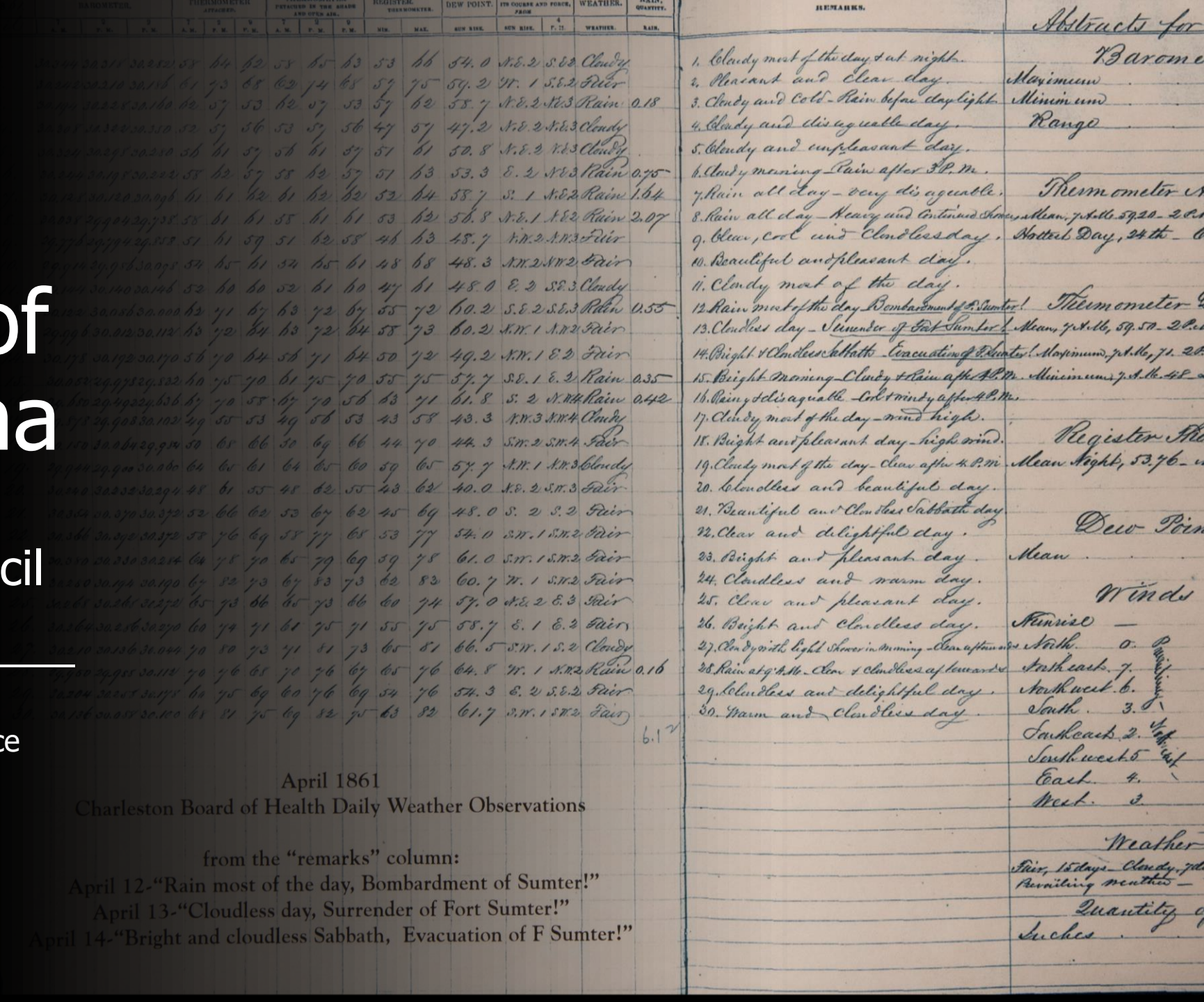
Climatology of South Carolina

Broad River Basin Council

Elliot D. Wickham
South Carolina State Climatology Office
SC Department of Natural Resources
Thursday, June 9th, 2022



SC State Climatology Office Team

Hope Mizzell
South Carolina
State Climatologist

Melissa Griffin
Assistant State
Climatologist

Elliot Wickham
Water Resource
Climatologist

Frank Strait
Severe Weather
Liaison

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What Is A State Climatology Office?

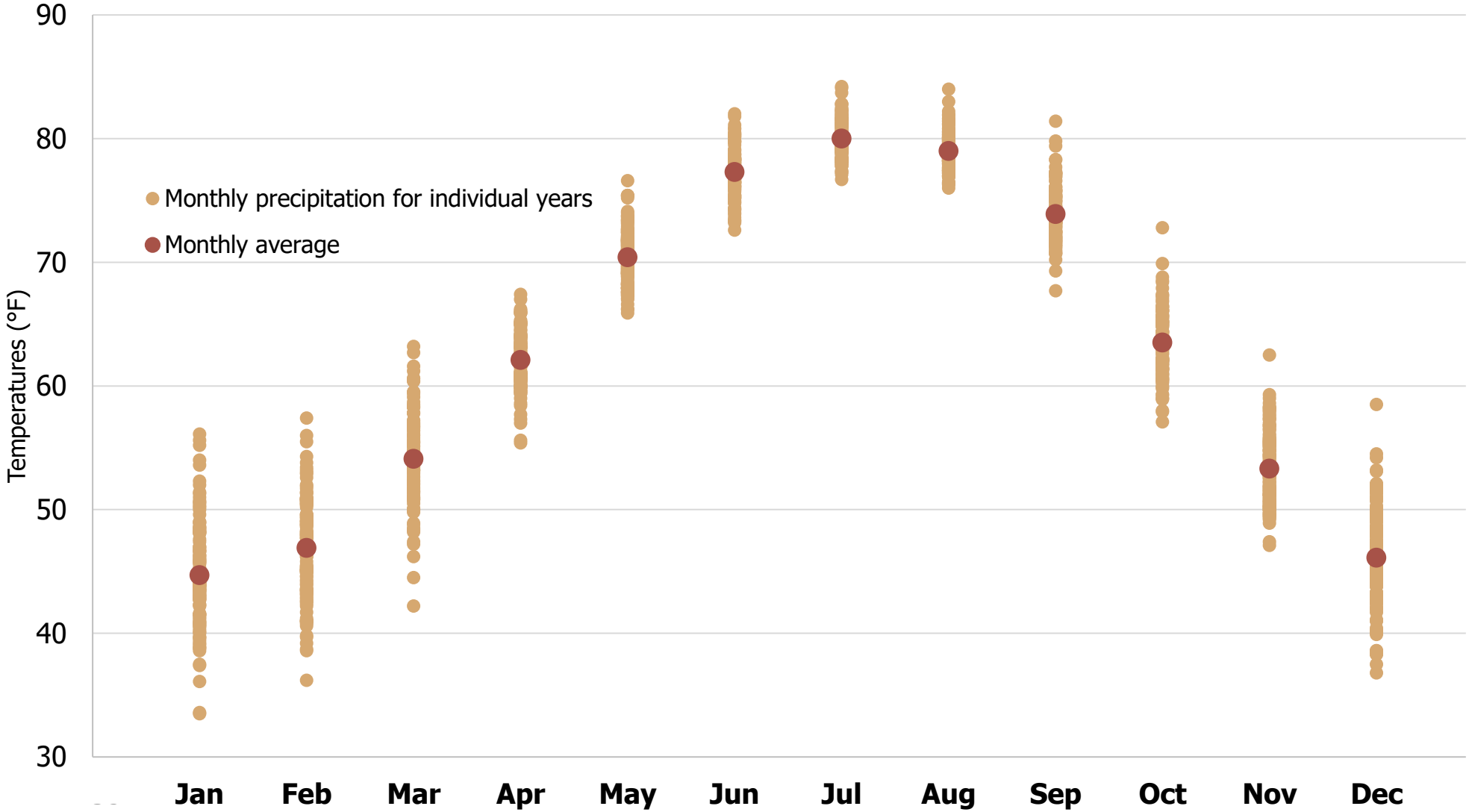
Promote climate and weather awareness and knowledge through the development and delivery of science-based climate services and tools on a local and state level.

Climate Office Responsibilities

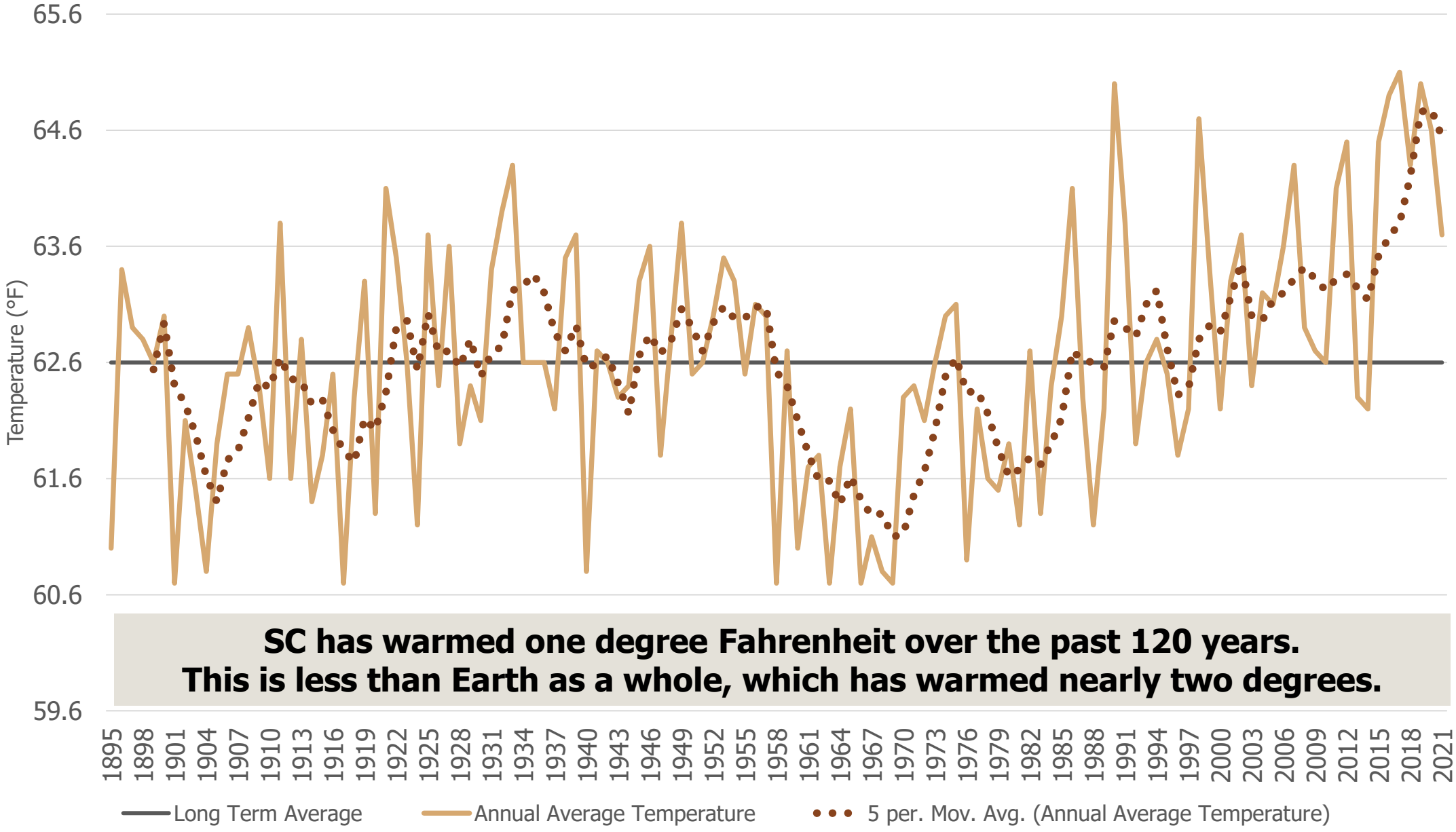
1	2	3	4	5
Coordinate and collect weather observations for the purpose of climate monitoring	Summarize and disseminate weather and climate information	Perform climate and weather impact assessments	Demonstrate the value of climate information in the decision-making process	Conduct applied climate research

Temperatures

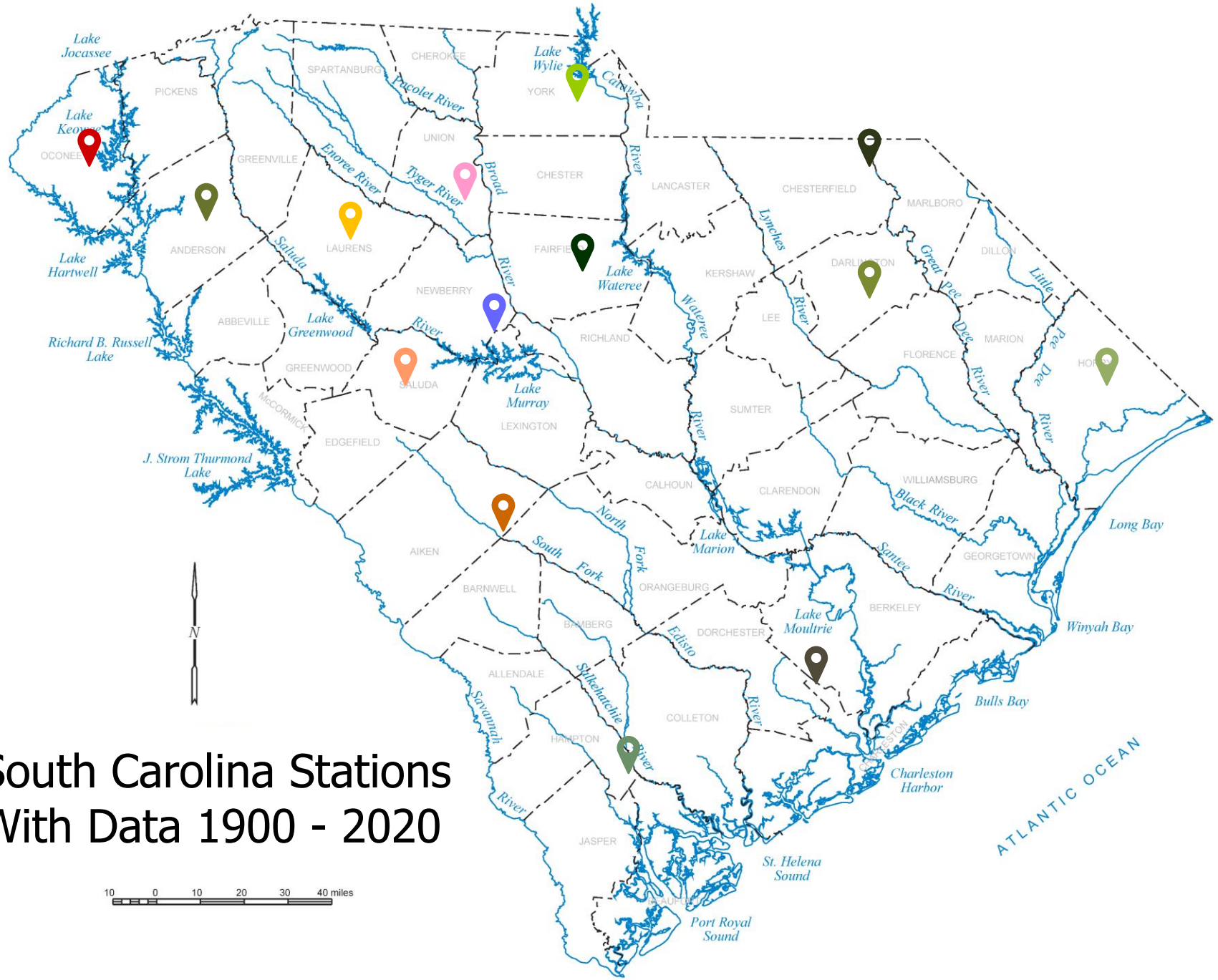
South Carolina Monthly Average Temperature (1895 – 2021)



South Carolina Annual Average Temperature (1895 – 2021)



