



Simple Planning Tools For South Carolina Climate- Related Hazards

Prepared by
South Carolina State Climatology Office
Land, Water, and Conservation Division
South Carolina Department of Natural Resources

The tools and websites highlighted in this document are not an exhaustive list, nor are they favored over other available resources.

If you have any additional questions regarding the information provided in this document, please contact Dr. Hope Mizzell or Melissa Griffin at the South Carolina State Climatology Office.

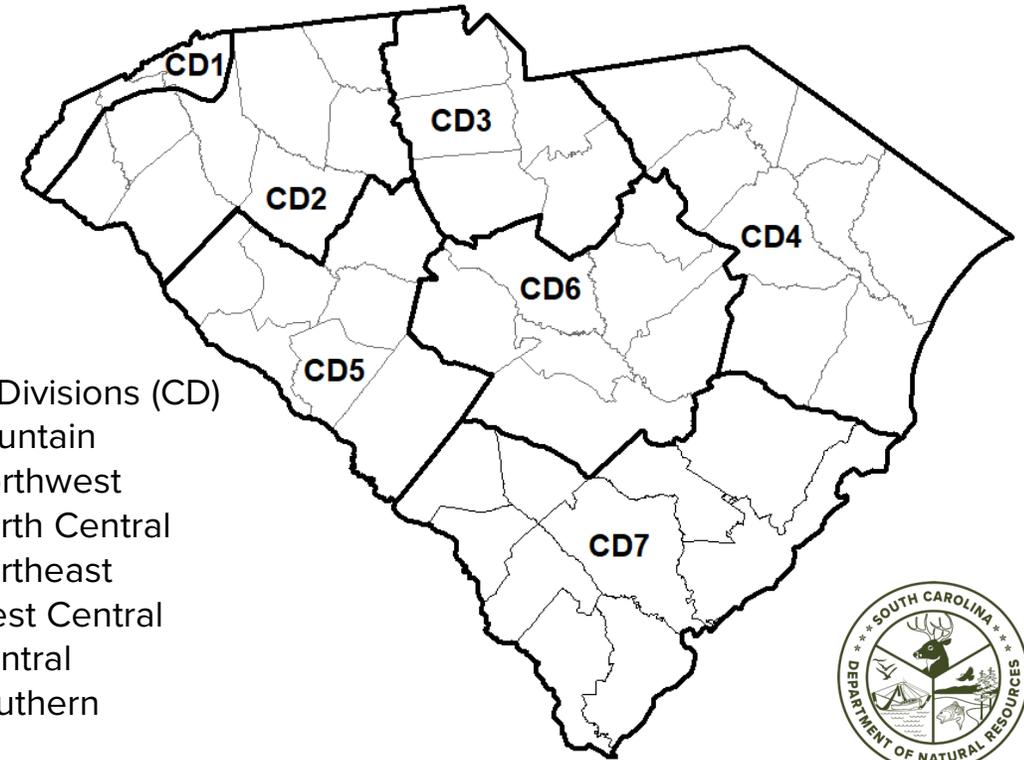
Hope P. Mizzell, PhD
South Carolina State Climatologist
MizzellH@dnr.sc.gov
803-734-9568

Melissa L. Griffin
SC Assistant State Climatologist
GriffinM@dnr.sc.gov
803-734-9091

South Carolina Department of Natural Resources
Land, Water, and Conservation Division
1000 Assembly Street, Columbia, SC 29201
www.dnr.sc.gov/climate/sco

Some of the tools highlighted in this document refer to data displayed by Climate Division, determined by the National Centers for Environmental Information (NCEI). The map below illustrates the boundaries of regions that have similar climatological characteristics.

South Carolina Climate Divisions



Climate Divisions (CD)
CD1: Mountain
CD2: Northwest
CD3: North Central
CD4: Northeast
CD5: West Central
CD6: Central
CD7: Southern

Overview of the Report

This report includes examples of easy-to-use and reputable online interactive tools, maps, and graphs to assist planners and emergency managers in South Carolina in assessing their long-term climate risks during planning processes and plans.

This report will focus on providing available tools for the following topic areas



Temperatures

- Extremes
- Normals/Averages
- Heat Index/Wind Chill



Precipitation

- Flooding
- Droughts
- Normals/Averages



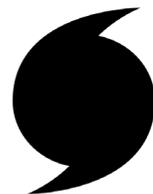
Tornadoes

- Climatology
- Observed Tornadoes
- Statistics and Assessments



Severe Weather

- Hail
- Wind
- Lightning



Tropical Cyclones

- Historic Tracks
- Narrative Reports
- Surge Analyses



Winter Weather

- Snowfall
- Ice Storms
- Freezing Rain

Data Availability

Ideally, every community in South Carolina would have a detailed, long-term climate record. However, data availability differs among weather variables. Some variables are more accessible and less costly to observe than others. For example, temperature and precipitation (rainfall and snowfall) have longer and more complete periods of record than tornadoes and freezing rain.

Because of changing practices in reporting tornadoes, severe wind, and hail due to population increases and advances in detecting and communicating information, it is not scientifically appropriate to analyze long-term trends.

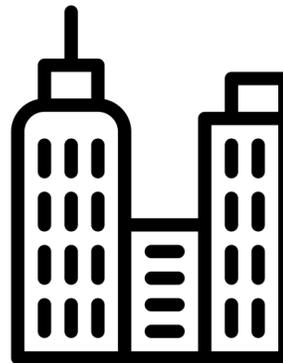
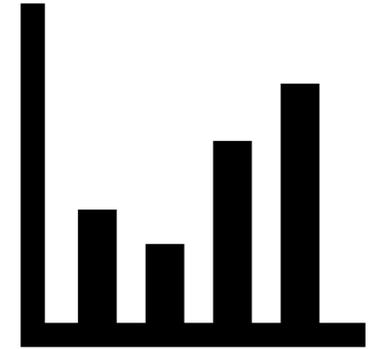


Analyses

Tables, graphs, and maps are produced from single-point observations, such as weather stations. Additional analyses interpolate between data points (for those locations that do not have individual records) or by averaging (such as across climate divisions).

Users should be aware that this document references tools showing observational points, some showing interpolation analyses, and some showing averages.

These tools are acknowledged by atmospheric science professionals, including climatologists, to represent accurate and relevant data when locations are under-represented.



Data Selection

When assessing hazard risk, it is crucial to consider nearby areas and the location of interest, especially if local data contains missing data or a shorter period of record, and to ensure the analysis does not under-estimate the hazard risk.

