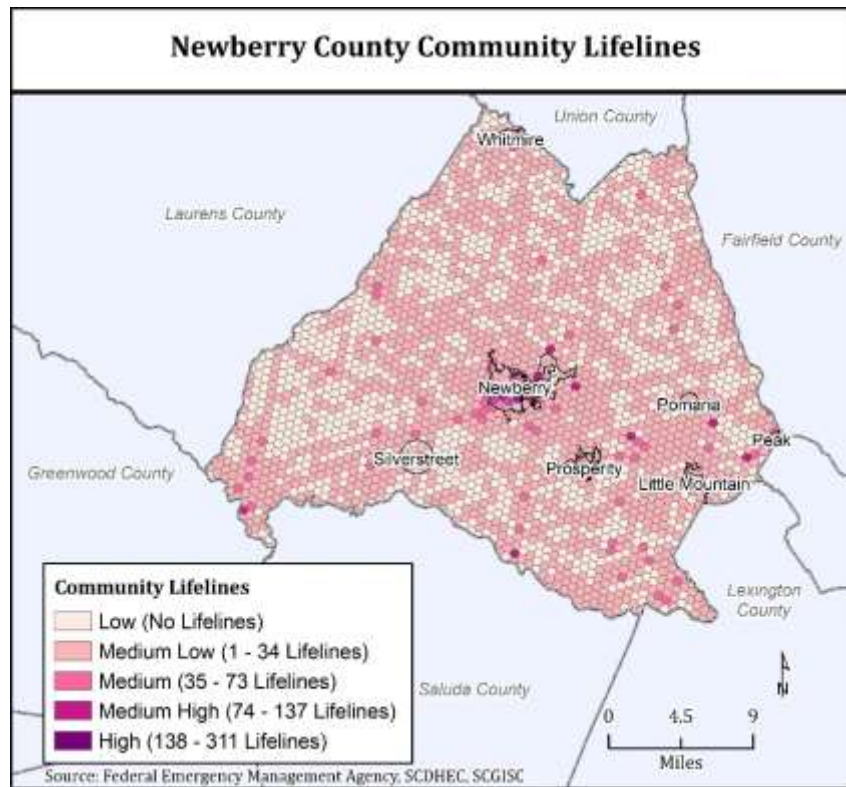


Figure 128 - Distribution of community lifelines and critical facilities in Newberry County.

Assets at risk (Table 75) were assessed using FEMA's Lifeline⁶⁶ with the understanding that

- Lifelines enable the continuous operation of critical government and business functions and is essential to human health and safety or economic security.
- Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function.
- FEMA has developed a construct for objectives-based response that prioritizes the rapid stabilization of Community Lifelines after a disaster.
- The integrated network of assets, services, and capabilities that provide lifeline services are used day-to-day to support the recurring needs of the community and enable all other aspects of society to function.
- When disrupted, decisive intervention (e.g., rapid re-establishment or employment of contingency response solutions) is required to stabilize the incident.

Table 75 - Critical Infrastructure Included in Newberry County's Hazard Risk Assessment.

FEMA Lifeline	Variable	Critical	Count
Safety and Security	Law Enforcement	Yes	5
Safety and Security	Prisons		1
Safety and Security	Fire/EMS	Yes	29
Safety and Security	Govt Services - Courthouses		1
Safety and Security	Local EOCs	Yes	1
Safety and Security	Community Safety - Convention Centers/Fairgrounds		0
Safety and Security	Public Schools		14

⁶⁶ <https://www.fema.gov/lifelines>

FEMA Lifeline	Variable	Critical	Count
Safety and Security	Private Schools		1
Safety and Security	Colleges and Universities		1
Safety and Security	Mobile Home Parks		7
Safety and Security	Places of Worship		58
Safety and Security	Nursing Homes		2
Food, Water, Shelter	Food Stores		29
Food, Water, Shelter	Nutrition Sites – Supplemental Meal Sites		13
Food, Water, Shelter	Water Treatment Plants and Water Supply Intake	Yes	6
Food, Water, Shelter	Shelter		8
Health and Medical	Hospitals	Yes	1
	Other Medical		41
Energy	Transmission Lines (1/10-mile road segments) and Substations		5,678
	Substations	Yes	58
	Electric power generation	Yes	3
Energy	Gas Stations		34
Communications	Infrastructure		22
Communications	Banks and Finance		15
Transportation	Non-State Highway/Roadway (1/10-mile road segments)		7,619
Transportation	Railway (1/10-mile road segments)		877
Transportation	Aviation	Yes	2
Hazardous Materials	Toxic Release Inventory Sites		22
Hazardous Materials	Superfund Sites		0
Hazardous Materials	Solid Waste	Yes	1

Building exposure exceeds more than \$4 billion in value with residential buildings accounting for more than \$3.2 billion alone (Table 76).

Table 76 - Building stock values by occupancy type in Newberry County. Source: HAZUS 4.2.

Building Type	Total Replacement Value (in \$2019 Millions)
Residential	\$3,206
Commercial	\$439
Industrial	\$196
Agricultural	\$24
Religious	\$83
Government	\$20
Education	\$41
Total	\$4,009

B) Social vulnerability and Population Density

Social vulnerability, a concept focused on understanding an area's capacity to prepare for, respond to, and rebound from disaster events⁶⁷, has a long conceptual and theoretical history in social and disaster science fields⁶⁸. Socially vulnerable populations have fewer resources to aid in preparation for disasters, often bear the brunt of disaster impacts, and take longer to bounce back from disaster events. Empirical measures of social vulnerability enable decision makers and emergency managers to understand where vulnerable populations reside and how that vulnerability is manifest across a landscape. Here, 29 indicators of social vulnerability, collected from www.vulnerabilitymap.org, were used to create a tract level SoVI for the county. SoVI scores were categorized from (0 – no data to 5 – high social vulnerability) using a standard deviation classification scheme (Figure 218).

The most socially vulnerable populations of Newberry County live north of the City of Newberry, from the city's northern border to the border with a large area south of Whitmire of low social vulnerability, due to low population in the north (Figure 129). The rest of Newberry County ranges from medium-low to medium-high levels of social vulnerability, with the majority being medium (Figure 129). Most of Newberry County has medium-low population density (1-111 people), with the City of Newberry having the highest population density of medium (112-366 per hexagon) (Figure 130).

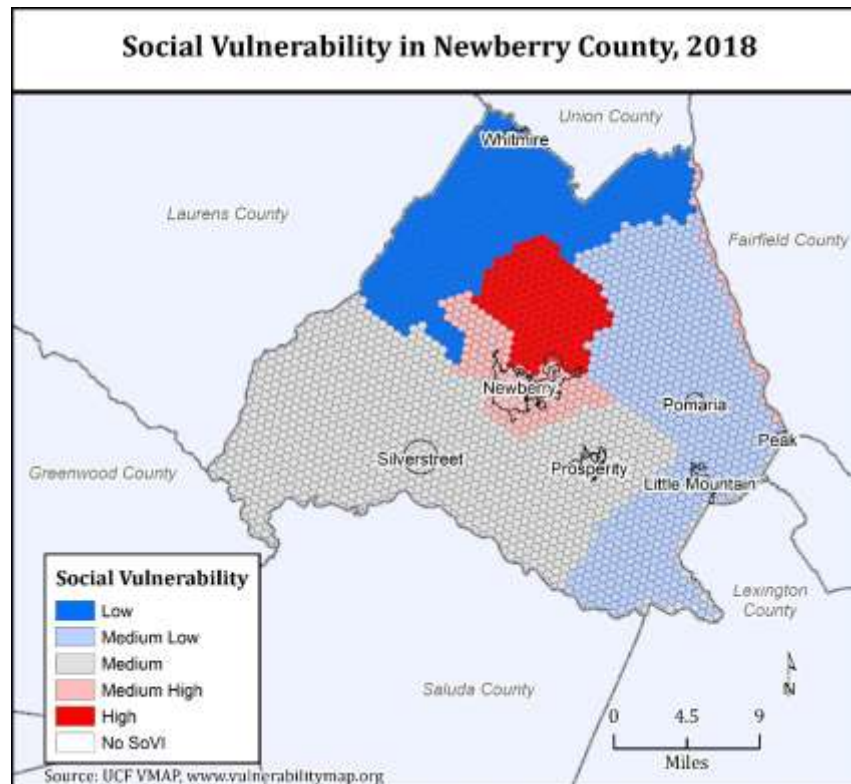


Figure 129 - Socially vulnerable tracts in Newberry County.

⁶⁷ <https://doi.org/10.1177/0002716205285515>

⁶⁸ <https://unu.edu/publications/books/measuring-vulnerability-to-natural-hazards-towards-disaster-resilient-societies-second-edition.html#overview>

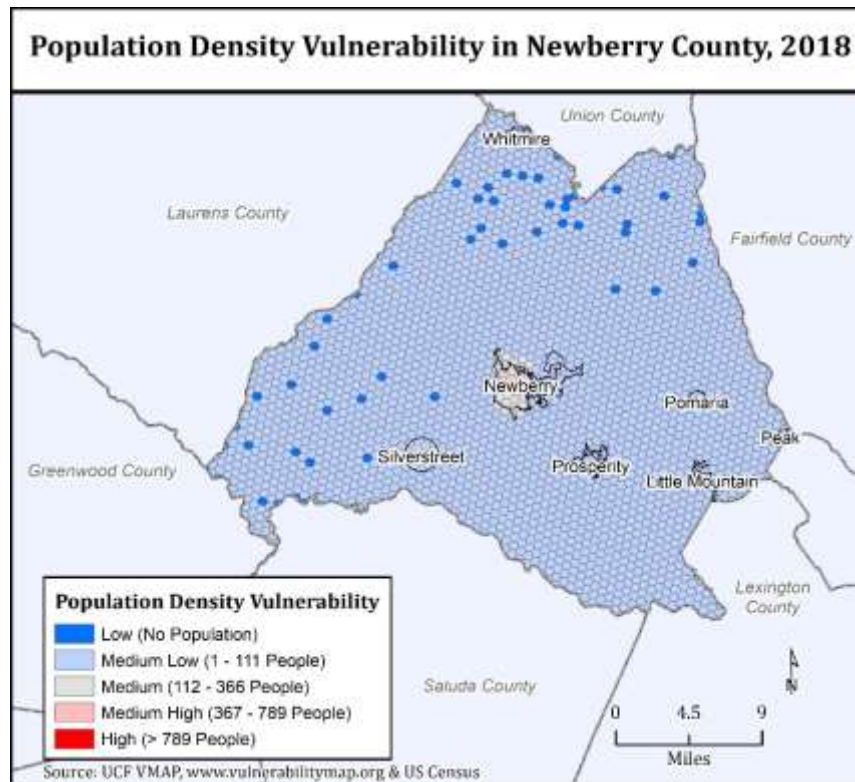


Figure 130 - Newberry County's Population Distribution.

6.3 Severity of Consequence Assessment for Newberry County

Every hazard is unique in terms of its past impacts and future potential for impacts. In this Plan, this is captured as the Severity of Consequence (CON). This universal accounting of hazard risk for Newberry County considers historical impacts (*HISTCON*), hazard frequencies, future climate impacts, as well as the current high priority hazards of the county, and those likely to cause continued losses if not mitigated (See Section 0 for more information on this calculation and its component variables).

For Newberry County, the hazards with the highest severity of consequence are the following (Table 77):

1. Heat
2. Tornado
3. Drought
4. Hurricane and tropical storm
5. Flash flood

Table 77 – Newberry County Severity of Consequence Scores by Hazard.

Hazard	Historical Score (1-5)	Climate Sensitivity Score (1-5)	Severity/Frequency Score (1-5)	Priority Score (1-5)	Severity of Consequences (CON) Score (4-20)	Standardized CON Score (1-5)
Drought	1.84	5	2.91	4.33	14.08	4.35
Earthquake	1.00	3	1.00	2.33	7.33	2.11
Extreme Cold	2.66	1	1.49	3.00	8.15	2.38
Flash Flood	2.49	5	1.41	1.67	10.57	3.18

Hazard	Historical Score (1-5)	Climate Sensitivity Score (1-5)	Severity/Frequency Score (1-5)	Priority Score (1-5)	Severity of Consequences (CON) Score (4-20)	Standardized CON Score (1-5)
Flooding	1.24	5	1.21	1.67	9.12	2.70
Fog	1.00	1	1.00	1.00	4.00	1.00
Hail	3.76	3	1.71	1.67	10.14	3.04
Heat	1.72	5	5.00	4.33	16.05	5.00
Hurricane/ Tropical Storm	1.18	5	1.98	3.00	11.16	3.38
Lightning	1.42	3	1.05	1.67	7.14	2.04
Severe Storm/ Thunderstorm	2.20	5	1.04	1.00	9.24	2.74
Tornado	5.00	3	3.67	3.67	15.34	4.76
Wildfire	1.03	5	1.19	1.00	8.22	2.40
Wind	2.46	3	1.02	3.00	9.48	2.82
Winter Weather	1.70	1	1.18	5.00	8.88	2.62

6.4 Risk Assessment for Newberry County

The following sections discuss the hazard-specific risks for each hazard affecting Newberry County. As described in the Risk Assessment Methodology section, a hazard's risk is the product of the *Hazard Threat (THR)*, *Vulnerability (VUL)*, and *Severity of Consequence (CON)*. All calculations are completed at the unit of analysis, which in this Plan is a 0.25-mile hexagon.

$$RISK_{HAZ} = (THR_{HAZ})(VUL)(CON_{HAZ}) \quad (1)$$

A) Flooding

The riverine flood hazard risk is most pronounced in 1000-year floodplains (0.1% annual chance of occurrence) is not distinctly high in any area of Newberry County, as the 1000-year floodplain rarely overlaps with densely populated or socially vulnerable regions (Figure 131). Exposure in the 1000-year floodplain is largely limited to residential building with none of the critical infrastructure located inside the 1000-year floodplain (Figure 132). It is important to note that the determination of infrastructure inside or outside the 1000-year floodplain was solely based on location and did not take elevation into account. Therefore, being located inside the 1000-year floodplain does not carry an implication regarding requirements for the National Flood Insurance Program.

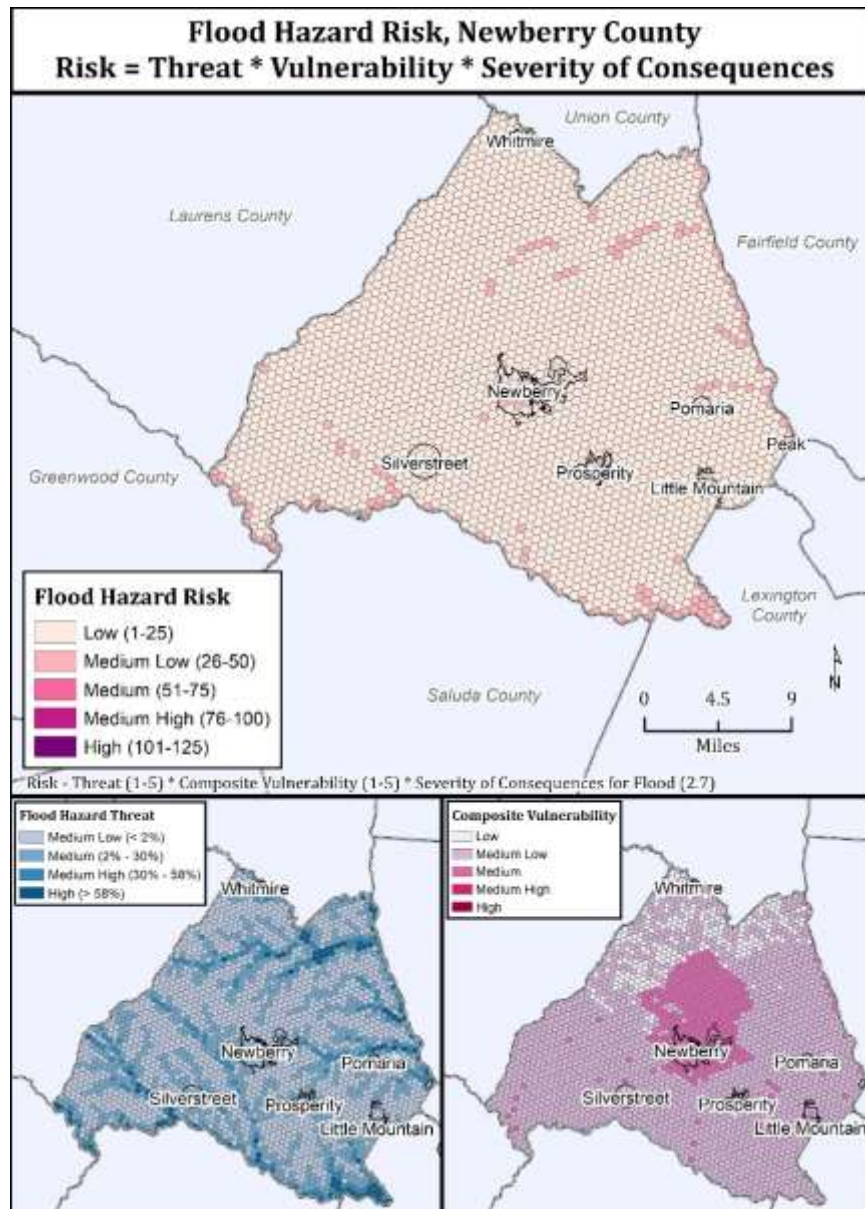


Figure 131 - Risk of riverine floods in Newberry County.

For a 1,000-year flood event (0.1% annual chance of occurrence) (Figure 133), 16 buildings (19% of buildings within modelled 1000-year floodplain) would be at least moderately damaged and 9 buildings would be completely destroyed. The total economic loss is estimated at nearly \$30 million (with over half of it residential) with most of the damage occurring in around Whitmire and Newberry (Figure 133). It is expected that none of the critical infrastructure would receive any damage. All estimates were derived using HAZUS-MH 2.2. Note that HAZUS-MH does not accurately model the outline of lakes incl. Lake Murray.

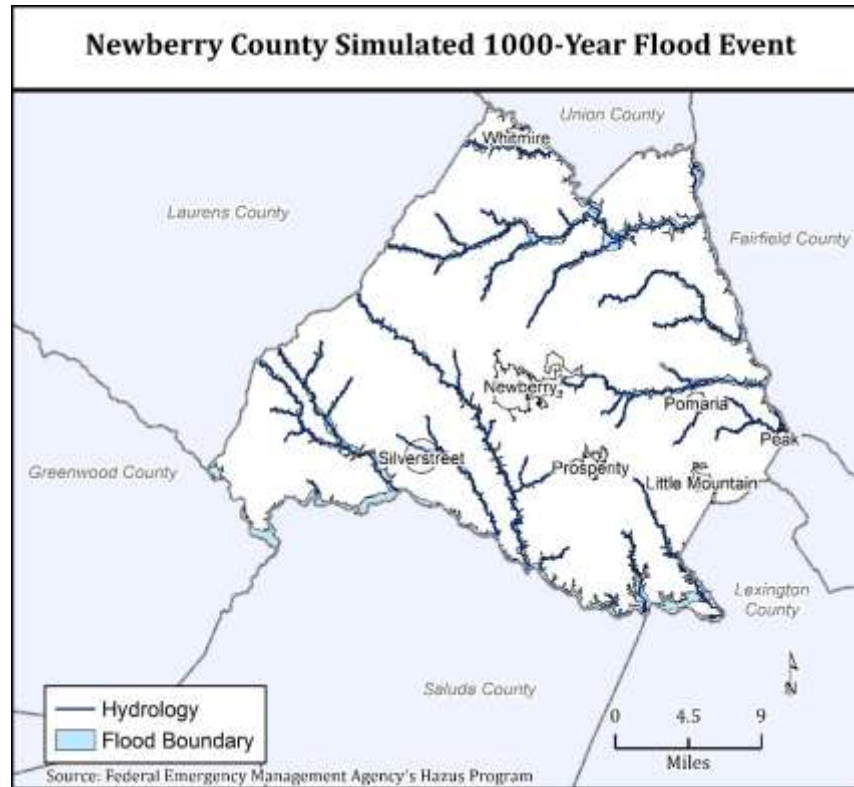


Figure 132 - Modelled 1,000-year flood event in Newberry County.

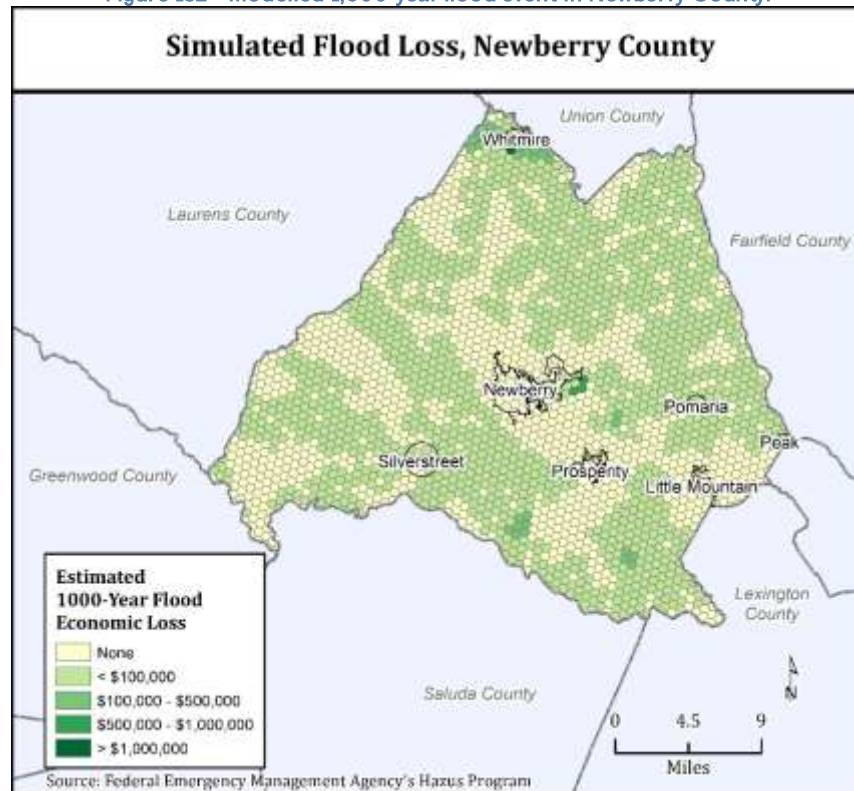


Figure 133 - Damage from a modelled 1,000-year flood event in Newberry County.

The flash flood hazard risk in Newberry County is limited, with most of the county having a low flash flooding risk, while only the center of the county in and around the City of Newberry experiencing higher levels of risk (medium low) (Figure 134). This is due to an overlap of medium flash flood threat levels and medium composite vulnerability in the center of the county, with no other areas of the county having significant overlap of higher levels of either composite vulnerability or flash flood threat (Figure 134).

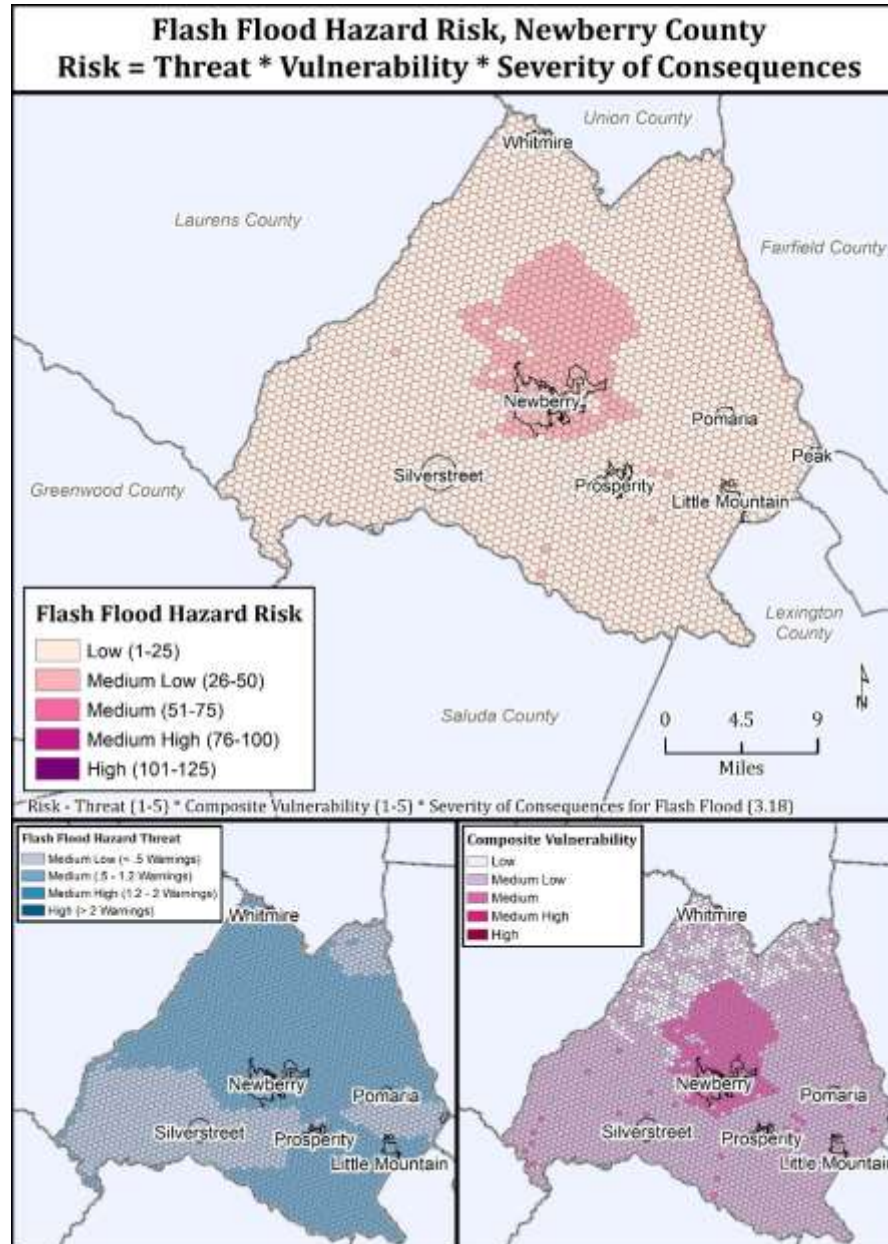


Figure 134 - Flash flood risk in Newberry County.

B) Hurricanes & Tropical Cyclones

Most of Newberry County experiences at least a medium-low level of composite vulnerability, while the area north of, in, and around the City of Newberry experiences medium to medium-high vulnerability (Figure 135). When overlaid with the hurricane hazard threat map where there is higher threat levels encompassing the entire southeastern diagonal of the county, areas of medium-low hurricane hazard risk are seen where composite vulnerability and hazard threat were higher, with a little overlap just south of Newberry (Figure 135). This creates a small strip of hexagon tracts where there is a medium hurricane hazard risk, compared to the rest of the county with low or medium-low scores (Figure 135).

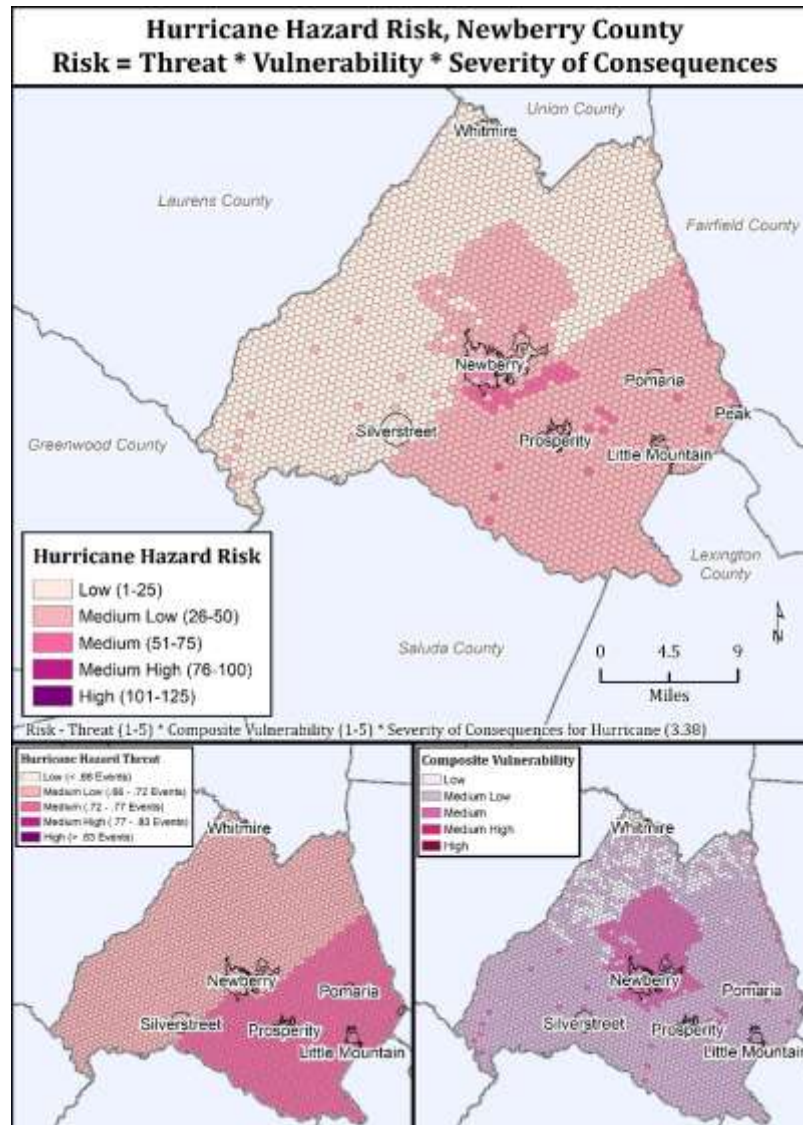


Figure 135 - Risk of tropical storms in Newberry County.

When using a 1000-year storm simulation, all of Newberry County except the southwestern corner including Silverstreet would see wind speeds between 111 to 130 miles per hour (Category 3) (Figure 136). The southwestern corner of Newberry County would only experience 74 to 95 miles per hour wind (Category 1) (Figure 136). Such wind speeds are probable with a fast-moving, major hurricane that has a similar track to Hurricane Hugo. About 87% of the county's infrastructure would not experience any damage. About 280 buildings (or 2% of the building stock) would be at least moderately damaged with an estimated property damage of \$62 million (nearly all of it residential) with most of the damage occurring

in the southeastern and central region of the county (Figure 137). The total building-related economic losses for this event would be \$66 million. All the critical infrastructure facilities should be operable within a day. The modelled storm's most catastrophic impact area would affect the City of Newberry and its surrounding area, which contains the population with the highest levels of vulnerability (Figure 135). All estimates were derived using HAZUS-MH 2.2.

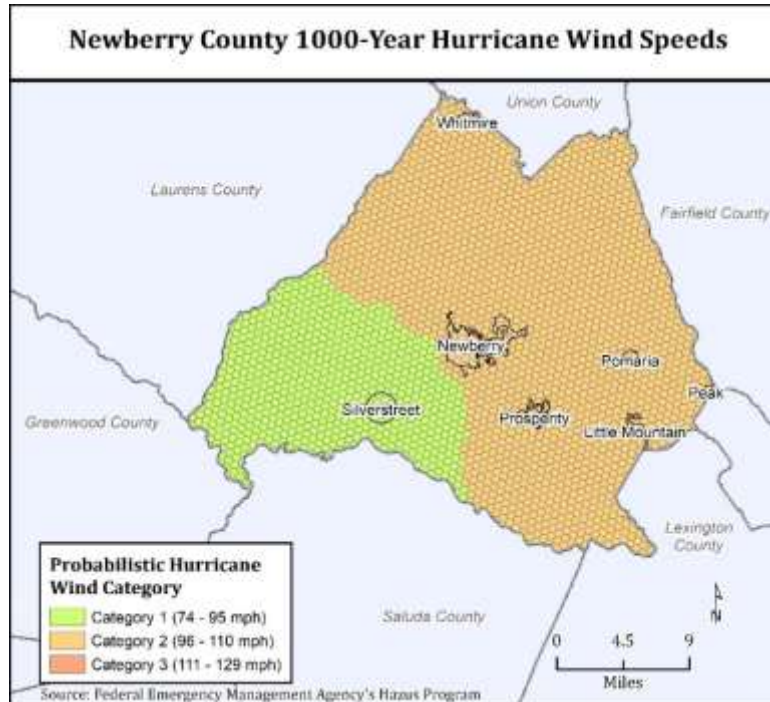


Figure 136 - Hurricane wind speeds using a 1,000-year storm event in Newberry County.

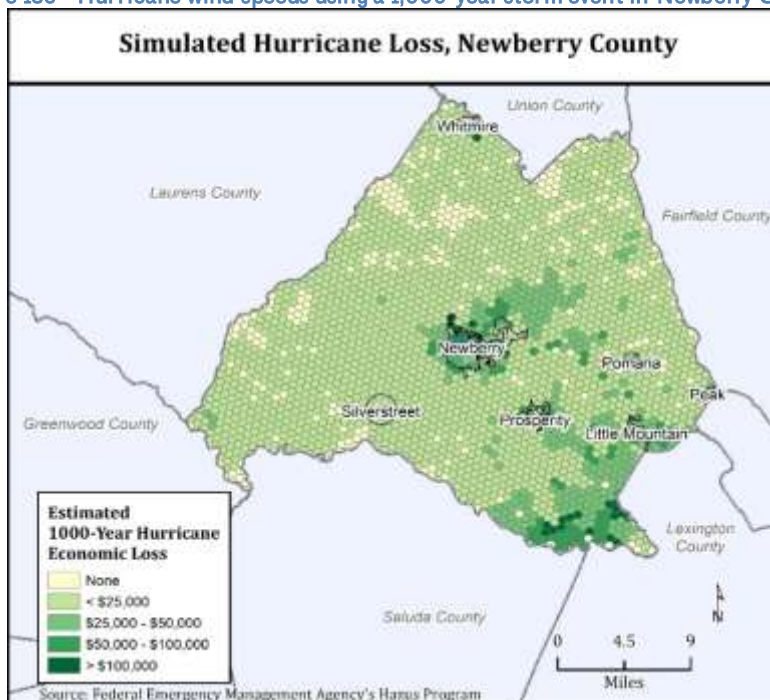


Figure 137 - Damage from a modelled 1,000-year hurricane event in Newberry County.

C) Tornadoes

The tornado hazard threat in Newberry County is very high, with most of the western half of the county having higher than .7 days of tornado warnings a year, as well as the far western edge of the county (Figure 138). The rest of Newberry County ranges between medium-high and medium-low hazard threat. These threat areas coincide with the higher composite vulnerability of central Newberry County near the City of Newberry, creating a large cluster of hexagons that scored medium on the tornado hazard risk scale (Figure 138). The rest of the county scored between 26 and 50 (medium-low) except for parts northern Newberry County, which rates as a low due to low composite vulnerability (Figure 138).

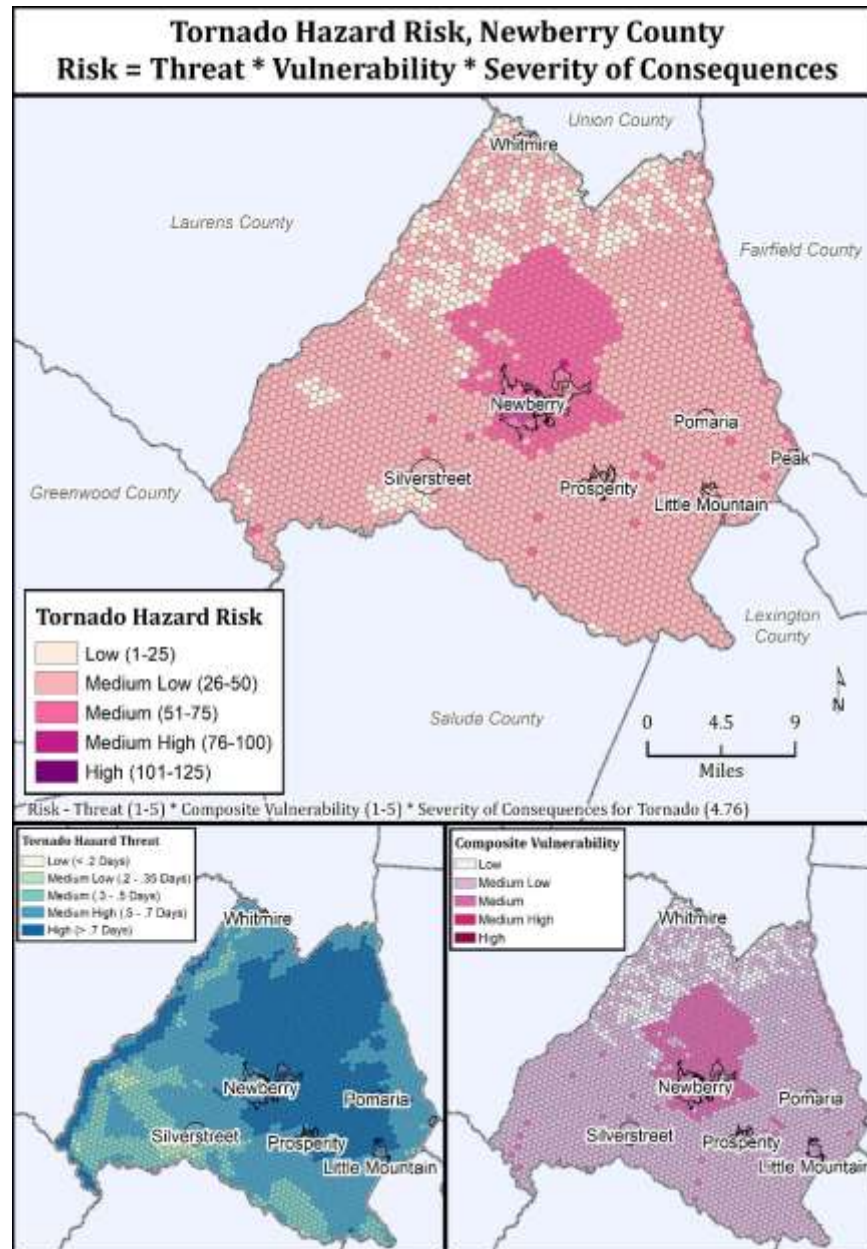


Figure 138 - Risk of tornadoes in Newberry County.

D) Thunderstorms

The area east of the City of Newberry near Pomaria, Prosperity, and Little Mountain has a higher level of severe storm threat than the rest of Newberry County at 8 to 11 days a year (Figure 139). Despite this, there is little overlap with regions that have higher composite vulnerability, meaning the whole county rates between 1 and 25 (low) on the severe storm hazard risk scale (Figure 139).

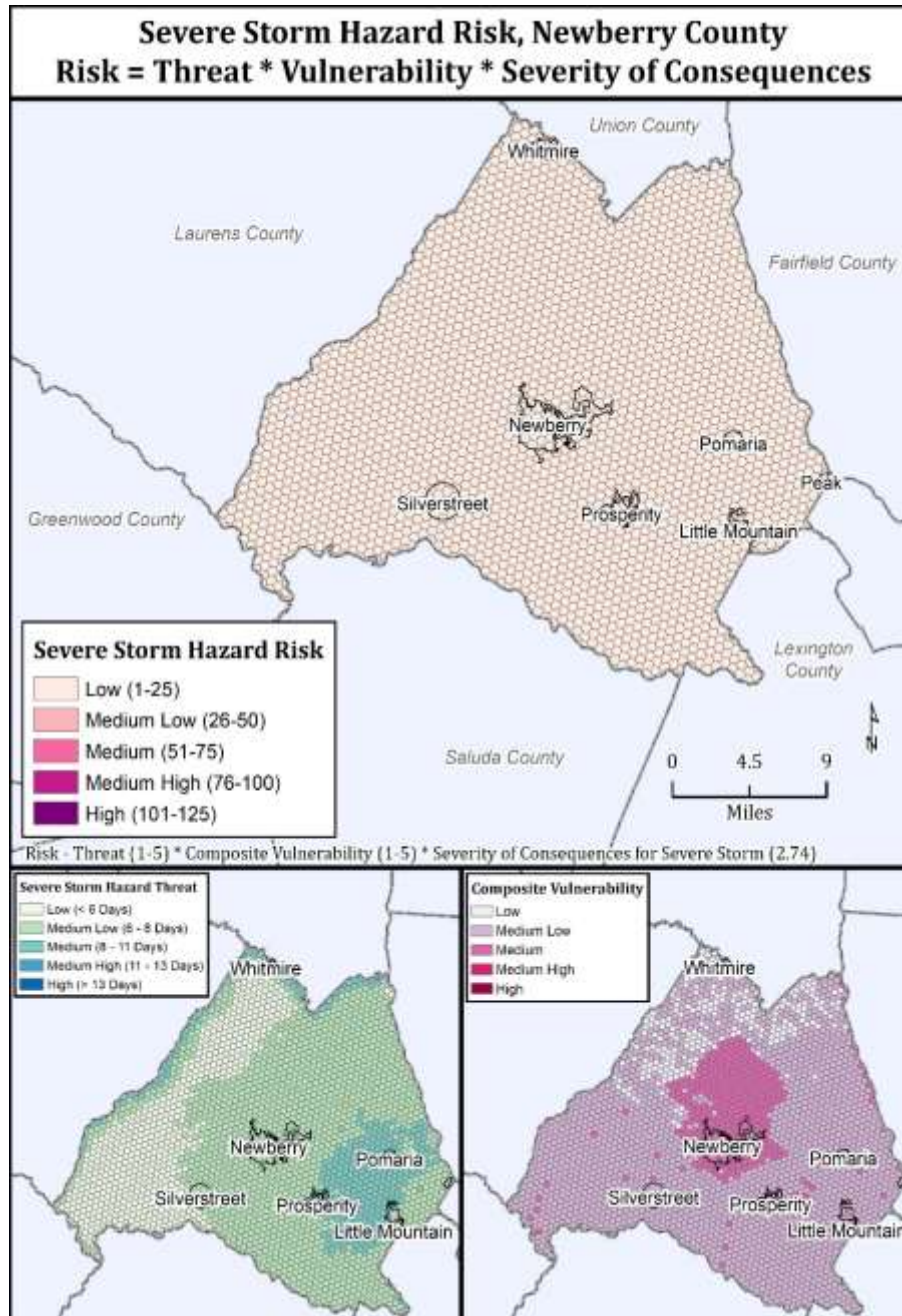


Figure 139 - Risk of severe thunderstorms in Newberry County.

E) Lightning

Due to all of Newberry County having a medium-low level lightning threat, there is no significant area of overlap with areas of higher composite vulnerability to create higher risk scores than low anywhere in Newberry County (Figure 140).

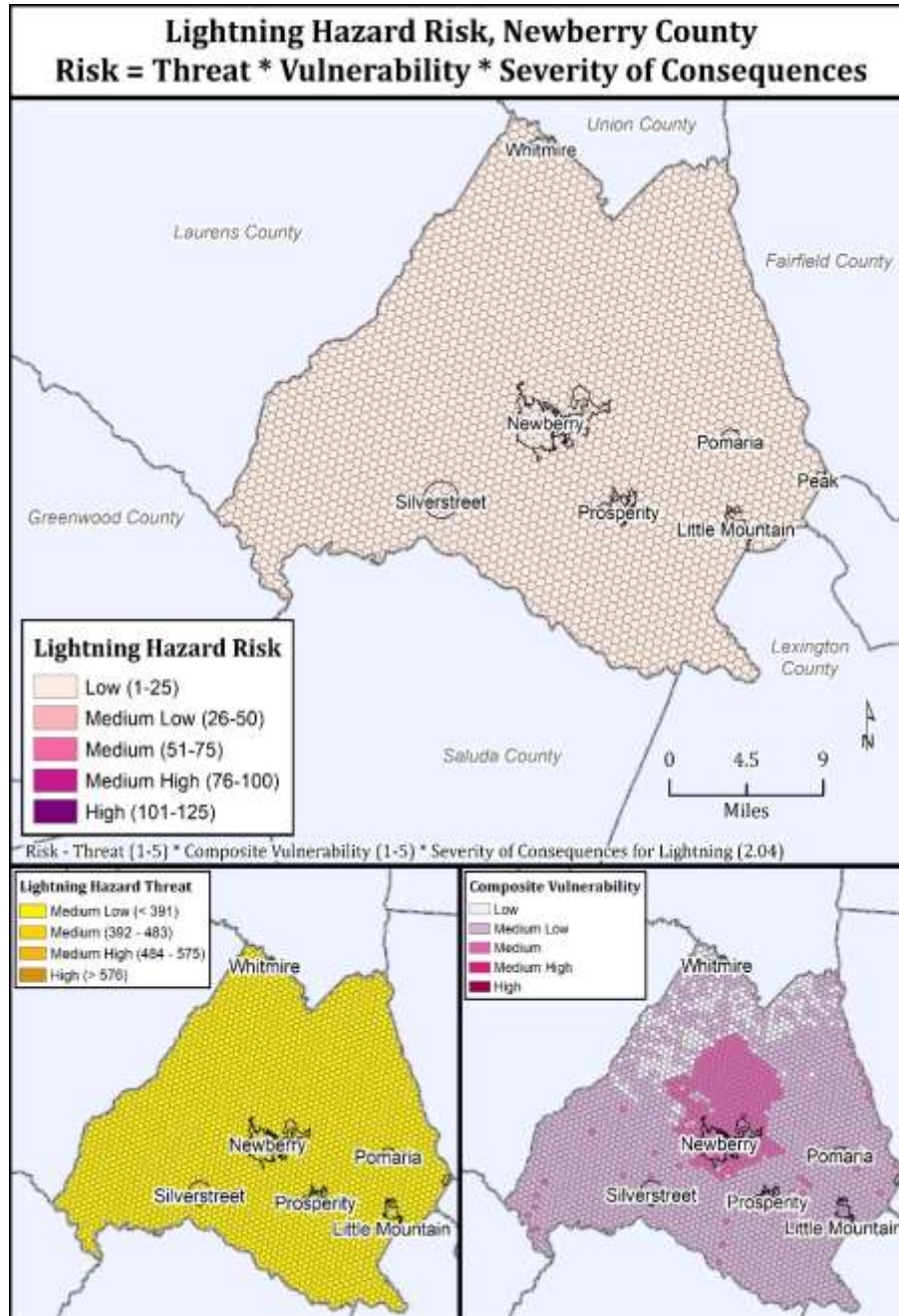


Figure 140 - Risk of lighting in Newberry County.

F) Wind

The highest threat level to winds exceeding 30 knots (34.5 mph) exists in southeastern Newberry County between Little Mountain, Pomaria, and the City of Newberry (Figure 141). In this area, a few tracts of medium composite vulnerability coincides with more than 0.02 to 0.05 days of high winds per year, creating small clusters of area with a medium-low score of risk compared to the rest of the count which scored low (Figure 141).

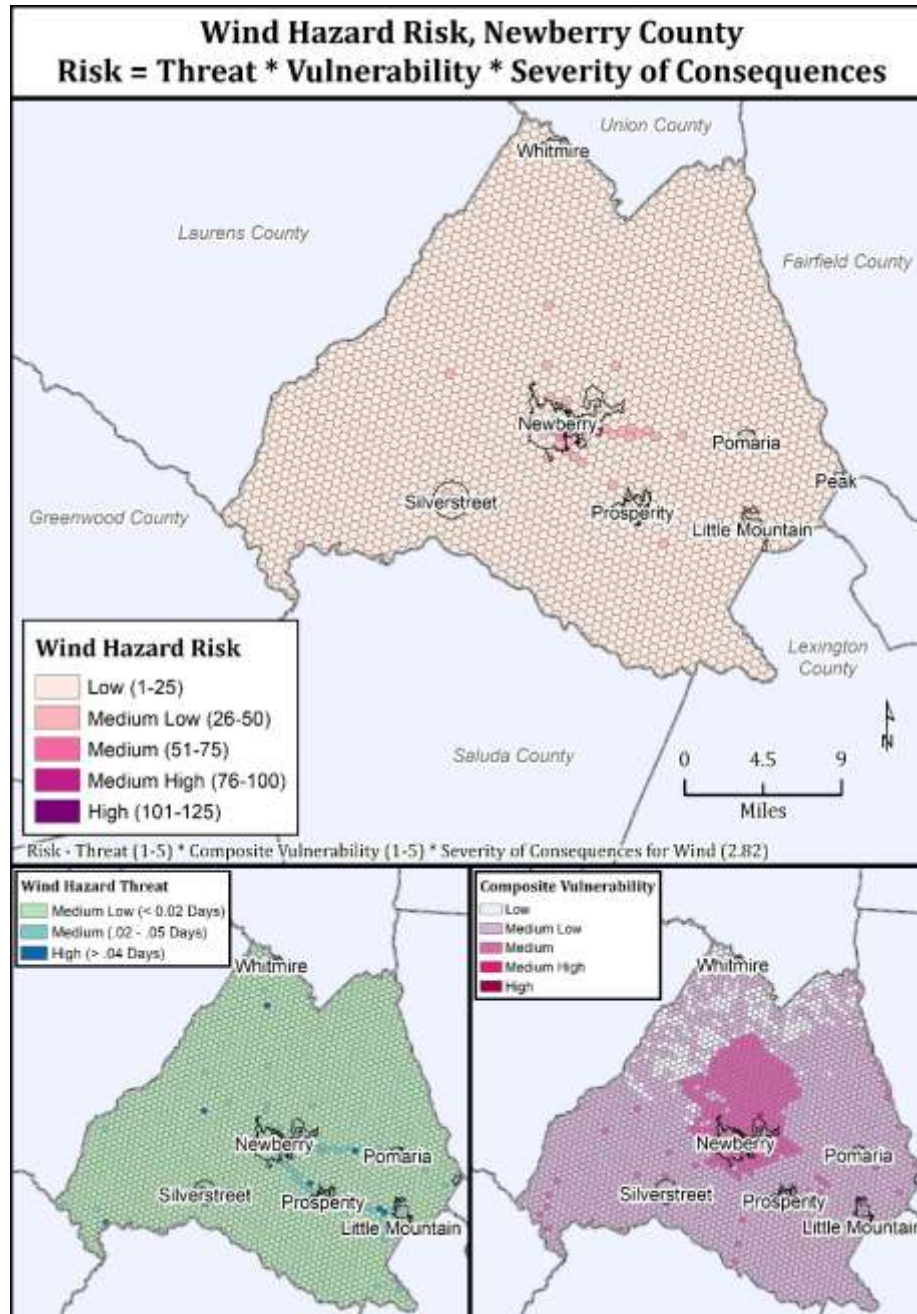


Figure 141 - Risk of high winds in Newberry County.

G) Hail

There are only few areas where higher composite vulnerability and high levels of hail hazard threat overlap, with no discernable pattern (Figure 142). The rest of Newberry County is rates with a medium-low level of hail hazard threat (Figure 142).

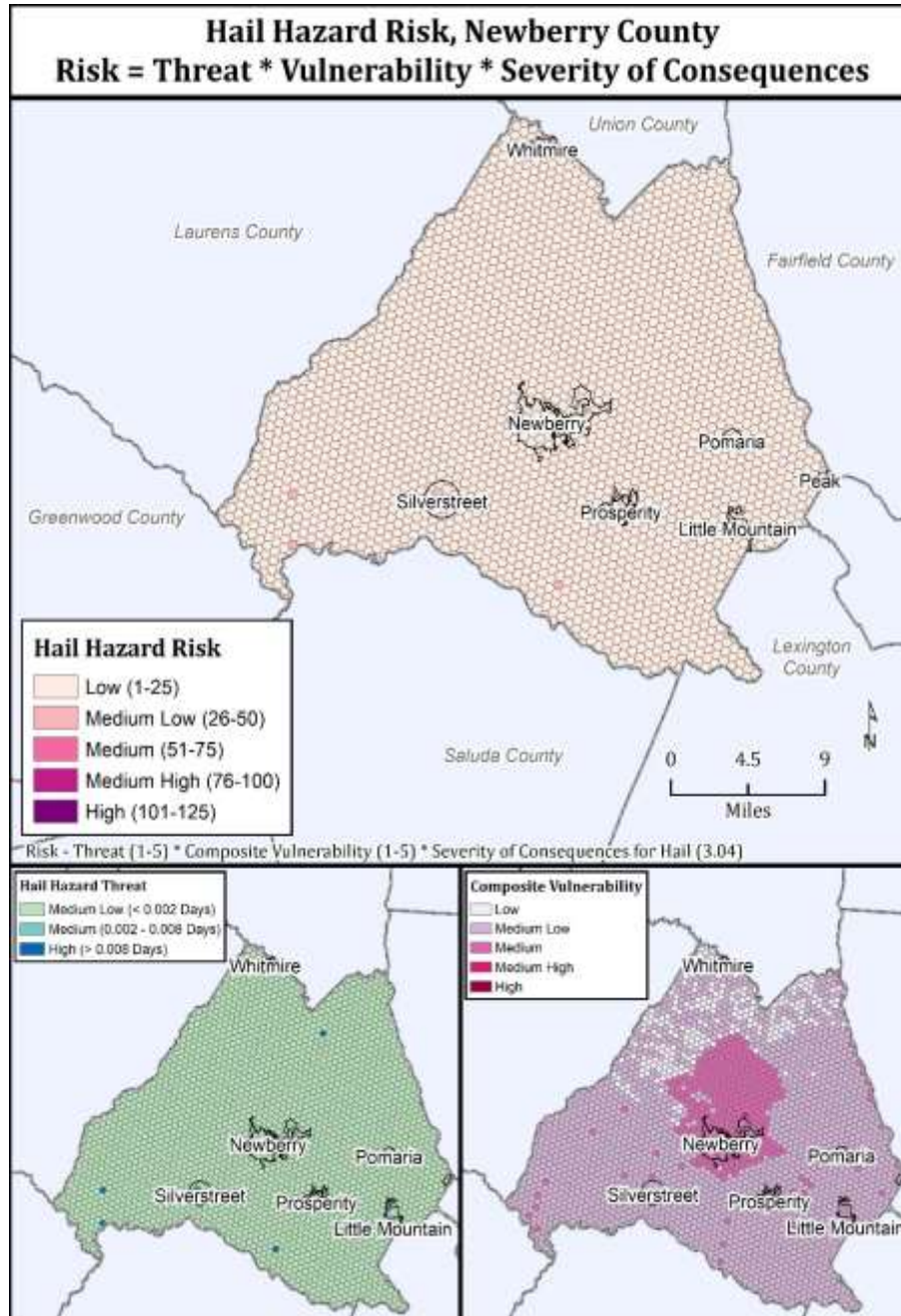


Figure 142 - Risk of hail in Newberry County.

H) Fog

Central and northern Newberry County experiences very low levels of fog hazard threats, while the western third of the county has a medium-low level and the eastern third experiences medium to medium-high levels of fog threat (20 to 28+ days a year) (Figure 143). None of the regions with higher fog hazard threat overlap with areas of higher composite vulnerability, so the whole county scored low on the fog hazard risk score (Figure 143).

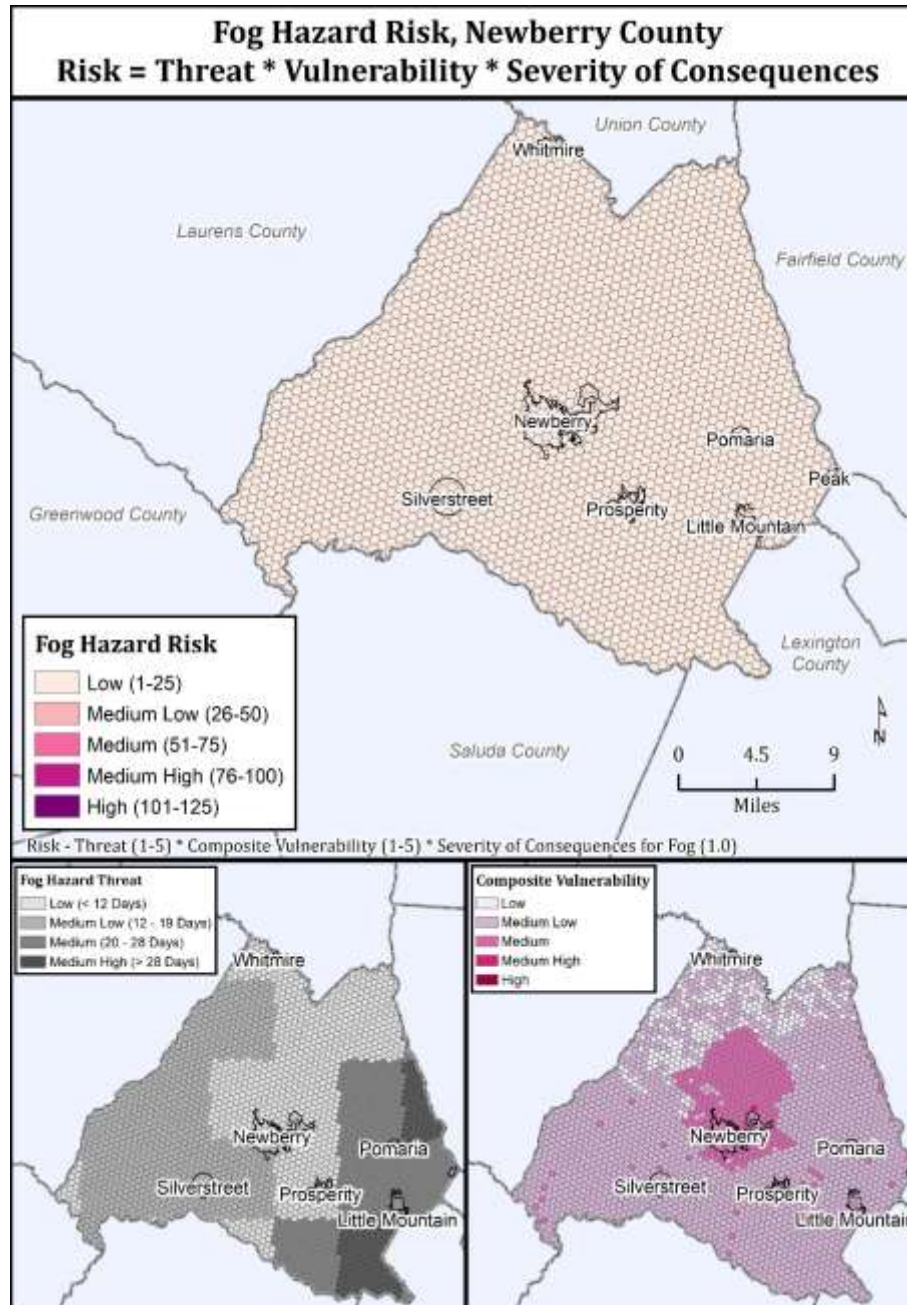


Figure 143 - Risk of fog in Newberry County.

l) Winter Weather & Ice Storms

The highest winter hazard threat levels occurs in southwestern and south-central Newberry County, with areas around the western and northern border of the county experiencing medium levels of threat (Figure 144). In the southwestern and south-central areas of high winter weather hazard threat, there is overlap with areas of medium-low composite vulnerability, resulting in medium-low winter weather hazard risk scores for that region and a small cluster of medium scoring hexagons inside the City of Newberry (Figure 144). The rest of the county was rated low on the winter weather hazard risk score (Figure 144).

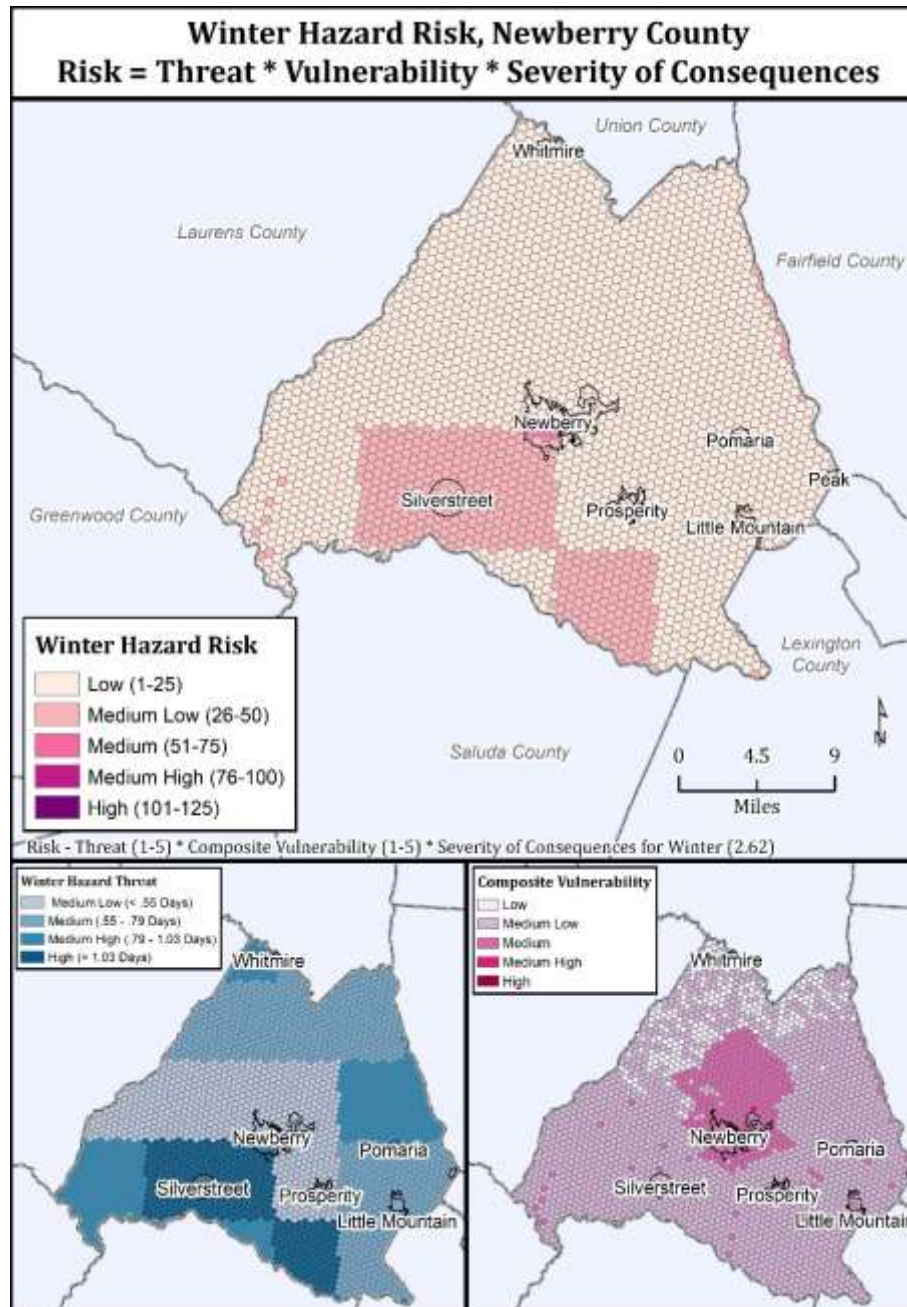


Figure 144 - Risk of winter weather in Newberry County.

J) Temperature Extremes

There is a distinct northwestern to southeastern gradient for the cold hazard threat levels, with the northwestern edge of Newberry County experiencing more than 65 days a year of cold weather, while the southeastern corner experiences less than 44 days a year (Figure 145). Most of the area between experiences 58 to 65 days of cold weather a year, transitioning to a lower level of threat to the east of the City of Newberry towards the Town of Prosperity (Figure 145). This gradient combines with the region of higher composite vulnerability around and north of the City of Newberry to create a central area of medium-low cold threat, while the rest of the county was only scored as low (Figure 145).

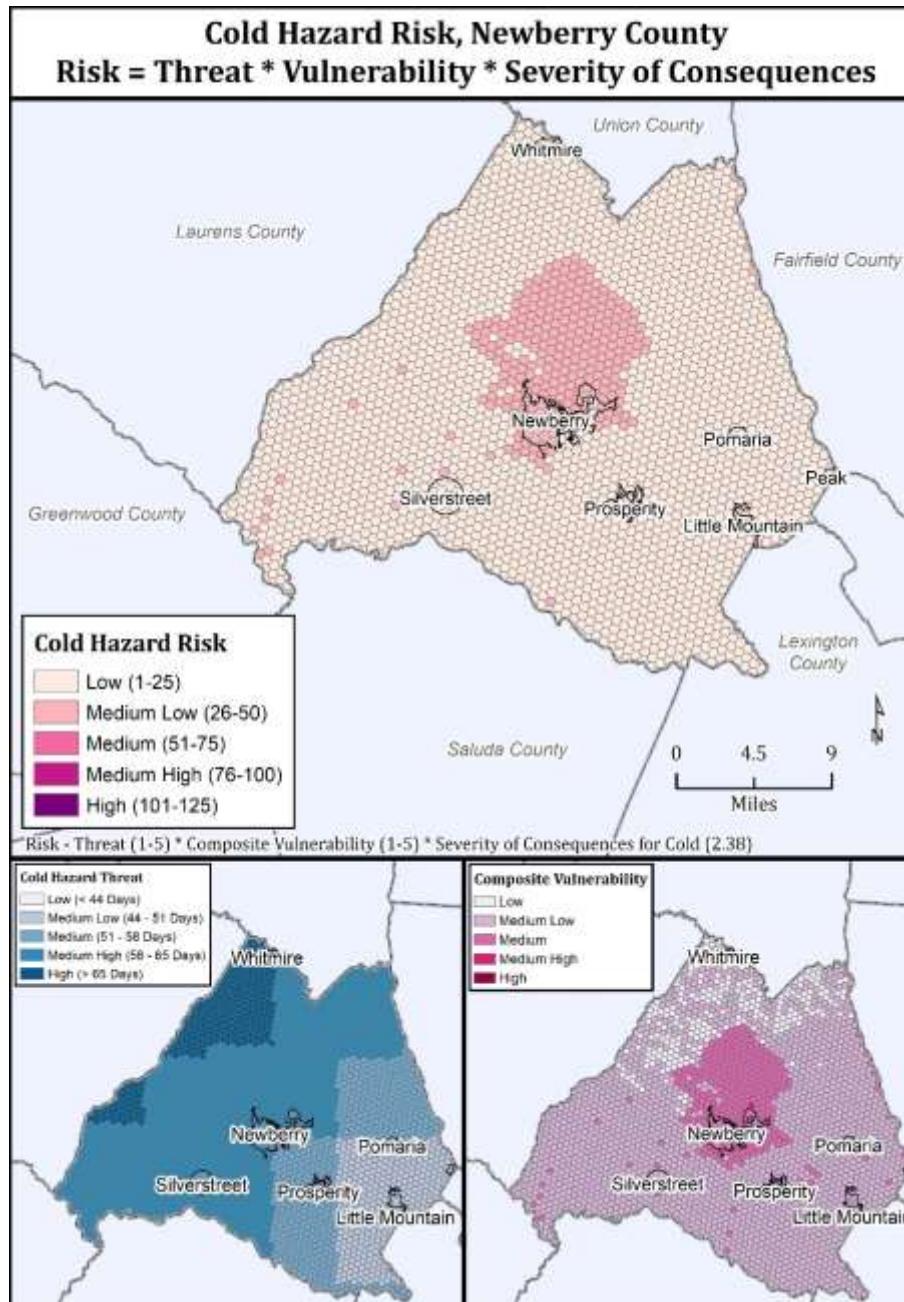


Figure 145 - Risk of cold weather in Newberry County.

Unlike most other counties in the Central Midlands, in Newberry County, the areas at risk from hot weather are largely a subset of the areas at risk from cold weather, except the heat hazard threat gradient is inverse, going from medium in the southwestern corner to low in the northeastern corner (Figure 146). As a result, vulnerabilities are distributed similarly, with the same area in central Newberry County being rated at medium-low risk, as well as the entire southwestern corner of the county (Figure 146).

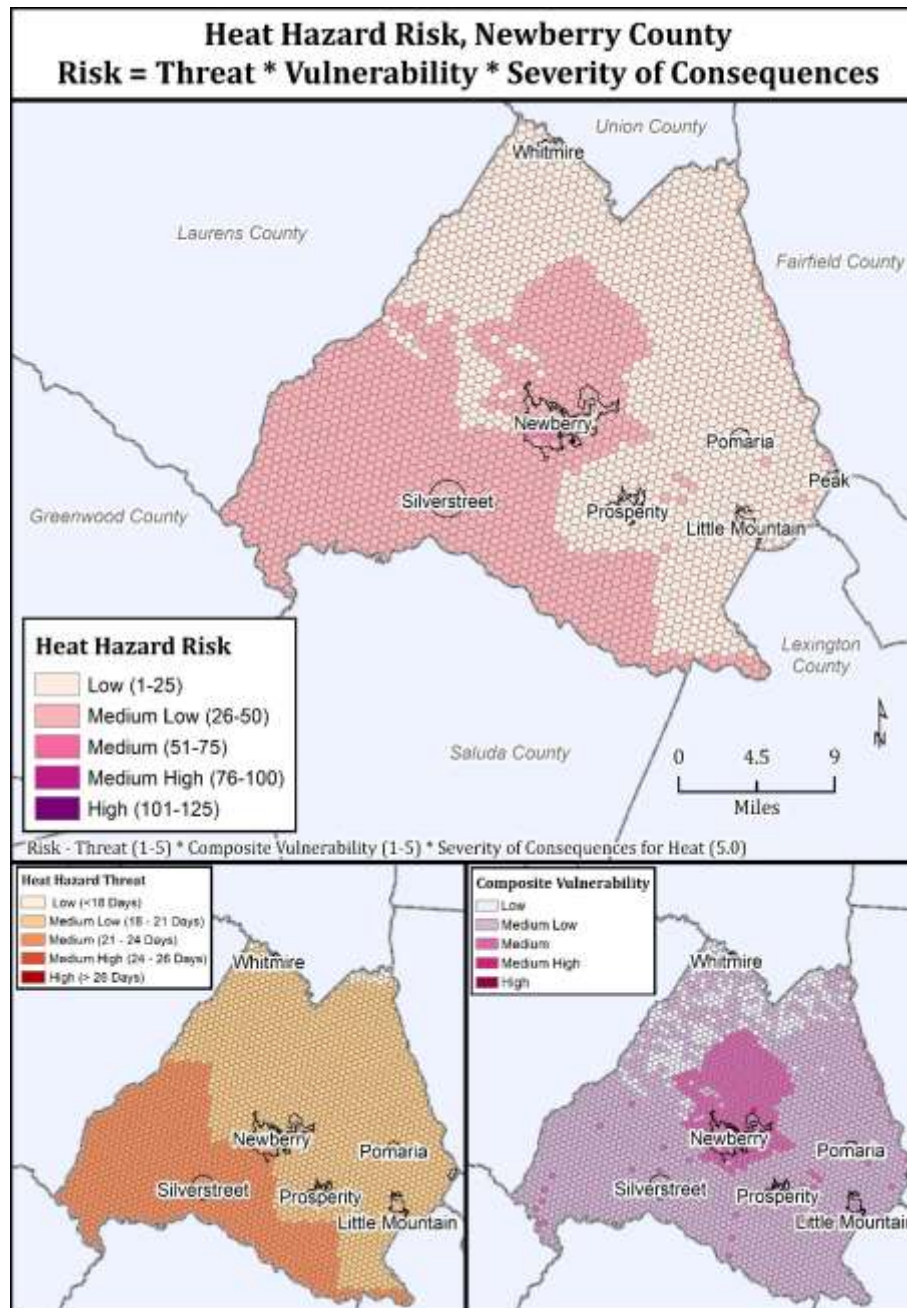


Figure 146 - Risk of extreme hot temperatures in Newberry County.

K) Wildfires

Much like the other three counties in the Central Midlands, there is no uniform or distinct distribution of high wildfire threat in the county besides a slight concentration near the major population center; in this case, it is the City of Newberry (Figure 147). Since this is where a large cluster of higher vulnerability areas are, the resulting overlap has sporadic hexagons rated as medium-low risk with the cluster being distinctively in central in Newberry County around and north of the City of Newberry (Figure 147).

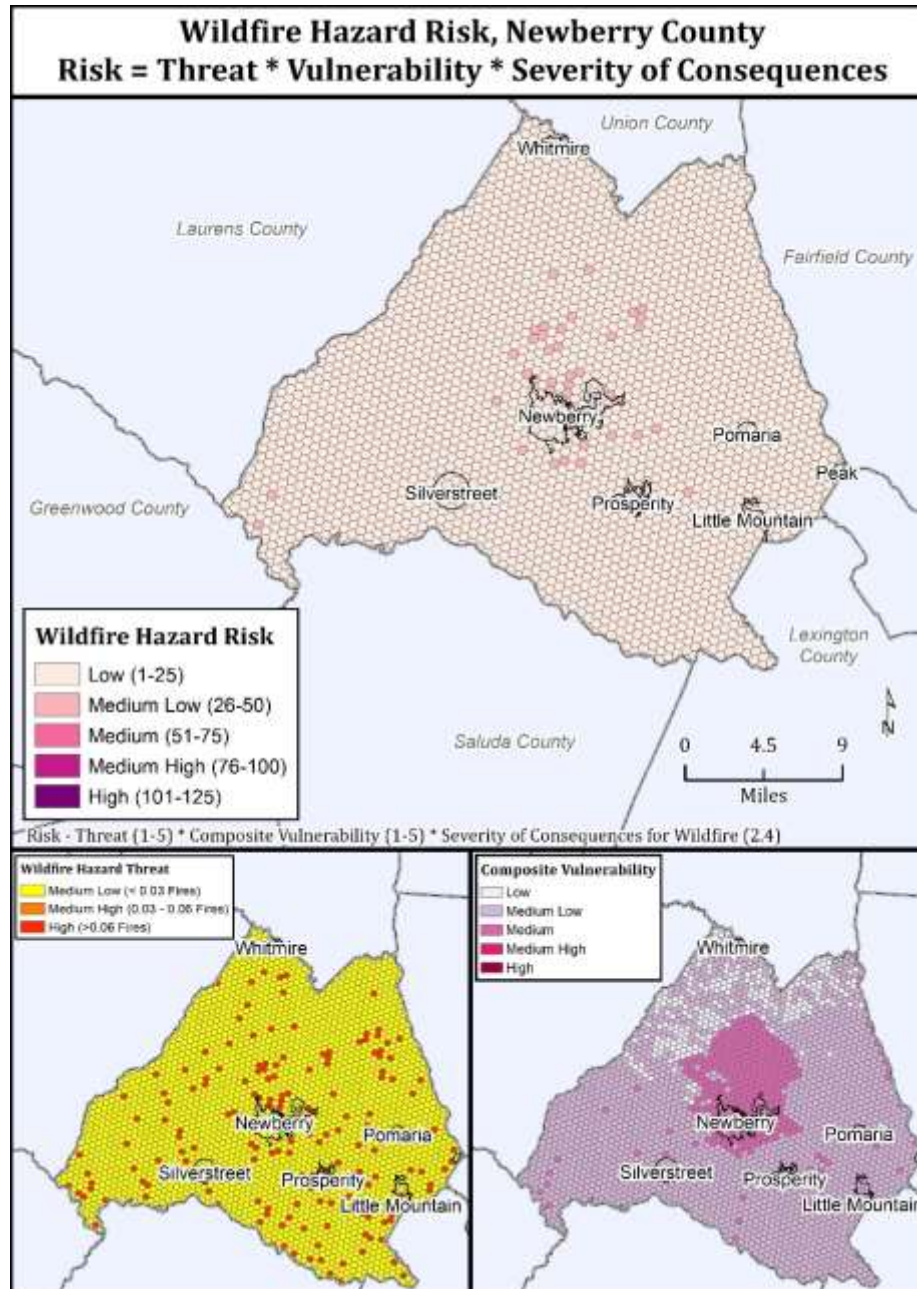


Figure 147 - Risk of wildfires in Newberry County.

L) Droughts

Newberry County is highly threatened by the drought hazard, with almost the entire county having at least a medium-high level (19 – 21 weeks a year) and the central and northwestern regions of the county having a high threat level (21+ weeks) (Figure 148). This creates a large area of medium drought hazard risk in the central part of the county in, around, and north of the City of Newberry that matches the areas of higher composite vulnerability (Figure 148). Outside of that major cluster, most of Newberry County scores at least a medium-low (26 – 50), with only northern Newberry County with low vulnerability scoring low (Figure 148).

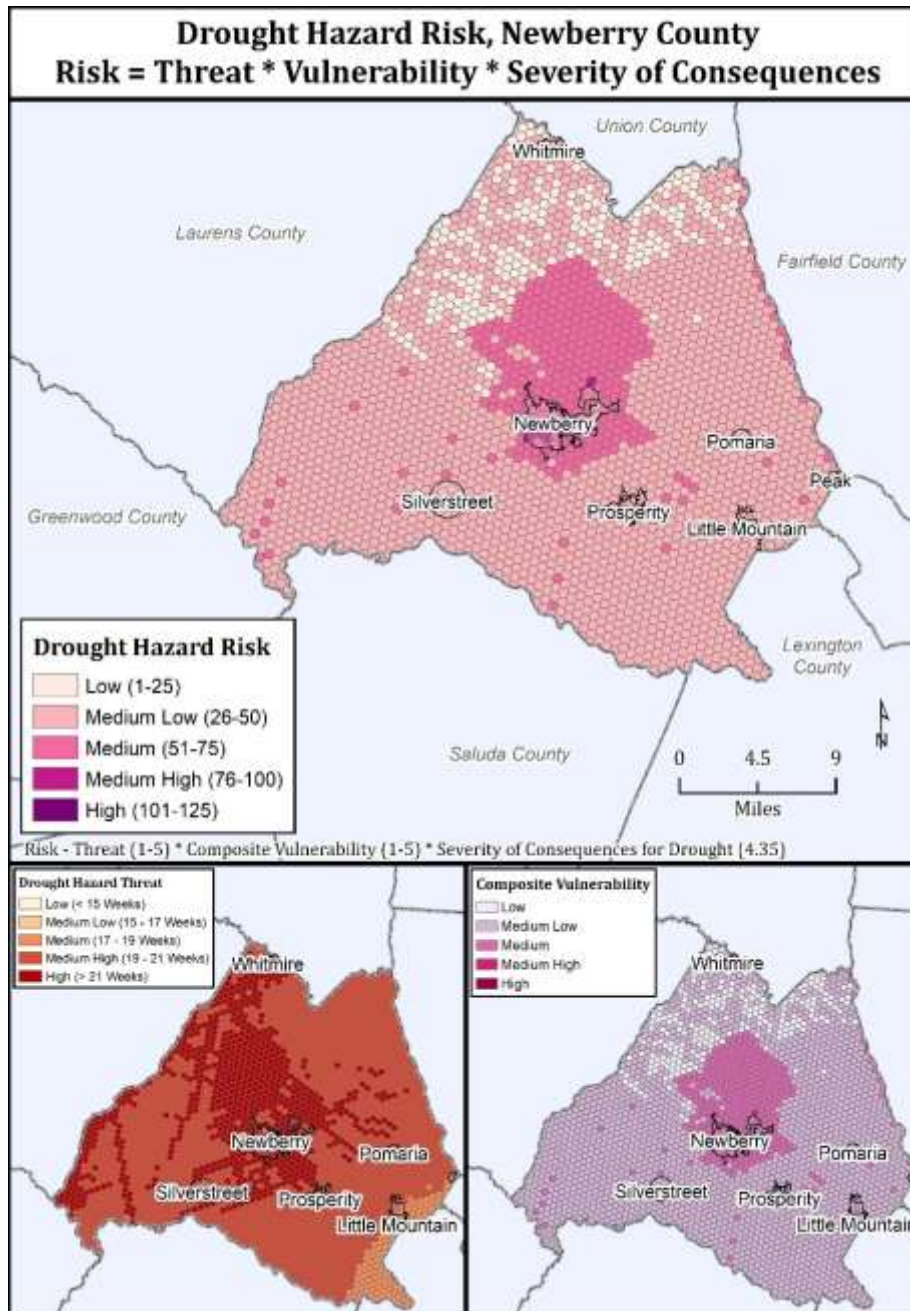


Figure 148 - Risk of droughts in Newberry County.

M) Earthquakes

The central part of Newberry County exhibits both medium composite vulnerability as well as medium threat from earthquake shaking, resulting in it scoring medium-low for earthquake hazard risk (Figure 149). According to the South Carolina Geological Survey, the worst-case scenario for Newberry County is a combination of the 1886 Charleston and the 1913 Union earthquake, which would equate to an intensity category VIII (severe)⁶⁹.

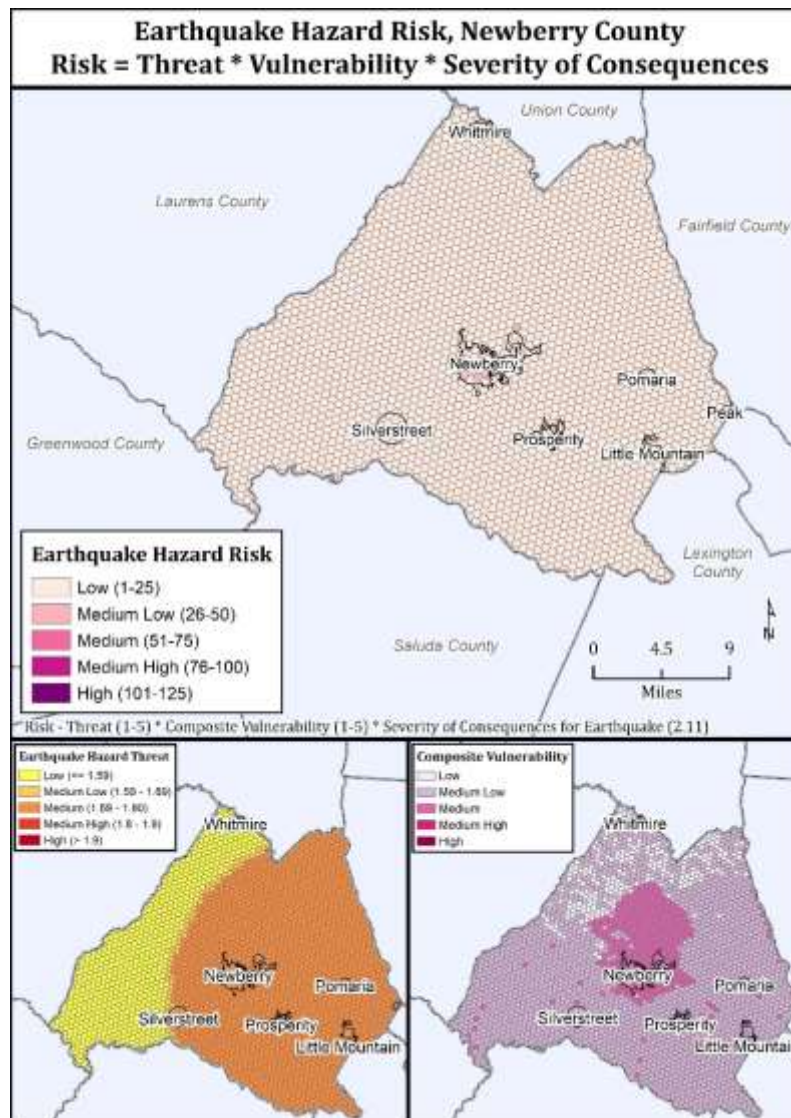


Figure 149 - Risk of earthquakes in Newberry County.

If the 1886 Charleston earthquake were to occur today (Figure 150), about 80% of buildings would survive undamaged in Newberry County. About 1,307 buildings would be damaged moderately (7% of the county's building stock) with an estimated property damage of \$56 million (about half of it residential). Most of the damage would occur in central and southeastern Newberry County (Figure 151). All the critical infrastructure would be at least 50% operable within a day. The modelled earthquake's most

⁶⁹ SCGS, Projected Earthquake Intensities for South Carolina, Educational Series #7a. Available at <http://www.dnr.sc.gov/geology/images/Equake%20intens1-pg.pdf>

devastating impact area would encompass some of Newberry County's most vulnerable population. All estimates were derived using HAZUS-MH 2.2.

