

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

Adopted by the CMCOG Board on October 28th, 2021

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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 Division

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 stakeholders. While the document is divided by county, each county-specific section includes various sub-county level analyses that include information on participating local government jurisdictions and organizations.

A Quarter Square Mile (1/4 sq mi) hexagonal grid is used throughout the analyses of this HMP. This provides the best coverage for small spatial areas, such as the participating sub-county organizations of this HMP, while still providing the ability to visualize spatial differences across the region. City or sub-county jurisdiction data on natural hazard type, location, extent, and community vulnerability and risk can effectively be analyzed utilizing this simplified method of summarizing complex geospatial information¹. This standardized regular gridded framework, enables analysis and evaluation within and between datasets that would normally be difficult (or impossible) to visually, statistically, or spatially compare.

To streamline the document in a way to accommodate all the natural hazard data per participating jurisdiction, additional information on the methodology, historical hazard data, and supplemental plan administration information and tools may be found in the Appendices. Finally, 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

¹ <https://www.tableau.com/about/blog/2017/11/data-map-discovery-78603>

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
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
CMCOG Board Meeting	28/October/2021
Public Input Meeting	1/November/2021

Public input was integrated into the HMP through a public opinion survey and a public comment period. Due to concerns regarding 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 was established for the final draft of the HMP from October 7th, 2021 to November 1st, 2021. 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 was presented for public comment on two virtual public meetings, on October 28th, 2021 and November 1st, 2021. 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

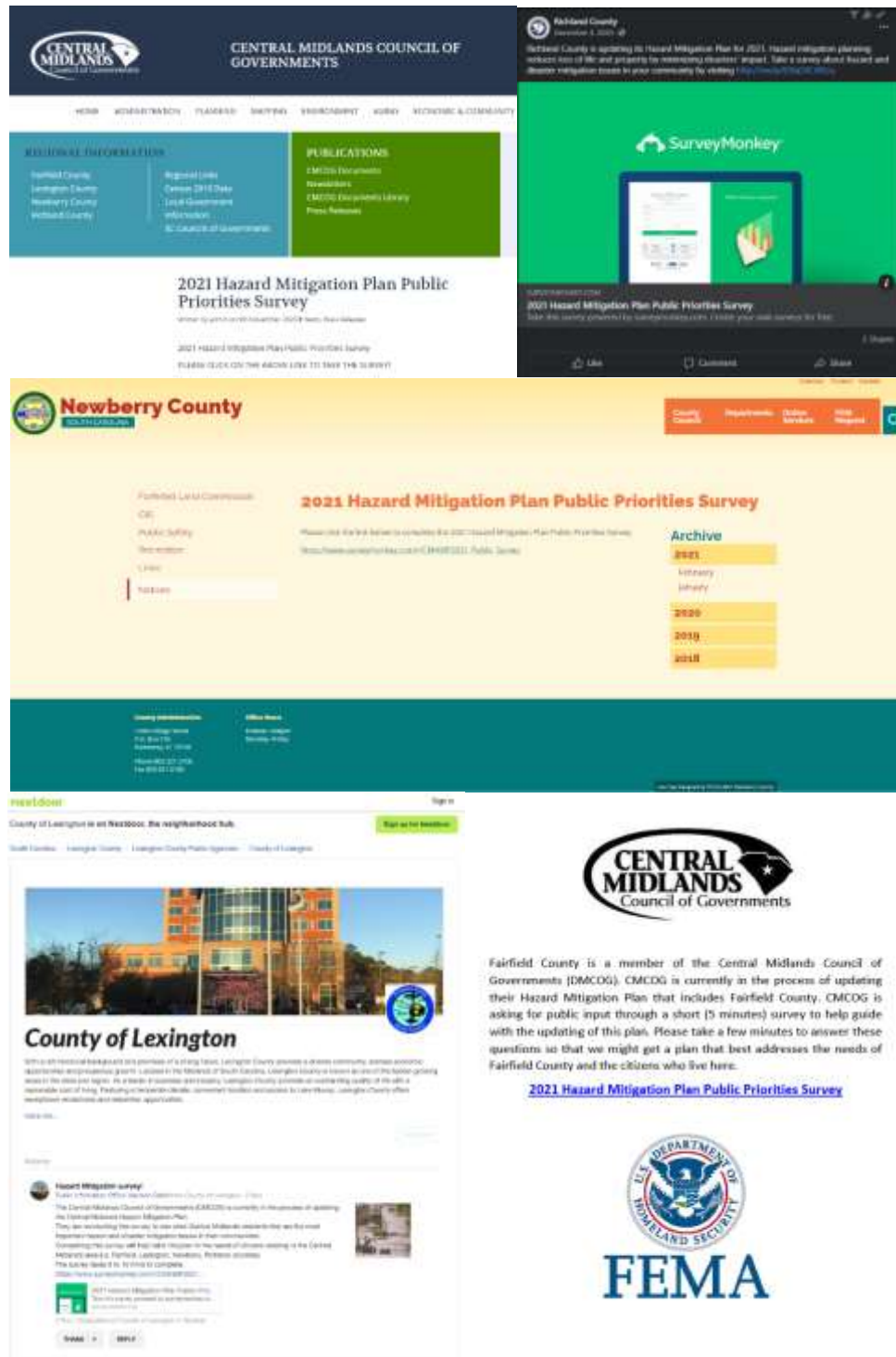


Figure 2 - Screenshot of HMP Public Survey Announcement posted on CMCOG and participating County web pages.

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	Ashley Watkins (Town Administrator)
Town of Irmo	Whitt Cline (Public Services Director)
Town of Lexington	Britt Poole (Town Manager) Wesley Crosby (Assistant Town Administrator)
Town of Pine Ridge	Viki Miller (Town Administrator)
Town of South Congaree	Cindy Campbell (Mayor)
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)
City of Columbia	Harry Tinsley (Emergency Management Director) 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 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 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 review historical jurisdiction-specific natural hazard data, their capabilities assessment, and their implemented mitigation strategies to refine their mitigation priorities.
- 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. If the technical expertise is not available to determine financial priorities, documents such as Capital Improvement Plans, Comprehensive Plans, and stakeholder feedback was utilized to refine mitigation priorities. More information on the mitigation action prioritization process may be found in the *Mitigation Goals and Objectives* section for each county.
- 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)

Following are procedures for yearly plan monitoring, citizen participation, and updating the HMP:

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 adopting the 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.

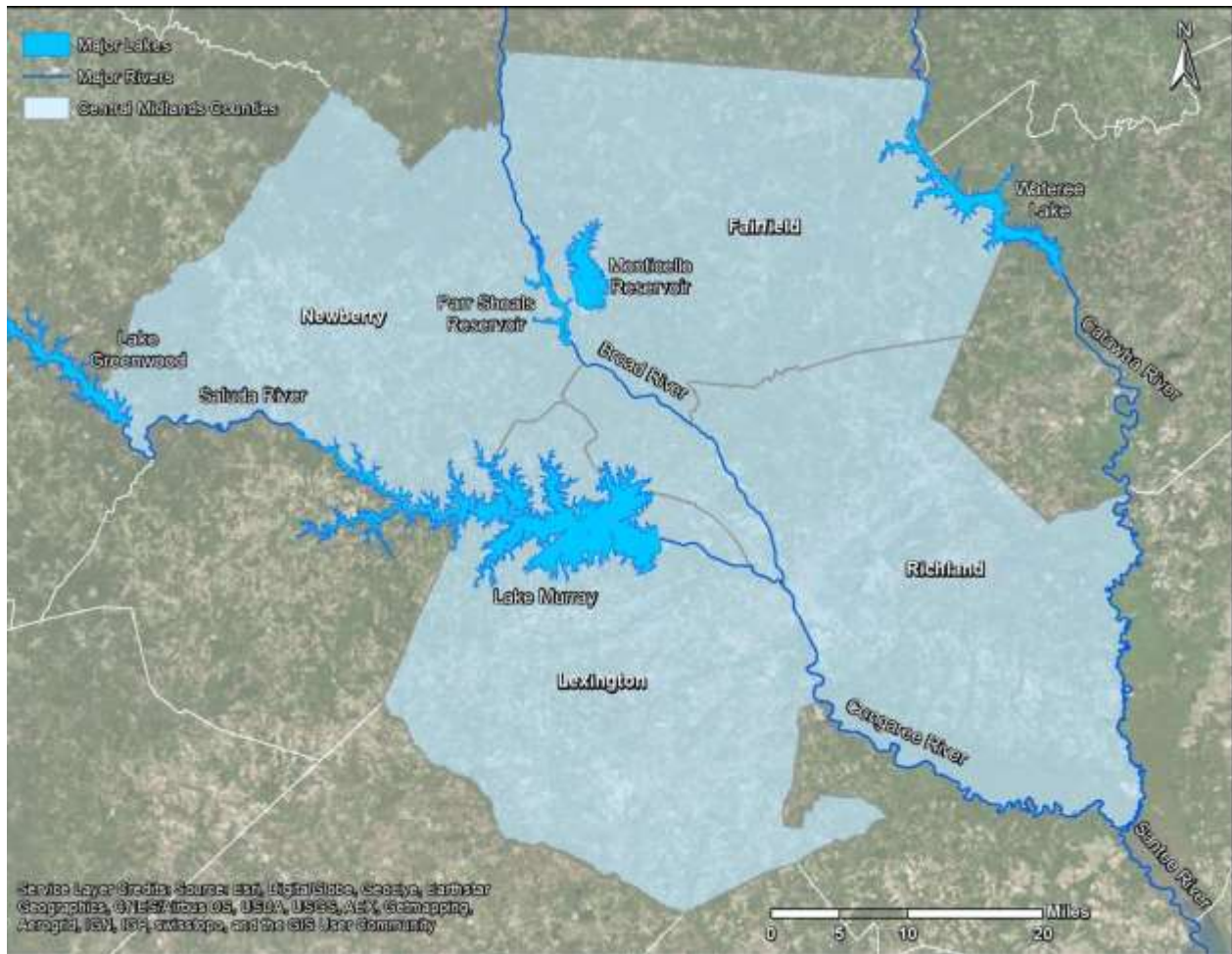


Figure 3 - Major rivers in the Central Midlands region.

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 surface². *Land use*, in contrast, refers to the utilization and possible alteration of land cover for various socioeconomic purposes³. 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 place⁴.

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 infiltration⁵. On the other hand, forest land

² (Gregorio & Jansen, 1998)

³ (Eurostat, 2001)

⁴ (Turner et al., 1995)

⁵ (Alberti et al., 2007)

cover can help with reducing flooding risk by serving as a buffer between urbanized areas⁶. 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 system⁷. 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 USEPA for more information on the NLCD classification system⁸.

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.

⁶ (Zhang & Schilling, 2006).

⁷ (Homer, Fry, & Barnes, 2012)

⁸ (Dewitz, J., National Land Cover Database (NLCD) 2016, 2019)

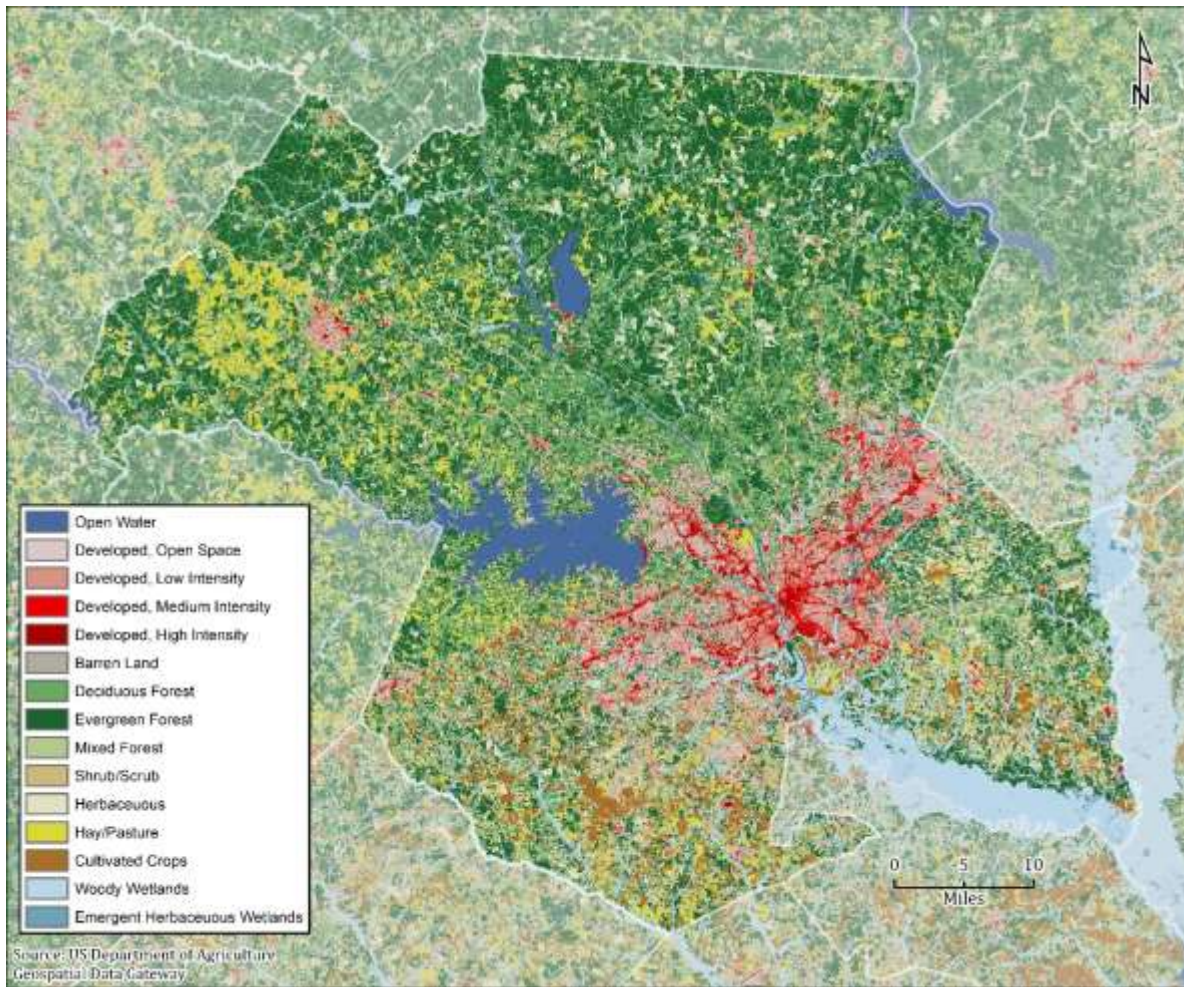


Figure 4 - Land Use and Land Cover Distribution Map for the Central Midlands Region. Source: NLCD 2016.

3.4 Demographic and Economic Trends⁹

A) Population Distribution Estimates

The Central Midlands region represents a major 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

⁹ 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	

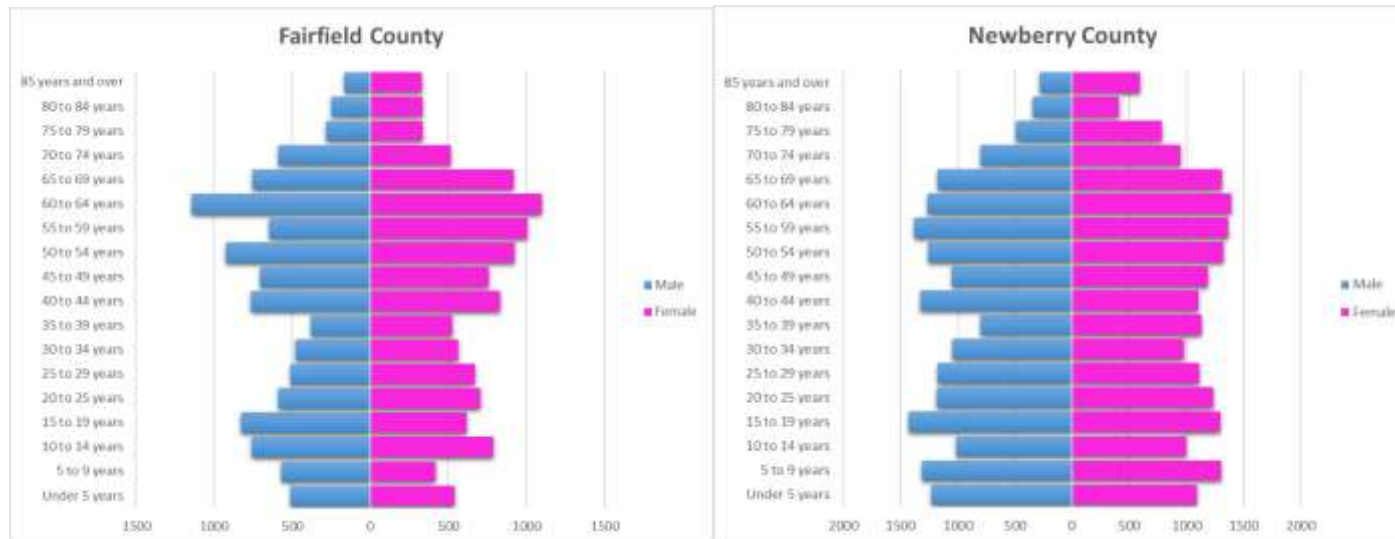


Figure 5 - Population Estimates for Fairfield and Newberry Counties. Source: Census ACS 2018 5yr Estimates.

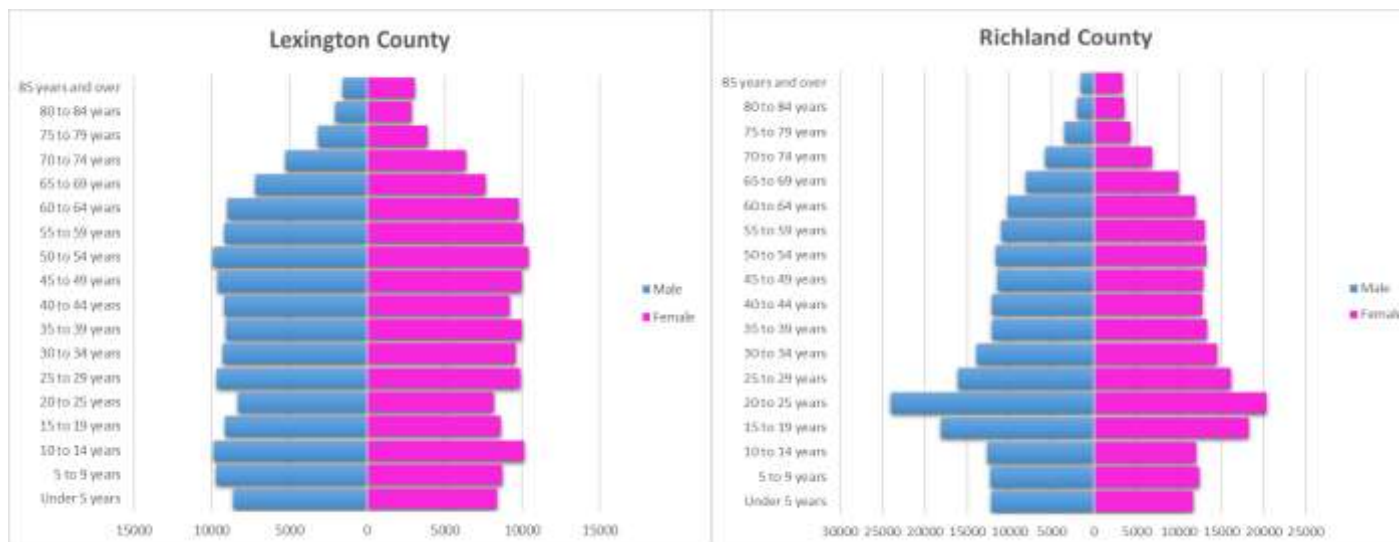


Figure 6 - Population Estimates for Lexington and Richland Counties. Source: Census ACS 2018 5yr Estimates.

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"¹⁰. 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.

¹⁰ (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

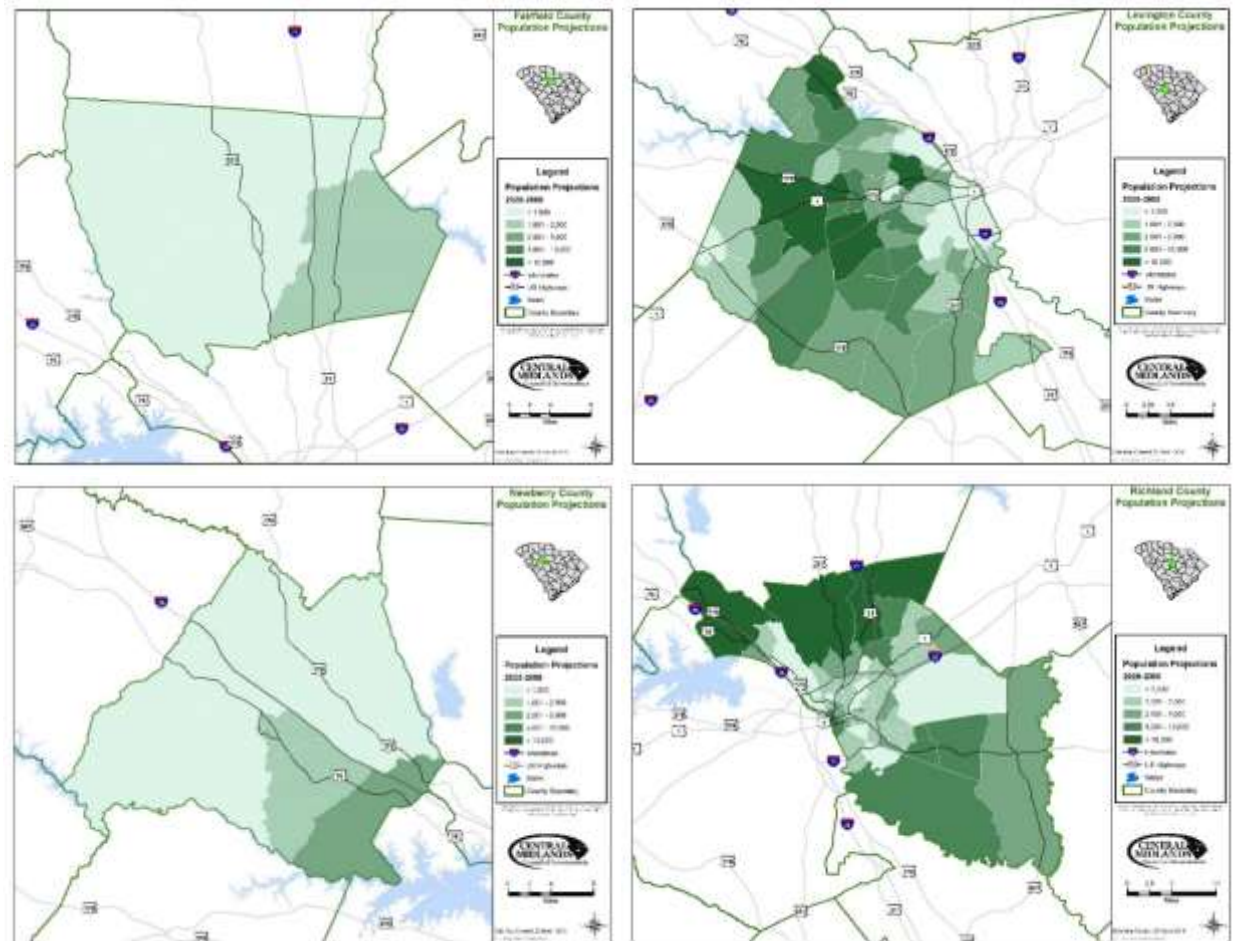


Figure 7 - 2050 Population Projection Estimates by Census Tract. Source: CMCOG.

4. Fairfield County

This section addresses
FEMA HMP requirement
201.6(c)(2)(i)

Each county-specific section of the HMP includes various sub-county level analyses that include information on participating local government jurisdictions and organizations. They end with a list of mitigation strategies provided by participating stakeholders.

A Quarter Square Mile (1/4 sq mi) hexagonal grid is used throughout the analyses of this HMP. This provides the best coverage for small spatial areas, such as the participating sub-county organizations of this HMP, while still providing the ability to visualize spatial differences across the region. City or sub-county jurisdiction data on natural hazard type, location, extent, and community vulnerability and risk can effectively be analyzed utilizing this simplified method of summarizing complex geospatial information. This standardized regular gridded framework, enables analysis and evaluation within and between datasets that would normally be difficult (or impossible) to visually, statistically, or spatially compare.

Analysis methodology and additional figures on sub-county natural hazard type, extent, location, and other metrics may be found in the [Appendices](#).

4.1 Historical Hazard Assessment for Fairfield County

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.

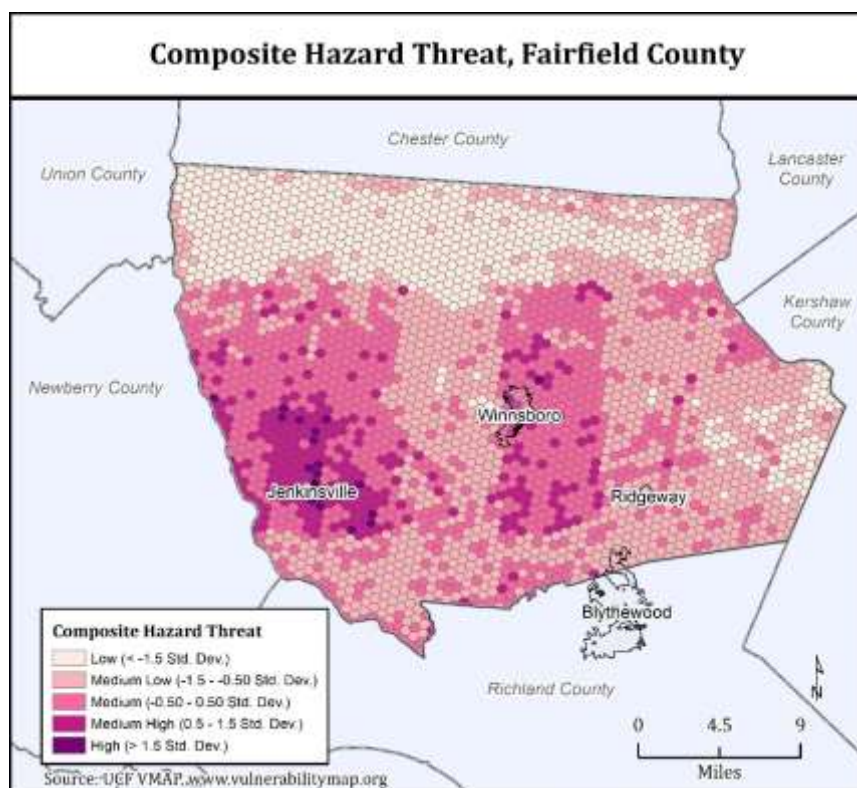


Figure 8 - Comprehensive risk profile of Fairfield County.

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)¹¹:

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 Longtown¹². 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 billion¹³ to \$12 billion¹⁴ 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.

¹¹ 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.

¹² NWS, 2015. Historic rainfall and flooding, October 2015. Available at <http://www.weather.gov/cae/HistoricFloodingOct2015.html>

¹³ NOAA National Centers for Environmental Information, 2016. Billion-Dollar Weather and Climate Disasters. Available at <http://www.ncdc.noaa.gov/billions/events>

¹⁴ 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>

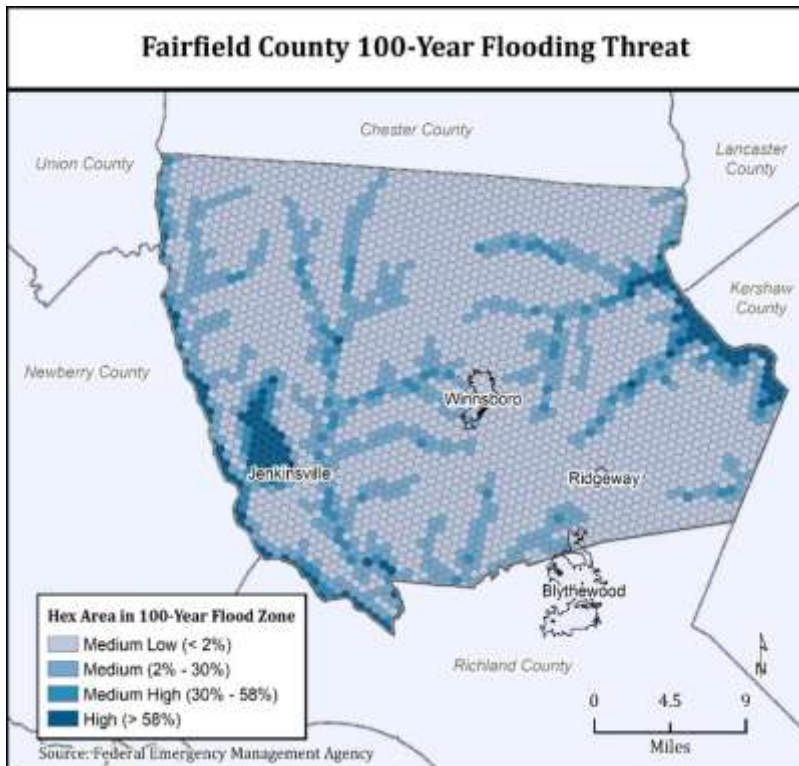


Figure 10 - Flood threat/extent in Fairfield County.

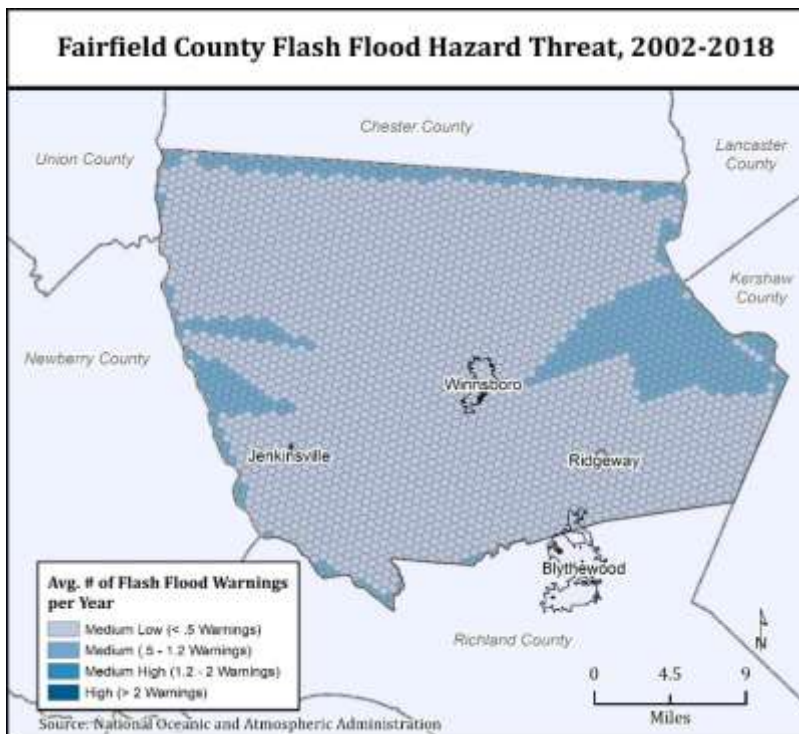


Figure 11 - Flash flood threat/extent in Fairfield County.

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.

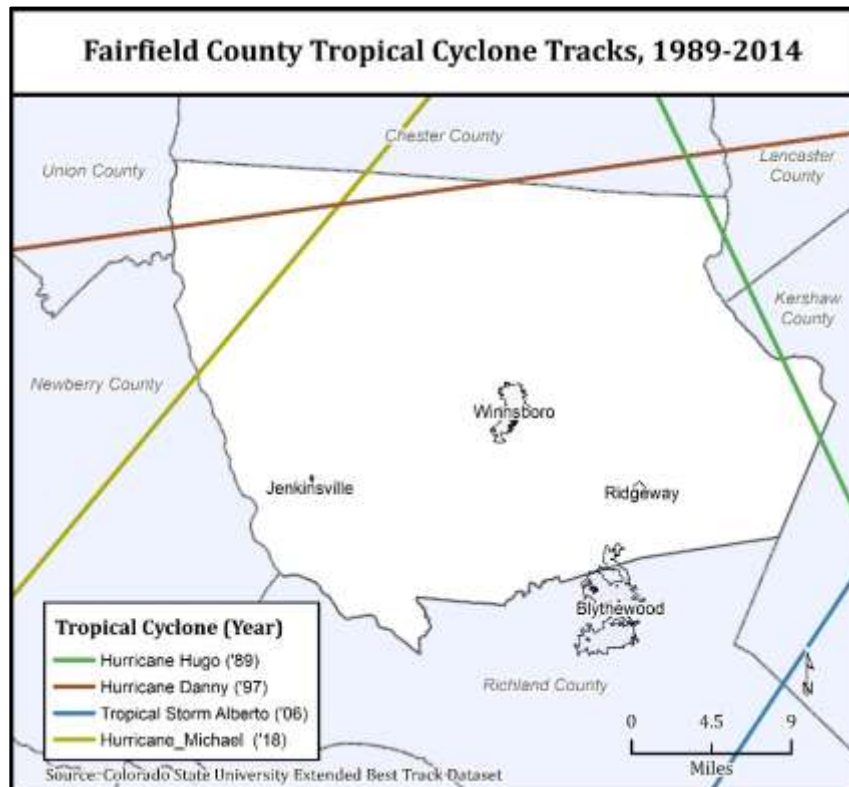


Figure 12 – Historical tropical cyclone tracks in Fairfield County.

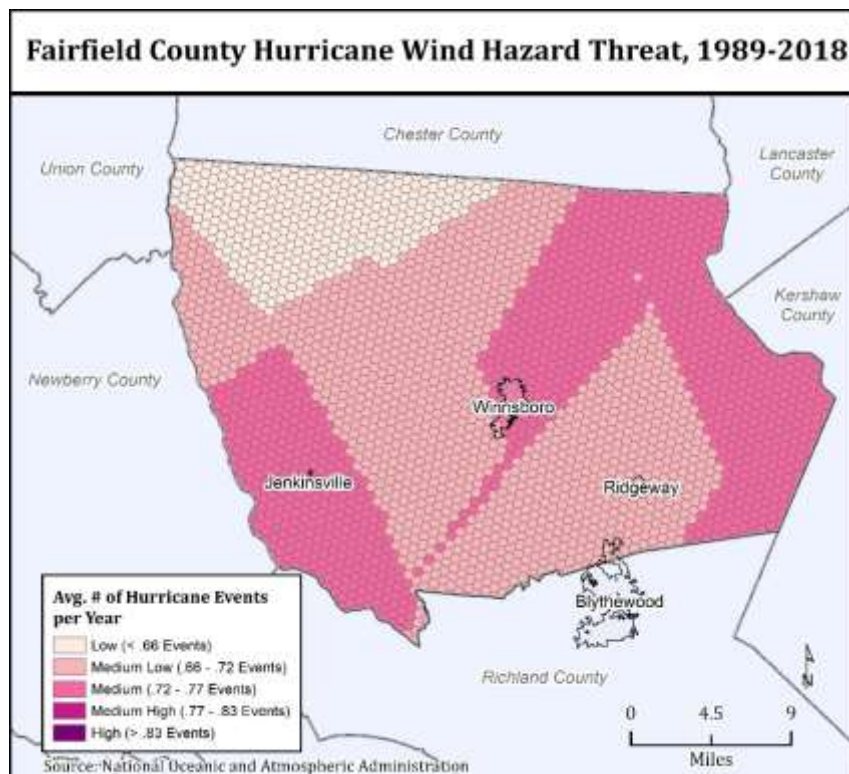


Figure 13 - Hurricane wind threat/extent in Fairfield County.

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)¹⁵.

¹⁵ NWS Wilmington, 2014. Carolinas Tornado Outbreak: March 28, 1984. Available at <http://www.weather.gov/ilm/CarolinasOutbreak>

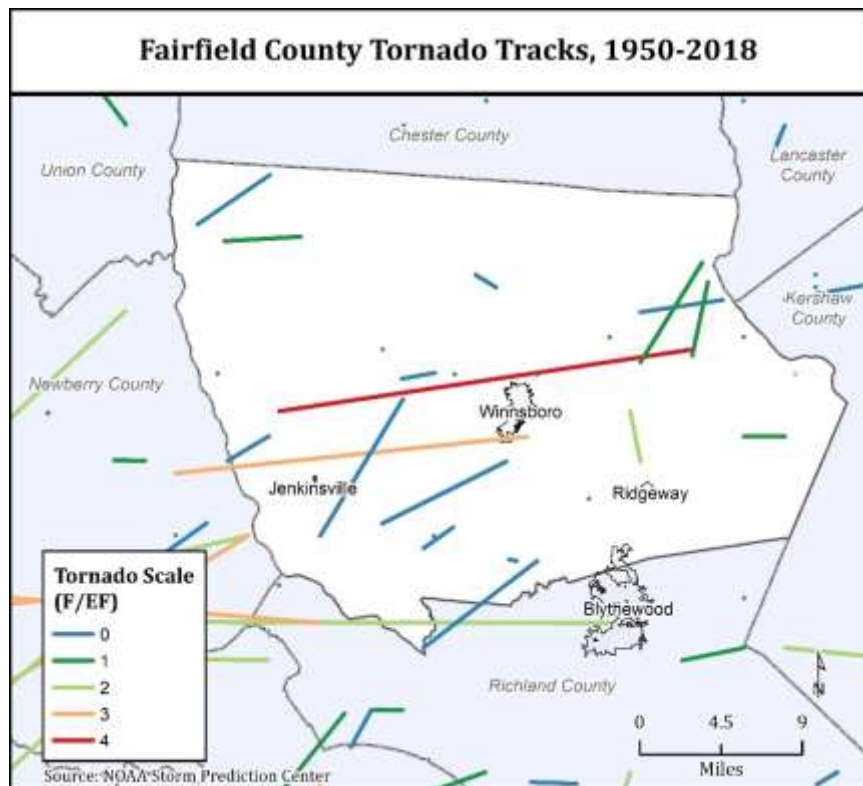


Figure 14 – Historical Tornado Tracks In Fairfield County.

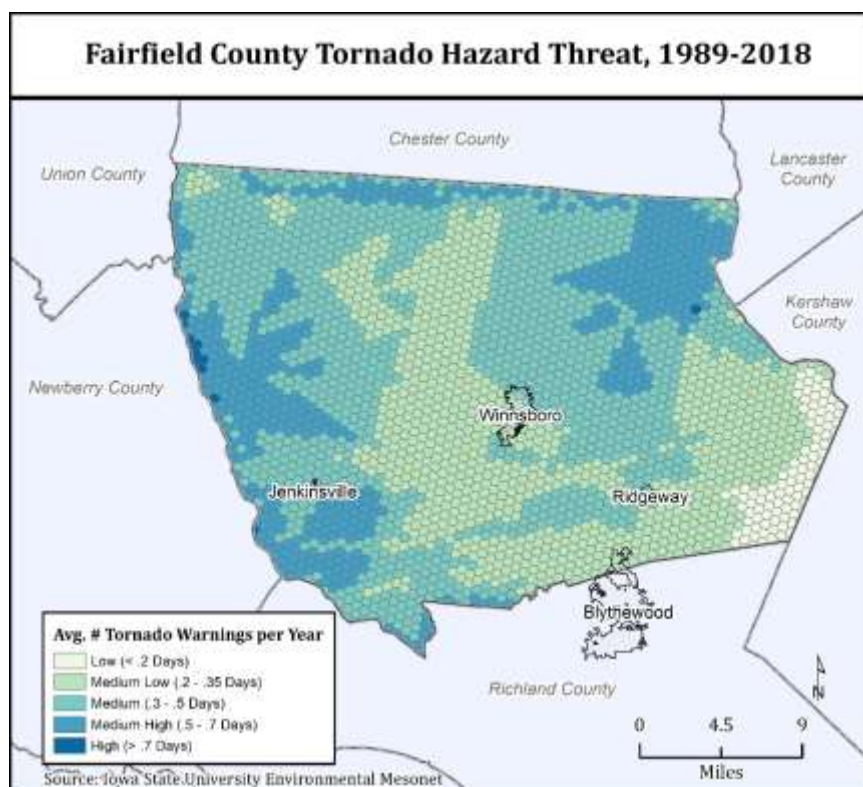


Figure 15 - Tornado risk in Fairfield County.

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	EFO	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 EFO 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	EFO	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	EFO	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	EFO	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	EFO	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 inch¹⁶. 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.

¹⁶ 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

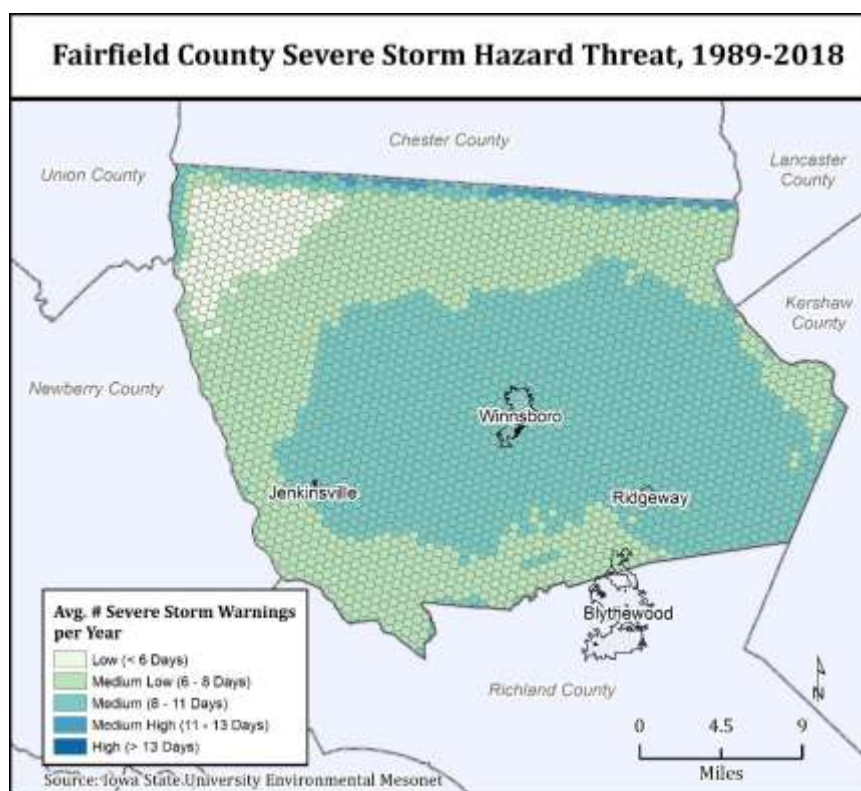


Figure 16 - Severe storm threat/extent in Fairfield County.

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

Begin Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)	Location	Description
9/30/1964	10/1/1964	0	0	\$15,273	\$15,273	0.46"	Midlands & Central Plains	Rainstorm
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.

Begin Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)	Location	Description
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 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

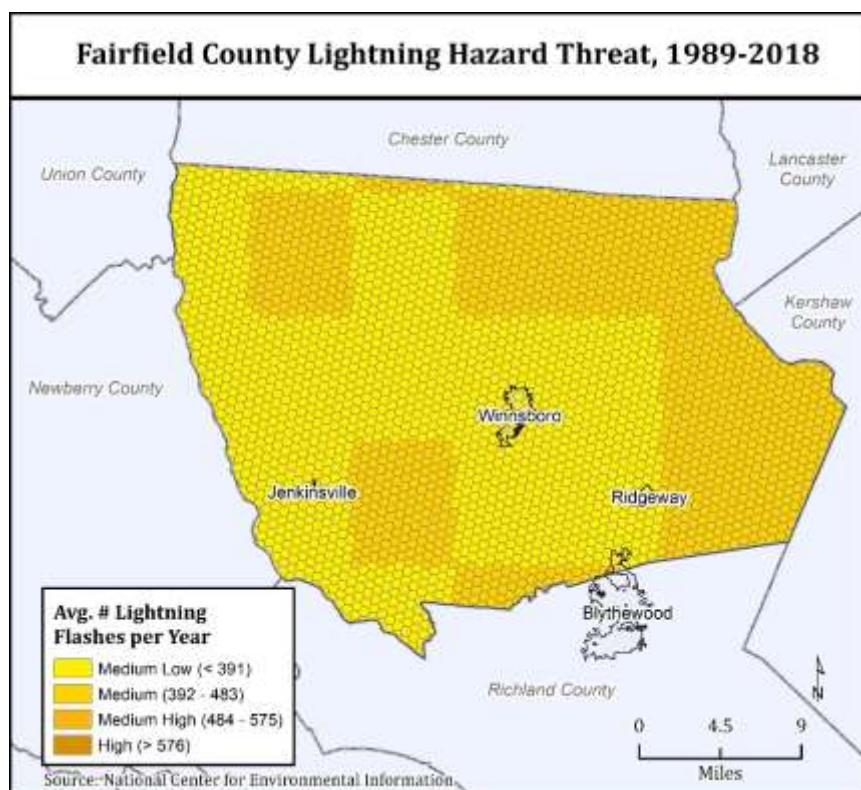


Figure 17 - Lightning threat/extent in Fairfield County.

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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
3/24/1975	3/24/1975	1	0	\$5,236	\$52	Statewide	Lightning & Wind
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, Lighting, & Wind
7/25/1984	7/25/1984	0	0	\$124,713	\$1,247	Central SC	Rain, Lighting, & 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.

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
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.
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

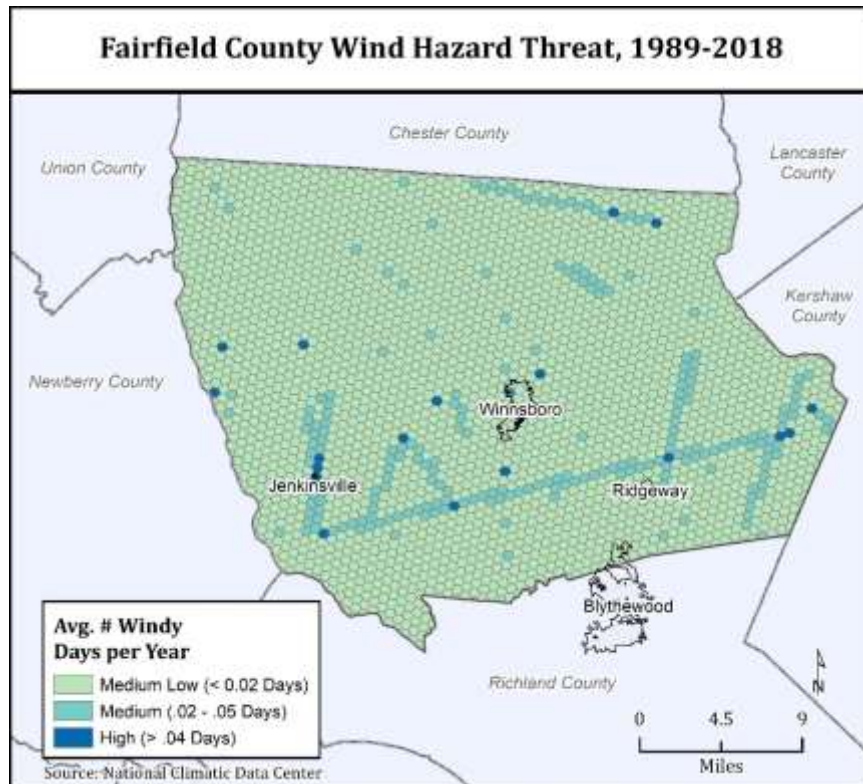


Figure 18 - Wind threat/extent in Fairfield County.

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 Glenns 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

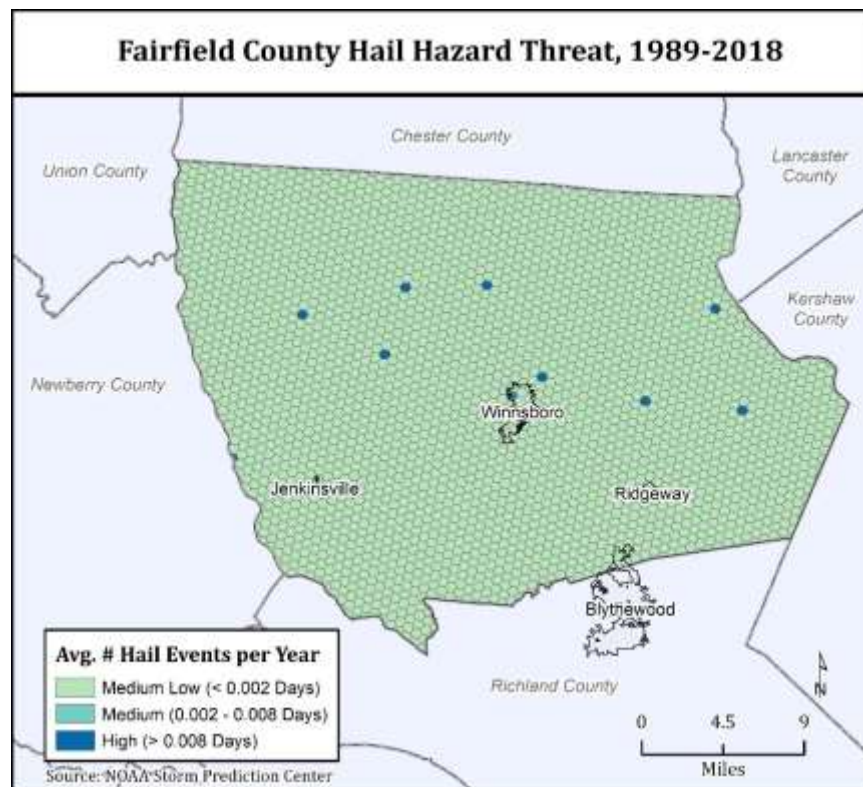


Figure 19 - Hail threat (occurrence) in Fairfield County.

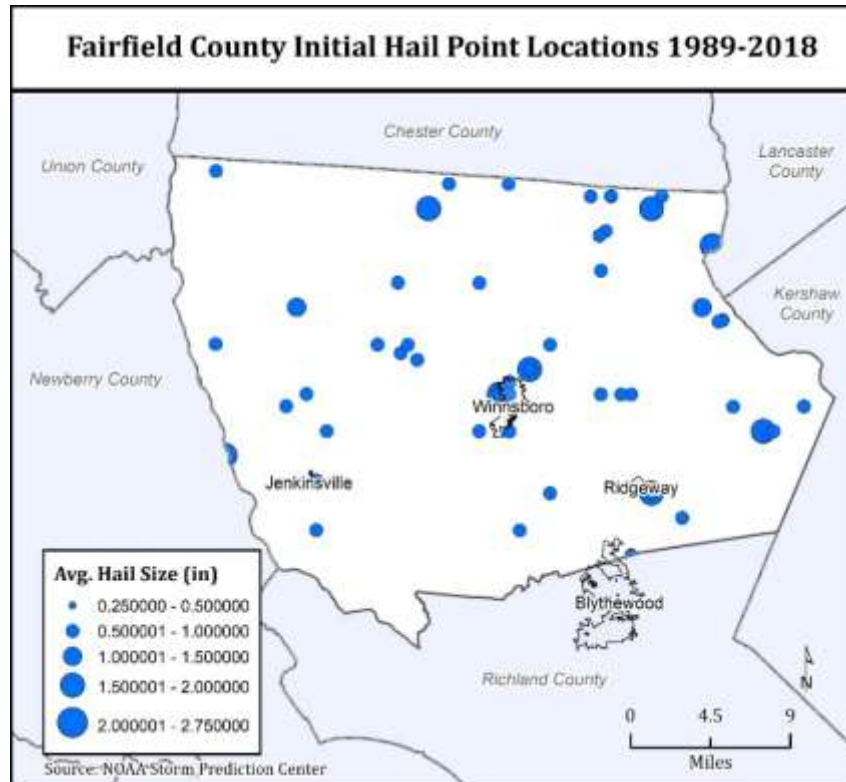


Figure 20 - Risk of large hail events in Fairfield County.

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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
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
6/5/1975	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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
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 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 EFO 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 days¹⁷ 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 DUS™ 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

¹⁷ A "fog day" has reduced visibility due to fog, haze, or smoke at any time of the day as indicated by NWS station data.

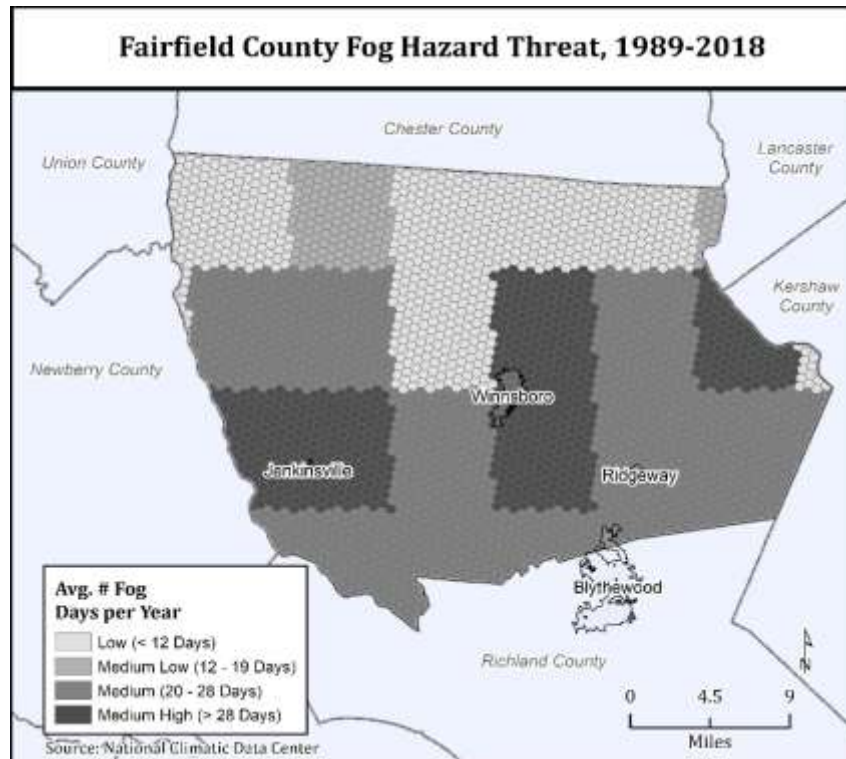


Figure 21 - Fog threat/extent in Fairfield County.

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)¹⁸.

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)

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:	\$21,703,596
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.

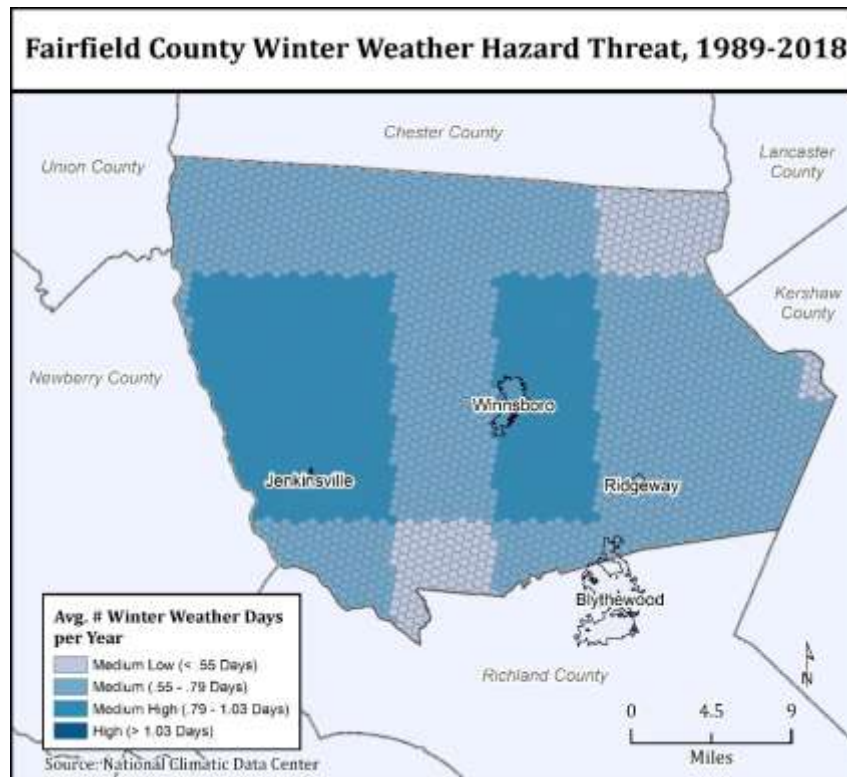


Figure 22 – Winter weather threat/extent in Fairfield County.

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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
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 Anderson to York	Ice & Snow
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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
3/1/1980	3/2/1980	0	0	\$3,419	\$3,419	Trace	Statewide	Snow, Freezing Rain, Drizzle, & Sleet
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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
1/14/1989	1/14/1989	0	0	\$8	\$0		SCZ001-002-003 Northwestern SC	Freezing Drizzle
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 Fahrenheit¹⁹. 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

¹⁹ SCDNR. South Carolina record minimum temperatures and date. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/data/min_temp_table.php

Frequency Year Range:	1989 - 2018
Loss Events on Record:	1960 - 2019
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)

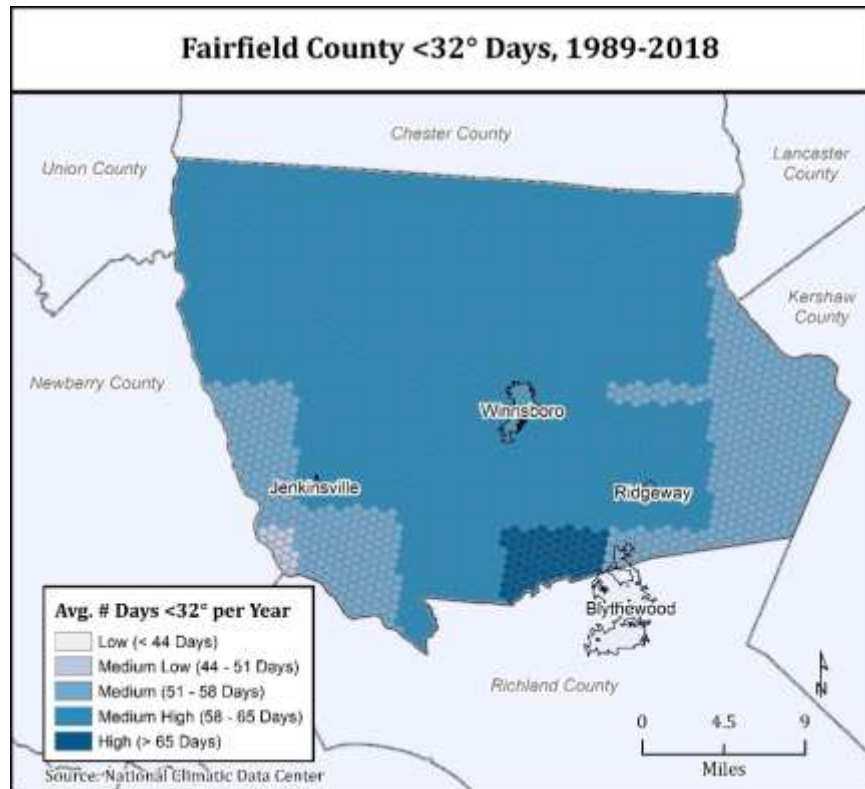


Figure 23 - Cold weather threat/extent in Fairfield County.

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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
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 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)²⁰.

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)

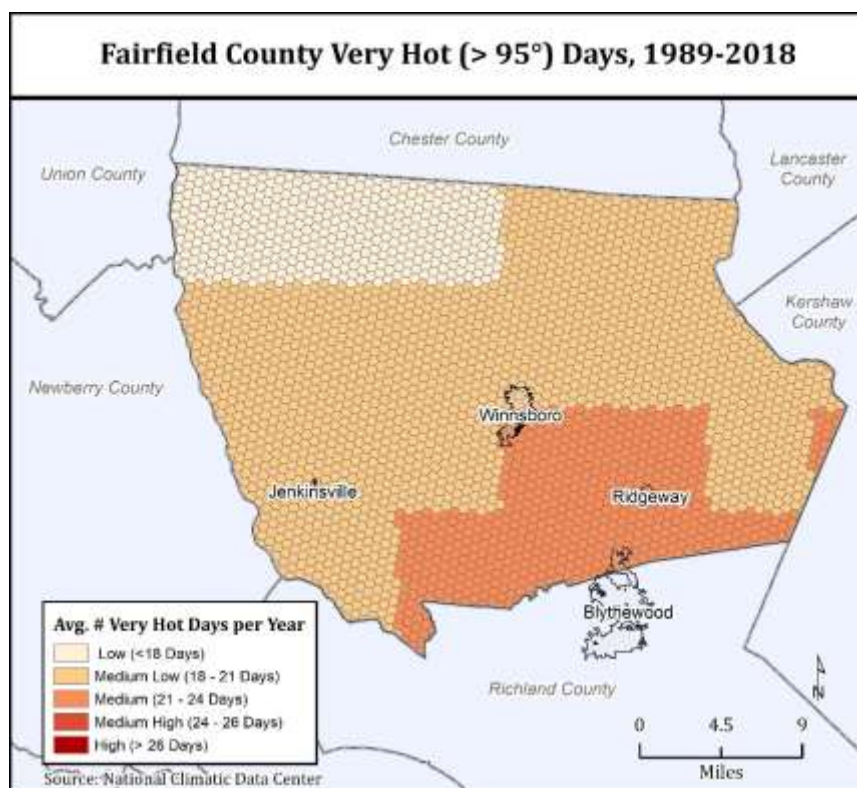


Figure 24 - Hot weather threat/extent in Fairfield County.

²⁰ 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

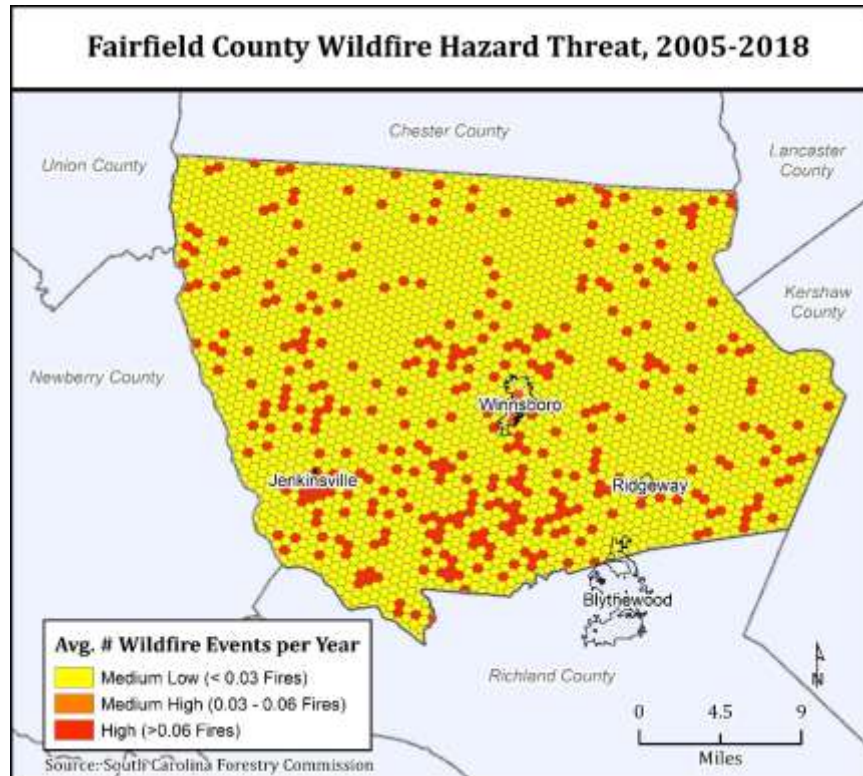


Figure 25 - Wildfire threat/extent in Fairfield County based on average number of wildfires per year.

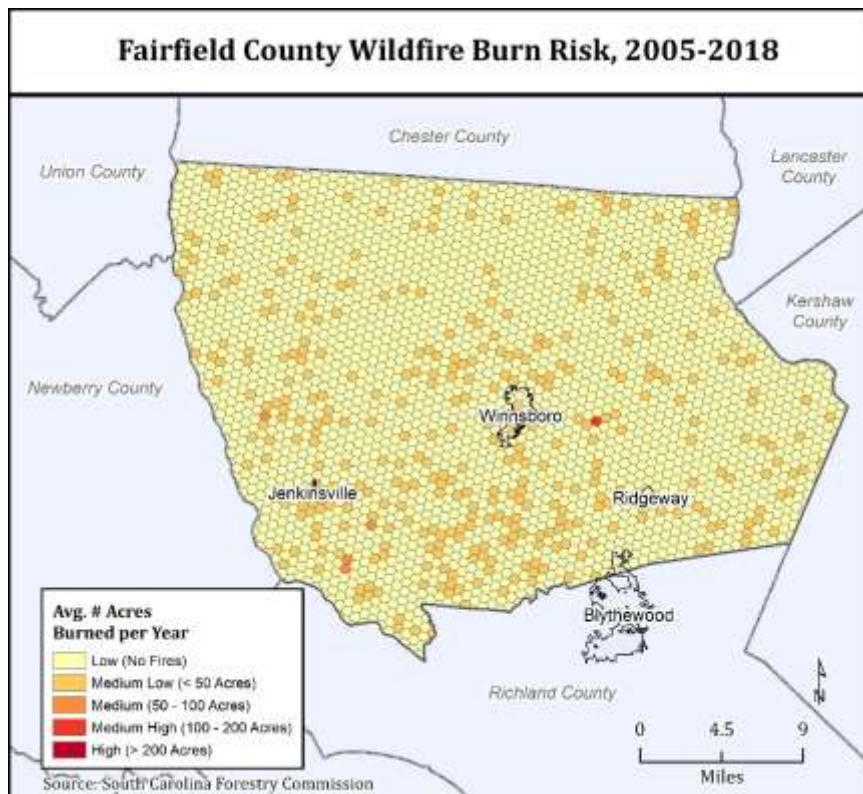


Figure 26 - Risk of large wildfires in Fairfield County.

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)²¹. 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 fisheries²². 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)

²¹ SCDNR, n/d. South Carolina County Weather Atlas. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/cli_county_statistics.php

²² SCDNR, n/d. South Carolina Climate. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/cli_sc_climate.php

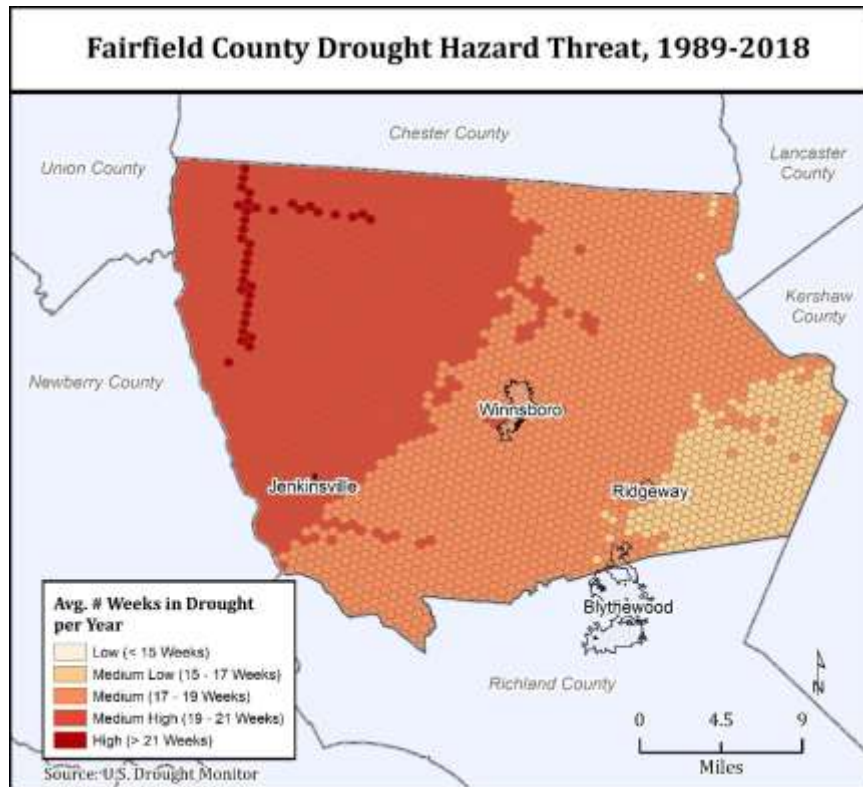


Figure 27 - Drought hazard threat/extent in Fairfield County.

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

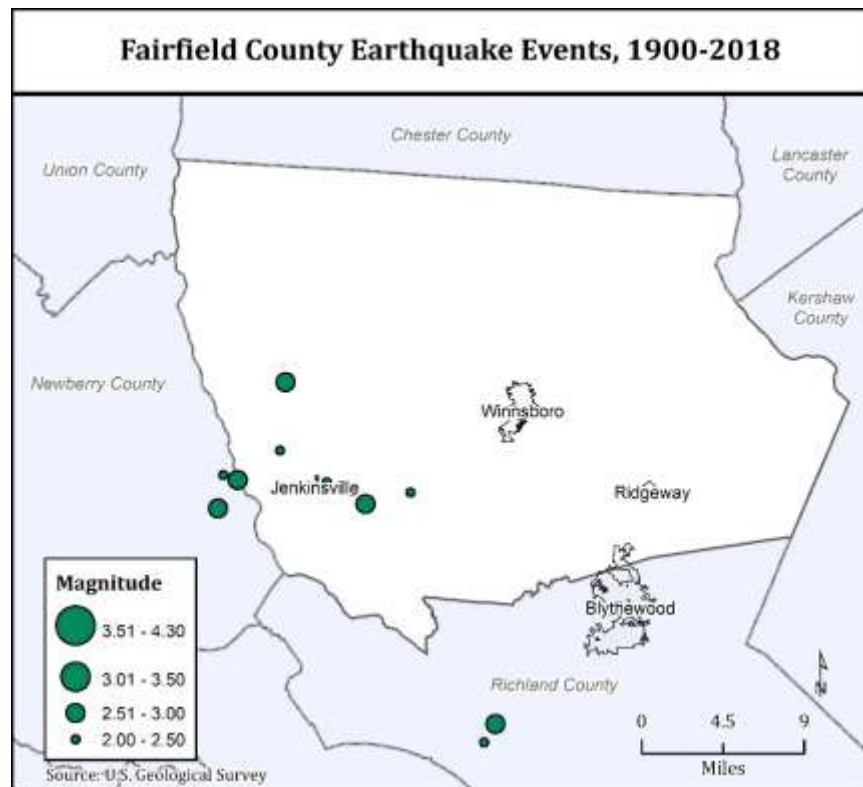


Figure 28 – Historical earthquake events in Fairfield County.

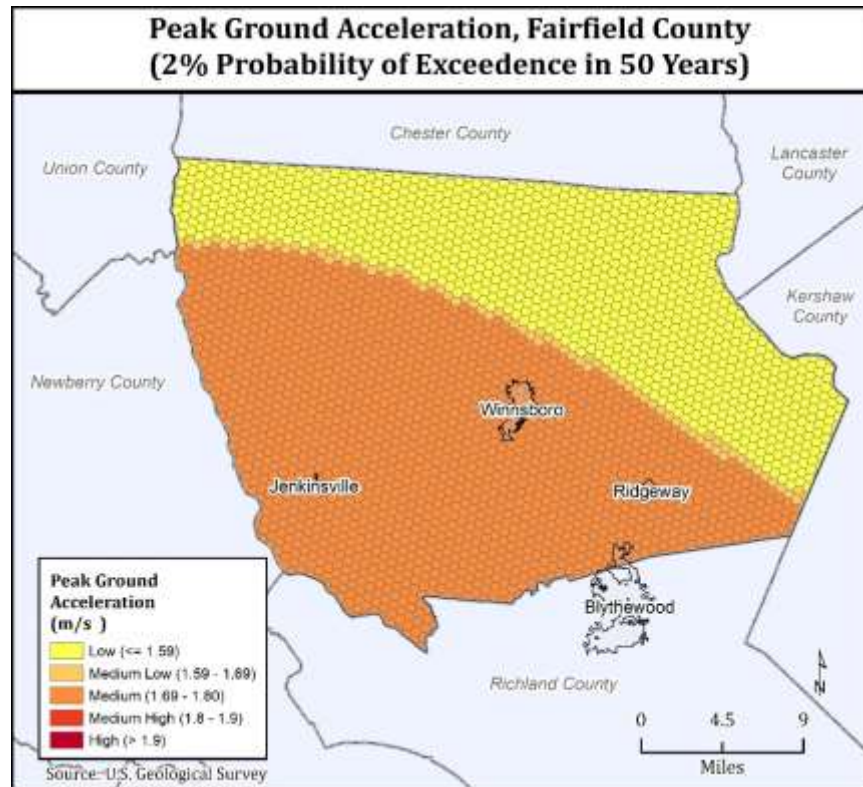


Figure 29 - Risk of shaking due to earthquakes in Fairfield County.

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 infrastructure²³ 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)²⁴ and later refined by scholars at the University of

²³ <https://www.fema.gov/lifelines>

²⁴ <https://onlinelibrary.wiley.com/doi/abs/10.1111/1540-6237.8402002>

Central Florida²⁵. 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.

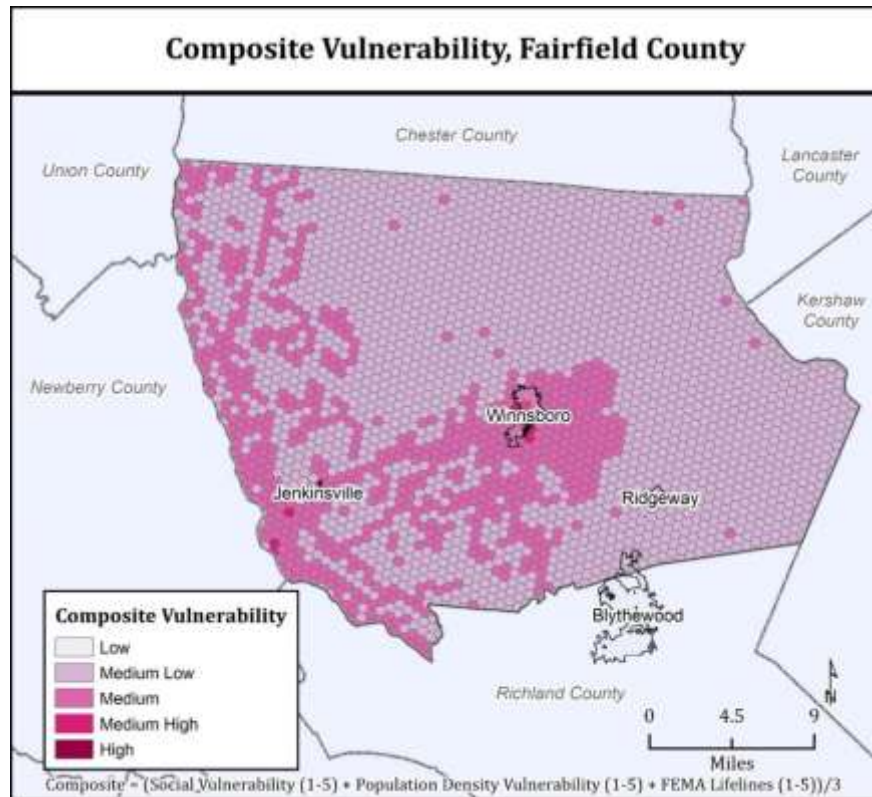


Figure 30 - Fairfield County's Composite Hazard Vulnerability

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.

²⁵ www.vulnerabilitymap.org

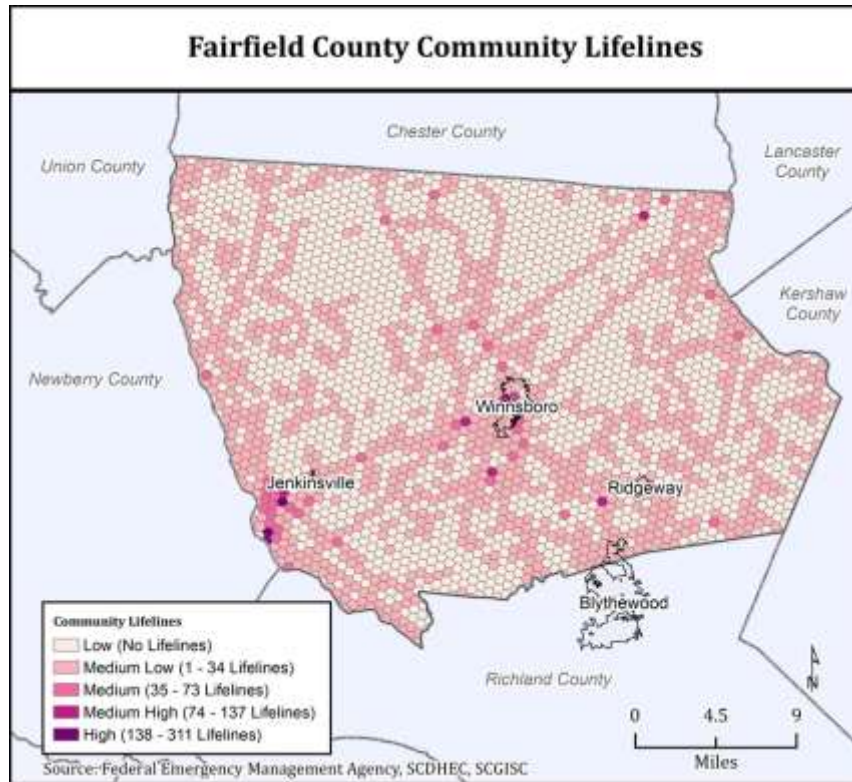


Figure 31 - Distribution of community lifelines and critical facilities in Fairfield County.

Assets at risk (Table 23) were assessed using FEMA's Lifeline²⁶ 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

²⁶ <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 events²⁷, has a long conceptual and theoretical history in social and disaster science fields.²⁸ 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).

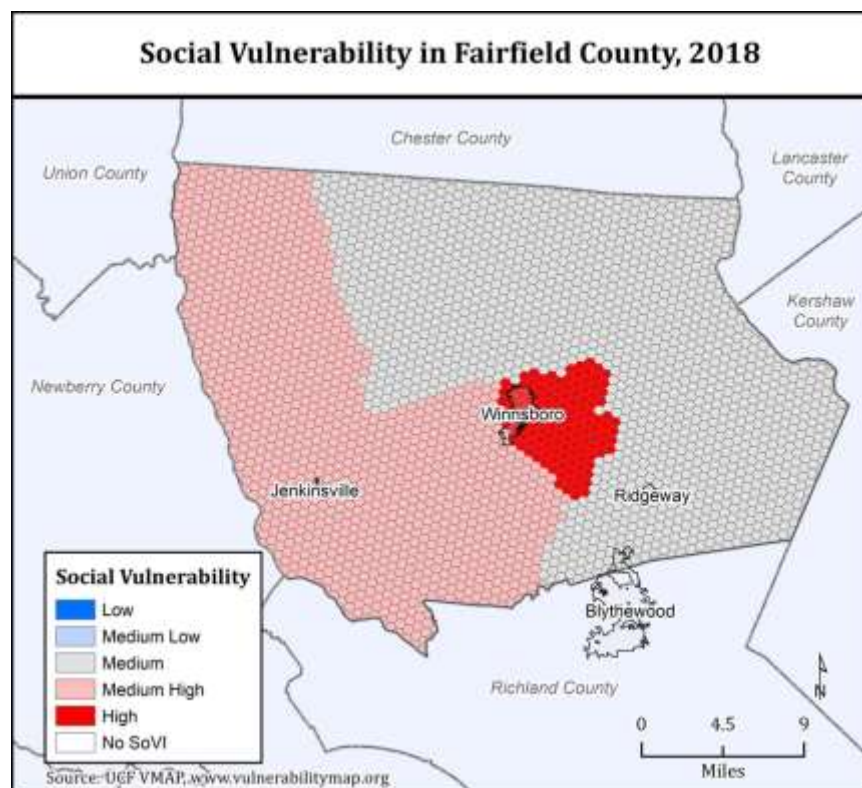


Figure 32 - Socially vulnerable tracts in Fairfield County.

²⁷ <https://doi.org/10.1177/0002716205285515>

²⁸ <https://unu.edu/publications/books/measuring-vulnerability-to-natural-hazards-towards-disaster-resilient-societies-second-edition.html#overview>

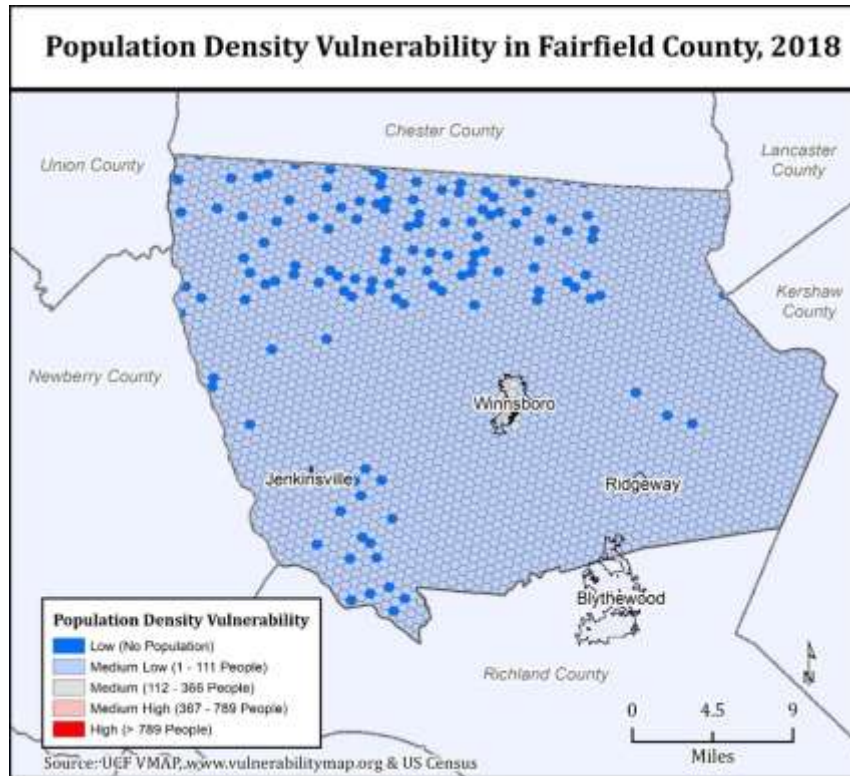


Figure 33 - Fairfield County's Population Distribution.

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 36). 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 37), 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 37). 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. Additional city-scale maps with detailed sub-county flooding hazard extent and risk information may be found in the [Appendices](#).

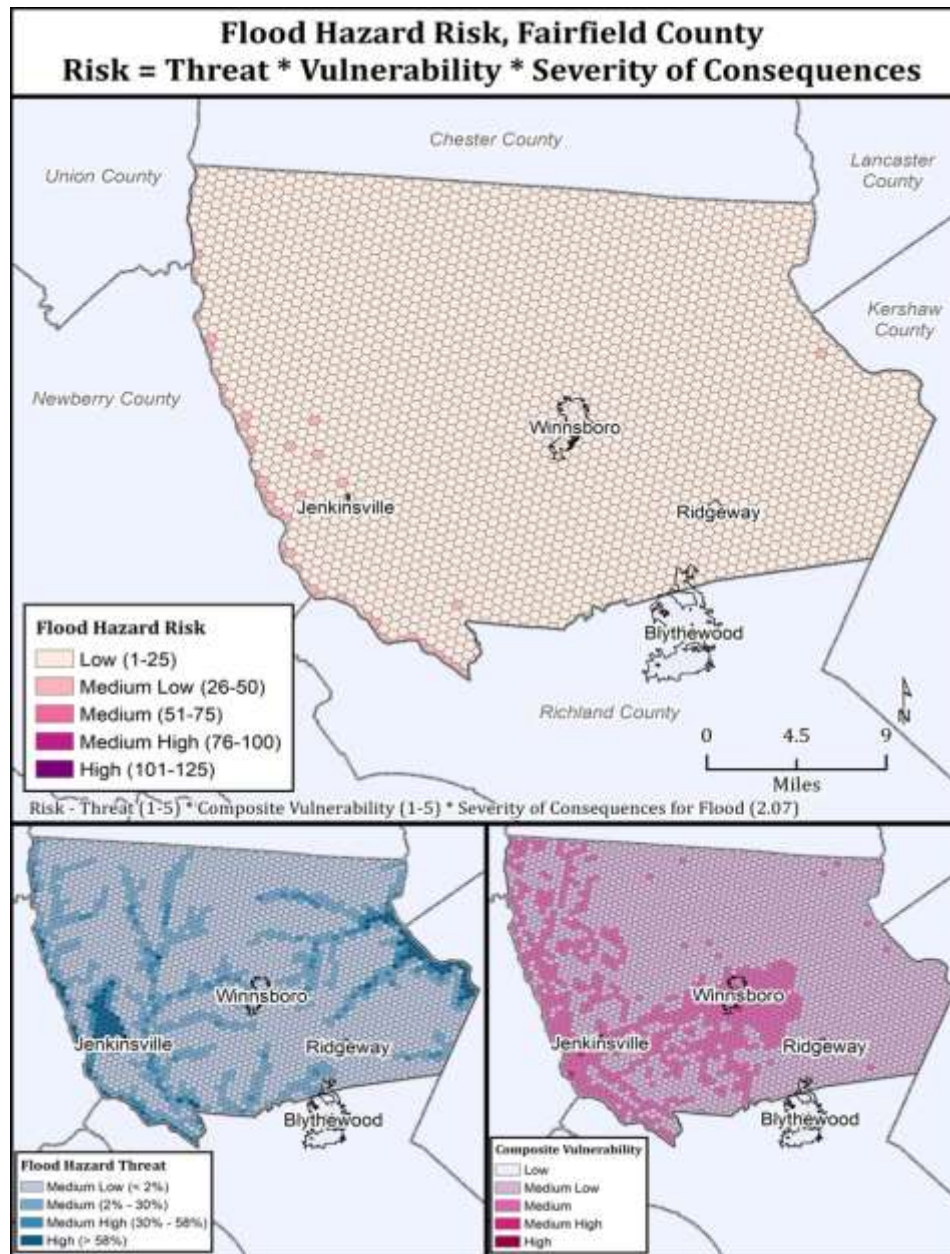


Figure 34 - Risk of a 1000-year flood event in Fairfield County.

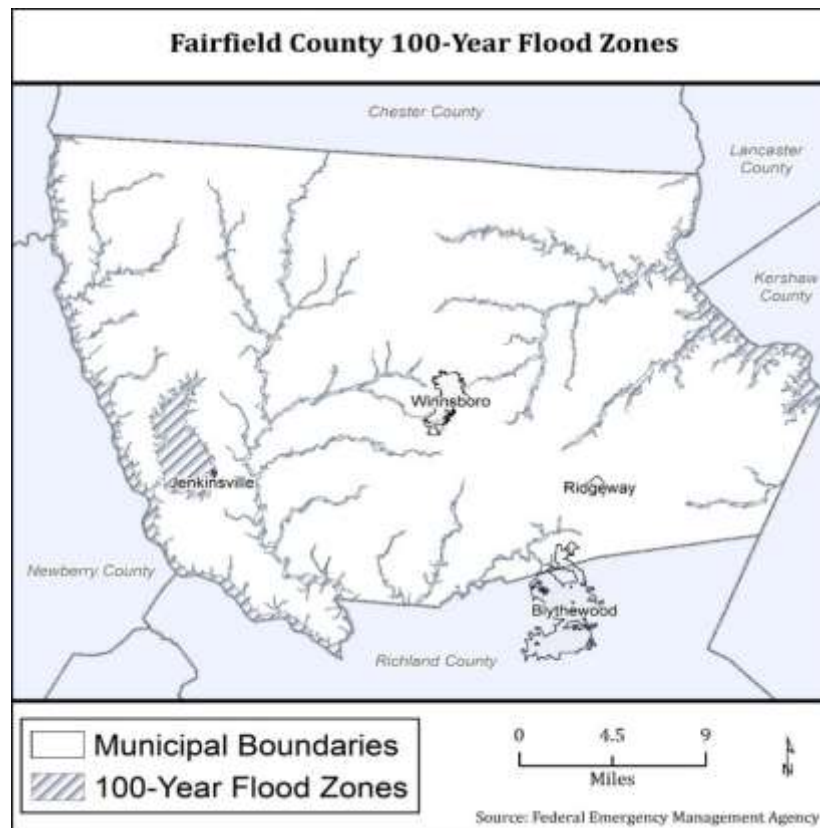


Figure 35 - Fairfield County 100-Year Flood Zones

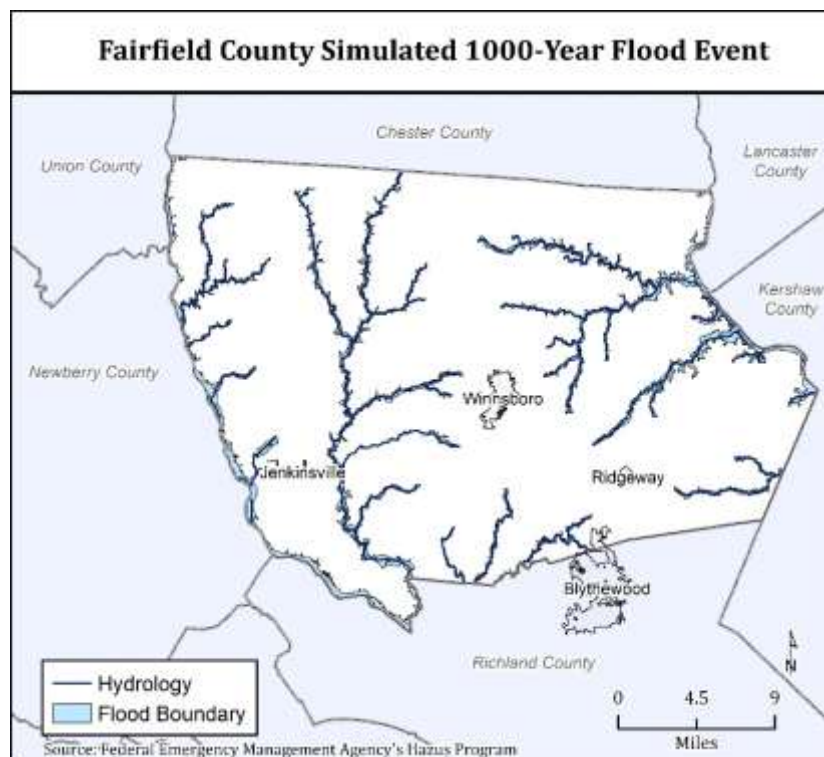


Figure 36 - Modelled 1,000-year flood event in Fairfield County.