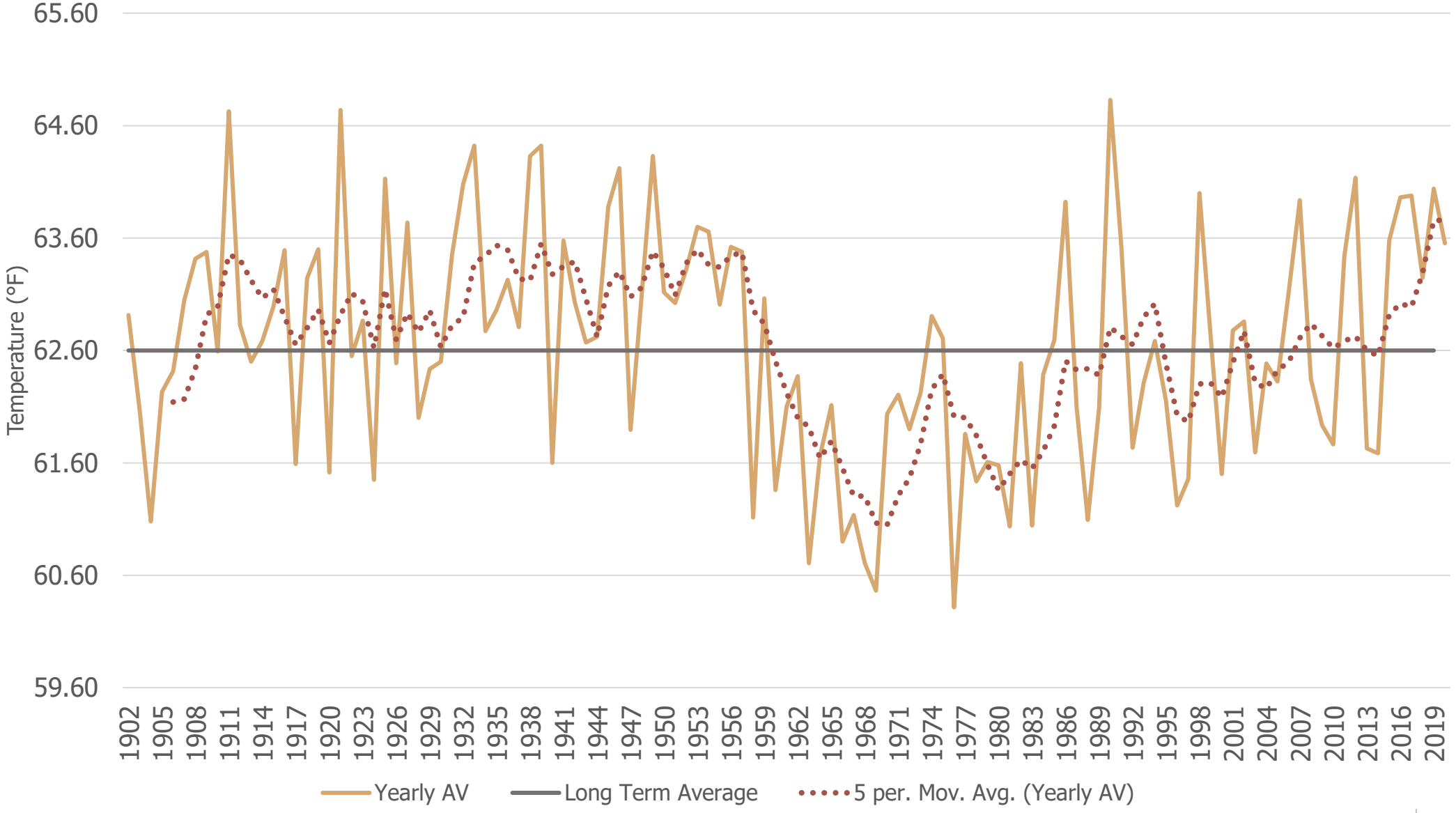
SC has warmed one degree Fahrenheit over the past 120 years.
This is less than Earth as a whole, which has warmed nearly two degrees.



South Carolina Stations With Data 1900 - 2020

- Anderson
- Blackville
- Cheraw
- Conway
- Darlington
- Laurens
- Little Mountain
- Saluda
- Santuck
- Summerville
- Walhalla
- Winnsboro
- Winthrop University
- Yemassee

South Carolina Long-Term Stations
Annual Average Temperature (1902 – 2020)



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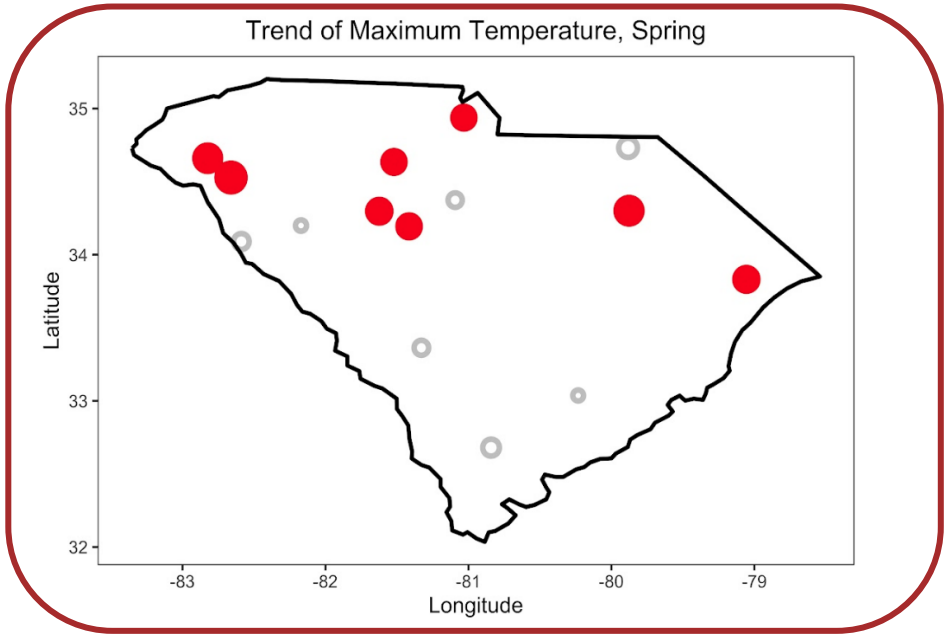
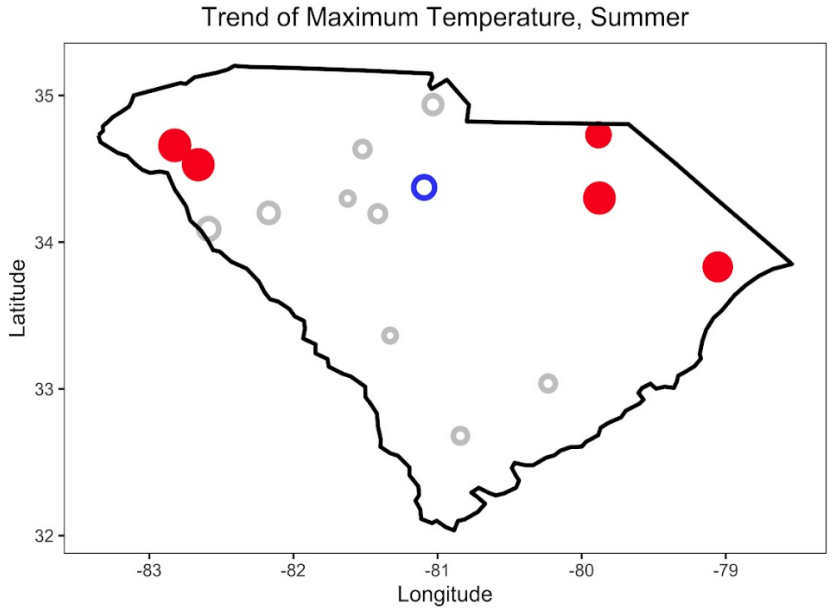
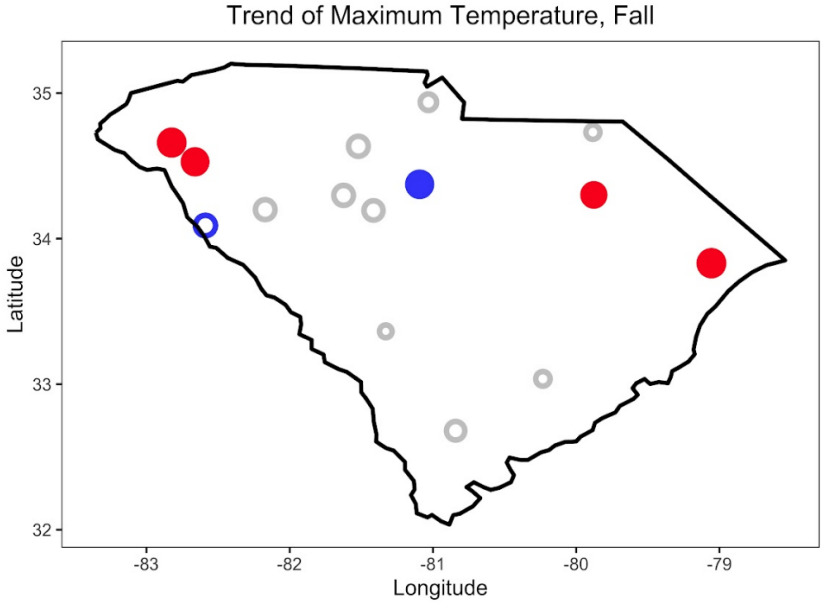
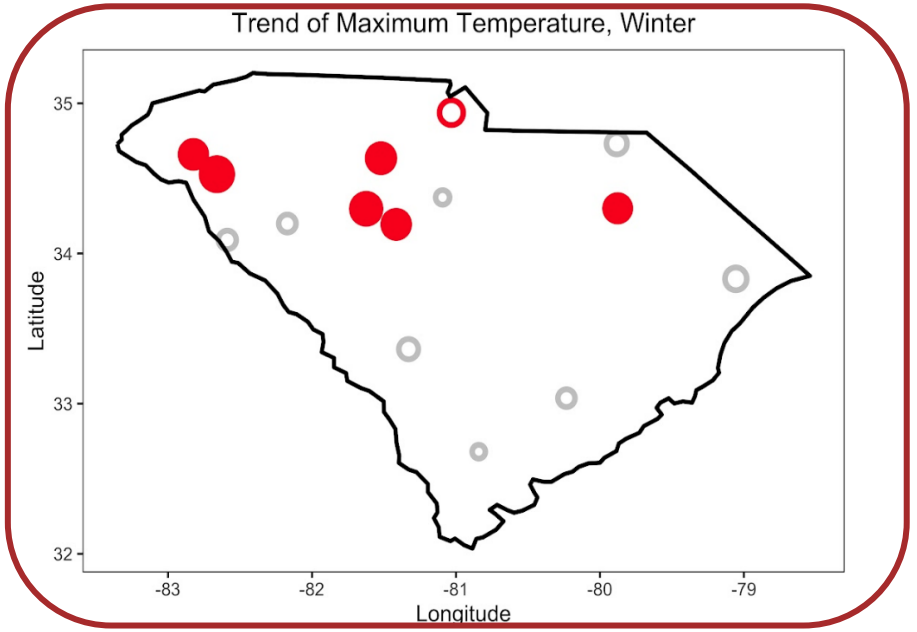
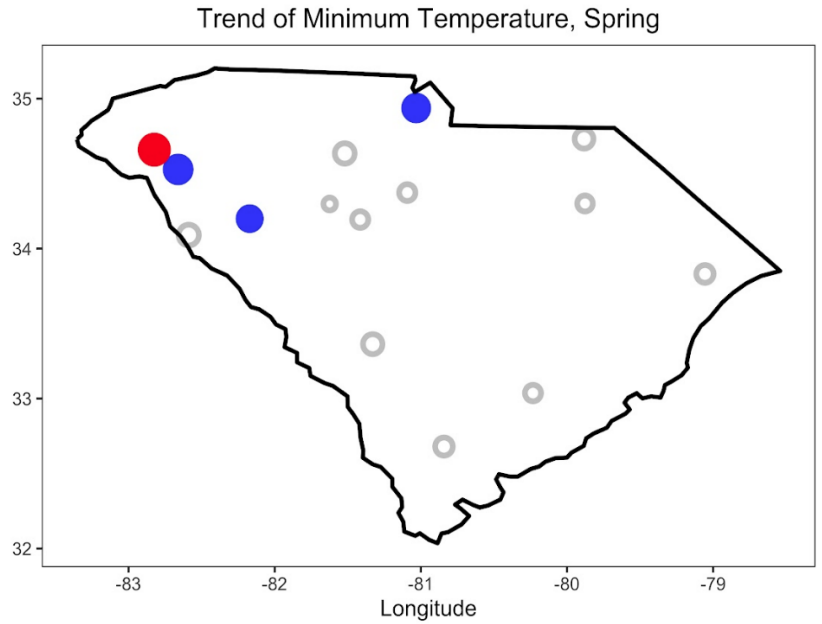


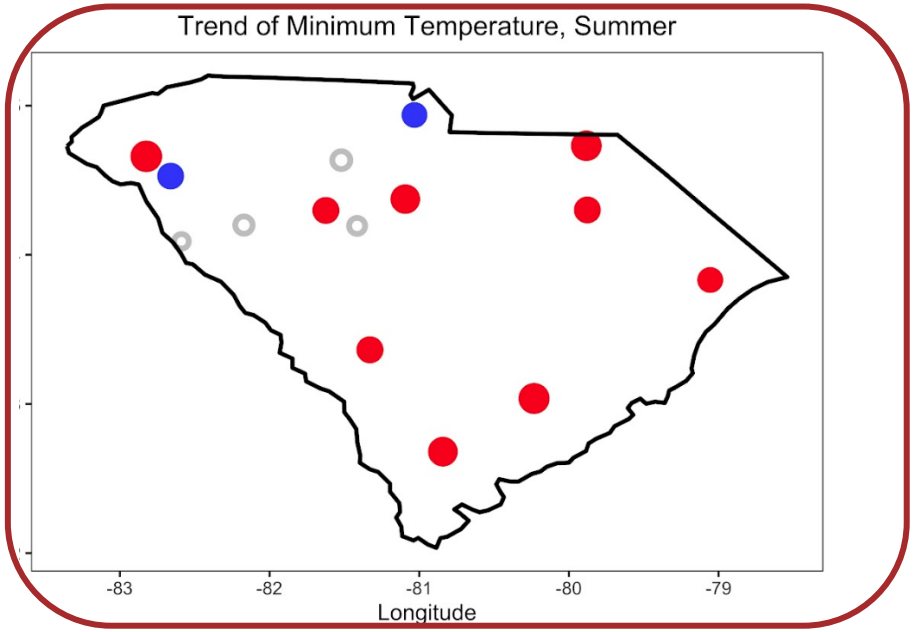


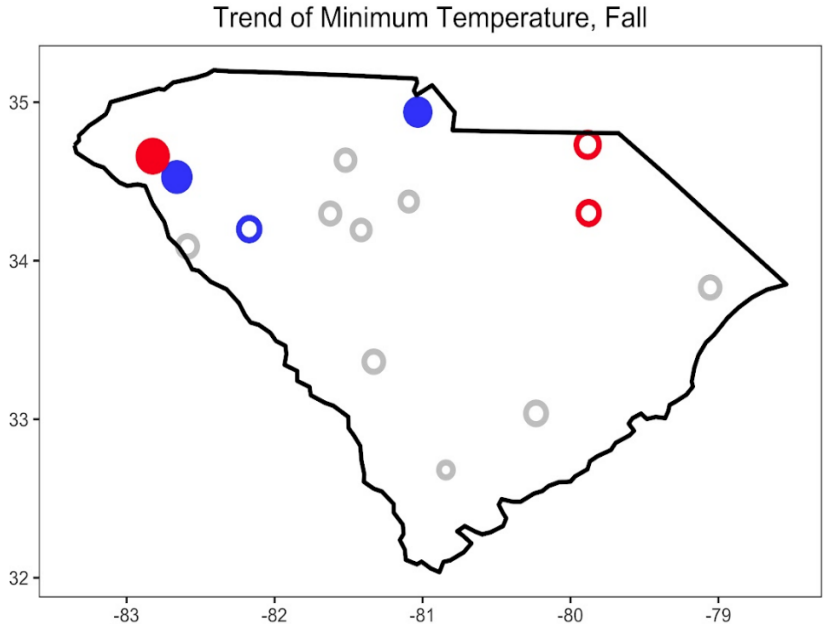


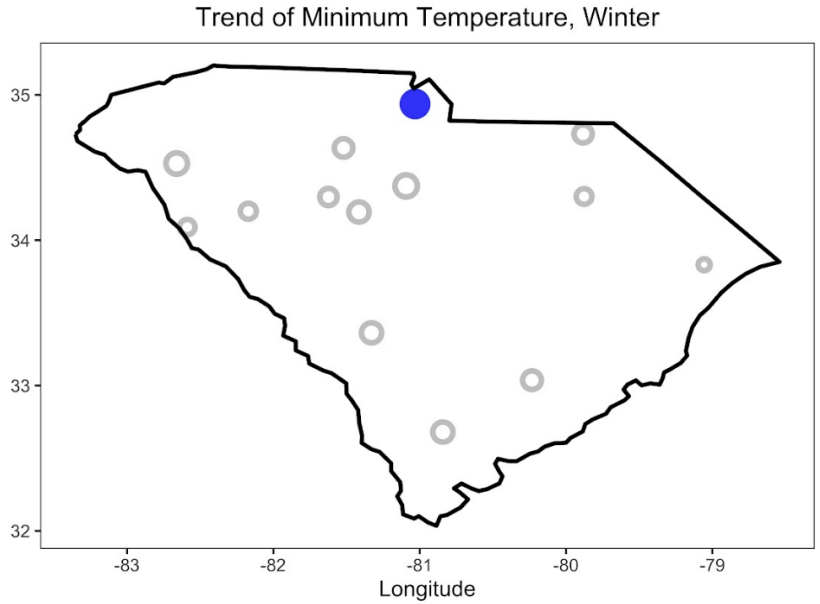


- Decrease
- Statistically-significant decrease
- Increase
- Statistically-significant increase