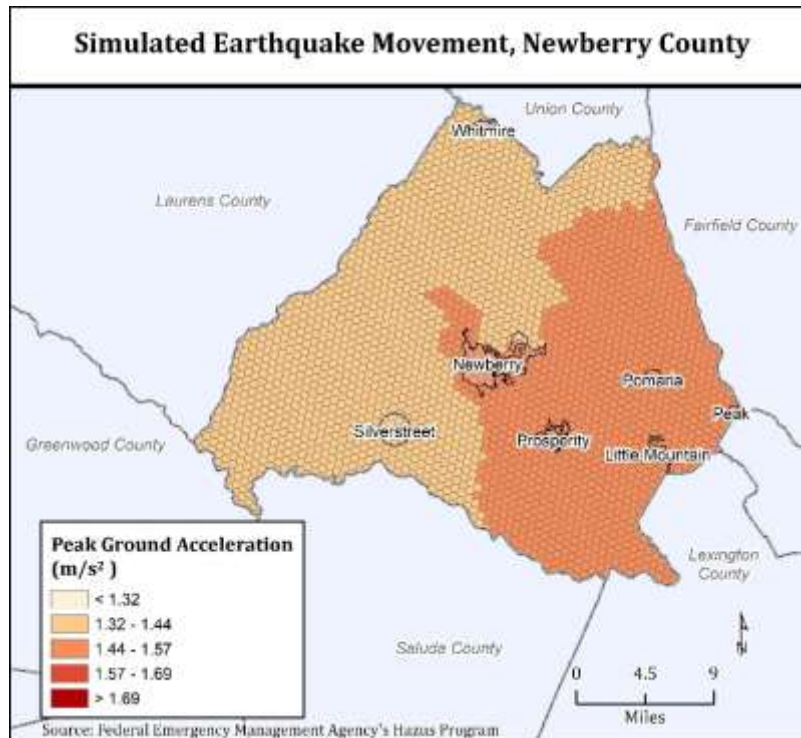


Figure 150 - Peak ground acceleration in Newberry County from a modelled 6.8 earthquake.

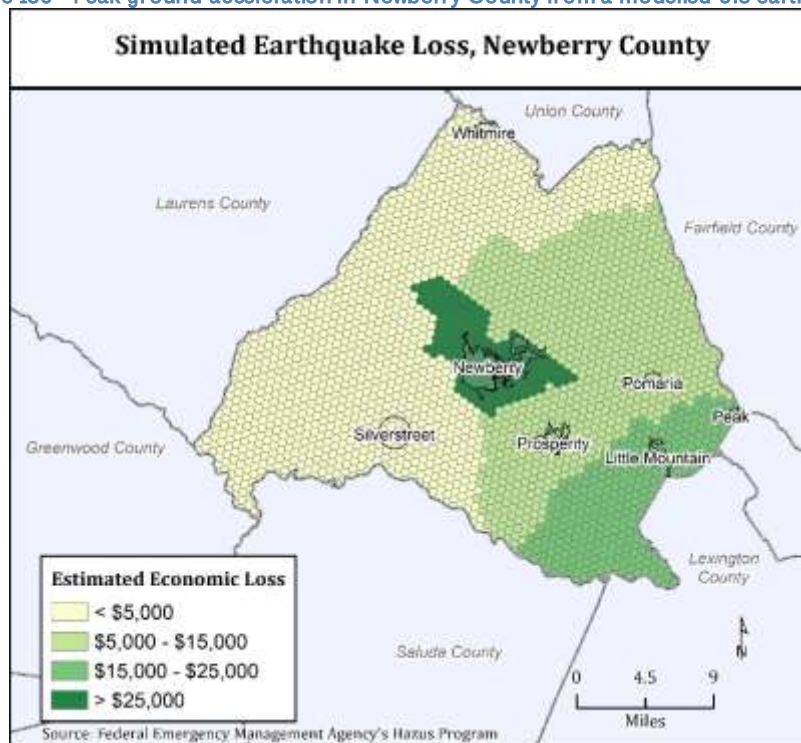


Figure 151 - Damage in Newberry County from a modelled 6.8 earthquake.

6.5 Newberry County Risk Assessment Summary

This section addresses
FEMA HMP requirement
201.6(c)(2)(ii)

As detailed in the *Risk Assessment Methodology* section of the Plan, the information generated by the hazard threat assessment, the vulnerability assessment and the severity of consequence assessment provide the input for the overall risk assessment for Fairfield County (Equation 3).

When the composite threat, vulnerability, and severity of consequence levels for Newberry County are overlaid, the county exhibits a composite risk level of at least medium-low except for a few areas in the northern third of the county (Figure 152). Additionally, the area around the City of Newberry has medium-high and high risk due to a very large concentration of composite vulnerability (Figure 152). There are also areas of noticeably higher composite risk near Pomaria, as well as between Silverstreet and Prosperity (Figure 152).

$$RISK_{HAZ} = (THR_{HAZ})(VUL)(CON_{HAZ}) \quad (3)$$

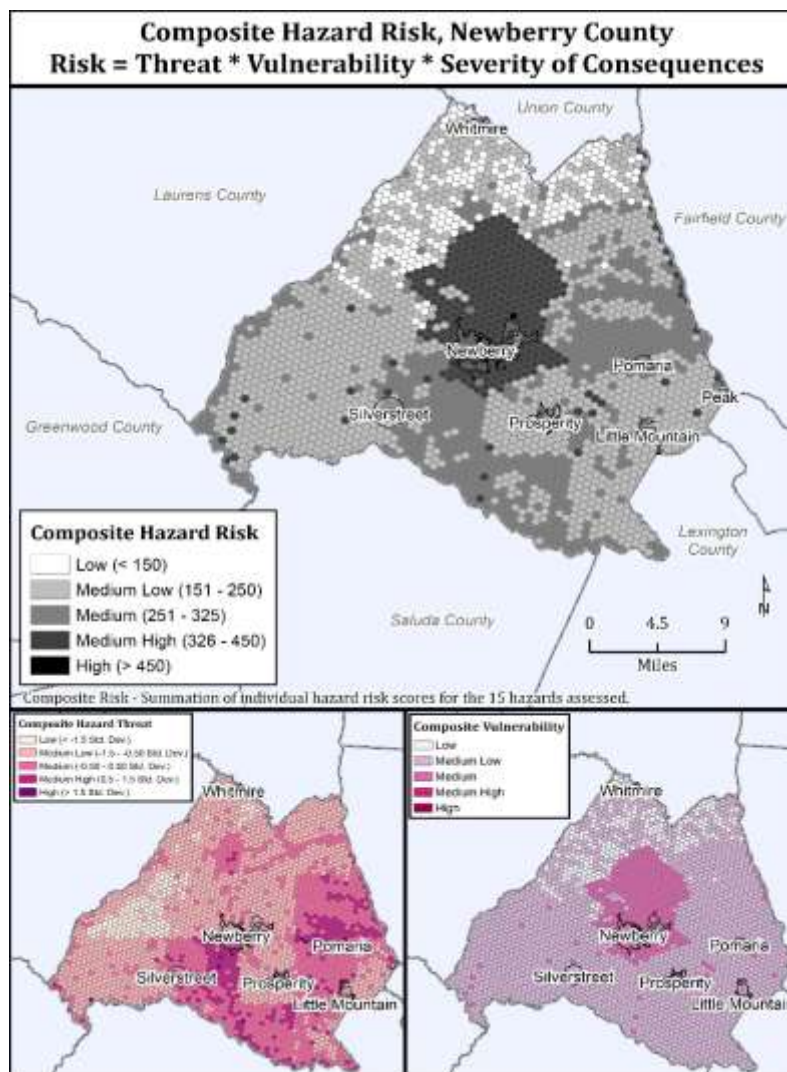


Figure 152 – Overall composite risk map of Newberry County considering all hazard threats, vulnerabilities, and severity of consequences.

In terms of risk assessment by hazard type, Table 78 summarizes the assessment criteria and rating values.

Categories of Risk by Hazard Type

While the composite risk map (Figure 152) shows the spatial distribution of various risk levels across Newberry County, breaks down the overall risk for each hazard assessed in this Plan. The information contained in Table 79 summarizes the numerous input metrics to quantify the overall risk for each hazard. Overall risk for each hazard is expressed in qualitative terms as detailed in Table 78. The high-risk hazards in Newberry County are heat, drought, tornadoes, winter weather, extreme cold and flash floods (Table 79).

Table 78 - Assessment criteria and values.

Geographical Extent	Vulnerability	Severity of Consequence	Future Climate Impacts	Probability of Future Occurrence	Historical Damage	Magnitude and Severity	Overall Risk Rating
Isolated	Low	Minor	Unlikely to worsen	Infrequent	Minor	Low	Low
Scattered	Medium	Moderate	Somewhat likely to worsen	Occasional	Major	Medium	Medium
Widespread	High	Severe	Likely to worsen	Likely	Extensive	High	High

The effectiveness and acceptance of hazard mitigation strategies depends on a community's risk awareness and risk perception. Therefore, we are including the survey results conducted by the CMCOG in October 2020 revealing the perceived mitigation priorities by residents of the Central Midlands region. The survey gauged hazard awareness, preparedness and impacts of residents in the Central Midlands region (see Appendix II for more information). The perceived risk highlights the overlaps and/or discrepancies between the objective risk (as developed in the hazard and vulnerability assessments) and subjective risk (as expressed by Central Midlands' residents).

The spatial risk assessment as well as the risk posed by an individual hazard form the basis for the development of mitigation strategies and prioritization (see Newberry County Mitigation Strategies in [Section 6.8](#)).

Table 79 - Overall risk assessment for Newberry County.

Perceived Risk	Hazard	Geographic Extent of Hazard Threat (THR)	Vulnerability (VUL)	Severity of Consequence (CON)	Severity of Consequence (CON) subcomponents				Overall Risk
					Future Climate Impacts		Historical Impacts	Priority Hazards ⁷⁰	
Less Important	Winter Weather	Widespread	Medium	Moderate	Unlikely to worsen	↔	Minor	High	High
More Important	Extreme Heat	Widespread	Medium	Severe	Likely to worsen	↑↑	Minor	High	High
Somewhat Important	Droughts	Widespread	High	Severe	Likely to worsen	↑↑	Minor	High	High
Somewhat Important	Tornadoes	Widespread	High	Severe	Somewhat likely to worsen	↑	Extensive	High	High
Somewhat Important	Tropical Storms	Isolated	Medium	Moderate	Likely to worsen	↑↑	Minor	Medium	Medium
Somewhat Important	Wind	Isolated	Low	Moderate	Somewhat likely to worsen	↑	Major	Medium	Medium
Less Important	Extreme Cold	Widespread	High	Moderate	Unlikely to worsen	↔	Major	Medium	High
Least Important	Earthquakes	Widespread	High	Moderate	Somewhat likely to worsen	↑	Minor	Medium	Medium
Somewhat Important	Flash Floods	Widespread	Medium	Severe	Likely to worsen	↑↑	Major	Low	High
More Important	Lightning	Isolated	High	Moderate	Somewhat likely to worsen	↑	Minor	Low	Low
Somewhat Important	Hail	Isolated	Low	Moderate	Somewhat likely to worsen	↑	Extensive	Low	Low
More Important	Thunderstorms	Isolated	Low	Moderate	Likely to worsen	↑↑	Major	Low	Low
Somewhat Important	Fog	Isolated	Low	Minor	Unlikely to worsen	↔	Minor	Low	Low
Least Important	Wildfires	Isolated	Low	Moderate	Likely to worsen	↑↑	Minor	Low	Medium
Somewhat Important	Riverine Floods	Scattered	Medium	Moderate	Likely to worsen	↑↑	Minor	Low	Medium

⁷⁰ CMCOG 2016 Hazard Mitigation Plan - <http://www.centralmidlands.org/pdf/CMHMP%202016%20-%20Final.pdf>

Another important aspect of the risk assessment is identifying currently available resources that a jurisdiction has to respond to and mitigate natural hazard events. Table 80 identifies emergency services and adopted ordinances available to the County.

**This section addresses
FEMA HMP requirement
201.6(c)(3)**

Table 80 - Services and Development Related Ordinances in Newberry County.

Name of Jurisdiction	Fire Service	Police Service	Emergency Medical Service	Adopted Zoning Ordinance	Adopted Comprehensive Land Development Regulations	Adopted Building Codes	Participates in National Flood Insurance Program
Newberry County	Provided by Newberry County Rural Fire Service	Provided by County Sheriff's Department	Provided by Countywide Emergency Medical Service	Yes	Yes	Yes	Yes
City of Newberry	Provides own fire service	Provides own police protection	"	Yes	Yes	Yes	Yes
Whitmire	Provided by Newberry County Rural Fire Service	Provides own police protection	"	No	Yes	Yes	Yes

The National Flood Insurance Program (NFIP) aims to reduce the impact of flooding on private and public structures (FEMA, 2016). Actions taken towards reducing flood hazard risk provide a compounding discount on flood insurance to residents in flood prone areas. The program tracks Repetitive Loss Properties (RLP) and Severe Repetitive Loss Properties (SRLP), which are properties that have made multiple flood insurance claims. This information is valuable to planners as it aids in allocating flood mitigation strategies.

Newberry County does not have insurance claims under the RLP and SRLP programs. The County participates in the NFIP, but not the Community Rating System (CRS) and therefore residents do not receive a discount in flood insurance premiums. The County reduces flood hazard risk with a combination of public outreach efforts, flood mitigation planning, enforcing zoning and building codes, and requiring buildings to be elevated in flood zones.

Capability Changes since the 2016 HMP

- Town of Whitmire
 - Fire service now provided by Newberry County instead of the Town of Whitmire

6.6 Newberry County Mitigation Goals and Objectives

The following are general hazard mitigation goals and objectives utilized by stakeholders. These serve as broad mission statements and help guide planners in making decisions that safeguard the life and property of Newberry County citizens.

**This section addresses
FEMA HMP requirement
201.6(c)(3)(i)**

1. Develop better data for the community relating to type, impact, location, and cost of the natural disaster mitigation strategies occurring in the area.
2. Increase the community's capacity to initiate and sustain emergency response operations during and after a natural disaster, thereby mitigating effects of hazardous events.
3. Enhance existing, or design new, policies and/or programs in the community to reduce the potential damaging effects of hazards without hindering other community goals or impeding hazard mitigation programming in the county.
4. Protect the most vulnerable populations, buildings, and critical facilities in the town through the implementation of cost-effective, environmentally sound, and technically feasible mitigation projects.
5. Protect the public health, safety, and welfare by increasing public awareness and understanding of hazards and by fostering both individual and public responsibility in the mitigation of risks through available techniques that minimize vulnerability to those hazards.
6. Increase understanding of all residents in the community about the natural hazards threatening local areas and techniques available to minimize vulnerability to those hazards.
7. Maintain the economic vitality of the community in the face of natural disasters.
8. Promote the security of homes, institutions, and places of employment throughout the community that are considered vulnerable to natural disasters.
9. Promote that the availability and function of community infrastructure will not be significantly disrupted by a natural disaster.
10. Inventory, map and assess all flood plain structures and properties that are or may be repetitive loss properties.

The Newberry County Emergency Preparedness Agency assumed mitigation strategy responsibility for the towns of Little Mountain, Peak, Pomaria, and Prosperity. The aforementioned towns may apply for mitigation funding through Newberry County, utilizing the goals and strategies of Newberry County.

6.7 Newberry County Federally-Supported Mitigation Portfolio

Since 2000, Newberry County has only received federal mitigation dollars to support hazard mitigation planning and purchase generators. Newberry County is in need of technical assistance and capacity to apply for federally-funded hazard mitigation projects to reduce disaster impacts on its residents.

Table 81 - Newberry County portfolio of federally-supported hazard mitigation projects.

Mitigation Category	HMGP	PDM	FMA	Amount	Mitigation Category	HMGP	PDM	FMA	Amount
Property Acquisition and Structure Demolition (200.x)					Soil Stabilization (300.x, 301.x)				
Property Acquisition and Structure Relocation (201.x)					Wildfire Mitigation (205.1/2, 300.2, 300.8, 304.1)				
Structure Elevation (202.x)					Post-Disaster Code Enforcement (104.1), Professional Education (101.1)				
Wet Floodproofing (203.x)					Advance Assistance (904.1)				
Mitigation Reconstruction (207.x)					5 Percent Initiative Projects				
Dry Floodproofing (204.x)					Aquifer and Storage Recovery (403.6)				
Generators (601.x, 602.x)	x			\$18,985	Flood Diversion and Storage (403.5, 403.8)				

Mitigation Category	HMGP	PDM	FMA	Amount	Mitigation Category	HMGP	PDM	FMA	Amount
Localized Flood Risk Reduction Projects (403.1-403.4, 404.1, 405.1)					Floodplain and Stream Restoration (303.1-303.3)				
Non-localized Flood Risk Reduction Projects (500.x, 501.1)					Green Infrastructure (403.7)				
Wind Retrofitting of Existing Buildings (205.7, 205.8)					Miscellaneous/Other (100.1, 106.1, 800.1)				
Non-structural Retrofitting of Existing Buildings and Facilities (205.3, 205.4)					Hazard Mitigation Planning		x		\$228,761
Safe Room Construction (206.x)					Technical Assistance (701.x)				
Infrastructure Retrofit (400.x-402.x)					Management Costs (700.x)				
Feasibility and Design Studies (103.x) Applied R&D (105.1)					Warning Systems (600.1)				

Note: Hazard mitigation planning costs have been generally shared with Fairfield, Lexington, and Richland counties as part of planning activities supported by the Central Midlands Council of Governments. Project costs for multi-county projects (e.g., planning) were reported as is and no county-share was calculated.

This section addresses
FEMA HMP requirements
201.6(c)(3)(ii), 201.6(c)(3)(iii),
and 201.6(c)(3)(iv)

6.8 Newberry County Mitigation Strategies

Table 82 - Unincorporated Newberry County Mitigation Strategies.

Newberry County								
Activity	Type of Hazards	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Improved suppression response (tankers, dry chemicals)	Forest Fire/Wild Fires	US Forestry /State Forestry and Fire Departments	2	2 & 3	State and County Budget	\$1,000,000.00	Ongoing	2021
Fire break tree & brush thinning Controlled open burning by permit (Red flag alerts)	Forest Fire/Wild Fires	State Forestry /US Forestry	3	2,3 & 6	State Budget	unknown	Ongoing	Continuous
Building & Fire Code enforcement/inspections	Forest Fire/Wild Fires	Building Department and Fire Departments	2	1,3,4 & 5	County Budget	\$200,000.00	Ongoing	Continuous
Construct dry hydrant program in rural areas of county	Forest Fire/Wild Fires	Fire Board	3	1,2,4 & 8	County Budget / Grants	\$10,000.00	Most completed looking for new sites	2020
Use GIS parcel-based GIS system to map, record wild fires, all hazards	Forest Fire/Wildfires	GIS Department	3	10	County Budget	\$5,000.00 yearly	Ongoing	Ongoing
Develop and publish brochures & articles on techniques to reduce forest & wild fires	Forest Fire/Wild Fires	State Forestry / Emergency Management	3	1 & 5	State and County Budgets	\$1,000.00 yearly	Ongoing	Ongoing
Install surge protectors in critical facilities	Thunder-storms (Hail, Wind, Lightning)	State, County, and City Government	3	5	State, County and City Government Budgets	\$500,000.00	Ongoing	Ongoing
Adopt procedure for suspension of operations during lightning storms	Thunder-storms (Hail, Wind, Lightning)	County Government	3	5 & 6	County Budget	Unknown	Ongoing	Ongoing
Clear power line and utility easements of debris Thunder-storms (Hail, Wind, Lightning)	Thunder-storms (Hail, Wind, Lightning)	Electric Companies	2	3	Independent Companies	Unknown	Ongoing	Ongoing
Remove taller trees near critical facilities	Thunder-storms (Hail, Wind, Lightning)	County Government	3	3	County Budget	\$50,000.00	Deferred	5 Years
Power line clearance with the	Winter Snow & Ice	Electric Companies	2	3	Private	Unknown	Ongoing	Ongoing

Newberry County								
Activity	Type of Hazards	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Elec. Coop./ Duke Dominion Energy	Storms				Companies			
Debris removal and road clearance work	Winter Snow & Ice Storms	County Public Works	1	3 & 4	County Budget	Dependent on Event	Ongoing	Ongoing
Employ van system for the elderly for emergency shelter, evacuation & communicate capacity	Winter Snow & Ice Storms	DSS	1	2	County and State Budget	Unknown	Ongoing	Ongoing
Procure and use elec. generators at critical facilities	Winter Snow & Ice Storms	County Government	3	2 & 4	County Budget or Grants	\$500,000.00	Ongoing	2020
Inspect dams at lakes and ponds to ensure their structural soundness	Flooding	DHEC	3	6	State Budget	Unknown	Ongoing	Ongoing
Enforce county zoning to restrict development in flood-plains	Flooding	Zoning Dept.	2	1 & 10	County Budget	\$10,000.00	Ongoing	Ongoing
Declare May of each year to be Flood Awareness Month	Flooding	Emergency Management	3	6	County Budget	NA	Ongoing	Ongoing
Develop a parcel based GIS system to track all structures & demolition permits in flood areas	Flooding	GIS	3	10	County Budget	\$10,000.00	Ongoing	Ongoing
Coordinate with other local gov'ts in county to make stream channel improvement	Flooding	DHEC	3	10	State Budget	Unknown	Ongoing	Ongoing
Replace structurally obsolete bridges	Flooding	Public Works	3	1 & 10	County Budget / Grants	\$300,000.00	Ongoing	Ongoing
Identify & contact all repetitive loss properties	Flooding	Zoning	3	1 & 10	County Budget	\$10,000.00	Ongoing	Ongoing
Ensure that the FEMA Elevation Certificate is properly completed before issuance on property in flood areas	Flooding	Zoning	3	10	County Budget	NA	Ongoing	Ongoing
Undertake Planning to participate in Community Rating System	Flooding	Zoning	3	1	County Budget	\$5,000.00	Ongoing	Ongoing
Maintain status in the NFIP	Flooding	Zoning	3	1,3 & 10	County Budget	NA	Ongoing	Ongoing
Install safe rooms in critical facilities especially those with	Tornados	County	3	3,4 & 5	County Budget /	\$3,000,000.00	Deferred	Deferred

Newberry County								
Activity	Type of Hazards	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
vulnerable populations					Grants			
Emergency response chain saw project and other efforts to remove debris	Tornados	Public Works /Fire/Rescue	1	4 & 5	County Budget	\$5,000.00	Completed Maintain Equipment	Ongoing
Harden utility services to facilities especially serving vulnerable populations	Tornados	County Buildings	3	3 & 9	County Budget	\$3,000,000.00	Ongoing improvements as building replaced or remodeled.	Ongoing
County Council declares International Building Safety Week to promote safety in built environment	Tornados	County Council	1	6	County Budget	NA	Ongoing	Ongoing
Develop Portable Water Treatment Facilities	Hurricane	Newberry County Water and Sewer Department	2	3	County Budget	\$15,000,000.00	Ongoing/CPST projects and Grants applied for as available	2025
Replace water storage tanks and pumps as needed	Hurricane	Newberry County Water and Sewer Department	3	3	County Budget	\$3,000,000.00	Ongoing	2020
Add capacity at solid waste disposal facilities serving the county to handle more debris	Hurricane	Public Works	3	2 & 3	County Budget	\$500,000.00	Deferred	2021
Develop and publicize water conservation practices to respond to drought declarations	Drought	Newberry County Water and Sewer	3	6	County Budget	\$1,000.00	Ongoing	2018
Add to dry hydrant program in rural areas of county	Drought	Newberry County Fire Board	2	3	County Budget	\$1,000,000	Ongoing	2018
Natural Hazard and flood management education campaign	All natural hazards	Newberry County	2	5 & 6	County Budget	<\$250,000	New	Ongoing

Mitigation Action Update for Newberry County since the 2016 HMP

- Installed 5, 60,000-gallon water supply tanks for fire suppression in the Consolidated Fire District to improve water supply. This was funded by the 1% tax for capital projects an estimated \$1,000,000 project.
- Newberry County's Flood Mitigation and Zoning Coordinator works proactively to guide development away from designated FEMA flood zones.

Table 83 - City of Newberry Mitigation Strategies.

City of Newberry								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals addressed	Finance Source	Cost	Status	Time Frame
Power line & road R-O-W clearance	Winter Snow & Ice Storms	Utilities	1	9	Utility Funds	\$150k yearly	Ongoing	Ongoing
Creation of alternate debris disposal locations	Winter Snow & Ice Storms	Public Works	3	2	HMGP Funds	\$100K +	Deferred	Deferred
Use van system for emergency shelter, evacuation, communication. capacity	Winter Snow & Ice Storms	N/A	3	2	HMGP Funds	\$100K +	Deferred	Deferred
Procure and use mobile emergency generators at critical facilities including city hall	Winter Snow & Ice Storms	Utilities	1	2	Utility Funds	\$1.5m	Completed	Completed
Primary and Secondary electric line hardening	Winter Snow & Ice Storms	Utilities	2	9	Utility Funds		Ongoing	Ongoing
Battery operated emergency radio receivers in homes & businesses	Winter Snow & Ice Storms	Public Safety	2	2	HMGP Funds		Deferred	Deferred
Develop public information program (How to Protect Against & Respond to Natural Hazards)	Winter Snow & Ice Storms	Public Safety	3	6	HMGP Funds		Deferred	Deferred
Install surge protectors in critical facilities	Thunder-storms (Hail, Wind, Lightning)	Utilities	1	2	Utility Funds	\$250k	Completed	Completed
Adopt procedure for suspension of operations during lightning storms	Thunder-storms (Hail, Wind, Lightning)	Utilities	3	3	Utility Funds		Ongoing	Ongoing
Clear power line and utility easements of debris	Thunder-storms (Hail, Wind, Lightning)	Utilities	1	2	Utility Funds		Ongoing	Ongoing
Remove taller trees near critical facilities	Thunder-storms (Hail, Wind, Lightning)	Utilities	1	2	Utility Funds	\$150k yearly	Ongoing	Ongoing
Clear and clean Scotts Creek inside city limits	Flooding	Public Works	1	4	Public Works (GF)	\$17,000 per	Ongoing	Every 2 yrs
Enforce city zoning to restrict development in flood-plains	Flooding	Planning, Zoning & Development	1	10	PZD (GF)		Ongoing	Ongoing

City of Newberry								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals addressed	Finance Source	Cost	Status	Time Frame
Declare May of each year to be Flood Awareness Month	Flooding	City Council	3	6	City Council (GF)		Deferred	Deferred
Use city's parcel based GIS system to track all structures and demolition permits in flood areas	Flooding	Planning, Zoning & Development	3	10	County		Deferred	Deferred
Build storm water holding ponds on Scotts Creek	Flooding	Public Works	3	2	HMGP Funds		Deferred	Deferred
Extend hazardous structure buyout program	Flooding	Planning, Zoning & Development	3	4	HMGP Funds		Deferred	Deferred
Identify & contact all repetitive loss properties	Flooding	Planning, Zoning & Development	3	10	HMGP Funds		Deferred	Deferred
Ensure that the FEMA Elevation Certificate is properly completed before issuance on property in flood areas	Flooding	Planning, Zoning & Development	1	10	PZD (GF)		Ongoing	Ongoing
Undertake Planning to participate in Community Rating System	Flooding	Planning, Zoning & Development	3	6	PZD (GF)		Deferred	Deferred
Maintain status in the NFIP	Flooding	Planning, Zoning & Development	1	2	City Council (GF)		Ongoing	Ongoing
Identify critical buildings needing hardening especially those serving vulnerable populations	Tornados	Planning, Zoning & Development	2	2	PZD (GF)		Deferred	Deferred
Install safe rooms in critical facilities especially those with vulnerable populations	Tornados	Planning, Zoning & Development	3	2	PZD (GF)		Deferred	Deferred
Emergency response chain saw project and other efforts to remove debris	Tornados	Utilities & Public Works	1	2	Utilities & Public Works		Ongoing	Ongoing
City Council declares International Building Safety Week to promote safety in built environment	Tornados	City Council	3	6	City Council (GF)		Deferred	Deferred
Develop Back-up Mobile Water Treat. Facilities	Hurricanes	Utilities	3	2	Utility Funds		Deferred	Deferred
Replace water storage tanks and pumps as needed	Hurricanes	Utilities	1	2	Utility Funds	\$5-6 m	Completed	Completed

City of Newberry								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals addressed	Finance Source	Cost	Status	Time Frame
Add capacity at solid waste disposal facilities serving the city	Hurricanes	Utilities	1	2	Utility Funds	\$10.25m	Completed	Completed
Amend state drought legislation to stiffen penalties for violators	Drought	State	3	6				
Build an additional clear well and elevated storage tank to add to the city's water supply	Drought	Utilities	1	2	Utility Funds	\$5-6 m	Completed	Completed
Build ponds near city for raw water storage for fire suppression	Drought	Fire, Utilities, & Public Works	3	2	Fire Dept.		Deferred	Deferred
Explore new raw water sources for the water treatment plant	Drought	Utilities	3	2	Utility Funds		Deferred	Deferred
Publicize water conservation practices	Drought	Utilities	3	6	City Council (GF)		Deferred	Deferred
Identify critical facilities in city that need hardening to withstand earthquake	Earthquake	Planning, Zoning & Development	2	2	PZD (GF)		Deferred	Deferred
Develop speakers bureau about earthquake and other natural disaster threats to the city	Earthquake	Planning, Zoning & Development	3	6	City Council (GF)		Deferred	Deferred
Enforce construction codes to ensure that buildings can withstand earthquakes	Earthquake	Planning, Zoning & Development	1	2	PZD (GF)		Ongoing	Ongoing

Mitigation Action Update for the City of Newberry since the 2016 HMP

- No natural hazard mitigation activities implemented, or changes provided to their mitigation strategy list.

Table 84 - Town of Whitmire Mitigation Strategies.

Town of Whitmire								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Install early warning system for major windstorms	Tornados	Town of Whitmire/ Newberry County Public Safety	1	4 & 5	Capital Improve. Budgets	<\$250,000	Deferred due to funding	Deferred
Training of Police, Fire, and EMS personnel for major storms	Tornados	Town of Whitmire/ Newberry County Public Safety	1	2, 4 & 7	Operating Budgets	<\$250,000	Ongoing	Ongoing
Create alternate non-land line communication with cell phones using new cell phone tower	Tornados	Town of Whitmire/Cellular phone provider	1	2, 4 & 7	Capital Improve. Budgets	\$250,000 to \$750,000	Deferred due to funding	Deferred
Identify critical buildings needing hardening especially those serving vulnerable populations	Tornados	Town of Whitmire/Newberry County/ School District	2	2 & 4	Operating Budgets	<\$250,000	Deferred due to funding	Deferred
Install safe rooms in critical facilities especially those with vulnerable populations	Tornados	Town of Whitmire/ towns in county/ school district	2	2, 4 & 7	Capital Improve. Budgets	\$250,000 to \$750,000	Deferred due to funding	Deferred
Emergency response chain saw project and other efforts to remove debris	Tornados	Town of Whitmire/ Duke Power/ SCDOT	1	2, 4, 7 & 9	Capital Improve. Budgets	<\$250,000	Deferred due to funding	Deferred
Town Council declares International Building Safety Week to promote safety in built environment	Tornados	Town of Whitmire.	3	5	Operating Budget	<\$250,000	Deferred due to funding	Ongoing
Power line & road R-O-W clearance	Winter Snow & Ice Storms	Town of Whitmire/Duke Power/ SCDOT	1	2, 4 & 7	Operating Budget	<\$250,000	Ongoing	Ongoing
Use van system for emergency shelters, evacuation and communication. capacity	Winter Snow & Ice Storms	Newberry. County Council on Aging.	1	2, 4 & 7	Operating Budget	<\$250,000	Ongoing	Ongoing
Procure and use mobile emergency generators at critical facilities including town hall	Winter Snow & Ice Storms	Town of Whitmire	1	2, 4 & 7	Capital Improve. Budget	\$250,000 to \$750,000	Deferred due to funding	Ongoing
Primary and Secondary electric	Winter Snow &	Duke Power	1	2, 4 & 7	Capital Improve.	\$250,000 to	Deferred due	Deferred

Town of Whitmire								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
line hardening	Ice Storms				Budget	\$750,000	to funding	
Battery operated emergency radio receivers in homes, businesses, police & fire	Winter Snow & Ice Storms	Town of Whitmire/ Newberry. County Public Safety	1	2, 4 & 7	Capital Improve. Budget	\$250,000 to \$750,000	Deferred due to funding	Ongoing
Develop public information program (How to Protect Against & Respond to Natural Hazards)	Winter Snow & Ice Storms	Town of Whitmire/ Newberry. County Public Safety	1	5	Capital Improve. Budget	<\$250,000	Deferred due to funding	Ongoing
Install surge protectors in identified critical facilities	Thunder- storms (Hail, Wind, Lightning)	Town of Whitmire/Newberry. County/ School District	1	2, 4 & 7	Capital Improve. Budgets	\$250,000 to \$750,000	Deferred due to funding	Deferred
Adopt procedure for suspension of operations during lightning storms	Thunder- storms (Hail, Wind, Lightning)	Town of Whitmire/ School District/Newberry. County	2	2, 4 & 7	Operating Budgets	<\$250,000	Deferred due to funding	Deferred
Clear power line and utility easements of debris	Thunder- storms (Hail, Wind, Lightning)	Town of Whitmire/ Duke Power	1	2, 4 & 7	Public Works Operating Budget	<\$250,000	Ongoing	Ongoing
Remove taller trees near critical facilities	Thunder- storms (Hail, Wind, Lightning)	Town of Whitmire/Duke Power	2	2, 4 & 7	Public Works Operating Budget	<\$250,000	Ongoing	Ongoing
Clear and clean creeks inside town limits	Flooding	Town of Whitmire	1	2, 4 & 7	Capital Improve. Budget	<\$250,000	Deferred due to funding	Ongoing
Adopt zoning ordinance to restrict development in flood-plains	Flooding	Town of Whitmire	1	2 & 4	Operating Budget	<\$250,000	Deferred due to funding	Deferred
Declare May of each year to be Flood Awareness Month	Flooding	Whitmire Town Council	2	5	Operating Budget	<\$250,000	Deferred due to funding	Deferred
Collaborate with county's parcel-based GIS system to track all structures and demolition permits in flood areas	Flooding	Town of Whitmire	2	10	Operating Budget	<\$250,000	Ongoing	Ongoing
Identify & contact all repetitive loss properties	Flooding	Newberry City	1	2, 4, 7 & 10	Operating Budgets	<\$250,000	Deferred due to funding	Ongoing

Town of Whitmire								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Ensure that the FEMA Elevation Certificate is properly completed before issuance on property in flood areas	Flooding	Newberry City	1	4 & 10	Operating Budgets	<\$250,000	Ongoing	Ongoing
Maintain status in the NFIP	Flooding	Town of Whitmire	1	2, 4, 5, 7 & 10	Operating Budget	<\$250,000	Ongoing	Ongoing
Develop Back-up Mobile Water Treat. Facilities	Hurricanes	Town of Whitmire Public Works Dept.	2	2, 4 & 7	Capital Improve. Budget	\$250,000 to \$750,000	Deferred due to funding	Deferred
Replace water storage tanks and pumps as needed	Hurricanes	Town of Whitmire Public Works Dept.	2	2, 4 & 7	Capital Improve. Budget	\$250,000 to \$750,000	Deferred due to funding	Ongoing
Add capacity at solid waste disposal facilities serving the town	Hurricanes	Town of Whitmire. and solid waste contractors	2	2, 4 & 7	Capital Improve. Budgets	\$250,000 to \$750,000	Deferred due to funding	Deferred
Amend state drought legislation to stiffen penalties for violators	Drought	SC General Assembly	3	3 & 4	Operating Budget	<\$250,000	Deferred due to funding	Deferred
Build an additional clear well and elevated storage tank to add to the town's water supply	Drought	Whitmire Town Public Works Dept.	2	2, 4 & 7	Capital Improve. Budget	\$250,000 to \$750,000	Deferred due to funding	Deferred
Build ponds near town for raw water storage for fire suppression	Drought	Whitmire Town Public Works Dept.	2	2, 3, 4 & 7	Capital Improve. Budget	\$250,000 to \$750,000	Deferred due to funding	Deferred
Publicize water conservation practices	Drought	Town of Whitmire	1	5	Operating Budget	<\$250,000	Ongoing	Ongoing
Identify critical facilities in town that need hardening to withstand earthquake	Earthquake	Town of Whitmire Public Works	1	4 & 10	Operating Budget	<\$250,000	Deferred due to funding	Deferred
Develop speakers bureau about earthquake and other natural disaster threats to the town	Earthquake	Newberry. County Public Safety Dept./ Whitmire Town Council	1	5	Operating Budgets	<\$250,000	Deferred due to funding	Deferred
Adopt building and fire codes to ensure that buildings can withstand earthquakes	Earthquake	Town of Whitmire	1	2	Operating Budgets	<\$250,000	Deferred due to funding	Deferred

Mitigation Action Update for the Town of Whitmire since the 2016 HMP

- No natural hazard mitigation activities implemented, or changes provided to their mitigation strategy list.

7. Richland County

7.1 Historical Hazard Assessment for Richland County

This section addresses
FEMA HMP requirement
201.6(c)(2)(i)

Summary of Historic Impacts

Richland County experiences an array of natural hazards (Table 85). Prior to the 2015 flash flood disaster, hurricanes posed the highest risk to Richland County. Flood damage used to rank fairly low—even behind tornadoes—although flash flooding is a very frequent occurrence (about every 2 months). Heat and drought pose serious threats to the county that are difficult to capture in loss figures or maps since their impacts tend to be vastly underreported (lack of data, secondary and/or prolonged effects on agriculture, public health, etc.). The most frequent year-round hazard in Richland County is thunderstorms (incl. lightning, hail, and wind). While thunderstorm, lightning, wind and hail damage is non-catastrophic, their cumulative impact and high frequency is still significant (almost \$29 million, 102 people injured/killed, 31%). When overlaying the risk from all hazards, southern Richland County exhibits the highest level of risk (Figure 153).

In the future, the frequency and possible damage from thunderstorms and other meteorological and hydrological hazards is very likely to increase. Based on climate projections, it is anticipated that the number of cold days and perhaps also winter storms will decrease.

Table 85 - Summary of natural hazards and their impacts on Richland County since 1960 (adj. to 2019 USD).

	Direct Losses (Property and Crop)	Total USDA Crop Indemnity Payout****	Direct Injuries and Fatalities	# Of Loss- Causing Events	Frequency	Recurrence Interval (in years)	Future Changes
Flooding	\$36,580,114	\$118,153	40	177	4.9%	0.2	▲
Hurricane	\$105,686,154	\$69,076	32	10	1.1%	0.94	▲
Tornadoes	\$19,554,807	n/av	18	18	1.6%	0.61	▲
Thunderstorm**	\$11,411,990	\$4,700,180	16	321	31%	0.03	▲
Lightning	\$6,474,975	n/av	65	84	1.4%*	0.73 days*	▲
Wind	\$10,228,633	\$98,201	18	348	18%	0.06	▲
Hail	\$728,465	\$180,631	3	76	5.7%	0.18	▲
Fog	n/av	n/av	n/av	n/av	0.08%*	12.7 days*	◄►
Winter Storm	\$18,260,484***	\$94,208	7	57	0.47%	2.1	▼
Cold*****	\$11,679,375	\$274,192	5	35	49%	0.02	▼
Heat	\$12,746,647	\$2,393,606	7	14	25%	0.04	▲
Drought	\$16,069,921	\$6,445,058	0	16	0.4%	2.5	▲
Wildfire	\$401,355	n/av	0	3	0.09%*	10.8 days*	▲
Earthquake	0	n/av	0	0	0.03%	40	◄►
TOTAL	\$238,143,545	\$14,733,305	211	1125			

* daily frequency/recurrence calculations instead of years

**coastal storms combined with thunderstorms/severe storms

***no 2004 ice storm losses reported by NWS

****hazards with n/av have no event records that resulted in USDA Crop Indemnity Payouts

*****cold hazard totals already included in winter storm totals

▲ indicates that future increase in occurrence and/or impacts is likely

▼ indicates that future decrease in occurrence and/or impacts is likely

◄► indicates that either no change in future occurrence or impacts is expected or that a determination of future changes cannot be made.

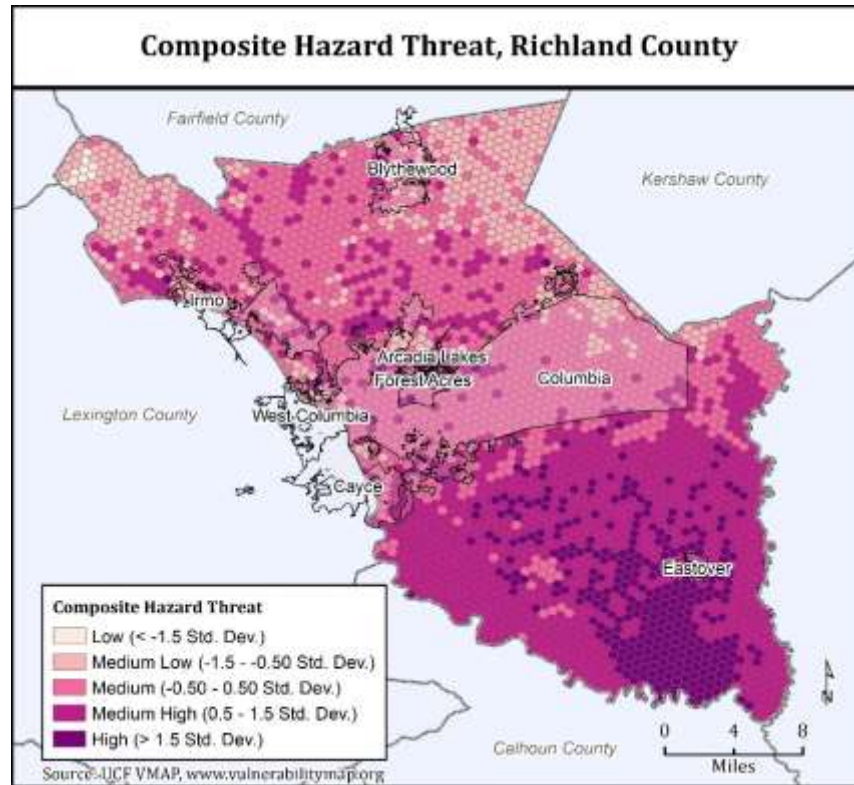


Figure 153 - Composite threat profile of Richland County.

A) Flooding

What to expect: Flood damage in Richland County is mostly the result of localized heavy precipitation leading to flooding along smaller creeks and tributaries to the Broad, Congaree and Saluda Rivers as well as flash flooding due ponding and/or inadequate drainage (Table 86). Virtually every building in Richland County is at some risk from flash flooding due to drainage issues and ponding. While most buildings are not at risk from flood waters reaching first floor levels, many homes may, however, experience flooded crawl spaces, driveways, etc. or experience secondary problems such as mold issues. In addition, the 2015 floods revealed a high risk from small pond dam failures—particularly when simultaneous and cascading dam failures occur in the same watershed.

Geographic Extent: Flooding in Richland County is not restricted to the 100-year and 500-year floodplains (Figure 155). Based on past occurrences, Richland County is very susceptible to flash flooding in low-lying areas, e.g., along Rocky Branch Creek near Main and Whaley Streets and in the Five Points area, and downstream from small dams. The Flash Flood Potential Index identifies the larger metropolitan area as having a high risk of flash flooding, especially in the western half of the county (Figure 156). During the 2015 event, problems also arose from backwater flooding along Saluda River tributaries when water was released from the Lake Murray Dam.

Flooding statistics for Richland County are as following:

Number of Loss-Causing Events:	177
Frequency of Occurrence:	4.9%
Recurrence Interval:	0.2 years
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return period
Frequency Year Range:	2008 - 2018

Loss Events on Record:	1960 - 2018
Flood-related Presidential Disaster Declarations:	DR-4241 (2015)
Total Losses:	\$36,580,114
Total Fatalities:	9
Deadliest Event:	2 fatalities (several instances)
Most Property Damage:	\$10,934,004 (October 4, 2015)
Most Crop Damage:	\$335,449 (October 4, 2015)
Highest USDA Crop Indemnity Payout:	\$68,810 (September 2018)

October 1-5, 2015 (DR-4241)^{71*}:

Over a five-day period, an upper low-pressure system combined with the remnants of Hurricane Joaquin streamed tropical moisture into South Carolina (Figure 154). The City of Columbia experienced its wettest day on record with 6.71 inches of rainfall on October 4th. Richland County experienced a record-setting 5-day rainfall total of up to 21.5 inches in some places (as reported by the Richland County Emergency Services Department's Mesonet station at Gills Creek)⁷². This record rainfall caused catastrophic flash flooding, dam breaches and failures (see section on Dams Failures) along with backwater flooding along the Saluda River due to emergency water release from the Lake Murray Dam. The last time the dam's spillway was opened was in 1969. Large areas of the City of Columbia were without drinking water due a breach in a diversions supply canal shutting down schools and economic activities in the city. According to NCDC's Storm Data, direct damage to property are estimated at about \$27 million and nearly \$1 million in crop damage. Two fatalities occurred. Overall damage estimates range from \$1 billion⁷³ to \$12 billion⁷⁴ for the entire impact area in South Carolina. Richland County received both individual and public assistance funding through FEMA.

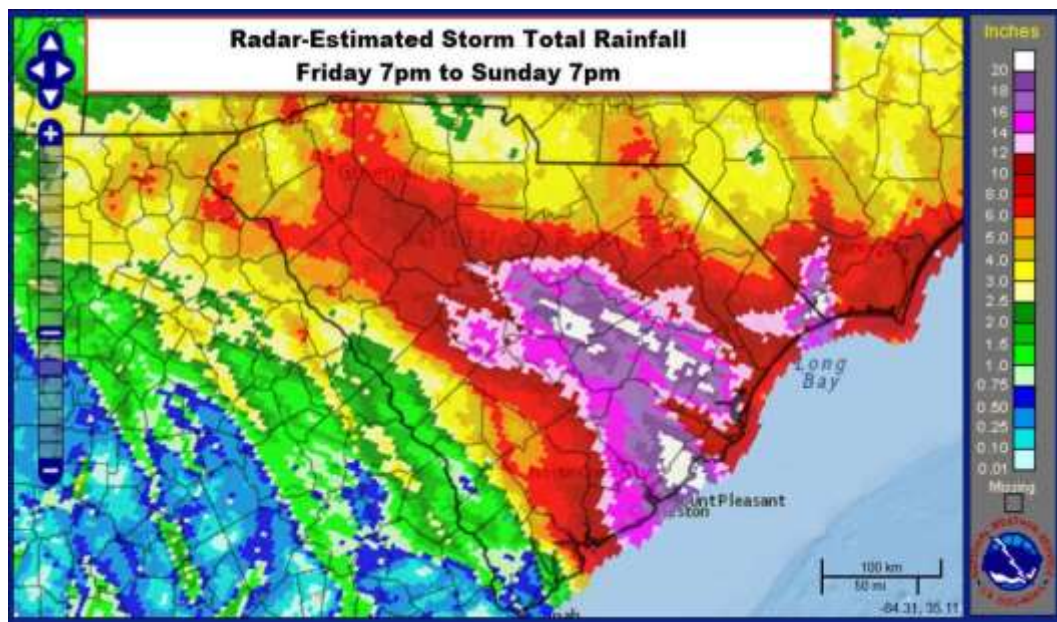


Figure 154 - Total rainfall amounts for the 2015 flood event. Source: NWS.

^{71*} Note: The historic record for all hazards in this plan covers the time period from 1960 through 2020

⁷² NWS, 2015. Historic rainfall and flooding, October 2015. Available at <http://www.weather.gov/cae/HistoricFloodingOct2015.html>

⁷³ NOAA National Centers for Environmental Information, 2016. Billion-Dollar Weather and Climate Disasters. Available at <http://www.ncdc.noaa.gov/billions/events>

⁷⁴ Burris, Roddie. SC Floods' Damage: \$12 billion, Economists say. *The State* [Online], Columbia, SC, December 1, 2015, Available at <http://www.thestate.com/news/local/article47471060.html>

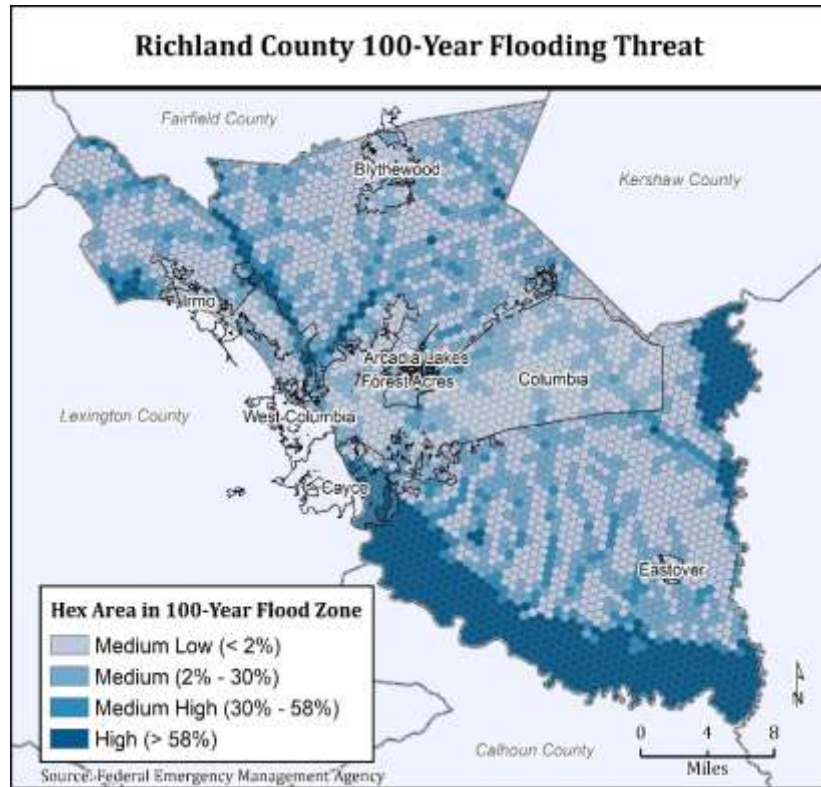


Figure 155 - 100-year riverine floodplain threat in Richland County.

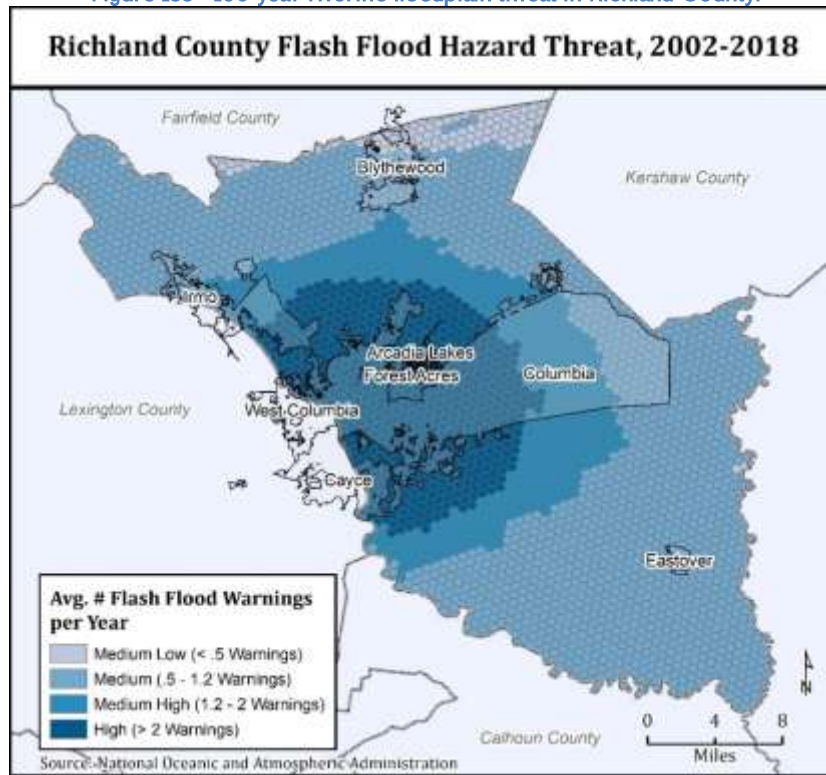


Figure 156 - Flash flood threat in Richland County.

Table 86 - Record of loss-causing flood events in Richland County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj .	Fat .	Property Damage	Crop Damage	Mag. (in.)*	Location	Description
3/1/1964	3/31/1964	0	0	\$909	\$909		Statewide	Flooding
3/1/1966	3/5/1966	0	0	\$8,694	\$8,694		Statewide	Flooding
2/3/1973	2/3/1973	0	0	\$6,344	\$6		Statewide	Flooding
3/15/1973	3/31/1973	0	0	\$1,824	\$18		Pee Dee, Edisto, & Congaree River Basins	Flooding due to heavy rains
6/8/1973	6/25/1973	0	0	\$10,063	\$1,006,347		Southern & Central SC	Heavy Rains & Flooding
6/16/1973	6/22/1973	0	0	\$1,006	\$101		Central, Northern, & Eastern SC	Heavy Rain & Flash Flooding
3/12/1975	3/18/1975	0	0	\$5,236	\$524		Statewide	Heavy Rains & Flooding
7/13/1975	7/18/1975	0	0	\$669	\$66,903		Eastern & Central SC	Rains & Flooding
7/4/1976	7/5/1976	0	0	\$1,139	\$11,386		Central SC, Lexington, & Richland Counties	Flash Flooding
10/9/1976	10/19/1976	0	0	\$49,506	\$49,506		Statewide	Flood
1/25/1978	1/26/1978	0	0	\$43,204	\$4		Statewide	Wind & Flash Flooding
1/26/1978	1/31/1978	0	0	\$4,320	\$0		Statewide	Flooding
7/21/1979	7/21/1979	0	0	\$178,481	\$0		Columbia	Rain & Flooding
3/15/1980	3/31/1980	0	0	\$3,419	\$3,419		Statewide	Flood
8/8/1980	8/8/1980	0	0	\$3,419	\$342		Statewide	Wind & Flood
7/3/1981	7/3/1981	0	0	\$4,752	\$475		Columbia, Mayesville, & Ruby	Flash Flood
1/1/1982	1/14/1982	0	0	\$610	\$61		Along Saluda, Broad, Congaree, Wateree, Lynches, & Pee Dee Rivers	Flooding
4/27/1982	4/27/1982	0	0	\$707	\$0		Central, Northeastern, & Eastern SC	Lightning & Flooding
3/17/1983	3/17/1983	0	0	\$28,282	\$2,828		Statewide	Flooding
12/6/1983	12/6/1983	0	0	\$3,336	\$33		Western, Northern & Central SC	Flood & Wind
2/27/1984	2/27/1984	0	0	\$2,711	\$27		Statewide	Rain, Wind, & Flood
6/21/1984	6/21/1984	3	0	\$62,357	\$6,236		Columbia	Rain, Flood, & Lightning
7/26/1984	7/26/1984	0. 07	0	\$2,711	\$27		Statewide	Wind, Rain, & Flood
8/2/1984	8/2/1984	0	0	\$4,300	\$0		Southern, Central, & Eastern SC	Lightning, Rain, & Flood
7/16/1986	7/16/1986	0	0	\$118	\$0		Columbia	Urban Flooding

Start Date	End Date	Inj	Fat	Property Damage	Crop Damage	Mag. (in.)*	Location	Description
8/12/1986	8/12/1986	0	0	\$118,227	\$0		Columbia	Flash Flooding
8/18/1986	8/19/1986	0	0	\$11,823	\$0		Columbia	Flash Flooding
10/8/1986	10/8/1986	0	0	\$1,182	\$0		Columbia	Urban Flooding
3/27/1987	3/27/1987	0	0	\$1,141	\$0		Countywide	Urban Flooding
5/5/1991	5/5/1991	0	0	\$665,962	\$0		Columbia	Flash Flooding
1/1/1993	1/31/1993	0	0	\$19,494	\$389,893		Statewide	Flooding
12/23/1994	12/23/1994	0	0	\$1,749	\$0		Northeastern Richland	Flooding
3/7/1996	3/7/1996	0	0	\$8,259	\$0		Countywide	Flooding
6/29/2007	6/30/2007	0	0	\$62,494	\$0	>2"	Columbia	Several inches of rain fell in a two-hour period that sent Rock Creek over its bank flooding the Five Points area and stranding several motorists in their vehicles. One had to be rescued that was trapped in his car.
8/7/2008	8/7/2008	0	0	\$2,407	\$0		Columbia	City police reported flooding in the Five Points area with roads closed due to several feet of water covering them.
8/25/2008	8/25/2008	0	0	\$24,073	\$0	2-4"	Columbia	Sheriff and public reported flash flooding across several roads with water up to 3 ft deep closing roadways. Some vehicles were stalled but no occupants were trapped. Spotters reported 2 to 4 inches of rain within a 1-to-2-hour period from the remnants of Tropical Storm Fay.
9/9/2008	9/9/2008	0	0	\$6,018	\$0		Columbia	Police reported flooding in downtown Columbia near USC and in the Five Points area closing several roads. Water was 1 to 3 ft deep.
9/15/2008	9/15/2008	0	0	\$36,110	\$0	1-3"	Columbia	Police reported roads closed from flash flooding at Elmwood, Bull St, Olympia Ave., Bluff Rd, Whaley, and Main St with a couple of vehicles trapped in those location.
5/24/2009	5/24/2009	0	0	\$19,328	\$0	1-3"	Columbia	Police and city officials reported flash flooding in the Five Points area. Several vehicles were stranded in 2 to 4 ft of water.
7/22/2009	7/23/2009	0	0	\$362,391	\$0	3-5"	Ft Jackson	Broadcast media and public reported torrential rains causing flash flooding in east central Lexington and west central Richland counties. Three to five inches of rain fell within a 1-to-3-hour period causing flash flooding in several areas.
12/9/2009	12/9/2009	0	0	\$2,416	\$0		Columbia	City PD reported flash flooding at Main and Whaley streets and on Pickens Street. Water levels rose to about 2 ft causing several cars to stall when they tried to drive through the flooded areas.
12/25/2009	12/25/2009	0	0	\$9,664	\$0	2-5"	Columbia	Police reported several roads flooding in the Five Points Area with 7 ft of water in the backyards of several homes in the Arborchase subdivision.
12/25/2009	12/25/2009	0	0	\$4,832	\$0	2-5"	State Park	Many road closures and widespread flooding along streams reported by emergency management and a small earthen dam breach on Bush River Rd in the St. Andrews/Whitehall area.
5/31/2010	5/31/2010	0	0	\$5,942	\$0	1-2"	Columbia	Public reported flash flood along Rocky Branch Creek in the Whaley Mill Area of downtown Columbia. Water rose to the bottom of vehicles.
7/15/2010	7/15/2010	0	0	\$2,377	\$0	2"	Columbia	Columbia and West Columbia police reported a couple of roads temporarily closed due to flash flooding as water levels rose to 1 to 2 ft in low lying areas.
7/26/2010	7/26/2010	0	0	\$14,262	\$0	2"	Columbia	USGS reported flash flooding in downtown

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)*	Location	Description
								Columbia along Rocky Creek where the gage was 3 ft over flood stage. Around 2 inches of rain fell within an hour.
8/18/2010	8/18/2010	0	0	\$26,146	\$0		Columbia	USGS and city police reported flooding in downtown Columbia in the Five Points area and the USC campus near Main and Whaley Streets. Water levels were up to 4 ft deep in some areas and spilled over into some apartments and Walgreens in Five Points. The Rocky Branch Creek gage crested at 10.7 ft which is 3.5 ft above flood stage. Several vehicles became trapped when they tried to drive through the area.
8/5/2011	8/5/2011	0	0	\$23,042	\$0		Columbia	Columbia police reported multiple roads and intersections flooded and closed due to high water levels of 2 to 5 ft . These included Main and Whaley, Gervais and Laurens, Santee and Harden, and Rosewood and Assembly. A vehicle was submerged at Key Rd
8/11/2011	8/11/2011	0	0	\$50,693	\$0	2-4"	Columbia	Heavy rains from training thunderstorms produced flash flooding in downtown in the Maxcy Park, Five Points, and USC areas. Water levels rose to as high as 4 to 6 ft in some areas submerging a few vehicles.
9/21/2011	9/21/2011	0	0	\$5,761	\$0	2-4"	Columbia	Flooding occurred along Rocky Branch Cr. The gauge at Pickens St. crested at 9.5 ft. and the gauge at Whaley St. crested at 10.5 ft . Flooding occurred in the Five Points area especially in the vicinity of Walgreens. Flooding also occurred at the intersection
9/23/2011	9/23/2011	0	0	\$40,324	\$0	2-4"	Columbia	Reported multiple areas of flooding with several cars stuck in high water in downtown. Sewers were overflowing in the Rosewood community. Minor flooding was reported in the Five Points area. Flooding also occurred along Rocky Branch Creek especially.
9/25/2011	9/25/2011	0	0	\$92,169	\$0	1-3"	Columbia	River gage along the Rocky Branch Creek near Blossom and Pickens Streets crested at 12.2 ft . Flood stage is 7.2 ft. Several cars were under water and a few people had to be rescued.
9/25/2011	9/25/2011	0	0	\$27,651	\$0	1-3"	Columbia	Numerous reports of flooding and road closures throughout the city.
5/16/2012	5/16/2012	0	0	\$11,288	\$0		Columbia, Owens Airport	Highway patrol reported flooding along Bluff Rd and South Beltline closing highways.
5/16/2012	5/16/2012	0	0	\$11,288	\$0		St Andrews	Highway patrol reported flooding along Hwy I-277 south bound and Sunset Dr.
5/16/2012	5/16/2012	0	0	\$2,258	\$0		Columbia	Police reported flooding at I-277 and Bull St.
6/11/2012	6/11/2012	0	0	\$1,129	\$0		Columbia	Kangaroo gas station reported road closed at the intersection of Whaley St and Main St in downtown Columbia.
7/1/2012	7/1/2012	0	0	\$4,515	\$0		Olympia Mills	Columbia PD reported flash flooding at Main and Whaley and in the Five Points area. Water was 2 to 3 ft deep at Main and Whaley.
7/10/2012	7/10/2012	0	0	\$4,515	\$0		Columbia	USGS webcam and river gages showed flash flooding at the intersection of Whaley and Main Streets. Water was 2 to 4 ft deep.
7/10/2012	7/10/2012	0	0	\$2,258	\$0		Columbia	Rocky Branch Creek peaked at 9.4 ft at Blossom and Pickens St during the flash flood event. Flood stage is 7.2 ft. Flash flooding occurred in the Five Points area and below the USC soccer stadium at Main and Whaley.
7/10/2012	7/10/2012	0	0	\$2,258	\$0		Columbia	Rocky Branch Creek peaked at 10.7 ft during the flash flood event. Flood stage is 7.2 ft.

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)*	Location	Description
8/9/2012	8/9/2012	0	0	\$1,129	\$0		Olympia Mills	Flash flooding from heavy rains occurred below the USC soccer stadium at the intersection of Main and Whaley Streets. Water depths rose to 2-3 ft at the intersection.
8/23/2012	8/23/2012	0	0	\$3,386	\$0		Columbia	The USGS gage near the intersection of Pickens and Blossom St reached 7.66 ft . Flood stage is 7.2 ft. This produced flash flooding in the Five Points area.
8/23/2012	8/23/2012	0	0	\$1,129	\$0		Olympia Mills	Flooding occurred at the intersection of Main and Whaley St and along Main St. The USGS gage reached 7.55 ft . Flood stage is 7.2 ft.
5/6/2013	5/12/2013	0	0	\$1,112	\$0	2-4"	Hopkins	Gadsden River gage on the Congaree went 3 ft above flood stage causing minor flooding of low-lying areas along the river.
5/7/2013	5/9/2013	0	0	\$3,337	\$0	2-4"	Arthurtown	Congaree National Park reported flooding of several areas within the park closing areas to tourists. The lower boardwalk was covered with several feet of water and portions of the upper boardwalk near Lake Weston even became submerged with several inches of water. The upper boardwalk is on average 8 ft above the ground.
5/21/2013	5/21/2013	0	0	\$2,225	\$0		Olympia Mills	USGS camera showed flash flooding at Main and Whaley with 2 to 4 ft of water flooding the area.
6/25/2013	6/25/2013	0	0	\$1,112	\$0		Woodfield	Columbia PD reported flooding in areas around Two Notch Rd around the 9000 block.
7/11/2013	7/11/2013	0	0	\$2,225	\$0		Columbia	Rocky Branch USGS gauge went above flood stage to 8.98 ft . One to two feet of water flooded the area.
7/17/2013	7/17/2013	0	0	\$2,225	\$0		Columbia	Flood waters rapidly covered the roads near Main and Whaley and rose to about 2 ft in depth. Flooding observed on the USGS webcam.
7/21/2013	7/21/2013	0	0	\$20,024	\$0	2-5"	Olympia Mills	Flash flooding from heavy rains produced 2" of rain in an hour over downtown Columbia closing several roads. Water levels rose to 4 ft over some roads, especially at the intersection of Main and Whaley Streets.
7/21/2013	7/21/2013	0	0	\$13,349	\$0	2-5"	Eau Claire	Local TV station reported flooding in Earlwood Park along Smith Branch Creek. The creek was out of its banks and the water was 3 to 4 ft deep in the park.
7/21/2013	7/21/2013	0	0	\$2,225	\$0	2-5"	Olympia Mills	The USGS gauge along Rocky Branch Creek at the intersection of Main and Whaley Streets rose to 11.02 ft . Flood stage is 7.2 ft.
7/21/2013	7/21/2013	0	0	\$2,225	\$0	2-5"	Olympia Mills	The USGS stream gauge along the Rocky Branch Creek at the intersection of Main and Whaley Streets rose to 11.73 ft . Flood stage is 7.2 ft. This is the 3rd highest flood level at this site. The record is 12.39 ft.
7/21/2013	7/21/2013	0	0	\$2,225	\$0	2-5"	Columbia	USGS stream gauge along Rocky Branch Creek at Pickens Street crested at 9.74 feet. Flood stage is 7.2 feet. This is the fourth highest reading at the site. The record is 11.08 feet.
8/6/2013	8/6/2013	0	0	\$26,699	\$0		Blythewood	Received a social media report of a small pond dam failure causing flooding of roads southwest of Blythewood. Blythewood fire department confirmed that Hwy 21 along with several other roads were closed due to the failure.
1/10/2014	1/10/2014	0	0	\$1,095	\$0		Columbia	The USGS webcam showed 1 to 2 ft of water flooding the intersection of Whaley and Main Streets from the Rocky Branch Creek flowing across the roadway. Other roads in the Five Points area also had 1 to 2 ft of water for a short period of time.

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)*	Location	Description
5/31/2014	5/31/2014	0	0	\$2,189	\$0		Columbia	Flooding occurred at Rocky Branch Creek and Pickens St. The creek crested at 8 ft at 345am EDT.
5/31/2014	5/31/2014	0	0	\$2,189	\$0		Columbia	Flooding occurred along the Rocky Branch Creek at Main and Whaley Streets. The creek crested at 7.8 ft around 4am EDT.
8/9/2014	8/9/2014	0	0	\$15,326	\$0		Olympia Mills	USGS river gage at the Rocky Branch Creek at Blossom and Pickens Streets reached 9.19 ft at 930pm. Flood state is 7.2 ft.
8/9/2014	8/9/2014	0	0	\$2,189	\$0		Columbia	Rocky Branch Creek at Main and Whaley Streets peaked at 10.36 ft at 945pm. Flood stage is 7.2 ft.
8/9/2014	8/9/2014	0	0	\$2,189	\$0		Columbia	Public reported a vehicle flooded at the intersection of Main and Whaley Streets with water 4 ft above the road covering the hood of the vehicle. Four occupants had to be rescued with no injuries.
8/31/2014	8/31/2014	0	0	\$4,379	\$0	2'	Columbia	Riverine flooding occurred along Rocky Branch Creek from the intersection of Blossom St and Pickens St downstream to the intersection of Whaley St and Main St. The gauge near Pickens St crested at 9.07 ft at 530 pm EDT. The gauge near Whaley St crested at 9.89 ft at 546 pm EDT. Flood stage at both gauges is 7.2 ft.
9/7/2014	9/7/2014	0	0	\$35,030	\$0		Columbia	Heavy rains produced flash flooding at Main and Whaley St, around the Fairgrounds, and on Rosewood just east of Assembly St. Water levels rose to 4 ft flooding several vehicles.
6/2/2015	6/2/2015	0	0	\$1,093	\$0	2-5"	Columbia	City police reported flash flooding at Main and Whaley streets. Water levels rose to 1-2 feet above the road.
6/4/2015	6/4/2015	0	0	\$131,208	\$0	2-5"	Columbia	USGS river gauge at Rocky Branch Creek measured 11.3 feet with 2 to 4 feet of water flooding the area around Main and Whaley Streets and in Five Points near the Walgreens. Water also got into several homes and apartments causing damage to the lower levels.
6/4/2015	6/4/2015	0	0	\$3,280	\$0	2-5"	Columbia	Highway Patrol reported flooding at the John C. Calhoun building near the State House with water getting in through the doors.
6/4/2015	6/4/2015	0	0	\$2,187	\$0	2-5"	Columbia	USGS Webcam showed flash flooding at Main and Whaley streets with about 1 to 2 feet of water closing the area.
6/4/2015	6/4/2015	0	0	\$2,187	\$0	2-5"	Columbia	Broadcast media reported several roads flooded and closed in downtown Columbia.
7/5/2015	7/5/2015	0	0	\$10,934	\$0	2-3"	Denny Terrace	Several social media posts reported flash flooding in Northwestern Richland County from near the Harbison Mall to around the Linrick Golf Club area.
8/5/2015	8/5/2015	0	0	\$13,121	\$0		Columbia Owns Airport	Broadcast media reported flash flooding near Williams Brice Stadium and the Fairgrounds. A couple of vehicles became trapped as the waters rose.
8/6/2015	8/6/2015	0	0	\$15,308	\$0	48"	Columbia	Water rescue by Columbia Fire Dept. for two motorists trapped in flood waters. Water levels were 4 feet deep. Vehicle stalled as they tried to drive through the flooded area.
8/6/2015	8/6/2015	0	0	\$2,187	\$0		Arthurtown	Highway Patrol reported Key Road closed due to high water from flash flooding.
8/6/2015	8/6/2015	0	0	\$1,093	\$0		Forest Acres	Public reported the intersection of Forest Drive and Harrison flooded.
8/6/2015	8/6/2015	0	0	\$1,093	\$0		Columbia	Broadcast media reported one to two feet of water closing the intersection of Harden and Devine streets from flash flooding.

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)*	Location	Description
8/30/2015	8/30/2015	0	0	\$2,187	\$0	84"	Olympia Mills	USGS cameras showed water covering the intersection of Main and Whaley below the USC soccer stadium. The USGS gage reached 7.87 feet at that site. Flood stage is 7.2 feet.
9/5/2015	9/5/2015	0	0	\$2,187	\$0	118"	Columbia	USGS cameras showed the intersection of Main, and Whaley flooded and impassable. The Rocky Branch Creek peaked at 9.81 feet.
9/5/2015	9/5/2015	0	0	\$2,187	\$0	36-48"	Denny Terrace	Sheriff reported 3 to 4 feet of water covering the 5300 block of Broad River Road near Youth Services Drive.
9/5/2015	9/5/2015	0	0	\$2,187	\$0		Ballenstine	Sheriff reported significant road flooding at Broad River Road and Royal Tower Drive.
9/21/2015	9/21/2015	0	0	\$19,681	\$0	2-4"	Columbia	Columbia Police reported flooding at the intersection of Main and Whaley trapping a car. The occupants escaped before the flood waters rose to 4 feet above the roads.
9/21/2015	9/21/2015	0	0	\$17,494	\$0	2-4"	Olympia Mills	Richland County EM reported flooding on several streets in downtown Columbia including Harden, Rosewood, Lyon, and Calhoun streets. One car was trapped when the water rose 3 feet above the road. The occupants were able to get safely to higher ground.
9/24/2015	9/24/2015	0	0	\$34,989	\$0	1-3"	Arthurtown	USGS camera at Main and Whaley showed flash flooding with water levels rising 3 to 4 feet above the road stranding several vehicles. Flooding on Hwy 1 near I-26 closed that intersection as well where water levels were 1 to 2 feet deep.
9/24/2015	9/24/2015	0	0	\$4,374	\$0	1-3"	Weddell	Sheriff reported the intersection of Legrand and Pinnacle Point Drive do to flash flooding. Water levels were 1 to 3 feet deep.
9/25/2015	9/26/2015	0	0	\$19,681	\$0	2-4"	McEntire ANG Airbase	Highway Patrol reported a vehicle encountered a flooded roadway and ended up going off the road into a ditch near Garners Ferry Road and Pond Drive.
9/26/2015	9/26/2015	0	0	\$67,791	\$0	2-4"	Leesburg	Images relayed from a trained spotter via social media showed road wash outs and flooded landscape. Murray Pond flooded and water went into residential properties.
9/26/2015	9/26/2015	0	0	\$17,494	\$0	2-4"	Eastover	Business owner reported flooding under Hwy 378 overpass at Hwy 601. Minor water damage to the interior rooms of the business.
10/4/2015	10/4/2015	0	0	\$1,093,400	\$546,700		Leesburg	SC Highway Patrol reports McCords Ferry Road Willie Kelly Road closed due to flooding.
10/4/2015	10/4/2015	0	0	\$546,700	\$218,680		Eastover	SC Highway Patrol reports US 601 at US 378 closed due to flooding.
10/4/2015	10/4/2015	0	0	\$1,093,400	\$54,670		Woodfield	SC Highway Patrol reports Percival Road at I-77 closed due to flooding.
10/4/2015	10/4/2015	0	0	\$1,093,400	\$54,670		Denny Terrace	NWS employee reports Piney Woods Road flooded.
10/4/2015	10/4/2015	0	0	\$273,350	\$54,670		Woodfield	SC Highway Patrol reports roadway flooding on I-77 at mile marker 13.
10/4/2015	10/4/2015	0	0	\$2,186,801	\$27,335		Weddell	SC Highway Patrol reports Spring Valley Road at Two Notch Road closed due to flooding.
10/4/2015	10/4/2015	0	0	\$874,720	\$10,934		Denny Terrace	SC Highway Patrol reports Monticello Road at I-20 closed due to flooding. Male driver drowned in his vehicle on Peebles Street near Crane Creek. The victim was found at 1100 PM EDT on the 5th.

Start Date	End Date	Inj .	Fat .	Property Damage	Crop Damage	Mag. (in.)*	Location	Description
10/4/2015	10/4/2015	1	1	\$874,720	\$10,934		Denny Terrace	SC Highway Patrol reports Monticello Road at I-20 closed due to flooding.
10/4/2015	10/4/2015	0	0	\$1,093,400	\$5,467		Forest Acres	SC Highway Patrol reports Pine Belt Road at Carter Street closed due to flooding.
10/4/2015	10/4/2015	20	2	\$10,934,004	\$0	80"	Woodland Terrace	Widespread flooding along Gills Creek through Devine Street...Fort Jackson Blvd... Wildcat Road and Garners Ferry Road area. Numerous water rescues and buildings flooded. One building partially collapsed. The stream gage along Gills Creek was destroyed. Peak stage along Gills Creek determined by USGS from high water marks to be 19.6 feet. Flood Stage is 6.7 feet. 2 Fatalities occurred in this area. One fatality occurred at Gills Creek and Devine Street. The second fatality occurred at Kilbourne Road and Gills Creek. The roadway was flooded due to upstream dam failures and heavy rainfall.
10/4/2015	10/4/2015	0	0	\$5,467,002	\$0		Myron Manor	SC Highway Patrol reports Kilbourne Road at Ft. Jackson Blvd closed due to flooding.
10/4/2015	10/4/2015	0	0	\$2,186,801	\$0		Weddell	SC Highway Patrol reports Grampian Hills Road at Two Notch Road closed due to flooding.
10/4/2015	10/4/2015	0	0	\$1,093,400	\$0		Denny Terrace	SC Highway Patrol reports Peebles Street at Monticello Road closed due to flooding.
10/4/2015	10/4/2015	0	0	\$874,720	\$0		Ballentine	SC Highway Patrol reports Chadford Road at N Royal Tower Drive closed due to flooding.
10/4/2015	10/4/2015	0	0	\$546,700	\$0		Weddell	SC Highway Patrol reports roadway flooded at Two Notch Road and Polo Road.
10/4/2015	10/4/2015	0	0	\$328,020	\$0		Olympia Mills	Flash flooding downtown Columbia. Rocky Branch Creek at Whaley and Main Street over the banks and water covering the roadway.
10/4/2015	10/4/2015	1	1	\$109,340	\$0		Perry	South Carolina DOT worker drowned in his work truck when it was swept off the road and overturned into Toms Creek. The worker was en route to assist another SC DOT group with a tree down across a roadway.
10/4/2015	10/4/2015	1	1	\$21,868	\$0	108"	St. Andrews	One person drowned in their vehicle when it stalled in flood waters along Sunset Drive near the stream Smith Branch. The person drowned at approximately 654 am EDT. The stream gage just upstream from the fatality crested at 18.93 feet at 0607 am EDT. Flood stage is 9.0 feet.
10/4/2015	10/4/2015	1	1	\$21,868	\$0		Capitol View	Heavy rainfall caused Sun View Lake to spill over Caughman Road into Mill Creek. One person drowned when their vehicle stalled in the floodwaters.
10/4/2015	10/4/2015	0	0	\$16,401	\$0		Dentsville	SC Highway Patrol reports Two Notch Road at Decker Blvd closed due to roadway flooding.
10/4/2015	10/4/2015	1	1	\$16,401	\$0		Dentsville	Male driving down driver N. Trenholm Road found the next morning in Carys Lake just off Trenholm Road.
10/4/2015	10/4/2015	0	0	\$5,467	\$0	86"	Olympia Mills	Downtown Columbia Rocky Branch Creek at Whaley Street and Main Street Flooded. The creek crested at 12.28 feet. Flood Stage is 7.2 feet. The stream crested above flood stage twice during the period. This is the second highest crest since the gage was installed in 2007.
10/7/2015	10/7/2015	5	2	\$109,340	\$0		McEntire ANG Airbase	Five railroad repair workers driving along Congaree Road plunged into the water of Cabin Creek

Start Date	End Date	Inj .	Fat .	Property Damage	Crop Damage	Mag. (in.)*	Location	Description
								because the roadway had been washed out. Sheriff's spokesman said that the barricade was in the wrong lane. The accident occurred at 145 AM EDT on the 7th.
10/10/2015	10/10/2015	0	0	\$109,340	\$0		Olympia Mills	USGS gauge at Main and Whaley Street rose above flood stage at 8:25 AM and crested at 10.3 feet at 9 AM and fell below flood stage again at 9:10 AM.
12/22/2015	12/22/2015	0	0	\$5,467	\$0	34"	Olympia Mills	USGS Gage along Rocky Branch Creek crested at 10.07 feet at 800 am. Flood stage is 7.2 feet. This resulted in the intersection of Main Street and Whaley Street to be closed.
12/22/2015	12/22/2015	0	0	\$5,467	\$0		Columbia	Local media reported flooding in the Five Points area along Blossom Street.
12/22/2015	12/22/2015	0	0	\$1,093	\$0		Columbia	Public report of portions of Gervais Street at the underpass near Gregg Street was flooded.
8/1/2016	8/1/2016	0	0	\$1,060,486	\$0		Greenlawn	SCHP reported Garner's Ferry Road at I-77 flooded and impassable.
8/1/2016	8/1/2016	0	0	\$26,512	\$0		Columbia	Media reported flash flooding occurring in the Rocky Branch Creek Watershed, Five Points area and at Main and Whaley Streets. Water entering Walgreen's Pharmacy at 1941 Blossom Street.
8/1/2016	8/1/2016	0	0	\$26,512	\$0	59"	Olympia Mills	USGS gauge on the Rocky Branch Creek at the intersection of Main and Whaley Streets peaked at 12.14 feet at 8:15 PM. Flood stage is 7.2 feet. USGS webcam at the intersection showed flooded roadway, swift-moving water and intersection was impassable.
8/1/2016	8/1/2016	0	0	\$10,605	\$0		Capitol View	SCHP reported roadway flooding on Garner's Ferry Road, Colonial Villa Drive and Fountain Lake Roads.
8/1/2016	8/1/2016	0	0	\$10,605	\$0		Sims	SCHP reported Atlas Road flooded at Bluff Road intersection.
8/1/2016	8/1/2016	0	0	\$1,060	\$0		Fairworld	Roadway flooded and impassable Fontaine Road at Farrow Road intersection.
8/1/2016	8/1/2016	0	0	\$1,060	\$0		Eau Claire	Flooded roadways reported I-277 and Sunset Blvd by SCHP.
8/1/2016	8/1/2016	0	0	\$1,060	\$0		Eau Claire	SCHP reported flooding on I-277 at the intersection with Farrow Road (SC 555). All lanes blocked; roadway impassable.
8/1/2016	8/1/2016	0	0	\$1,060	\$0		Olympia Mills	Flooding reported at Olympia Avenue and Florida Street by SCHP.
9/2/2016	9/2/2016	0	0	\$2,121	\$0		Myron Manor	Reported Trenholm Road closed between Wyndham Road and Tanglewood Road due to roadway flooding.
10/8/2016	10/8/2016	0	0	\$2,121	\$0		Woodland Terrace	Columbia City Police Department reported area flooded along Timberlane Drive near Gills Creek.
3/30/2017	3/30/2017	0	0	\$5,195	\$0	39"	Olympia Mills	The USGS gage along Rocky Branch Creek crested at 10.47 feet at 430 pm at the intersection of Whaley Street and Main Street.
4/5/2017	4/5/2017	0	0	\$1,039	\$104		Arthurtown	A car stalled in flood waters near the intersection of Key Rd and Market Rd. Report received via social media.
4/5/2017	4/5/2017	0	0	\$104	\$104	51"	Olympia Mills	The USGS stream gage along Rocky Branch Creek at the intersection of Main and Whaley St reached the flood stage of 7.2 feet at 243 pm EDT, crested at 11.47 feet at 330 pm EDT, and fell back below flood stage at 4:12 pm EDT.

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)*	Location	Description
4/5/2017	4/5/2017	0	0	\$104	\$104	15"	Eau Claire	USGS gage along Smith Branch at North Main St near Earlewood Park crested at 10.29 feet. Flood stage is 9 feet.
4/23/2017	4/23/2017	0	0	\$1,039	\$104	3-5"	Columbia	A car was submerged halfway up the door near the intersection of Gervais St and Harden St under the railroad bridge.
4/23/2017	4/23/2017	0	0	\$104	\$104	3-5"	Olympia Mills	USGS stream gage at Rocky Branch Creek at Main and Whaley St reached the flood stage of 7.2 feet at 1217 am EDT on April 24th (1117 pm EST on April 23rd).
4/23/2017	4/23/2017	0	0	\$104	\$104	38"	Olympia Mills	USGS stream gage at Rocky Branch Creek at the intersection of Main and Whaley St peaked at 10.29 feet at 12:45 am EDT April 24th (11:45 pm EST April 23rd). Flood stage is 7.2 feet. The stream fell below flood stage at 1:09 am EDT April 24th (12:09 am EST April 24th).
5/22/2017	5/22/2017	0	0	\$104	\$104		Olympia Mills	Columbia Police reported flash flooding at Main St and Whaley St. Rocky Branch Creek in flood.
5/22/2017	5/22/2017	0	0	\$104	\$104		Woodfield	Flash flooding reported on Percival Rd at Northshore Rd at Gills Creek.
6/15/2017	6/15/2017	0	0	\$104	\$104	32"	Olympia Mills	The USGS gage along Rocky Branch Creek at Whaley St and Main St went above the flood stage of 7.2 feet at 1030pm EDT (930 pm EST). The stream crested at 9.84 feet at 1100 pm EDT (1000 pm EST).
6/15/2017	6/15/2017	0	0	\$104	\$104		Columbia	Richland County reported flooding on Gervais St near Harden St under the railroad bridge.
6/15/2017	6/15/2017	0	0	\$104	\$104	4"	Killian	Approximately 4 inches of water was reported on Wilson Blvd near Killian Rd.
6/15/2017	6/15/2017	0	0	\$104	\$104		Woodland Terrace	SC Highway Patrol reported roadway flooding at Deerwood St and Capers Ave.
6/15/2017	6/15/2017	0	0	\$104	\$104		Langfords XRDS	Roadway flooding reported at the intersection of Hard Scrabble Rd and Lake Carolina Blvd.
6/15/2017	6/15/2017	0	0	\$104	\$104	19"	Olympia Mills	The USGS gage along Rocky Branch Creek at Whaley St and Main St rose back above the flood stage of 7.2 feet at 1157 pm EDT (1057 pm EST). The stream crested at 8.78 feet at 12:15 am EDT on June 16th (11:15 pm EST June 15th), then fell below flood stage at 12:30 am EDT on June 16th (11:30 pm EST June 15th).
6/16/2017	6/16/2017	0	0	\$104	\$104		Columbia Owens Airport	Roadway flooding reported near the intersection of S. Beltline Blvd and Shop Rd.
7/10/2017	7/10/2017	0	0	\$104	\$104		Pontiac	Minor street flooding on Spears Creek Church Rd and Two Notch Rd, and on Two Notch Rd near entrance to Sesquicentennial State Park.
7/16/2017	7/16/2017	0	0	\$104	\$104		Pontiac Airstrip Airport	Richland Co dispatch reported water getting into multiple vehicles on Two Notch Rd at Polo Rd.
7/16/2017	7/16/2017	0	0	\$104	\$104		Pontiac Airstrip Airport	Public reported, via social media, multiple vehicles stalled in floodwaters behind a grocery store at Villages of Sandhills Mall.
7/16/2017	7/16/2017	0	0	\$104	\$104		Weddell	Columbia Fire Dept reported multiple vehicles stalled in floodwaters 9300 to 9700 Two Notch Rd.
7/23/2017	7/23/2017	0	0	\$104	\$104		Olympia Mills	Flash flooding observed on USGS webcam at the intersection of Main and Whaley St. Car partially submerged.
7/23/2017	7/23/2017	0	0	\$104	\$104		Olympia Mills	Columbia, SC Fire Dept reported one person trapped and rescued from a flooded vehicle at the

Start Date	End Date	Inj	Fat	Property Damage	Crop Damage	Mag. (in.)*	Location	Description
								intersection of Main and Whaley St. No injuries. Rocky Branch crested at 12.35 feet.
7/23/2017	7/23/2017	0	0	\$104	\$104		Columbia	Report and photo, via social media, of flooded roadways at 1024 Elmwood Ave in Columbia, SC.
7/24/2017	7/24/2017	0	0	\$104	\$104		Olympia Mills	Flooding at the intersection of Main and Whaley St. Road impassable.
7/24/2017	7/24/2017	0	0	\$104	\$104		Columbia	Columbia SC PD reported that the intersection of Hilton and Blossom St flooded and impassable.
7/24/2017	7/24/2017	0	0	\$104	\$104		Columbia	Columbia SC PD reported car stuck in water on Senate St.
7/24/2017	7/24/2017	0	0	\$104	\$104		Columbia	Columbia SC PD reported flooding in and around MLK Park.
7/24/2017	7/24/2017	0	0	\$104	\$104		Olympia Mills	Intersection of Main and Whaley St impassable due to flooding.
7/24/2017	7/24/2017	0	0	\$104	\$104		Columbia Owens Airport	S Beltline Blvd near Shop Rd impassable due to flooding. Report and photos provided via social media.
11/12/2018	11/13/2018	0	0	\$5,160	\$103		Columbia Owens Airport	Runoff from heavy rain led to a flooded roadway at S. Beltline Blvd, near Shop Rd, where a vehicle was flooded.
11/12/2018	11/13/2018	0	0	\$103	\$103	7"	Olympia Mills	A river gage on the Rocky Branch Creek, at the intersection of Main and Whaley St in Columbia, indicated that the creek rose above the flood stage of 7.2 feet around 2350 EST on the 12th, peaked at 7.8 feet at 0000 EST on the 13th, and fell below flood stage around 0010 EST on the 13th.
6/7/2019	6/7/2019	0	0	\$3,000	\$100	13"	Olympia Mills	Flooding observed at Main St and Whaley St, via USGS webcam, with stranded and stalled vehicles noted. Stream gage (RBWS1) on the Rocky Branch creek at the intersection of Main St and Whaley St reached flood stage around 1910 EDT (1810 EST). Rocky Branch crested at 8.28 feet.
12/13/2019	12/13/2019	0	0	\$100	\$10		St. Andrews	SCHP reported roadway flooding and washout on Bush River Rd near Interstate 20. Location and times estimated.