The South Carolina State Climatology Office (SCO) has compiled various databases and statistics on the climate and weather of South Carolina at the state, regional and local levels. Please visit the following SCO resources:

South Carolina Hurricane and Tropical Storm Database: <https://www.dnr.sc.gov/climate/sco/hurricanes/>

South Carolina Winter Weather Database: <https://www.dnr.sc.gov/scwinterweather>

South Carolina Extreme Events Timeline: <http://www.dnr.sc.gov/climate/sco/wxtimeline>

South Carolina Drought: <http://www.scdrought.com/>

South Carolina County Atlas of Climate and Extremes: https://www.dnr.sc.gov/climate/sco/ClimateData/cli_county_statistics.php

Dillon County						
30 Year Climate Normals (Dillon)						
	Max Temp.	Mean Temp.	Min Temp.	Precip	CDD	HDD
1971-2000	72.2 F	61.0 F	49.8 F	47.05 Inches	1654	3091
1981-2010	74.6 F	61.9 F	59.1 F	45.33 Inches	1801	2938
1991-2020	75.2 F	62.7 F	50.3 F	48.63 Inches	1950	2752

Temperature Records (1904-2020)

Highest Maximum: 107 F, June 28, 1954; Dillon
 Lowest Minimum: -1 F, January 21, 1985; Dillon

Precipitation Records (1904-2020)

Highest Daily Rainfall (COOP): 7.65 Inches, September 5, 1979;
 Highest Daily Rainfall (CoCoRaHS): 9.25 inches, September 16, 2018; Dillon 3.8 NW
 Annual Average Rainfall: 46.86 Inches
 Wettest Year: 1971, 63.67 inches; Dillon
 Driest Year: 2001, 26.99 inches; Dillon
 Highest Daily Snowfall: 10.0 Inches, February 26, 1914; Dillon

Example of South Carolina County Atlas of Climate and Extremes

The NOAA State Climate Summaries were initially produced in response to a growing demand for state-level information in the Third National Climate Assessment (NCA) and subsequent sustained activities. This 2022 version represents a new and improved summary for each state that provides more up-to-date information on observed changes in climate, including both long-term trends and extreme weather events relevant to that state.

The U.S. Climate Normals provide information about typical climate conditions for thousands of locations across the United States. Normals act both as a ruler to compare today's weather and tomorrow's forecast and as a predictor of future conditions. The official normals are calculated for a uniform 30-year period and consist of annual/seasonal, monthly, daily, and hourly averages and statistics of temperature, precipitation, and other climatological variables.

NOAA National Centers for Environmental Information | State Climate Summaries 2022 150-SC

SOUTH CAROLINA

Key Messages

Temperatures in South Carolina have risen more than 1°F since the beginning of the 20th century, less than the warming for the contiguous United States. Under a higher emissions pathway, historically unprecedented warming is projected during this century, including increases in extreme heat events.

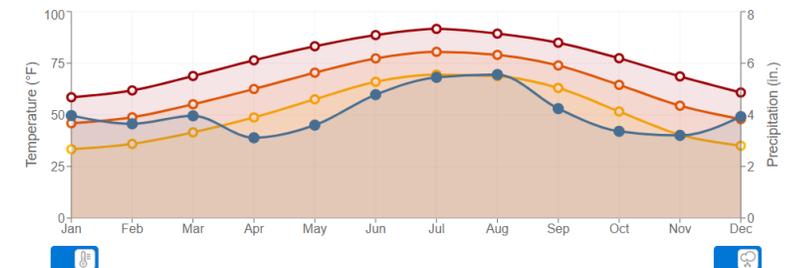
Future changes in precipitation are uncertain, but extreme precipitation is projected to increase. In addition, projected increases in temperature will likely increase the intensity of naturally occurring droughts.

Sea level at Charleston has risen by 1.3 inches per decade, nearly double the global sea level rise, since reliable record keeping began in 1921. Global sea level is projected to rise another 1 to 4 feet by 2100, with greater rises projected for South Carolina. Rising sea levels pose widespread and continuing threats to both natural and built environments in coastal South Carolina.

<https://statesummaries.ncics.org/chapter/sc/>

ALLENDALE 2 NW, SC

Get this data as [.csv](#) | [.pdf](#)
 Station info: [USC00380126](https://www.nccei.noaa.gov/access/us-climate-normals/)



<https://www.nccei.noaa.gov/access/us-climate-normals/>

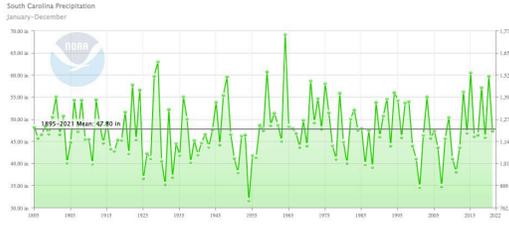
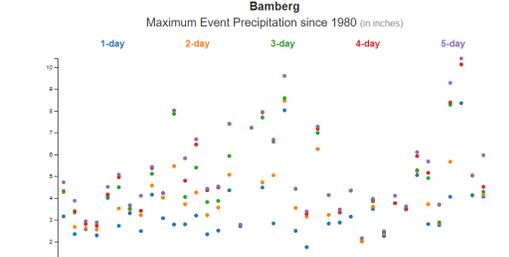
TEMPERATURES

The state's annual average temperature varies from the mid-50s in the Upstate to the low-60s along the coast. Since the late-1800s, the statewide annual average temperatures have gone through multiple periods of above and below normal temperatures. Despite the year-to-year variability, the overall pattern of average temperatures across South Carolina has increased since the mid-1970s.