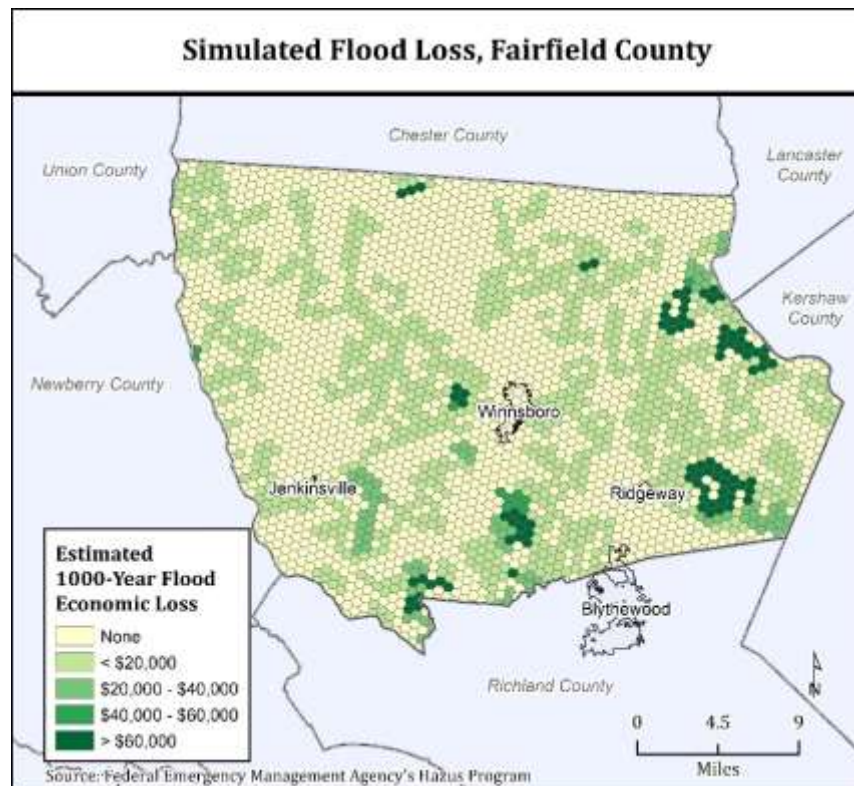


Figure 37 - Damage from a modelled 1,000-year flood event in Fairfield County.

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 38). 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 38).

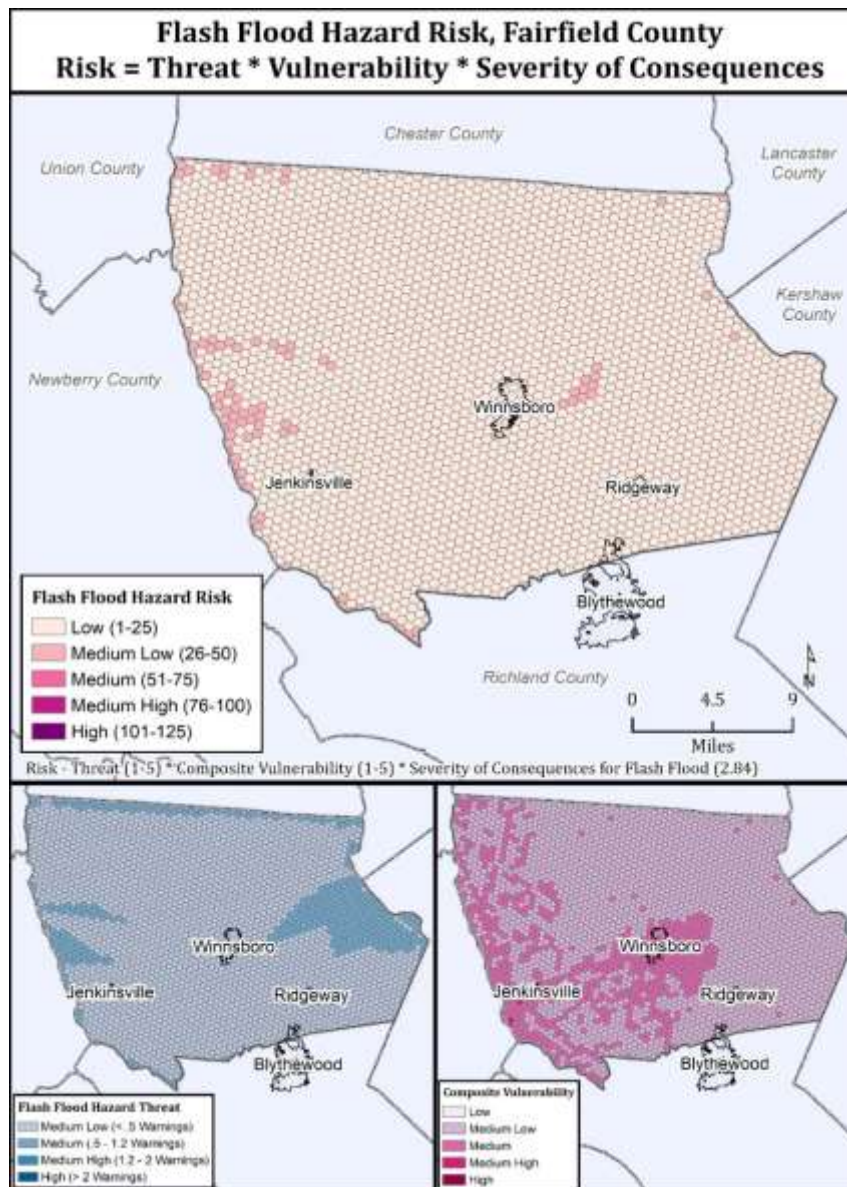


Figure 38 – Risk of flash flooding in Fairfield County.

B) Hurricanes & Tropical Cyclones

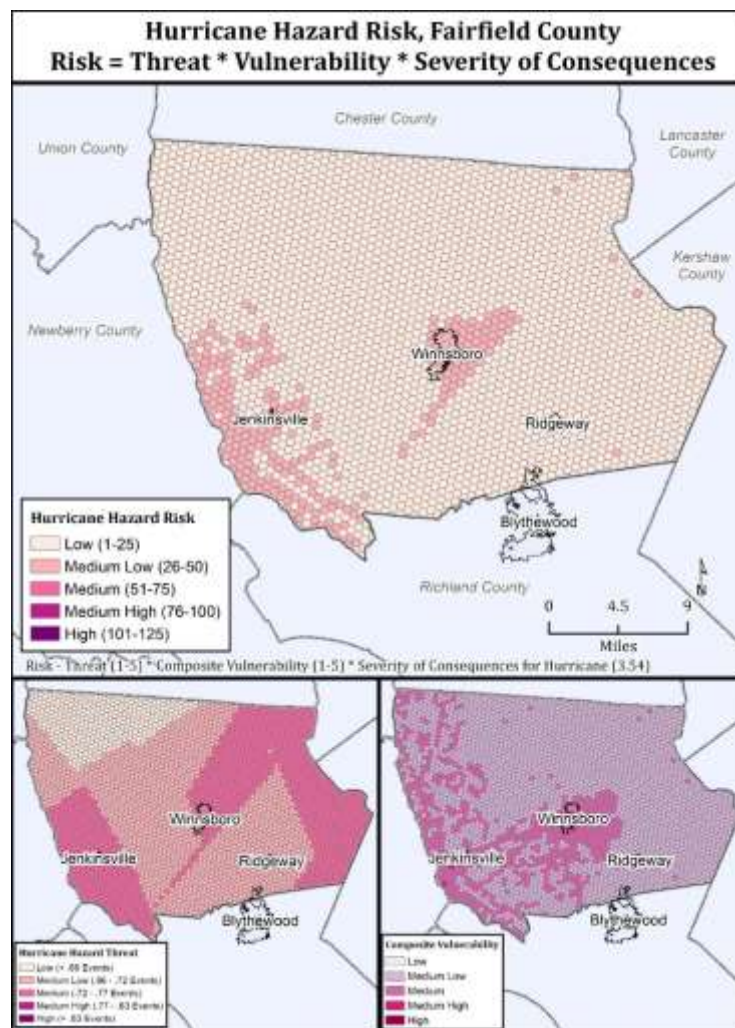


Figure 39 - Risk of tropical cyclones in Fairfield County.

The central and western portions of Fairfield County exhibit a higher vulnerability to tropical storms than the eastern or northern regions (Figure 39). 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 40).

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 41). 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 40). 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.

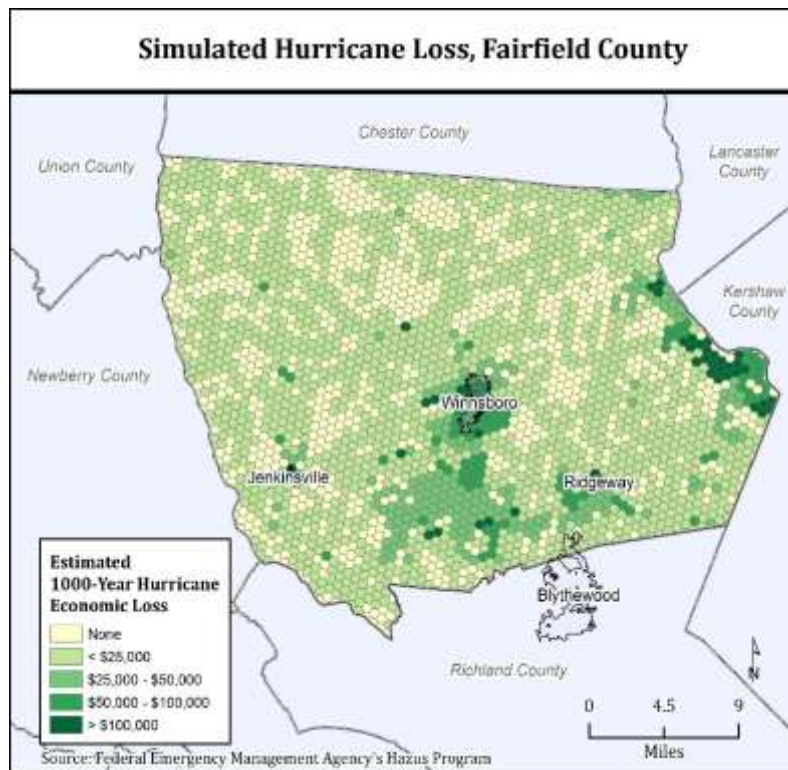


Figure 40 - Wind Speeds from a modelled 1,000-year hurricane event in Fairfield County.

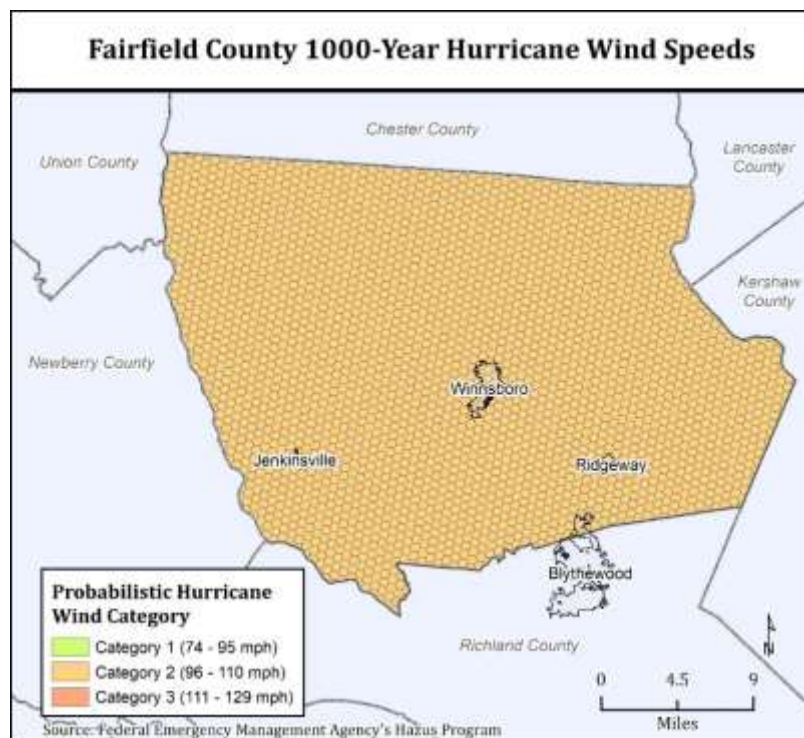


Figure 41 - Damage from a modelled 1,000-year hurricane event in Fairfield County.

C) Tornadoes

The central and western part of Fairfield County exhibits high vulnerability to tornadoes (Figure 42). 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 42).

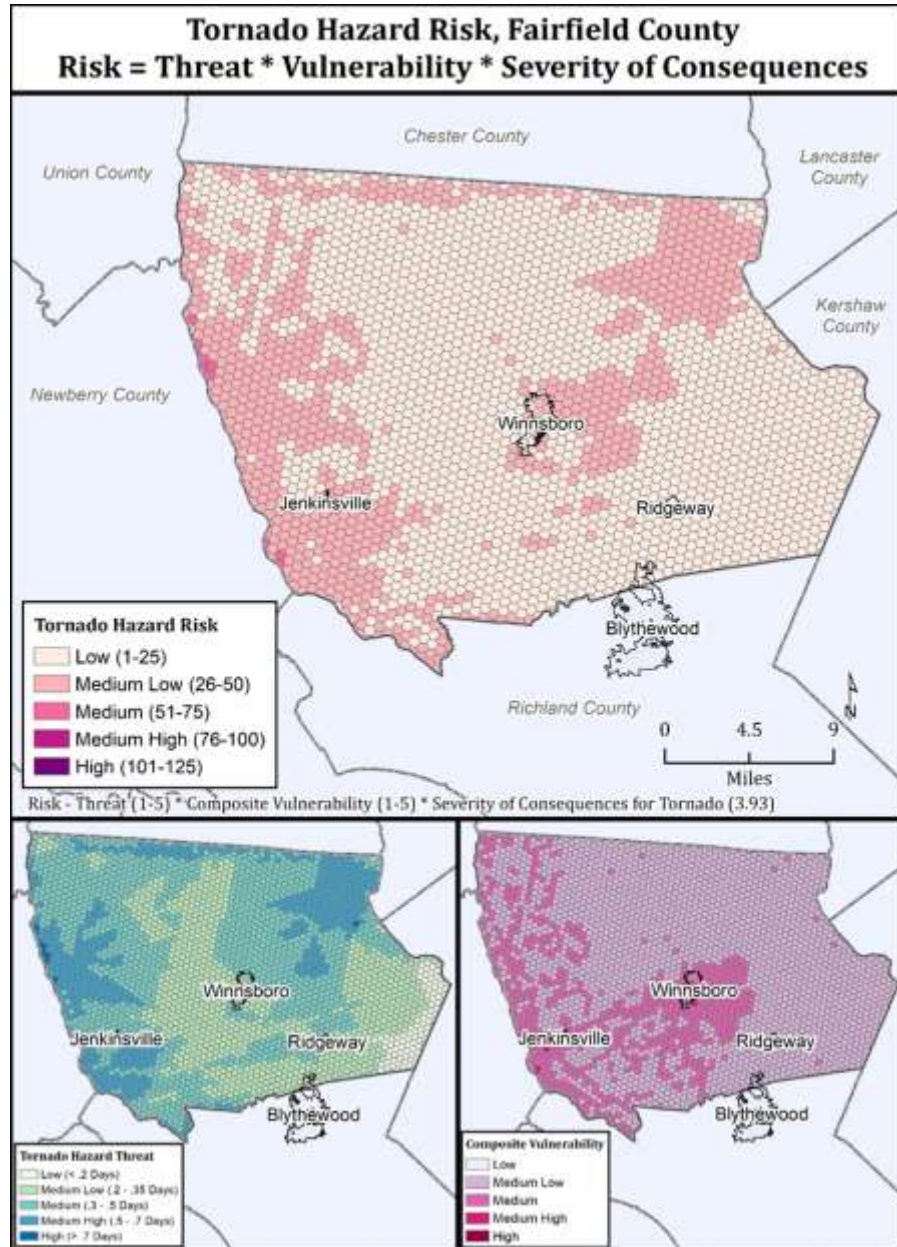
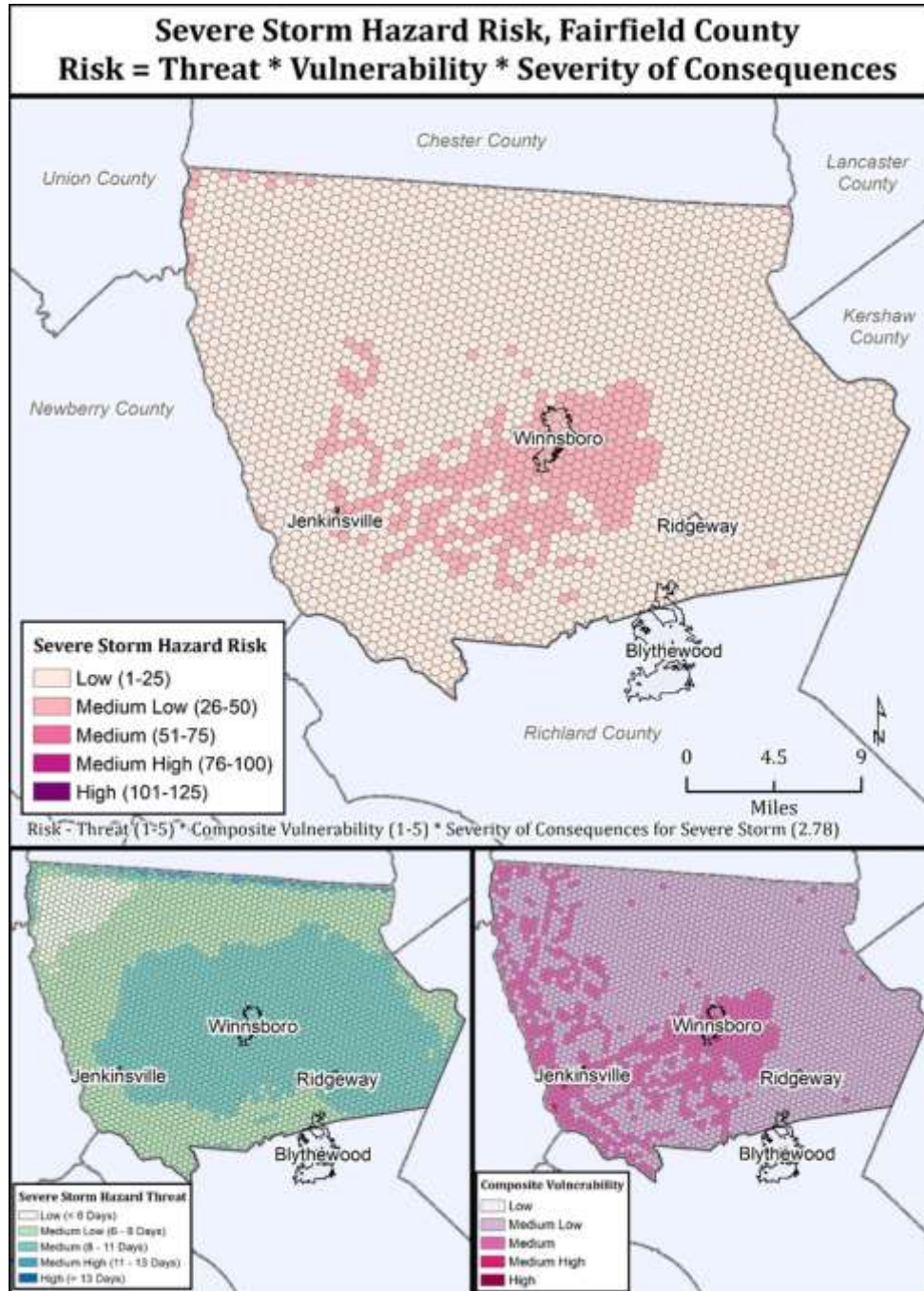


Figure 42 – Risk of tornadoes In Fairfield County.

D) Thunderstorms

The central portion of Fairfield County exhibit higher vulnerability to severe thunderstorms, particularly around the Towns of Winnsboro and Jenkinsville (Figure 43). In these areas, higher vulnerability coincides with up to 11 severe storm warnings per year.



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 44). 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.

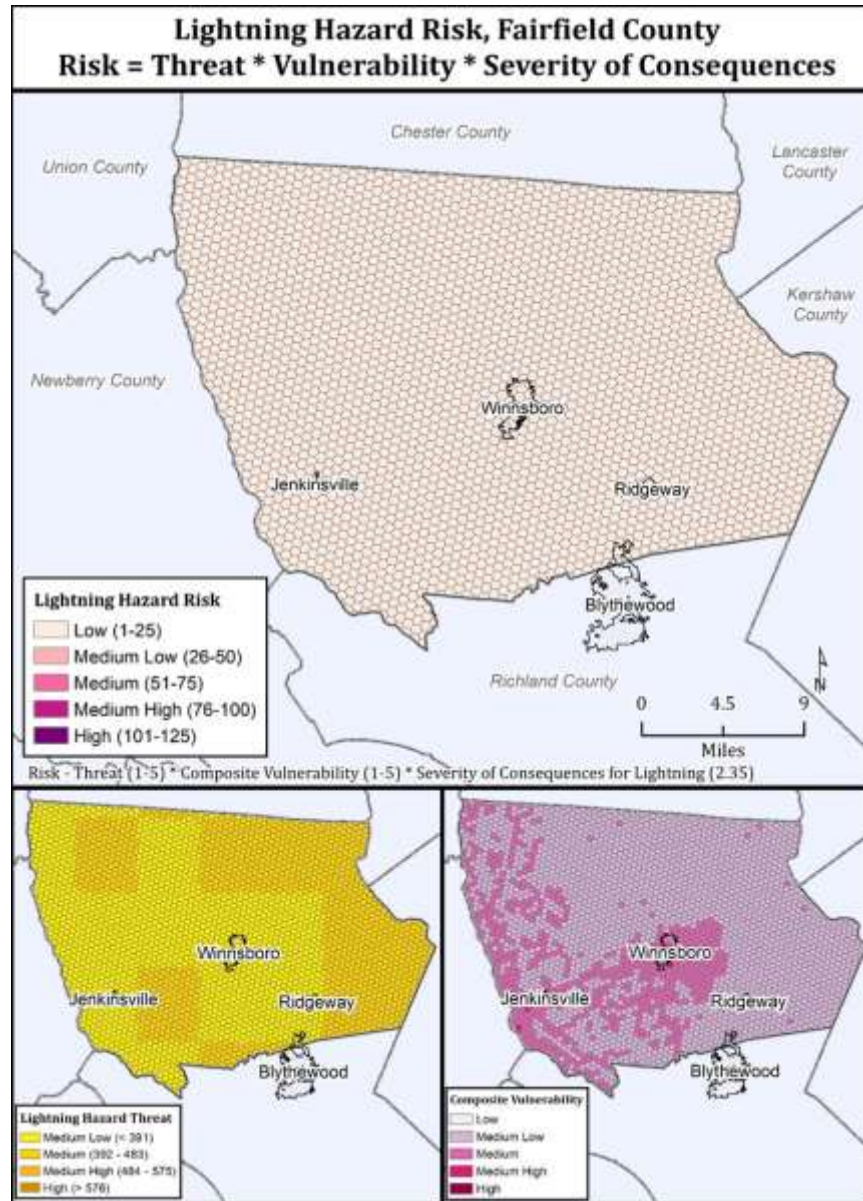


Figure 44 – Risk of lightning in Fairfield County.

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 45). 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 45). This creates an overlap of vulnerability and wind hazard threat around the Town of Jenkinsville and in between Jenkinsville and Winnsboro (Figure 45).

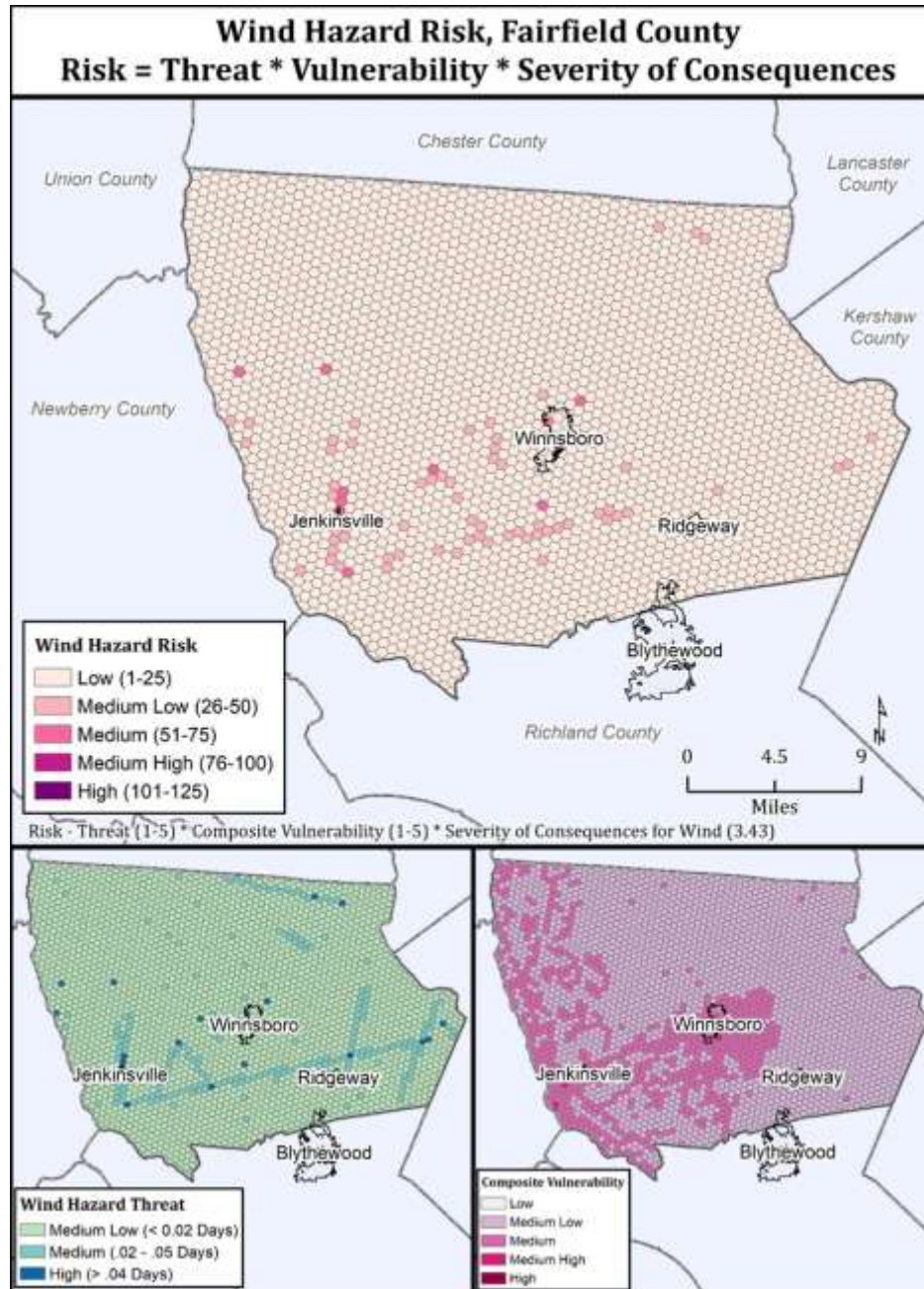


Figure 45 – Risk of high wind in Fairfield County.

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 46). 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 46).

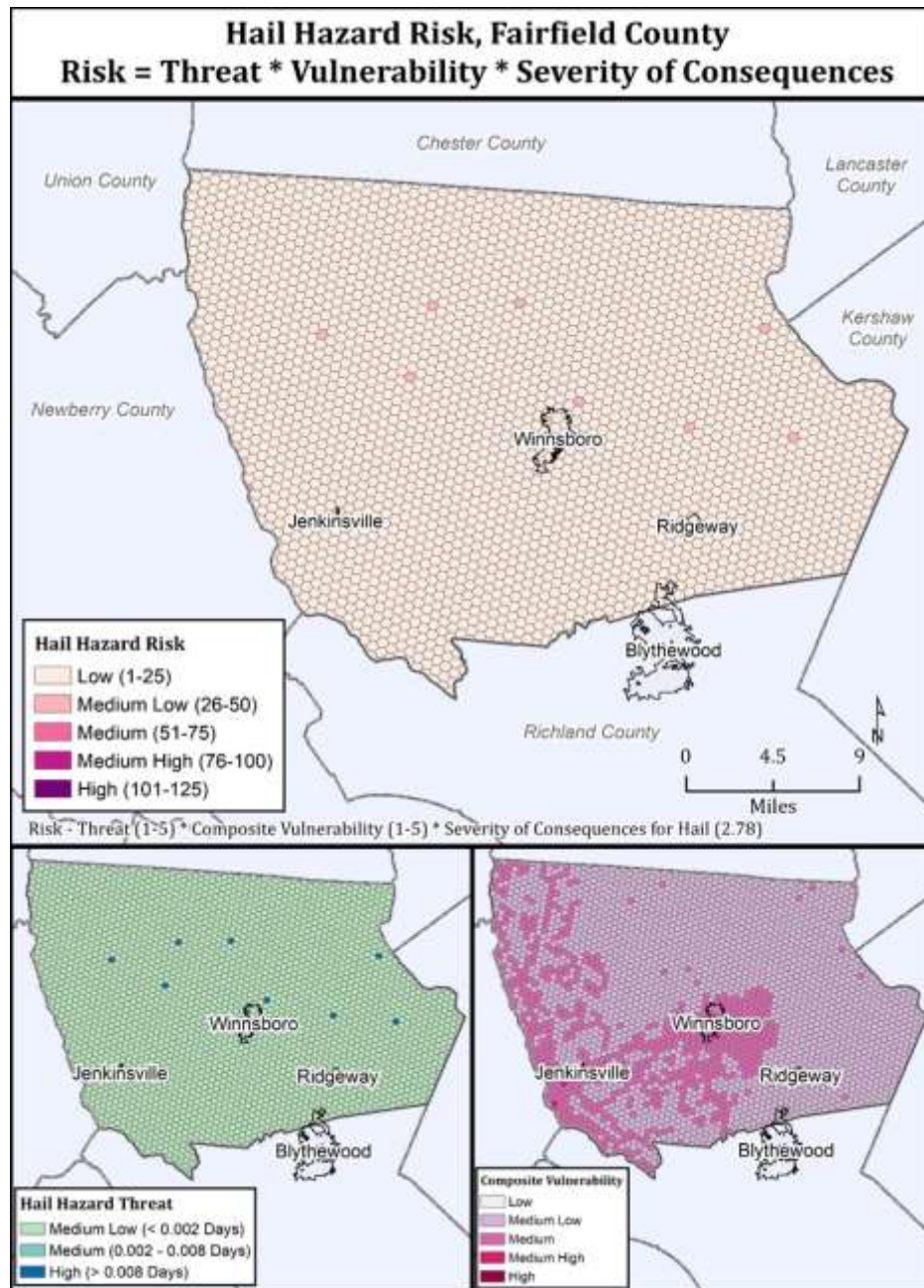


Figure 46 – Risk of hail in Fairfield County.

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 47). 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 47).

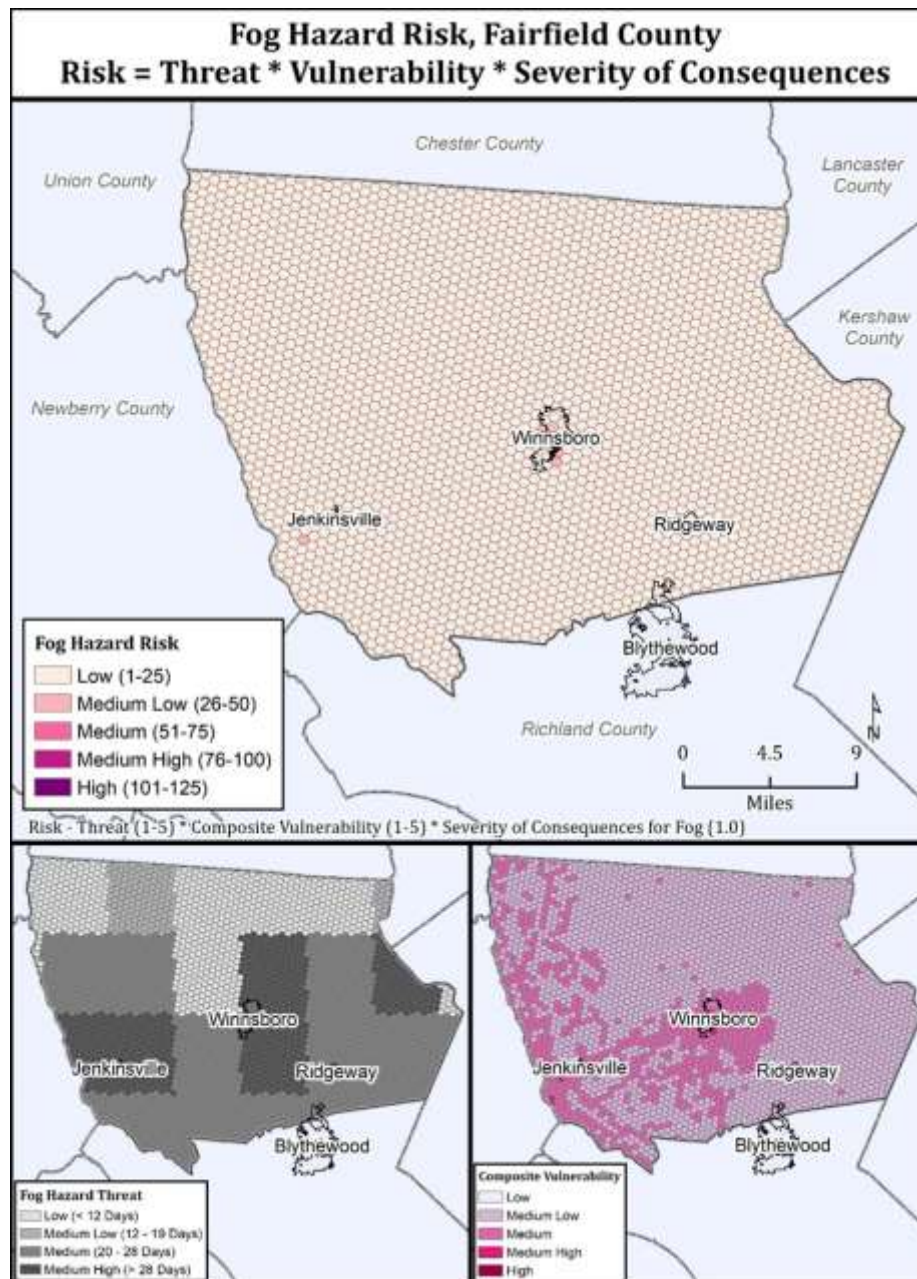


Figure 47 – Risk of fog in Fairfield County.

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 48).

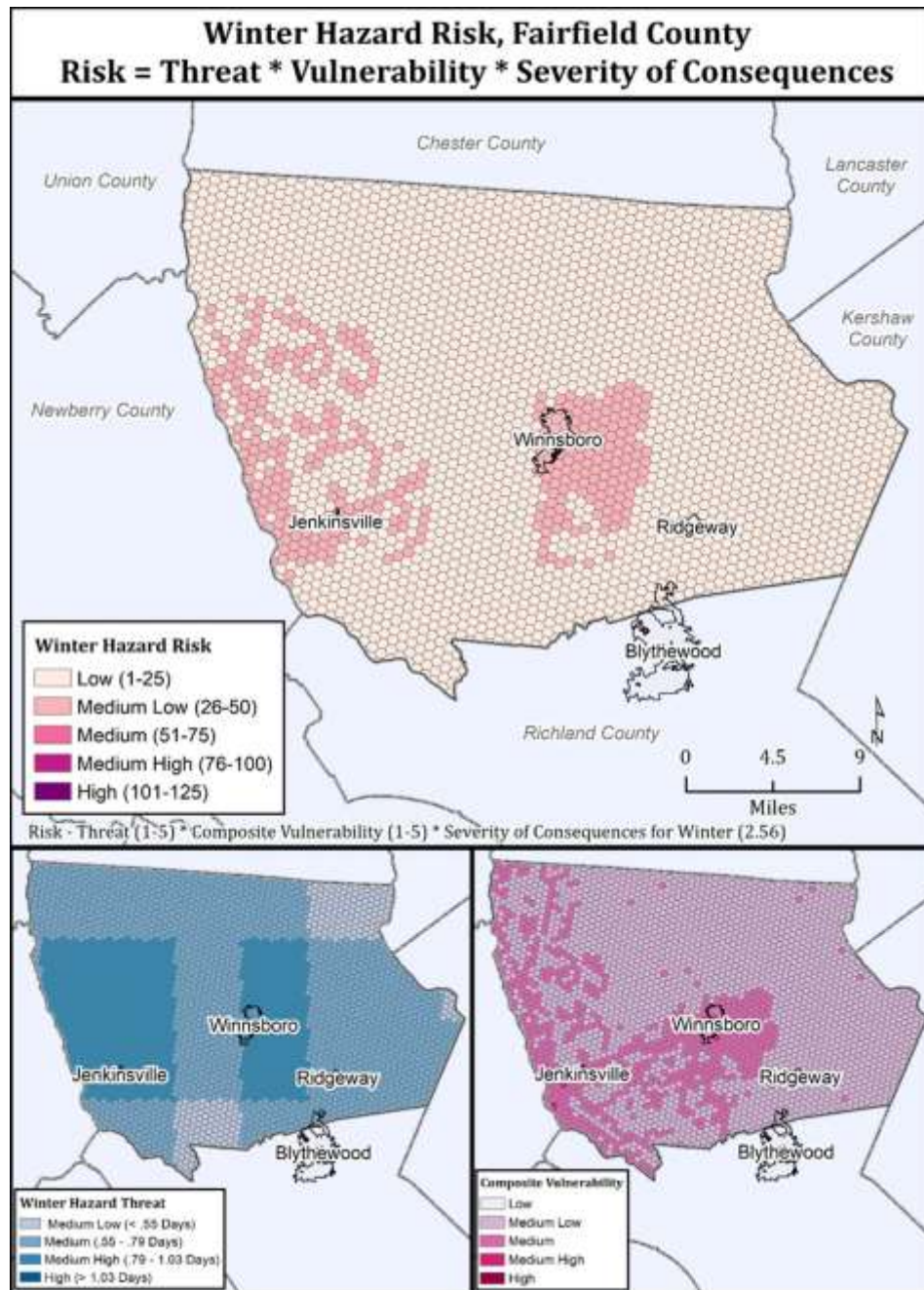


Figure 48 – Risk of winter weather in Fairfield County.

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 49). 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 49).

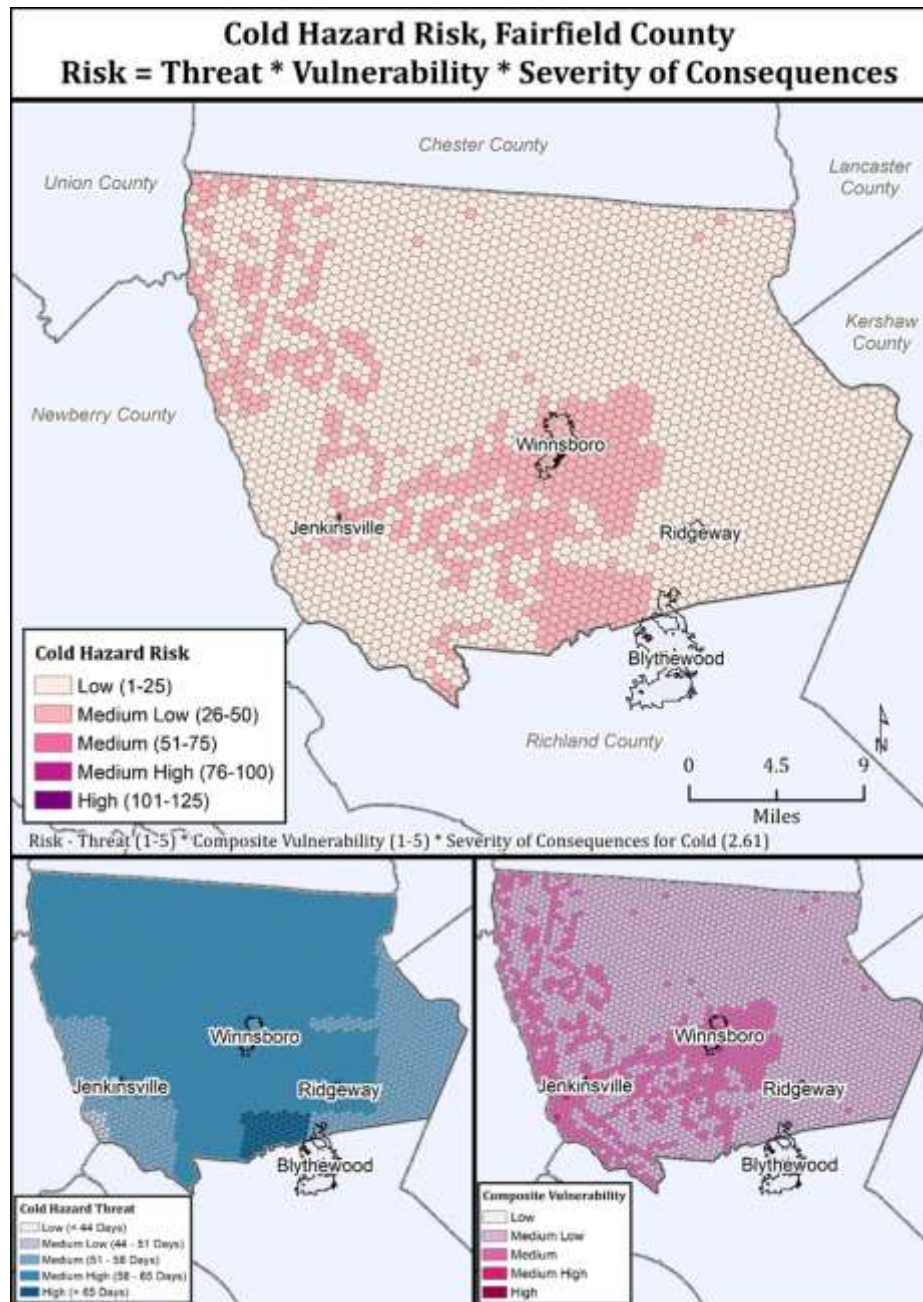


Figure 49 - Risk of cold weather in Fairfield County.

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 50). The south-central portion of the county above and around Ridgeway experiences more days of hot weather (between 21 and 24). 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 50).

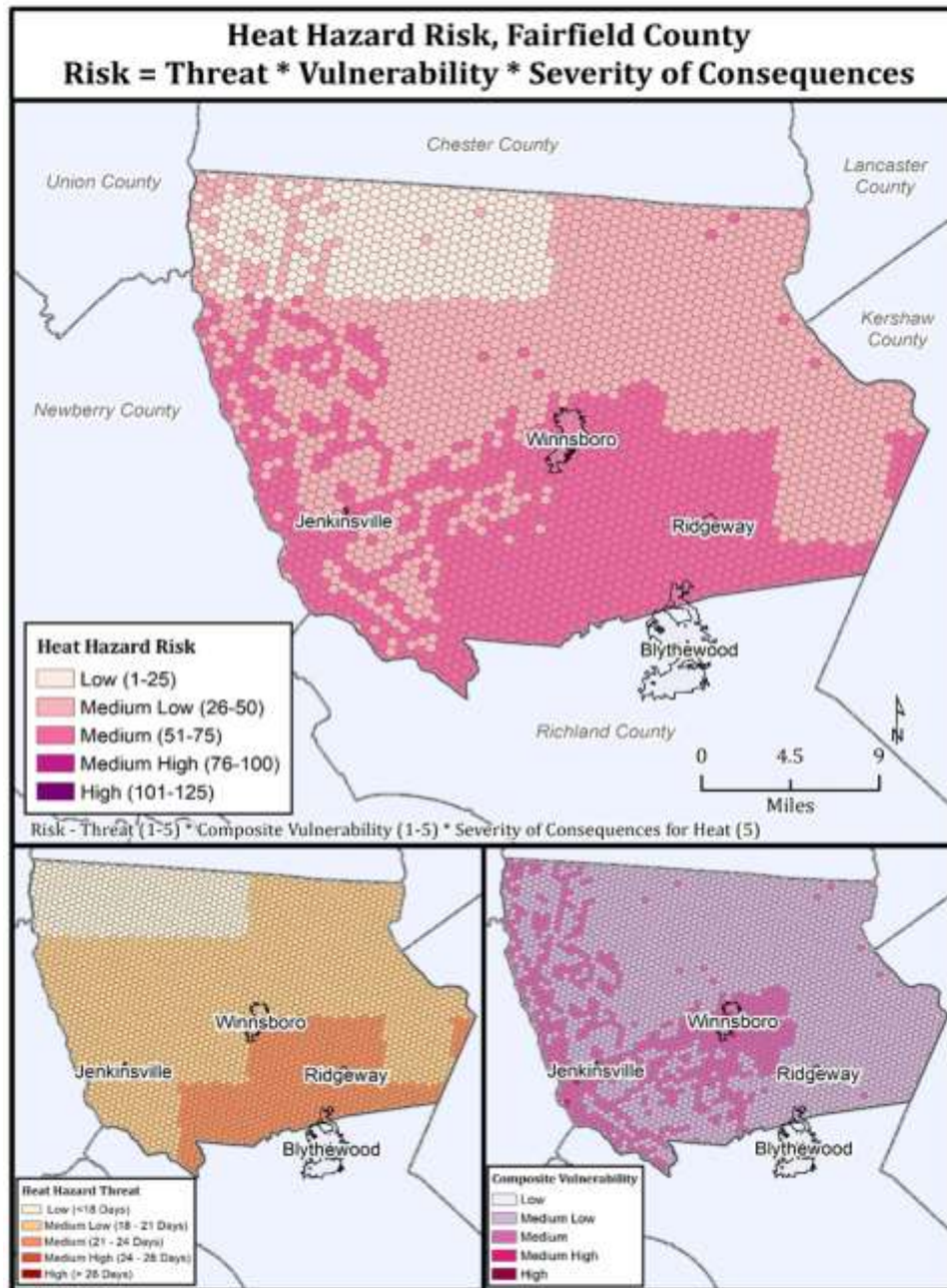


Figure 50 – Risk of hot weather in Fairfield County.

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 51). 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 51).

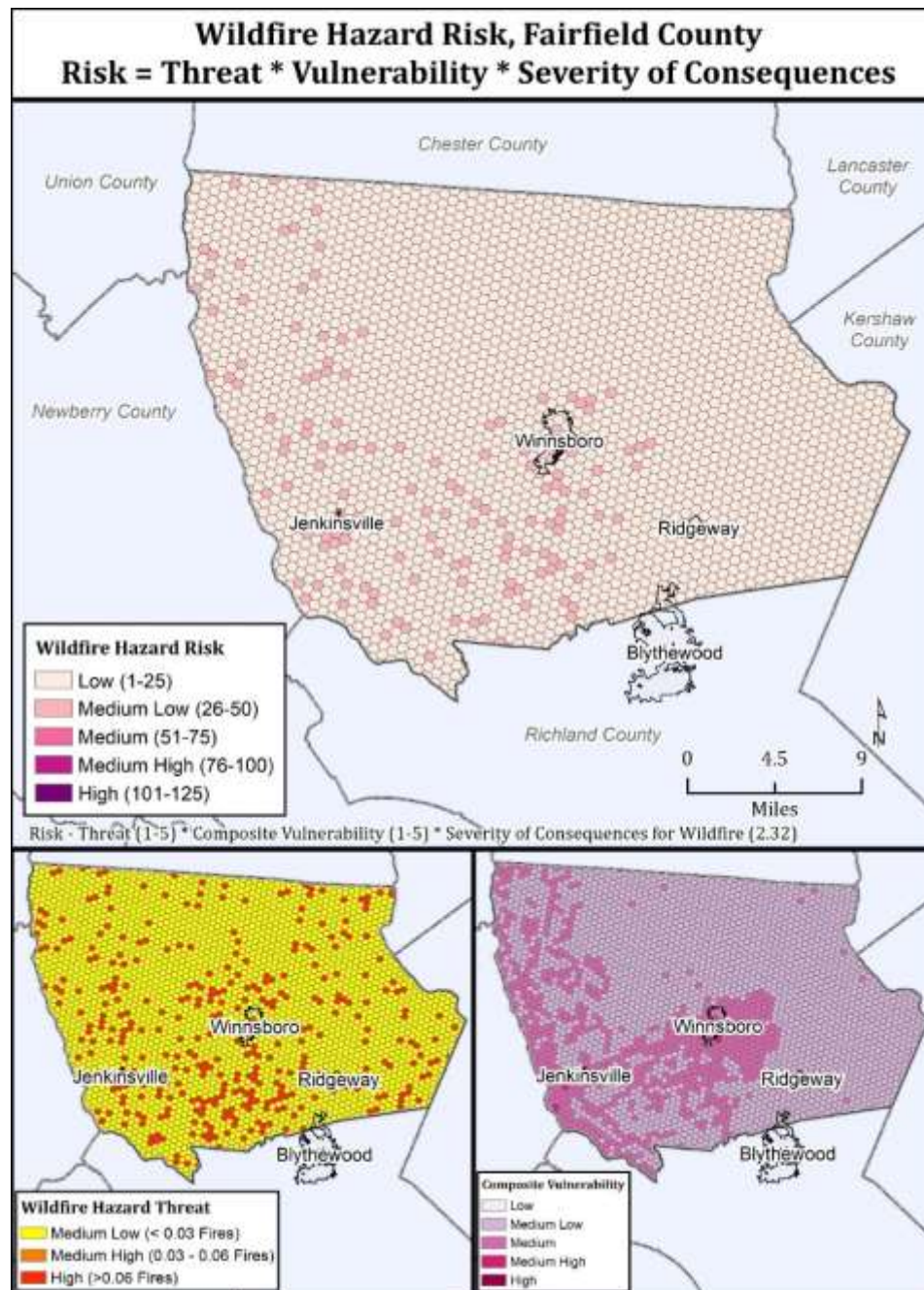


Figure 51 – Risk of wildfires in Fairfield County.

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 52). 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 52).

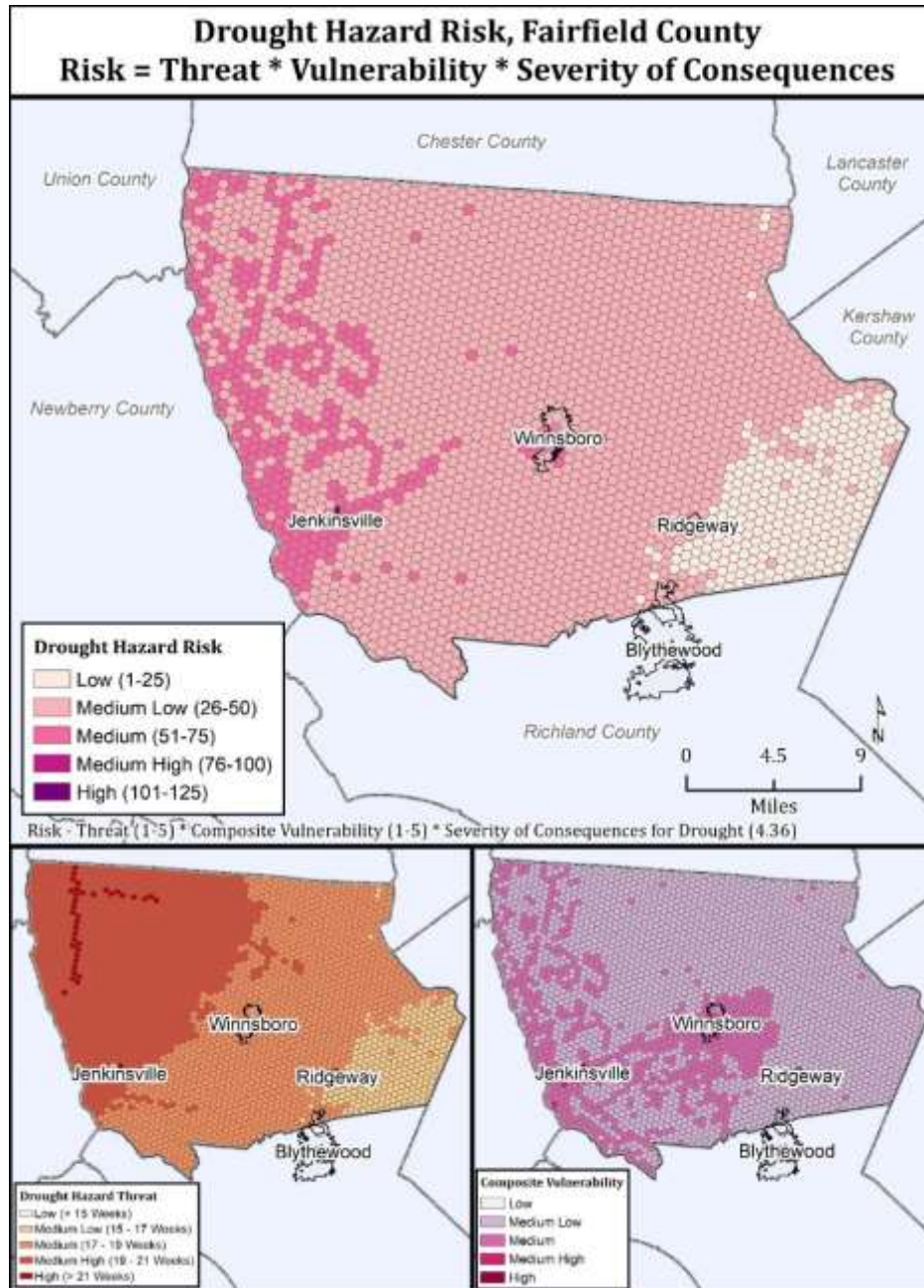


Figure 52 – Risk of droughts in Fairfield County.

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 53).

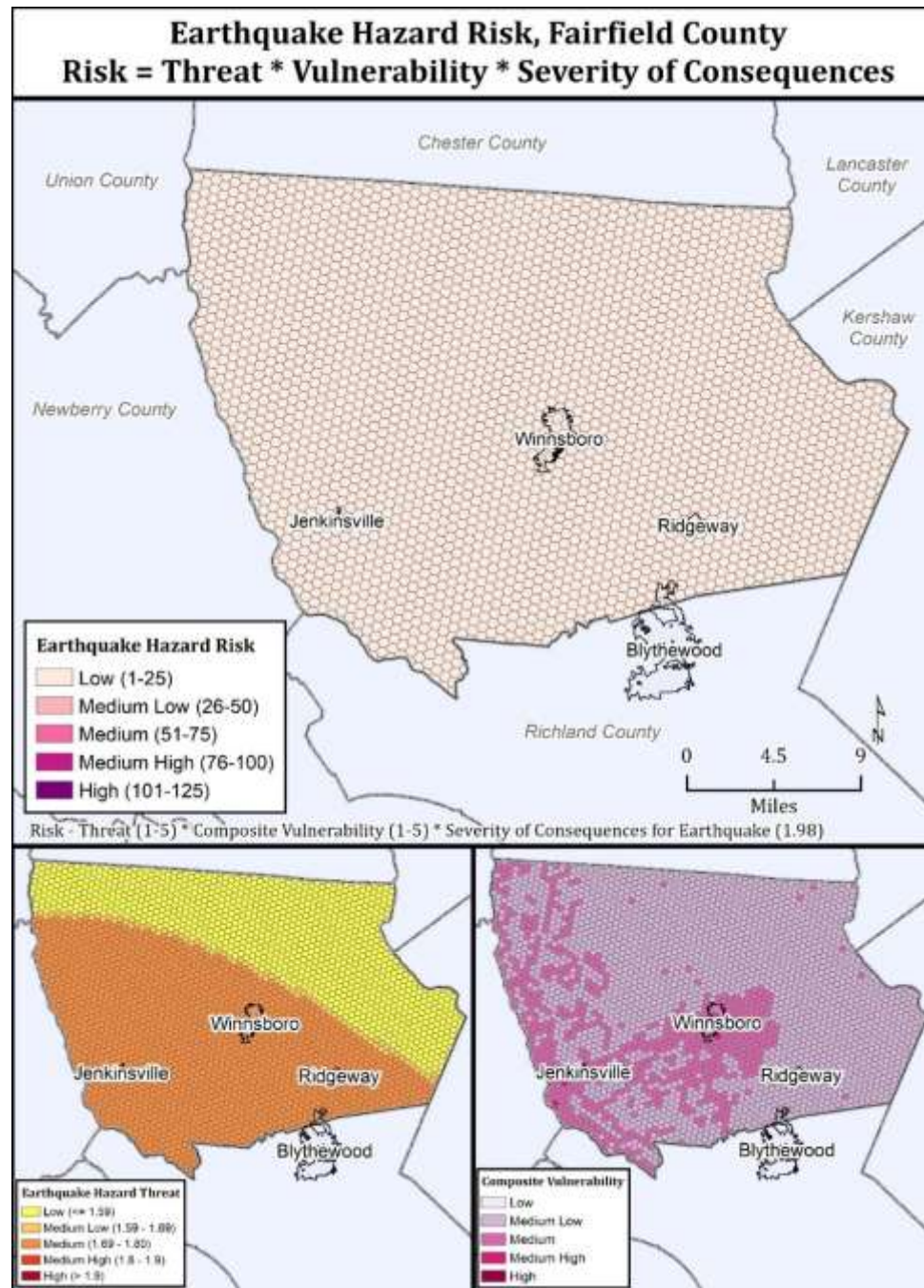


Figure 53 – Risk of earthquakes in Fairfield County.

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)²⁹. If the 1886 Charleston earthquake were to occur today (Figure 55), 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 54). 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.

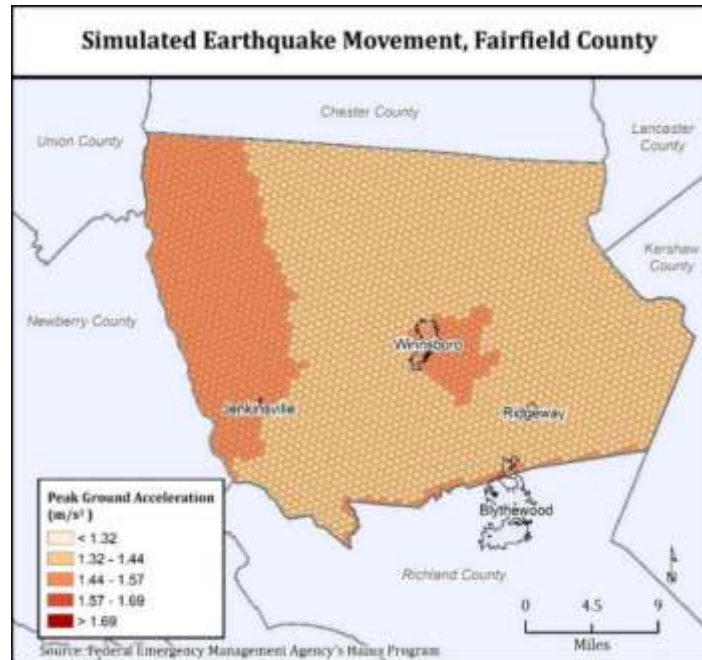


Figure 54 - Peak ground acceleration in Fairfield County from a modelled 6.8 earthquake.

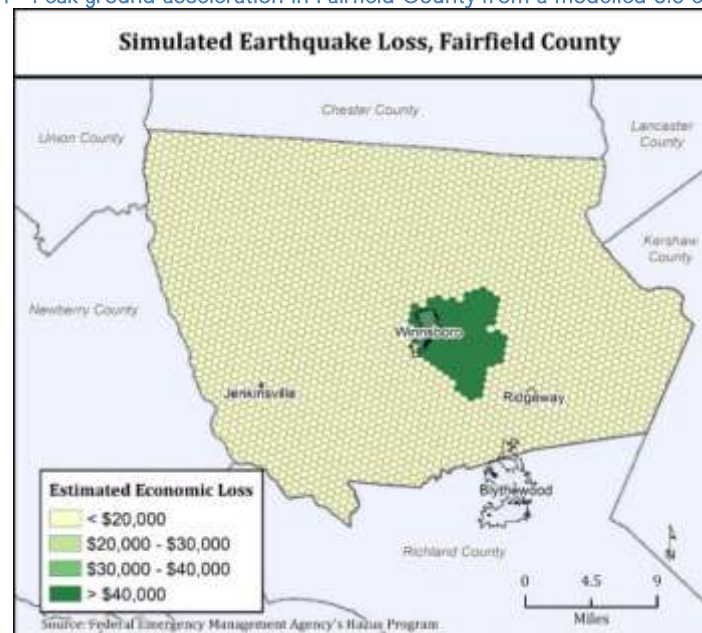


Figure 55 - Damage in Fairfield County from a modelled 6.8 earthquake.

²⁹ 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 56).

$$RISK_{HAZ} = (THR_{HAZ})(VUL)(CON_{HAZ}) \quad (1)$$

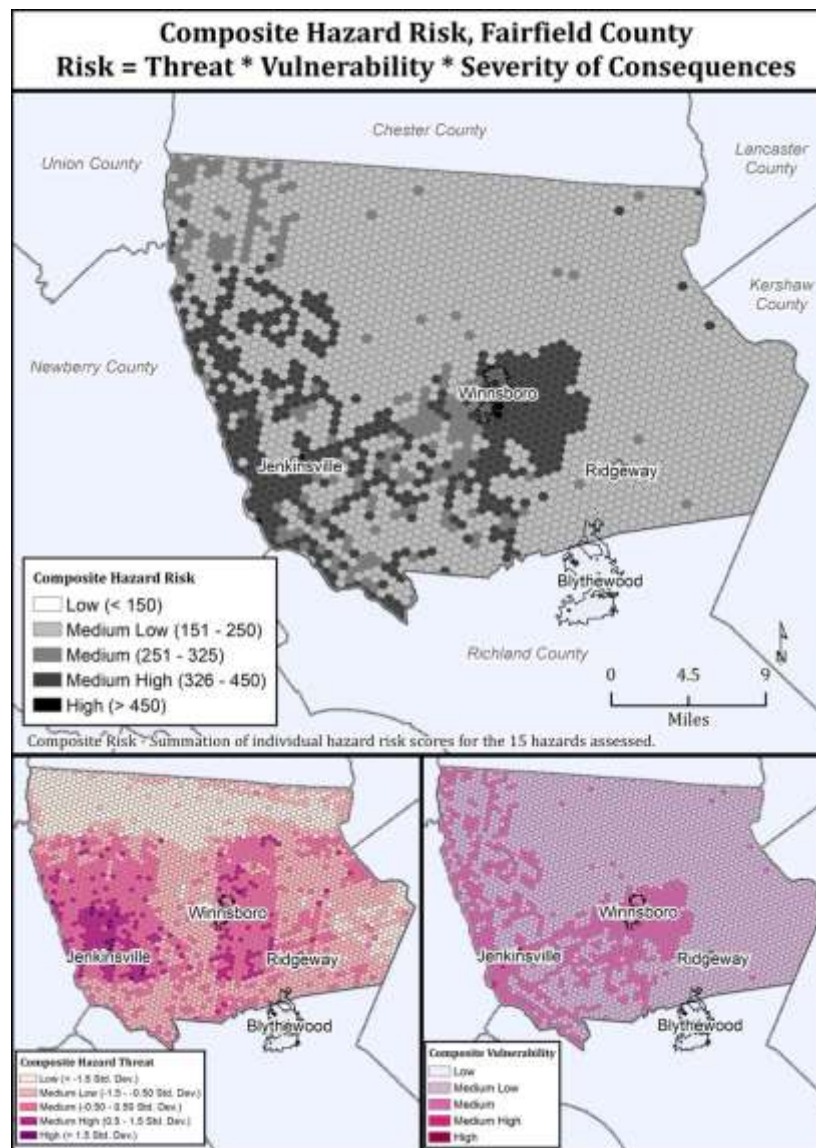


Figure 56 – Overall composite risk map of Fairfield County considering all hazard threats, vulnerabilities, and severity of consequences.

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 56) 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 III 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 4.9).

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 ³⁰	
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

³⁰ 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	Yes
Ridgeway	Provided by County system	Provided by County system	Provided by County	Yes	Yes	Yes	Yes

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 National Flood Insurance Program Information

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). Residential and commercial properties that have active flood insurance properties are located within the unincorporated boundaries of Fairfield County, outside of Winnsboro and Ridgeway (Table 29). 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.

Table 29 - Active NFIP Flood Insurance Policies in Fairfield County by Jurisdiction

Name of Jurisdiction	Active Residential Flood Insurance Policies	Active Non-Residential Flood Insurance Policies
Fairfield County	233	2
Winnsboro	0	0
Ridgeway	0	0

4.7 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.

These goals reflect the hazard mitigation priorities of plan participants, guided by the information compiled through the Capabilities Assessment. Goals were the basis of designing a broad range of mitigation actions and guided plan participants in the action prioritization process. Plan participants will rely on grants and other sources in order to fund mitigation projects. Mitigation action prioritization took into account multiple factors:

- 1) The updated hazard extent, vulnerability, and risk analyses created through the planning process of this HMP provided plan participants with the most recent information on natural hazard impacts. This guided which natural hazards should be prioritized, with higher priority given to hazards of higher frequency and/or extent.
- 2) A Benefit Cost Analysis (BCA) methodology was utilized to determine project effectiveness and plausibility. Actions that required minimal funds and utilized existing funding mechanisms were prioritized due to the higher likelihood that they could be accomplished.
- 3) If the technical expertise was not available, mitigation actions were prioritized utilizing documents such as Capital Improvement Plans, Comprehensive Plans, and stakeholder feedback on organizational priorities. The technical ability of plan participants to implement and maintain mitigation actions, without additional funding sources or staff, was also highly prioritized.

Each mitigation action includes the following information: a description of the mitigation activity, the type/s of natural hazard addressed, the organization or department responsible for implementing the mitigation activity, a priority rank, which broad goals are addressed through the mitigation activity, source of financing, generalized cost estimates, status since the previous HMP update, and a general timeframe of implementation. A template for providing mitigation goals is provided in [Appendix VIII – A](#).

4.8 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 30 - Fairfield County portfolio of federally-supported hazard mitigation projects.

Mitigation Category	HMG P	PD M	FM A	Amount	Mitigation Category	HMG P	PD M	FM A	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)				
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)

4.9 Fairfield County Mitigation Strategies

Table 31 - 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	Thunder-storms (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	Thunder-storms (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	Thunder-storms (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	Thunder-storms (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 32 - 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	Thunderstorms (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	Thunderstorms (Hail and Wind)	Town of Winnsboro	1	2, 4, 5 & 7	Capital Improve. Budget	< \$250,000	Ongoing	Ongoing
Remove taller trees near critical facilities	Thunderstorms (Hail and Wind)	Town of Winnsboro	2	2, 4, 5 & 7	Capital Improve. Budget	< \$250,000	Ongoing	Ongoing
Acquire portable disinfection equipment	Thunderstorms (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/Dominion 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 33 - 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 34 - 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

This section addresses
FEMA HMP requirement
201.6(c)(2)(I)

Each county-specific section of the HMP includes various sub-county level analyses that include information on participating local government jurisdictions and organizations. They end with a list of mitigation strategies provided by participating stakeholders.

A Quarter Square Mile (1/4 sq mi) hexagonal grid is used throughout the analyses of this HMP. This provides the best coverage for small spatial areas, such as the participating sub-county organizations of this HMP, while still providing the ability to visualize spatial differences across the region. City or sub-county jurisdiction data on natural hazard type, location, extent, and community vulnerability and risk can effectively be analyzed utilizing this simplified method of summarizing complex geospatial information. This standardized regular gridded framework, enables analysis and evaluation within and between datasets that would normally be difficult (or impossible) to visually, statistically, or spatially compare.

Analysis methodology and additional figures on sub-county natural hazard type, extent, location, and other metrics may be found in the [Appendices](#)

5.1 Historical Hazard Assessment for Lexington County

Summary of Historic Impacts

Lexington County experiences an array of natural hazards (Table 35). 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 57).

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 35 - 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.

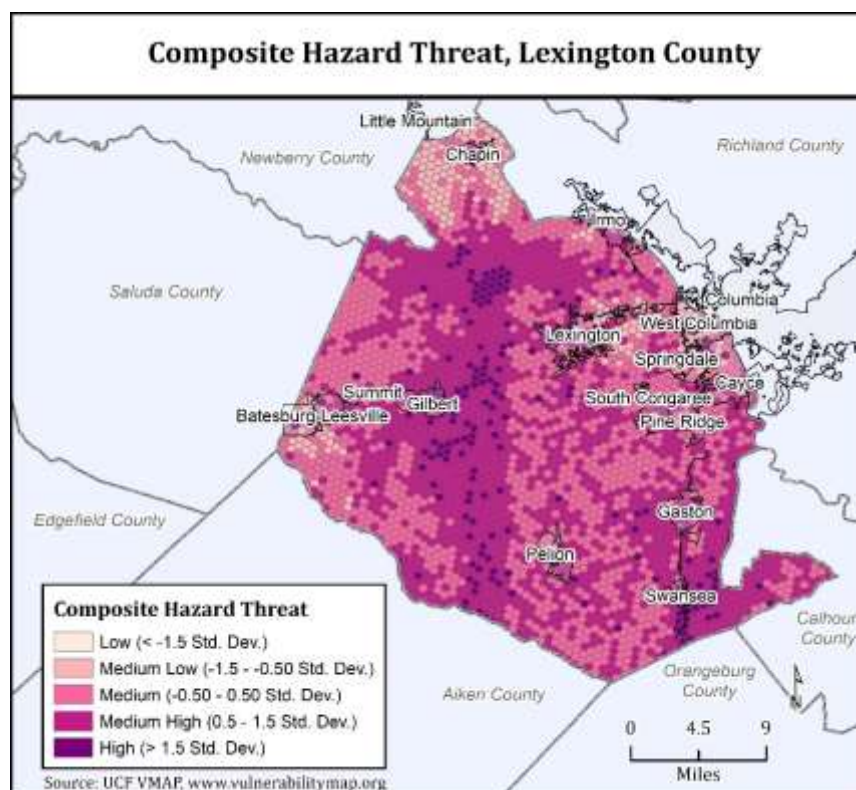


Figure 57 - Comprehensive risk profile of Lexington County.

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 to ponding and/or inadequate drainage (Table 36). 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 59). 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 60). 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)^{31*}:

Over a five-day period, an upper low-pressure system combined with the remnants of Hurricane Joaquin streamed tropical moisture into South Carolina (Figure 58). Lexington County experienced a record-setting 5-day rainfall total of up to 17.21 inches in some places³². 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 NCEM'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 billion³³ to \$12 billion³⁴ for the entire impact area in South Carolina. Lexington County received both individual and public assistance funding through FEMA.



Figure 58 - Total rainfall amounts for the 2015 flood event. Source: NWS.

^{31*} 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.

³² NWS, 2015. Historic rainfall and flooding, October 2015. Available at <http://www.weather.gov/cae/HistoricFloodingOct2015.html>

³³ NOAA National Centers for Environmental Information, 2016. Billion-Dollar Weather and Climate Disasters. Available at <http://www.ncdc.noaa.gov/billions/events>

³⁴ 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>

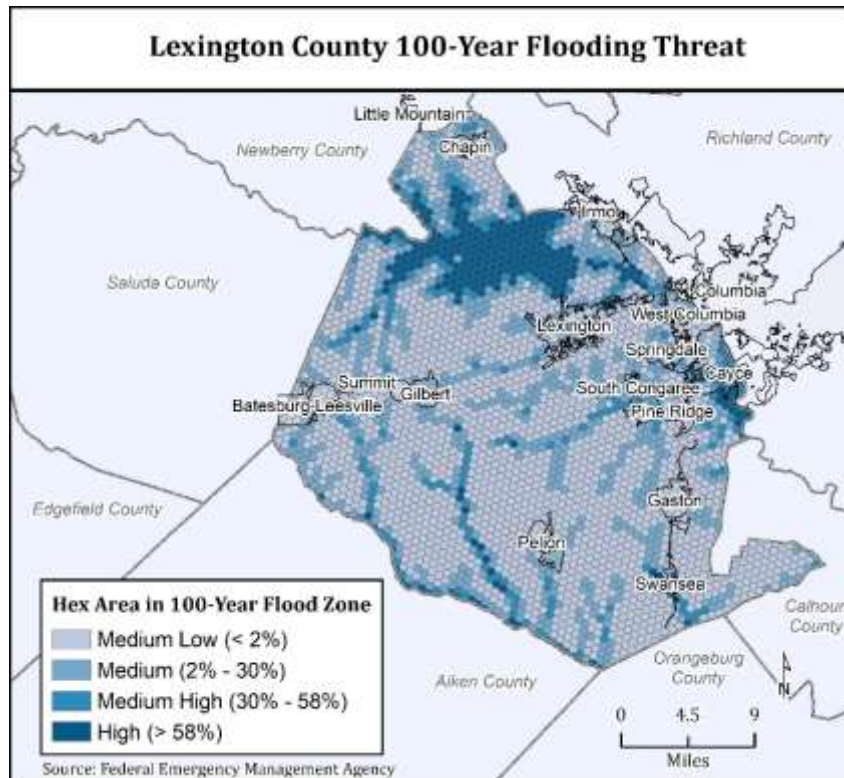


Figure 59 - Flood threat/extent in Lexington County.

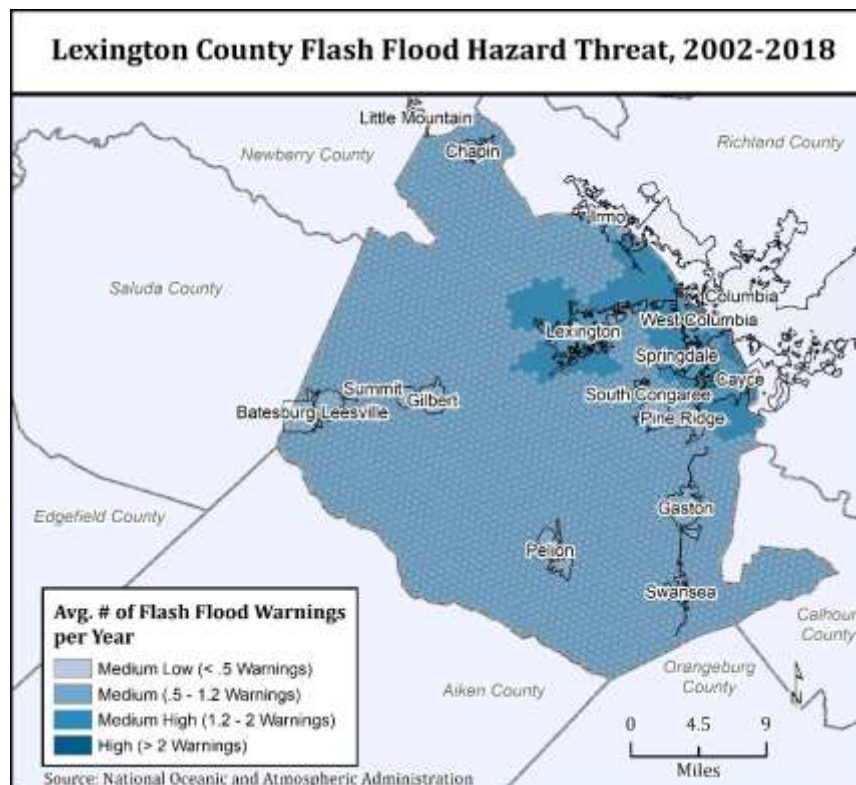


Figure 60 - Flash flood threat/extent in Lexington County.

Table 36 - 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, 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	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.

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
								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 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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
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
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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
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'"³⁵. 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 36) and 4 dam failures during the 2015 flood disaster alone (Table 37).

³⁵ DOMINION ENERGY, 2008. Saluda Hydro Project Relicense. Attachment 3b Finale Schedule A response. Available at <http://www.thestate.com/news/local/article53937070.html>

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 37 - 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 62). 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 61 & Table 38). 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.

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.

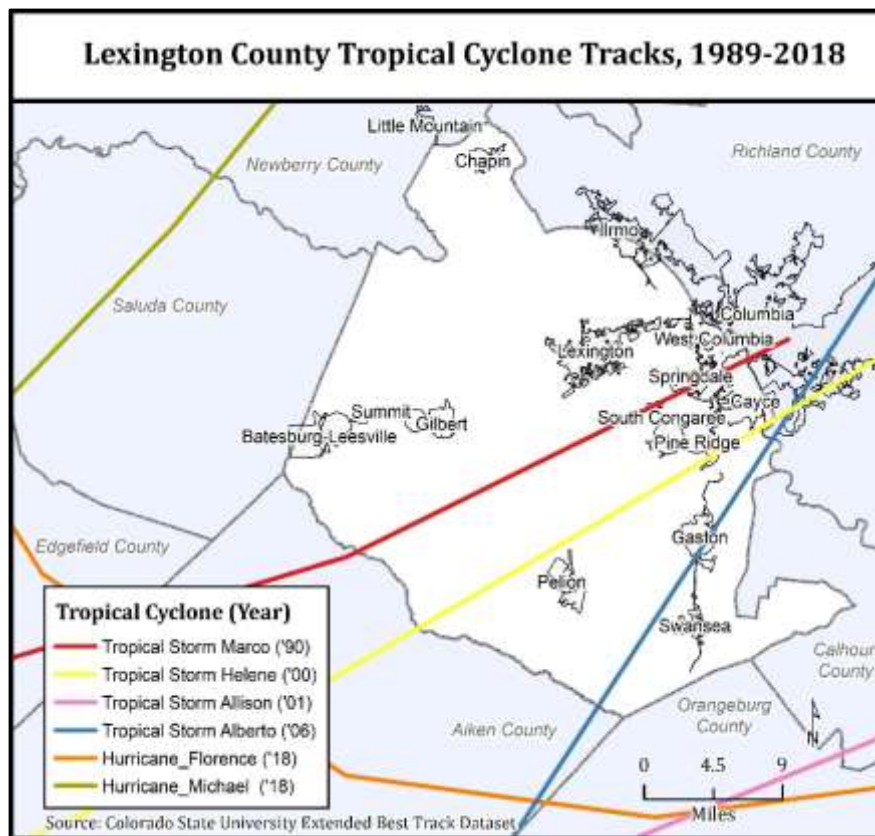


Figure 61 – Historical tropical cyclone tracks in Lexington County.

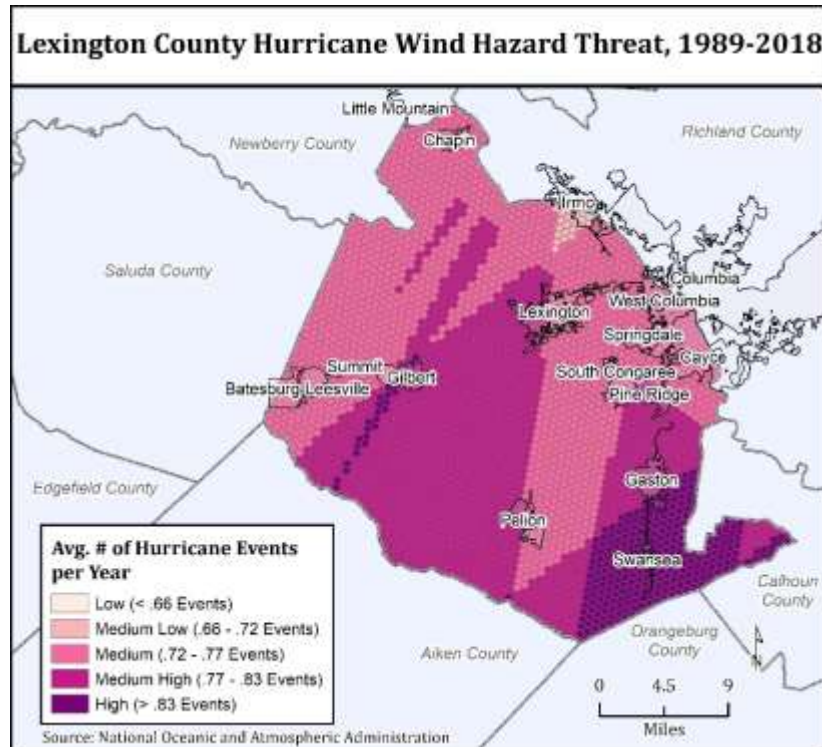


Figure 62 - Hurricane wind threat/extent in Lexington County.

Table 38 - 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 64). 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 63). 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

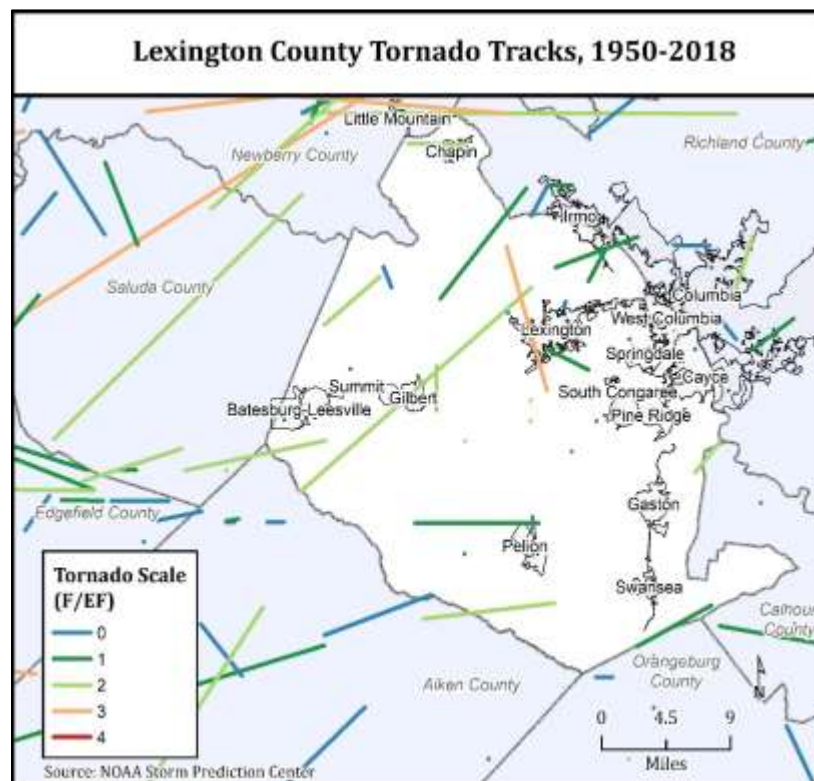


Figure 63 - Historical tornado tracks in Lexington County.

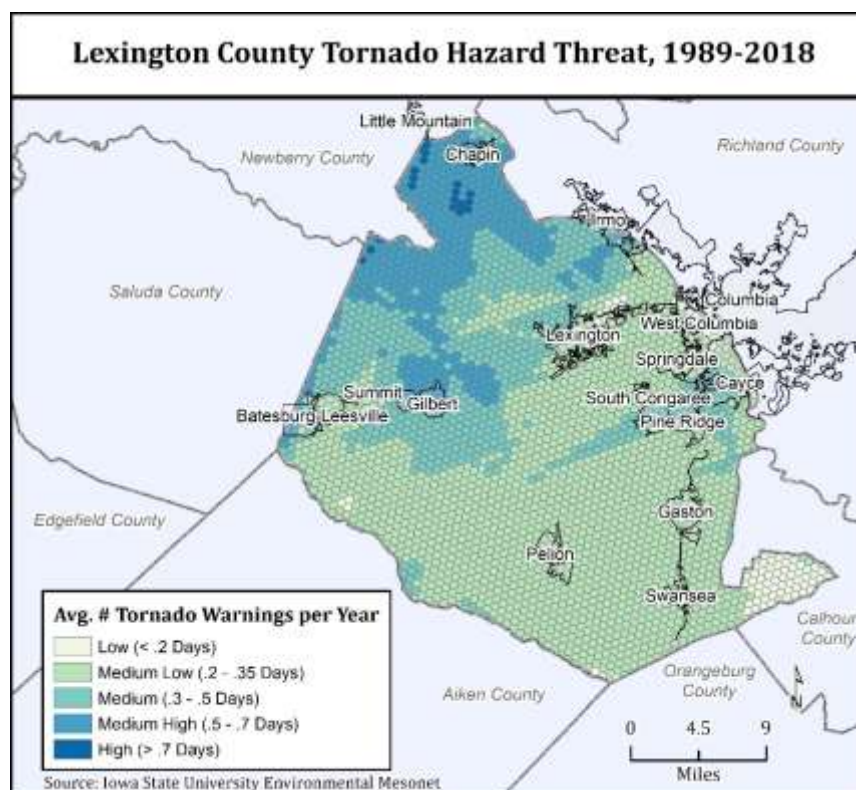


Figure 64 – Tornado threat/extent in Lexington County.

Table 39 - 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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag.	Location	Description
								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.
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 EFO 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 65). 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 inch³⁶. Prior to the 2015 flash flood disaster, the daily rainfall record stood at 7.1 inches (September 4, 1998). During the October 2015

³⁶ SCDNR, n/d. South Carolina Climate. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/cli_sc_climate.php

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 40).

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)

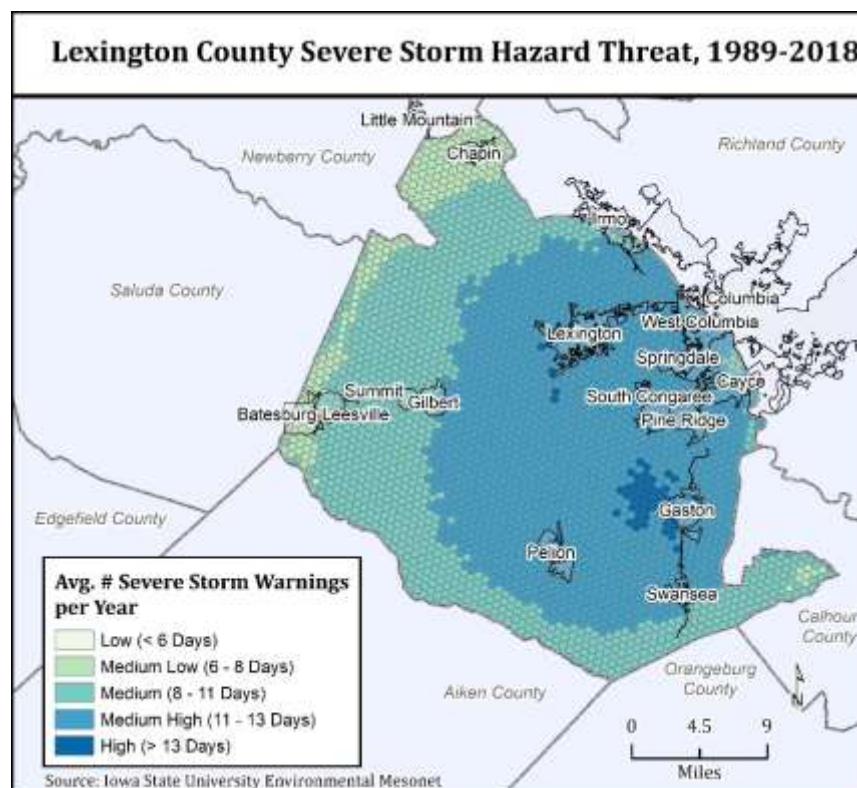


Figure 65 - Severe storm risk in Lexington County.

Table 40 - 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 Thunderstorm & 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
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,	Lightning, Rain, & Wind

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
							& Eastern SC	
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
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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
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.
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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
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 66). 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

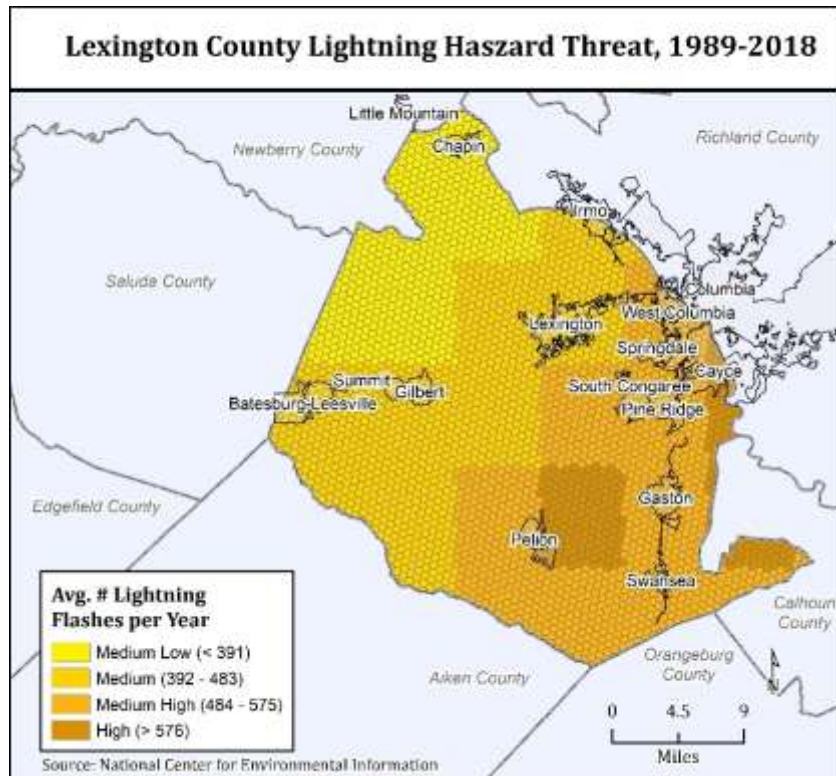


Figure 66 - Lightning threat/extent in Lexington County.