*No magnitude information indicates flood height or rainfall amounts were unavailable.

Dam Failures

There are 111, largely privately own, dams in Richland County. Most of these dams are small pond/recreational pond dams.

Lake Murray/Saluda Dam: The dam is located on the Saluda River, approximately 10 miles west of the City of Columbia, near the towns of Irmo, Lexington and Chapin. The Saluda River drains about 2,420 square miles above the dam and into Lake Murray to power the hydroelectric plant. State Highway, SC Route 6, runs atop of the dam. The dam is a 7,800 ft long earthen fill dam with additional steel sheet pile wall, a backup dam and emergency spillway with six Tainter gates. The backup dam was added during a seismic remediation project in 2005. The spillway gates are opened "when the reservoir level reaches or is predicted to exceed an elevation of 358.5'. At a flood elevation of 368.5', the spillway capacity is approximately 154,000 ft³/s. Under Probable Maximum Flood (PMF) conditions, the spillway is rated to pass 197,000 ft³/s with the reservoir at El. 374.4'⁷⁵. During normal operation times, the plant has a total

⁷⁵ DOMINION ENERGY, 2008. Saluda Hydro Project Relicense. Attachment 3b Finale Schedule A response. Available at <http://www.thestate.com/news/local/article53937070.html>

discharge of 18,000 ft³/s at full load. The dam's operating range lies between an elevation of 352.5' and 356.5' with a maximum operation pool elevation of 358.5' (full pool).

What to expect: Richland County is at risk from dam failures of all categories, i.e., low hazard to high hazard dams. There have been two, recorded failures of small pond dams in the past (Table 86) and 20 dam failures during the 2015 flood disaster alone (Table 87). Most failed dams were privately owned except for the Semmes Lake Dam on Fort Jackson, which had received a serious hazard rating by the U.S. Army Corps of Engineers two years prior⁷⁶.

Geographic Extent: Based on past occurrences, areas downstream from small pond dams are very susceptible to the effects of dam failures, particularly if dams are poorly maintained, have been weakened and/or not repaired after the 2015 floods, or show structural deficiencies.

Likelihood of Future Occurrences: A return rate for dam failures cannot be calculated. Based on past occurrences though, it is highly likely to expect future failure of small pond dams. The Lake Murray dam is not at risk from failure caused by natural hazards.

Table 87 - List of failed dams in Richland County during the 2015 floods. Source: DHEC.

Dam Name	Class
Cary's Lake Dam	C1 (High Hazard)
Upper Rocky Creek/North Lake/Overcreek Rd	C1 (High Hazard)
Lower Rockyford Dam/Rocky Ford Lake	C1 (High Hazard)
Semmes Lake Dam (Ft. Jackson)	Federal
Beaver Dam/Wildewood Pond #2/Boyd Pond Two (controlled release)	C2 (Significant Hazard)
Lake Elizabeth	C1 (High Hazard)
Ulmers Pond	C1 (High Hazard)
Sunview Lake Dam	C2 (Significant Hazard)
Walden Place Dam	C1 (High Hazard)
Pinewood Lake Dam	C2 (Significant Hazard)
Covington Lake Dam	C2 (Significant Hazard)
Murray Pond Dam	C2 (Significant Hazard)
Wilson Millpond Dam	C2 (Significant Hazard)
Weston Pond Dam	C3 (Low Hazard)
Clarkson Pond Dam	C3 (Low Hazard)
Duffies Pond Dam	C2 (Significant Hazard)
Boyd's Pond Dam	C3 (Low Hazard)
Drafts Pond Dam	C3 (Low Hazard)
Haithcock Pond Dam	C3 (Low Hazard)
M. R. Trotter Dam	C3 (Low Hazard)

B) Hurricanes & Tropical Cyclones

What to expect: Every property and person is at risk from hurricane-force winds and associated heavy rainfall and tornadoes in Richland County. Large tropical cyclones and hurricanes have affected Richland County in the past, with smaller hurricane events occurring every year (Figure 157). The county is at risk from hurricane-force winds as experienced during Hurricane Hugo as well as associated heavy rainfall, flash flooding, and tornadoes (Figure 158 & Table 88). While direct wind damage to property is unlikely, property and infrastructure damage due to falling trees as well as power outages are highly likely.

⁷⁶ Fretwell, Sammy. Inspectors noted "serious hazard" at Fort Jackson dam before it failed. The State [online], January 06, 2016. Available at <http://www.thestate.com/news/local/article53937070.html>

Geographic Extent: Based on past occurrences, the entire county is susceptible to the impacts of tropical cyclones.

It is important to note that the frequency and impact calculations below exclude the damage from wind, lightning, and tornadoes because they are reported separately.

Tropical cyclone statistics for Richland County are as following:

Number of Loss-Causing Events:	10
Frequency of Occurrence:	1.1%
Recurrence Interval:	0.94 years
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Tropical cyclone-related Presidential Disaster Declarations:	DR-843 (1989) DR-1299 (1999) DR-1566 (2004) DR-4286 (2016) DR-4346 (2017)
Total Losses:	\$105,686,154
Total Fatalities:	1
Deadliest Event:	1 fatality (September 22, 1989)
Most Property Damage:	\$56,428,798 (September 22, 1989)
Most Crop Damage:	\$48,068,976 (September 22, 1989)
Highest USDA Crop Indemnity Payout:	\$22,386 (1989)

Hurricane Hugo (September 22, 1989; DR-843): Hurricane Hugo was the most damaging hurricane in South Carolina's history. It made landfall north of the Charleston Harbor as a Category 4 storm with a storm surge of 15-20 feet. Due to its rapid forward motion, relatively large size, hurricane force winds affected inland counties including Richland County. The county experienced high winds and excessive rain, leading to widespread property damage due to falling trees. Many areas lost power for several days and even weeks in some areas. One man was crushed in his car by a falling tree in Eastover.

Hurricane Floyd (September 9, 1999; DR-1299): Richland County received no direct damage from the storm but hosted large number of evacuees from the coast. Hurricane Floyd revealed significant weaknesses in South Carolina's coastal evacuation plan caused by the "sudden" convergence of evacuees onto roads without a reversal of I-26 in place for many hours. This led to massive gridlock on the interstate and adjacent roads without adequate support for stranded motorists.

Tropical Storm Frances (September 7, 2004; DR-1566): The storm system caused high winds and caused a widespread tornado outbreak. The high winds uprooted trees, caused power outages, and property damage—particularly mobile homes. Two tornadoes touched down in Richland County injuring 3 people. Losses for this event are reported and factored into the hazard statistics for tornadoes.

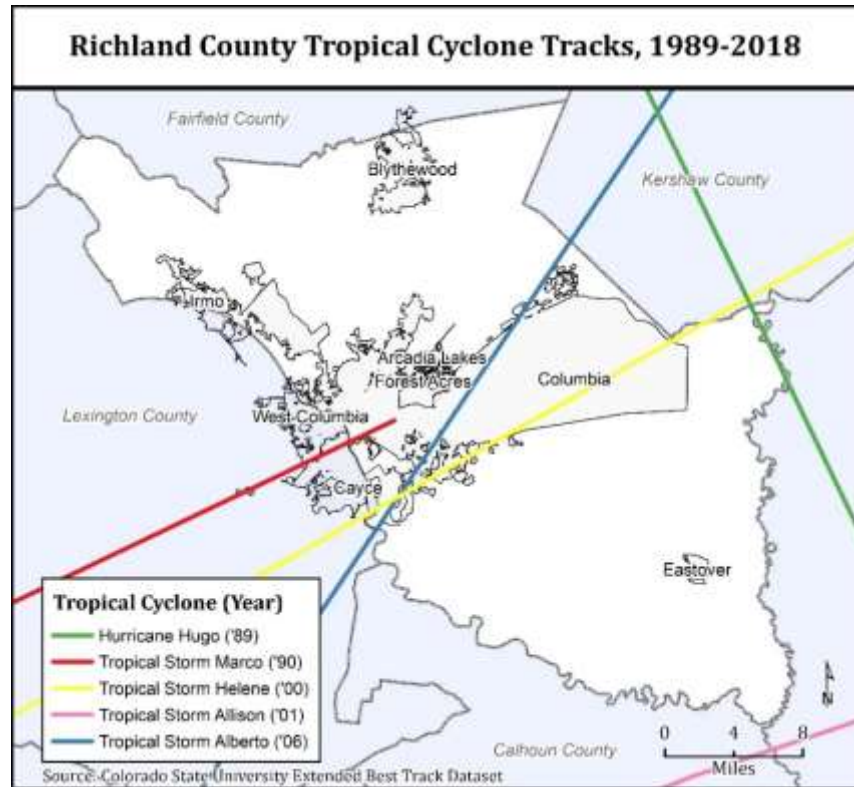


Figure 157 - Historical tropical cyclone tracks in Richland County.

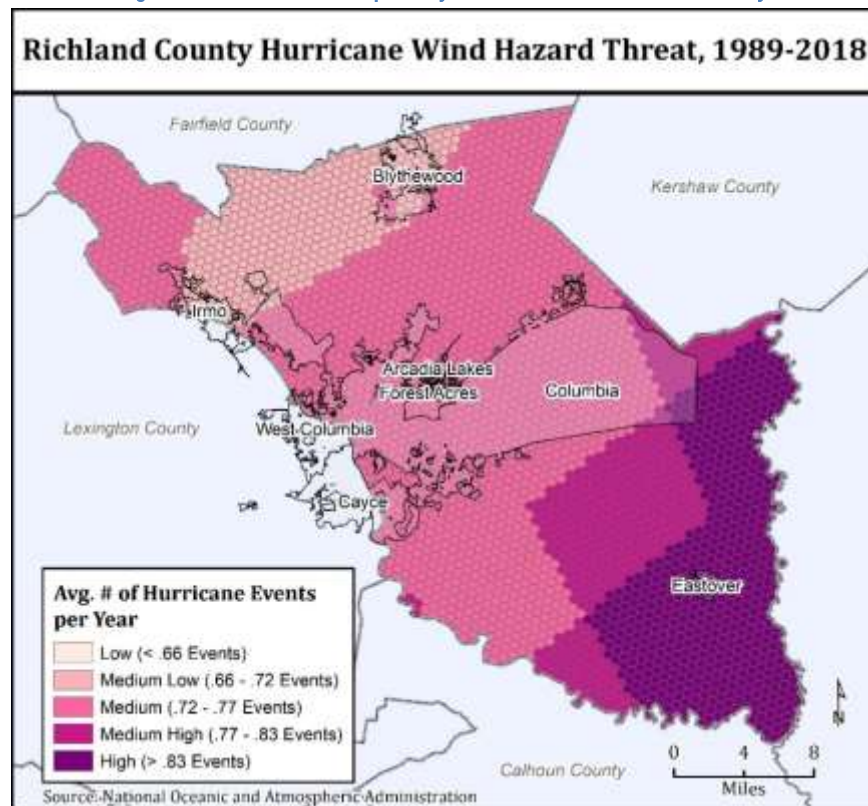


Figure 158 - Tropical cyclone threat in Richland County.

Table 88 - Record of loss-causing tropical cyclone events in Richland County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag.	Location	Description
8/29/1964	8/31/1964	0	0	\$9,087	\$9,087	TS	Statewide	Tropical Storm Cleo
9/12/1964	9/13/1964	0	0	\$909	\$909	TS	Statewide	Tropical Storm Dora
6/7/1968	6/8/1968	0	0	\$809	\$81	TS	Statewide	Tropical Storm Abby
6/20/1972	6/21/1972	0	0	\$674	\$6,739	TD	Statewide	Tropical Depression Agnes
9/4/1979	9/5/1979	0	0	\$776,005	\$0	Cat 1	Eastern & Central SC	Hurricane David
9/4/1987	9/7/1987	0	0	\$0	\$4,074	TD	Eastern SC	Tropical Depression Nine
8/28/1988	8/28/1988	0	0	\$3,319	\$3,319	TS	Eastern & Central SC	Tropical Storm Chris
9/22/1989	9/22/1989	30	1	\$56,428,798	\$48,068,976	Cat 4	Richland	Hurricane Hugo
8/24/1995	8/29/1995	0	0	\$369,671	\$3,697	TS	Statewide	Tropical Storm Jerry
10/10/2018	10/11/2018	1	0	\$0	\$0	TS	Richland	Tropical Storm Michael

C) Tornadoes

What to expect: Every property and person is at risk from tornadoes in Richland County. Low magnitude tornadoes are not uncommon in Richland County with twisters occurring about every half a year. Thus far, Richland County has only experienced almost entirely EF0 through EF2, with one recorded incident of an EF3 in the northwestern edge of the county (Figure 159). This does not mean that stronger tornadoes are impossible. Neighboring counties have experienced multiple EF3s and even EF4s have occurred in South Carolina. The County is not only at risk from tornadoes spawned by severe thunderstorms but also from outbreaks associated with tropical systems as seen during Tropical Storm Frances (Figure 160).

Geographic Extent: Based on past occurrences, the entire county is susceptible to tornadoes.

Tornado statistics for Richland County are as following:

Number of Loss-Causing Events:	18
Frequency of Occurrence:	1.6%
Recurrence Interval:	0.61 years
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	1989-2018
Loss Events on Record:	1960-2019
Tornado-related Presidential Disaster Declarations:	0
Total Losses:	\$19,554,807
Total Fatalities:	1
Deadliest Event:	1 (May 15, 1976)
Most Property Damage:	\$17,004,887 (January 6, 1995)
Most Crop Damage:	\$10,450 (June 16, 1989)
Highest USDA Crop Indemnity Payout:	n/av*

*No tornado events caused a USDA Crop Indemnity Payout

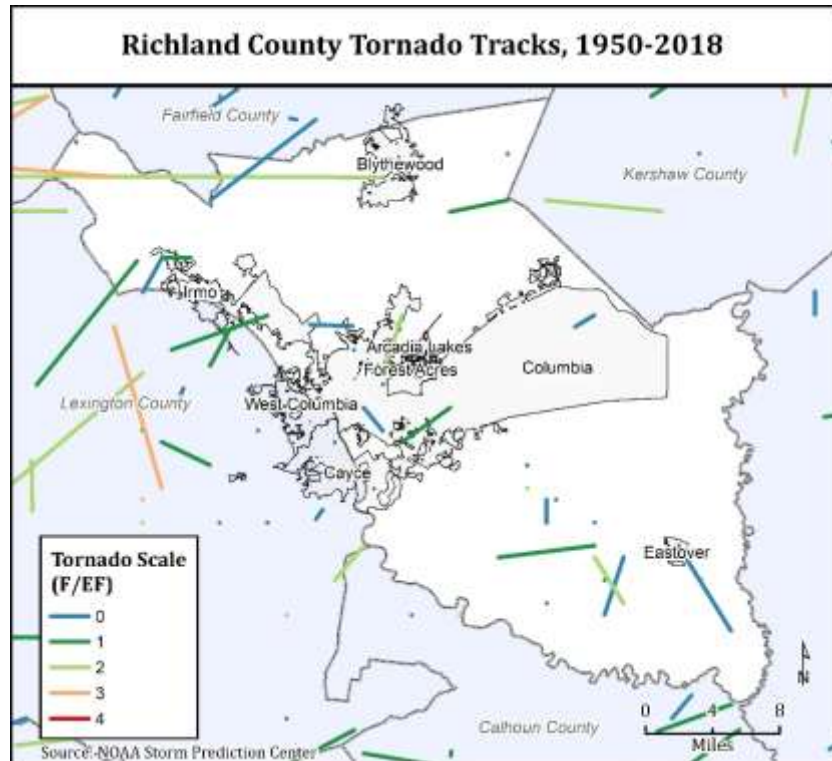


Figure 159 - Historical tornado tracks in Richland County.

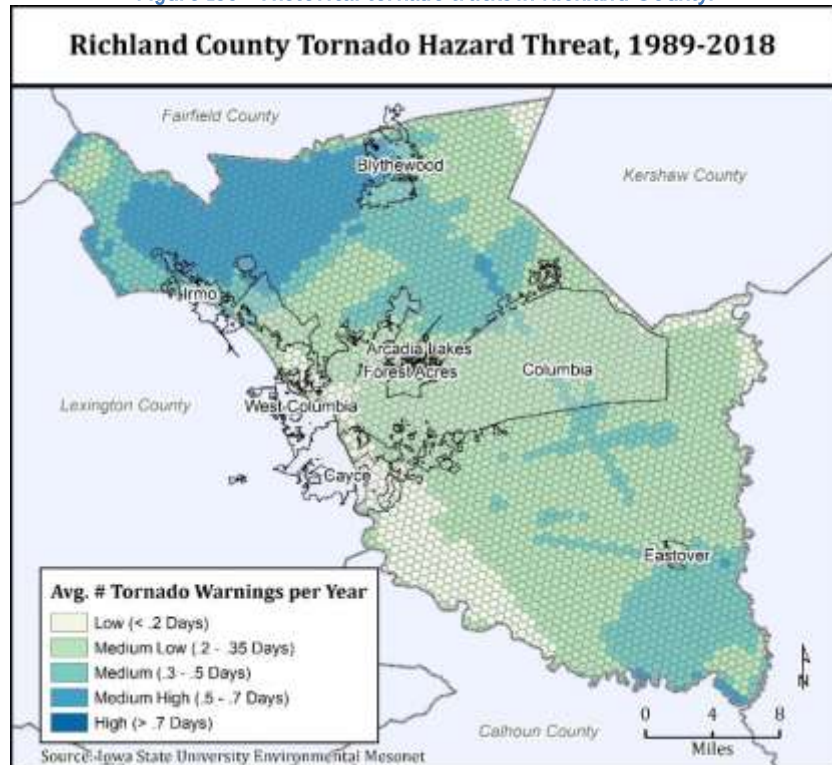


Figure 160 – Tornado threat in Richland County.

Table 89 - Record of loss-causing tornado events in Richland County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag.	Location	Description
7/3/1964	7/3/1964	0	0	\$41,799	\$0	F2	Columbia & Richland County	Tornado
8/29/1964	8/29/1964	0	0	\$417,991	\$0	F2	Columbia	Columbia
5/29/1967	5/29/1967	3	0	\$3,880	\$3,880	F2	Richland County	Small Tornado, Wind, & Hail
11/24/1967	11/24/1967	0	0	\$387,956	\$0	F1	Richland County	Small Tornado
5/12/1971	5/12/1971	0	0	\$0	\$320	F1	Richland County	Tornado
11/12/1975	11/12/1975	7	0	\$240,850	\$0	F2	Columbia	Tornado
5/15/1976	5/15/1976	3	1	\$227,728	\$228	F2	Columbia	Tornado
6/19/1977	6/19/1977	0	0	\$21,382	\$214	F1	Eastover	Tornado
5/20/1980	5/20/1980	0	0	\$157,254	\$0	F1	Hopkins-Eastover	Tornado
4/20/1981	4/20/1981	0	0	\$1,425	\$0	F1	Gasden	Tornado
8/31/1987	8/31/1987	2	0	\$114,064	\$0	F2	Horrell Hill Road	Tornado
6/16/1989	6/16/1989	0	0	\$0	\$10,450	F0	Northeastern Richland County	Tornado
1/6/1995	1/6/1995	0	0	\$17,004,887	\$0	F1	Ballentine	Tornado
7/23/1997	7/23/1997	1	0	\$331,007	\$0	F1	Columbia	An F1 tornado produced winds to 100 mph. Numerous trees were down, and 35 homes had minor damage. Seventeen businesses also had minor damage. One person was injured.
9/7/2004	9/7/2004	3	0	\$137,191	\$0	F2	Gadsden	NWS survey found 3 mobiles destroyed, several others damaged along with a couple of businesses. Three people were injured. Numerous trees and powerlines down.
9/7/2004	9/7/2004	0	0	\$411,574	\$0	F1	Ft. Jackson	Ft. Jackson reported 22 homes with light to moderate damage from an F1 tornado.
3/15/2008	3/15/2008	0	0	\$12,037	\$0	EF1	Spring Hill	The EF3 that hit Prosperity gradually weakened as it moved east into Northwestern Richland County. Many trees were down, and a few mobile homes had moderate damage.
3/3/2012	3/3/2012	0	0	\$33,863	\$0	EF0	Denny Terrace	An EF0 tornado touched down just west of Monticello Road on the back end of Columbia International University then crossed the intersection of Houston Street and Bishopville Ave. Theo tornado continued with intermittent touchdown east to Patton Lane. Many trees and large branches were down, some which fell on a mobile home doing minor damage.

D) Thunderstorms

What to expect: Every property and person is at risk from severe thunderstorms in Richland County. Severe thunderstorms are a common occurrence in Richland County with 7 to 14 or more severe thunderstorm warnings issued annually by the local NWS forecast office (Figure 161). Thunderstorms are complex and associated with different hazards: lightning, wind, rain, and/or hail. The Midlands see on average up to 12 days per year with rainfall amounts of 1 inch or more, 30 days per year with rainfall between 1/2 inch and 1 inch, and about 70 days per year with rainfall amounts of less than 1/2 inch⁷⁷. Prior to the 2015 flash flood disaster, the daily rainfall record stood at 7.3 inches (July 9, 1959). During the October 2015 flood, 21.5 inches of rain fell over several days. To understand the full impact of severe thunderstorms, the impacts of thunderstorms, wind, hail, and lightning should be considered jointly (Table 90).

Geographic Extent: Based on past occurrences, the entire county is susceptible to thunderstorms. There appears to be a higher likelihood for severe weather in the central and southern part of the county.

It is important to note the frequency and impact calculations below exclude wind, lightning, and hail damage since they are reported separately—although in a meteorological sense they are tied together.

Thunderstorm statistics for Richland County are as following:

Number of Loss-Causing Events:	321
Frequency of Occurrence:	31%
Recurrence Interval:	0.03 years
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Thunderstorm-related Presidential Disaster Declarations:	DR-4241 (2015)
Total Losses:	\$11,411,990
Total Fatalities:	4
Deadliest Event:	2 fatalities (June 11, 1961)
Most Property Damage:	\$6,966,518 (June 16, 1989)
Most Crop Damage:	\$670,898 (June 8, 1973)
Highest USDA Crop Indemnity Payout:	\$783,348 (October 2015)

⁷⁷ SCDNR, n/d. South Carolina Climate. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/cli_sc_climate.php

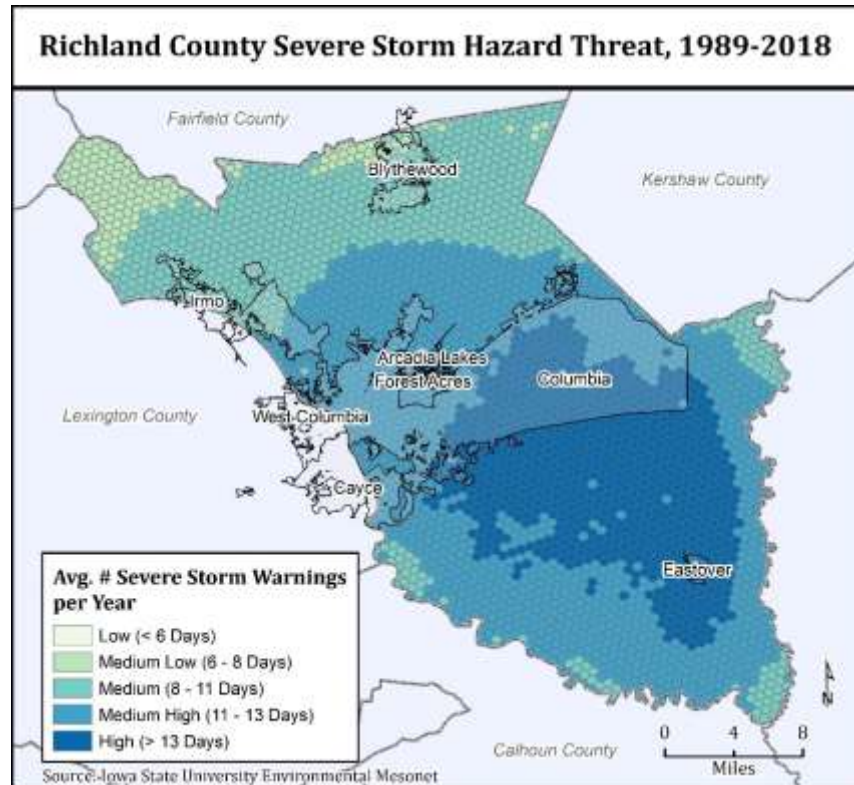


Figure 161 - Thunderstorm risk in Richland County.

Table 90 - Record of loss-causing thunderstorm events in Richland County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)	Location	Description
7/14/1960	7/14/1960	0	0	\$219	\$0	<1"	Columbia & Vicinity	Thunderstorm
9/29/1960	9/29/1960	0	0	\$43,776	\$0	1-2"	Columbia	Heavy Rain
2/24/1961	2/24/1961	0	0	\$1,238	\$0	3"	Western & Central SC	Wind and Rain
6/11/1961	6/11/1961	0	2	\$43,337	\$0	1-2"	Columbia	Heavy Rain
7/18/1961	7/18/1961	2	0	\$4,334	\$0	1"	Columbia	Severe Thunderstorm
9/30/1964	10/1/1964	0	0	\$16,720	\$16,720	3-4"	South Carolina Midlands & Central Plains	Rainstorms
10/4/1964	10/6/1964	0	0	\$90,868	\$90,868	3-4"	Statewide	Rainstorm
10/15/1964	10/16/1964	0	0	\$0	\$9,087	3-7"	Statewide	Rainstorm
6/8/1965	6/16/1965	0	0	\$0	\$89,425	6-9"	Statewide	Locally Heavy Rains
7/15/1965	7/15/1965	2	0	\$41,183	0	1-2"	Columbia	Heavy Rain
9/2/1965	9/2/1965	0	0	\$2,057	0	3-6"	Columbia & Vicinity Richland & Lexington Counties	Heavy Rain
2/13/1966	2/13/1966	0	0	\$869	0	<1"	Statewide	Wind and Rain
8/20/1967	8/25/1967	0	0	\$84,338	\$843	5-6"	Statewide	Rain
1/9/1968	1/13/1968	0	0	\$116,359	\$12	3-4"	Northern 2/3rds of SC	Rain, Sleet, Snow, & Freezing Rain
8/24/1968	8/24/1968	0	0	\$372,348	\$0	<1"	Richland	Thunderstorm & Windstorm

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)	Location	Description
3/15/1971	3/15/1971	0	0	\$696	\$0	<1"	Statewide	Thunderstorms & High Winds
7/2/1971	7/2/1971	0	0	\$319,994	\$0	2"	Columbia	Thunderstorm & Heavy Rain
12/3/1971	12/3/1971	1	0	\$69,553	\$69,553	2-3"	Statewide	Snow, Sleet, Freezing Rain, Rain, & Winds
7/27/1972	7/27/1972	0	0	\$30,999	\$0	<1"	Richland	Thunderstorm & High Winds
3/12/1974	3/12/1974	0	0	\$202	\$0	<1"	Western & Central SC	Thunderstorm
1/25/1975	1/25/1975	0	0	\$524	0	<1"	Statewide	Squall Line
7/14/1975	7/14/1975	0	0	\$71	\$7	2-3"	Northern & Central SC	Wind & Rain
6/16/1976	6/16/1976	0	0	\$1,139	\$114	1-4"	Lexington & Richland Counties	Thunderstorms & Heavy Rains
6/16/1976	6/17/1976	0	0	\$1,139	\$114	2-4"	Lexington & Richland Counties	Thunderstorms & Heavy Rains
10/20/1976	10/20/1976	0	0	\$990	\$10	2-3"	Eastern & Central SC	Thunderstorms & High Winds
2/24/1977	2/24/1977	0	0	\$972	\$10	<1"	Eastern & Central SC	Wind & Rain
3/4/1977	3/4/1977	0	0	\$930	\$93	<1"	Eastern & Central SC	Thunderstorms & High Winds
3/31/1977	3/31/1977	0	0	\$46	\$0	No measurable rainfall	Statewide	High Winds & Heavy Rains
9/7/1977	9/7/1977	0	0	\$465	\$46	<1"	Statewide	Thunderstorms, High Winds, & Heavy Rains
12/5/1977	12/5/1977	0	0	\$46	\$0	1"	Statewide	Thunderstorms
6/24/1978	6/24/1978	0	0	\$19,874	\$0	2"	Richland County	Thunderstorms
8/21/1979	8/21/1979	0	0	\$8,924	\$0	<1"	St. Andrews Area, Richland, & Lexington Counties	Severe Thunderstorm
7/10/1980	7/10/1980	1	0	\$52,418	\$5,242	<1"	Lexington, Richland, & Sumter Counties	Severe Storms & Winds
4/17/1982	4/17/1982	0	0	\$0	\$671	<1"	Columbia	High Winds & Thunderstorms
12/3/1983	12/4/1983	0	0	\$5,004	\$500	1-2"	Western and Central SC	Wind & Heavy Rain
12/28/1983	12/28/1983	0	0	\$8,131	0	<1"	Central SC	Severe Storm & Wind
3/28/1984	3/28/1984	0	0	\$1,247	0	1-2"	Columbia	Wind & Thunderstorm
2/21/1989	2/21/1989	0	0	\$20,900	0	<1"	Eastern & Central SC	Thunderstorm
6/29/1995	6/29/1995	0	0	\$8,502	0	1-3"	Columbia	Heavy Rains
11/11/2002	11/11/2002	0	0	\$4,322	0	1"	Columbia	Severe Storm, Thunderstorm, & Wind
6/11/2003	6/11/2003	0	0	\$42,253	0	<1"	Columbia	Severe Storm, Thunderstorm, & Wind
9/25/2011	9/25/2011	0	0	\$138,253	0	1-3"	Columbia	Scattered thunderstorms around the Midlands produced significant wind damage with storms taking down trees and powerlines. Some of these storms produced heavy rain with 1 to 3 inches falling in several areas within an hour or two causing some flash flood.
7/21/2013	7/21/2013	0	0	\$2,225	0	3.48"	Forest Acres	South Carolina Climate Office employee reported 3.48 inches of rain in approximately 2 hours in the Forest Acres Community. Urban and small stream flooding occurred along

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)	Location	Description
								with flash flooding in Columbia.
8/12/2014	8/12/2014	0	0	\$1,095	0	1-3"	Pontiac	SCHP reported road flooding on Two Notch Road east of Clemson Road.
8/12/2014	8/12/2014	0	0	\$1,095	0	1-3"	Denny Terrace	SCHP reported road flooding on Broad River Road between St. Andrews and Irmo.
9/2/2014	9/2/2014	0	0	\$3,284	\$0		Pontiac	SC Highway Patrol reported trees down at Jacobs Millpond Road and Sandy Oaks Road.
11/23/2014	11/23/2014	0	0	\$4,379	\$0		Columbia	Richland County Dispatch reported power lines and traffic lights down in downtown Columbia at the intersection of Maple and Blossom Streets.
11/23/2014	11/23/2014	0	0	\$3,284	\$0		Ballentine	Richland County Dispatch reported power lines down on Coogler Road in Irmo.
11/23/2014	11/23/2014	0	0	\$2,189	\$0		Killian	Highway Patrol reported trees down along US 321 near Blythewood Road.
1/4/2015	1/4/2015	0	0	\$4,374	\$0		Langfords XRDS	Electric company reported power outages in the Dentsville and eastern Ft. Jackson areas from trees on powerlines.
4/7/2015	4/7/2015	0	0	\$6,560	\$0		Sharp	Highway Patrol reported trees down near the intersection of Longtown Road and Holly Ridge Lane.
4/7/2015	4/7/2015	0	0	\$4,374	\$0		Hopkins	Highway Patrol reported trees down near the intersection of Bluff Road and Old Bluff Road.
4/19/2015	4/19/2015	0	0	\$3,280	\$0		Denny Terrace	Highway Patrol reported trees down across the road at the intersection of Hutchinson Street and Blue Ridge Terrace.
4/19/2015	4/19/2015	0	0	\$2,187	\$0		Columbia	Dispatch reported trees in the road at the intersection of Wilmont Ave. and Walker Street.
5/11/2015	5/11/2015	0	0	\$2,187	\$0		Eastover	Sheriff reported trees down near Hwy 48 around Gadsden.
5/11/2015	5/11/2015	0	0	\$2,187	\$0		Leesburg	Highway Patrol reported trees in the roadway on the US 76 bridge over the Wateree River.
5/11/2015	5/11/2015	0	0	\$2,187	\$0		Sims	Highway Patrol reported trees down at the intersection of Longwood Road and Bluff Road.
5/11/2015	5/11/2015	0	0	\$2,187	\$0		St. Andrews	Highway Patrol reported trees down on Broad River Road near Brevard Street.
6/18/2015	6/18/2015	0	0	\$4,374	\$0	1"	Lykesland	Highway Patrol reported trees down at Universal Drive and Garners Ferry.
6/23/2015	6/23/2015	0	0	\$4,374	\$0		St. Andrews	Sheriff reported trees down along Nunmaker Drive between Kathleen Drive and Chandler Avenue.
6/23/2015	6/23/2015	0	0	\$3,280	\$0		Killian	Highway Patrol reported trees down at Majestic Drive and North Brickyard Road.
6/27/2015	6/27/2015	0	0	\$3,280	\$0		Greenlawn	Sheriff reported trees down in the road at 301 Dean Hall Lane.
6/27/2015	6/27/2015	0	0	\$2,187	\$0		St. Andrews	Highway Patrol reported trees down near Clement Road at Mountain Drive.

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)	Location	Description
6/27/2015	6/27/2015	0	0	\$547	\$0		Eastover	Sheriff reported a tree across the road at the intersection of Fork Church Road and Bluff Road in Gadsden.
6/30/2015	6/30/2015	0	0	\$19,681	\$0		Capitol View	Highway Patrol reported trees and power lines down throughout central Richland County in the Garners Ferry Road area.
6/30/2015	6/30/2015	0	0	\$3,280	\$0		Arthurtown	Highway Patrol reported trees down at the intersection of Quarry Street and Granby Lane.
6/30/2015	6/30/2015	0	0	\$3,280	\$0		Forest Acres	Highway Patrol reported trees down along Briarfield Road.
7/2/2015	7/2/2015	0	0	\$39,362	\$0		Olympia Mills	Public reported a tree fell on a home in the Olympia neighborhood of Columbia.
7/13/2015	7/13/2015	0	0	\$547	\$0		Eau Claire	Columbia Police reported a tree down at Barhamville and Tremain Roads.
7/18/2015	7/18/2015	0	0	\$4,374	\$0		Lykesland	Highway Patrol reported a couple of trees down in Columbia including Merrimac Drive and Chilhowie Road.
7/19/2015	7/19/2015	0	0	\$8,747	\$0		Eastover	DOT reported trees down from Hopkins to Eastover.
7/19/2015	7/19/2015	0	0	\$3,280	\$0		Pontiac Airstrip Airport	Highway Patrol reported trees down on Running Fox Road and Leaning Tree Road.
7/19/2015	7/19/2015	0	0	\$2,187	\$0		Horrell Hill	Highway Patrol reported trees down on Leesburg Road and Harmon Road.
7/19/2015	7/19/2015	0	0	\$2,187	\$0		Horrell Hill	Highway Patrol reported trees down on Davis Road and Leesburg Road.
8/5/2015	8/5/2015	0	0	\$229,614	\$0		Columbia	DOT and broadcast media reported numerous trees down and powerlines down on the southeast, east, and northeastern side of Columbia. Some trees fell on homes and vehicles causing significant damage.
8/6/2015	8/6/2015	0	0	\$10,934	\$0		Dentsville	Dispatch reported multiple trees down on Chatsworth Road, Castleton Lane, and Exeter Lane.
8/6/2015	8/6/2015	0	0	\$3,280	\$0		Pontiac Airstrip Airport	Social media reported power outages northeast of the Dentsville area.
8/6/2015	8/6/2015	0	0	\$2,187	\$0		Oak Grove	Highway Patrol reported trees down at Winsboro Road and Lorick Road.
8/6/2015	8/6/2015	0	0	\$2,187	\$0		Dentsville	Highway Patrol reported trees down on Oneil Court at Trenholm Road.
8/6/2015	8/6/2015	0	0	\$547	\$0		Woodfield	Highway Patrol reported a tree across the intersection of Faraway and Height roads.
9/3/2015	9/3/2015	0	0	\$6,560	\$0		Pontiac Airstrip Airport	Highway Patrol reported trees down at Summit Parkway and Clemson Road.
9/21/2015	9/21/2015	0	0	\$1,093	\$0		Eastover	NWS storm survey found a couple of trees down on Pine Thicket Road.
7/15/2016	7/15/2016	0	0	\$11	\$0		Langfords XRDS	Dime size hail on Palmetto Park Cir. in Columbia.
7/15/2016	7/15/2016	1	0	\$0	\$0		Eau Claire	Tree on house, tree on deck, and power lines down, on Delverton Rd.
8/1/2016	8/1/2016	0	0	\$1,060,486	\$0	3.46"	Columbia	Richland County Emergency Services automated rain gauge in MLK Park

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)	Location	Description
								reported 3.46 inches of rain in 44 minutes from 7:15 PM to 7:59 PM EST.
8/1/2016	8/1/2016	0	0	\$21,210	\$0	3.46"	Olympia Mills	Broadcast Media report of downed tree on car along S. Edisto Ave.
4/23/2017	4/24/2017	0	0	\$104	\$104	5.63"	Horrell Hill	RCWINDS gage at Lower Richland Fire Station measured a 2-day rainfall total of 5.63 inches.
6/15/2017	6/16/2017	0	0	\$104	\$104	4.33"	Horrell Hill	RCWINDS site at Lower Richland Fire Station measured 4.33 inches of rain from thunderstorm activity that occurred during the late afternoon and evening of June 15th into the very early morning hours of June 16th.
6/15/2017	6/16/2017	0	0	\$104	\$104	4.61"	Fairworld	RCWINDS site at Crane Creek Fire Station, north of Columbia, measured 4.61 inches of rain from thunderstorm activity that occurred during the late afternoon and evening of June 15th into the very early morning hours of June 16th.
7/10/2017	7/10/2017	0	0	\$104	\$104	1.22"	Columbia	NWS rain gage at the University of SC near Bull St and Whaley St measured 1.22 inches of rain. USGS stream gage at Rocky Branch Creek at Main St and Whaley St reached 6.97 feet at 5:15 pm EDT (4:15 pm EST). Flood stage is 7.2 feet.
7/10/2017	7/10/2017	0	0	\$104	\$104	2.76"	Pontiac Airstrip Airport	RCWINDS gage at Spring Valley HS measured 2.76 inches of rain in a 90-minute period ending at 5:25 pm EDT (4:25 PM EST).
7/10/2017	7/10/2017	0	0	\$104	\$104	2.72"	Pontiac	RCWINDS gage at Screaming Eagle Rd measured 2.72 inches of rain in a 2-hour period ending at 5:35 pm EDT (4:35 pm EST).
7/16/2017	7/16/2017	0	0	\$104	\$104	4.69"	Pontiac Airstrip Airport	RCWINDS gage at Spring Valley High School measured 2.88 inches of rain in a 30-minute period ending at 6:20 pm EDT (5:20 pm EST). 3.98 inches of rain fell in the one-hour period ending at 6:50 pm EDT (5:50 pm EST). Total rainfall for the calendar day there was 4.69 inches.
7/24/2017	7/24/2017	0	0	\$104	\$104	1.55"	Columbia	An automated rain gage, at the University of SC near Bull and Whaley St, measured 1.55 inches of rain in the 40-minute period ending at 4:25 pm EDT (1525 EST).
7/24/2017	7/24/2017	0	0	\$104	\$104		Columbia Owens Airport	ASOS at Hamilton Owens Field in Columbia measured at 42 knot (48 MPH) wind gust in a thunderstorm at 3:52 pm EDT (1452 EST).
7/24/2017	7/24/2017	0	0	\$104	\$104	1.81"	Ft. Jackson	RCWINDS Gills Creek gage, near Forest Dr and I-77, measured 1.81 inches of rain in the 40-minute period ending at 4:40 pm EDT (1540 EST).
3/1/2018	3/1/2018	0	0	\$103	\$103		Columbia Owens Airport	ASOS unit at Hamilton Owens Airport in Columbia measured a peak wind gust of 49 MPH at 343 pm EST.

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)	Location	Description
3/1/2018	3/1/2018	0	0	\$103	\$103		McEntire ANG Airbase	ASOS unit at McEntire JNG Base near Eastover measured a peak wind gusts of 49 MPH at 358 pm EST.
6/11/2018	6/11/2018	0	0	\$103	\$103		McEntire ANG Airbase	A wind gust of 52 MPH was recorded at McEntire JNGB.
7/23/2018	7/23/2018	0	0	\$103	\$103		Horrell Hill	Richland Co SC mesonet (RCWINDS) gage at Horrell Hill measured a wind gust of 56 mph.
2/12/2019	2/12/2019	0	0	\$10	\$10		St. Andrews	RCWINDS gage at St. Andrews Rd and Broad River Rd measured a peak wind gust of 50 MPH at 1730 EST.
4/8/2019	4/8/2019	0	0	\$100	\$100		Columbia Owens Airport	ASOS at Columbia Hamilton-Owens Airport measured a peak wind gust of 49 MPH at 2154Z or 1754 EDT (1654 EST).
4/19/2019	4/19/2019	0	0	\$100	\$100		Columbia Owens Airport	ASOS unit at Owens Field airport measured a peak wind gust of 52 MPH at 1355 EDT (1255 EST).
4/19/2019	4/19/2019	0	0	\$100	\$100		Columbia Owens Airport	Public reported 2 large trees were downed in the Rosewood neighborhood. Wind gusts were estimated at 50-55 mph. A peak wind gust of 52 MPH was measured at nearby Owens Field at 1355 EDT (1255 EST).
5/4/2019	5/4/2019	0	0	\$100	\$100		Eastover	Retired emergency manager reported several trees down on Vanboklen Road near Eastover.
5/11/2019	5/11/2019	0	0	\$100	\$100		Columbia Owens Airport	ASOS unit at Hamilton Owens Field measured a peak wind gust of 44 mph.
6/20/2019	6/20/2019	0	0	\$100	\$100		Hilton	NWS equipment at Flotilla Island
6/20/2019	6/20/2019	0	0	\$100	\$100		McEntire ANG Airbase	Measured gust at McEntire Air National Guard (MMT).
6/20/2019	6/20/2019	0	1	\$0	\$0		St. Andrews	A 61-year-old man was killed when a tree, that was felled by thunderstorm winds, landed on him while he was in his backyard at his home on Columbia Ave in Columbia.

E) Lightning

What to expect: Every property and person is at risk from lightning in Richland County. Lightning occurs very frequently in Richland County averaging several strikes per day. While Richland County does not experience a thunderstorm every day, the fact that a single thunderstorm produces hundreds of lightning strikes—each of which is counted in the statistic below—results in high frequency and recurrence figures. Like the pattern of thunderstorm risk, most lightning strikes (cloud-to-ground) occur in the central and southern part of the county (Figure 162 & Table 91). House fires and personal harm are common with lightning.

Geographic Extent: Based on past occurrences, the entire county is susceptible to lightning strikes. There appears to be a higher propensity for severe weather and therefore lightning strikes in the central and southern part of the county.

Lightning statistics for Richland County are as following:

Number of Loss-Causing Events:	84
Daily Frequency of Occurrence:	1.4%
Daily Recurrence Interval:	0.73 days (several times per day)
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	\$6,474,975
Total Fatalities:	4
Deadliest Event:	1 fatality (several instances)
Most Property Damage:	\$1,928,233 (June 12, 2006)
Most Crop Damage:	\$65,501 (June 10, 1982)
Highest USDA Crop Indemnity Payout:	n/av*

*No lightning events caused a USDA Crop Indemnity Payout

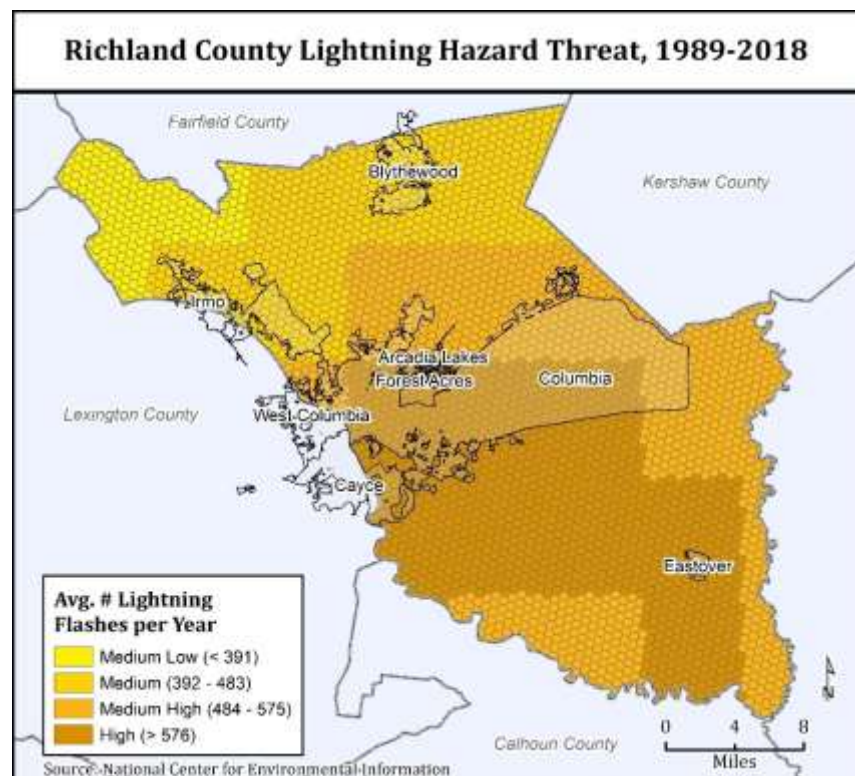


Figure 162 - Lightning threat in Richland County.

Table 91 - Record of loss-causing lightning events in Richland County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
6/13/1961	6/13/1961	0	0	\$43,337	\$0	Congaree	Lightning
9/5/1961	9/5/1961	0	0	\$2,064	\$0	Eastern & Central SC	High Winds & Excessive Lightning
7/24/1964	7/24/1964	28	0	\$0	\$0	Fort Jackson	Electrical
4/12/1965	4/12/1965	0	0	\$41,136	\$0	Columbia	Lightning
5/28/1965	5/28/1965	3	0	\$0	\$0	Fort Jackson	Lightning
6/30/1965	6/30/1965	0	0	\$41,136	\$0	Columbia	Lightning

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
7/12/1965	7/12/1965	8	0	\$0	\$0	Fort Jackson	Lightning
7/19/1965	7/19/1965	0	0	\$894	\$89	Statewide	Hail, Lightning, & Wind
8/10/1965	8/10/1965	0	0	\$20,568	\$0	Richland & Lee Counties	Lightning & Wind
8/18/1965	8/18/1965	0	0	\$20,568	\$0	Columbia & Vicinity, Richland, & Lexington Counties	Heavy Thundershower & Lightning
8/27/1965	8/27/1965	0	0	\$894	\$0	Statewide	Severe Lightning
4/13/1966	4/13/1966	0	0	\$3,999	\$400	Columbia-Eastover	Rain, Hail, Wind, & Electrical
7/15/1966	7/15/1966	0	0	\$19,996	\$0	Columbia & Lexington Counties	Wind & Electrical
7/29/1966	7/29/1966	1	0	\$39,993	\$0	Columbia	Wind, Hail, Electrical, & Heavy Rains
7/29/1967	7/29/1967	0	0	\$38,796	\$0	Richland County	Lightning, Wind, Rain, & Hail
7/9/1973	7/9/1973	0	0	\$29,184	\$0	Columbia	Wind & Lightning
7/15/1973	7/15/1973	0	1	\$0	\$0	Lakeview	Lightning
8/4/1973	8/4/1973	0	0	\$162	\$16	Midlands & Southern SC	Rain, Wind, & Electrical
8/29/1973	8/29/1973	0	0	\$146	\$15	Northwestern & Midlands SC	Wind, Rain, & Electrical
3/21/1974	3/21/1974	1	0	\$5,714	\$571	Statewide	High Winds & Electrical
3/29/1974	3/29/1974	0	0	\$6,258	\$6,258	Northern, Eastern, & Central SC	Wind, Hail, & Electrical
4/8/1974	4/8/1974	0	0	\$7,301	\$7	Central, Western, & Northern SC	Wind & Electrical
4/8/1974	4/8/1974	0	0	\$105	\$0	Central SC	Wind & Electrical
5/12/1974	5/12/1974	0	0	\$13,833	\$13,833	Central, Southern, & Eastern SC	Lightning, Heavy Rain, & High Winds
6/7/1974	6/7/1974	0	0	\$2,628	\$0	Columbia	Heavy Rain & Lightning
8/13/1974	8/13/1974	0	0	\$1,195	\$119	Central SC	Wind & Lightning
3/7/1975	3/7/1975	0	0	\$688	\$0	Northwestern, Central, & Northeastern SC	Wind, Lightning, & Hail
3/24/1975	3/24/1975	1	0	\$5,236	\$52	Statewide	Wind, Lightning, & Hail
5/10/1975	5/10/1975	0	0	\$13,381	\$133,806	York to Bamberg, Spartanburg to Oconee, & Anderson	Wind, Lightning, & Hail
5/15/1975	5/15/1975	0	0	\$5,236	\$52	Statewide	Wind & Lightning
6/15/1975	6/15/1975	0	0	\$708	\$708	Northern & Central SC	Wind, Lightning, & Hail
6/18/1975	6/18/1975	0	0	\$52	\$5,236	Statewide	Wind, Lightning, & Hail
7/4/1975	7/4/1975	0	0	\$6,881	\$68,814	Northern & Central SC	Wind, Lightning, & Hail
7/24/1975	7/24/1975	0	0	\$688	\$0	Western, Central, & Northern SC	Lightning
8/27/1975	8/27/1975	0	0	\$6,338	\$63	Northern, Northeastern, & Central SC	Lightning, High Winds, & Thunderstorms
10/9/1976	10/9/1976	0	0	\$6,326	\$63	Central & Eastern SC	Wind & Lightning

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
6/6/1977	6/6/1977	0	0	\$465	\$4,648	Statewide	Wind, Lightning, & Hail
7/14/1977	7/14/1977	0	0	\$4,648	\$46	Statewide	Wind & Lightning
7/12/1981	7/12/1981	0	0	\$7,127	\$713	Abbeville & Columbia	Thunderstorms, Lightning, & Heavy Rain
7/16/1981	7/16/1981	1	0	\$35,637	\$0	Greenwood, Newberry, Lexington, & Richland Counties	Lightning, Wind, & Rain
4/26/1982	4/27/1982	0	0	\$29	\$29	Statewide	Thunderstorm, Wind, Lightning, & Hail
4/27/1982	4/27/1982	0	0	\$707	\$0	Central, Northeastern, & Eastern SC	Lightning & Flooding
6/3/1982	6/3/1982	0	0	\$134,277	\$13,428	Columbia	Lightning, Rain, & Wind
6/10/1982	6/10/1982	1	0	\$327,505	\$327,505	Western, Northern, Central, & Eastern SC	Hail, Lightning, Rain, & Wind
7/3/1983	7/3/1983	2	0	\$1,301	\$0	Columbia	Lightning
7/25/1983	7/25/1983	0	0	\$2,828	\$28	Statewide	Wind & Lightning
8/23/1983	8/23/1983	0	0	\$3,717	\$0	Northern & Central SC	Wind & Lightning
6/20/1984	6/20/1984	0	0	\$2,711	\$271	Statewide	Rain, Hail, Lightning, & Wind
6/21/1984	6/21/1984	3	0	\$62,357	\$6,236	Columbia	Rain, Flood, & Lightning
7/12/1984	7/12/1984	2	0	\$1,247	\$0	Columbia	Lightning
7/13/1984	7/13/1984	0	0	\$6,236	\$0	Columbia, West Columbia, & Cayce	Lightning
7/25/1984	7/25/1984	3	0	\$124,713	\$1,247	Central SC	Rain, Hail, Lightning, & Wind
8/2/1984	8/2/1984	0	0	\$4,300	\$0	Southern, Central, & Eastern SC	Lightning, Rain, & Flood
8/21/1985	8/21/1985	0	0	\$12,042	\$0	Columbia	Lightning
5/28/1986	5/28/1986	0	0	\$5,911	\$0	Lexington & Richland Counties	Lightning
7/16/1986	7/16/1986	0	0	\$118,227	\$0	Columbia	Lightning
7/27/1986	7/27/1986	0	0	\$1,182	\$0	Eastern Columbia	Lightning
10/8/1986	10/8/1986	0	0	\$1,182	\$0	Columbia	Lightning
6/1/1987	6/1/1987	1	0	\$1,141	\$0	Richland County	Lightning
6/4/1987	6/4/1987	0	0	\$1,141	\$0	Richland County	Lightning
7/28/1987	7/28/1987	0	0	\$1,141	\$0	Columbia	Lightning
4/23/1988	4/23/1988	0	0	\$10,953	\$0	Richland County	Lightning
5/16/1988	5/16/1988	0	0	\$10,953	\$0	Eastover	Lightning
7/27/1988	7/27/1988	1	0	\$0	\$0	St. Andrews	Lightning
8/20/1989	8/20/1989	0	1	\$0	\$0	Columbia	Lightning
5/16/1991	5/16/1991	0	0	\$8,562	\$0	Columbia	Lightning
7/4/1991	7/4/1991	0	0	\$665,962	\$0	Columbia	Lightning
8/8/1991	8/8/1991	1	1	\$0	\$0	McEntire ANG Airbase	Lightning

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
7/18/1994	7/18/1994	0	0	\$8,743	\$0	Columbia	Lightning
7/6/1995	7/6/1995	4	1	\$0	\$0	Fort Jackson	Lightning
8/23/1996	8/23/1996	0	0	\$171,779	\$0	White Rock	Lightning
4/27/1999	4/27/1999	3	0	\$0	\$0	Columbia	Lightning
2/22/2003	2/22/2003	0	0	\$98,591	\$0	Columbia	A home was struck by lightning that caused a fire resulting in \$70,000 worth of damage.
6/11/2003	6/11/2003	0	0	\$77,465	\$0	Columbia	Lightning struck a home starting a fire that caused \$55k in damage.
7/21/2003	7/21/2003	0	0	\$246,478	\$0	Columbia	Lightning struck a home in Spring Valley at 411 Bridgecrest Drive and caused \$175,000 in damage.
6/7/2005	6/7/2005	0	0	\$902,330	\$0	St. Andrews	A lightning strike started a fire at Pine Apartments that did major damage to the complex.
8/14/2005	8/14/2005	0	0	\$398,087	\$0	Columbia	Lightning caused a home fire at 204 Upland Trail that caused \$300k worth of damage.
6/12/2006	6/12/2006	0	0	\$1,928,233	\$0	Columbia	Lightning struck a tree and ran through the ground into the home starting a fire in the home in the Woodcreek Farms Subdivision.
6/11/2009	6/11/2009	0	0	\$603,986	\$0	Columbia	Lightning struck a home at 38 Shoreline Drive and ignited a fire which destroyed it.
6/11/2009	6/11/2009	0	0	\$265,754	\$0	Columbia	Lightning struck a home and ignited a fire which destroyed it. The home was located at 150 Rivendale Drive.
7/26/2010	7/26/2010	0	0	\$273,350	\$0	St. Andrews	WIS TV reported a home destroyed from a fire caused by lightning on Ripplerock Road.
6/28/2011	6/28/2011	5	0	\$0	\$0	Columbia	A midafternoon thunderstorm produced lightning that struck an Oak tree at Allen Benedict Court on Harden Street where 5 landscape and maintenance workers were sitting. One worker was taken to the hospital with non-life-threatening injuries. The others were treated and released.
5/17/2012	5/17/2012	0	0	\$56,438	\$0	Blythewood	The State reported that a home on North Firetower Road in Blythewood was struck by lightning causing \$50k in damage. There were no injuries.
7/12/2018	7/12/2018	0	0	\$103	\$103	Pontiac	According to reports from the media, and from Fort Jackson Public Affairs, a lightning strike occurred in the NE portion of the post around 1600 EDT (1500 EST) about 50 meters away from a group of soldiers that were under a lightning-safe structure. 15 soldiers were transported to a local hospital as a precaution and were released that evening. There were no injuries.

F) Wind

What to expect: Every property and person is at risk from wind in Richland County. The county frequently experiences high wind events with gust of 50 knots (58mph) or more. Wind gust of 85 knots (98 mph) have been recorded. On average, severe winds occur every month. Due to concurrence of high wind with severe thunderstorms, the spatial distribution of wind events within the county is similar to the thunderstorm risk. High winds cause largely property damage and power outages due to falling tree or tree limbs.

Geographic Extent: Based on past occurrences, the entire county is susceptible to wind damage (Table 92). There appears to be a higher propensity for severe weather and therefore wind damage in the west-central and southern part of the county (Figure 163).

Wind statistics for Richland County are as following:

Number of Loss-Causing Events:	348
Frequency of Occurrence:	18%
Recurrence Interval:	0.06 years
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	1989-2018
Loss Events on Record:	1960-2019
Total Losses:	\$10,228,633
Total Fatalities:	2
Deadliest Event:	1 (Several Instances)
Most Property Damage:	\$3,488,259 (June 16, 1989)
Most Crop Damage:	\$65,501 (July 29, 1987)
Highest USDA Crop Indemnity Payout:	\$36,867 (September 1999)

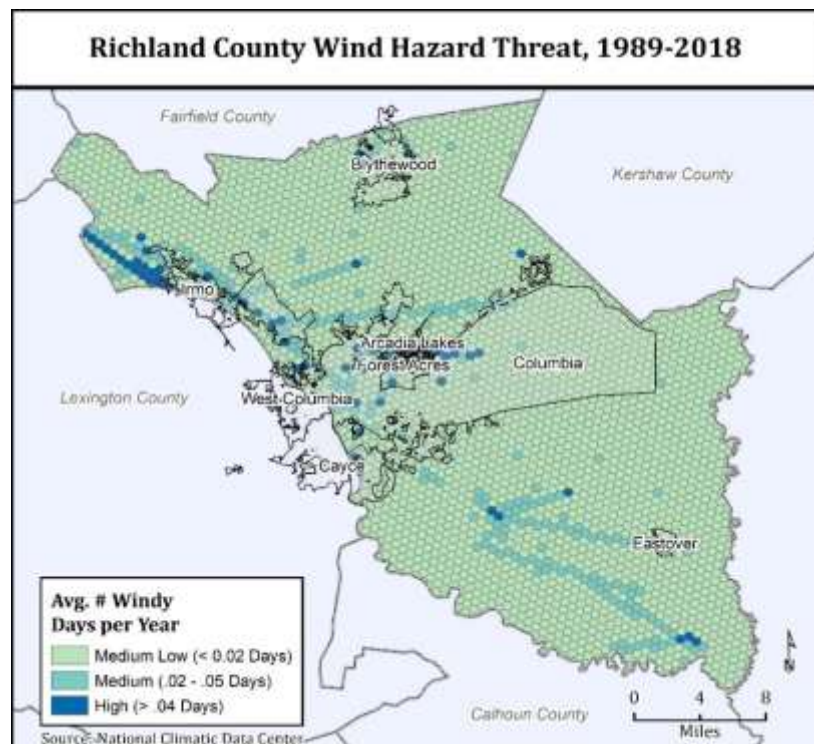


Figure 163 - Wind risk in Richland County.

Table 92 - Record of loss-causing high wind events in Richland County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (kts)*	Location	Description
3/13/1986	3/13/1986	0	0	\$1,182,274	\$0		Countywide	Thunderstorm Wind
6/25/1987	6/25/1987	0	0	\$11,406	\$0		Countywide	Thunderstorm Wind
7/2/1987	7/2/1987	0	0	\$1,141	\$0		Eastover	Thunderstorm Wind
7/29/1987	7/29/1987	0	0	\$1,141	\$0		Columbia	Thunderstorm Wind
7/29/1987	7/29/1987	0	0	\$1,141	\$1,141		Columbia	Thunderstorm Wind
5/23/1988	5/23/1988	0	0	\$110	\$0		Cedar Creek	Thunderstorm Wind
6/23/1988	6/23/1988	0	0	\$1,095	\$0		Cedar Creek	Thunderstorm Wind
2/21/1989	2/21/1989	0	0	\$1,045	\$0		Shandon	Thunderstorm Wind
5/5/1989	5/5/1989	0	0	\$1,045	\$0		Irmo	Thunderstorm Wind
5/5/1989	5/5/1989	0	0	\$10,450	\$0		Columbia	Thunderstorm Wind
5/5/1989	5/5/1989	0	0	\$10,450	\$0		Forest Acres	Thunderstorm Wind
6/16/1989	6/16/1989	0	1	\$10,449,777	\$0		Countywide	Thunderstorm Wind
3/1/1991	3/1/1991	0	0	\$9,514	\$0		Forest Acres	Thunderstorm Wind
5/15/1994	5/15/1994	0	0	\$437	\$0		Irmo	Thunderstorm Wind
5/19/1995	5/19/1995	0	0	\$25,507	\$0		East Columbia	Thunderstorm Wind
6/9/1995	6/9/1995	0	0	\$85,024	\$0	60	Columbia	Thunderstorm Wind
2/21/1997	2/21/1997	0	0	\$8,073	\$0	50	Pontiac	Thunderstorm Wind
5/9/1997	5/9/1997	1	0	\$32,293	\$0	65	Columbia	Thunderstorm Wind
7/29/1997	7/29/1997	0	0	\$35,523	\$0	50	Columbia	A severe thunderstorm blew down a couple of trees on homes on Murray St causing some damage.
11/22/1997	11/22/1997	0	0	\$3,229	\$0	50	Columbia	A severe thunderstorm produced damaging winds that took down billboard and other permanent signs along Garners Ferry Rd.
11/11/2002	11/11/2002	0	0	\$4,322	\$0	50	Columbia	SKYWARN spotter reported siding ripped from part of a home in the Summit subdivision
6/11/2003	6/11/2003	0	0	\$42,253	\$0	55	Columbia	Trees fell on a home in Columbia causing moderate damage to the roof. WOLO TV studio had part of the roof and side of the building torn off.
8/12/2004	8/12/2004	0	0	\$8,231	\$0	50	Blythewood	A microburst did minor damage to several service stations near the I-77 Blythewood exit.
8/12/2004	8/12/2004	3	0	\$411,574	\$0	80	Ft Jackson	An intense downburst associated with a squall line did moderate damage to several facilities on the base and warped aluminum bleachers around telephone poles. Three people reported minor injuries.
6/28/2008	6/28/2008	0	0	\$6,018	\$0	60	Columbia	Spotter reported a couple of trees down on a home on Chavis St. Only minor damage was reported.
12/11/2008	12/11/2008	0	0	\$24,073	\$0	60	Eastover	Sheriff reported trees down on trailers on Chalk Street with no injuries.
6/11/2009	6/11/2009	0	0	\$2,416	\$0	50	Eastover	SKYWARN spotter reported a couple of trees down near the intersection of Hwys 601 and 378.
6/11/2009	6/11/2009	0	0	\$2,416	\$0	50	Columbia	SKYWARN spotter reported a couple of trees down on Dan Boldan Rd.
6/18/2009	6/18/2009	0	0	\$3,624	\$0	55	Eastover	DOT reported trees down on Joe Collins and McCords Ferry roads.
7/16/2009	7/16/2009	0	0	\$7,248	\$0	60	Eastover	Public reported from Mr. Bunkys on US 378 that trees and powerlines were down on Congress Rd about 2 blocks from Mr. Bunkys.

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (kts)*	Location	Description
7/22/2009	7/22/2009	0	0	\$3,624	\$0	55	Montgomery	Public reported 4 trees snapped off at I-26 and Broad River Rd at the Cracker Barrel.
7/22/2009	7/22/2009	0	0	\$3,624	\$0	60	Littleton	Sheriff reported trees down on Kennerly Rd.
8/5/2009	8/5/2009	0	0	\$7,248	\$0	60	Denny Terrace	DOT and public reported many trees down on Hwy 215, at the Oak Hills Golf Course, and Koon Store Rd.
8/5/2009	8/5/2009	0	0	\$7,248	\$0	60	Sharp	DOT reported trees down in the Blythewood area around Fulmer Rd, McNutty Rd, and Oak Hills Rd.
8/5/2009	8/5/2009	3	0	\$19,328	\$0	60	Forest Acres	Media reported trees down on Trenholm Rd near Forest Acres. One tree fell on a vehicle and 3 people were injured.
8/22/2009	8/22/2009	0	0	\$4,832	\$0	55	Lykesland	DOT reported a couple of trees and powerlines down on Old Hopkins Rd and Garners Ferry Rd.
8/22/2009	8/22/2009	0	0	\$604	\$0	50	Leesburg	DOT reported a tree down at Leesburg Road and Congress Rd.
12/9/2009	12/9/2009	0	0	\$2,416	\$0	50	Columbia	Dispatch reported powerlines down on Broad River Rd.
1/25/2010	1/25/2010	0	0	\$1,188	\$0	50	Columbia	Sheriff reported large limbs down on Middle and Faust Streets.
1/25/2010	1/25/2010	0	0	\$1,188	\$0	50	Forest Acres	Sheriff reported large limbs down near Brandon Ave.
6/20/2010	6/20/2010	0	0	\$9,508	\$0	60	Ft Jackson	Ft. Jackson reported many trees down on the east end of the property from a downburst.
6/20/2010	6/20/2010	0	0	\$4,754	\$0	55	Forest Acres	DOT reported a few trees down in the Forest Acres area.
6/20/2010	6/20/2010	0	0	\$14,262	\$0	60	Gadsden	Congaree National Park Services reported many trees down on the southeastern end of the park.
6/26/2010	6/26/2010	0	0	\$5,942	\$0	50	Blythewood	Highway Patrol reported trees down on Longtown and Lee Rds.
6/27/2010	6/27/2010	0	0	\$5,942	\$0	55	Columbia	Sheriff reported trees down McGraw and McCords Ferry Rds.
6/27/2010	6/27/2010	0	0	\$9,508	\$0	50	Eastover	Sheriff reported trees down north of Eastover.
6/28/2010	6/28/2010	0	0	\$16,639	\$0	55	Columbia	WIS TV reported a couple of trees down on a home in the Shandon subdivision of Columbia.
6/28/2010	6/28/2010	0	0	\$33,277	\$0	55	Blythewood	WIS TV reported trees down on a home causing moderate damage.
6/29/2010	6/29/2010	0	0	\$28,524	\$0	50	Dentsville	WIS TV reported large limbs down and a tree on a home.
6/29/2010	6/29/2010	0	0	\$4,754	\$0	50	Eastover	Sheriff reported trees down on Hwy 378 near Hwy 601.
7/9/2010	7/9/2010	0	0	\$4,754	\$0	50	McEntire ANG	Fire Dept. reported several trees down in the Hopkins and McIntire ANG area.
7/26/2010	7/26/2010	0	0	\$3,565	\$0	55	Ballentine	Sheriff reported a tree down on Bush River Road and Ashland Road.
7/26/2010	7/26/2010	0	0	\$4,754	\$0	55	Columbia	Police reported trees down on Abella Street and Atlantic Drive.
7/26/2010	7/26/2010	0	0	\$33,277	\$0	60	Columbia	Sheriff reported trees down from Percival Road at Smallwood Court to Screaming Eagle and Kelly Mill roads. A tree also fell on a car at Claremont and Kilbourne roads crushing it.
7/26/2010	7/26/2010	0	0	\$3,565	\$0	50	Pontiac	Sheriff reported a couple of trees down on Two Notch and Bookman roads.
7/26/2010	7/26/2010	0	0	\$7,131	\$0	55	Horrell Hill	Sheriff reported trees down on Rabbit Run and Lower Richland Blvd.
7/27/2010	7/27/2010	0	0	\$7,131	\$0	55	Eastover	EM reported trees and powerlines down on Richard Simons Road.
7/27/2010	7/27/2010	0	0	\$2,377	\$0	55	Ballentine	Sheriff reported powerlines down along Boulters Lock Road.
7/27/2010	7/27/2010	0	0	\$4,754	\$0	55	Horrell Hill	Sheriff reported trees down on Harmon and Hill roads.
7/27/2010	7/27/2010	0	0	\$4,754	\$0	55	Dentsville	Sheriff reported trees down on Kelly Mill and Robin Hood roads.

Start Date	End Date	Inj	Fat	Property Damage	Crop Damage	Mag. (kts)*	Location	Description
7/27/2010	7/27/2010	0	0	\$4,754	\$0	55	Langfords	Sheriff reported trees down on Kelly Mill Road near the county line.
7/27/2010	7/27/2010	0	0	\$4,754	\$0	55	McEntire ANG	Sheriff reported trees down at Old Eastover and Garners Ferry roads.
8/13/2010	8/13/2010	0	0	\$9,508	\$0	60	Oak Grove	Trained spotter reported numerous trees down in his yard...along with numerous pine tree topped off near the intersection of Winnsboro Road and Sherrill Road.
11/16/2010	11/16/2010	0	0	\$3,565	\$0	55	Dentsville	DOT reported trees down near I-20 and Alpine Road.
11/16/2010	11/16/2010	0	0	\$2,377	\$0	55	Columbia	Large tree uprooted at the intersection of Fernwood Rd and Satchelford Road blocking both lanes and 2 driveways. Mailboxes and fences were also destroyed by the fallen tree.
4/5/2011	4/5/2011	0	0	\$1,036,899	\$0	85	Woodfield	Fire Dept. reported numerous trees on homes in the Greenview area of Columbia on over to Ft. Jackson.
4/5/2011	4/5/2011	0	0	\$23,042	\$0	80	Woodfield	Sheriff reported numerous trees and powerlines down in Columbia and Dentsville.
4/16/2011	4/16/2011	0	0	\$13,825	\$0	55	Weddell	Sheriff reported t and powerlines down at Hwy 76 and Hiller Road.
4/28/2011	4/28/2011	0	0	\$9,127	\$0	55	Arthurtown	Highway Patrol reported trees and powerlines down in the Olympia area.
4/28/2011	4/28/2011	0	0	\$4,608	\$0	55	Columbia	Highway Patrol reported trees down near Laurel and Waverly streets.
4/28/2011	4/28/2011	0	0	\$9,217	\$0	55	Sims	Highway Patrol reported trees down near Bluff and Avalon roads.
4/28/2011	4/28/2011	0	0	\$5,761	\$0	65	Killian	WXJ20 NOAA Weather Radio Transmitter Tower Antenna damaged by a strong wind gust as relayed by the ETV contractor.
5/13/2011	5/13/2011	0	0	\$18,434	\$0	55	Columbia	Sheriff reported trees down at Victoria and Wallace streets. One was on a vehicle. Time estimated from radar.
6/2/2011	6/2/2011	0	0	\$576	\$0	55	Montgomery	DOT reported a tree down on Dhreher Island Road.
6/2/2011	6/2/2011	0	0	\$3,456	\$0	55	Oak Grove	DOT reported trees down on Monticello Road.
6/2/2011	6/2/2011	0	0	\$6,913	\$0	55	Ballentine	Public reported trees down in Irmo.
6/2/2011	6/2/2011	0	0	\$576	\$0	55	Montgomery	Tree down on Kennerly road near US 76 reported by Highway patrol.
6/2/2011	6/2/2011	0	0	\$576	\$0	55	Blythewood	Sheriff reported tree down on Coon Road.
6/2/2011	6/2/2011	0	0	\$34,563	\$0	55	Columbia	Trees down at the Governor's Mansion. One tree fell and crushed a vehicle.
6/2/2011	6/2/2011	0	0	\$6,913	\$0	55	Ballentine	Trees down, estimated 50 kt wind by NWS employee.
6/2/2011	6/2/2011	0	0	\$4,608	\$0	55	White Rock	Highway Patrol reported trees in the roadway near I-26 and Julius Richardson Road.
6/2/2011	6/2/2011	0	0	\$5,761	\$0	55	Ballentine	Public reported trees down.
6/2/2011	6/2/2011	0	0	\$576	\$0	50	Woodfield	Highway Patrol reported a tree in the road near SC 277 and Bull Street.
6/2/2011	6/2/2011	0	0	\$3,456	\$0	55	Langfords	Highway Patrol reported trees in the roadway near Hines Road and Smyrna Road.
6/5/2011	6/5/2011	0	0	\$51,845	\$0	75	Columbia	The State also reported that part of a roof was torn off a USC building and damage to other buildings and vehicles. This was also reported through Charleston NWS, a pilot reported part of a room torn off at a building along Huger Street.
6/5/2011	6/5/2011	0	0	\$4,608	\$0	55	Olympia Mills	Sheriff reported trees down at the intersection of Rosewood Drive and Assembly Street.
6/5/2011	6/5/2011	0	0	\$576	\$0	50	Eau Claire	Highway Patrol reported a tree down at Glenn Ave. and Ryan Street.
6/5/2011	6/5/2011	0	0	\$576	\$0	50	Columbia	Highway Patrol reported a tree down along Hwy 12 at the Congaree River Bridge.

Start Date	End Date	Inj	Fat	Property Damage	Crop Damage	Mag. (kts)*	Location	Description
6/5/2011	6/5/2011	0	0	\$576	\$0	50	St. Andrews	Sheriff reported a tree down at Marley Drive.
6/5/2011	6/5/2011	0	0	\$576	\$0	50	St. Andrews	Highway Patrol reported a tree down at I-26 and Greystone Blvd.
6/5/2011	6/5/2011	0	0	\$4,608	\$0	50	Olympia Mills	Sheriff reported a tree down on a house at Florida Street.
6/5/2011	6/5/2011	0	0	\$576	\$0	50	Cedar Creek	Highway Patrol reported a tree in the roadway at Cedar Creek and Monticello Roads.
6/5/2011	6/5/2011	0	0	\$576	\$0	50	Oak Grove	Highway Patrol reported a tree down at Cedar Creek and Blume Roads.
6/5/2011	6/5/2011	0	0	\$576	\$0	50	St. Andrews	Dispatch reported a tree in the roadway at I-26 and Greystone Blvd.
6/12/2011	6/12/2011	0	0	\$4,608	\$0	55	Hopkins	Sheriff reported trees down on Airbase Road and Congaree Road near McEntire ANG Base.
6/13/2011	6/13/2011	0	0	\$3,456	\$0	55	Greenlawn	Public reported several trees down around the VA Hospital area.
6/15/2011	6/15/2011	0	0	\$6,913	\$0	60	Blythewood	Sheriff reported trees and powerlines down around the Blythewood area.
6/15/2011	6/15/2011	0	0	\$6,913	\$0	55	Ballentine	Sheriff reported trees and a few powerlines down in the Ballentine and Irmo areas.
6/15/2011	6/15/2011	0	0	\$11,521	\$0	60	Woodfield	Highway Patrol reported numerous trees down in the northeastern Columbia area.
6/18/2011	6/18/2011	0	0	\$2,304	\$0	55	Hilton	Sheriff reported trees down near US 76 and Hiller Road.
6/21/2011	6/21/2011	0	0	\$4,608	\$0	55	Littleton	Highway Patrol reported trees down on Screaming Eagle and Koon roads.
6/21/2011	6/21/2011	0	0	\$2,304	\$0	55	Hopkins	Sheriff reported several trees down in the Hopkins area.
6/21/2011	6/21/2011	0	0	\$2,304	\$0	55	Eastover	Sheriff reported several trees down in the Eastover area.
6/23/2011	6/23/2011	0	0	\$3,456	\$0	55	Ft Jackson	Multiple reports of trees down along Leesburg Road.
7/31/2011	7/31/2011	0	0	\$2,304	\$0	50	Columbia	EM reported trees down near Heyward and Pickens streets.
7/31/2011	7/31/2011	0	0	\$2,304	\$0	50	Columbia	Highway Patrol reported trees in the roadway on Main Street and on Monticello Road.
8/11/2011	8/11/2011	0	0	\$3,456	\$0	55	Columbia	The State newspaper reported several trees down in the city.
9/25/2011	9/25/2011	0	0	\$13,825	\$0	55	Myron Manor	Public reported trees and powerlines down off Kilbourne Rd. near Fort Jackson Blvd.
9/25/2011	9/25/2011	0	0	\$23,042	\$0	55	Columbia	Numerous reports of trees down throughout the City of Columbia.
9/25/2011	9/25/2011	0	0	\$6,913	\$0	55	Columbia	Police reported trees down on Saluda Rivers Road and Leesburg Road.
9/25/2011	9/25/2011	0	0	\$6,913	\$0	55	Dentsville	Highway Patrol reported trees down on Norwood Road.
10/13/2011	10/13/2011	0	0	\$1,152	\$0	50	Littleton	Public reported a tree down on a powerline at Old Brickyard and Old Tamah roads.
10/13/2011	10/13/2011	0	0	\$3,456	\$0	55	Denny Terrace	Highway Patrol reported trees down on I-20 near Mile Marker 68.
10/13/2011	10/13/2011	0	0	\$5,761	\$0	55	Eau Claire	Sheriff reported trees down on Monticello Road near Eau Claire High School.
10/13/2011	10/13/2011	0	0	\$4,608	\$0	55	Weddell	Sheriff reported trees down near Two Notch Road and Daulton Road.
10/13/2011	10/13/2011	0	0	\$4,608	\$0	55	Pontiac Airstrip Arp	Highway Patrol reported trees down near Hardscrabble Road at Sandhills Church.
3/3/2012	3/3/2012	0	0	\$13,545	\$0	60	Denny Terrace	SKYWARN Spotters reported antennas and trees down across northern Richland County from southeast of Irmo to the Kershaw County line.
3/3/2012	3/3/2012	0	0	\$4,515	\$0	55	Forest Acres	SKYWARN spotter reported some trees down in the Forest Acres area.

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (kts)*	Location	Description
3/3/2012	3/3/2012	0	0	\$2,258	\$0	55	Eau Claire	Sheriff reported trees blocking the road on Burning tree road and near Bush River Road.
3/3/2012	3/3/2012	0	0	\$3,386	\$0	55	Denny Terrace	Sheriff reported trees down at Broad River Road and Haviland Circle.
4/3/2012	4/3/2012	0	0	\$3,386	\$0	50	Ballentine	Public reported trees down in Irmo.
5/15/2012	5/15/2012	0	0	\$4,515	\$0	55	Leesburg	Highway Patrol reported trees down near the intersection of Screaming Eagle Road and Koon Road.
5/15/2012	5/15/2012	0	0	\$4,515	\$0	55	Leesburg	Highway Patrol reported trees down at the intersection of Screaming Eagle Road and Hwy 601.
5/15/2012	5/15/2012	0	0	\$9,030	\$0	50	Columbia	The State newspaper reported several trees down in the city.
5/16/2012	5/16/2012	0	0	\$3,386	\$0	55	Forest Acres	Police reported trees down on Hutto Ct.
5/16/2012	5/16/2012	0	0	\$4,515	\$0	55	Forest Acres	Police reported trees down on Spring Lake Road.
6/1/2012	6/1/2012	0	0	\$5,644	\$0	55	Montgomery	Utility Company reported power outages and a couple of lines down just east of Irmo to near I-26.
6/1/2012	6/1/2012	0	0	\$5,644	\$0	55	Dentsville	Utility Company reported power outages and lines down on Arbor Drive and Lake Avenue.
6/1/2012	6/1/2012	0	0	\$5,644	\$0	55	Woodfield	Utility Company reported power outages and lines down on Grebeck Drive and Mokernut Ave.
6/13/2012	6/13/2012	0	0	\$1,129	\$0	50	McEntire ANG	Highway Patrol reported a couple of trees down on Congaree Road below McEntire ANG Base.
7/1/2012	7/1/2012	0	0	\$5,644	\$0	55	Ballentine	NWS employee reported trees and powerlines down in Irmo on Lake Murray Blvd.
7/1/2012	7/1/2012	0	0	\$22,575	\$0	60	Woodfield	Trees down in the roadway on Bluff Road, Pineview road, Montgomery Road, Amicks Ferry Road, 155 Newberry Drive, and Lynch Road. A tree was also down on I-20 east bound at the 67-mile marker.
7/1/2012	7/1/2012	0	0	\$11,288	\$0	65	Eastover	A 40 Foot amateur radio antenna was blown over which was anchored in concrete.
7/1/2012	7/1/2012	0	0	\$4,515	\$0	60	Blythewood	Sheriff reported trees down at Longtown road and Farrow Road.
7/1/2012	7/1/2012	0	0	\$4,515	\$0	55	Blythewood	Highway Patrol reported trees down near I-26 at exit 24.
7/5/2012	7/5/2012	0	0	\$6,733	\$0	55	Montgomery	Highway Patrol reported a few trees and powerlines down east of Irmo.
7/5/2012	7/5/2012	0	0	\$2,258	\$0	50	Ballentine	Sheriff reported a couple of trees down at Western Lane and Koon Road.
7/5/2012	7/5/2012	0	0	\$3,386	\$0	50	Spring Hill	Sheriff reported several trees down.
7/10/2012	7/10/2012	0	0	\$2,258	\$0	50	Langfords	Blythewood Fire Dept. reported a tree on a powerline at Branham Road and Claude Bundrick Road.
7/10/2012	7/10/2012	0	0	\$2,258	\$0	55	Ballentine	Public reported several trees down.
7/10/2012	7/10/2012	0	0	\$2,258	\$0	55	White Rock	NWS employee reported trees down on I-26 at exit 97.
7/16/2012	7/16/2012	0	0	\$2,258	\$0	50	Pontiac	Public reported trees down along I-20 near the Richland and Kershaw County line.
8/2/2012	8/2/2012	0	0	\$2,258	\$0	55	Killian	Highway Patrol reported trees down on Brickyard Road.
1/30/2013	1/30/2013	0	0	\$3,337	\$0	50	Columbia	Dispatch reported a few trees down in Columbia.
1/30/2013	1/30/2013	0	0	\$3,337	\$0	50	Columbia	Columbia City Official reported a few trees down in Columbia.
1/30/2013	1/30/2013	0	0	\$8,900	\$0	50	Capitol View	Dominion Energy reported trees and powerlines down with outages.
3/18/2013	3/18/2013	0	0	\$11,125	\$0	65	Capitol View	Sheriff reported many trees down along Leesburg and Ulmer Roads.
3/18/2013	3/18/2013	0	0	\$8,900	\$0	60	Pontiac	Sheriff reported trees down on Screaming Eagle Road near Melton Road.