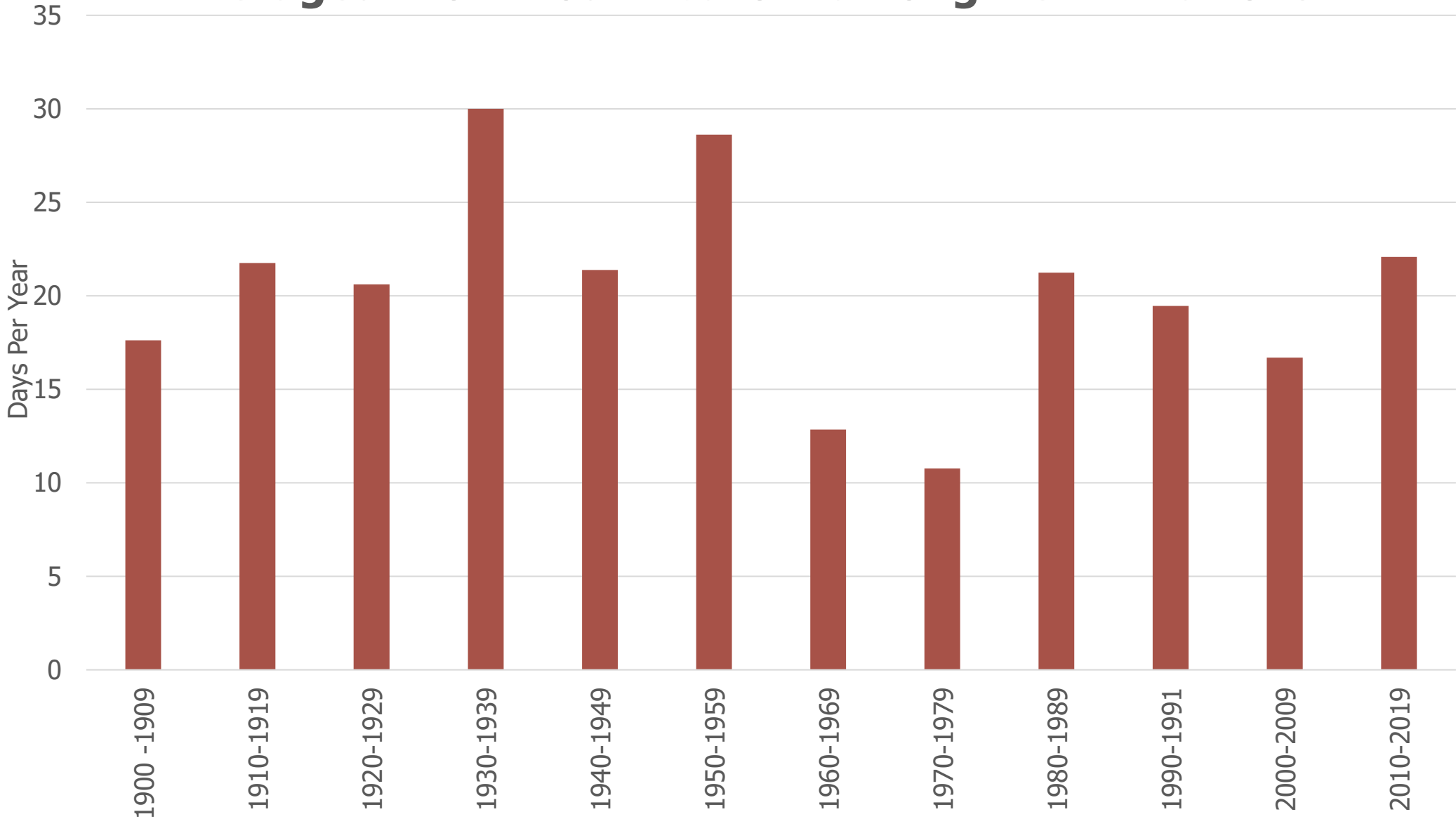






- Statistically-significant decrease
- Decrease
- Increase
- Statistically-significant increase

Number of Days Maximum Temperature Above 95°F Averaged From South Carolina Long-Term Stations



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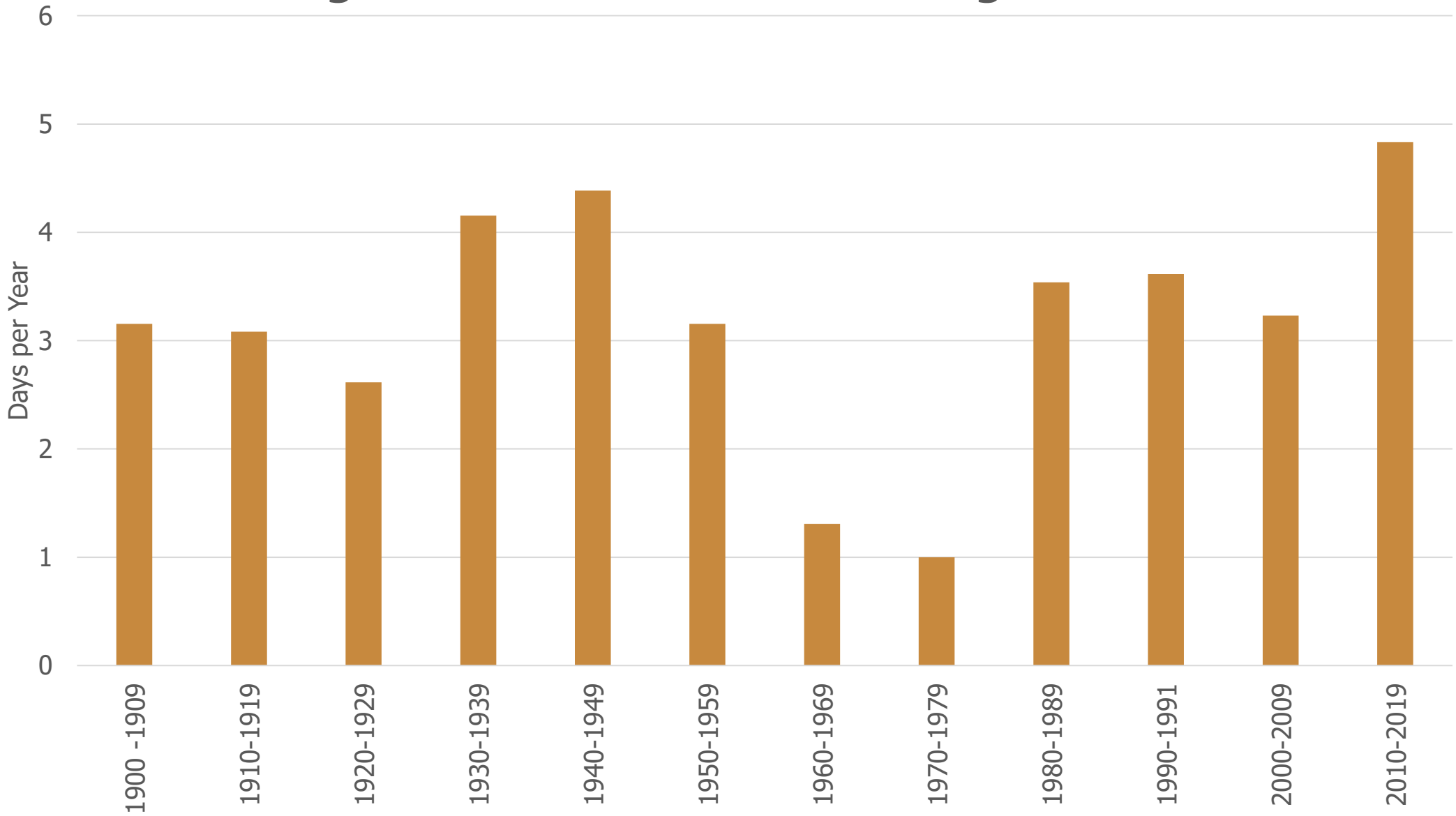
Number of Days Minimum Temperature Above 75°F Averaged From South Carolina Long-Term Stations



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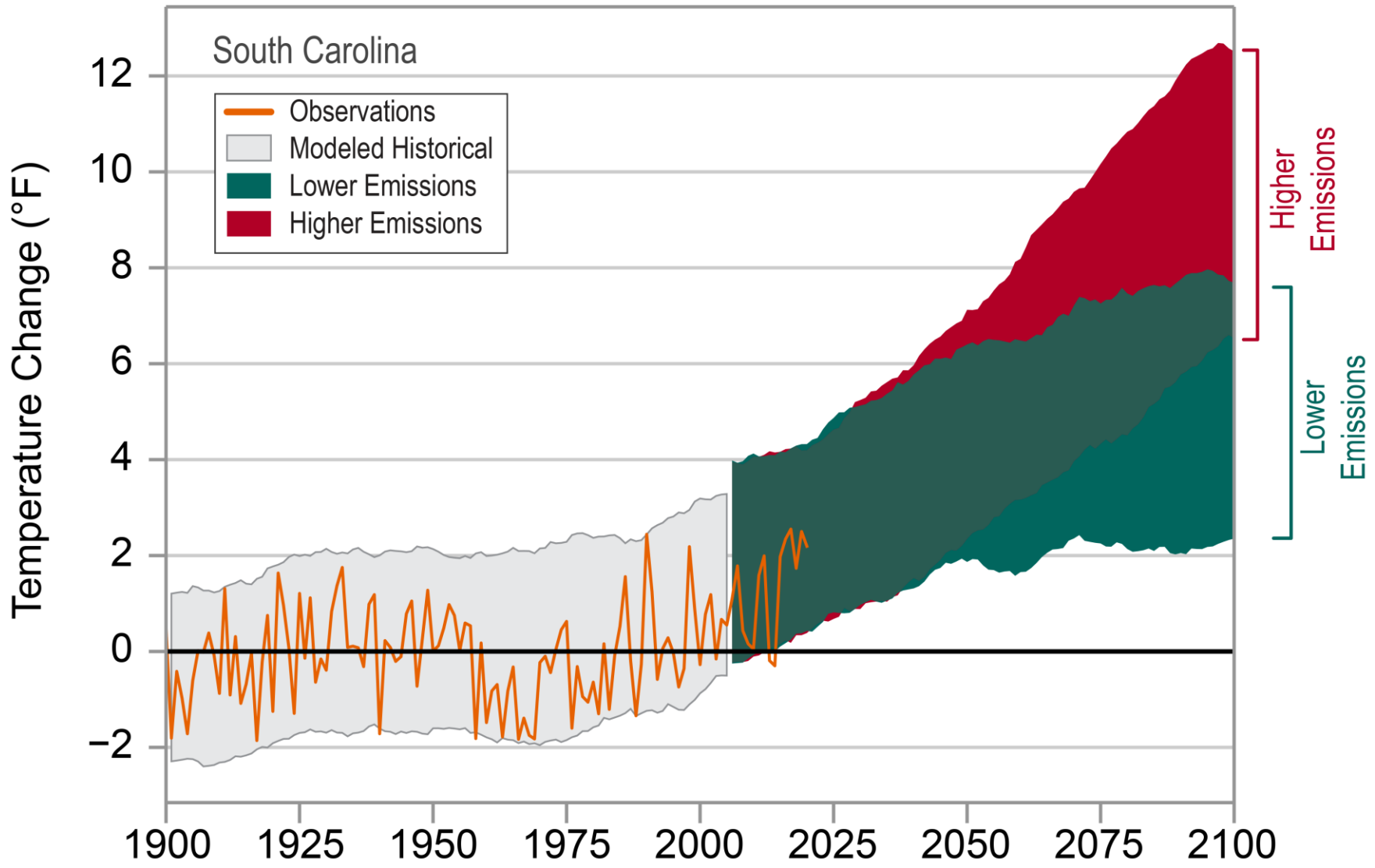
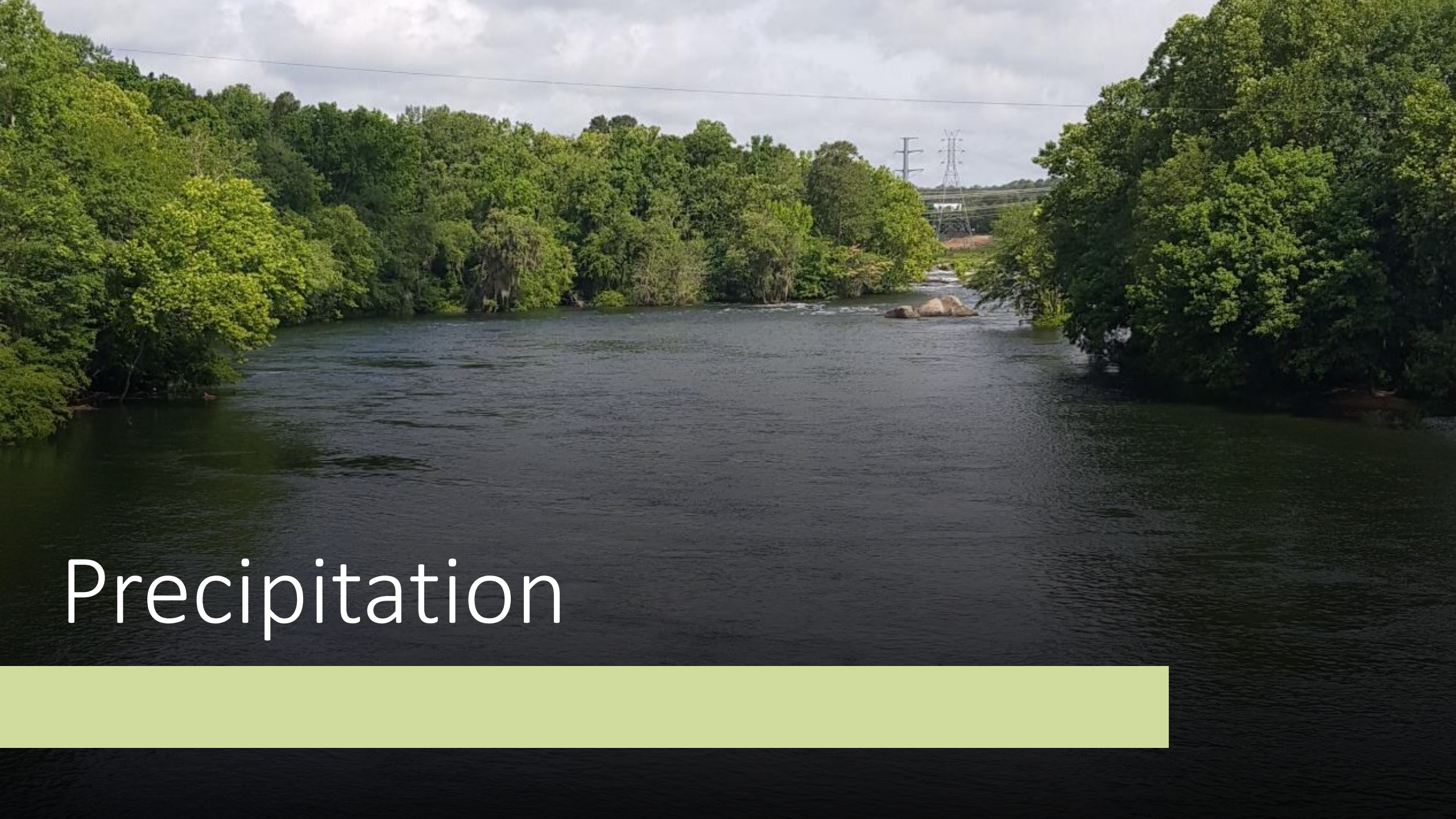
Observed and Projected Temperature Change