Table 41 - 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
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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
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
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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
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 67 & Table 42). 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)

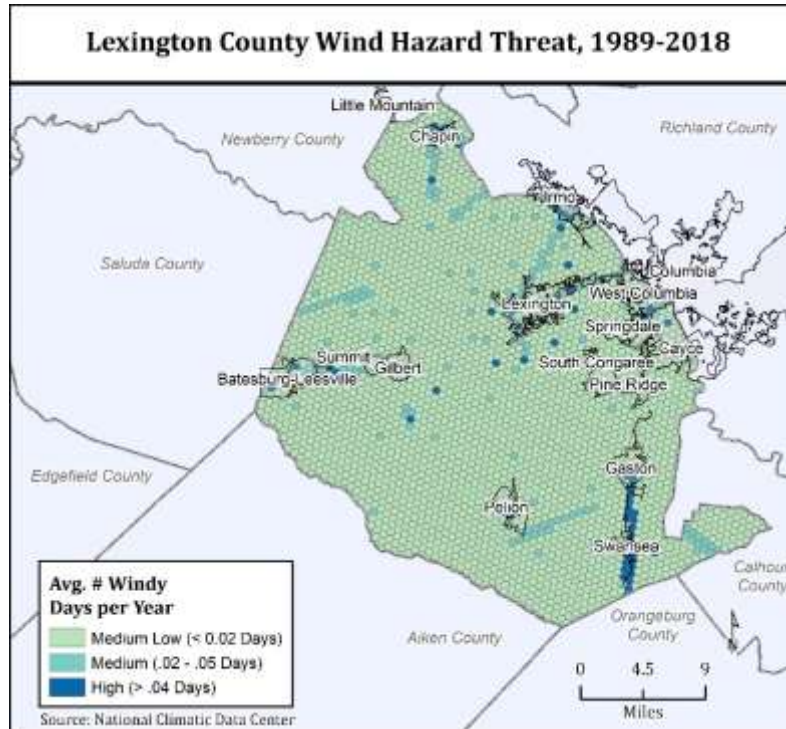


Figure 67 - Wind threat/extent in Lexington County.

Table 42 - 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 & Anderson	Wind & Lightning
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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag.(kts)*	Location	Description
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
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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag.(kts)*	Location	Description
								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	Pellon	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 storm and Oswald Lumber company.
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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag.(kts)*	Location	Description
								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.
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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag.(kts)*	Location	Description
								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.
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.

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag.(kts)*	Location	Description
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.
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.

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag.(kts)*	Location	Description
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.
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.

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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.
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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag.(kts)*	Location	Description
								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.
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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag.(kts)*	Location	Description
								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 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.

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag.(kts)*	Location	Description
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).
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 68). Hail events occur mostly during spring thunderstorms from March through May. The county has seen hailstones of up to 2.5" in diameter (Figure 69) 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)

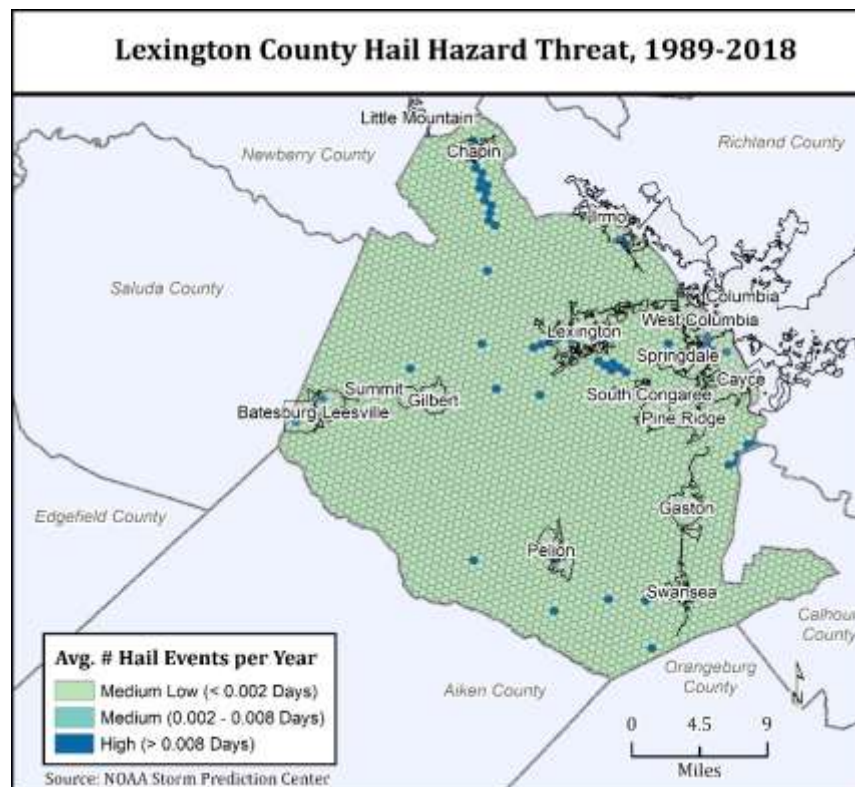


Figure 68 - Hail threat (occurrence) in Lexington County.

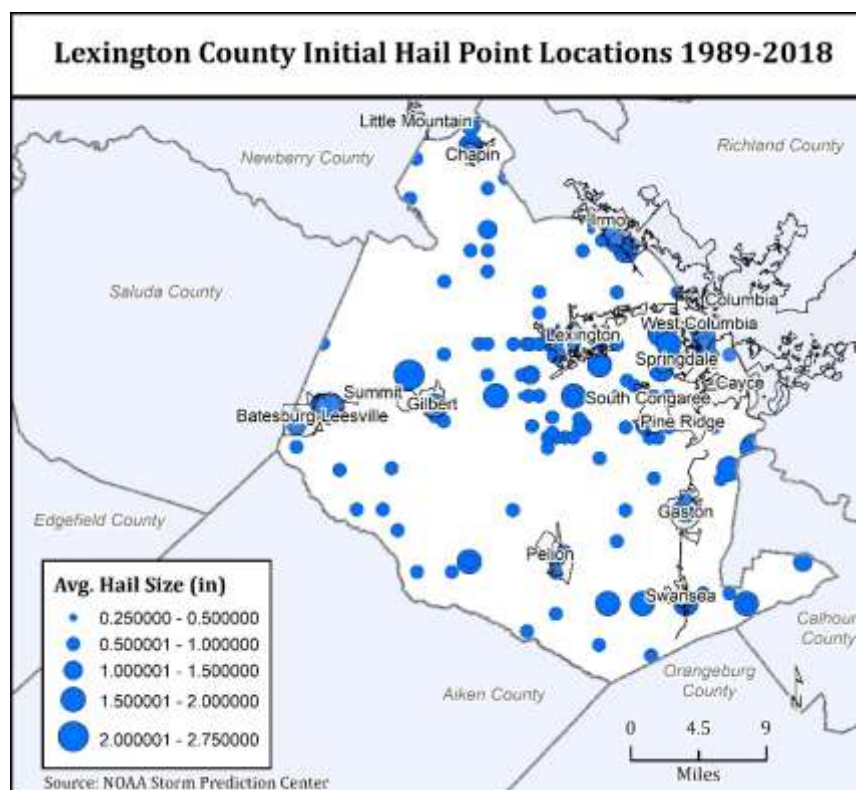


Figure 69 - Risk of large hail events in Lexington County.

Table 43 - 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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
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. Beaufort Co.	Thunderstorm Wind, Hail, & Lightning
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, Lightning, & Wind
7/25/1984	7/25/1984	0	0	\$124,713	\$1,247	1.75	Central SC	Rain, Hail, Lightning, & Wind
10/30/1984	10/30/1984	0	0	\$12,471	\$0	0.75	Columbia	Wind & Hail

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
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
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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
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	Pellion	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 days³⁷ 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 70). There is no explicit record of property damage or fatalities associated with fog as reported by 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

³⁷ A "fog day" has reduced visibility due to fog, haze, or smoke at any time of the day as indicated by NWS station data.

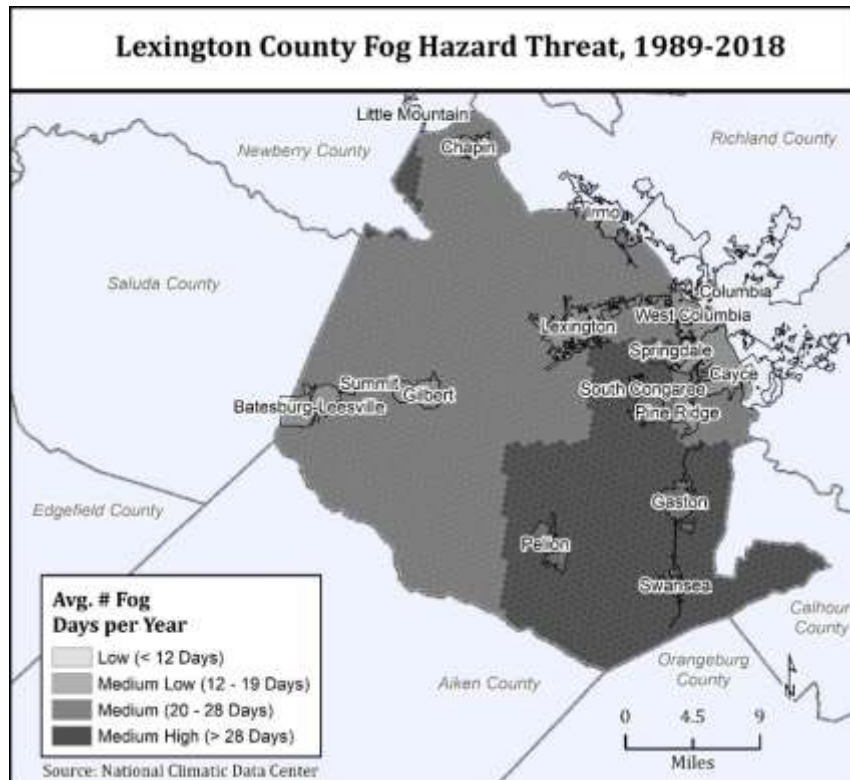


Figure 70 - Fog threat/extent in Lexington County.

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 71). Snow accumulations of 2 inches and more are uncommon, though the area has seen significant snow accumulations in the past (Table 44). Record snowfall of 16 inches occurred in 1973, and in 2010 8.6 inches were recorded in the City of Columbia³⁸. The highest daily snowfall amount was 12.3 inches (February 10, 1973)³⁹.

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 71).

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

³⁸ NWS Columbia Forecast Office, 2010. February snowfall and the record books. Available at http://www.weather.gov/cae/Snowfall_Total_Records_cor.html

³⁹ 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
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.

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.

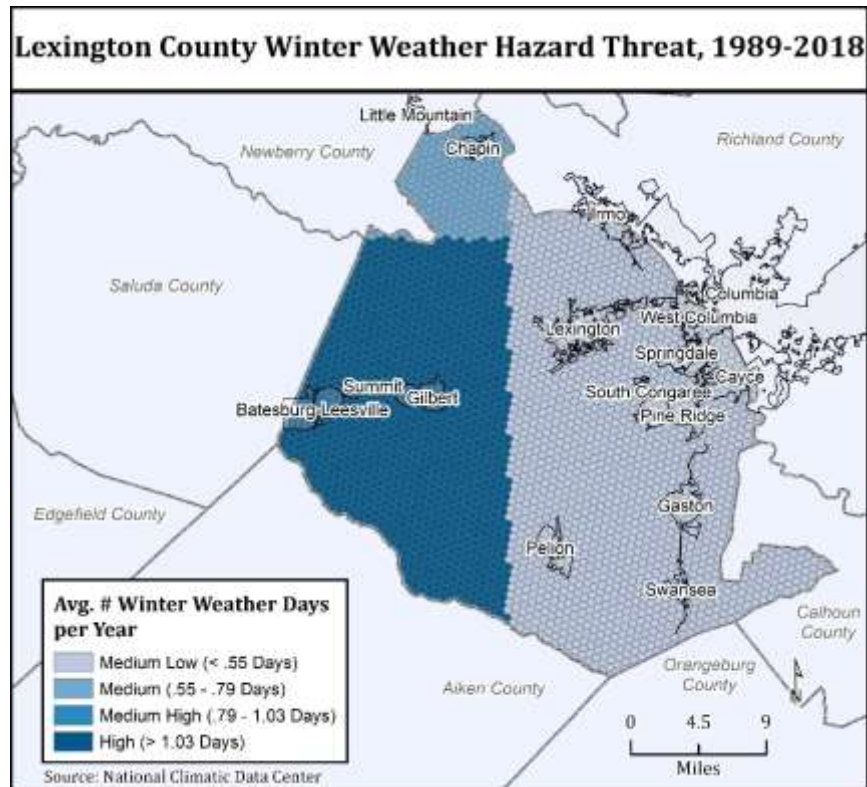


Figure 71 - Winter weather threat/extent in Lexington County.

Table 44 - 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, & 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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
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
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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.) *	Location	Description
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 72). The record minimum temperature for Lexington County was set on February 14, 1899, with -4 degrees Fahrenheit⁴⁰. 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
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)

⁴⁰ SCDNR. South Carolina record minimum temperatures and date. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/data/min_temp_table.php

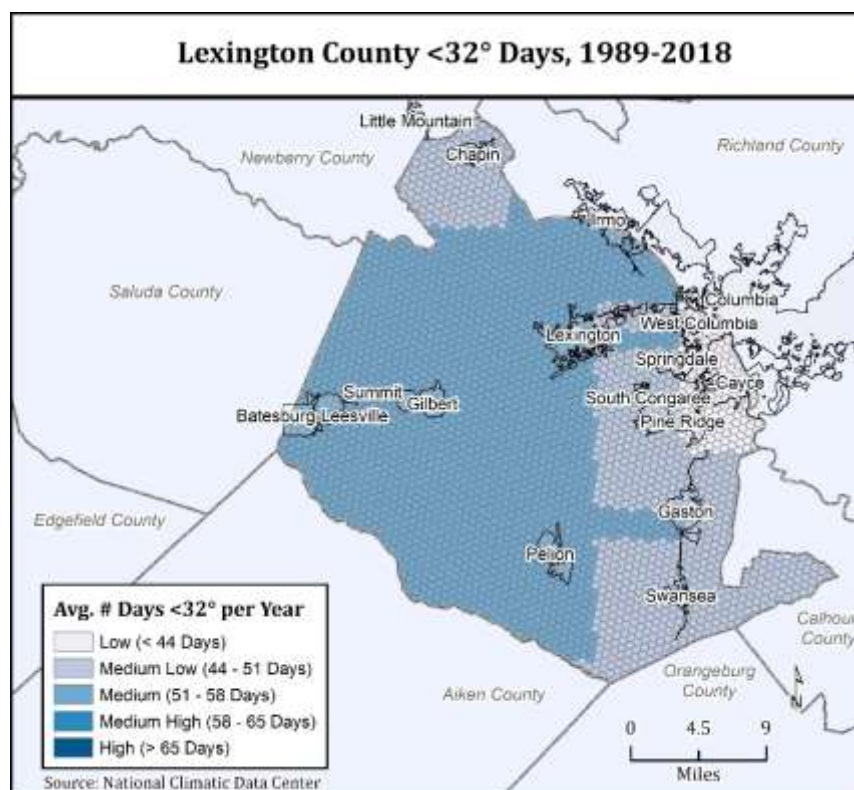


Figure 72 - Cold weather threat/extent in Lexington County.

Table 45 - 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
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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
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 73). 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)⁴¹

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

⁴¹ NWS Weather Forecast Office Columbia, SC, 2018. NOWDATA - NOAA Online Weather Data. Available at <https://w2.weather.gov/climate/xmacis.php?wfo=cae>

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)

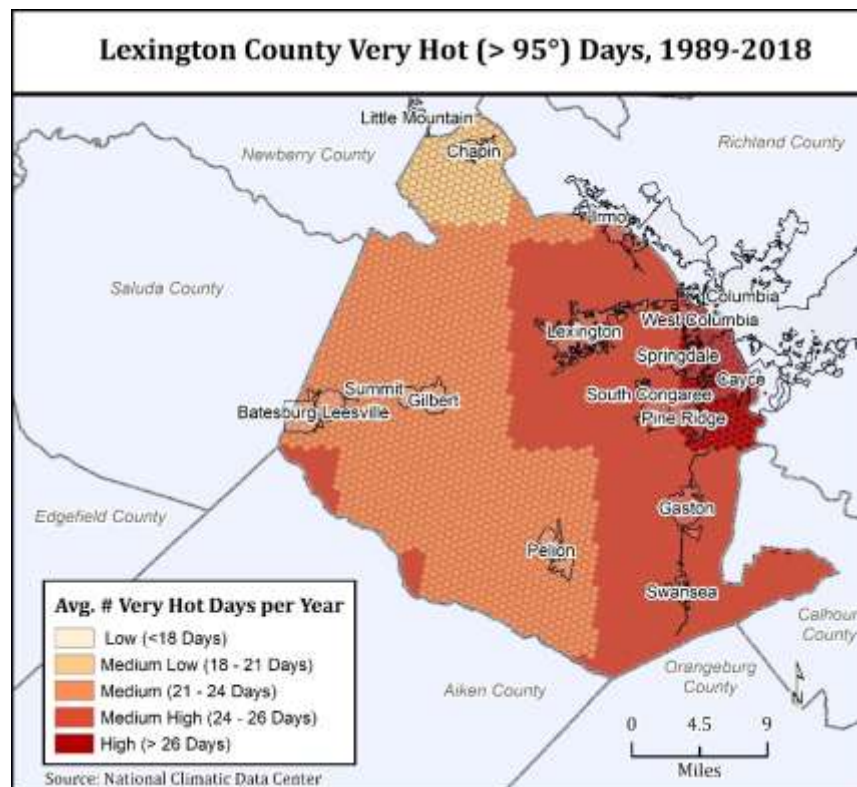


Figure 73 - Hot weather threat/extent in Lexington County.

Table 46 - 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 74). Instances of recorded property and crop damage are rare (

Table 47). However, the number of wildfire incidents has decreased significantly due to a change in the outdoor burning ordinance in 2007 (Figure 75). 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 76). 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

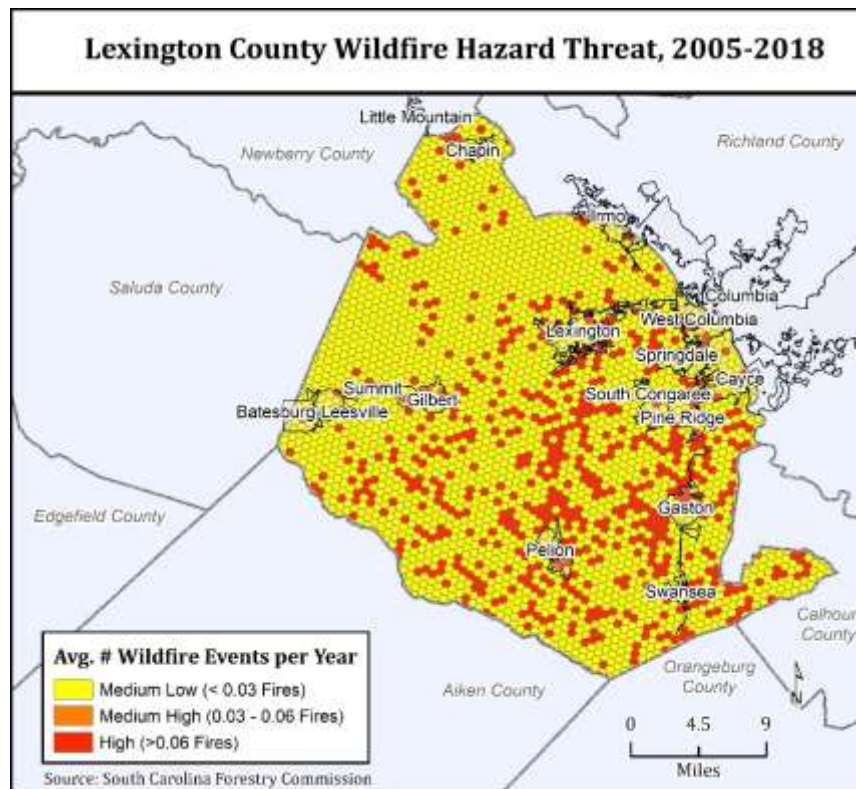


Figure 74 - Wildfire threat/extent in Lexington County based on average number of wildfires per year.

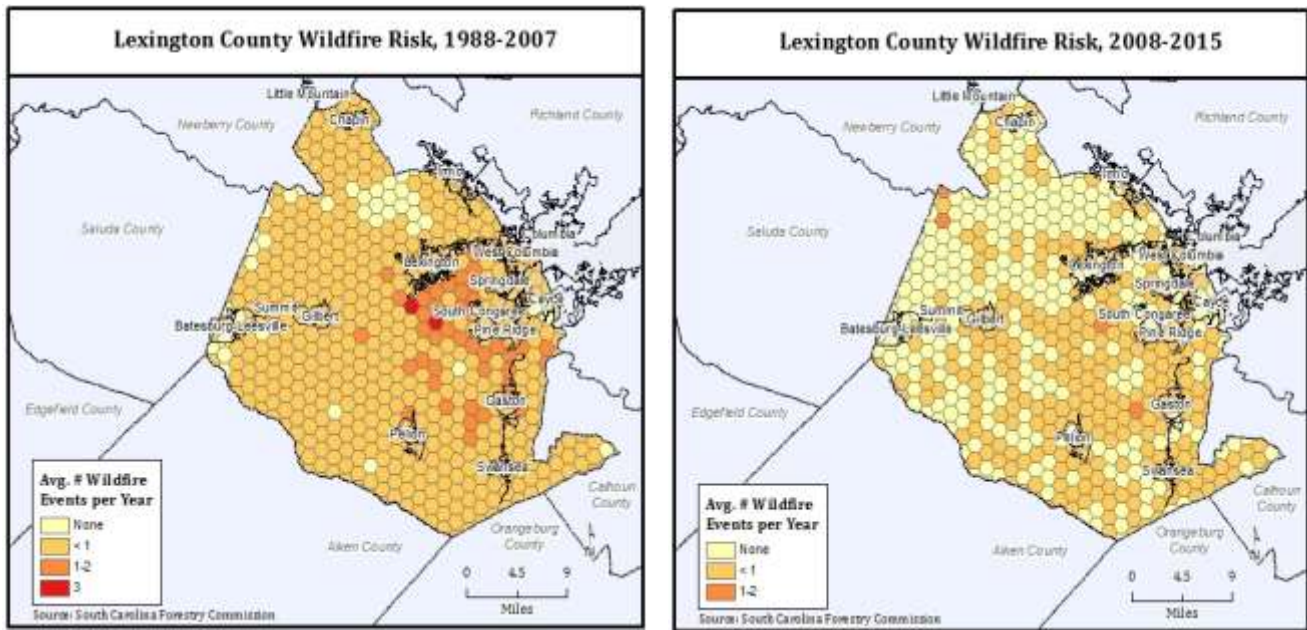


Figure 75 - Effect of changes in burn ordinance on wildfire occurrence in Lexington County.

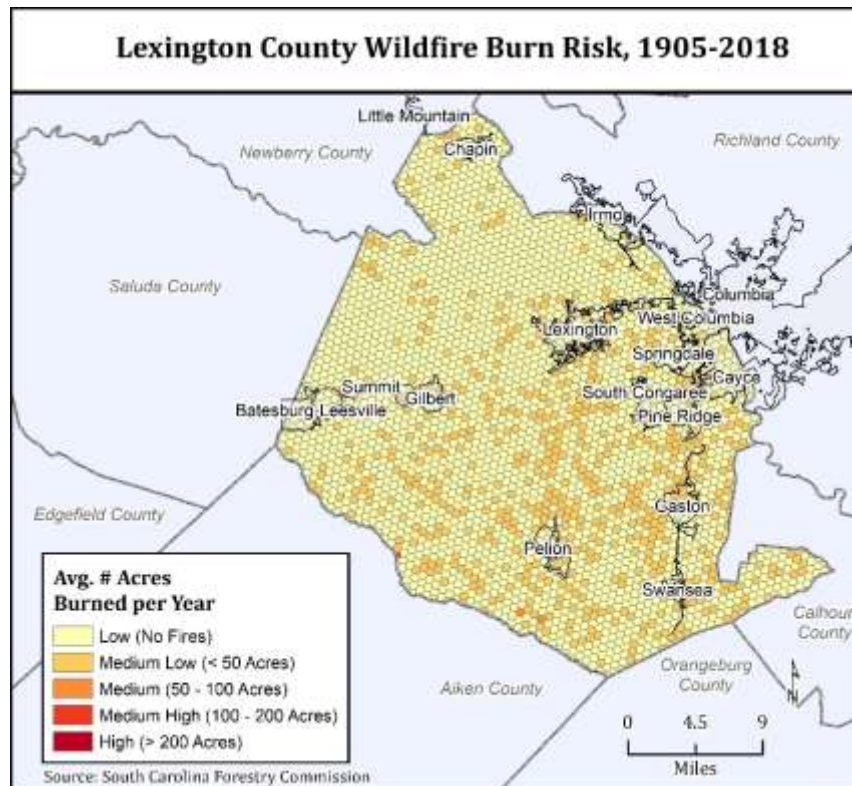


Figure 76 - Wildfire burn risk in Lexington County.

Table 47 - 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 77). 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)⁴². 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 drought 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 77).

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 fisheries⁴³. 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)

⁴² SCDNR, n/d. South Carolina County Weather Atlas. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/cli_county_statistics.php

⁴³ SCDNR, n/d. South Carolina Climate. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/cli_sc_climate.php

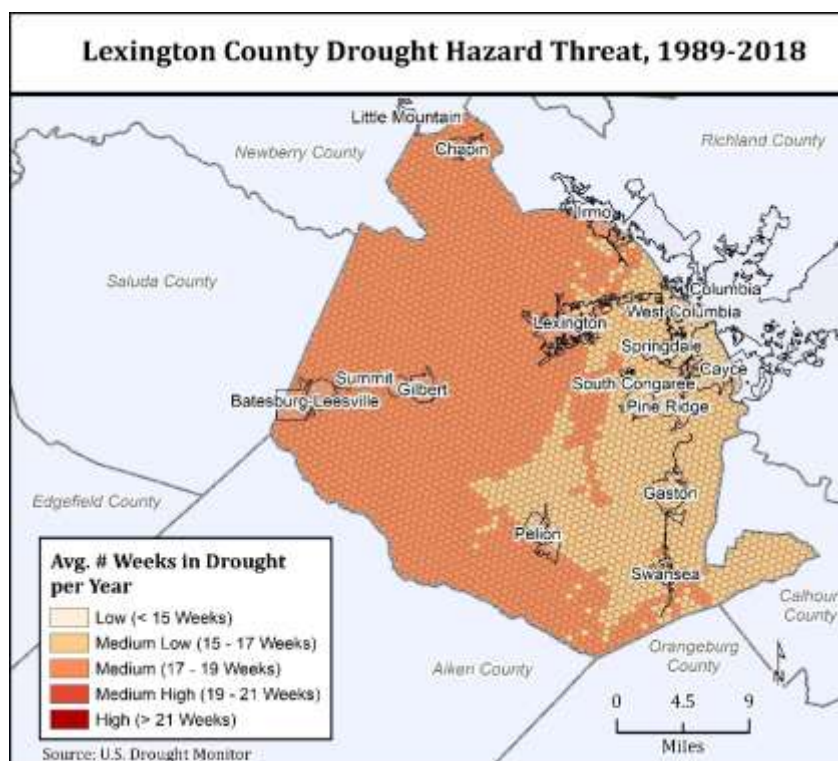


Figure 77 - Drought risk in Lexington County.

Table 48 - 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 78). 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 79).

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

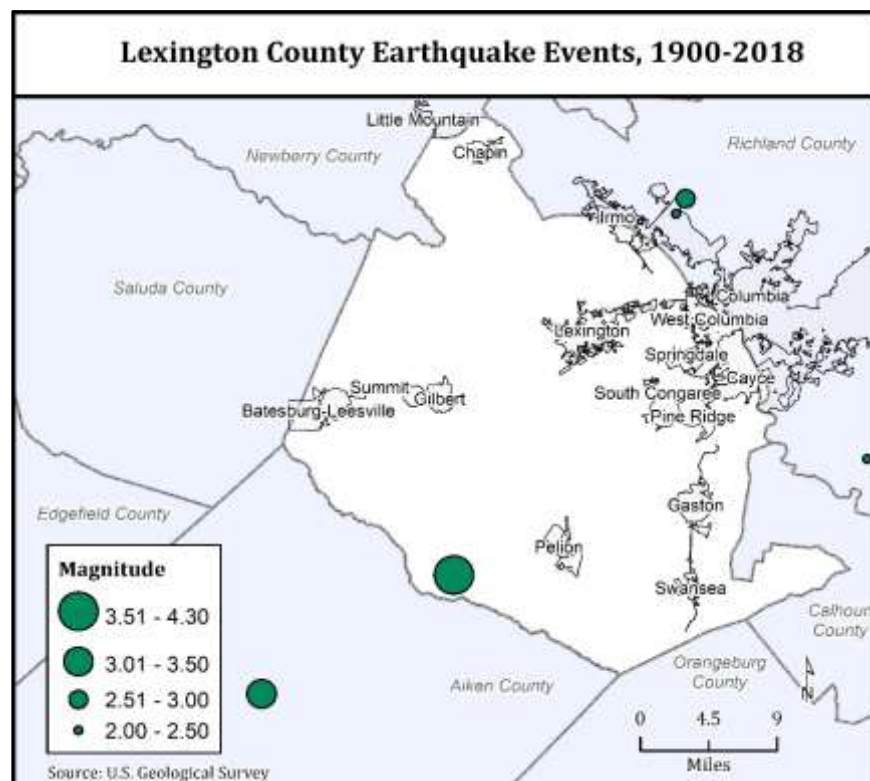


Figure 78 - Historical earthquake events in Lexington County.

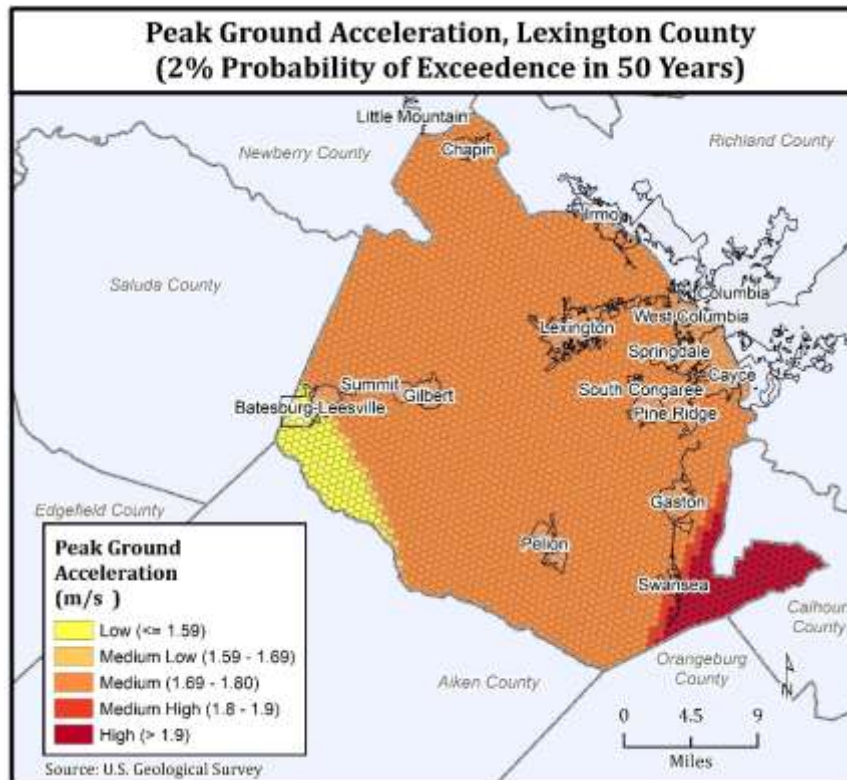


Figure 79 - Risk of shaking due to earthquakes in Lexington County.

5.2 Hazard Vulnerability Assessment for Lexington 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 infrastructure⁴⁴ 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

⁴⁴ <https://www.fema.gov/lifelines>

Vulnerability Index first developed by Cutter (2003)⁴⁵ and later refined by scholars at the University of Central Florida⁴⁶. 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.

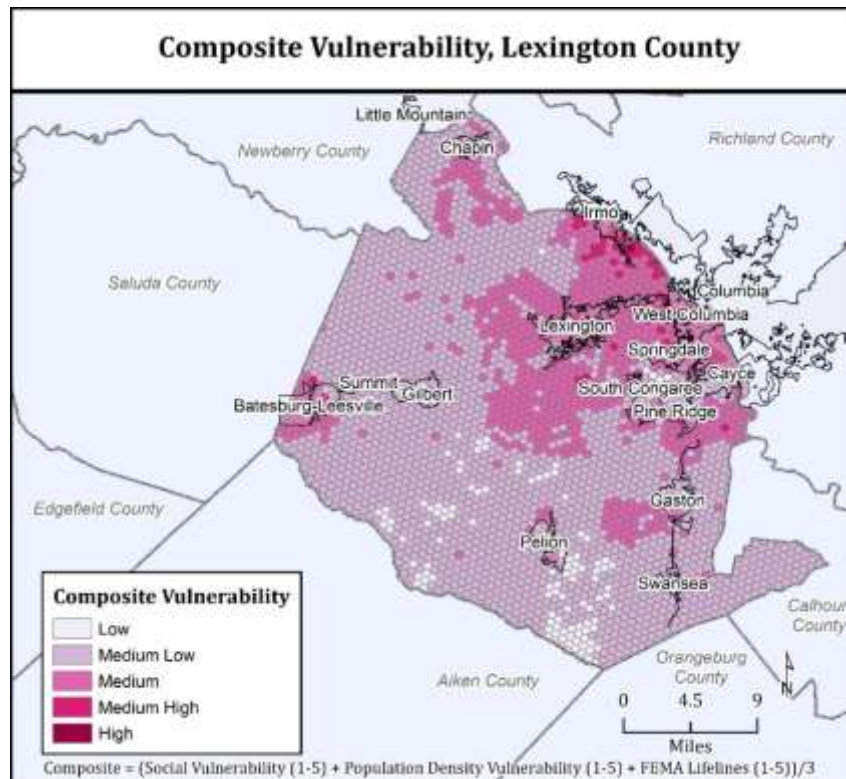


Figure 80 - Lexington County's Composite Hazard Vulnerability.

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 50). 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 49). 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 81). More information on the vulnerability assessment for each critical facility can be found in Appendix I.

⁴⁵ <https://onlinelibrary.wiley.com/doi/abs/10.1111/1540-6237.8402002>

⁴⁶ www.vulnerabilitymap.org

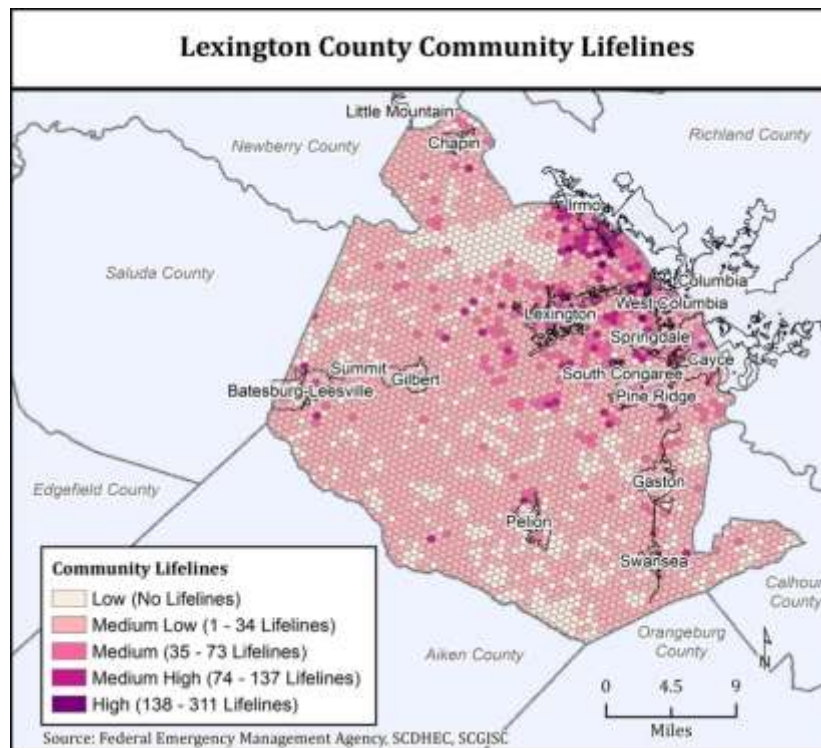


Figure 81 - Distribution of community lifelines and critical facilities in Lexington County.

Assets at risk (Table 49) were assessed using FEMA's Lifeline⁴⁷ 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 49 - 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

⁴⁷ <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 50).

Table 50 - 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 events⁴⁸, has a long conceptual and theoretical history in social and disaster science fields.⁴⁹ 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 251).

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 82). The City of West Columbia is also the most densely populated area in Lexington County (Figure 83).

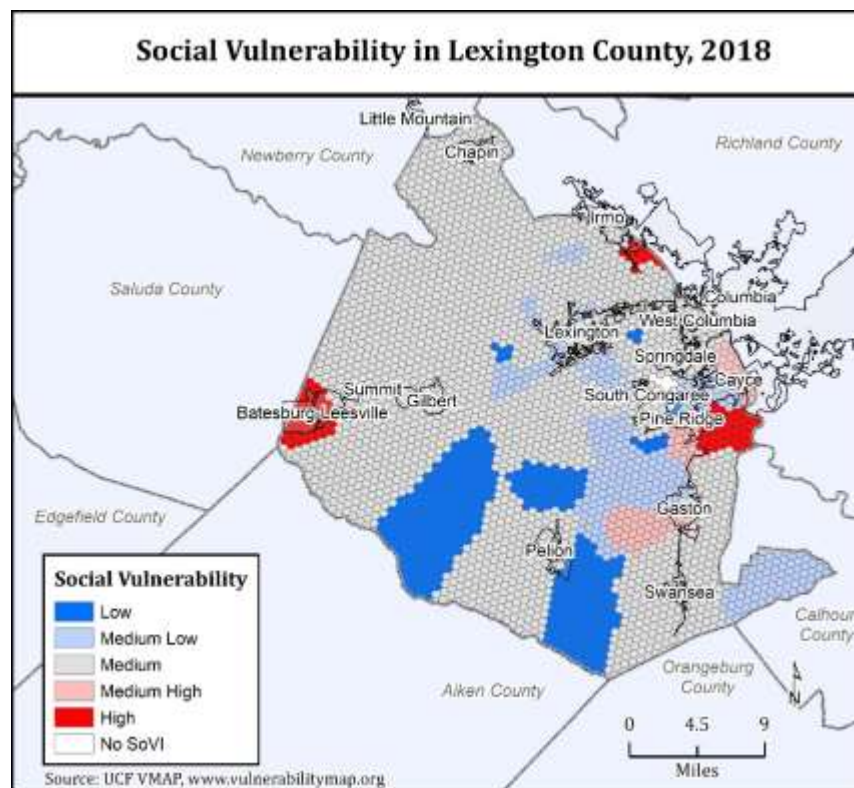


Figure 82 - Socially vulnerable tracts in Lexington County.

⁴⁸ <https://doi.org/10.1177/0002716205285515>

⁴⁹ <https://unu.edu/publications/books/measuring-vulnerability-to-natural-hazards-towards-disaster-resilient-societies-second-edition.html#overview>

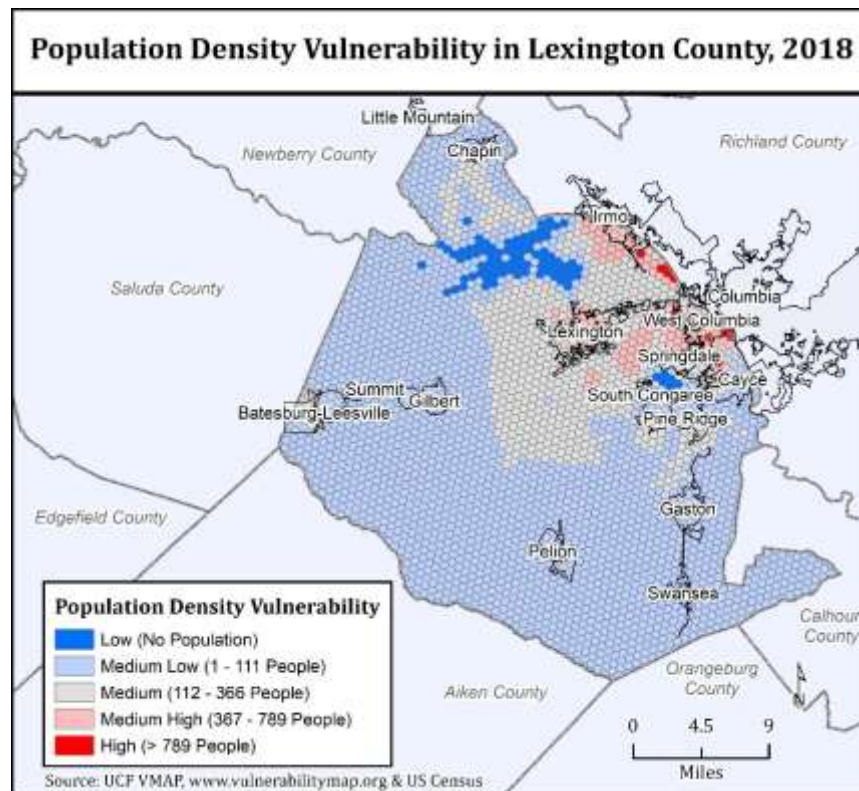


Figure 83 - Lexington County's Population Distribution.

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 51):

1. Tornado
2. Heat
3. Drought
4. Flash Flood
5. Severe Thunderstorms

Table 51 - 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 84 & 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 84). 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.

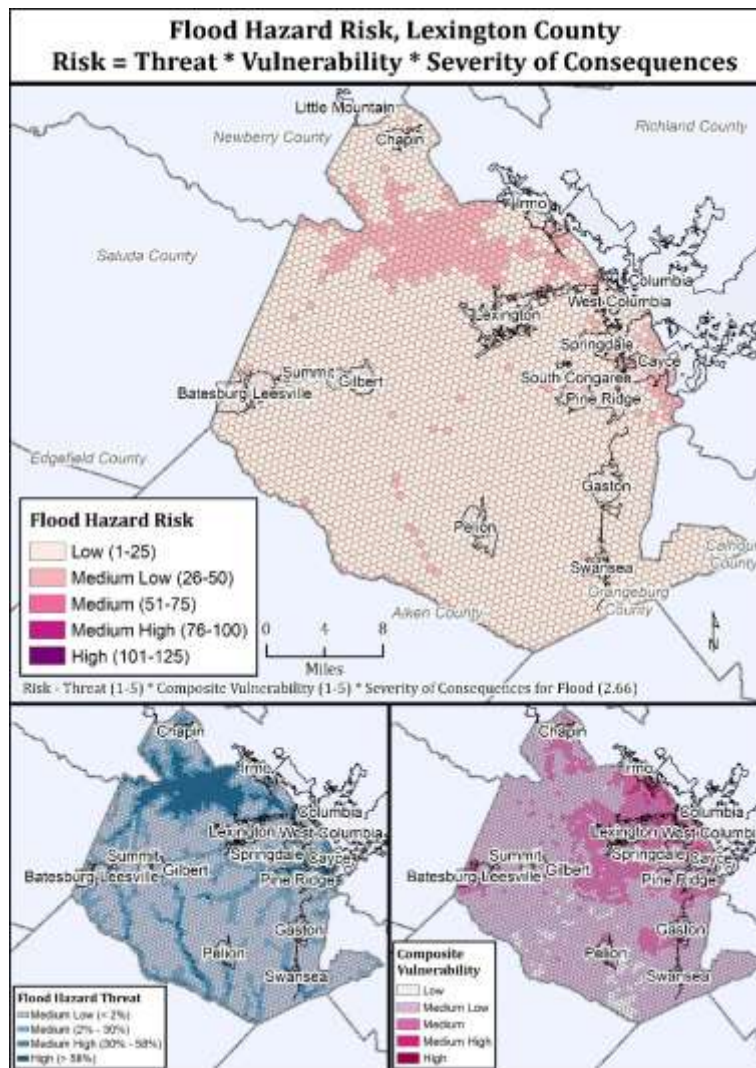


Figure 84 - Risk of riverine floods in Lexington County.

According to the HAZUS model using a 1,000-year flood scenario (0.1% annual chance of occurrence) (Figure 87), 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 87). 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 84 and Figure 87). All of these estimates were derived using HAZUS-MH 4.2. Additional city-scale maps with detailed sub-county flooding hazard extent and risk information may be found in the [Appendices](#).

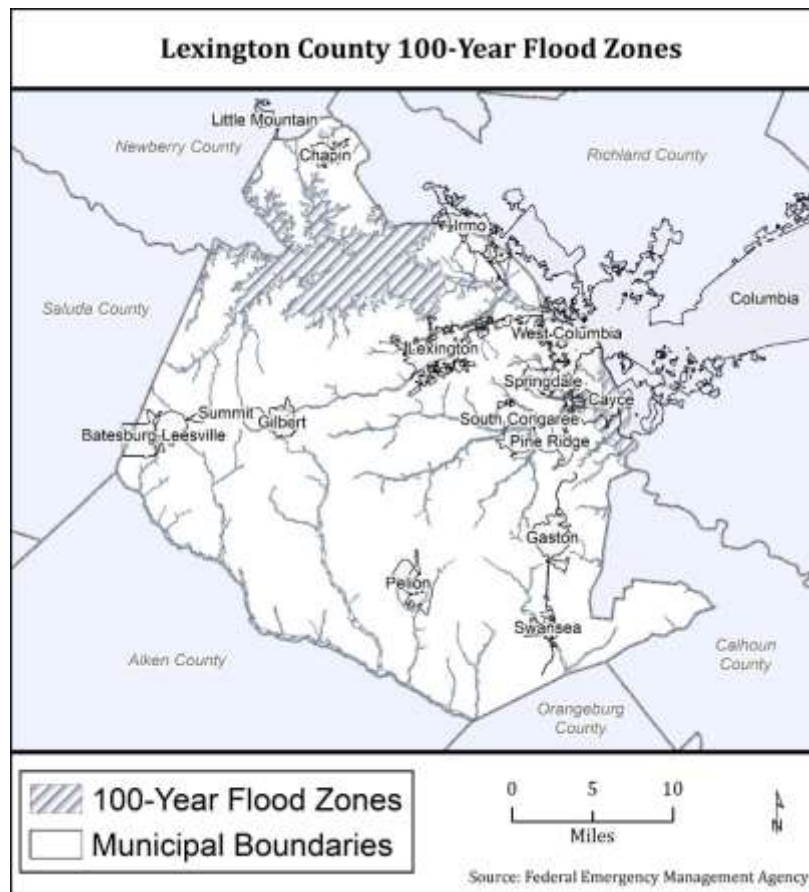


Figure 85 - Lexington County 100-Year Flood Zones

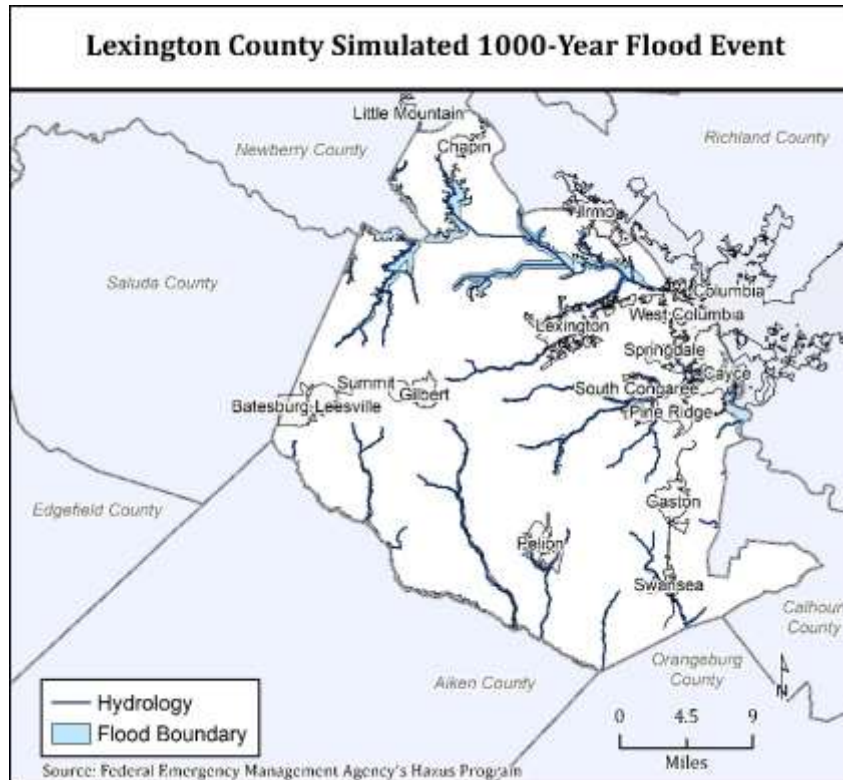


Figure 86 - Modelled 1,000-year flood event In Lexington County.

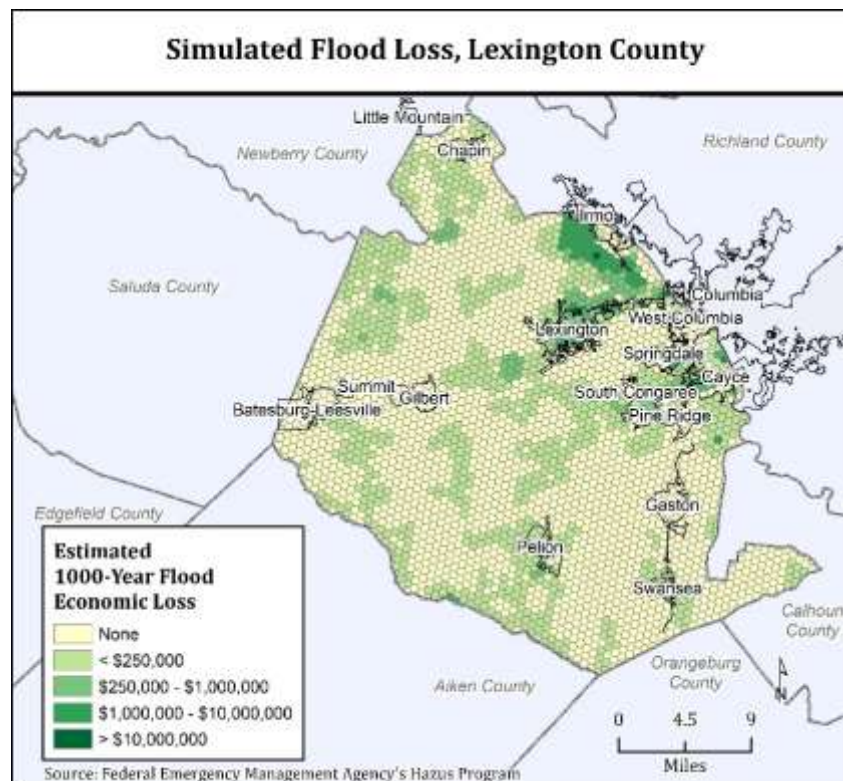


Figure 87 - Damage from a modelled 1,000-year flood event In Lexington County.

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 88). 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 88).

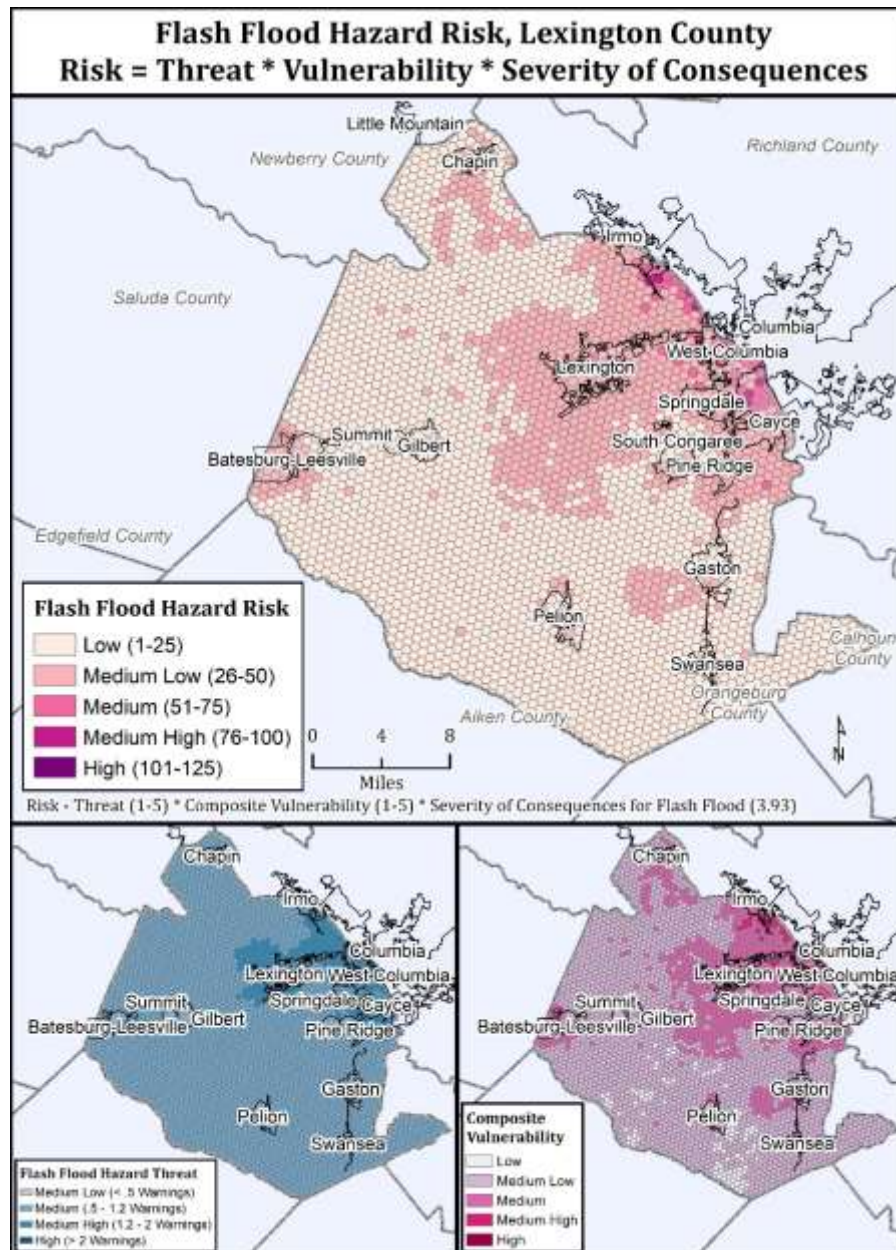


Figure 88 - Risk of flash flooding in Lexington County.

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 89). Only about 10% of critical infrastructure, building stock, and population are in this high vulnerability area (Figure 89).

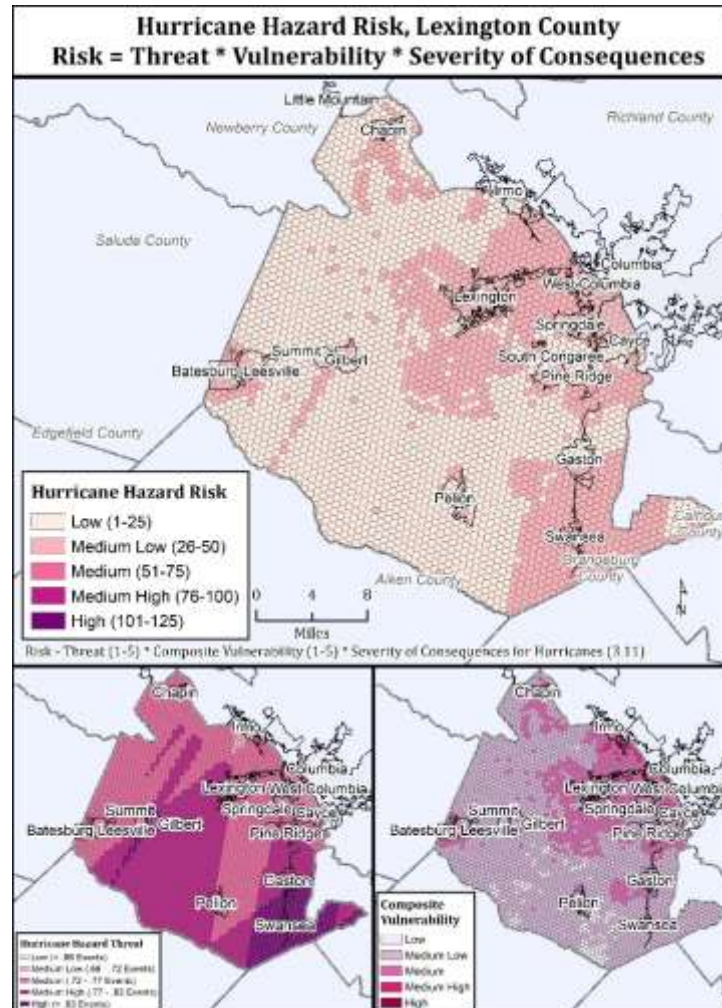


Figure 89 - Risk of tropical storms in Lexington County.

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 90). 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.

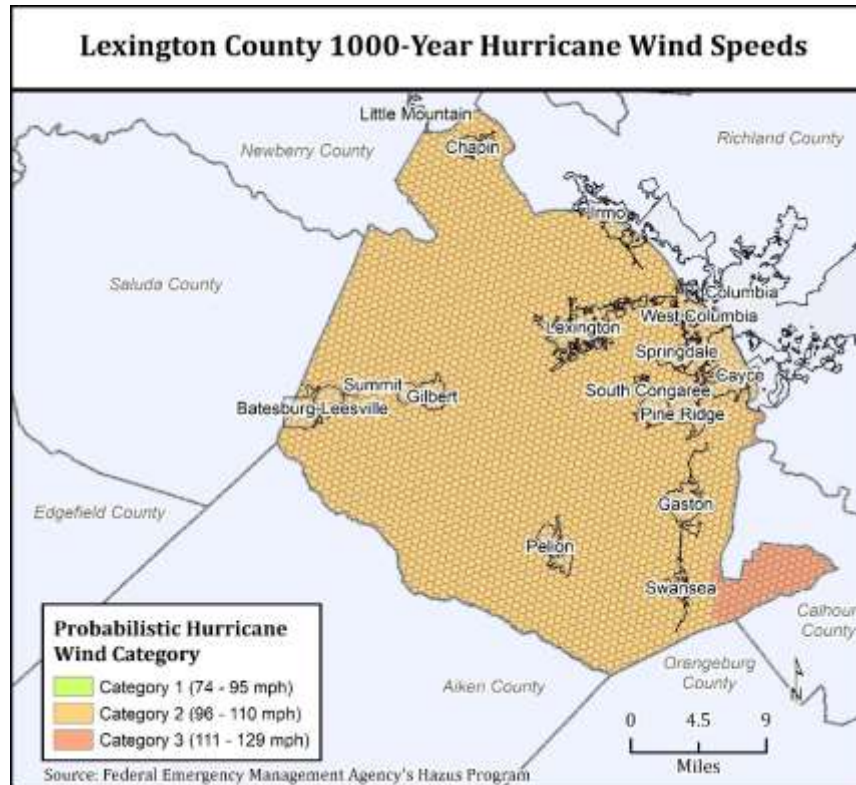


Figure 90 - Hurricane wind speeds using a 1,000-year storm event in Lexington County.

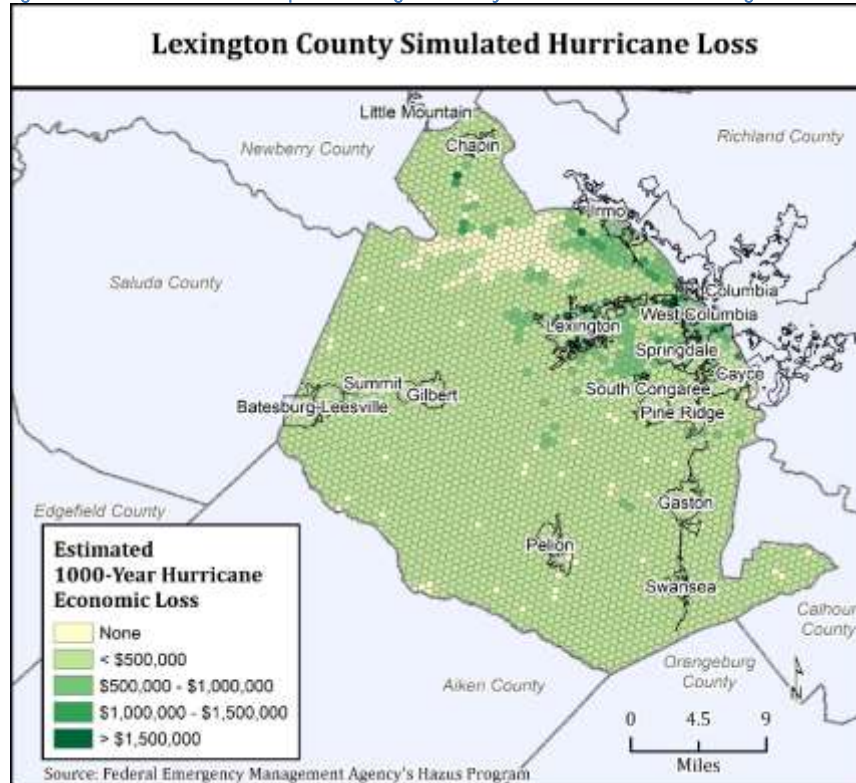


Figure 91 - Damage from a modelled 1,000-year hurricane event in Lexington County.

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 92). 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 92).

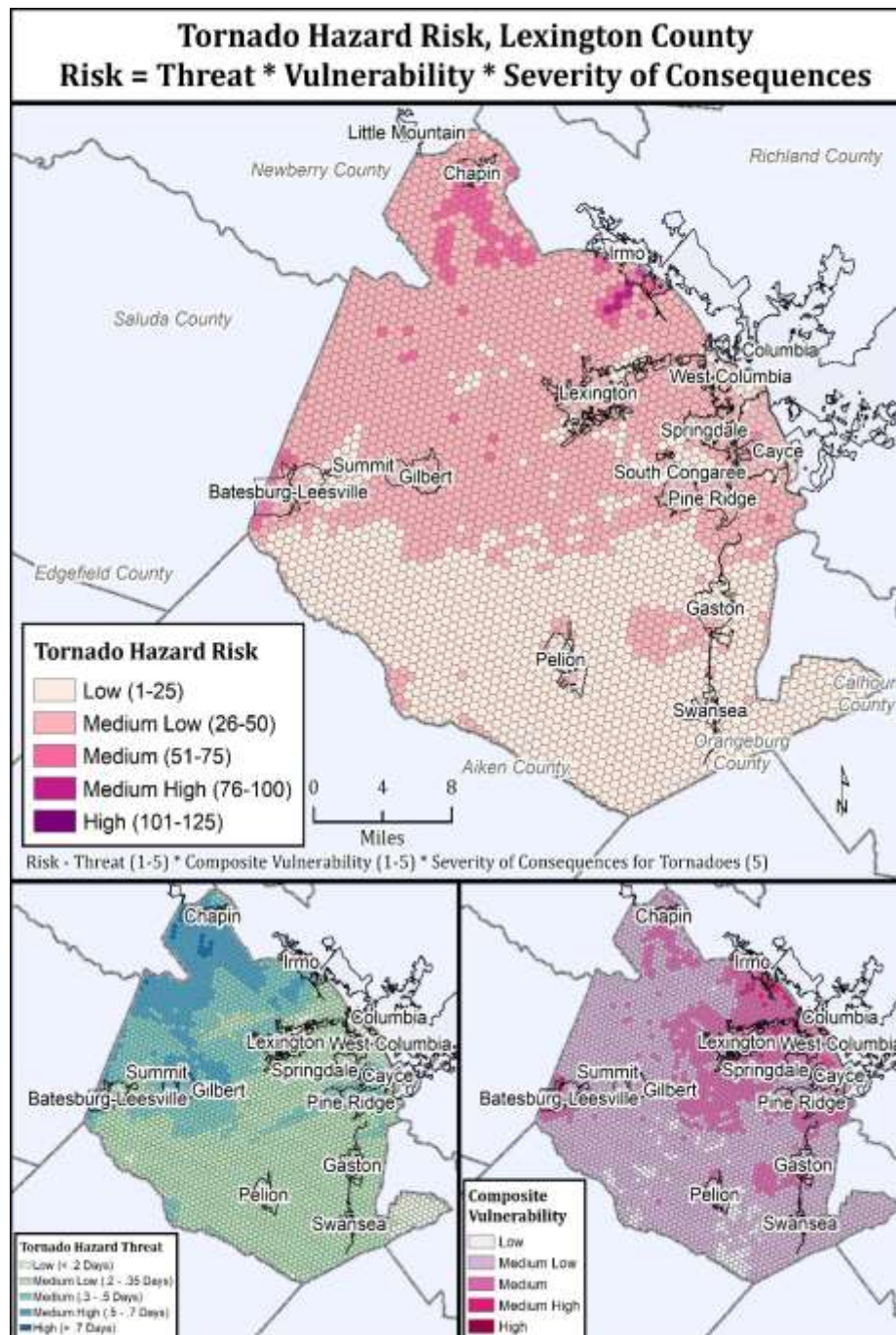


Figure 92 - Risk of tornadoes in Lexington County.

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 93). 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 93).

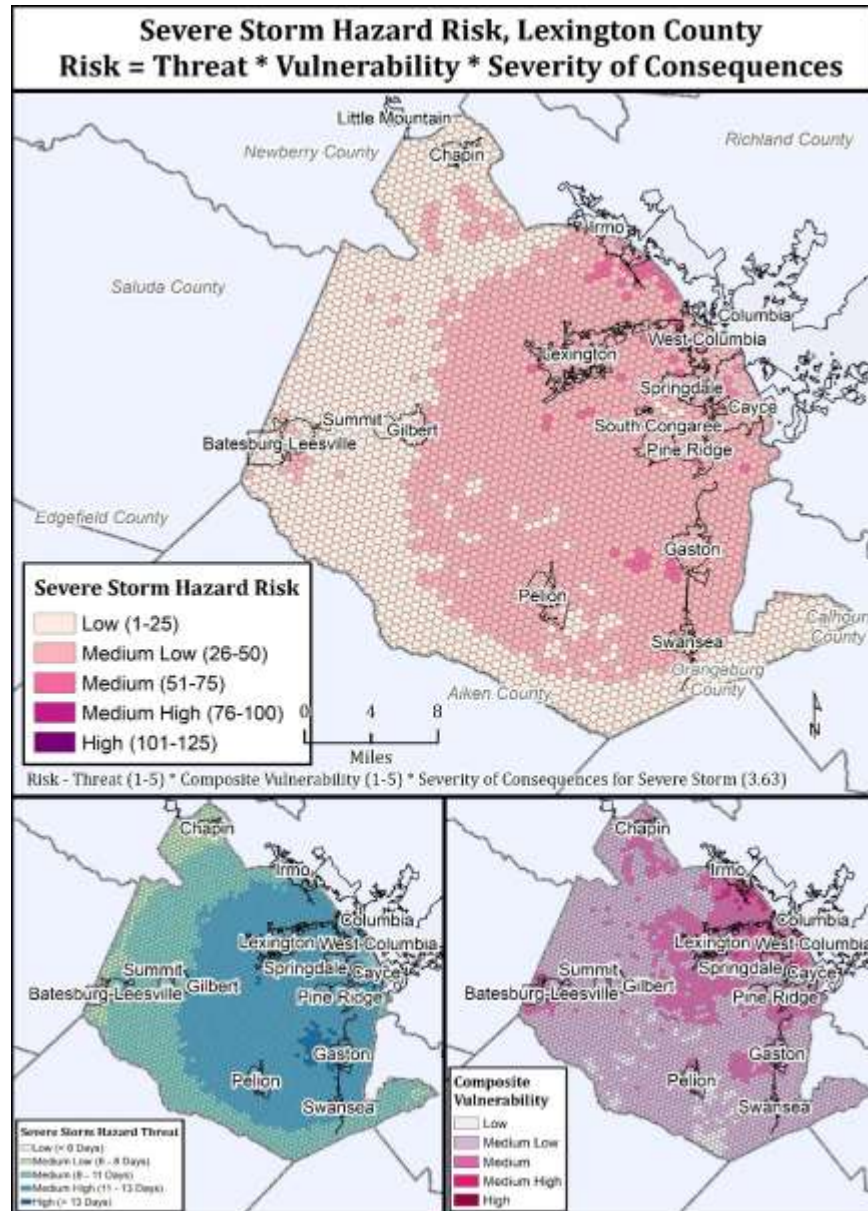


Figure 93 - Risk of severe thunderstorms in Lexington County.

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 94). 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 94).

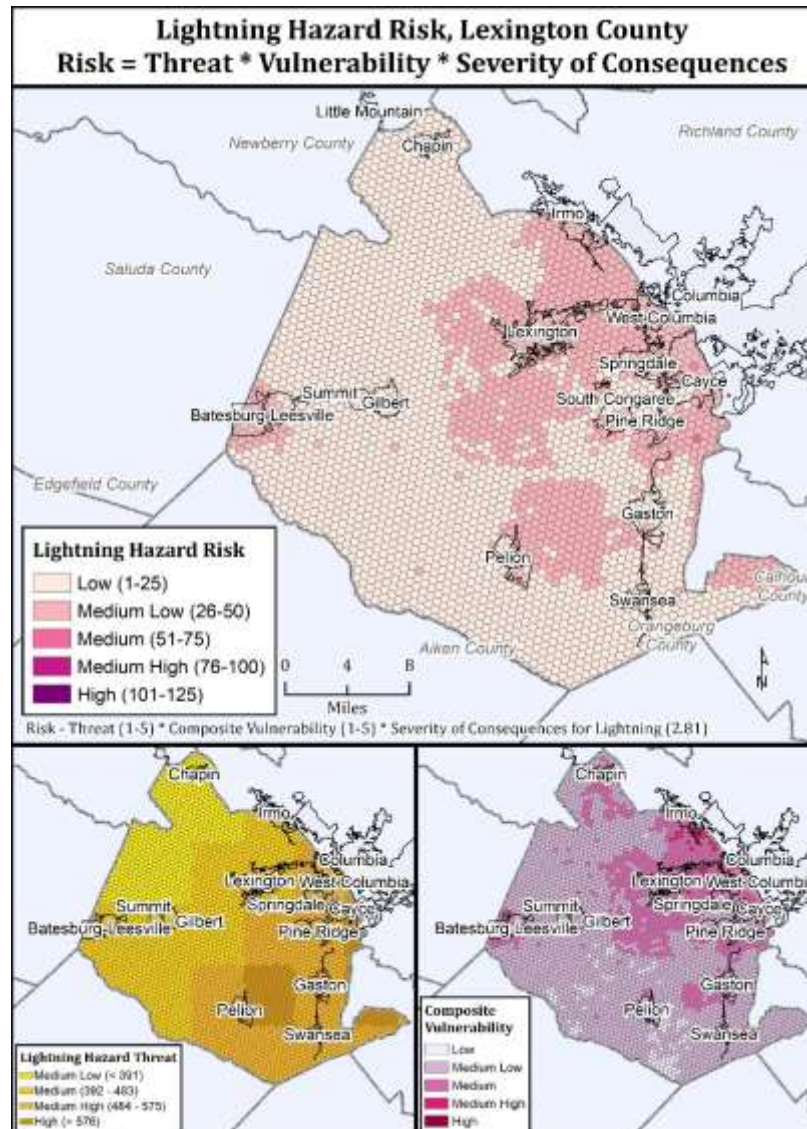


Figure 94 - Risk of Lightning in Lexington County.

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 95). 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 95). 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 95).

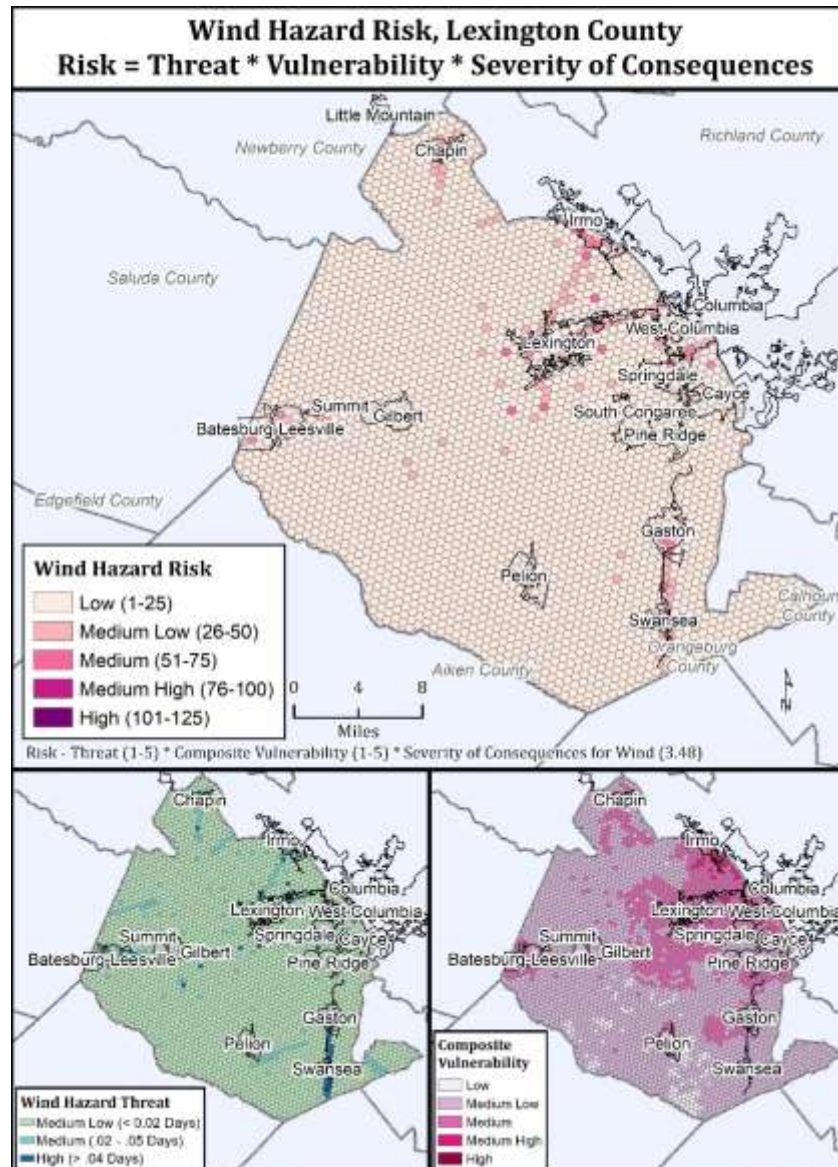


Figure 95 - Risk of high winds in Lexington County.

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 96). 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 96).

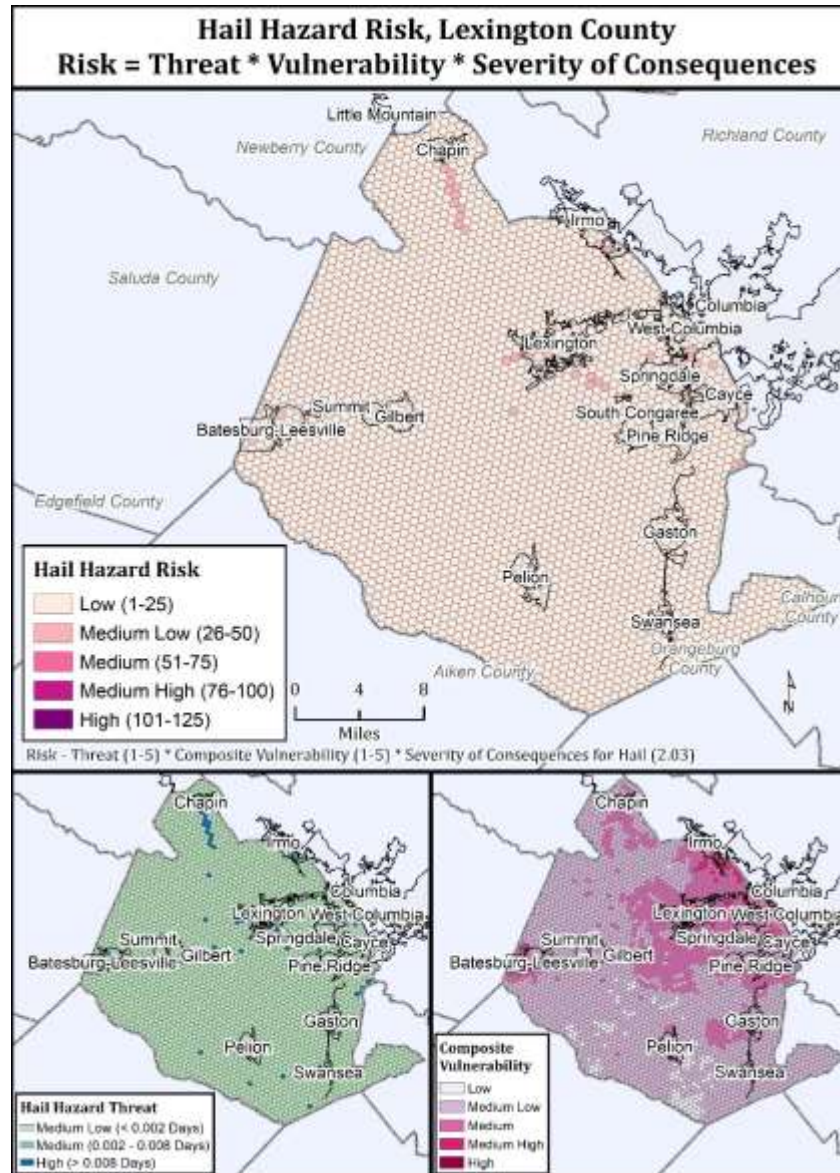


Figure 96 - Risk of hail in Lexington County.

H) Fog

The highest fog hazard threat amounts occur in southeastern Lexington County. Completely enveloping the Towns of Pelion, Gaston, Swansea, and Springdale (Figure 97). 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 97). 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 97).

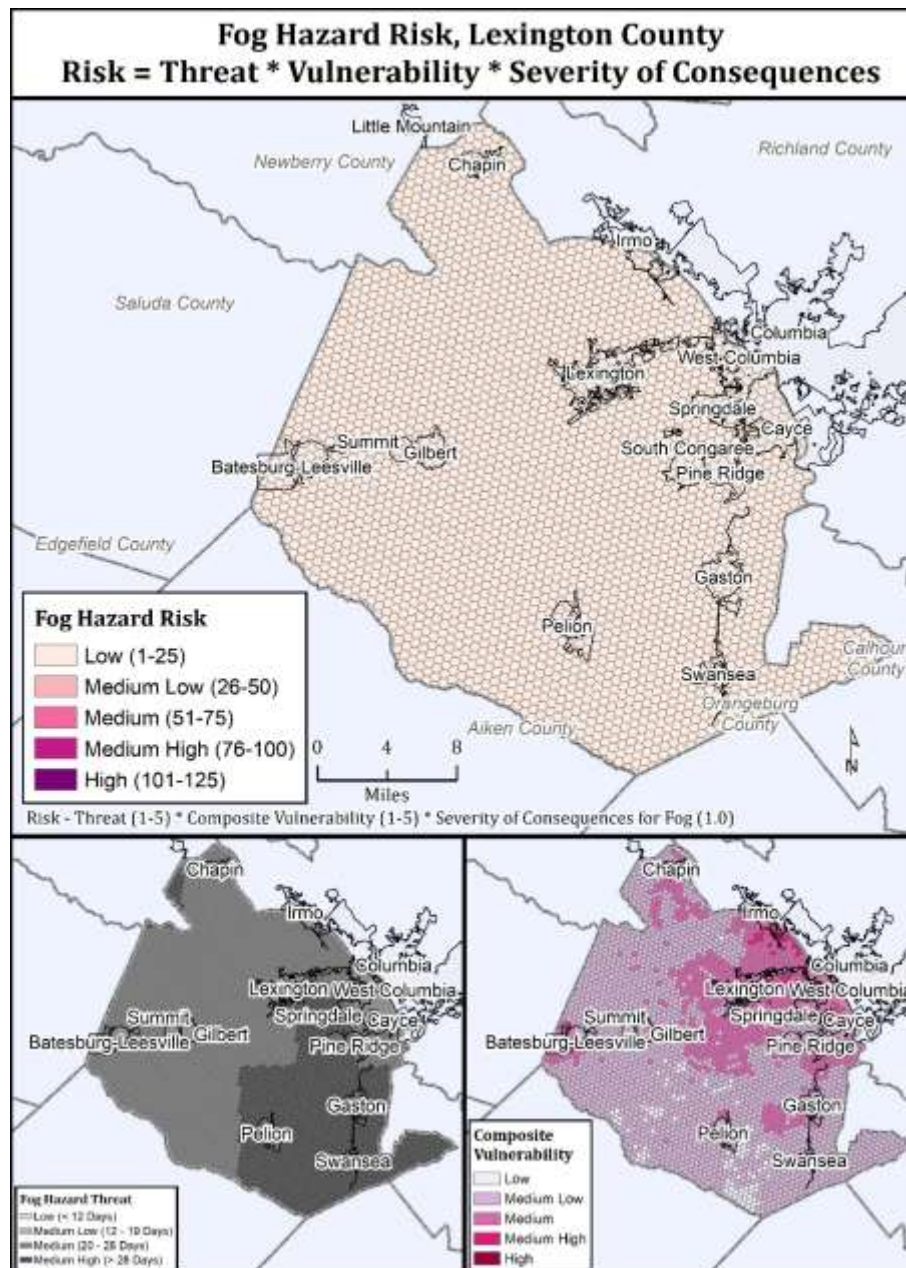
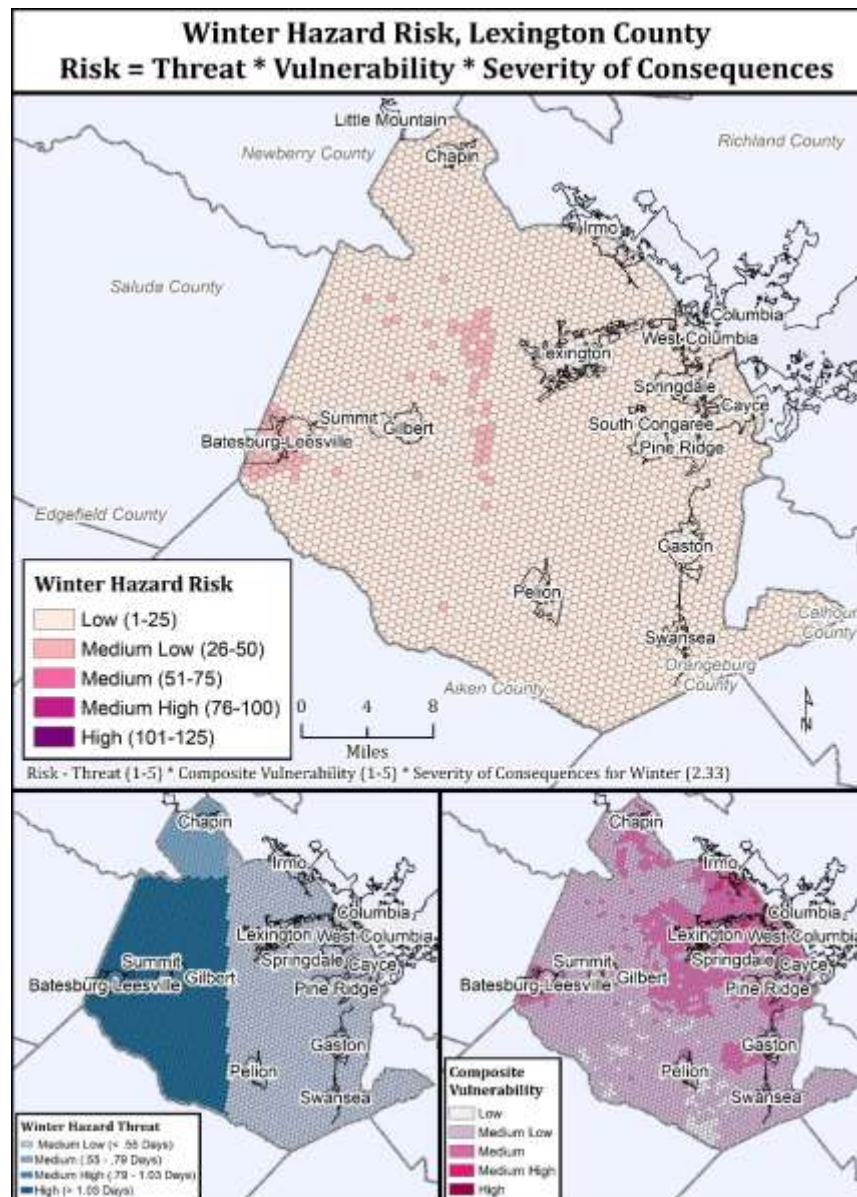


Figure 97 - Risk of fog in Lexington County.

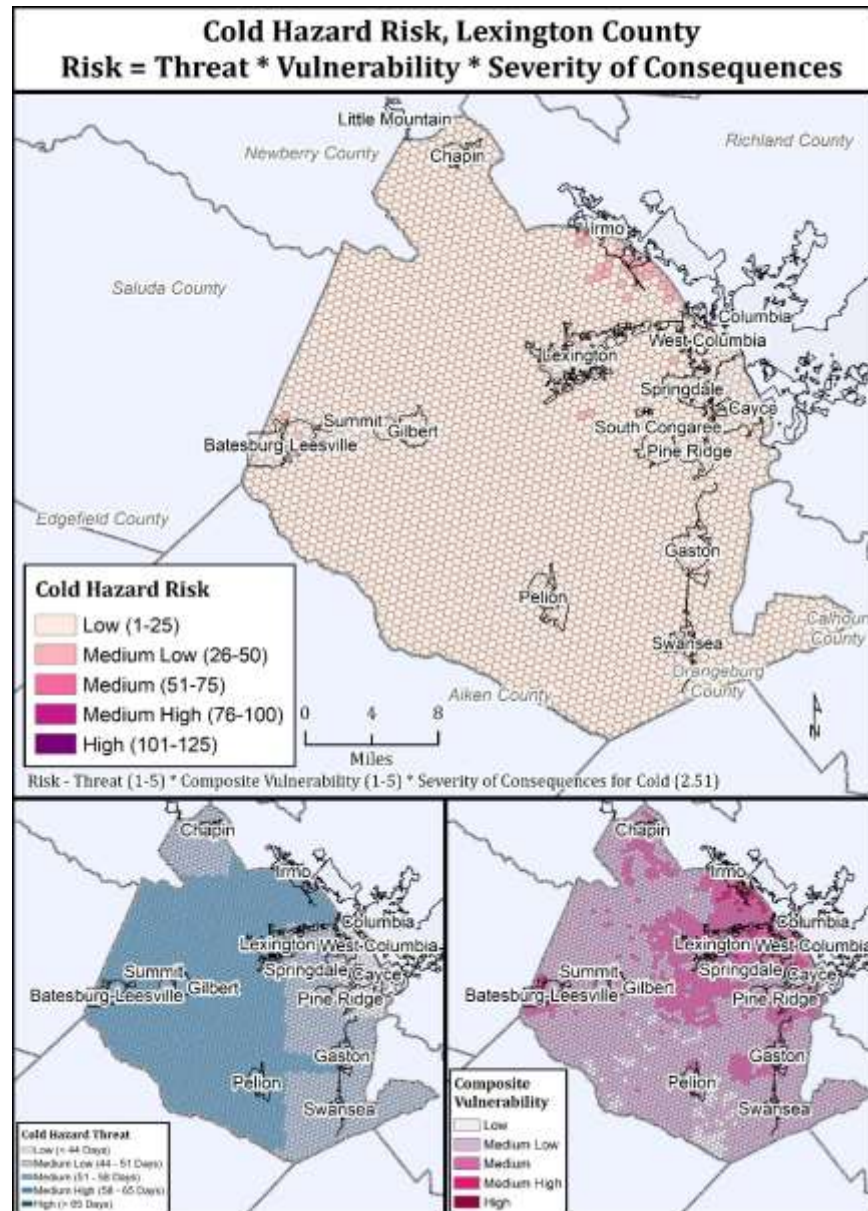
I) Winter Weather & Ice Storms

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 98). 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 98).



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 99). 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 99). This results in very few areas with higher than low cold hazard risk scores, including the area around Irmo and below Lexington (Figure 99).



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 100). 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 100). The rest of the county excluding Chapin experiences at least a medium-low risk score.