Tool	Description	Example																																																																																																																																																																																
<p>South Carolina County Climate Atlas</p>	<p>The South Carolina County Climate Atlas (CCA) provides a snapshot of the recorded climatological history, extremes, and severe weather for each of the forty-six (46) counties in South Carolina.</p> <p>https://www.dnr.sc.gov/climate/sco/ClimateData/cli_county_statistics.php</p>	<p>Cherokee County</p> <table border="1"> <thead> <tr> <th colspan="7">30 Year Climate Normals (Ninety Nine Islands)</th> </tr> <tr> <th></th> <th>Max Temp.</th> <th>Mean Temp.</th> <th>Min Temp.</th> <th>Precip</th> <th>CDD</th> <th>HDD</th> </tr> </thead> <tbody> <tr> <td>1971-2000</td> <td>70.2 F</td> <td>58.1 F</td> <td>45.9 F</td> <td>48.37 Inches</td> <td>1223</td> <td>3737</td> </tr> <tr> <td>1981-2010</td> <td>71.3 F</td> <td>58.4 F</td> <td>45.5 F</td> <td>46.01 Inches</td> <td>1306</td> <td>3716</td> </tr> <tr> <td>1991-2020</td> <td>70.4 F</td> <td>57.9 F</td> <td>45.5 F</td> <td>45.32 Inches</td> <td>1235</td> <td>3788</td> </tr> </tbody> </table>	30 Year Climate Normals (Ninety Nine Islands)								Max Temp.	Mean Temp.	Min Temp.	Precip	CDD	HDD	1971-2000	70.2 F	58.1 F	45.9 F	48.37 Inches	1223	3737	1981-2010	71.3 F	58.4 F	45.5 F	46.01 Inches	1306	3716	1991-2020	70.4 F	57.9 F	45.5 F	45.32 Inches	1235	3788																																																																																																																																													
30 Year Climate Normals (Ninety Nine Islands)																																																																																																																																																																																		
	Max Temp.	Mean Temp.	Min Temp.	Precip	CDD	HDD																																																																																																																																																																												
1971-2000	70.2 F	58.1 F	45.9 F	48.37 Inches	1223	3737																																																																																																																																																																												
1981-2010	71.3 F	58.4 F	45.5 F	46.01 Inches	1306	3716																																																																																																																																																																												
1991-2020	70.4 F	57.9 F	45.5 F	45.32 Inches	1235	3788																																																																																																																																																																												
<p>National Centers for Environmental Information (NCEI)</p> <p>Climate at a Glance Tool</p> <p>(1895 – present)</p>	<p>This interactive graphing tool shows average, maximum, and minimum temperatures trends at the state, climate division, and county levels on different time scales. Cooling and heating degree days are also available. Data can be used to identify periods of below-normal or above-normal temperatures. Graphs and data can be downloaded.</p> <p>https://www.ncdc.noaa.gov/cag/statewide/time-series</p>																																																																																																																																																																																	
<p>Midwest Regional Climate Center (MRCC) Heat Index and Wind Chill Climatology Tools</p> <p>(1973 – 2019)</p>	<p>These GIS tools provide detailed information on the number of days/hours at defined thresholds of heat inches and wind chill. Only available from long-term hourly stations (ex: Charleston, Columbia, and Greenville)</p> <p>https://mrcc.purdue.edu/gismaps/windchill.htm https://mrcc.purdue.edu/gismaps/heatindex.htm</p>	<p>Wind Chill Climatology: Average Number of Hours</p> <p>COLUMBIA METRO AP</p> <table border="1"> <thead> <tr> <th>Wind Chill ≤</th> <th>30°F</th> <th>25°F</th> <th>20°F</th> <th>15°F</th> <th>10°F</th> <th>5°F</th> <th>0°F</th> <th>-5°F</th> <th>-10°F</th> <th>-15</th> <th>-20°F</th> <th>-25°F</th> <th>-30°F</th> <th>-35°F</th> <th>-40°F</th> </tr> </thead> <tbody> <tr> <td>Snow Year</td> <td>345.1</td> <td>171.1</td> <td>67.5</td> <td>26.6</td> <td>10.5</td> <td>3.4</td> <td>1.2</td> <td>0.5</td> <td>0.2</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>July</td> <td>0</td> </tr> <tr> <td>August</td> <td>0</td> </tr> <tr> <td>September</td> <td>0</td> </tr> <tr> <td>October</td> <td>1.9</td> <td>0.2</td> <td>0</td> </tr> <tr> <td>November</td> <td>24.7</td> <td>8.5</td> <td>0.9</td> <td>0.1</td> <td>0</td> </tr> <tr> <td>December</td> <td>83.4</td> <td>40.3</td> <td>15.7</td> <td>6.2</td> <td>2.4</td> <td>1.1</td> <td>0.4</td> <td>0.1</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>January</td> <td>128.6</td> <td>73.3</td> <td>32.7</td> <td>13.5</td> <td>5.6</td> <td>1.9</td> <td>0.8</td> <td>0.4</td> <td>0.2</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>February</td> <td>77.5</td> <td>38.5</td> <td>14.9</td> <td>5.3</td> <td>1.8</td> <td>0.2</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>March</td> <td>27</td> <td>10</td> <td>3.3</td> <td>1.5</td> <td>0.7</td> <td>0.2</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </tbody> </table>	Wind Chill ≤	30°F	25°F	20°F	15°F	10°F	5°F	0°F	-5°F	-10°F	-15	-20°F	-25°F	-30°F	-35°F	-40°F	Snow Year	345.1	171.1	67.5	26.6	10.5	3.4	1.2	0.5	0.2	0	0	0	0	0	0	July	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	August	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	September	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	October	1.9	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	November	24.7	8.5	0.9	0.1	0	0	0	0	0	0	0	0	0	0	0	December	83.4	40.3	15.7	6.2	2.4	1.1	0.4	0.1	0	0	0	0	0	0	0	January	128.6	73.3	32.7	13.5	5.6	1.9	0.8	0.4	0.2	0	0	0	0	0	0	February	77.5	38.5	14.9	5.3	1.8	0.2	0	0	0	0	0	0	0	0	0	March	27	10	3.3	1.5	0.7	0.2	0	0	0	0	0	0	0	0	0
Wind Chill ≤	30°F	25°F	20°F	15°F	10°F	5°F	0°F	-5°F	-10°F	-15	-20°F	-25°F	-30°F	-35°F	-40°F																																																																																																																																																																			
Snow Year	345.1	171.1	67.5	26.6	10.5	3.4	1.2	0.5	0.2	0	0	0	0	0	0																																																																																																																																																																			
July	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																																																																																																																																			
August	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																																																																																																																																			
September	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																																																																																																																																																			
October	1.9	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0																																																																																																																																																																			
November	24.7	8.5	0.9	0.1	0	0	0	0	0	0	0	0	0	0	0																																																																																																																																																																			
December	83.4	40.3	15.7	6.2	2.4	1.1	0.4	0.1	0	0	0	0	0	0	0																																																																																																																																																																			
January	128.6	73.3	32.7	13.5	5.6	1.9	0.8	0.4	0.2	0	0	0	0	0	0																																																																																																																																																																			
February	77.5	38.5	14.9	5.3	1.8	0.2	0	0	0	0	0	0	0	0	0																																																																																																																																																																			
March	27	10	3.3	1.5	0.7	0.2	0	0	0	0	0	0	0	0	0																																																																																																																																																																			
<p>NOAA Regional Climate Centers</p> <p>Applied Climate Information System (ACIS)</p> <p>(period of record varies)</p>	<p>The Regional Climate Centers (RCC) Applied Climate Information System (ACIS) offers interactive charts with single- or multi-station capabilities. Station products include daily or monthly average, maximum and minimum temperature, temperature extremes, and heating degree and cooling degree day observations.</p> <p>https://xmacis.rcc-acis.org/</p>																																																																																																																																																																																	

PRECIPITATION

The geography of the state has an impact on the observed precipitation. The statewide annual rainfall average from 1895 – 2021 is 47.80 inches, though the rainfall is varied across South Carolina. Annual rainfall ranges from less than 40 inches in the Sandhills to over 80 inches in the higher elevations of the Appalachian Mountains in the western portion of the state.