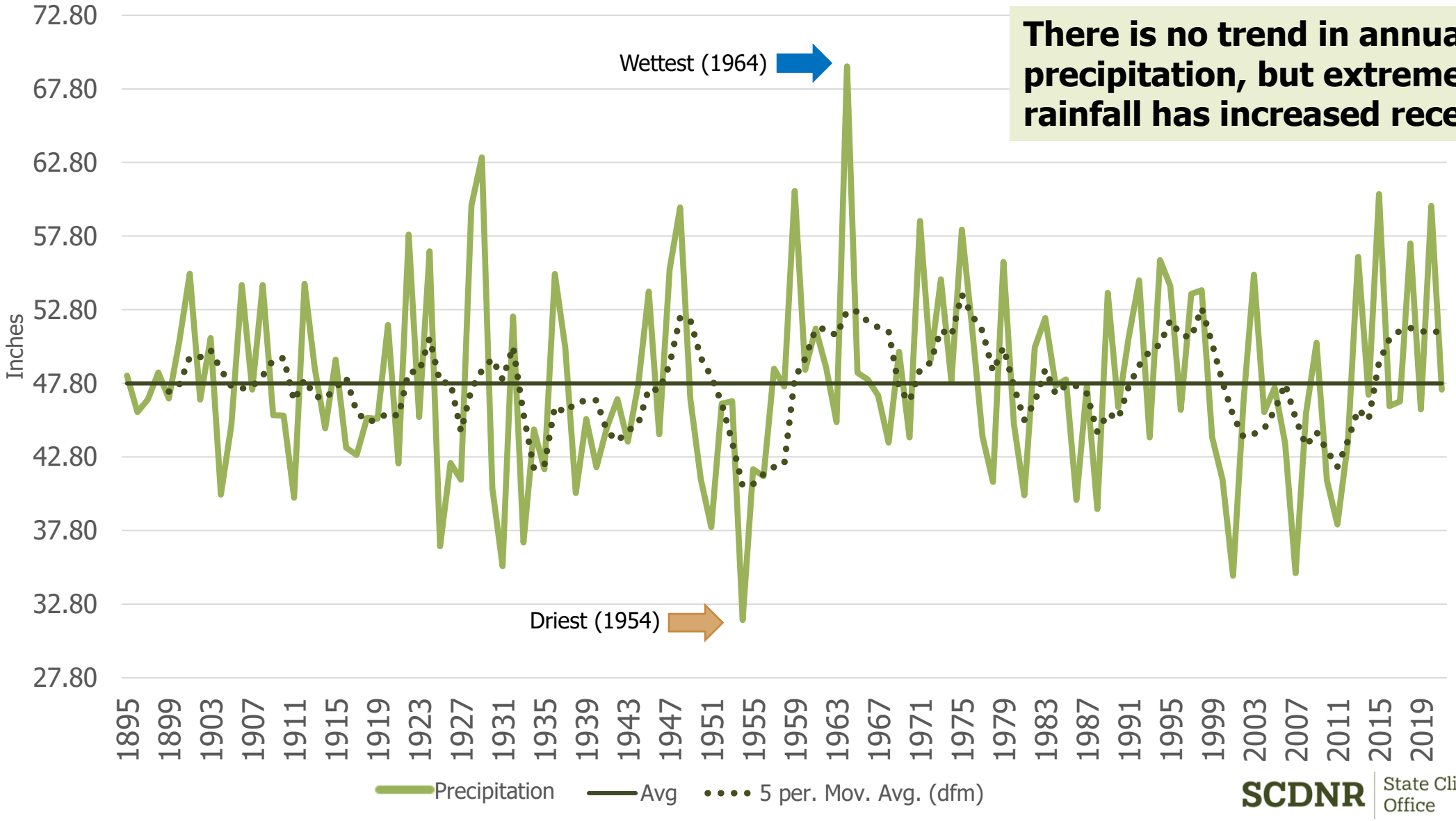


National Centers for Environmental Information
South Carolina State Climate Summary, 2022



Precipitation

South Carolina Annual Precipitation (1895 – 2021)



There is no trend in annual precipitation, but extreme rainfall has increased recently.

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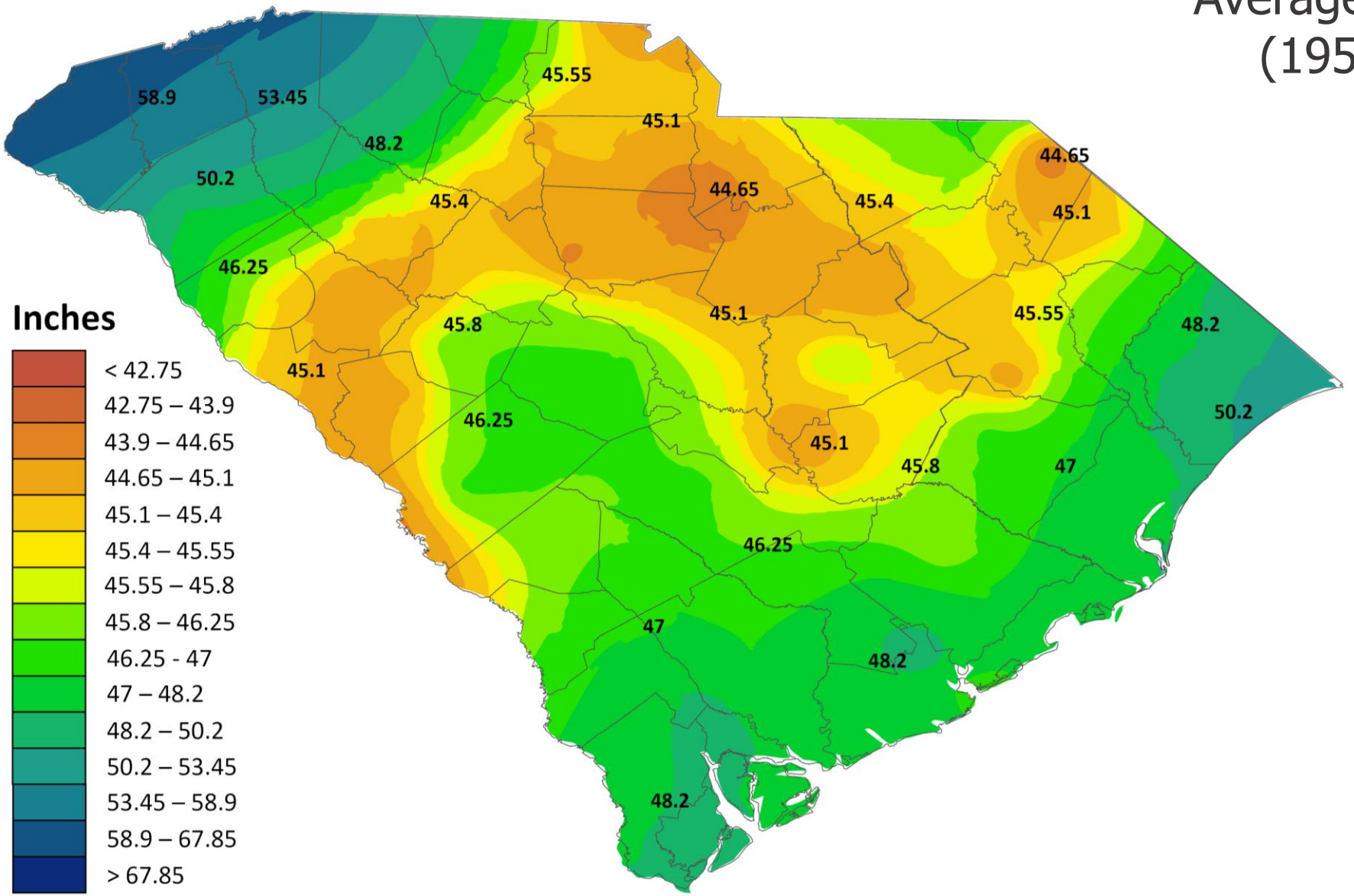
South Carolina Annual Average Precipitation (1950 – 2021)



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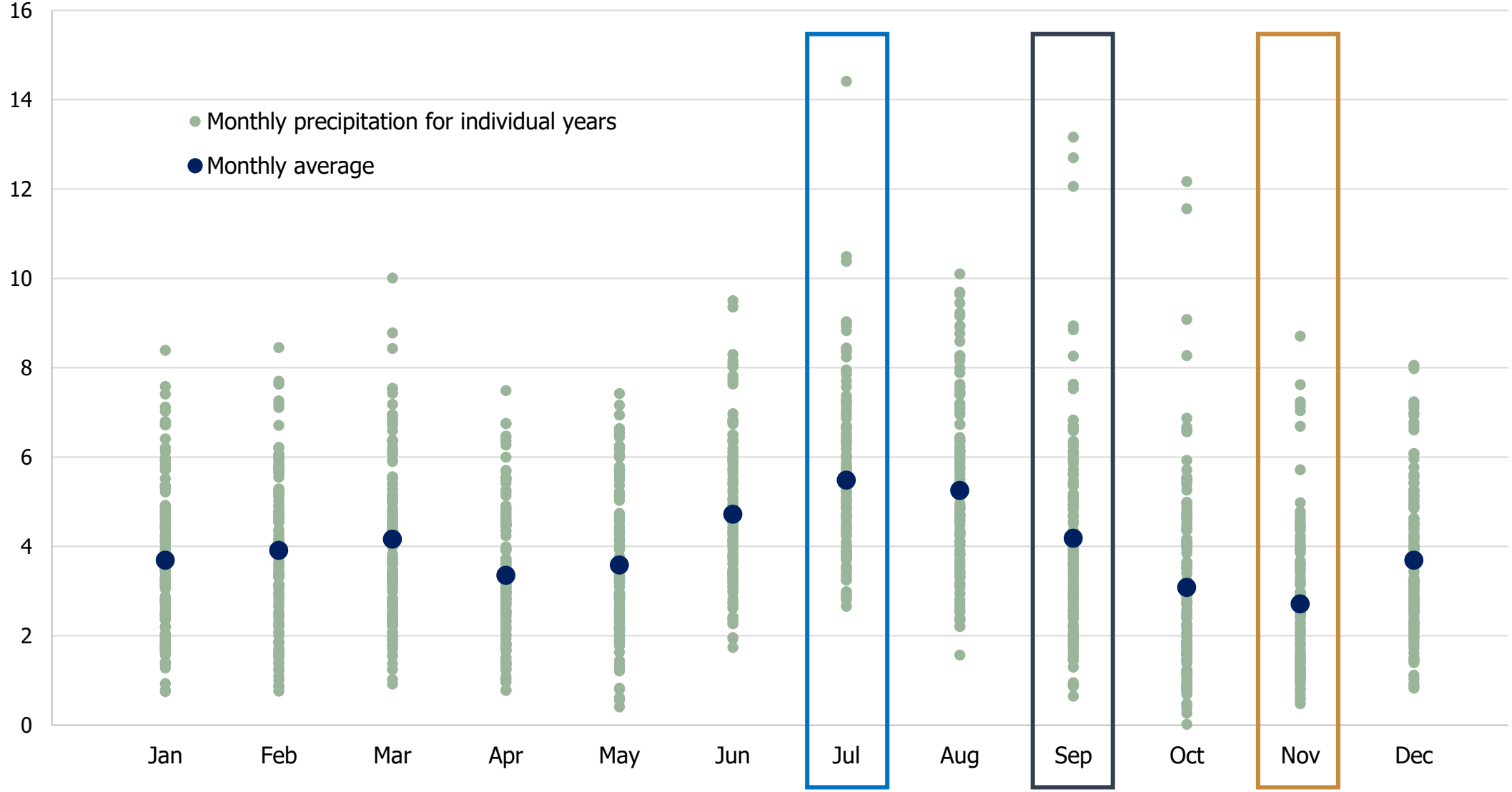
South Carolina Monthly Precipitation (1895 – 2021)



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Ten Driest Years from Long-Term Stations in South Carolina (1902 – 2020)

Note: Percent of Normal based on 1902- 2020 average of 47.85”

	Year	Rainfall Total	Percent of Normal	
★	2007	33.18”	69.35%	
	1954	33.27”	69.53%	
★	2001	33.50”	70.01%	
	1925	36.13”	75.52%	✚
	1931	37.04”	77.41%	✚
	1933	37.24”	77.84%	✚
★	2011	39.10”	81.72%	
	1986	39.74”	83.06%	
	1938	39.81”	83.21%	✚
	1921	39.93”	83.45%	✚

★ 3 of 10 driest occurred during 2001-2020

✚ 5 of 10 driest occurred during 1921-1940

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Ten Wettest Years from Long-Term Stations in South Carolina (1902 – 2020)

Note: Percent of Normal based on 1902- 2020 average of 47.85”

Year	Rainfall Total	Percent of Normal
1964	70.23”	146.79%
1929	64.73”	135.28% ✚
★ 2018	61.98”	129.54%
★ 2015	61.90”	129.38%
1959	61.10”	127.69%
★ 2020	60.77”	127.01%
1948	58.98”	123.27%
★ 2013	58.86”	123.03%
1975	58.73”	122.74%
1924	57.98”	121.19% ✚

★ 4 of 10 wettest occurred during 2001-2020

✚ 2 of 10 wettest occurred during 1921-1940

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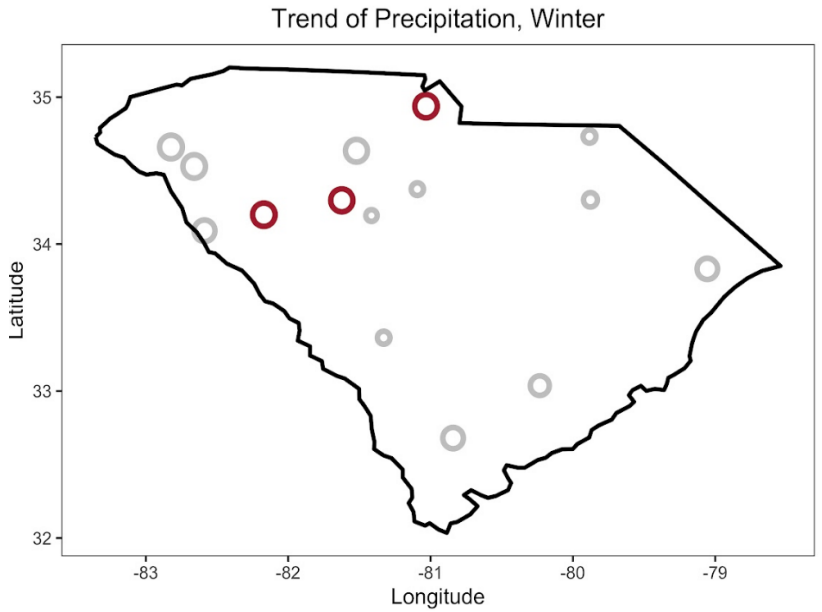