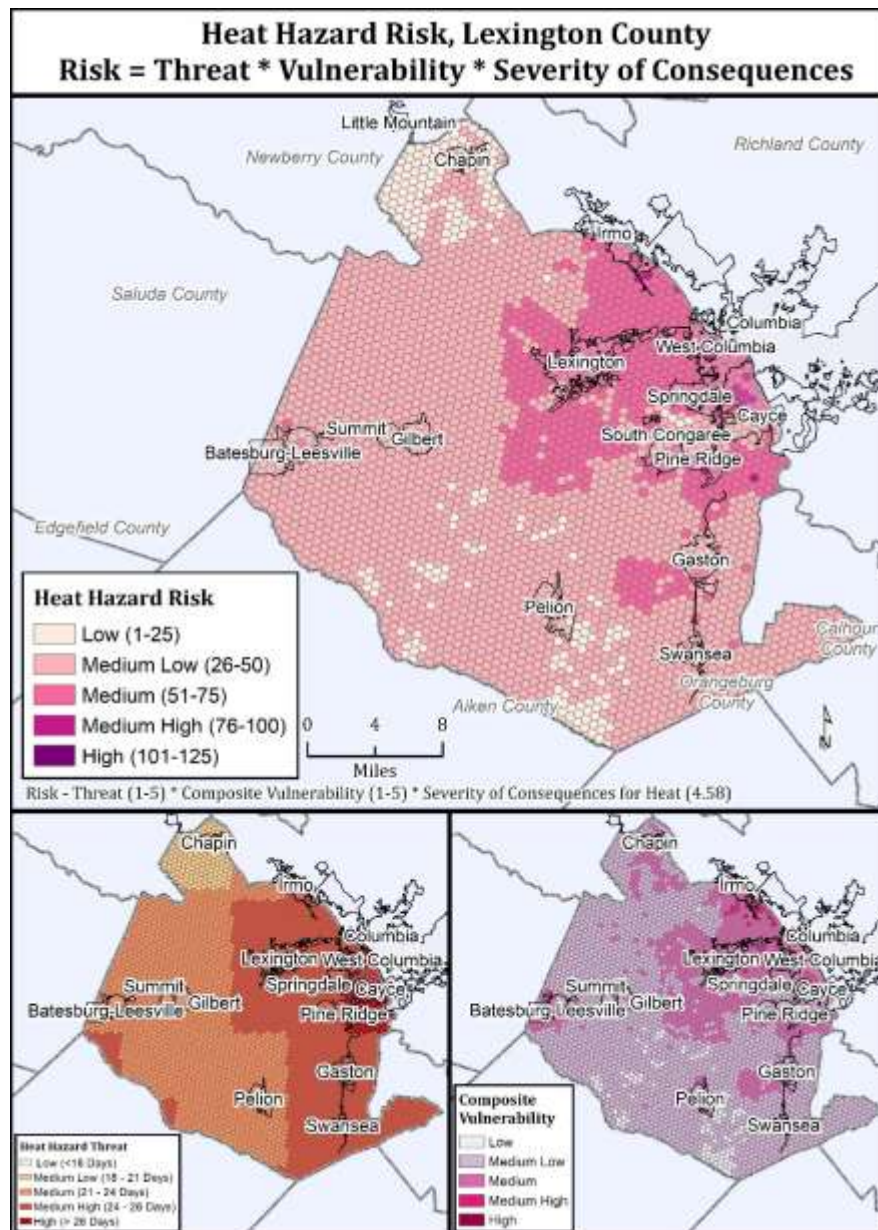
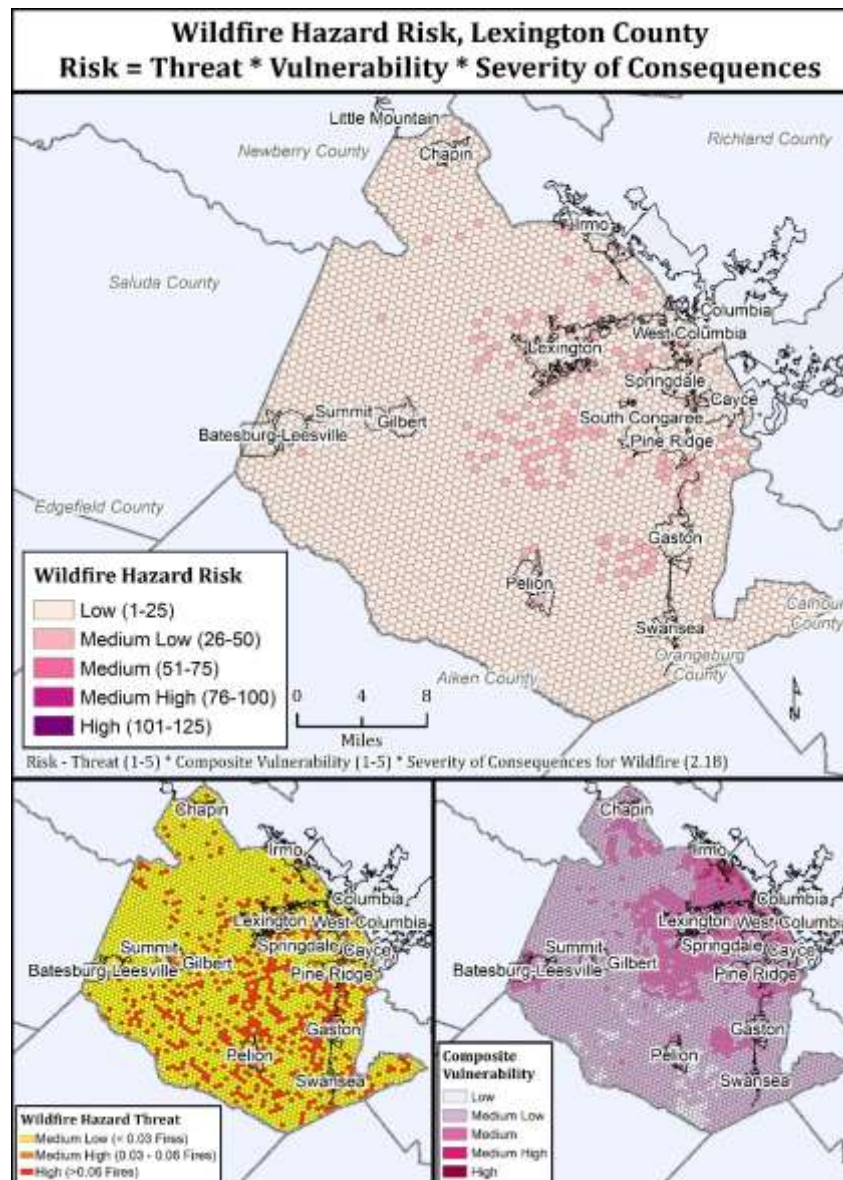


Figure 100 - Risk of hot weather in Lexington County.

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 101). 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 101).



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 102). 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 102). 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 102).

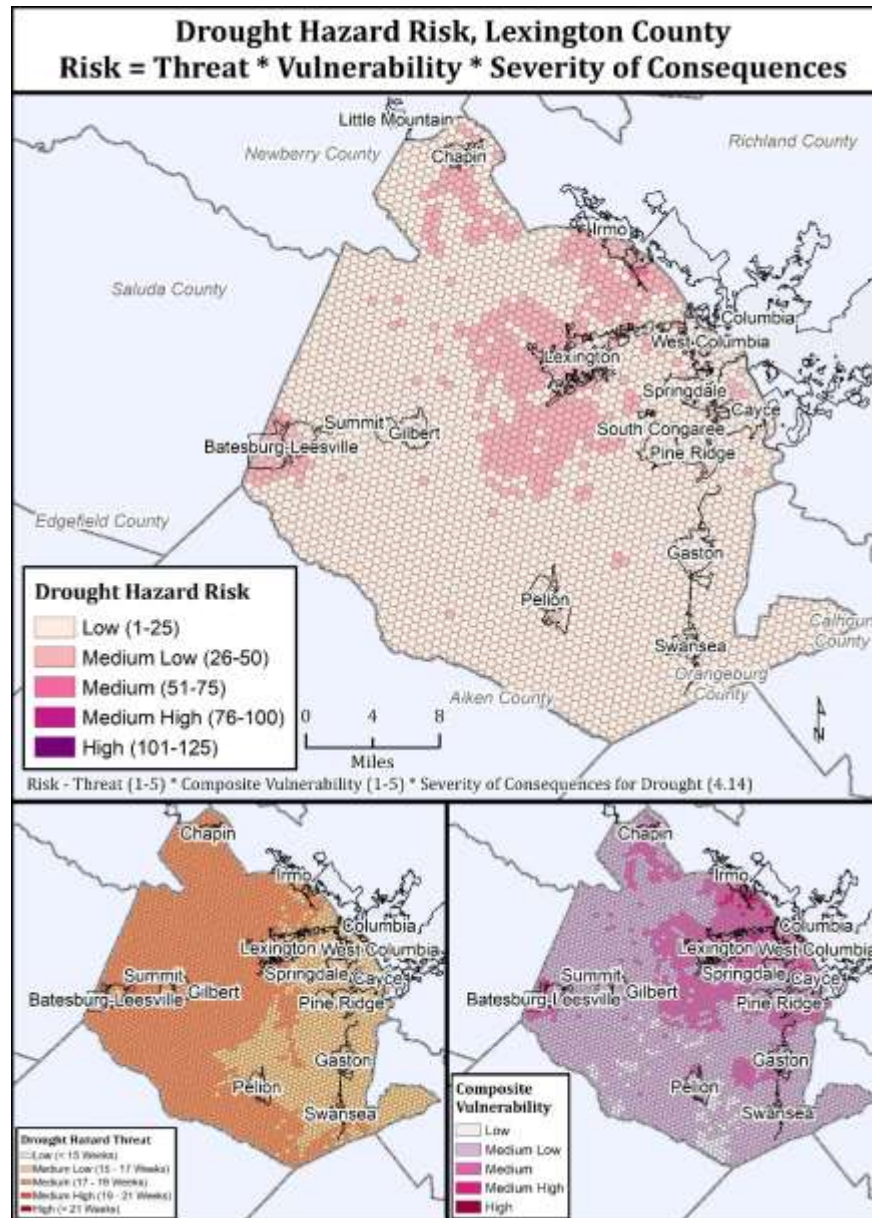


Figure 102 - Risk of drought In Lexington County.

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 103). 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 103).

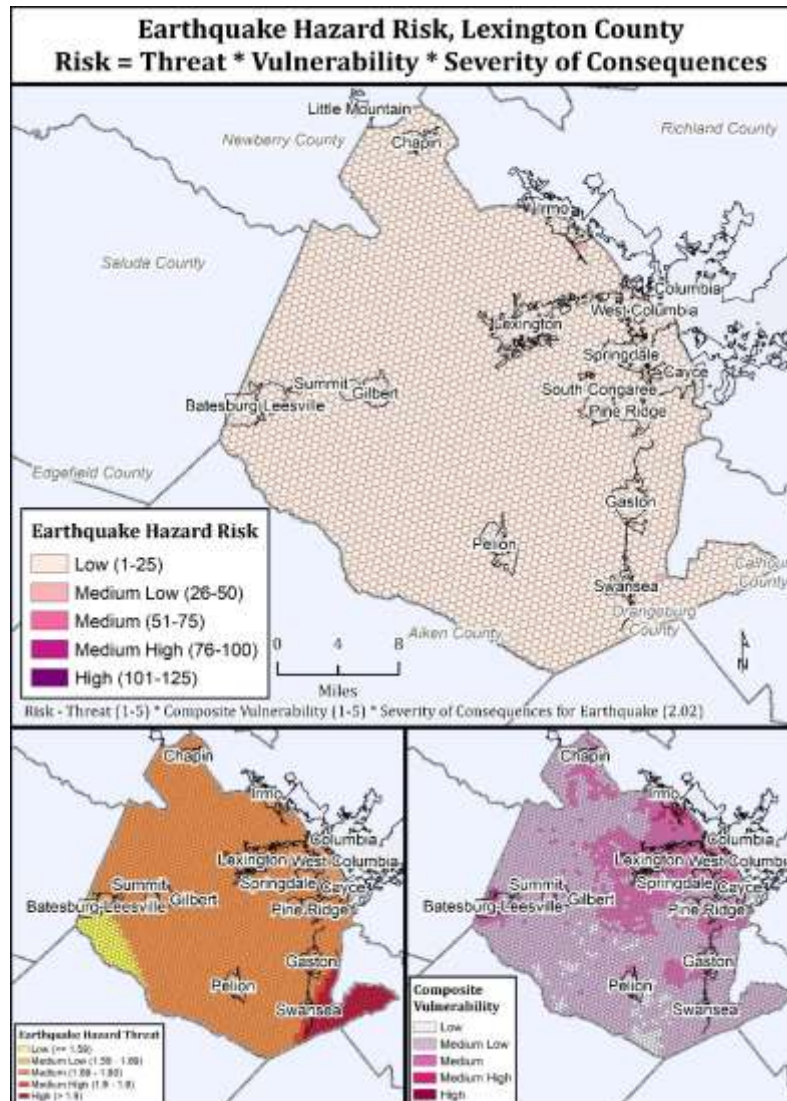


Figure 103 - Risk of earthquakes in Lexington County.

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)⁵⁰. If the 1886 Charleston earthquake were to occur today (Figure 105), 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

⁵⁰ 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 105). 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 104). All estimates were derived using HAZUS-MH 2.2.

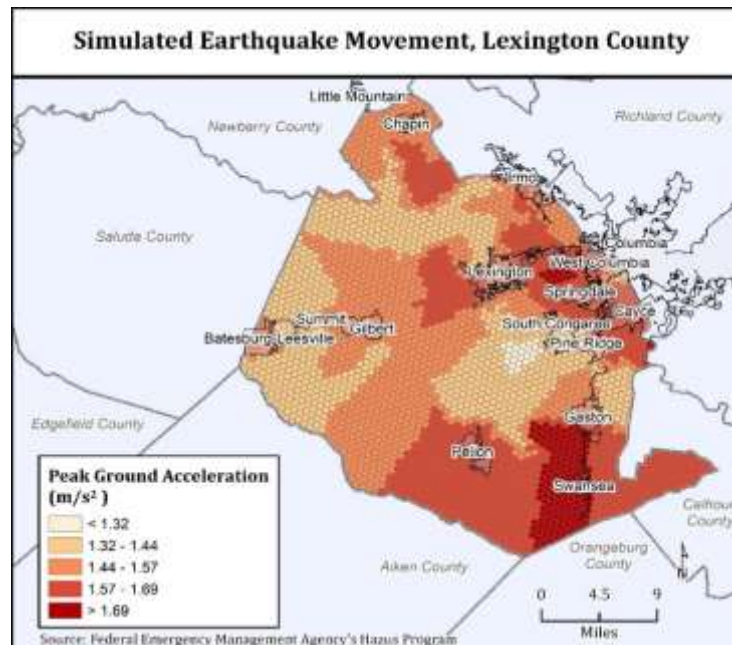


Figure 104 - Peak ground acceleration in Lexington County from a modelled 6.8 earthquake.

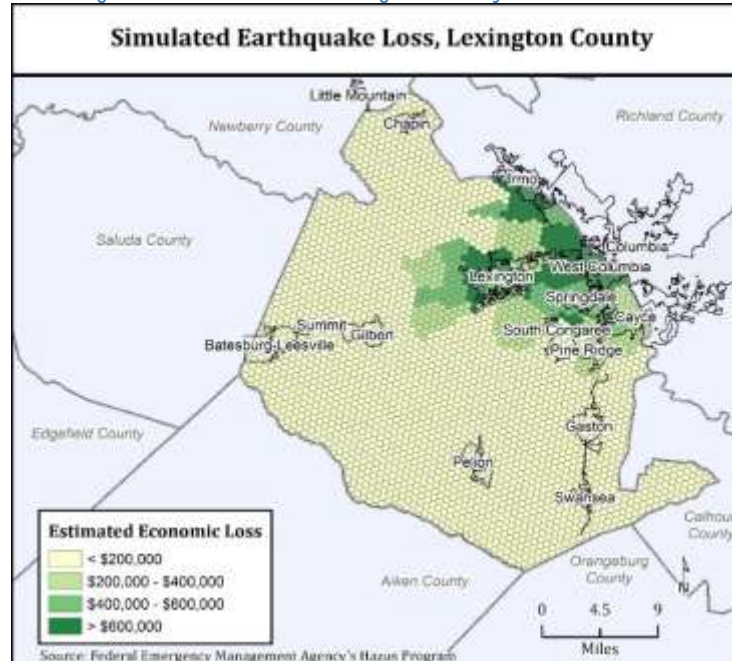


Figure 105 - Damage in Lexington County from a modelled 6.8 earthquake.

5.5 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 106). There are a few areas in southwestern Lexington County with low composite risk, due to low composite vulnerability in those areas (Figure 106). 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 106).

$$RISK_{HAZ} = (THR_{HAZ})(VUL)(CON_{HAZ}) \quad (2)$$

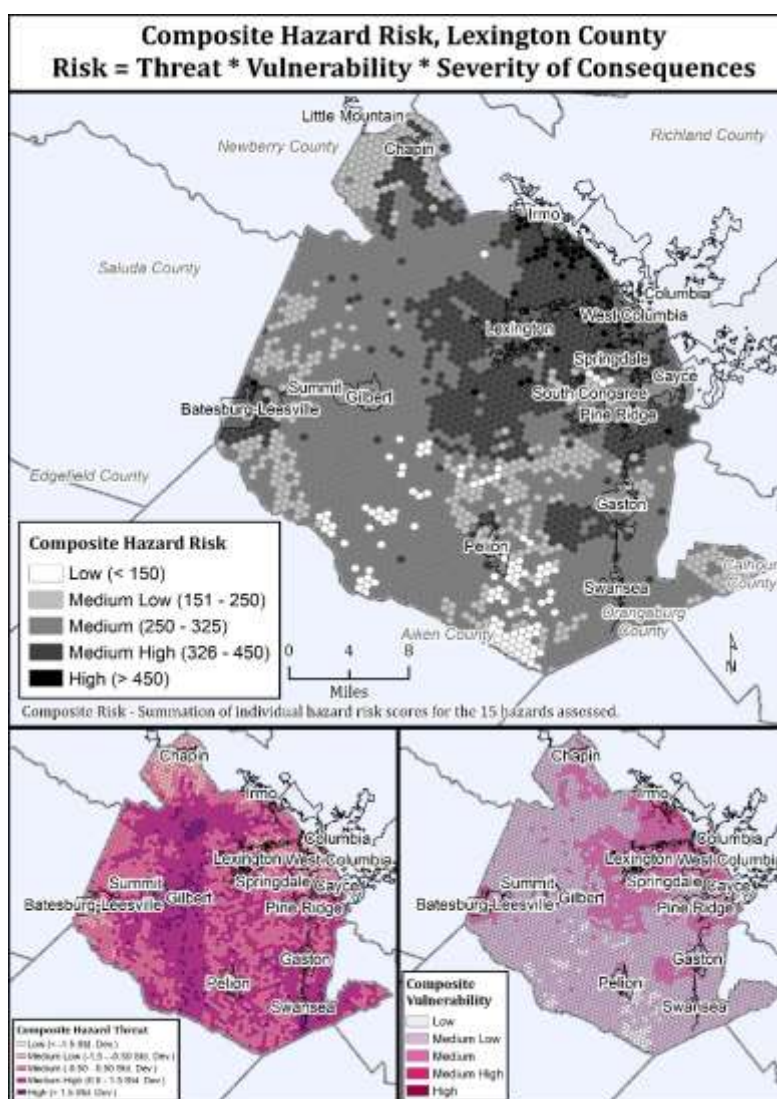


Figure 106 - Overall composite risk map of Lexington County considering all hazard threats, vulnerabilities, and severity of consequences.

In terms of risk assessment by hazard type, Table 52 summarizes the assessment criteria and rating values.

Categories of Risk by Hazard Type

While the composite risk map (Figure 106) shows the spatial distribution of various risk levels across Lexington County, Table 53 breaks down the overall risk for each hazard assessed in this Plan. The information contained in Table 53 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 52. The high-risk hazards in Lexington County are hurricanes and tropical storms, tornadoes, heat, flash floods, and severe thunderstorms (Table 53).

Table 52 - 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 5.9](#)).

Table 53 - 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 ⁵¹	
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

⁵¹ 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 54 identifies emergency services and adopted ordinances available to each municipality in Lexington County.

This section addresses
FEMA HMP requirement
201.6(c)(3)

Table 54 - 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
Pine Ridge	Provided by County Fire Service	Provides own police protection	"	Yes	Yes	Yes	Yes
South Congaree	Provided by County Fire Service	Provides own police protection	"	Yes	Yes	Yes	Yes
Swansea	Provided by County Fire Service	Provides own police protection	"	Yes	Yes	Yes	Yes

Capability Changes since the 2016 HMP

- Town of Chapin
 - Currently undergoing a Land Development Regulation update, including flooding mitigation strategies.

5.6 Lexington County National Flood Insurance Program Information

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 55 - Number of Lexington County Repetitive Loss Properties.

Building Type	Number of Properties
Residential	10

Table 55 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. Table 56 shows residential and commercial properties that have active flood insurance located within participating NFIP jurisdictions. the unincorporated boundaries of Fairfield County, outside of Winnsboro and Ridgeway.

Table 56 - Active NFIP Flood Insurance Policies in Lexington County by Jurisdiction

Name of Jurisdiction	Active Residential Flood Insurance Policies	Active Non-Residential Flood Insurance Policies
Lexington County	1,265	22
Lexington	54	3
West Columbia	74	2
Cayce	129	12
Irmo	80	2
Chapin	4	1
Batesburg-Leesville	5	1
Pine Ridge	6	0
South Congaree	10	2

5.7 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.

These goals reflect the hazard mitigation priorities of plan participants, guided by the information compiled through the Capabilities Assessment. Goals were the basis of designing a broad range of mitigation actions and guided plan participants in the action prioritization process. Plan participants will rely on grants and other sources in order to fund mitigation projects. Mitigation action prioritization took into account multiple factors:

- 1) The updated hazard extent, vulnerability, and risk analyses created through the planning process of this HMP provided plan participants with the most recent information on natural hazard impacts. This guided which natural hazards should be prioritized, with higher priority given to hazards of higher frequency and/or extent.
- 2) A Benefit Cost Analysis (BCA) methodology was utilized to determine project effectiveness and plausibility. Actions that required minimal funds and utilized existing funding mechanisms were prioritized due to the higher likelihood that they could be accomplished.
- 3) If the technical expertise was not available, mitigation actions were prioritized utilizing documents such as Capital Improvement Plans, Comprehensive Plans, and stakeholder feedback on organizational priorities. The technical ability of plan participants to implement and maintain mitigation actions, without additional funding sources or staff, was also highly prioritized.

Each mitigation action includes the following information: a description of the mitigation activity, the type/s of natural hazard addressed, the organization or department responsible for implementing the mitigation activity, a priority rank, which broad goals are addressed through the mitigation activity, source of financing, generalized cost estimates, status since the previous HMP update, and a general timeframe of implementation. A template for providing mitigation goals is provided in [Appendix VIII – A](#).

5.8 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 57: Lexington County portfolio of federally-supported hazard mitigation projects.

Mitigation Category	HMG P	PD M	FM A	Amount	Mitigation Category	HMG P	PD M	FM A	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 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)	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)

5.9 Lexington County Mitigation Strategies

Table 58 - 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 59 - 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 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	Thunder storms (hail, wind, lightning)	City of West Columbia, Dominion Energy	2	2, 7 & 9	Operating budget		Completed	Completed
Install surge protectors in critical facilities	Thunder storms (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	Thunder storms (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

City of West Columbia								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Publicize National Hurricane Awareness week annually	Hurricane	City of West Columbia	3	4, 5 & 6	Operating budget		Ongoing	Ongoing

Mitigation Action Update for the City of West Columbia since the 2016 HMP

- No natural hazard mitigation activities implemented, or changes provided to their mitigation strategy list.

Table 60 - 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

City of Cayce								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
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
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,	City of Cayce & Dominion Energy	2	2 & 7	Public Works Operating Budget	<\$250,000	Removed from plan	Removed from plan

City of Cayce								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
	Wind, Lightning)							
Install surge protectors in critical facilities	Thunderstorms (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	Thunderstorms (Hail, Wind, Lightning)	City of Cayce	2	2 & 4	Operating Budget	< \$250,000	Deferred due to funding	Deferred
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 61 - 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

Town of Lexington								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
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
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	Forest	Town of Lexington/	1	2, 4 & 7	Capital Improve.	<\$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
critical facilities to lessen threat from forest/wildfires	Fire/Wildfires	Lexington County Public Works/ S. C. DOT			Budget			
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
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 62 - 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	Flooding	Town of Irmo	1	2, 5 & 10	Operating Budget	< \$250,000	Deferred due to funding	Deferred

Town of Irmo								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Ranking								
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 facilities	Thunder-storms (Hail, Wind, Lightning)	Lexington/Rich. Counties & School Districts	1	2 & 7	Capital Improve. Budgets	<\$250,000	Deferred due to funding	Deferred
Adopt procedure to suspend operations in elec. storms	Thunder-storms (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	Thunder-storms (Hail, Wind, Lightning)	Dominion Energy/ Elec. Coops	1	2 & 7	Public Works Operating Budgets	<\$250,000	Ongoing	Ongoing
Remove taller trees near critical facilities	Thunder-storms (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 63 - 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 (Conduc ted 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

Town of Chapin								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
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
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

Town of Chapin								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
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
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

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 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 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/Infrast ructure 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/Infrast ructure 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/Infrast ructure 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/Infrast ructure 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/Infrast ructure 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/Infrast ructure 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 64 - 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.

Table 65 - Town of Pine Ridge Mitigation Strategies

Town of Pine Ridge								
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 Pine Ridge	1	2 & 5	Operating Budgets	< \$250,000	Ongoing	Ongoing
Declare May of each year to be Flood Awareness Month	Flooding	Town of Pine Ridge	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 Pine Ridge/Lexington County	3	2 & 7	Capital Improve. Budgets	< \$250,000	Ongoing	Ongoing
Identify & contact any repetitive loss properties	Flooding	Town of Pine Ridge	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 Pine Ridge	1	2, 5 & 10	Operating Budget	< \$250,000	Ongoing	Ongoing
Undertake Planning to improve Community Rating System Ranking	Flooding	Town of Pine Ridge	1	2, 5 & 10	Operating Budget	< \$250,000	Deferred due to funding	Deferred
Install surge protectors in critical facilities	Thunderstorms (Hail, Wind, Lightning)	Lexington/Rich. Counties & School Districts	1	2 & 7	Capital Improve. Budgets	< \$250,000	Deferred due to funding	Deferred
Adopt procedure to suspend operations in elec. storms	Thunderstorms (Hail, Wind, Lightning)	Town of Pine Ridge/ 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 Pine Ridge/ Lexington/Richland Counties & Coops Dominion Energy	2	2 & 7	Public Works Operating Budget	< \$250,000	Ongoing	Ongoing

Town of Pine Ridge								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
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 Pine Ridge/ Lexington County	2	2 & 4	Operating Budget	<\$250,000	Ongoing	Ongoing
Cooperate with the two County's Emergency Response Plans for Severe Weather	Hurricanes	Town of Pine Ridge/ 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 Pine Ridge	1	5	Operating Budget	<\$250,000	Ongoing	Ongoing
Improve early warning system in city for wind events	Tornados	Town of Pine Ridge	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 Pine Ridge	2	1, 2, 3, 7 & 8	Capital Improve. Budgets	\$250,000 to \$750,000	Deferred due to funding	Ongoing

Mitigation Action Update for the Town of Pine Ridge since the 2016 HMP

- Town of Pine Ridge is a new participant in the Central Midlands Hazard Mitigation Plan.

Table 66 - Town of South Congaree Mitigation Strategies

Town of South Congaree								
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 South Congaree	1	2 & 5	Operating Budgets	<\$250,000	Ongoing	Ongoing
Declare May of each year to be Flood Awareness Month	Flooding	Town of South Congaree	2	2 & 5	Operating Budget	<\$250,000	Deferred due to funding	Deferred

Town of South Congaree								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Coordinate with other local gov'ts in counties to make stream channel imp.	Flooding	Town of South Congaree /Lexington County	3	2 & 7	Capital Improve. Budgets	<\$250,000	Ongoing	Ongoing
Identify & contact any repetitive loss properties	Flooding	Town of South Congaree	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 South Congaree	1	2, 5 & 10	Operating Budget	<\$250,000	Ongoing	Ongoing
Undertake Planning to improve Community Rating System Ranking	Flooding	Town of South Congaree	1	2, 5 & 10	Operating Budget	<\$250,000	Deferred due to funding	Deferred
Install surge protectors in critical facilities	Thunderstorms (Hail, Wind, Lightning)	Lexington County & School Districts	1	2 & 7	Capital Improve. Budgets	<\$250,000	Deferred due to funding	Deferred
Adopt procedure to suspend operations in elec. storms	Thunderstorms (Hail, Wind, Lightning)	Town of South Congaree / 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 South Congaree / Lexington County & 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 South Congaree / Lexington County	2	2 & 4	Operating Budget	<\$250,000	Ongoing	Ongoing
Cooperate with the two County's Emergency Response Plans for Severe Weather	Hurricanes	Town of South Congaree / Lexington County	2	2, 4 & 7	Operating Budgets	<\$250,000	Ongoing	Ongoing
Develop and publicize water conservation practices to respond to drought declarations	Drought	Town of South Congaree	1	5	Operating Budget	<\$250,000	Ongoing	Ongoing

Town of South Congaree								
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 South Congaree	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 South Congaree	2	1, 2, 3, 7 & 8	Capital Improve. Budgets	\$250,000 to \$750,000	Deferred due to funding	Ongoing

Mitigation Action Update for the Town of South Congaree since the 2016 HMP

- Town of South Congaree is a new participant in the Central Midlands Hazard Mitigation Plan.

Table 67 - Town of Swansea Mitigation Strategies

Town of Swansea								
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 Swansea	1	2 & 5	Operating Budgets	<\$250,000	Ongoing	Ongoing
Declare May of each year to be Flood Awareness Month	Flooding	Town of Swansea	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 Swansea /Lexington County	3	2 & 7	Capital Improve. Budgets	<\$250,000	Ongoing	Ongoing
Identify & contact any repetitive loss properties	Flooding	Town of Swansea	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 Swansea	1	2, 5 & 10	Operating Budget	<\$250,000	Ongoing	Ongoing
Undertake Planning to improve Community Rating System Ranking	Flooding	Town of Swansea	1	2, 5 & 10	Operating Budget	<\$250,000	Deferred due to funding	Deferred
Install surge protectors in critical facilities	Thunder-storms (Hail, Wind, Lightning)	Lexington County & School Districts	1	2 & 7	Capital Improve. Budgets	<\$250,000	Deferred due to funding	Deferred
Adopt procedure to suspend operations in elec.	Thunder-storms (Hail,	Town of Swansea / Counties	2	2, 4 & 5	Operating Budget	<\$250,000	Deferred	Deferred

Town of Swansea								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
storms	Wind, Lightning)							
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 Swansea / Lexington County & 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 Swansea / Lexington County	2	2 & 4	Operating Budget	<\$250,000	Ongoing	Ongoing
Cooperate with the two County's Emergency Response Plans for Severe Weather	Hurricanes	Town of Swansea / Lexington County	2	2, 4 & 7	Operating Budgets	<\$250,000	Ongoing	Ongoing
Develop and publicize water conservation practices to respond to drought declarations	Drought	Town of Swansea	1	5	Operating Budget	<\$250,000	Ongoing	Ongoing
Improve early warning system in city for wind events	Tornados	Town of Swansea	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 Swansea	2	1, 2, 3, 7 & 8	Capital Improve. Budgets	\$250,000 to \$750,000	Deferred due to funding	Ongoing

Mitigation Action Update for the Town of Swansea since the 2016 HMP

- Town of Swansea is a new participant in the Central Midlands Hazard Mitigation Plan.

6. Newberry County

Each county-specific section of the HMP includes various sub-county level analyses that include information on participating local government jurisdictions and organizations. They end with a list of mitigation strategies provided by participating stakeholders.

This section addresses
FEMA HMP requirement
201.6(c)(2)(i)

A Quarter Square Mile (1/4 sq mi) hexagonal grid is used throughout the analyses of this HMP. This provides the best coverage for small spatial areas, such as the participating sub-county organizations of this HMP, while still providing the ability to visualize spatial differences across the region. City or sub-county jurisdiction data on natural hazard type, location, extent, and community vulnerability and risk can effectively be analyzed utilizing this simplified method of summarizing complex geospatial information. This standardized regular gridded framework, enables analysis and evaluation within and between datasets that would normally be difficult (or impossible) to visually, statistically, or spatially compare.

Analysis methodology and additional figures on sub-county natural hazard type, extent, location, and other metrics may be found in the [Appendices](#)

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 107).

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 68 - 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.

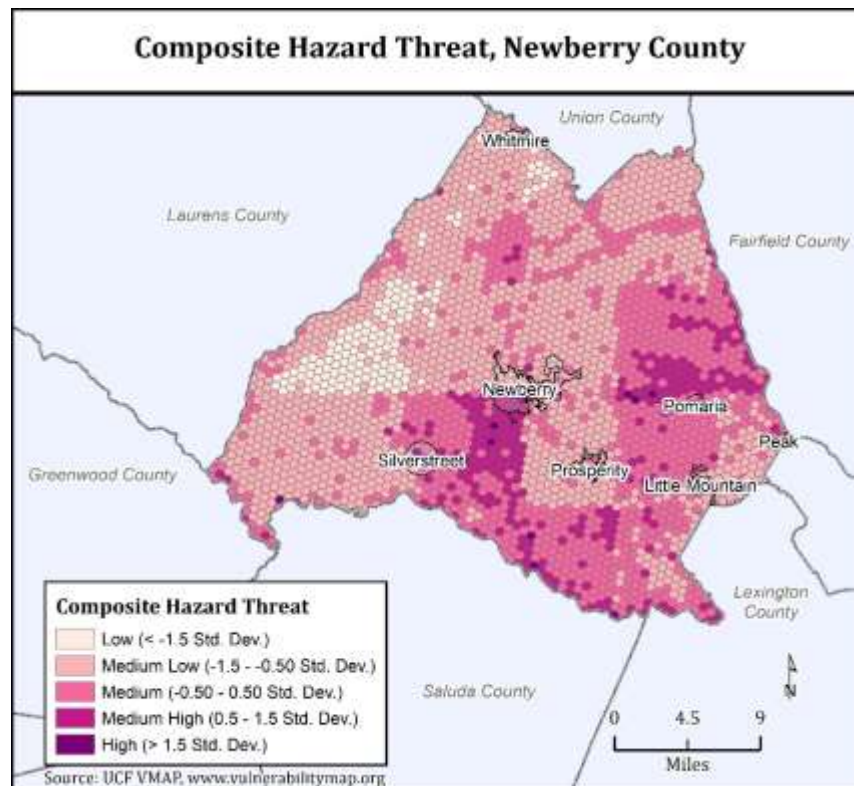


Figure 107 - Comprehensive risk profile of Newberry County.

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 ponding and/or inadequate drainage (Table 69). 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 109). The Flash Flood Potential Index identifies the northern half and southeastern quarter of Newberry County as having a high potential for flash flooding (Figure 110). 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)⁵²:

Over a five-day period, an upper low-pressure system combined with the remnants of Hurricane Joaquin streamed tropical moisture into South Carolina (Figure 108) leading to countless road and bridge closures. Newberry County experienced a record-setting 5-day rainfall total of 12.76 inches in Little Mountain⁵³. Overall damage estimates range from \$1 billion⁵⁴ to \$12 billion⁵⁵ 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 108 - Total rainfall amounts for the 2015 flood event. Source: NWS.

⁵²* Note: The historic record for all hazards in this plan covers the time period from 1960 through 2020

⁵³ NWS, 2015. Historic rainfall and flooding, October 2015. Available at <http://www.weather.gov/cae/HistoricFloodingOct2015.html>

⁵⁴ NOAA National Centers for Environmental Information, 2016. Billion-Dollar Weather and Climate Disasters. Available at <http://www.ncdc.noaa.gov/billions/events>

⁵⁵ 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>

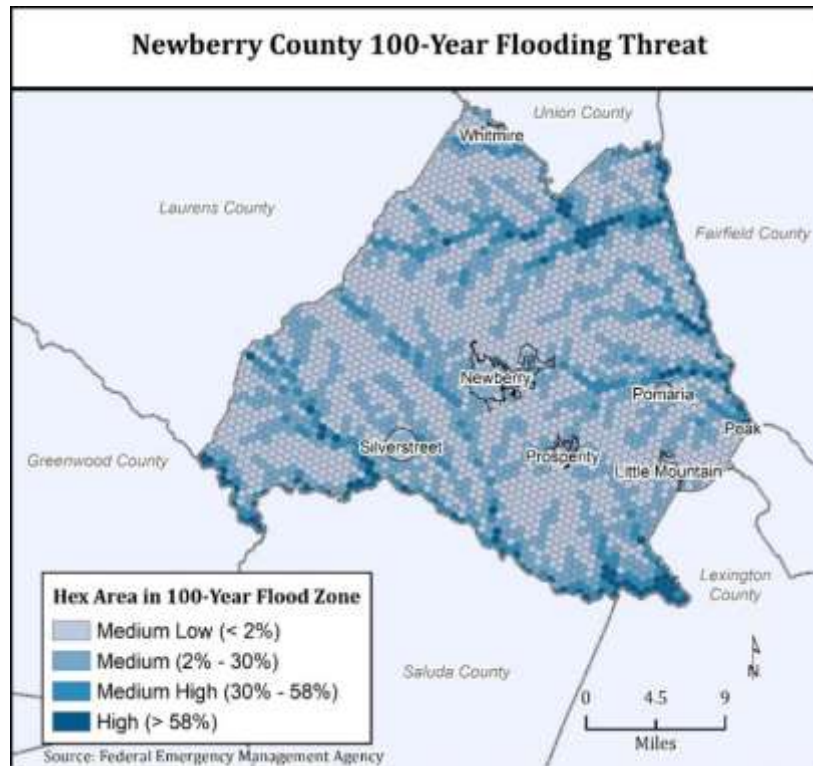


Figure 109 - Flood threat/extent in Newberry County.

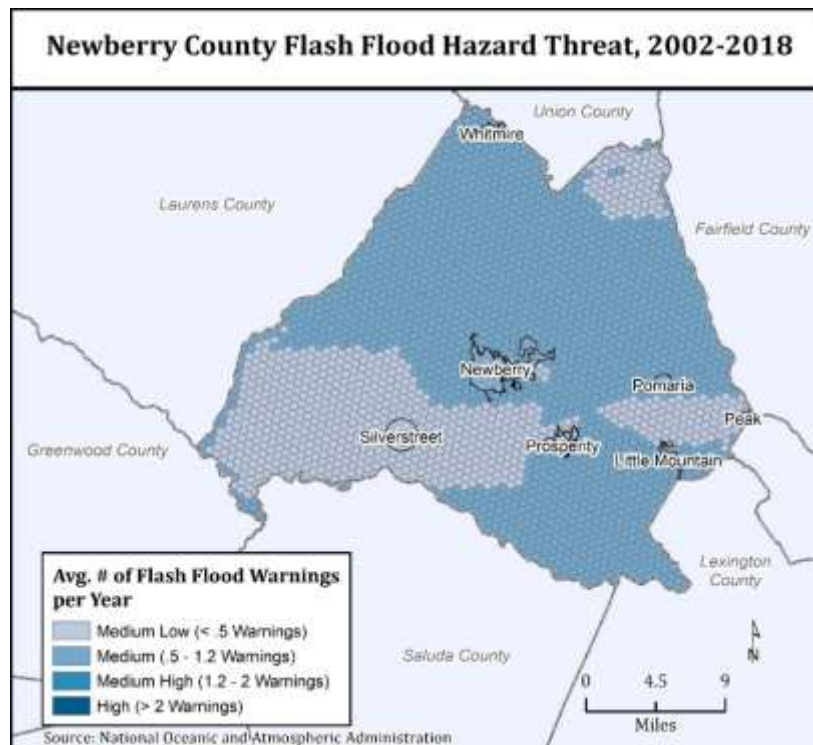


Figure 110 - Flash flood risk in Newberry County.

Table 69 - 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 112). 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 112 &

Table 70). 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.

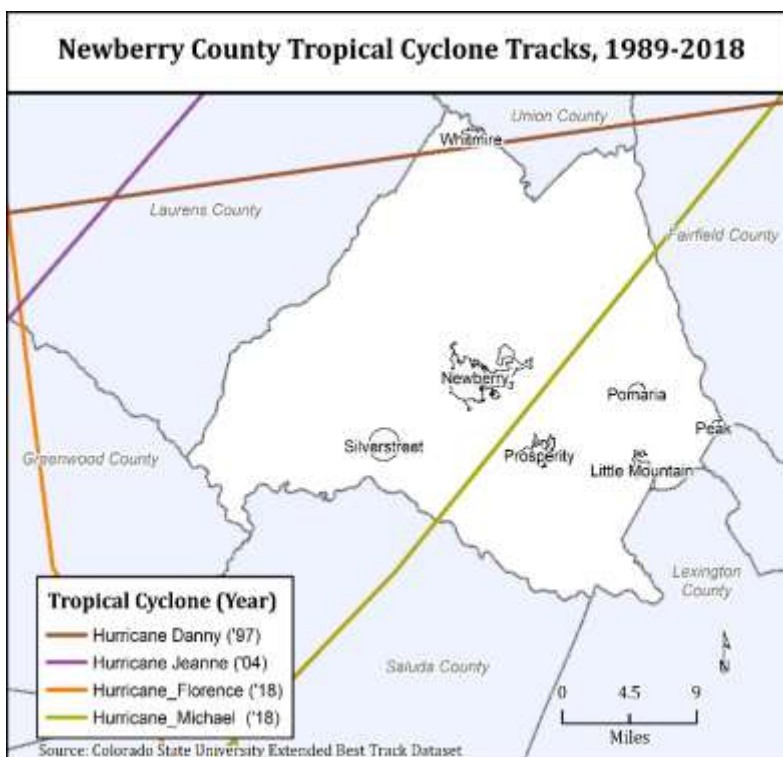


Figure 111 - Historical tropical cyclone tracks in Newberry County.

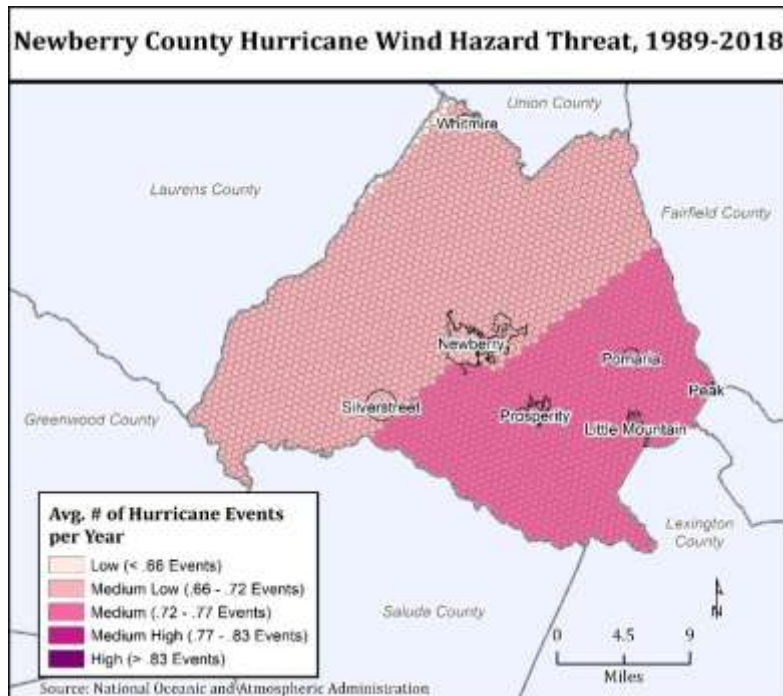


Figure 112 - Hurricane wind threat/extent in Newberry County.

Table 70 - 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 113). 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"⁵⁶.

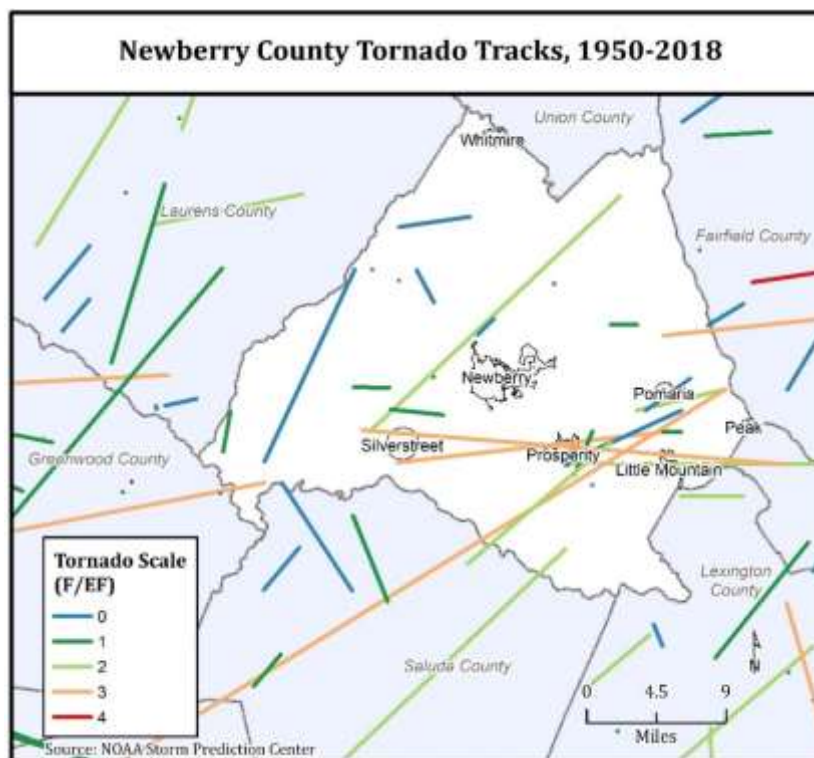


Figure 113 - Tornado threat/extent in Newberry County.

⁵⁶ NWS Wilmington, 2014. Carolinas Tornado Outbreak: March 28, 1984. Available at <http://www.weather.gov/ilm/CarolinasOutbreak>

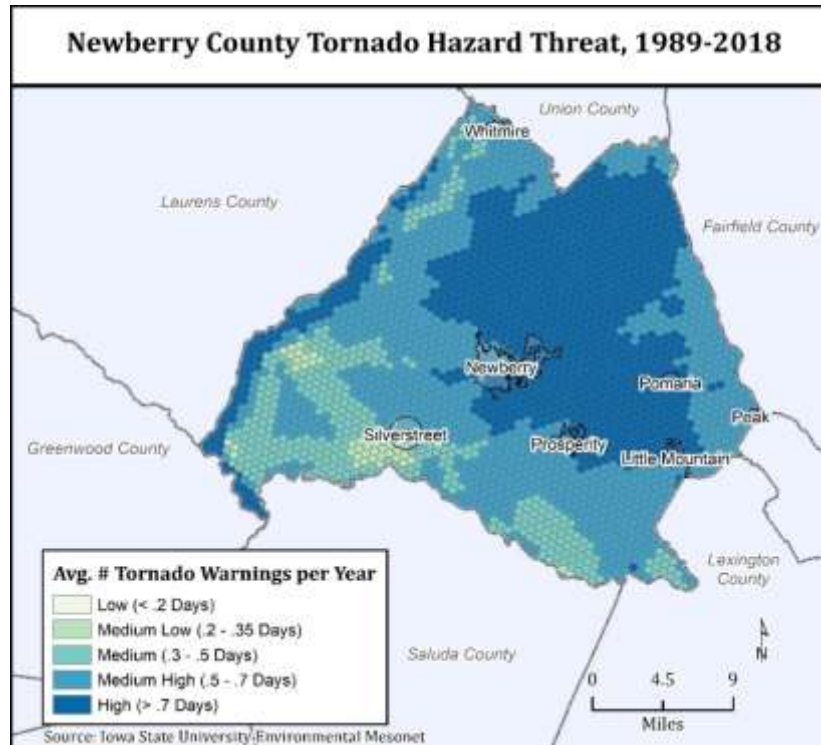


Figure 114 - Tornado risk in Newberry County.

Table 71 - 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	EFO	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	EFO	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	EFO	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 115). 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 inch⁵⁷. 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 72).

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.

⁵⁷ 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

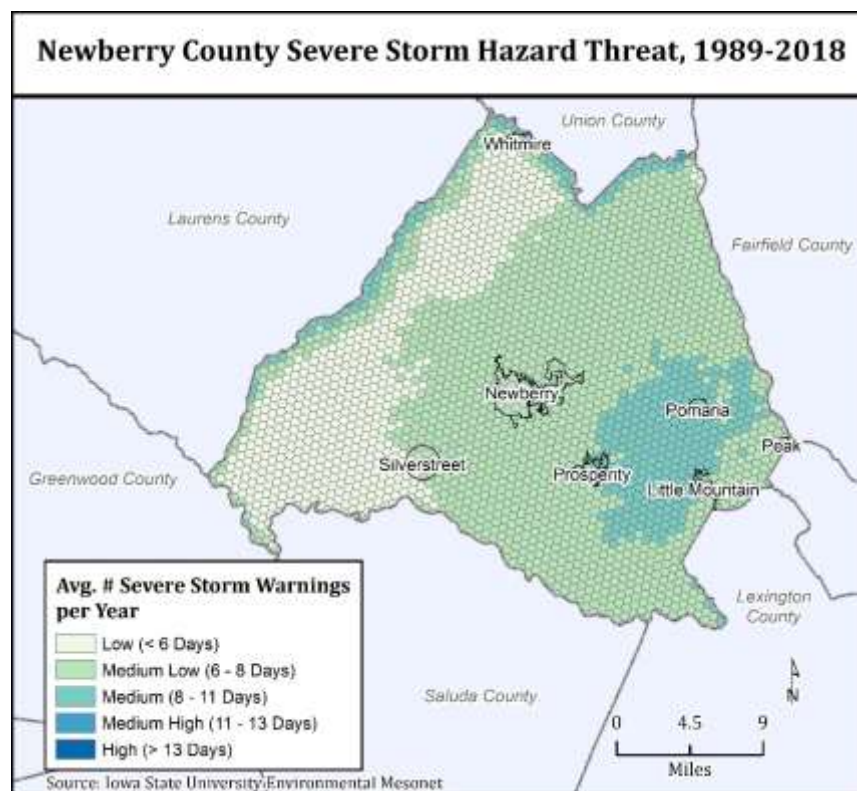


Figure 115 - Severe storm threat/extent in Newberry County.

Table 72 - 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
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 flattened 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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)	Location	Description
								near Peak.
7/2/2015	7/2/2015	0	0	\$2,187	\$0		Jalapa	Highway Patrol reported trees down along Lalapa Road 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 116).

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

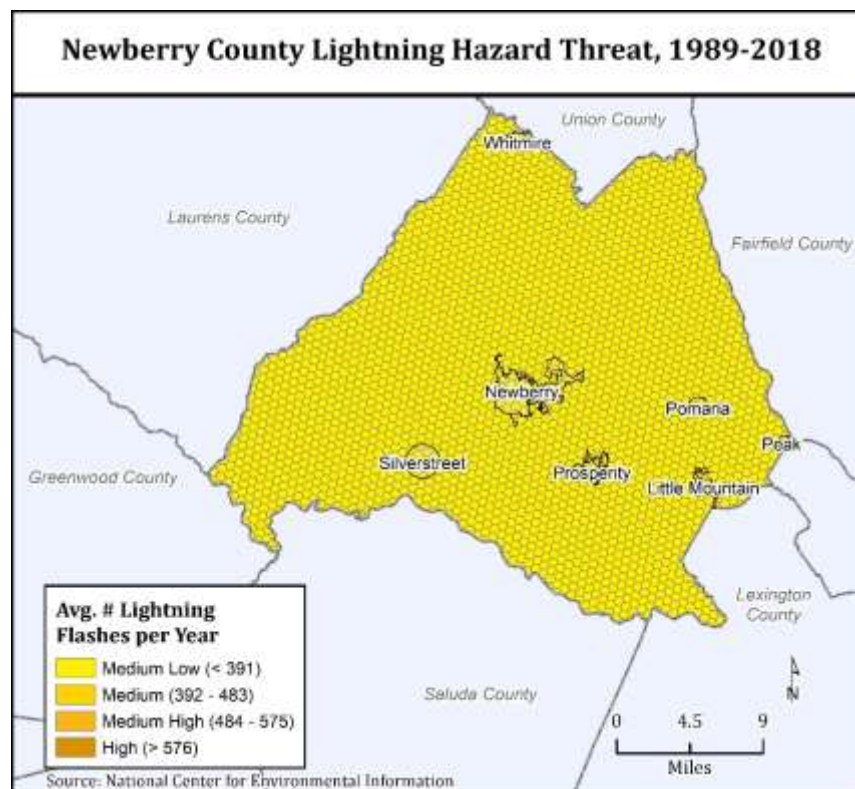


Figure 116 - Lightning threat/extent in Newberry County.

Table 73 - 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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
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
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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
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
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 117 & Table 74). 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)

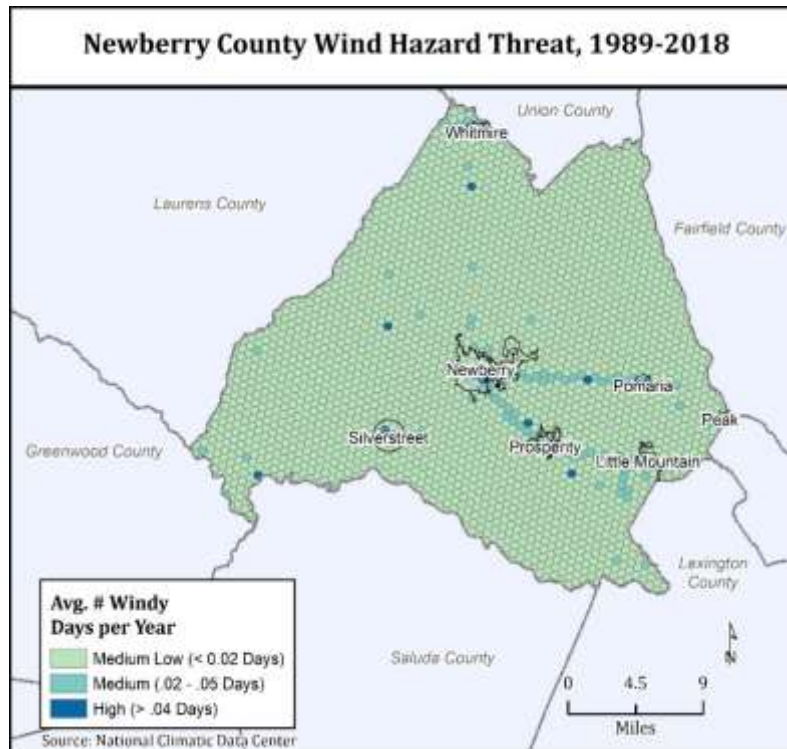


Figure 117 - Wind threat/extent in Newberry County.

Table 74 - 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 xlds	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 231eme 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 232emetry 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 flattened 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 118). 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 119, Table 75). 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

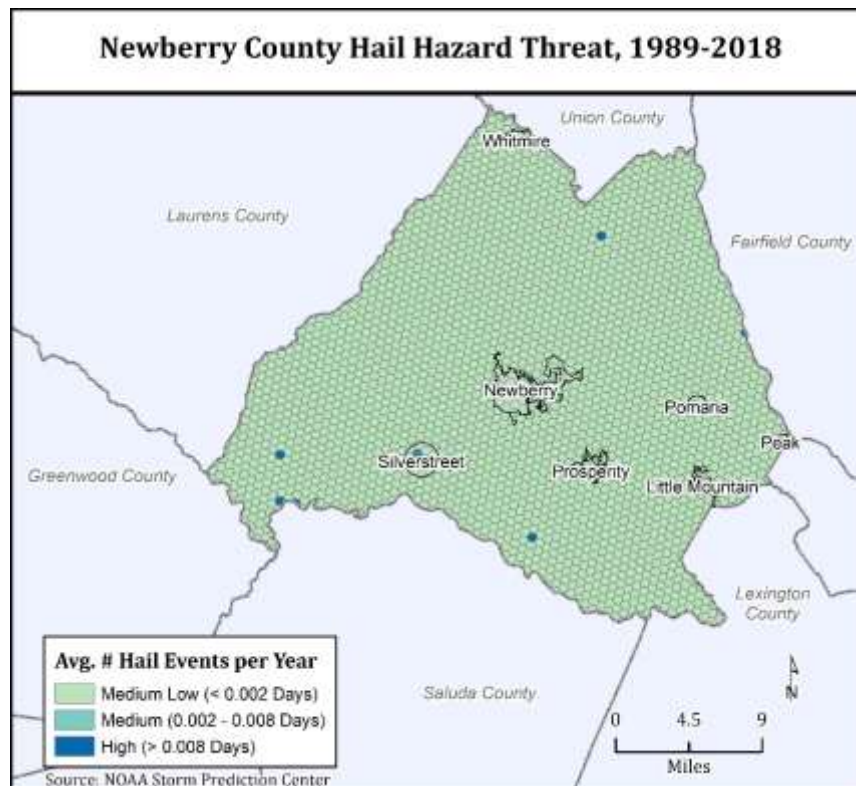


Figure 118 - Hail threat (occurrence) in Newberry County.

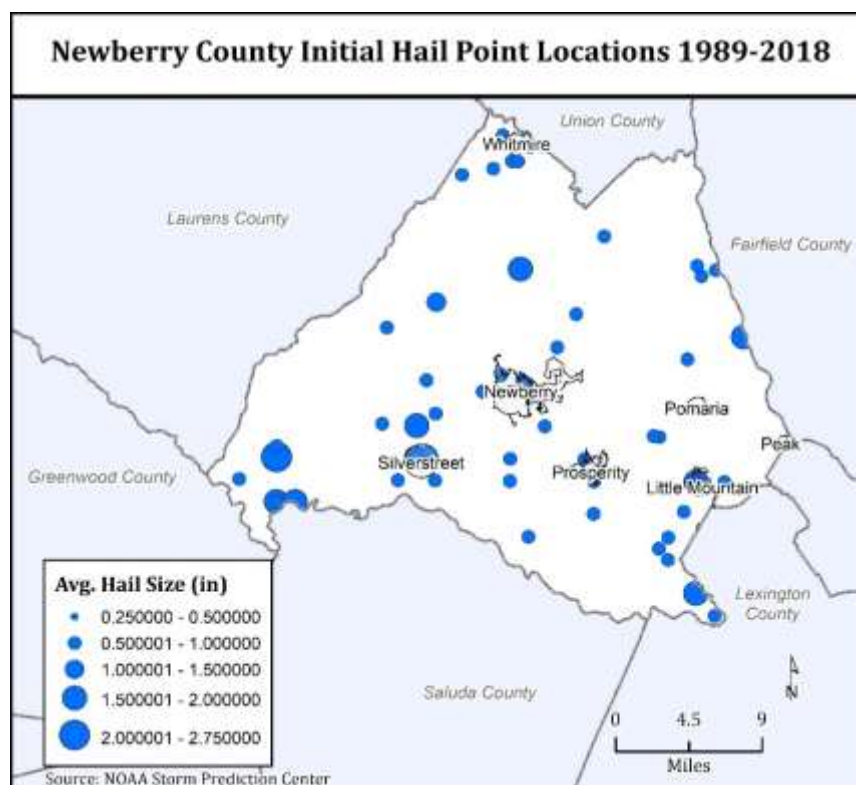


Figure 119 - Risk of large hail events in Newberry County.

Table 75 - 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 days⁵⁸ 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 county, around Little Mountain (Figure 120). There is no record of property damage or fatalities associated with fog as reported by SHELDUS™ 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

⁵⁸ A "fog day" has reduced visibility due to fog, haze, or smoke at any time of the day as indicated by NWS station data.

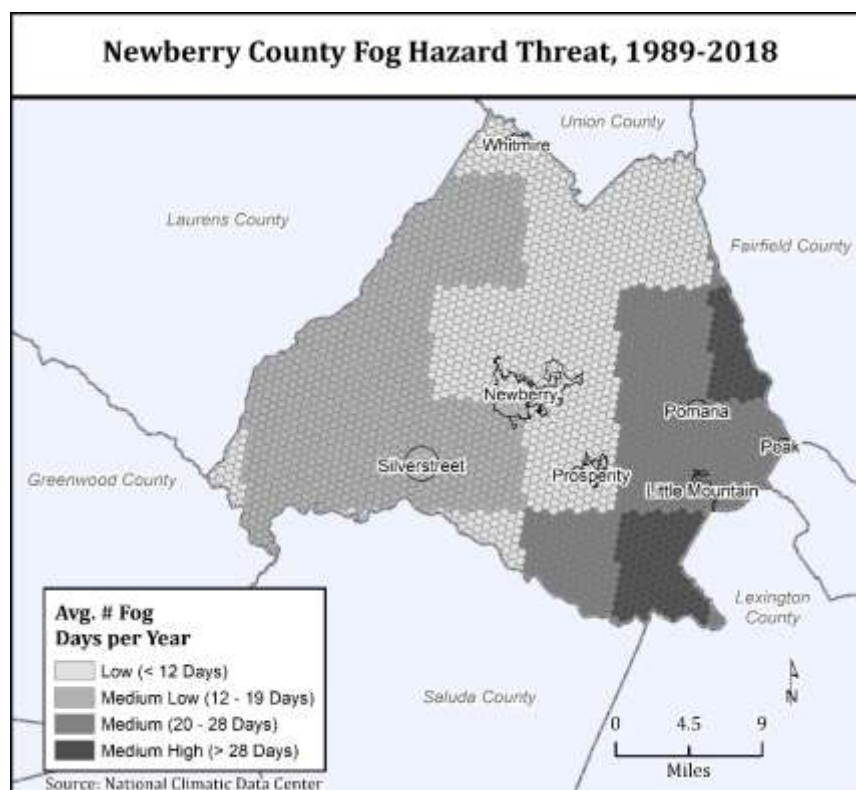


Figure 120 - Fog threat/extent in Newberry County.

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 121). 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 76). The highest daily snowfall amount was 11 inches (February 26, 1914)⁵⁹.

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

⁵⁹ 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.

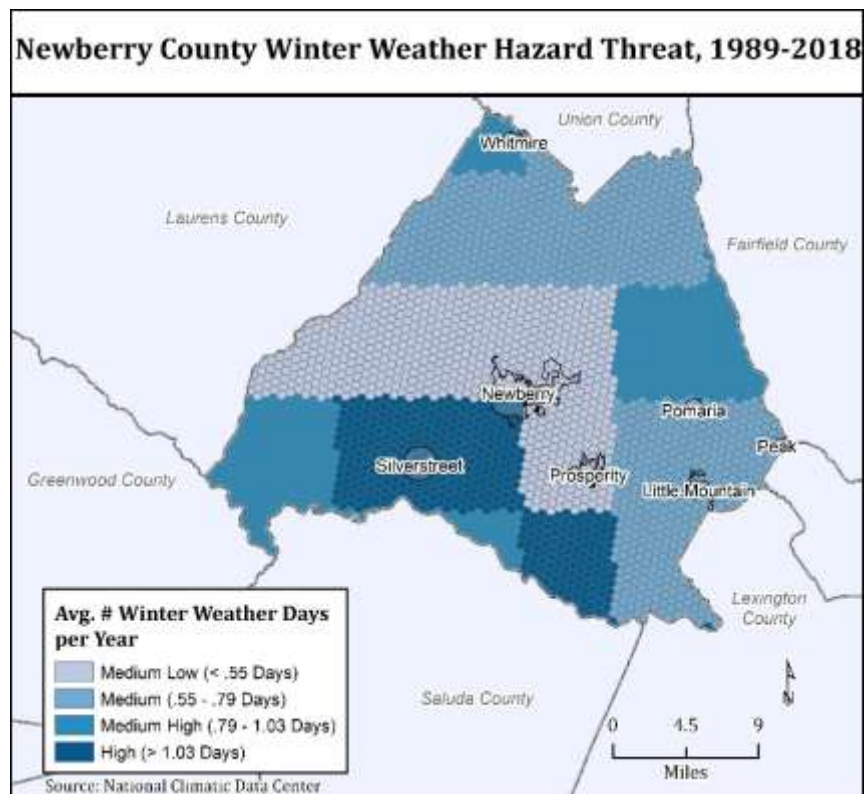


Figure 121 - Winter weather threat/extent in Newberry County.

Table 76 - 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 122). The record minimum temperature for Newberry County was set on February 14, 1899, with -8 degrees Fahrenheit⁶⁰. 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

⁶⁰ 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)

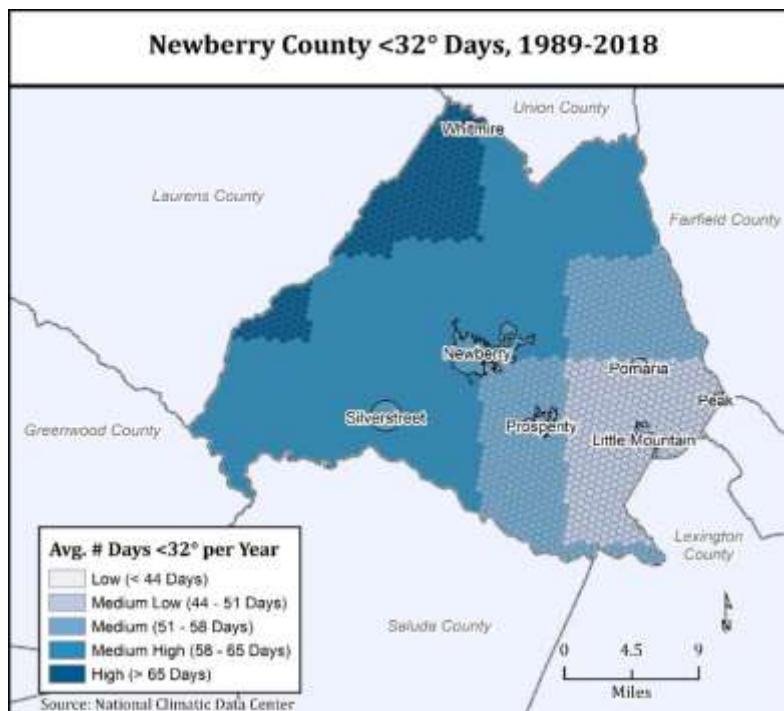


Figure 122 - Cold weather threat/extent in Newberry County.

Table 77 - 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 123). 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 123).

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)⁶¹.

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)

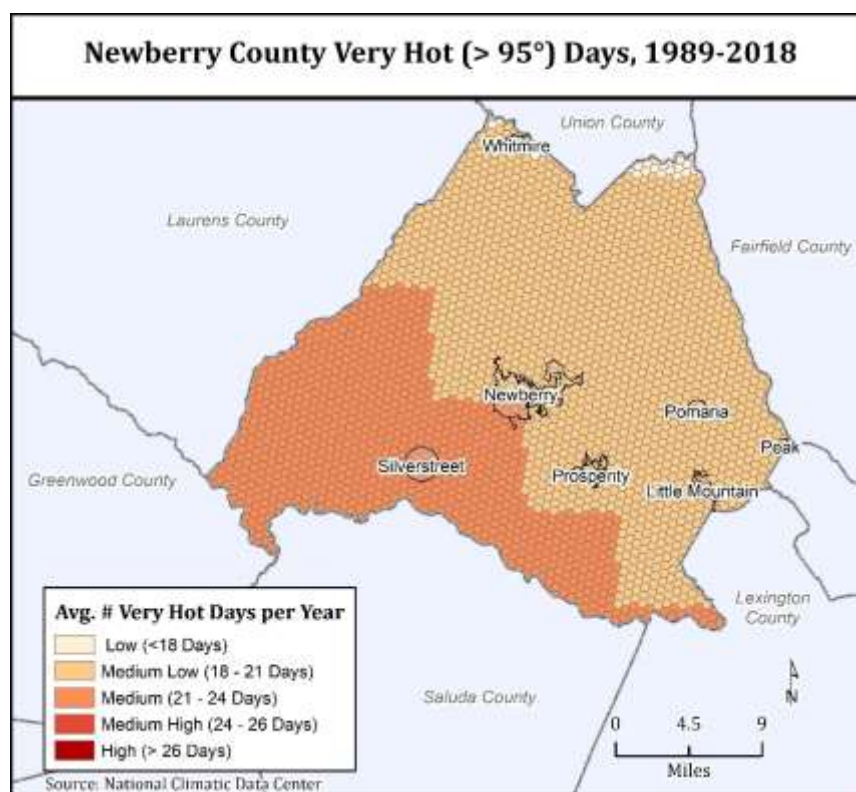


Figure 123 - Hot weather threat/extent in Newberry County.

⁶¹ SCDNR, n/d. South Carolina County Weather Atlas. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/cli_county_statistics.php

Table 78 - 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 79). 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 165 & Figure 166) 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

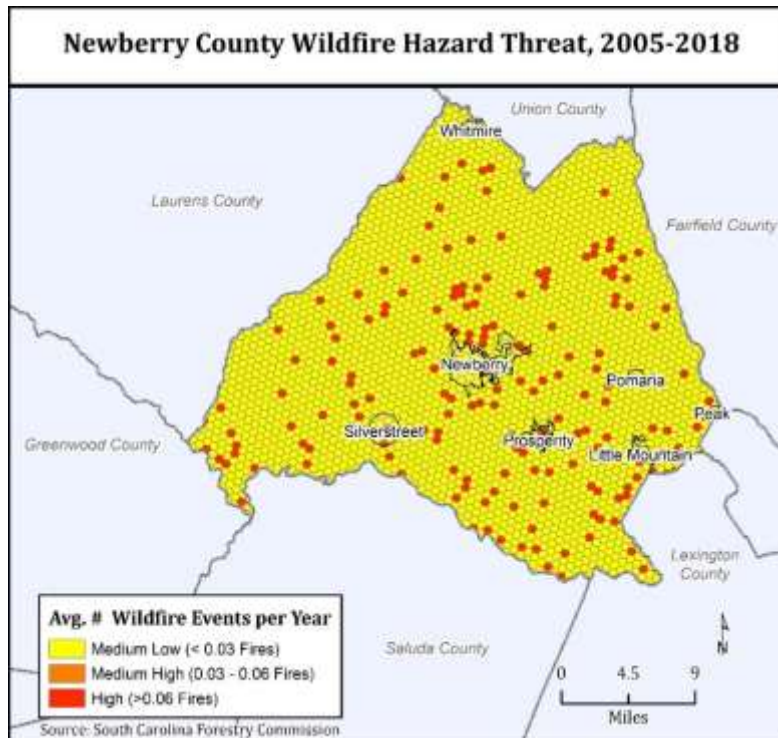


Figure 124 - Wildfire threat/extent in Newberry County based on average number of wildfires per year.

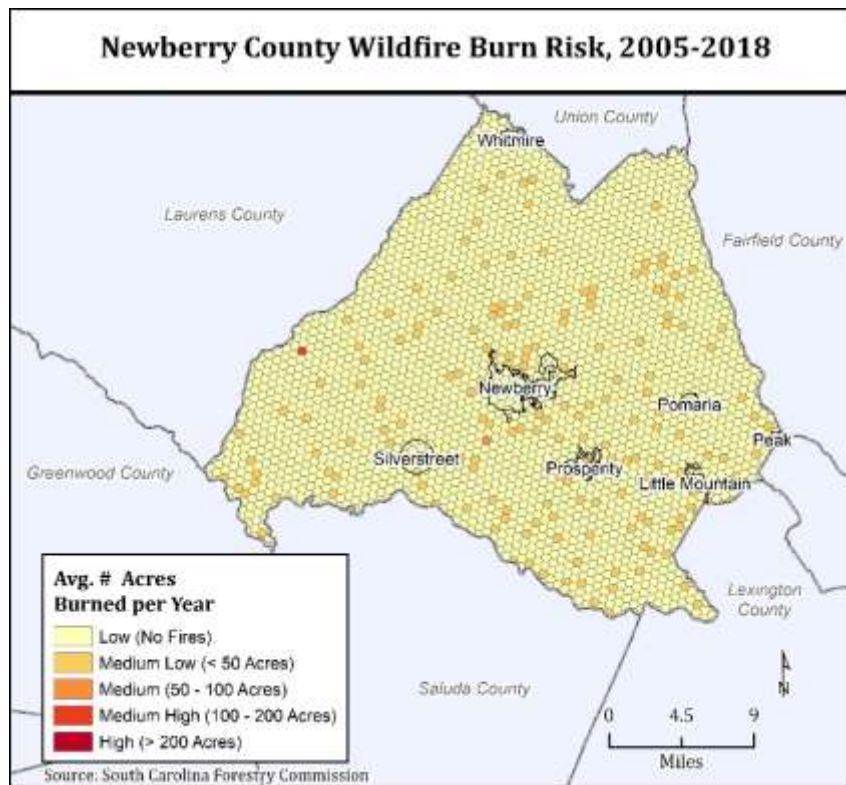


Figure 125 - Risk of large wildfires in Newberry County.

Table 79 - 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 126). 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)⁶². 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 fisheries⁶³ (Table 80). 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)

⁶² SCDNR, n/d. South Carolina County Weather Atlas. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/cli_county_statistics.php

⁶³ SCDNR, n/d. South Carolina Climate. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/cli_sc_climate.php

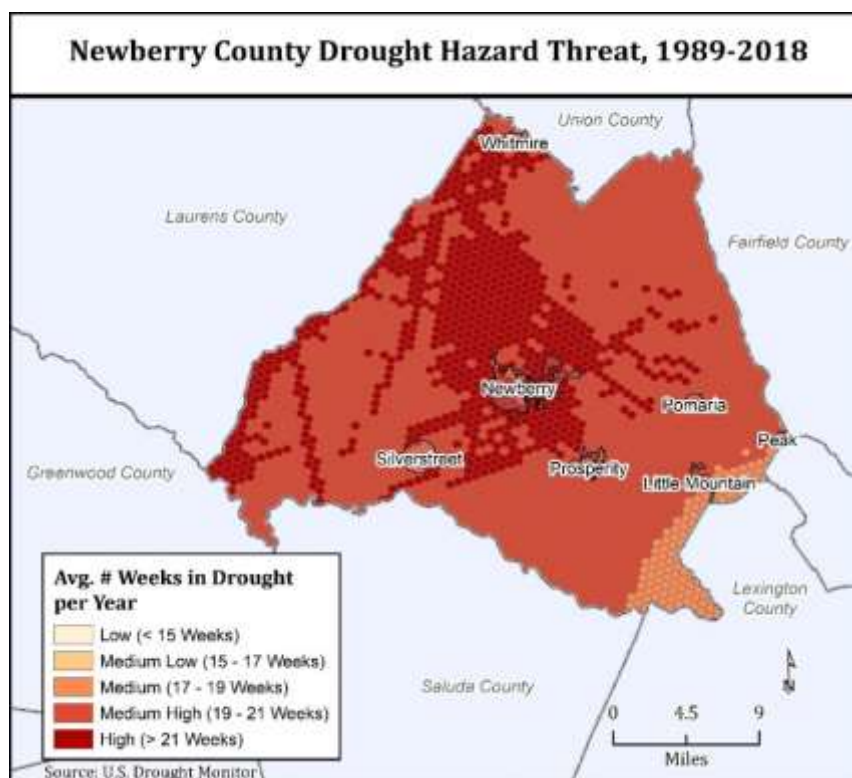


Figure 126 - Drought threat/extent in Newberry County.

Table 80 - 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 127). 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 128).

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

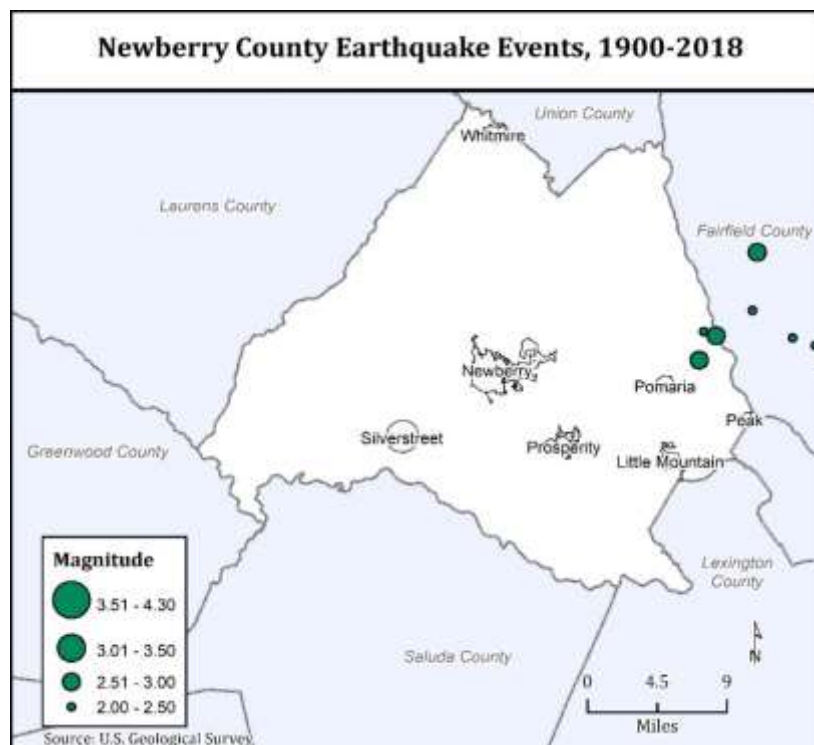


Figure 127 – Historical earthquake events in Newberry County.

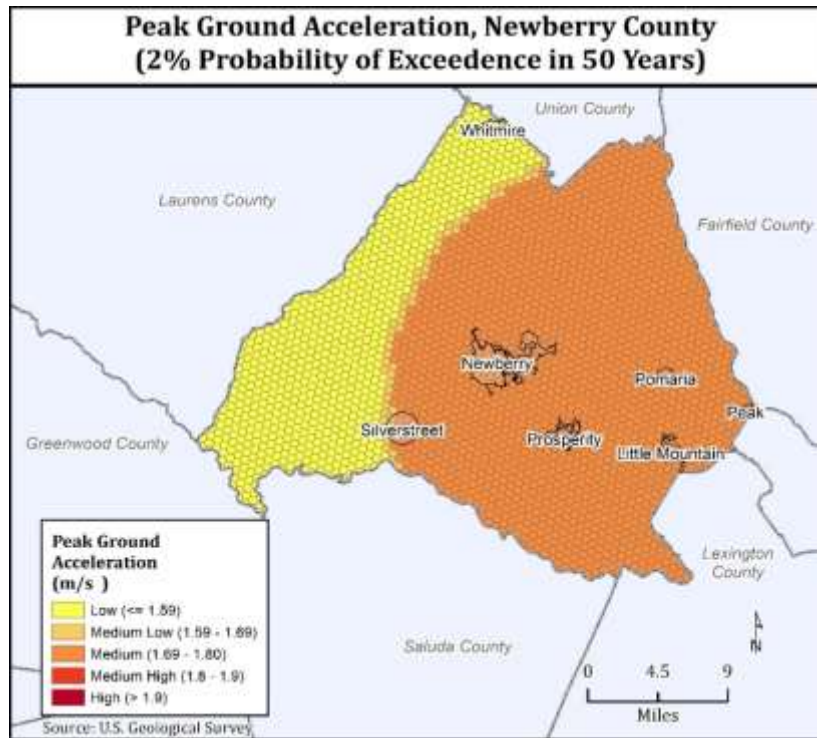


Figure 128 - Threat/extent of shaking due to earthquakes in Newberry County.

6.2 Hazard Vulnerability Assessment for Newberry 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:

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 infrastructure⁶⁴ 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

⁶⁴ <https://www.fema.gov/lifelines>

Vulnerability Index first developed by Cutter (2003)⁶⁵ and later refined by scholars at the University of Central Florida⁶⁶. 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 129). 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 129). 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 129).

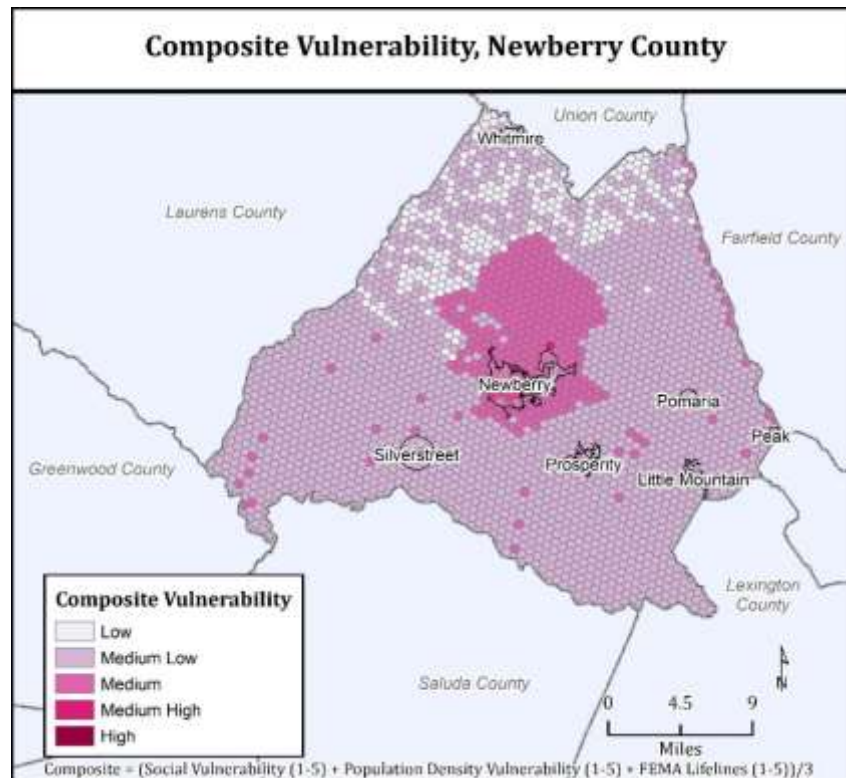


Figure 129 - Newberry County's Composite Hazard Vulnerability.

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 50). 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 81). Almost all the county's critical infrastructure is in and around the City of Newberry, with some scattered

⁶⁵ <https://onlinelibrary.wiley.com/doi/abs/10.1111/1540-6237.8402002>

⁶⁶ www.vulnerabilitymap.org

clusters near Prosperity and Peak as well (Figure 130). More information on the vulnerability assessment for each critical facility can be found in Appendix II.

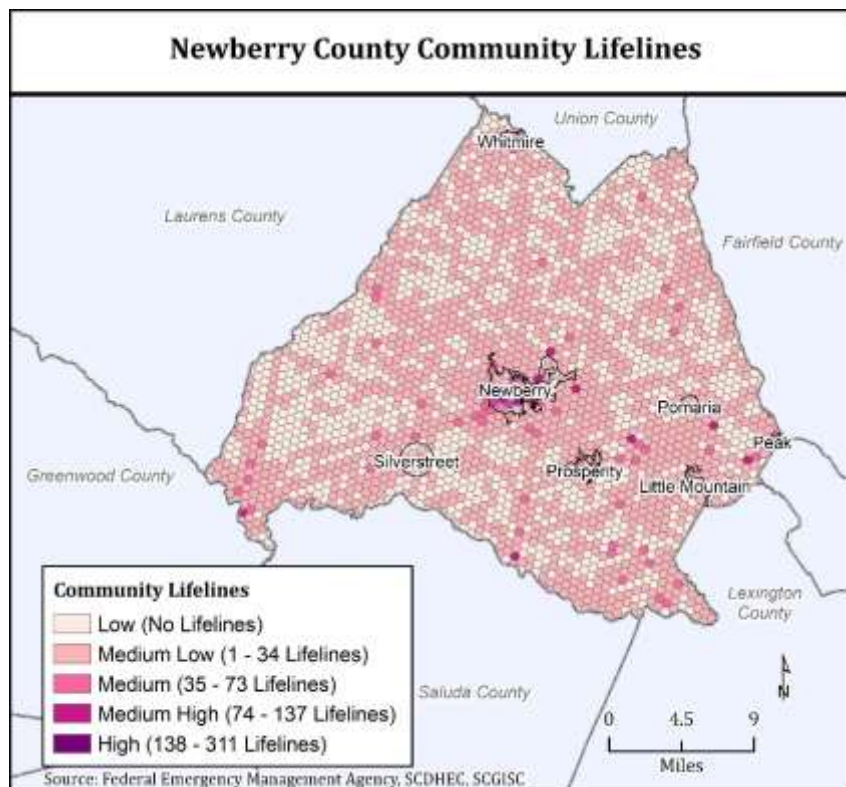


Figure 130 - Distribution of community lifelines and critical facilities in Newberry County.

Assets at risk (Table 81) were assessed using FEMA's Lifeline⁶⁷ 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 81 - 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

⁶⁷ <https://www.fema.gov/lifelines>

FEMA Lifeline	Variable	Critical	Count
Safety and Security	Community Safety - Convention Centers/Fairgrounds		0
Safety and Security	Public Schools		14
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 82).

Table 82 - 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 events⁶⁸, has a long conceptual and theoretical history in social and disaster science fields⁶⁹. 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 251).

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 131). The rest of Newberry County ranges from medium-low to medium-high levels of social vulnerability, with the majority being medium (Figure 131). 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 132).

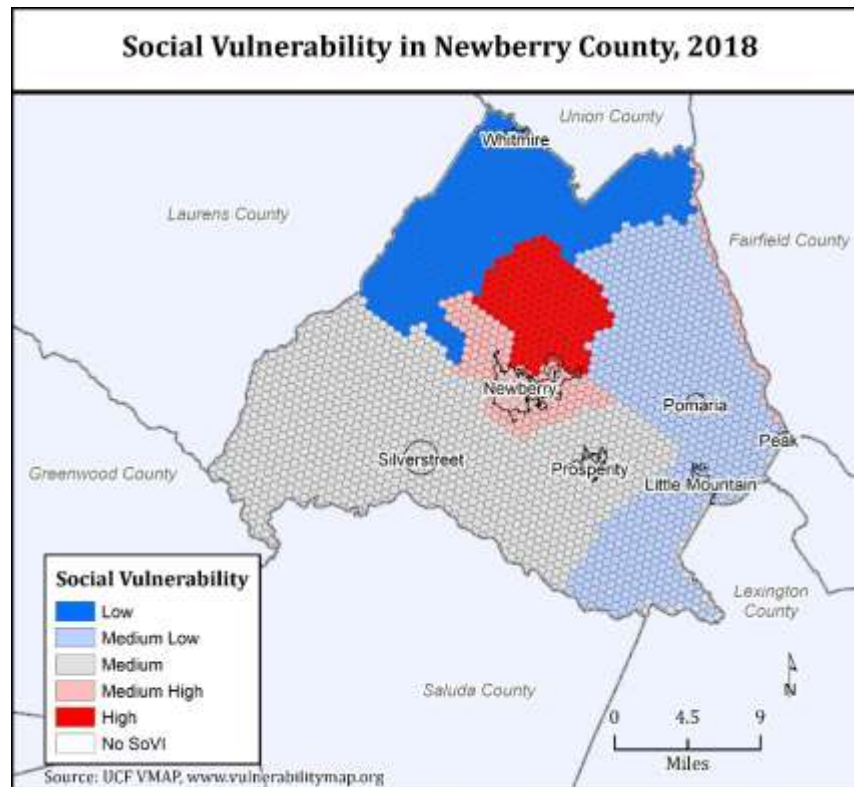


Figure 131 - Socially vulnerable tracts in Newberry County.

⁶⁸ <https://doi.org/10.1177/0002716205285515>

⁶⁹ <https://unu.edu/publications/books/measuring-vulnerability-to-natural-hazards-towards-disaster-resilient-societies-second-edition.html#overview>

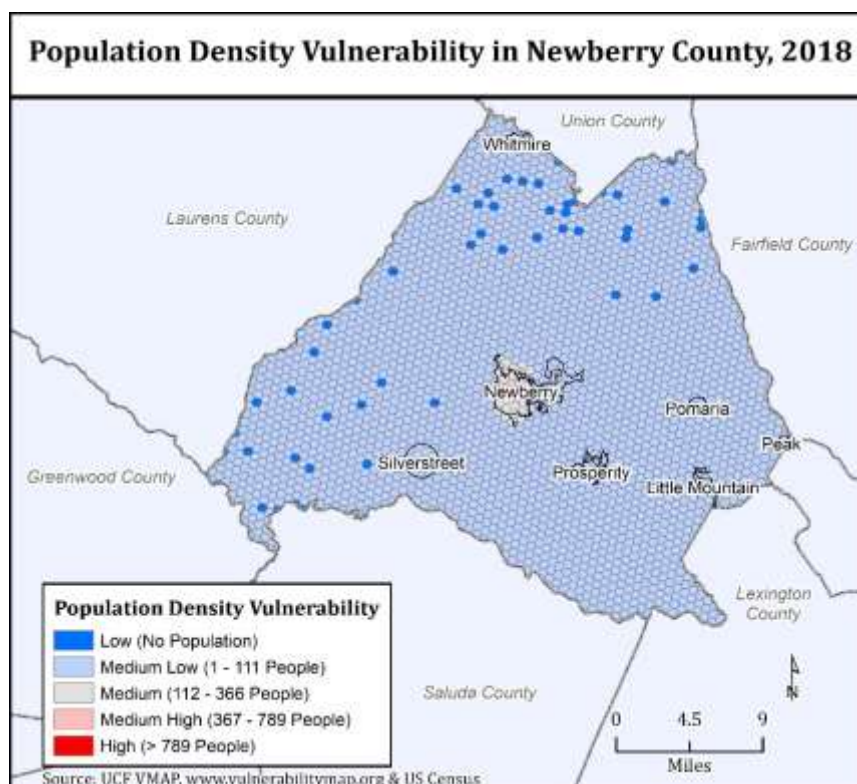


Figure 132 - Newberry County's Population Distribution.

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 Risk Assessment Methodology 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 83):

1. Heat
2. Tornado
3. Drought
4. Hurricane and tropical storm
5. Flash flood

Table 83 – 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 133). 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 135). 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.