Tool	Description	Example																																												
<p>South Carolina County Climate Atlas</p>	<p>The South Carolina County Climate Atlas (CCA) provides a snapshot of the recorded climatological history, extremes, and severe weather for each of the forty-six (46) counties in South Carolina.</p> <p>https://www.dnr.sc.gov/climate/sco/ClimateData/cli_county_statistics.php</p>	<p>Colleton County Precipitation Records (1903-2020)</p> <p>Highest Daily Rainfall (COOP): 11.64 Inches, November 2, 1969; Edisto Beach State Park Highest Daily Rainfall (CoCoRaHS): 11.66 inches, October 8, 2016; Green Pond 1.3 S Annual Average Rainfall: 49.86 Inches Wettest Year: 1959, 84.12 inches; Walterboro 1 SW Driest Year: 2011, 27.98 Inches; Walterboro 1 SW Highest Daily Snowfall: 7.0 inches, February 13, 2010; Smoaks 0.1 SE (CoCoRaHS)</p>																																												
<p>National Centers for Environmental Information (NCEI)</p> <p>Climate at a Glance Tool</p> <p>(1895 – present)</p>	<p>This interactive graphing tool shows precipitation trends at the state, climate division, and county levels. It can be used to identify periods of above-normal and below-normal precipitation. Graphs and data can be downloaded.</p> <p>https://www.ncdc.noaa.gov/cag/statewide/time-series</p>																																													
<p>NOAA Regional Climate Centers</p> <p>Applied Climate Information System (ACIS)</p> <p>(period of record varies)</p>	<p>The Regional Climate Centers (RCC) Applied Climate Information System (ACIS) offers interactive charts with single- or multi-station capabilities. Station products include daily or monthly precipitation, information on multi-day precipitation extremes, and the number of days of rain or snow at user-defined thresholds.</p> <p>https://xmacis.rcc-acis.org/</p>	<p>Maximum 3-Day Total Precipitation for CHERAW, SC</p> <p>Click column heading to sort ascending, click again to sort descending.</p> <table border="1" data-bbox="2000 856 2433 1078"> <thead> <tr> <th>Rank</th> <th>Value</th> <th>Ending Date</th> <th>Missing Days</th> </tr> </thead> <tbody> <tr><td>1</td><td>22.58</td><td>2018-09-17</td><td>0</td></tr> <tr><td>2</td><td>20.82</td><td>2018-09-18</td><td>0</td></tr> <tr><td>3</td><td>12.74</td><td>2018-09-16</td><td>0</td></tr> <tr><td>4</td><td>10.13</td><td>1916-07-16</td><td>0</td></tr> <tr><td>5</td><td>10.07</td><td>2018-09-19</td><td>0</td></tr> <tr><td>6</td><td>9.80</td><td>1916-07-17</td><td>0</td></tr> <tr><td>7</td><td>9.71</td><td>1916-07-15</td><td>0</td></tr> <tr><td>8</td><td>9.01</td><td>1945-09-18</td><td>0</td></tr> <tr><td>9</td><td>8.40</td><td>1945-09-19</td><td>0</td></tr> <tr><td>10</td><td>8.00</td><td>1904-07-23</td><td>0</td></tr> </tbody> </table> <p>Period of record: 1893-01-01 to 2022-04-04</p>	Rank	Value	Ending Date	Missing Days	1	22.58	2018-09-17	0	2	20.82	2018-09-18	0	3	12.74	2018-09-16	0	4	10.13	1916-07-16	0	5	10.07	2018-09-19	0	6	9.80	1916-07-17	0	7	9.71	1916-07-15	0	8	9.01	1945-09-18	0	9	8.40	1945-09-19	0	10	8.00	1904-07-23	0
Rank	Value	Ending Date	Missing Days																																											
1	22.58	2018-09-17	0																																											
2	20.82	2018-09-18	0																																											
3	12.74	2018-09-16	0																																											
4	10.13	1916-07-16	0																																											
5	10.07	2018-09-19	0																																											
6	9.80	1916-07-17	0																																											
7	9.71	1916-07-15	0																																											
8	9.01	1945-09-18	0																																											
9	8.40	1945-09-19	0																																											
10	8.00	1904-07-23	0																																											
<p>Carolinas Precipitation Patterns & Probabilities Atlas</p> <p>(1895 – 2016)</p>	<p>This digital atlas of hydroclimate extremes brings together information on precipitation patterns in the Carolinas over the past 120 years. It is intended to complement existing information sources on extreme precipitation (e.g., NOAA's Atlas 14) and drought (e.g., products of the National Drought Mitigation Center). Its maps and figures show various measures of precipitation and drought.</p> <p>https://www.cisa.sc.edu/atlas/index.html</p>	<p>Bamberg Maximum Event Precipitation since 1980 (in inches)</p> 																																												

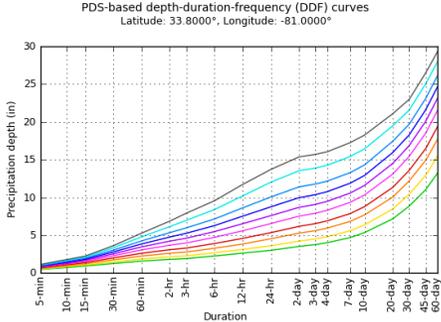
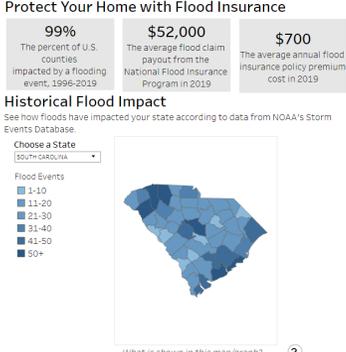
DROUGHT

Multiple indicators are needed to assess drought. Unlike many other hazards, drought typically has a slow onset and impacts different sectors on different timescales. Consequently, it is crucial to assess drought using various indicators that respond better to short-term conditions, such as agriculture, and others that respond to longer-term needs, such as water resources.

Tool	Description	Example
<p>South Carolina Drought</p>	<p>The South Carolina State Climatology Office Drought Website contains information on current and historic drought conditions across the state, based on the South Carolina Drought Response Committee designations. The website has data on drought resources and impacts, along with information on the DRC, legislation, and plans.</p> <p>http://www.scdrought.com/</p>	
<p>National Centers for Environmental Information (NCEI)</p> <p>Climate at a Glance Tool</p> <p>(1895 – present)</p>	<p>This interactive graphing tool shows precipitation, and Palmer Drought Severity Index (PDSI) trends at the state, climate division, and county levels. It can be used to identify periods of below-normal precipitation and dry conditions. Graphs and data can be downloaded.</p> <p>https://www.ncdc.noaa.gov/cag/statewide/time-series</p>	
<p>United States Drought Monitor (USDM)</p> <p>(2000 – present)</p>	<p>This interactive graphing tool shows the frequency of abnormally dry and drought conditions since 2000 and the maximum intensity and duration (indicated by color scale). The USDM is the official source for aid decisions by the USDA and several other agencies and programs.</p> <p>https://droughtmonitor.unl.edu/DmData/TimeSeries.aspx</p>	
<p>Carolinas Precipitation Patterns & Probabilities</p> <p>(1895 – 2016)</p>	<p>This digital atlas of hydroclimate extremes brings together information on precipitation patterns in the Carolinas over the past 120 years. It is intended to complement existing information sources on extreme precipitation (e.g., NOAA's Atlas 14) and drought (e.g., products of the National Drought Mitigation Center). Its maps and figures show various measures of precipitation and drought.</p> <p>https://www.cisa.sc.edu/atlas/index.html</p>	