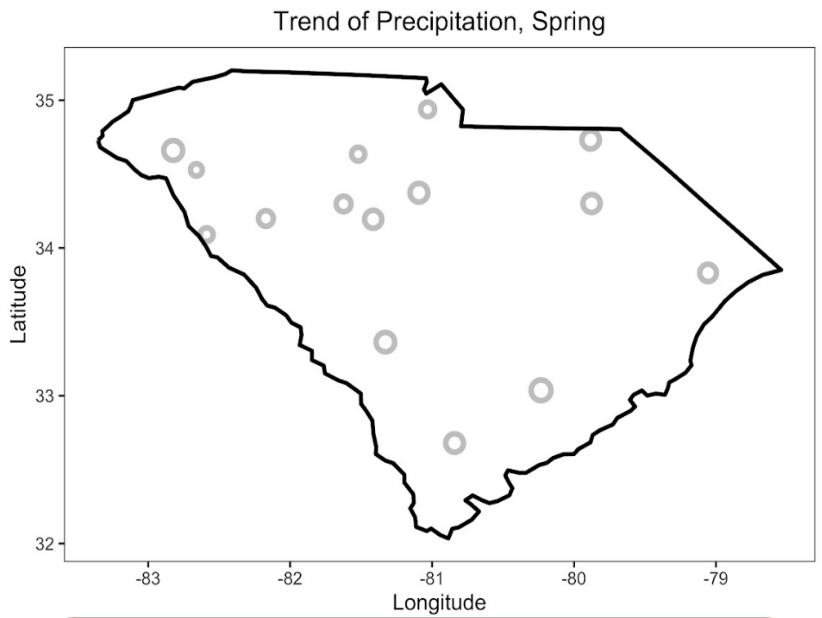

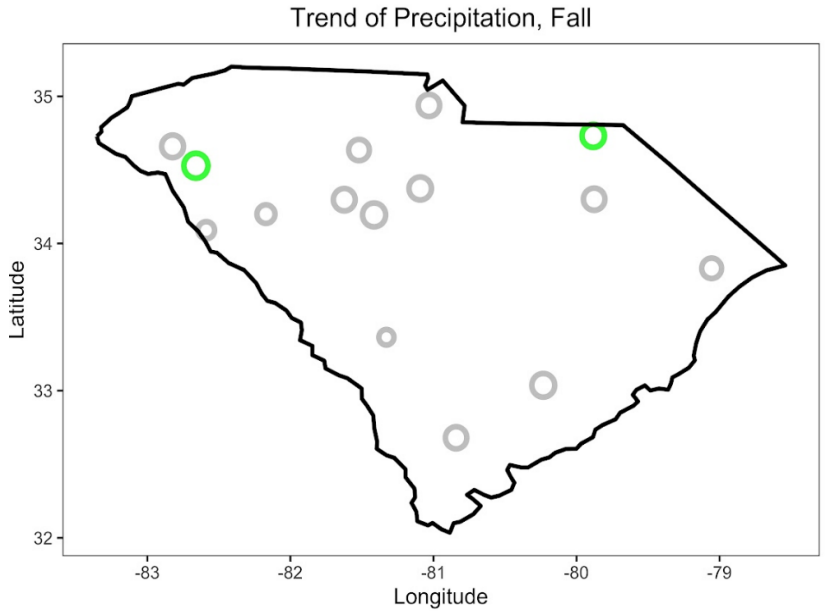

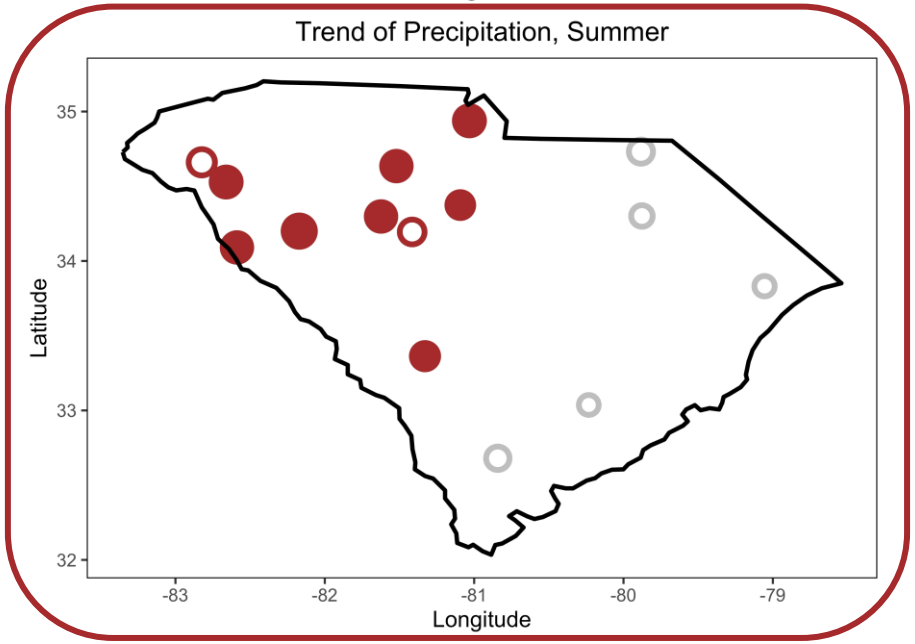

Decrease

Increase

Statistically-significant decrease

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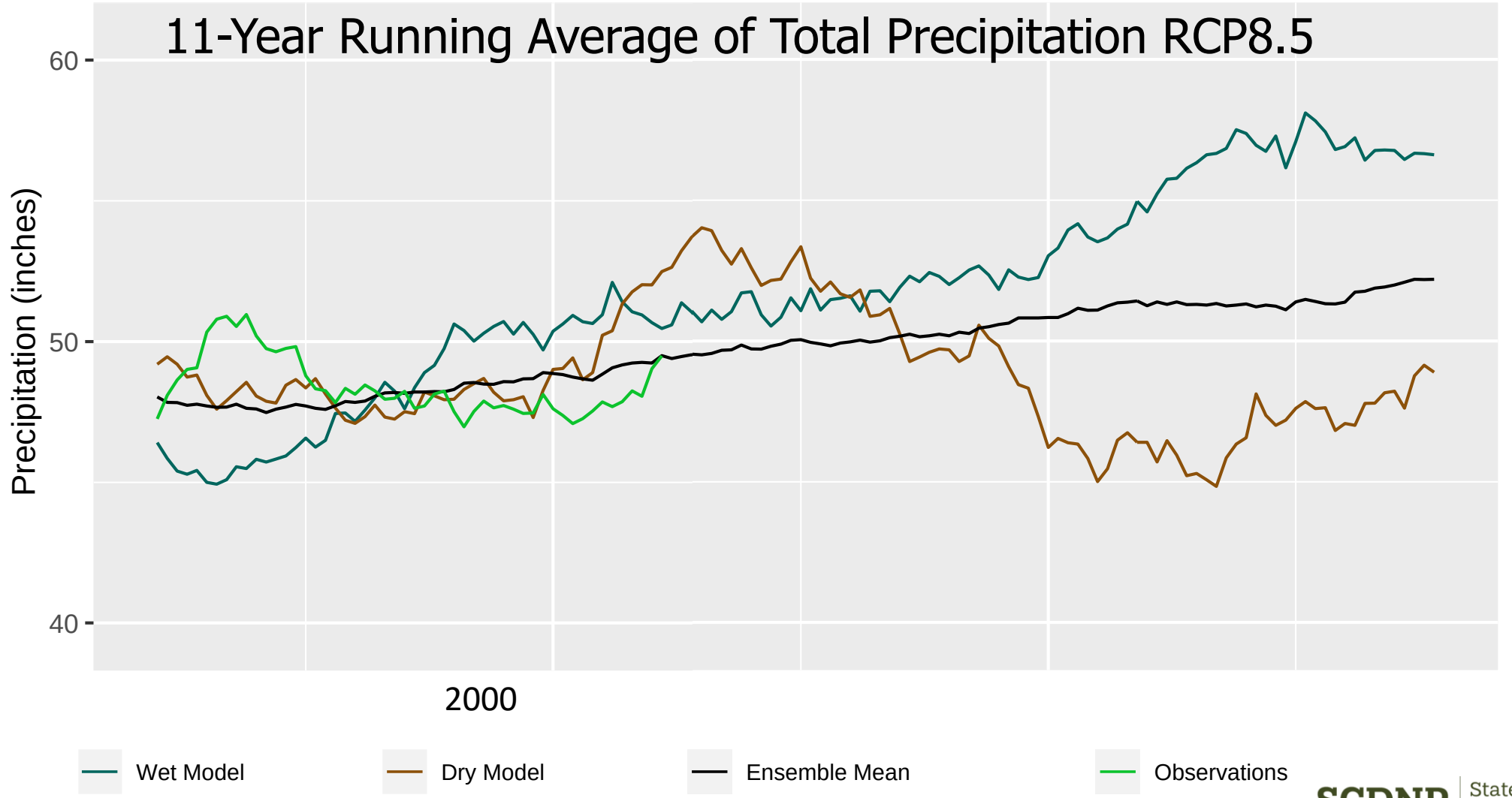
Precipitation Projections

- Modest increases in annual precipitation
- Continued annual and decadal variability



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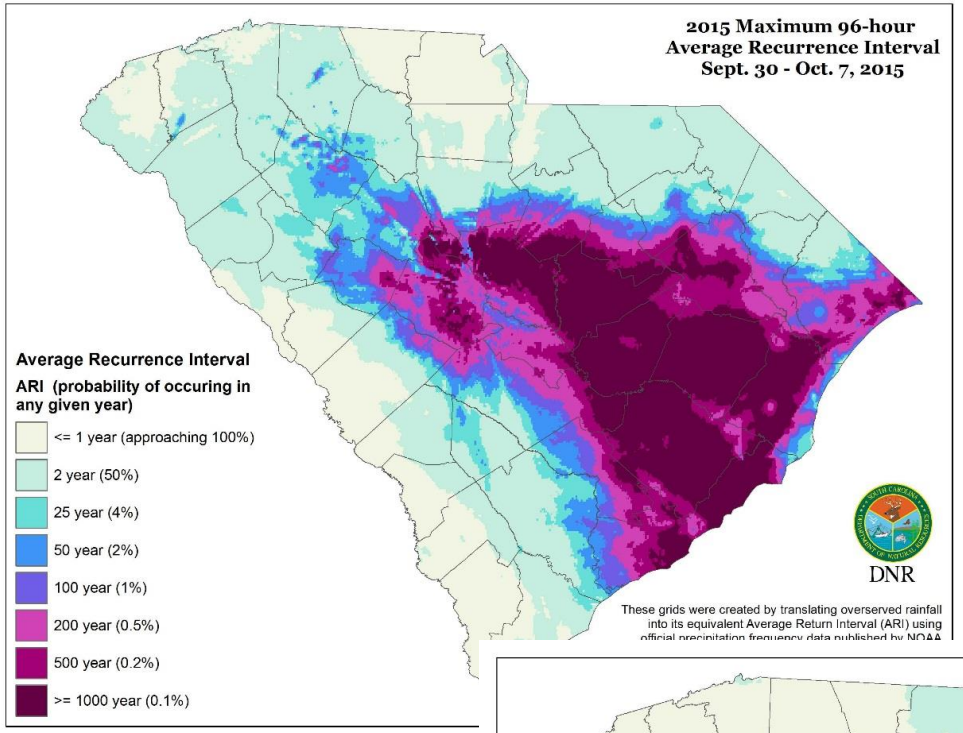
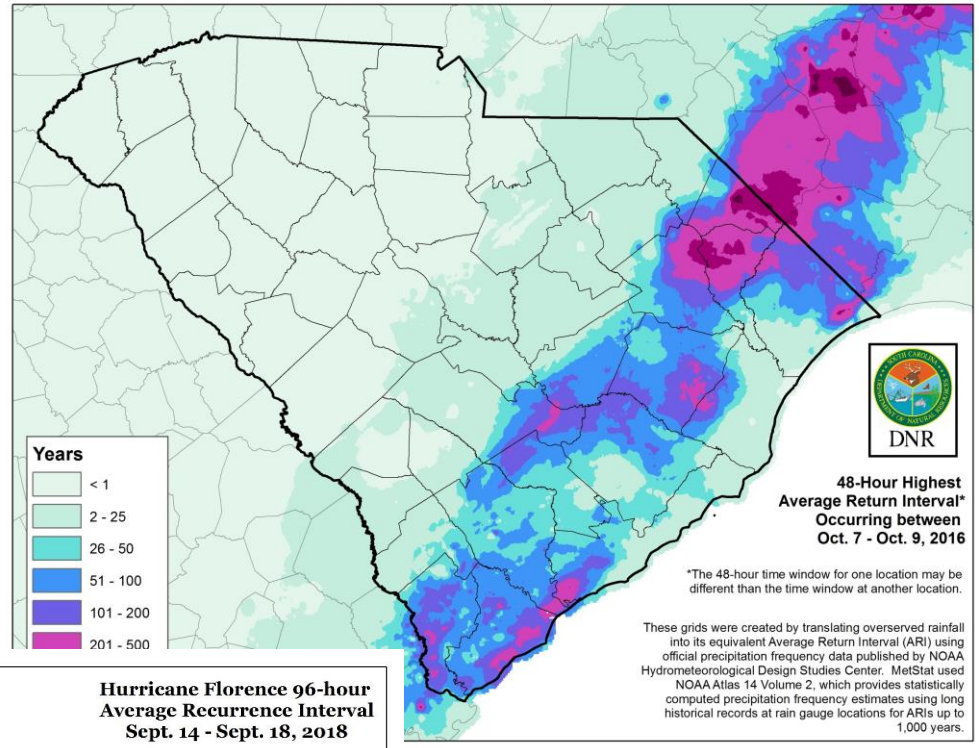
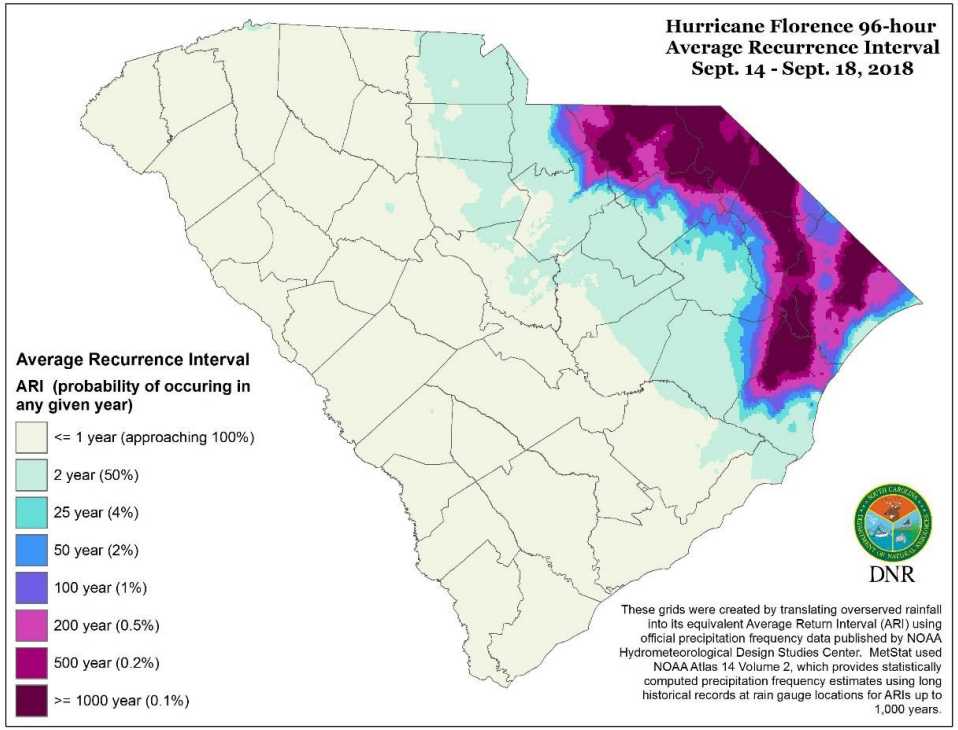
Extreme Rainfall







Areas in purple met or exceeded the 500-year event, a probability of 0.2% happening each year