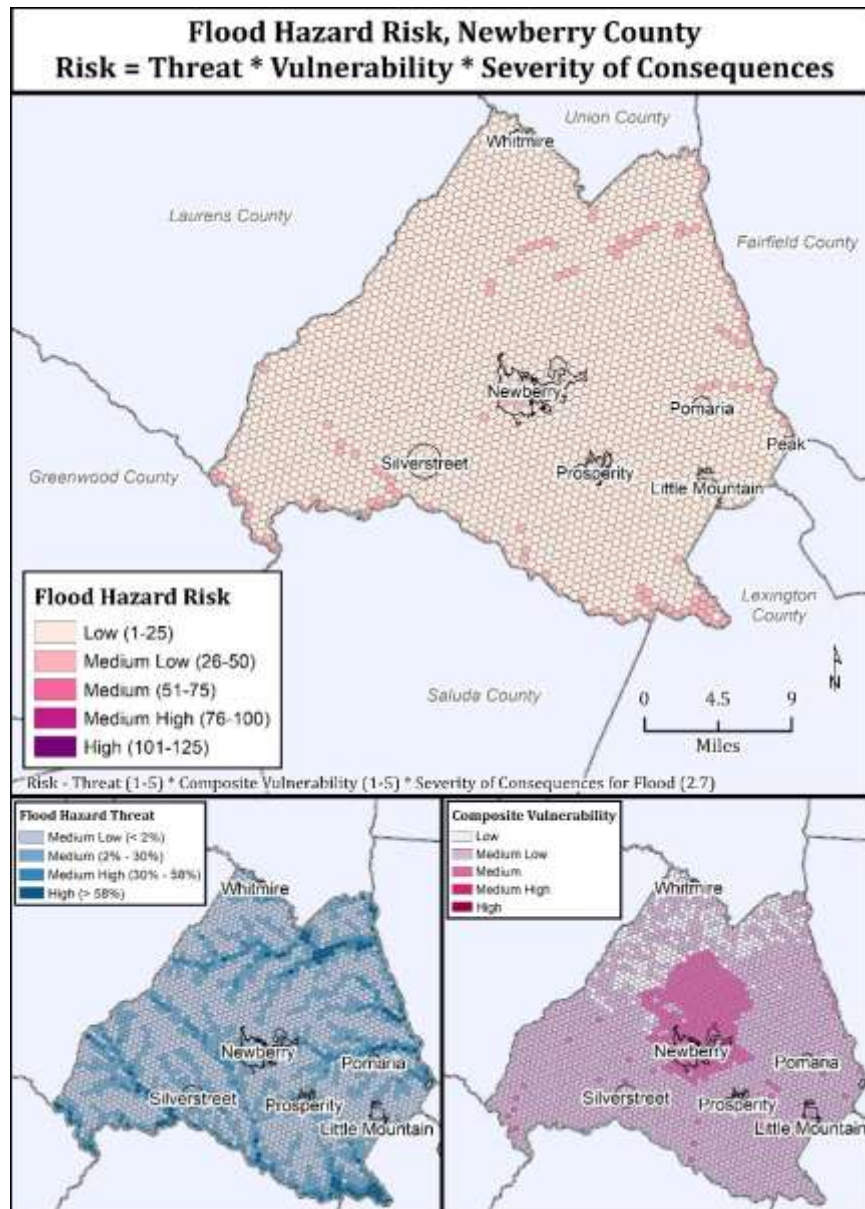


Figure 133 - Risk of riverine floods in Newberry County.

For a 1,000-year flood event (0.1% annual chance of occurrence) (Figure 136), 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 136). 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. Additional city-scale maps with detailed sub-county flooding hazard extent and risk information may be found in the [Appendices](#).

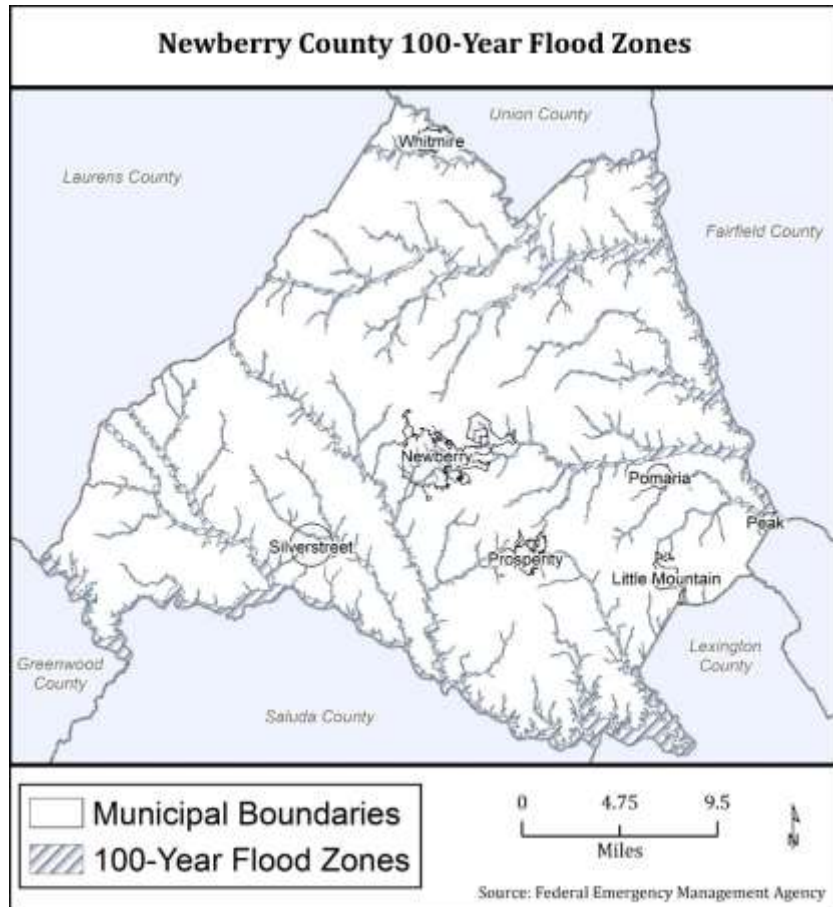


Figure 134 - Newberry County 100-Year Flood Zones

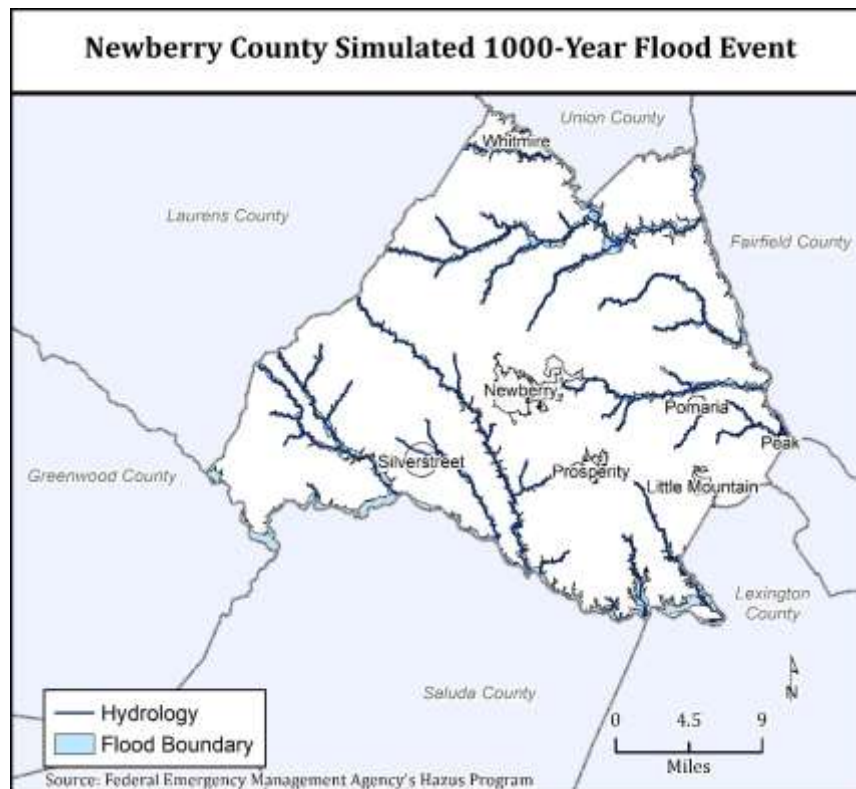


Figure 135 - Modelled 1,000-year flood event in Newberry County.

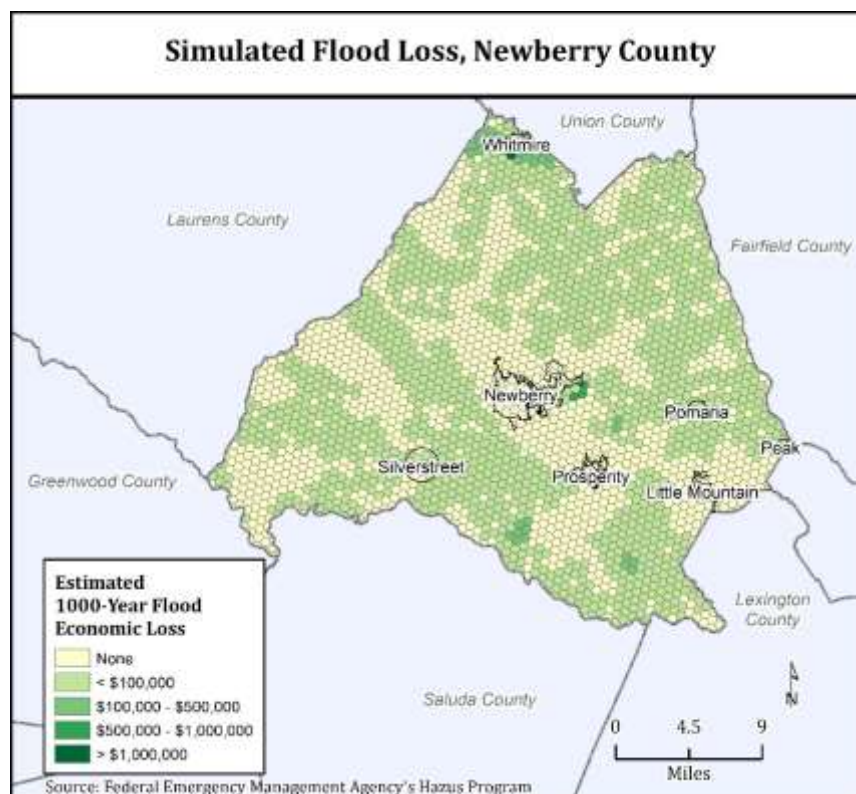


Figure 136 - Damage from a modelled 1,000-year flood event in Newberry County.

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 137). 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 137).

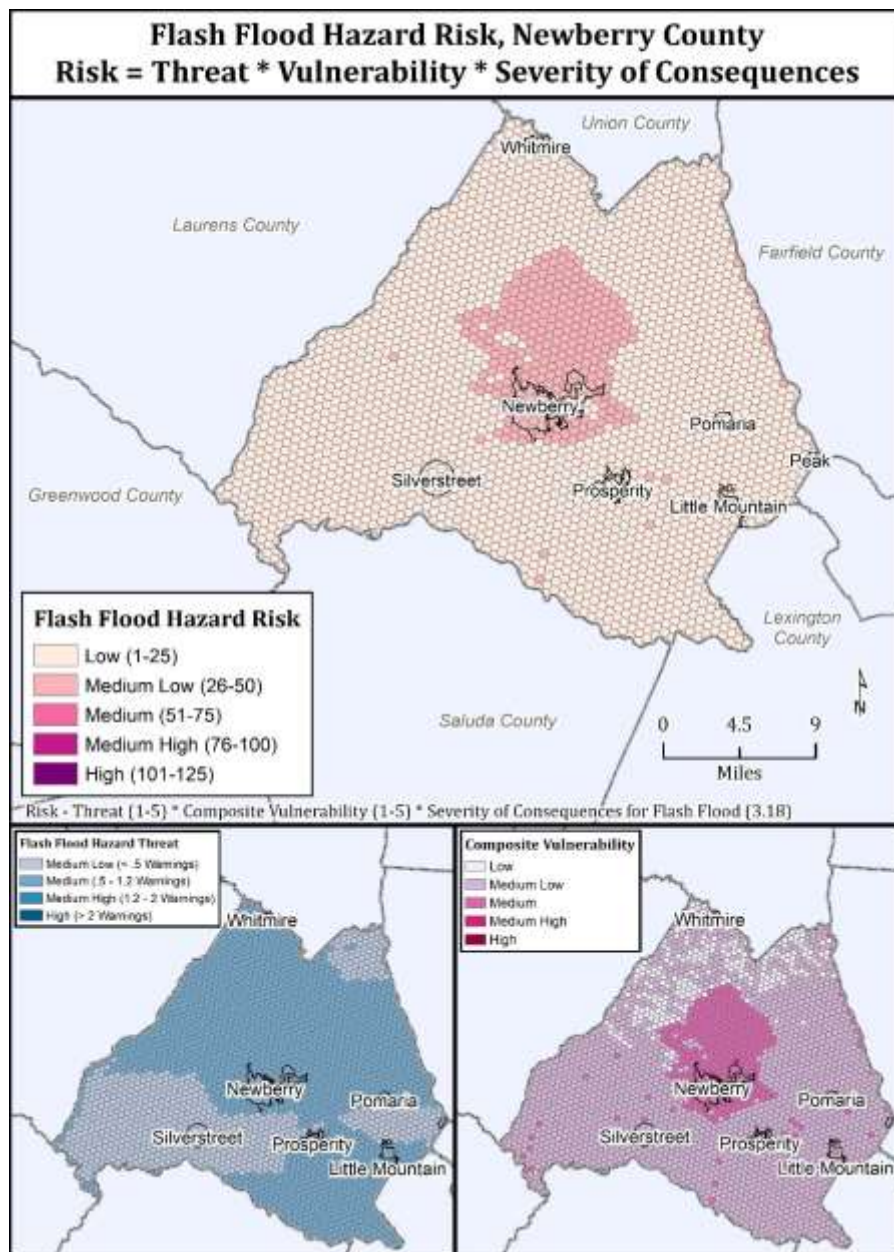


Figure 137 - Flash flood risk in Newberry County.

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 138). 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 138). 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 138).

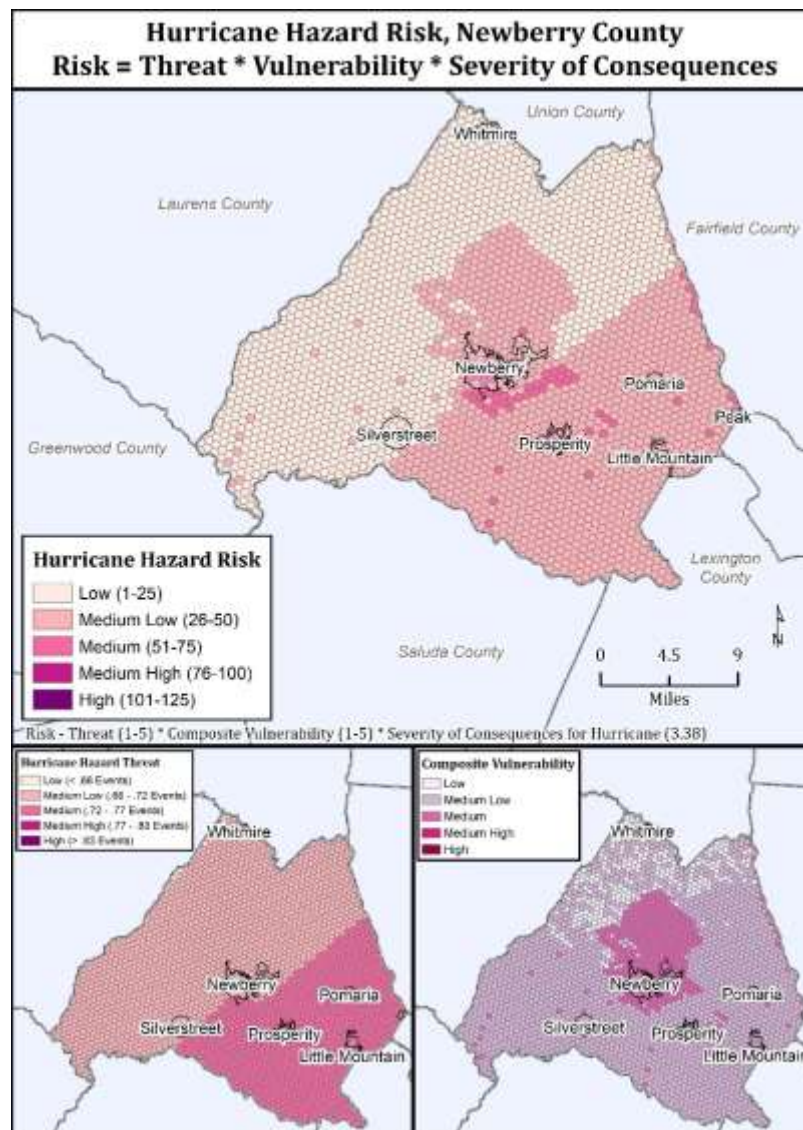


Figure 138 - Risk of tropical storms in Newberry County.

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 139). The southwestern corner of Newberry County would only experience 74 to 95 miles per hour wind (Category 1) (Figure 139). 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 140). 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 138). All estimates were derived using HAZUS-MH 2.2.

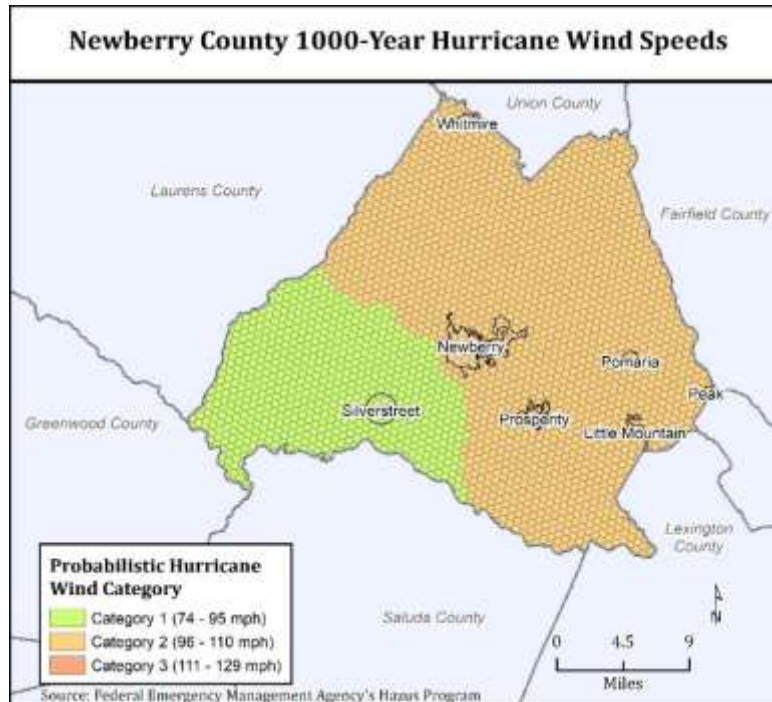


Figure 139 - Hurricane wind speeds using a 1,000-year storm event in Newberry County.

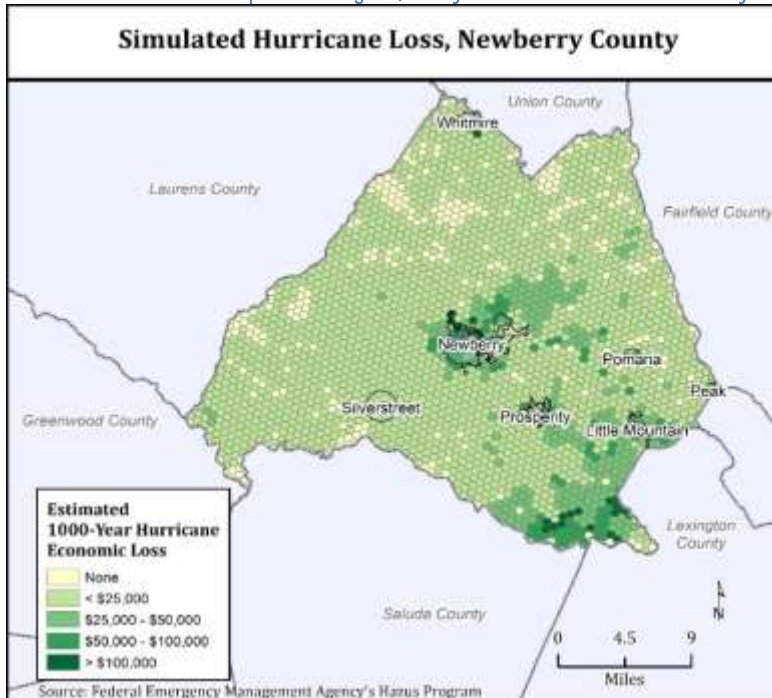


Figure 140 - Damage from a modelled 1,000-year hurricane event in Newberry County.

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 141). 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 141). 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 141).

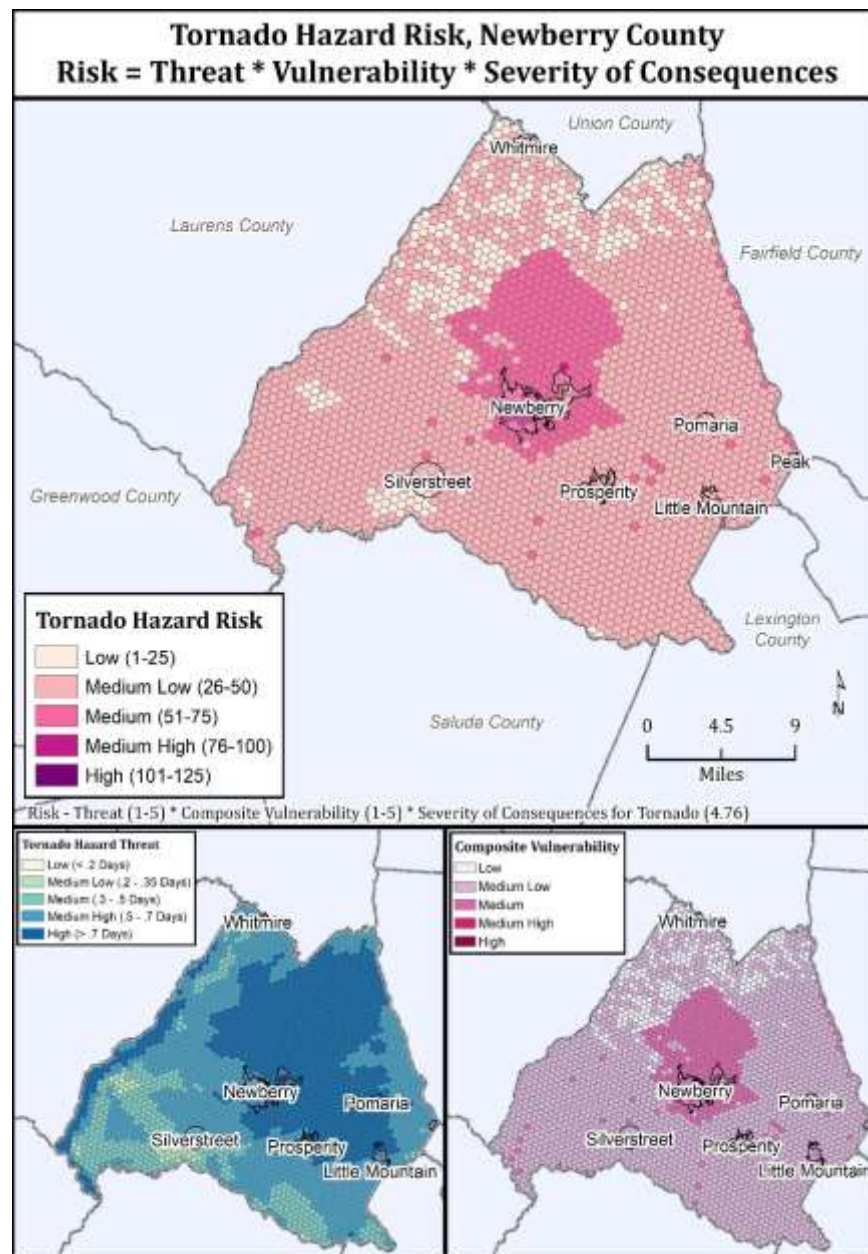


Figure 141 - Risk of tornadoes in Newberry County.

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 142). 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 142).

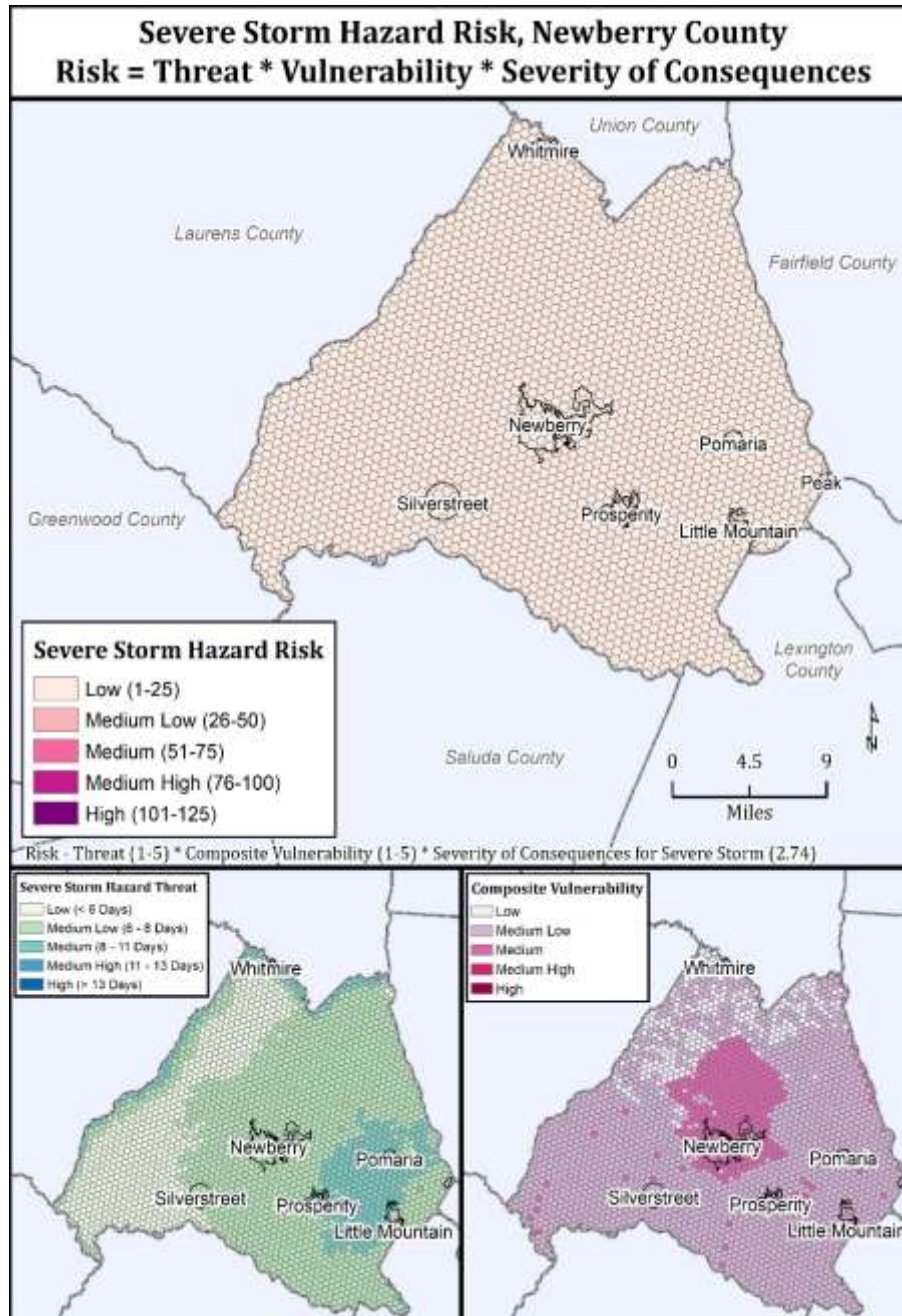


Figure 142 - Risk of severe thunderstorms in Newberry County.

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 143).

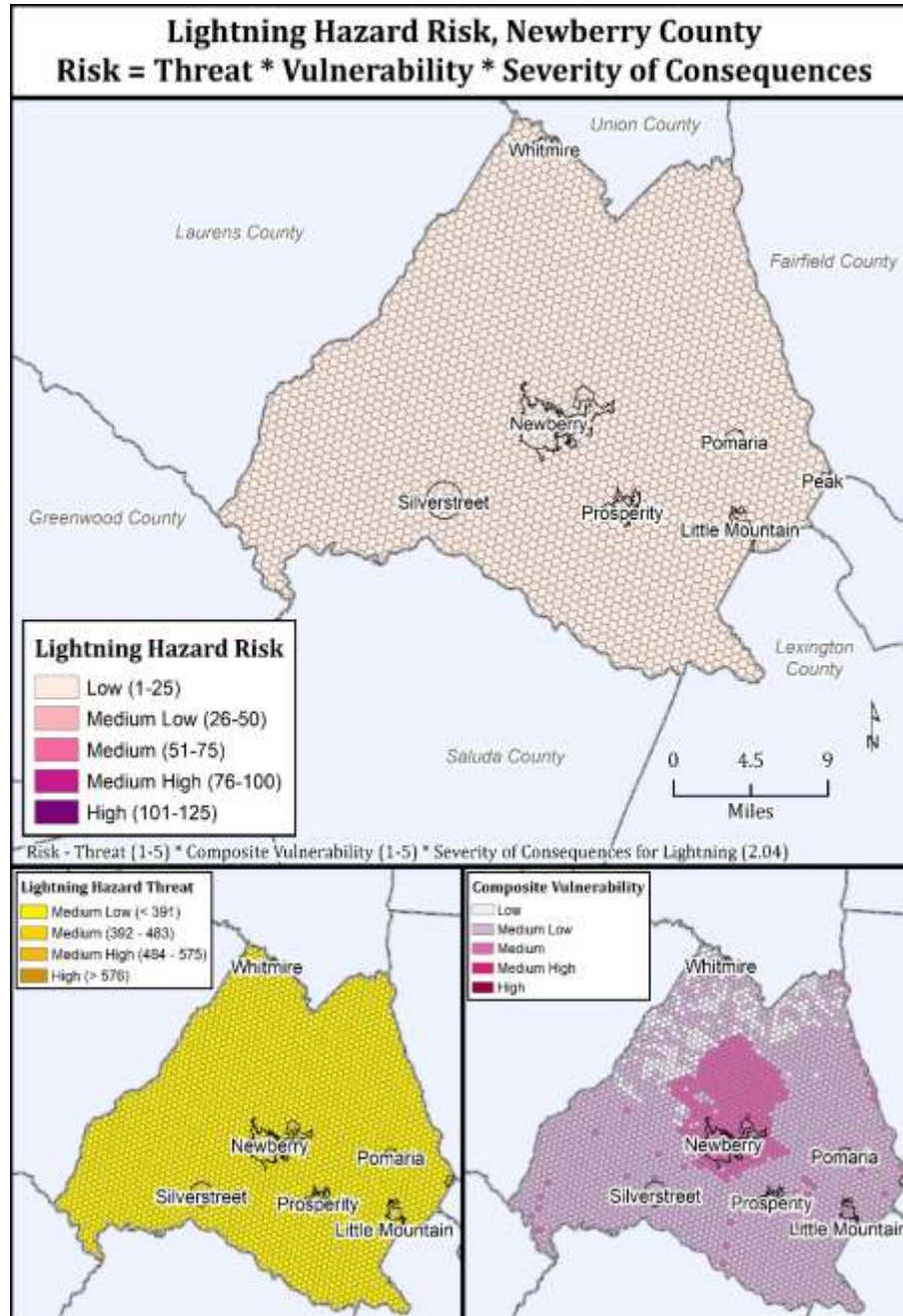


Figure 143 - Risk of lightning in Newberry County.

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 144). 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 144).

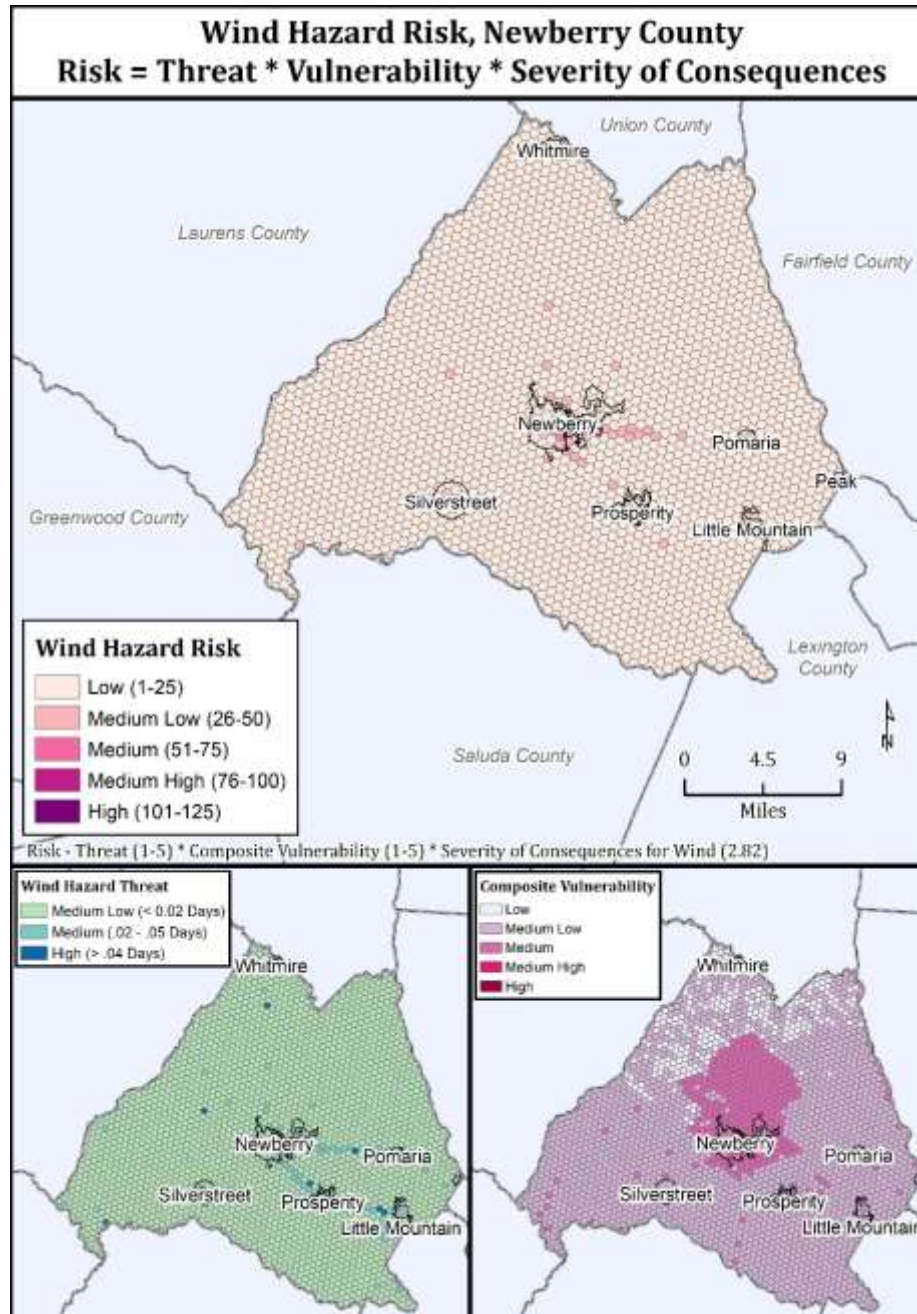


Figure 144 - Risk of high winds in Newberry County.

G) Hail

There are only few areas where higher composite vulnerability and high levels of hail hazard threat overlap, with no discernable pattern (Figure 145). The rest of Newberry County is rates with a medium-low level of hail hazard threat (Figure 145).

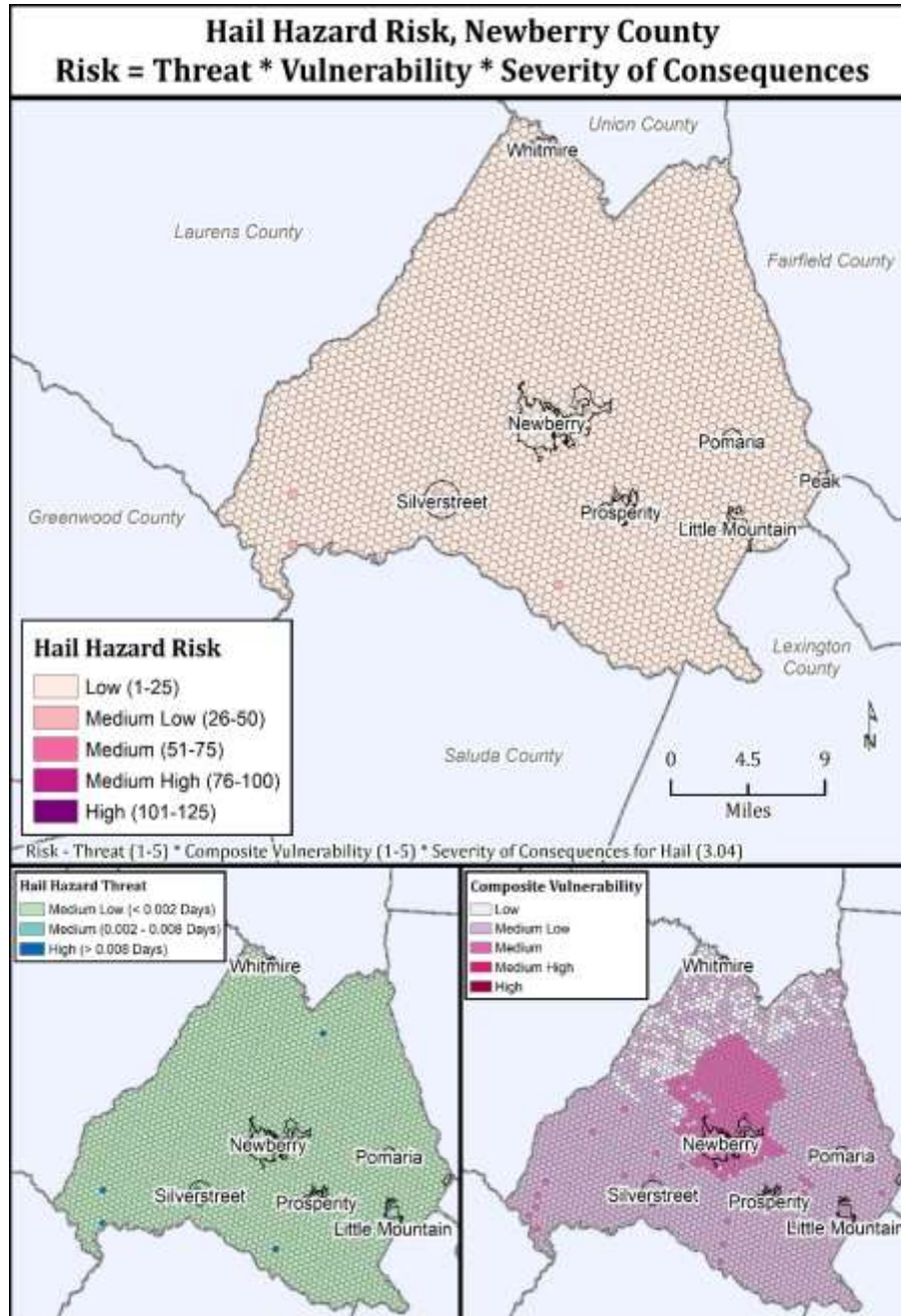


Figure 145 - Risk of hail in Newberry County.

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 146). 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 146).

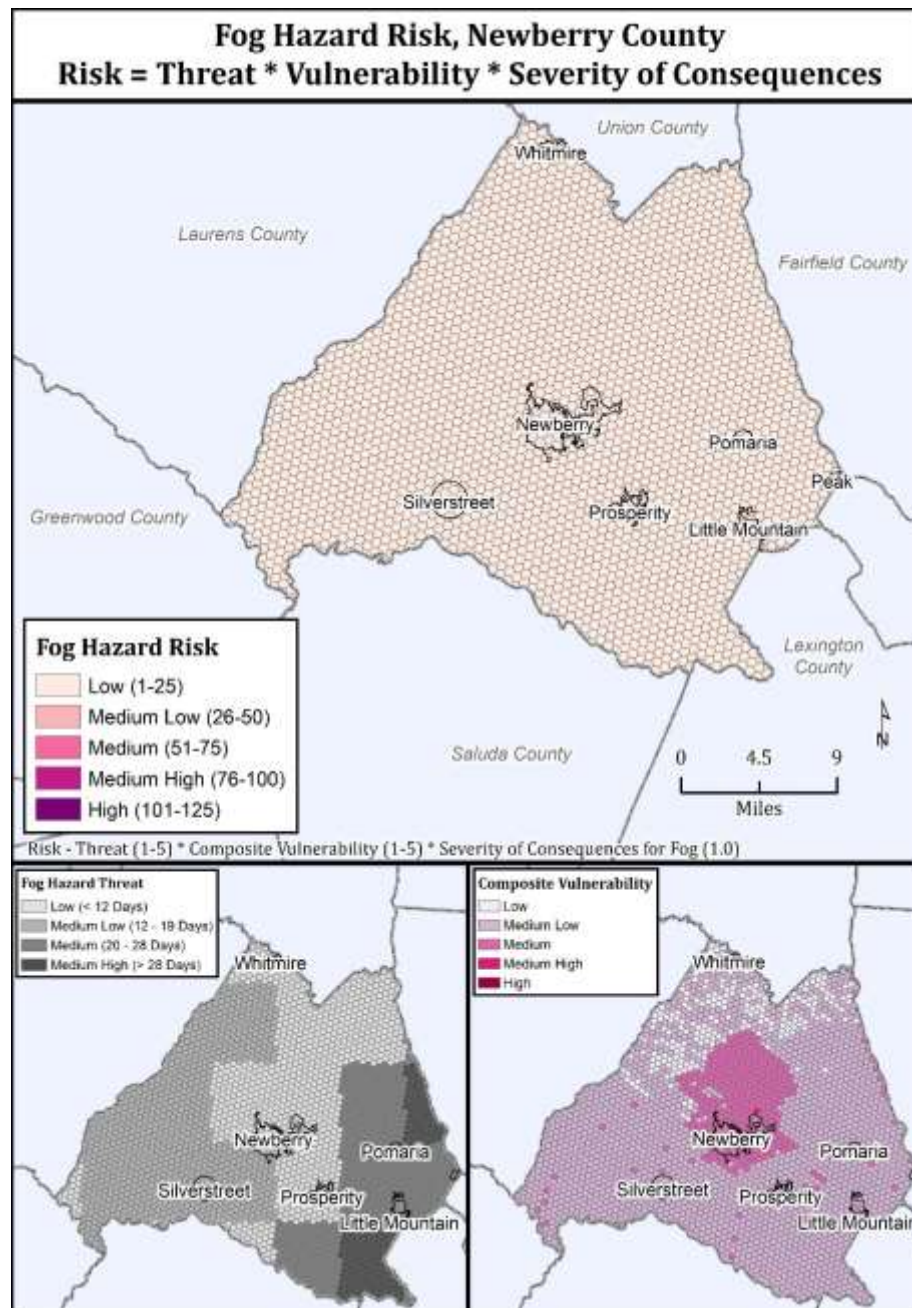


Figure 146 - Risk of fog in Newberry County.

I) 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 147). 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 147). The rest of the county was rated low on the winter weather hazard risk score (Figure 147).

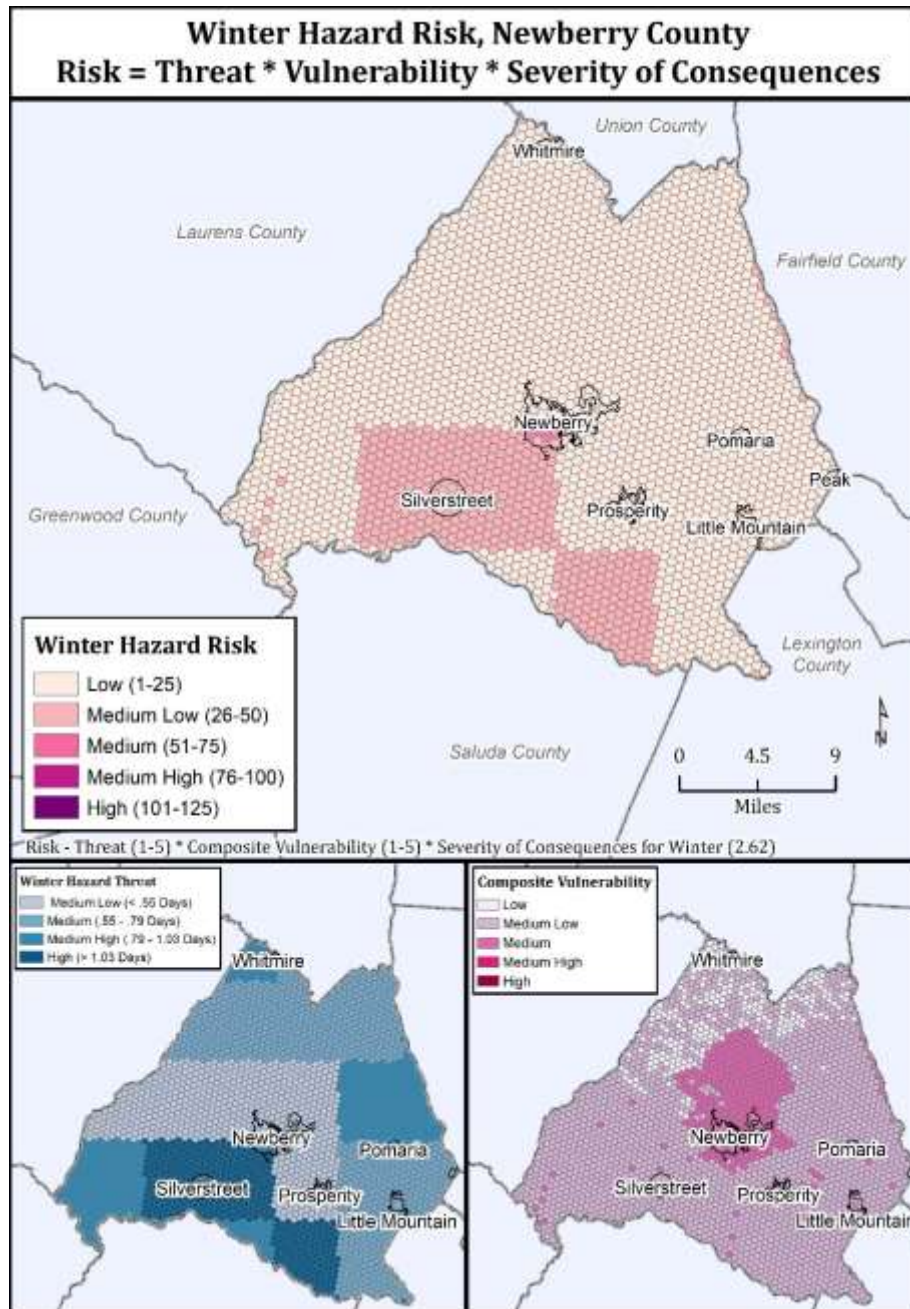


Figure 147 - Risk of winter weather in Newberry County.

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 148). 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 148). 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 148).

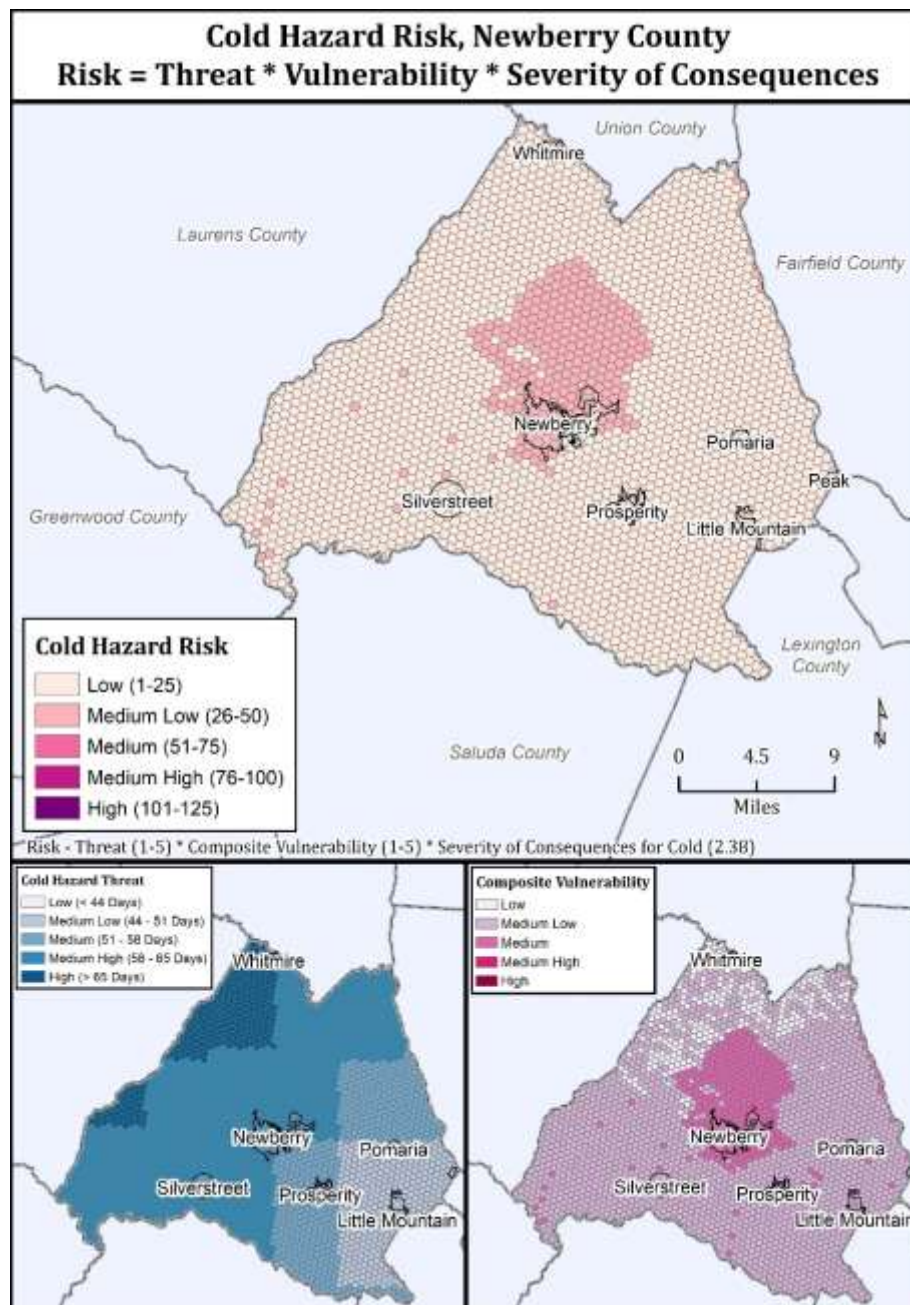


Figure 148 - Risk of cold weather in Newberry County.

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 149). 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 149).

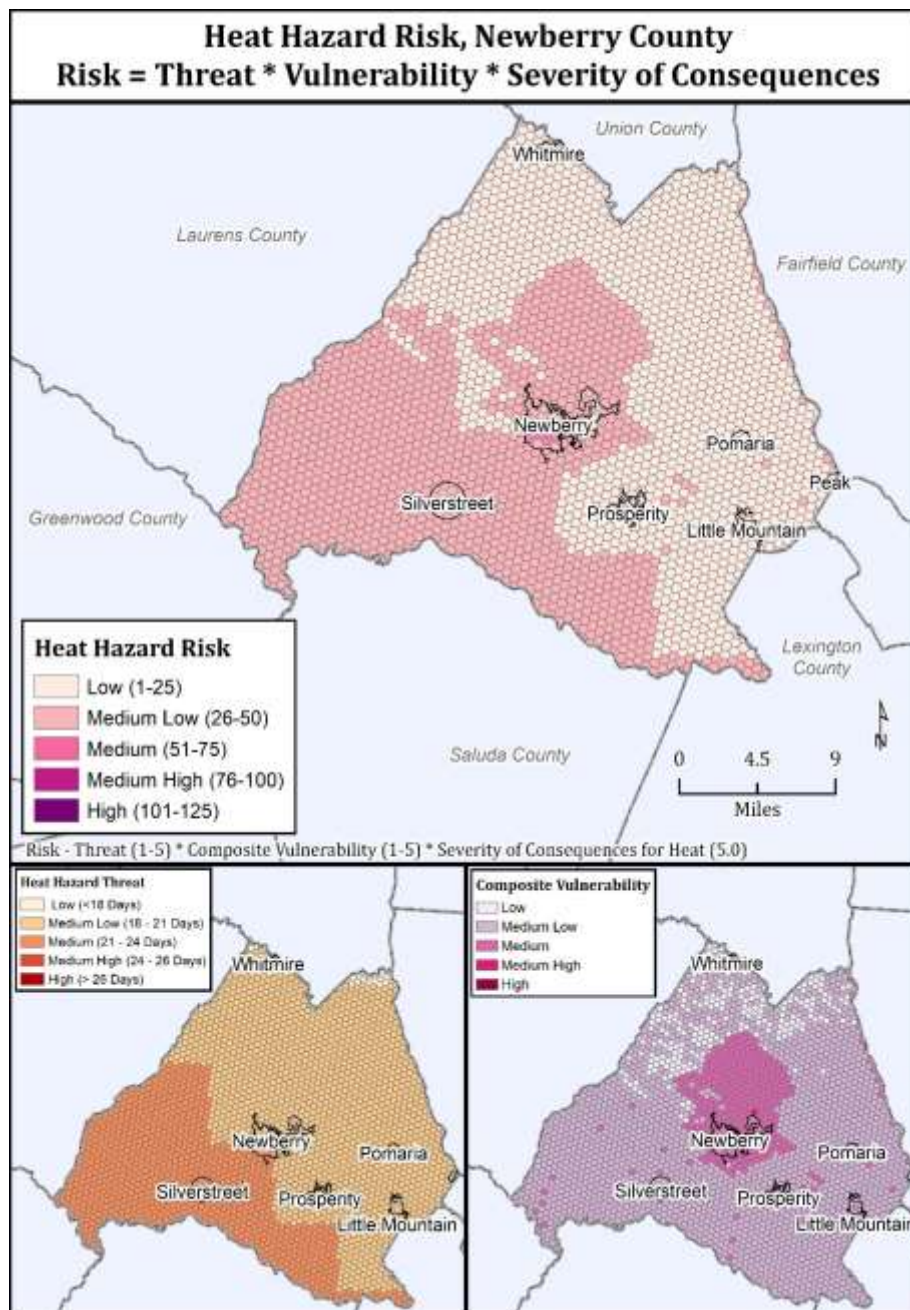


Figure 149 - Risk of extreme hot temperatures in Newberry County.

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 150). 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 150).

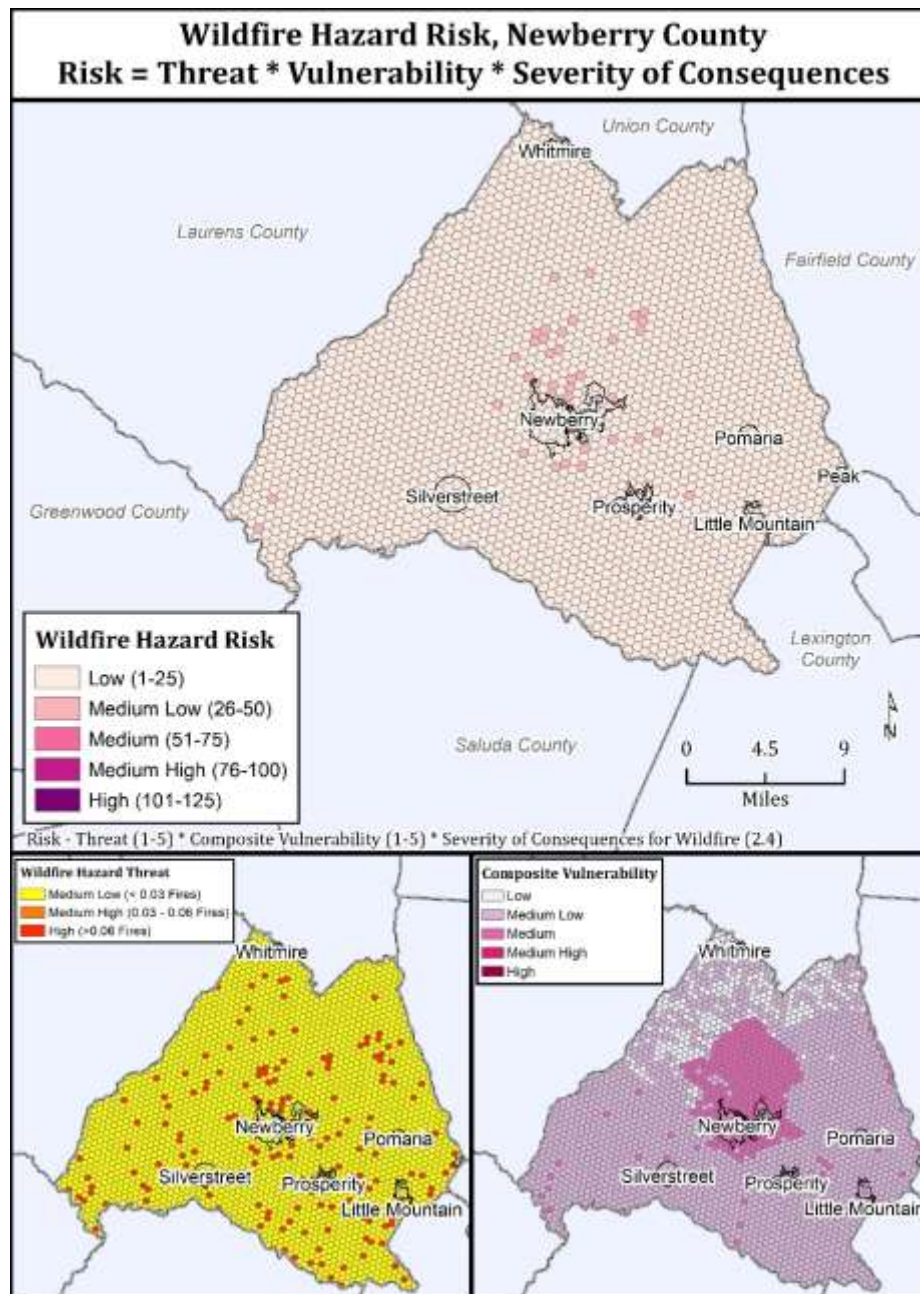


Figure 150 - Risk of wildfires in Newberry County.

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 151). 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 151). 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 151).

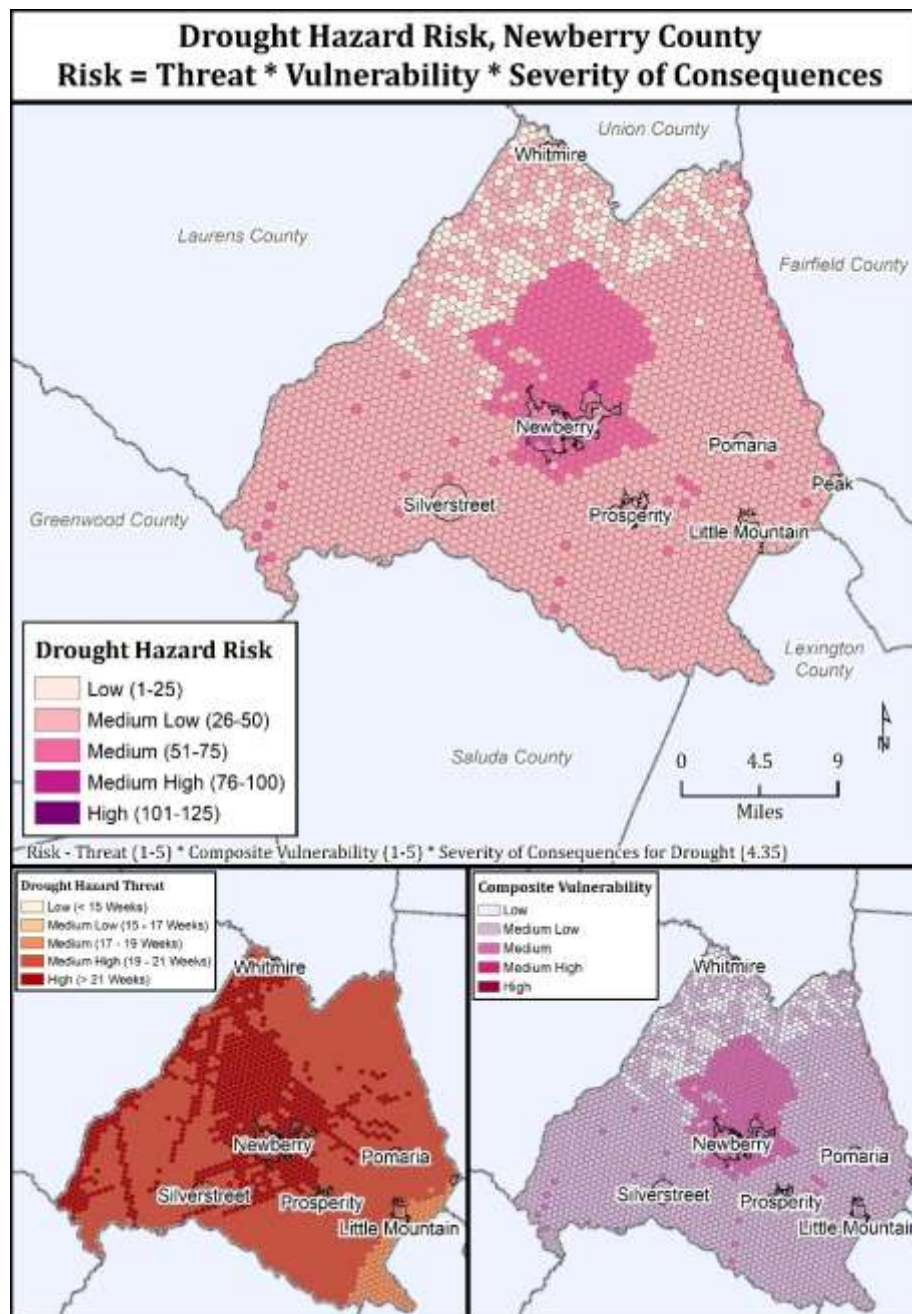


Figure 151 - Risk of droughts In Newberry County.

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 152). 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)⁷⁰.

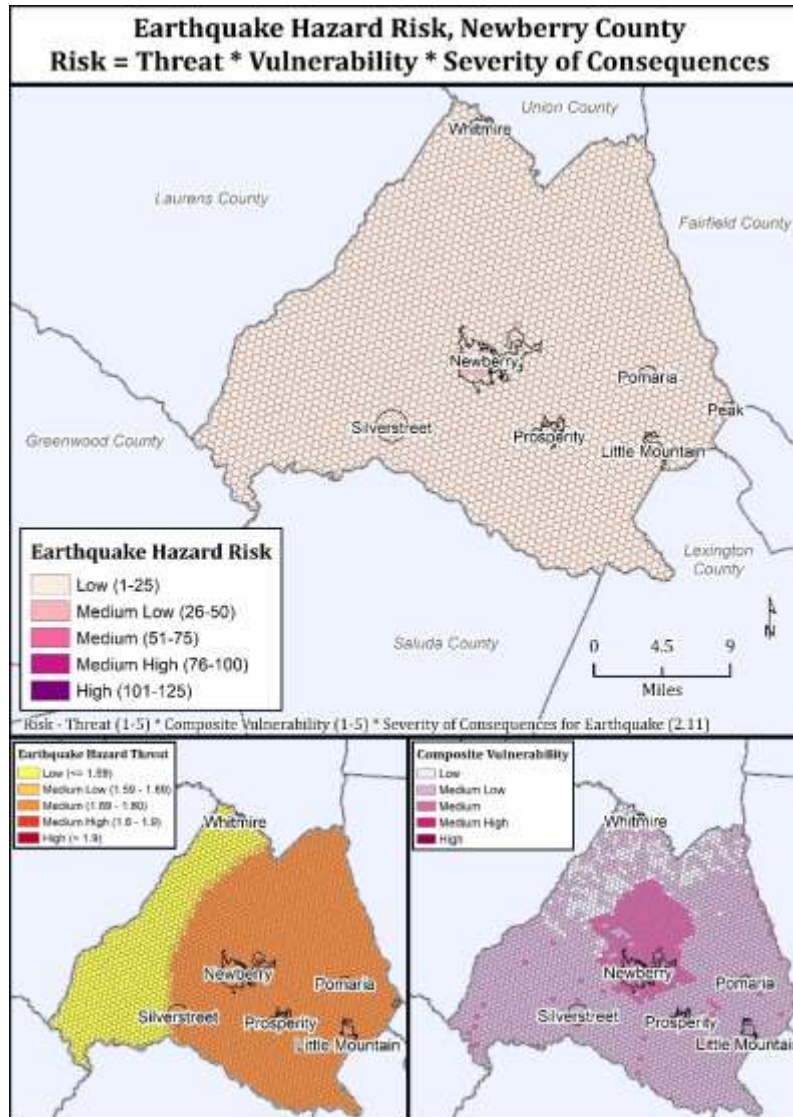


Figure 152 - Risk of earthquakes in Newberry County.

If the 1886 Charleston earthquake were to occur today (Figure 153), 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 154). All the critical infrastructure would be at least 50% operable within a day. The modelled earthquake's most

⁷⁰ 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.

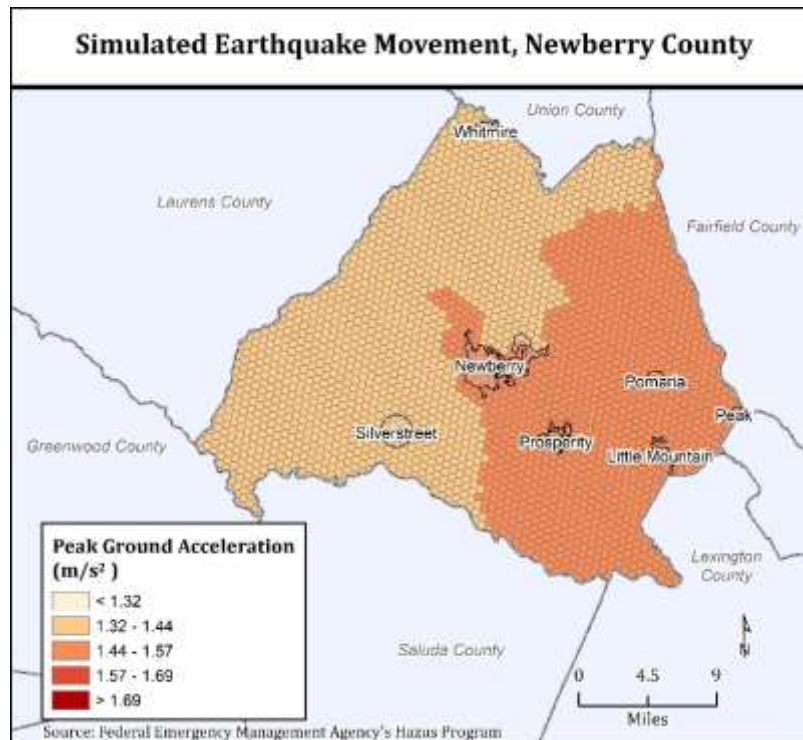


Figure 153 - Peak ground acceleration in Newberry County from a modelled 6.8 earthquake.

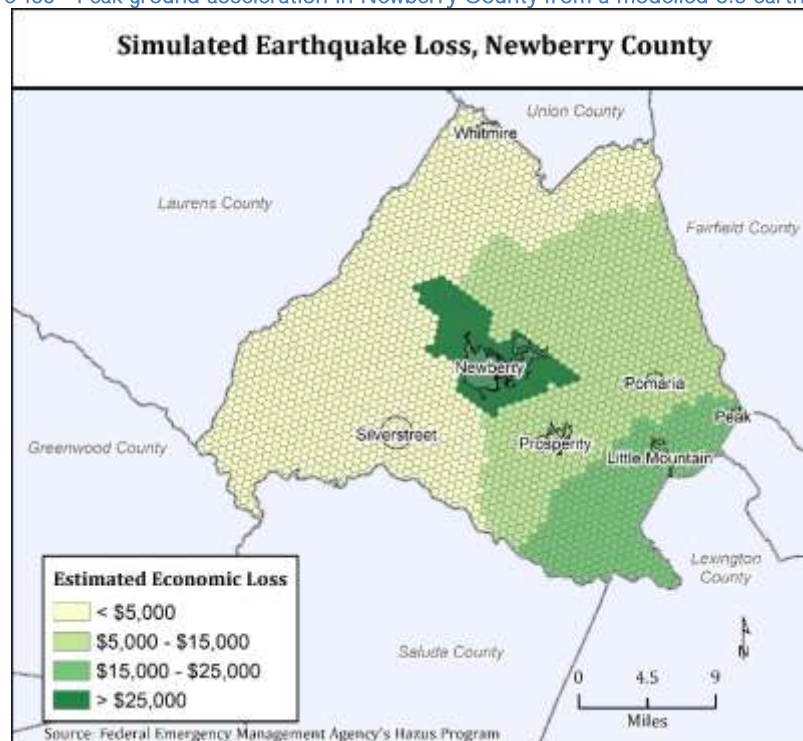


Figure 154 - Damage in Newberry County from a modelled 6.8 earthquake.

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 155). Additionally, the area around the City of Newberry has medium-high and high risk due to a very large concentration of composite vulnerability. There are also areas of noticeably higher composite risk near Pomaria, as well as between Silverstreet and Prosperity.

$$RISK_{HAZ} = (THR_{HAZ})(VUL)(CON_{HAZ}) \quad (3)$$

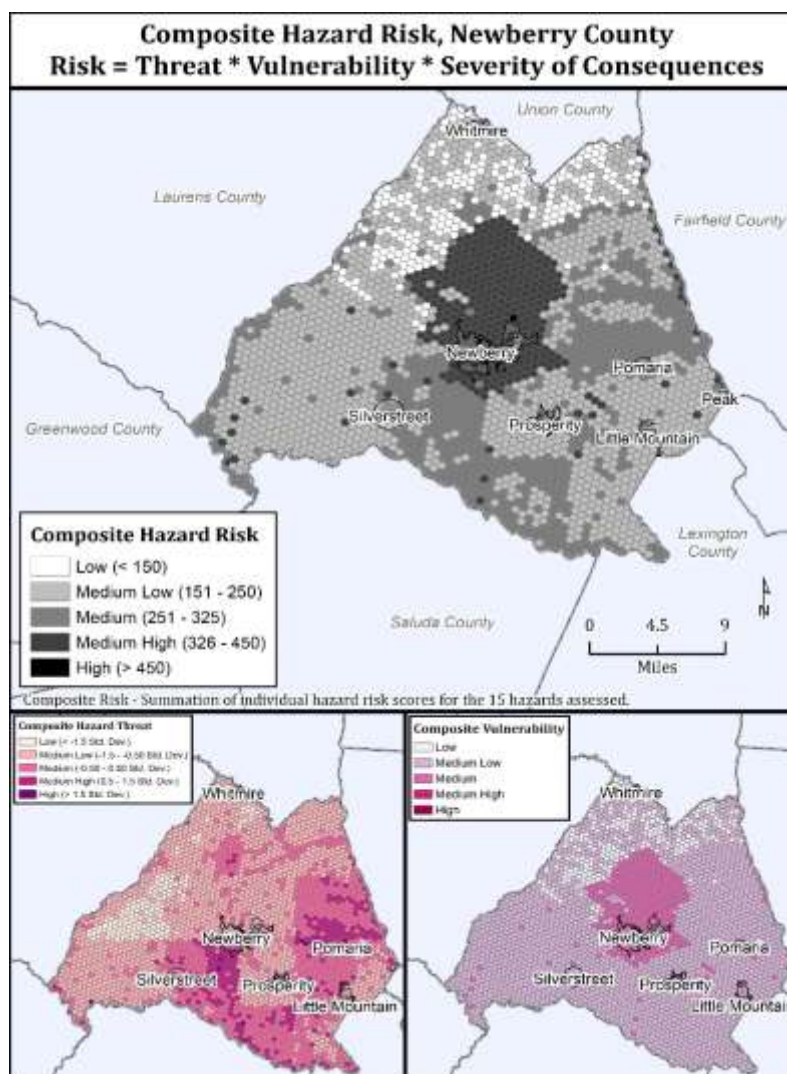


Figure 155 – Overall composite risk map of Newberry County considering all hazard threats, vulnerabilities, and severity of consequences.

In terms of risk assessment by hazard type, Table 84 summarizes the assessment criteria and rating values.

Categories of Risk by Hazard Type

While the composite risk map (Figure 155) 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 85 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 84. The high-risk hazards in Newberry County are heat, drought, tornadoes, winter weather, extreme cold and flash floods (Table 85).

Table 84 - 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 6.9](#)).

Table 85 - 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 ⁷¹	
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

⁷¹ 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 86 identifies emergency services and adopted ordinances available to the County.

This section addresses
FEMA HMP requirement
201.6(c)(3)

Table 86 - 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

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 National Flood Insurance Program Information

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. Table 87 shows residential and commercial properties that have active flood insurance located within participating NFIP jurisdictions. The majority of the insured properties are located within the unincorporated boundaries of Newberry County.

Table 87 - Active NFIP Flood Insurance Policies in Newberry County by Jurisdiction

Name of Jurisdiction	Active Residential Flood Insurance Policies	Active Non-Residential Flood Insurance Policies
Newberry County	122	5
Newberry	13	3

6.7 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.

These goals reflect the hazard mitigation priorities of plan participants, guided by the information compiled through the Capabilities Assessment. Goals were the basis of designing a broad range of mitigation actions and guided plan participants in the action prioritization process. Plan participants will rely on grants and other sources in order to fund mitigation projects. Mitigation action prioritization took into account multiple factors:

- 1) The updated hazard extent, vulnerability, and risk analyses created through the planning process of this HMP provided plan participants with the most recent information on natural hazard impacts. This guided which natural hazards should be prioritized, with higher priority given to hazards of higher frequency and/or extent.
- 2) A Benefit Cost Analysis (BCA) methodology was utilized to determine project effectiveness and plausibility. Actions that required minimal funds and utilized existing funding mechanisms were prioritized due to the higher likelihood that they could be accomplished.
- 3) If the technical expertise was not available, mitigation actions were prioritized utilizing documents such as Capital Improvement Plans, Comprehensive Plans, and stakeholder feedback on organizational priorities. The technical ability of plan participants to implement and maintain mitigation actions, without additional funding sources or staff, was also highly prioritized.

Each mitigation action includes the following information: a description of the mitigation activity, the type/s of natural hazard addressed, the organization or department responsible for implementing the mitigation activity, a priority rank, which broad goals are addressed through the mitigation activity, source of financing, generalized cost estimates, status since the previous HMP update, and a general timeframe of implementation. A template for providing mitigation goals is provided in [Appendix VIII – A](#).

6.8 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 88 - Newberry County portfolio of federally-supported hazard mitigation projects.

Mitigation Category	HMG P	PD M	FM A	Amount	Mitigation Category	HMG P	PD M	FM A	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)				
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)

6.9 Newberry County Mitigation Strategies

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.

Table 89 - 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	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	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	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 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 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	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

Newberry County								
Activity	Type of Hazards	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Remove taller trees near critical facilities	Thunder-storms (Hail, Wind, Lightning)	County Government	3	3	County Budget	\$50,000	Deferred	5 Years
Power line clearance with the Elec. Coop./ Duke Dominion Energy	Winter Snow & Ice Storms	Electric Companies	2	3	Private Companies	Unknown	Ongoing	Ongoing
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	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	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	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	Ongoing	Ongoing
Identify & contact all repetitive loss properties	Flooding	Zoning	3	1 & 10	County Budget	\$10,000	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	Ongoing	Ongoing

Newberry County								
Activity	Type of Hazards	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
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 vulnerable populations	Tornados	County	3	3,4 & 5	County Budget / Grants	\$3,000,000	Deferred	Deferred
Emergency response chain saw project and other efforts to remove debris	Tornados	Public Works /Fire/Rescue	1	4 & 5	County Budget	\$5,000	Completed Maintain Equipment	Ongoing
Harden utility services to facilities especially serving vulnerable populations	Tornados	County Buildings	3	3 & 9	County Budget	\$3,000,000	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	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	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	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	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 90 - 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

City of Newberry								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals addressed	Finance Source	Cost	Status	Time Frame
Enforce city zoning to restrict development in flood-plains	Flooding	Planning, Zoning & Development	1	10	PZD (GF)		Ongoing	Ongoing
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

City of Newberry								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals addressed	Finance Source	Cost	Status	Time Frame
Replace water storage tanks and pumps as needed	Hurricanes	Utilities	1	2	Utility Funds	\$5-6 m	Completed	Completed
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 91 - 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

Town of Whitmire								
Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe
Primary and Secondary electric line hardening	Winter Snow & Ice Storms	Duke Power	1	2, 4 & 7	Capital Improve. Budget	\$250,000 to \$750,000	Deferred due to funding	Deferred
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	Thunderstorms (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	Thunderstorms (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	Thunderstorms (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	Thunderstorms (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

This section addresses
FEMA HMP requirement
201.6(c)(2)(i)

Each county-specific section of the HMP includes various sub-county level analyses that include information on participating local government jurisdictions and organizations. They end with a list of mitigation strategies provided by participating stakeholders.

A Quarter Square Mile (1/4 sq mi) hexagonal grid is used throughout the analyses of this HMP. This provides the best coverage for small spatial areas, such as the participating sub-county organizations of this HMP, while still providing the ability to visualize spatial differences across the region. City or sub-county jurisdiction data on natural hazard type, location, extent, and community vulnerability and risk can effectively be analyzed utilizing this simplified method of summarizing complex geospatial information. This standardized regular gridded framework, enables analysis and evaluation within and between datasets that would normally be difficult (or impossible) to visually, statistically, or spatially compare.

Analysis methodology and additional figures on sub-county natural hazard type, extent, location, and other metrics may be found in the [Appendices](#)

7.1 Historical Hazard Assessment for Richland County

Summary of Historic Impacts

Richland County experiences an array of natural hazards (Table 92). 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 156).

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 92 - 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.

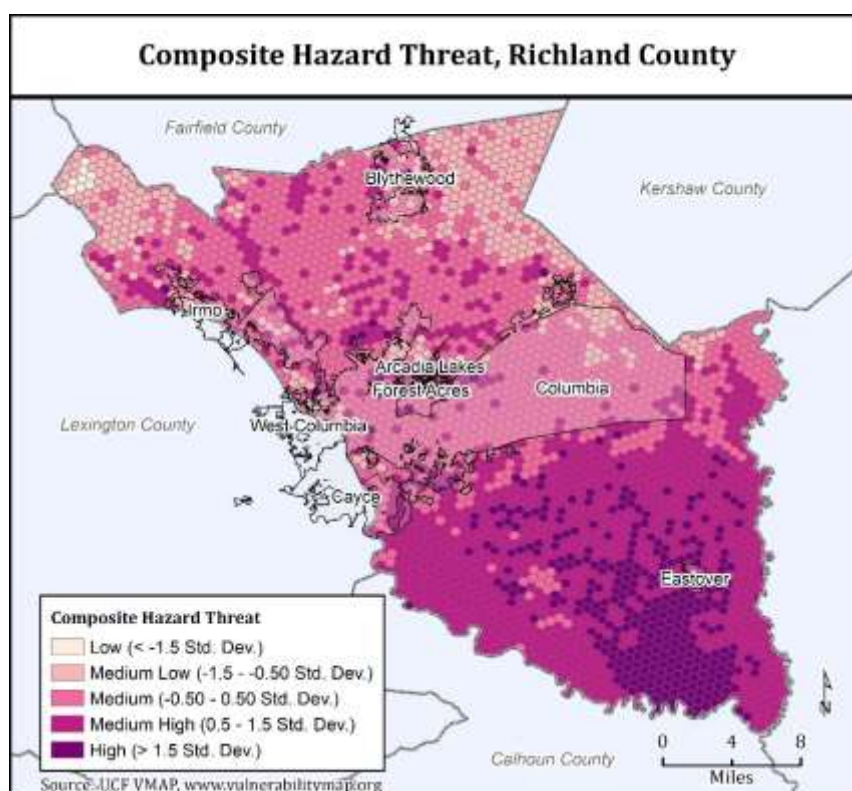


Figure 156 - Composite threat/extent profile of Richland County.

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 to ponding and/or inadequate drainage (Table 93). 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 158). 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 159). 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)^{72*}:

Over a five-day period, an upper low-pressure system combined with the remnants of Hurricane Joaquin streamed tropical moisture into South Carolina (Figure 157). 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)⁷³. 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 billion⁷⁴ to \$12 billion⁷⁵ for the entire impact area in South Carolina. Richland County received both individual and public assistance funding through FEMA.

^{72*} Note: The historic record for all hazards in this plan covers the time period from 1960 through 2020

⁷³ NWS, 2015. Historic rainfall and flooding, October 2015. Available at <http://www.weather.gov/cae/HistoricFloodingOct2015.html>

⁷⁴ NOAA National Centers for Environmental Information, 2016. Billion-Dollar Weather and Climate Disasters. Available at <http://www.ncdc.noaa.gov/billions/events>

⁷⁵ 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>

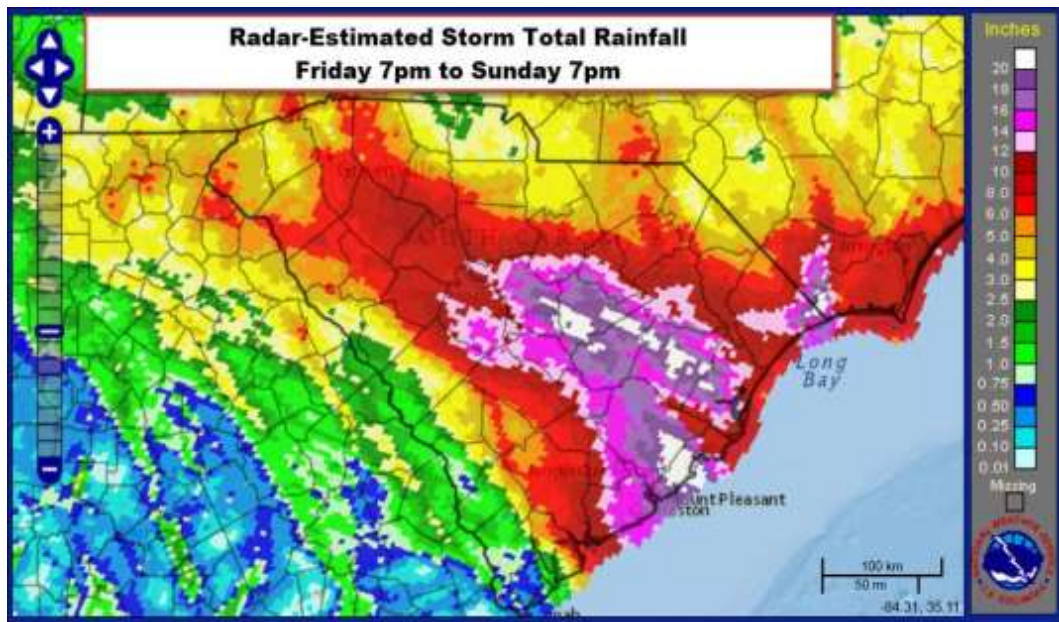


Figure 157 - Total rainfall amounts for the 2015 flood event. Source: NWS.

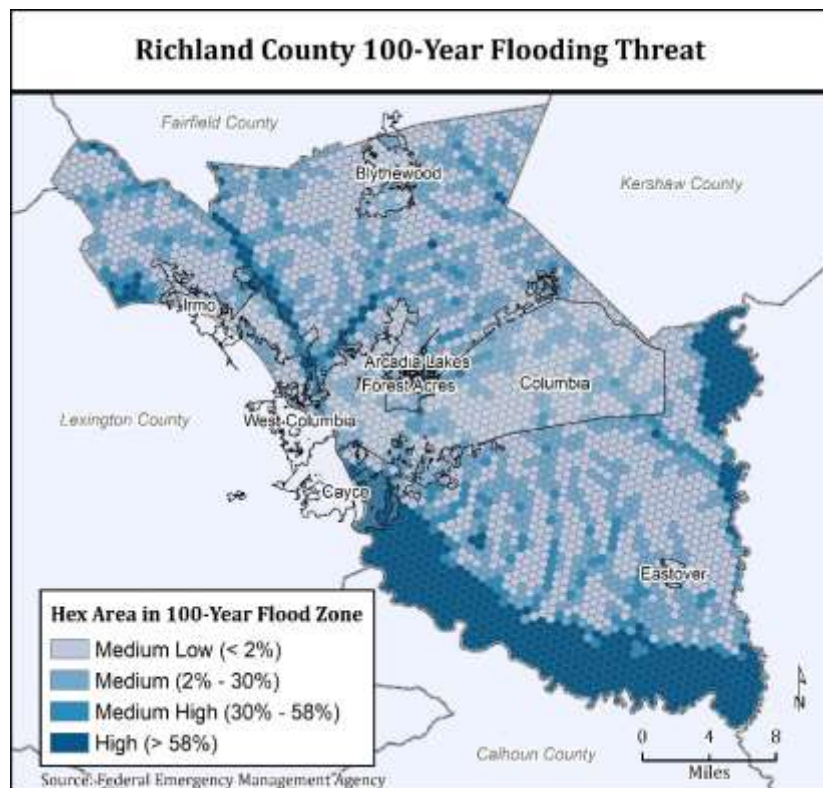


Figure 158 - 100-year riverline floodplain threat/extent in Richland County.

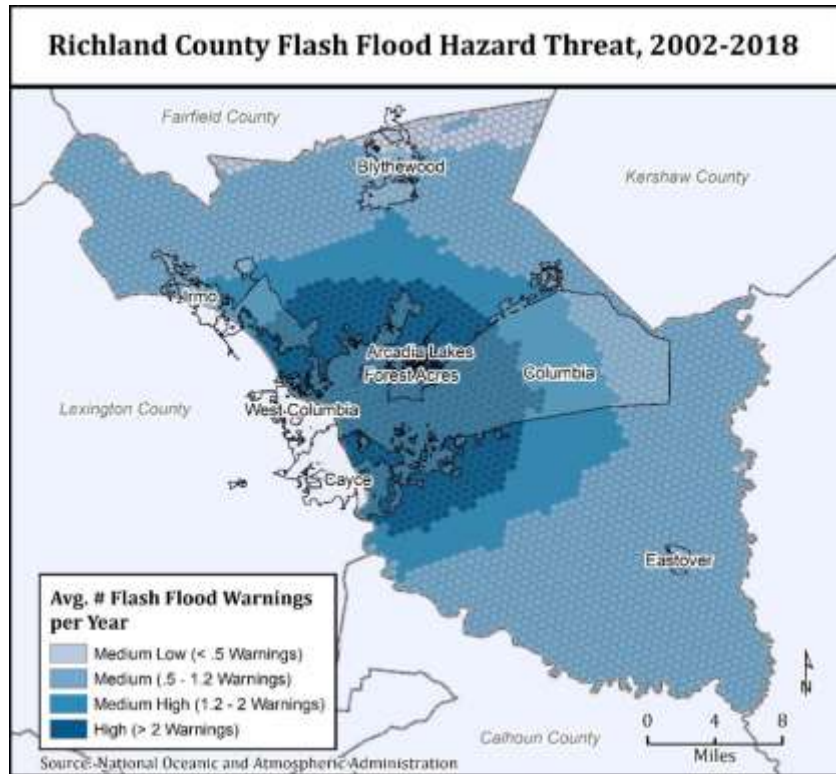


Figure 159 - Flash flood threat/extent in Richland County.

Table 93 - 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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)*	Location	Description
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	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
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.

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)*	Location	Description
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 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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)*	Location	Description
								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.
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 state 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.

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)*	Location	Description
								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.
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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)*	Location	Description
								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.
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.

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)*	Location	Description
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.
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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)*	Location	Description
								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 SCDOT 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 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.

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)*	Location	Description
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.
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.

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)*	Location	Description
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 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

Start Date	End Date	Inj	Fat	Property Damage	Crop Damage	Mag. (in.)*	Location	Description
								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''⁷⁶. 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: 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 93) and 20 dam failures during the 2015 flood disaster alone (Table 94). 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 prior⁷⁷.

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 94 - 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 Rocky ford 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)

⁷⁶ DOMINION ENERGY, 2008. Saluda Hydro Project Relicense. Attachment 3b Finale Schedule A response. Available at <http://www.thestate.com/news/local/article53937070.html>

⁷⁷ 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>

Dam Name	Class
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 160). 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 161 & Table 95). 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 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.

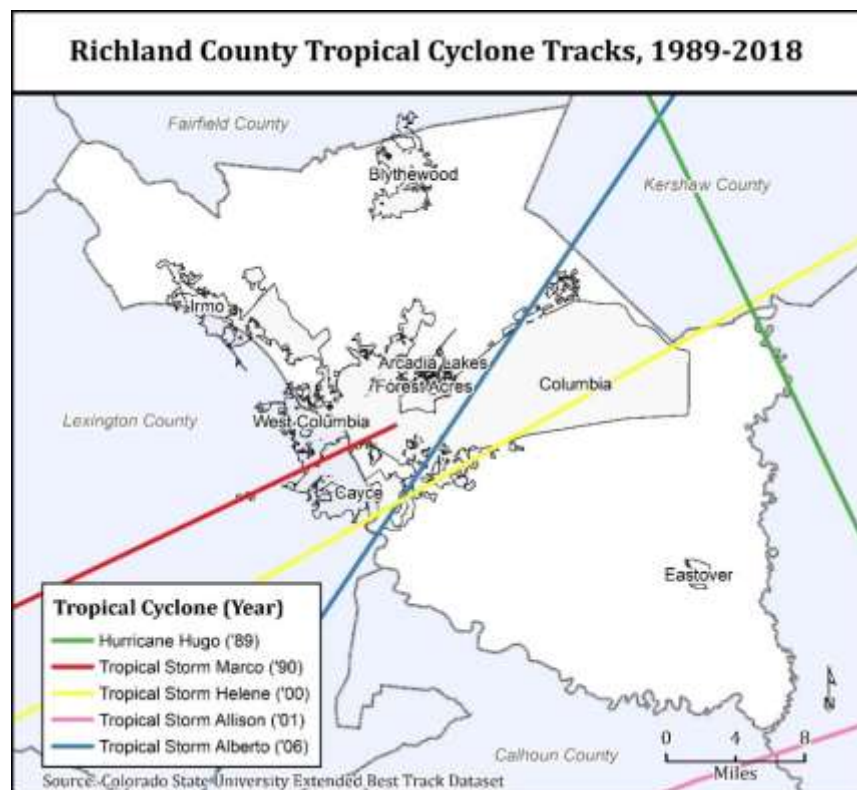


Figure 160 - Historical tropical cyclone tracks in Richland County.