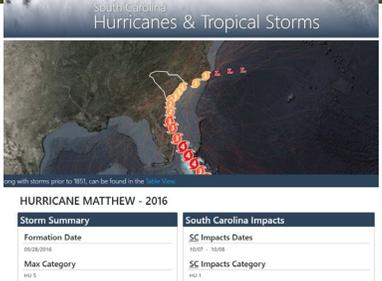
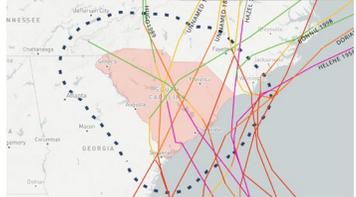
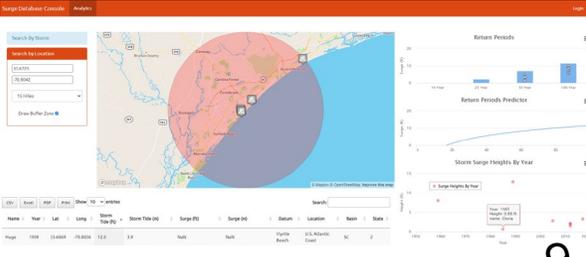
FLOOD

The general definition of a flood is the temporary condition of a partial or complete inundation of typically dry land. There are three common types of flooding; fluvial, pluvial, and coastal. Flooding is very complex, and multiple types of flooding can occur within one single flood event. Numerous factors other than rain determine the occurrence of flooding, including the location of the rainfall within the river basin, the areal extent of rain, duration and rate of rainfall, and land use.

Tool	Description	Example
<p>SC Flood IMPACT (Inundation and Mapping for Action) Tool</p>	<p>SC Flood IMPACT is an interactive website for state and local officials and the public, with reliable and accessible resources to communicate flood hazards and identify areas at risk of flooding. Users can identify flood hazard zones in a jurisdiction and produce maps for inclusion in a hazard mitigation plan. The website also provides instantaneous forecasts, accessible flood information, and an alert system.</p> <p>https://scfloodimpact.com/Home</p>	
<p>NOAA's Hydrometeorological Design Studies Center Atlas 14</p> <p>Precipitation Frequency Estimates</p>	<p>The interactive tool shows rainfall frequency estimates for select durations (e.g., 3-, 12-, and 24 hours) and recurrence intervals (e.g., 100-, 500-, and 1000-years) with 90% confidence intervals.</p> <p>https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html?bkmrk=sc</p>	
<p>Federal Emergency Management Agency Historical Flood Risk and Cost Tool</p> <p>(1996 – present)</p>	<p>Map and graphs show state and county flood events documented in NOAA's Storm Events Database. It shows the number of flood events by county and costs of flooding based on the average National Flood Insurance Program and FEMA's Individual and Household Program payments.</p> <p>https://www.fema.gov/data-visualization/historical-flood-risk-and-costs</p>	

TROPICAL CYCLONES

Understanding hurricanes and tropical storms are an essential piece of South Carolina's climatology, especially when considering the growth of coastal communities. However, impacts from these systems are not limited to those living along the coast. Inland portions of the state have also been affected by heavy rain, flooding, high winds, and tornadoes.

Tool	Description	Example
<p>South Carolina Hurricanes and Tropical Storms</p>	<p>The South Carolina Hurricanes and Tropical Storms application lets you search for and view information for over 300 years of hurricanes and tropical storms that have impacted South Carolina. You will find storm track data for all storms after 1851 when official records began.</p> <p>https://www.dnr.sc.gov/climate/sco/hurricanes/index.html</p>	
<p>NOAA Office of Coastal Management</p> <p>Digital Coast Historic Hurricane Tracking Tool</p> <p>(1851 – 2020)</p>	<p>The interactive mapping tool can view, analyze, and share historical hurricane tracking information. Users can search and display hurricanes by location, name, year, basin, National Hurricane Center technical reports, and storm details.</p> <p>https://coast.noaa.gov/hurricanes/</p>	
<p>National Hurricane Center</p> <p>Tropical Cyclone Report Archive</p> <p>(1958 – present)</p>	<p>The National Hurricane Center's Tropical Cyclone Reports contain comprehensive information on each tropical cyclone, including synoptic history, meteorological statistics, casualties and damages, and the post-analysis best track (six-hourly positions and intensities).</p> <p>1995 to Present: https://www.nhc.noaa.gov/data/tcr/index.php Prior to 1995: https://www.nhc.noaa.gov/archive/storm_wallets/atlantic/</p>	
<p>Louisiana State University Surge Database Console</p>	<p>This tool lets users map all storm surge observations for hurricanes and tropical storms that have impacted the U.S. Atlantic and Gulf Coasts. A map of storm surge observations is plotted when users select the name and year of a storm. This tool also provides an interactive map that lists information related to the location of observation, the storm surge and storm tide height, and the datum and type of observation.</p> <p>https://surgedat.climate.lsu.edu/surge/</p>	

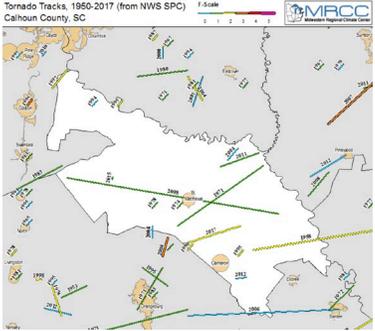
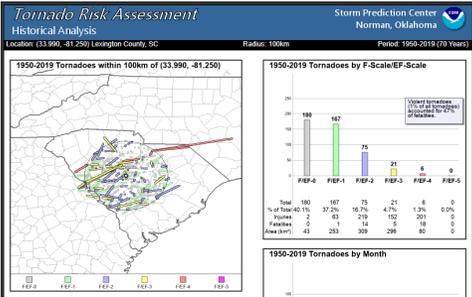
SEVERE WEATHER

Severe weather comes to South Carolina in thunderstorms, tornadoes, and tropical cyclones. Although thunderstorms are more common in the summer months, the more violent storms generally occur in the spring, with the passage of cold fronts into the warming Southeast. On average, there are between 45 and 70 thunderstorm days each year across the Palmetto State. Thunderstorms can cause hail, high winds, and lightning.