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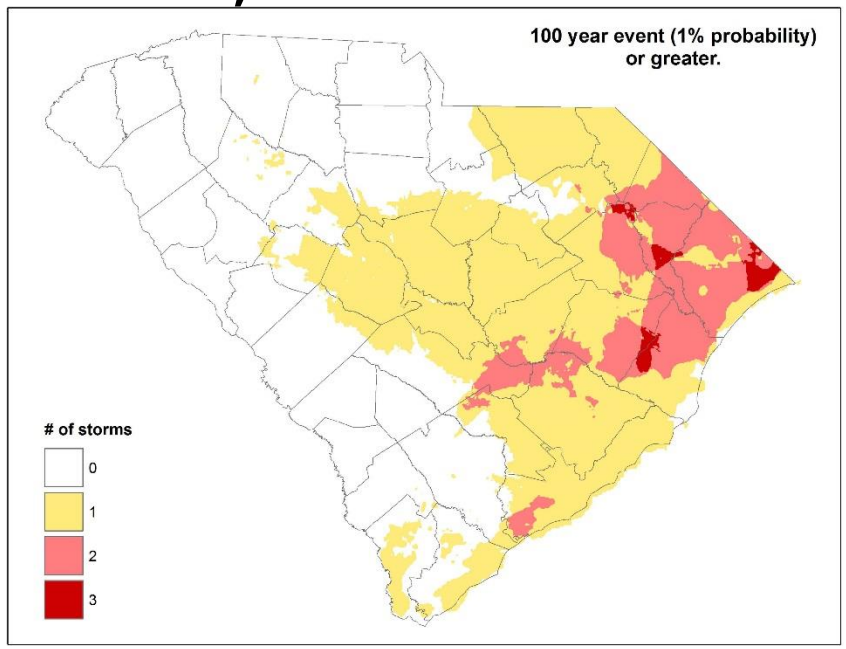
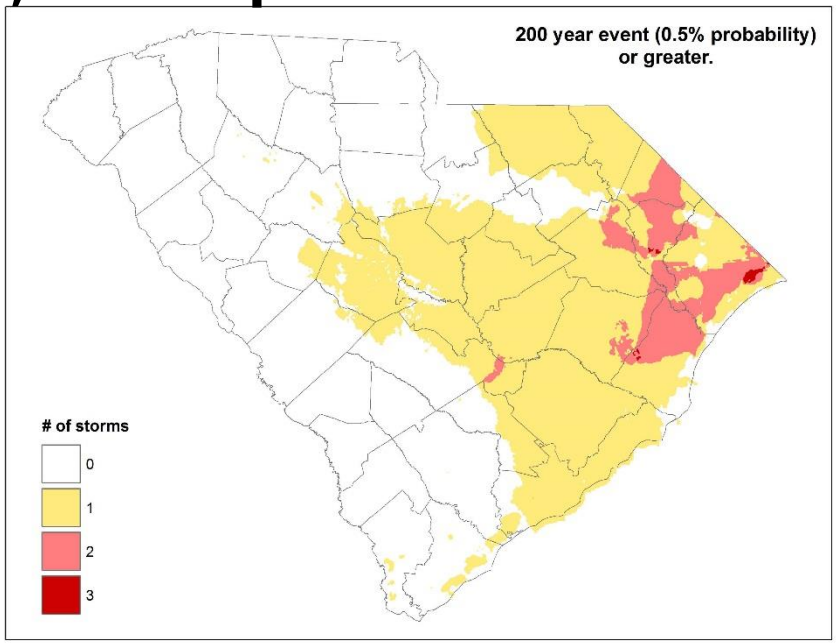
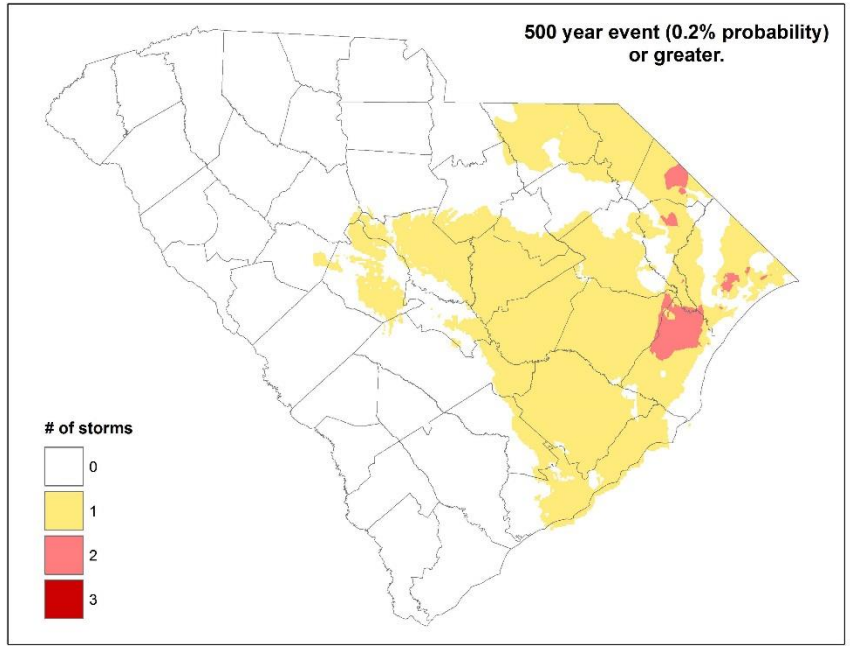
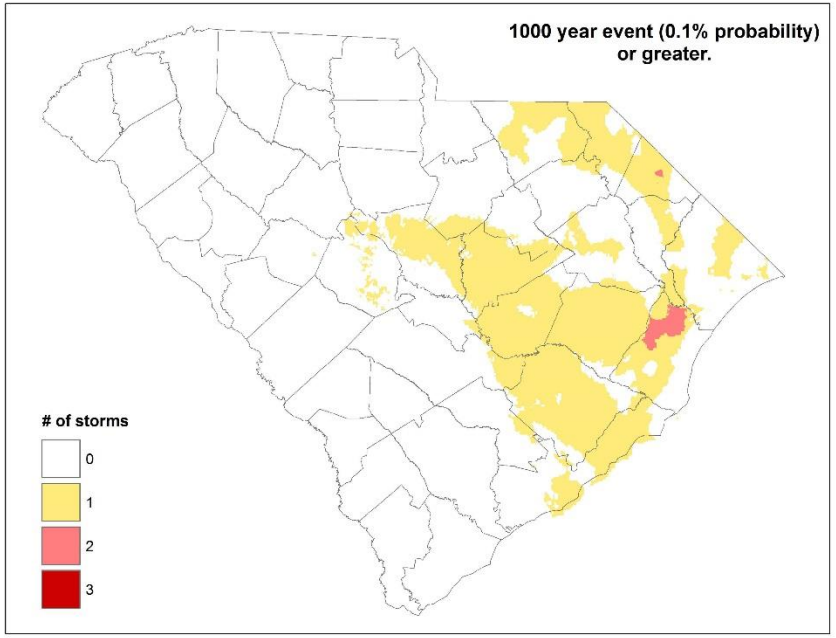
Areas impacted by one or more of the recent extreme storms (October 2015, Hurricane Matthew 2016, and Tropical Storm Florence 2018)









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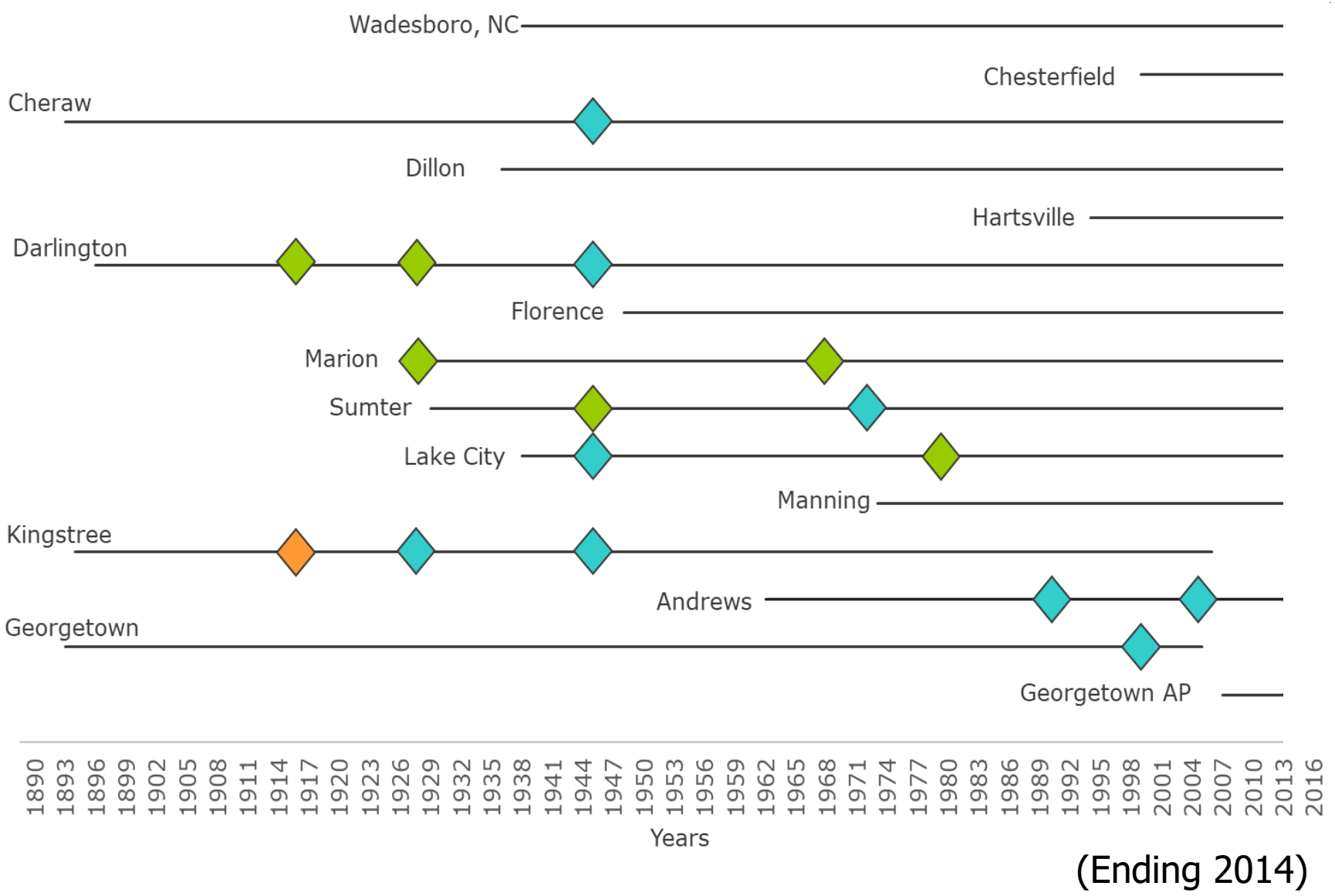
Timeline 4-day Maximum Rainfall Events Along The Pee Dee Watershed



The purposes of ARI/AEP analysis, the following scale will be used in this

Average Recurrence Intervals (AEP)

- 1,000 Year (0.1%)
- 500 Year (0.2%)
- 200 Year (0.5%)
- 100 Year (1.0%)

(Ending 2014)

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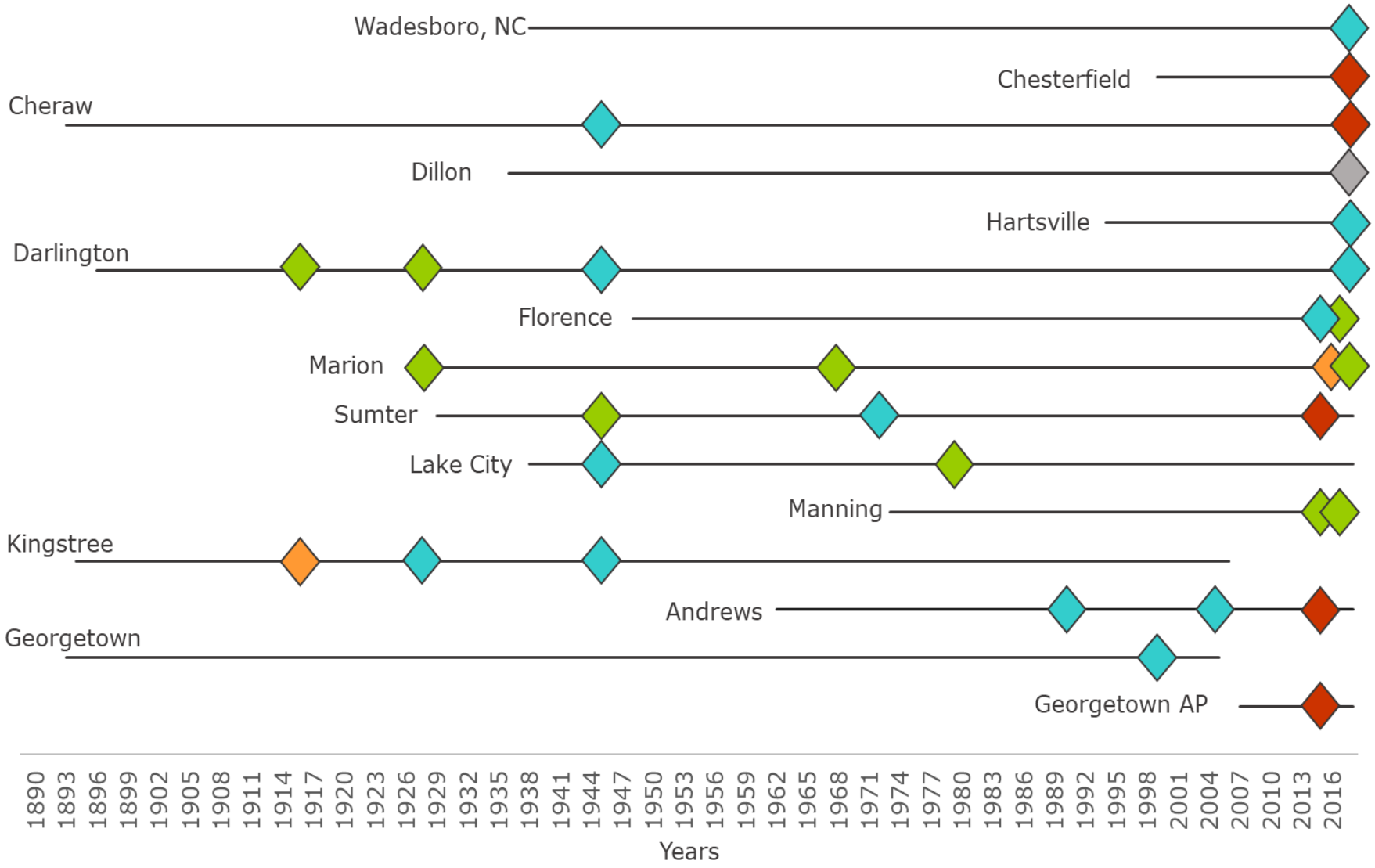
Timeline 4-day Maximum Rainfall Events Along The Pee Dee Watershed



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- 500 Year (0.2%)
- 200 Year (0.5%)
- 100 Year (1.0%)

(Ending 2020)

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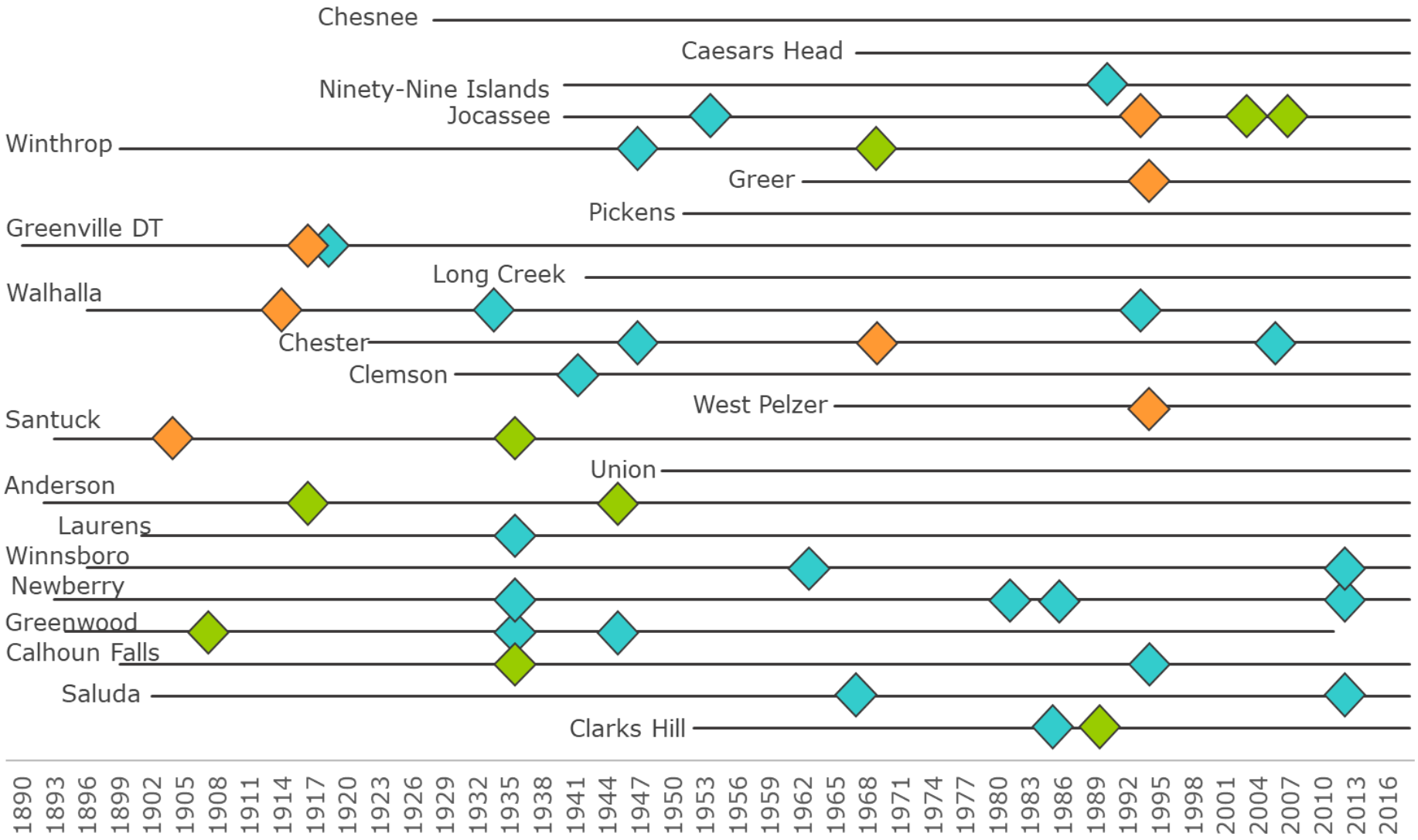
Timeline Of Maximum 4-day Rainfall Events In The Upstate