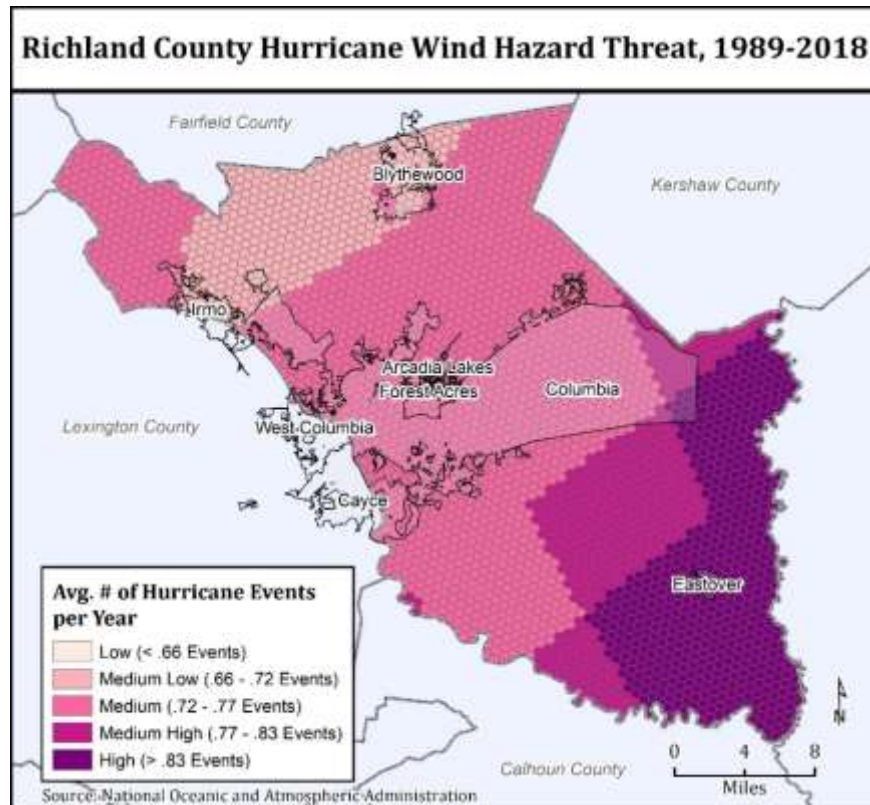


Figure 161 - Tropical cyclone threat/extent in Richland County.

Table 95 - 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 EFO through EF2, with one recorded incident of an EF3 in the northwestern edge of the county (Figure 162). 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 163).

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

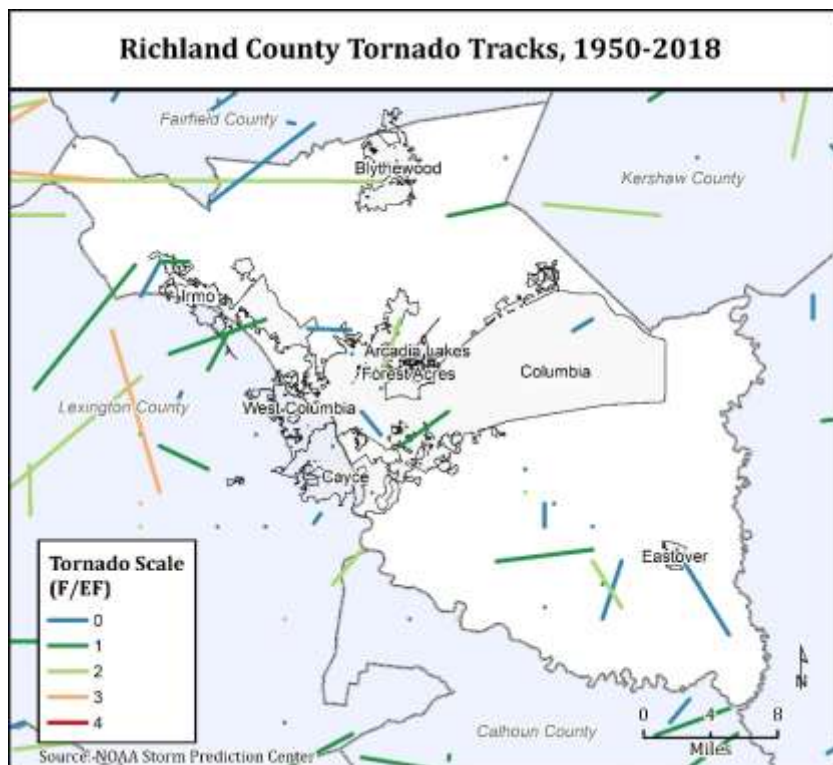


Figure 162 - Historical tornado tracks in Richland County.

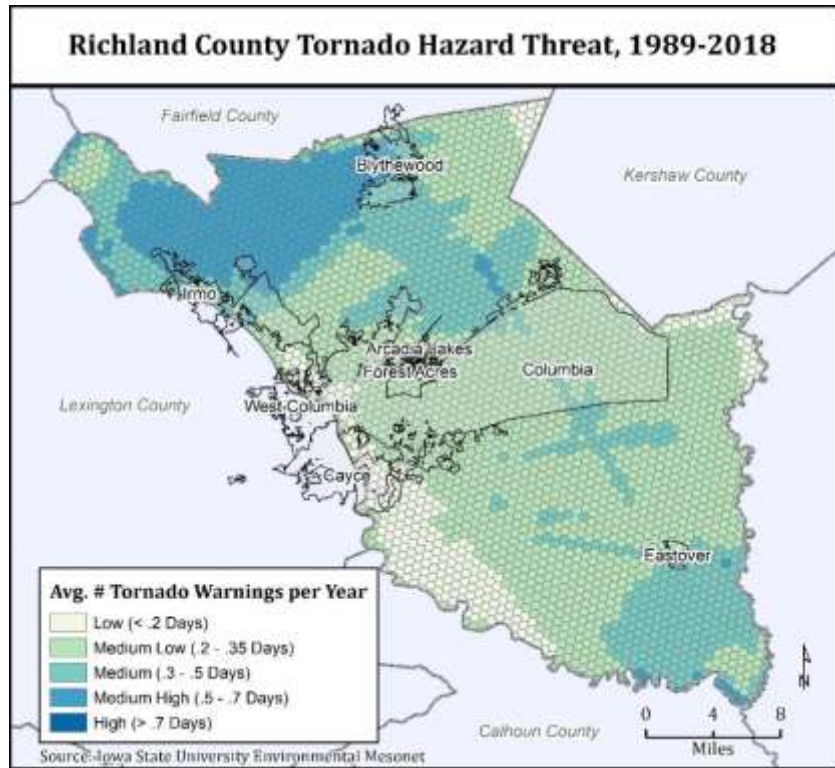


Figure 163 – Tornado threat/extent in Richland County.

Table 96 - 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	EFO	Denny Terrace	An EFO 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. The 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 164). 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 inch⁷⁸. 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 97).

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)

⁷⁸ SCDNR, n/d. South Carolina Climate. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/cli_sc_climate.php

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)

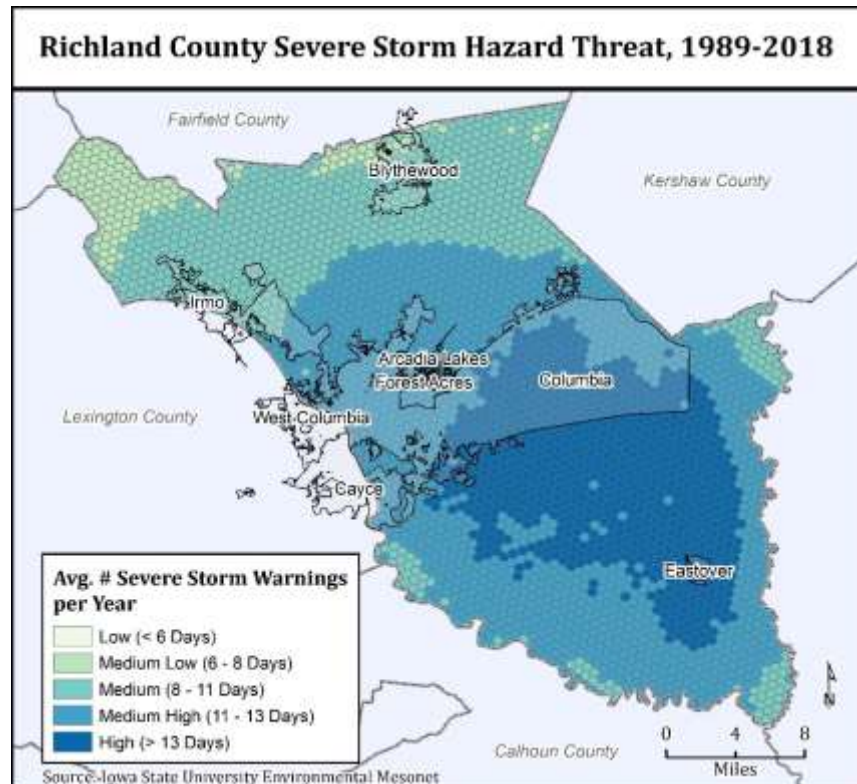


Figure 164 - Thunderstorm risk in Richland County.

Table 97 - 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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)	Location	Description
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
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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)	Location	Description
								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 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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)	Location	Description
								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.
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 Winnsboro 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.

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)	Location	Description
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 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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Mag. (in.)	Location	Description
								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.
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 165 & Table 98). 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

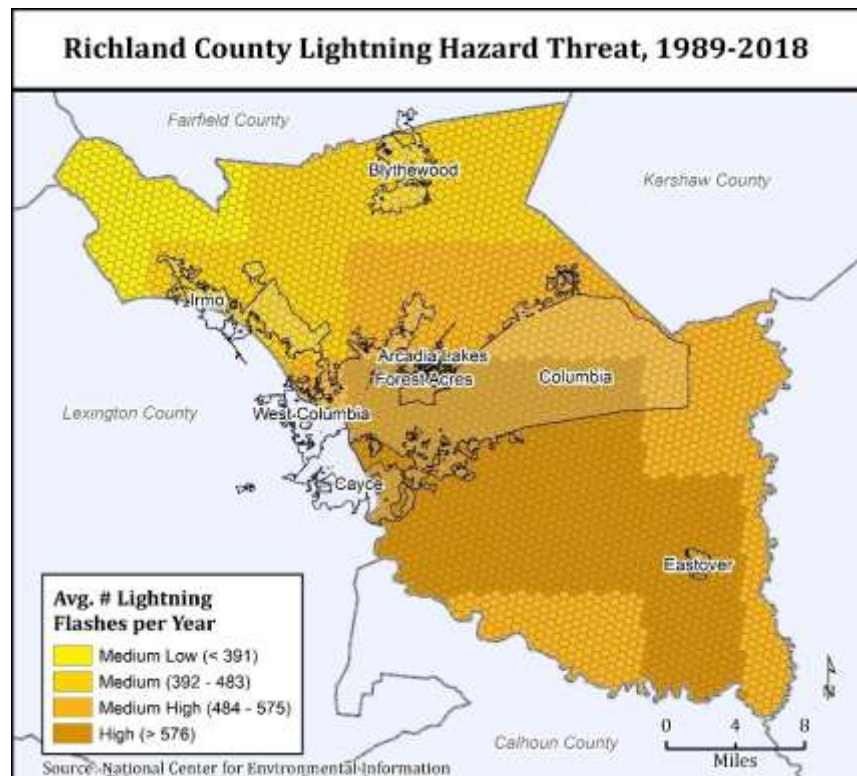


Figure 165 - Lightning threat/extent in Richland County.

Table 98 - 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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
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
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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
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
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

Start Date	End Date	Inj.	Fat.	Property Damage	Crop Damage	Location	Description
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
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 99). 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 166).

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)

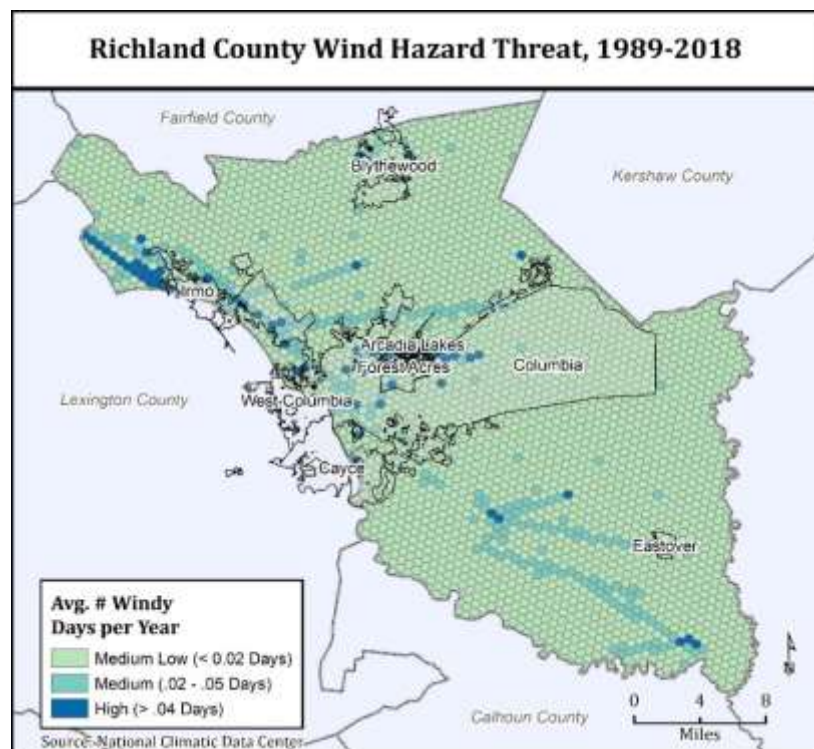


Figure 166 - Wind risk in Richland County.

Table 99 - 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-126 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.

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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	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	55	Hopkins	Highway Patrol reported trees down near the intersection of Bluff Road and Old Bluff Road.

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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 Lorick Road.
8/6/2015	8/6/2015	0	0	\$2,187	\$0	50	Dentsville	Highway Patrol reported trees down on Oneil Court at

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								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 Vanboklen 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 167). 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 168). 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)

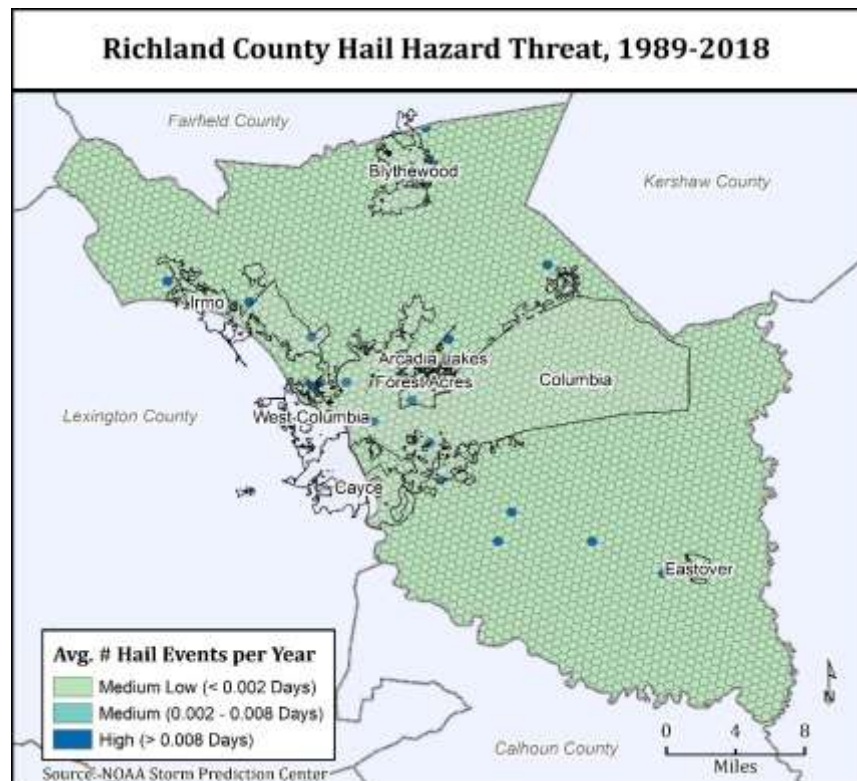


Figure 167 - Hail threat (occurrence) in Richland County.

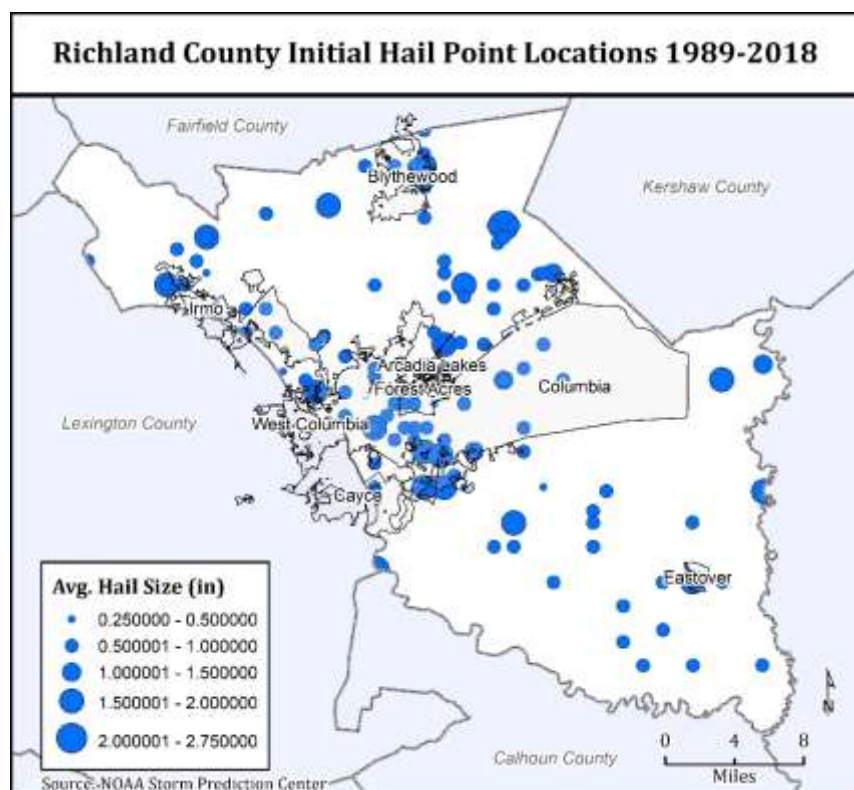


Figure 168 - Risk of large hail events in Richland County.

Table 100 - 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 be 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 days⁷⁹ 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 169). 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

⁷⁹ "Fog days" have reduced visibility due to fog, haze, or smoke at any time of the day as indicated by NWS station data.

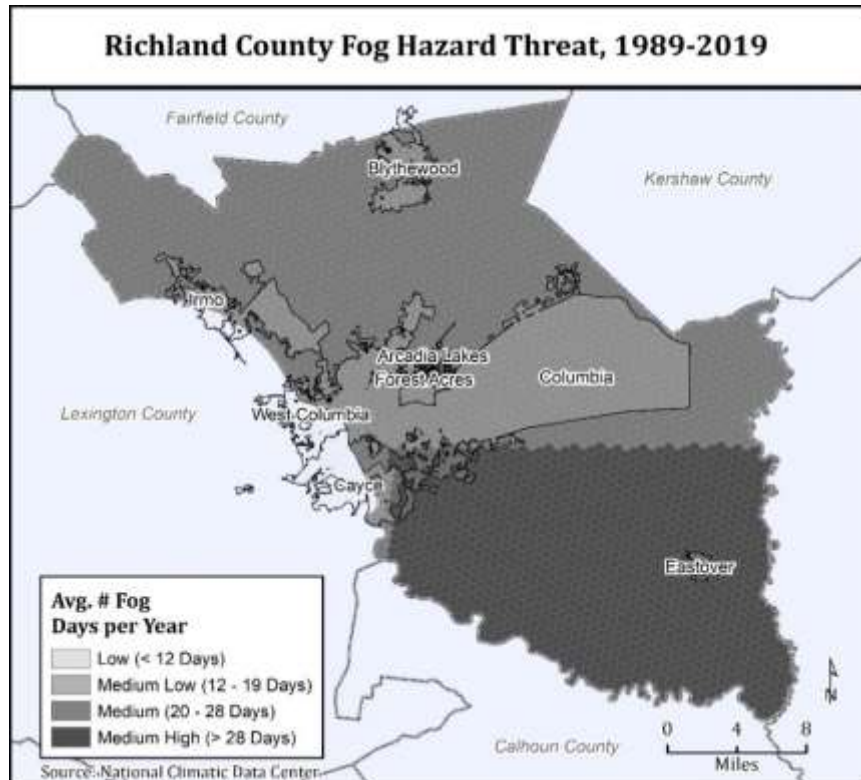


Figure 169 - Fog threat/extent in Richland County.

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 170). Snow accumulations of 2 inches and more are rare, though the area has seen significant snow accumulations in the past (Table 101). Record snowfall of 16 inches occurred in 1973, and in 2010 with 8.6 inches⁸⁰. The highest daily snowfall amount was 12.3 inches (February 10, 1973)⁸¹.

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

⁸⁰ NWS Columbia Forecast Office, 2010. February snowfall and the record books. Available at http://www.weather.gov/cae/Snowfall_Total_Records_cor.html

⁸¹ 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.

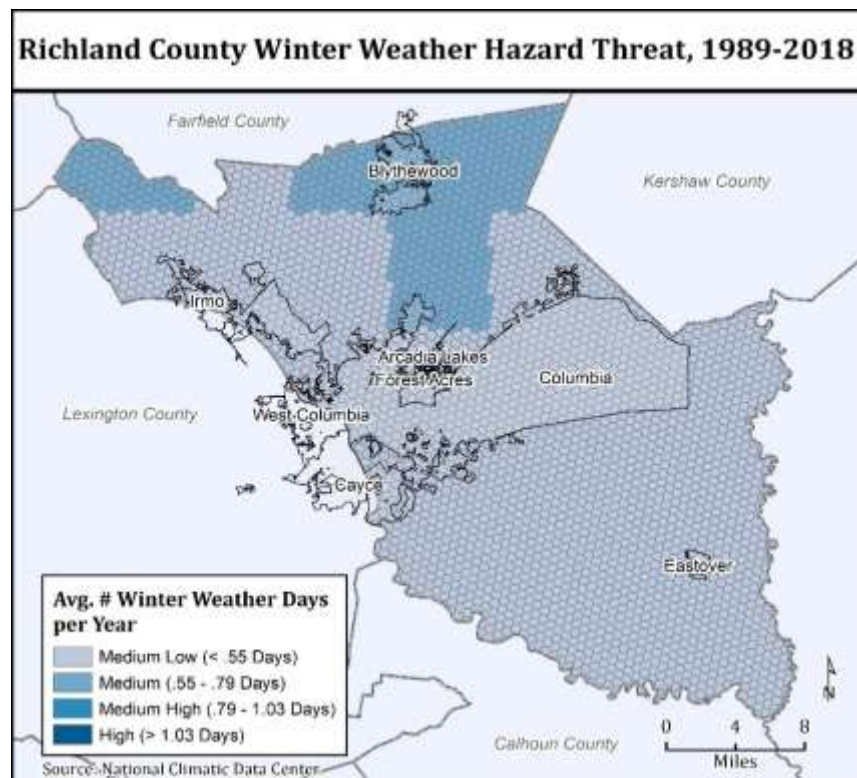


Figure 170 - Threat/extent of winter weather in Richland County.

Table 101 - 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 171). The record minimum temperature for Richland County was set on January 16, 1994, with -5 degrees⁸². 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.

⁸² 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)

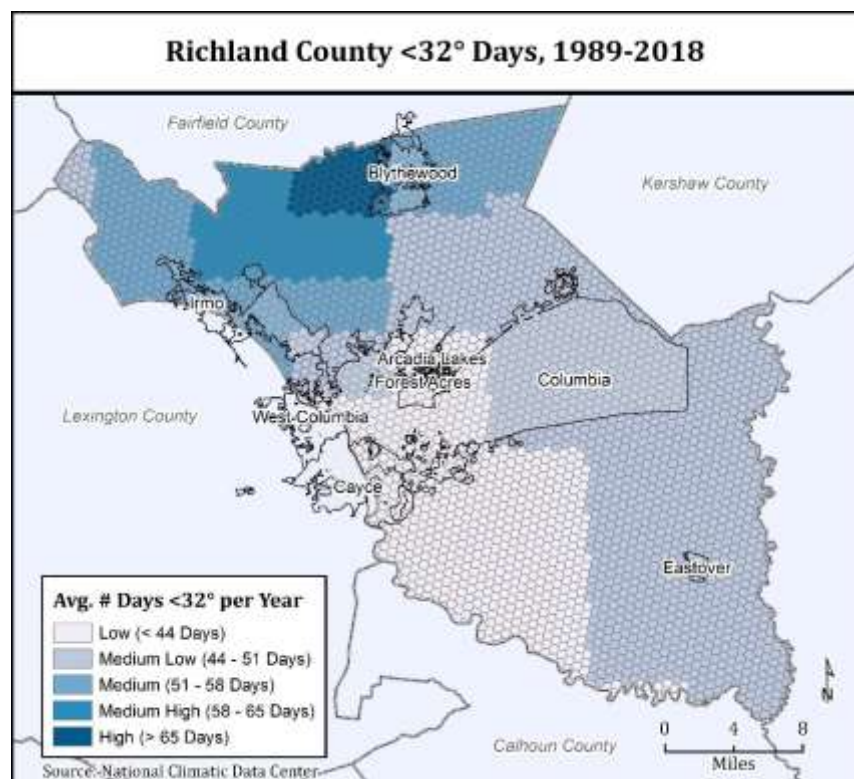


Figure 171 - Cold weather threat/extent in Richland County.

Table 102 - 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 172). 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 October⁸³. 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)⁸⁴

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)

⁸³ Southeast Regional Climate Center, 2012. Record high temperatures for selected cities in the Southeast. Available at <https://sercc.com/comparative-climate-data/>

⁸⁴ NWS Weather Forecast Office Columbia, SC, 2015. June 2015 climate summary. Available at <http://www.weather.gov/cae/June2015Climate.html>

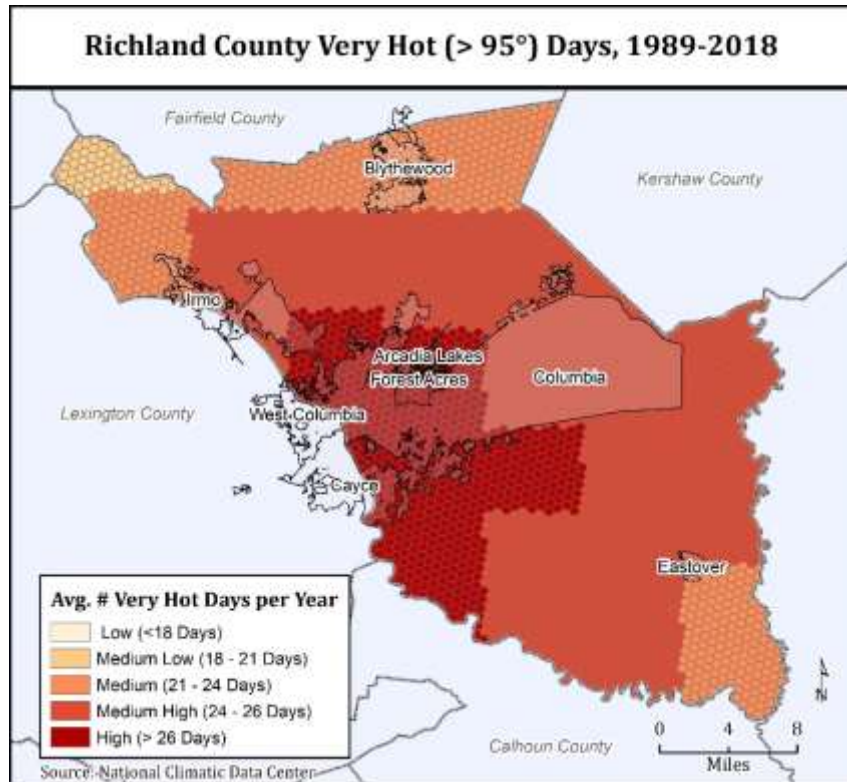


Figure 172 - Hot weather risk in Richland County.

Table 103 - 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 104). 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 173). 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 174). 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 173).

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

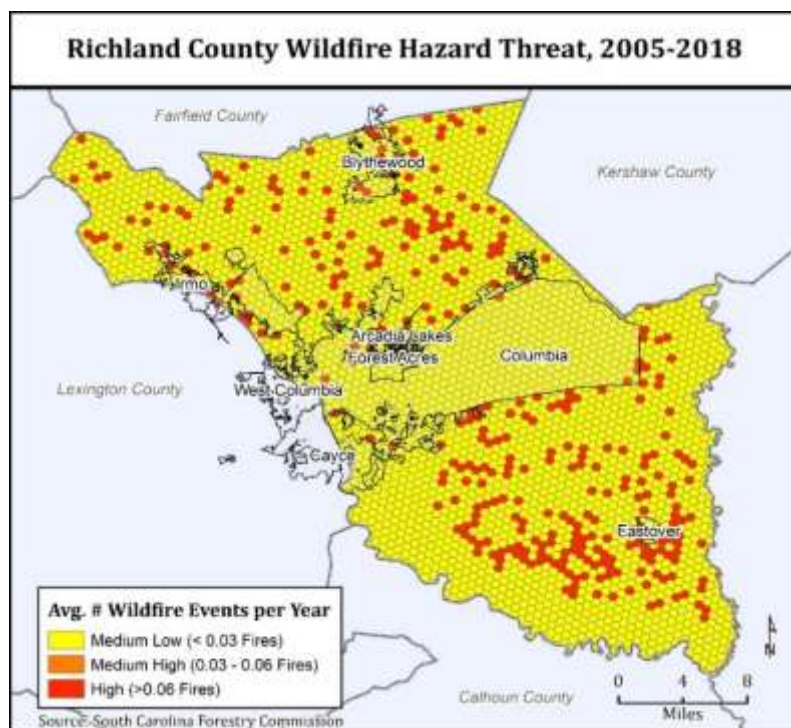


Figure 173 - Wildfire risk in Richland County based on average number of wildfires per year.

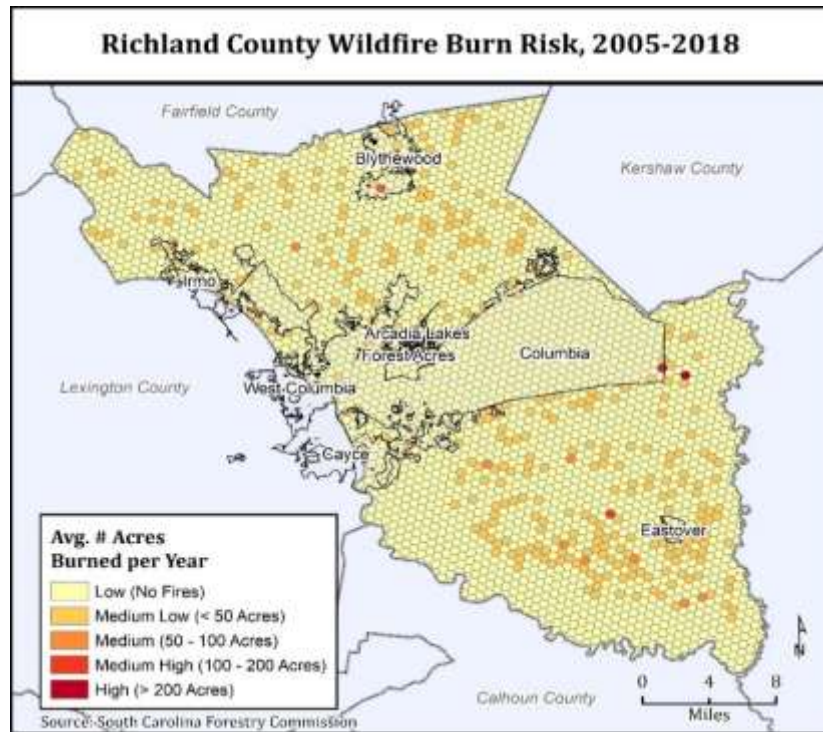


Figure 174 - Risk of large wildfires in Richland County.

Table 104 - 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 175). 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)⁸⁵. 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 175).

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 105). The latest severely impacted economic

⁸⁵ 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 fisheries⁸⁶. 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)

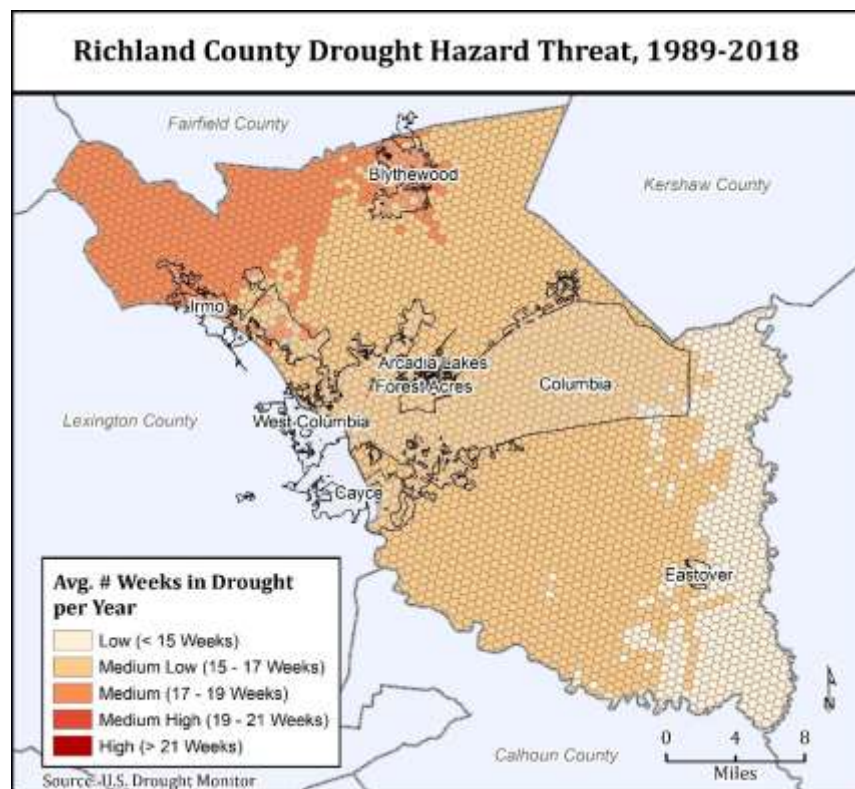


Figure 175 - Drought risk in Richland County.

⁸⁶ SCDNR, n/d. South Carolina Climate. Available at http://www.dnr.sc.gov/climate/sco/ClimateData/cli_sc_climate.php

Table 105 - 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 176). 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 177).

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

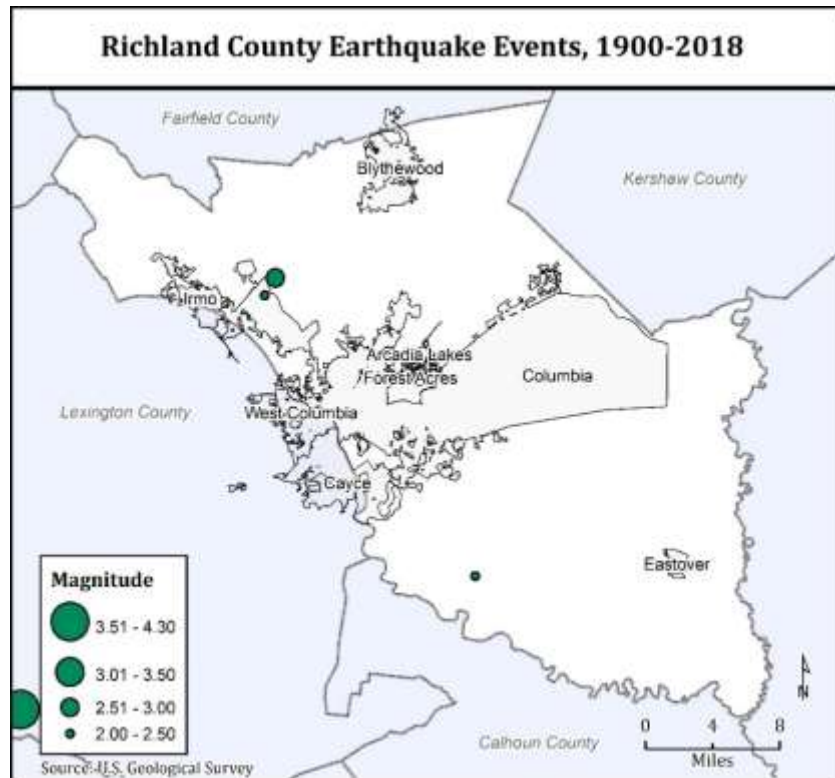


Figure 176 – Historical earthquake events in Richland County.

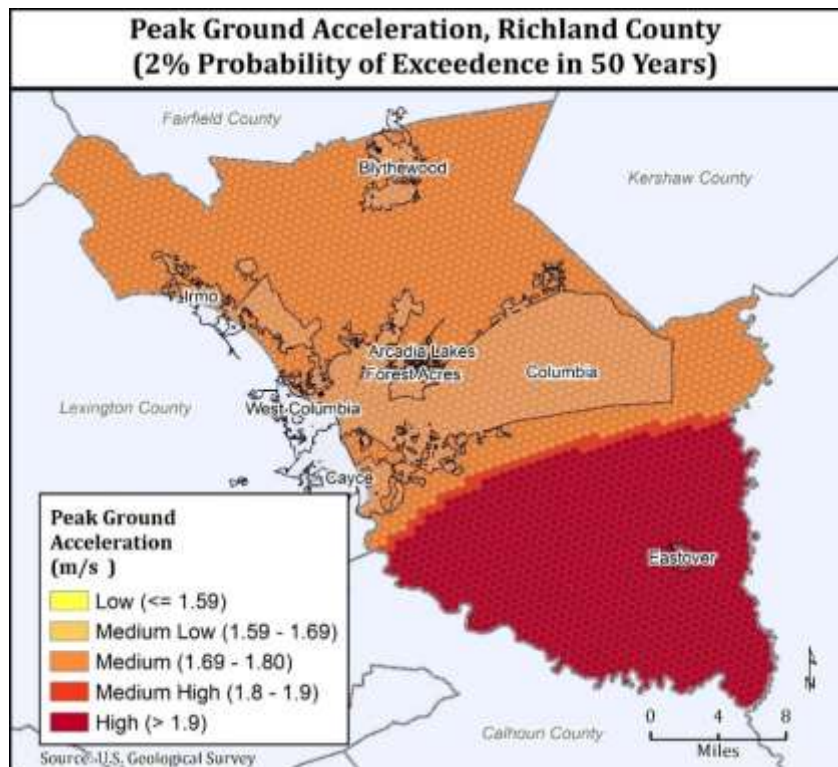


Figure 177 - Risk of shaking due to earthquakes in Richland County.

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 infrastructure⁸⁷ 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)⁸⁸ and later refined by scholars at the University of Central Florida⁸⁹. 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 178). 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. The City of Columbia has low composite vulnerability for the most part, except for the most western edge of the city.

⁸⁷ <https://www.fema.gov/lifelines>

⁸⁸ <https://onlinelibrary.wiley.com/doi/abs/10.1111/1540-6237.8402002>

⁸⁹ www.vulnerabilitymap.org

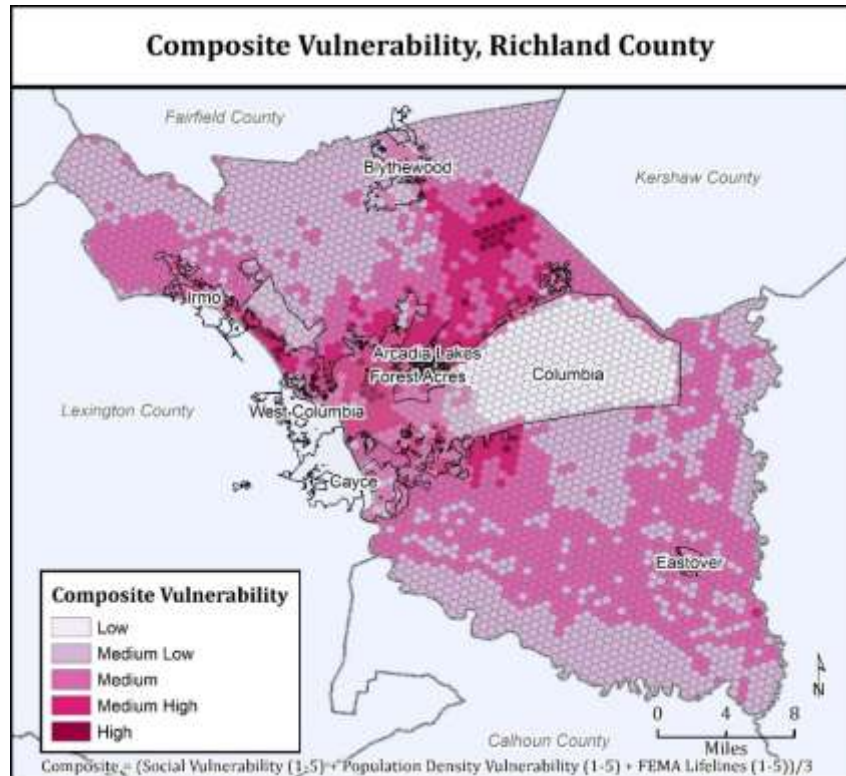


Figure 178 - Richland County's Composite Hazard Vulnerability.

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 107). 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 106). 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 179). More information on the vulnerability assessment for each critical facility can be found in Appendix I.

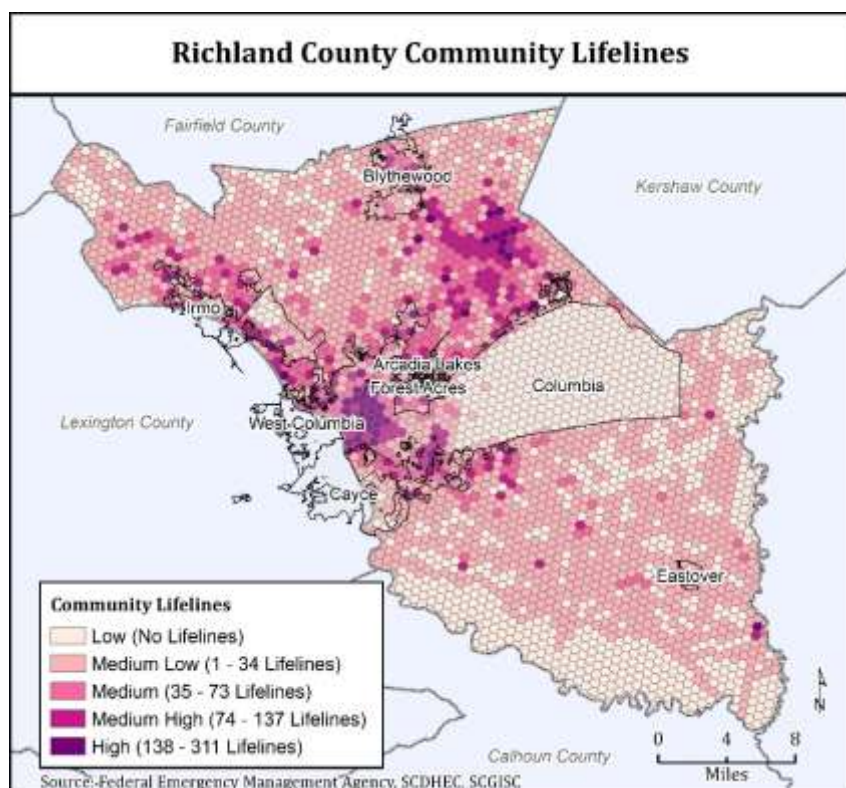


Figure 179 - Distribution of community lifelines and critical facilities in Richland County.

Assets at risk (Table 106) were assessed using FEMA's Lifeline⁹⁰ 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 106 - 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

⁹⁰ <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 107).

Table 107 - 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 events⁹¹, has a long conceptual and theoretical history in social and disaster science fields.⁹² 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 251).

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 180). The southern third of Richland County rates medium-high, while the northern third ranges from medium to medium-low (Figure 180). 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 181).

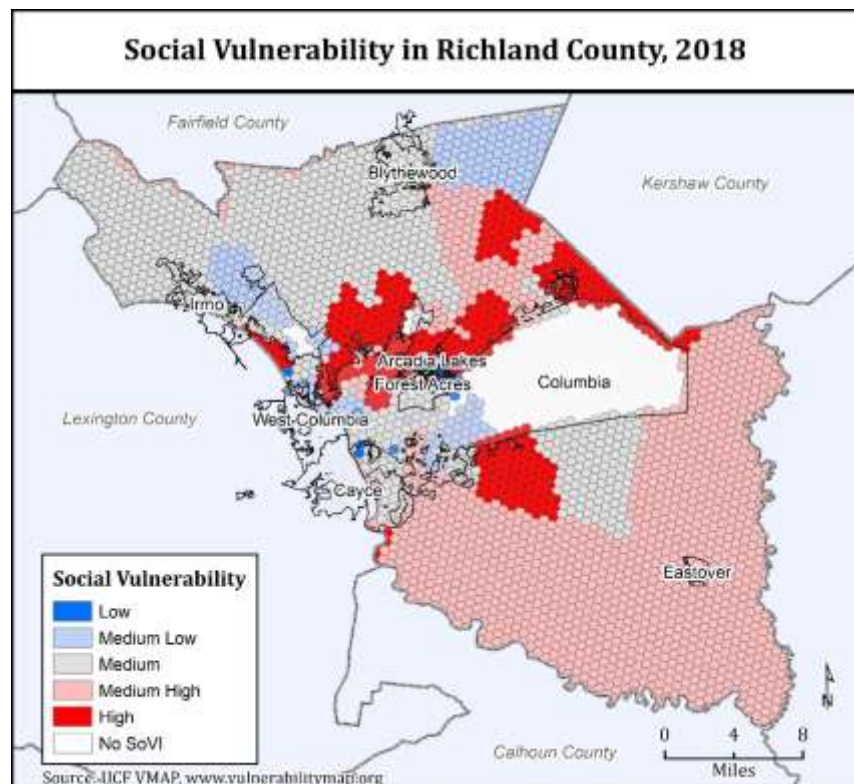


Figure 180 - Socially vulnerable tracts in Richland County.

⁹¹ <https://doi.org/10.1177/0002716205285515>

⁹² <https://unu.edu/publications/books/measuring-vulnerability-to-natural-hazards-towards-disaster-resilient-societies-second-edition.html#overview>

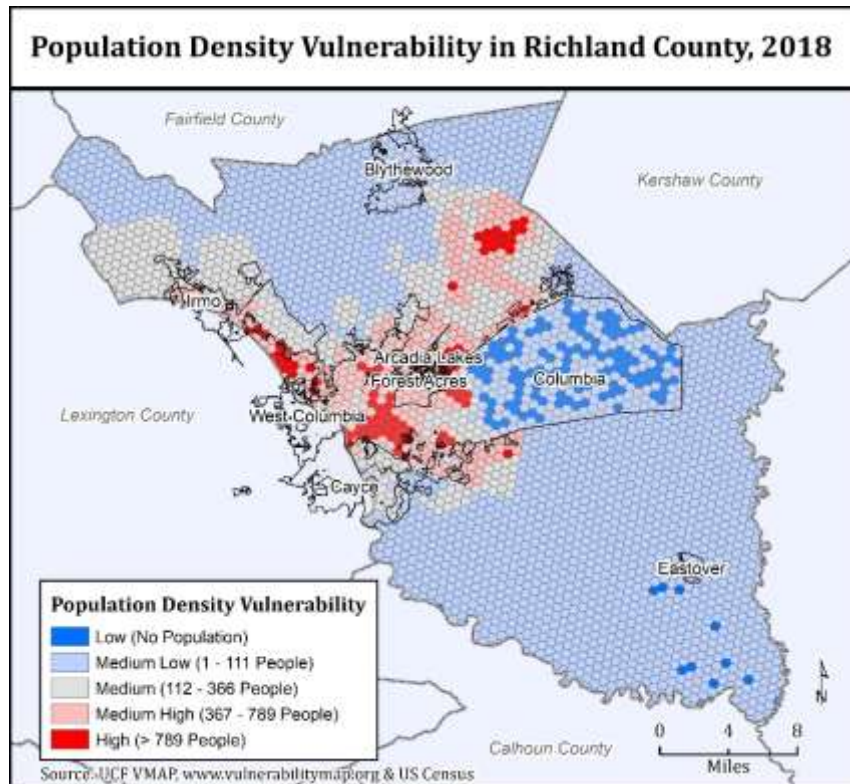


Figure 181 - Richland County's Population Distribution.

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 108):

1. Hurricane and tropical storm
2. Flash Flood
3. Heat
4. Drought
5. Severe Thunderstorms

Table 108 - 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 182). Exposure in the 1000-year floodplain is largely limited to residential buildings with four six critical facilities located inside the 1000-year floodplain (Figure 184). 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.

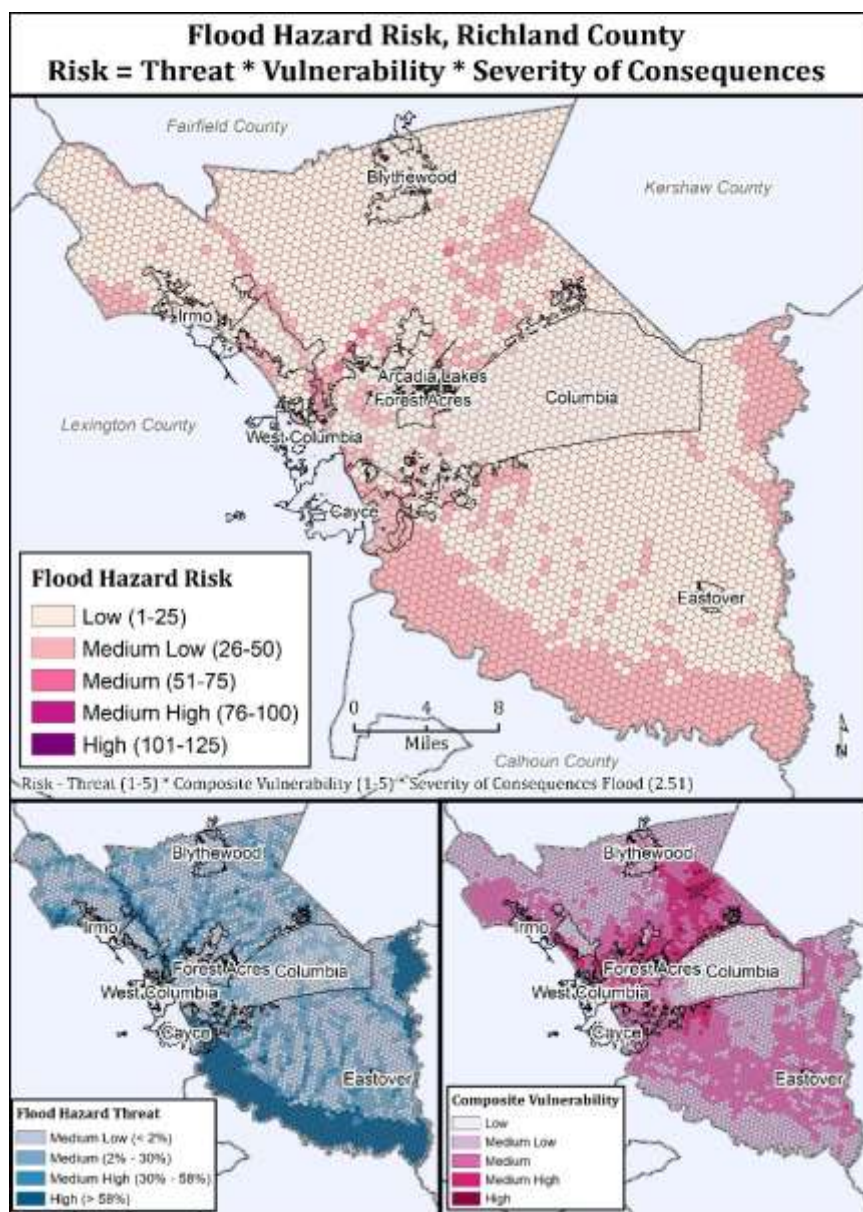


Figure 182 - Risk of floods in Richland County.

For a 1,000-year flood event (0.1% annual chance of occurrence) (Figure 184), 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 185). 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. Additional city-scale maps with detailed sub-county flooding hazard extent and risk information may be found in the [Appendices](#).

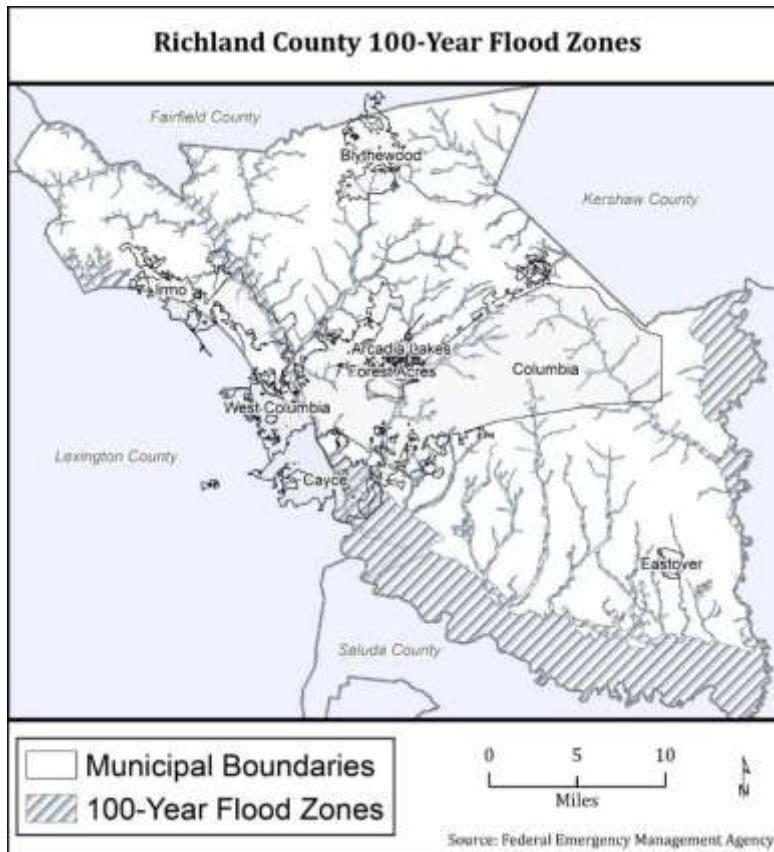


Figure 183 - Richland County 100-Year Flood Zones

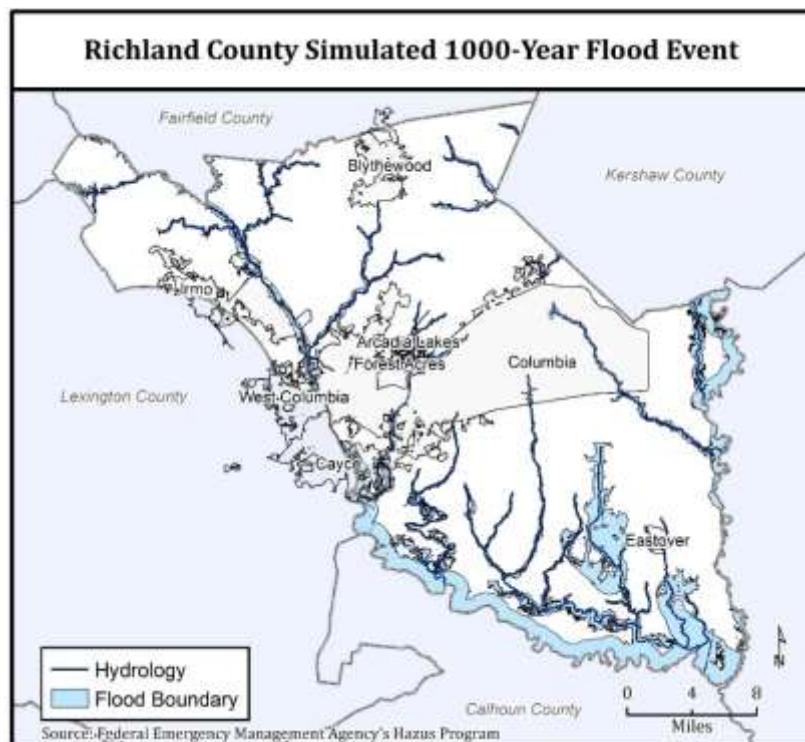


Figure 184 - Modelled 1,000-year flood event in Richland County.

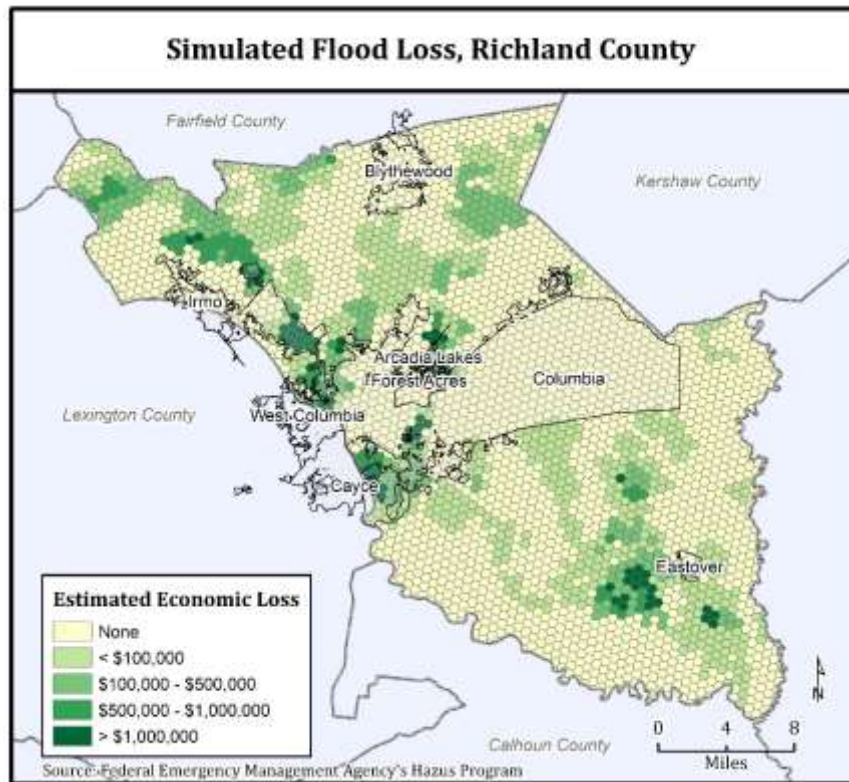


Figure 185 - Damage from a modelled 1,000-year flood event in Richland County.

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 186). 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 186).

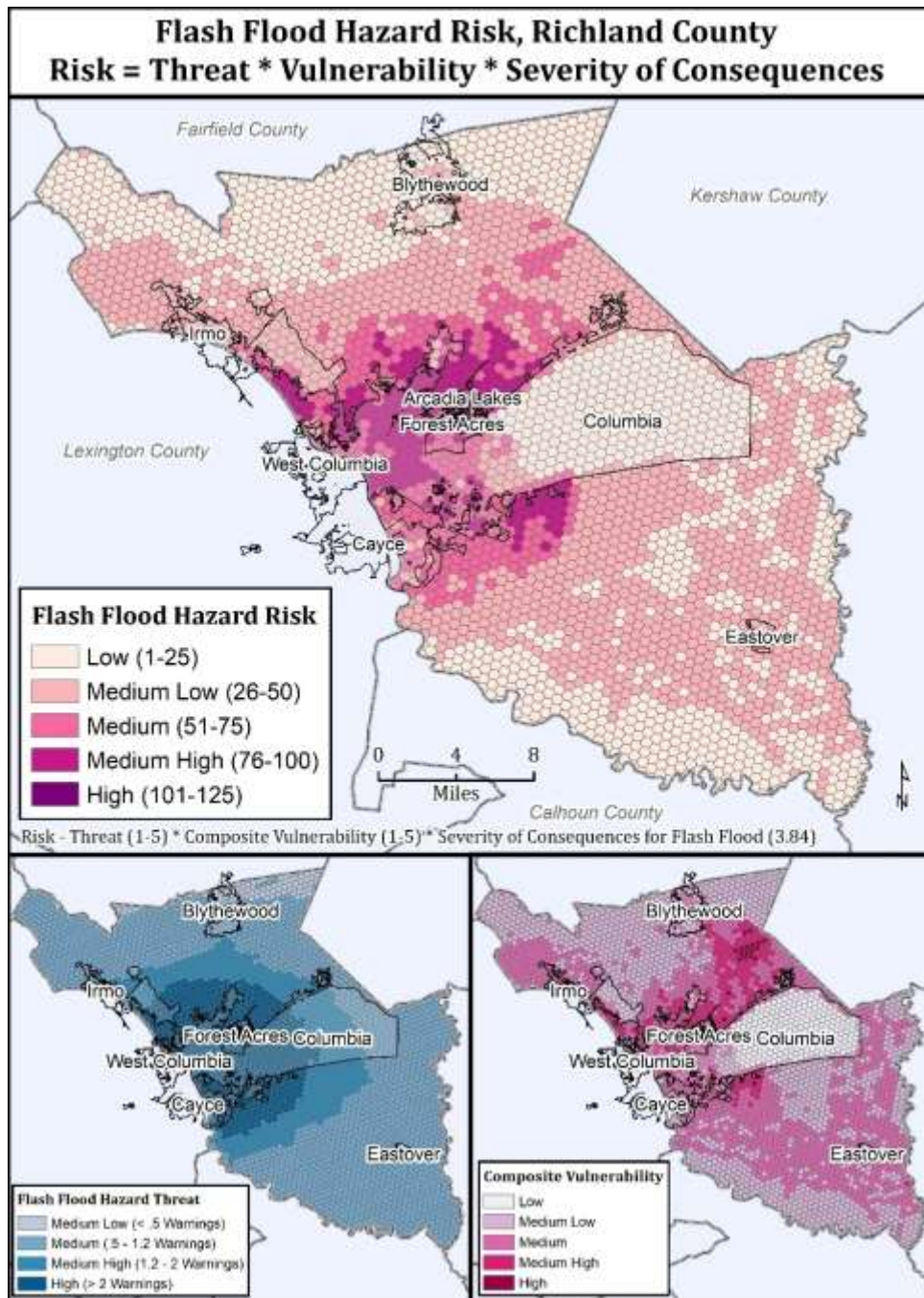


Figure 186 - Flash flood risk in Richland County.

B) Hurricanes & Tropical Cyclones

The southern and central part of Richland County exhibits a higher risk to tropical cyclones than the northern areas (Figure 187). 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 187).

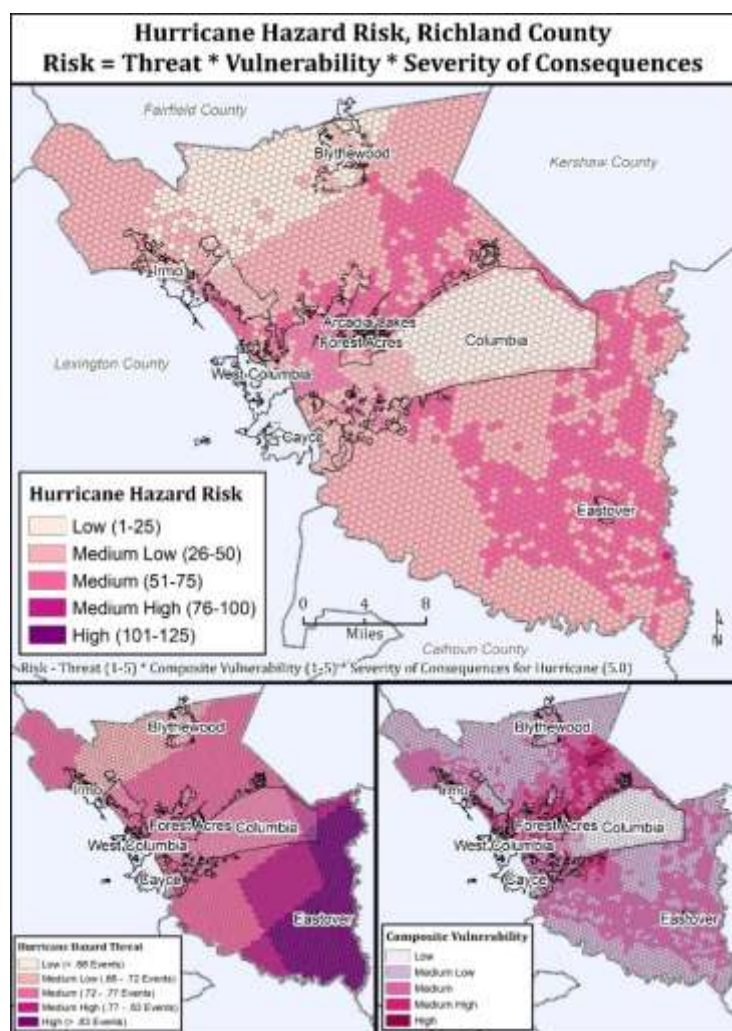


Figure 187 - Risk of tropical storms in Richland County.

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 188). 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 189). 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.

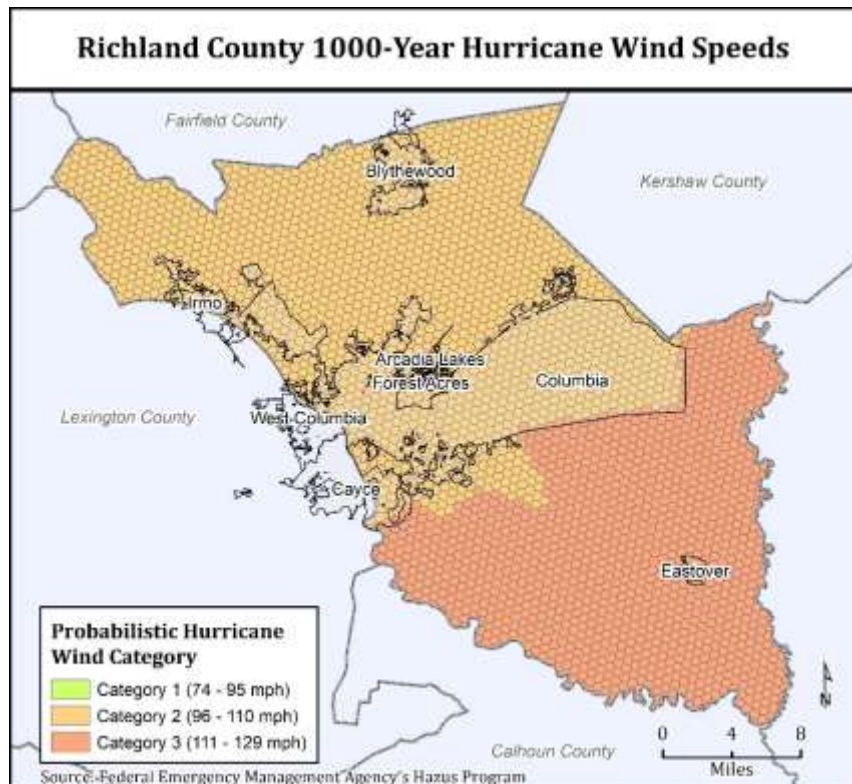


Figure 188 - Hurricane wind speeds using a 1,000-year storm event in Richland County.

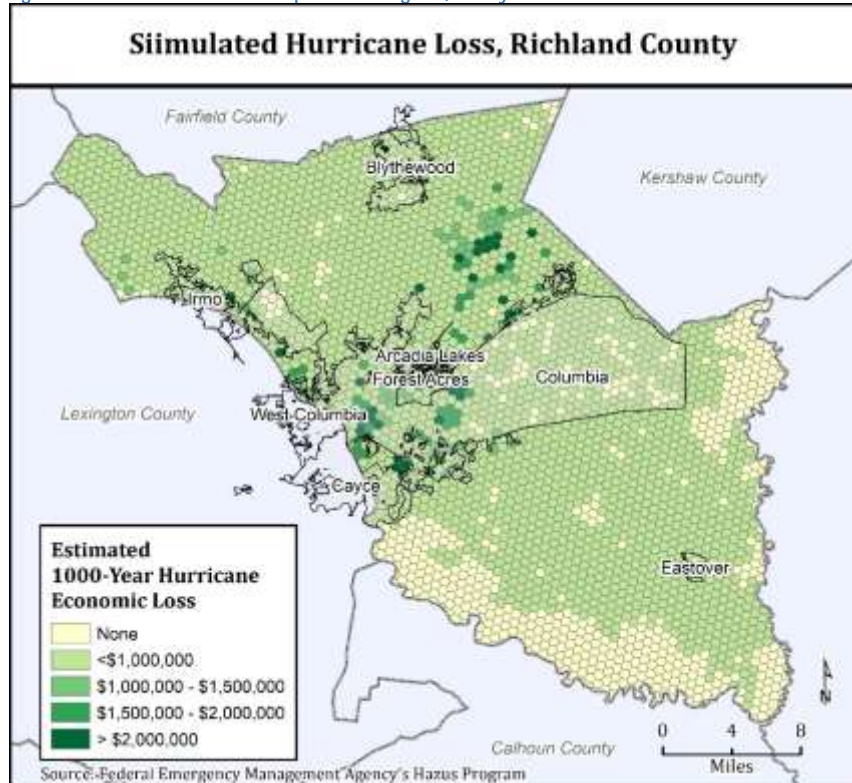


Figure 189 - Damage from a modelled 1,000-year hurricane event in Richland County.

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 190). 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 190).

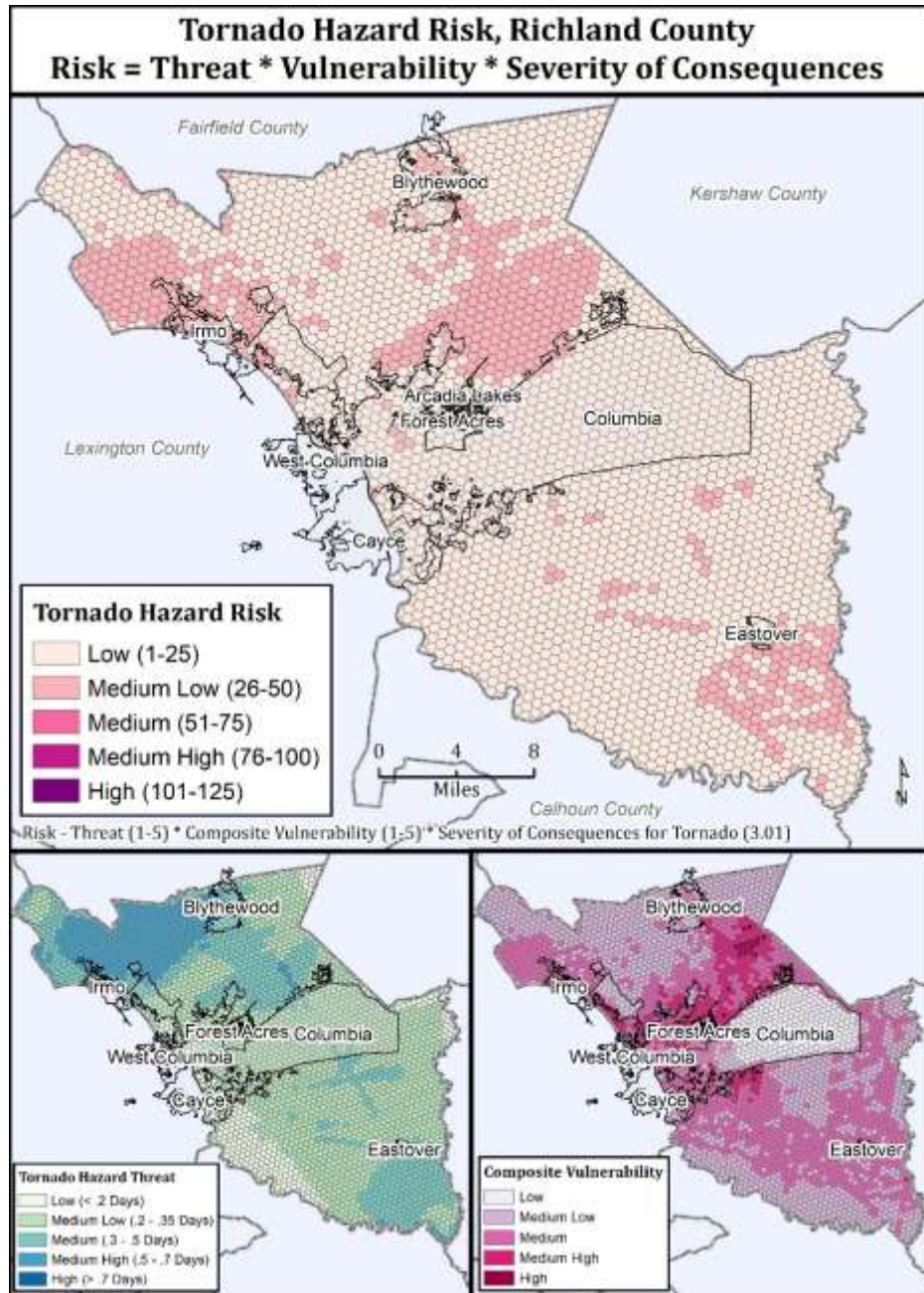


Figure 190 - Risk of tornadoes in Richland County.

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 191). The region of high threat stretches from the middle of the City of Columbia's borders all the way to Eastover (Figure 191). 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 191). 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 191).

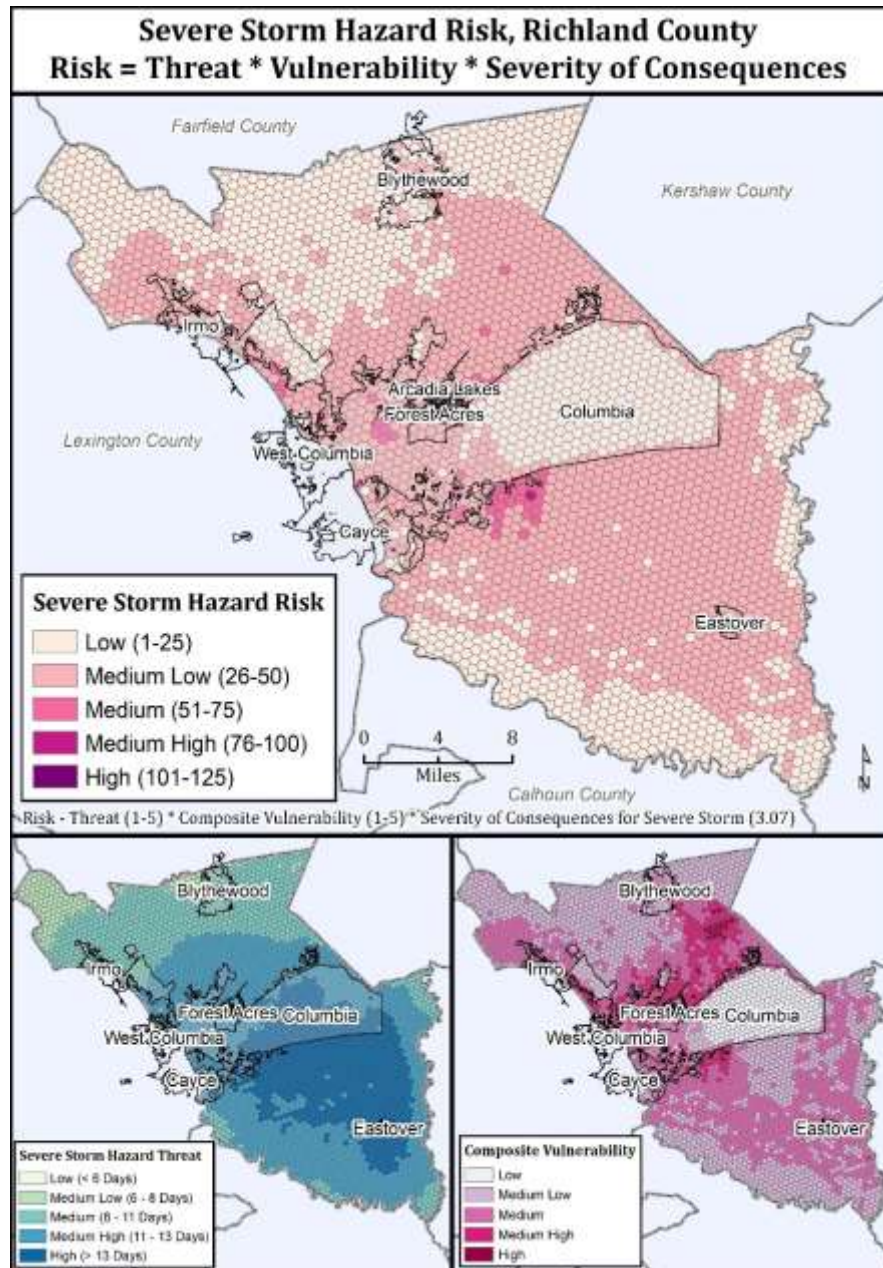


Figure 191 - Risk of severe thunderstorms in Richland County.

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 192). In this area, the threat level is medium-high to high, meaning it experiences around 484 to 576 or more strikes a year (Figure 192).

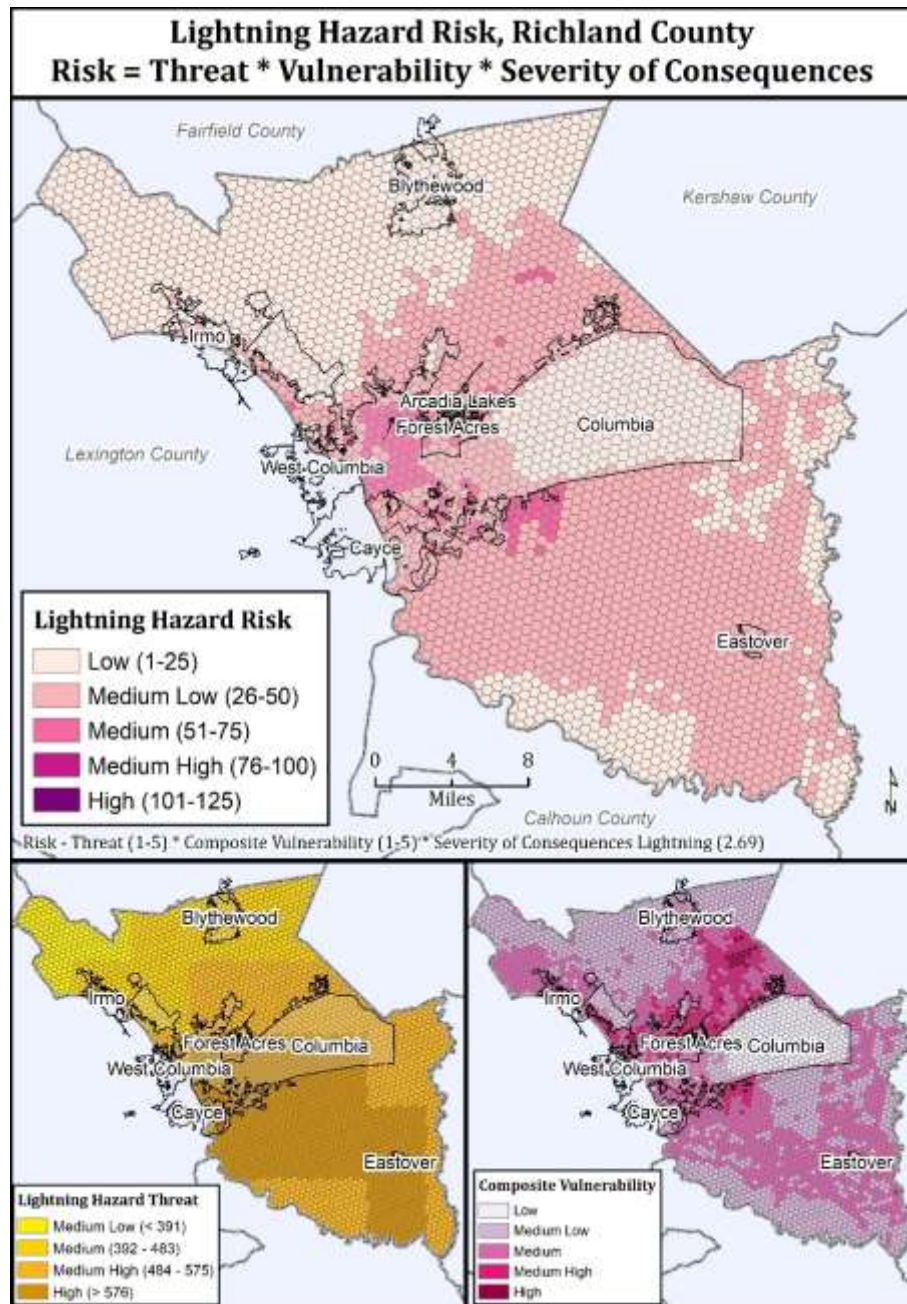


Figure 192 - Risk of lightning in Richland County.

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 193). Due to this limited range of threat occurrence in the county, there is little overlap with large areas of higher composite vulnerability (Figure 193). 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 193).

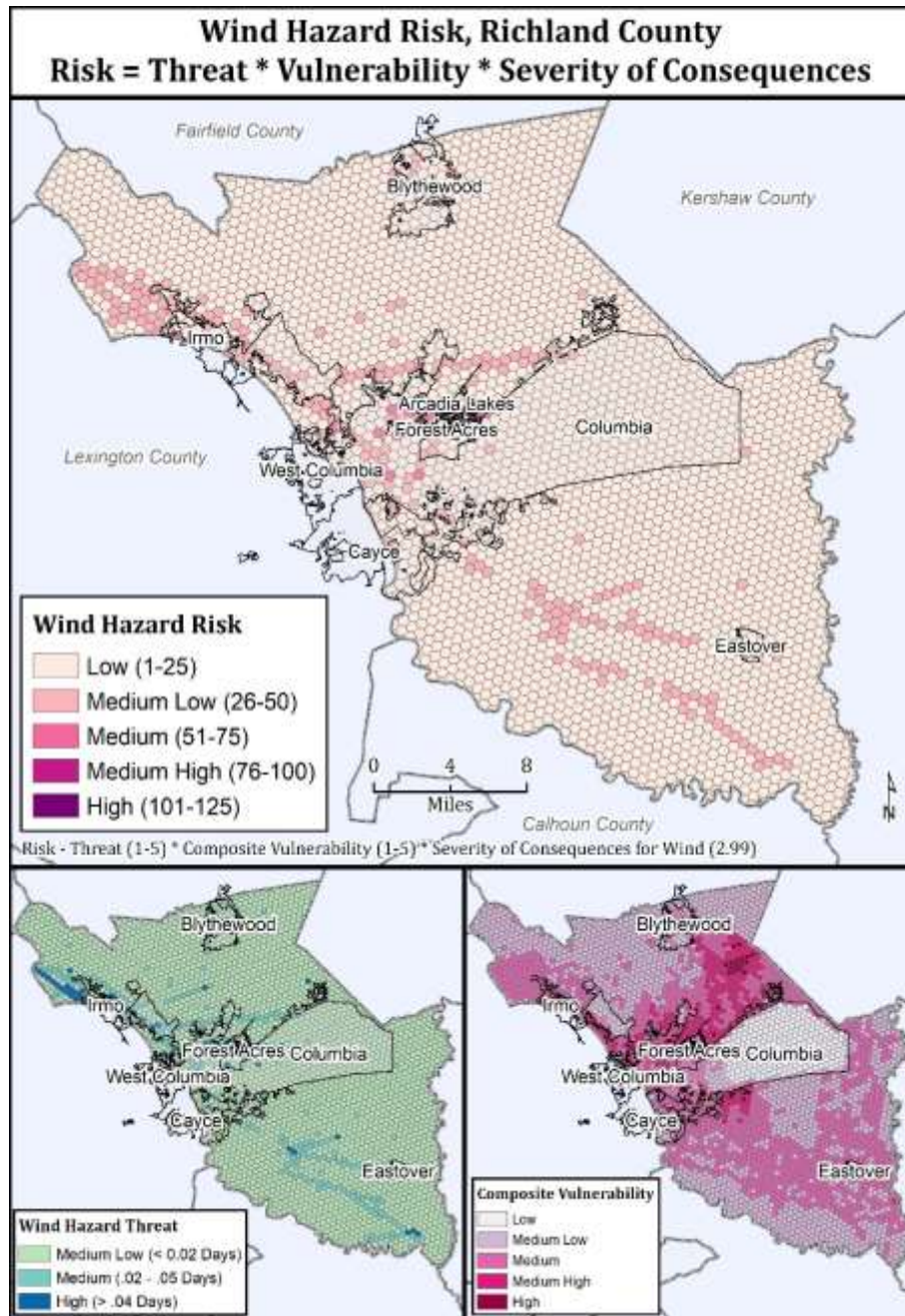


Figure 193 - Risk of high winds in Richland County.

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 194). 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 194).

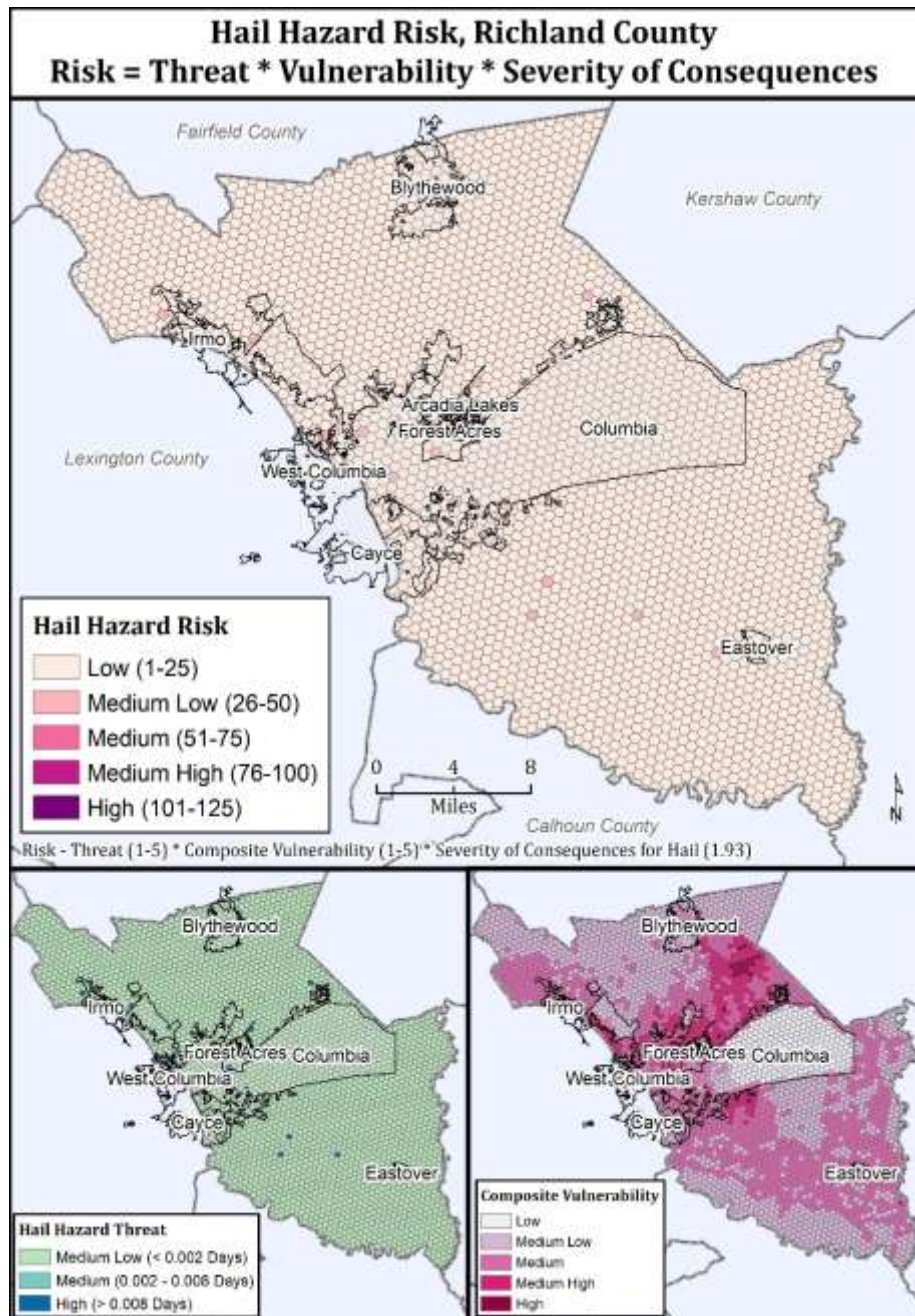


Figure 194 - Risk of hail in Richland County.

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 195). 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 195). 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.