Tool	Description	Example																																																																																																																																								
<p>National Centers for Environmental Information (NCEI)</p> <p>Storm Events Database</p> <p>(1950 – present)</p>	<p>This interactive tool from NCEI provides a catalog of historical local storm reports for individual severe weather events, searchable by dates, state, and county. Users can use it to determine the documented extreme events that have impacted an area.</p> <p>https://www.ncdc.noaa.gov/stormevents/</p>	<table border="1"> <thead> <tr> <th>Location</th> <th>County/Zone</th> <th>St.</th> <th>Date</th> <th>Time</th> <th>T.Z.</th> <th>Type</th> <th>Mag</th> </tr> </thead> <tbody> <tr><td>Totals:</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>YORK CO.</td><td>YORK CO.</td><td>SC</td><td>04/24/1955</td><td>15:20</td><td>CST</td><td>Hail</td><td>4.00 in.</td></tr> <tr><td>ANDERSON CO.</td><td>ANDERSON CO.</td><td>SC</td><td>04/08/1957</td><td>17:10</td><td>CST</td><td>Hail</td><td>4.00 in.</td></tr> <tr><td>SPARTANBURG CO.</td><td>SPARTANBURG CO.</td><td>SC</td><td>05/02/1957</td><td>13:14</td><td>CST</td><td>Hail</td><td>4.00 in.</td></tr> <tr><td>LEE CO.</td><td>LEE CO.</td><td>SC</td><td>03/12/1967</td><td>15:00</td><td>CST</td><td>Hail</td><td>4.00 in.</td></tr> <tr><td>FLORENCE</td><td>FLORENCE CO.</td><td>SC</td><td>05/25/2000</td><td>20:04</td><td>EST</td><td>Hail</td><td>4.50 in.</td></tr> <tr><td>CALHOUN FALLS</td><td>ABBEVILLE CO.</td><td>SC</td><td>05/06/2003</td><td>13:45</td><td>EST</td><td>Hail</td><td>4.00 in.</td></tr> <tr><td>IVA</td><td>ANDERSON CO.</td><td>SC</td><td>03/15/2008</td><td>16:12</td><td>EST-5</td><td>Hail</td><td>4.25 in.</td></tr> <tr><td>CLOVER</td><td>YORK CO.</td><td>SC</td><td>04/09/2011</td><td>16:26</td><td>EST-5</td><td>Hail</td><td>4.00 in.</td></tr> <tr><td>GABLE</td><td>CLARENDON CO.</td><td>SC</td><td>04/16/2011</td><td>14:28</td><td>EST-5</td><td>Hail</td><td>4.25 in.</td></tr> <tr><td>TURBEVILLE</td><td>CLARENDON CO.</td><td>SC</td><td>04/16/2011</td><td>14:38</td><td>EST-5</td><td>Hail</td><td>4.25 in.</td></tr> <tr><td>HANNAH</td><td>FLORENCE CO.</td><td>SC</td><td>05/10/2011</td><td>17:25</td><td>EST-5</td><td>Hail</td><td>4.50 in.</td></tr> <tr><td>CONWAY</td><td>HORRY CO.</td><td>SC</td><td>05/10/2011</td><td>17:40</td><td>EST-5</td><td>Hail</td><td>4.50 in.</td></tr> <tr><td>MARY</td><td>HORRY CO.</td><td>SC</td><td>05/10/2011</td><td>17:57</td><td>EST-5</td><td>Hail</td><td>4.50 in.</td></tr> <tr><td>NEW HOPE</td><td>GEORGETOWN CO.</td><td>SC</td><td>05/10/2011</td><td>20:18</td><td>EST-5</td><td>Hail</td><td>4.50 in.</td></tr> <tr><td>Totals:</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>	Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Totals:								YORK CO.	YORK CO.	SC	04/24/1955	15:20	CST	Hail	4.00 in.	ANDERSON CO.	ANDERSON CO.	SC	04/08/1957	17:10	CST	Hail	4.00 in.	SPARTANBURG CO.	SPARTANBURG CO.	SC	05/02/1957	13:14	CST	Hail	4.00 in.	LEE CO.	LEE CO.	SC	03/12/1967	15:00	CST	Hail	4.00 in.	FLORENCE	FLORENCE CO.	SC	05/25/2000	20:04	EST	Hail	4.50 in.	CALHOUN FALLS	ABBEVILLE CO.	SC	05/06/2003	13:45	EST	Hail	4.00 in.	IVA	ANDERSON CO.	SC	03/15/2008	16:12	EST-5	Hail	4.25 in.	CLOVER	YORK CO.	SC	04/09/2011	16:26	EST-5	Hail	4.00 in.	GABLE	CLARENDON CO.	SC	04/16/2011	14:28	EST-5	Hail	4.25 in.	TURBEVILLE	CLARENDON CO.	SC	04/16/2011	14:38	EST-5	Hail	4.25 in.	HANNAH	FLORENCE CO.	SC	05/10/2011	17:25	EST-5	Hail	4.50 in.	CONWAY	HORRY CO.	SC	05/10/2011	17:40	EST-5	Hail	4.50 in.	MARY	HORRY CO.	SC	05/10/2011	17:57	EST-5	Hail	4.50 in.	NEW HOPE	GEORGETOWN CO.	SC	05/10/2011	20:18	EST-5	Hail	4.50 in.	Totals:							
Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag																																																																																																																																			
Totals:																																																																																																																																										
YORK CO.	YORK CO.	SC	04/24/1955	15:20	CST	Hail	4.00 in.																																																																																																																																			
ANDERSON CO.	ANDERSON CO.	SC	04/08/1957	17:10	CST	Hail	4.00 in.																																																																																																																																			
SPARTANBURG CO.	SPARTANBURG CO.	SC	05/02/1957	13:14	CST	Hail	4.00 in.																																																																																																																																			
LEE CO.	LEE CO.	SC	03/12/1967	15:00	CST	Hail	4.00 in.																																																																																																																																			
FLORENCE	FLORENCE CO.	SC	05/25/2000	20:04	EST	Hail	4.50 in.																																																																																																																																			
CALHOUN FALLS	ABBEVILLE CO.	SC	05/06/2003	13:45	EST	Hail	4.00 in.																																																																																																																																			
IVA	ANDERSON CO.	SC	03/15/2008	16:12	EST-5	Hail	4.25 in.																																																																																																																																			
CLOVER	YORK CO.	SC	04/09/2011	16:26	EST-5	Hail	4.00 in.																																																																																																																																			
GABLE	CLARENDON CO.	SC	04/16/2011	14:28	EST-5	Hail	4.25 in.																																																																																																																																			
TURBEVILLE	CLARENDON CO.	SC	04/16/2011	14:38	EST-5	Hail	4.25 in.																																																																																																																																			
HANNAH	FLORENCE CO.	SC	05/10/2011	17:25	EST-5	Hail	4.50 in.																																																																																																																																			
CONWAY	HORRY CO.	SC	05/10/2011	17:40	EST-5	Hail	4.50 in.																																																																																																																																			
MARY	HORRY CO.	SC	05/10/2011	17:57	EST-5	Hail	4.50 in.																																																																																																																																			
NEW HOPE	GEORGETOWN CO.	SC	05/10/2011	20:18	EST-5	Hail	4.50 in.																																																																																																																																			
Totals:																																																																																																																																										
<p>NOAA National Weather Service Storm Prediction Center (SPC)</p> <p>Severe Weather Climatology</p> <p>(1986 – 2015)</p>	<p>Maps produced by SPC show the average number of days per year in which severe hail and wind reports were reported during the period noted. The provided maps display the approximate number of days each year to expect severe hail (1-inch or greater in diameter), winds over 50 knots (58 mph) at a location, and different magnitudes of tornadoes.</p> <p>https://www.spc.noaa.gov/wcm/#30yrclimo</p>	<p>Mean Number of >50-knot Wind Days per Year Within 25 Miles of a Point 1986 - 2015</p>																																																																																																																																								
<p>Vaisala Interactive Lightning Density Map (2016 – 2021) and Annual Report</p>	<p>This interactive map displays the average lightning density observed for every country and ocean in the world for 2016 through 2021, plus each state/province when you zoom in. The scale shows events / km² / year. The 2021 report includes additional information on lightning activity across the globe.</p> <p>https://interactive-lightning-map.vaisala.com/ https://www.vaisala.com/en/annual-lightning-report</p>	<p>Total Lightning Density Events / km² / yr</p> <ul style="list-style-type: none"> 256 and up 128 to 256 96 to 128 64 to 96 32 to 64 24 to 32 16 to 24 12 to 16 8 to 12 4 to 8 2 to 4 1 to 2 0.5 to 1 0.1 to 0.5 up to 0.1 																																																																																																																																								