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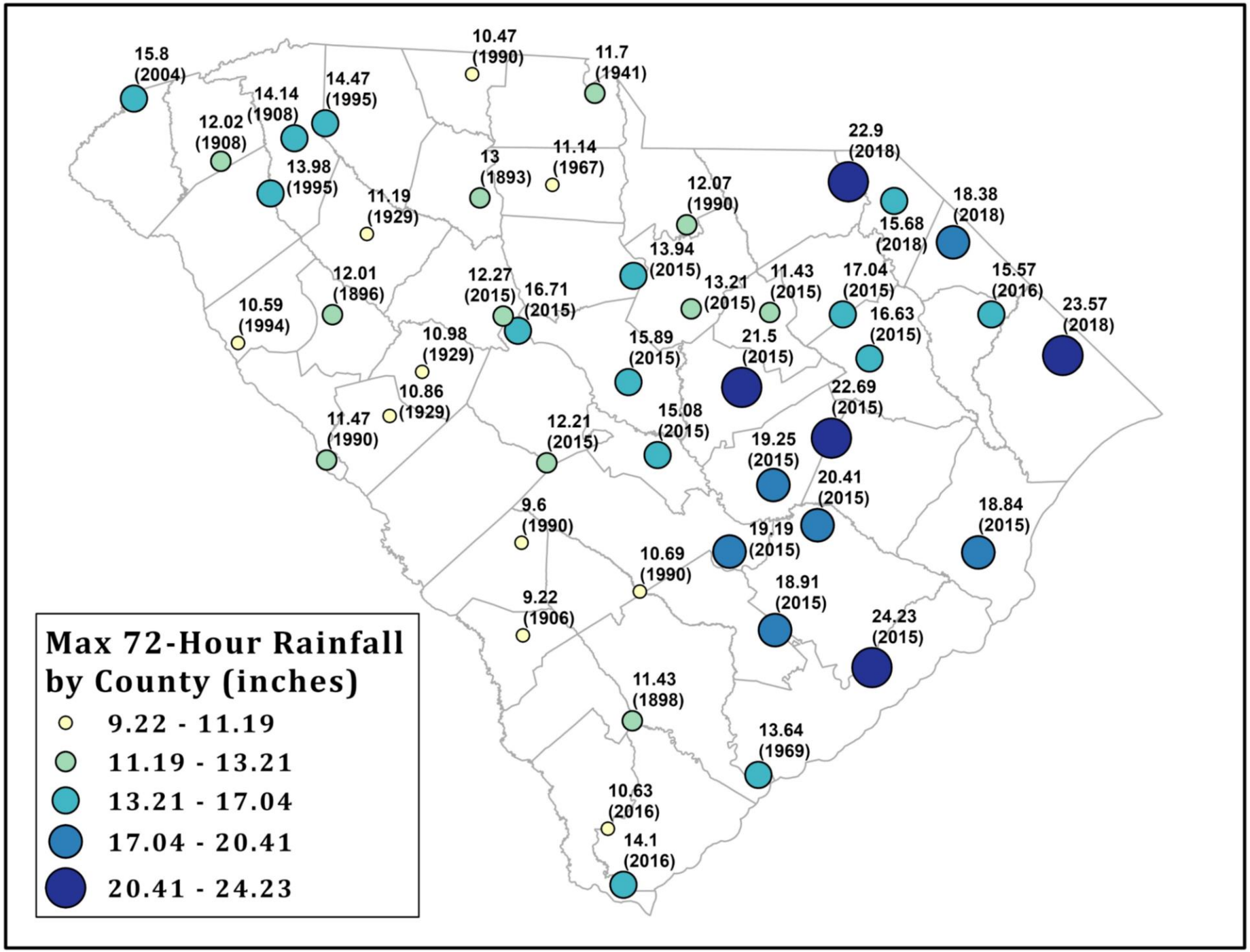

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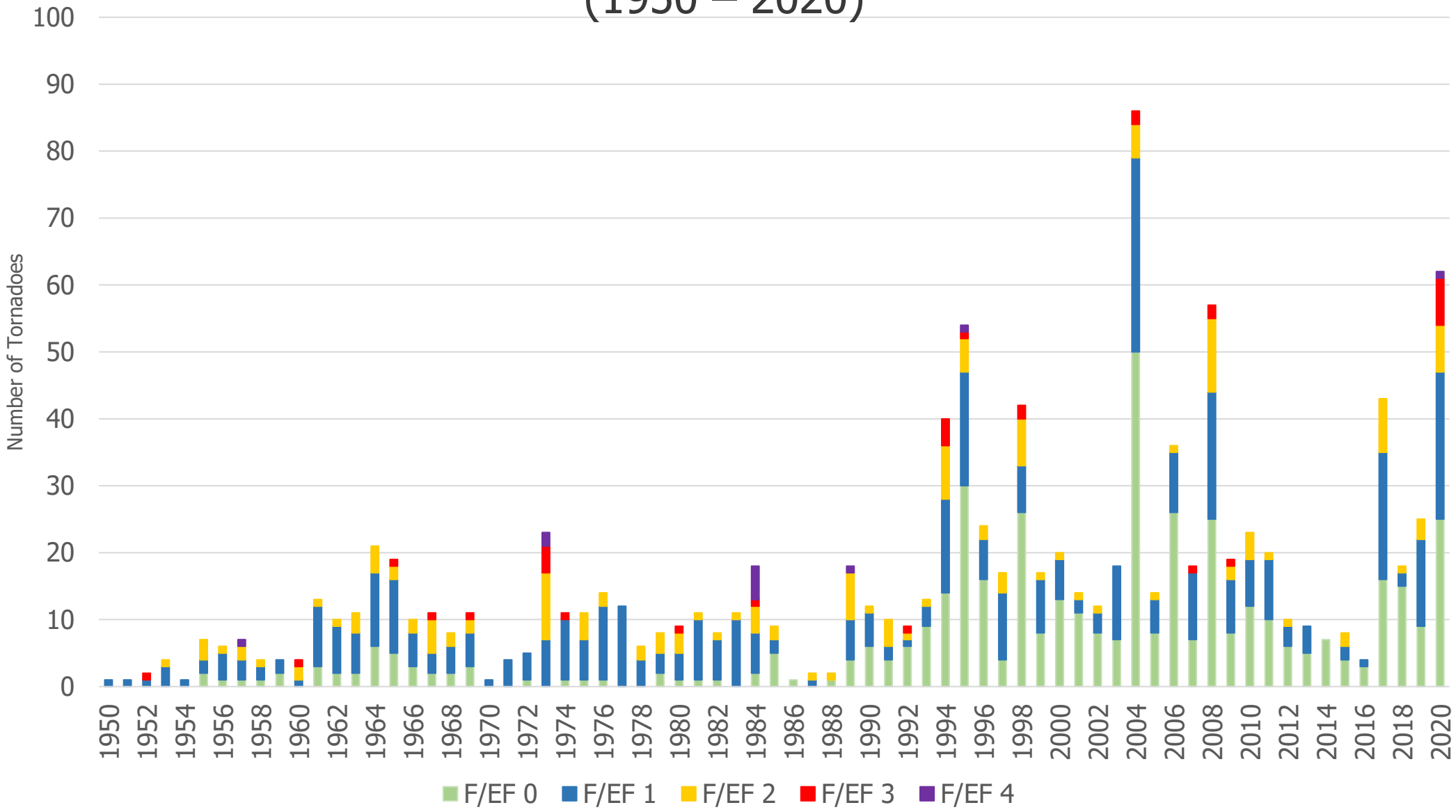
Tornadoes

Confirmed South Carolina Tornadoes (1950 – 2020)



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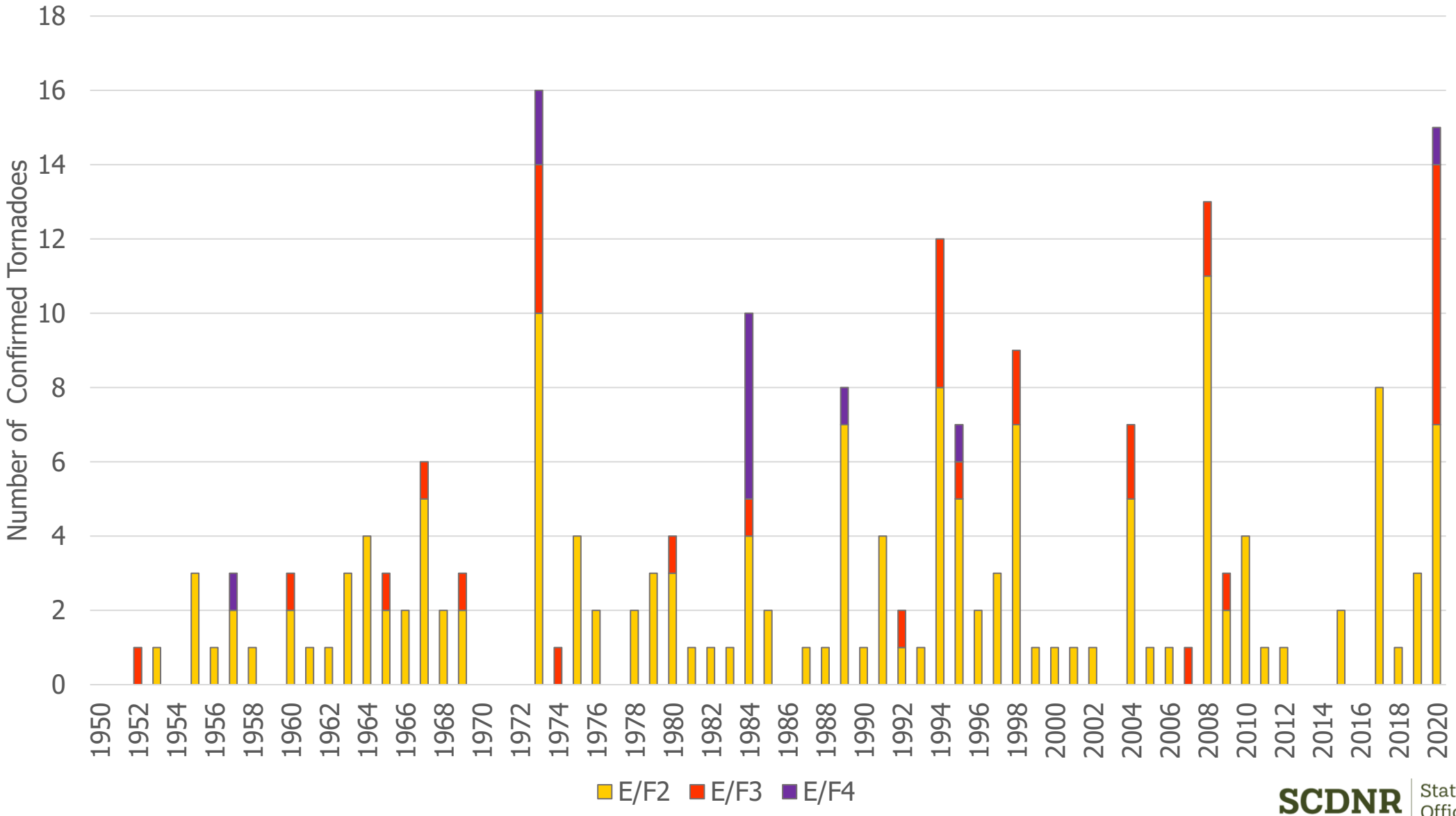
South Carolina (EF2, EF3, and EF4) Tornadoes (1950 - 2020)



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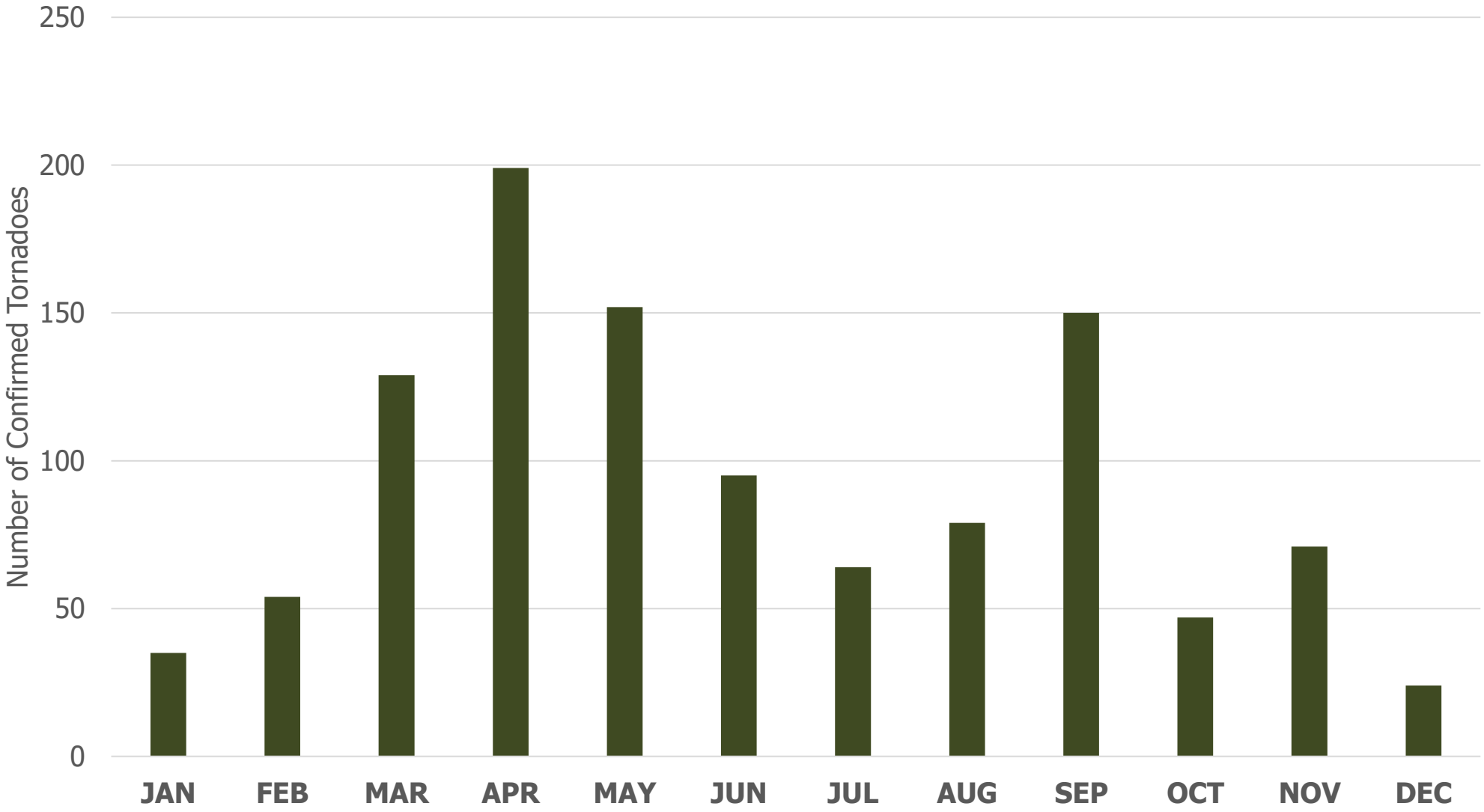
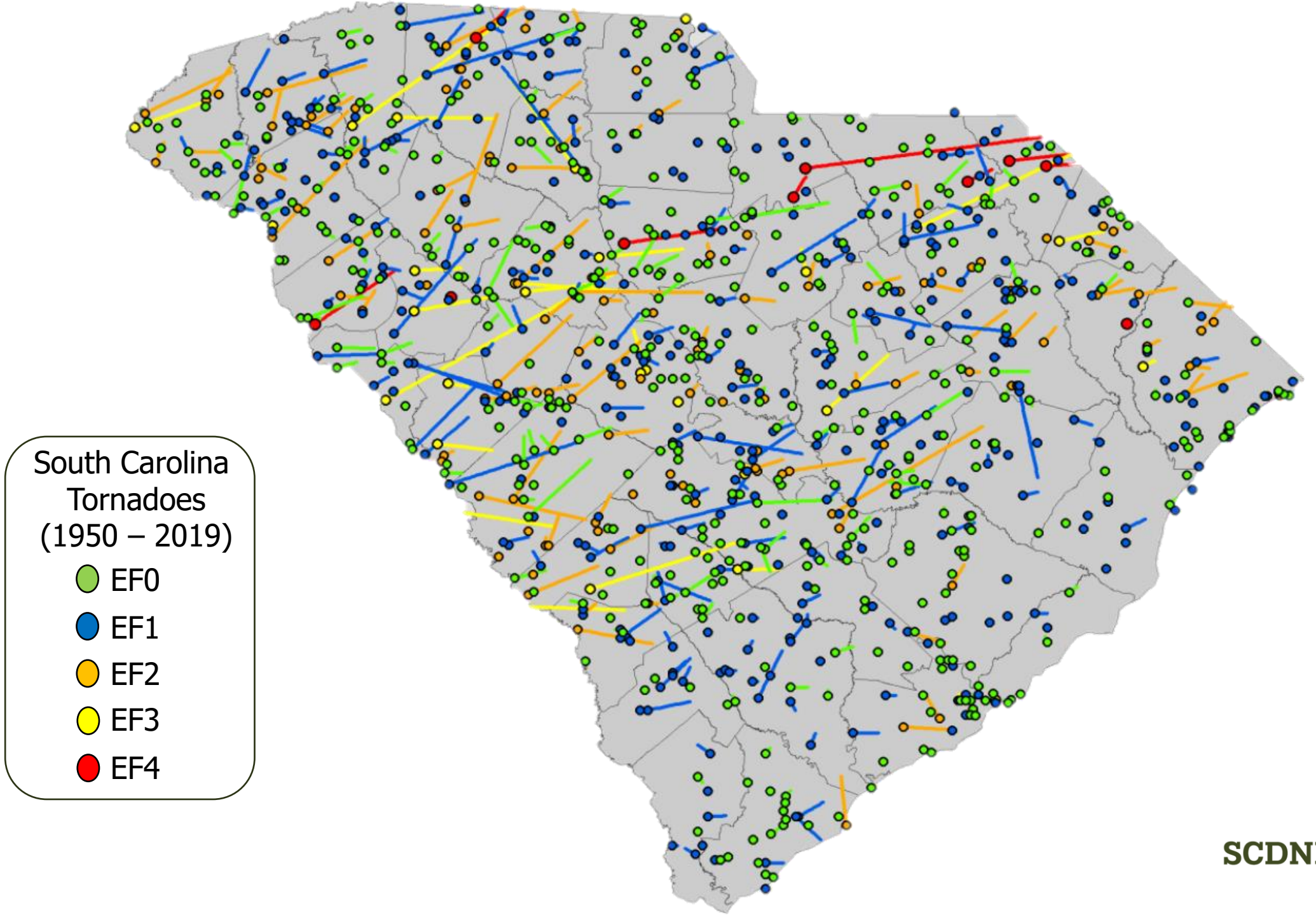
South Carolina Monthly Tornado Counts (1950 - 2020)