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (kts)*	Location	Description
3/18/2013	3/18/2013	0	0	\$11,125	\$0	65	Olympia Mills	Sheriff reported many trees down along Bulff and Heyward Roads.
3/18/2013	3/18/2013	0	0	\$11,125	\$0	65	Capitol View	Sheriff reported many trees down along Leesburg and Trotter Roads.
3/18/2013	3/18/2013	0	0	\$11,125	\$0	65	Horrell Hill	Sheriff reported many trees down along Leesburg and Harmon Roads.
3/18/2013	3/18/2013	0	0	\$11,125	\$0	65	Leesburg	Sheriff reported many trees down along McCords Ferry and McGraw Roads.
4/19/2013	4/19/2013	0	0	\$4,450	\$0	55	Oak Grove	Highway Patrol reported trees down on Blythewood Road at US 321.
6/10/2013	6/10/2013	0	0	\$556	\$0	50	Gadsden	Forestry Service reported a tree down on South Cedar Creek Road in Congaree National Park.
6/13/2013	6/13/2013	0	0	\$2,225	\$0	55	Weddell	Highway Patrol reported trees down on I-20 close to mile marker 80.
6/25/2013	6/25/2013	0	0	\$2,225	\$0	55	Pontiac	SC Highway Patrol reported trees down on Bookman Road past Kelly Mill Road.
7/8/2013	7/8/2013	0	0	\$8,900	\$0	50	Myron Manor	Dispatch reported a couple of trees down on Kilbourne Road.
7/8/2013	7/8/2013	0	0	\$2,225	\$0	55	Columbia	Dominion Energy reported trees and powerlines down around Richland County with power outages.
7/17/2013	7/17/2013	0	0	\$912,214	\$0	50	Eau Claire	Sheriff reported trees down in northeastern Columbia.
7/17/2013	7/17/2013	0	0	\$3,337	\$0	60	Columbia	The State Newspaper reported several trees fell on homes in Columbia. At least 8 homes were damaged so thoroughly that they were deemed unsafe for habitation.
7/29/2013	7/29/2013	0	0	\$2,225	\$0	50	Gadsden	Highway Patrol reported trees down near Gadsden.
5/23/2014	5/23/2014	0	0	\$7,663	\$0	55	Horrell Hill	Highway Patrol reported trees down on Lower Richland Blvd.
5/23/2014	5/23/2014	0	0	\$6,568	\$0	55	Eastover	Dispatch reported trees down along Bluff Road in the Gadsden and Wateree Communities.
5/23/2014	5/23/2014	0	0	\$3,284	\$0	55	Eastover	Highway Patrol reported trees down near Southwind and Antioch Amez Church roads near Eastover.
5/23/2014	5/23/2014	0	0	\$3,284	\$0	55	Eastover	Highway Patrol reported trees down in the Horrell Hill area.
5/23/2014	5/23/2014	0	0	\$3,284	\$0	55	Capitol View	Highway Patrol reported trees down on Leesburg Road near Green Lakes.
5/23/2014	5/23/2014	0	0	\$2,189	\$0	50	Blythewood	Highway Patrol reported trees down at Muller and Pine Grove roads.
5/23/2014	5/23/2014	0	0	\$2,189	\$0	55	Langfords XRDS	Sheriff reported power lines down across Hardscrabble Road between Kelly Mill and Langford roads.
5/27/2014	5/27/2014	0	0	\$4,379	\$0	55	Columbia	DOT reported several trees down on the south side of Columbia.
8/8/2014	8/8/2014	0	0	\$4,379	\$0	50	Columbia	Highway Patrol reported a tree down across the road at the intersection of Lady and Oak Streets.
8/8/2014	8/8/2014	0	0	\$547	\$0	50	Blythewood	Highway Patrol reported trees down at the intersection of Syrup and Blythewood Roads.
9/2/2014	9/2/2014	0	0	\$3,284	\$0	50	Pontiac	SC Highway Patrol reported trees down at Jacobs Millpond Road and Sandy Oaks Road.
11/23/2014	11/23/2014	0	0	\$4,379	\$0	55	Killian	Highway Patrol reported trees down along US 321 near Blythewood Road.
11/23/2014	11/23/2014	0	0	\$3,284	\$0	55	Columbia	Richland County Dispatch reported power lines and traffic lights down in downtown Columbia at the intersection of Maple and Blossom Streets.
11/23/2014	11/23/2014	0	0	\$2,189	\$0	50	Pontiac	SC Highway Patrol reported trees down at Jacobs Millpond Road and Sandy Oaks Road.
1/4/2015	1/4/2015	0	0	\$4,374	\$0	50	Langsords XRDS	Electric company reported power outages in the Dentsville and eastern Ft. Jackson areas from trees on powerlines.
4/7/2015	4/7/2015	0	0	\$6,560	\$0	55	Hopkins	Highway Patrol reported trees down near the intersection of Bluff Road and Old Bluff Road.

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (kts)*	Location	Description
4/7/2015	4/7/2015	0	0	\$4,374	\$0	55	Sharp	Highway Patrol reported trees down near the intersection of Longtown Road and Holly Ridge Lane.
4/19/2015	4/19/2015	0	0	\$2,187	\$0	50	Columbia	Dispatch reported trees in the road at the intersection of Wilmont Ave. and Walker Street.
4/19/2015	4/19/2015	0	0	\$3,280	\$0	55	Denny Terrace	Highway Patrol reported trees down across the road at the intersection of Hutchinson Street and Blue Ridge Terrace.
5/11/2015	5/11/2015	0	0	\$2,187	\$0	55	Eastover	Sheriff reported trees down near Hwy 48 around Gadsden.
5/11/2015	5/11/2015	0	0	\$2,187	\$0	55	St. Andrews	Highway Patrol reported trees down on Broad River Road near Brevard Street.
5/11/2015	5/11/2015	0	0	\$2,187	\$0	55	Leesburg	Highway Patrol reported trees in the roadway on the US 76 bridge over the Wateree River.
5/11/2015	5/11/2015	0	0	\$2,187	\$0	55	Sims	Highway Patrol reported trees down at the intersection of Longwood Road and Bluff Road.
6/18/2015	6/18/2015	0	0	\$4,374	\$0	55	Lykesland	Highway Patrol reported trees down at Universal Drive and Garners Ferry.
6/23/2015	6/23/2015	0	0	\$4,374	\$0	55	St. Andrews	Sheriff reported trees down along Nunmaker Drive between Kathleen Drive and Chandler Avenue.
6/23/2015	6/23/2015	0	0	\$3,280	\$0	55	Killian	Highway Patrol reported trees down at Majestic Drive and North Brickyard Road.
6/27/2015	6/27/2015	0	0	\$3,280	\$0	55	Greenlawn	Sheriff reported trees down in the road at 301 Dean Hall Lane.
6/27/2015	6/27/2015	0	0	\$2,187	\$0	50	St. Andrews	Highway Patrol reported trees down near Clement Road at Mountain Drive.
6/27/2015	6/27/2015	0	0	\$547	\$0	50	Eastover	Sheriff reported a tree across the road at the intersection of Fork Church Road and Bluff Road in Gadsden.
6/30/2015	6/30/2015	0	0	\$19,681	\$0	60	Capitol View	Highway Patrol reported trees and power lines down throughout central Richland County in the Garners Ferry Road area.
6/30/2015	6/30/2015	0	0	\$3,280	\$0	55	Forest Acres	Highway Patrol reported trees down along Briarfield Road.
6/30/2015	6/30/2015	0	0	\$3,280	\$0	55	Arthurtown	Highway Patrol reported trees down at the intersection of Quarry Street and Granby Lane.
7/2/2015	7/2/2015	0	0	\$39,362	\$0	50	Olympia Mills	Public reported a tree fell on a home in the Olympia neighborhood of Columbia.
7/13/2015	7/13/2015	0	0	\$547	\$0	50	Eau Claire	Columbia Police reported a tree down at Barhamville and Tremain Roads.
7/18/2015	7/18/2015	0	0	\$4,374	\$0	50	Lykesland	Highway Patrol reported a couple of trees down in Columbia including Merrimac Drive and Chilhowie Road.
7/19/2015	7/19/2015	0	0	\$8,747	\$0	55	Eastover	DOT reported trees down from Hopkins to Eastover.
7/19/2015	7/19/2015	0	0	\$3,280	\$0	55	Pontiac Airstrip Airport	Highway Patrol reported trees down on Running Fox Road and Leaning Tree Road.
7/19/2015	7/19/2015	0	0	\$2,187	\$0	50	Horrell Hill	Highway Patrol reported trees down on Davis Road and Leesburg Road.
7/19/2015	7/19/2015	0	0	\$2,187	\$0	55	Horrell Hill	Highway Patrol reported trees down on Leesburg Road and Harmon Road.
8/5/2015	8/5/2015	0	0	\$229,614	\$0	60	Columbia	DOT and broadcast media reported numerous trees down and powerlines down on the southeast, east, and northeastern side of Columbia. Some trees fell on homes and vehicles causing significant damage.
8/6/2015	8/6/2015	0	0	\$10,934	\$0	60	Dentsville	Dispatch reported multiple trees down on Chatsworth Road, Castleton Lane, and Exeter Lane.
8/6/2015	8/6/2015	0	0	\$3,280	\$0	55	Pontiac Airstrip Airport	Social media reported power outages northeast of the Dentsville area.
8/6/2015	8/6/2015	0	0	\$2,187	\$0	55	Oak Grove	Highway Patrol reported trees down at Winnsboro Road and Loricck Road.
8/6/2015	8/6/2015	0	0	\$2,187	\$0	50	Dentsville	Highway Patrol reported trees down on Oneil Court at

Start Date	End Date	Inj	Fat	Property Damage	Crop Damage	Mag. (kts)*	Location	Description
								Trenholm Road.
8/6/2015	8/6/2015	0	0	\$547	\$0	50	Woodfield	Highway Patrol reported a tree across the intersection of Faraway and Height roads.
9/3/2015	9/3/2015	0	0	\$6,560	\$0	50	Pontiac Airstrip Airport	Highway Patrol reported trees down at Summit Parkway and Clemson Road.
9/21/2015	9/21/2015	0	0	\$1,093	\$0	50	Eastover	NWS storm survey found a couple of trees down on Pine Thicket Road.
2/24/2016	2/24/2016	0	0	\$15,907	\$0	43	Richland	Reported a large tree limb fell on top of a taxi near the intersection of Millwood Avenue and Maple Street. There were no injuries.
7/15/2016	7/15/2016	0	0	\$11	\$0	44	McEntire ANG Airbase	Measured gust of 50 mph at McEntire Joint National Guard Base.
7/15/2016	7/15/2016	1	0	\$0	\$0	60	Eau Claire	Tree on house, tree on deck, and power lines down, on Delverton Rd.
8/1/2016	8/1/2016	0	0	\$21,210	\$0	55	Olympia Mills	Broadcast Media report of downed tree on car along S. Edisto Ave.
9/2/2016	9/2/2016	0	0	\$1,060	\$0	40	Richland	Reported a tree down in Woodland Park neighborhood.
10/8/2016	10/8/2016	0	0	\$1,060,486	\$0	52	Richland	Law Enforcement, Department of Transportation and Media reported numerous trees and power lines down throughout the county. City officials closed at least 35 different streets and roads throughout the City of Columbia. Up to 15 homes received damage from falling trees and limbs. Reports indicated damage was heaviest in Forest Acres, Columbia, Fort Jackson and Eastover communities.
7/24/2017	7/24/2017	0	0	\$104	\$104	42	Columbia Owens Airport	ASOS at Hamilton Owens Field in Columbia measured at 42 knot (48 MPH) wind gust in a thunderstorm at 3:52 pm EDT (1452 EST).
3/1/2018	3/1/2018	0	0	\$103	\$103	43	Columbia Owens Airport	ASOS unit at Hamilton Owens Airport in Columbia measured a peak wind gust of 49 MPH at 343 pm EST.
3/1/2018	3/1/2018	0	0	\$103	\$103	43	McEntire ANG Airbase	ASOS unit at McEntire JNG Base near Eastover measured a peak wind gusts of 49 MPH at 358 pm EST.
6/11/2018	6/11/2018	0	0	\$103	\$103	45	McEntire ANG Airbase	A wind gust of 52 MPH was recorded at McEntire JNGB.
7/23/2018	7/23/2018	0	0	\$103	\$103	49	Horrell Hill	Richland Co SC mesonet (RCWINDS) gage at Horrell Hill measured a wind gust of 56 mph.
2/12/2019	2/12/2019	0	0	\$10	\$10	43	St. Andrews	RCWINDS gage at St. Andrews Rd and Broad River Rd measured a peak wind gust of 50 MPH at 1730 EST.
4/8/2019	4/8/2019	0	0	\$100	\$100	43	Columbia Owens Airport	ASOS at Columbia Hamilton-Owens Airport measured a peak wind gust of 49 MPH at 2154Z or 1754 EDT (1654 EST).
4/19/2019	4/19/2019	0	0	\$100	\$100	48	Columbia Owens Airport	Public reported 2 large trees were downed in the Rosewood neighborhood. Wind gusts were estimated at 50-55 mph. A peak wind gust of 52 MPH was measured at nearby Owens Field at 1355 EDT (1255 EST).
4/19/2019	4/19/2019	0	0	\$100	\$100	45	Columbia Owens Airport	ASOS unit at Owens Field airport measured a peak wind gust of 52 MPH at 1355 EDT (1255 EST).
5/4/2019	5/4/2019	0	0	\$100	\$100	50	Eastover	Retired emergency manager reported several trees down on Vanboken Rd near Eastover.
5/11/2019	5/11/2019	0	0	\$100	\$100	38	Columbia Owens Airport	ASOS unit at Hamilton Owens Field measured a peak wind gust of 44 mph.
6/20/2019	6/20/2019	1	0	\$0	\$0	65	St. Andrews	A 61-year-old man was killed when a tree, that was felled by thunderstorm winds, landed on him while he was in his backyard at his home on Columbia Ave in Columbia.
6/20/2019	6/20/2019	0	0	\$100	\$100	44	Hilton	NWS equipment at Flotilla Island.
6/20/2019	6/20/2019	0	0	\$100	\$100	45	McEntire ANG Airbase	Measured gust at McEntire Air National Guard (MMT).

*No magnitude information indicates wind speeds were unavailable.

G) Hail

What to expect: Every property and person is at risk from hail in Richland County. Hail occurs at least every three months in Richland County (Figure 164). Hail events occur mostly during spring thunderstorms from March through May. Thus far no damage has been reported for hailstones larger than 2.75 inches, although the county has seen hailstones of 3 inches in diameter (Figure 165). It appears that crop damage from hail events is severely underreported.

Geographic Extent: Based on past occurrences, the entire county is susceptible to hail damage.

Hail statistics for Richland County are as following:

Number of Loss-Causing Events:	76
Frequency of Occurrence:	5.7%
Recurrence Interval:	0.18 years
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	\$728,465
Total Fatalities:	0
Deadliest Event:	n/a
Most Property Damage:	\$65,501 (June 10, 1982)
Most Crop Damage:	\$92,055 (June 11, 1963)
Highest USDA Crop Indemnity Payout:	\$62,388 (April 2000)

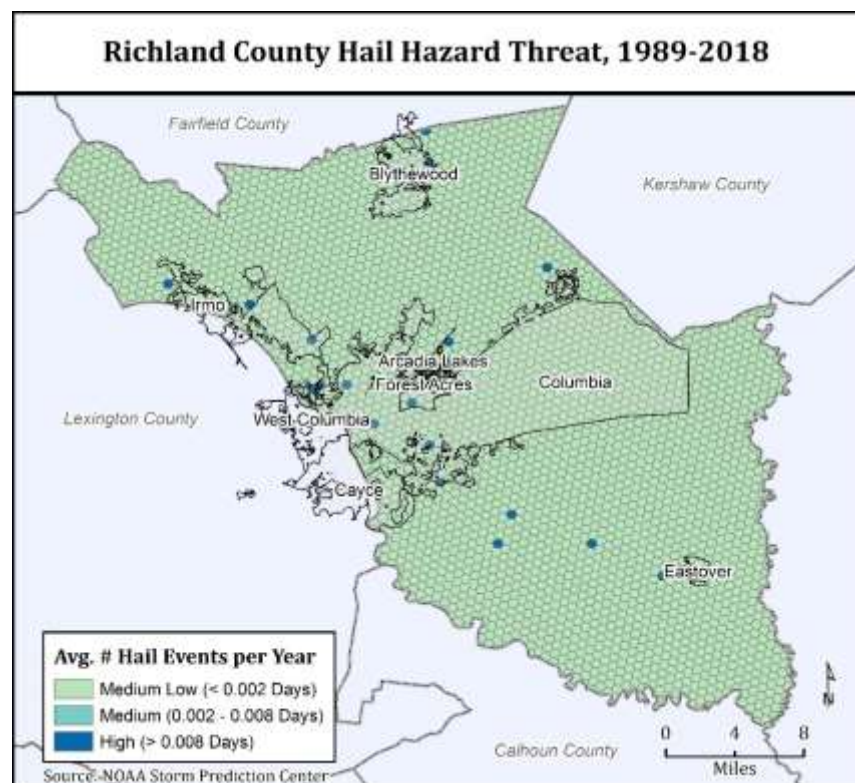


Figure 164 - Hail threat (occurrence) in Richland County.

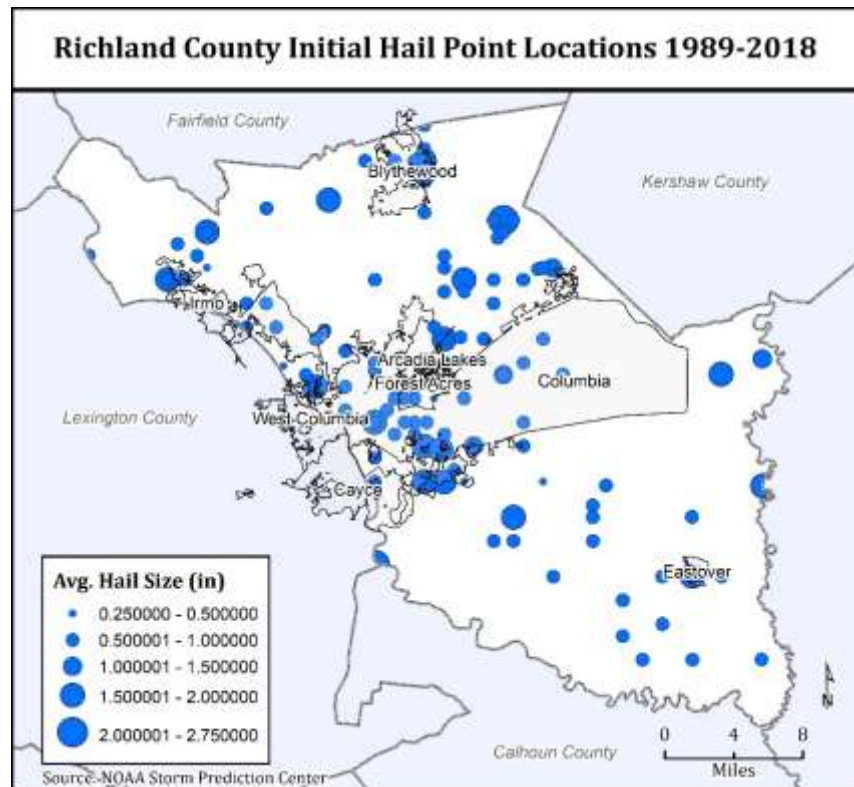


Figure 165 - Risk of large hail events in Richland County.

Table 93 - Record of loss-causing hail events in Richland County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
2/18/1960	2/18/1960	0	0	\$1,251	\$0		Central & Northern SC	Windstorms & Hail
7/1/1960	7/1/1960	0	0	\$219	\$0		Columbia	Wind & Hail
4/12/1962	4/12/1962	0	0	\$1,716	\$0		Central SC	Wind & Hail
6/11/1963	6/11/1963	0	0	\$0	\$92,055		Statewide	Hailstorms
4/7/1965	4/7/1965	0	0	\$4,571	\$0		Owensville, Greenville County to St. Matthews, & Calhoun County	Hail
7/1/1965	7/31/1965	0	0	\$894	\$0		Statewide	Wind, Heavy Rain, & Hail
7/19/1965	7/19/1965	0	0	\$894	\$89		Statewide	Hail, Lightning, & Wind
4/13/1966	4/13/1966	0	0	\$3,999	\$400		Columbia & Eastover	Rain, Hail, Wind, & Electrical
7/29/1966	7/29/1966	1	0	\$39,993	\$0		Columbia	Wind, Hail, Electrical, & Heavy Rains
3/12/1967	3/12/1967	0	0	\$38,796	\$0		Countywide	Wind & Hail
5/29/1967	5/29/1967	3	0	\$3,880	\$3,880		Countywide	Small Tornado, Wind, & Hail
7/29/1967	7/29/1967	0	0	\$38,796	\$0		Countywide	Lightning, Wind, Rain, & Hail
6/21/1970	6/21/1970	1	0	\$11,132	\$11,132		Area from Richland County to Dillon & Marlboro Counties	Thunderstorms, Hail, Wind, & Rain
6/15/1971	6/15/1971	0	0	\$26,662	\$26,662		A 12-county area centered on Lee, Darlington, Sumter &	Thunderstorms, Hail, Wind, & Rain

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
							Florence counties	
3/29/1974	3/29/1974	0	0	\$6,258	\$6,258		Northern, Eastern, & Central SC	Wind, Hail, & Electrical
7/16/1974	7/16/1974	0	0	\$1,011	\$1,011		Central & Southern SC	Wind & Hail
7/21/1974	7/21/1974	0	0	\$52,567	\$5,257		Charleston, Lexington, Richland, Georgetown, & Horry Counties	Wind, Hail, & Rain
3/7/1975	3/7/1975	0	0	\$688	\$0		Northwestern, Central, & Northeastern SC	Hail, Lightning, & Wind
3/24/1975	3/24/1975	1	0	\$5,236	\$52		Statewide	Hail, Lightning, & Wind
5/10/1975	5/10/1975	0	0	\$13,381	\$133,806		York to Bamberg, Spartanburg to Oconee, & Anderson	Hail, Lightning, & Wind
6/15/1975	6/15/1975	0	0	\$708	\$708		Northern & Central SC	Hail, Lightning, & Wind
6/18/1975	6/18/1975	0	0	\$52	\$5,236		Statewide	Hail, Lightning, & Wind
7/4/1975	7/4/1975	0	0	\$6,881	\$68,814		Northern & Central SC	Hail, Lightning, & Wind
9/5/1975	9/5/1975	0	0	\$2,190	\$2,190		Northwestern & Central SC	Thunderstorm, Wind, & Hail
6/1/1976	6/1/1976	0	0	\$228	\$2,277		Columbia	Hail
6/6/1977	6/6/1977	0	0	\$465	\$4,648		Statewide	Hail, Lightning, & Wind
4/26/1982	4/27/1982	0	0	\$29	\$29	1.75"	Statewide	Thunderstorm, Wind, Lightning, & Hail
5/17/1982	5/17/1982	0	0	\$37	\$373		Northern, Central, & Southern SC	Thunderstorms, High Winds, & Hail
6/10/1982	6/10/1982	1	0	\$327,505	\$327,505		Statewide	Hail, Lightning, Rain, & Wind
3/28/1984	3/28/1984	0	0	\$62,357	\$6,236	1"	Columbia	Hail
3/28/1984	3/28/1984	0	0	\$1,247	\$1,247	1.5"	Cayce, Irmo, and Columbia	Hail
4/14/1984	4/14/1984	0	0	\$125	\$1,247	1.75"	White Rock	Hail
4/14/1984	4/14/1984	0	0	\$445	\$445	1.75"	Northern & Central SC	Wind & Hail
5/2/1984	5/2/1984	0	0	\$12,471	\$1,247	2.75"	Irmo, Killian, & Elgin	Hail
5/6/1984	5/6/1984	0	0	\$0	\$624	1.75"	Chapin & White Rock	Hail
6/20/1984	6/20/1984	0	0	\$2,711	\$271	1.75"	Statewide	Rain, Hail, Lightning, & Wind
7/25/1984	7/25/1984	3	0	\$124,713	\$1,247	1.75"	Central SC	Rain, Hail, Lightning, & Wind
2/11/1985	2/12/1985	0	0	\$2,618	\$3		Statewide	Wind, Snow, Hail, & Thunderstorms
6/4/1985	6/4/1985	0	0	\$634	\$634		North-Central & Central SC	Hail
6/7/1985	6/7/1985	0	0	\$2,618	\$262	2"	Statewide	Wind & Hail
3/13/1986	3/13/1986	0	0	\$11,823	\$0	.75-1.75"	Columbia	Hail
6/2/1986	6/2/1986	0	0	\$11,823	\$0		Countywide	Hail
6/26/1986	6/26/1986	0	0	\$11,823	\$0	1.75"	Fort Jackson	Hail
7/16/1986	7/16/1986	0	0	\$118	\$0		Columbia	Hail

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
4/15/1987	4/15/1987	0	0	\$1,141	\$114		Countywide	Hail
4/16/1987	4/16/1987	0	0	\$114	\$114		Countywide	Hail
7/29/1987	7/29/1987	0	0	\$1,141	\$0	1.75"	Columbia	Hail
8/31/1987	8/31/1987	0	0	\$114	\$114		Horrell Hill	Hail
4/6/1988	4/6/1988	0	0	\$1,095	\$0	.75"	Eastern Columbia	Hail
4/11/1988	4/11/1988	0	0	\$4	\$0		Eastern & Lower Piedmont & Northern & Southern Midlands	Small hail
4/12/1988	4/12/1988	0	0	\$7	\$0		Lower Piedmont & Southern Midlands	Small hail
5/4/1988	5/4/1988	0	0	\$110	\$0	1.75"	Columbia	Hail
5/16/1988	5/16/1988	0	0	\$110	\$110	1"	Eastern Columbia	Hail
5/17/1988	5/17/1988	0	0	\$110	\$1,095	1"	White Rock	Hail
5/23/1988	5/23/1988	0	0	\$110	\$1,095	.75-1.75"	Columbia	Hail
6/26/1988	6/26/1988	0	0	\$110	\$1,095	1.5"	Pontiac	Hail
9/25/1988	9/25/1988	0	0	\$109,533	\$1,095	3"	Columbia	Severe Storm & Hail
4/24/1995	4/24/1995	0	0	\$3,401	\$0	1"	Rosewood Dr.	Hail
5/15/1995	5/15/1995	0	0	\$17,005	\$0	1.75"	Irmo	Hail
7/6/1995	7/6/1995	0	0	\$17,005	\$0	1"	Columbia	Hail
4/16/2011	4/16/2011	0	0	\$13,825	\$0	1"	Weddell	WIS TV reported quarter size hail along with trees and powerlines down at the Village of Sandhills.
4/26/2011	4/26/2011	0	0	\$0	\$4,608	1"	Pontiac Airstrip Airport	Quarter size hail fell in NE Columbia in the Woodlands subdivision in the vicinity of Two Notch Road, Clemson Rd, and Sparkleberry Lane.
4/26/2011	4/26/2011	0	0	\$0	\$4,608	0.75"	Killian	Dime size hail reported by the public via WLTX TV in the NE Columbia and Spring Valley areas.
7/1/2012	7/1/2012	0	0	\$5,644	\$0	1"	Horrell Hill	Public reported 1 inch hail in Shandon at the intersection of Duncan and Bonham roads.
7/15/2016	7/15/2016	0	0	\$11	\$0	0.75"	Langfords XRDS	Dime size hail on Palmetto Park Cir. In Columbia.
3/30/2017	3/30/2017	0	0	\$10	\$10	0.75"	Myron Manor	Public reported dime size hail, that lasted 3-4 minutes, at the intersection of Millwood Ave and Devine St.
3/30/2017	3/30/2017	0	0	\$10	\$10	0.50"	Forest Acres	Reports from the public received via social media and local news media of one-half inch hail in Forest Acres.
3/30/2017	3/30/2017	0	0	\$10	\$10	0.75"	Woodland Terrace	Dime size hail was reported near the intersection of Beltline Blvd and Devine St.
4/5/2017	4/5/2017	0	0	\$10	\$10	0.88"	Columbia	Dime to nickel size hail reported in downtown Columbia.
7/10/2017	7/10/2017	0	0	\$104	\$104	0.25"	St. Andrews	Pea size hail reported by the public on St. Andrews Rd.
7/16/2017	7/16/2017	0	0	\$104	\$104	0.75"	Pontiac Airstrip Airport	Public reported, via social media, dime size hail on Brickyard Rd.
6/11/2018	6/11/2018	0	0	\$103	\$103	0.25"	Capitol View	Pea size hail at Pineview-Garners Ferry EMS Station. Time estimated.

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
6/11/2018	6/11/2018	0	0	\$103	\$103	0.25"	Horrell Hill	Pea size hail fell, and a sign was blown down, on US Hwy 378 near Horrel Hill.
7/23/2018	7/23/2018	0	0	\$103	\$103	0.25"	Ballentine	Pea size hail near Koon Rd and Coogler Rd north of Irmo.
5/4/2019	5/4/2019	0	0	\$100	\$100	0.70"	Eastover	Retired emergency manager reported dime size to ¾-inch hail on Vanboklen Rd near Eastover.
8/1/2019	8/1/2019	0	0	\$10	\$10	0.88"	Pontiac Airstrip Airport	Report and photo of nickel size hail received via social media.

*No magnitude information indicates hailstone sizes were unavailable.

H) Fog

What to expect: Fog does not cause direct property damage or injuries. But indirectly, the personal safety of boaters, motorists, and other travelers is at risk due to poor visibility during fog conditions. Fog is very common in Richland County and occurs most frequently during the fall and spring months. On average, the county experiences at least 24 days⁷⁸ with some periods of fog (or haze). The number of fogs days varies considerably ranging from an average of 24 days of fog per year in the northern part of the county up to 34 days in the southern portion of the country (Figure 166). There is no explicit record of property damage or fatalities associated with fog as reported by SHELDUSTM or NCDC's Storm Data. This is likely because most damage from fog is indirect (e.g., traffic accidents).

Geographic Extent: Based on past occurrences, the entire county is susceptible to fog. Southern Richland County experiences significantly larger number of days with reduced visibility compared to the Irmo or Blythewood areas.

Fog statistics for Richland County are as following:

Number of Loss-Causing Events:	n/av (largely motorist accidents)
Daily Frequency of Occurrence:	0.08%
Daily Recurrence Interval:	12.7 days
Expected changes to frequency and recurrence interval in the future:	Not enough information available to make assumptions about future changes
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	n/av
Total Fatalities:	n/av
Deadliest Event:	n/av
Most Property Damage:	n/av
Most Crop Damage:	n/av
Highest USDA Crop Indemnity Payout:	n/av

⁷⁸ "Fog days" have reduced visibility due to fog, haze, or smoke at any time of the day as indicated by NWS station data.

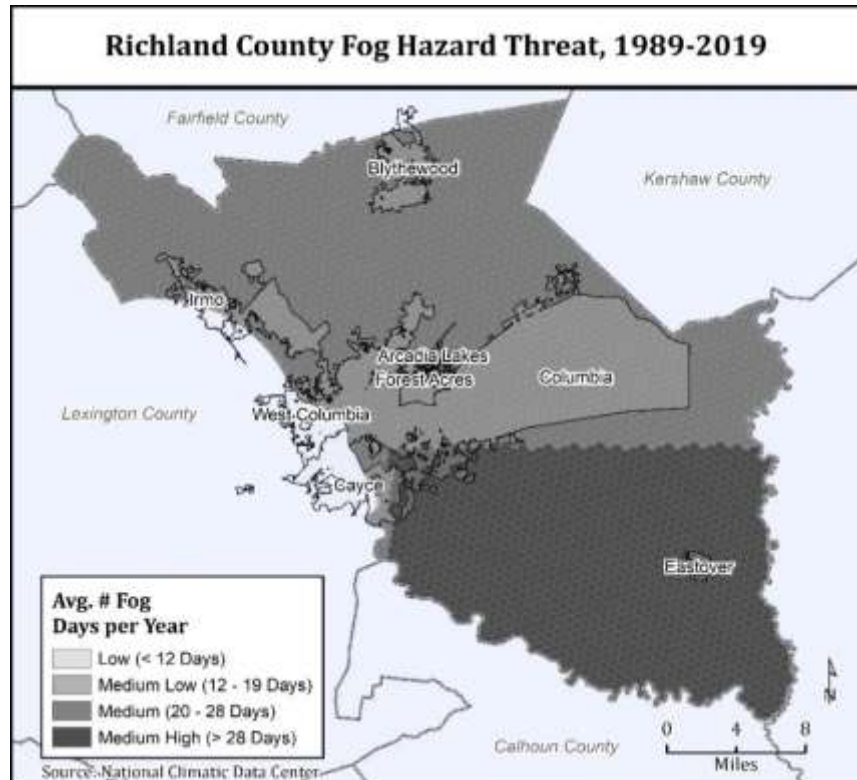


Figure 166 - Fog threat in Richland County.

I) Winter Weather & Ice Storms

What to expect: Every property and person is at risk from winter weather in Richland County. Ice storms and winter weather occur nearly every year in Richland County—on average at least 1 day every other year (Figure 167). Snow accumulations of 2 inches and more are rare, though the area has seen significant snow accumulations in the past (Table 94). Record snowfall of 16 inches occurred in 1973, and in 2010 with 8.6 inches⁷⁹. The highest daily snowfall amount was 12.3 inches (February 10, 1973)⁸⁰.

More damaging than snow events are ice storms, which tend to occur frequently in this area. Ice accumulations of $\frac{3}{4}$ of an inch or more are possible but even thin coatings of ice cause havoc. Falling trees lead to power outages, road closures, and damage to homes and other properties. In addition, winter weather tends to adversely affect agriculture more than any other hazard. It appears that crop damage from winter weather events is severely underreported.

Geographic Extent: The entire county is susceptible to damage from winter weather.

Winter weather statistics for Richland County are as following:

Number of Loss-Causing Events:	57
Frequency of Occurrence:	0.47%
Recurrence Interval:	2.1 years
Expected changes to frequency and recurrence interval in the	Decreased likelihood of occurrence and lengthening of return

⁷⁹ NWS Columbia Forecast Office, 2010. February snowfall and the record books. Available at http://www.weather.gov/cae/Snowfall_Total_Records_cor.html

⁸⁰ SCDNR. South Carolina record minimum temperatures and date. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/data/min_temp_table.php

future:	periods though extreme events remain a possibility
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Winter weather-related Presidential Disaster Declarations:	DR-1313 (2000) DR-1509 (2004)
Total Losses:	\$18,260,484
Total Fatalities:	6
Deadliest Event:	1 fatality (several instances)
Most Property Damage:	\$634,436 (February 9, 1973)
Most Crop Damage:	\$7,512,160 (February 15, 1969)
Highest USDA Crop Indemnity Payout:	\$70,346 (March 1997)

January 22, 2000 (DR-1313): A severe winter storm resulted in widespread power outages. Thirty-eight counties in South Carolina were designated for federal assistance including Richland County.

January 26-30, 2004 (DR-1509): An ice storm began over the North Midlands of South Carolina on Sunday night and gradually spread south into the Central Midlands on Monday. The storm continued into Tuesday but was mainly freezing drizzle during that time. Ice accumulations of 1/2 to 3/4 of an inch occurred which brought numerous trees and powerlines down. The heaviest ice accumulations occurred in Lancaster, Chesterfield, Fairfield, Newberry, Saluda, McCormick, Orangeburg, and Clarendon counties. Over 250,000 homes, businesses, and schools were without power for several days. Sleet also fell in Lancaster and Chesterfield counties and accumulated up to 2 inches. Six people were injured in traffic related accidents and there were no deaths. Damage estimates from SCEMD were \$28.5 million.

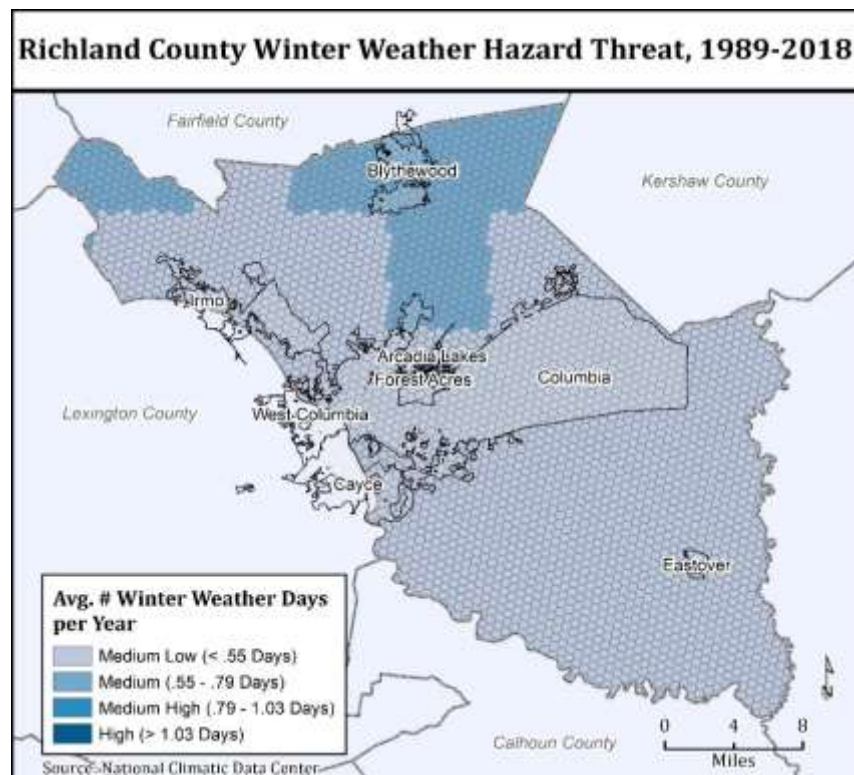


Figure 167 - Threat of winter weather in Richland County.

Table 94 - Record of loss-causing winter weather events in Richland County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
3/9/1960	3/11/1960	0	0	\$12,507	\$0	3.2 in	Northern & Central SC	Snow, Sleet, & Ice
1/25/1961	1/26/1961	0	0	\$9,421	\$942	1.4 in	Statewide	Ice Storm
2/3/1961	2/4/1961	0	0	\$942	\$0	0.9 in	Statewide	Glaze
12/31/1963	1/1/1964	1	0	\$92,055	\$9,206	Trace	Statewide	Ice
3/30/1964	3/31/1964	0	0	\$0	\$908,676	1.0 in	Statewide	Killing Freeze
1/26/1966	1/27/1966	0	0	\$114,266	\$0	-	Northern & Central SC	Ice & Snow
1/29/1966	1/30/1966	0	1	\$0	\$86,941	0.8 in	Statewide	Severe Cold, Ice, & Snow
3/29/1966	3/29/1966	0	0	\$17,388	\$0	-	Inland SC	Frost
1/9/1968	1/13/1968	0	0	\$116,359	\$12	2.2 in	Northern 2/3rds of SC	Sleet, Snow, Rain, & Freezing Rain
2/15/1969	2/17/1969	0	0	\$75,122	\$7,512,160	16 in.	Statewide	Sleet, Snow, & Freezing Rain
11/1/1969	11/1/1969	0	0	\$14,123	\$14	Trace	Central SC	Wind & Snow
1/8/1970	1/9/1970	0	0	\$726	\$7	Trace	Statewide	Severe Freeze
11/24/1970	11/25/1970	0	0	\$7	\$7	5.5 in	Statewide	Severe Freeze
12/3/1971	12/3/1971	1	0	\$69,553	\$69,553	3.1 in	Statewide	Sleet, Snow, Rain, Freezing Rain, & Wind
4/1/1972	4/30/1972	0	0	\$0	\$352,265	4.1 in	Statewide	Cold Spell
1/7/1973	1/8/1973	0	0	\$63,444	\$634,436	0.46 in	Statewide	Snow & Ice
2/9/1973	2/10/1973	0	1	\$634,436	\$634	3.5 in	Statewide	Snowstorm
12/17/1973	12/17/1973	0	0	\$3,648	\$36	1.0 in	North-Central SC	Heavy Snow
10/3/1974	10/4/1974	0	0	\$6,739	\$0	0.1 in	Western, Northern, & Central SC	Frost & Freeze
3/2/1975	3/3/1975	0	0	\$0	\$5,236	0.4 in	Statewide	Low Temperatures
1/1/1977	1/31/1977	0	0	\$465	\$465	0.02 in	Statewide	Unusual Cold Weather
1/1/1977	1/31/1977	0	0	\$465	\$465	Trace	Statewide	Unusual Cold Weather
2/6/1979	2/6/1979	0	0	\$594,937	\$595	-	Northwestern & Central SC	Sleet, Snow, & Ice
2/17/1979	2/18/1979	0	1	\$38,800	\$388	4.3 in	Statewide	Sleet, Snow, & Freezing Rain
2/5/1980	2/6/1980	0	0	\$34,186	\$342	-	Statewide except for Southern Coastal Region	Snowstorm over most of State except Ice Storm near Beaches North Coastal Area
3/1/1980	3/2/1980	0	0	\$3,419	\$3,419	-	Statewide	Sleet, Snow, Drizzle, & Freezing Rain
12/23/1980	12/23/1980	0	0	\$71	\$0	1.2 in	Northwestern & Central SC	Freezing Rain
1/11/1982	1/11/1982	0	1	\$292	\$292		Statewide	Hard Freeze
1/12/1982	1/12/1982	0	0	\$4,796	\$473	3-4"	Statewide except for Coastal Plain Region	Sleet, Snow, & Freezing Rain
2/26/1982	2/27/1982	0	0	\$2,919	\$0	6"	Statewide	Sleet, Snow, & Glaze
3/27/1982	3/27/1982	0	0	\$0	\$291,907		Statewide	Extreme Cold
4/7/1982	4/7/1982	0	0	\$0	\$3,356,923		Statewide except Southern Region	Frost & Freeze
4/23/1982	4/24/1982	0	0	\$0	\$29		Statewide	Frost & Freeze
1/21/1983	1/21/1983	0	0	\$2,828	\$28	4-5"	Statewide	Sleet, Snow, & Freezing Rain

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
3/24/1983	3/24/1983	0	0	\$283	\$3	2"	Statewide	Wind, Snow, & Winter Storm
4/17/1983	4/18/1983	0	0	\$0	\$2,828,209		Statewide	Extreme Cold
12/25/1983	12/25/1983	0	1	\$28,282	\$28,282		Statewide	Extreme Cold
12/30/1983	12/31/1983	0	0	\$2,828	\$283		Statewide	Extreme Cold
1/13/1984	1/13/1984	0	0	\$4,454	\$445		Northern Half of SC	Freezing Rain & Glaze
1/20/1985	1/24/1985	0	1	\$26,179	\$2,618		Statewide	Extreme Cold & Snow
2/11/1985	2/12/1985	0	0	\$2,618	\$3		Statewide	Wind, Snow, Hail, & Thunderstorms
3/19/1985	3/19/1985	0	0	\$0	\$2,618		Statewide	Frost & Freeze
12/26/1985	12/26/1985	0	0	\$262	\$26		Statewide	Cold
1/26/1986	1/27/1986	0	0	\$2,570	\$26		Statewide	Cold
3/22/1986	3/23/1986	0	0	\$0	\$2,570		Statewide	Cold
4/23/1986	4/24/1986	0	0	\$0	\$2,570		Statewide	Frost & Freeze
4/1/1987	4/1/1987	0	0	\$0	\$2,925		Statewide except the Immediate Coastal Region	Freeze
10/1/1987	10/31/1987	0	0	\$0	\$248		Statewide	Cold Weather
1/7/1988	1/11/1988	0	0	\$23,811	\$0	4.3"	Statewide	Sleet, Snow, & Ice
1/15/1988	1/15/1988	0	0	\$391	\$0	<4"	Northeastern SC	Heavy Snow
3/14/1988	3/17/1988	0	0	\$238	\$0		Statewide	Low Temperature
2/23/1989	2/23/1989	0	0	\$2,272	\$0	6"	Statewide	Heavy Snow
12/22/1989	12/25/1989	0	0	\$29,027	\$0		Mountains, Foothills, Piedmont, & Midlands	Extreme Cold
3/21/1990	3/21/1990	0	0	\$0	\$215,524		Statewide	Freeze
1/24/1991	1/24/1991	0	1	\$0	\$0		Richland County	Hypothermia
11/4/1991	11/4/1991	0	1	\$0	\$0		Richland County	Hypothermia
3/13/1993	3/13/1993	0	0	\$112,091	\$11,209		SCZ006	High Winds & Cold

*No magnitude information indicates snowfall amounts or ice thickness were unavailable.

J) Temperature Extremes

What to expect: Richland County experiences between 39 and 69 days per year when temperatures fall below freezing at any given time of the day, which is generally during nighttime hours in the winter months (Figure 168). The record minimum temperature for Richland County was set on January 16, 1994, with -5 degrees⁸¹. Since 1994, no other minimum temperature records have been set anywhere in the state. Most record minimum temperatures date back to 1985 or 1899. Property damage tends to be restricted to busted water pipes and motor vehicle accidents. However, periods of frost and freeze cause significant damage to agricultural production.

Geographic Extent: Based on past occurrences, the entire county is susceptible to cold weather temperatures.

⁸¹ SCDNR. South Carolina record minimum temperatures and date. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/data/min_temp_table.php

Cold weather statistics for Richland County are as following:

Number of Loss-Causing Events:	35
Frequency of Occurrence:	49%
Recurrence Interval:	0.02 years
Expected changes to frequency and recurrence interval in the future:	Decreased likelihood of occurrence and lengthening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	\$11,679,375
Total Fatalities:	0
Deadliest Event:	n/av
Most Property Damage:	\$112,091 (March 13, 1993)
Most Crop Damage:	\$3,356,923 (April 7, 1982)
Highest USDA Crop Indemnity Payout:	\$80,718 (1989)

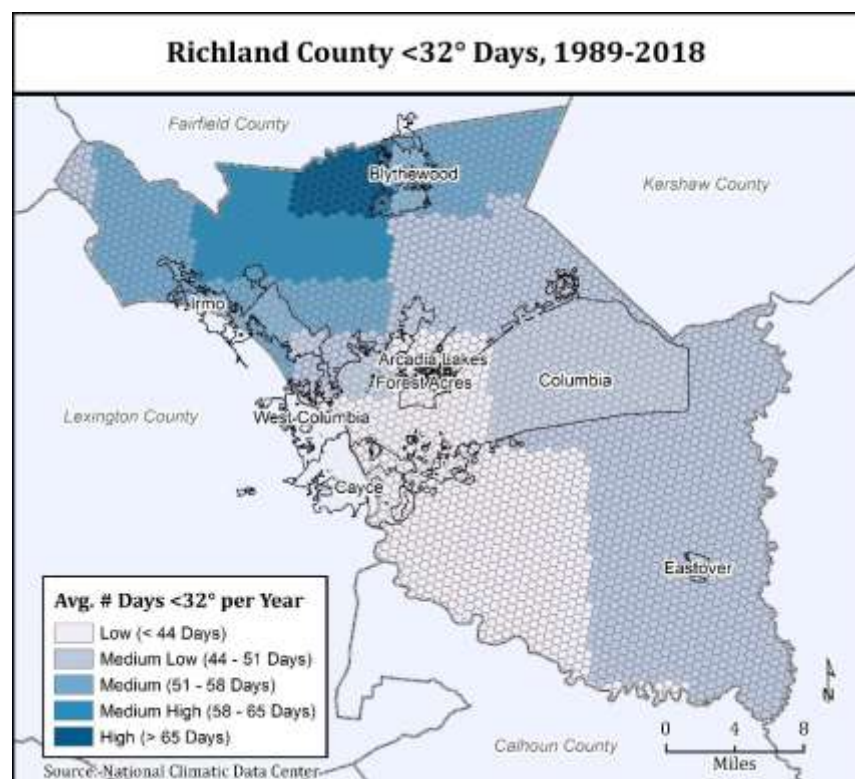


Figure 168 - Cold weather threat in Richland County.

Table 95 - Record of loss-causing cold weather events in Richland County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj	Fat	Property Damage	Crop Damage	Location	Description
3/30/1964	3/31/1964	0	0	\$0	\$908,676	Statewide	Killing Freeze
1/29/1966	1/30/1966	0	1	\$0	\$86,941	Statewide	Severe Cold, Ice, & Snow
1/8/1970	1/9/1970	0	0	\$726	\$7	Statewide	Severe Freeze
11/24/1970	11/25/1970	0	0	\$7	\$7	Statewide	Severe Freeze
4/1/1972	4/30/1972	0	0	\$0	\$352,265	Statewide	Cold Spell
10/3/1974	10/4/1974	0	0	\$6,739	\$0	Western, Northern, & Central SC	Frost & Freeze

Start Date	End Date	Inj .	Fat .	Property Damage	Crop Damage	Location	Description
10/3/1974	10/4/1974	0	0	\$6,739	\$0	Western, Northern, & Central SC	Frost & Freeze
3/2/1975	3/3/1975	0	0	\$0	\$5,236	Statewide	Low Temperatures
1/1/1977	1/31/1977	0	0	\$465	\$465	Statewide	Unusual Cold Weather
1/1/1977	1/31/1977	0	0	\$465	\$465	Statewide	Unusual Cold Weather
1/11/1982	1/11/1982	0	1	\$292	\$292	Statewide	Hard Freeze
3/27/1982	3/27/1982	0	0	\$0	\$291,907	Statewide	Extreme Cold
4/7/1982	4/7/1982	0	0	\$0	\$3,356,923	Statewide except the Southern Region	Frost & Freeze
4/7/1982	4/7/1982	0	0	\$0	\$3,356,923	Statewide except the Southern Region	Frost & Freeze
4/23/1982	4/24/1982	0	0	\$0	\$29	Statewide	Frost & Freeze
4/23/1982	4/24/1982	0	0	\$0	\$29	Statewide	Frost & Freeze
4/17/1983	4/18/1983	0	0	\$0	\$2,828,209	Statewide	Extreme Cold
12/25/1983	12/25/1983	0	1	\$28,282	\$28,282	Statewide	Extreme Cold
12/30/1983	12/31/1983	0	0	\$2,828	\$283	Statewide	Extreme Cold
1/20/1985	1/24/1985	0	1	\$26,179	\$2,618	Statewide	Extreme Cold & Snow
3/19/1985	3/19/1985	0	0	\$0	\$2,618	Statewide	Unusual Cold Weather
3/19/1985	3/19/1985	0	0	\$0	\$2,618	Statewide	Unusual Cold Weather
12/26/1985	12/26/1985	0	0	\$262	\$26	Statewide	Cold
1/26/1986	1/27/1986	0	0	\$2,570	\$26	Statewide	Cold
3/22/1986	3/23/1986	0	0	\$0	\$2,570	Statewide	Cold
4/23/1986	4/24/1986	0	0	\$0	\$2,570	Statewide	Unusual Cold Weather
4/23/1986	4/24/1986	0	0	\$0	\$2,570	Statewide	Unusual Cold Weather
4/1/1987	4/1/1987	0	0	\$0	\$2,925	Statewide except the Immediate Coastal Region	Freeze
10/1/1987	10/31/1987	0	0	\$0	\$248	Statewide	Cold Weather
3/14/1988	3/17/1988	0	0	\$238	\$0	Statewide	Low Temperature
12/22/1989	12/25/1989	0	0	\$29,027	\$0	Mountains, Foothills, Piedmont, & Midlands	Extreme Cold
3/21/1990	3/21/1990	0	0	\$0	\$215,524	Statewide	Freeze
1/24/1991	1/24/1991	0	1	\$0	\$0	Richland County	Hypothermia
11/4/1991	11/4/1991	0	1	\$0	\$0	Richland County	Hypothermia
3/13/1993	3/13/1993	0	0	\$112,091	\$11,209	SCZ006	High Winds & Cold

What to expect: Hot weather is common in Richland County during the late spring, summer and early fall months. On average, there are 20 to 29 days of above 95 degrees in any given year (Figure 169). Richland County will experience periods of above 100-degree temperatures in the months of May, June, July, August, September, and October. The hottest temperature recorded in Richland County was 113°F (June 29, 2012), which broke a 58-year-old record. Heat events are a high-risk event to public health due to the possibility of heat exhaustion and heat stroke. The number of high temperature days and the duration of heat waves are expected to increase.

Geographic Extent: The entire county is susceptible to hot temperatures. However, the central and western parts of the county experience more days of above 95 degrees.

New heat records have been set in South Carolina in recent years due to a warming climate. According to South Carolina's State Climatology Office, summer maximum temperatures in Richland County have increased by 2.7 degrees for the time period from 1901 through 2010. The City of Columbia has seen temperatures of above 100°F in the months of May, June, July, August, September, and October⁸². The hottest temperature on record for the state was set in Richland County with 113°F (June 29, 2012) breaking a 58-year-old record. The previous hottest temperature on record was 111°F (June 1954).

Top 10 warmest average June temperature records on record (Columbia, SC)⁸³

1. 83.7 degrees set in 2010
2. 83.7 degrees set in 1952
3. 83.3 degrees set in 2011
4. 82.6 degrees set in 2015
5. 82.3 degrees set in 1998
6. 82.3 degrees set in 1943
7. 82.0 degrees set in 2014
8. 82.0 degrees set in 1986
9. 81.9 degrees set in 1944
10. 81.9 degrees set in 1939

June years with the most days of 100 degrees or higher (Columbia, SC)

1. June 1952 – 10 days
2. June 2015 – 6 days
3. June 1956 – 6 days
4. June 2010 – 5 days
5. June 1998 – 5 days
6. June 1954 – 5 days
7. June 1950 – 5 days
8. June 1899 – 5 days

Hot weather statistics for Richland County are as following:

Number of Loss-Causing Events:	14
Frequency of Occurrence:	25%
Recurrence Interval:	0.04 years
Expected changes to frequency and recurrence interval in the future:	Increased occurrence and shortening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	\$12,746,647
Total Fatalities:	7
Deadliest Event:	1 fatality (several instances)
Most Property Damage:	\$5,146,441 (July 1993)
Most Crop Damage:	\$5,146,441 (August 1993)
Highest USDA Crop Indemnity Payout:	\$299,376 (June 2002)

⁸² Southeast Regional Climate Center, 2012. Record high temperatures for selected cities in the Southeast. Available at <https://sercc.com/comparative-climate-data/>

⁸³ NWS Weather Forecast Office Columbia, SC, 2015. June 2015 climate summary. Available at <http://www.weather.gov/cae/June2015Climate.html>

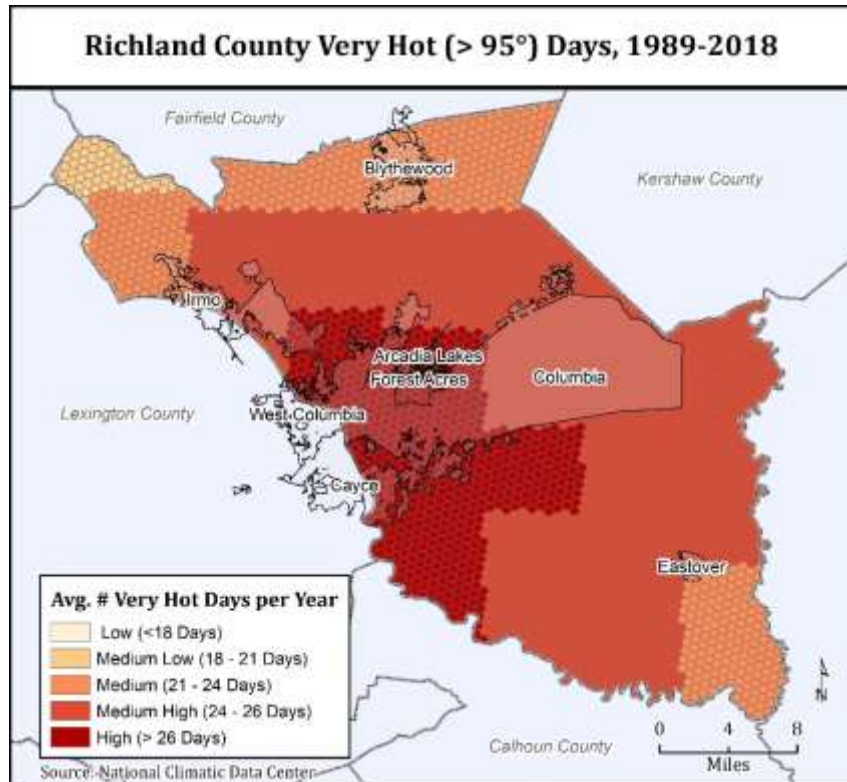


Figure 169 - Hot weather risk in Richland County.

Table 96 - Record of loss-causing hot weather events in Richland County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj .	Fat .	Property Damage	Crop Damage	Location	Description
2/1/1976	2/29/1976	0	0	\$495	\$4,951	Statewide	Heat
7/1/1977	7/31/1977	0	0	\$4,648	\$464,834	Statewide	Drought & Heat
10/1/1978	10/31/1978	0	0	\$432	\$4,320	Statewide	Drought & Heat
6/19/1981	6/19/1981	0	1	\$0	\$0	Columbia	Heat
6/1/1985	6/7/1985	0	0	\$0	\$261,793	Statewide	Heat
7/23/1986	7/23/1986	0	1	\$0	\$0	Richland County	Heat
7/10/1990	7/10/1990	0	1	\$0	\$0	Columbia	Heat
6/1/1993	6/30/1993	0	0	\$0	\$1,949,409	Statewide	Heat
7/1/1993	7/31/1993	0	0	\$10,292,881	\$0	Statewide	Drought & Heat
7/13/1993	7/13/1993	0	1	\$0	\$0	Richland county	Heat
8/1/1993	8/31/1993	0	0	\$0	\$10,292,881	Statewide	Drought & Heat
8/6/2007	8/6/2007	0	1	\$0	\$0	Richland	Excessive Heat
10/7/2009	10/7/2009	0	1	\$0	\$0	Richland	Excessive Heat
5/22/2019	5/22/2019	0	1	\$0	\$0	Richland	Heat

K) Wildfires

What to expect: In Richland County wildfires occur on average every 10 to 11 days, but damage to life and property is limited (Table 97). Wildfires happen all around the county, with clusters around the Blythewood and Eastover areas, while the region that is within Ft. Jackson is unreported due to it being federal land (Figure 170). The largest wildfire had a size of more than 1.5 square miles (1,005 acres) in 2007. Most wildfires in Richland County are very small, less than 50 acres; however, there are a few fires historically in Richland County that have exceeded 100 or even 200 acres burned (Figure 171). The number of wildfire events and the size of wildfires are expected to increase.

Geographic Extent: The entire county is susceptible to wildfire. The risk of wildfire including the propensity for large wildfires is highest in southern Richland County (Figure 170).

Wildfire statistics for Richland County are as following:

Number of Loss-Causing Events:	3
Daily Frequency of Occurrence:	0.09%
Daily Recurrence Interval:	10.8 days
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	\$401,355
Total Fatalities:	0
Deadliest Event:	n/a
Most Property Damage:	\$86,941 (March 15, 1966)
Most Crop Damage:	\$261,793 (March 1, 1985)
Highest USDA Crop Indemnity Payout:	n/av*

*No wildfire events caused a USDA Crop Indemnity Payout

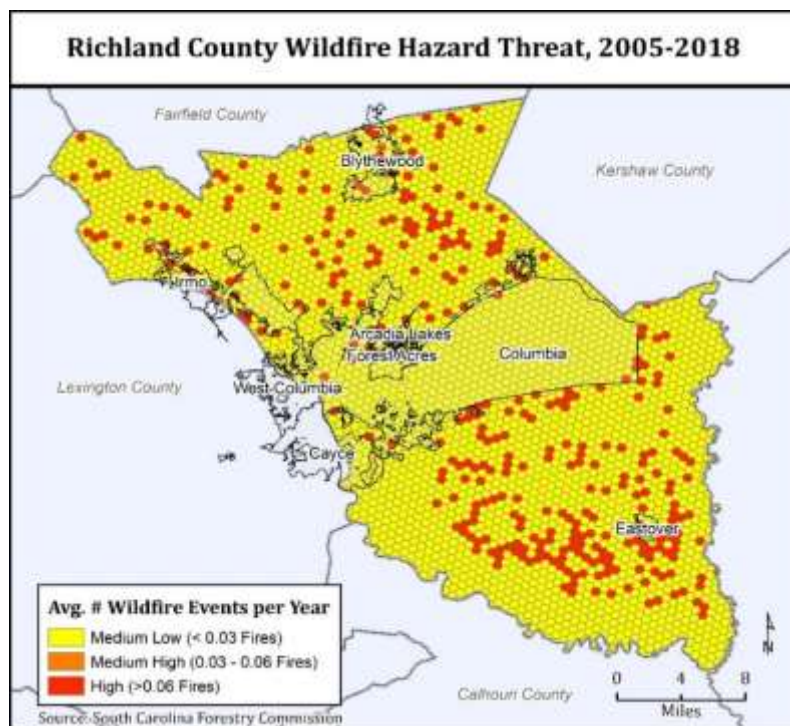


Figure 170 - Wildfire risk in Richland County based on average number of wildfires per year.

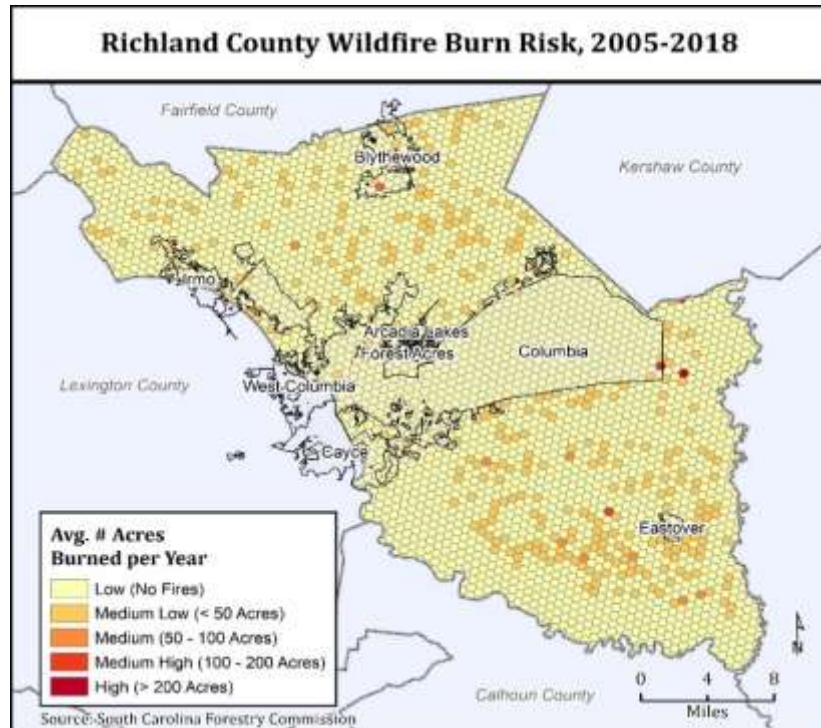


Figure 171 - Risk of large wildfires in Richland County.

Table 97 - Record of loss-causing wildfires in Richland County since 1960 (adj. to 2019 USD).

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag.	Location	Description
3/15/1966	3/31/1966	0	0	\$86,941	\$0		Statewide	Forest fires
3/1/1985	3/21/1985	0	0	\$26,179	\$261,793		Statewide	Fire
4/1/1985	4/30/1985	0	0	\$262	\$26,179		Statewide	Fire

L) Droughts

What to expect: Richland County sees drought conditions, i.e., weeks of moderate to extreme drought according to the Palmer Drought Severity Index, on average for 13 to 19 weeks a year (Figure 172). Multi-year, severe droughts are possible in the County as seen from 1998 through 2002. In 1993, the County experienced its driest year with only 27.14 inches of rainfall (annual average: 47.75 inches)⁸⁴. Droughts are detrimental to agricultural production (incl. forestry and water supply). Agricultural crops (especially corn, cotton, and soybean) are easily stressed by drought conditions and irrigation systems are not common in South Carolina. Severe droughts also affect tourism and freshwater fisheries. The number of droughts days and the duration of drought events are expected to increase.

Geographic Extent: The entire county is susceptible to drought, but the northern part of Richland County has experienced more weeks in drought conditions. It is important to note that northern Richland County despite its elevated drought risk has less generally hot weather than the rest of the county (Figure 172).

The most damaging droughts occurred in 1954, 1986, and 1998-2002, but the NCEI records do not fully capture their impact, likely due to underreporting (Table 98). The latest severely impacted economic

⁸⁴ SCDNR, n/d. South Carolina County Weather Atlas. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/cli_county_statistics.php

sectors such as agriculture, forestry, tourism, power generation, public water supplies, and freshwater fisheries⁸⁵. Less severe droughts were reported in 1988, 1990, 1993, and 1995. Unfortunately, the record on losses, particularly agricultural losses is sparse—not because of a lack of losses but because of shortcomings in tracking drought losses. The current tally of more than \$16 million in direct losses is most likely a vast underestimation and possibly exceeds \$100 million.

Drought statistics for Richland County are as following:

Number of Loss-Causing Events:	16
Frequency of Occurrence:	0.4%
Recurrence Interval:	2.5 years
Expected changes to frequency and recurrence interval in the future:	Increased likelihood of occurrence and shortening of return periods
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	\$16,069,921
Total Fatalities:	0
Deadliest Event:	n/a
Most Property Damage:	\$5,146,441 (July 1, 1993)
Most Crop Damage:	\$5,146,441 (August 1, 1993)
Highest USDA Crop Indemnity Payout:	\$344,631 (July 2002)

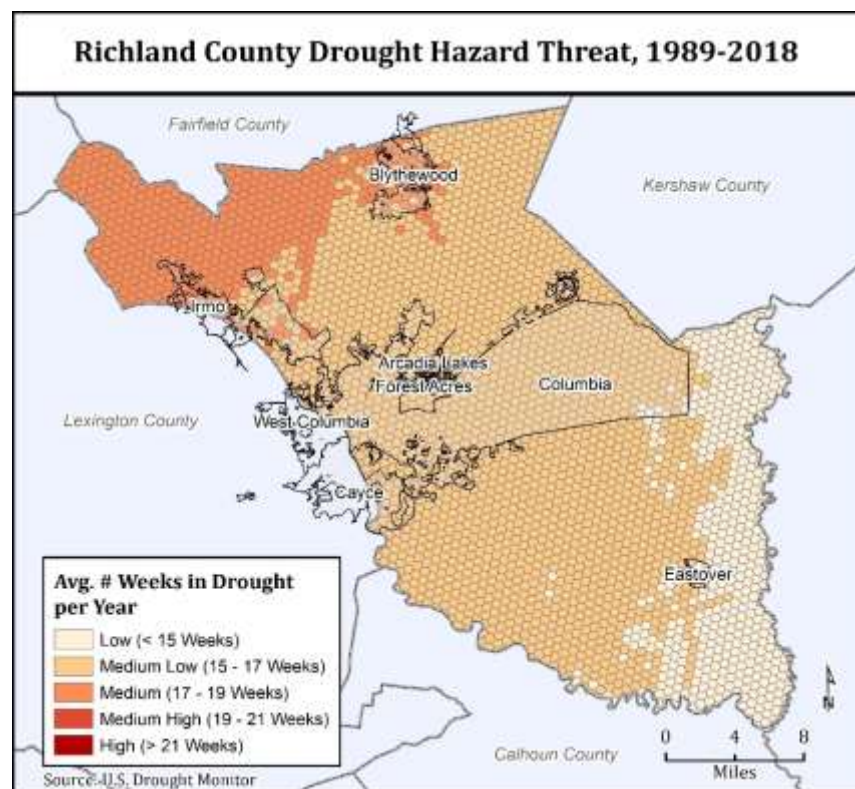


Figure 172 - Drought risk in Richland County.

⁸⁵ SCDNR, n/d. South Carolina Climate. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/cli_sc_climate.php

Table 98 - Record of loss-causing drought in Richland County since 1960 (adj. to 2019 USD).

Begin Date	End Date	Inj .	Fat .	Property Damage	Crop Damage	Mag.*	Location	Description
7/1/1977	7/31/1977	0	0	\$4,648	\$464,834	Moderate	Statewide	Drought & Heat
4/1/1978	4/13/1978	0	0	\$43	\$4,320	Dry	Statewide	Dry Weather
10/1/1978	10/31/1978	0	0	\$432	\$4,320	Moderate	Statewide	Drought & Dry Weather
6/1/1984	6/20/1984	0	0	\$0	\$2,711	Moist	Statewide	Drought
4/1/1986	4/30/1986	0	0	\$0	\$303	Dry	Statewide	Drought
5/1/1986	5/31/1986	0	0	\$0	\$2,570	Moderate	Statewide	Drought
6/1/1986	6/30/1986	0	0	\$2,570	\$25,702	Severe	Statewide	Drought
7/1/1986	7/31/1986	0	0	\$257,016	\$2,570,161	Severe	Statewide	Drought
2/1/1988	2/28/1988	0	0	\$24	\$2,381	Extreme	Statewide	Drought
6/1/1988	6/30/1988	0	0	\$2,381	\$23,811	Dry	Statewide	Drought
7/1/1988	7/31/1988	0	0	\$238	\$2,381	Dry	Statewide	Drought
8/1/1988	8/31/1988	0	0	\$3	\$3,222	Moderate	Northwestern, West-Central, Central, & Southern SC	Drought
7/1/1993	7/31/1993	0	0	\$10,292,881	\$0	Dry	Statewide	Drought & Hot Weather
8/1/1993	8/31/1993	0	0	\$0	\$10,292,881	Moderate	Statewide	Dry & Hot Weather
5/1/1994	5/31/1994	0	0	\$0	\$1,900,740	Moderate	Statewide	Drought
5/1/1995	5/31/1995	0	0	\$0	\$739,343	Moderate	Statewide	Drought

*Based on historic Palmer Drought Severity Index categories.

Note: While droughts occurred since 1995, the NCEI (formerly NCDC) did not report any losses. The occurrence of drought is reflected in Figure 247.

M) Earthquakes

What to expect: Richland County has a much lower earthquake risk than coastal counties in South Carolina and experiences only low magnitude earthquakes. Since 1900, the strongest earthquake had a magnitude of 2.9 (Figure 173). There is only a 0.03% chance that Richland County could experience shaking of up to 2m/s with a slightly higher shaking potential in the southern parts of the county (Figure 174).

Geographic Extent: The entire county is susceptible to earthquakes.

Earthquake statistics for Richland County are as following:

Number of Loss-Causing Events:	0
Frequency of Occurrence:	0.03%
Recurrence Interval:	40 years
Expected changes to frequency and recurrence interval in the future:	No changes
Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
Total Losses:	0
Total Fatalities:	0
Deadliest Event:	n/av
Most Property Damage:	n/av
Most Crop Damage:	n/av
Highest USDA Crop Indemnity Payout:	n/av

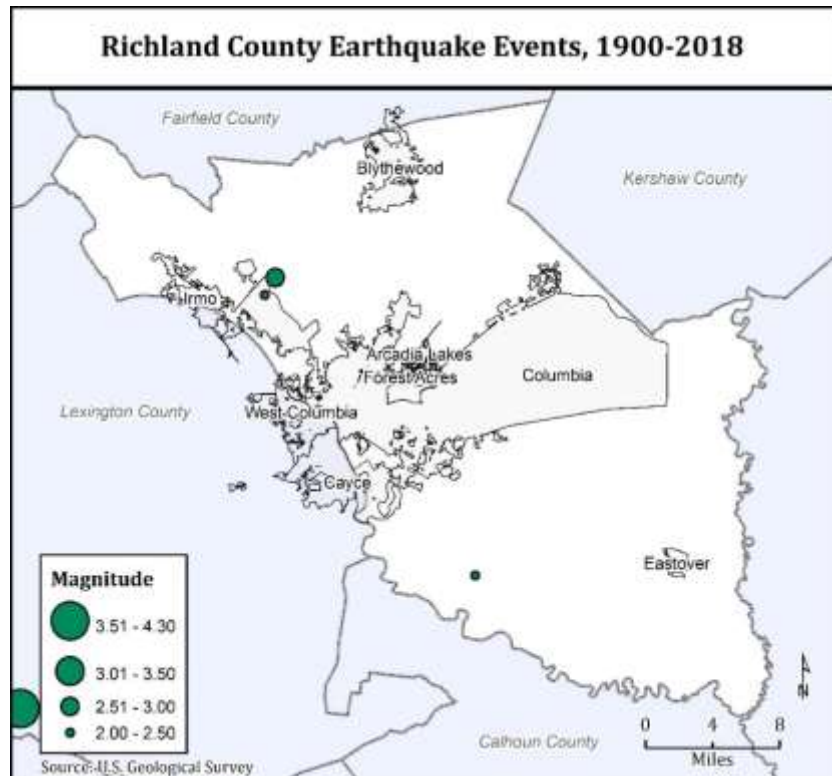


Figure 173 – Historical earthquake events in Richland County.

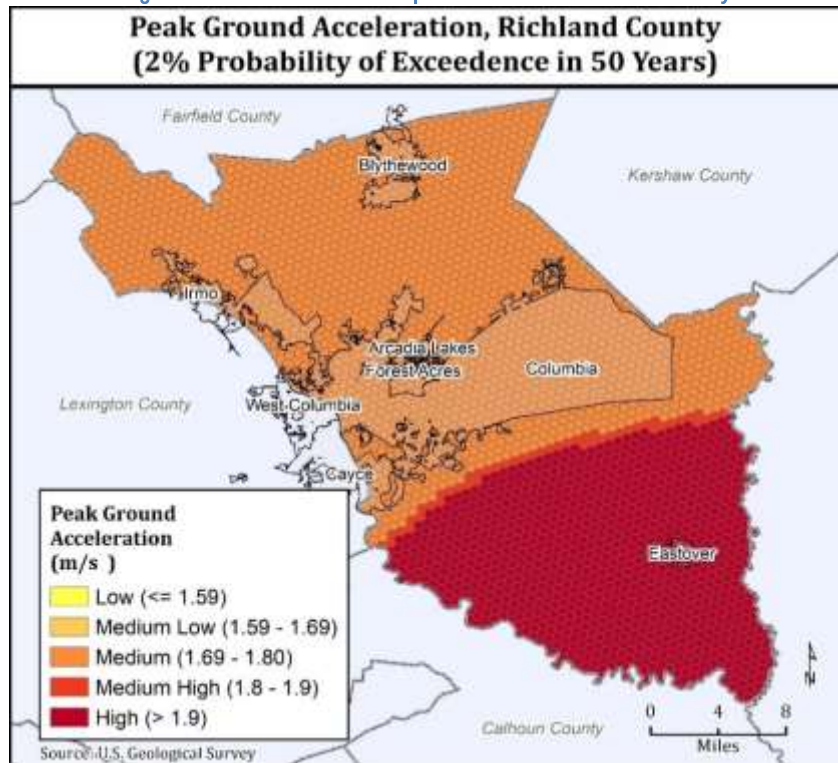


Figure 174 - Risk of shaking due to earthquakes in Richland County.

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7.2 Hazard Vulnerability Assessment for Richland County

Vulnerability is generally defined as the potential for loss. Understanding which populations and what assets are likely to be impacted by hazard events is critical for developing sound mitigation planning activities and projects. This assessment draws on three vulnerability indicators that are combined and averaged into a *Composite Vulnerability* measure that is then later overlayed with a hazard and the potential severity of consequence:

- Community lifeline and critical infrastructure assets (*INF*) provide a representation of what is at risk (*INF*).
- Areas with socially vulnerable residents provide an idea of who has a lower capacity to absorb shocks and stresses (*SoVI*), and
- Population density (*POP*) provides a representation of how many people are at risk and support a utilitarian approach to serving the greatest number of peoples.

$$VUL = \frac{(SoVI) + (INF) + (POP)}{3} \quad (2)$$

Community lifelines and critical infrastructure⁸⁶ assets such as transportation facilities, communication facilities, water and wastewater facilities, power facilities, and more. These facilities are those that all other infrastructure lifelines are dependent on. Socially vulnerable populations were derived from the Social Vulnerability Index first developed by Cutter (2003)⁸⁷ and later refined by scholars at the University of Central Florida⁸⁸. Understanding where populations reside who have a lower ability to prepare for, respond to, and recover from disaster events can help decision makers distribute scarce resources before, during, or after disasters.

The central region of Richland County above and to the west of City of Columbia experiences the highest levels of composite vulnerability, with the highest concentrations between Columbia and Blythewood, as well as in and around the Town of Arcadia Lakes and the City of Forest Acres (Figure 175). Most of the county outside of those two areas rates as either medium or medium-low composite vulnerability, with significant areas of medium vulnerability in the south near Eastover (Figure 175). The City of Columbia has low composite vulnerability for the most part, except for the most western edge of the city (Figure 175).

⁸⁶ <https://www.fema.gov/lifelines>

⁸⁷ <https://onlinelibrary.wiley.com/doi/abs/10.1111/1540-6237.8402002>

⁸⁸ www.vulnerabilitymap.org

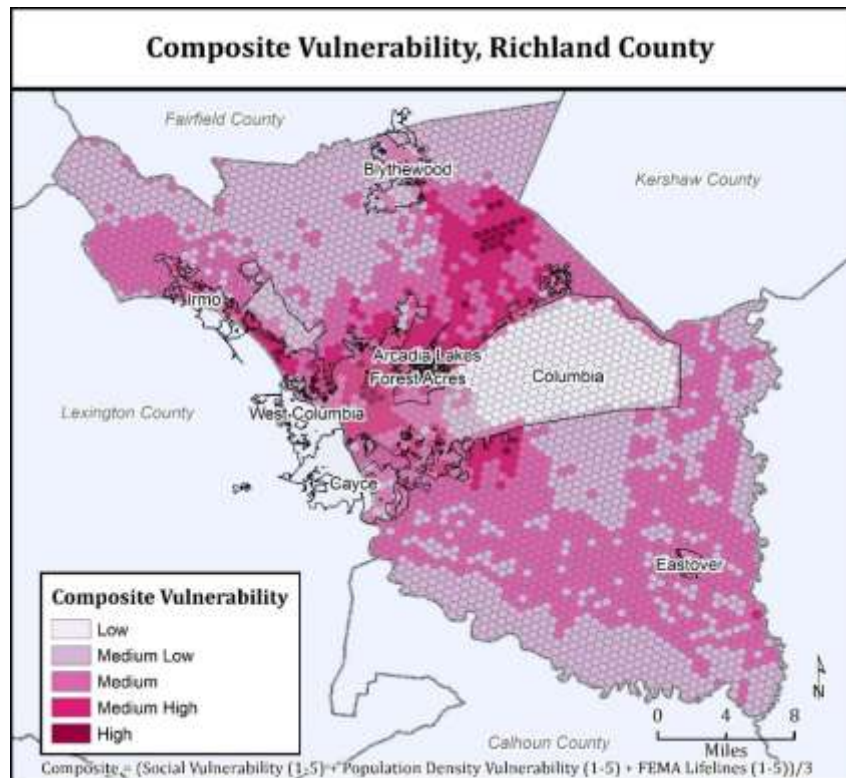


Figure 175 - Richland County's Composite Hazard Vulnerability.

Please see the Risk Assessment Methodology for a more detailed description of the approach.

A) Assets at Risk

Richland County has about 415,700 residents (2019 US Census) and has an approximate building stock of about 137,000 buildings with a replacement value of about \$49,031 million (in \$2019 according to HAZUS-MH 2.4) (Table 100). Since 2010, Richland County's population has increased by 8.2%, which has the effect of increasing composite vulnerability to hazards. See Section 3.4 for more information on development changes in the county.

There are 256 critical facilities in Richland County such as three Emergency Operation Centers, 17 hospitals, administrative buildings as well as numerous law enforcement, fire/EMS, and school facilities (Table 99). Almost all the county's critical infrastructure is in and around the West Columbia, Forest Acres Arcadia Lakes, and the City of Columbia, with some scattered clusters near Blythewood and Irmo as well (Figure 176). More information on the vulnerability assessment for each critical facility can be found in Appendix I.

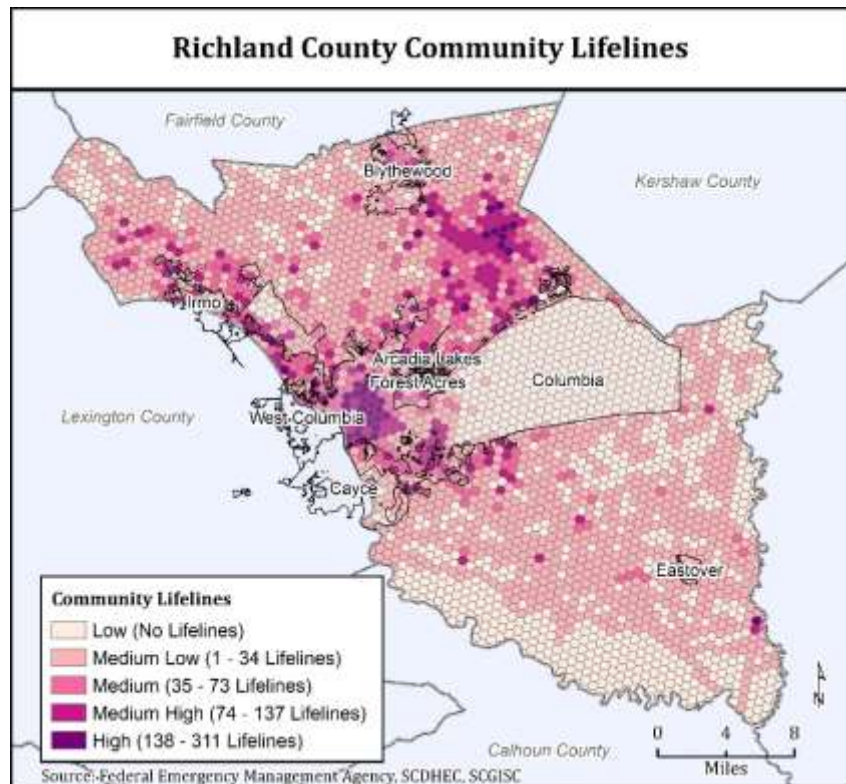


Figure 176 - Distribution of community lifelines and critical facilities in Richland County.

Assets at risk (Table 99) were assessed using FEMA's Lifeline⁸⁹ with the understanding that:

- Lifelines enable the continuous operation of critical government and business functions and is essential to human health and safety or economic security.
- Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function.
- FEMA has developed a construct for objectives-based response that prioritizes the rapid stabilization of Community Lifelines after a disaster.
- The integrated network of assets, services, and capabilities that provide lifeline services are used day-to-day to support the recurring needs of the community and enable all other aspects of society to function.
- When disrupted, decisive intervention (e.g., rapid re-establishment or employment of contingency response solutions) is required to stabilize the incident.

Table 99 - Critical Infrastructure Included in Richland County's Hazard Risk Assessment.

FEMA Lifeline	Variable	Critical	Count
Safety and Security	Law Enforcement	Yes	26
Safety and Security	Prisons		16
Safety and Security	Fire/EMS	Yes	54
Safety and Security	Govt Services - Courthouses		2
Safety and Security	Local EOCs	Yes	3
Safety and Security	Community Safety - Convention Centers/Fairgrounds		12
Safety and Security	Public Schools		105

⁸⁹ <https://www.fema.gov/lifelines>

FEMA Lifeline	Variable	Critical	Count
Safety and Security	Private Schools		28
Safety and Security	Colleges and Universities		17
Safety and Security	Mobile Home Parks		56
Safety and Security	Places of Worship		479
Safety and Security	Nursing Homes		14
Food, Water, Shelter	Food Stores		187
Food, Water, Shelter	Nutrition Sites – Supplemental Meal Sites		219
Food, Water, Shelter	Water Treatment Plants and Water Supply Intake	Yes	8
Food, Water, Shelter	Shelter		47
Health and Medical	Hospitals	Yes	17
	Other Medical		643
Energy	Transmission Lines (1/10-mile road segments) and Substations		7,825
	Substations	Yes	135
	Electric power generation	Yes	3
Energy	Gas Stations		208
Communications	Infrastructure		149
Communications	Banks and Finance		174
Transportation	Non-State Highway/Roadway (1/10-mile road segments)		41,708
Transportation	Railway (1/10-mile road segments)		1,740
Transportation	Aviation	Yes	7
Hazardous Materials	Toxic Release Inventory Sites		64
Hazardous Materials	Superfund Sites		3
Hazardous Materials	Solid Waste	Yes	3

Building exposure exceeds more than \$49 billion in value with residential buildings accounting for more than \$38 billion alone (Table 100).