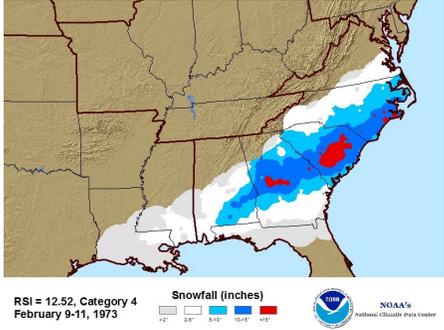
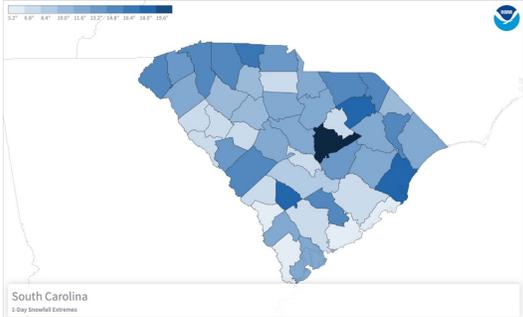
TORANDOES

Since 1950, more than a thousand tornadoes have been reported in the state, with a primary peak in activity during the spring from supercell thunderstorms and squall lines and a secondary peak in August and September due to increased tropical cyclone activity in the Atlantic Basin. Every South Carolina county has reported at least one tornado, with the most frequent touchdowns and track paths found in the Midlands and Pee Dee.