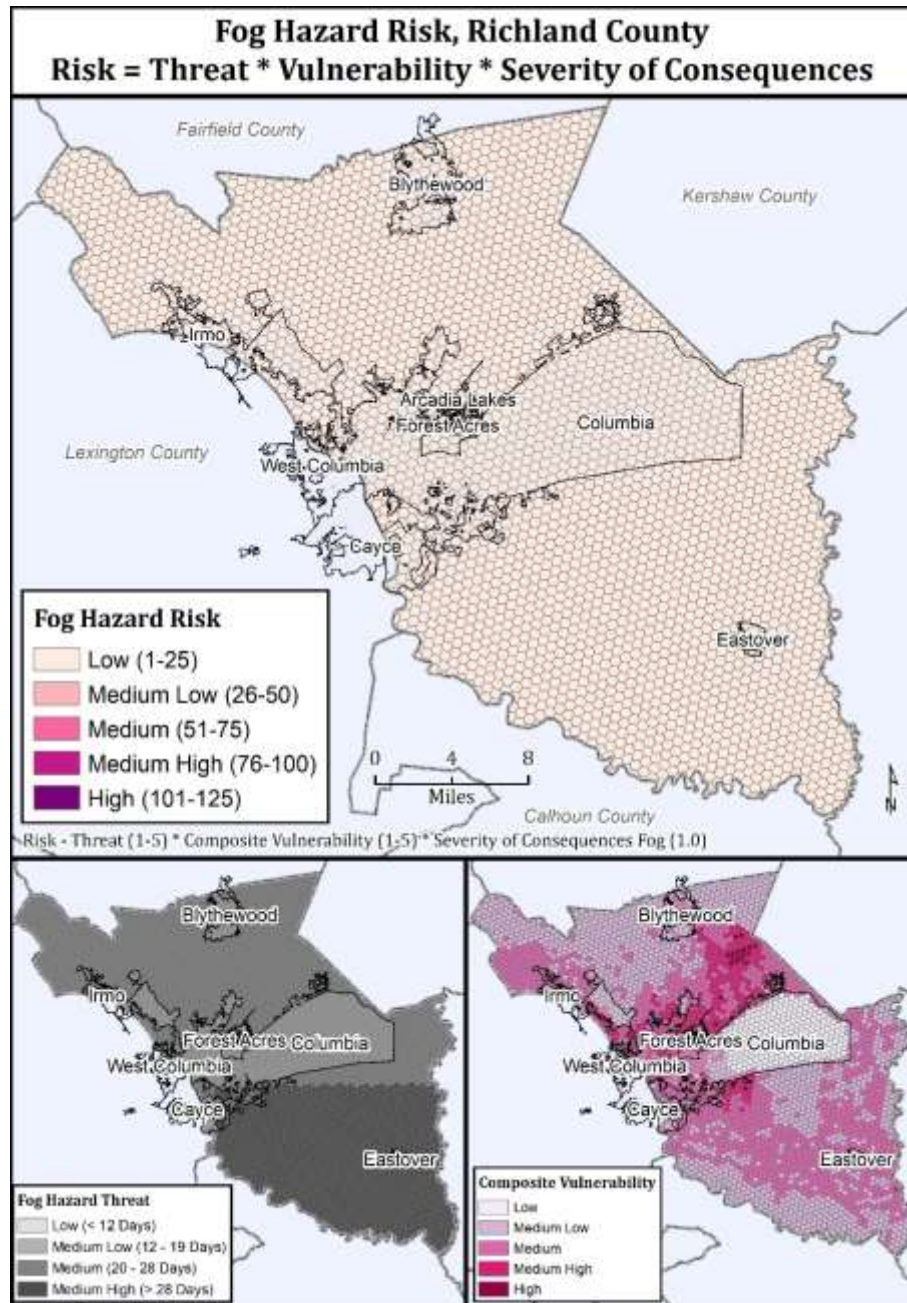


Figure 195 - Risk of fog in Richland County.

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 196). 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.

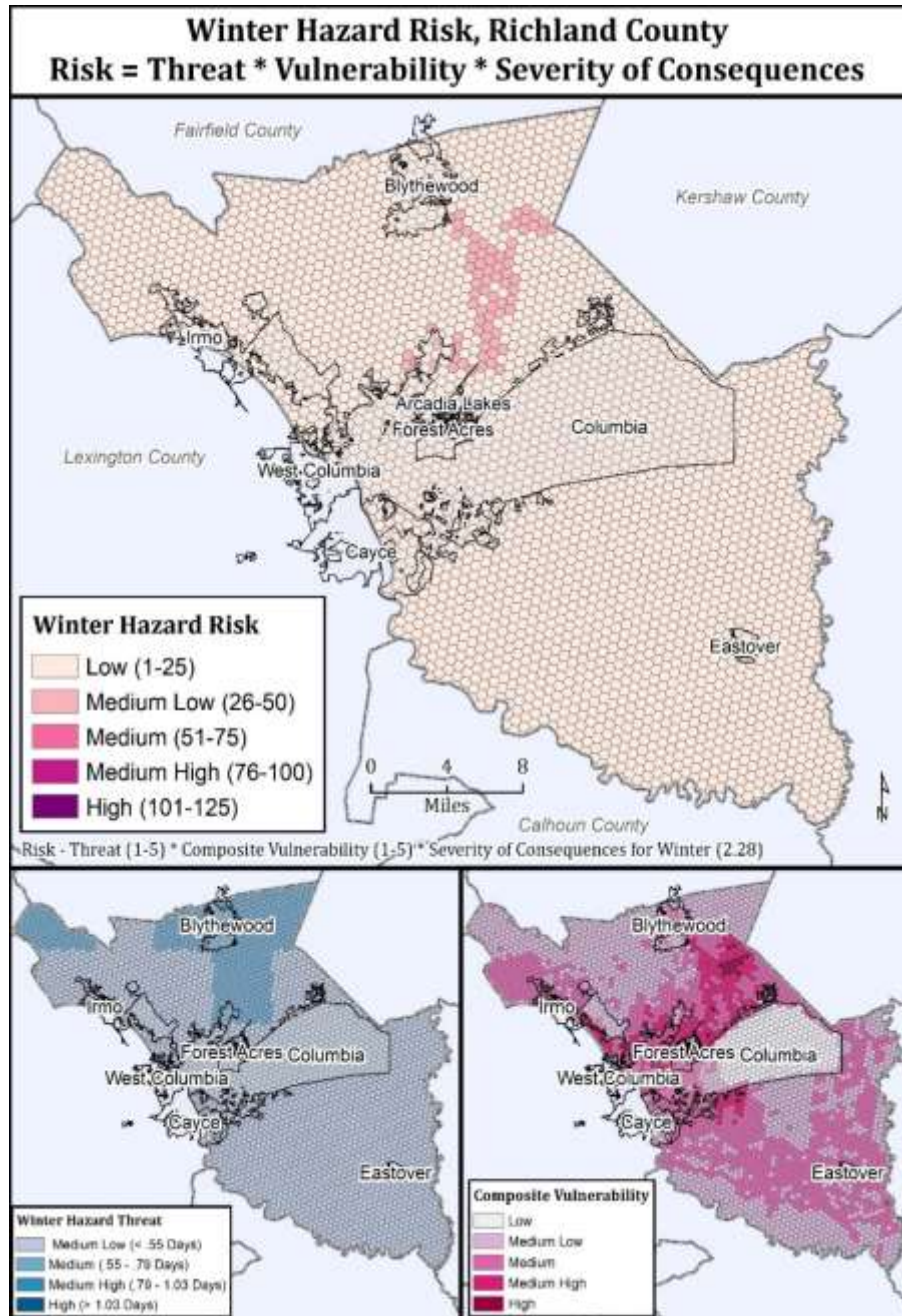


Figure 196 - Risk of winter weather in Richland County.

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 197). 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 197).

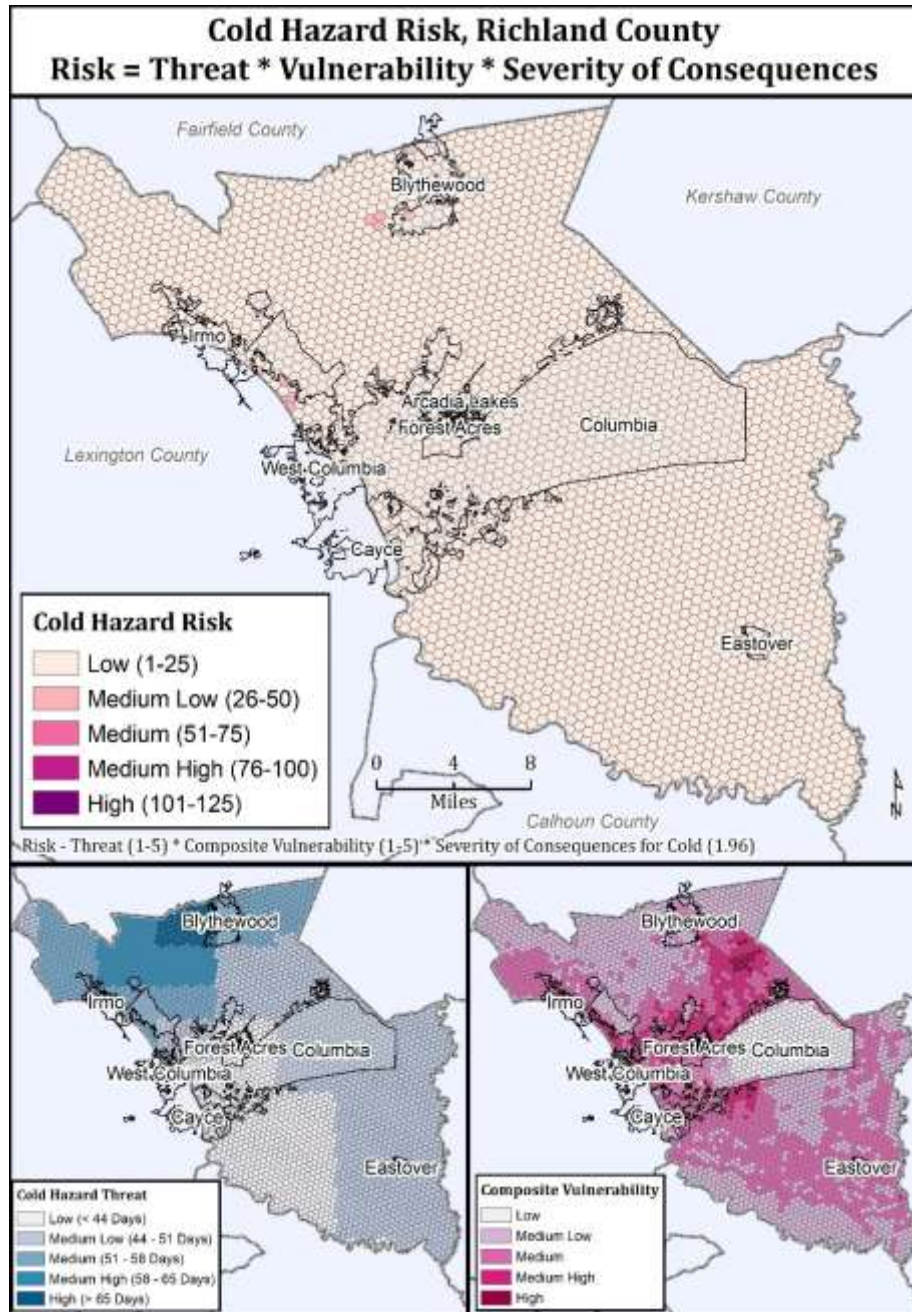


Figure 197 - Risk of cold weather in Richland County.

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 198). 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.

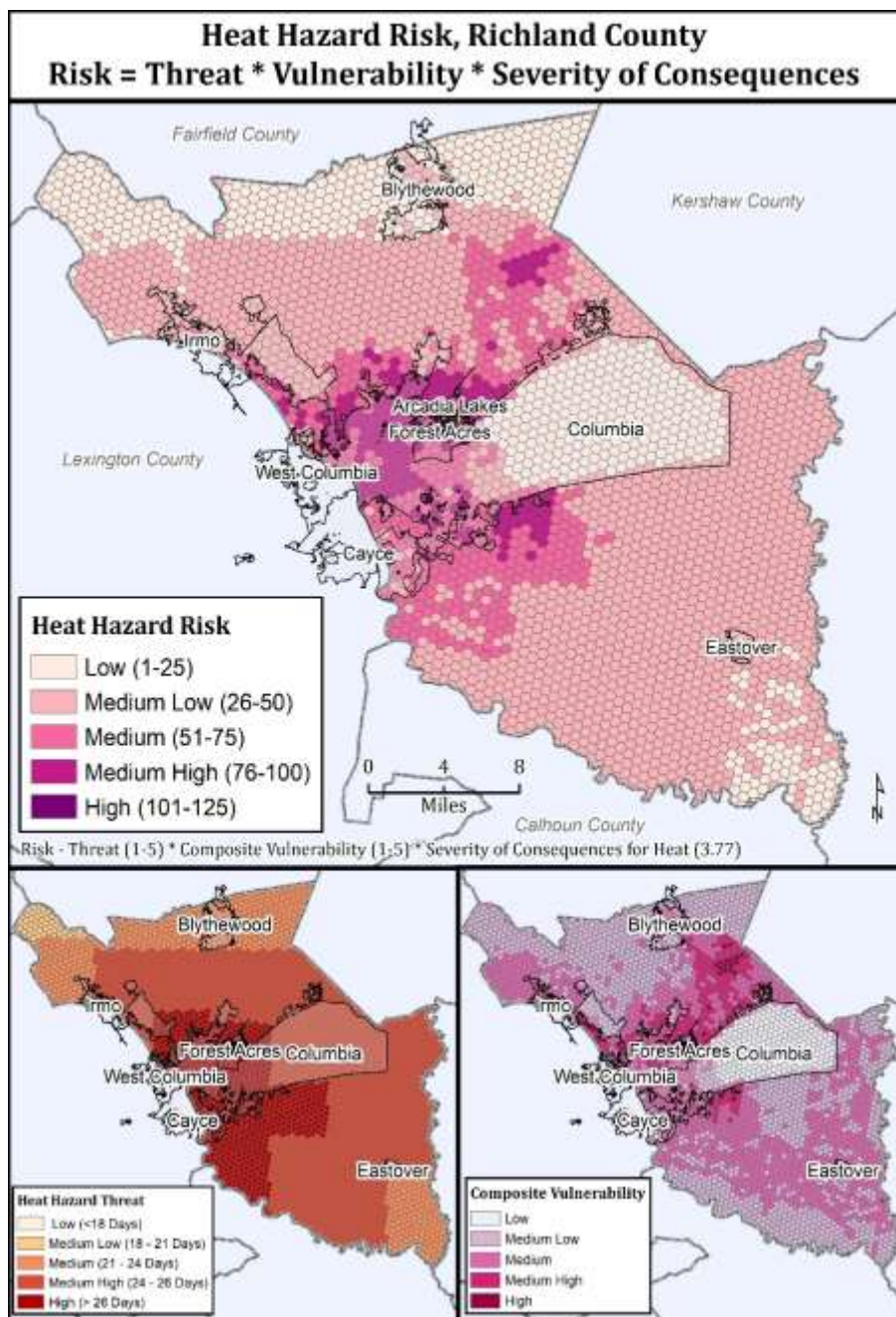


Figure 198 - Risk of hot weather in Richland County.

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 199). 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 199).

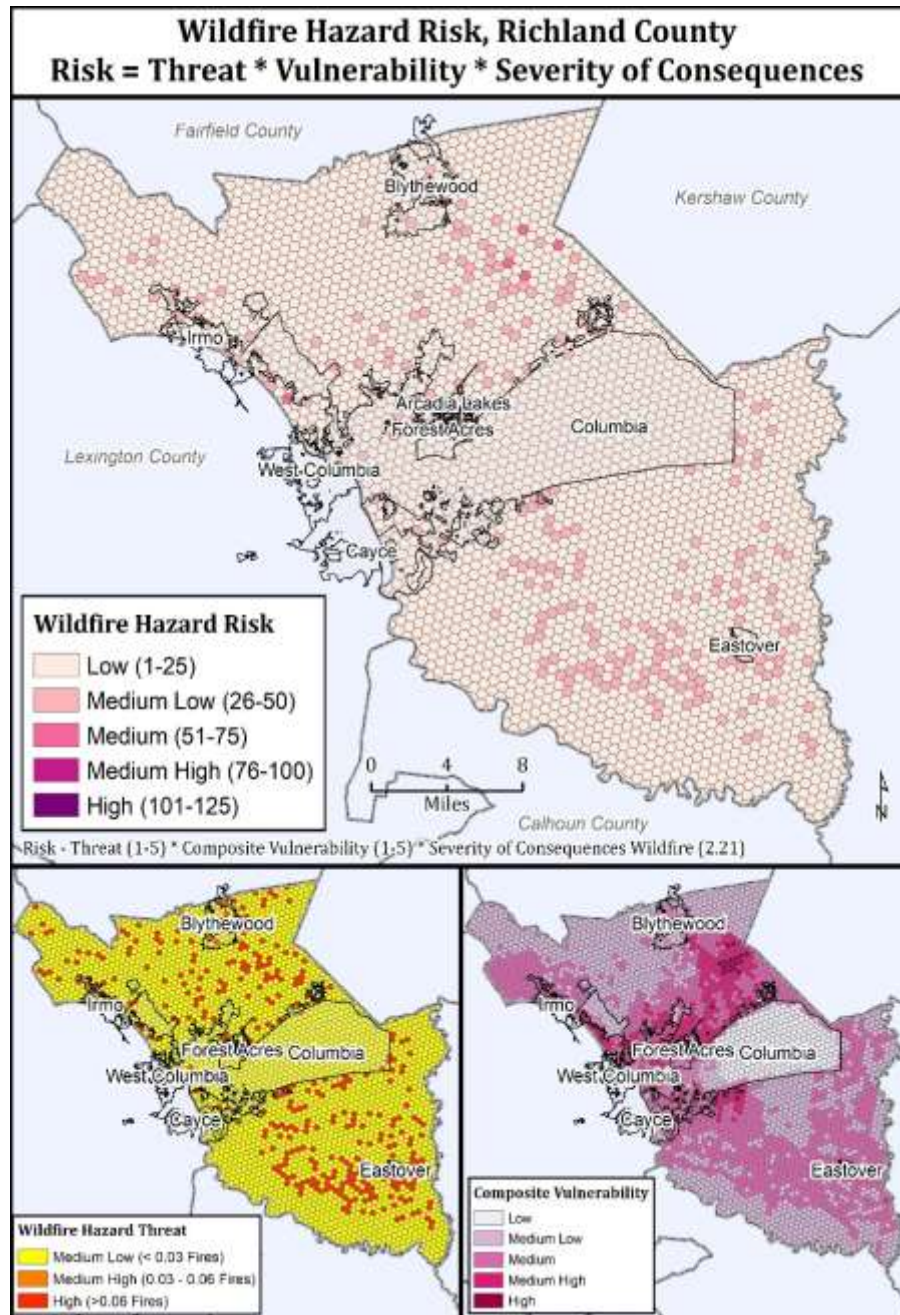


Figure 199 - Risk of wildfires in Richland County.

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 200). 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 200).

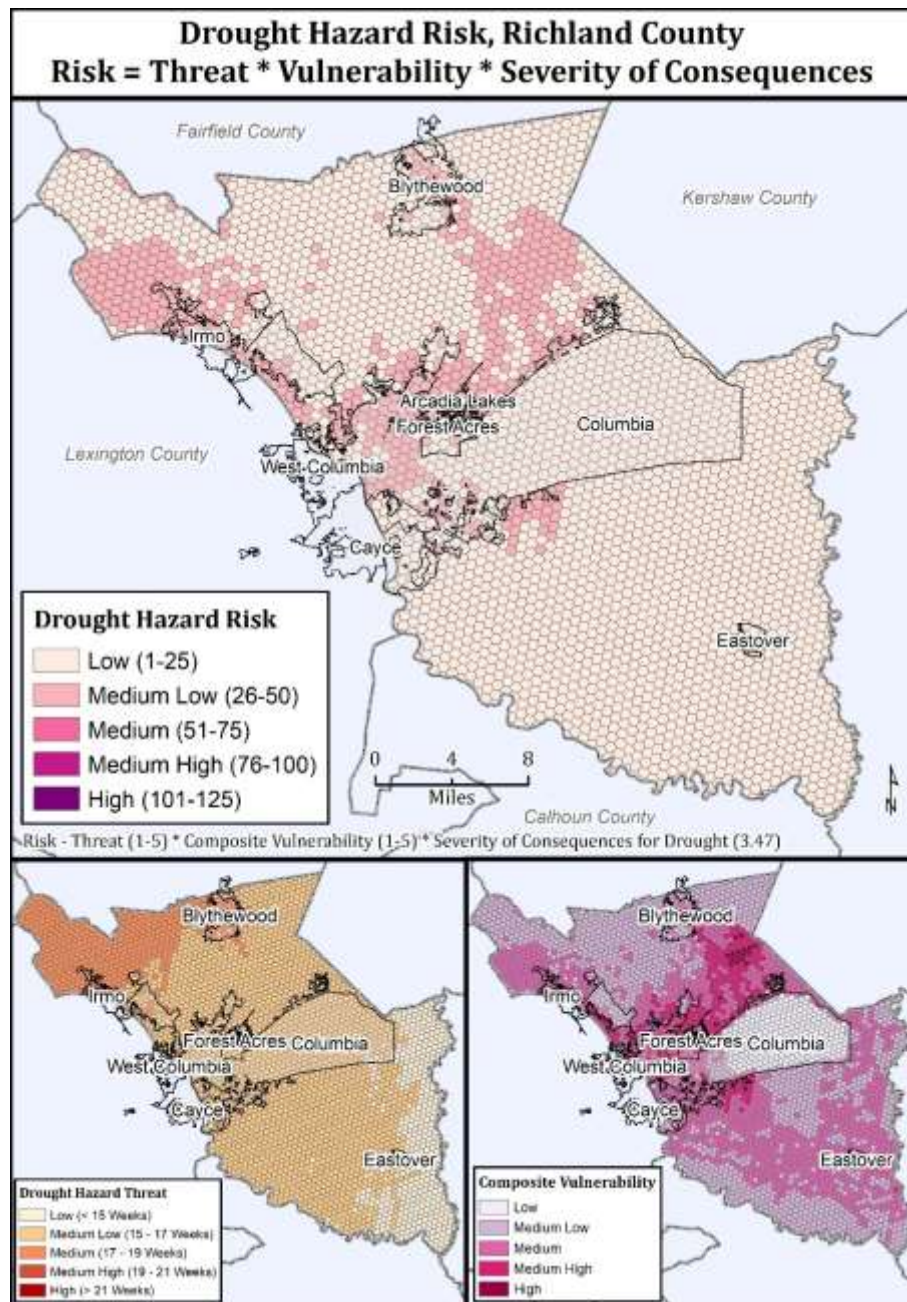


Figure 200 - Risk of droughts in Richland County.

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 201). The rest of the county only experiences a low risk of earthquakes comparatively due to only having a medium earthquake threat (Figure 201).

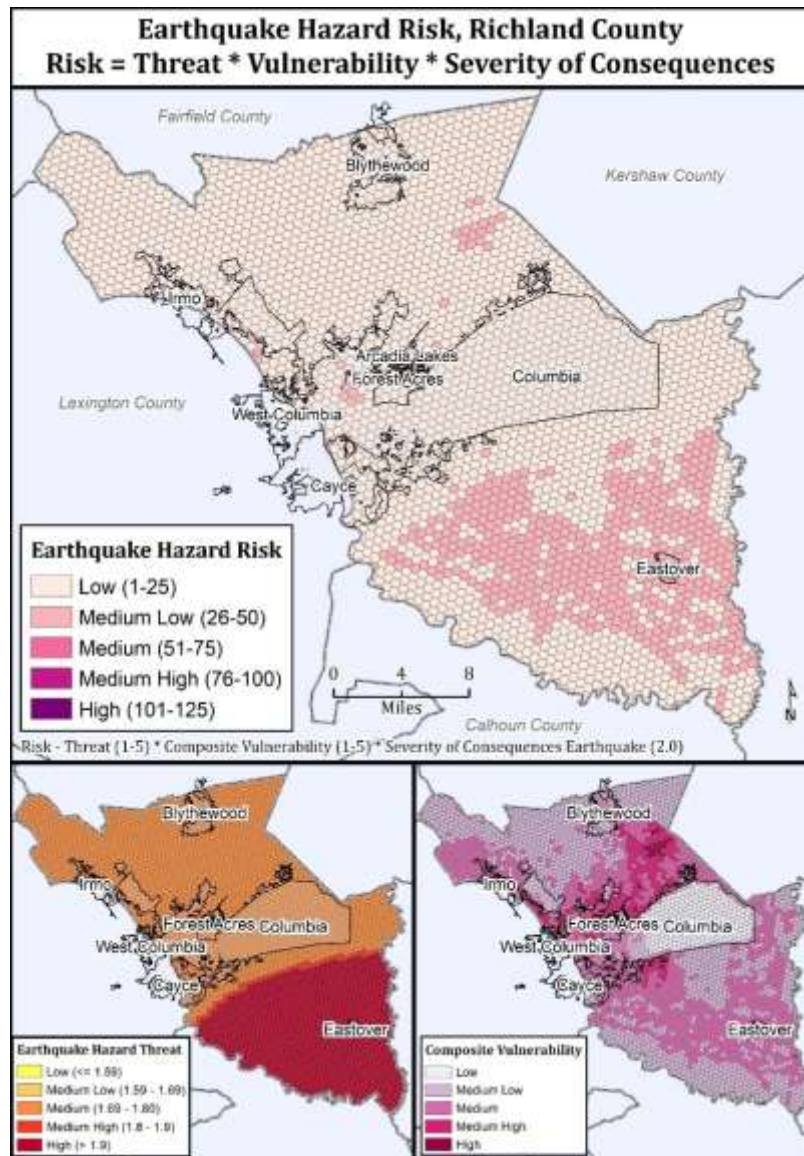


Figure 201 - Risk of earthquakes in Richland County.

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)⁹³. If the 1886 Charleston earthquake were to occur today (Figure 202), 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 203). All

⁹³ 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.

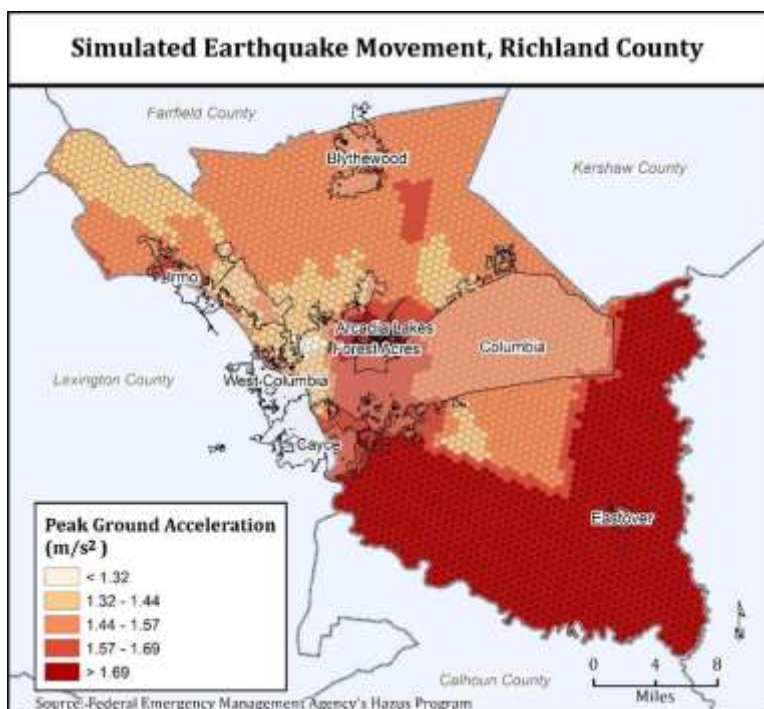


Figure 202 - Peak ground acceleration in Richland County from a modelled 6.8 earthquake.

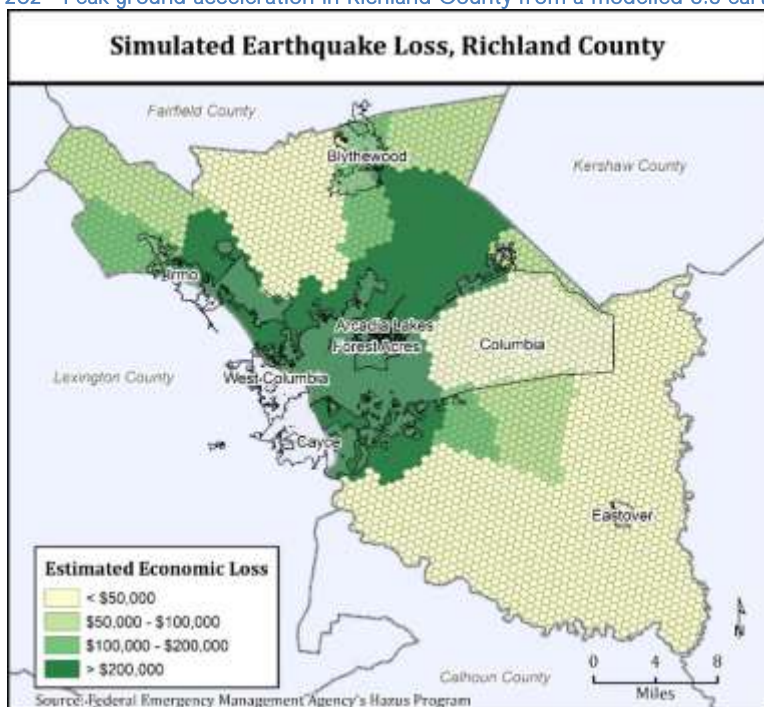


Figure 203 - Damage in Richland County from a modelled 6.8 earthquake.

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 204). 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 204). 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 204).

$$RISK_{HAZ} = (THR_{HAZ})(VUL)(CON_{HAZ}) \quad (4)$$

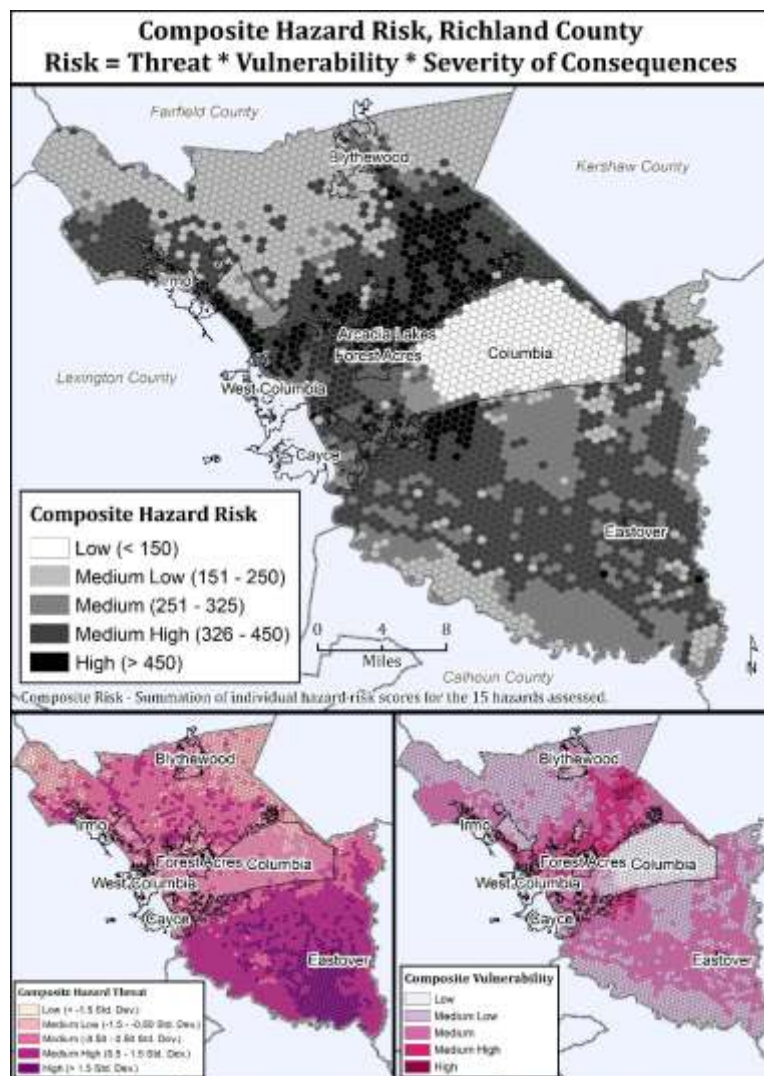


Figure 204 - Overall composite risk map of Richland County considering all hazard threats, vulnerabilities, and severity of consequences.

In terms of risk assessment by hazard type, Table 109 summarizes the assessment criteria and rating values.

Categories of Risk by Hazard Type

While the composite risk map (Figure 204) 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 110 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 109. The high-risk hazards in Richland County are hurricanes and tropical storms, heat, flash floods, lightning, and severe thunderstorms (Table 110).

Table 109 - 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 7.9](#)).

Table 110 - 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 ⁹⁴	
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

⁹⁴ 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 111 identifies emergency services and adopted ordinances available to each municipality in Richland County.

This section addresses
FEMA HMP requirement
201.6(c)(3)

Table 111 - 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	Yes

7.6 Richland County National Flood Insurance Program Information

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 112 - 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. Table 113 shows residential and commercial properties that have active flood insurance located within participating NFIP jurisdictions. The majority of the insured properties are located within the unincorporated boundaries of Newberry County.

Table 113 - Active NFIP Flood Insurance Policies In Richland County by Jurisdiction

Name of Jurisdiction	Active Residential Flood Insurance Policies	Active Non-Residential Flood Insurance Policies
Richland County	1,256	58
Columbia	1,020	48
Forest Acres	192	25
Eastover	0	1
Blythewood	19	0

7.7 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.

These goals reflect the hazard mitigation priorities of plan participants, guided by the information compiled through the Capabilities Assessment. Goals were the basis of designing a broad range of mitigation actions and guided plan participants in the action prioritization process. Plan participants will rely on grants and other sources in order to fund mitigation projects. Mitigation action prioritization took into account multiple factors:

- 1) The updated hazard extent, vulnerability, and risk analyses created through the planning process of this HMP provided plan participants with the most recent information on natural hazard impacts. This guided which natural hazards should be prioritized, with higher priority given to hazards of higher frequency and/or extent.
- 2) A Benefit Cost Analysis (BCA) methodology was utilized to determine project effectiveness and plausibility. Actions that required minimal funds and utilized existing funding mechanisms were prioritized due to the higher likelihood that they could be accomplished.
- 3) If the technical expertise was not available, mitigation actions were prioritized utilizing documents such as Capital Improvement Plans, Comprehensive Plans, and stakeholder feedback on organizational priorities. The technical ability of plan participants to implement and maintain mitigation actions, without additional funding sources or staff, was also highly prioritized.

Each mitigation action includes the following information: a description of the mitigation activity, the type/s of natural hazard addressed, the organization or department responsible for implementing the mitigation activity, a priority rank, which broad goals are addressed through the mitigation activity, source of financing, generalized cost estimates, status since the previous HMP update, and a general timeframe of implementation. A template for providing mitigation goals is provided in [Appendix VIII – A](#).

7.8 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 114 - Richland County portfolio of federally-supported hazard mitigation projects.

Mitigation Category	HMG P	PD M	FM A	Amount	Mitigation Category	HMG P	PD M	FM A	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)				
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)

7.9 Richland County Mitigation Strategies

Table 115 - 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)	\$5,000 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	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	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	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 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 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 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	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 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	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	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	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	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	\$5,000	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 116 - 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 117 - 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 118 - 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 119 - 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 120 - 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	New	2016
Use GIS capacity to map, record wildfires, all hazard events	Forest Fire/Wildfires	County/Admin	3	2 & 4	Budget/Grant	\$100,000	New	2017
Implement warning siren system	Flooding	Admin	3	2, 4 & 8	Budget/Grant	\$85,000	New	2017
Enforce zoning and building codes to restrict development in flood-plains	Flooding	Flood	1	2,4 & 5	Budget/Grant	\$60,000	New	2016
Implement Flood Awareness incentives	Flooding	Admin	2	2 & 5	Budget/Grant	\$35,000	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	New	2016
Coordinate with other local gov'ts in county to make stream channel imp.	Flooding	Flood	2	5 & 7	Budget/Grant	\$15,000	New	2016
Increase drainage capabilities within flood prone areas of the Town.	Flooding	Flood	1	2,4 & 7	Budget/Grant	\$100,000	New	2018
Replace structurally obsolete bridges	Flooding	DOT/County	2	7	Budget/Grant	\$75,000	New	2018
Identify & contact all repetitive loss properties	Flooding	Flood	1	4,7 & 10	Budget/Grant	\$50,000	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	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	New	2017
Undertake Planning to participate in Community Rating System	Flooding	Admin	3	4, 5 & 7	Budget/Grant	\$30,000	New	2017
Maintain status in the NFIP	Flooding	Flood	1	4, 5 & 7	Budget/Grant	\$25,000	New	Ongoing
Power line easement clearance	Winter Snow & Ice Storms	Maintenance	2	2 & 4	Budget/Grant	\$55,000	New	2016
Debris removal and road clearance work	Winter Snow & Ice Storms	Maintenance	1	2 & 4	Budget/Grant	\$55,000	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	New	2019
Procure and use elec. generators at critical facilities	Winter Snow & Ice Storms	Maintenance	1	2 & 5	Budget/Grant	\$150,000	New	2017
Install surge protectors in critical facilities	Thunderstorms (Hail, Wind, Lightning)	Maintenance	2	2 & 7	Budget/Grant	\$65,000	New	2017
Adopt procedure to suspend operations during lightning storms	Thunderstorms (Hail, Wind, Lightning)	Admin	3	2,4 & 5	Budget/Grant	\$20,000	New	2016
Clear utility easements of debris	Thunderstorms (Hail, Wind, Lightning)	Maintenance	1	2,4,5 & 7	Budget/Grant	\$55,000	New	2017
Remove taller trees near critical facilities	Thunderstorms (Hail, Wind, Lightning)	Maintenance	2	2,4 & 7	Budget/Grant	\$55,000	New	2017
Fortify structural integrity of critical facilities	Thunderstorms (Hail, Wind, Lightning)	Admin	2	2,4 & 7	Budget/Grant	\$350,000	New	2017
Develop Portable Water Treatment Facilities	Hurricanes	Admin	2	2,4,5 & 7	Budget/Grant	\$24,000	New	2017
Replace water storage tanks and pumps as needed	Hurricanes	Admin	1	2,4,5 & 7	Budget/Grant	\$50,000	New	Ongoing
Add capacity to manage the handling and disposal of debris	Hurricanes	Admin	3	2,4 & 5	Budget/Grant	\$75,000	New	2018
Conduct engineering strength studies of critical facilities	Tornados	Admin	3	2,4,5 & 7	Budget/Grant	\$150,000	New	2018
Emergency response chain saw project and other efforts to remove debris	Tornados	Maintenance	1	2 & 8	Budget/Grant	\$200,000	New	2016
Install safe rooms in critical facilities especially those with vulnerable populations	Tornados	Admin	3	2,4 & 5	Budget/Grant	\$45,000	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	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	New	2019
Conduct earthquake impact analysis on critical facilities	Earthquake	Admin	3	2,4 & 5	Budget/Grant	\$100,000	New	2017
Develop clearly marked and explained evacuation routes.	All	Admin	2	2,5 & 10	Budget/Grant	\$7,000	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	New	2018
Develop and publicize water conservation practices to respond to drought declarations	Drought	Admin	3	2,4 & 5	Budget/Grant	\$200	New	2016
Amend state drought legislation to stiffen penalties & clarify laws	Drought	Admin	3	2 & 5	Budget/Grant	\$30,000	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	New	2017
Institute a drought water storage program for fire suppression	Drought	Admin	3	2,4 & 5	Budget/Grant	\$30,000	New	2016
Establish cooling stations for vulnerable population	Heat	Admin	1	2,4 & 5	Budget/Grant	\$65,000	New	2017
Implement public awareness and outreach campaign	Heat	Police	1	2,4 & 5	Budget/Grant	\$20,000	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.

8. References and Bibliography

- AAA. (2014). *Hidden Highways: Fog and Traffic Crashes on America's Roads*. American Automobile Association Foundation for Traffic Safety, Available at <https://www.aaafoundation.org/sites/default/files/2014FogAndCrashesReport.pdf>
- Alberti, M., Booth, D., Hill, K., Coburn, B., Avolio, C., Coe, S., & Spirandelli, D. (2007). *The impact of urban patterns on aquatic ecosystems: An empirical analysis in Puget lowland sub-basins*. *Landscape and Urban Planning*, 80(4), 345-361. <http://doi.org/10.1016/j.landurbplan.2006.08.001>
- ASDSO. (2013). *National Inventory of Dams*. Association of State Dam Safety Officials, Available at <http://www.damsafety.org/map/state.aspx?s=41>
- ASFP. (2004). *Reducing Flood Losses: Is the 1% Chance (100-Year) Flood Standard Sufficient?*. 156pp. Washington D.C.: Association of State Floodplain Managers.
- 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>
- CMCOG. (2010). 2010 - 2040 Population Projections for the Central Midlands Region. Central Midlands Council of Governments
- Cutter, S.L., B.J. Boruff, and W.L. Shirley. (2003). "Social Vulnerability to Environmental Hazards," *Social Science Quarterly*, 84(1): 242-261.
- Eurostat. (2001). *Manual of Concepts on Land Cover and Land Use Information Systems*. Luxembourg: Office for Official Publications of the European Communities. Retrieved from <http://ec.europa.eu/eurostat/ramon/statmanuals/files/KS-34-00-407--I-EN.pdf>
- FEMA. (2011). *Wind Zone Map*. Federal Emergency Management Agency, Available at <http://patapsco.nist.gov/imagegallery/details.cfm?imageid=972>
- FEMA. (2013). *Local Mitigation Planning Handbook*. Federal Emergency Management Agency, Available at http://www.fema.gov/media-library-data/20130726-1910-25045-9160/fema_local_mitigation_handbook.pdf
- FEMA. *National Flood Insurance Program Summary of Coverage for Commerical Property* Federal Emergency Management Agency, <http://www.fema.gov/media-library/assets/documents/34505>
- 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>
- Gregorio, A. Di, & Jansen, L. (1998). *Land cover classification system: LCCS: Classification concepts and user manual*. Rome: Food and Agriculture Organization of the United Nations. Retrieved from ftp://ftp.repec.org/opt/ReDIF/RePEc/raf/anonymous/WKIEMP/Datasets/Louis_Verchot_handover/X_Markus_cd5/GEF/Supporting_documents/LCCS_manual.pdf
- Heinz Center. (2002). *Human Links to Coastal Disasters*. Washington, DC: The H. John Heinz III Center for Science, Economics and the Environment
- Homer, C., Fry, J., & Barnes, C. (2012). *The National Land Cover Database. US Geological Survey Fact Sheet*, (February), 1-4 Retrieved from <http://pubs.usgs.gov/fs/2012/3020/>
- NOAA. (2016). *Average number of tornado watches per year (1993-2012)*. <http://www.spc.noaa.gov/wcm/>
- NOAA. (2016). *Billion-Dollar Weather and Climate Disasters*. National Centers for Environmental Information, Available at <http://www.ncdc.noaa.gov/billions/events>
- NWS. *Atlantic 2-day Graphical Tropical Weather Outlook*. National Hurricane Center, Available at http://www.nhc.noaa.gov/gtwo_atl.shtml
- NWS. *Drought Fact Sheet*. National Weather Service, Available at http://www.nws.noaa.gov/om/csd/graphics/content/outreach/brochures/FactSheet_Drought.pdf
- NWS. (2013). *Number of Cloud-To-Ground Flashes by State from 1997 to 2012*. National Weather Service, Available at http://www.lightningsafety.noaa.gov/stats/97-12Flash_DensitybyState.pdf
- NWS. (2015). *Historic rainfall and flooding*. National Weather Service, Available at <http://www.weather.gov/cae/HistoricFloodingOct2015.html>
- NWS. *National Weather Service Glossary*. National Weather Service, Available at <http://www.weather.gov/glossary/>
- NWS. *Watch, Warning, Advisory Display*. National Weather Service, Available at <http://www.spc.noaa.gov/products/wwa/>
- SCANA. (2008). *Saluda Hydro Project Relicence. Attachment 3b Finale Schedule A response*. Available at <http://www.thestate.com/news/local/article53937070.html>
- SCEMD. *Earthquake Preparedness Information*. South Carolina Emergency Management Division, <http://www.scemd.org/planandprepare/disasters/earthquakes>
- SCFC. *Facts about wildfire in South Carolina*. South Carolina Forestry Commission, Available at <http://www.state.sc.us/forest/refwild.htm>

- Turner, B., Skole, D., Sanderson, S., Fischer, G., Fresco, L., & Leemans, R. (1995). *Land-use and land-cover change. Science/Research Plan. Global Change*. Stockholm. Retrieved from <http://agris.fao.org/agris-search/search/display.do?f=1996/SE/SE96013.xml;SE9611062>
- US EPA. (2007). *Definitions | MRLC*. US Environmental Protection Agency. Retrieved March 31, 2016, from <http://www.epa.gov/mrlc/definitions.html>
- Zhang, Y. K., & Schilling, K. E. (2006). Effects of land cover on water table, soil moisture, evapotranspiration, and groundwater recharge: A Field observation and analysis. *Journal of Hydrology*, 319(1-4), 328-338. <http://doi.org/10.1016/j.jhydrol.2005.06.044>

Appendices

I. Additional Hazard Threat, Vulnerability, and Risk Maps by Participating Jurisdiction

I-A. Flood Zones

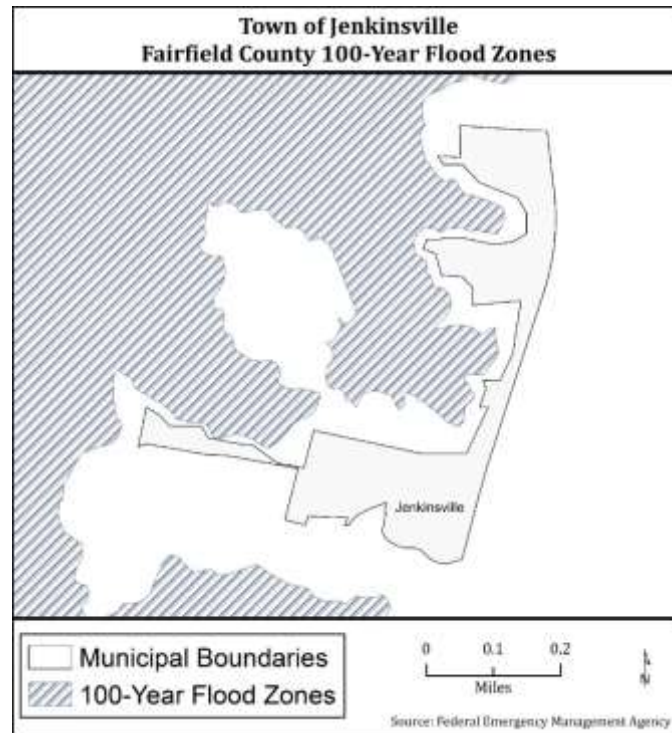


Figure 205 - Town of Jenkinsville 100-Year Flood Zones

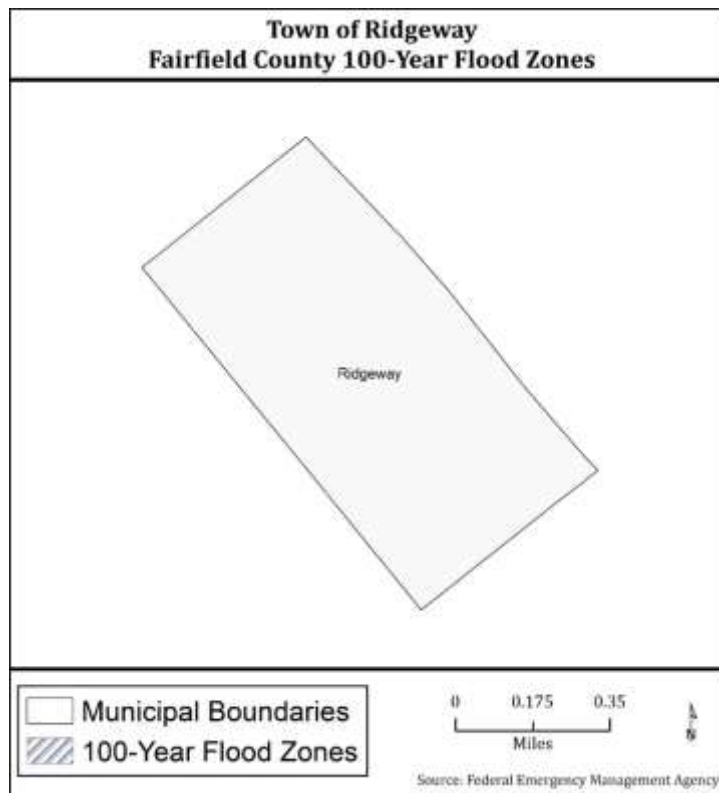


Figure 206 - Town of Ridgeway 100-Year Flood Zones

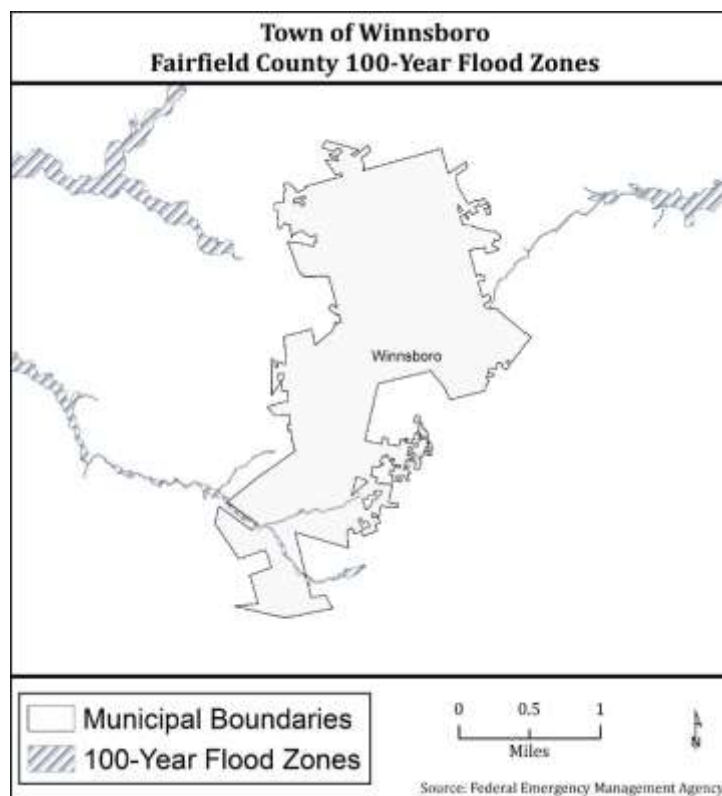


Figure 207 - Town of Winnsboro 100-Year Flood Zones

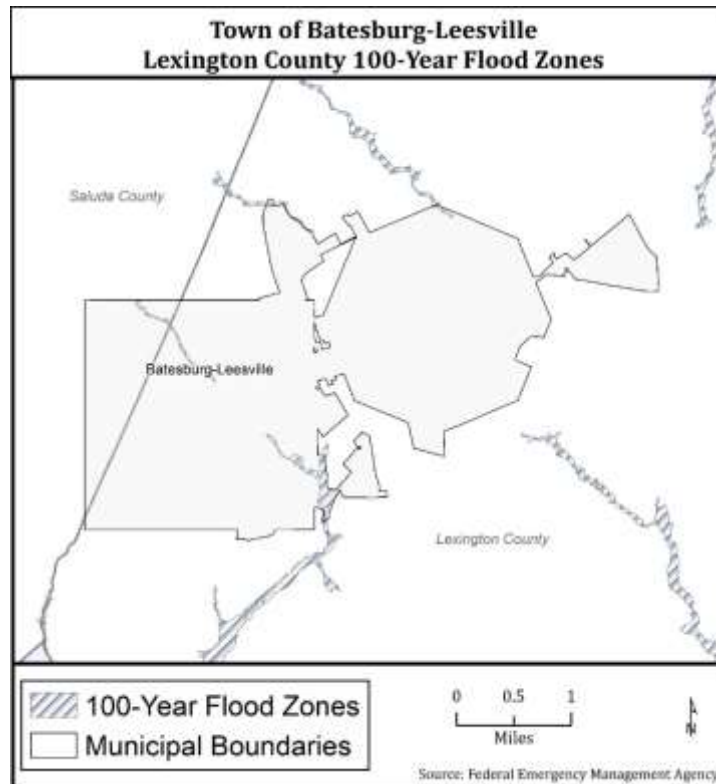


Figure 208 - Town of Batesburg-Leesville 100-Year Flood Zones

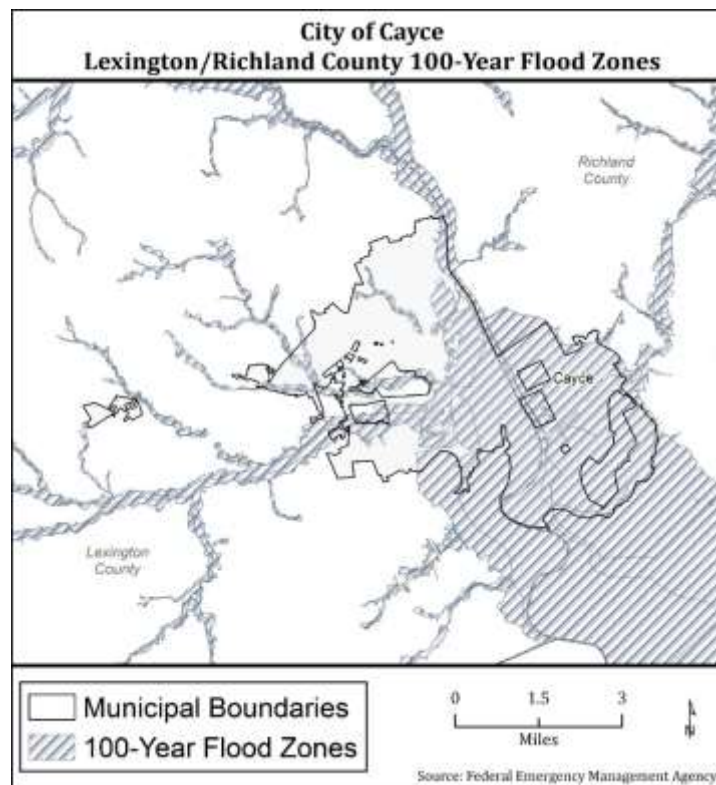


Figure 209 - City of Cayce 100-Year Flood Zones

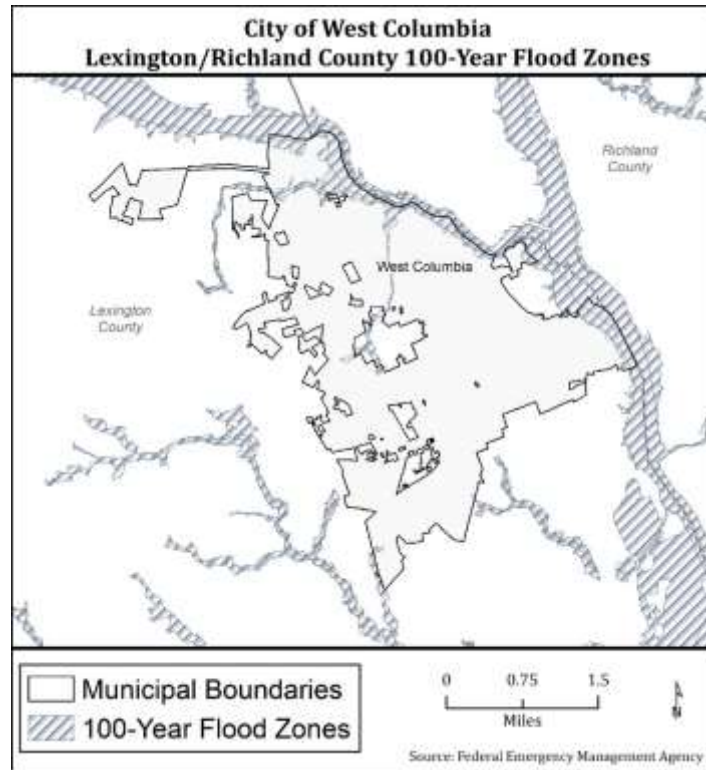


Figure 210 - City of West Columbia 100-Year Flood Zones

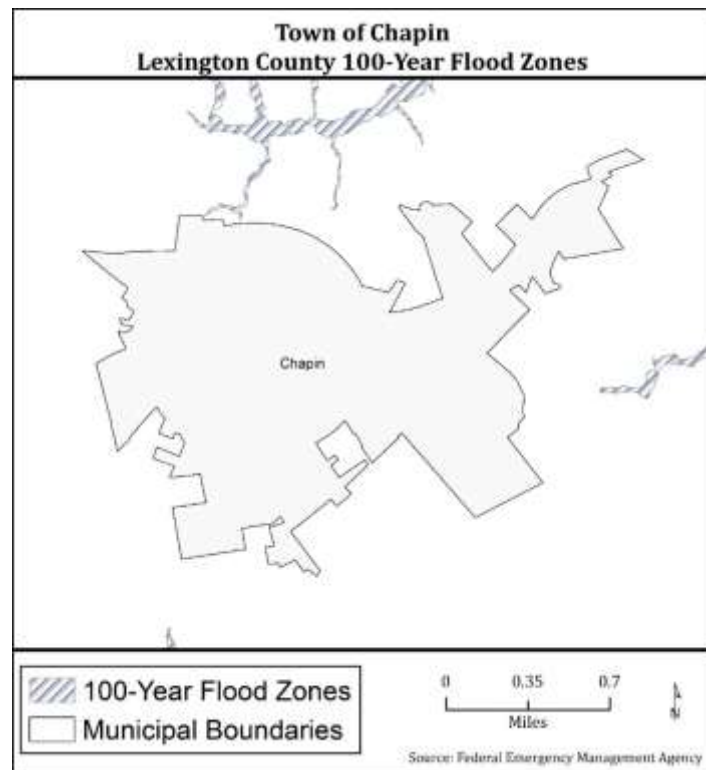


Figure 211 - Town of Chapin 100-Year Flood Zones

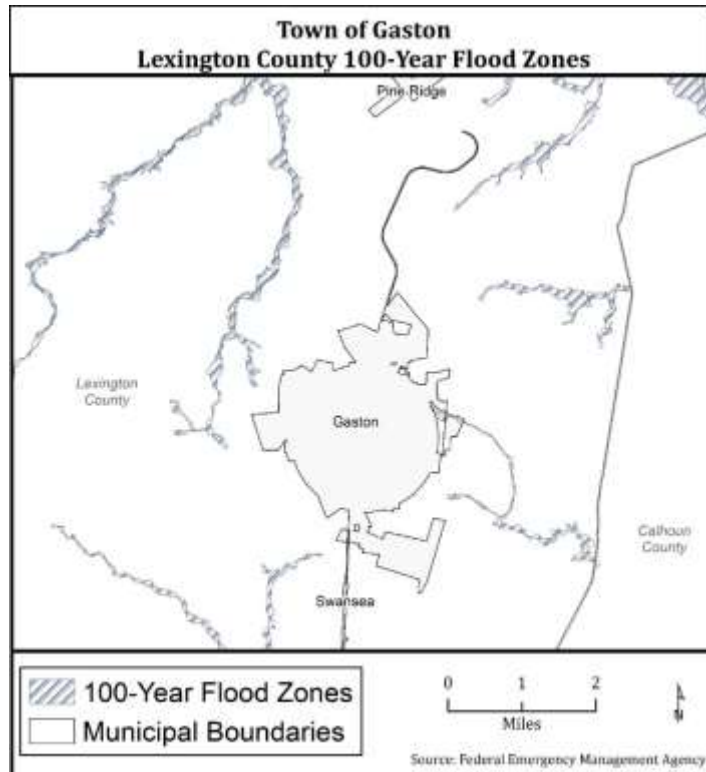


Figure 212 - Town of Gaston 100-Year Flood Zones

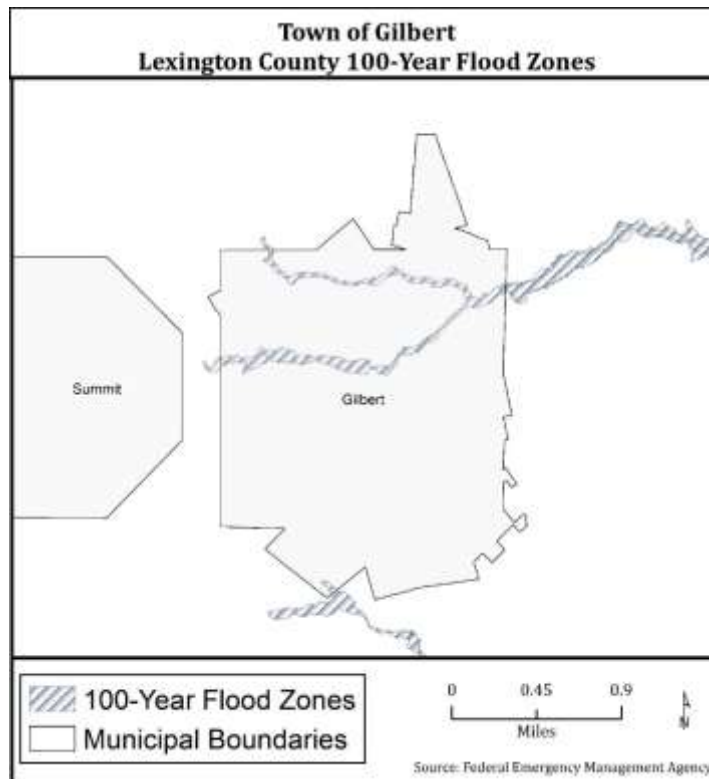


Figure 213 - Town of Gilbert 100-Year Flood Zones

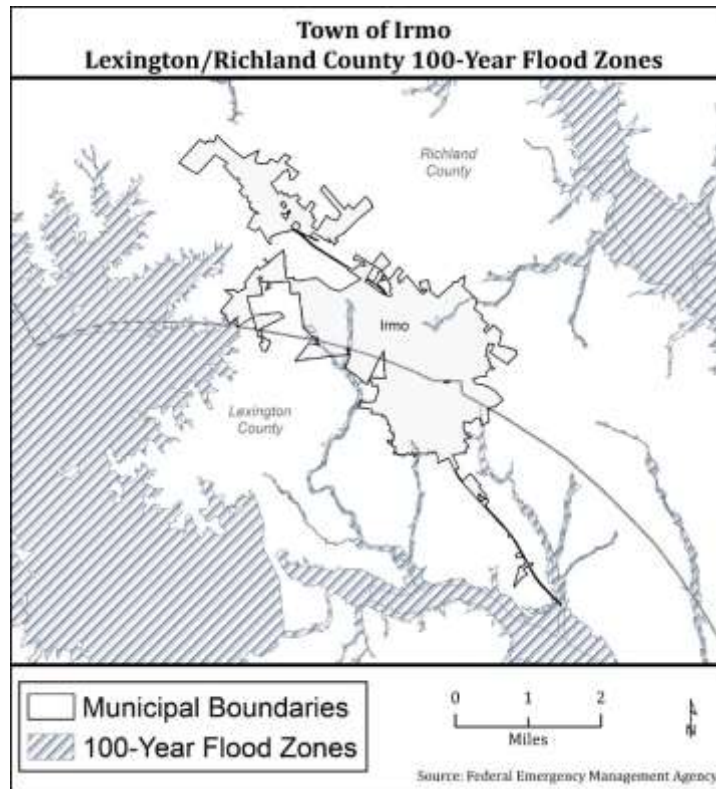


Figure 214 - Town of Irmo 100-Year Flood Zones

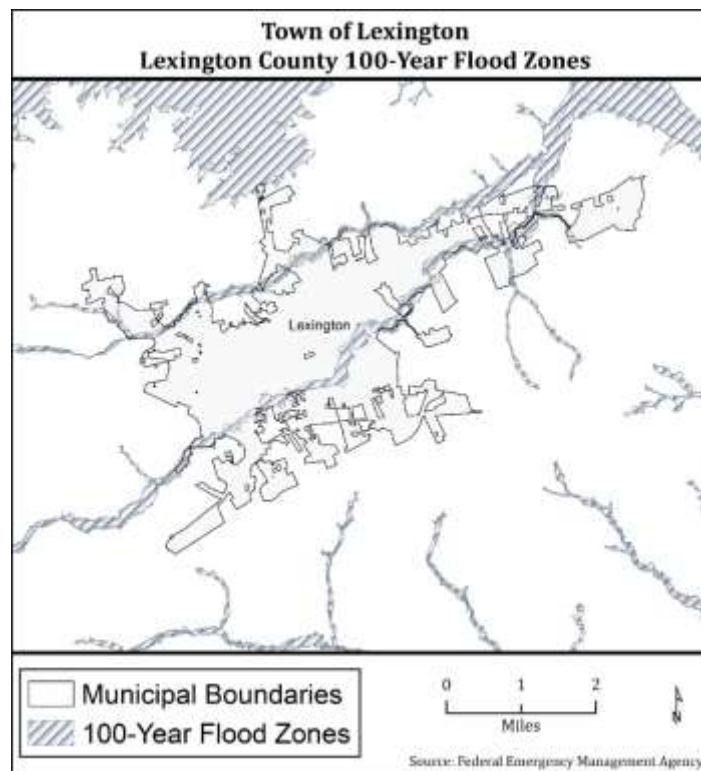


Figure 215 - Town of Lexington 100-Year Flood Zones

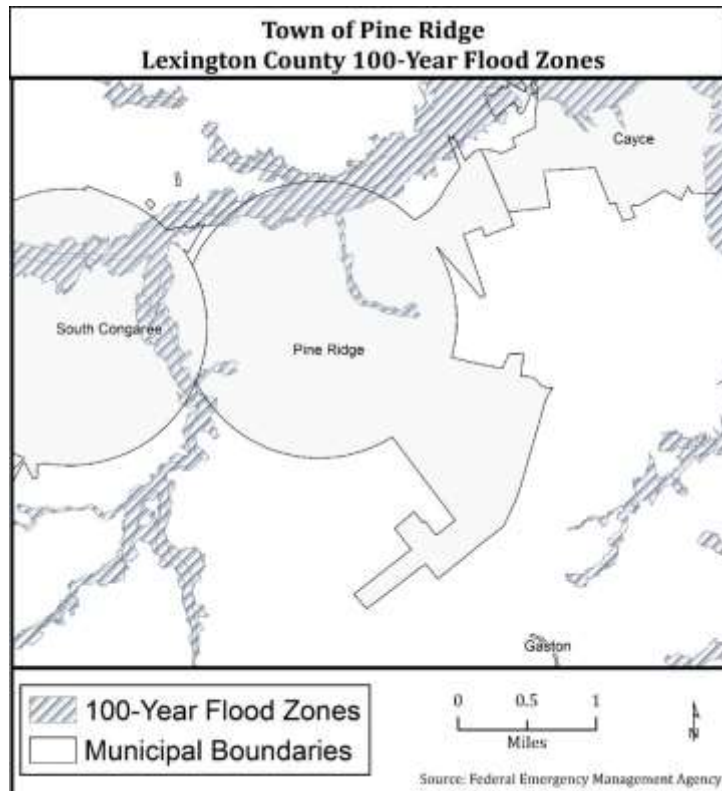


Figure 216 - Town of Pine Ridge 100-Year Flood Zones

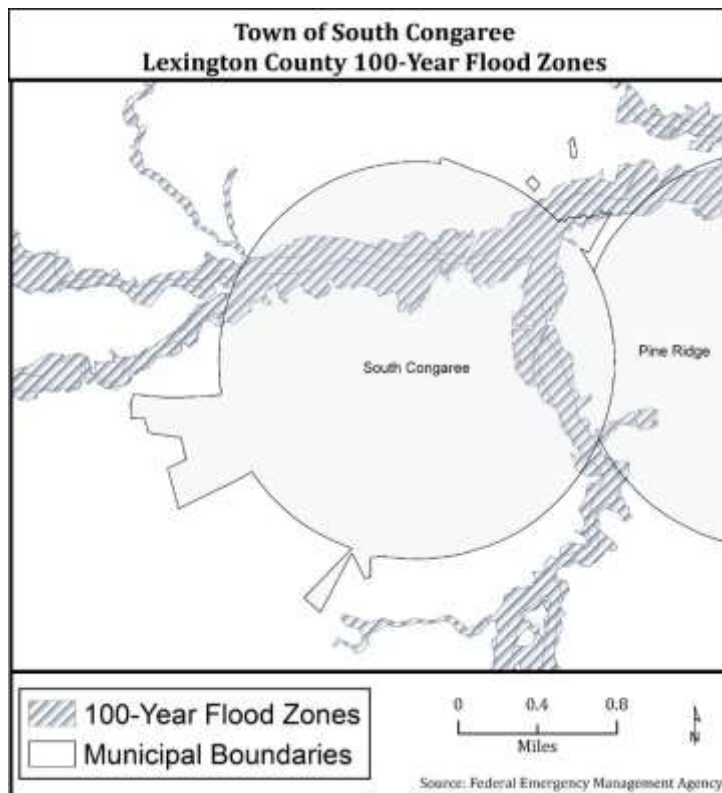


Figure 217 - Town of South Congaree 100-Year Flood Zones

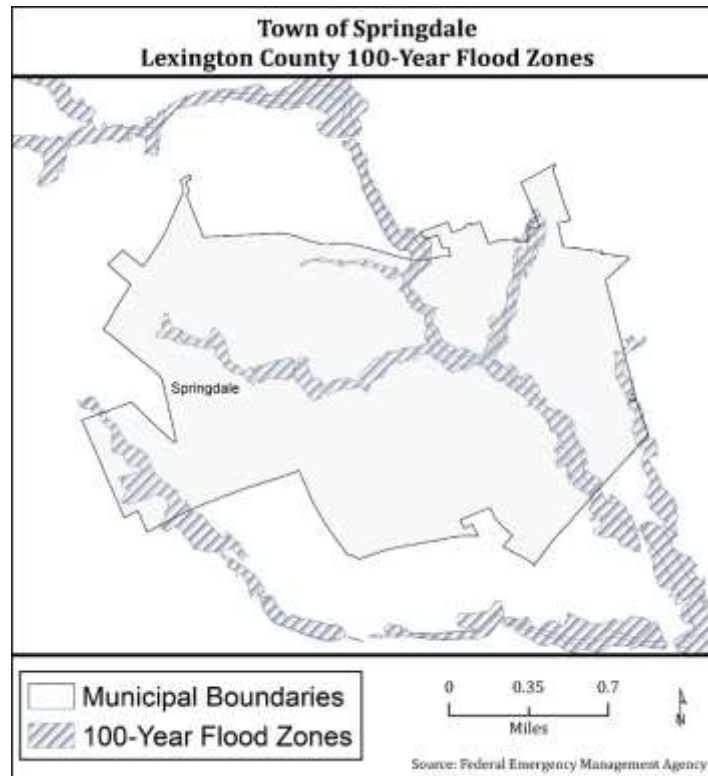


Figure 218 - Town of Springdale 100-Year Flood Zones

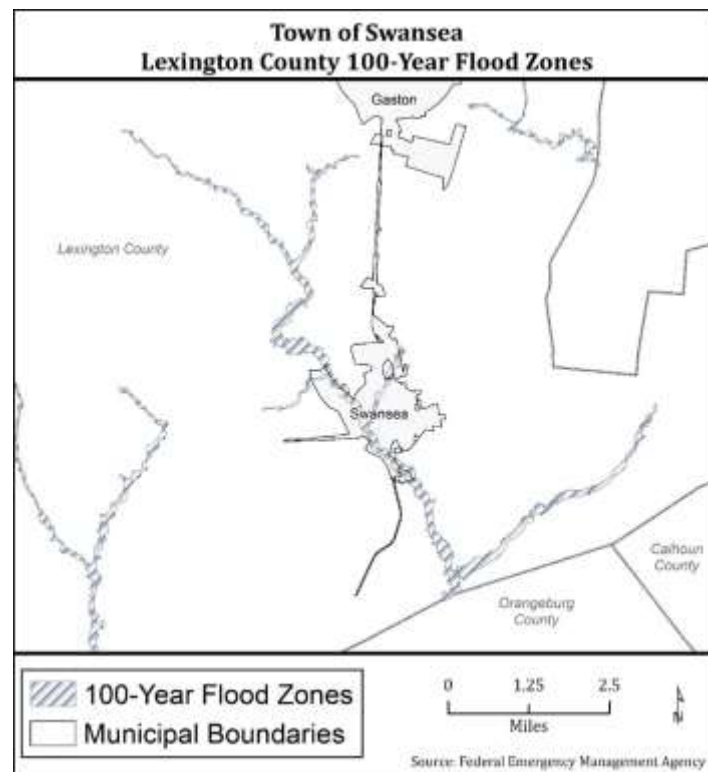


Figure 219 - Town of Swansea 100-Year Flood Zones

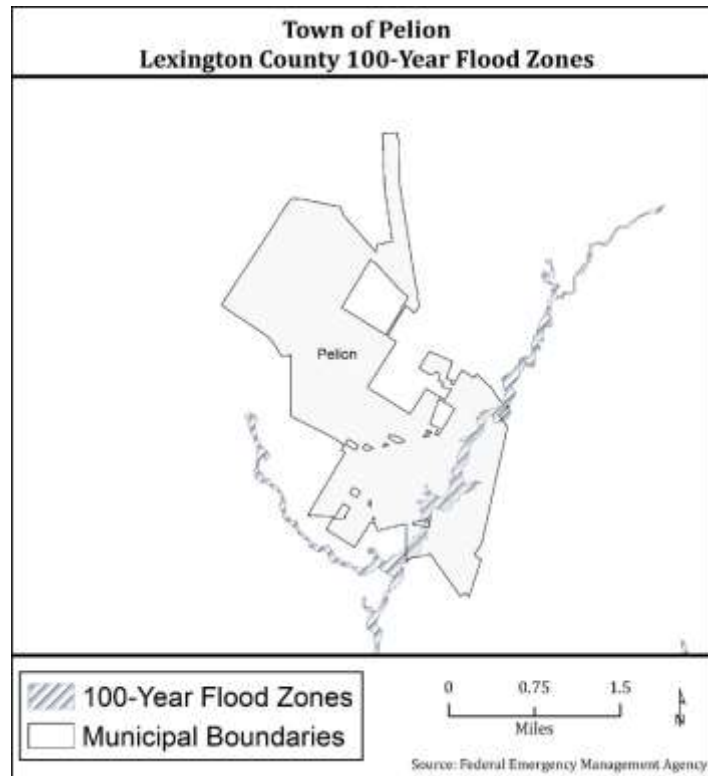


Figure 220 - Town of Pelion 100-Year Flood Zones

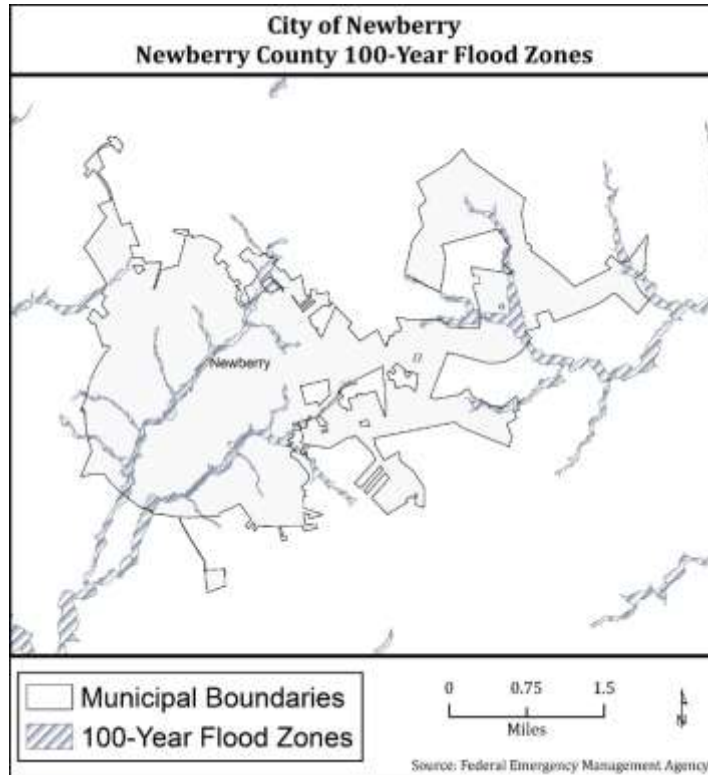


Figure 221 - City of Newberry 100-Year Flood Zones

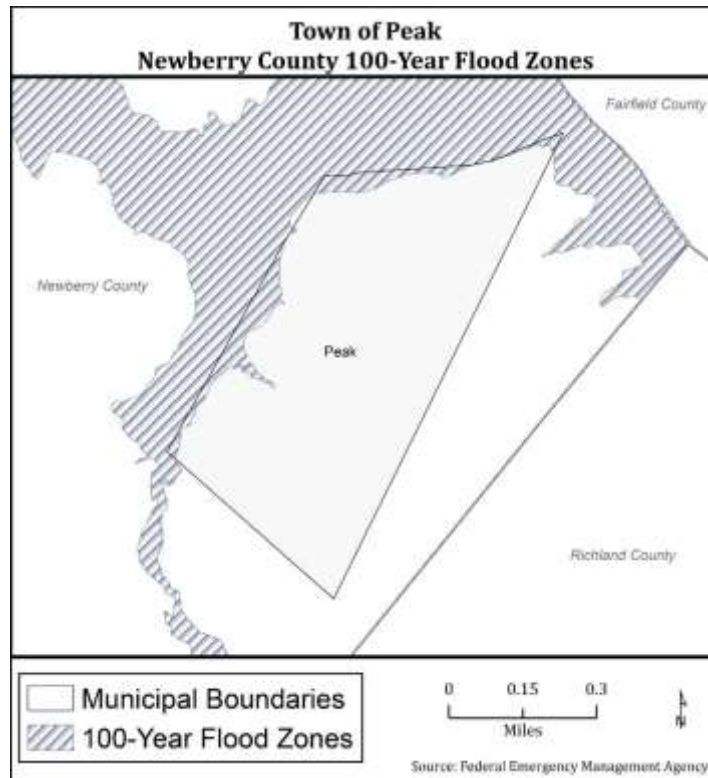


Figure 222 - Town of Peak 100-Year Flood Zones

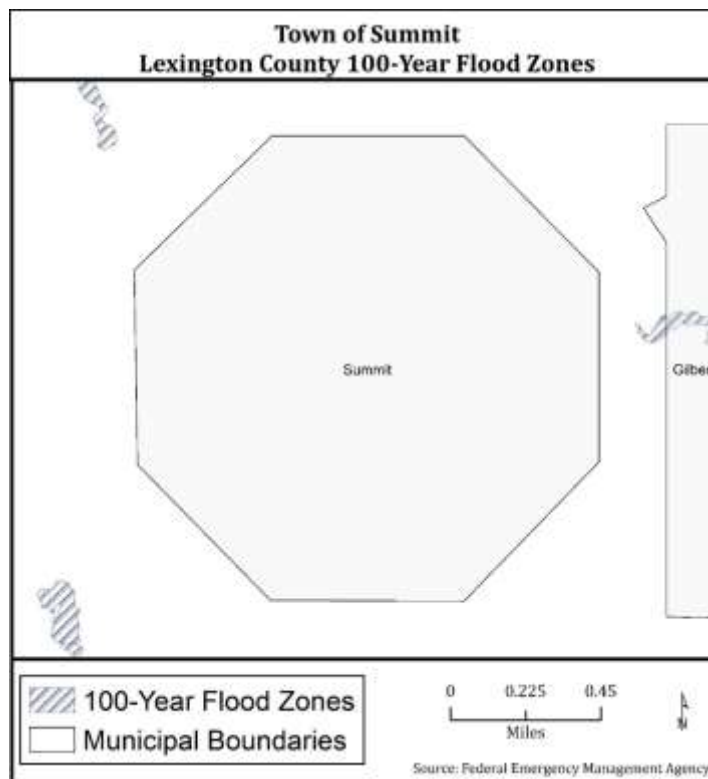


Figure 223 - Town of Summit 100-Year Flood Zones

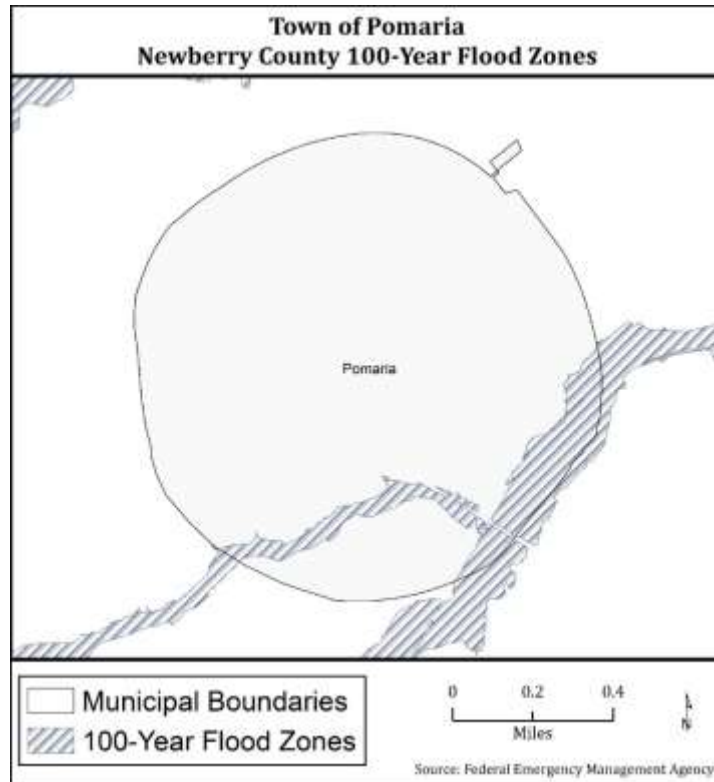


Figure 224 - Town of Pomaria 100-Year Flood Zones

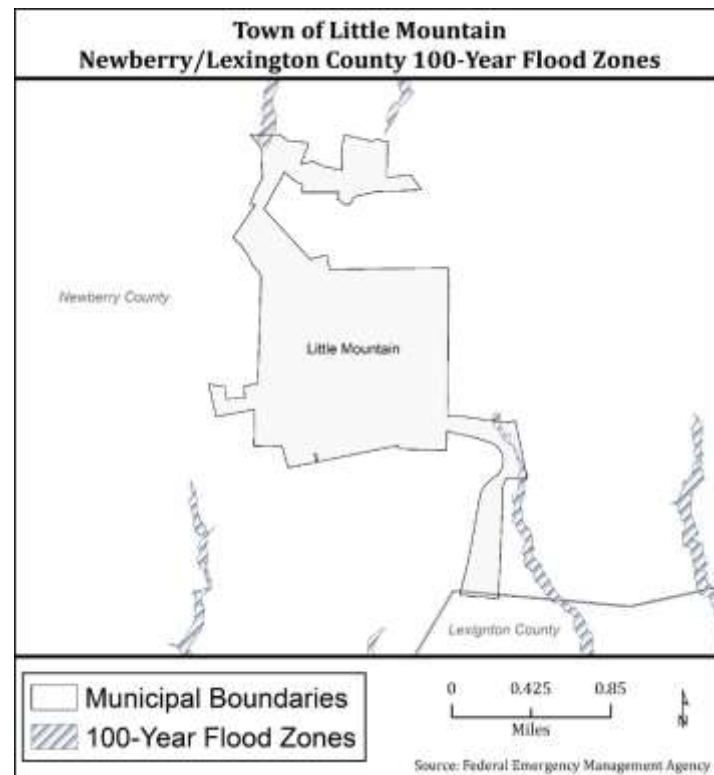


Figure 225 - Town of Little Mountain 100-Year Flood Zones

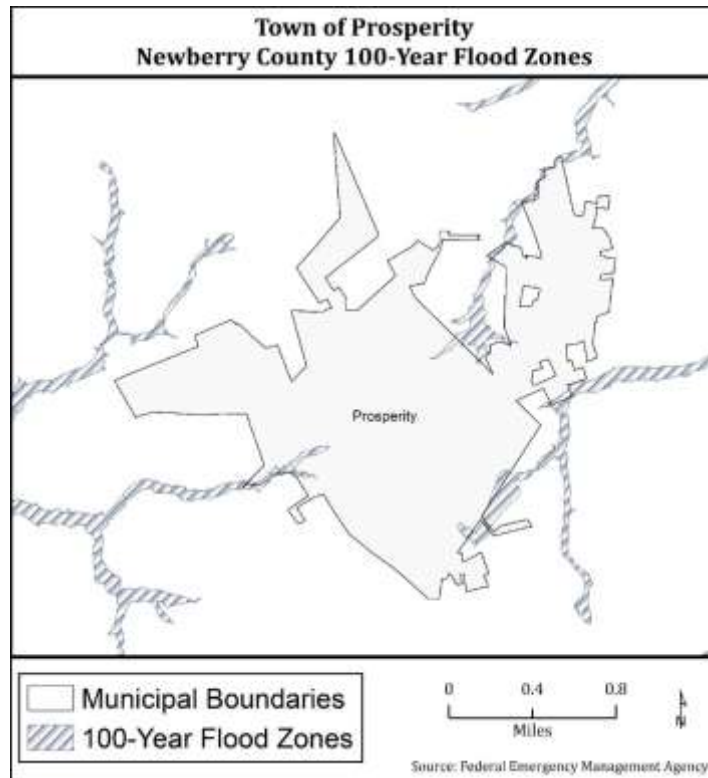


Figure 226 - Town of Prosperity 100-Year Flood Zones

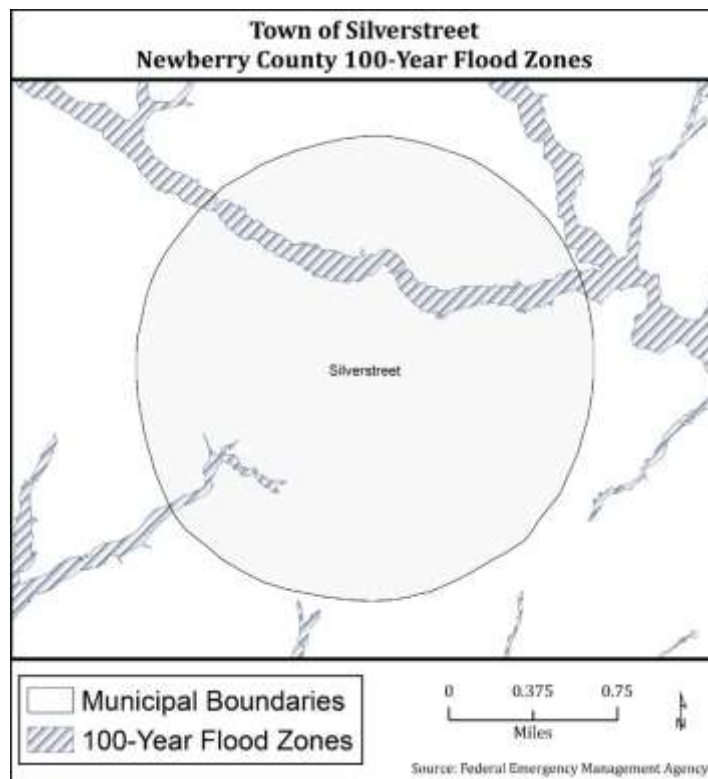


Figure 227 - Town of Silverstreet 100-Year Flood Zones

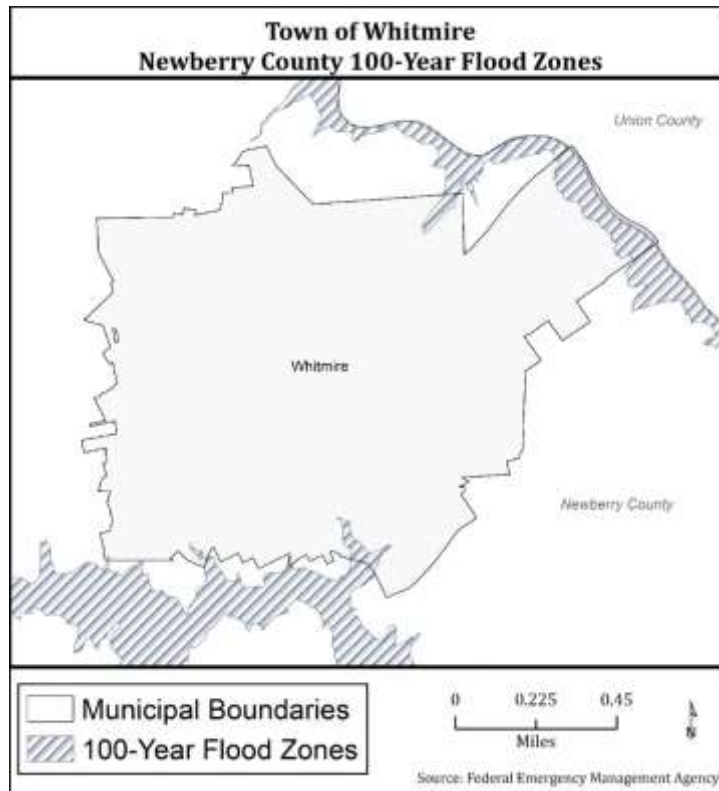


Figure 228 - Town of Whitmire 100-Year Flood Zones

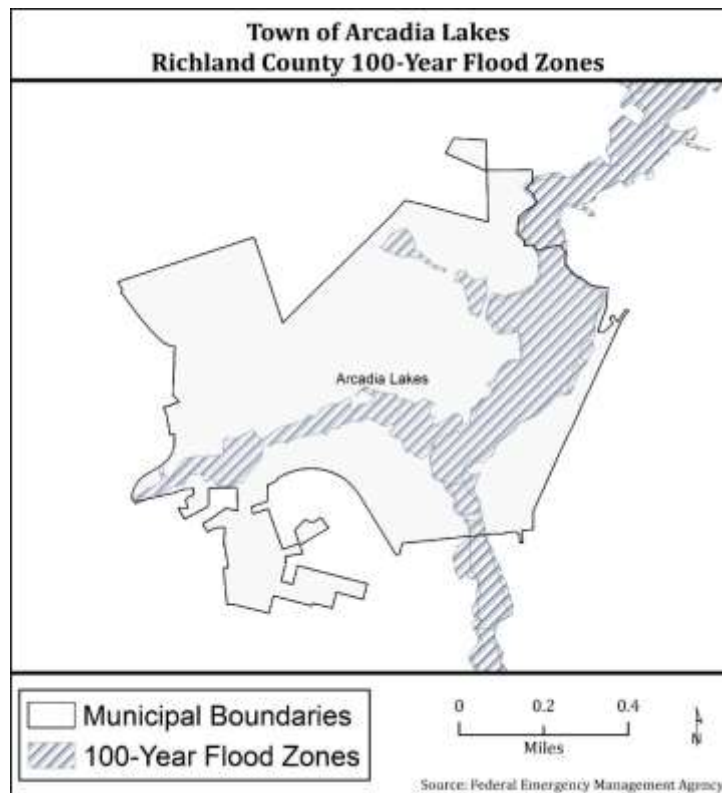


Figure 229 - Town of Arcadia Lakes 100-Year Flood Zones

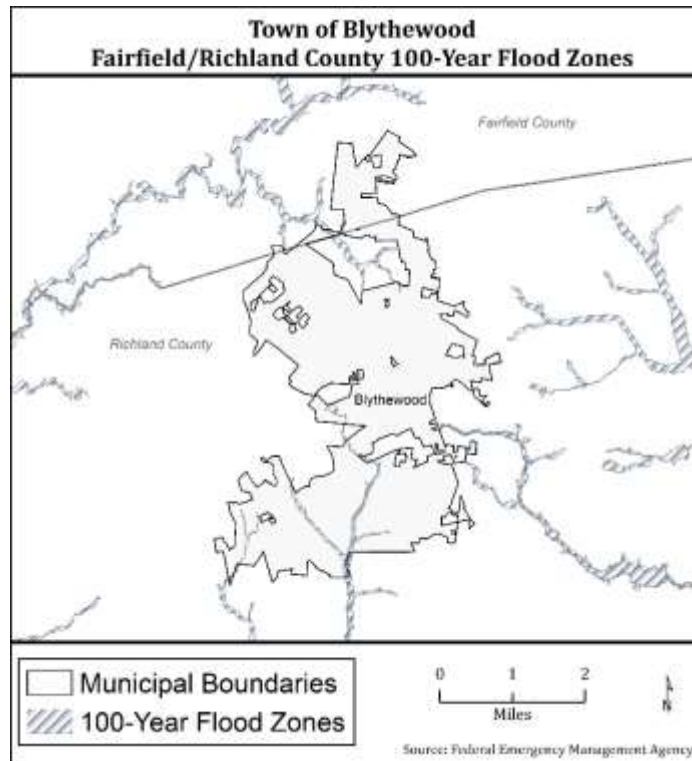


Figure 230 - Town of Blythewood 100-Year Flood Zones

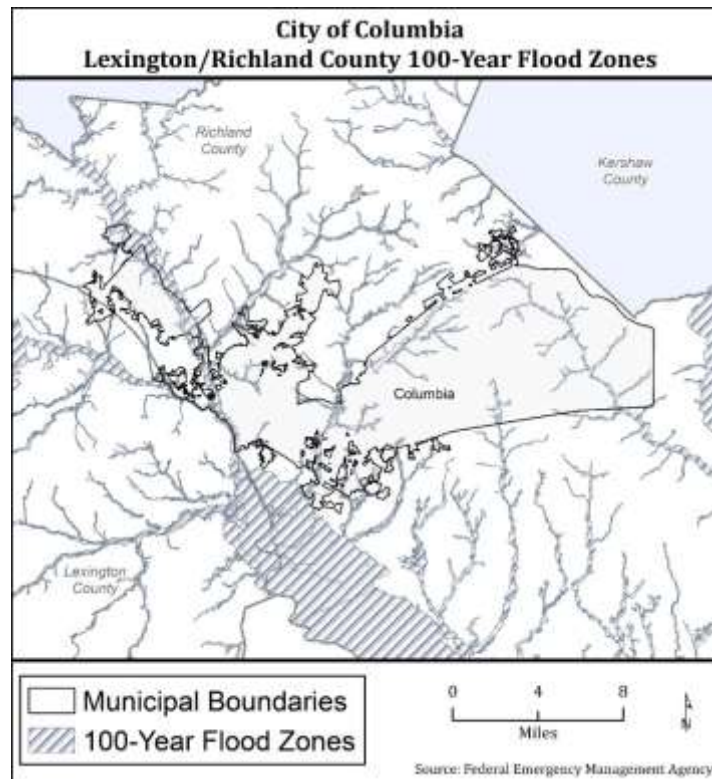


Figure 231 - City of Columbia 100-Year Flood Zones

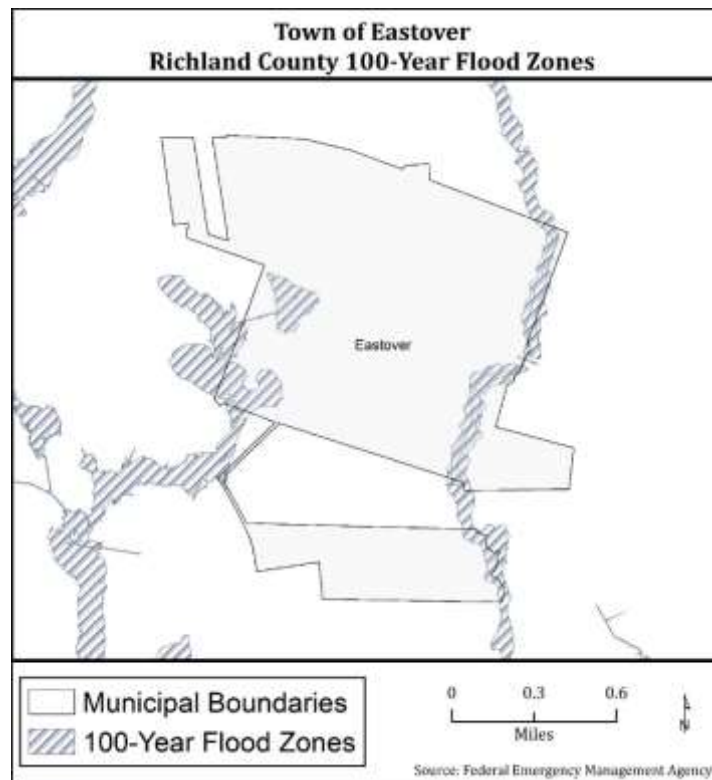


Figure 232 - Town of Eastover 100-Year Flood Zones

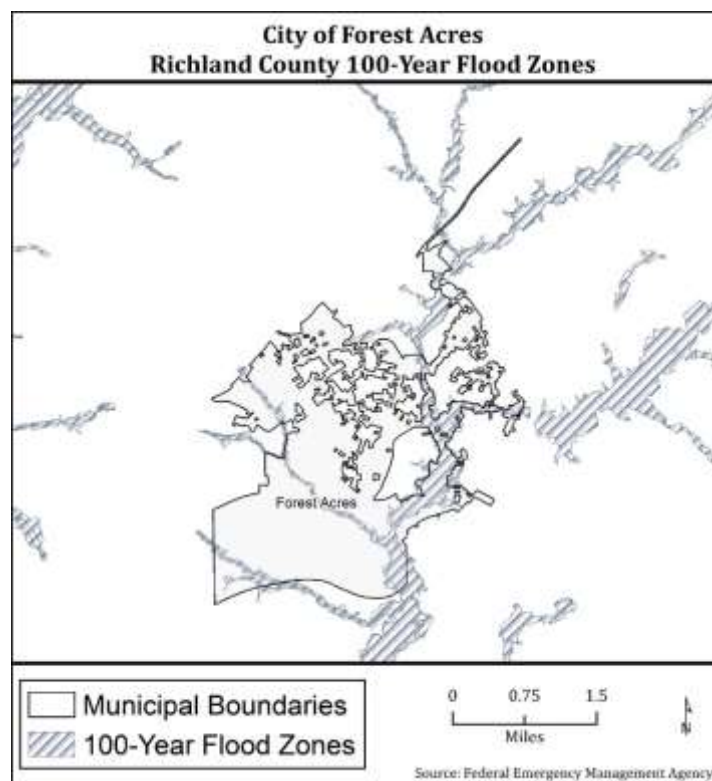


Figure 233 - City of Forest Acres 100-Year Flood Zones

II. Risk Assessment Methodology

II-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 234).