Table 100 - Building stock values by occupancy type in Richland County. Source: HAZUS 4.2.

Building Type	Total Replacement Value (in \$2019 Millions)
Residential	\$38,577
Commercial	\$6,449
Industrial	\$1,326
Agricultural	\$65
Religious	\$780
Government	\$754
Education	\$1,080
Total	\$49,031

B) Social vulnerability and Population Density

Social vulnerability, a concept focused on understanding an area's capacity to prepare for, respond to, and rebound from disaster events⁹⁰, has a long conceptual and theoretical history in social and disaster science fields.⁹¹ Socially vulnerable populations have fewer resources to aid in preparation for disasters, often bear the brunt of disaster impacts, and take longer to bounce back from disaster events. Empirical measures of social vulnerability enable decision makers and emergency managers to understand where vulnerable populations reside and how that vulnerability is manifest across a landscape. Here, 29 indicators of social vulnerability, collected from www.vulnerabilitymap.org, were used to create a tract level SoVI for the county. SoVI scores were categorized from (0 – no data to 5 – high social vulnerability) using a standard deviation classification scheme (Figure 218).

The most socially vulnerable populations of Richland County are north of Columbia around the Town of Arcadia Lakes and the City of Forest Acres, as well as below the City of Columbia and along the east-central border of the county (Figure 177). The southern third of Richland County rates medium-high, while the northern third ranges from medium to medium-low (Figure 177). Most of Richland County has low to medium-low population density, with only areas of high population density near Forest Acres, Arcadia Lakes, Columbia, and West Columbia (Figure 178).

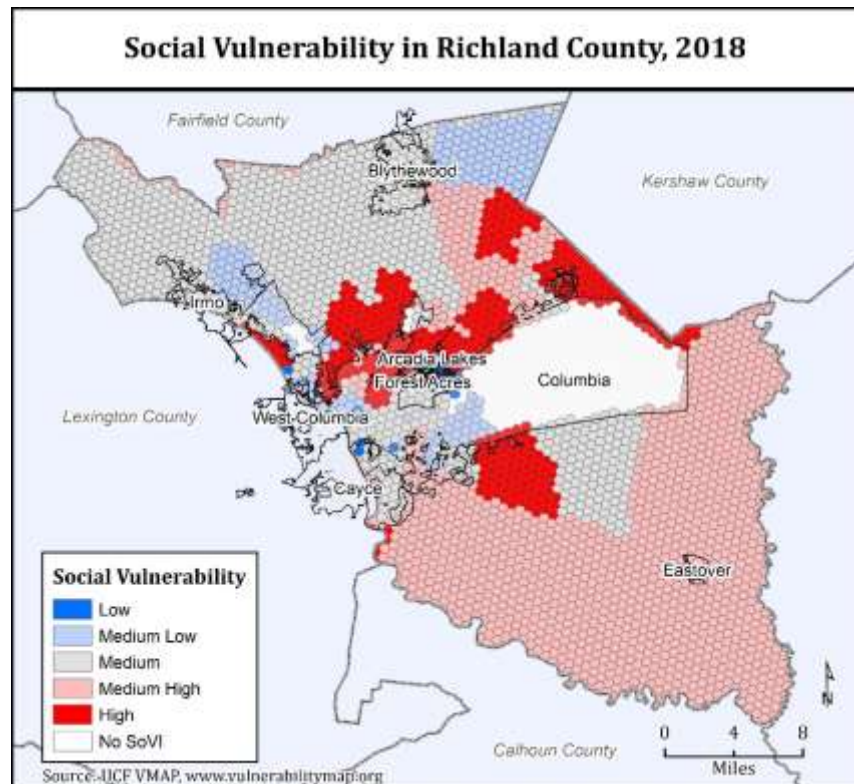


Figure 177 - Socially vulnerable tracts in Richland County.

⁹⁰ <https://doi.org/10.1177/0002716205285515>

⁹¹ <https://unu.edu/publications/books/measuring-vulnerability-to-natural-hazards-towards-disaster-resilient-societies-second-edition.html#overview>

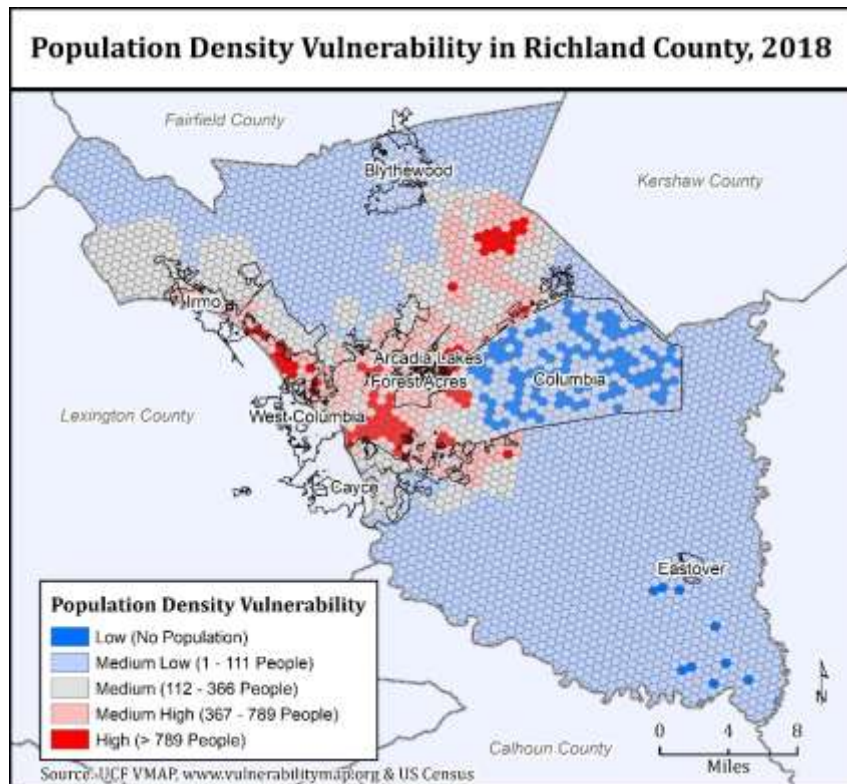


Figure 178 - Richland County's Population Distribution.

7.3 Severity of Consequence Assessment for Richland County

Every hazard is unique in terms of its past impacts and future potential for impacts. In this Plan, this is captured as the Severity of Consequence (CON). This universal accounting of hazard risk for Richland County considers historical impacts (*HISTCON*), hazard frequencies, future climate impacts, as well as the current high priority hazards of the county, and those likely to cause continued losses if not mitigated (See Section 0 for more information on this calculation and its component variables).

For Richland County, the hazards with the highest severity of consequence are the following (Table 101):

1. Hurricane and tropical storm
2. Flash Flood
3. Heat
4. Drought
5. Severe Thunderstorms

Table 101 - Richland County Severity of Consequence Scores by Hazard.

Hazard	Historical Score (1-5)	Climate Sensitivity Score (1-5)	Severity/Frequency Score (1-5)	Priority Score (1-5)	Severity of Consequences (CON) Score (4-20)	Standardized CON Score (1-5)
Drought	1.41	5	1.51	4.33	12.25	3.47
Earthquake	1.00	3	1.00	2.33	7.33	2.00
Extreme Cold	2.14	1	1.06	3.00	7.20	1.96
Flash Flood	5.00	5	1.15	2.33	13.48	3.84
Flooding	1.29	5	1.08	1.67	9.04	2.51
Fog	1.00	1	1.00	1.00	4.00	1.00
Hail	1.43	3	1.01	1.67	7.11	1.93
Heat	2.54	5	1.37	4.33	13.24	3.77
Hurricane/ Tropical Storm	3.69	5	5.00	3.67	17.36	5.00
Lightning	3.92	3	1.05	1.67	9.64	2.69
Severe Storm/ Thunderstorm	3.90	5	1.03	1.00	10.93	3.07
Tornado	2.28	3	1.75	3.67	10.70	3.01
Wildfire	1.02	5	1.03	1.00	8.05	2.21
Wind	3.62	3	1.02	3.00	10.64	2.99
Winter Weather	1.23	1	1.03	5.00	8.26	2.28

7.4 Risk Assessment for Richland County

The following sections discuss the hazard-specific risks for each hazard affecting Richland County. As described in the Risk Assessment Methodology section, a hazard's risk is the product of the *Hazard Threat (THR)*, *Vulnerability (VUL)*, and *Severity of Consequence (CON)*. All calculations are completed at the unit of analysis, which in this Plan is a 0.25-mile hexagon.

$$RISK_{HAZ} = (THR_{HAZ})(VUL)(CON_{HAZ}) \quad (1)$$

A) Flooding

The risk to riverine flooding is most pronounced in 1000-year floodplains (0.1% annual chance of occurrence) in southern and central Richland County due to the presence of higher composite vulnerability in the central region and higher flood hazard threat levels in the southern region (Figure 179). Exposure in the 1000-year floodplain is largely limited to residential buildings with four six critical facilities located inside the 1000-year floodplain (Figure 180). It is important to note that the determination of infrastructure inside or outside the 1000-year floodplain was solely based on location and did not take elevation into account. Therefore, being located inside the 1000-year floodplain does not carry any implications regarding requirements for the National Flood Insurance Program.

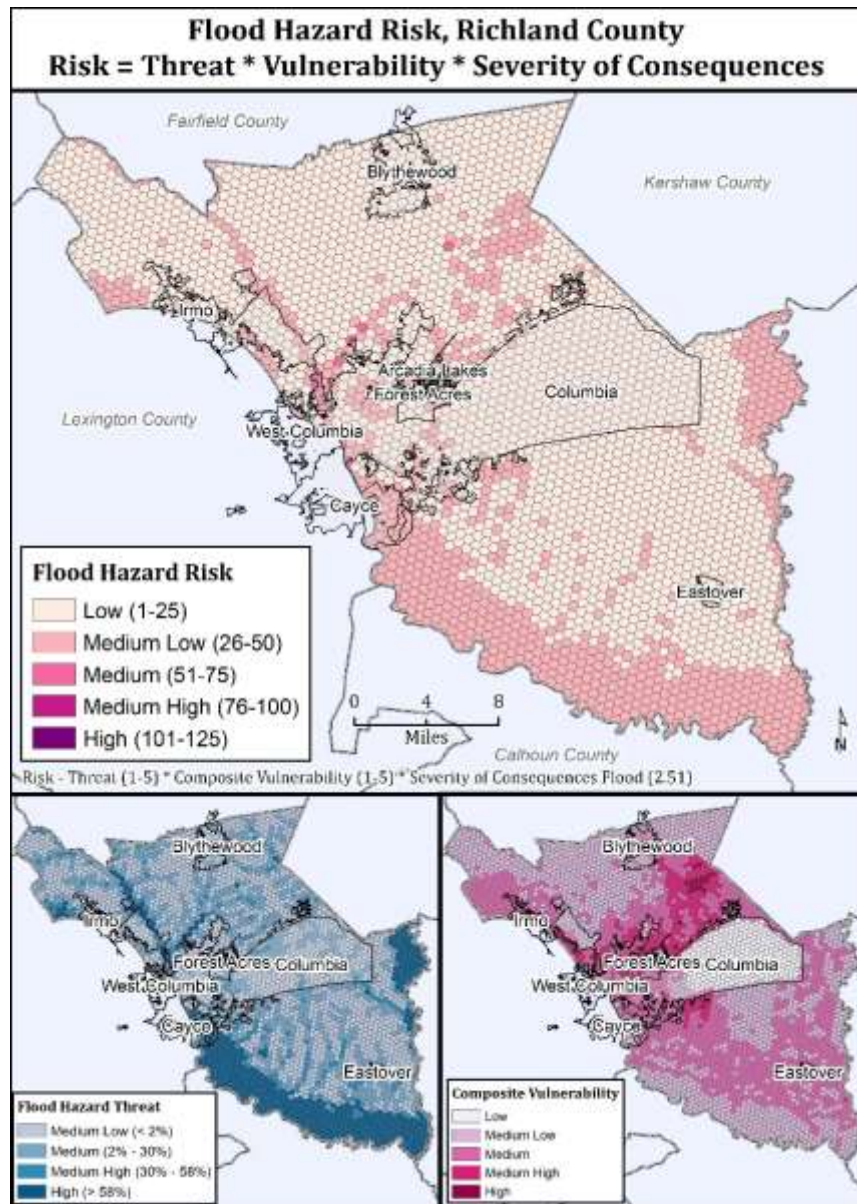


Figure 179 - Risk of floods in Richland County.

For a 1,000-year flood event (0.1% annual chance of occurrence) (Figure 180), about 178 buildings (more than 45% of buildings within modelled 1000-year floodplain) would be at least moderately damaged with an estimated property damage of \$198 million (over 2/3rds of it residential) with most of the damage occurring pockets of northern, central, and southern Richland County around Irmo, West Columbia, and Eastover respectively (Figure 181). It is expected that one police station and three school would receive at least moderate damage. The modelled flood's impact area overlaps to some degree with the county's vulnerable populations. All estimates were derived using HAZUS-MH 2.2. Note that HAZUS-MH does not accurately model the outline of lakes incl. Lake Murray. In addition, stretches of the lower Congaree River, southwest of Eastover, had to be excluded due to computational issues with HAZUS.

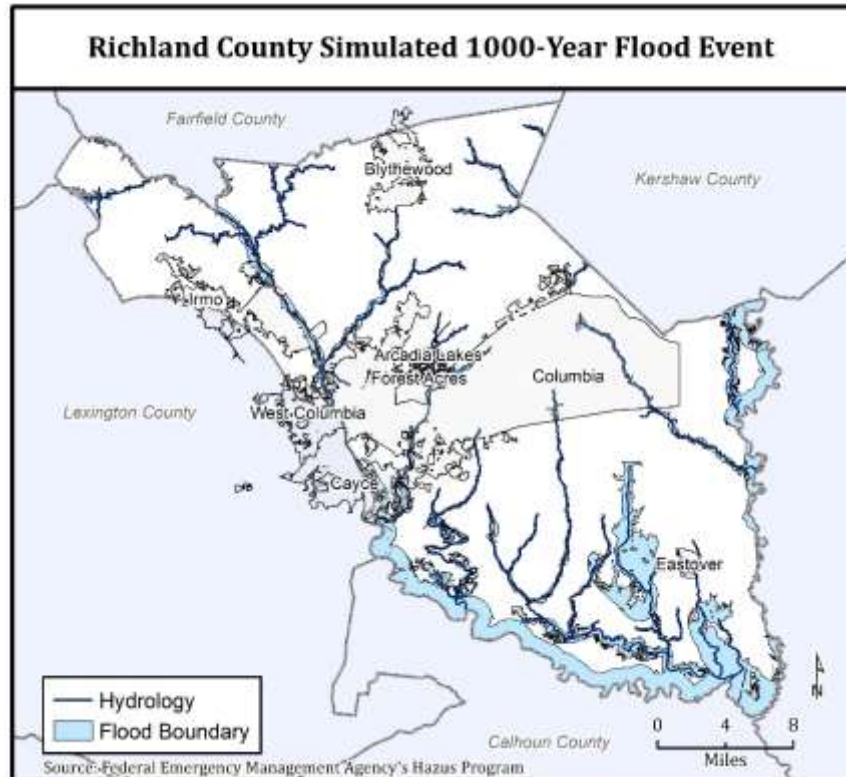


Figure 180 - Modelled 1,000-year flood event in Richland County.

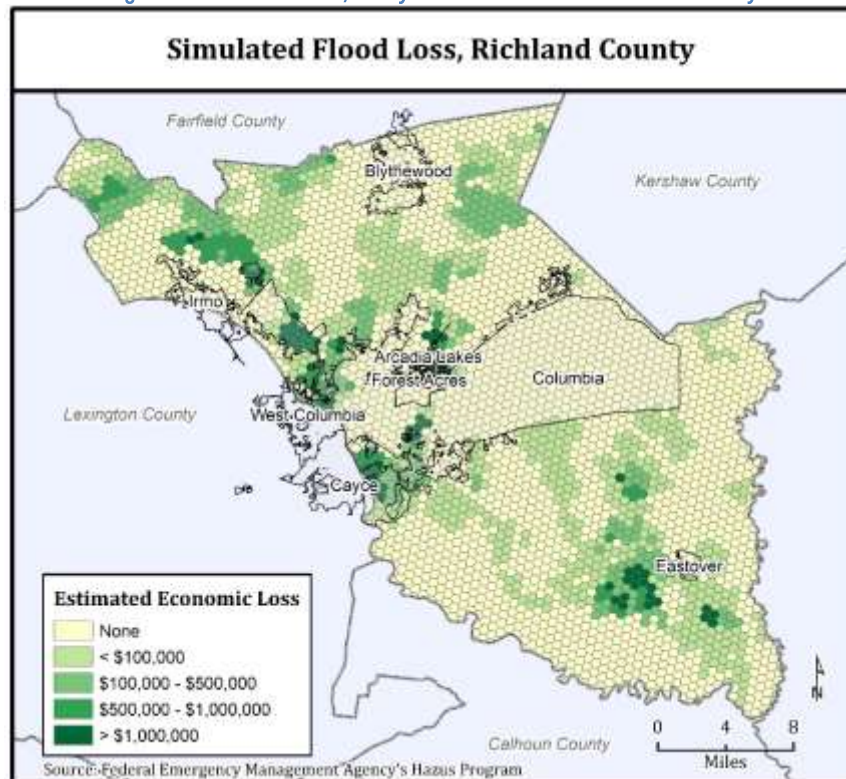


Figure 181 - Damage from a modelled 1,000-year flood event in Richland County.

Flash flooding hazard risk in Richland County has a distinct decreasing radiation of threat levels, with the highest flash flood threat enveloping the entire Cities of Columbia, Cayce, and Forest Acres with greater

than 2 flash flood warnings a year (Figure 182). Most of the county outside of the first two layers of the circle emanating from the City of Columbia experiences medium levels of flash flood threat. When this is overlaid with Richland County's composite vulnerability, the risk follows a fairly similar geographic pattern to the threat map, with the urban area in and around the City of Columbia having medium through high risk, and the rest of the county only rating as having medium-low to medium risk (Figure 182).

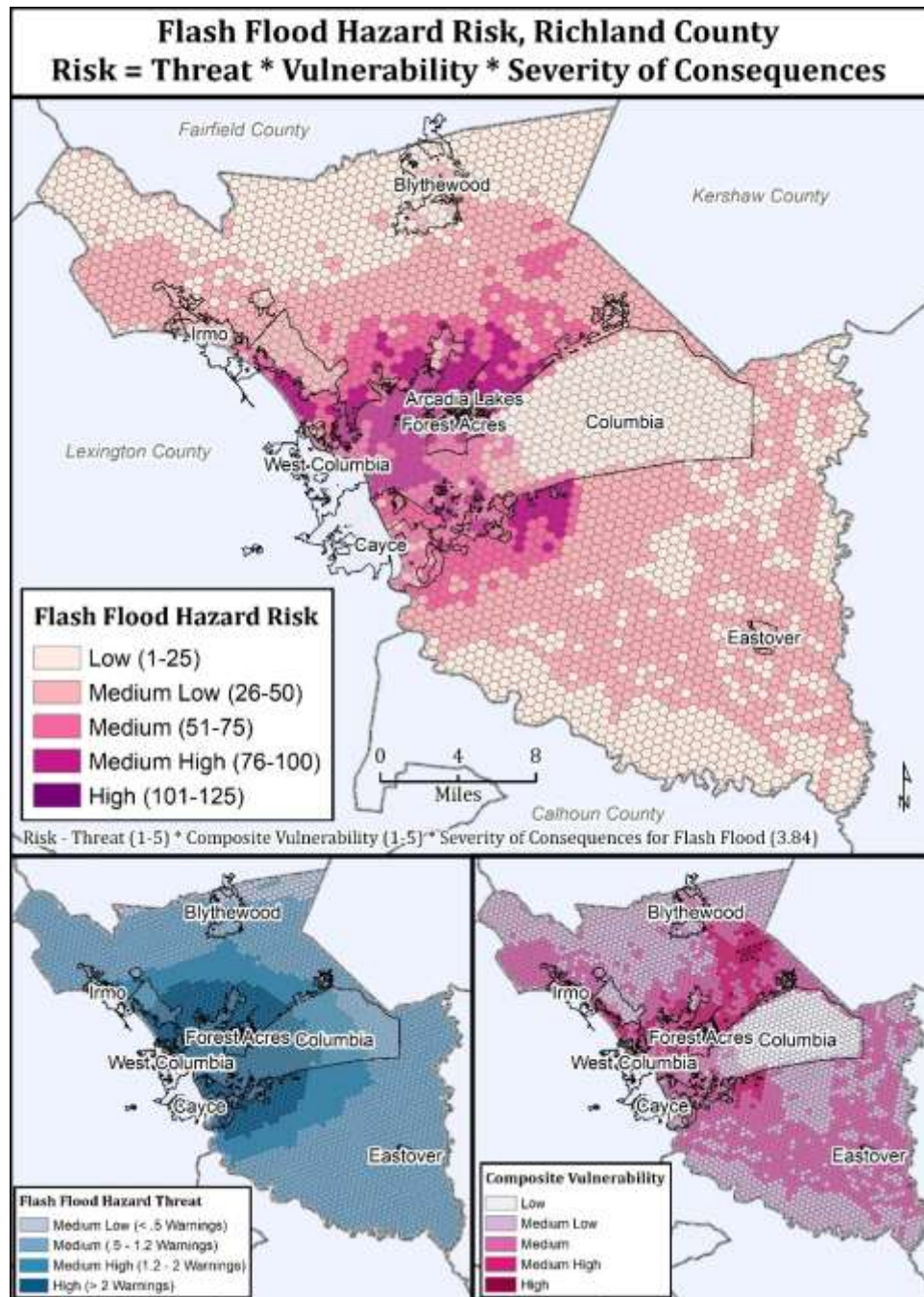


Figure 182 - Flash flood risk in Richland County.

B) Hurricanes & Tropical Cyclones

The southern and central part of Richland County exhibits a higher risk to tropical cyclones than the northern areas (Figure 183). Especially in southern Richland County, medium composite vulnerability overlaps with a high tropical storm threat. None of the critical infrastructure is located in the highest risk areas (Figure 183).

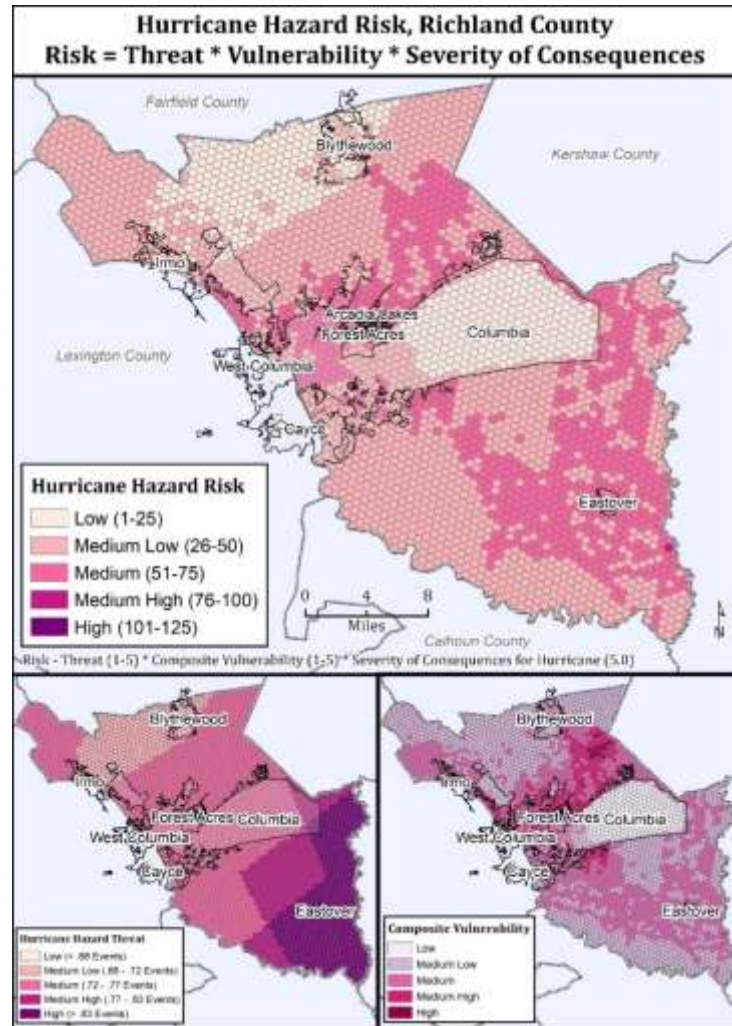


Figure 183 - Risk of tropical storms in Richland County.

For a 1,000-year hurricane event, southern Richland County is expected to see wind speeds between 111 and 129 miles per hour (Category 3), while the central and northern Richland County would see 96 to 110 miles per hour (Category 2) (Figure 184). Such wind speeds are probable with a fast-moving, major hurricane that has a similar track to Hurricane Hugo. About 67% of the county's infrastructure would be undamaged. Over 9,500 buildings (or 7% of the building stock) would be at least moderately damaged with an estimated property damage over \$1.6 billion (87% of it residential) with most of the damage occurring in central and northeastern Richland County (Figure 185). It is expected that some EOC's, fire stations, hospitals, police stations, & schools will receive minor damages, but will be operational within a day. In central Richland County, the modelled storm's most catastrophic impact area overlaps with some of the county's most vulnerable populations. All estimates were derived using HAZUS-MH 2.2.

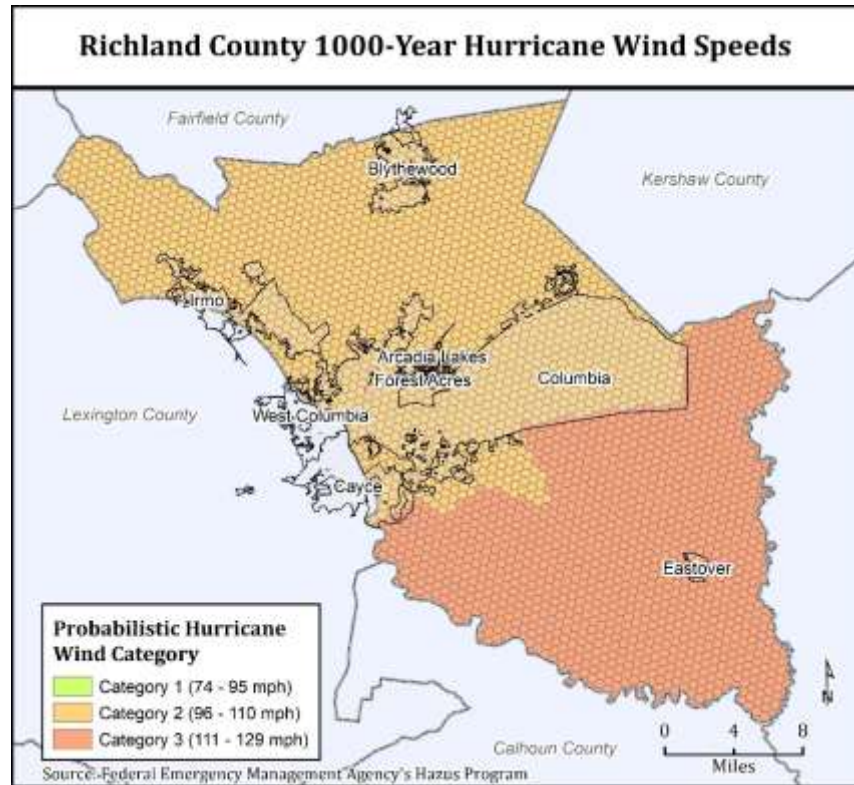


Figure 184 - Hurricane wind speeds using a 1,000-year storm event in Richland County.

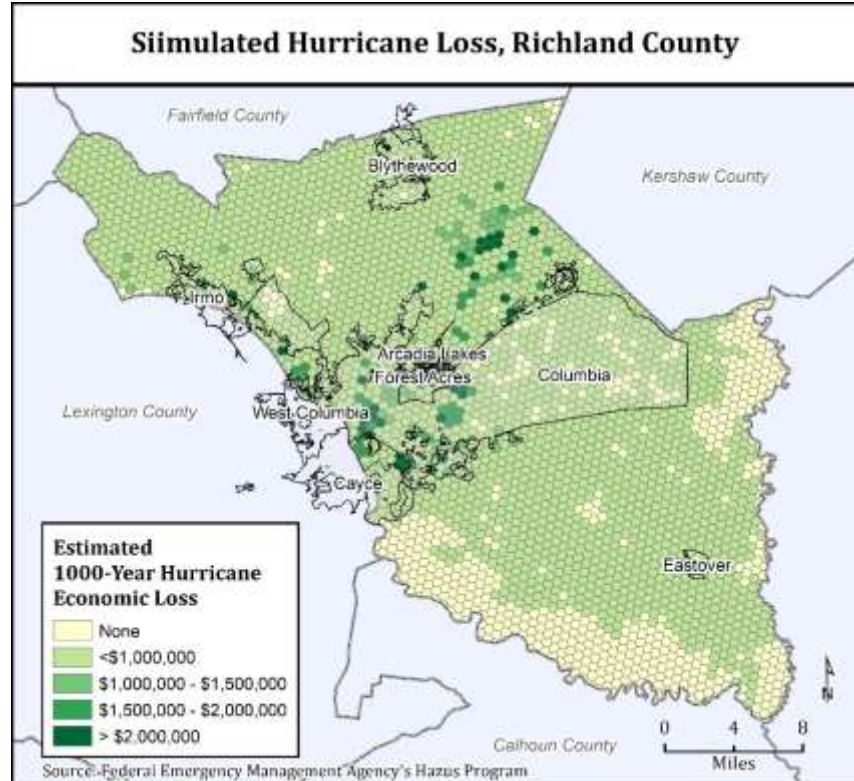


Figure 185 - Damage from a modelled 1,000-year hurricane event in Richland County.

C) Tornadoes

Areas of medium-low risk to tornadoes, i.e., a high level of tornado threat (more than 0.2 warnings per year) along with high composite vulnerability, occur in southernmost Richland County near Eastover, between Blythewood and Columbia, and in a small area near the Town of Irmo (Figure 186). The rest of the county experiences a low tornado hazard risk due to the tornado threat being concentrated only in the north near Irmo and the south near Eastover (Figure 186).

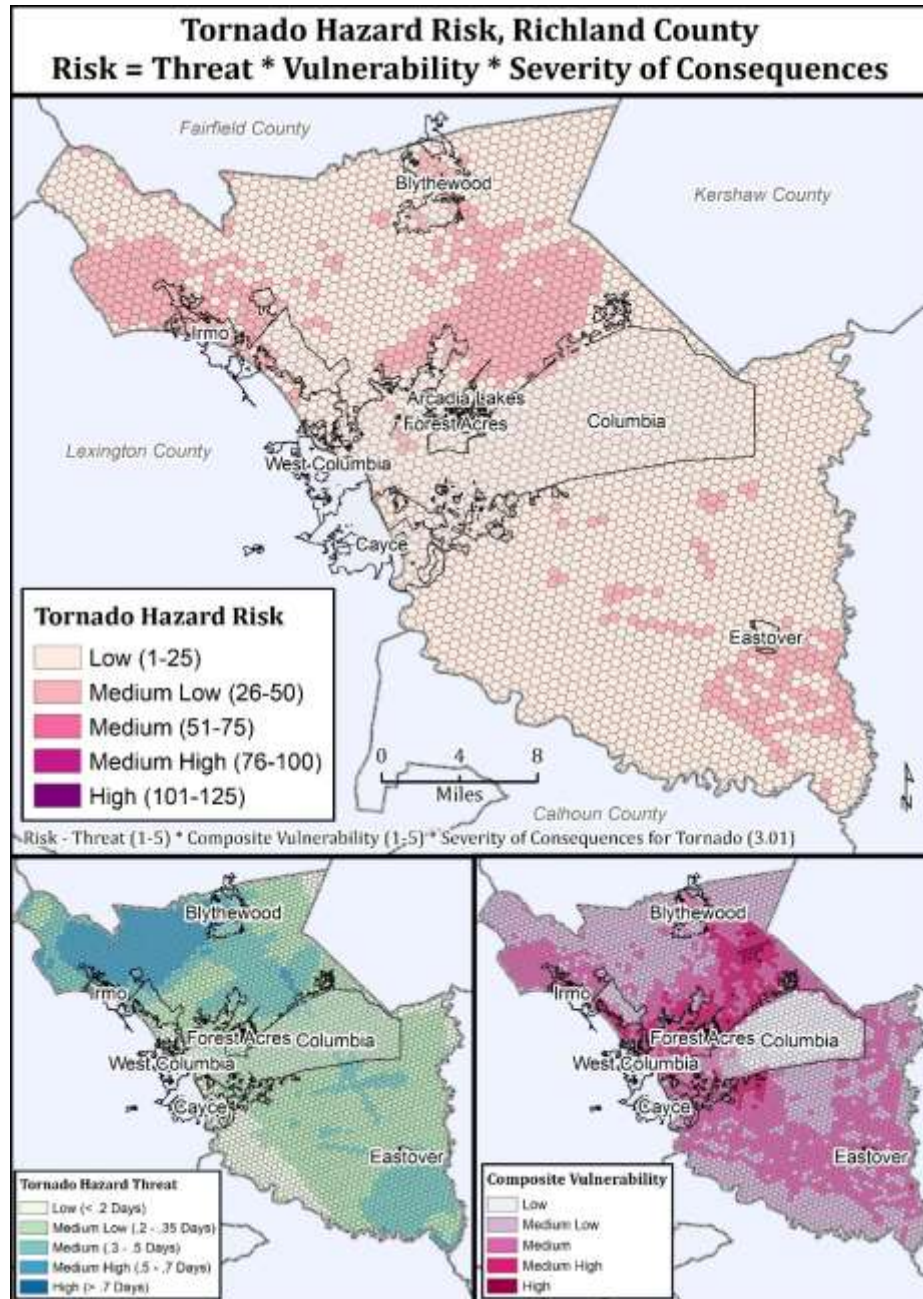


Figure 186 - Risk of tornadoes in Richland County.

D) Thunderstorms

While all of Richland County experiences severe storm hazard threat levels higher than low (> 8 days), there is a large cluster of medium-high and high threat level sections near the south-central region of the county (Figure 187). The region of high threat stretches from the middle of the City of Columbia's borders all the way to Eastover (Figure 187). This threat level area overlaps with the central and southern regions of higher composite vulnerability to put most of the county at a medium-low severe storm hazard risk, and a small area of medium and medium-high risk south of Forest Acres (Figure 187). Since most of the risk area is outside areas of high composite vulnerability, most of the critical infrastructure of Richland County would not be majorly affected by severe storms (Figure 187).

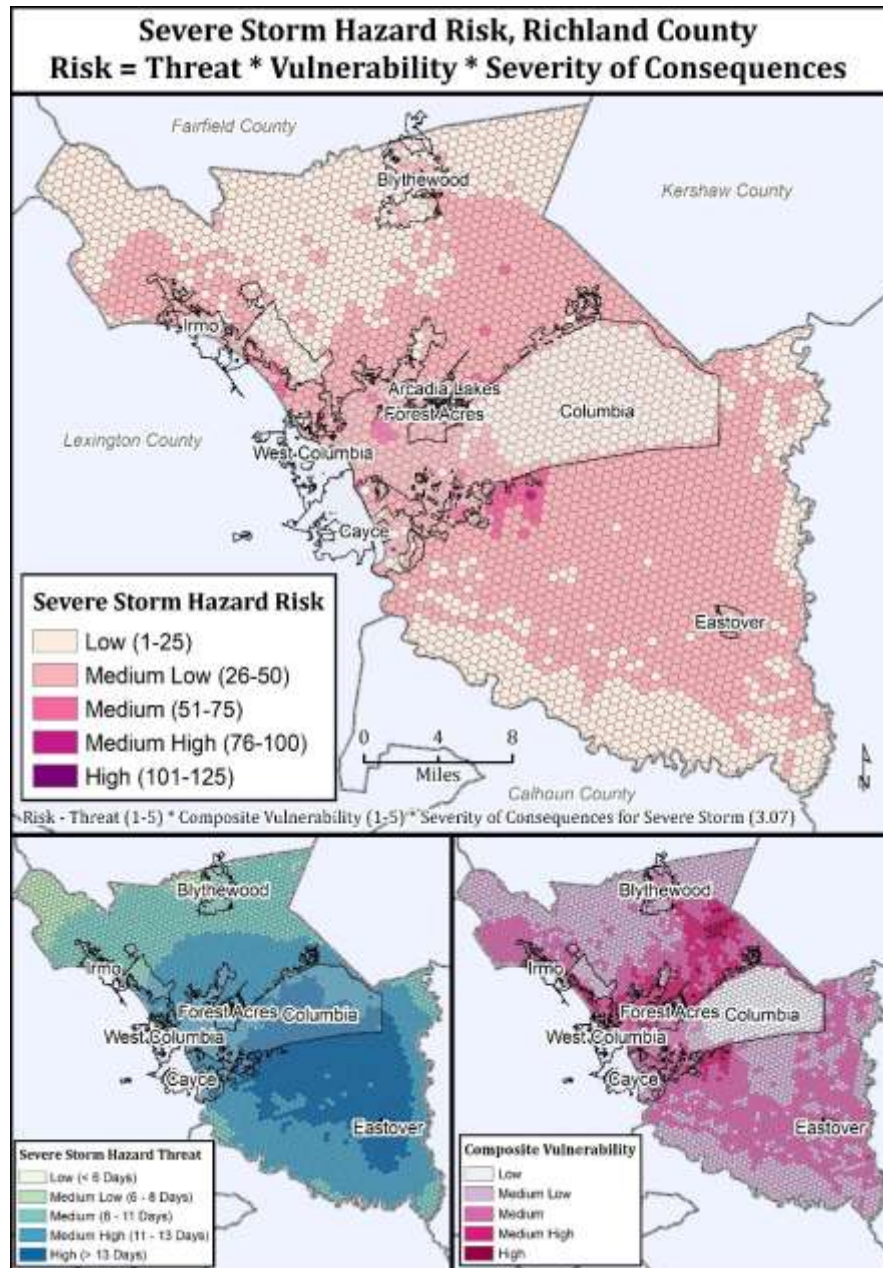


Figure 187 - Risk of severe thunderstorms in Richland County.

E) Lightning

The highest risk to lightning occurs in central and south-central part of Richland County, due to high clusters of composite vulnerability in and near West Columbia and the City of Columbia, as well as higher lightning hazard threat in the lower half of the county (Figure 188). In this area, the threat level is medium-high to high, meaning it experiences around 484 to 576 or more strikes a year (Figure 188).

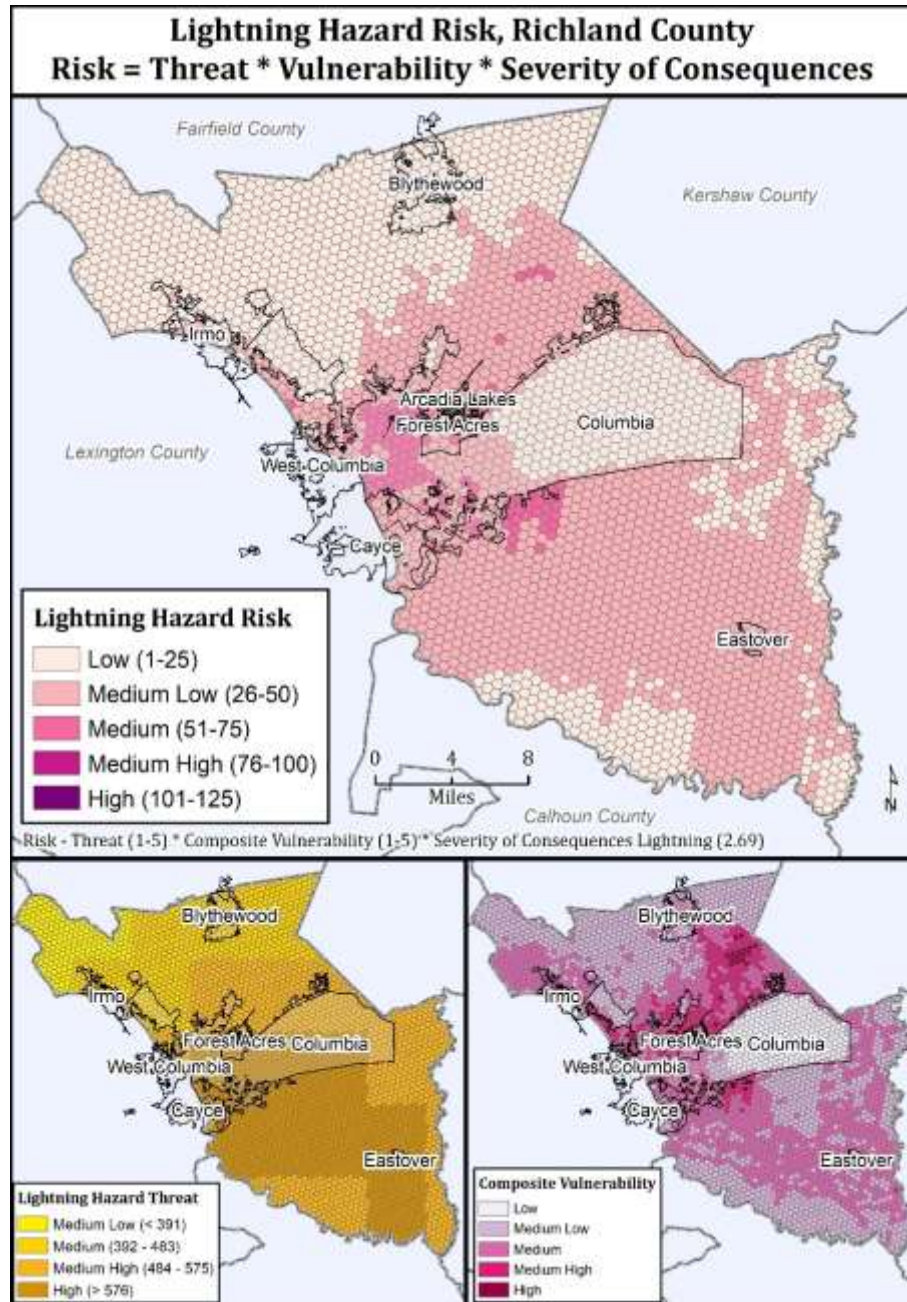


Figure 188 - Risk of lighting in Richland County.

F) Wind

Areas with the highest wind hazard threat in Richland County are irregularly distributed, following straight line tracts that have a threat level of medium or high (.02 to .05+ days) compared to their surrounding area of low threat (Figure 189). Due to this limited range of threat occurrence in the county, there is little overlap with large areas of higher composite vulnerability (Figure 189). However, some regions of coincidence do exist around the Towns of Irmo and Arcadia Lakes, as well as in and around the City of Forest Acres and west of the Town of Eastover (Figure 189).

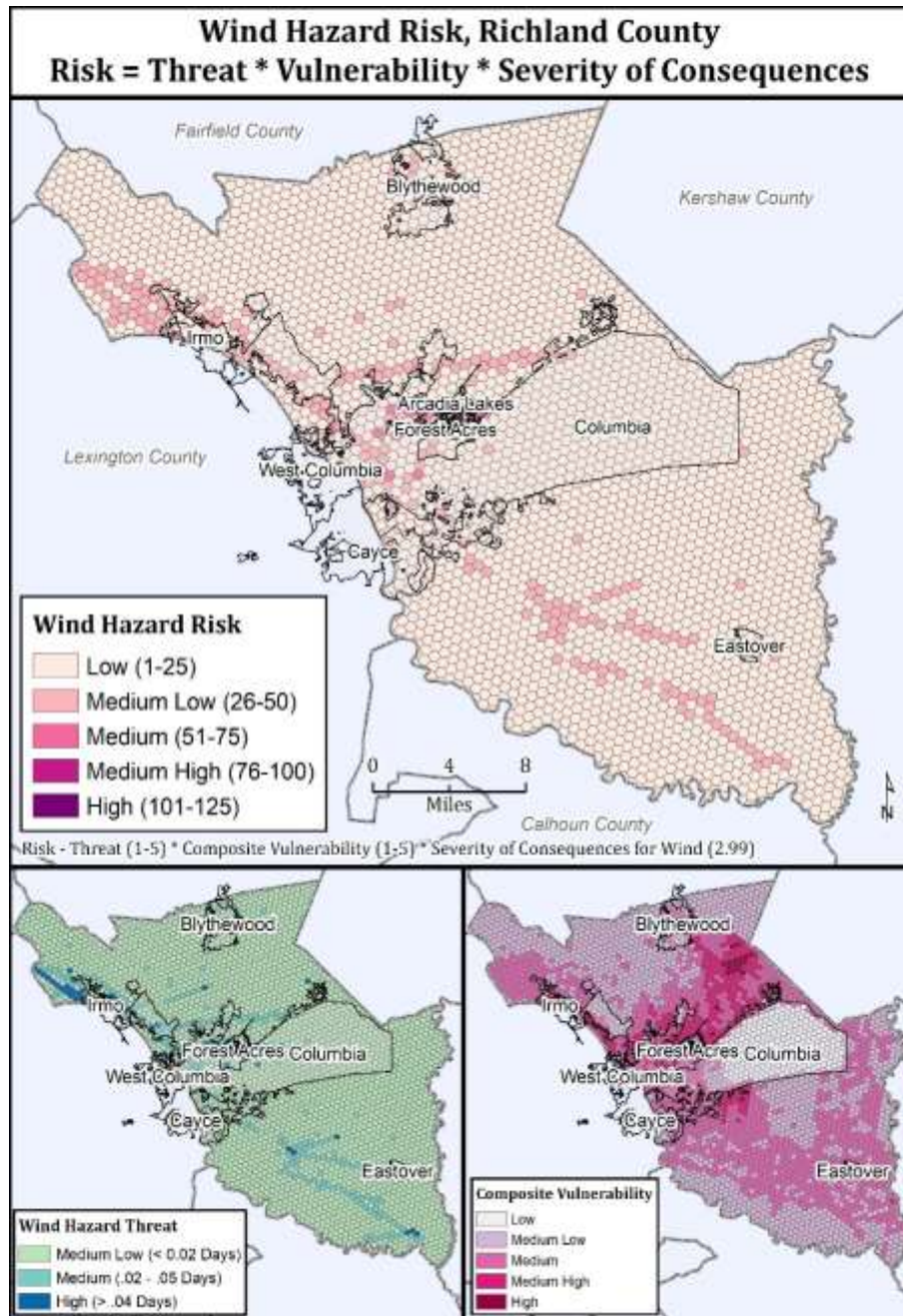


Figure 189 - Risk of high winds in Richland County.

G) Hail

There is very little hail threat in Richland County, except for a few hexagons spread throughout the central region of the county that exhibited high threat levels (Figure 190). And while some of these overlap with areas of higher composite vulnerability, it only creates sporadic areas of medium-low risk, with the rest of the county scoring low (Figure 190).

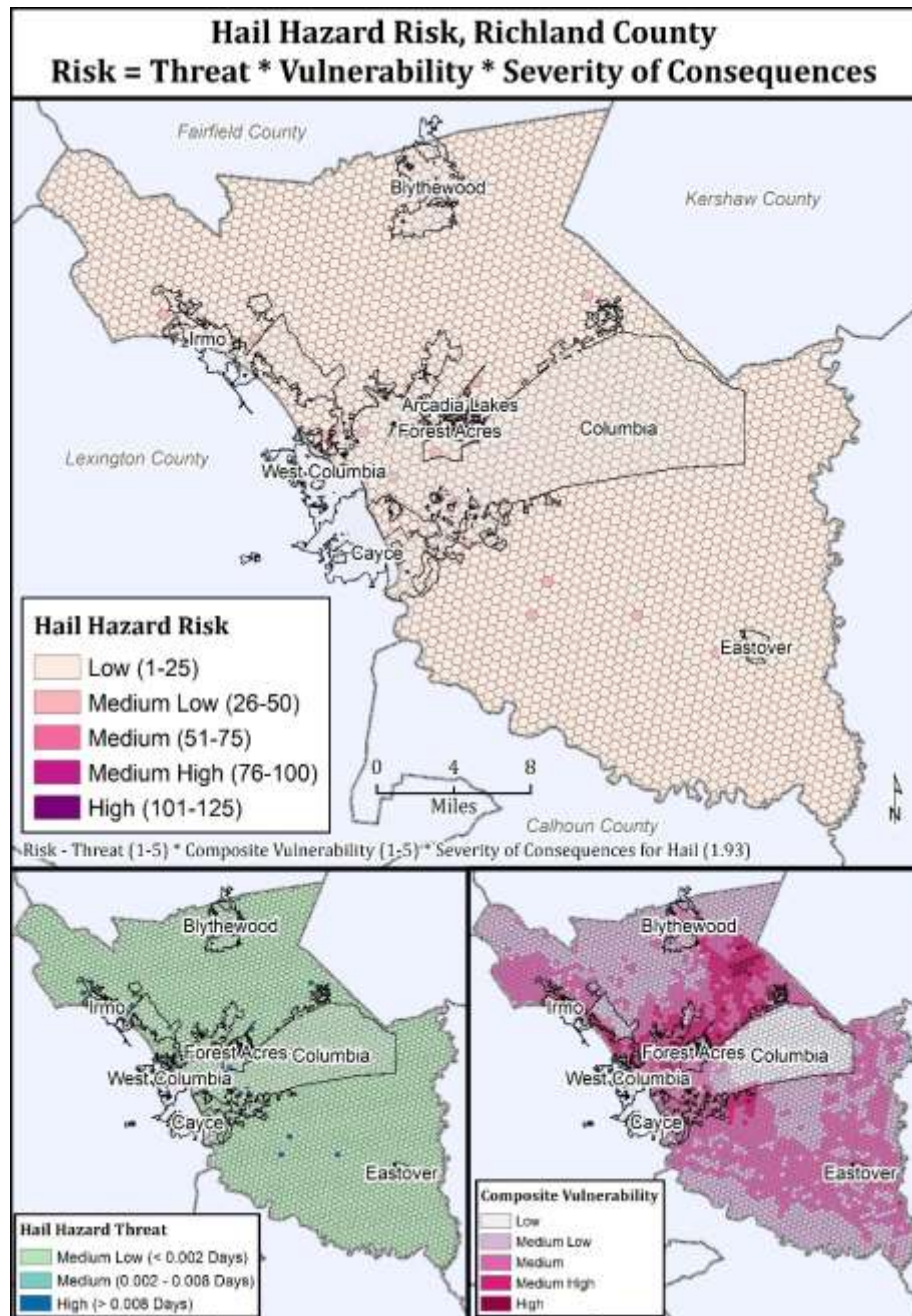


Figure 190 - Risk of hail in Richland County.

H) Fog

The highest levels of fog hazard threat exist in the entire southern half of Richland County, from south of the City of West Columbia all the way to the southern tip below the Town of Eastover bordering Sumter County (Figure 191). The rest of the county has a medium level of fog hazard, however, when overlaid with the composite vulnerability map, nowhere in the county has higher than a low fog hazard risk score despite significant overlap between the two components (Figure 191). This can be attributed to the fog hazards indirect impact on the county, meaning that its overall risk to vulnerable areas is low by itself.

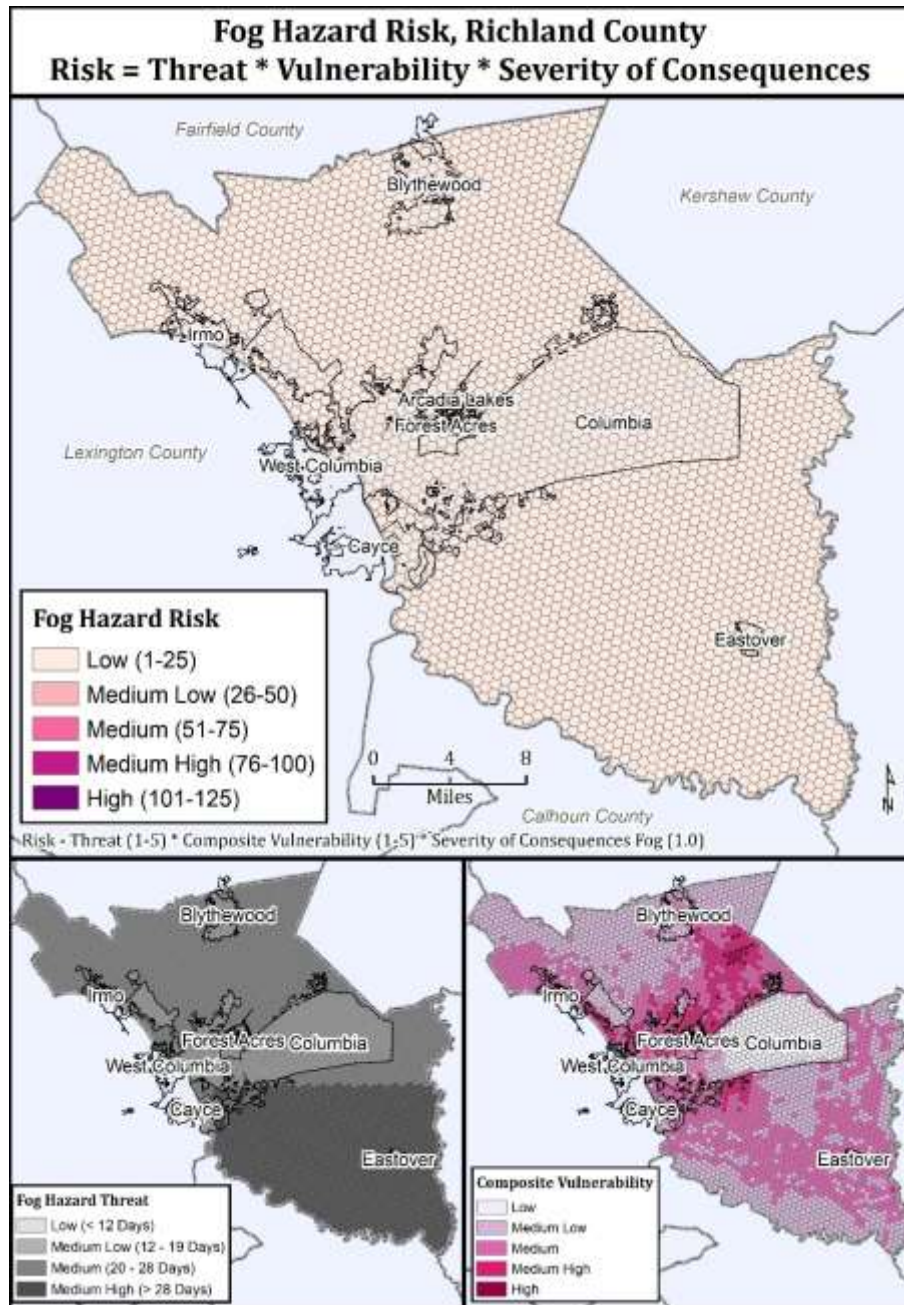


Figure 191 - Risk of fog in Richland County.

I) Winter Weather & Ice Storms

The highest winter weather hazard threat levels are in the northeastern corner of the county, around the Town of Blythewood stretching down to the City of Forest Acres (Figure 192). This overlaps with areas of significantly higher composite vulnerability between Blythewood and Fort Jackson, resulting in this area having a medium-low risk of winter weather hazard compared to the rest of the county with a low risk.

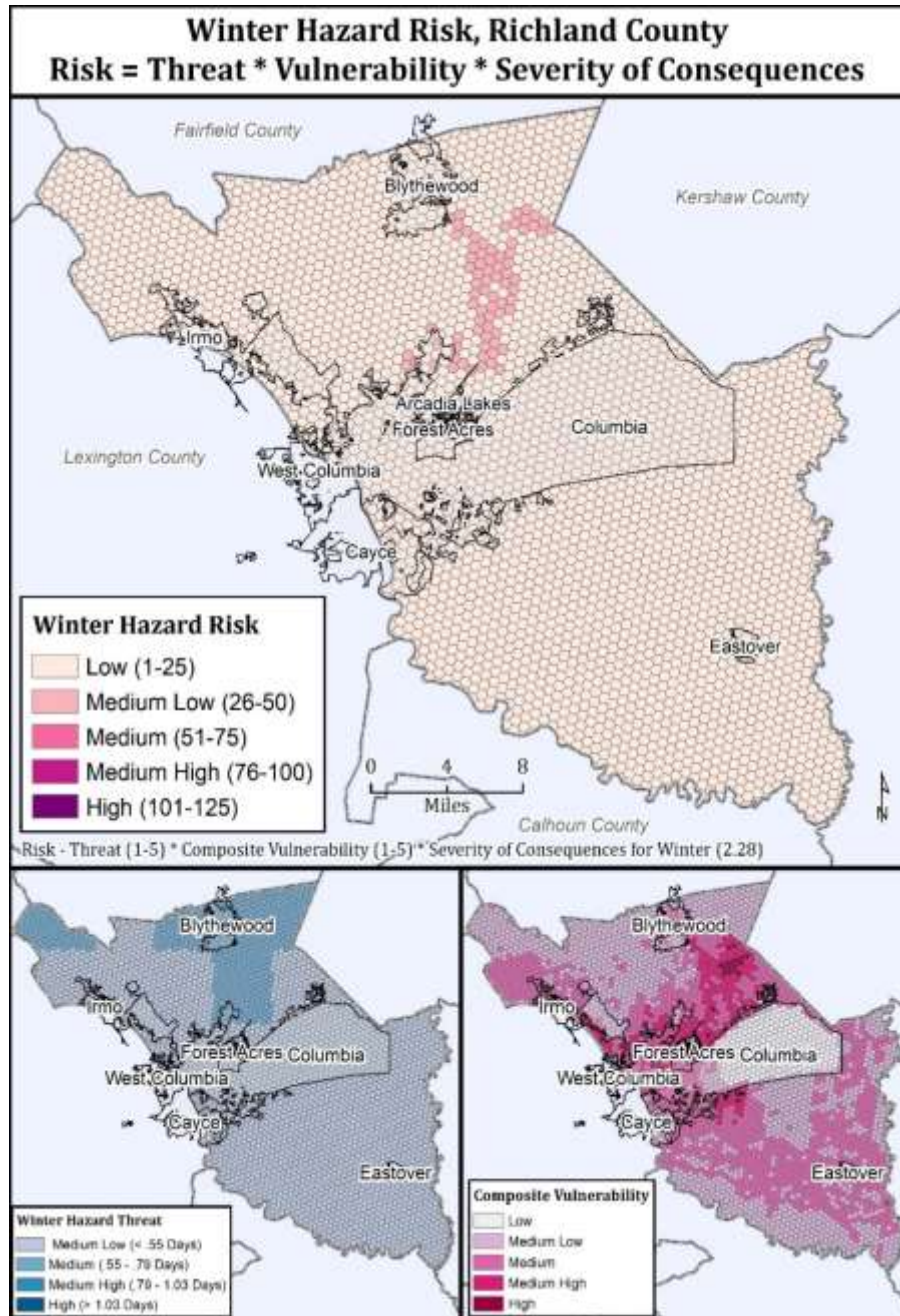


Figure 192 - Risk of winter weather in Richland County.

J) Temperature Extremes

The region of Richland County with the highest levels of threat to a cold hazard is the northern fourth of the county in and around the Town of Blythewood, where the threat level reaches medium-high to the west of the town (Figure 193). The rest of the county has either medium-low or low threat levels (44 to 51 days a year), and overall, there are so significant areas of overlap between high threat and high vulnerability, giving Richland County an overall low risk of cold weather (Figure 193).

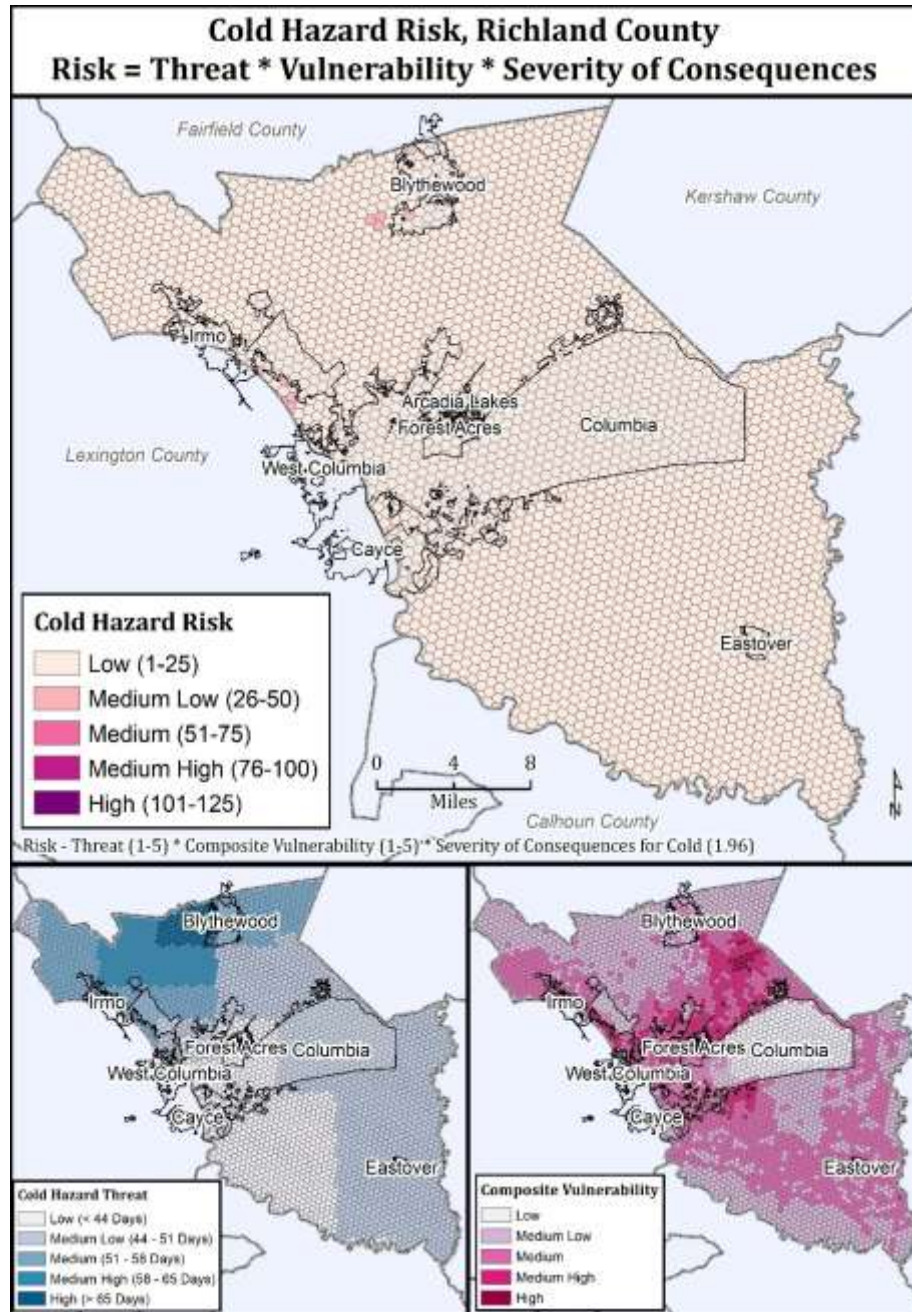


Figure 193 - Risk of cold weather in Richland County.

The highest levels of heat threat center around the City of Columbia and its urban area, and radiate outwards in all directions in Richland County in decreasing levels of threat, from high all the way out the City of Forest Acres and the westernmost part of Fort Jackson, decreasing to medium-high around the Town of Irmo and Eastover, and settling on medium for the rest of the county including the Town of Blythewood (Figure 194). Much of this threat pattern overlaps with areas of high composite vulnerability, creating an area of high and medium-high risk in and around the City of Columbia and its suburbs. The rest of the risk follows the trend of the hazard threat in decreasing intensity mirroring the threat levels.

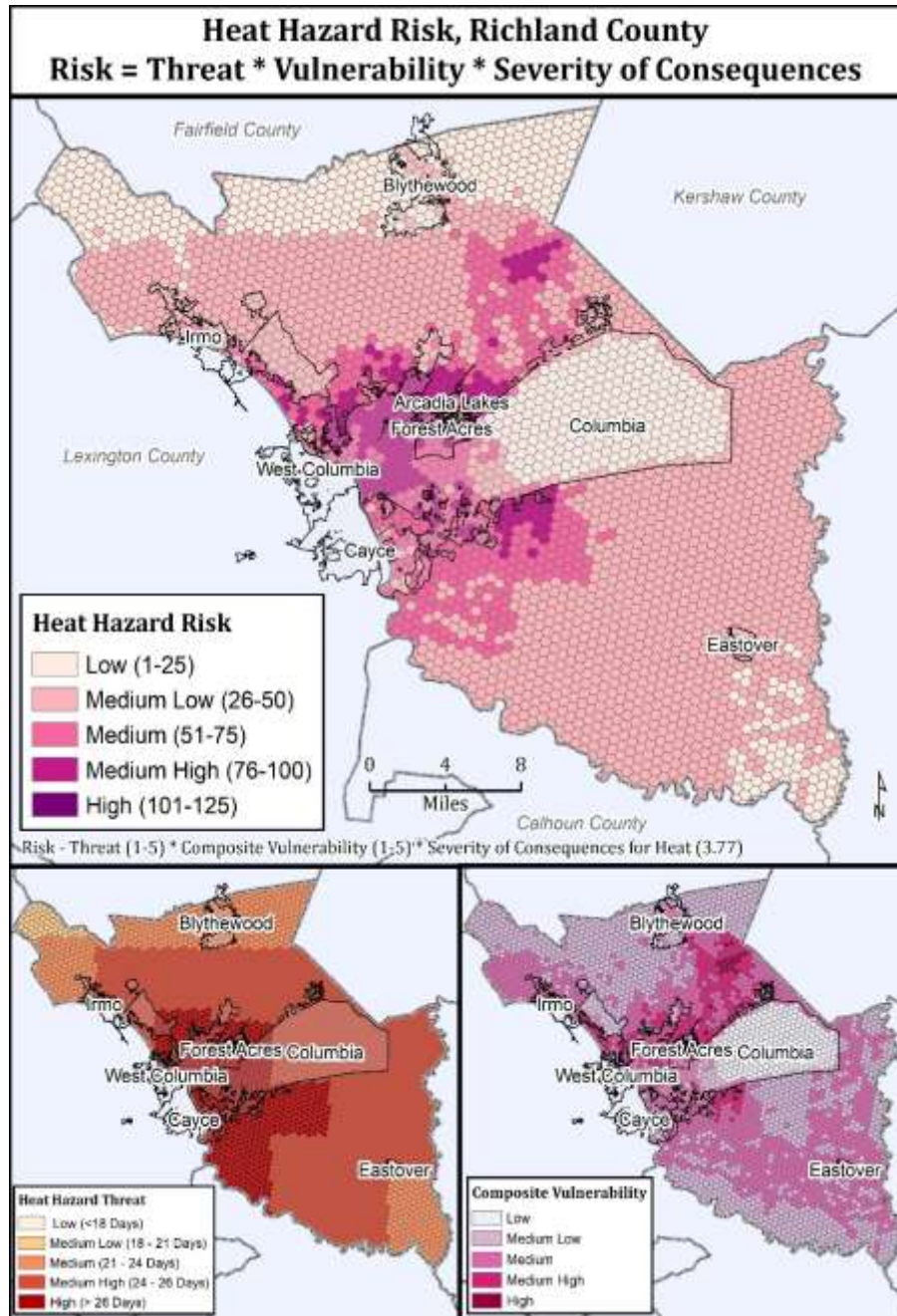


Figure 194 - Risk of hot weather in Richland County.

K) Wildfires

There wildfire hazard threat is, like the other three counties in the Central Midlands, sporadic and not distributed in a uniform way. However, Richland County does have a higher concentration of wildfire running along the vertical middle of the county, with concentrations around the Town of Eastover and the Town of Blythewood (Figure 195). Due to this frequent and large spread of high wildfire risk, there are many places where it coincides with high composite vulnerability in and around Eastover, Blythewood, and Columbia, creating areas of medium-low risk (Figure 195).

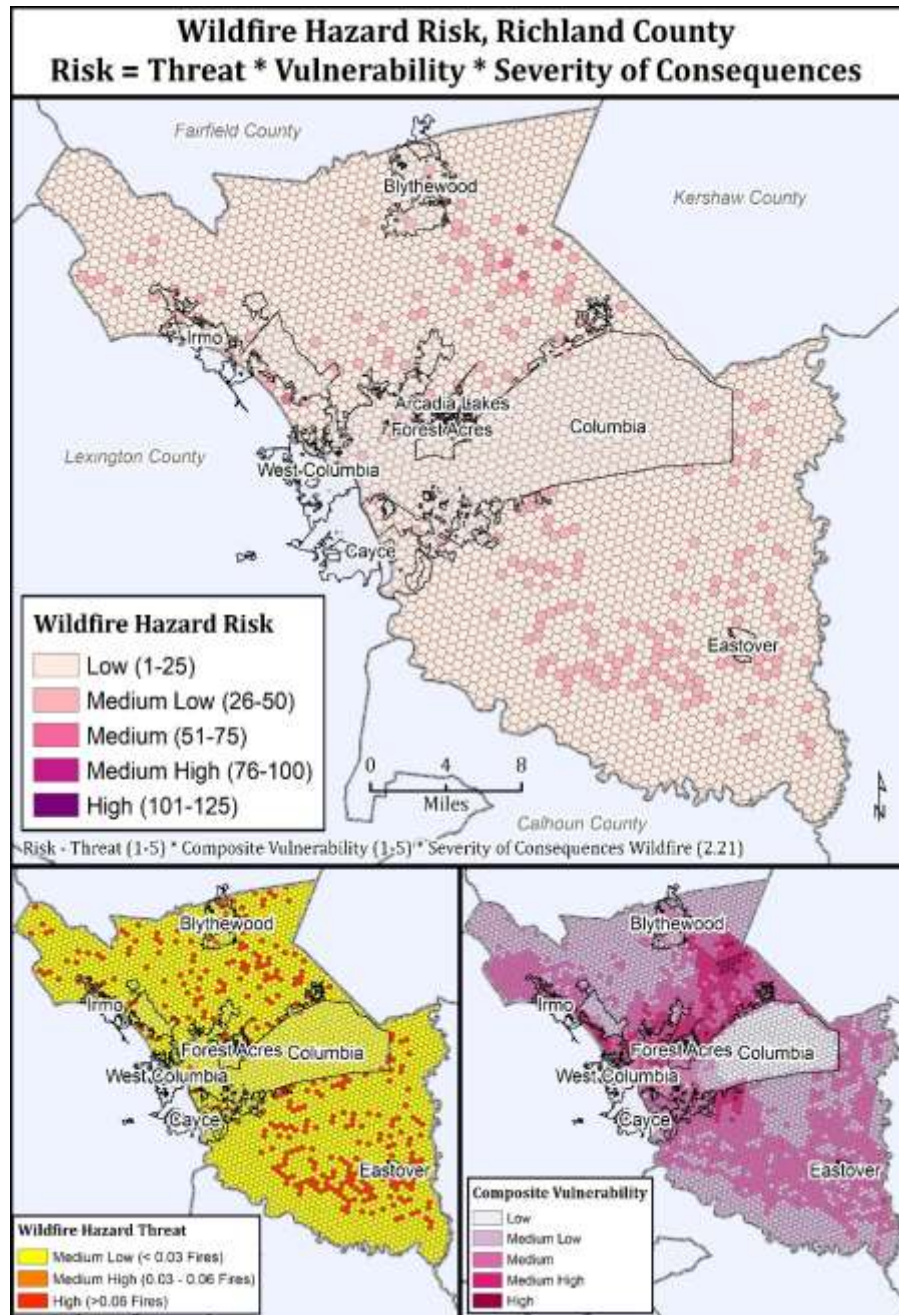


Figure 195 - Risk of wildfires in Richland County.

L) Droughts

The north-central and central areas of Richland County are more at risk from droughts either because of increase drought threat (orange areas in northwest corner) or a mix of high composite vulnerability and medium drought threat as is the case around the City of Columbia and south of the Town of Blythewood (Figure 196). The rest of Richland County does not have a high enough drought threat or composite vulnerability to rate higher than a low for drought hazard risk (Figure 196).

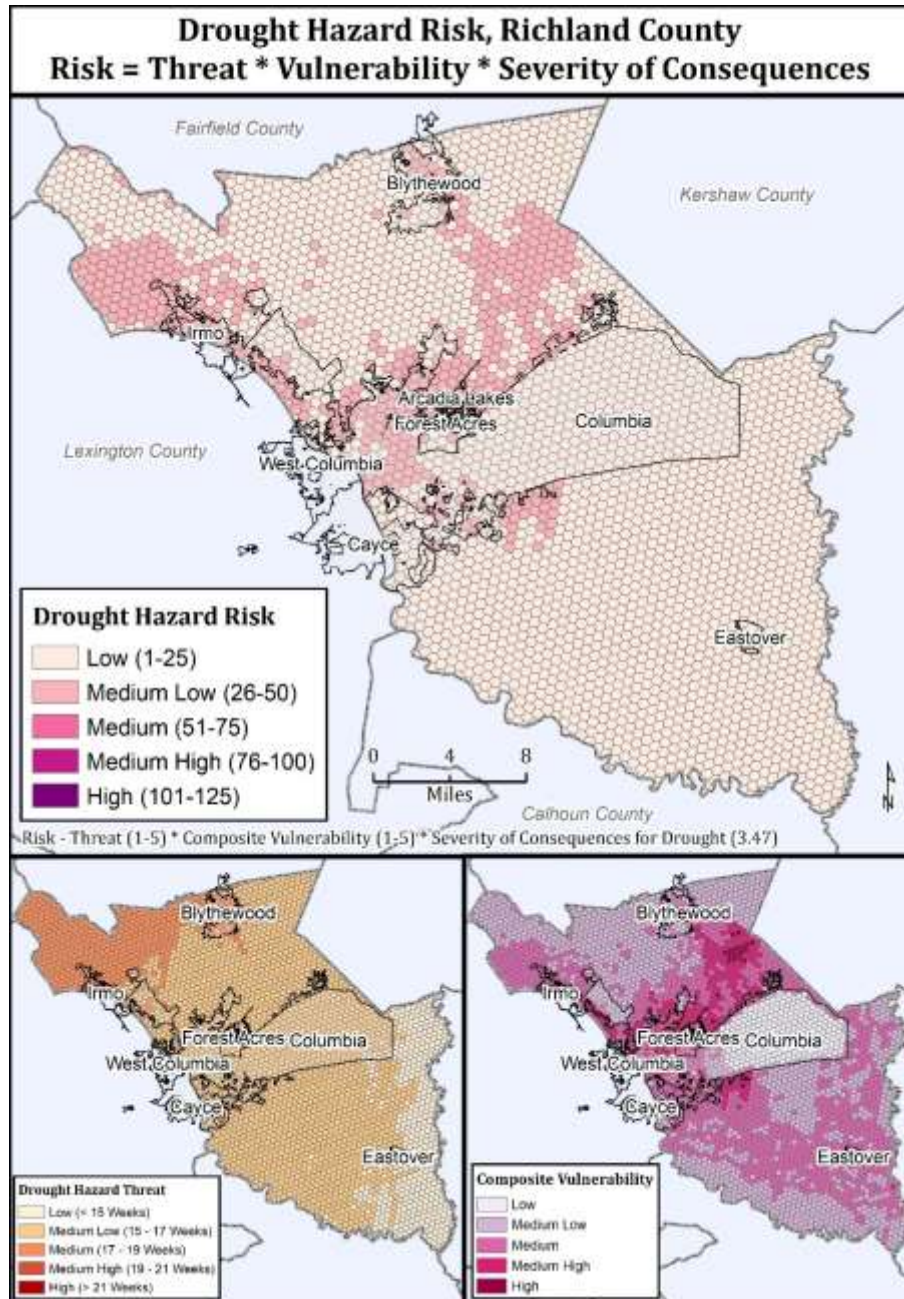


Figure 196 - Risk of droughts in Richland County.

M) Earthquakes

Southern Richland County is the most vulnerable to earthquakes since the region exhibits a high threat level for earthquakes, as well as experiences a medium level of composite vulnerability (Figure 197). The rest of the county only experiences a low risk of earthquakes comparatively due to only having a medium earthquake threat (Figure 197).

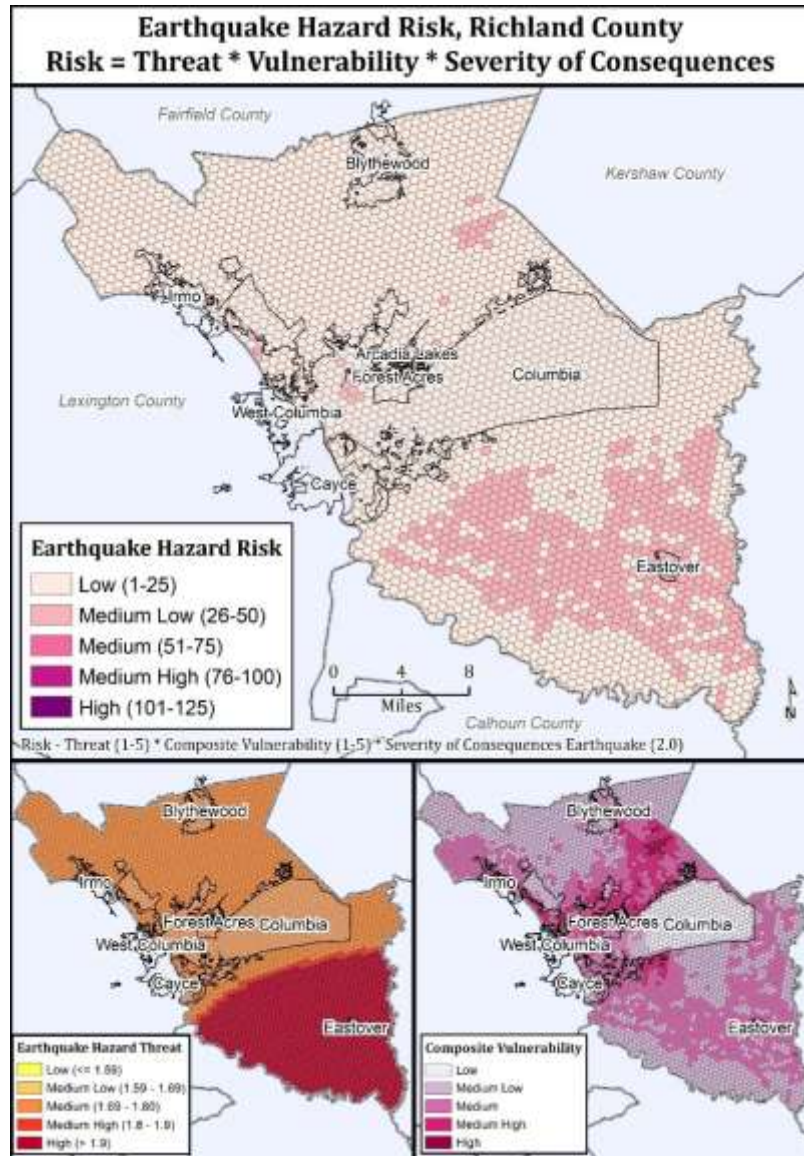


Figure 197 - Risk of earthquakes in Richland County.

According to the South Carolina Geological Survey, the worst-case scenario for Richland County is a combination of the 1886 Charleston and the 1913 Union earthquake, which would equate to an intensity category VIII (severe)⁹². If the 1886 Charleston earthquake were to occur today (Figure 198), 83% of buildings would survive undamaged in Richland County. About 7,144 buildings would be at least damaged moderately (5% of the county's building stock) with an estimated property damage of \$803 million (over two thirds of it residential). Most of the damage would occur in central Richland County (Figure 199). All

⁹² SCGS, Projected Earthquake Intensities for South Carolina, Educational Series #7a. Available at <http://www.dnr.sc.gov/geology/images/Equake%20intens1-pg.pdf>

of the critical infrastructure would be at least 50% operable within a day. The modelled earthquake's most devastating impact area would encompass some of Richland County's most vulnerable population. All estimates were derived using HAZUS-MH 2.2.

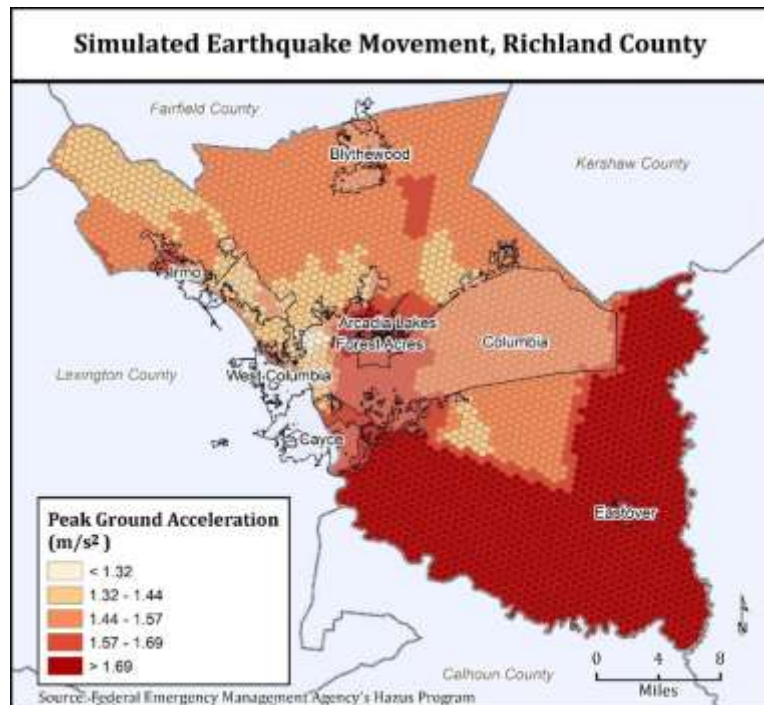


Figure 198 - Peak ground acceleration in Richland County from a modelled 6.8 earthquake.

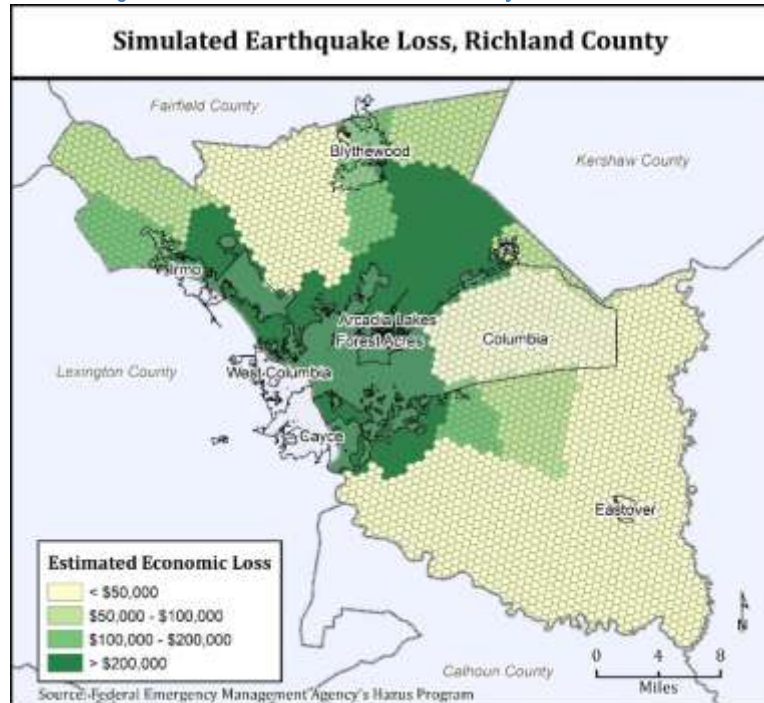


Figure 199 - Damage in Richland County from a modelled 6.8 earthquake.

This section addresses
FEMA HMP requirement
201.6(c)(2)(ii)

7.5 Richland County Risk Assessment Summary

As detailed in the *Risk Assessment Methodology* section of the Plan, the information generated by the hazard threat assessment, the vulnerability assessment and the severity of consequence assessment provide the input for the overall risk assessment for Fairfield County (Equation 4).