Tool	Description	Example																																																																																																																																																
<p>Midwest Regional Climate Center</p> <p>Tornado Database</p> <p>(1950 – 2017)</p>	<p>This interactive tool shows historical tornado track details by track location or county and provides tornado information for the surrounding area.</p> <p>https://mrcc.purdue.edu/gismaps/cntyorn.htm#</p>																																																																																																																																																	
<p>NOAA's Storm Prediction Center</p> <p>Tornado Risk Assessment</p> <p>(1950 – 2019)</p>	<p>This site generates a series of graphs showing tornado occurrences and statistics based on a given point. Statistics include F/EF scale frequency and probabilities of strikes occurring per month and time of day.</p> <p>https://www.spc.noaa.gov/climo/online/probs/?zip=29072&rad=100 (replace zip code, and adjust radius in kilometers as needed)</p>																																																																																																																																																	
<p>National Centers for Environmental Information (NCEI)</p> <p>Storm Events Database</p> <p>(1950 – present)</p>	<p>This interactive tool from NCEI provides a catalog of historical local storm reports for individual severe weather events, searchable by dates, state, and county. Users can use it to determine the documented extreme events that have impacted an area.</p> <p>https://www.ncdc.noaa.gov/stormevents/</p>	<table border="1"> <thead> <tr> <th>Location</th> <th>County/Zone</th> <th>St.</th> <th>Date</th> <th>Time</th> <th>T.Z.</th> <th>Type</th> <th>Mag</th> </tr> </thead> <tbody> <tr> <td colspan="8">Totals:</td> </tr> <tr> <td>LANCASTER CO.</td> <td>LANCASTER CO.</td> <td>SC</td> <td>04/08/1957</td> <td>16:00</td> <td>CST</td> <td>Tornado</td> <td>F4</td> </tr> <tr> <td>CHESTERFIELD CO.</td> <td>CHESTERFIELD CO.</td> <td>SC</td> <td>04/08/1957</td> <td>16:20</td> <td>CST</td> <td>Tornado</td> <td>F4</td> </tr> <tr> <td>MARLBORO CO.</td> <td>MARLBORO CO.</td> <td>SC</td> <td>04/08/1957</td> <td>17:00</td> <td>CST</td> <td>Tornado</td> <td>F4</td> </tr> <tr> <td>ABBEVILLE CO.</td> <td>ABBEVILLE CO.</td> <td>SC</td> <td>03/31/1973</td> <td>18:20</td> <td>CST</td> <td>Tornado</td> <td>F4</td> </tr> <tr> <td>GREENWOOD CO.</td> <td>GREENWOOD CO.</td> <td>SC</td> <td>03/31/1973</td> <td>19:00</td> <td>CST</td> <td>Tornado</td> <td>F4</td> </tr> <tr> <td>GREENWOOD CO.</td> <td>GREENWOOD CO.</td> <td>SC</td> <td>12/13/1973</td> <td>14:30</td> <td>CST</td> <td>Tornado</td> <td>F4</td> </tr> <tr> <td>FAIRFIELD CO.</td> <td>FAIRFIELD CO.</td> <td>SC</td> <td>03/28/1984</td> <td>17:00</td> <td>CST</td> <td>Tornado</td> <td>F4</td> </tr> <tr> <td>KERSHAW CO.</td> <td>KERSHAW CO.</td> <td>SC</td> <td>03/28/1984</td> <td>17:20</td> <td>CST</td> <td>Tornado</td> <td>F4</td> </tr> <tr> <td>LANCASTER CO.</td> <td>LANCASTER CO.</td> <td>SC</td> <td>03/28/1984</td> <td>17:25</td> <td>CST</td> <td>Tornado</td> <td>F4</td> </tr> <tr> <td>CHESTERFIELD CO.</td> <td>CHESTERFIELD CO.</td> <td>SC</td> <td>03/28/1984</td> <td>17:45</td> <td>CST</td> <td>Tornado</td> <td>F4</td> </tr> <tr> <td>MARLBORO CO.</td> <td>MARLBORO CO.</td> <td>SC</td> <td>03/28/1984</td> <td>18:10</td> <td>CST</td> <td>Tornado</td> <td>F4</td> </tr> <tr> <td>MARLBORO CO.</td> <td>MARLBORO CO.</td> <td>SC</td> <td>03/28/1984</td> <td>18:20</td> <td>CST</td> <td>Tornado</td> <td>F4</td> </tr> <tr> <td>SPARTANBURG CO.</td> <td>SPARTANBURG CO.</td> <td>SC</td> <td>05/05/1989</td> <td>16:20</td> <td>CST</td> <td>Tornado</td> <td>F4</td> </tr> <tr> <td>CHEROKEE CO.</td> <td>CHEROKEE CO.</td> <td>SC</td> <td>05/05/1989</td> <td>16:33</td> <td>EST</td> <td>Tornado</td> <td>F4</td> </tr> <tr> <td>Penderboro</td> <td>MARION CO.</td> <td>SC</td> <td>11/07/1995</td> <td>17:05</td> <td>EST</td> <td>Tornado</td> <td>F4</td> </tr> <tr> <td>ESTILL MUNIARPT</td> <td>HAMPTON CO.</td> <td>SC</td> <td>04/13/2020</td> <td>05:10</td> <td>EST-5</td> <td>Tornado</td> <td>EF4</td> </tr> </tbody> </table>	Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Totals:								LANCASTER CO.	LANCASTER CO.	SC	04/08/1957	16:00	CST	Tornado	F4	CHESTERFIELD CO.	CHESTERFIELD CO.	SC	04/08/1957	16:20	CST	Tornado	F4	MARLBORO CO.	MARLBORO CO.	SC	04/08/1957	17:00	CST	Tornado	F4	ABBEVILLE CO.	ABBEVILLE CO.	SC	03/31/1973	18:20	CST	Tornado	F4	GREENWOOD CO.	GREENWOOD CO.	SC	03/31/1973	19:00	CST	Tornado	F4	GREENWOOD CO.	GREENWOOD CO.	SC	12/13/1973	14:30	CST	Tornado	F4	FAIRFIELD CO.	FAIRFIELD CO.	SC	03/28/1984	17:00	CST	Tornado	F4	KERSHAW CO.	KERSHAW CO.	SC	03/28/1984	17:20	CST	Tornado	F4	LANCASTER CO.	LANCASTER CO.	SC	03/28/1984	17:25	CST	Tornado	F4	CHESTERFIELD CO.	CHESTERFIELD CO.	SC	03/28/1984	17:45	CST	Tornado	F4	MARLBORO CO.	MARLBORO CO.	SC	03/28/1984	18:10	CST	Tornado	F4	MARLBORO CO.	MARLBORO CO.	SC	03/28/1984	18:20	CST	Tornado	F4	SPARTANBURG CO.	SPARTANBURG CO.	SC	05/05/1989	16:20	CST	Tornado	F4	CHEROKEE CO.	CHEROKEE CO.	SC	05/05/1989	16:33	EST	Tornado	F4	Penderboro	MARION CO.	SC	11/07/1995	17:05	EST	Tornado	F4	ESTILL MUNIARPT	HAMPTON CO.	SC	04/13/2020	05:10	EST-5	Tornado	EF4
Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag																																																																																																																																											
Totals:																																																																																																																																																		
LANCASTER CO.	LANCASTER CO.	SC	04/08/1957	16:00	CST	Tornado	F4																																																																																																																																											
CHESTERFIELD CO.	CHESTERFIELD CO.	SC	04/08/1957	16:20	CST	Tornado	F4																																																																																																																																											
MARLBORO CO.	MARLBORO CO.	SC	04/08/1957	17:00	CST	Tornado	F4																																																																																																																																											
ABBEVILLE CO.	ABBEVILLE CO.	SC	03/31/1973	18:20	CST	Tornado	F4																																																																																																																																											
GREENWOOD CO.	GREENWOOD CO.	SC	03/31/1973	19:00	CST	Tornado	F4																																																																																																																																											
GREENWOOD CO.	GREENWOOD CO.	SC	12/13/1973	14:30	CST	Tornado	F4																																																																																																																																											
FAIRFIELD CO.	FAIRFIELD CO.	SC	03/28/1984	17:00	CST	Tornado	F4																																																																																																																																											
KERSHAW CO.	KERSHAW CO.	SC	03/28/1984	17:20	CST	Tornado	F4																																																																																																																																											
LANCASTER CO.	LANCASTER CO.	SC	03/28/1984	17:25	CST	Tornado	F4																																																																																																																																											
CHESTERFIELD CO.	CHESTERFIELD CO.	SC	03/28/1984	17:45	CST	Tornado	F4																																																																																																																																											
MARLBORO CO.	MARLBORO CO.	SC	03/28/1984	18:10	CST	Tornado	F4																																																																																																																																											
MARLBORO CO.	MARLBORO CO.	SC	03/28/1984	18:20	CST	Tornado	F4																																																																																																																																											
SPARTANBURG CO.	SPARTANBURG CO.	SC	05/05/1989	16:20	CST	Tornado	F4																																																																																																																																											
CHEROKEE CO.	CHEROKEE CO.	SC	05/05/1989	16:33	EST	Tornado	F4																																																																																																																																											
Penderboro	MARION CO.	SC	11/07/1995	17:05	EST	Tornado	F4																																																																																																																																											
ESTILL MUNIARPT	HAMPTON CO.	SC	04/13/2020	05:10	EST-5	Tornado	EF4																																																																																																																																											

WINTER STORMS

Winter weather events in South Carolina are usually high-impact situations because of their rarity. Most of the state averages two inches or less of snowfall each year. The annual snowfall average increases in the mountains, with a mean yearly snowfall of five to seven inches at the state's highest elevations. Many of the winter weather events that impact South Carolina include a combination of snow, sleet, and freezing rain.

Tool	Description	Example
<p>South Carolina Winter Weather Database</p> <p>(1958 – Present)</p>	<p>The South Carolina Winter Weather Database is a searchable tool to identify historical winter weather events (snow, sleet, freezing rain/ice, and extreme cold/wind chills) and the extent of their impacts within the state. Data on snowfall totals, rainfall totals, and observed minimum temperatures are included for each event.</p> <p>https://www.dnr.sc.gov/scwinterweather</p>	
<p>National Centers for Environmental Information (NCEI)</p> <p>Regional Snowfall Index</p>	<p>The Snowstorm Database is a collection of over 500 snowstorms dating back to 1900 and updated operationally. Only storms with large heavy snowfall areas (10-20 inches or greater) are included. The spatial extent consists of the contiguous U.S., but most storms are in the eastern two-thirds of the U.S.</p> <p>https://www.ncei.noaa.gov/maps/rsi/</p>	
<p>National Centers for Environmental Information (NCEI)</p> <p>Snowfall Extremes</p> <p>(varying period of record)</p>	<p>This interactive website provides the 1-, 2-, and 3-day snowfall maximums from each county and the location at which it occurred. Data is available in map formats and can be downloaded.</p> <p>https://www.ncdc.noaa.gov/snow-and-ice/snowfall-extremes/SC/1</p>	



Spring 2022