Figure 234 - 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 lifelines⁹⁵, 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 by Cutter (2003)⁹⁶ and later refined by scholars at the University of Central Florida⁹⁷. Population

⁹⁵ <https://www.fema.gov/lifelines>

⁹⁶ <https://onlinelibrary.wiley.com/doi/abs/10.1111/1540-6237.8402002>

⁹⁷ www.vulnerabilitymap.org

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 Midlands'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 5.⁹⁸

$$CON_{HAZ} = (HISTCON_{HAZ}) + (CLIMSENS_{HAZ}) + \left(\frac{FREQUENCY_{HAZ}}{SEVERITY_{HAZ}} \right) + (PRIORITY_{HAZ}) \quad (3)$$

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 recorded⁹⁹ 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 122).

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.

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

⁹⁸ CMCOG 2016 Hazard Mitigation Plan - <http://www.centralmidlands.org/pdf/CMHMP%202016%20-%20Final.pdf>

⁹⁹ <https://www.ncdc.noaa.gov/stormevents/>

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.

II-B. Data and data transformations

A. Spatial Binning for Sub-County Data Aggregation and Analysis

A Quarter Square Mile (1/4 sq mi) hexagonal grid is used throughout the analyses of this HMP. This provides the best coverage for small spatial areas, such as the participating sub-county organizations of this HMP, while still providing the ability to visualize spatial differences across the region. City or sub-county jurisdiction data on natural hazard type, location, extent, and community vulnerability and risk can effectively be analyzed utilizing this simplified method of summarizing complex geospatial information¹⁰⁰. Summarizing underlying spatial data to the 1/4-square-mile grid cell provides a specific set of information that will be different than using a different sized grid cell. Different grid sizes will yield different results.

Using regular spatial bins (hexagons) serves three primary goals: First, it simplifies data sets and aids in visual communication of complex data. If done correctly, visual binning can enable readers to make reasonable count or density estimates that would otherwise be impossible because of the complexity of underlying data. Second, spatial binning shows a smooth surface of aggregated values across larger areas. Finally, a standardized regular gridded framework, such as the hexagonal grids used here enables analysis and evaluation within and between datasets that would normally be difficult (or impossible) to visually, statistically, or spatially compare¹⁰¹.

B. Social Vulnerability

Social vulnerability, a concept focused on understanding an area's capacity to prepare for, respond to, and rebound from disaster events¹⁰², has a long conceptual and theoretical history in social and disaster science fields.¹⁰³ 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.

C. Community Lifelines and Critical Infrastructure

Data on community lifelines and critical infrastructure assets (Table 121) were collected based on FEMA's Community Lifelines¹⁰⁴ 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.

¹⁰⁰ <https://www.tableau.com/about/blog/2017/11/data-map-discovery-78603>

¹⁰¹ https://www.researchgate.net/publication/303290602_Shapes_on_a_plane_evaluating_the_impact_of_projection_distortion_on_spatial_binning

¹⁰² <https://doi.org/10.1177/0002716205285515>

¹⁰³ <https://unu.edu/publications/books/measuring-vulnerability-to-natural-hazards-towards-disaster-resilient-societies-second-edition.html#overview>

¹⁰⁴ <https://www.fema.gov/lifelines>

- 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 121 - 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 - Courthouses	https://www.arcgis.com/home/item.html?id=7d121358b28042fe863d10a0c3c46709	
Safety and Security	Local EOCs	https://www.arcgis.com/home/item.html?id=874798faedc74358bac9bbe1867af3c7	Yes
Safety and Security	Community Safety - Convention Centers/Fairgrounds	https://www.arcgis.com/home/item.html?id=86c323b5d44748228ef10bc8b452d9f7	
Safety and Security	Public Schools	https://www.arcgis.com/home/item.html?id=87376bdb0cb3490cbda39935626f6604	
Safety and Security	Private Schools	https://www.arcgis.com/home/item.html?id=0dfe37d2a68545a699b999804354dacf	
Safety and Security	Colleges and Universities	https://www.arcgis.com/home/item.html?id=0d7bedf9d582472e9ff7a6874589b545	
Safety and Security	Mobile Home Parks	https://www.arcgis.com/home/item.html?id=4cdbccc5c538452aa91ceee277c460f9	
Safety and Security	Places of Worship	https://www.arcgis.com/home/item.html?id=97603afcff00443f874acbe03c9e794a	
Safety and Security	Nursing Homes	https://www.arcgis.com/home/item.html?id=78c58035fb3942ba82af991bb4476f13	
Food, Water, Shelter	Food Stores	https://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	https://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	https://www.arcgis.com/home/item.html?id=bcaf5fdb3db24c78afee52d4c8a02748	
Health and Medical	Medical Care	https://www.arcgis.com/home/item.html?id=48f5722c8ab746ac8fd976442c37439e	Yes
Energy	Transmission Lines and Substations	https://www.arcgis.com/home/item.html?id=70512b03fe994c6393107cc9946e5c22 ; https://www.arcgis.com/home/item.html?id=755e8c8ae15a4c9abfcec7b2e95fb9a	Yes
Energy	Gas Stations	https://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	

FEMA Lifeline	Variable	Source	Critical
		/item.html?id=98d19dce5c1b443eaaae3288229e103d	
Communications	Banks and Finance	https://www.arcgis.com/home/item.html?id=6c8c635b1ea94001a52bf28179d1e32b	
Transportation	Non-State Highway/Roadway	http://info2.scdot.org/GISMapping/Pages/GIS.aspx	
Transportation	Railway	https://www.arcgis.com/home/item.html?id=d209f26edc86485a9c631311e50d9940	
Transportation	Aviation	https://www.arcgis.com/home/item.html?id=e747ab91a11045e8b3f8a3efd093d3b5	Yes
Hazardous Materials	Toxic Release Inventory Sites	https://www.arcgis.com/home/item.html?id=2c4a0b5f85b945f8a67125e6a93fa7fe	
Hazardous Materials	Superfund Sites	https://www.arcgis.com/home/item.html?id=c2b7cdf579c41bbba4898400aa38815	
Hazardous Materials	Solid Waste	https://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 121) 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/extent maps.

D. Population Density

Population data at the block group level originate from the American Community Survey products developed for HUD's LMI block group dataset.¹⁰⁵ 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.

E. 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 122). A climate sensitivity score of 1 represents low (or negative) climate sensitivity and a score of 5 represents high (or strong positive) climate sensitivity.

¹⁰⁵ <https://www.hudexchange.info/programs/acs-low-mod-summary-data/acs-low-mod-summary-data-block-groups-places/>

Table 122 - 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
Hurricane/Tropical Storm	5	Smith, T. J., Robblee, M. B., Wanless, H. R., & Doyle, T. W. (1994). Mangroves, hurricanes, and lightning strikes. BioScience, 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. Journal of Coastal Research, 159-168. http://www.jstor.org/stable/25736006
Lightning	3	Mitsch, W.J. and J.G. Gosselink, 2007: Wetlands, 4 th ed. Wiley, New York, 600 pp.
Severe Storm/Thunder Storm	5	Mitsch, W.J. and J.G. Gosselink, 2007: Wetlands, 4 th ed. Wiley, New York, 600 pp.
Tornado	3	Mitsch, W.J. and J.G. Gosselink, 2007: Wetlands, 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. 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
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. BioScience, 51(9), 723-734. http://dx.doi.org/10.1641/0006-3568(2001)051[0723:ccafd]2.0.co;2
Winter Weather	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/

II-C. Definitions

According to FEMA (2013, pp. 5-1)¹⁰⁶, 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., lightning) is measured in days. Statistical probabilities are only available for floods (i.e. 100- and 500-year floods).

II-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 235). 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

¹⁰⁶ FEMA, “Local Mitigation Planning Handbook”, 2013

- 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.¹⁰⁷

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't 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.

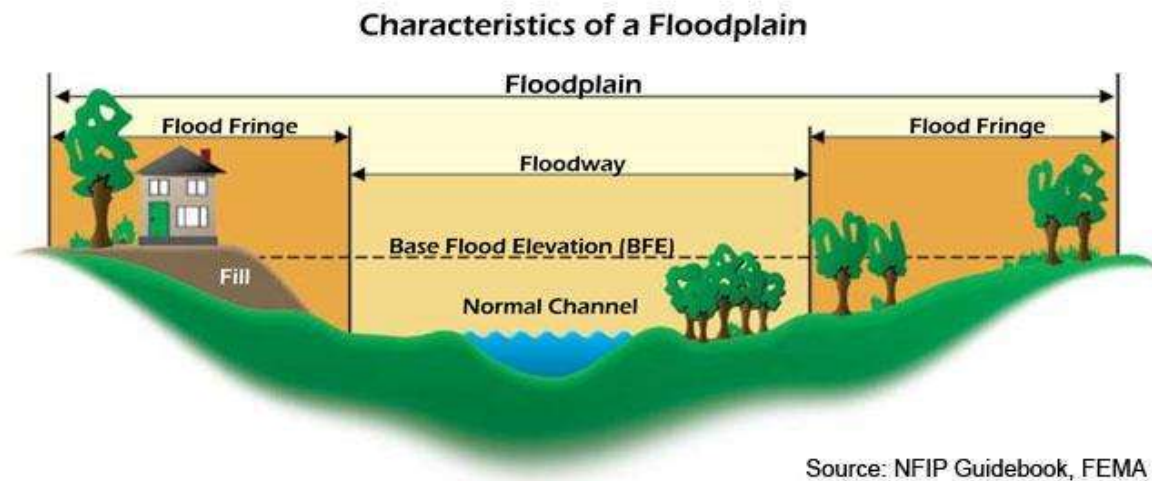


Figure 235 - Schematic of a floodplain.

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 categories¹⁰⁸:

- **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.

¹⁰⁷ 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

¹⁰⁸ NWS, "National Weather Service Glossary".

- **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.¹⁰⁹ 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 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 warnings¹¹⁰. 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.

¹⁰⁹ ASFPM. "Reducing Flood Losses: Is the 1% Chance (100-Year) Flood Standard Sufficient?", 156pp. Washington D.C.: Association of State Floodplain Managers, 2004.

¹¹⁰ Information is accessible at <http://www.spc.noaa.gov/products/wwa/>.

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.
- **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 236)¹¹¹. 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.

¹¹¹ <https://damsafety.org/south-carolina>

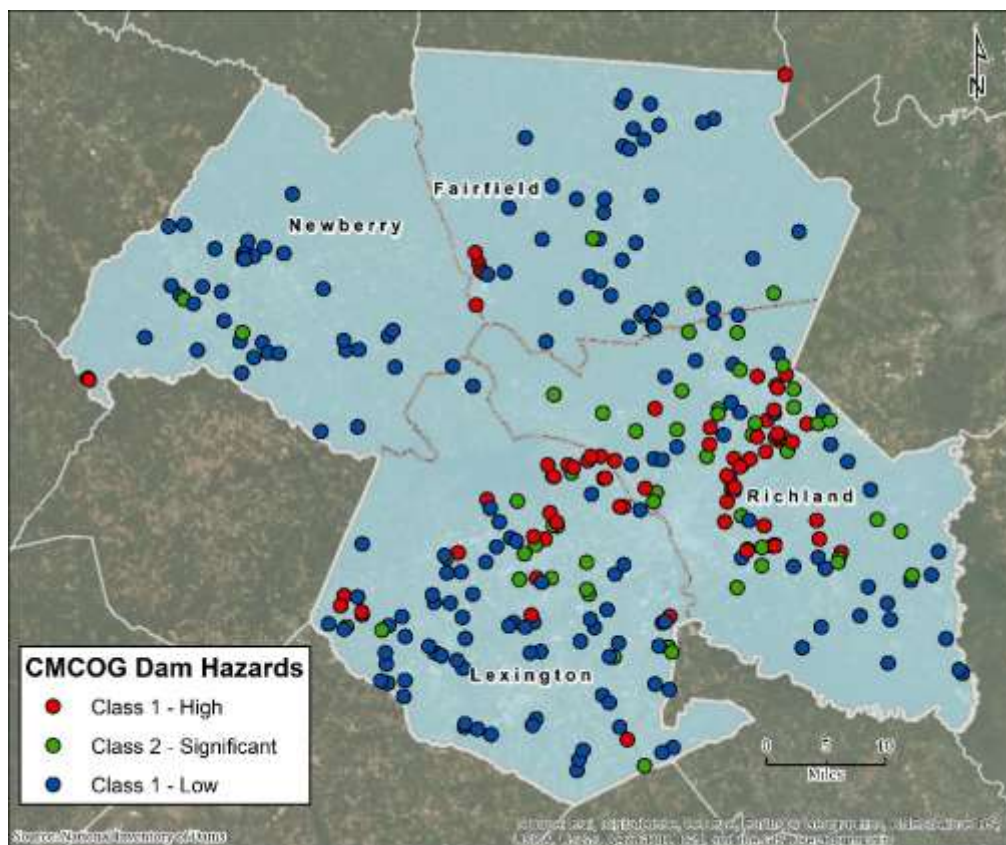


Figure 236 - 2018 National Inventory of Dams. Source: Damsafety.org.

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, derechos), flash flooding, riverine flooding, dam/levee failures, lightning, hail, dust storms and in the wintertime blizzards and ice storms (Figure 237). All thunderstorms contain lightning.

Based on Doppler radar and storm spotters, the NWS posts severe thunderstorm watches and warnings¹¹², along with the following statements:

- **Severe Thunderstorm Warning¹¹³:** 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.

¹¹² Information is accessible at <http://www.spc.noaa.gov/products/wwa/>

¹¹³ National Weather Service Glossary, <http://www.spc.noaa.gov/products/wwa/>

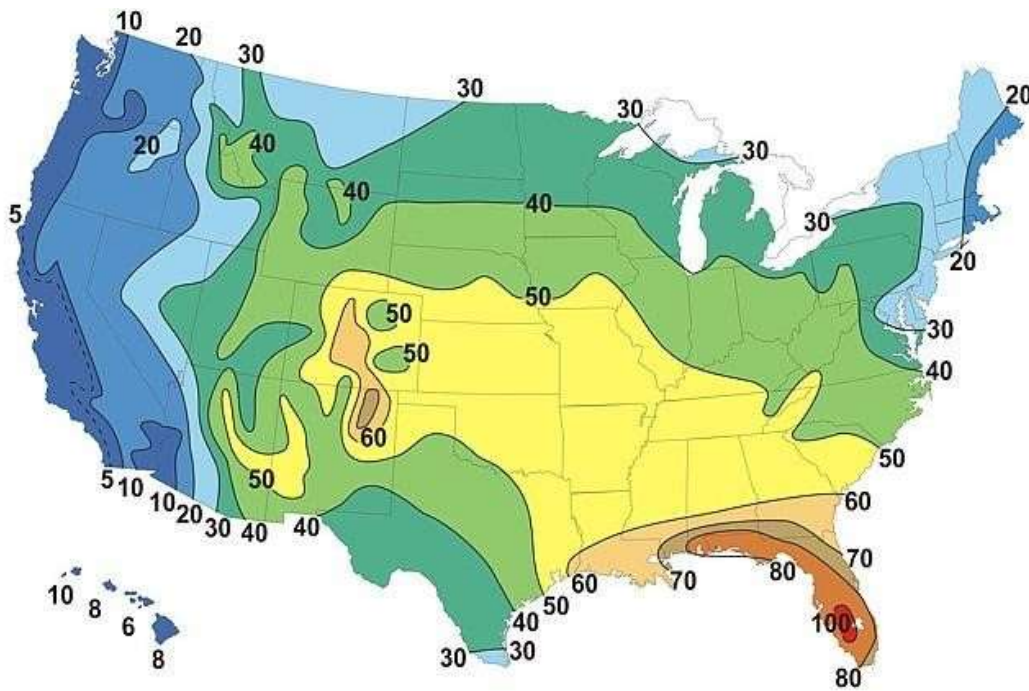


Figure 237 - Average number of thunderstorm days per year. Source: NOAA

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 123). Hurricane categories 3, 4, and 5 are considered *major* hurricanes.

Table 123 - 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 ≥ 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 238).

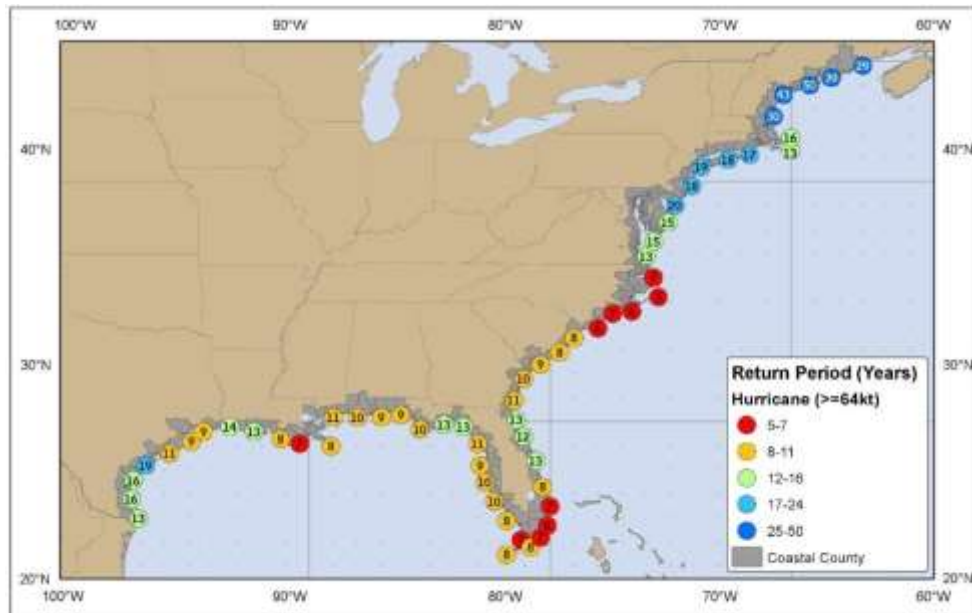


Figure 238 - Estimated return period in years for hurricanes passing within 50 nautical miles off the U.S. coast. Source: NOAA

Since 1851 nearly 90 tropical cyclones have affected South Carolina, of which 34 impacted the Central Midlands region (Figure 239). 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.¹¹⁴. The NHC issues the following weather statements in regard to tropical cyclones:

- **Tropical Storm Warning**¹¹⁵: An announcement that tropical storm conditions (sustained winds of 39 to 73 mph) are *expected* somewhere within the specified coastal area within 36 hours.
- **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.

¹¹⁴ Information is accessible at http://www.nhc.noaa.gov/gtwo_atl.shtml

¹¹⁵ NWS. "National Weather Service Glossary." National Weather Service, <http://www.weather.gov/glossary/>

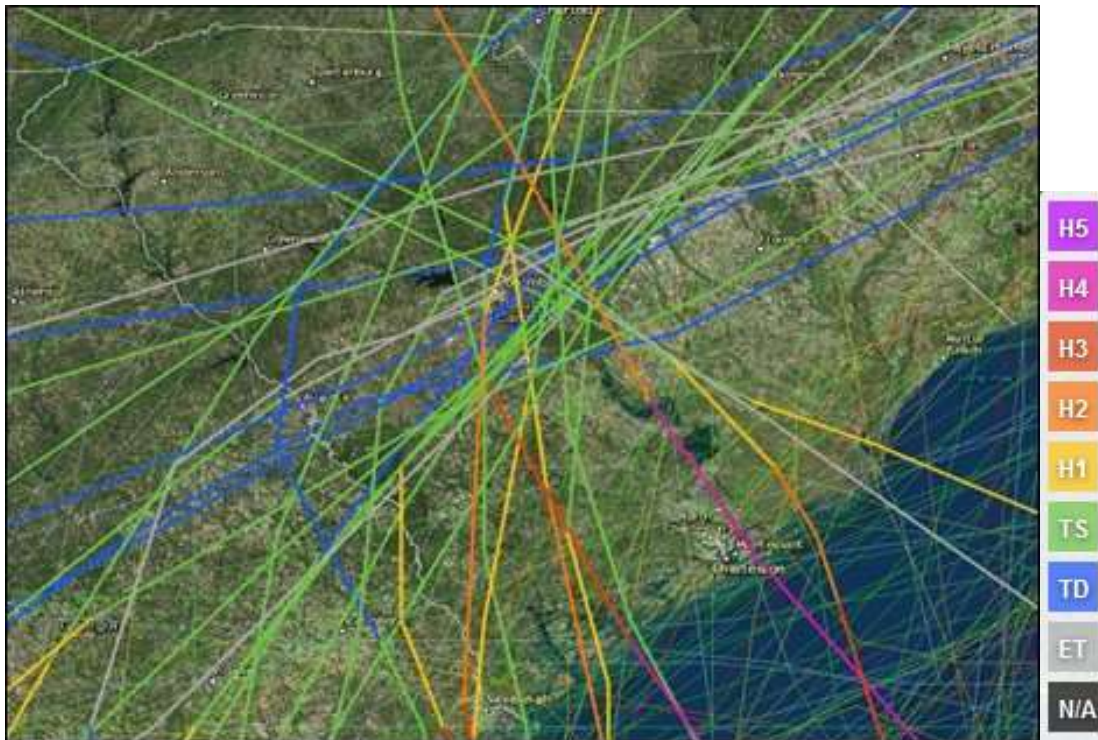


Figure 239 - Tropical cyclones that have impacted the Central Midlands region (indicated by thicker track lines)

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 240)¹¹⁶.

Since 2007, the intensity of tornadoes is measured by the Enhanced Fujita-Pearson Scale (Table 124). 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.

¹¹⁶ NOAA, 2016. Average number of tornado watches per year (1993–2012).
<http://www.spc.noaa.gov/wcm/>

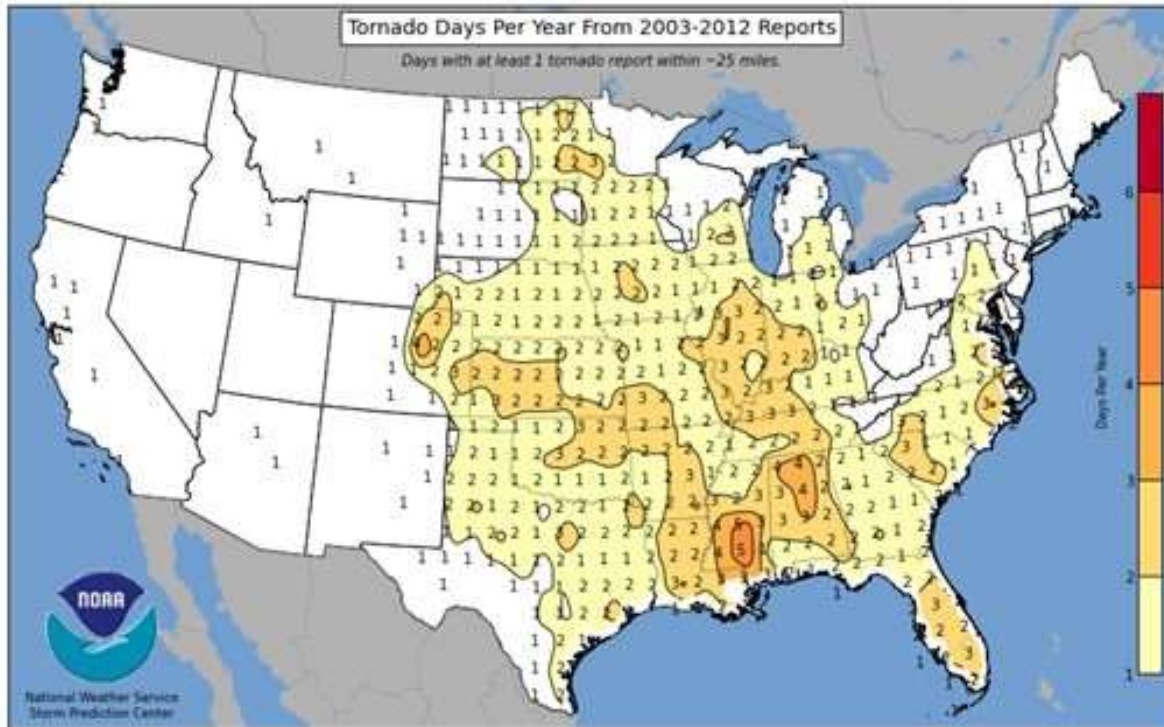


Figure 240 - Annual number of tornado days (1993-2012). Source: NOAA.

Table 124 - 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 FEMA¹¹⁷, the Central Midlands region wind rating is Zone III (Figure 241), where winds can reach 200 miles per hour. Parts of the region are also susceptible to the impacts of hurricanes.

¹¹⁷ <http://patapasco.nist.gov/imagegallery/details.cfm?imageid=972>



Figure 241 - 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 warnings¹¹⁸:

- **Tornado Warning**¹¹⁹: 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.

¹¹⁸ Information is accessible at <http://www.spc.noaa.gov/products/wwa/>.

¹¹⁹ Ibid.,

Between 1997 and 2012, South Carolina experienced on average 447,014 cloud-to-ground flashes per year¹²⁰. The Central Midlands region sees on average of 12 to 18 flashes per mi² and year (Figure 242).

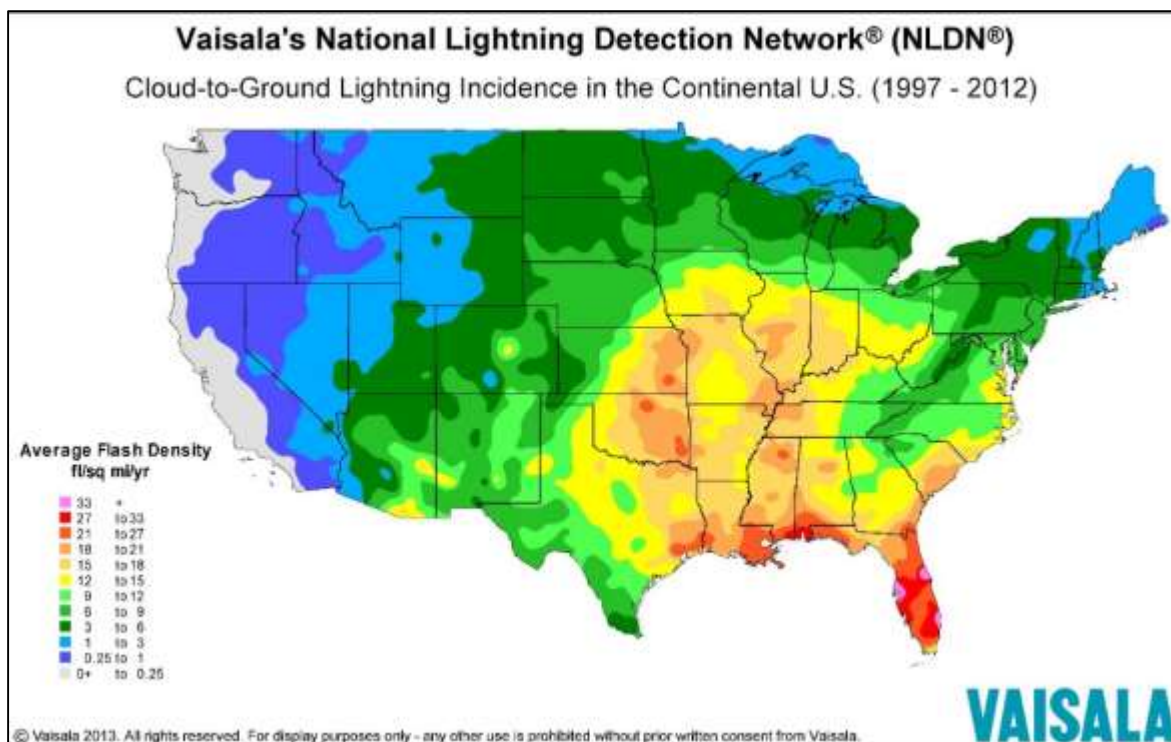


Figure 242 - Cloud-to-ground lightning incidences in the U.S. (1997-2012). Source: National Lightning Detection Network.

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)¹²¹. 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.

¹²⁰ http://www.lightningsafety.noaa.gov/stats/97-12Flash_DensitybyState.pdf

¹²¹ <https://aaaafoundation.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”¹²². 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 243). These events are generally winds associated with (severe) thunderstorms.

Based on Doppler radar and storm spotters, the NWS posts wind advisories, watches and warnings¹²³. 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.

¹²² National Weather Service, Glossary, <http://w1.weather.gov/glossary/>

¹²³ Information is accessible at <http://www.spc.noaa.gov/products/wwa/>.

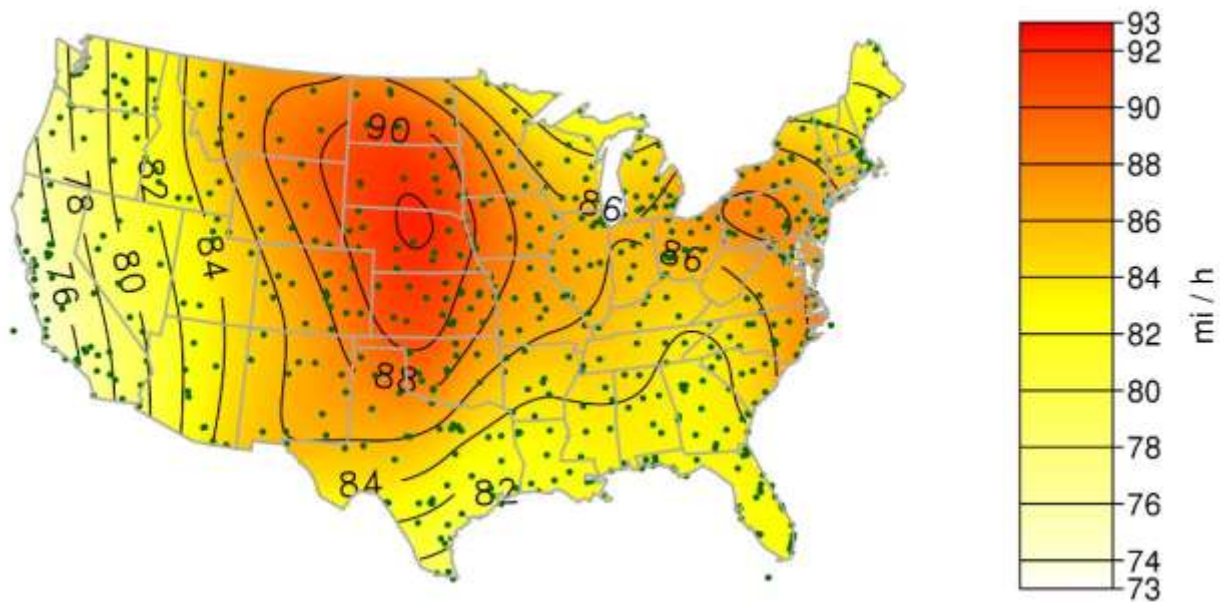


Figure 243 - Annual non-hurricane and non-tornadic extreme wind events in the U.S. The dots indicate weather station locations. Source: NIST

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*¹²⁴. 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

¹²⁴ <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 NWS¹²⁵:

- **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 244). 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

¹²⁵ 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 125).

Table 125 - 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

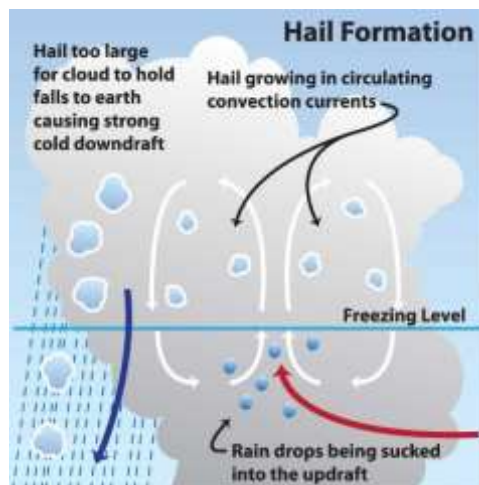


Figure 244 - How hail forms in severe thunderstorm clouds. Source: JPL.

The Central Midlands region experiences, on average, 8 severe hail days per year (Figure 245). While rarely deadly, it damages property and causes significant damage to agricultural operations.

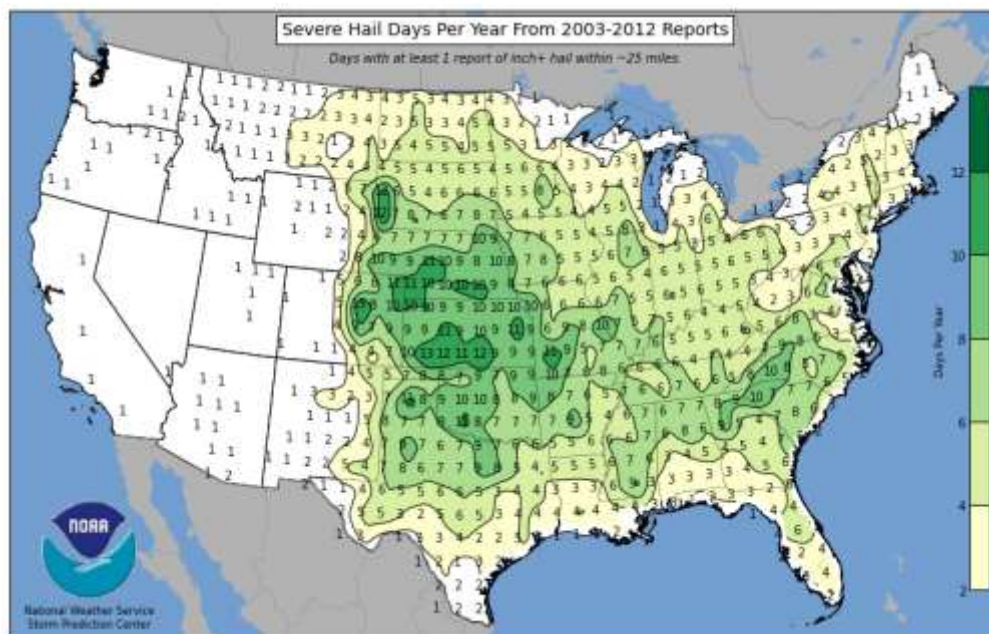


Figure 245 - Severe hail days per year (2003-2012). Source: NOAA.

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 246). 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)

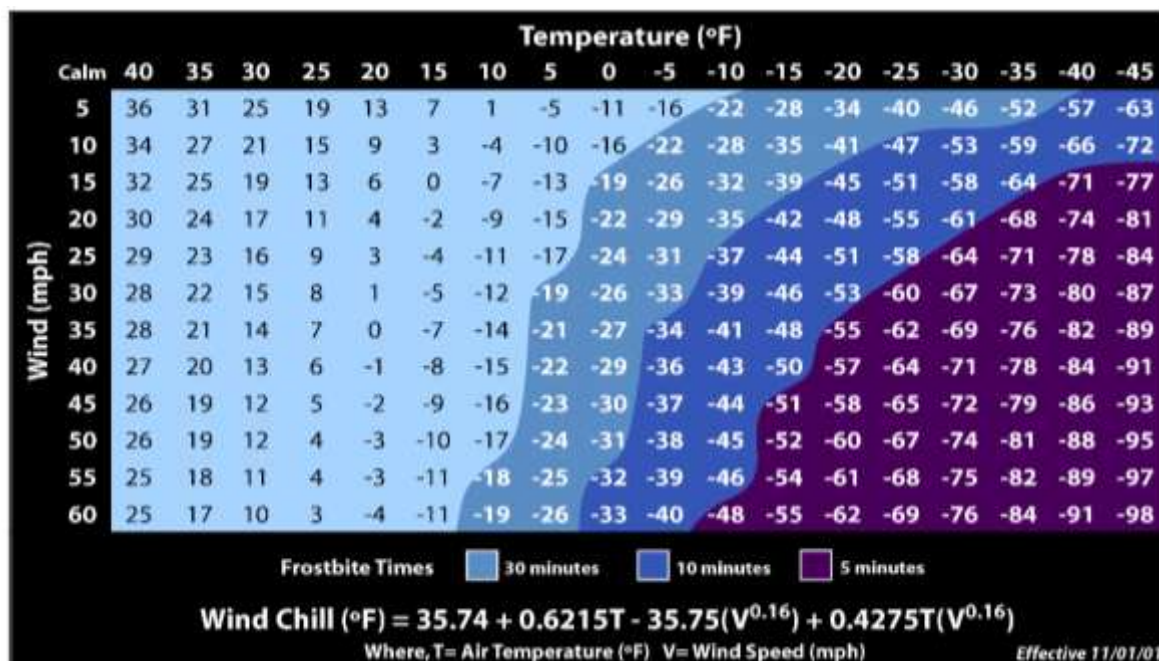


Figure 246 - National Weather Service windchill chart. Source: NOAA.

NWS posts the following cold weather advisories based on Doppler radar and storm spotters¹²⁶:

- **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.

¹²⁶ 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 supervised¹²⁷. 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)¹²⁸, 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 247.

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.

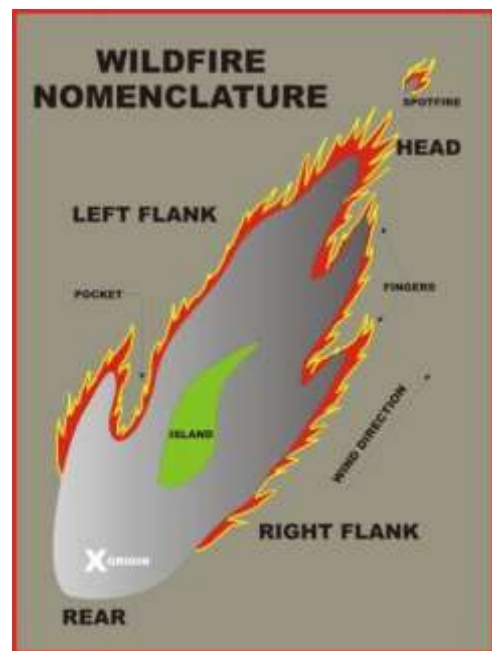


Figure 247 - Nomenclature of a forest fire. The fastest-moving, hottest, and most dangerous part of a wildfire is called the head. Source: SC Forestry Commission.

¹²⁷ South Carolina Forestry Commission, <http://www.state.sc.us/forest/refwild.htm>

¹²⁸ 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*¹²⁹.

- **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

¹²⁹ 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 248). 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.

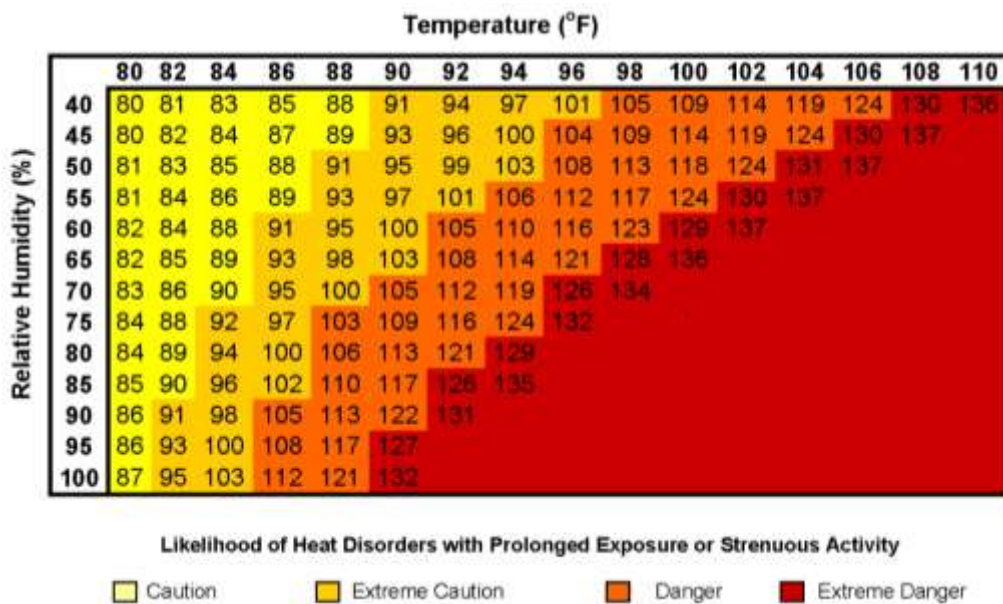


Figure 248 - Heat Index expresses the temperature the body feels based on relative humidity and air temperature.
Source: NOAA.

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 temperatures¹³⁰:

- **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.

¹³⁰ Information is accessible at <http://www.weather.gov/cae/>

There are several faults dissecting the Midlands region, especially Lexington and Richland County (Figure 250). 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 249): *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 126).

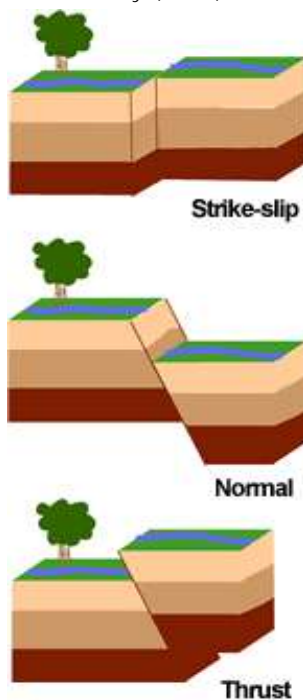


Figure 249 - Types of earthquake faults. Source: USGS.

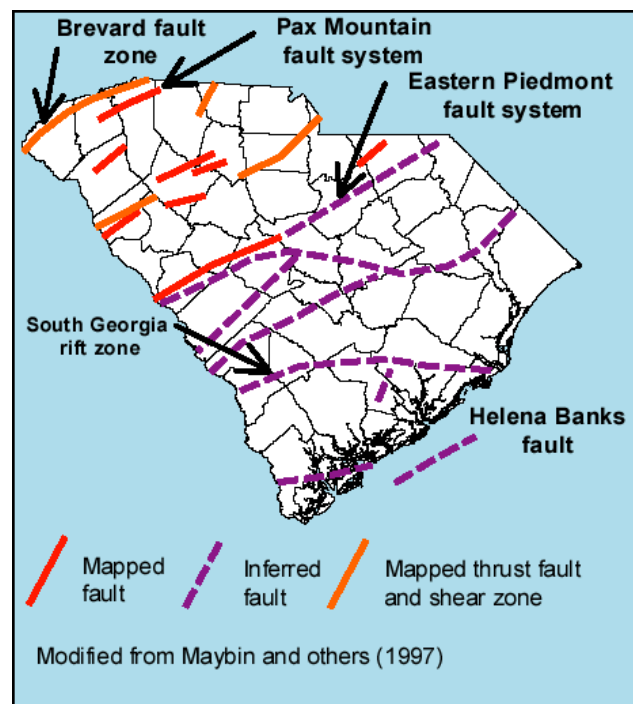


Figure 250 - Fault map of South Carolina. Source: DNR.

Table 126 - 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 people¹³¹. 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).

¹³¹ SCEMD, <http://www.scmd.org/planandprepare/disasters/earthquakes>

II-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 127 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 127 - 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 SHELDES 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®¹³². 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 disasters¹³³.

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 128) 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 deviation¹³⁴ 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)

¹³² Cutter, S.L., B.J. Boruff, and W.L. Shirley, 2003. "Social Vulnerability to Environmental Hazards," *Social Science Quarterly*, 84(1): 242-261.

¹³³ Heinz Center. 2002. *Human Links to Coastal Disasters*. Washington, DC: The H. John Heinz III Center for Science, Economics and the Environment.

¹³⁴ 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 128 - 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
HOSPTPC	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 251). 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.

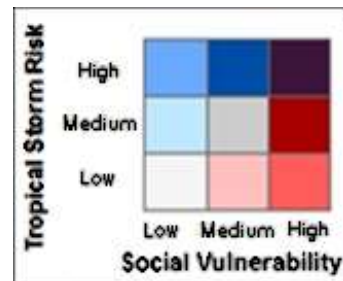


Figure 251 - Bivariate color scheme of hazard risk and social vulnerability.

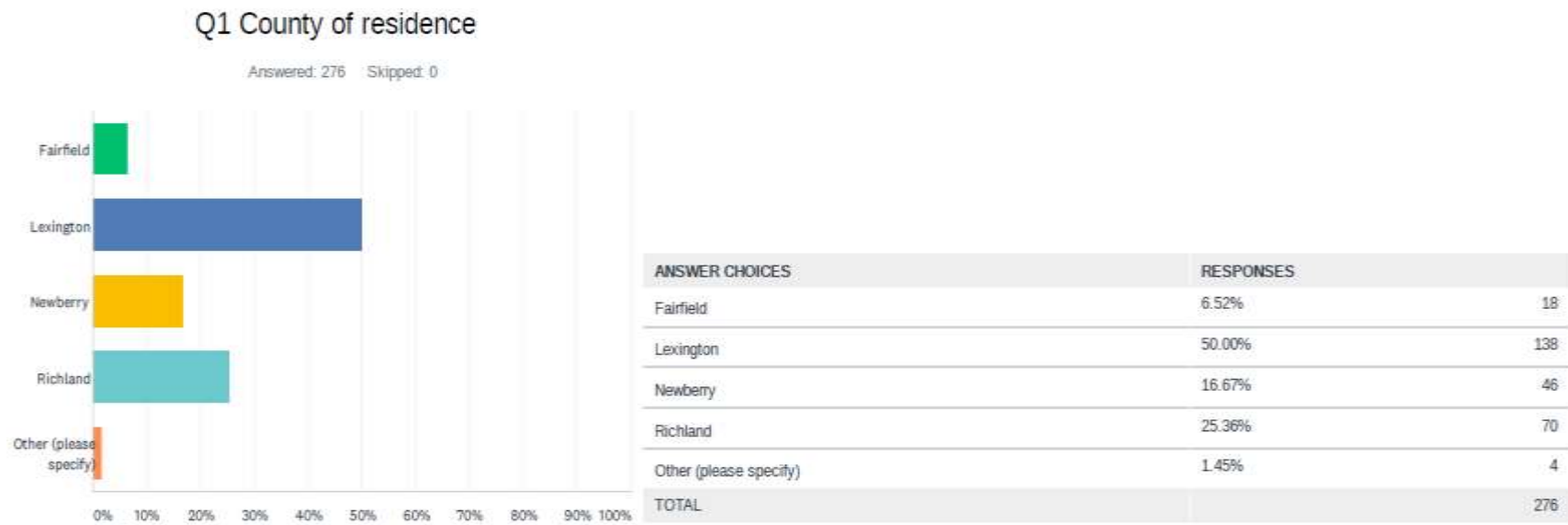
III. Hazard and Mitigation Strategy Public Opinion Survey

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.

III – A. Questions

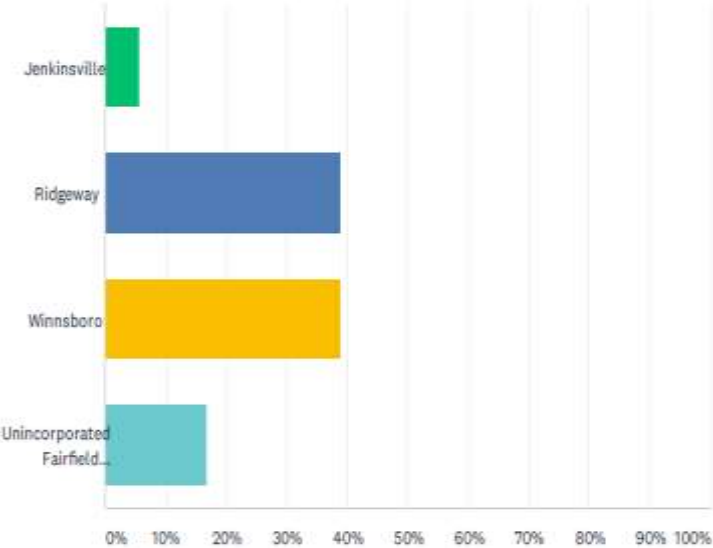
- 1) County of Residence
- 2) Jurisdiction/Municipality of Residence
- 3) Have you experienced personal/economic loss from any of the following hazards?
 - Flooding
 - Wildfires
 - Hurricanes and Tropical Storms
 - Thunderstorms
 - Tornadoes
 - Earthquakes
 - Landslides
 - Sinkholes
 - Winter Storms
 - 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

III – B. Summary of Results



Q2 Jurisdiction of residence

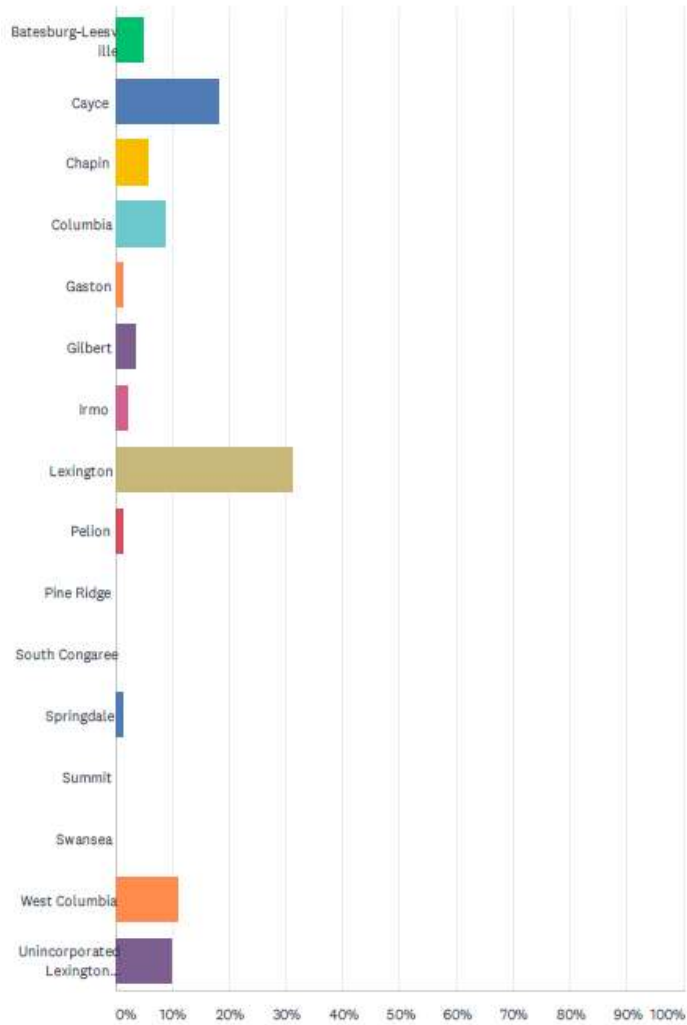
Answered: 18 Skipped: 258



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

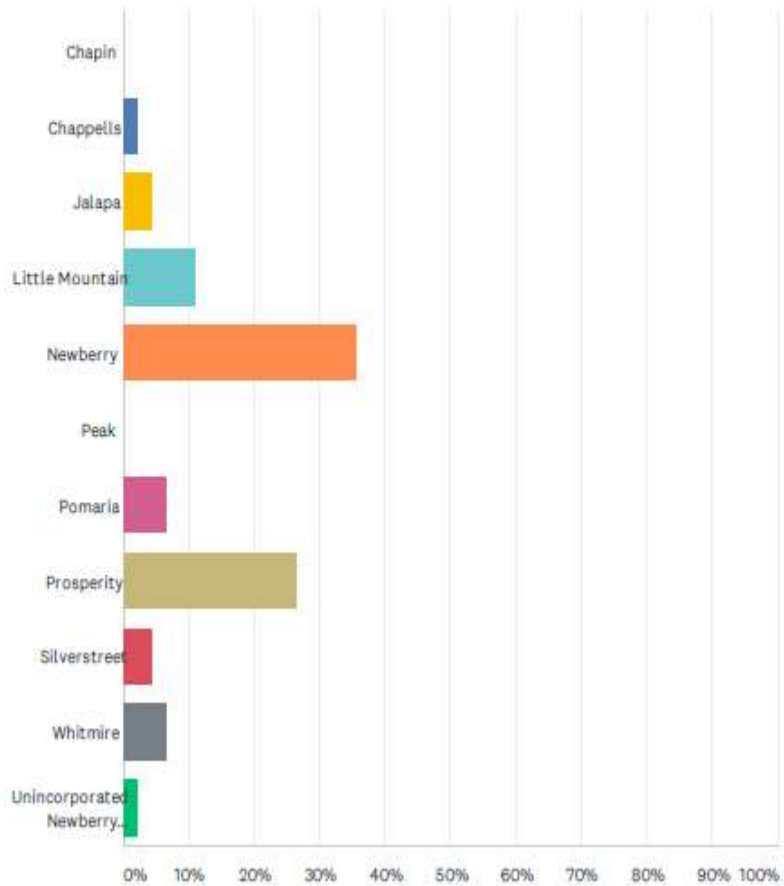
Answered: 138 Skipped: 138



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

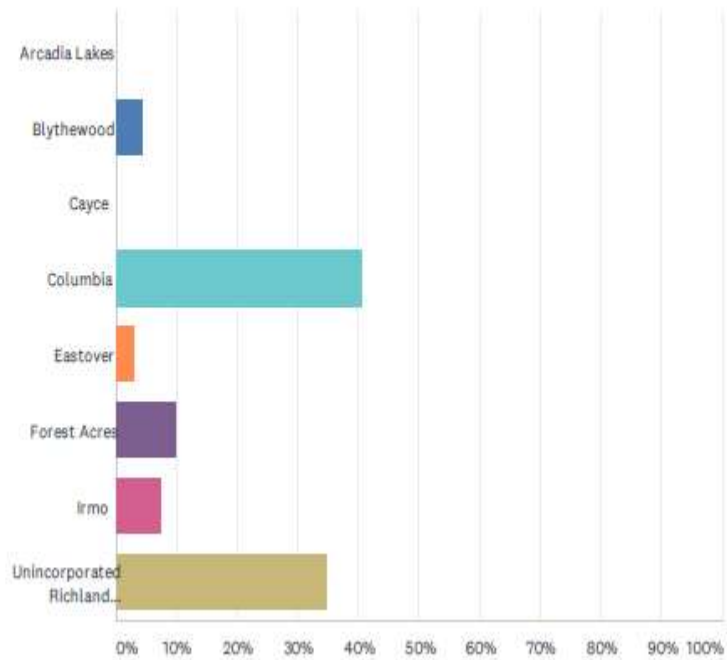
Answered: 45 Skipped: 231



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

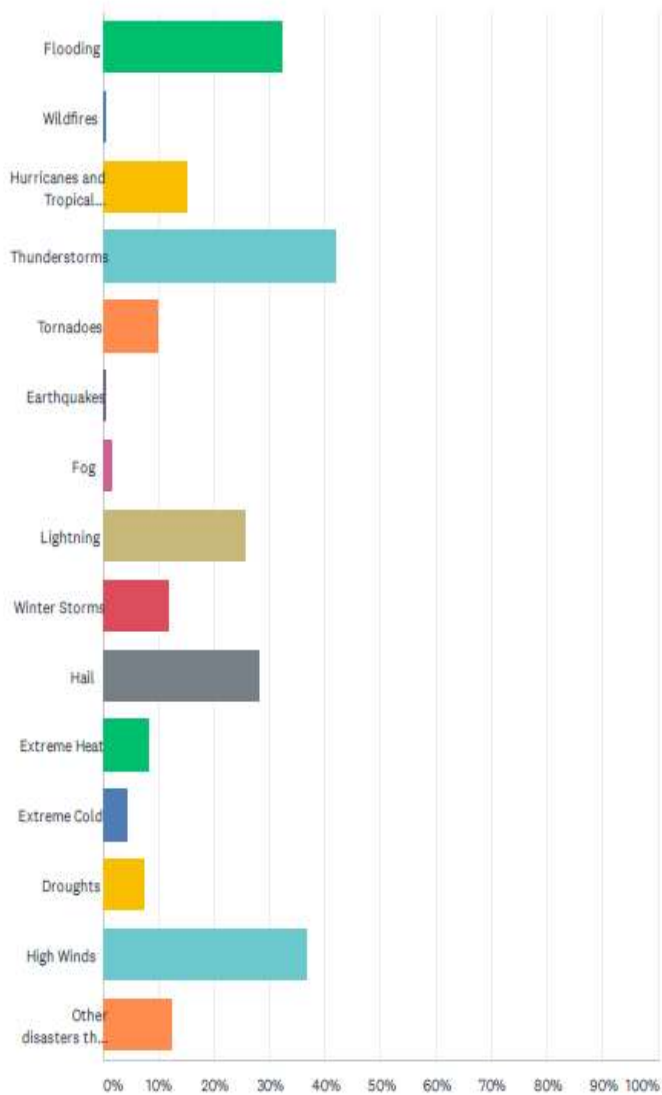
Answered: 69 Skipped: 207



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

Answered: 179 Skipped: 97

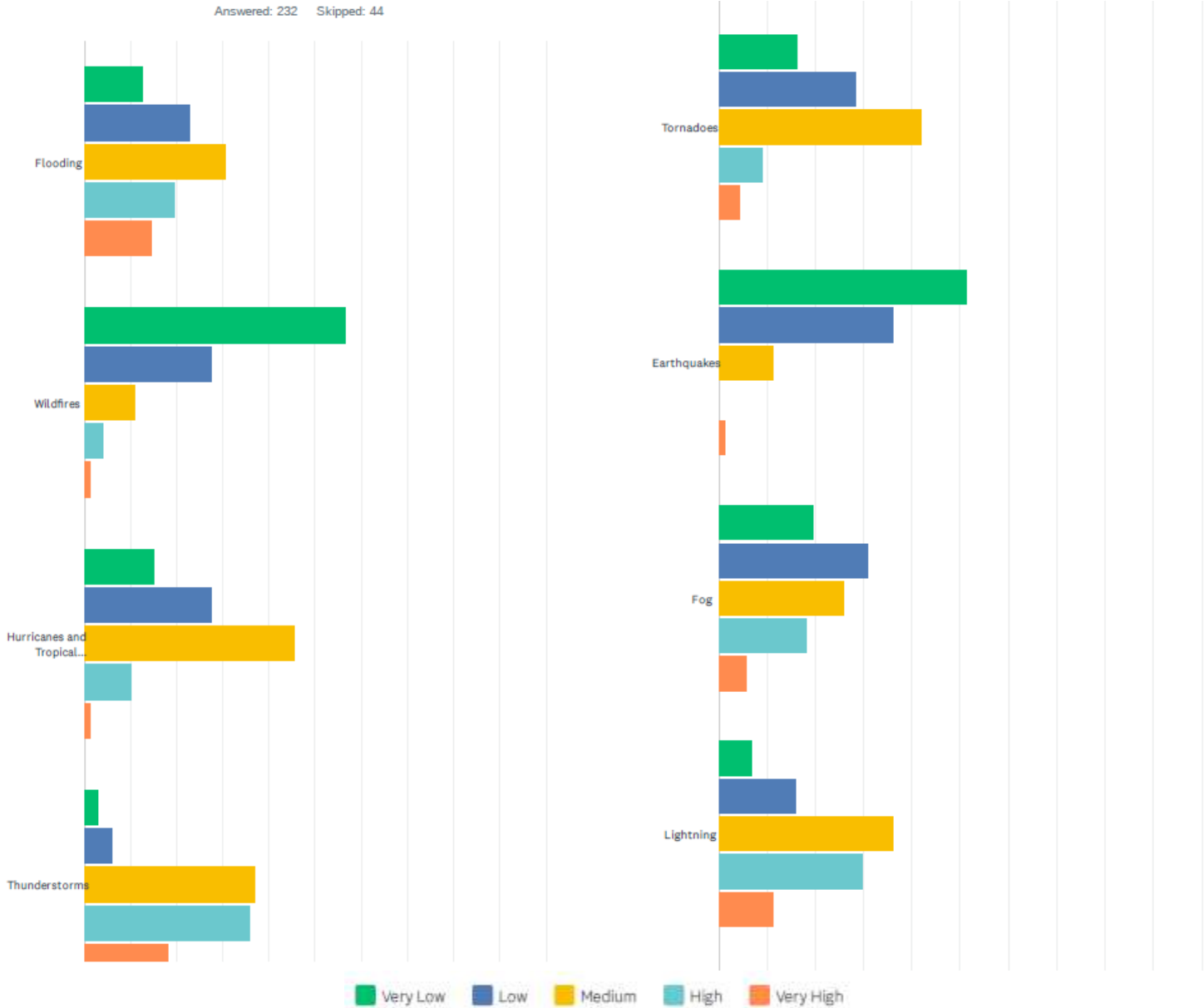


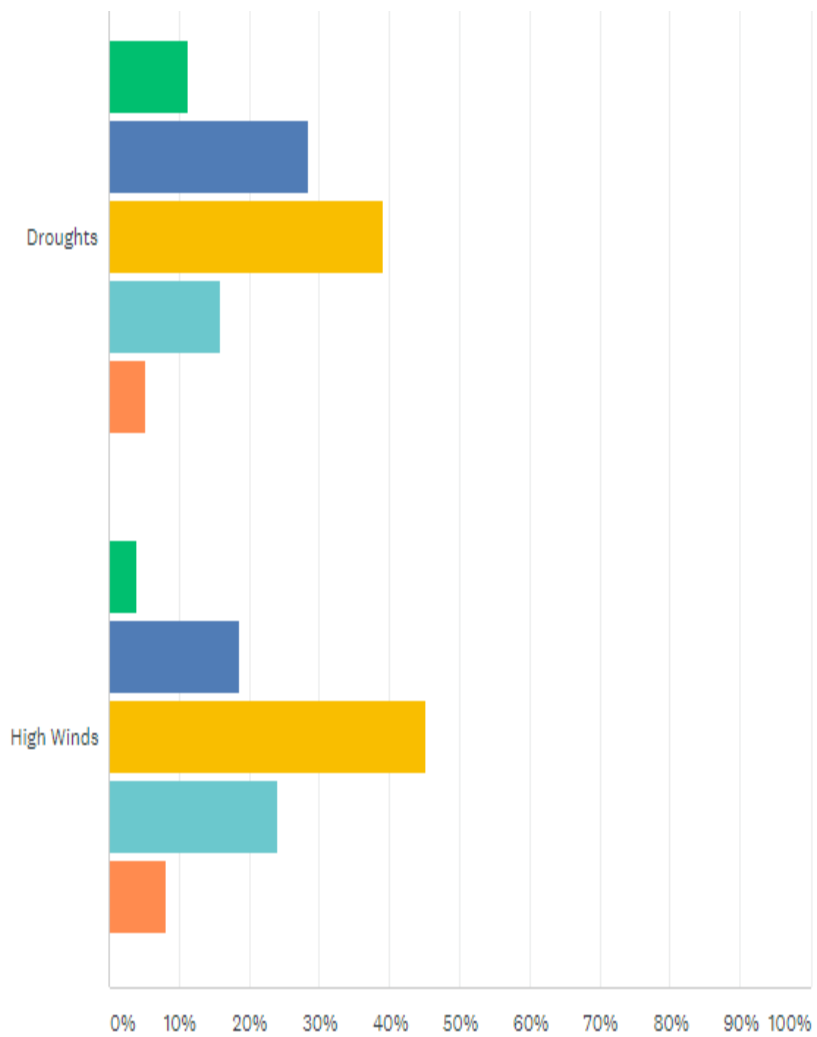
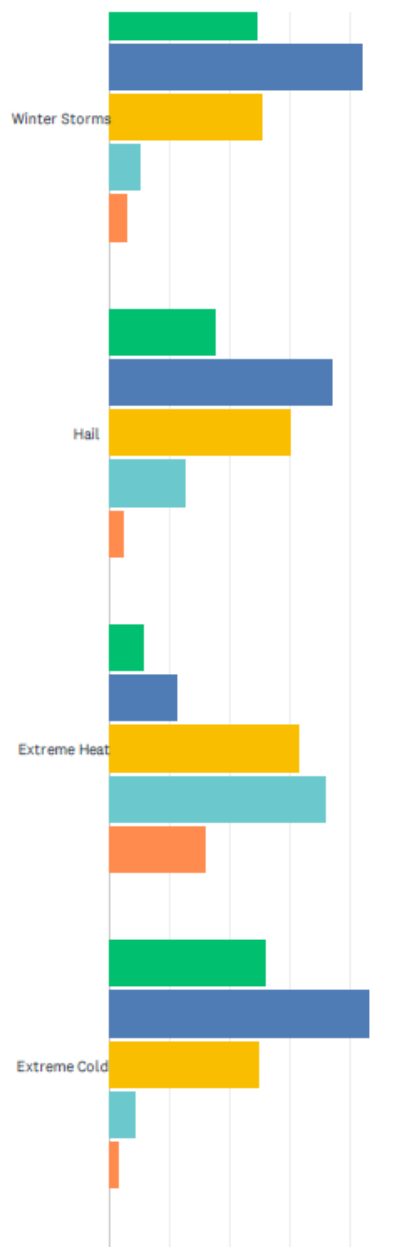
ANSWER CHOICES	RESPONSES	
Flooding	32.40%	58
Wildfires	0.56%	1
Hurricanes and Tropical Cyclones	15.08%	27
Thunderstorms	41.90%	75
Tornadoes	10.06%	18
Earthquakes	0.56%	1
Fog	1.68%	3
Lightning	25.70%	46
Winter Storms	11.73%	21
Hail	27.93%	50
Extreme Heat	8.38%	15
Extreme Cold	4.47%	8
Droughts	7.26%	13
High Winds	36.87%	66
Other disasters that caused loss (please specify)	12.29%	22
Total Respondents: 179		

Very Low Low Medium High Very High

Q7 Rank the following hazards based on how much they impact your community

Answered: 232 Skipped: 44



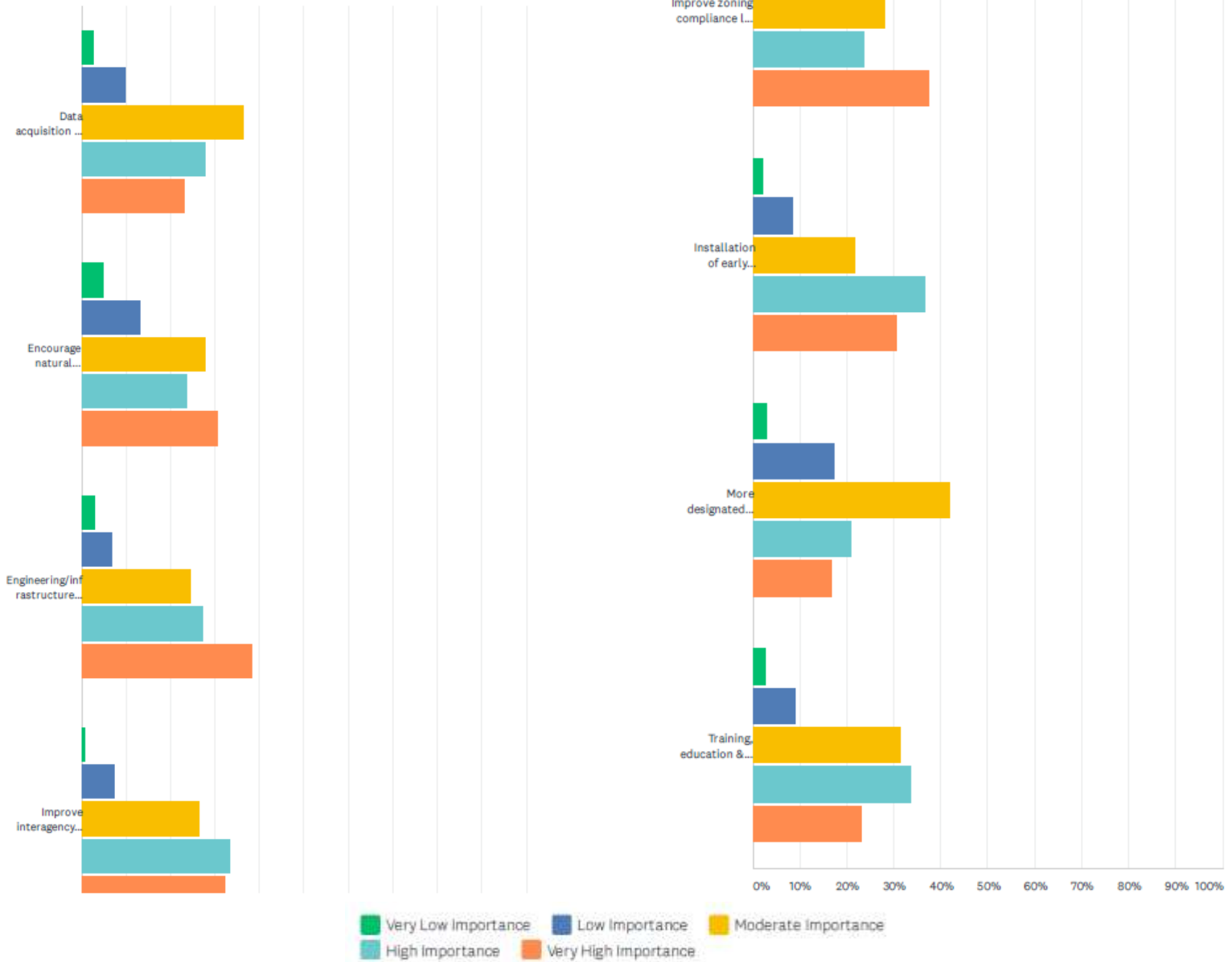


Very Low Low Medium High Very High

	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	3.9
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

IV. Input Scores for Severity of Consequence Calculations

IV – 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 129 - 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 130 - 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

IV – 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 131 - 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 132 - 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

IV – 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 133 - 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 134 - 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

IV – 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 135 - 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 136 - 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

V. Plan Adoption Letters for each Jurisdiction

V – A. Fairfield County Adoption Letters

A) Unincorporated Fairfield County



RESOLUTION NO. 2021-09

A RESOLUTION ADOPTING THE ALL NATURAL HAZARDS RISK ASSESSEMENT AND MITIGATION PLAN FOR THE CENTRAL MIDLANDS REGION OF SOUTH CAROLINA.

Incident to the adoption of this resolution (this "*Resolution*"), the County Council of Fairfield County (the "*County Council*"), the governing body of Fairfield County, South Carolina ("*Fairfield County*"), finds that the facts set forth below exist, and the statements made with respect thereto are in all respects true and correct:

Whereas, Fairfield County 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 mitigation projects; and

Whereas, Fairfield County 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, Fairfield County is aware that revision and updating of the plan is crucial for active and effective hazard mitigation and that Fairfield County will monitor and record hazard related data and events that can be used to update the all-natural hazards mitigation plan;

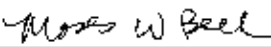
NOW THEREFORE, be it resolved, that the Fairfield County Council, hereby adopts the update to the All Natural Hazards Risk Assessment and Mitigation Plan from the Central Midlands Region in its entirety as an official plan and will undertake annual recording of hazards events, their impact duration and 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.

DONE IN MEETING DULY ASSEMBLED THIS 27TH DAY OF SEPTEMBER 2021.

FAIRFIELD COUNTY, SOUTH CAROLINA

[SEAL]


Chairman, County Council

Attest:


Clerk to County Council


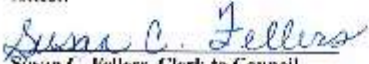
- B) City of Winnsboro
- C) Town of Ridgeway
- D) Mid-County Water Company

V – 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

V – C. Newberry County Adoption Letters

A) Unincorporated Newberry County

<p>STATE OF SOUTH CAROLINA) COUNTY OF NEWBERRY)</p>	<p>RESOLUTION 09-21</p>	<p>FILED NEWBERRY COUNTY 2021 OCT 27 PM 3:20 ELIZABETH P. FOLK CLERK OF COURT</p>
<p>A RESOLUTION ADOPTING THE ALL NATURAL HAZARDS RISK ASSESSMENT AND MITIGATION PLAN FOR THE CENTRAL MIDLANDS REGION OF SOUTH CAROLINA</p>		
<p>WHEREAS, Newberry County recognizes the threat that natural hazards pose to the people and property; and</p>		
<p>WHEREAS, undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and</p>		
<p>WHEREAS, an adopted all hazards mitigation plan is required as a condition of future grant funding of mitigation projects; and</p>		
<p>WHEREAS, Newberry County 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;</p>		
<p>WHEREAS, Newberry County is aware that revision and updating of the plan is critical for active and effective hazard mitigation and that Newberry County will monitor and record hazard related data and events that can be used to update the all-natural hazards mitigation plan;</p>		
<p>NOW, THEREFORE BE IT RESOLVED THAT NEWBERRY COUNTY 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 CODING OF HAZARD EVENTS, THEIR IMPACT DURATION AND COST.</p>		
<p>AND 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.</p>		
<p>AND IT IS SO RESOLVED this 20th day of October 2021.</p>		
<p>(SEAL)</p>	<p>NEWBERRY COUNTY COUNCIL BY:  Henry H. Livingston, III, Chairman</p>	
<p>Attest:  Susan C. Fellers, Clerk to Council</p>		

B) City of Newberry

C) Town of Whitmire

V – 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

VI. NFIP Compliance Letters for each Jurisdiction

VI – 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 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 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 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 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

VI – 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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 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

VI – C. Newberry County NFIP Compliance Letters

A) Unincorporated Newberry 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 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 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 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 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 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

VI – D. Richland County NFIP Compliance Letters

A) Unincorporated Richland 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 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 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 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 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 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 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 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 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 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 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 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

VII. 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

VIII. 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
CMCOG Board Meeting	28/October/2021
Public Input Meeting	1/November/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)744.5156

CENTRAL MIDLANDS
Council of Governments

228 Stoneridge Drive, Columbia, SC 29210
www.CMCOG.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

238 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>

Thu, Aug 13, 2020, 10:45 AM



to wjeffcoat, wwoods, Gregory

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 28210

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>

Thu, Aug 13, 2020, 3:40 PM



to Tommy, Gregory, Anne

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: jvwater, 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-qyoDsoHNSDNIntRtoCU0GTR_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/tZIoF-2rpsqEtVyaZWwIRxO4yA2Ng_d9II

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.

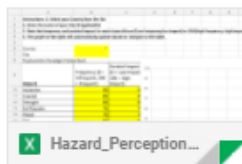
Senior Planner for Central Midlands Council of Governments

238 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_d5A

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.

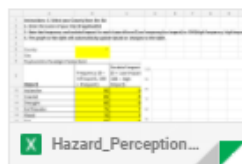
Senior Planner for Central Midlands Council of Governments

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 🔍 📅 📄

Woods, Wilita "Chase" 📅 📄 📄

to Woods, Wilita; Tooley, Brad; RAJEE, MICHAEL; graham@lexingtoncounty.gov; me +

10 PM

Discussion about Hazard Mitigation Plan

View on Google Calendar

When: Fri Sep 10, 2021 11am - 11am (EDT)

Where: Lexington County GOC (434 Ball Park Rd, Lexington SC 29073)

Who: Douglas, Brad; Hest, David; hest.david@lexingtoncounty.gov; Tooley, Long, Jeff; woot, Wendy;

[More options](#)

Agenda

Fri Sep 10, 2021

No verbal events

When: Discussion about Hazard Mitigation Plan

When: 10/27/21 Wilita - County Board, Executive

When: When: Wilita, Wilita (Hazard Mitigation Meeting)

Guest Meeting:


This meeting will be to discuss the Hazard Mitigation Plan proposed by the Central Midlands Council of Governments. If you can attend in person please do so. If you need an alternative option for attending (webcam call) please let me know.

This meeting will take place at 11:00 on Friday August 13, 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)761-8329 (C) (803)667-6661 (F) (803)761-8828
 E: cwoods@lexsc.gov
 M: (803)761-8329

Central Midlands Council of Governments Board Meeting (28/October/2021)



Board of Directors Meeting
 Thursday, October 28, 2021 • 12:00 p.m.
 Midlands Technical College – Harbison Campus (in person)
 7300 College Street, Irmo, SC 29063
 Continuing Education Center, Room 113 and Zoom Meeting (virtual)
<https://us02web.zoom.us/j/83756673212?pwd=MTk3eUJRVNFRNTM0wlc25vZmBUUT09>
 Meeting ID: 837 5667 3212 • Passcode: 888314 • Dial-In Number (929) 295-6099

OVERALL AGENDA		
ACTION	A. Call to Order and Introductions:	Foster Senn, Chair
	1. Welcome from Midlands Technical College	Dr. Ronald Rhames
	2. Introduction of Guests	
	3. Determination of a Quorum	
	4. Approve Order and Contents of the Overall Agenda	
	5. Invocation	
	6. Introduction of New Board Members:	
	• Rep. Beth Bernstein, Richland County Legislator Delegation	
	• Mayor John McMeekin, Town of Wadsworth	
	• Rebecca Connelley, Lexington County	
7. Good News from CMCOG, Around the Region and Regional Spotlight	Foster Senn Benjamin Mauldin Will Brennan	
INFORMATION	B. Consent Agenda:	
	1. Approval of the September 23, 2021 Board Meeting Minutes (<i>Enclosure 3</i>)	
	C. Regular Agenda:	
	1. Quarterly Financial Status Report (1st Quarter FY 22) (<i>Enclosure 2</i>)	Penda Headley
	2. 2021 Annual Update of the Central Midlands Region Comprehensive Economic Development Strategy (CEDS) (<i>Enclosure 1</i>)	Gregory Spruitt
	3. 2021 Update of the Natural Hazard Risk Assessment and Mitigation Plan for the Central Midlands Region (<i>Enclosure 4</i>)	Guillermo Espinosa
	D. Announcements / Committee or Staff Reports / Correspondence:	
	1. Overview of the 2045 Long Range Transportation Plan	Reginald Simmons
	2. Long-Term Care Ombudsman Program Report (<i>Enclosure 3</i>)	Anna Harmon
	3. Executive Director's Report	Benjamin Mauldin
E. Old Business		
F. Other Business		
G. Adjourn		

REMINDER: The next CMCOG Board Meeting will be held on Thursday, December 9, 2021

Note: Full Agenda packets can be found on the CMCOG website at www.cmcog.org.

Central Midlands Hazard Mitigation Plan 2021 Update Public Meeting Documentation
(1/November/2021)

Country Chronicle

STATE OF SOUTH CAROLINA

COUNTY OF FAIRFIELD

Personally appeared before me, a Notary Public, in and for said State and County, Michael Mischner, who being duly sworn according to law deposes and says that he is publisher of the Country Chronicle, a newspaper published each week in said county, and who further deposes that the Notice, a true copy of which is hereto affixed, was published by and for:

Central Midlands Council of Governments



In the issues dated 10/7/21

M. K. M.
Publisher

Subscribed and sworn to before me this

8 day of October, 2021

Christina M. Baker

Notary Public for South Carolina

My commission expires: 05/30/2028



AFFP
CMHMP 2021

Affidavit of Publication

STATE OF SOUTH
CAROLINA }
COUNTY OF NEWBERRY ;

SS

not

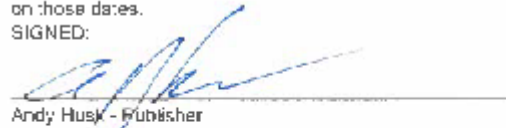
Andy Husk, being duly sworn, says:

That he is Andy Husk - Publisher of the Newberry
Observer, a weekly newspaper of general circulation,
printed and published in Newberry, Newberry County,
South Carolina; that the publication, a copy of which is
attached hereto, was published in the said newspaper on

October 06, 2021

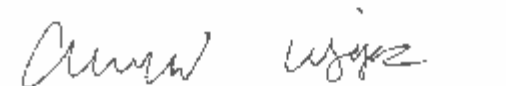
That said newspaper was regularly issued and circulated
on those dates.

SIGNED:



Andy Husk - Publisher

Subscribed to and sworn to me this 6th day of October
2021.



Andrew Veggie - Notary Public - State of South Carolina

My commission expires: January 09, 2029

20207402 01054161


Gregory Sprunze
435-Central Midlands Council of Gov -ROP
236 Stoneridge Dr.
Columbia, SC 29210

PUBLIC COMMENT PERIOD for the 2021 update of the Natural Hazard Risk Assessment and Mitigation Plan for the Central Midlands Region

Written by admin on 5th October 2021 ► News, Press Releases

The staff of the Central Midlands Council of Governments seeks public comment and input on the 2021 update of the natural hazard risk assessment and mitigation plan for the Central Midlands region, which encompasses jurisdictions within the counties of Fairfield, Lexington, Newberry, and Richland. The purpose of this plan update is to meet the requirements of the Disaster Mitigation Act of 2000 by helping local governments in the region to be more prepared and resilient to the impacts of natural hazards, such as wildfires and floods. The plan details the nature of the most significant natural hazards threatening the region, and contains hazard mitigation goals and strategies that address the natural hazard priorities of participating local governments. After public comments are addressed, local governments may choose to pass a resolution to adopt the updated regional plan, making them eligible for FEMA 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. This plan does not provide funding to address non-natural hazard events such as chemical spills, or terrorism.

A virtual public meeting will be held through the offices of Central Midlands Council of Governments on **November 1st 2021 from 6:00 PM to 7:30 PM**. Interested parties may register in advance to attend the meeting, learn more about the plan, and provide comments. To access a copy of the draft plan and register for the public meeting please see the following pages:

-  CMHMP 2021 – Draft Plan for FEMA Review (Compressed)
- **Register to attend the public meeting**

IX. Templates

IX – A. Mitigation Strategy Template

Activity	Type of Hazard	Responsible Department	Priority (1 highest, 3 lowest)	Goals Addressed	Finance Source	Cost	Status	Timeframe

IX – 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

IX – 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 _____