Since a majority of Richland County experiences high levels of composite hazard threat, especially south of the Town of Eastover, north of the City of Forest Acres, and on the eastern border near the Town of Irmo, there are several areas of high and medium-high risk scores (Figure 200). Much of these concentrate around the central area of the county above Ft. Jackson and on the western border near Irmo due to high composite vulnerability (Figure 200). There is a noticeable area of low risk score in the center of the county, which is Ft. Jackson on Federal land, causing a low area of threat and vulnerability (Figure 200).

$$RISK_{HAZ} = (THR_{HAZ})(VUL)(CON_{HAZ}) \quad (4)$$

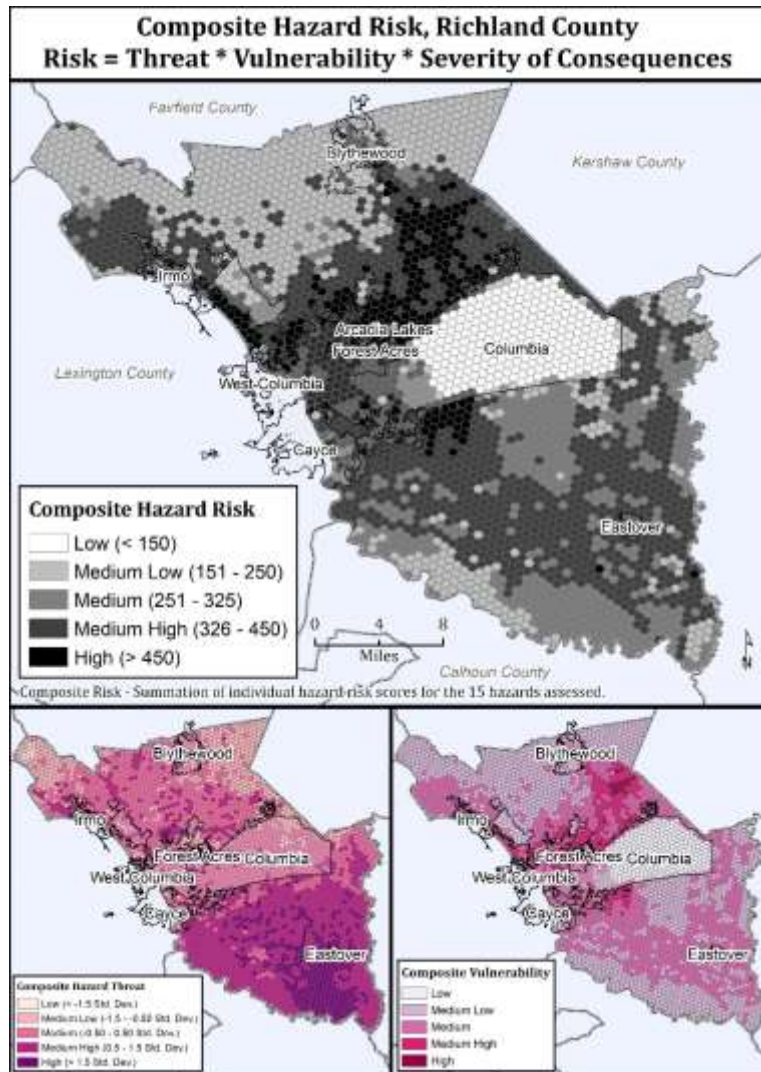


Figure 200 - Overall composite risk map of Richland County considering all hazard threats, vulnerabilities, and severity of consequences.

In terms of risk assessment by hazard type, Table 102 summarizes the assessment criteria and rating values.

Categories of Risk by Hazard Type

While the composite risk map (Figure 200) shows the spatial distribution of various risk levels across Richland County, breaks down the overall risk for each hazard assessed in this Plan. The information contained in Table 103 summarizes the numerous input metrics to quantify the overall risk for each hazard. Overall risk for each hazard is expressed in qualitative terms as detailed in Table 102. The high-risk hazards in Richland County are hurricanes and tropical storms, heat, flash floods, lightning, and severe thunderstorms (Table 103).

Table 102 - Assessment criteria and values.

Geographical Extent	Vulnerability	Severity of Consequence	Future Climate Impacts	Probability of Future Occurrence	Historical Damage	Magnitude and Severity	Overall Risk Rating
Isolated	Low	Minor	Unlikely to worsen	Infrequent	Minor	Low	Low
Scattered	Medium	Moderate	Somewhat likely to worsen	Occasional	Major	Medium	Medium
Widespread	High	Severe	Likely to worsen	Likely	Extensive	High	High

The effectiveness and acceptance of hazard mitigation strategies depends on a community's risk awareness and risk perception. Therefore, we are including the survey results conducted by the CMCOG in October 2020 revealing the perceived mitigation priorities by residents of the Central Midlands region. The survey gauged hazard awareness, preparedness and impacts of residents in the Central Midlands region (see Appendix I for more information). The perceived risk highlights the overlaps and/or discrepancies between the objective risk (as developed in the hazard and vulnerability assessments) and subjective risk (as expressed by Central Midlands' residents).

The spatial risk assessment as well as the risk posed by an individual hazard form the basis for the development of mitigation strategies and prioritization (see Richland County Mitigation Strategies in [Section 7.8](#)).

Table 103 - Overall risk assessment for Richland County.

Perceived Risk	Hazard	Geographic Extent of Hazard Threat (THR)	Vulnerability (VUL)	Severity of Consequence (CON)	Severity of Consequence (CON) subcomponents				Overall Risk
					Future Climate Impacts		Historical Impacts	Priority Hazards ⁹³	
Somewhat Important	Winter Weather	Isolated	Low	Moderate	Unlikely to worsen	↔	Minor	High	Low
More Important	Extreme Heat	Widespread	High	Severe	Likely to worsen	↑↑	Major	High	High
Somewhat Important	Droughts	Isolated	Low	Severe	Likely to worsen	↑↑	Minor	High	Medium
Somewhat Important	Tornadoes	Scattered	Medium	Moderate	Somewhat likely to worsen	↑	Major	High	Medium
Somewhat Important	Tropical Storms	Widespread	Medium	Severe	Likely to worsen	↑↑	Extensive	High	High
More Important	Wind	Isolated	Low	Moderate	Somewhat likely to worsen	↑	Extensive	Medium	Low
Less Important	Extreme Cold	Isolated	Medium	Minor	Unlikely to worsen	↔	Major	Medium	Low
Least Important	Earthquakes	Widespread	High	Moderate	Somewhat likely to worsen	↑	Minor	Medium	Medium
Somewhat Important	Flash Floods	Widespread	High	Severe	Likely to worsen	↑↑	Extensive	Medium	High
More Important	Lightning	Widespread	High	Moderate	Somewhat likely to worsen	↑	Extensive	Low	High
Somewhat Important	Hail	Isolated	Low	Minor	Somewhat likely to worsen	↑	Minor	Low	Low
Somewhat Important	Thunderstorms	Widespread	Medium	Moderate	Likely to worsen	↑↑	Extensive	Low	High
Less Important	Fog	Widespread	High	Minor	Unlikely to worsen	↔	Minor	Low	Low
Least Important	Wildfires	Isolated	Low	Moderate	Likely to worsen	↑↑	Minor	Low	Medium
Somewhat Important	Riverine Floods	Widespread	Medium	Moderate	Likely to worsen	↑↑	Minor	Low	Medium

⁹³ CMCOG 2016 Hazard Mitigation Plan - <http://www.centralmidlands.org/pdf/CMHMP%202016%20-%20Final.pdf>

Another important aspect of the risk assessment is identifying currently available resources that a jurisdiction has to respond to and mitigate natural hazard events. Table 104 identifies emergency services and adopted ordinances available to each municipality in Richland County.

**This section addresses
FEMA HMP requirement
201.6(c)(3)**

Table 104 - Services and Development Related Ordinances in Richland County.

Name of Jurisdiction	Fire Service	Police Service	Emergency Response Service	Adopted Zoning Ordinance	Adopted Comprehensive Land Development Regulations	Adopted Building Codes	Participates in National Flood Insurance Program
Richland County	Columbia provides to Richland County under contract	County Sheriff's Department	EMS provided by Rich. County countywide	Yes	Yes	Yes	Yes
Columbia	Provided by Columbia	Provides own police protection	"	Yes	Yes	Yes	Yes
Forest Acres	Provided by Columbia	Provides own police protection	"	Yes	Yes	Yes	Yes
Arcadia Lakes	Provided by Columbia	Provided by County Sheriff's Department	"	Yes	Yes	Yes	Yes
Eastover	Provided by Columbia	Provides own police protection	"	Yes	Yes	Yes	Yes
Blythewood	Provided by Columbia	Provided by County Sheriff's Department	"	Yes	Yes	Yes	No

The National Flood Insurance Program (NFIP) aims to reduce the impact of flooding on private and public structures (FEMA, 2016). Actions taken towards reducing flood hazard risk provide a compounding discount on flood insurance to residents in flood prone areas. The program tracks Repetitive Loss Properties (RLP) and Severe Repetitive Loss Properties (SRLP), which are properties that have made multiple flood insurance claims. This information is valuable to planners as it aids in allocating flood mitigation strategies.

Table 105 - Number of Richland County Repetitive Loss Properties.

Building Type	Number of Properties
Residential	10
Commercial	1

Table 128 shows the number and building type of RLP and SRLP in Richland County. The County participates in both the NFIP and Community Rating System (CRS). The County also has a designated Special Flood Hazard Area (SFHA), in which around 75% of all flood insurance claims are registered. Through public outreach efforts, flood mitigation planning and enforcing building codes, Richland County residents are provided with an automatic 10% discount on flood insurance premiums.

7.6 Richland County Mitigation Goals and Objectives

The following are general hazard mitigation goals and objectives utilized by stakeholders. These serve as broad mission statements and help guide planners in making decisions that safeguard the life and property of Richland County citizens.

**This section addresses
FEMA HMP requirement
201.6(c)(3)(i)**

1. Develop better data for the community relating to type, impact, location, and cost of the natural disaster mitigation strategies occurring in the area.
2. Increase the community's capacity to initiate and sustain emergency response operations during and after a natural disaster, thereby mitigating effects of hazardous events.
3. Enhance existing, or design new, policies and/or programs in the community to reduce the potential damaging effects of hazards without hindering other community goals or impeding hazard mitigation programming in the county.
4. Protect the most vulnerable populations, buildings, and critical facilities in the town through the implementation of cost-effective, environmentally sound, and technically feasible mitigation projects.
5. Protect the public health, safety, and welfare by increasing public awareness and understanding of hazards and by fostering both individual and public responsibility in the mitigation of risks through available techniques that minimize vulnerability to those hazards.
6. Increase understanding of all residents in the community about the natural hazards threatening local areas and techniques available to minimize vulnerability to those hazards.
7. Maintain the economic vitality of the community in the face of natural disasters.
8. Promote the security of homes, institutions, and places of employment throughout the community that are considered vulnerable to natural disasters.
9. Promote that the availability and function of community infrastructure will not be significantly disrupted by a natural disaster.
10. Inventory, map and assess all flood plain structures and properties that are or may be repetitive loss properties.

7.7 Richland County Federally-Supported Mitigation Portfolio

Since 2000, Richland County has largely received federal mitigation dollars post-disaster, i.e. after a declared disaster through the Hazard Mitigation Grant Program. Funds for pro-active mitigation have been limited to hazard mitigation planning.

Table 106 - Richland County portfolio of federally-supported hazard mitigation projects.

Mitigation Category	HMGP	PDM	FMA	Amount	Mitigation Category	HMGP	PDM	FMA	Amount
Property Acquisition and Structure Demolition (200.x)	x		x	\$25,028,149	Soil Stabilization (300.x, 301.x)				
Property Acquisition and Structure Relocation (201.x)					Wildfire Mitigation (205.1/2, 300.2, 300.8, 304.1)				
Structure Elevation (202.x)					Post-Disaster Code Enforcement (104.1), Professional Education (101.1)				
Wet Floodproofing (203.x)					Advance Assistance (904.1)				
Mitigation Reconstruction (207.x)					5 Percent Initiative Projects				
Dry Floodproofing (204.x)					Aquifer and Storage Recovery (403.6)				
Generators (601.x, 602.x)	x			\$5,926,615	Flood Diversion and Storage (403.5, 403.8)				
Localized Flood Risk Reduction Projects (403.1-403.4, 404.1, 405.1)	x			\$2,825,998	Floodplain and Stream Restoration (303.1-303.3)				

Mitigation Category	HMGP	PDM	FMA	Amount	Mitigation Category	HMGP	PDM	FMA	Amount
Non-localized Flood Risk Reduction Projects (500.x, 501.1)					Green Infrastructure (403.7)				
Wind Retrofitting of Existing Buildings (205.7, 205.8)					Public Awareness/Miscellaneous (100.1, 106.1, 800.1)	x			\$201,635
Non-structural Retrofitting of Existing Buildings and Facilities (205.3, 205.4)					Hazard Mitigation Planning	x	x	x	\$1,197,754
Safe Room Construction (206.x)					Technical Assistance (701.x)				
Infrastructure Retrofit (400.x-402.x)	x			\$2,289,232	Management Costs (700.x)	x	x		\$100,000
Feasibility and Design Studies (103.x) Applied R&D (105.1)					Warning Systems (600.1)	x			\$383,064

Note: Hazard mitigation planning costs have been generally shared with Fairfield, Newberry, and Richland counties as part of planning activities supported by the Central Midlands Council of Governments. Project costs for multi-county projects (e.g., planning) were reported as is and no county-share was calculated.

This section addresses
FEMA HMP requirements
201.6(c)(3)(ii), 201.6(c)(3)(iii),
and 201.6(c)(3)(iv)

7.8 Richland County Mitigation Strategies

Table 107 - Unincorporated Richland County Mitigation Strategies.

Unincorporated Richland County								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Improved suppression response (tankers, dry chemicals)	Forest Fire/Wild Fires	Richland County	1	2 & 7	Capital Improvement Budget	\$250,000 to \$750,000	Ongoing	1-2 yrs.
Regulate open burning through enforcement and education	Forest Fire/Wild Fires	Richland County	2	3 & 8	Operating Budget	<\$250,000	Ongoing	6 month
Maintain dry hydrant program, while building a resilient fire suppression water supply system in rural areas of county	Forest Fire/Wild Fires	Richland County/City of Columbia	1	2 & 7	CDBG-MIT	\$1,000,000	Ongoing	Current
Use GIS capacity to map, record wild fires, all hazards events	Forest Fire/Wild Fires	Richland County	1	10	Operating Budget	<\$250,000	Ongoing	1-2 yrs.
Power line easement clearance	Winter Snow & Ice Storms	Richland County /Dominion Energy Elec Coops	1	2 & 7	Electric Utility Providers	<\$250,000	Ongoing	1-2 yrs.
Debris removal and road clearance work	Winter Snow & Ice Storms	Richland County Public Works & SCDOT	1	2 & 7	Richland County Public Works, SCDOT Operating Budgets, and FEMA PA when disaster related	<\$250,000 to >\$1,000,000 when disaster related	Ongoing	1-2 yrs.
Use bus & van transit for shelters, evacuation and comm. capacity	Winter Snow & Ice Storms	COMET, School Districts, Senior Resources	1	4 & 7	COMET, School Districts, Senior Resources Operating Budgets	<\$250,000	Ongoing	1-2 yrs.
Procure and use generators at critical facilities	Winter Snow & Ice Storms	Richland County/School District/City of Columbia/Rec. Commission	1	2 & 7	Capital Improvement Budgets	\$250,000 to \$750,000	Ongoing	1-2 yrs.
Install surge protectors in critical facilities	Thunderstorm, Hail, wind, lightning	Richland County/School District/City of Columbia/	1	2 & 7	Capital Improvement Budgets	\$250,000 to \$750,000	Ongoing	1-2yrs
Adopt procedure to suspend operations during lightning storms	Thunderstorm, Hail, wind, lightning	Richland County	2	2,4 & 5	Operating Budget	<\$250,000	Ongoing	1-2 yrs.

Unincorporated Richland County								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Clear power line and utility easements of debris	Thunderstorm, Hail, wind, lightning	Dominion Energy Elec Coops	1	2 & 7	Public Works Operating Budgets, and FEMA PA when disaster related	<\$250,000 to >\$1,000,000 when disaster related	Ongoing	1-2 yrs.
Remove taller trees near critical facilities	Thunderstorm, Hail, wind, lightning	Richland County /Dominion Energy Elec Coops	2	2 & 7	Public Works Operating Budgets	<\$250,000	Ongoing	1-2 yrs.
Develop portable water treatment facilities	Hurricanes	Richland Utilities /City of Columbia	2	2 & 7	Capital Improvement Budgets	\$250,000 to \$750,000	Ongoing	1-2 yrs.
Replace water storage tanks and pumps as needed	Hurricanes	Richland Utilities /City of Columbia	2	2 & 7	Capital Improvement Budgets	\$250,000 to \$750,000	Ongoing	1-2yrs
Add capacity at solid waste disposal facilities to handle more debris	Hurricanes	Richland County and solid waste contractors	2	2 & 7	Capital Improvement Budgets	\$250,000 to \$750,000	Ongoing	1-2 yrs.
Strengthen utility services especially in highly vulnerable areas	Tornados	Richland Utilities /City of Columbia	1	2 & 7	Capital Improvement Budgets	\$250,000 to \$750,000	Ongoing	1-2 yrs.
Conduct engineering strength studies of critical facilities	Tornados	Richland County	1	2 & 4	Capital Improvement Budgets	\$250,000 to \$750,000	Ongoing	1-2 yrs.
Emergency response chain saw project/efforts to remove debris	Tornados	Richland County /Dominion Energy Elec Coops	2	2 & 7	Capital Improvement Budgets, and FEMA PA when disaster related	<\$250,000 to >\$1,000,000 when disaster related	Ongoing	1-2 yrs.
Install safe rooms in critical facilities especially with vulnerable population	Tornados	Richland County	2	2 & 7	Capital Improvement Budgets	\$250,000 to \$750,000	Ongoing	1-2yrs
Establish GIS mapping of all hazard events by location, effect and time	Tornados	Richland County/ /City of Columbia/other municipalities	3	10	Capital Improvement Budgets	<\$250,000	Ongoing	1-2 yrs.
Conduct earthquake impact analysis on critical facilities	Earthquake	Richland County /City of Columbia	1	2 & 4	Public Works Operating Budgets	<\$250,000	Ongoing	1-2 yrs.
Develop and publicize water conservation practices to respond to drought declarations	Drought	Richland County	2	5	Operating Budget	<\$250,000	Ongoing	1-2 yrs.
Amend state drought	Drought	SC General		5	Operating Budget	<\$250,000	Ongoing	1-2yrs

Unincorporated Richland County								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
legislation to stiffen penalties and clarify laws		Assembly	3					
Develop a county well water program in vulnerable fringe areas	Drought	Richland County/ /City of Columbia/	2	2,4 & 7	Public Works Operating Budgets	<\$250,000	Ongoing	1-2 yrs.
Maintain Higher Regulatory Standards and continue to enforce current County Ordinance.	Flood	Floodplain/Legal/ County Council	1	3, 4 & 9	Staff time	0.00	Ongoing	5 years
A Zone Detailed Flood Study	Flood	Floodplain/Cons ultant	1	1	Staff time; Public Works funds (budget)	\$750,000	New	5 years
Improve the CRS Ranking	Flood	Floodplain/Buildi ng/PIO/Council	1	5 & 6	Staff time; Public Works funds (budget)	0.00	Ongoing	5 years
Enhance and improve Open Space Regulations	Flood	Floodplain/Planni ng/Zoning/Legal/ Council	1	3, 4 & 9	Staff time	0.00	New	5 years
Continue public awareness program that informs all property owners that are located in the special flood hazard area.	Flood	Floodplain/PIO	1	5 & 6	Staff time; Public Works funds (budget)	\$5000.00 annually	Ongoing	5 years
Provide advice and assistance to property owners concerning the protection of their properties from flooding and local drainage.	Flood	Floodplain	1	5 & 6	Staff time	0.00	Ongoing	5 years
Develop a program to identify and obtain funding for both pre- and post-disaster mitigation projects.	Flood	Floodplain/Coun cil/Consultant/P ublic Works	1	1	Staff time; Public Works funds (budget)	Cost Unknown, scope unknown estimated \$200,000.00	New	5 years
Prioritize capital projects that will mitigate flood impacts in those areas of the County that have experienced significant flooding problems.	Flood	Floodplain/Public Works/Council/ Consultant/Emer gency Management	1	1	Staff time; Public Works funds (budget)	Cost estimated \$200,000.00	New	5 years
Develop a floodplain management plan that will guide and assist the County in reviewing all new requests for development and in establishing priority for hazard mitigation projects.	Flood	Floodplain/Coun cil/Consultant	1	1	Staff time; Public Works funds (budget)	\$200,000.00	New	5 years

Unincorporated Richland County								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Review the effects and locations of areas that experience flooding and determine what steps, if any, the County can take to alleviate future impacts.	Flood	Floodplain/Public Works/Council/Consultant	1	1, 3 & 4	Staff time; Public Works funds (budget)	0.00	New	5 years
Increase and improve outreach programs, brochures, and handouts.	Flood	Floodplain/PIO	1	5 & 6	Staff time; Public Works funds (budget)	\$5,000.00 annually	Ongoing	5 years
Implement a Program for Public Information as outlined in the Community Rating System guidance.	Flood	Floodplain/PIO	1	5 & 6	Staff time; Public Works funds (budget)	\$10,000.00 annually	New	5 years
Provide annual notices to all property owners outlining the County's services regarding floodplain management, property protection, and insurance information.	Flood	Floodplain/PIO	1	5 & 6	Staff time; Public Works funds (budget)	\$5,000.00 annually	Ongoing	5 years
Develop grant applications to mitigate current and potential flood vulnerable structure in the special flood hazard area.	Flood	Floodplain/Council/Consultant/Public Works/Emergency Management	1	1, 2 & 4	Staff time; Public Works funds (budget)	\$150,000.00	New	5 years
Initiate a debriefing within ninety days of a declared disaster and utilize lessons learned to improve response capabilities.	Flood	Floodplain/Council/Consultant/Public Works/Emergency Management	1	1, 3 & 4	Staff time	0.00	New	5 years
Educate citizens about the dangers of driving through flooded roadways, maintain depth signs, and police presence at high water crossings.	Flood	Floodplain/Public Works/Sheriff's Department/Emergency Management/Council	1	5 & 6	Staff time; Public Works funds (budget)	\$5000.00 Annually	New	5 years
Develop a comprehensive program to deliver flood insurance information to property owners in the special flood hazard area.	Flood	Floodplain/PIO/Council	1	5 & 6	Staff time; Public Works funds (budget)	\$10,000.00	New	5 years
Declare May (or October) of each year to be Flood	Flood	Floodplain/PIO/Council	1	5 & 6	Staff time; Public Works funds (budget)	\$10,000.00	New	5 years

Unincorporated Richland County								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Awareness Month								
Continue to identify and contact all repetitive loss properties.	Flood	Floodplain	1	4, 5 & 6	Staff time; Public Works funds (budget)	0.00	Ongoing	5 years
Stockpile PPE and sanitization supplies	Pandemic	Richland County	1	2, 8, 9	Staff time; Operating Budget; Grant Funding		New	
Improve telework capability	Pandemic	IT	1	2, 8, 9	Staff time; Operating Budget; Grant Funding		New	
Stockpile Food for congregate sheltering	Pandemic	Emergency Management	1	2, 8	Staff time; Operating Budget; Grant Funding		New	
Increase and improve outreach programs, brochures, and handouts.	Pandemic	LDRM/PIO	1	5 & 6	Staff time; Operating Budget; Grant Funding	\$5,000.00	Ongoing	1-2 years
Develop grant applications to mitigate current and potential pandemic impacts to government and community	Pandemic	Council/Consultant/Emergency Management	1	1, 2, 4, 7, 8	Staff time; Operating Budget; Grant Funding	\$150,000.00	New	1-2 years
Installing Plexiglas barriers	Pandemic	Richland County	1	2, 8, 9	Staff time; Operating Budget; Grant Funding		New	
Educate citizens about the dangers of the virus and the non-pharmaceutical interventions (NPIs)	Pandemic	Council/PIO/Consultant/Emergency Management	1	5 & 6	Staff time; Operating Budget; Grant Funding	\$5000.00	New	1-2 years
Stockpile Virus Testing Materials	Pandemic	Council/Consultant/Emergency Management	1	2, 8	Staff time; Operating Budget; Grant Funding		New	
Stockpile symptomatic materials (thermometers, etc.)	Pandemic	Council/Consultant/Emergency Management	1	2, 8	Staff time; Operating Budget; Grant Funding		New	
Develop/update Pandemic plan	Pandemic	Consultant/Emergency Management	1	1, 2, 3, 5	Staff time; Operating Budget; Grant Funding	\$50,000	New	
Develop staffing plan	Pandemic	Council/HR/Emergency Management	1	2, 3, 8, 9	Staff time; Operating Budget; Grant Funding		New	

Mitigation Action Update for Richland County since the 2016 HMP

- The following strategies were refined to reflect additional funding sources and cost estimates:

- Maintain dry hydrant program, while building a resilient fire suppression water supply system in rural areas of county.
- Emergency response chain saw project/efforts to remove debris
- Clear power line and utility easements of debris
- Debris removal and road clearance work
- Pandemic-hazard related strategies were included to provide a holistic emergency management perspective.

Table 108 - City of Columbia Mitigation Strategies.

City of Columbia								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Install surge protectors in critical facilities	Thunder-storms (Hail, Wind, Lightning)	City of Columbia/Rich. County/School Districts	1	2, 4 & 7	Capital Improve. Budgets	\$250,000 to \$750,000	Deferred due to funding	Deferred
Procure and provide auxiliary power supply to critical facilities	Thunder-storms (Hail, Wind, Lightning)	City of Columbia	1	2, 4 & 7	Capital Improve. Budget	\$250,000 to \$750,000	Deferred due to funding	Ongoing
Clear power line and utility easements of debris	Thunder-storms (Hail, Wind, Lightning)	City of Columbia/Dominion Energy	1	2, 4 & 7	Public Works' Operating Budgets	<\$250,000	As needed	Ongoing
Remove taller trees near critical facilities	Thunder-storms (Hail, Wind, Lightning)	City of Columbia/Dominion Energy	2	2, 4 & 7	Public Works' Operating Budget	<\$250,000	As needed	Ongoing
Maintain & upgrade warning siren system for Lake Murray Dam	Flooding	Dominion Energy	1	4 & 5	Capital Improve. Budget	<\$250,000	As needed	Ongoing
Enforce county zoning to restrict development in flood-plains	Flooding	City of Columbia	1	4 & 5	Operating Budget	<\$250,000	As needed	Ongoing
Declare May of each year to be Flood Awareness Month	Flooding	Columbia City Council	2	5	Operating Budget	<\$250,000	Ongoing	Ongoing
Use Columbia's GIS system to track all structures and demolition permits in flood areas	Flooding	City of Columbia	2	10	Operating Budget	<\$250,000	As needed	Ongoing
Coordinate with other local gov'ts in county to make stream channel improvement	Flooding	City of Columbia/Rich. County/ towns in county	3	2, 4 & 7	Capital Improve. Budgets	<\$250,000	As needed	Ongoing
Identify & contact all repetitive loss properties	Flooding	City of Columbia	1	5	Operating Budgets	<\$250,000	Ongoing	Ongoing
Ensure that the FEMA Elevation Certificate is properly completed before issuance on property in flood	Flooding	City of Columbia	1	5	Operating Budgets	<\$250,000	Ongoing	Ongoing

City of Columbia								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
areas								
Undertake Planning to participate in Community Rating System	Flooding	City of Columbia	1	5	Operating Budgets	<\$250,000	Ongoing	Ongoing
Replace structurally obsolete bridges	Flooding	City of Columbia/SCDOT	2	2, 4 & 7	Capital Improve. Budgets	\$750,000>	Ongoing	Ongoing
Maintain status in the NFIP	Flooding	City of Columbia	1	2, 4, 5, 7 & 10	Operating Budget	<\$250,000	Ongoing	Ongoing
Power line clearance with the Elec. Coop. & Dominion Energy	Winter Snow & Ice Storms	Rich. County/ Dominion Energy Elect. Coops.	1	2, 4 & 7	Electric utility providers	<\$250,000	As needed	Ongoing
Debris removal and road clearance work	Winter Snow & Ice Storms	City of Columbia Public Works/ SCDOT	1	2, 4, 7, 8 & 9	City of Columbia/ County Public Works Operating Budget	<\$250,000	As needed	Ongoing
Use bus and van transit system for emergency shelter, evacuation & communication capacity	Winter Snow & Ice Storms	Central Midlands Transit System/ DART system, etc.	1	4 & 7	CMRTA and DART budgets	<\$250,000	Ongoing	Ongoing
Procure and use elec. generators at critical facilities	Winter Snow & Ice Storms	City of Columbia/Richland County/ school dist. cities/ recreation comm.	1	2, 4 & 7	Capital budgets	\$250,000 to \$750,000	Deferred due to funding	Deferred
Harden utility services to facilities especially serving vulnerable populations	Tornados	City of Columbia/Rich. County	1	2, 4 & 7	Capital Improve. Budget	\$250,000 to \$750,000	Deferred due to funding	Deferred
Conduct engineering strength studies of critical facilities	Tornados	City of Columbia	1	2 & 7	Capital Improve. Budget	<\$250,000	Deferred due to funding	Deferred
Emergency response chain saw project and other efforts to remove debris	Tornados	City of Columbia/Dominion Energy	1	2, 4 & 7	Capital Improve. Budget	<\$250,000	Deferred due to funding	Deferred
Install safe rooms in critical facilities especially those serving vulnerable populations	Tornados	City of Columbia/School District1	2	2, 4 & 7	Capital Improve. Budgets	\$250,000 to \$750,000	Deferred due to funding	Deferred
Establish GIS mapping of all hazard events by location, effect, and time	Tornados	City of Columbia/Rich. County	3	10	Operating Budgets of city and county	<\$250,000	Ongoing	Ongoing
Increased generating capacity at water plants and key pump stations	Hurricanes	City of Columbia/other water providers	2	2, 4 & 7	Capital Improve. Budgets	\$750,000>	Deferred due to funding	Deferred
Develop more raw and	Hurricanes	City of Columbia	2	2, 4 & 7	Capital Improve.	\$750,000>	Deferred	Deferred

City of Columbia								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
treated water impoundments offsite		and other water providers in county			Budgets		due to funding	
Add capacity at solid waste disposal facilities serving the county to handle more debris	Hurricanes	City of Columbia and solid waste contractors	2	2, 4 & 7	Capital Improve. Budgets and Plans	\$750,000>	Deferred due to funding	Deferred
Implement the terms and provisions of Columbia's Severe Weather Operation Plans	Hurricane	City of Columbia	2	2 & 4	Capital and Operating Budgets	<\$250,000	Ongoing	Ongoing
Conduct earthquake impact analysis on critical facilities in the City of Columbia	Earthquake	City of Columbia/Rich. County	1	2 & 4	Public Works Depts. Capital Budgets	\$250,000 to \$750,000	Deferred due to funding	Deferred
Work with Dominion Energy to ensure that the Lake Murray Dam withstands future earthquakes	Earthquake related dam failure	Rich. County and Dominion Energy	1	2 & 4	Operating Budget	<\$250,000	Ongoing	Ongoing
Ensure that warning signal system works for rapid evacuation from lands downstream of Lake Murray Dam	Earthquake related dam failure	City of Columbia/Dominion Energy	1	2 & 4	Operating Budget	<\$250,000	Ongoing	Ongoing
Develop clearly marked and explained evacuation routes for Lake Murray dam failure	Earthquake related dam failure	City of Columbia/Rich. County/ Dominion Energy	1	2 & 4	Capital Improve. Budgets	<\$250,000	Ongoing	Ongoing
Develop speakers bureau about earthquake and other natural disaster threats to the county	Earthquake	City of Columbia/ Rich. County/ Dominion Energy towns cities	1	4 & 5	Operating Budget	<\$250,000	Deferred due to funding	Deferred
Develop and publicize water conservation practices to respond to drought declarations	Drought	City of Columbia	1	5	Operating Budget	<\$250,000	Ongoing	Ongoing
Amend state drought legislation to stiffen penalties & clarify laws	Drought	SC General Assembly	3	5	Operating Budget	<\$250,000	Deferred	Deferred
Institute a drought water storage program for fire suppression	Drought	City of Columbia	1	2, 4 & 7	Capital Budgets of Public Works Programs	<\$250,000	Ongoing	Ongoing

Mitigation Action Update for the City of Columbia since the 2016 HMP

- No natural hazard mitigation activities implemented, or changes provided to their mitigation strategy list.

Table 109 - City of Forest Acres Mitigation Strategies.

City of Forest Acres								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Install surge protectors in critical facilities	Thunderstorm, Hail, Wind, Lightning	City of Forest Acres/ Rich. County/School Districts	1	2, 4 & 7	Capital Improve. Budgets	\$250,000 to \$750,000	Deferred due to funding	Deferred
Clear power line and utility easements of debris	Thunderstorm, Hail, Wind, Lightning	City of Columbia/ E. Richland Publ. Serv. District/ Dominion Energy City of Forest Acres	1	2, 4 & 7	Public Works Operating Budgets	<\$250,000	Ongoing	Ongoing
Remove taller trees near critical facilities	Thunderstorm, Hail, Wind, Lightning	City of Forest Acres/Dominion Energy	2	2, 4 & 7	Public Works Operating Budget	<\$250,000	Ongoing	Ongoing
Enforce city zoning to restrict development in flood-plains	Flooding	City of Forest Acres	1	4 & 7	Operating Budget	<\$250,000	Ongoing	Ongoing
Declare May of each year to be Flood Awareness Month	Flooding	Forest Acres City Council	2	4 & 7	Operating Budget	<\$250,000	Deferred due to funding	Ongoing
Coordinate with Rich. County's GIS system to track all structures and demolition permits in flood areas	Flooding	City of Forest Acres	2	10	Operating Budget	<\$250,000	Ongoing	Ongoing
Coordinate with other local gov'ts in county to make stream channel improvement	Flooding	City of Forest Acres/ Rich. County	3	2 & 10	Special millage agreement w/Richland County for stormwater management	<\$250,000	Ongoing	Ongoing
Replace structurally obsolete bridges	Flooding	Rich. County/SCDOT	2	2, 4 & 7	Capital Improve. Budgets	\$750,000>	Ongoing	Ongoing
Identify & contact all repetitive loss properties	Flooding	City of Forest Acres	1	1, 2, 3 & 10	Operating Budgets	<\$250,000	Ongoing	Ongoing
Ensure that the FEMA Elevation Certificate is properly completed before issuance on property in flood areas	Flooding	City of Forest Acres	1	4	Operating Budgets	<\$250,000	Deferred due to funding	Ongoing
Undertake Planning to participate in Community Rating System	Flooding	City of Forest Acres	1	4	Operating Budgets	<\$250,000	Deferred due to funding	2015
Maintain status in the NFIP	Flooding	City of Forest Acres	1	2, 4, 5, 7 & 10	Operating Budget	<\$250,000	Ongoing	Ongoing

City of Forest Acres								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Power line & utility easement clearance	Winter Snow & Ice Storms	City of Columbia, Forest Acres/ Dominion Energy/Columbia	1	2, 4 & 7	Electric & water and sewer utility providers	<\$250,000	Ongoing	Ongoing
Debris removal and road clearance work	Winter Snow & Ice Storms	City of Forest Acres Dominion Energy/ E. Rich. Co. Pub. Serv. District	1	2, 4 & 7	City of F. Acres/ County Public Works Operating Budget	<\$250,000	Ongoing	Ongoing
Use bus and van transit system for emergency shelter, evacuation & communication capacity	Winter Snow & Ice Storms	Central Midlands Transit System/ DART system, etc.	1	2 & 4	CMRTA and DART budgets	<\$250,000	Ongoing	Ongoing
Procure and use elec. generators at critical facilities	Winter Snow & Ice Storms	Town A. Lakes/ Rich. County/ school district	1	2, 4 & 7	Capital Improve. Budgets	\$250,000 to \$750,000	Deferred due to funding	2015
Harden utility services to facilities especially serving vulnerable populations	Tornados	E. Rich. Public Serv. Dist./ Rich. County/City of Columbia	1	2, 4 & 7	Capital Improve. Budget	\$250,000 to \$750,000	Deferred due to funding	2015
Emergency response chain saw project and other efforts to remove debris	Tornados	City of Forest Acres/ Dominion Energy/ SCDOT	1	2, 4 & 7	Capital Improve. Budget	<\$250,000	Deferred due to funding	2015
Establish GIS mapping of all hazard events by location, effect, and occurrence	Tornados	City of Forest Acres/ Rich. County	3	10	Operating Budgets of city and county	<\$250,000	Ongoing	Ongoing
Increased generating capacity at water plants and key pump stations	Hurricanes	City of Columbia	2	2, 4 & 7	Capital Improve. Budgets	\$250,000 to \$750,000	Deferred due to funding	Deferred
Continue to enforce International Building and Fire Codes	Hurricanes	City of Forest Acres	2	2 & 4	Operating Budgets	<\$250,000	Ongoing	Ongoing
Cooperate with the County's Emergency Response Plans for Severe Weather	Hurricane	City of Forest Acres/ Rich. County	2	2, 4 & 7	Operating Budgets	<\$250,000	Ongoing	Ongoing
Work with S.C. DHEC to ensure that the major lakes & ponds in F.A. may withstand future earthquakes	Earthquake	City of Forest Acres/ SC DHEC	1	2 & 4	Operating Budget	\$750,000 >	Ongoing	Ongoing
Develop speakers bureau about earthquake and other hazards to F. Acres	Earthquake	City of Forest Acres/ Richland County	1	2 & 4	Operating Budgets	<\$250,000	Deferred due to funding	Deferred

City of Forest Acres								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Develop and publicize water conservation practices to respond to drought declarations	Drought	City of Forest Acres	1	5	Operating Budget	<\$250,000	Ongoing	Ongoing
Amend state drought legislation to stiffen penalties & clarify laws	Drought	SC General Assembly	3	5	Operating Budget	<\$250,000	Deferred due to funding	Deferred

Mitigation Action Update for the City of Forest Acres since the 2016 HMP

- No natural hazard mitigation activities implemented, or changes provided to their mitigation strategy list.

Table 110 - Town of Arcadia Lakes Mitigation Strategies.

Town of Arcadia Lakes								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Clear power line and utility easements of debris	Thunder-storms (Hail, Wind, Lightning)	Dominion Energy	1	2, 4 & 7	Public Works Operating Budgets	<\$250,000	As needed	Ongoing
Remove taller trees near critical facilities	Thunder-storms (Hail, Wind, Lightning)	Town of Arcadia Lakes/ Dominion Energy	2	2, 4 & 7	Public Works Operating Budget	<\$250,000	As needed	Ongoing
Enforce town zoning to restrict development in flood-plains	Flooding	Town of Arcadia Lakes	1	3	Operating Budget	<\$250,000	As needed	Ongoing
Declare May of each year to be Flood Awareness Month	Flooding	Arcadia Lakes Town Council	2	6	Operating Budget	<\$250,000	Ongoing	Ongoing
Coordinate with Rich. County's GIS system to track all structures and demolition permits in flood area	Flooding	Town of Arcadia Lakes	2	10	Operating Budget	<\$250,000	Ongoing	Ongoing
Coordinate with other local gov'ts in county to make stream channel improvement	Flooding	Town of Arcadia Lakes/ Rich. County	3	2, 4 & 7	Capital Improve. Budgets	<\$250,000	As needed	Ongoing
Identify & contact all repetitive loss properties	Flooding	Town of Arcadia Lakes	1	10	Operating Budgets	<\$250,000	Ongoing	Ongoing
Ensure that the FEMA Elevation Certificate is properly completed before issuance on property in flood areas	Flooding	Town of Arcadia Lakes	1	7 & 9	Operating Budgets	<\$250,000	Ongoing	Ongoing

Town of Arcadia Lakes								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Undertake Planning to participate in Community Rating System	Flooding	Town of Arcadia Lakes	1	3	Operating Budgets	<\$250,000	Deferred due to funding	Ongoing
Replace structurally obsolete bridges	Flooding	Rich. County/SCDOT	2	2, 4 & 7	Capital Improve. Budgets	\$750,000>	Ongoing	Ongoing
Maintain status in the NFIP	Flooding	Town of Arcadia Lakes	1	2, 4, 5, 7 & 10	Operating Budget	<\$250,000	Ongoing	Ongoing
Power line and utility R-O-W easement clearance	Winter Snow & Ice Storms	Dominion Energy/City of Columbia	1	2, 4 & 7	Electric utility providers	<\$250,000	As needed	Ongoing
Debris removal and road clearance work	Winter Snow & Ice Storms	Dominion Energy/ SC DOT/Rich County	1	2, 4 & 7	Town A. Lakes/ County Public Works Operating Budget	<\$250,000	As needed	Ongoing
Use bus and van transit system for emergency shelter, evacuation & communication capacity	Winter Snow & Ice Storms	Central Midlands Transit System/ DART system, etc.	1	4	CMRTA and DART budgets	<\$250,000	Ongoing	Ongoing
Procure and use elec. generators for vulnerable citizens of Arcadia Lakes	Winter Snow & Ice Storms	Town of Arcadia Lakes	1	2, 4 & 7	Capital Improve Budgets	\$250,000 to \$750,000	Deferred due to funding	Ongoing
Increased generating capacity at water plants and key pump stations	Hurricanes	City of Columbia/other water provider	2	2, 4 & 7	Capital Improve. Budgets	\$250,000 to \$750,000	Deferred due to funding	Deferred
Continue to enforce International Building and Fire Codes with Rich. County	Hurricanes	Town of Arcadia Lakes / Rich. County	2	2 & 4	Operating Budgets	<\$250,000	Ongoing	Ongoing
Cooperate with the County's Emergency Response Plans for Severe Weather	Hurricane	Town of Arcadia Lakes/ Rich. County	2	2 & 4	Operating Budgets	<\$250,000	Ongoing	Ongoing
Harden utility services identified as critical	Tornados	Town of Arcadia Lakes/ Rich. County/City of Columbia	1	2, 4 & 7	Capital Improve. Budget	\$250,000 to \$750,000	Deferred due to funding	Deferred
Emergency response chain saw project and other efforts to remove debris	Tornados	Town of Arcadia Lakes /Dominion Energy	1	2, 4 & 7	Capital Improve. Budget	<\$250,000	Deferred due to funding	Deferred
Establish GIS mapping of all hazard events by location, effect, and time	Tornados	Town of Arcadia Lakes/ Rich. County	3	10	Operating Budgets of town and county	\$250,000 to \$750,000	Ongoing	Ongoing
Work with S.C. DHEC to ensure that the major lakes & ponds in town may withstand	Earthquake	Town of Arcadia Lakes. / SC DHEC	1	4	Operating Budget	\$250,000 to \$750,000	Ongoing	Ongoing

Town of Arcadia Lakes								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
future earthquakes								
Develop speakers bureau about earthquake and other natural disaster threats to the town	Earthquake	Town of Arcadia Lakes/ Rich. County	1	5	Operating Budgets	\$250,000 to \$750,000	Deferred due to funding	Ongoing
Develop and publicize water conservation practices to respond to drought declarations	Drought	Town of Arcadia Lakes	1	5	Operating Budget	<\$250,000	Ongoing	Ongoing
Amend state drought legislation to stiffen penalties & clarify laws	Drought	SC General Assembly	3	5	Operating Budget	<\$250,000	Deferred	Deferred

Mitigation Action Update for the Town of Arcadia Lakes since the 2016 HMP

- No natural hazard mitigation activities implemented, or changes provided to their mitigation strategy list.

Table 111 - Town of Blythewood Mitigation Strategies.

Town of Blythewood								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Improved suppression response (tankers, dry chemicals)	Forest Fire/Wildfires	Rich. County	1	2 & 7	Capital Improve. Budget	\$250,000 to \$750,000	Ongoing	Ongoing
Fire Code enforcement/inspections	Forest Fire/Wildfires	Rich. County	1	2 & 5	Operating budgets	<\$250,000	Ongoing	Ongoing
Construct dry hydrant program in rural areas of county	Forest Fire/Wildfires	Rich. County/Columbia/Winningsboro	1	2 & 7	Capital Improve. Budgets	\$250,000 to \$750,000	Ongoing	Ongoing
Use GIS capacity to map, record wildfires, all hazard events	Forest Fire/Wildfires	Rich. County	1	10	Operating Budget	<\$250,000	Ongoing	Ongoing
Adopt development standards to restrict development in flood-plains	Flooding	Town of Blythewood	1	2 & 5	Operating Budget	<\$250,000	Ongoing	Ongoing
Declare May of each year to be Flood Awareness Month	Flooding	Town of Blythewood	2	2 & 5	Operating Budget	<\$250,000	Ongoing	Ongoing
Coordinate with county to make stream channel imp.	Flooding	Rich. County/ Town of Blythewood	3	2 & 7	Capital Improve. Budgets	<\$250,000	Ongoing	Ongoing
Replace structurally obsolete bridges	Flooding	Rich. County/ Town of Blythewood SCDOT	2	2 & 7	Capital Improve. Budgets	\$750,000>	Deferred due to funding	Deferred
Identify & contact all repetitive	Flooding	Rich. County/ Town	1	5 & 10	Operating	<\$250,000	Ongoing	Ongoing

Town of Blythewood								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
loss properties		of Blythewood			Budgets			
Ensure that the FEMA Elevation Certificate is properly completed before issuance on property in flood areas	Flooding	Rich. County/ Town of Blythewood	1	2, 5 & 10	Operating Budgets	<\$250,000	Ongoing	Ongoing
Undertake Planning to participate in Community Rating System	Flooding	Town of Blythewood	1	2, 5 & 10	Operating Budgets	<\$250,000	Ongoing	Ongoing
Power line easement clearance	Winter Snow & Ice Storms	Rich. County/ Dominion Energy Fairfield Elect. Coop.	1	2 & 7	Electric utility providers	<\$250,000	Ongoing	Ongoing
Debris removal and road clearance work	Winter Snow & Ice Storms	Town of Blythewood/Rich. County Public Works and SCDOT	1	2 & 7	Rich. County Public Works & SCDOT Operating Budgets	<\$250,000	Ongoing	Ongoing
Use bus and van transit system for emergency shelters, evacuation & communication. capacity	Winter Snow & Ice Storms	Central Midlands Transit System/ DART system, etc.	1	4 & 7	CMRTA and DART budgets	<\$250,000	Ongoing	Ongoing
Procure and Use elec. generators at critical facilities	Winter Snow & Ice Storms	Town of Blythewood/ school dist. cities/ recreation comm.	1	2 & 7	Capital Improve. budgets	\$250,000 to \$750,000	Ongoing	Ongoing
Install surge protectors in critical facilities	Thunder-storms (Hail, Wind, Lightning)	Town of Blythewood/ Rich. County/ School Districts & cities	1	2 & 7	Capital Improve. Budgets	\$250,000 to \$750,000	Ongoing	Ongoing
Adopt procedure to suspend operations during lightning storms	Thunder-storms (Hail, Wind, Lightning)	Town of Blythewood/Rich. County	2	2, 4 & 5	Operating Budget	<\$250,000	Ongoing	Ongoing
Clear power line and utility easements of debris	Thunder-storms (Hail, Wind, Lightning)	Dominion Energy/ Fairfield Electric Coop	1	2 & 7	Public Works Operating Budgets	<\$250,000	As needed	Ongoing
Remove taller trees near critical facilities	Thunderstorms (Hail, Wind, Lightning)	Town of Blythewood/ Rich. County/ Fairfield Electric Coop/ Dominion Energy	2	2 & 7	Public Works Operating Budget	<\$250,000	As needed	Ongoing
Develop Portable Water Treatment Facilities	Hurricanes	City of Columbia/Town of Winnsboro.	2	2 & 7	Capital Improve. Budget	\$250,000 to \$750,000	Ongoing	Ongoing
Replace water storage tanks and pumps as needed	Hurricanes	City of Columbia/Town of Winnsboro	2	2 & 7	Capital Improve. Budgets	\$250,000 to \$750,000	As needed	Ongoing

Town of Blythewood								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Add capacity at solid waste disposal facilities serving the county to handle more debris	Hurricanes	Rich. County and solid waste contractor	2	2 & 7	Capital Improve. Budgets	\$250,000 to \$750,000	Ongoing	Ongoing
"Harden" utility services especially in highly vulnerable areas	Tornados	Rich. County/utility providers	1	2 & 7	Capital Improve. Budget	\$250,000 to \$750,000	Ongoing	Ongoing
Conduct engineering strength studies of critical facilities	Tornados	Town of Blythewood/Rich. County	1	2 & 4	Capital Improve. Budget	\$250,000 to \$750,000	Ongoing	Ongoing
Emergency response chain saw project and other efforts to remove debris	Tornados	Town of Blythewood/Rich. County/ Dominion Energy/Fairfield Electric Coop	1	2 & 7	Capital Improve. Budgets	<\$250,000	Ongoing	Ongoing
Install safe rooms in critical facilities especially those with vulnerable populations	Tornados	Town of Blythewood/Rich. County	2	2 & 7	Capital Improve. Budget	\$250,000 to \$750,000	Ongoing	Ongoing
Establish GIS mapping of all hazard events by location, effect, and time	Tornados	Town of Blythewood/Rich. County,	3	10	Capital Improve. Budgets	<\$250,000	Ongoing	Ongoing
Conduct earthquake impact analysis on critical facilities in Rich. County	Earthquake	Town of Blythewood/Rich. County.	1	2 & 4	Public Works Depts./ Capital Budgets	<\$250,000	Ongoing	Ongoing
Develop speakers bureau about earthquake and other natural disaster threats to the county	Earthquake.	Town of Blythewood/Rich. County/ Dominion Energy towns cities	1	2, 4 & 5	Operating Budget	<\$250,000	Ongoing	Ongoing
Develop and publicize water conservation practices to respond to drought declarations	Drought	Town of Blythewood	1	5	Operating Budget	<\$250,000	Ongoing	Ongoing
Amend state drought legislation to stiffen penalties & clarify laws	Drought	SC General Assembly	3	5	Operating Budget	<\$250,000	Ongoing	Ongoing
Institute a drought water storage program for fire suppression	Drought	Rich. County/City of Columbia	1	2, 4 & 7	Capital Budgets of Public Works Programs	<\$250,000	Ongoing	Ongoing

Mitigation Action Update for the Town of Blythewood since the 2016 HMP

- No natural hazard mitigation activities implemented, or changes provided to their mitigation strategy list.

Table 112 - Town of Eastover Mitigation Strategies.

Town of Eastover								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Regulate open burning by ordinance (Red flag alerts)	Forest Fire/Wildfires	Fire	3	4 & 5	Budget/Grant	\$75,000.00	New	2016
Use GIS capacity to map, record wildfires, all hazard events	Forest Fire/Wildfires	County/Admin	3	2 & 4	Budget/Grant	\$100,000.00	New	2017
Implement warning siren system	Flooding	Admin	3	2, 4 & 8	Budget/Grant	\$85,000.00	New	2017
Enforce zoning and building codes to restrict development in flood-plains	Flooding	Flood	1	2,4 & 5	Budget/Grant	\$60,000.00	New	2016
Implement Flood Awareness incentives	Flooding	Admin	2	2 & 5	Budget/Grant	\$35,000.00	New	2016
Coordinate with Rich. County's GIS system to track all structures and demolition permits in flood area	Flooding	Admin	2	2,5 & 10	Budget/Grant	\$20,000.00	New	2016
Coordinate with other local gov'ts in county to make stream channel imp.	Flooding	Flood	2	5 & 7	Budget/Grant	\$15,000.00	New	2016
Increase drainage capabilities within flood prone areas of the Town.	Flooding	Flood	1	2,4 & 7	Budget/Grant	\$100,000.00	New	2018
Replace structurally obsolete bridges	Flooding	DOT/County	2	7	Budget/Grant	\$75,000.00	New	2018
Identify & contact all repetitive loss properties	Flooding	Flood	1	4,7 & 10	Budget/Grant	\$50,000.00	New	2016
Implement initiatives to improve structural integrity and safety of properties in flood prone areas through flood proofing, elevations or buyouts.	Flooding	Admin	1	2,4 & 5	Budget/Grant	\$1,000,000.00	New	2017
Mitigation of homes and businesses located in special flood hazard area and were substantially damaged.	Flooding	Admin	1	2,4,5 & 7	Budget/Grant	\$300,000.00	New	2017
Undertake Planning to participate in Community Rating System	Flooding	Admin	3	4, 5 & 7	Budget/Grant	\$30,000.00	New	2017
Maintain status in the NFIP	Flooding	Flood	1	4, 5 & 7	Budget/Grant	\$25,000.00	New	Ongoing
Power line easement clearance	Winter Snow & Ice Storms	Maintenance	2	2 & 4	Budget/Grant	\$55,000.00	New	2016
Debris removal and road clearance work	Winter Snow & Ice Storms	Maintenance	1	2 & 4	Budget/Grant	\$55,000.00	New	2016

Town of Eastover								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Use bus and van transit system for emergency shelters, evacuation & communication capacity	Winter Snow & Ice Storms	Admin	3	2 & 4	Budget/Grant	\$250,000.00	New	2019
Procure and use elec. generators at critical facilities	Winter Snow & Ice Storms	Maintenance	1	2 & 5	Budget/Grant	\$150,000.00	New	2017
Install surge protectors in critical facilities	Thunderstorms (Hail, Wind, Lightning)	Maintenance	2	2 & 7	Budget/Grant	\$65,000.00	New	2017
Adopt procedure to suspend operations during lightning storms	Thunderstorms (Hail, Wind, Lightning)	Admin	3	2,4 & 5	Budget/Grant	\$20,000.00	New	2016
Clear utility easements of debris	Thunderstorms (Hail, Wind, Lightning)	Maintenance	1	2,4,5 & 7	Budget/Grant	\$55,000.00	New	2017
Remove taller trees near critical facilities	Thunderstorms (Hail, Wind, Lightning)	Maintenance	2	2,4 & 7	Budget/Grant	\$55,000.00	New	2017
Fortify structural integrity of critical facilities	Thunderstorms (Hail, Wind, Lightning)	Admin	2	2,4 & 7	Budget/Grant	\$350,000.00	New	2017
Develop Portable Water Treatment Facilities	Hurricanes	Admin	2	2,4,5 & 7	Budget/Grant	\$24,000.00	New	2017
Replace water storage tanks and pumps as needed	Hurricanes	Admin	1	2,4,5 & 7	Budget/Grant	\$50,000.00	New	Ongoing
Add capacity to manage the handling and disposal of debris	Hurricanes	Admin	3	2,4 & 5	Budget/Grant	\$75,000.00	New	2018
Conduct engineering strength studies of critical facilities	Tornados	Admin	3	2,4,5 & 7	Budget/Grant	\$150,000.00	New	2018
Emergency response chain saw project and other efforts to remove debris	Tornados	Maintenance	1	2 & 8	Budget/Grant	\$200,000.00	New	2016
Install safe rooms in critical facilities especially those with vulnerable populations	Tornados	Admin	3	2,4 & 5	Budget/Grant	\$45,000.00	New	2019
Establish GIS mapping of all hazard events by location, effect, and time	Tornados	Flood/County	2	1,5 & 10	Budget/Grant	\$20,000.00	New	2016

Town of Eastover								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
"Harden" utility services especially in highly vulnerable areas	Tornados	Admin	3	2,4,5 & 7	Budget/Grant	\$85,000.00	New	2019
Conduct earthquake impact analysis on critical facilities	Earthquake	Admin	3	2,4 & 5	Budget/Grant	\$100,000.00	New	2017
Develop clearly marked and explained evacuation routes.	All	Admin	2	2,5 & 10	Budget/Grant	\$7,000.00	New	2016
Develop speakers bureau about earthquake and other natural disaster threats to the county	Earthquake	Admin	3	2,4 & 5	Budget/Grant	\$15,000.00	New	2018
Develop and publicize water conservation practices to respond to drought declarations	Drought	Admin	3	2,4 & 5	Budget/Grant	\$200.00	New	2016
Amend state drought legislation to stiffen penalties & clarify laws	Drought	Admin	3	2 & 5	Budget/Grant	\$30,000.00	New	2019
Develop a quality water consumption program in vulnerable fringe areas of the town	Drought	Admin	2	2,4 & 5	Budget/Grant	\$1,500.00	New	2017
Institute a drought water storage program for fire suppression	Drought	Admin	3	2,4 & 5	Budget/Grant	\$30,000.00	New	2016
Establish cooling stations for vulnerable population	Heat	Admin	1	2,4 & 5	Budget/Grant	\$65,000.00	New	2017
Implement public awareness and outreach campaign	Heat	Police	1	2,4 & 5	Budget/Grant	\$20,000.00	New	Ongoing

Mitigation Action Update for the Town of Eastover since the 2016 HMP

- No natural hazard mitigation activities implemented, or changes provided to their mitigation strategy list.

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Appendices

I. Risk Assessment Methodology

I-A. Conducting a Risk Assessment

This section provides definitions of frequently used terms, describes data sources and hazards analyzed, and outlines the analytical steps of the risk assessment. A risk assessment forms the empirical basis for the identification and justification of mitigation actions by highlighting the most significant risks and overall vulnerability of an area (i.e., its capabilities to mitigate, prepare for, respond to, and recover from events).

The steps of a risk assessment include:

1. A description of past, and future, hazards affecting a county (e.g., location, date of occurrence, magnitude, losses).
2. Identification of community assets (e.g., population, community lifelines, critical infrastructure).
3. Determination of exposure (e.g., at risk infrastructure and population).
4. Estimation of possible adverse impacts and consequences (Figure 201).



Figure 201 - Elements of a risk assessment (FEMA 2013).

In this Plan, *Risk* is calculated for each hazard as a product of the *Hazard Threat (THR)*, *Vulnerability (VUL)*, and *Severity of Consequence (CON)*. All calculations are completed at the unit of analysis, which in this Plan is a 0.25 mile hexagon.

$$RISK_{HAZ} = (THR_{HAZ})(VUL)(CON_{HAZ}) \quad (1)$$

Vulnerability, i.e. a locality's pre-existing characteristics, remains static for each hazard, and is calculated as the average of *Social Vulnerability (SoVI)*, *community lifelines (INF)*, and *population density (POP)*.

$$VUL = \frac{(SoVI) + (INF) + (POP)}{3} \quad (2)$$

Vulnerability was determined by developing a GIS inventory of FEMA's community lifelines⁹⁴, a census block group representation of population density, and an area (tract) measure of social vulnerability. Community lifelines and critical infrastructure assets include those are transportation facilities, communication facilities, water and wastewater facilities, and power facilities among others described below. Socially vulnerable populations were derived from the Social Vulnerability Index first developed

⁹⁴ <https://www.fema.gov/lifelines>

by Cutter (2003)⁹⁵ and later refined by scholars at the University of Central Florida⁹⁶. Population density was derived from the HUD LMISD at the block group level. Each vulnerability variable was then transformed into classes zero (0) to five (5). The variable classes were then summed and divided by three (3) to develop a composite vulnerability score from zero (0) to five (5) (Equation 2).

Every hazard is unique in terms of its past impacts and future potential for impacts. In this Plan, this is captured as the Severity of Consequence (*CON*). This universal accounting of hazard risk for the Central Midland's area considers historical impacts (*HISTCON*), hazard frequencies, future climate impacts (*CLIMSENS*), as well as the current high priority hazards of the county (based on the 2016 Plan), and those likely to cause continued losses if not mitigated. For this assessment, *Severity of Consequence* is the sum of these four components. Prior to summation all components were categorized and grouped into five classes ranging from 1 to 5.⁹⁷

$$CON_{HAZ} = (HISTCON_{HAZ}) + (CLIMSENS_{HAZ}) + \left(\frac{FREQUENCY_{HAZ}}{SEVERITY_{HAZ}} \right) + (PRIORITY_{HAZ}) \quad (3)$$

Hazard consequence is the sum of historical frequency, economic impacts, fatalities, and injuries from past disaster events (Equation 4).

$$HISTCON_{HAZ} = \text{Historical Frequency Score} + \text{Historical Economic Impacts Score} + \text{Historical Fatality Score} + \text{Historical Injury Score} \quad (4)$$

Where:

- Historical Frequency Score: A Min/Max standardized (1-5) indicator of recorded⁹⁸ frequency of occurrence for past loss causing Hazard (*HAZ*) events.
- Historical Economic Impacts Score: A Min/Max standardized (1-5) indicator of recorded damages from past loss causing Hazard (*HAZ*) events.
- Historical Fatality Score: A Min/Max standardized (1-5) indicator of recorded fatalities from past loss causing Hazard (*HAZ*) events.
- Historical Injury Score: A Min/Max standardized (1-5) indicator of recorded injuries from past loss causing Hazard (*HAZ*) events.

Each hazard was classified (1-5) on its climate sensitivity, or its connection to current and future weather based on findings from peer reviewed and government documents such as the Southeastern Climate Assessment. A hazard threat's climate sensitivity score was calculated from 1-5 where 1 represents low (or negative) climate sensitivity and 5 represents high (or strong positive) climate sensitivity (Table 114).

Generally, hazards fall into two specific types in terms of their frequency vs. their severity. Low probability/high consequence disasters (Earthquake, Hurricane) have a generally low frequency of occurrence with a much higher consequence when they do occur. Conversely, high probability/low consequence events occur more frequently but cause less damage and impact on society when they do. Each hazard event type was appraised on its frequency/severity by dividing the total loss by the total number of events and then standardizing/normalizing the resulting values on a (1-5) scale where 1 indicates hazard threats with less loss per hazard incidence and 5 indicates hazard threats with more loss per hazard incidence.

⁹⁵ <https://onlinelibrary.wiley.com/doi/abs/10.1111/1540-6237.8402002>

⁹⁶ www.vulnerabilitymap.org

⁹⁷ CMCOG 2016 Hazard Mitigation Plan - <http://www.centralmidlands.org/pdf/CMHMP%202016%20-%20Final.pdf>

⁹⁸ <https://www.ncdc.noaa.gov/stormevents/>

Each hazard included in the assessment has either impacted the Central Midlands area in the past or has the potential to cause future impacts. Previous plans have prioritized hazards for mitigation funding and planning. Including the current prioritization of hazards provides a connection between this plan and previous planning efforts and moves these assessments towards becoming living documents. Like the historical score, climate sensitivity, and severity/frequency scores, the hazard priority score ranges from low to high (1-5) for each hazard threat.

I-B. Data and data transformations

A. Social Vulnerability

Social vulnerability, a concept focused on understanding an area's capacity to prepare for, respond to, and rebound from disaster events⁹⁹, has a long conceptual and theoretical history in social and disaster science fields.¹⁰⁰ Socially vulnerable populations have fewer resources to aid in preparation for disasters, often bear the brunt of disaster impacts, and take longer to bounce back from disaster events. Empirical measures of social vulnerability enable decision makers and emergency managers to understand where vulnerable populations reside and how that vulnerability is manifest across a landscape. Here, 29 indicators of social vulnerability, collected from www.vulnerabilitymap.org, were used to create a tract level SoVI for the county. SoVI scores were categorized from (0 – no data to 5 – high social vulnerability) using a standard deviation classification scheme.

B. Community Lifelines and Critical Infrastructure

Data on community lifelines and critical infrastructure assets (Table 113) were collected based on FEMA's Community Lifelines¹⁰¹ with the understanding that:

- Lifelines enable the continuous operation of critical government and business functions and is essential to human health and safety or economic security.
- Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function.
- FEMA has developed a construct for objectives-based response that prioritizes the rapid stabilization of Community Lifelines after a disaster.
- The integrated network of assets, services, and capabilities that provide lifeline services are used day-to-day to support the recurring needs of the community and enable all other aspects of society to function.
- When disrupted, decisive intervention (e.g., rapid re-establishment or employment of contingency response solutions) is required to stabilize the incident.

Data originated from the following sources:

Table 113 - Data sources for community lifelines and critical assets.

FEMA Lifeline	Variable	Source	Critical
Safety and Security	Law Enforcement	https://www.arcgis.com/home/item.html?id=0d79b978d71b4654bddb6ca0f4b7f830	Yes
Safety and Security	Prisons	https://www.arcgis.com/home/item.html?id=2d6109d4127d458eaf0958e4c5296b67	
Safety and Security	Fire/EMS	https://www.arcgis.com/home/item.html?id=424601040221460d8d190e9be913fde5	Yes
Safety and Security	Search and Rescue	By request of South Carolina GISC	Yes
Safety and Security	Govt Services -	https://www.arcgis.com/home/item.html?id=7d121358b28042fe863d10a	

⁹⁹ <https://doi.org/10.1177/0002716205285515>

¹⁰⁰ <https://unu.edu/publications/books/measuring-vulnerability-to-natural-hazards-towards-disaster-resilient-societies-second-edition.html#overview>

¹⁰¹ <https://www.fema.gov/lifelines>

FEMA Lifeline	Variable	Source	Critical
	Courthouses	0c3c46709	
Safety and Security	Local EOCs	tps://www.arcgis.com/home/item.html?id=874798faedc74358bac9bbe1867af3c7	Yes
Safety and Security	Community Safety - Convention Centers/Fairgrounds	tps://www.arcgis.com/home/item.html?id=86c323b5d44748228ef10bc8b452d9f7	
Safety and Security	Public Schools	tps://www.arcgis.com/home/item.html?id=87376bdb0cb3490cbda39935626f6604	
Safety and Security	Private Schools	tps://www.arcgis.com/home/item.html?id=0dfe37d2a68545a699b999804354dacf	
Safety and Security	Colleges and Universities	tps://www.arcgis.com/home/item.html?id=0d7bedf9d582472e9ff7a6874589b545	
Safety and Security	Mobile Home Parks	tps://www.arcgis.com/home/item.html?id=4cdbccc5c538452aa91ceee277c460f9	
Safety and Security	Places of Worship	tps://www.arcgis.com/home/item.html?id=97603afcff00443f874acbe03c9e794a	
Safety and Security	Nursing Homes	tps://www.arcgis.com/home/item.html?id=78c58035fb3942ba82af991bb4476f13	
Food, Water, Shelter	Food Stores	tps://www.arcgis.com/home/item.html?id=6c8c635b1ea94001a52bf289d1e32b , https://sc-department-of-health-and-environmental-control-gis-sc-dhec.hub.arcgis.com/	
Food, Water, Shelter	Nutrition Sites	tps://www.arcgis.com/home/item.html?id=4c347ec17803406d86d101811a81e2aa	
Food, Water, Shelter	Water Treatment and Water Supply	https://sc-department-of-health-and-environmental-control-gis-sc-dhec.hub.arcgis.com/	Yes
Food, Water, Shelter	Shelter	tps://www.arcgis.com/home/item.html?id=bcaf5fdb3db24c78afee52d4c8a02748	
Health and Medical	Medical Care	tps://www.arcgis.com/home/item.html?id=48f5722c8ab746ac8fd976442c37439e	Yes
Energy	Transmission Lines and Substations	tps://www.arcgis.com/home/item.html?id=70512b03fe994c6393107cc9946e5c22 ; tps://www.arcgis.com/home/item.html?id=755e8c8ae15a4c9abfcec47b2e95fb9a	Yes
Energy	Gas Stations	tps://www.arcgis.com/home/item.html?id=6c8c635b1ea94001a52bf28179d1e32b	
Communications	Infrastructure	Cell Towers - https://www.arcgis.com/home/item.html?id=15dabb4108254481b591018be2598f3c Landmobile Communications Towers - https://www.arcgis.com/home/item.html?id=4ec3d6fe24124d7597da4c88dfeae678 FM Transmission towers - https://www.arcgis.com/home/item.html?id=fc3838297bb844daadb4bebe714bba78 Paging Transmission Towers - https://www.arcgis.com/home/item.html?id=98d19dce5c1b443eaaae3288229e103d	
Communications	Banks and Finance	tps://www.arcgis.com/home/item.html?id=6c8c635b1ea94001a52bf28179d1e32b	
Transportation	Non-State Highway/Roadway	http://info2.scdot.org/GISMapping/Pages/GIS.aspx	
Transportation	Railway	tps://www.arcgis.com/home/item.html?id=d209f26edc86485a9c63131e50d9940	
Transportation	Aviation	tps://www.arcgis.com/home/item.html?id=e747ab91a11045e8b3f8a3efd093d3b5	Yes
Hazardous Materials	Toxic Release Inventory Sites	tps://www.arcgis.com/home/item.html?id=2c4a0b5f85b945f8a67125e6a93fa7fe	
Hazardous Materials	Superfund Sites	tps://www.arcgis.com/home/item.html?id=c2b7cdf579c41bbba4898400aa38815	
Hazardous Materials	Solid Waste	tps://www.arcgis.com/home/item.html?id=155761d340764921ab7fb2e88257bd97	Yes

Community Lifeline locations are captured and mapped using either point features (individual locations) or line features (sets of point features) depending on the infrastructure asset. For example, electric

generation facilities are represented by a point while electrical transmission lines are represented as line features inside a GIS system. For this assessment, line feature classes representing critical infrastructure were converted to point feature classes using the ESRI ArcGIS Pro Generate Points Along Lines tool generating a point at each end point and every 1/10 mile (528 feet) along the line feature. Critical infrastructure point data and point data generated from the line features was then merged to create one complete point feature representation of community lifelines across the central midlands region and summarized to generate a count of points within each .25-mile hex grid. Here, critical lifelines (denoted in Table 113) representing assets that are either lacking redundancy (EOCs, substations, wastewater, airports) or those that are essential for response and recovery from disasters (hospitals, police/fire/EMS) were weighted (3x) more heavily than other community lifelines to reflect their critical importance across the central midlands. Community lifeline counts were then classified using an equal interval classifications scheme and mapped using the same output hex grid as the hazard threat maps.

C. Population Density

Population data at the block group level originate from the American Community Survey products developed for HUD's LMI block group dataset.¹⁰² Population counts were randomly distributed across the geographic area of each respective block group. Like critical infrastructure, population data was summed to generate a count of points within each .25-mile hex grid. Population per hex grid was classified on a quasi-exponential classification scale showing areas with higher populations across the county.

D. Climate Sensitivity

The climate sensitivity of a hazard based on an extensive literature review for which the sources and respective climate sensitivity scores are listed in (Table 114). A climate sensitivity score of 1 represents low (or negative) climate sensitivity and a score of 5 represents high (or strong positive) climate sensitivity.

Table 114 - Climate sensitivity by hazard type.

Hazard	Climate Sensitivity Score (1-5)	Reference
Drought	5	Abatzoglou, J.T. and A.P. Williams, 2016: Impact of anthropogenic climate change on wildfire across western US forests. Proceedings of the National Academy of Sciences of the United States of America, 113 (42), 11770-11775. http://dx.doi.org/10.1073/pnas.1607171113
Earthquake	3	https://climate.nasa.gov/news/2926/can-climate-affect-earthquakes-or-are-the-connections-shaky/
Extreme Cold	1	IPCC, 2013: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex, and P.M. Midgley, Eds. Cambridge University Press, Cambridge, UK and New York, NY, 1535 pp. http://www.climatechange2013.org/report/
Flash Flood	5	Mitsch, W.J. and J.G. Gosselink, 2007: Wetlands, 4 th ed. Wiley, New York, 600 pp.
Flooding	5	Sweet, W.V. and J.J. Marra, 2016: 2015 State of U.S. Nuisance Tidal Flooding. Supplement to State of the Climate: National Overview for May 2016. National Oceanic and Atmospheric Administration, National Centers for Environmental Information, 5 pp. http://www.ncdc.noaa.gov/monitoring-content/sotc/national/2016/may/sweet-marra- nuisanceflooding-2015.pdf
Fog	1	https://aaqr.org/articles/aaqr-15-05-0a-0353
Hail	3	Mitsch, W.J. and J.G. Gosselink, 2007: Wetlands, 4 th ed. Wiley, New York, 600 pp.
Heat	5	Allen, C.D., D.D. Breshears, and N.G. McDowell, 2015: On underestimation of global vulnerability to tree mortality and forest die-off from hotter drought in the Anthropocene. Ecosphere, 6 (8), 1-55. http://dx.doi.org/10.1890/ES15-00203.1

¹⁰² <https://www.hudexchange.info/programs/acs-low-mod-summary-data/acs-low-mod-summary-data-block-groups-places/>

Hazard	Climate Sensitivity Score (1-5)	Reference
Hurricane/Tropical Storm	5	Smith, T. J., Robblee, M. B., Wanless, H. R., & Doyle, T. W. (1994). Mangroves, hurricanes, and lightning strikes. <i>BioScience</i> , 44(4), 256-262. http://dx.doi.org/10.2307/1312230 . Doyle, T. W., Smith III, T. J., & Robblee, M. B. (1995). Wind damage effects of Hurricane Andrew on mangrove communities along the southwest coast of Florida, USA. <i>Journal of Coastal Research</i> , 159-168. http://www.jstor.org/stable/25736006
Lightning	3	Mitsch, W.J. and J.G. Gosselink, 2007: <i>Wetlands</i> , 4 th ed. Wiley, New York, 600 pp.
Severe Storm/Thunder Storm	5	Mitsch, W.J. and J.G. Gosselink, 2007: <i>Wetlands</i> , 4 th ed. Wiley, New York, 600 pp.
Tornado	3	Mitsch, W.J. and J.G. Gosselink, 2007: <i>Wetlands</i> , 4 th ed. Wiley, New York, 600 pp.
Wildfire	5	Abatzoglou, J.T. and A.P. Williams, 2016: Impact of anthropogenic climate change on wildfire across western US forests. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 113 (42), 11770-11775. http://dx.doi.org/10.1073/pnas.1607171113
Wind	3	Dale, V. H., Joyce, L. A., McNulty, S., Neilson, R. P., Ayres, M. P., Flannigan, M. D., ... & Wotton, B. M. (2001). Climate change and forest disturbances: climate change can affect forests by altering the frequency, intensity, duration, and timing of fire, drought, introduced species, insect and pathogen outbreaks, hurricanes, windstorms, ice storms, or landslides. <i>BioScience</i> , 51(9), 723-734. http://dx.doi.org/10.1641/0006-3568(2001)051[0723:cacafd]2.0.co;2
Winter Weather	1	IPCC, 2013: <i>Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change</i> . Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex, and P.M. Midgley, Eds. Cambridge University Press, Cambridge, UK and New York, NY, 1535 pp. http://www.climatechange2013.org/report/

I-C. Definitions

According to FEMA (2013, pp. 5-1)¹⁰³, a **hazard** is a “source of harm or difficulty created by a meteorological, environmental, or geological event.” **Community assets** include the “people, structures, facilities, and systems that have value to the community.” **Impacts** are “consequences or effects of a hazard on the community and its assets.” **Vulnerability** comprises the “characteristics of community assets that make them susceptible to impacts from a given hazard.” **Risk** is the “potential for damage, loss, or other impacts created by the interaction of natural hazards with community assets”.

In this Plan, the likelihood of a hazard is measured in two ways: (1) The **frequency of occurrence** is based on the historical record. It is measured in percentage and expresses how likely a hazard is to occur in any given year (or day for high frequency hazards). For example, if two tornadoes occurred in the past 20 years then the likelihood of a tornado to happen in any given year is 10% (2 events divided by 20 years). (2) A **recurrence interval** (or return period) also draws on the historic record. It is expressed in years and identifies when a hazard is likely to repeat. It is measured by dividing the time period of interest by the number of events. For the tornado example, this would mean that tornadoes are likely to occur every 10 years. The recurrence interval for frequently occurring hazards (e.g., lighting) is measured in days. Statistical probabilities are only available for floods (i.e. 100- and 500-year floods).

¹⁰³ FEMA, “Local Mitigation Planning Handbook”, 2013

I-D. Hazards Affecting the Region

The Central Midlands region faces multiple natural hazards, including:

- Flooding
- Droughts
- Tornadoes
- Wildfires
- Thunderstorms
- Lightning
- Cold Hazards
- Heat Hazards
- Winter Storms
- Hail
- Wind
- Earthquakes
- Fog
- Hurricanes & Tropical Storms

These hazards are mostly meteorological and hydrological in nature, some of them interrelated (e.g., hurricanes may cause flooding and tornadoes), and some consisting of hazardous elements that are not listed separately (e.g., winter storms cause snow). Natural hazards such as landslides, volcanic activity, tsunamis and sinkholes are excluded from any jurisdictional risk assessment because those hazards are not encountered or experienced in the region. The following provides general descriptions for each of the above listed hazards.

A. Flooding

A flood is the overflow of water onto land that is normally dry (Figure 202). The National Flood Insurance Program (NFIP) defines a flood as a "general and temporary condition of partial or complete inundation of two or more acres of normally dry land area or of two or more properties (at least one of which is your property) from:

- Overflow of inland or tidal waters;
- Unusual and rapid accumulation or runoff of surface waters from any source;
- Mudflow (a river of liquid and flowing mud on the surfaces of normally dry land areas, as when earth is carried by a current of water. Other earth movements such as landslide, slope failure or a saturated soil mass moving by liquidity down a slope, are not mudflows.); or
- Collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels that result in a flood as defined above.¹⁰⁴

There are four distinctive types of flooding that affect the region:

- **Flash flooding:** occurs from heavy rainfall that accumulates faster than the ground can absorb.
- **Urban flooding:** occurs because impervious surfaces (streets, roads, parking lots, residential and business areas) inhibit ground water absorption causing surface runoff
- **Riverine flooding:** occurs when an increase in water volume within a river channel overflows onto the surrounding floodplain. A floodplain is the lowland area adjacent to a river, lake or ocean.
- **Local drainage problems:** occur anywhere where the ground is flat, drainage patterns haven been disrupted, or where channels or culverts have not been maintained.
- **Dam/levee failure:** occurs when a dam/levee fails releases the impounded water, flooding the land downstream.

¹⁰⁴ P. 3, FEMA. "National Flood Insurance Program Summary of Coverage for Commercial Property." Federal Emergency Management Agency, https://www.fema.gov/sites/default/files/documents/fema_nfip-summary-coverage-commercial-property_3-26-2021.pdf

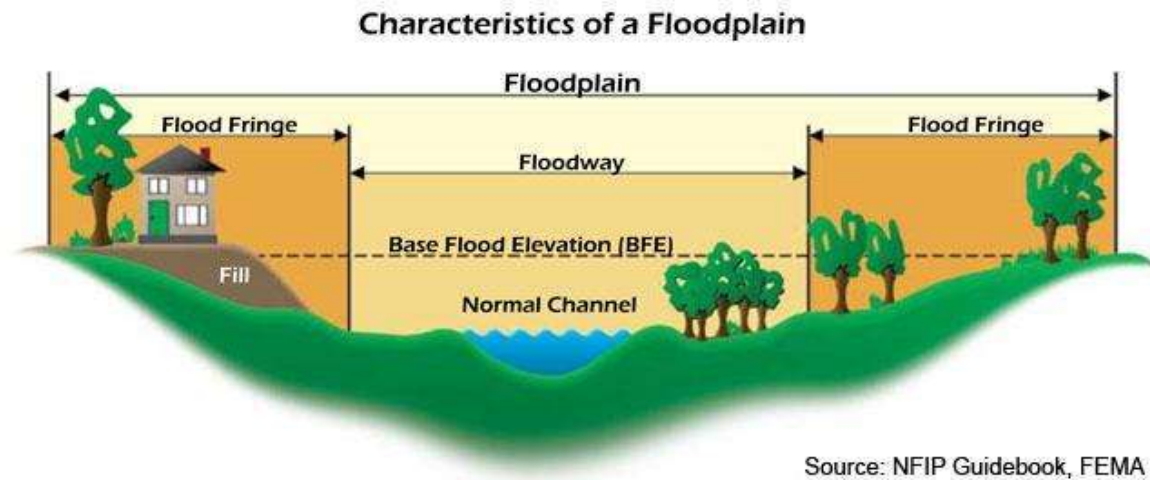


Figure 202 - Schematic of a floodplain.

The severity of flooding depends on the flood water volume, depth, velocity, and duration of flooding. These variables are influenced by stream and river basin physiography, precipitation and weather patterns, recent soil moisture conditions and the degree of vegetative clearing. As a result, floods may be highly localized. An event that led to severe flooding in one area may have low to no impacts on nearby locations. The National Weather Service (NWS) distinguishes four flood categories¹⁰⁵:

- **Minor Flooding:** minimal or no property damage, but possibly some public threat.
- **Moderate Flooding:** some inundation of structures and roads near stream. Some evacuations of people and/or transfer of property to higher elevations.
- **Major Flooding:** extensive inundation of structures and roads. Significant evacuations of people and/or transfer of property to higher elevations.
- **Record Flooding:** flooding which equals or exceeds the highest stage or discharge at a given site during the period of record keeping.

The 100-year flood serves as regulatory standard and is determined by engineering studies. The 100-year flood has a 1% chance to occur in any given year—it can occur every year, not just once in 100 years. A 10-year flood event is an event of smaller magnitude than the 100-year flood but with a higher annual probability (10% annual chance). A 500-year flood, on the other hand, is significantly larger than a 100-year event but has a lower probability to occur in any given year (0.2% annual chance).

Given that statistical probability terms are difficult to grasp, the Association of State Floodplain Managers (ASFPM) promotes the use of more tangible expressions of flood probability. As such, the ASFPM expresses the 100-year flood event as having a 1 in 4 chance of occurring over the life of a 30-year mortgage.¹⁰⁶ More frequent flood events tend to be less severe (e.g., 10-year flood) whereas rare events tend to be catastrophic (e.g., 500-year flood).

The definition of what constitutes a 100-year flood event is specific to every location, river, and point in time – because floodplain and river characteristics are not static and change over time. For example, two 100-year flood events have the same likelihood to occur, but they do not necessarily have the same

¹⁰⁵ NWS, "National Weather Service Glossary".

¹⁰⁶ ASFPM. "Reducing Flood Losses: Is the 1% Chance (100-Year) Flood Standard Sufficient?", 156pp. Washington D.C.: Association of State Floodplain Managers, 2004.

magnitude. In other words, a 100-year event for the Saluda River means something completely different in terms of discharge values (cubic feet per second) than, for example, the Mississippi River. Not only are 100-year events different between rivers, but they are also different along a river. A 100-year event upstream of the river is different than downstream since river characteristics (volume, discharge, and topography) change. Defining the size of a specific flood event (e.g., 100-year) depends largely on historical data on flow and discharge rates. The 100-year event is of significance since it is the regulatory standard that determines the obligation, or lack thereof, to purchase flood insurance. Flood insurance premiums are set depending on the flood zone as modeled by National Flood Insurance Rate Maps.

The Central Midlands suffer mostly damage from flash flooding. The Saluda Dam, completed in 1930 and 10 miles west of Columbia, has nearly eliminated riverine flooding along the Congaree River. A record catastrophic flash flood event in the Central Midlands region occurred in October of 2015 (Presidential Disaster Declaration DR-4241). The event was triggered by record rainfall amounts that led to widespread flash flooding with cascading infrastructure and dam failures.

Based on stream gage levels and precipitation forecasts, the NWS posts flood statements watches and warnings¹⁰⁷. These are defined as:

- **Flood Warning:** This is issued along larger streams when there is a serious threat to life or property.
- **Flood Watch:** This is issued when current and developing hydro-meteorological conditions are such that there is a threat of flooding, but the occurrence is neither certain nor imminent.
- **Flash Flood Watch:** This is issued generally when there is the possibility of flash flooding or urban flooding over an area within the next 36 hours.
- **Flash Flood Warning:** This is issued when flash flooding is imminent, generally within the next 1 to 3 hours. Usually issued based on observed heavy rainfall (measured or radar estimated), but may also be issued for significant dam breaks that have occurred or are imminent.

B. Dam and Levee Failure

Dams are artificial barriers which impound or divert water usually constructed of concrete, steel, timber, rock, earth or a combination thereof. Dams have spillway systems to safely convey normal stream and flood flows over, around, or through the dam. Spillways are commonly constructed of non-erosive materials such as concrete. Dams often have drain or other water-withdrawal facilities to control the pool or lake level and to lower or drain the lake for normal maintenance and emergency purposes.

The likelihood for dam failure increases with inadequately maintained and/or aging dams, and when additional dams are built for retention basins or amenity ponds in new developments. Many dams exist on smaller streams that are not mapped as floodplains or subject to floodplain regulation, leaving downstream residents unaware of potential risks. The National Inventory of Dams (NID) includes only dams of more than 25' in height or storing more than 50 acres-ft. or classified as high or significant hazard potential.

Dam risk and failure consequences are defined as following:

- **Low (L):** A dam where failure or mis-operation results in no probable loss of human life and low economic and/or environmental loss. Losses are principally limited to the owner's property.
- **Significant (S):** Potential hazard is significant. A dam where failure or mis-operation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns. These dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

¹⁰⁷ Information is accessible at <http://www.spc.noaa.gov/products/wwa/>.

- **High (H):** Potential hazard is high. A dam failure or mis-operation will probably cause loss of human life.

As of 2018, there were 2,299 state-regulated dams in South Carolina of which 16% (369) were classified as a high hazard level (high probability of loss of human life), 16% (376) are significant (significant economic loss, but lower human loss), and 68% (1,554) are low hazards (Figure 203)¹⁰⁸. The South Carolina Department of Health Environmental Control (DHEC) regulates dams in the State. DHEC classifies dams into Class 1, 2, and 3 dams. A C1 dam (high hazard) may cause loss of life or serious damage to infrastructure. A C2 dam (significant hazard) will likely not cause loss of life but may damage infrastructure. A C3 dam (low hazard) causes limited property damage. There is currently no assistance program in South Carolina that would aid dam owners with removal, repair, or abandonment.

During the 2015 catastrophic flash flood events 32 dams failed statewide of which 19 dam failures occurred in the Central Midlands Region. Out of the 32 failed dams, 7 dams were C3 (low hazard) dams, 17 dams belonged to the C2 (significant hazard) category, 7 dams classified as C1 or high hazard dams, and one federal dam failed. These dam failures added to and compounded the devastation from the heavy rainfall and led to cascading failures of flood control infrastructure.

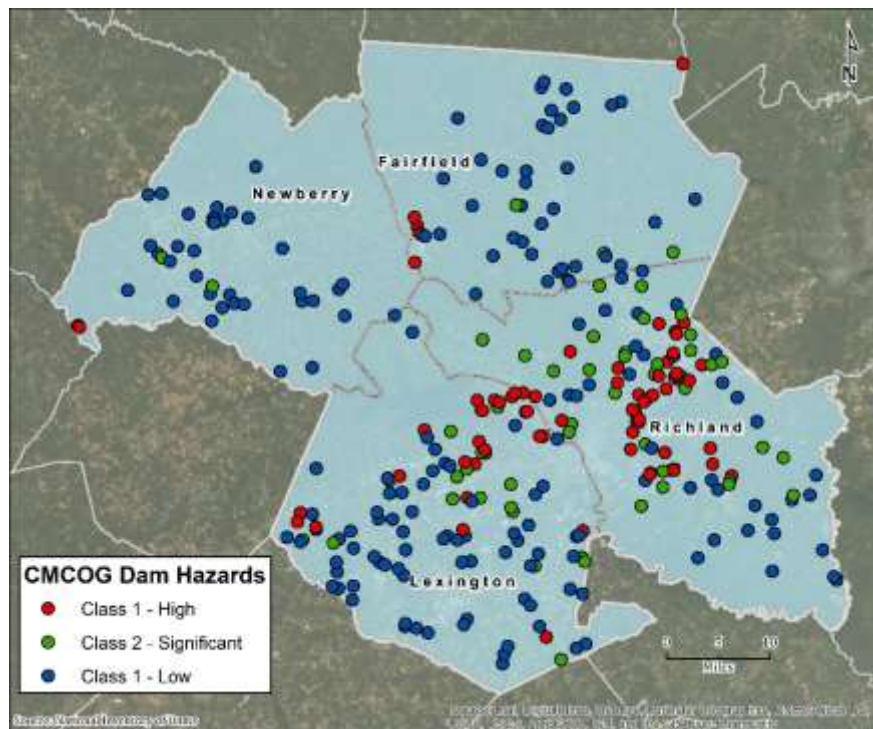


Figure 203 - 2018 National Inventory of Dams. Source: Damsafety.org.

C. Thunderstorms

Severe thunderstorms are defined by the NWS as storms that have wind speeds of 58 miles per hour or higher, produce hail at least three quarters of an inch in diameter, or produce tornadoes. In order to form, thunderstorms simply require moisture to form clouds and rain, coupled with an unstable mass of warm air that can rise rapidly. They more frequently occur in the spring and summer months and during the afternoon and evening hours but may happen year-round and at all hours. On average, the Central Midlands region experiences between 50 and 60 thunderstorm days per year (Similar to tropical cyclones, severe thunderstorms can bring an array of hazards such as high winds (e.g., downbursts,

¹⁰⁸ <https://damsafety.org/south-carolina>

derechos), flash flooding, riverine flooding, dam/levee failures, lightning, hail, dust storms and in the wintertime blizzards and ice storms (Figure 204). All thunderstorms contain lightning.

Based on Doppler radar and storm spotters, the NWS posts severe thunderstorm watches and warnings¹⁰⁹, along with the following statements:

- **Severe Thunderstorm Warning¹¹⁰:** Issued when a severe thunderstorm (thunderstorm producing hail 3/4 inch or larger in diameter and/or winds equal or exceed 58 mph) occurs. Lightning frequency is not a criterion for issuing a severe thunderstorm warning. Severe thunderstorm watches are usually issued for 1-hour duration.
- **Severe Thunderstorm Watch:** Issued when conditions are favorable for the development of severe thunderstorms in and close to the watch area. The size of the watch can vary depending on the weather situation. They are usually issued well in advance of the actual occurrence of severe weather and tend to last 4 to 8 hours.

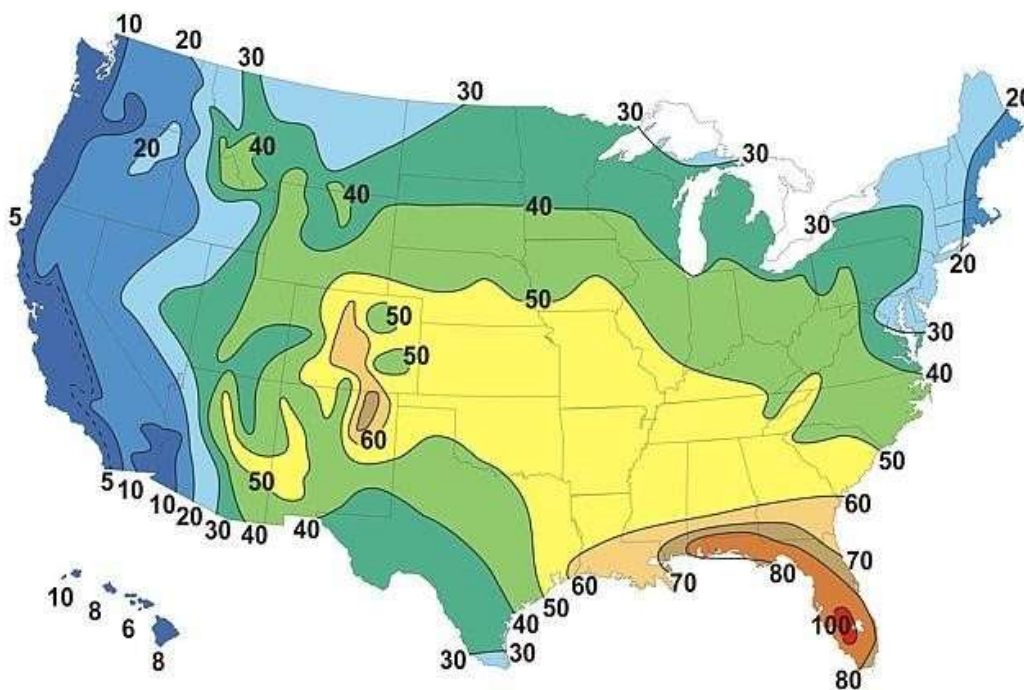


Figure 204 - Average number of thunderstorm days per year. Source: NOAA

D. Hurricanes & Tropical Storms

Hurricanes and tropical storms (more generically called tropical cyclones) are low-pressure systems that originate over warm ocean waters and are capable of causing immense destruction. The primary damaging forces are high winds, storm surge, heavy precipitation and tornadoes.

The lifecycle of a hurricane starts as a tropical disturbance, and as wind speed and system organization increase evolves into a tropical depression, tropical storm (wind speed > 39mph) and then a hurricane. Once a storm reaches the stage of tropical storm it is given a name and closely monitored by the National Hurricane Center in Miami, Florida. Hurricane intensity is classified by the Saffir-Simpson Hurricane Wind Scale (Table 115). Hurricane categories 3, 4, and 5 are considered *major* hurricanes.

¹⁰⁹ Information is accessible at <http://www.spc.noaa.gov/products/wwa/>

¹¹⁰ National Weather Service Glossary, <http://www.spc.noaa.gov/products/wwa/>

Table 115 - Saffir-Simpson Hurricane Wind Scale of Hurricane Intensity.

Category	Wind Speed	Damage Potential
1	74 – 95 mph	Minimal
2	96 – 110 mph	Moderate
3	111 – 129 mph	Extensive
4	130 – 156 mph	Extreme
5	157 $\geq$ mph	Catastrophic

The key energy source for a tropical cyclone is the release of latent heat from the condensation of warm water. Their formation requires a low-pressure disturbance, sufficiently warm sea surface temperature, rotational force from the spinning of the earth and the absence of wind shear in the lowest 50,000 feet of the atmosphere. Hurricanes and tropical storms form in the Atlantic Ocean, Caribbean Sea and Gulf of Mexico largely during the months of June to November. The peak of the Atlantic hurricane season is early to mid-September. On average, every eight to nine years, the South Carolina coast is impacted by a hurricane—though not necessarily by a hurricane making landfall (Figure 205).

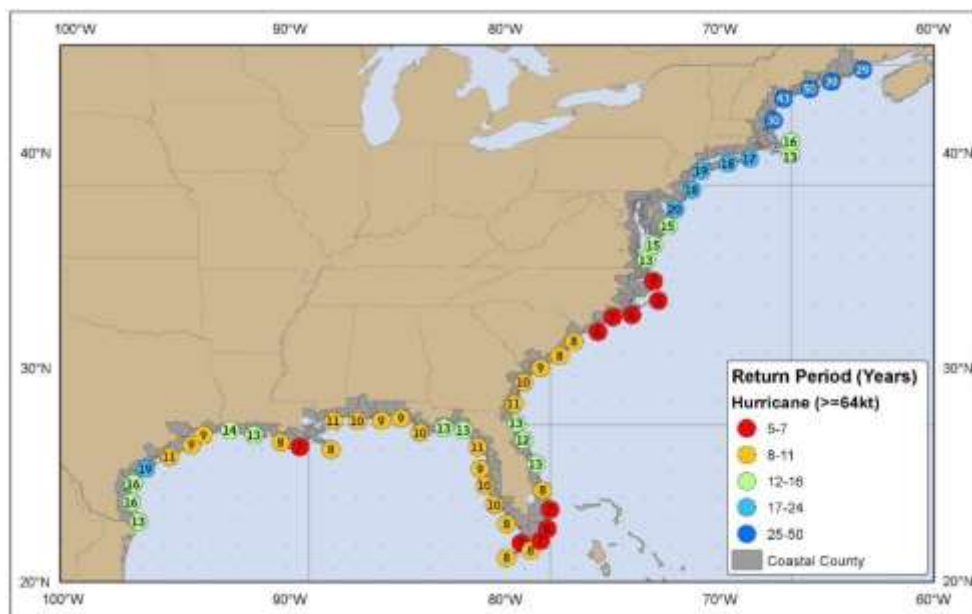


Figure 205 - Estimated return period in years for hurricanes passing within 50 nautical miles off the U.S. coast. Source: NOAA

Since 1851 nearly 90 tropical cyclones have affected South Carolina, of which 34 impacted the Central Midlands region (Figure 206). The most catastrophic hurricane in recent history was Hurricane Hugo (1989), which devastated large parts of South Carolina's coast. Due to its size and high forward speed, hurricane-forced winds reached far inland causing extensive devastation.

Based on aircraft reconnaissance and computer models, the National Hurricane Center (NHC) generates hurricane advisories every three hours including information on wind speed, projected track, storm surge, etc.¹¹¹. The NHC issues the following weather statements in regard to tropical cyclones:

- **Tropical Storm Warning¹¹²:** An announcement that tropical storm conditions (sustained winds of 39 to 73 mph) are *expected* somewhere within the specified coastal area within 36 hours.

¹¹¹ Information is accessible at http://www.nhc.noaa.gov/gtwo_atl.shtml

¹¹² NWS. "National Weather Service Glossary." National Weather Service, <http://www.weather.gov/glossary/>

- **Tropical Storm Watch:** An announcement that tropical storm conditions (sustained winds of 39 to 73 mph) are *possible* within the specified coastal area within 48 hours.
- **Hurricane Warning:** An announcement that hurricane conditions (sustained winds of 74 mph or higher) are *expected* somewhere within the specified coastal area. Because hurricane preparedness activities become difficult once winds reach tropical storm force, the hurricane warning is issued 36 hours in advance of the anticipated onset of tropical-storm-force winds.
- **Hurricane Watch:** An announcement that hurricane conditions (sustained winds of 74 mph or higher) are *possible* within the specified coastal area. Because hurricane preparedness activities become difficult once winds reach tropical storm force, the hurricane watch is issued 48 hours in advance of the anticipated onset of tropical-storm-force winds.

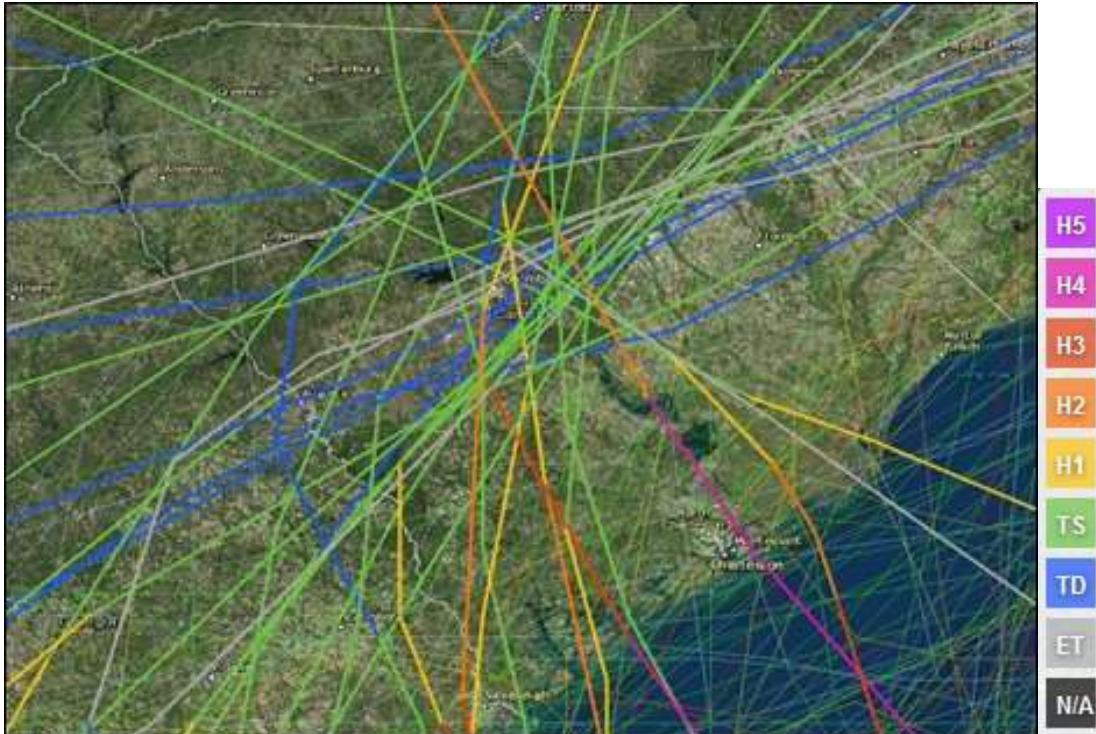


Figure 206 - Tropical cyclones that have impacted the Central Midlands region (indicated by thicker track lines)

E. Tornadoes

A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud extending to the ground. It is most often generated by a thunderstorm and produced when cool, dry air intersects and overrides a layer of warm, moist air forcing the warm air to rise rapidly. The damage from a tornado is a result of high wind velocity and wind-blown debris, although they are commonly accompanied by large hail as well. On average, the Central Midlands region experiences 2 tornado days and about 6 tornado watches per year (Figure 207)¹¹³.

Since 2007, the intensity of tornadoes is measured by the Enhanced Fujita-Pearson Scale (Table 116). The most violent tornadoes have rotating winds of 200 miles per hour or more and are capable of causing extreme destruction, including uprooting trees and well-made structures, and turning normally harmless objects into deadly missiles.

¹¹³ NOAA, 2016. Average number of tornado watches per year (1993-2012).
<http://www.spc.noaa.gov/wcm/>

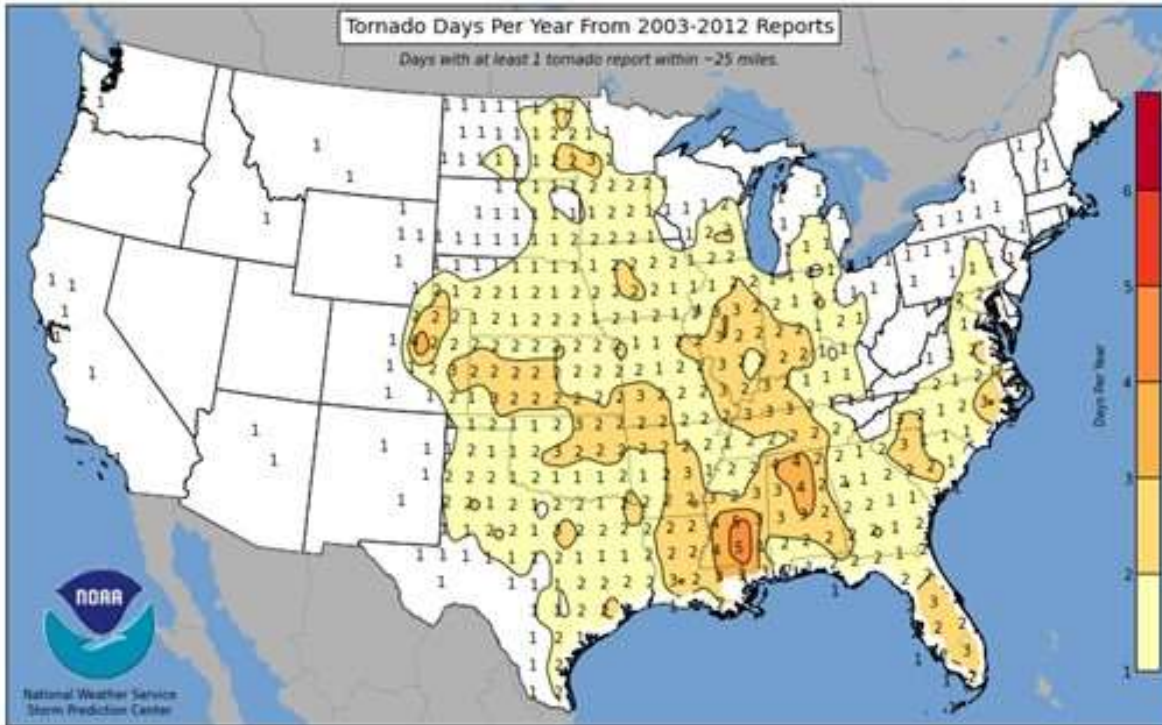


Figure 207 - Annual number of tornado days (1993-2012). Source: NOAA.

Table 116 - Enhanced Fujita Scale for Tornadoes. Source: NOAA

F-SCALE NUMBER	WIND SPEED (mph)	TYPE OF DAMAGE DONE
EF0	65 - 85	Minor damage. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees push over.
EF1	86 - 110	Moderate damage. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF2	111 - 135	Considerable damage. Roofs torn off well-constructed houses; foundations of frame houses shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF3	136 - 165	Severe damage. Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF4	166 - 200	Devastating damage. Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated.
EF5	>200	Extreme damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 m; steel reinforced concrete structure badly damaged; high-rise buildings have significant structural deformation.

The Central Midlands region experiences mostly weak tornadoes though EF3s and EF4s have occurred in the past. There has not been a recorded EF5 tornado thus far. According to FEMA¹¹⁴, the Central Midlands region wind rating is Zone III (Figure 208), where winds can reach 200 miles per hour. Parts of the region are also susceptible to the impacts of hurricanes.

¹¹⁴ <http://patapsco.nist.gov/imagegallery/details.cfm?imageid=972>



Figure 208 - Wind zone map showing the magnitude of extreme windstorms across the United States. Source: FEMA.

Based on Doppler radar and storm spotters, the NWS issues the following tornado watches and warnings¹¹⁵:

- **Tornado Warning¹¹⁶:** Issued when a tornado has been sighted either on radar or by a storm spotter. Thus, during a tornado warning the threat is imminent and people in the affected area should seek safe shelter immediately. They can be issued without a Tornado Watch being already in effect. They are usually issued for a duration of around 30 minutes.
- **Tornado Watch:** Issued when conditions are favorable for the development of tornadoes in and close to the watch area. Tornado watches are usually issued for a duration of 4 to 8 hours. During the watch, people should review tornado safety rules and be prepared to move a place of safety if threatening weather approaches.

F. Lightning

All thunderstorms produce lightning. Lightning is a spark of static electricity and results from the buildup of electrical energy between positively and negatively charged areas. It is not well understood why charge separation occurs in clouds. Whenever thunder is audible, there is the risk of a lightning strike. The only safe place during a thunderstorm is inside. Lightning has also occurred in volcanic eruptions, intense forest fires, surface nuclear detonations, heavy snowstorms, and in large hurricanes.

There are four types of lightning: *cloud to ground*, *intra-cloud*, *cloud-to-cloud*, and *cloud to air*. The term "heat lightning" is a misnomer and is not related to high temperatures. Heat lightning is lightning that is simply too far away for the thunder to be audible.

¹¹⁵ Information is accessible at <http://www.spc.noaa.gov/products/wwa/>.

¹¹⁶ Ibid.,

Between 1997 and 2012, South Carolina experienced on average 447,014 cloud-to-ground flashes per year¹¹⁷. The Central Midlands region sees on average of 12 to 18 flashes per mi² and year (Figure 209).

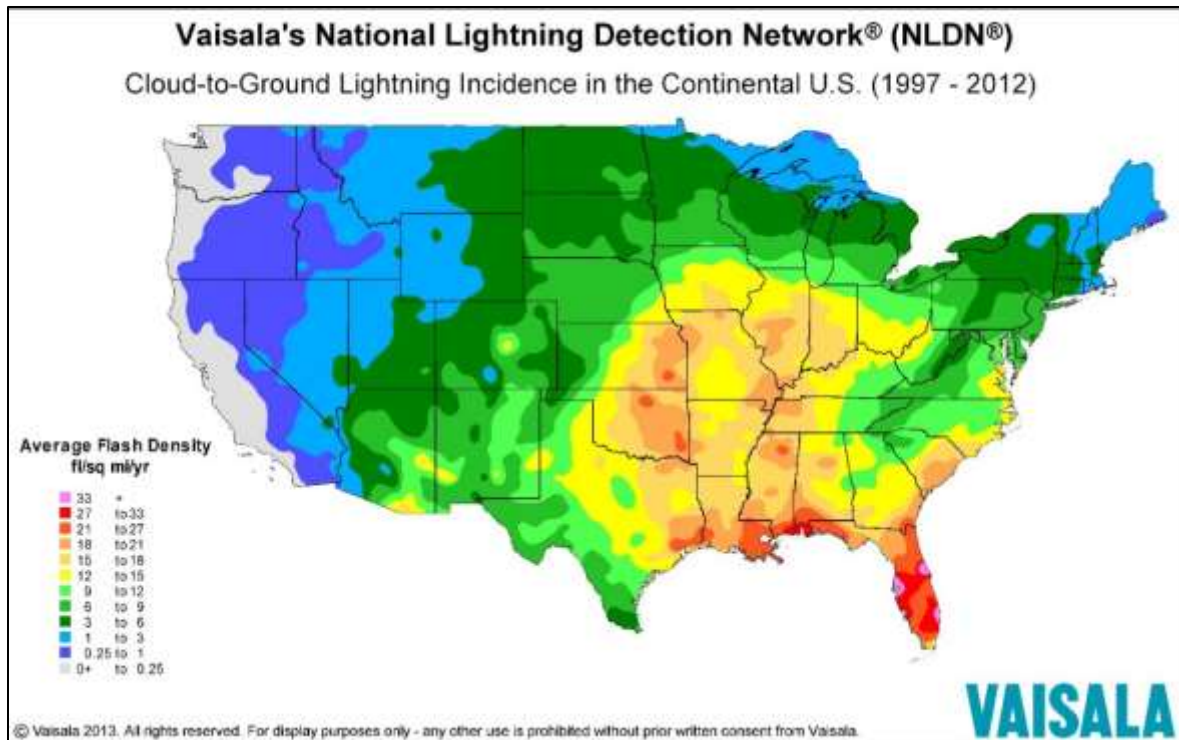


Figure 209 - Cloud-to-ground lightning incidences in the U.S. (1997-2012). Source: National Lightning Detection Network.

G. Fog

Fog is a hazard to drivers, mariners, and aviators. On average, fog contributes to 12 accidents per year in South Carolina (or 0.76% of motor vehicle accidents)¹¹⁸. There are several different conditions under which fog forms. In the Central Midlands region, *radiation fog* is the most common type of fog.

- **Radiation fog** mostly forms during the fall and winter months as air near to the ground cools. When the air reaches saturation, fog will form. Initially, fog will form near or at the surface and will thicken as the air continues to cool (e.g., overnight) and also extend upward. Radiation fog mostly occurs in sheltered valleys and near bodies of water. Its appearance is usually patchy and localized since wind disrupts the development of radiation fog.
- **Advection fog** forms as warmer, moist air moves over a cold ground. Ground cools the air to saturation, forming clouds. Advection fog can form under cloudy skies with moderate winds and can last for several days. Sea or lake fog (i.e., warm moist air flowing over colder bodies of water) is a type of advection fog.
- **Mountain/Valley fog** is common in areas of variable terrain. It forms when overnight denser cooler air from higher elevations sinks into valleys causing the valley to fill from the bottom with cold air (also called cold air drainage). As a result, surrounding air temperatures drop closer to the dew point and saturation. Fog formation will continue over night given a sufficient amount of moisture is in the air. Mountain/valley fog is densest around sunrise and occurs mostly during fall and spring.

¹¹⁷ http://www.lightningsafety.noaa.gov/stats/97-12Flash_DensitybyState.pdf

¹¹⁸ <https://aaafoundation.org/wp-content/uploads/2017/12/FogAndCrashesReport.pdf>

- **Freezing fog** occurs when tiny, supercooled water droplets come in contact with surfaces (e.g., trees, sidewalks, roads, and vehicle) that have a temperature at or below freezing. Water droplets will freeze instantly. Black ice formation on roadways is common.
- **Super fog** is a combination of smoke released from smoldering organic material (e.g., brush, leaves) mixed with cooler, nearly saturated air. Visibility is generally less than 10 feet. Super fog moves under light wind conditions through low terrain, such as creeks and drainage ditches. Due to its low visibility, super fog is extremely dangerous to motorists.

The NWS issues the following weather statements in regard to fog:

- **Dense Fog Advisory:** This is issued when widespread dense fog develops, frequently with visibilities below one-quarter of a mile or less for an extended period of time (2 or more hours) - or with visibility of one mile or less when fog is over water.
- **Freezing Fog Advisory:** This is issued when fog develops and surface temperatures are at or below freezing. Water droplets can freeze instantly to any surface including vehicles and road surfaces. Visibilities are typically at or below 1 mile.

H. Wind

Wind is “the horizontal motion of the air past a given point”¹¹⁹. Winds occur when there are differences in air pressure, always moving from a location with high pressure to one with relatively lower pressure. Wind speed depends on two factors: (a) the pressure difference between two areas, and (b) and the distance between those two areas. Stronger winds occur the higher the pressure difference and/or the closer the areas of high/low pressure. Wind speed is usually expressed in miles per hour or knots.

The direction from which the wind is blowing is used to describe the wind. For example, “westerly winds” mean winds are blowing from the west. The wind events discussed in the HMP are non-hurricane, and non-tornadic wind events (i.e., mostly thunderstorm winds).

It is estimated that about 85 extreme wind events occur in the Central Midlands region annually (Figure 210). These events are generally winds associated with (severe) thunderstorms.

Based on Doppler radar and storm spotters, the NWS posts wind advisories, watches and warnings¹²⁰. The NWS issues the following weather statements in regard to wind:

- **Wind Advisory:** Issued when either sustained winds of 30 to 39 mph or winds gusts of 46 to 57 mph are expected for one hour or longer.
- **Lake Wind Advisory:** Issued when windy conditions on area lakes are expected to be hazardous for boaters and other recreational events on or around lakes.
- **High Wind Watch:** Issued when either sustained winds of 40 mph or higher for one hour or more or when wind gusts of 58 mph or higher for one hour or more are possible.
- **High Wind Warning:** Issued when either sustained winds of 40 mph or higher for one hour or more or when wind gusts of 58 mph or higher for one hour or more are occurring or imminent.
- **Extreme Wind Warning:** Issued when surface winds of 115 mph or greater associated with non-convective, downslope, derecho (not tornado), or sustained hurricane winds are expected to occur within one hour.

¹¹⁹ National Weather Service, Glossary, <http://w1.weather.gov/glossary/>

¹²⁰ Information is accessible at <http://www.spc.noaa.gov/products/wwa/>.

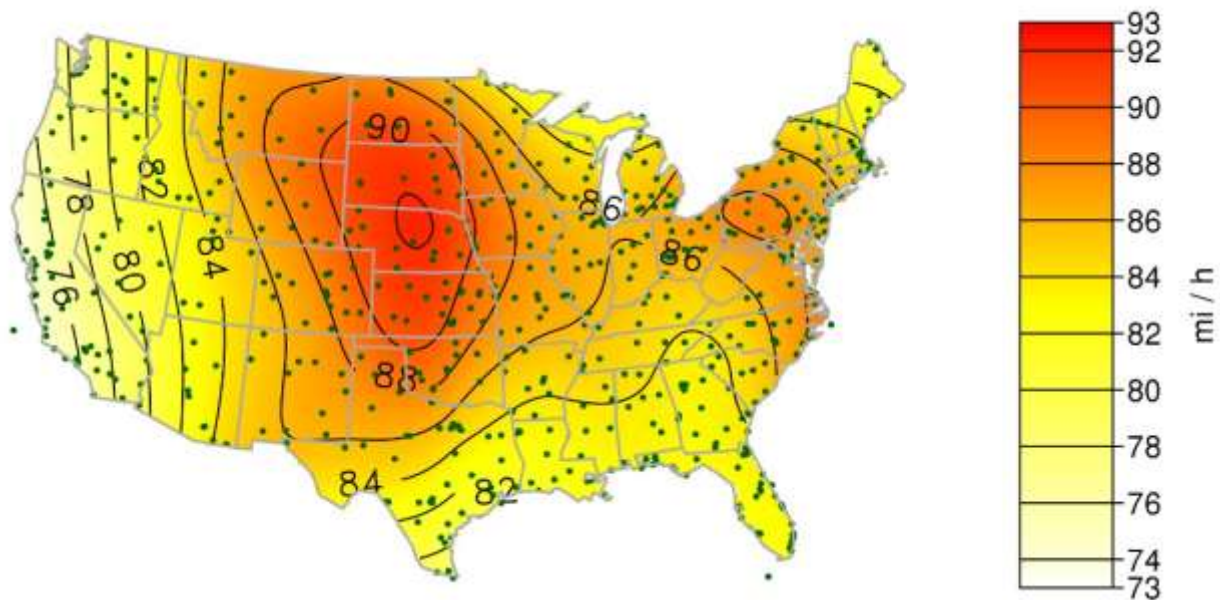


Figure 210 - Annual non-hurricane and non-tornadic extreme wind events in the U.S. The dots indicate weather station locations. Source: NIST

I. Winter Storms

Many hazards are associated with winter storms and weather including strong winds, coastal flooding, heavy snow and ice. There is no generally accepted classification of winter storms or destruction, but winter storm types include: *blizzard*, *lake effect*, *ice storm*, and *nor'easter*¹²¹. Due to South Carolina's geography and southern location, lake effect snow is not considered.

- **Blizzard:** A blizzard is a winter storm with wind speeds at least 35 miles per hour and low visibility that is reduced to 1/4 mile or less for a period of 3 hours or more.
- **Ice Storm:** When freezing rain accumulates to at least 1/4 inch or more, it is considered an ice storm. Freezing rain occurs when rain falls onto surfaces with temperatures that are below freezing, thus the rain freezes as ice on contact.
- **Nor'easter:** Nor'easters are very strong winter storms. Strong northeasterly winds blow from the ocean, either formed in the Gulf of Mexico or off the eastern coast in the Atlantic Ocean. Heavy snow, rain, wind, and great waves accompany these storms, often causing beach erosion and structural damage.

There are three components for winter storm formation: cold air, moisture, and lift. Cold temperatures below freezing at ground level allow for snow and ice formation; moisture from bodies of water allows for the precipitation that eventually freezes to snow and ice; lift allows moisture to rise for cloud and precipitation formation.

The severity of winter weather depends on a community's ability to manage and cope with the event, such as the rapid mobilization of snow removal equipment or road salt. Due to the rare occurrence of severe winter weather in central South Carolina, coupled with the expensive costs to acquire and maintain the necessary resources to combat their effects, many communities are not prepared for such events. Winter storms, though infrequent, are not unusual occurrences in the Central Midlands region of

¹²¹ <http://www.weather.com/encyclopedia/winter/types.html>

South Carolina. The most recent winter weather event in March 2014, while affecting all of the Central Midlands, triggered a Presidential Disaster Declaration (DR-4166) solely for Lexington County.

Winter storms cause extensive property damage as well as indirect threats associated with vehicle accidents and the loss of power/heat. Telecommunications and power can be disrupted for days during these events. Depending on ice thickness, the size of the area covered, and the duration of the ice storm, the impact can be crippling: roadways become impassible, power is disrupted, communication is severed, and travel by vehicle or by foot may become treacherous, causing injuries and fatalities. Homes and buildings are damaged by ice accumulation, either directly by the weight of the ice on roofs or by trees and/or branches falling on buildings.

There are several winter season warning products issues by the NWS¹²²:

- **Winter Weather Advisory:** Issued when a low pressure system produces a combination of winter weather (snow, freezing rain, etc.) that present a hazard, but does not meet warning criteria.
- **Winter Storm Watch:** Issued when there is a potential for heavy snow or ice accumulations, usually at least 24 to 36 hours in advance. The criteria for this warning vary by location.
- **Winter Storm Warning:** Issued when a winter storm is producing or is forecast to produce heavy snow or significant ice accumulations. The criteria for this warning vary by location.
- **Snow Advisory:** Issued when snow accumulations of 2 to 4 inches are expected. An advisory may still be warranted if lesser accumulations will produce travel difficulties, especially early in the winter season.
- **Blowing Snow Advisory:** Issued when blowing snow is expected to occasionally reduce visibilities to 1/4 mile or less with winds generally 25 to 34 mph. The event should last at least 3 hours.
- **Snow and Blowing Snow Advisory:** Issued when winds of 25 to 34 mph are expected to be accompanied by falling and blowing snow, occasionally reducing the visibility to 1/4 mile or less. The event should last at least 3 hours.
- **Heavy Snow Warning:** Issued when snow is expected to accumulate 4 inches or more in 12 hours, or 6 inches or more in 24 hours.
- **Freezing Rain/Drizzle Advisory:** Issued for freezing rain when ice accumulations are expected to cause travel problems, but not exceed 1/4".
- **Sleet Advisory:** Issued for accumulating sleet of 1/4" to 1". Because sleet usually occurs with other precipitation types, a winter weather advisory will almost always be used in such cases.
- **Heavy Sleet Warning:** Issued when a period of sleet is expected to produce ice accumulations of 1" or greater, or cause significant disruptions to travel or utilities.
- **Ice Storm Warning:** Issued when a period of freezing rain is expected to produce ice accumulations of 1/4" or greater, or cause significant disruptions to travel or utilities.
- **Blizzard Watch:** Issued when these conditions may be met 12 to 48 hours in the future.
- **Blizzard Warning:** Issued for sustained wind or frequent gusts greater than or equal to 35 mph accompanied by falling and/or blowing snow, frequently reducing visibility to less than 1/4 mile for three hours or more.

J. Hail

Hail can occur year-round and happen anywhere because it derives from severe thunderstorms. It is a precipitation type, consisting of ice pellets that form when water droplets bounce above and below the freezing level of the atmosphere (Figure 211). Initially, water droplets are propelled by updrafts from thunderstorms into the atmosphere, where they freeze. As the droplets collide and combine with other (super-cooled) droplets in the atmosphere, it falls and gets propelled up again to the freezing level, and another layer of ice can form around the original. Eventually, when the hailstone develops sufficient weight to overcome the updraft, it falls towards the ground. The size of hail is a function of the intensity of the

¹²² Information is accessible at <http://www.spc.noaa.gov/products/wwa/>

updraft and hence, the severity of the storm. Strong vertical motion can keep lifting hailstones so that they continue to accumulate in size.

The speed when hail reaches the ground, or its terminal velocity, is a function of its size and weight. However, very rarely does hail reach its maximum terminal velocity due to friction and drag, collision with other droplets, and the hailstones irregular shape. Hail can be small, generally pea-sized. But it may be larger, capable of damaging property and killing livestock and people. Hail size is estimated by descriptive comparison to a known object (Table 117).

Table 117 - Classification of hail size. Source: NOAA.

Known Object	Estimated Hail Diameter (Inch)
Pea	0.2
Marble	1/2
Dime/Penny	3/4
Nickel	7/8
Quarter	1
Ping-Pong Ball	1 1/2
Golf Ball	1 3/4
Tennis Ball	2 1/2
Baseball	2 3/4
Tea Cup	3
Grapefruit	4
Softball	4 1/2

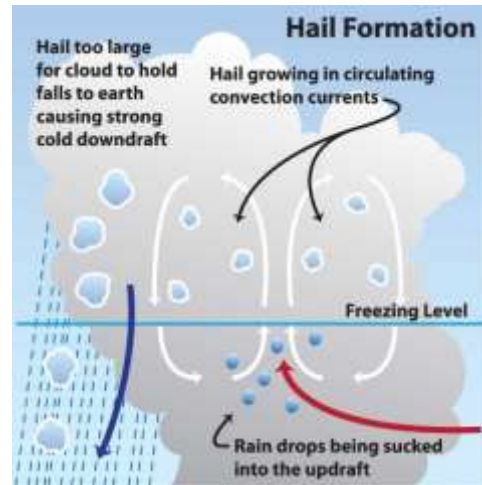


Figure 211 - How hail forms in severe thunderstorm clouds. Source: JPL.

The Central Midlands region experiences, on average, 8 severe hail days per year (Figure 212). While rarely deadly, it damages property and causes significant damage to agricultural operations.

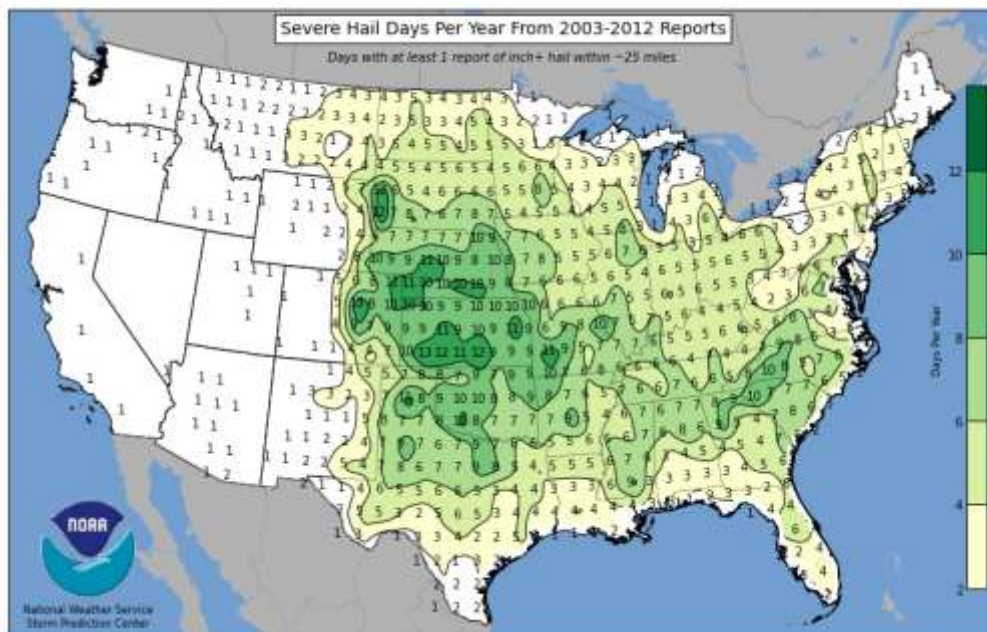


Figure 212 - Severe hail days per year (2003-2012). Source: NOAA.

K. Cold Hazards

Extreme cold temperatures occur occasionally in South Carolina during the winter months. Frigid temperatures are largely a danger to humans and livestock, with impacts such as hypothermia or frostbite. Many fatalities may occur from carbon monoxide poisoning when utilizing faulty heating equipment or outdoor heating equipment indoors. Property damage is largely limited to unprotected (water) pipes. Disruption in water service and decreases in water pressure, however, cause a cascading problem for emergency responders (e.g., firefighting).

The NWS Windchill Temperature (WCT) index uses advances in science, technology, and computer modeling to provide an accurate, understandable, and useful formula for calculating the dangers from winter winds and freezing temperatures (Figure 213). The index:

- Is based on a human face model
- Calculates wind speed at a height of 5 feet (average height of an adult human face) based on readings from the national standard height of 33 feet (typical height of an anemometer)
- Incorporates heat transfer theory: heat loss from the body to its surroundings, during cold and breezy/windy days
- Lowers the calm wind threshold to 3 mph
- Uses a consistent standard for skin tissue resistance
- Assumes no impact from the sun (i.e., clear night sky)

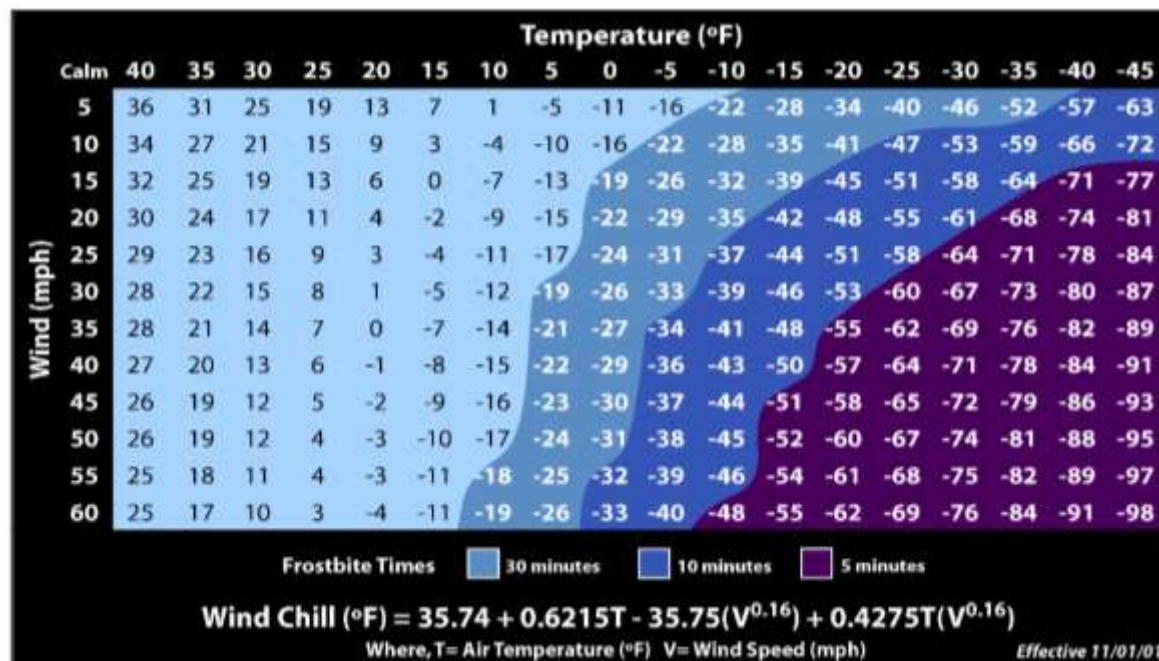


Figure 213 - National Weather Service windchill chart. Source: NOAA.

NWS posts the following cold weather advisories based on Doppler radar and storm spotters¹²³:

- **Wind Chill Advisory:** Issued when wind chill values reach -5°F to -19°F, with winds speeds around 10 mph or more.
- **Wind Chill Watch:** Issued when conditions are favorable within the next 12 to 24 hours that wind chill values will reach -20°F or colder, with winds speeds around 10 mph or more.
- **Wind Chill Warning:** Issued when wind chill values reach -20°F or colder, with winds speeds around 10 mph or more.

¹²³ Information is accessible at <http://www.spc.noaa.gov/products/wwa/>

- **Frost Advisory:** Issued when nighttime minimum temperatures are expected to range from 33°F to 36°F in the growing season.
- **Freeze Warning:** Issued in the growing season when nighttime minimum temperatures are expected to reach 32°F or lower. Usually issued to highlight the first few freezes of the fall, or unusually late freezes in the spring. A Freeze Watch is issued when these conditions may be met 12 to 48 hours in the future.

L. Wildfires

According to the South Carolina Forestry Commission, a wildfire is any type of forest, grass, brush, or outdoor fire that is not controlled or supervised¹²⁴. In South Carolina, the average number of fires per year is 3,000 and the yearly average acreage burned is 18,000. Accounting for the size and population of the state, this is one of the highest rates in the United States. Only 2% of wildfires in South Carolina are started by natural causes (e.g. lightning). Most wildfires (35-45%) are started by debris burning such as trash, crop stubble, etc. Woods arson (burning someone else's property without the owner's consent)¹²⁵, is the second leading cause of wildfires (25-30%). As a result, wildfires can occur anywhere in the state of South Carolina and are not limited to the urban-wildland-interface.

Fire season generally lasts from late winter to early spring. For South Carolina, the highest danger of fire is during the winter because of dead or dormant vegetation acting as fuel. The potential for wildfire depends upon fuel characteristics, weather conditions, recent climate conditions, topography and fire behavior. Fuels are anything that fire can and will burn, and are the combustible materials that sustain a wildfire. Typically, this is the most prevalent vegetation in a given area.

Weather is one of the most significant factors in determining the severity of wildfires. The intensity of fires and the rate with which they spread is directly related to the wind speed, temperature and relative humidity. Climatic conditions such as long-term drought also play a major role in the number and intensity of wildfires, and topography is important because the slope and shape of the terrain can change the rate of speed at which fire travels. Wildfire-specific terminology is visualized in Figure 214.

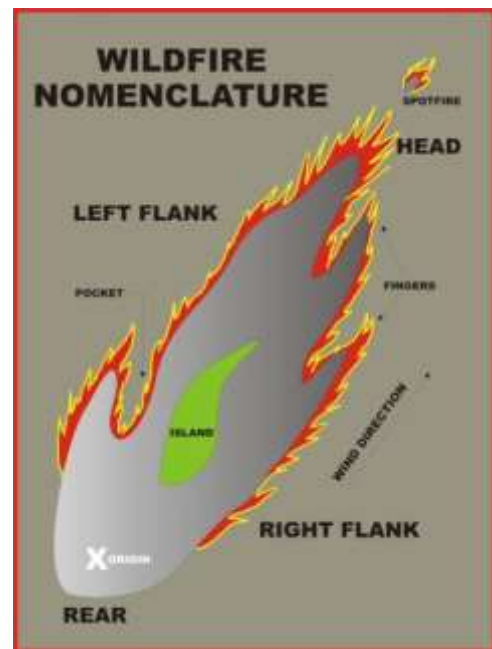


Figure 214 - Nomenclature of a forest fire. The fastest-moving, hottest, and most dangerous part of a wildfire is called the head. Source: SC Forestry Commission.

There are four major types of wildfires:

- **Ground fires** burn in natural litter, duff, roots or sometimes-high organic soils. Once started they are very difficult to control, and some ground fires may even rekindle after being extinguished.
- **Surface fires** burn in grasses and low shrubs (up to 4' tall) or in the lower branches of trees. They have the potential to spread rapidly, and the ease of their control depends upon the fuel involved.
- **Crown fires** burn in the tops of trees, and the ease of their control depends greatly upon wind conditions.
- **Spotting fires** occur when embers are thrown ahead of the main fire, and can be produced by crown fires as well as wind and topographic conditions. Once spotting begins, the fire will be very difficult to control.

¹²⁴ South Carolina Forestry Commission, <http://www.state.sc.us/forest/refwild.htm>

¹²⁵ Ibid.

Two agencies issue fire warnings in the region, The South Carolina Forestry Commission and NWS:

- **Red Flag Fire Alert** (SC Forestry Commission): The Red Flag cautions that wildfire danger is increasing, and that outdoor burning could become difficult to control.
- **Burning Ban** (SC Forestry Commission): A burning ban legally prohibits outdoor burning and is declared only when there is a significant threat to public safety.
- **Dense Smoke Advisory (NWS)**: Dense smoke advisories are issued when smoke is expected to reduce visibility to 1/4 mile or less.
- **Fire Weather Watch (NWS)**: Issued when dry vegetation and conditions favoring extreme fire danger are expected 12 to 72 hours in the future.
- **Red Flag Warning (NWS)**: Issued when dry vegetation and conditions favoring extreme fire danger are expected, generally within 24 hours. Red Flag Warnings are issued when any two of the following conditions are met: sustained wind speeds in excess of 20 mph, frequent wind gusts of 25 mph or greater, significant wind shifts, relative humidity of 25% or lower, and high lightning potential.

M. Droughts

In the most general sense, drought originates from a deficiency of precipitation over an extended period, resulting in a water shortage for some activity, group, or environmental sector. Drought has a natural and human component; therefore, it is defined in both conceptual and operational terms. Droughts are generally classified as *meteorological*, *agricultural*, *hydrological*, or *socioeconomic*¹²⁶.

- **Meteorological** drought is based on the degree of dryness for a given period.
- **Agricultural** drought is based on the impact to agricultural activity from a deficit in precipitation, soil moisture, ground water supply, or reservoir levels.
- **Hydrological** drought is from a precipitation deficit that affects the surface and subsurface water supply (stream flow, lake levels, ground water).
- **Socioeconomic** drought reflects the adverse supply and demand relationship between economic goods that are dependent on precipitation and water supply.

Drought occurs in a broad geographic area and can occur anywhere in the state of South Carolina. The severity of a drought is measured by several drought indices—each with a different focus and purpose (e.g., crop moisture index, surface water supply index, etc.). The most commonly used index is the Palmer Drought Severity Index (PDSI), although it may lag emerging droughts by several months. The PDSI ranges from -4 to +4 with an index of -4 or less represents extreme drought, -3 to -3.9, severe drought, -2.0 to -2.9, moderate drought, and -1.0 to -1.9, incipient drought. Values between -1 and +1 are considered normal. Larger positive values indicate anomalously wet conditions.

N. Heat Hazards

A heat wave is an extended period of above normal temperatures over a given period of time. The World Meteorological Organization recommends the declaration of a heat wave when the daily maximum temperatures exceed the average maximum temperatures by 9 degrees Fahrenheit and lasts for a period of at least five days.

Temperature alone is insufficient to describe the stress placed on humans as well as flora and fauna in hot weather. It is crucial to consider the effect of relative humidity since it is essential to the body's ability to perspire and cool off. Once air temperature reaches 95°F (35°C), perspiration becomes the most important manner of heat loss. Perspiration does not work if the water cannot evaporate (i.e. sweating in high relative humidity is less effective than in dry climate). To communicate this relationship between

¹²⁶ NWS, 2012. Drought Fact sheet.
http://www.nws.noaa.gov/om/csd/graphics/content/outreach/brochures/FactSheet_Drought.pdf

temperature and humidity, the NWS developed the Heat Index (Figure 215). For example, if the air temperature is 94°F and the relative humidity is 80%, the heat index—how hot it feels—is 129°F.

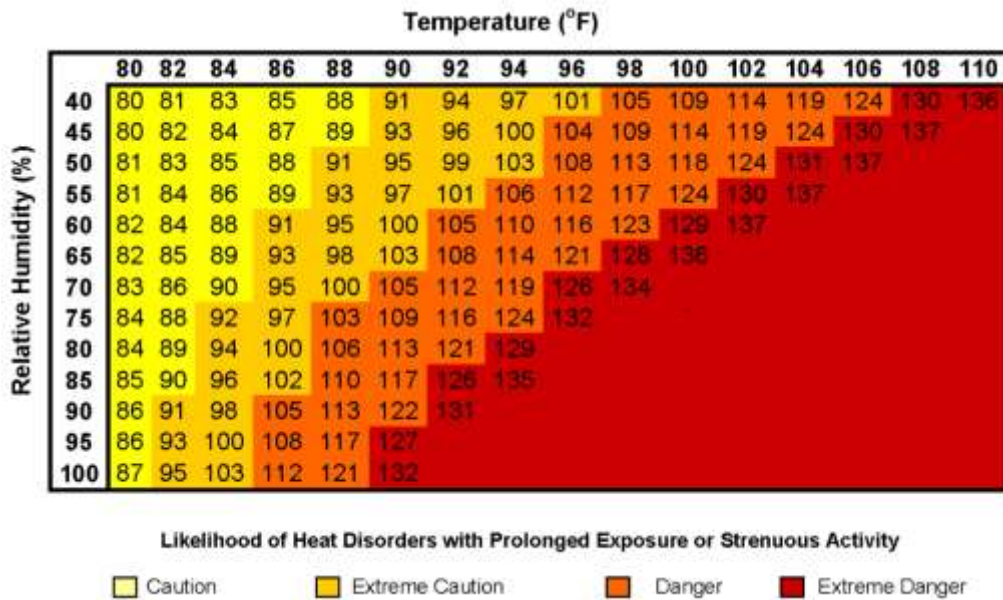


Figure 215 - Heat Index expresses the temperature the body feels based on relative humidity and air temperature.

Source: NOAA.

Most heat disorders (e.g., sunburn, heat cramps, heat exhaustion, and heat stroke) occur because the victim has been overexposed to heat or has over-exercised for their age and physical condition. Other conditions that can induce heat-related illnesses include stagnant atmospheric conditions and poor air quality. Seniors and children are most at risk from adverse heat effects. Although heat represents the biggest threat to human health, it can also cause damage to roads, bridges, pipelines, utilities, and railroads. High temperatures can be partially responsible for deflection of rails and related railroad accidents.

The NWS Columbia Forecast Office posts the following weather advisories for hot temperatures¹²⁷:

- **Heat Advisory:** Issued when maximum daytime heat index values are expected to reach or exceed 105°F on at least 2 consecutive days, with intermediate low temperatures of 75°F or higher.
- **Excessive Heat Watch:** Issued when conditions are favorable within the next 12 to 48 hours to reach maximum daytime heat index values of 110°F or more on at least two consecutive days, with intermediate low temperatures of 75°F or higher.
- **Excessive Heat Warning:** Issued when maximum daytime heat index values are expected to reach or exceed 110°F on at least two consecutive days, with intermediate low temperatures of 75°F or higher. An *Excessive Heat Watch* is issued when these conditions may be met 12 to 48 hours in the future.

O. Earthquakes

An earthquake is the motion or trembling of the ground produced by sudden displacement of rock in the Earth's crust. Earthquakes result from crustal strain, wastewater disposal from fracking, volcanism, and landslides. An earthquake occurs when stress built up in the Earth's crust causes rocks to break and slip. This region along which the slip occurs is called a fault.

¹²⁷ Information is accessible at <http://www.weather.gov/cae/>

There are several faults dissecting the Midlands region, especially Lexington and Richland County (Figure 217). Some of these faults are only presumed to exist (so-called inferred faults) because there is no surface evidence for their existence. In general, there are three types of faults (Figure 216): *strike-slip* (rock blocks move horizontally), *normal* (rock moves down relative to the other side), and *thrust* (rock moves up relative to the other side). Earthquakes occur along faults, tectonic plate boundaries, and mid-oceanic ridges (underwater mountain ranges). The majority of earthquakes occur along tectonic plate boundaries, known as *interplate earthquakes*. The point within the Earth's crust where an earthquake begins is called the focus, and the point directly above this depth on the Earth's surface is the epicenter. *Aftershocks* are smaller earthquakes which may occur after the initial main shock and can also cause considerable damage.

The severity of an earthquake is determined based on magnitude (i.e. the amount of energy release) and intensity (i.e. the amount of damage caused). Magnitude is measured using the Moment Magnitude Scale (denoted as Mw or M). The Richter Scale is no longer in use. Intensity is measured using the Modified Mercalli Intensity (MMI) Scale based on direct and indirect measurements of seismic effects (Table 118).

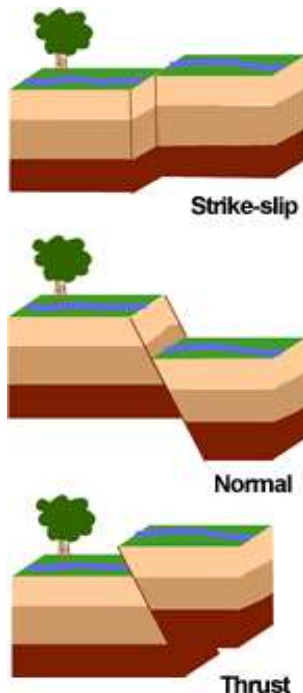


Figure 216 - Types of earthquake faults. Source: USGS.

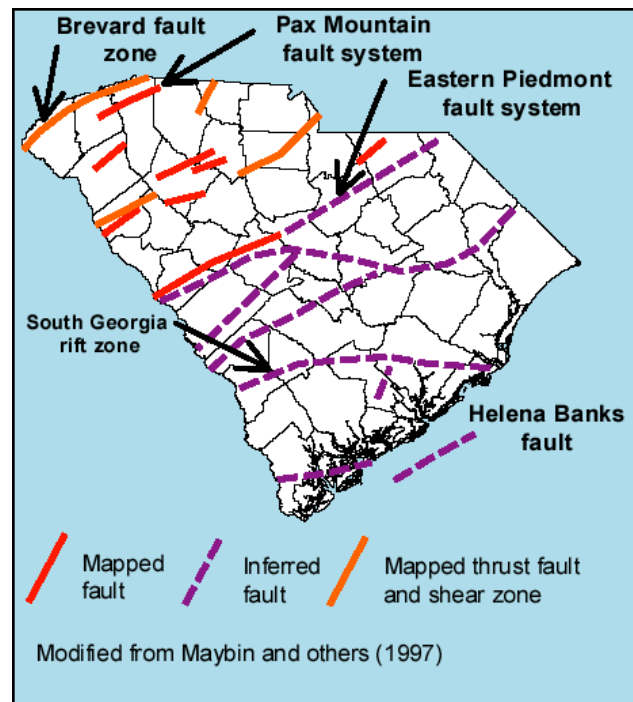


Figure 217 - Fault map of South Carolina. Source: DNR.

Table 118 - Modified Mercalli Intensity Scale capturing the impacts from earthquakes. Source: USGS.

Scale	Description Of Effects
I	Only detectable by instruments
II	Felt by some people, especially if on higher floors, some objects may swing
III	Felt indoors, feels like a truck rumbling by
IV	Felt indoors by many people, felt by some outdoors, dishes and doors may move
V	Felt by most people, some dishes and windows break, objects fall
VI	Felt by everyone, may move heavy furniture, slight damage
VII	Slight to moderate damage in ordinary-built structures, great damage in poorly built structures
VIII	Considerable damage in ordinary-built structures, chimneys, columns, walls fall
IX	Great damage, buildings may shift from foundation
X	Most masonry and frame structures collapse, rails bent
XI	Few buildings remain, bridges collapse and rails damaged
XII	Total destruction, lines of sight distorted

The level of damage depends upon the amplitude and duration of the shaking, which are directly related to the earthquake size, distance from the fault, time of occurrence (greater fatalities tend to occur during weekday work hours when more people are in large office buildings or schools), site and soil type. Strength of shock waves diminish from the focus, thus greater distance from the earthquake origin will decrease likelihood or extent of damage. A measure called Peak Ground Acceleration (PGA) captures the probabilistic risk of shaking (measured in meters per second; m/s) at a given location. For the purpose of this plan, PGA is expressed as the 2% chance of exceeding a certain amount of shaking over a 50-year period. Again, PGA is not equivalent to the magnitude of an earthquake but indicates how hard the ground can shake at a given location. Other damaging earthquake effects include landslides and liquefaction (in which ground soil loses the ability to resist shear and flows, much like quick sand). In the case of liquefaction, anything relying on the substrata for support can shift, tilt, rupture, or collapse. In urban areas, damage to electric and gas lines may lead to the common occurrence of local fires. Earthquakes that trigger movement of the seafloor may also generate tsunamis.

In South Carolina there are about 10 to 15 earthquakes recorded annually, with only 3-5 events actually noticed by people¹²⁸. Because of the low frequency of noticeable events, many people are unaware of the earthquake risk in South Carolina. However, all 46 counties in the state are susceptible to effects of earthquakes. According to the U. S. Geological Survey (USGS), the Central Midlands region faces only minimal to moderate risk from earthquakes in a given year, generally less than 10% probability of exceedance in 50 years.

The most recent earthquake in the region occurred in 1971 and caused no major damage. The last catastrophic earthquake occurred in 1886 near Charleston and was felt in the Central Midlands region with only minor damage. Similarly, the great earthquake of 1811 near New Madrid, MO and the 1916 earthquake near Asheville, NC were both felt in the region but caused only minor damage (MMI scale level V effects).

¹²⁸ SCEMD, <http://www.scmd.org/planandprepare/disasters/earthquakes>

I-E. Data Sources and Methodological Approach

Natural hazards used in this plan are of two types: those that have distinct spatial footprints (e.g., earthquakes, hail, tornados, and flooding) and other hazards that are widespread in their effects and cannot be mapped as distinct geographic occurrences (e.g., winter storms and drought).

**This section addresses
FEMA HMP requirement
201.6(b)(3)**

It must be emphasized that in many cases detailed information is not available regarding the areas potentially impacted by a specific hazard, as well as its potential health, safety, property, environmental and economic impacts.

Table 119 shows data source origins for hazard occurrences and physical observations (e.g., latitude/longitude) utilized in the hazard and vulnerability analyses of the Plan.

Table 119 - Data Utilized in Hazard Identification and Assessment Sections of HMP. Source: HVRI.

Hazard	Years of Record	Observations	Source
Drought	2000-2018	Weekly U.S. Drought Monitor	National Drought Mitigation Center
Earthquake		Epicenter; PGA w/ 2% exceedance in 50 years	USGS
Flood		100- year flood zones	FEMA
Fog	1989-2018	Global Historical Climatology Network (GHCN)-Daily	NCDC
Hail	1989-2018	Hail Path	NOAA Storm Prediction Center
Hurricanes	1989-2018	Hurricane wind	
Lightning	1989-2017	Cloud-to-ground flash location	NCEI
High Temperature Extremes	1989-2018	Global Historical Climatology Network (GHCN)-Daily	NCDC
Low Temperature Extremes	1989-2018	Global Historical Climatology Network (GHCN)-Daily	NCDC
Tornado	2002-2018	Warning Polygons	Iowa State University IEM Cow
Severe Thunderstorm	2002-2018	Warning Polygons	Iowa State University IEM Cow
Wildfire	1988-2015	Location; acreage burnt	SC Department of Natural Resources
Wind	1989-2018	Wind Path	NOAA Storm Prediction Center
Winter Weather	1989-2018	Global Historical Climatology Network (GHCN)-Daily	NCDC

CMCOG staff has chosen to use hazard and vulnerability assessment data provided by HVRI at USC. Where the absence of data at the sub-county level, or the nature of the hazard itself (such as with droughts, hurricane wind zones, and flood events) hinders sub-county analysis, CMCOG staff has relied on the knowledge of participating jurisdictions.

Loss data (direct property and crop damage as well as fatalities and injuries) originated from SHEL DUS Version 19 and covered the time period 1960 through 2019. Information on event magnitude came from the National Centers for Environmental Information (formerly NCDC). For a spatial representation of risk, additional observational data sources such as NWS warnings or weather station data or data models such as the Flash Flood Potential Index were utilized.

To generate a county's overall, comprehensive risk profile, all historic hazard occurrences were summed with each hazard classified into low, medium, and high risk categories (equal to scores from 1 to 3). The range of each hazard risk category can be found in the vulnerability assessment section. The maximum

score is 45 given the inclusion of 15 hazards. The risk of riverine flooding was expressed as the percentage of floodplain area within a hexagon and then scaled from low (1) to high (3) risk.

For the **vulnerability assessment**, this plan draws largely on two products: HAZUS-MH 2.2 and the Social Vulnerability Index (SoVI®). HAZUS-MH 2.2 is a GIS-based software developed by FEMA to model impacts and losses from flood, earthquake and hurricanes impacts. All building replacement values (or so-called general building stock) for each county, as well as modelled economic losses, originate from HAZUS-MH 2.2. For all other hazards, simple overlays of potential impact areas and assets at risk were conducted using ArcGIS v10.x.

To capture the socioeconomic complexities of each county, this plan uses the SoVI®¹²⁹. Social vulnerability is a well-established concept that explains why some places better prepare, respond to, and recover from a hazardous event. Social vulnerability captures the underlying characteristics of a population that either attenuate or exacerbate the effects of a hazard event.

The SoVI®, a peer reviewed methodology, is a standardized, comparative metric that builds upon this concept by measuring the socio-economic and demographic differences between places. SoVI® includes those population characteristics known to influence the ability of social groups and communities to prepare for, respond to, and recover from disasters¹³⁰.

Key social indicators that consistently appear in the literature as influencing pre-impact preparedness and post-event response and recovery include attributes such as socioeconomic status (e.g., wealth, education, occupation), age (e.g., elderly populations and young children are more vulnerable to hazards), gender, race and ethnicity, employment and employment sector, and special needs populations. However, it is not just the proportion of residents in these broad categories that is important, but instead how race, socioeconomic status, and gender interact to produce socially vulnerable populations. As such, SoVI® allows planners and emergency managers to: 1) quickly identify broad differences within a county, 2) understand the characteristics of their populations at the tract level that either increase or decrease vulnerability, and 3) identify where resources and attention should be directed for planning and mitigation.

SoVI® synthesizes 29 socioeconomic variables (Table 120) into multiple dimensions using principal component analysis. These dimensions are then summed to produce an overall score (index) for a spatial unit. This plan uses the census tract as the spatial unit (e.g., census tract). For more information, such as the dimension results, please see a county-specific vulnerability assessment. Since SoVI® is a comparative metric that identifies differences between places, SoVIs® were calculated for all four counties separately to ensure that only census tracts within a county are compared to each other.

The SoVI® scores are mapped using a three-class standard deviation¹³¹ model:

- High social vulnerability (standard deviation greater than 0.5)
- Medium social vulnerability (standard deviations between 0.5 to -0.5)
- Low social vulnerability (standard deviation lower than -0.5)

¹²⁹ Cutter, S.L., B.J. Boruff, and W.L. Shirley, 2003. "Social Vulnerability to Environmental Hazards," *Social Science Quarterly*, 84(1): 242-261.

¹³⁰ Heinz Center. 2002. *Human Links to Coastal Disasters*. Washington, DC: The H. John Heinz III Center for Science, Economics and the Environment.

¹³¹ Standard deviation is a measure of variability within a data set. It measures the distance to the mean. A large standard deviation means that the observation is further away from the mean of the data set. For normally distributed data, 68.2% of observations fall within 1 and -1 standard deviations.

Table 120 - Data inputs to the Social Vulnerability Index (SoVI).

VARIABLE	DESCRIPTION
QASIAN	Percent Asian
QBLACK	Percent Black
QHISP	Percent Hispanic
QNATAM	Percent Native American
QAGEDEPT†	Percent of Population Under 5 Years or 65 and Over
QFAM†	Percent of Children Living in Married Couple Families
MEDAGE	Median Age
QSSBEN	Percent of Households Receiving Social Security
QPOVTY	Percent Poverty
QRICH200K	Percent of Households Earning Greater Than \$200,000 Annually
PERCAP	Per Capita Income
QESL†	Percent Speaking English as a Second Language with Limited English Proficiency
QFEMALE	Percent Female
QFHH	Percent Female Headed Households
QNRRES	Percent of Population Living in Nursing and Skilled-Nursing Facilities
HOSPPTC	Hospitals Per Capita (County Level ONLY)
QNOHLTH†	Percent of Population Without Health Insurance (County Level ONLY)
QED12LES	Percent with Less Than 12 th Grade Education
QCVLUN	Percent Civilian Unemployment
PPUNIT	People Per Unit
QRENTER	Percent Renters
MDHSEVAL†	Median House Value
MDGRENT†	Median Gross Rent
QMOHO	Percent Mobile Homes
QEXTRCT	Percent Employment in Extractive Industries
QSERV	Percent Employment in Service Industry
QFEMILBR	Percent Female Participation in Labor Force
QNOAUTO†	Percent of Housing Units with No Car
QUNOCCHU	Percent Unoccupied Housing Units

To investigate the relationship between social vulnerability and hazard risk, the SoVI® map for each county is converted from administrative boundaries to hexagon units identical to the hexagon maps developed in the hazard assessment of the HMP. Furthermore, hazard risk maps are categorized into three risk classes: low, medium, and high risk. By overlaying social vulnerability and hazard risk, the intersection of both elements can be visualized and communicated through color using a bivariate color scheme: the bivariate color scheme consists of hazard risk (y-axis, bluish colors) and social vulnerability (x-axis, reddish colors) (Figure 218). For example, the color white represents areas of low social vulnerability and low hazard risk whereas purple hexagons have both high social vulnerability and high hazard risk.

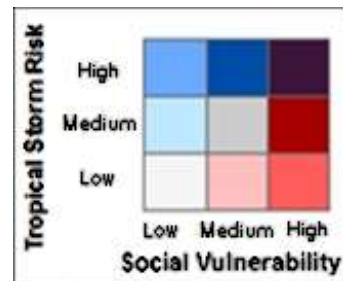


Figure 218 - Bivariate color scheme of hazard risk and social vulnerability.

II. Hazard and Mitigation Strategy Public Opinion Survey

From October 7th, 2020 to March 5th, 2021 the CMCOG posted on their web page an online public opinion survey for the HMP. In it, citizens were asked if they were directly impacted by any hazard, which hazards should be prioritized and to rank proposed mitigation goals. Results were divided by county, and then further subdivided by municipality. CMCOG staff shared the survey through social media and planning committee members were asked to share it through their own web pages and social media outlets. A total of 218 Central Midlands residents completed the survey. Following are a template for the survey along with a summary of results accumulated at the time the survey closed on March 5th, 2021.

II – A. Questions

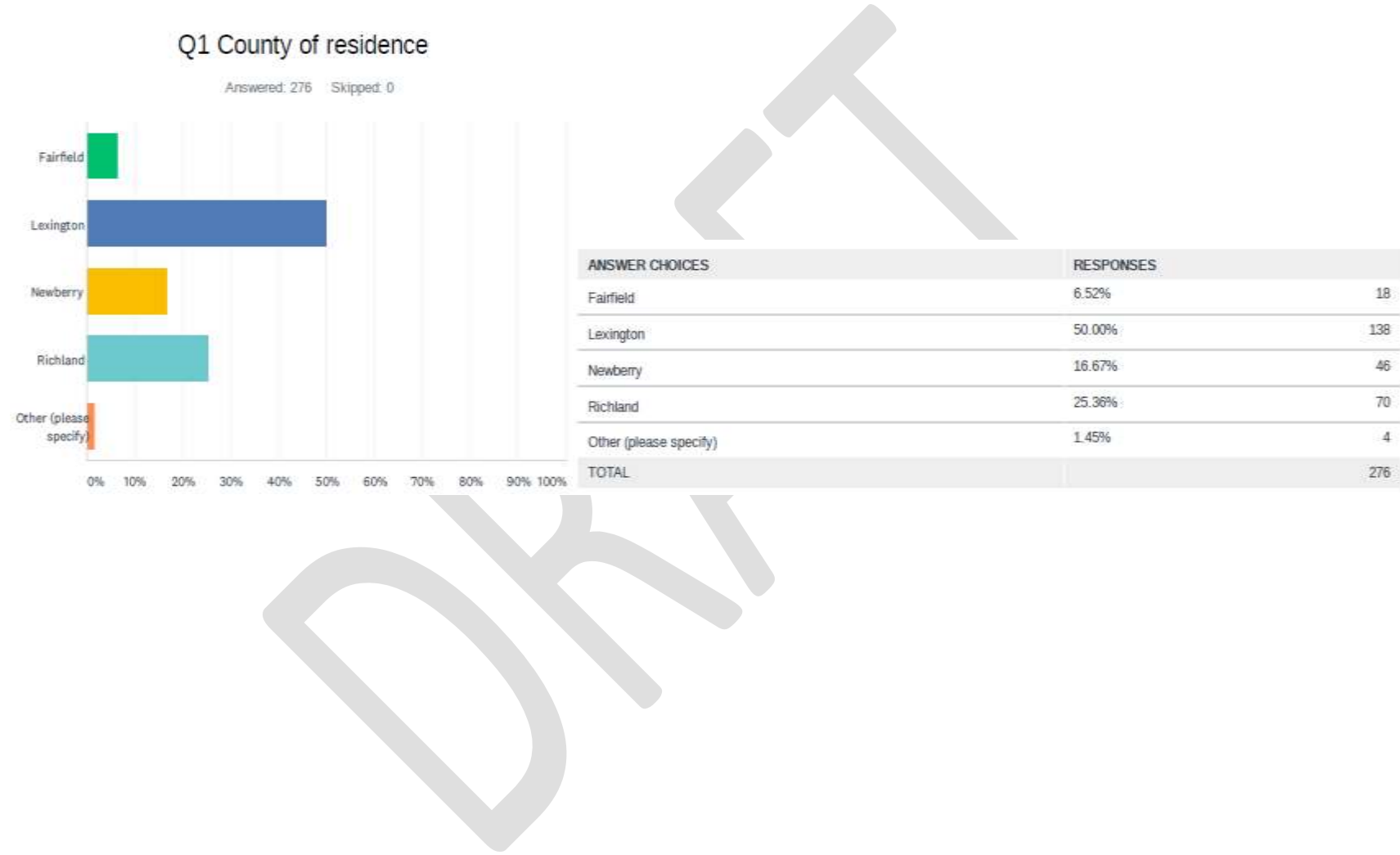
- 1) County of Residence
- 2) Jurisdiction/Municipality of Residence
- 3) Have you experienced personal/economic loss from any of the following hazards?

• Flooding • Wildfires • Hurricanes and Tropical Storms • Thunderstorms • Tornadoes • Earthquakes	• Landslides • Sinkholes • Winter Storms • Hail • Extreme Heat • Drought
--	---
- 4) Rank the following hazards based on how much they impact your community (from Very Low to Very High Priority):

• Flooding • Wildfires • Hurricanes and Tropical Storms • Thunderstorms • Tornadoes • Earthquakes	• Landslides • Sinkholes • Winter Storms • Hail • Extreme Heat • Drought
--	---
- 5) Rank the following hazard mitigation strategies based on how important they would be to your community (from Very Low to Very High Importance):

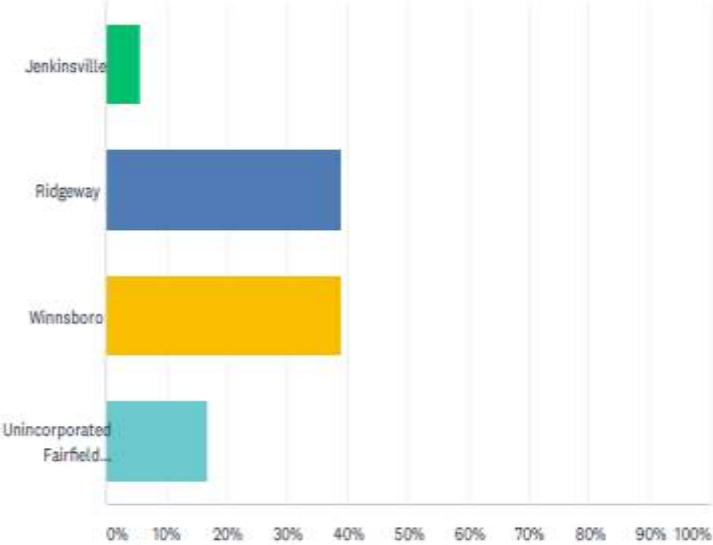
• Data acquisition and analysis of location and impact of different disasters to improve policy decisions • Encourage natural resource protection as a way of reducing the impact of hazards (e.g., wetland protection/mitigation, riparian buffers, low impact "green" developments) • Engineering/infrastructure projects (e.g., levees, stormwater, water and sewer upgrades) • Improve interagency coordination to respond to disasters more effectively	• Improve zoning compliance laws to limit development in disaster prone areas (e.g., floodplains) • Installation of early warning systems, for appropriate disasters (e.g., sirens or cell phone messaging services) • More designated shelters and emergency preparedness infrastructure • Training, education & outreach efforts to prepare citizens for disasters
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II – B. Summary of Results



Q2 Jurisdiction of residence

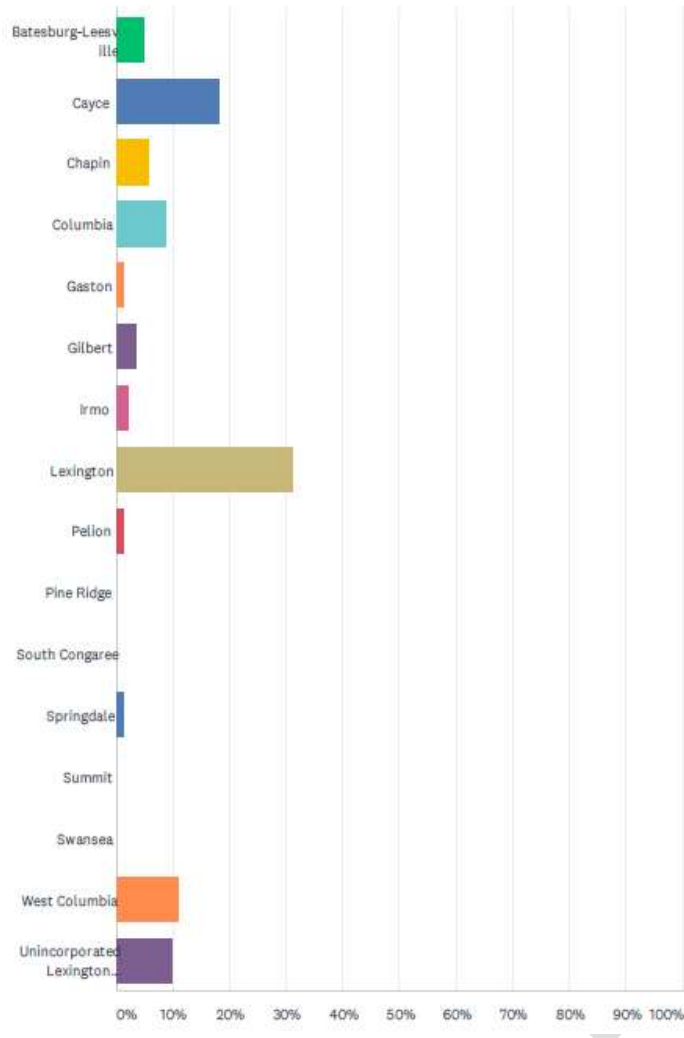
Answered: 18 Skipped: 258



ANSWER CHOICES	RESPONSES	
Jenkinsville	5.56%	1
Ridgeway	38.89%	7
Winnsboro	38.89%	7
Unincorporated Fairfield Communities	16.67%	3
TOTAL		18

Q3 Jurisdiction of residence

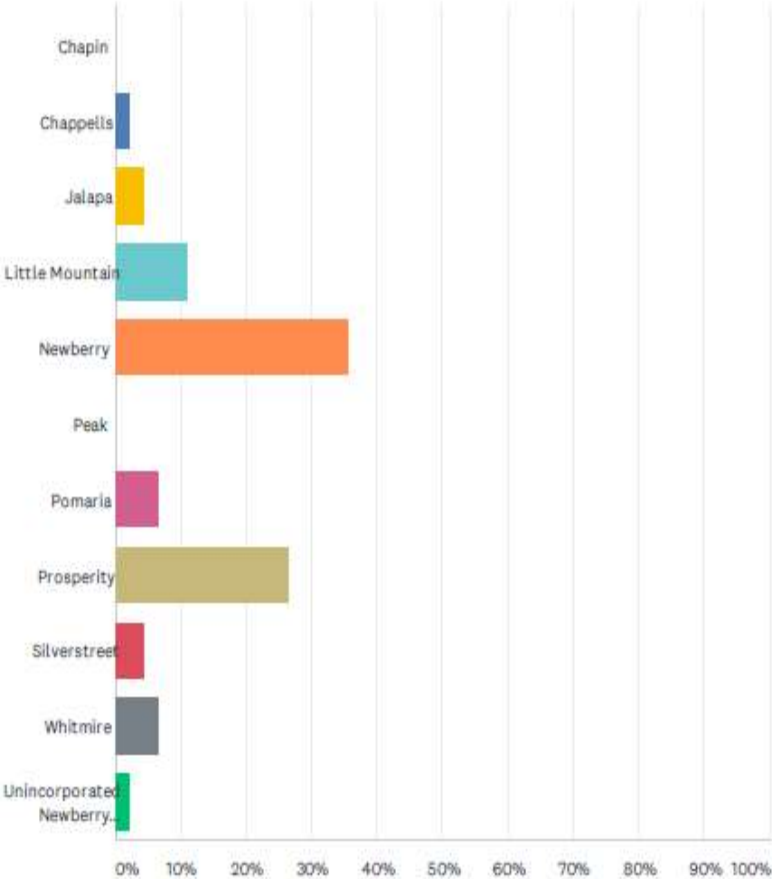
Answered: 138 Skipped: 138



ANSWER CHOICES	RESPONSES	
Batesburg-Leesville	5.07%	7
Cayce	18.12%	25
Chapin	5.80%	8
Columbia	8.70%	12
Gaston	1.45%	2
Gilbert	3.62%	5
Irmo	2.17%	3
Lexington	31.16%	43
Pelion	1.45%	2
Pine Ridge	0.00%	0
South Congaree	0.00%	0
Springdale	1.45%	2
Summit	0.00%	0
Swansea	0.00%	0
West Columbia	10.87%	15
Unincorporated Lexington Communities	10.14%	14
TOTAL		138

Q4 Jurisdiction of Residence

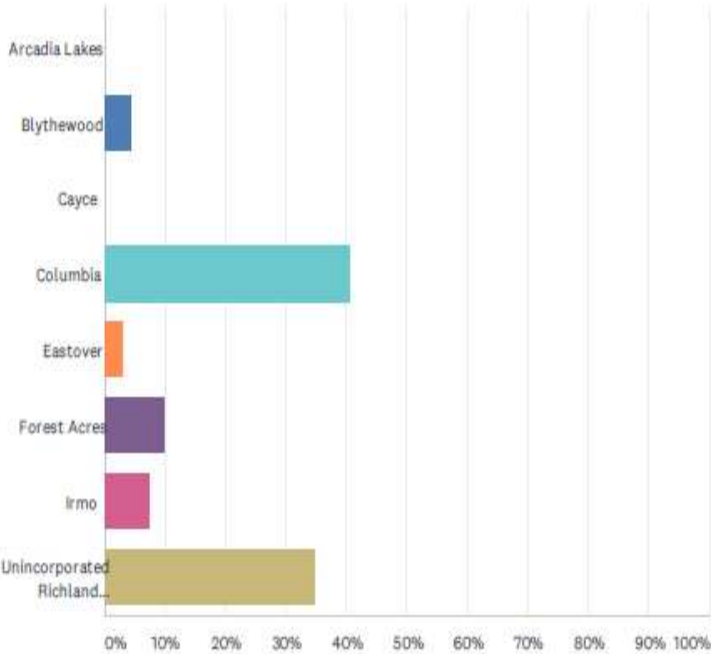
Answered: 45 Skipped: 231



ANSWER CHOICES	RESPONSES	
Chapin	0.00%	0
Chappells	2.22%	1
Jalapa	4.44%	2
Little Mountain	11.11%	5
Newberry	35.56%	16
Peak	0.00%	0
Pomaria	6.67%	3
Prosperity	26.67%	12
Silverstreet	4.44%	2
Whitmire	6.67%	3
Unincorporated Newberry Communities	2.22%	1
TOTAL		45

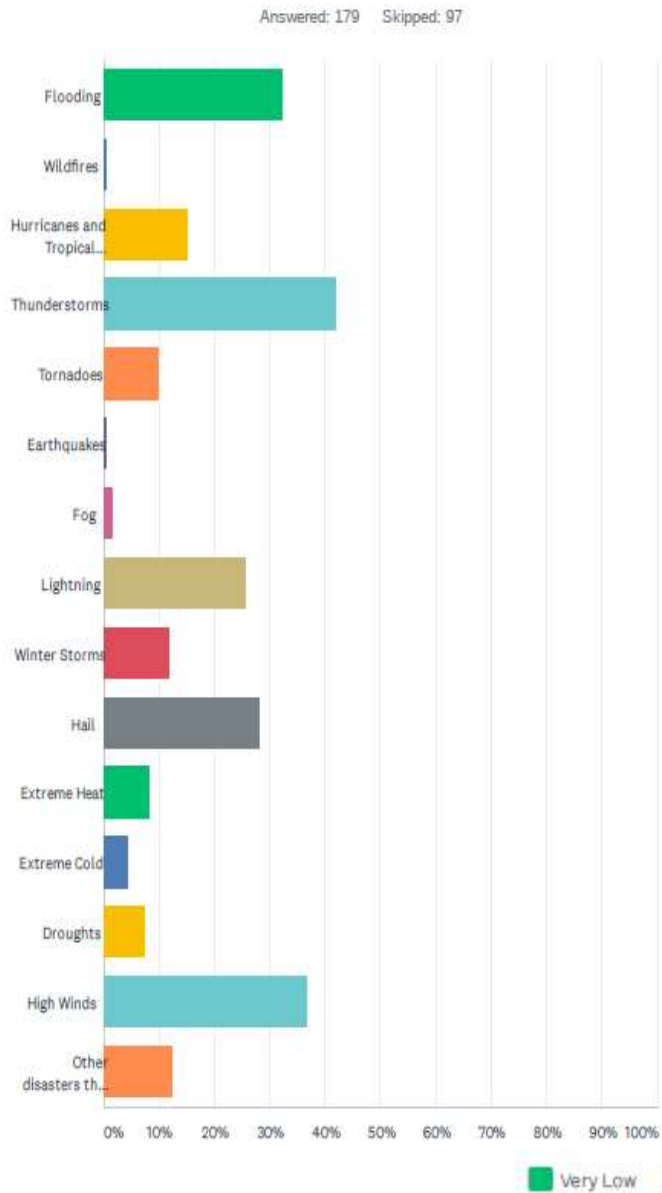
Q5 Jurisdiction of Residence

Answered: 69 Skipped: 207



ANSWER CHOICES	RESPONSES	
Arcadia Lakes	0.00%	0
Blythewood	4.35%	3
Cayce	0.00%	0
Columbia	40.58%	28
Eastover	2.90%	2
Forest Acres	10.14%	7
Irmo	7.25%	5
Unincorporated Richland Communities	34.78%	24
TOTAL		69

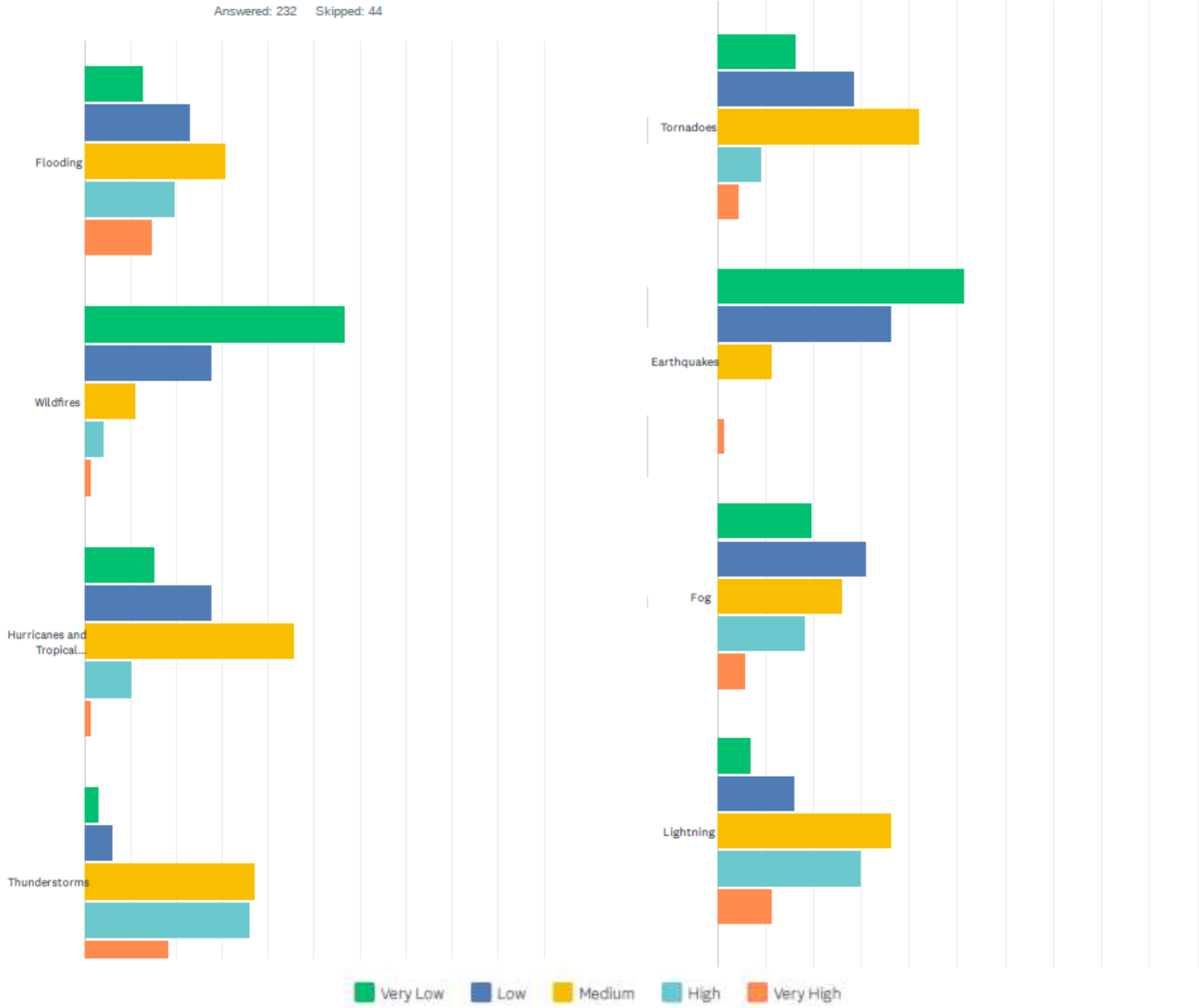
Q6 Have you experienced personal/economic loss from any of the following hazards? Mark all that apply

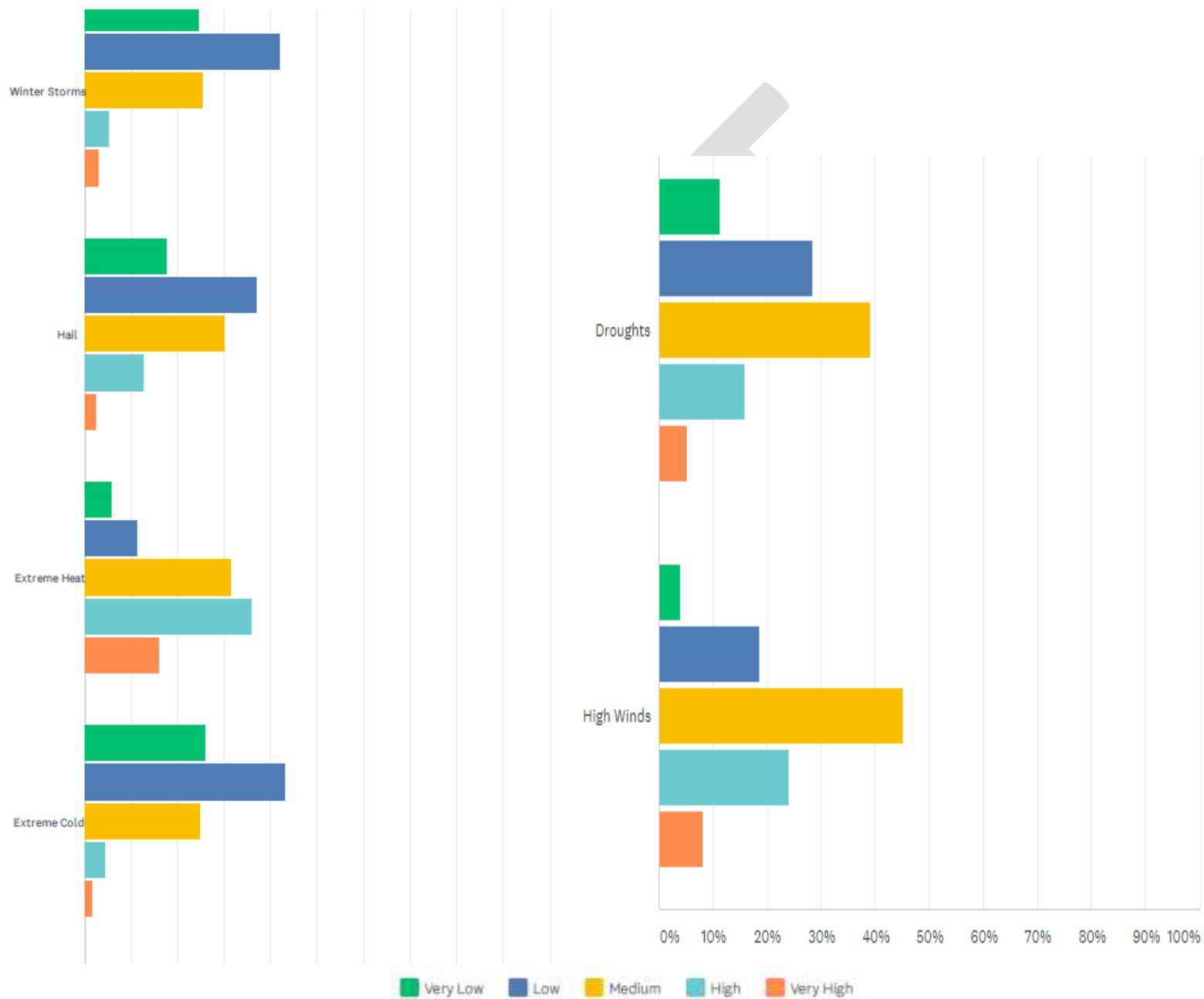


ANSWER CHOICES	RESPONSES	
Flooding	32.40%	58
Wildfires	0.56%	1
Hurricanes and Tropical Cyclones	15.08%	27
Thunderstorms	41.90%	75
Tornadoes	10.06%	18
Earthquakes	0.56%	1
Fog	1.68%	3
Lightning	25.70%	46
Winter Storms	11.73%	21
Hail	27.93%	50
Extreme Heat	8.38%	15
Extreme Cold	4.47%	8
Droughts	7.26%	13
High Winds	36.87%	66
Other disasters that caused loss (please specify)	12.29%	22
Total Respondents: 179		

Q7 Rank the following hazards based on how much they impact your community

Answered: 232 Skipped: 44

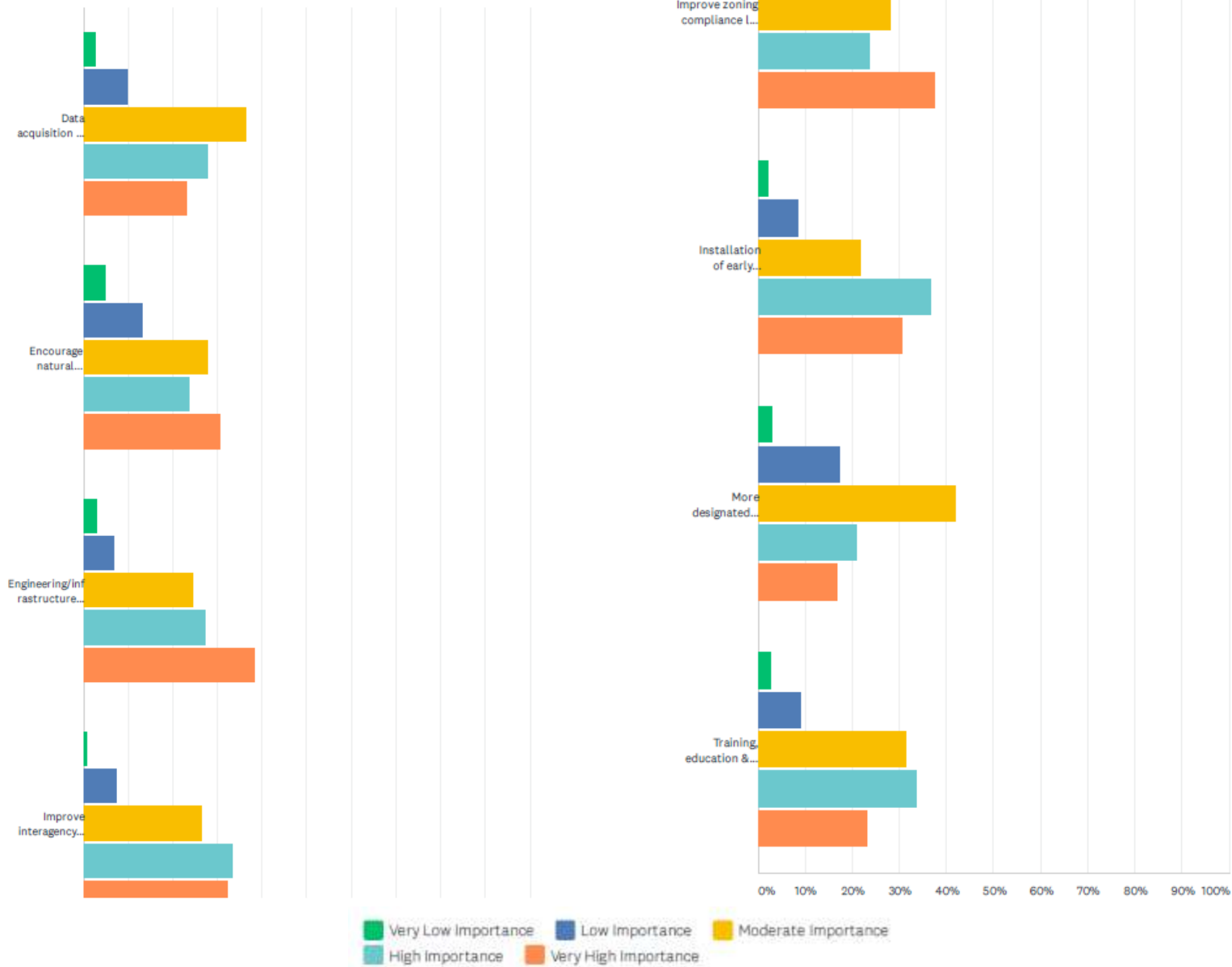




	VERY LOW	LOW	MEDIUM	HIGH	VERY HIGH	TOTAL	WEIGHTED AVERAGE
Flooding	12.50% 29	22.84% 53	30.60% 71	19.40% 45	14.66% 34	232	3.01
Wildfires	56.47% 131	27.59% 64	10.78% 25	3.88% 9	1.29% 3	232	1.66
Hurricanes and Tropical Cyclones	15.09% 35	27.59% 64	45.69% 106	10.34% 24	1.29% 3	232	2.55
Thunderstorms	3.02% 7	6.03% 14	37.07% 86	35.78% 83	18.10% 42	232	3.60
Tornadoes	16.38% 38	28.45% 66	41.81% 97	9.05% 21	4.31% 10	232	2.56
Earthquakes	51.29% 119	36.21% 84	11.21% 26	0.00% 0	1.29% 3	232	1.64
Fog	19.40% 45	31.03% 72	25.86% 60	18.10% 42	5.60% 13	232	2.59
Lightning	6.90% 16	15.95% 37	36.21% 84	29.74% 69	11.21% 26	232	3.22
Winter Storms	24.57% 57	41.81% 97	25.43% 59	5.17% 12	3.02% 7	232	2.20
Hail	17.67% 41	37.07% 86	30.17% 70	12.50% 29	2.59% 6	232	2.45
Extreme Heat	5.60% 13	11.21% 26	31.47% 73	35.78% 83	15.95% 37	232	3.45
Extreme Cold	25.86% 60	43.10% 100	25.00% 58	4.31% 10	1.72% 4	232	2.13
Droughts	11.21% 26	28.45% 66	39.22% 91	15.95% 37	5.17% 12	232	2.75
High Winds	3.88% 9	18.53% 43	45.26% 105	24.14% 56	8.19% 19	232	3.14

Q8 Rank the following hazard mitigation strategies based on how important they would be to your community

Answered: 220 Skipped: 56



	VERY LOW IMPORTANCE	LOW IMPORTANCE	MODERATE IMPORTANCE	HIGH IMPORTANCE	VERY HIGH IMPORTANCE	TOTAL	WEIGHTED AVERAGE
Data acquisition and analysis of location and impact of different disasters to improve policy decisions	2.73% 6	10.00% 22	36.36% 80	27.73% 61	23.18% 51	220	3.5
Encourage natural resource protection as a way of reducing the impact of hazards (e.g. wetland protection/mitigation, riparian buffers, low impact "green" developments)	5.00% 11	13.18% 29	27.73% 61	23.64% 52	30.45% 67	220	3.6
Engineering/infrastructure projects (e.g. levees, stormwater, water and sewer upgrades, reinforcing critical buildings)	3.18% 7	6.82% 15	24.55% 54	27.27% 60	38.18% 84	220	3.6
Improve interagency coordination to respond to disasters more effectively	0.91% 2	7.27% 16	26.36% 58	33.18% 73	32.27% 71	220	3.8
Improve zoning compliance laws to limit development in disaster prone areas (e.g. floodplains)	2.73% 6	7.73% 17	28.18% 62	23.64% 52	37.73% 83	220	3.8
Installation of early warning systems, for appropriate disasters (e.g. sirens or cell phone messaging services)	2.27% 5	8.64% 19	21.82% 48	36.82% 81	30.45% 67	220	3.8
More designated shelters and emergency preparedness infrastructure	3.18% 7	17.27% 38	41.82% 92	20.91% 46	16.82% 37	220	3.3
Training, education & outreach efforts to prepare citizens for disasters	2.73% 6	9.09% 20	31.36% 69	33.64% 74	23.18% 51	220	3.6

III. Input Scores for Severity of Consequence Calculations

III – A. Fairfield County Historical Consequences Score by Hazard and Severity/Frequency and Priority Scores by Hazard Tables

The following tables served as input values for the calculation of the Severity of Consequences scores.

Table 121 - Historical Consequence Scores by Hazard for Fairfield County.

Hazard	Historical Frequency Score (1-5)	Historical Damage Score (1-5)	Historical Fatality Score (1-5)	Historical Injury Score (1-5)	Sum of Historical Scores (4-20)	Normalized Historical Score (1-5)
Drought	1.39	5.00	1.00	1.00	8.39	2.84
Earthquake	1.00	1.00	1.00	1.00	4.00	1.00
Extreme Cold	1.49	2.19	5.00	2.39	11.07	3.95
Flash Flood	1.10	1.52	1.00	1.00	4.62	1.26
Flooding	1.00	1.00	1.00	1.00	4.00	1.00
Fog	1.00	1.00	1.00	1.00	4.00	1.00
Hail	2.32	3.01	2.66	2.84	10.84	3.86
Heat	1.20	4.79	1.83	1.00	8.82	3.02
Hurricane/ Tropical Storm	1.20	2.62	1.00	1.00	5.82	1.76
Lightning	2.00	1.12	2.66	2.42	8.20	2.76
Severe Storm/ Thunderstorm	4.07	1.64	1.02	1.31	8.04	2.69
Tornado	1.34	3.25	3.49	5.00	13.09	4.80
Wildfire	1.10	1.08	1.00	1.00	4.18	1.08
Wind	5.00	3.15	2.71	2.70	13.57	5.00
Winter Weather	2.63	2.64	1.00	1.00	7.27	2.37

Table 122 - Fairfield County Frequency/Severity and Priority Scores by hazard type.

Hazard	Severity/ Frequency (Losses / Incidence)	Normalized Severity/ Frequency Score (1-5)	Normalized Priority Score (From 2016 Plan) (1-5)
Drought	\$339,516.92	3.11	4.43
Earthquake	\$0.00	1	2.71
Extreme Cold	\$80,601.44	1.5	3.29
Flash Flood	\$176,794.79	2.1	2.14
Flooding	\$0.00	1	1
Fog	\$0.00	1	1.57
Hail	\$50,652.59	1.31	2.14
Heat	\$644,126.87	5	4.43
Hurricane/ Tropical Storm	\$275,740.37	2.71	3.29
Lightning	\$4,013.22	1.02	2.14
Severe Storm/ Thunderstorm	\$6,935.65	1.04	1.57
Tornado	\$218,379.48	2.36	3.86
Wildfire	\$28,349.19	1.18	1.57
Wind	\$17,806.60	1.11	3.29
Winter Weather	\$33,245.87	1.21	5

III – B. Lexington County Historical Consequences Score by Hazard and Severity/Frequency and Priority Scores by Hazard Tables

The following tables served as input values for the calculation of the Severity of Consequences scores.

Table 123 - Historical Consequence Scores by Hazard for Lexington County.

Hazard	Historical Frequency Score (1-5)	Historical Damage Score (1-5)	Historical Fatality Score (1-5)	Historical Injury Score (1-5)	Sum of Historical Scores (4-20)	Normalized Historical Score (1-5)
Drought	1.20	2.51	1.00	1.00	5.72	1.81
Earthquake	1.00	1.00	1.00	1.00	4.00	1.00
Extreme Cold	1.23	1.80	4.15	1.05	8.22	2.99
Flash Flood	1.89	5.00	2.67	1.29	10.85	4.23
Flooding	1.15	1.20	1.00	1.00	4.36	1.17
Fog	1.00	1.00	1.00	1.00	4.00	1.00
Hail	1.96	1.19	1.00	1.01	5.16	1.54
Heat	1.09	2.19	1.00	1.00	5.28	1.60
Hurricane/ Tropical Storm	1.11	1.25	1.00	1.00	4.36	1.17
Lightning	1.78	1.52	5.00	1.68	9.97	3.81
Severe Storm/ Thunderstorm	4.53	1.63	4.69	1.64	12.49	5.00
Tornado	1.19	3.89	2.33	5.00	12.42	4.97
Wildfire	1.04	1.02	1.00	1.00	4.06	1.03
Wind	5.00	1.79	3.41	1.94	12.15	4.84
Winter Weather	1.51	1.40	1.00	1.00	4.91	1.43

Table 124 - Lexington County Frequency/Severity and Priority Scores by hazard type.

Hazard	Severity/ Frequency (Losses / Incidence)	Normalized Severity/ Frequency Score (1-5)	Normalized Priority Score (From 2016 Plan) (1-5)
Drought	0.49	2.96	4.43
Earthquake	0.00	1.00	2.71
Extreme Cold	0.23	1.92	3.29
Flash Flood	0.30	2.18	2.14
Flooding	0.09	1.35	2.14
Fog	0.00	1.00	1.57
Hail	0.01	1.05	2.14
Heat	0.88	4.52	4.43
Hurricane/ Tropical Storm	0.14	1.58	3.29
Lightning	0.04	1.18	2.14
Severe Storm/ Thunderstorm	0.01	1.05	1.57
Tornado	1.00	5.00	3.86
Wildfire	0.04	1.17	1.00
Wind	0.01	1.05	3.29
Winter Weather	0.05	1.21	5.00

III – C. Newberry County Historical Consequences Score by Hazard and Severity/Frequency and Priority Scores by Hazard Tables

The following tables served as input values for the calculation of the Severity of Consequences scores.

Table 125 - Historical Consequence Scores by Hazard for Newberry County.

Hazard	Historical Frequency Score (1-5)	Historical Damage Score (1-5)	Historical Fatality Score (1-5)	Historical Injury Score (1-5)	Sum of Historical Scores (4-20)	Normalized Historical Score (1-5)
Drought	1.32	3.29	1.00	1.00	6.61	1.84
Earthquake	1.00	1.00	1.00	1.00	4.00	1.00
Extreme Cold	1.34	1.62	4.62	1.55	9.14	2.66
Flash Flood	1.20	1.31	5.00	1.11	8.62	2.49
Flooding	1.42	1.32	1.00	1.00	4.75	1.24
Fog	1.00	1.00	1.00	1.00	4.00	1.00
Hail	2.19	4.12	3.00	3.24	12.55	3.76
Heat	1.14	3.10	1.00	1.00	6.24	1.72
Hurricane/ Tropical Storm	1.12	1.44	1.00	1.00	4.56	1.18
Lightning	1.97	1.18	1.00	1.16	5.30	1.42
Severe Storm/ Thunderstorm	4.19	1.44	1.04	1.04	7.71	2.20
Tornado	1.40	5.00	5.00	5.00	16.40	5.00
Wildfire	1.06	1.04	1.00	1.00	4.10	1.03
Wind	5.00	1.37	1.12	1.06	8.54	2.46
Winter Weather	2.29	1.87	1.00	1.00	6.16	1.70

Table 126 - Newberry County Frequency/Severity and Priority Scores by hazard type.

Hazard	Severity/ Frequency (Losses / Incidence)	Normalized Severity/ Frequency Score (1-5)	Normalized Priority Score (From 2016 Plan) (1-5)
Drought	0.48	2.91	4.33
Earthquake	0.00	1.00	2.33
Extreme Cold	0.12	1.49	3.00
Flash Flood	0.10	1.41	1.67
Flooding	0.05	1.21	1.67
Fog	0.00	1.00	1.00
Hail	0.18	1.71	1.67
Heat	1.00	5.00	4.33
Hurricane/ Tropical Storm	0.25	1.98	3.00
Lightning	0.01	1.05	1.67
Severe Storm/ Thunderstorm	0.01	1.04	1.00
Tornado	0.67	3.67	3.67
Wildfire	0.05	1.19	1.00
Wind	0.01	1.02	3.00
Winter Weather	0.05	1.18	5.00

III – D. Richland County Historical Consequences Score by Hazard and Severity/Frequency and Priority Scores by Hazard Tables

The following tables served as input values for the calculation of the Severity of Consequences scores.

Table 127 - Historical Consequence Scores by Hazard for Richland County.

Hazard	Historical Frequency Score (1-5)	Historical Damage Score (1-5)	Historical Fatality Score (1-5)	Historical Injury Score (1-5)	Sum of Historical Scores (4-20)	Normalized Historical Score (1-5)
Drought	1.18	1.82	1.00	1.00	5.01	1.41
Earthquake	1.00	1.00	1.00	1.00	4.00	1.00
Extreme Cold	1.22	1.12	3.38	1.07	6.79	2.14
Flash Flood	2.61	3.16	5.00	3.05	13.83	5.00
Flooding	1.43	1.29	1.00	1.00	4.71	1.29
Fog	1.00	1.00	1.00	1.00	4.00	1.00
Hail	1.87	1.04	1.00	1.15	5.07	1.43
Heat	1.16	1.52	4.11	1.00	7.80	2.54
Hurricane/ Tropical Storm	1.11	5.00	1.44	3.05	10.61	3.69
Lightning	1.97	1.44	2.78	5.00	11.18	3.92
Severe Storm/ Thunderstorm	4.68	2.06	2.56	1.83	11.12	3.90
Tornado	1.21	2.36	1.44	2.13	7.13	2.28
Wildfire	1.03	1.01	1.00	1.00	4.04	1.02
Wind	5.00	1.70	1.69	2.04	10.43	3.62
Winter Weather	1.44	1.13	1.00	1.00	4.57	1.23

Table 128 - Richland County Frequency/Severity and Priority Scores by hazard type.

Hazard	Severity/ Frequency (Losses / Incidence)	Normalized Severity/ Frequency Score (1-5)	Normalized Priority Score (From 2016 Plan) (1-5)
Drought	0.13	1.51	4.33
Earthquake	0.00	1.00	2.33
Extreme Cold	0.02	1.06	3.00
Flash Flood	0.04	1.15	2.33
Flooding	0.02	1.08	1.67
Fog	0.00	1.00	1.00
Hail	0.00	1.01	1.67
Heat	0.09	1.37	4.33
Hurricane/ Tropical Storm	1.00	5.00	3.67
Lightning	0.01	1.05	1.67
Severe Storm/ Thunderstorm	0.01	1.03	1.00
Tornado	0.19	1.75	3.67
Wildfire	0.01	1.03	1.00
Wind	0.01	1.02	3.00
Winter Weather	0.01	1.03	5.00

IV. Plan Adoption Letters for each Jurisdiction

IV – A. Fairfield County Adoption Letters

- A) Unincorporated Fairfield County
- B) City of Winnsboro
- C) Town of Ridgeway
- D) Mid-County Water Company

DRAFT

IV – B. Lexington County Adoption Letters

- A) Unincorporated Lexington County
- B) City of Cayce
- C) City of West Columbia
- D) Town of Lexington
- E) Town of Springdale
- F) Town of Chapin
- G) Town of Batesburg – Leesville
- H) Town of Gilbert

IV – C. Newberry County Adoption Letters

A) Unincorporated Newberry County

B) City of Newberry

C) Town of Whitmire

DRAFT

IV – D. Richland County Adoption Letters

- A) Unincorporated Richland County
- B) City of Columbia
- C) Town of Arcadia Lakes
- D) Town of Forest Acres
- E) Town of Irmo
- F) Town of Blythewood

DRAFT

V. NFIP Compliance Letters for each Jurisdiction

V – A. Fairfield County NFIP Compliance Letters

A) Unincorporated Fairfield County

The following sections
address FEMA HMP
requirement 201.6(c)(3)(ii)

South Carolina Department of Natural Resources



Robert H. Boyles, Jr.
Director

Ken Ranziers
Deputy Director for
Land, Water and Conservation

November 18, 2020

To Whom It May Concern, The South Carolina Department of Natural Resources, Land, Water and Conservation Division, Flood Mitigation Program is charged with overseeing community implementation of the National Flood Insurance Program (NFIP) under contract with the Federal Emergency Management Agency (FEMA). SCDNR provides technical and compliance assistance to communities participating in the NFIP.

The purpose of this letter is to confirm that Fairfield County is currently an active participant of the National Flood Insurance Program.

Should you have any questions, please do not hesitate to contact me at (803) 734-4012 or artzj@dnr.sc.gov.

Sincerely,

Jessica Artz, CFM
Flood Mitigation Specialist

B) Town of Ridgeway

South Carolina Department of
Natural Resources



Robert H. Boyles, Jr.
Director
Ken Rensiers
Deputy Director for
Land, Water and Conservation

November 18, 2020

To Whom It May Concern, The South Carolina Department of Natural Resources, Land, Water and Conservation Division, Flood Mitigation Program is charged with overseeing community implementation of the National Flood Insurance Program (NFIP) under contract with the Federal Emergency Management Agency (FEMA). SCDNR provides technical and compliance assistance to communities participating in the NFIP.

The purpose of this letter is to confirm that the Town of Ridgeway is currently an active participant of the National Flood Insurance Program.

Should you have any questions, please do not hesitate to contact me at (803) 734-4012 or artzj@dnr.sc.gov.

Sincerely,

Jessica Artz, CFM
Flood Mitigation Specialist

V – B. Lexington County NFIP Compliance Letters

A) Unincorporated Lexington County

South Carolina Department of
Natural Resources



Robert H. Boyles, Jr.
Director
Ken Rempers
Deputy Director for
Land, Water and Conservation

November 18, 2020

To Whom It May Concern, The South Carolina Department of Natural Resources, Land, Water and Conservation Division, Flood Mitigation Program is charged with overseeing community implementation of the National Flood Insurance Program (NFIP) under contract with the Federal Emergency Management Agency (FEMA). SCDNR provides technical and compliance assistance to communities participating in the NFIP.

The purpose of this letter is to confirm that Lexington County is currently an active participant of the National Flood Insurance Program.

Should you have any questions, please do not hesitate to contact me at (803) 734-4012 or artzj@dnr.sc.gov.

Sincerely,

Jessica Artz, CFM
Flood Mitigation Specialist

B) City of Cayce

South Carolina Department of
Natural Resources



Robert H. Boyles, Jr.
Director
Ken Rensiers
Deputy Director for
Land, Water and Conservation

November 18, 2020

To Whom It May Concern, The South Carolina Department of Natural Resources, Land, Water and Conservation Division, Flood Mitigation Program is charged with overseeing community implementation of the National Flood Insurance Program (NFIP) under contract with the Federal Emergency Management Agency (FEMA). SCDNR provides technical and compliance assistance to communities participating in the NFIP.

The purpose of this letter is to confirm that the City of Cayce is currently an active participant of the National Flood Insurance Program.

Should you have any questions, please do not hesitate to contact me at (803) 734-4012 or artzj@dnr.sc.gov.

Sincerely,

Jessica Artz, CFM
Flood Mitigation Specialist

C) City of West Columbia

South Carolina Department of
Natural Resources



Robert H. Boyles, Jr.
Director
Ken Rensiers
Deputy Director for
Land, Water and Conservation

November 18, 2020

To Whom It May Concern, The South Carolina Department of Natural Resources, Land, Water and Conservation Division, Flood Mitigation Program is charged with overseeing community implementation of the National Flood Insurance Program (NFIP) under contract with the Federal Emergency Management Agency (FEMA). SCDNR provides technical and compliance assistance to communities participating in the NFIP.

The purpose of this letter is to confirm that the City of West Columbia is currently an active participant of the National Flood Insurance Program.

Should you have any questions, please do not hesitate to contact me at (803) 734-4012 or artzj@dnr.sc.gov.

Sincerely,

Jessica Artz, CFM
Flood Mitigation Specialist

D) Town of Batesburg-Leesville

South Carolina Department of
Natural Resources



Robert H. Boyles, Jr.
Director
Ken Rensiers
Deputy Director for
Land, Water and Conservation

November 18, 2020

To Whom It May Concern, The South Carolina Department of Natural Resources, Land, Water and Conservation Division, Flood Mitigation Program is charged with overseeing community implementation of the National Flood Insurance Program (NFIP) under contract with the Federal Emergency Management Agency (FEMA). SCDNR provides technical and compliance assistance to communities participating in the NFIP.

The purpose of this letter is to confirm that the Town of Batesburg-Leesville is currently an active participant of the National Flood Insurance Program.

Should you have any questions, please do not hesitate to contact me at (803) 734-4012 or artzj@dnr.sc.gov.

Sincerely,

Jessica Artz, CFM
Flood Mitigation Specialist

E) Town of Lexington

South Carolina Department of
Natural Resources



Robert H. Boyles, Jr.
Director
Ken Rensiers
Deputy Director for
Land, Water and Conservation

November 18, 2020

To Whom It May Concern, The South Carolina Department of Natural Resources, Land, Water and Conservation Division, Flood Mitigation Program is charged with overseeing community implementation of the National Flood Insurance Program (NFIP) under contract with the Federal Emergency Management Agency (FEMA). SCDNR provides technical and compliance assistance to communities participating in the NFIP.

The purpose of this letter is to confirm that the Town of Lexington is currently an active participant of the National Flood Insurance Program.

Should you have any questions, please do not hesitate to contact me at (803) 734-4012 or artzj@dnr.sc.gov.

Sincerely,

Jessica Artz, CFM
Flood Mitigation Specialist

F) Town of Pine Ridge

South Carolina Department of
Natural Resources



Robert H. Boyles, Jr.
Director
Ken Rensiers
Deputy Director for
Land, Water and Conservation

November 18, 2020

To Whom It May Concern, The South Carolina Department of Natural Resources, Land, Water and Conservation Division, Flood Mitigation Program is charged with overseeing community implementation of the National Flood Insurance Program (NFIP) under contract with the Federal Emergency Management Agency (FEMA). SCDNR provides technical and compliance assistance to communities participating in the NFIP.

The purpose of this letter is to confirm that the Town of Pine Ridge is currently an active participant of the National Flood Insurance Program.

Should you have any questions, please do not hesitate to contact me at (803) 734-4012 or artzj@dnr.sc.gov.

Sincerely,

Jessica Artz, CFM
Flood Mitigation Specialist

G) Town of South Congaree

South Carolina Department of
Natural Resources



Robert H. Boyles, Jr.
Director
Ken Rensiers
Deputy Director for
Land, Water and Conservation

November 18, 2020

To Whom It May Concern, The South Carolina Department of Natural Resources, Land, Water and Conservation Division, Flood Mitigation Program is charged with overseeing community implementation of the National Flood Insurance Program (NFIP) under contract with the Federal Emergency Management Agency (FEMA). SCDNR provides technical and compliance assistance to communities participating in the NFIP.

The purpose of this letter is to confirm that the Town of South Congaree is currently an active participant of the National Flood Insurance Program.

Should you have any questions, please do not hesitate to contact me at (803) 734-4012 or artzj@dnr.sc.gov.

Sincerely,

Jessica Artz, CFM
Flood Mitigation Specialist

H) Town of Swansea

South Carolina Department of
Natural Resources



Robert H. Boyles, Jr.
Director
Ken Rensiers
Deputy Director for
Land, Water and Conservation

November 18, 2020

To Whom It May Concern, The South Carolina Department of Natural Resources, Land, Water and Conservation Division, Flood Mitigation Program is charged with overseeing community implementation of the National Flood Insurance Program (NFIP) under contract with the Federal Emergency Management Agency (FEMA). SCDNR provides technical and compliance assistance to communities participating in the NFIP.

The purpose of this letter is to confirm that the Town of Swansea is currently an active participant of the National Flood Insurance Program.

Should you have any questions, please do not hesitate to contact me at (803) 734-4012 or artzj@dnr.sc.gov.

Sincerely,

Jessica Artz, CFM
Flood Mitigation Specialist

l) Town of Chapin

South Carolina Department of
Natural Resources



Robert H. Boyles, Jr.
Director
Ken Rensiers
Deputy Director for
Land, Water and Conservation

November 18, 2020

To Whom It May Concern, The South Carolina Department of Natural Resources, Land, Water and Conservation Division, Flood Mitigation Program is charged with overseeing community implementation of the National Flood Insurance Program (NFIP) under contract with the Federal Emergency Management Agency (FEMA). SCDNR provides technical and compliance assistance to communities participating in the NFIP.

The purpose of this letter is to confirm that the Town of Chapin is currently an active participant of the National Flood Insurance Program.

Should you have any questions, please do not hesitate to contact me at (803) 734-4012 or artzj@dnr.sc.gov.

Sincerely,

Jessica Artz, CFM
Flood Mitigation Specialist

V – C. Newberry County NFIP Compliance Letters

A) Unincorporated Newberry County

South Carolina Department of
Natural Resources



Robert H. Boyles, Jr.
Director
Ken Rensiers
Deputy Director for
Land, Water and Conservation

November 18, 2020

To Whom It May Concern, The South Carolina Department of Natural Resources, Land, Water and Conservation Division, Flood Mitigation Program is charged with overseeing community implementation of the National Flood Insurance Program (NFIP) under contract with the Federal Emergency Management Agency (FEMA). SCDNR provides technical and compliance assistance to communities participating in the NFIP.

The purpose of this letter is to confirm that Newberry County is currently an active participant of the National Flood Insurance Program.

Should you have any questions, please do not hesitate to contact me at (803) 734-4012 or artzj@dnr.sc.gov.

Sincerely,

Jessica Artz, CFM
Flood Mitigation Specialist

B) City of Newberry

South Carolina Department of
Natural Resources



Robert H. Boyles, Jr.
Director
Ken Rensiers
Deputy Director for
Land, Water and Conservation

November 18, 2020

To Whom It May Concern, The South Carolina Department of Natural Resources, Land, Water and Conservation Division, Flood Mitigation Program is charged with overseeing community implementation of the National Flood Insurance Program (NFIP) under contract with the Federal Emergency Management Agency (FEMA). SCDNR provides technical and compliance assistance to communities participating in the NFIP.

The purpose of this letter is to confirm that the City of Newberry is currently an active participant of the National Flood Insurance Program.

Should you have any questions, please do not hesitate to contact me at (803) 734-4012 or artzj@dnr.sc.gov.

Sincerely,

Jessica Artz, CFM
Flood Mitigation Specialist

C) Town of Whitmire

South Carolina Department of
Natural Resources



Robert H. Boyles, Jr.
Director
Ken Rensiers
Deputy Director for
Land, Water and Conservation

November 18, 2020

To Whom It May Concern, The South Carolina Department of Natural Resources, Land, Water and Conservation Division, Flood Mitigation Program is charged with overseeing community implementation of the National Flood Insurance Program (NFIP) under contract with the Federal Emergency Management Agency (FEMA). SCDNR provides technical and compliance assistance to communities participating in the NFIP.

The purpose of this letter is to confirm that the Town of Whitmire is currently an active participant of the National Flood Insurance Program.

Should you have any questions, please do not hesitate to contact me at (803) 734-4012 or artzj@dnr.sc.gov.

Sincerely,

Jessica Artz, CFM
Flood Mitigation Specialist

V – D. Richland County NFIP Compliance Letters

A) Unincorporated Richland County

South Carolina Department of Natural Resources



Robert H. Boyles, Jr.
Director
Ken Rensiers
Deputy Director for
Land, Water and Conservation

November 18, 2020

To Whom It May Concern, The South Carolina Department of Natural Resources, Land, Water and Conservation Division, Flood Mitigation Program is charged with overseeing community implementation of the National Flood Insurance Program (NFIP) under contract with the Federal Emergency Management Agency (FEMA). SCDNR provides technical and compliance assistance to communities participating in the NFIP.

The purpose of this letter is to confirm that Richland County is currently an active participant of the National Flood Insurance Program.

Should you have any questions, please do not hesitate to contact me at (803) 734-4012 or artzj@dnr.sc.gov.

Sincerely,

Jessica Artz, CFM
Flood Mitigation Specialist

B) City of Columbia

South Carolina Department of
Natural Resources



Robert H. Boyles, Jr.
Director
Ken Rensiers
Deputy Director for
Land, Water and Conservation

November 18, 2020

To Whom It May Concern, The South Carolina Department of Natural Resources, Land, Water and Conservation Division, Flood Mitigation Program is charged with overseeing community implementation of the National Flood Insurance Program (NFIP) under contract with the Federal Emergency Management Agency (FEMA). SCDNR provides technical and compliance assistance to communities participating in the NFIP.

The purpose of this letter is to confirm that the City of Columbia is currently an active participant of the National Flood Insurance Program.

Should you have any questions, please do not hesitate to contact me at (803) 734-4012 or artzj@dnr.sc.gov.

Sincerely,

Jessica Artz, CFM
Flood Mitigation Specialist

C) City of Forest Acres

South Carolina Department of
Natural Resources



Robert H. Boyles, Jr.
Director
Ken Rensiers
Deputy Director for
Land, Water and Conservation

November 18, 2020

To Whom It May Concern, The South Carolina Department of Natural Resources, Land, Water and Conservation Division, Flood Mitigation Program is charged with overseeing community implementation of the National Flood Insurance Program (NFIP) under contract with the Federal Emergency Management Agency (FEMA). SCDNR provides technical and compliance assistance to communities participating in the NFIP.

The purpose of this letter is to confirm that the City of Forest Acres is currently an active participant of the National Flood Insurance Program.

Should you have any questions, please do not hesitate to contact me at (803) 734-4012 or artzj@dnr.sc.gov.

Sincerely,

Jessica Artz, CFM
Flood Mitigation Specialist

D) Town of Irmo

South Carolina Department of
Natural Resources



Robert H. Boyles, Jr.
Director
Ken Rensiers
Deputy Director for
Land, Water and Conservation

November 18, 2020

To Whom It May Concern, The South Carolina Department of Natural Resources, Land, Water and Conservation Division, Flood Mitigation Program is charged with overseeing community implementation of the National Flood Insurance Program (NFIP) under contract with the Federal Emergency Management Agency (FEMA). SCDNR provides technical and compliance assistance to communities participating in the NFIP.

The purpose of this letter is to confirm that the Town of Irmo is currently an active participant of the National Flood Insurance Program.

Should you have any questions, please do not hesitate to contact me at (803) 734-4012 or artzj@dnr.sc.gov.

Sincerely,

Jessica Artz, CFM
Flood Mitigation Specialist

E) Town of Blythewood

South Carolina Department of
Natural Resources



Robert H. Boyles, Jr.
Director
Ken Rensiers
Deputy Director for
Land, Water and Conservation

November 18, 2020

To Whom It May Concern, The South Carolina Department of Natural Resources, Land, Water and Conservation Division, Flood Mitigation Program is charged with overseeing community implementation of the National Flood Insurance Program (NFIP) under contract with the Federal Emergency Management Agency (FEMA). SCDNR provides technical and compliance assistance to communities participating in the NFIP.

The purpose of this letter is to confirm that the Town of Blythewood is currently an active participant of the National Flood Insurance Program.

Should you have any questions, please do not hesitate to contact me at (803) 734-4012 or artzj@dnr.sc.gov.

Sincerely,

Jessica Artz, CFM
Flood Mitigation Specialist

F) Town of Eastover

South Carolina Department of
Natural Resources



Robert H. Boyles, Jr.
Director
Ken Rensiers
Deputy Director for
Land, Water and Conservation

November 18, 2020

To Whom It May Concern, The South Carolina Department of Natural Resources, Land, Water and Conservation Division, Flood Mitigation Program is charged with overseeing community implementation of the National Flood Insurance Program (NFIP) under contract with the Federal Emergency Management Agency (FEMA). SCDNR provides technical and compliance assistance to communities participating in the NFIP.

The purpose of this letter is to confirm that the Town of Eastover is currently an active participant of the National Flood Insurance Program.

Should you have any questions, please do not hesitate to contact me at (803) 734-4012 or artzj@dnr.sc.gov.

Sincerely,

Jessica Artz, CFM
Flood Mitigation Specialist

VI. Advertisements and Notices



Notice of Availability for Review and Public Comment Public meeting

An All-Natural Hazards Risk Assessment and Hazard Mitigation Plan
for the Central Midlands Region of South Carolina

The staff of the Central Midlands Council of Governments seeks public comment and input on the update of the regional risk assessment and natural hazard mitigation plan. A public meeting will be held at the offices of Central Midlands Council of Governments on **X from 6:00 PM to 7:30 PM**. The public may access the plan draft by visiting our website (www.cmcog.org) and searching for "Press Releases". A physical copy is also available for review at the offices of the Central Midlands Council of Governments on 236 Stoneridge Drive, Columbia, SC, 29210.

The purpose of this plan update is to meet the requirements of the Disaster Mitigation Act of 2000 by helping to make the local governments in the region more prepared and resistant to the effects of natural hazards. The plan details the nature of the most significant natural hazards threatening local governments in the region. It contains hazard mitigation goals and strategies that address the natural hazard priorities of many of the local governments in the region. After public comments are addressed, local governments may choose to pass a resolution to adopt the updated regional plan, making them eligible for hazard mitigation grants. It will also involve said local governments in more detailed record keeping on the occurrence and cost of natural hazard events as well as a process to update and revise the plan periodically.

For further information and comments on the draft plan update, individuals may attend the public meeting or contact Mr. Guillermo Espinosa at Central Midlands Council of Governments, by close of business hours on X, utilizing the information below.

Guillermo Espinosa
Phone (803) 744-5126
Email gespinosa@cmcog.org

VII. Meeting Documentation

Meeting or Presentation	Dates
SCEMD Coordination Calls	8/Jan/2020, 21/Oct/2020
Regional Committee Kickoff #1	29/Jul/2020
Regional Committee Kickoff #2	5/Aug/2020
FC Committee Mitigation Workshop	13/Oct/2020
LC Committee Mitigation Workshop	15/Oct/2020
NC Committee Mitigation Workshop	20/Oct/2020
RC Committee Mitigation Workshop	22/Oct/2020
Lexington County EMD Coordination Meeting	29/Oct/2020
Town of Chapin Coordination Calls	6/Nov/2020; 16/Nov/2020
City of Cayce Coordination Calls	16/Dec/2020; 5/Mar/2021
Town of Winnsboro Coordination Call	16/Dec/2020
Northside (FC + NC) Committee Spring Update	16/Mar/2021
LC Committee Spring Update	18/Mar/2021
NC County Coordination Call	23/March/2021
RC Committee Spring Update	25/Mar/2021
County Emergency Manager Meeting	10/September/2021

Regional Kick-off Meetings (29/July/2020; 5/Aug/2020)

**CENTRAL MIDLANDS
REGIONAL HAZARD MITIGATION PLAN
2021 UPDATE**

VIRTUAL KICK OFF MEETING
Please register for the date that works best with your schedule:

July 29 | 2:00PM EST
[Register](#)

August 5 | 2:00PM EST
[Register](#)

Central Midlands Council of Governments is asking for your participation in the development of the 2021 update of the Regional Hazard Mitigation Plan. This plan is required for local governments and other public agencies to be eligible for FEMA hazard mitigation funding. The agenda for this meeting will include:

- Plan Purpose and Organization
- Relationship to Funding Opportunities
- County Steering Committees and Stakeholder Input
- Timeline, Next Steps, and Q&A

If you are unable to attend the meeting, have questions, or need assistance accessing the virtual meeting platform, please contact Guillermo Espinosa with Central Midlands Council of Governments at the phone # or email below:

FOR MORE INFORMATION CONTACT:
Guillermo Espinosa
Central Midlands Council of Governments
gespinosa@centralmidlands.org
(803)744-5166

CENTRAL MIDLANDS
Council of Governments
218 Stonewall Drive, Columbia, SC 29218
www.centralmidlands.org

Fairfield County Committee Mitigation Workshop (13/October/2020)

CMHMP 2021 - Fairfield County Review of 2016 Capabilities Assessment



Environmental/Hazard Mitigation X



Guillermo Espinosa <gespinosa@centralmidlands.org>

Thu, Aug 13, 2020, 4:45 PM



to Phyllis, Gregory ▾

Hi Ms Watkins,

We are currently updating our all natural Central Midlands Hazard Mitigation Plan for 2021. As a previous participant in the plan we are reaching out to you to keep your organization's involvement up to date. The first step is to work on updating all the plan requirements for each jurisdiction.

Please see attached for a word document summarizing the information from the 2016 plan that your organization submitted. Please take a moment to answer the questions and review the answers your organization provided in 2016. A Fairfield County Steering Committee is scheduled for Tuesday, October 13th, 2020 to workshop these updates and answer any questions. [You may use this link to register.](#)

Please let me know if you are not the right point of contact to address these planning requirements. Happy to answer any questions you may have about the plan and its benefits.

Thank you,

Guillermo

—

[Guillermo Espinosa M.A.](#)

Senior Planner for Central Midlands Council of Governments

236 Stoneridge Drive,

Columbia, SC 29210

Phone: 803-376-5390 ext. 308

Fax: 803-376-5394



Lexington County Committee Mitigation Workshop (15/October/2020)

CMHMP 2021 - Lexington County Review of 2016 Capabilities Assessment



Guillermo Espinosa <gespinosa@centralmidlands.org>
to wjeffcoat, wwoods, Gregory

Thu, Aug 13, 2020, 10:45 AM



Hi Ms Jeffcoat,

My name is Guillermo Espinosa, a planner for Central Midlands Council of Governments. We are currently updating our all natural hazard Central Midlands Hazard Mitigation Plan for 2021. As a previous plan participant we are reaching out to you to update all plan requirements to keep your organization involvement up to date.

Please see attached for a word document summarizing the information from the 2016 plan that your organization submitted. A Lexington County Steering Committee is scheduled for Thursday, October 15th, 2020 to workshop these updates and answer any questions. [You may use this link to register.](#)

Please let me know if you are not the right point of contact to address these planning requirements. Happy to answer any questions you may have about the plan and its benefits.

Thank you,

Guillermo

—

[Guillermo Espinosa M.A.](#)

Senior Planner for Central Midlands Council of Governments

238 Stoneridge Drive,

Columbia, SC 29210

Phone: 803-376-5390 ext. 308

Fax: 803-376-5394

2 Attachments



Reply

Reply all

Forward

Newberry County Committee Mitigation Workshop (20/October/2020)

CMHMP 2021 - Newberry County Review of 2016 Capabilities Assessment



Inbox X



Guillermo Espinosa <gespinosa@centralmidlands.org>
to Tommy, Gregory, Anne ▾

Thu, Aug 13, 2020, 3:40 PM



Hi Tommy,

We are currently updating our all natural Central Midlands Hazard Mitigation Plan for 2021. As a previous participant in the plan we are reaching out to you to keep your organization's involvement up to date. The first step is to work on updating all the plan requirements for each jurisdiction.

Please see attached for a word document summarizing the information from the 2016 plan that your organization submitted. A Newberry County Steering Committee is scheduled for Thursday, October 20th, 2020 to workshop these updates and answer any questions. [You may use this link to register.](#)

Please let me know if you are not the right point of contact to address these planning requirements. Happy to answer any questions you may have about the plan and its benefits.

Thank you,

Guillermo

—

Guillermo Espinosa M.A.

Senior Planner for Central Midlands Council of Governments

236 Stoneridge Drive,

Columbia, SC 29210

Phone: 803-376-5390 ext. 308

Fax: 803-376-5394



Richland County Committee Mitigation Workshop (22/October/2020)

CMHMP 2021 - Richland County Review of 2016 Capabilities Assessment



Environmental/Hazard Mitigation X



Guillermo Espinosa <gespinosa@centralmidlands.org>
to kalec.michael, CLAYTON, Gregory, MICHAEL ▾

Mon, Aug 17, 2020, 11:50 AM



Hi Mike and Clayton,

Thanks for attending our kickoff meeting for the Central Midlands Hazard Mitigation Plan. As we mentioned in the meeting, the first step is to work on updating all the plan requirements for each jurisdiction.

Please see attached for a word document summarizing the information from the 2016 plan that your organization submitted. Please take a moment to answer the questions and review the answers your organization provided in 2016. A Richland County Steering Committee is scheduled for Thursday, October 22nd, 2020 to workshop these updates and answer any questions. [You may register by following this link.](#)

Please let me know if you are not the right point of contact for this; I've copied both of you, but let me know if you would prefer to address this internally between county staff and have a single point of contact for Richland County. Happy to answer any questions you may have about the plan and its benefits.

Thank you,

Guillermo

Guillermo Espinosa M.A.

Senior Planner for Central Midlands Council of Governments

236 Stoneridge Drive,
Columbia, SC 29210

Phone: 803-376-5390 ext. 308
Fax: 803-376-5394



Northside (Fairfield and Newberry Counties) Spring Committee Update (16/March/2021)

[REMINDER] CMHMP 2021 - Fairfield & Newberry County Committee
Meeting, 16/Mar/21, 2pm 



Guillermo Espinosa <gespinosa@centralmidlands.org>

Fri, Mar 12, 11:29 AM

to Gregory, bcc: brad.douglas, bcc: Chris, bcc: jwater, bcc: Vivian, bcc: Mid-County, bcc: Cyndi, bcc: Jana, bcc: Tommy, bcc: Anne, bcc: dshent

Hey all,

Just a quick reminder of the upcoming Central Midlands Hazard Mitigation Plan meeting next week. Please note, **the Fairfield and Newberry County committee meetings have been combined to a single date**. The meeting date for this joint work session is March 16th, 2021 at 2PM. Please see below for the meeting information:

CMHMP 2021 - Fairfield County Steering Committee Meeting
When: Mar 16, 2021 02:00 PM Eastern Time (US and Canada)

Register in advance for this meeting:

https://us02web.zoom.us/join/zoom/register/tZyuf-qyaDsoHNSDNIntRtgCU0GTR_rKfwZt

After registering, you will receive a confirmation email containing information about joining the meeting.

Following is the meeting agenda:

1. Historical Hazard Summary Update
2. Hazard Risk Assessment and Severity of Consequence Analysis
3. Capability Assessment Update/Discussion
 - Critical Facilities
 - Mitigation Strategies and Recommendations
4. Plan timeline/Next steps

Home(?)work request before the meeting

In the interest of facilitating the creation and prioritization of hazard mitigation strategies, we have attached a Hazard Perception Survey to this email. All it asks is to rate different natural hazards on a scale from 0-100. Please take some time to complete it before the meeting; it should only take 5-10 mins. The difference between hazard perception and the new data in the plan will be helpful in generating discussion.

Let me know if you have any questions. We would also be happy to discuss scheduling individual meetings if this time does not work with you, so please don't hesitate to reach out if that's the case. Hope to see you there!

Best regards,

—
Guillermo Espinosa M.A.

Senior Planner for Central Midlands Council of Governments

236 Stoneridge Drive,

Columbia, SC 29210

Phone: 803-376-5390 ext. 308

Fax: 803-376-5394



Lexington County Committee Spring Update (18/March/2021)

[REMINDER] CMHMP 2021 - Lexington County Committee Meeting,
18/Mar/21, 2pm  



Guillermo Espinosa <gespinosa@centralmidlands.org>

Fri, Mar 12, 11:53 AM



to Gregory, bcc: jsanders57, bcc: Wesley, bcc: Britt, bcc: Wayne, bcc: Andy, bcc: Whit, bcc: Jay, bcc: Wendy, bcc: Wilton, bcc: Town, bcc: Viki, bc

Hey all,

Just a quick reminder of the upcoming Central Midlands Hazard Mitigation Plan meeting. Please see below for the meeting information:

CMHMP 2021 - Lexington County Steering Committee Meeting
When: Mar 18, 2021 02:00 PM Eastern Time (US and Canada)

Register in advance for this meeting:

https://us02web.zoom.us/join/zoom/register/tZlOf-2rpsqEtVyaZWwIRxO4yA2Ng_d9li

After registering, you will receive a confirmation email containing information about joining the meeting.

Following is the meeting agenda:

1. Historical Hazard Summary Update
2. Hazard Risk Assessment and Severity of Consequence Analysis
3. Capability Assessment Update/Discussion
 - Critical Facilities
 - Mitigation Strategies and Recommendations
4. Plan timeline/Next steps

Home(?)work request before the meeting

In the interest of facilitating the creation and prioritization of mitigation strategies, we have attached a Hazard Perception Survey to this email. All it asks is to rate different natural hazards on a scale from 0-100. Please take some time to complete it before the meeting, it should only take 5-10 mins. The difference between hazard perception and the new data in the plan will be helpful in generating discussion.

Let me know if you have any questions. We would also be happy to discuss scheduling individual meetings if this time does not work with you, so please don't hesitate to reach out if that's the case. Hope to see you there!

Best regards,

--

Guillermo Espinosa M.A.

Senior Planner for Central Midlands Council of Governments

236 Stoneridge Drive,

Columbia, SC 29210

Phone: 803-376-5390 ext. 308

Fax: 803-376-5394



Richland County Committee Spring Update (25/March/2021)

[REMINDER] CMHMP 2021 - Richland County Committee Meeting, 25/Mar/21, 2pm   



Guillermo Espinosa <gespinosa@centralmidlands.org>

Fri, Mar 12, 11:53 AM



to Gregory, bcc: townofarcadia, bcc: Yarboroughs, bcc: Harry.Tinsley, bcc: asstclerk, bcc: Shaun, bcc: MICHAEL, bcc: williamsonc

Hey all,

Just a quick reminder of the upcoming Central Midlands Hazard Mitigation Plan meeting. Please see below for the meeting information:

CMHMP 2021 - Richland County Steering Committee Meeting
When: Mar 25, 2021 02:00 PM Eastern Time (US and Canada)

Register in advance for this meeting:

https://us02web.zoom.us/join/tZUrduqgDMjGd5J2DErf68KLWUKupRk_dsA

After registering, you will receive a confirmation email containing information about joining the meeting.

Following is the meeting agenda:

1. Historical Hazard Summary Update
2. Hazard Risk Assessment and Severity of Consequence Analysis
3. Capability Assessment Update/Discussion
 - Critical Facilities
 - Mitigation Strategies and Recommendations
4. Plan timeline/Next steps

Home(?)work request before the meeting

In the interest of facilitating the creation and prioritization of mitigation strategies, we have attached a Hazard Perception Survey to this email. All it asks is to rate different natural hazards on a scale from 0-100. Please take some time to complete it before the meeting, it should only take 5-10 mins. The difference between hazard perception and the new data in the plan will be helpful in generating discussion.

Let me know if you have any questions. We would also be happy to discuss scheduling individual meetings if this time does not work with you, so please don't hesitate to reach out if that's the case. Hope to see you there!

Best regards,

—

Guillermo Espinosa M.A.

Senior Planner for Central Midlands Council of Governments

236 Stoneridge Drive,

Columbia, SC 29210

Phone: 803-376-5390 ext. 308

Fax: 803-376-5394



County Emergency Manager Meeting (10/September/2021)

Discussion about Hazard Mitigation Plan DRAFT DRAFT

Woods, Witan "Chase"
to Woods, Witan; Toomey, David; HALL, MICHAEL; graham@lewiscountysc.gov; me

Wed, Aug 18, 8:07 AM

10
Fri

Discussion about Hazard Mitigation Plan
View on Google Calendar

When: Fri Sep 10, 2021 10am – 11am (EDT)

Where: Lexington County GOC (434 Ball Park Rd, Lexington SC 29073)

Who: Douglas, Brad; Hite, David; hite.david@lexcountysc.gov; Toomey, David; wittan, chad

[More options](#)

Agenda
Fri Sep 10, 2021

No verbal events

Items: Discussion about Hazard Mitigation Plan

Item: 8/10/21 Witan - County Emergency Services

Item: 10/10/21 Witan - Hazard Mitigation Plan Meeting

Good Morning,

This meeting will be to discuss the Hazard Mitigation Plan proposed by the Central Midland Council of Governments. If you can attend in person please do so. If you need an alternative option for attending (performance call) please let me know.

This meeting will take place at 1000 on Friday August 19, 2021 at the Lexington County GOC (434 Ball Park Rd.)

Respectfully,

Chase W. Woods
Deputy Emergency Manager
Lexington County Emergency Management Division
Lexington County Department of Emergency Services
434 Ball Park Rd, Lexington, SC 29073
(O) (803)761-8129 (C) (803)667-6661 (F) (803)761-8628
E: cwoods@lexsc.gov
M: [8037618129](tel:8037618129)

VIII. Templates

VIII – A. Mitigation Strategy Template

Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe

VIII – B. Plan Adoption Letter Template

All Natural Hazards Mitigation Plan Adoption Resolution

Resolution # _____ Adopting the All Natural Hazards Risk Assessment and Mitigation Plan for the Central Midlands Region of South Carolina

Whereas, (_____) recognizes the threat that natural hazards pose to people and property; and
Name of local government

Whereas, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

Whereas, an adopted all hazards mitigation plan is required as a condition of future grant funding of mitigation projects; and

Whereas, (_____) participated jointly in the planning process with the other units of
Name of local government
 government in the Central Midlands region of South Carolina to prepare an all hazards mitigation plan;

Whereas, (_____) is aware that revision and updating of the plan is critical for active and
Name of local government
 effective hazard mitigation and that (_____) will monitor and record hazard related data
Name of local government

and events that can be used to update the all-natural hazards mitigation plan;

Now, therefore, be it resolved, that the (Name of governing council), hereby adopts the update to the All Natural Hazards Risk Assessment and Mitigation Plan for the Central Midlands Region in its entirety as an official plan and will undertake annual recording of hazard events, their impact duration and cost.

Be it further resolved, that the Central Midlands Council of Governments, accepting the All Natural Hazards Risk Assessment and Mitigation Plan from the Central Midlands Regional Risk Assessment and Hazard Mitigation Committee, will submit on behalf of the participating counties and municipalities the adopted All Natural Hazards Plan to the Federal Emergency Management Agency officials for final review and approval.

Passed: (_____)
Date

Certifying Official (_____)
Typed Name and Signature of Chief Administrative or Elected Official

VIII – C. Plan Update Review Template

Questionnaire for Six-months and Annual Update of the _____ Action Plan:
(Insert Name of Local Government)

Type of Hazard Event	Date of Hazard Event	Estimate of Hazard Damages	Activities to Implement Plan	Date Activities Effected	Collaborative Activities to Implement Plan	New Obstacles to Implement Plan	Activities Undertaken to Resolve Obstacles to Plan Implementation

Name and title of person completing form _____

Date form completed _____

Signature of persons completing form _____

RESOLUTION NO.: R-2021-105

Authorizing consumption of beer and wine only within Boyd Plaza adjacent to the Columbia Museum of Art for CMA Gala: Celebrating 30 Americans on Saturday, December 4, 2021

WHEREAS, the Columbia Museum of Art (hereinafter "CMA" or "Organizer") is hosting CMA Gala: Celebrating 30 Americans on Saturday, December 4, 2021, from 7:00 p.m. until 10:00 p.m.; and,

WHEREAS, the Organizer has requested permission for the temporary closing and use of the courtyard/plaza area adjacent to the Museum for CMA Gala: Celebrating 30 Americans from 8:00 a.m. until midnight for preparation and staging of the area for an outdoor event to be held between 7:00 p.m. until 10:00 p.m., and for patrons to consume beer and wine beverages only on Saturday, December 4, 2021, from 7:00 p.m. until 9:30 p.m.; and,

WHEREAS, to ensure the safety of attendees, Organizer understands and agrees as follows:

1. Firearms shall be prohibited in the courtyard/plaza area adjacent to the Museum regardless of whether such firearm is carried openly or concealed, and regardless of whether the individual carrying such firearm is a valid concealed weapons permit holder, on Saturday, December 4, 2021, from 8:00 a.m. until midnight. See Resolution No. 2021-099 (Sept. 7, 2021).
2. Organizer shall establish a boundary line around the event space at the courtyard/plaza area adjacent to the Museum, and the Organizer shall ensure all entrance points into the permitted event area are posted with signage stating "NO CONCEALABLE WEAPONS ALLOWED" that complies with the size and formatting requirements of section 23-31-235 of the South Carolina Code.
3. When publicizing the event in the community, Organizer shall include the statement: "NO CONCEALABLE WEAPONS ALLOWED" to ensure the public has prior notice of this restriction.
4. Organizer shall work with the City to develop a written plan and design a footprint of the event area that adheres to COVID-19 pandemic safety and social distancing protocols, as published by the CDC and SCDHEC, and Organizer shall modify the plans and footprint as safety protocols published by the CDC and SCDHEC are updated.
5. The City may cancel the event at any time based upon public safety and/or public health concerns. The City shall not be financially responsible for any costs associated with the cancellation of the event.
6. Organizer shall display signs (physical and/or electronic) throughout the event area that discourage physical contact, such as hugs, handshakes, fist bumps, and high-fives during the event.
7. Organizer shall require that its agents, employees, vendors, contractors, and event attendees adhere to all COVID-19 safety protocols in effect at the time of the event, to include, but not be limited to, wearing of face masks, social distancing, and frequent washing of hands.
8. To the extent the event occurs during a time in which the City has in effect any emergency ordinance or ordinance requiring face coverings or adherence to social distancing requirements, Organizer shall require that its agents, employees, vendors, contractors, and event attendees comply with the requirements of such ordinance(s).
9. The City strongly encourages Organizer to require that its agents, employees, vendors, contractors, and event attendees provide proof that they have been fully vaccinated against the SARS-CoV-2 virus prior to being granted permission to enter the event.
10. Organizer shall provide portable restroom facilities at the event unless it can substantiate the sufficient availability of both ADA accessible and non-accessible facilities in the immediate area of the event site which will be available to attendees during the event. Organizer shall provide a minimum of four (4) chemical or portable toilets and two (2) wash stations for every 250 people, or portion thereof, who attend the event. Ten percent (10%) of these facilities shall be ADA accessible. This figure is based upon the maximum number of attendees at the event during peak time. The City may determine the total number of required restroom facilities on a case-by-case basis. Organizer shall post signs or markers to prohibit lines or crowds forming near the event's restroom facilities without maintaining a distance of at least six (6) feet from other people.

11. Organizer shall post signs or markers to prohibit lines or crowds forming near food vendors and should encourage attendees to bring their own water. Alcohol, beer and/or wine shall be prohibited at the event without approval of a written resolution of City Council.

12. Organizer shall coordinate with food vendors to offer touchless payment options, if possible and available, or provide a tray for the exchange of payment to avoid hand-to-hand contact. Frequently touched surfaces should be cleaned after each customer and customers are encouraged to use their own pens.

13. At no cost to the City, Organizer shall be responsible for hiring no fewer than two (2) off-duty City of Columbia police officers during the hours of 6:30 p.m. until 11:30 p.m.

WHEREAS, it has been determined that such an event would be in the public interest; NOW, THEREFORE,

BE IT RESOLVED by the Mayor and Council this ____ day of _____, 2021, that the sale of beer and wine beverages only in plastic containers or cans only is authorized between the hours of 7:00 p.m. and 9:30 p.m. on December 4, 2021; and,

BE IT FURTHER RESOLVED that all vendors be restricted to stationary location and,

BE IT FURTHER RESOLVED that possession and consumption of alcoholic liquors or alcoholic beverages, other than beer and/or wine beverages only within the event area is prohibited; and,

BE IT FURTHER RESOLVED that VIP tents or VIP areas for the possession and consumption of alcoholic liquors or alcoholic beverages, other than beer and/or wine beverages only, within the event area are prohibited; and,

BE IT FURTHER RESOLVED that Organizer is responsible or shall make arrangements for the clean-up of all trash and debris within the event area and shall place same in the roll carts provided by the City. Any overflow of trash and debris shall be placed in garbage bags with the top securely closed and placed beside the City roll carts. The number of roll carts needed for the event shall be determined by Organizer and the City's Solid Waste Division prior to the event and placed throughout the event area to ensure that trash and debris are well contained. Organizer shall return the roll carts and bagged trash and debris to the collection point designated by the City in a timely manner. If the Organizer has not opted to use City services to clean up the event area, any costs incurred by the City in removing loose trash and debris within the event area, which the Organizer has failed to clean up, shall be billed to and paid by the Organizer; and,

BE IT FURTHER RESOLVED that outdoor possession and consumption of beer and wine beverages only, all outdoor musical performances and use of sound-amplifying devices shall end by 10:00 p.m. due to the proximity of the event to residential properties; and,

BE IT FURTHER RESOLVED that only pedestrian traffic will be allowed within the event area. All other traffic, including, but not limited to, automobiles, trucks, motorcycles, mopeds, bicycles, skate boards, and horses, golf carts (except police golf carts or ATVs), and horse-drawn carriages, is prohibited. All pets, including cats, dogs (except police K-9s), horses, birds, lizards, and snakes, are prohibited. Coolers, glass bottles, breakable drinking glasses and/or cups, large bags, and backpacks shall be prohibited inside the event area; and,

BE IT FURTHER RESOLVED that during the designated time the closed portion of the courtyard/plaza area adjacent to the Museum that serves as the designated event area, with the exception of any parking area and/or any other areas posted as to not allow alcoholic beverages, shall be declared to be a Public Park and the provisions of Chapter 15, Parks and Recreation, Sec. 15-1, 15-2, and 15-3, of the Code of Ordinances of the City of Columbia, South Carolina are in effect. Pursuant to Chapter 14, Offenses and Miscellaneous Provisions, Article IV, Offenses Against the Public Peace and Order, Sec. 14-99, of the Code of Ordinances of the City of Columbia, South Carolina, the designated event area of the closed portion of courtyard/plaza area adjacent to the Museum, with the exception of any parking area and/or any other areas posted as to not allow alcoholic beverages, is deemed to be the site of a public festival at which beer and wine beverages only may be consumed and the prohibition against possession or consumption of alcoholic beverages set forth in Sec. 14-99 shall not apply to the possession or consumption of beer or wine within the designated event area. Possession and consumption of beer and wine beverages shall be permitted

only in containers provided by vendors within the areas designated, and such containers provided by vendors for the sale of beer and wine may only be in plastic containers or cans.

PROVIDED, FURTHER, that the Organizer shall provide the names and cell phone numbers of a least two contact persons who can receive and address complaints during the event, including any set up and breakdown times. The cell phones shall remain on, with ringers and alerts functioning, at all times during the event and during any set up and breakdown time.

PROVIDED, FURTHER, that failure of the event Organizer to strictly comply with the time frames and other requirements and responsibilities set forth in this resolution may result in the immediate cancellation of the event and/or a denial of subsequent requests to allow the event.

PROVIDED, HOWEVER, that no solicitation or transactions be made in violation of Sec. 14-32 of the Code of Ordinances of the City of Columbia, South Carolina.

BE IT FURTHER RESOLVED that should the Organizer reschedule the event for another date beyond one (1) week from the date of the originally scheduled event or inclement weather date, a request for a resolution of City Council approving the new date of the event shall be required.

Requested by:

Assistant City Manager Shealy

Mayor

Approved by:

City Manager

Approved as to form:

ATTEST:



Deputy City Attorney

City Clerk

Introduced:

Final Reading:

RESOLUTION NO.: R-2021-116

Authorizing consumption of beer and wine only within Boyd Plaza adjacent to the Columbia Museum of Art for Live on Boyd Plaza on Sunday, November 7, 2021

WHEREAS, the Columbia Museum of Art ("CMA") is hosting Live on Boyd Plaza on Sunday, November 7, 2021 from 3:00 p.m. until 5:30 p.m.; and,

WHEREAS, the CMA has requested permission for the temporary closing and use of the courtyard/plaza area adjacent to the Museum for Live on Boyd from 2:30 p.m. until 6:00 p.m. for preparation and staging of the area for an outdoor event to be held between 3:00 p.m. until 5:30 p.m., and for patrons to consume beer and wine beverages only on Sunday, November 7, 2021 from 3:00 p.m. until 5:00 p.m.; and,

WHEREAS, Organizer has requested permission for the temporary closing and use of the courtyard/plaza area adjacent to the Museum for Live on Boyd from 2:30 p.m. until 6:30 p.m. for preparation and staging of the event location for an outdoor event to be held between from 3:00 p.m. until 5:30 pm, and for patrons to consume beer and wine beverages only on Sunday, November 7, 2021, from 3:00 pm until 5:00 p.m.;

WHEREAS, to ensure the safety of attendees, Organizer understands and agrees as follows:

1. Firearms shall be prohibited in the Museum for Live on Boyd, regardless of whether such firearm is carried openly or concealed, and regardless of whether the individual carrying such firearm is a valid concealed weapons permit holder, on Sunday, November 7, 2021, 3:00 p.m. until 5:30 p.m. See Resolution No. 2021-099 (Sept. 7, 2021).
2. Organizer shall establish a boundary line around the event space at the courtyard/plaza area adjacent to the Museum and the Organizer shall ensure all entrance points into the permitted event area are posted with signage stating "NO CONCEALABLE WEAPONS ALLOWED" that complies with the size and formatting requirements of section 23-31-235 of the South Carolina Code.
3. When publicizing the event in the community, Organizer shall include the statement: "NO CONCEALABLE WEAPONS ALLOWED" to ensure the public has prior notice of this restriction.
4. Organizer shall work with the City to develop a written plan and design a footprint of the event area that adheres to COVID-19 pandemic safety and social distancing protocols, as published by the CDC and SCDHEC, and Organizer shall modify the plans and footprint as safety protocols published by the CDC and SCDHEC are updated.
5. The City may cancel the event at any time based upon public safety and/or public health concerns. The City shall not be financially responsible for any costs associated with the cancellation of the event.
6. Organizer shall display signs (physical and/or electronic) throughout the event area that discourage physical contact, such as hugs, handshakes, fist bumps, and high-fives during the event.
7. Organizer shall require its agents, employees, vendors, contractors, and event attendees to adhere to all COVID-19 safety protocols in effect at the time of the event, to include, but not be limited to, wearing of face coverings, social distancing, and frequent washing of hands.
8. To the extent the event occurs during a time in which the City has in effect any emergency ordinance or ordinance requiring face coverings or adherence to social distancing requirements, Organizer shall require that its agents, employees, vendors, contractors, and event attendees comply with the requirements of such ordinance(s).
9. The City strongly encourages Organizer to require that its agents, employees, vendors, contractors, and event attendees provide proof that they have been fully vaccinated against the SARS-CoV-2 virus prior to being granted permission to enter the event.
10. Organizer shall provide portable restroom facilities at the event unless it can substantiate the sufficient availability of both ADA accessible and non-accessible facilities in the immediate area of the event site which will be available to attendees during the event. Organizer shall provide a minimum of four (4) chemical or portable toilets and two (2) wash stations for every 250 people, or portion thereof, who attend the event. Ten percent (10%) of

LEGAL DEPARTMENT DRAFT

these facilities shall be ADA accessible. This figure is based upon the maximum number of attendees at the event during peak time. The City may determine the total number of required restroom facilities on a case-by-case basis. Organizer shall post signs or markers to prohibit lines or crowds forming near the event's restroom facilities without maintaining a distance of at least six (6) feet from other people.

11. Organizer shall post signs or markers to prohibit lines or crowds forming near food vendors and should encourage attendees to bring their own water. Alcohol, beer and/or wine shall be prohibited at the event without approval of a written resolution of City Council.

12. Organizer shall coordinate with food vendors to offer touchless payment options, if possible and available, or provide a tray for the exchange of payment to avoid hand-to-hand contact. Frequently touched surfaces should be cleaned after each customer and customers are encouraged to use their own pens.

13. At no cost to the City, Organizer shall be responsible for hiring no fewer than two (2) off-duty City of Columbia police officers during the hours 2:30 p.m. until 6:30 p.m.

WHEREAS, it has been determined that such an event would be in the public interest; NOW, THEREFORE,

BE IT RESOLVED by the Mayor and Council this ____ day of _____, 2021, that the sale of beer and wine beverages only in plastic containers or cans only is authorized on Sunday, November 7, 2021, from 3:00 p.m. until 5:00 p.m.

BE IT FURTHER RESOLVED that all vendors be restricted to stationary location and,

BE IT FURTHER RESOLVED that possession and consumption of alcoholic liquors or alcoholic beverages, other than beer and/or wine beverages only within the event area is prohibited; and,

BE IT FURTHER RESOLVED that VIP tents or VIP areas for the possession and consumption of alcoholic liquors or alcoholic beverages, other than beer and/or wine beverages only, within the event area are prohibited; and,

BE IT FURTHER RESOLVED that Organizer is responsible or shall make arrangements for the clean-up of all trash and debris within the event area and shall place same in the roll carts provided by the City. Any overflow of trash and debris shall be placed in garbage bags with the top securely closed and placed beside the City roll carts. The number of roll carts needed for the event shall be determined by Organizer and the City's Solid Waste Division prior to the event and placed throughout the event area to ensure that trash and debris are well contained. Organizer shall return the roll carts and bagged trash and debris to the collection point designated by the City in a timely manner. If the Organizer has not opted to use City services to clean up the event area, any costs incurred by the City in removing loose trash and debris within the event area, which the Organizer has failed to clean up, shall be billed to and paid by the Organizer; and,

BE IT FURTHER RESOLVED that outdoor possession and consumption of beer and wine beverages only, all outdoor musical performances and use of sound-amplifying devices shall end by 5:30 p.m. due to the proximity of the event to residential properties; and,

BE IT FURTHER RESOLVED that only pedestrian traffic will be allowed within the event area. All other traffic, including, but not limited to, automobiles, trucks, motorcycles, mopeds, bicycles, skate boards, and horses, golf carts (except police golf carts or ATVs), and horse-drawn carriages, is prohibited. All pets, including cats, dogs (except police K-9s), horses, birds, lizards, and snakes, are prohibited. Coolers, glass bottles, breakable drinking glasses and/or cups, large bags, and backpacks shall be prohibited inside the event area; and,

BE IT FURTHER RESOLVED that during the designated time the closed portion of courtyard/plaza area adjacent to the Museum for Live on Boyd that serves as the designated event area, with the exception of any parking area and/or any other areas posted as to not allow alcoholic beverages, shall be declared to be a Public Park and the provisions of Chapter 15, Parks and Recreation, Sec. 15-1, 15-2, and 15-3, of the Code of Ordinances of the City of Columbia, South Carolina are in effect. Pursuant to Chapter 14, Offenses and Miscellaneous Provisions, Article IV, Offenses Against the Public Peace and Order, Sec. 14-99, of the Code of Ordinances of the City of Columbia, South Carolina, the designated event area of courtyard/plaza area adjacent to the Museum for Live on Boyd, with the exception of any parking area and/or any other areas posted as to not allow alcoholic beverages, is deemed to be the

site of a public festival at which beer and wine beverages only may be consumed and the prohibition against possession or consumption of alcoholic beverages set forth in Sec. 14-99 shall not apply to the possession or consumption of beer or wine within the designated event area. Possession and consumption of beer and wine beverages shall be permitted only in containers provided by vendors within the areas designated, and such containers provided by vendors for the sale of beer and wine may only be in plastic containers or cans.

PROVIDED, FURTHER, that the Organizer shall provide the names and cell phone numbers of a least two contact persons who can receive and address complaints during the event, including any set up and breakdown times. The cell phones shall remain on, with ringers and alerts functioning, at all times during the event and during any set up and breakdown time.

PROVIDED, FURTHER, that failure of the event Organizer to strictly comply with the time frames and other requirements and responsibilities set forth in this resolution may result in the immediate cancellation of the event and/or a denial of subsequent requests to allow the event.

PROVIDED, HOWEVER, that no solicitation or transactions be made in violation of Sec. 14-32 of the Code of Ordinances of the City of Columbia, South Carolina.

BE IT FURTHER RESOLVED that should the Organizer reschedule the event for another date beyond one (1) week from the date of the originally scheduled event or inclement weather date, a request for a resolution of City Council approving the new date of the event shall be required.

Requested by:

Assistant City Manager Shealy

Mayor

Approved by:

City Manager

Approved as to form:

ATTEST:

City Attorney
Introduced:
Final Reading:

City Clerk

LEGAL DEPARTMENT DRAFT

DATE OF REQUEST

09/28/21

REQUESTOR'S NAME/CONTACT
INFORMATION (E-MAIL/
PHONE#/FAX#)Wilson Bame
wbame@columbiamuseum.org
(843) 617-9329

EVENT NAME/PURPOSE (i.e., St. Patrick's/Charity Fund-raiser)

Live on Boyd Plaza

DATE(S) OF EVENTS: (multiple day can be on one request)

November 7, 2021

RAIN CONTINGENCY DATE: (Rescheduling due to inclement weather is allowed once within one week from the date of the originally scheduled event upon 24-hours written notice to the City, without a new request. The time of event operation shall remain the same.)

LOCATION OF EVENT

(i.e., Amphitheater area of Finlay Park; 1300 and 1400 blocks of Main Street between Lady Street and Hampton Street)

1515 Main Street, Columbia, SC 29201

STREET(S) OR PARK AREA TO BE CLOSED

(i.e., 1300 and 1400 blocks of Main Street between Lady Street and Hampton Street; Amphitheater area of Finlay Park; Boyd Plaza)

Boyd Plaza

HOURS FOR STREET(S) OR PARK AREA TO BE CLOSED

(i.e., 5:00 p.m. - 12:00 a.m.) ALLOW TIME FOR SET UP/CLEAN UP

2:00PM - 6:30PM

HOURS OF EVENT

(i.e., 6:00 p.m. - 10:00 p.m.)*

3:00 PM - 5:30PM

HOURS OF SERVICE OF BEER/WINE BEVERAGES ONLY (NO LIQUOR**)

(Service should end one-half hour prior to end of event (i.e., event is 6-10 p.m., beer/wine service is 6-9:30 p.m.)*)

3:00PM - 5:00PM

DUE TO COVID-19 THERE ARE ADDITIONAL REQUIREMENTS AND PROCEDURES THAT MUST BE IN PLACE TO INSURE PUBLIC SAFETY. PLEASE PROVIDE YOUR SAFETY PLAN/PROTOCOL WITH DRAWING DEPICTING CLEANING/SANITIZATION AREAS WITH YOUR SPECIAL EVENT REQUEST FORM

Requests should be submitted by mail, e-mail or fax at least **NINETY (90) days in advance of the event** to allow for preparation and review of the Resolution and scheduling on Council's agenda. Requests may be sent by e-mail (shari.ardis@columbiasc.gov), fax (803-737-4250) or mailed to City Attorney's Office, ATTN: Shari Ardis, POB 667, Columbia, SC 29202. A draft Resolution will be prepared and forwarded for review to the event organizer, as well as to the City departments for coordination of City services and requirements (i.e., Police, Solid Waste, Parks and Recreation, etc.). **Approval from the adjoining business/property owners must be obtained before your request will be submitted to City Council if streets are to be closed off during business hours.** The event organizer is responsible for obtaining a permit or license if required by the South Carolina Department of Revenue.

Outdoor possession and consumption of beer and wine beverages only, all outdoor musical performances and use of sound-amplifying devices shall end by 10:00 p.m. due to the proximity of events to residential properties.***ONLY BEER AND WINE BEVERAGES ARE ALLOWED ON CITY PROPERTY. POSSESSION OF LIQUOR IS STRICTLY PROHIBITED. VIP tents or VIP areas for possession and consumption of beer and wine beverages within the event area are PROHIBITED.****NOTE: This form should only be used for public events where beer and/or wine are to be sold and consumed on City property (i.e., Main Street Latin Festival, St. Patrick's Festival, Vista Lights, Rocky Shoals Spider Lily Festival, etc.).**

This form **should not** be used to request use of City property for private events (birthday, retirement, anniversary parties, etc.) nor for sidewalk sales or neighborhood block parties. Requests for private events at City parks should be made through the Parks and Recreation Department. Requests for sidewalk sales should be made to the City Manager. Requests for street closings for private neighborhood block parties should be made to the Police Department Special Events and Public Safety.

Fire Marshal George N. Adams, Jr., 803-545-3703; george.adams@columbiasc.gov

Legal Department - Shari Ardis; 803-737-4242; shari.ardis@columbiasc.gov or fax 803-737-4250 - resolution preparation

Parking Services - Jessica Argoe; (803) 545-0287; jessica.argoe@columbiasc.gov - meter bagging

Parks and Recreation - Pearl Osborne; 803-545-3100; pearl.osborne@columbiasc.gov - park reservations

Police Department Special Events - Sgt. Jennifer L. Jordan; (803) 545-3514; jennifer.jordan@columbiasc.gov - parade permit, police

Police Department Community Services - Brenda Murphy; 803-545-3507; brenda.murphy@columbiasc.gov - street closing

Last revised: 3/3/2021