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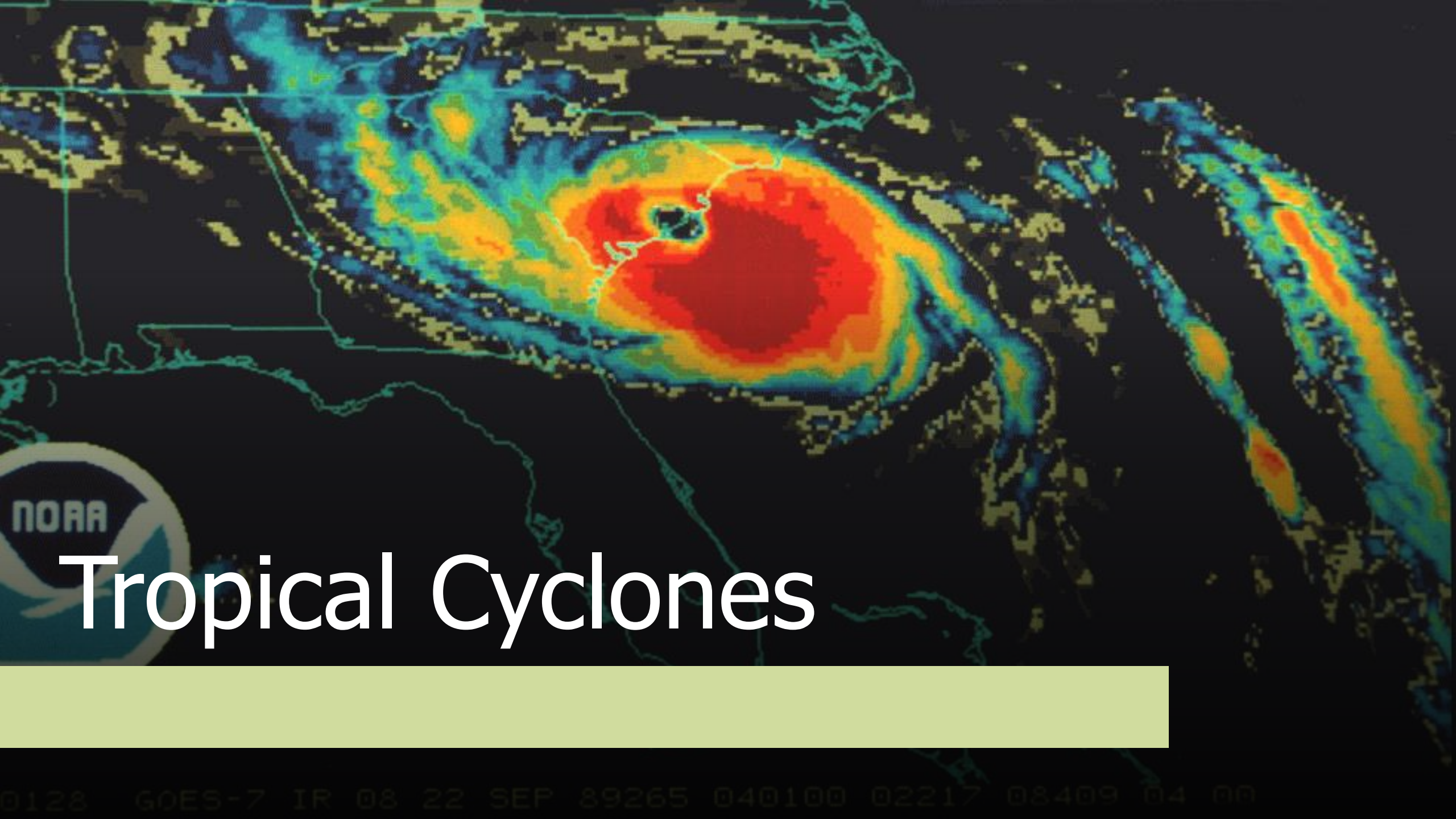


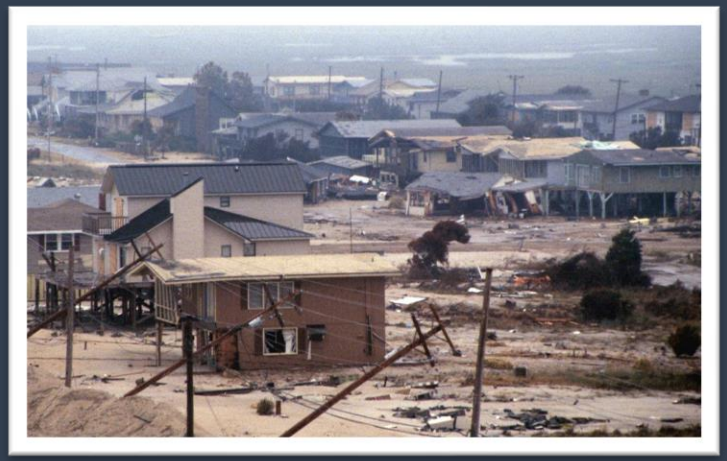
Tropical Cyclones

Tropical Storms are part of South Carolina's Climatology and History.

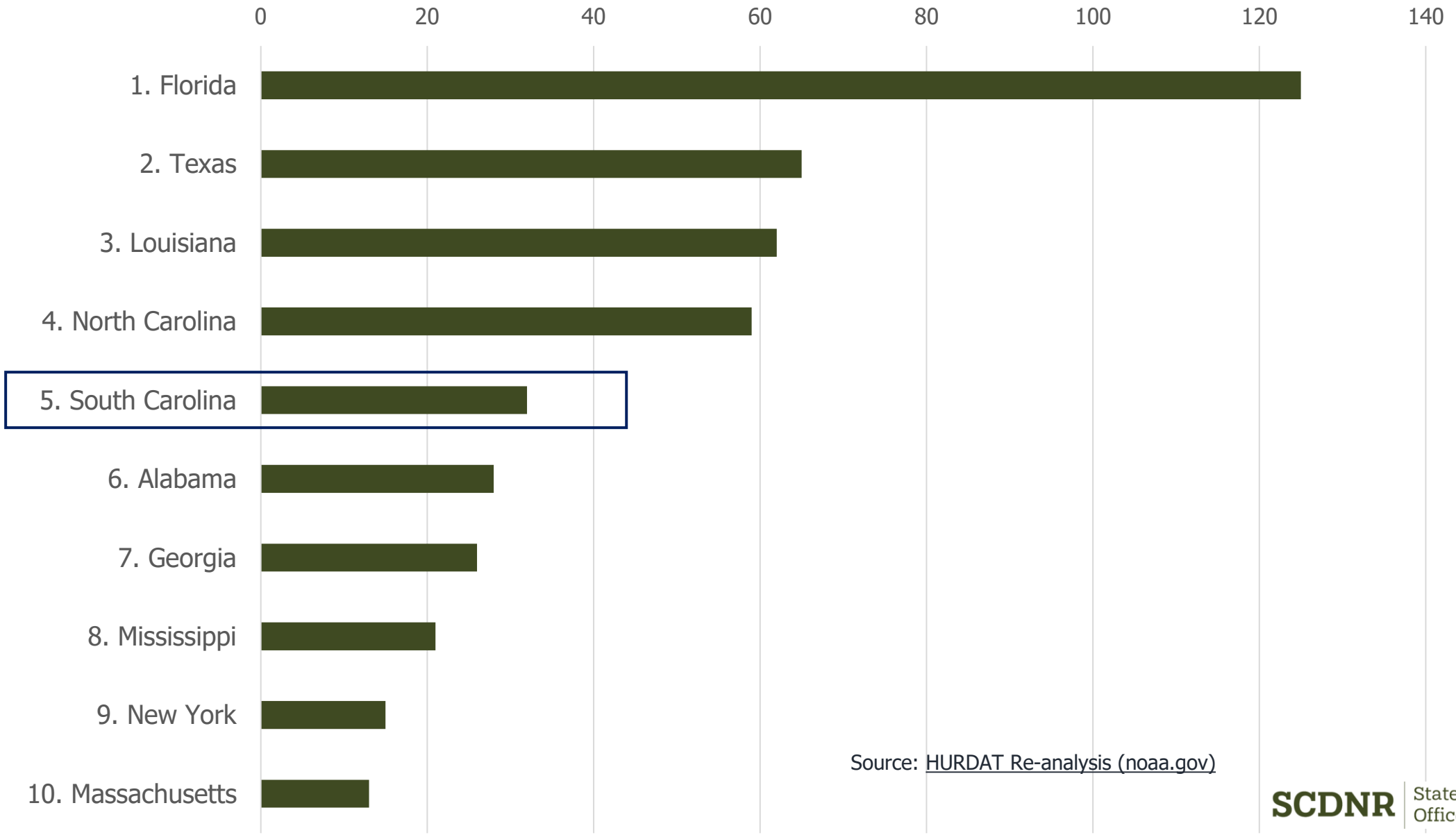
Impacts are not limited to the coast.

Inland portions of the state have been affected by:

- Heavy rains
- Flooding
- High winds
- Tornadoes



10 States Where Hurricanes Hit the Most



Source: HURDAT Re-analysis (noaa.gov)

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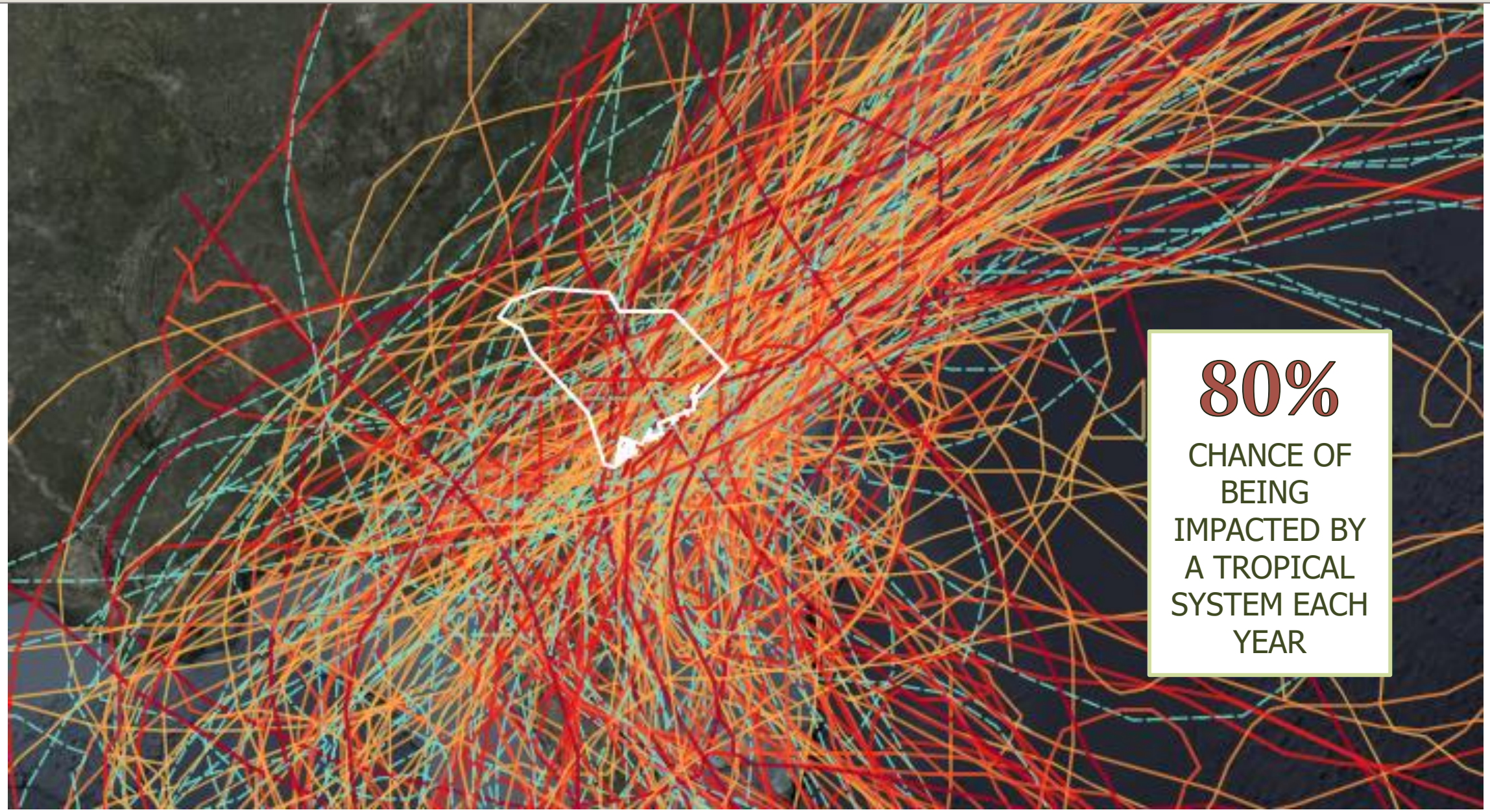
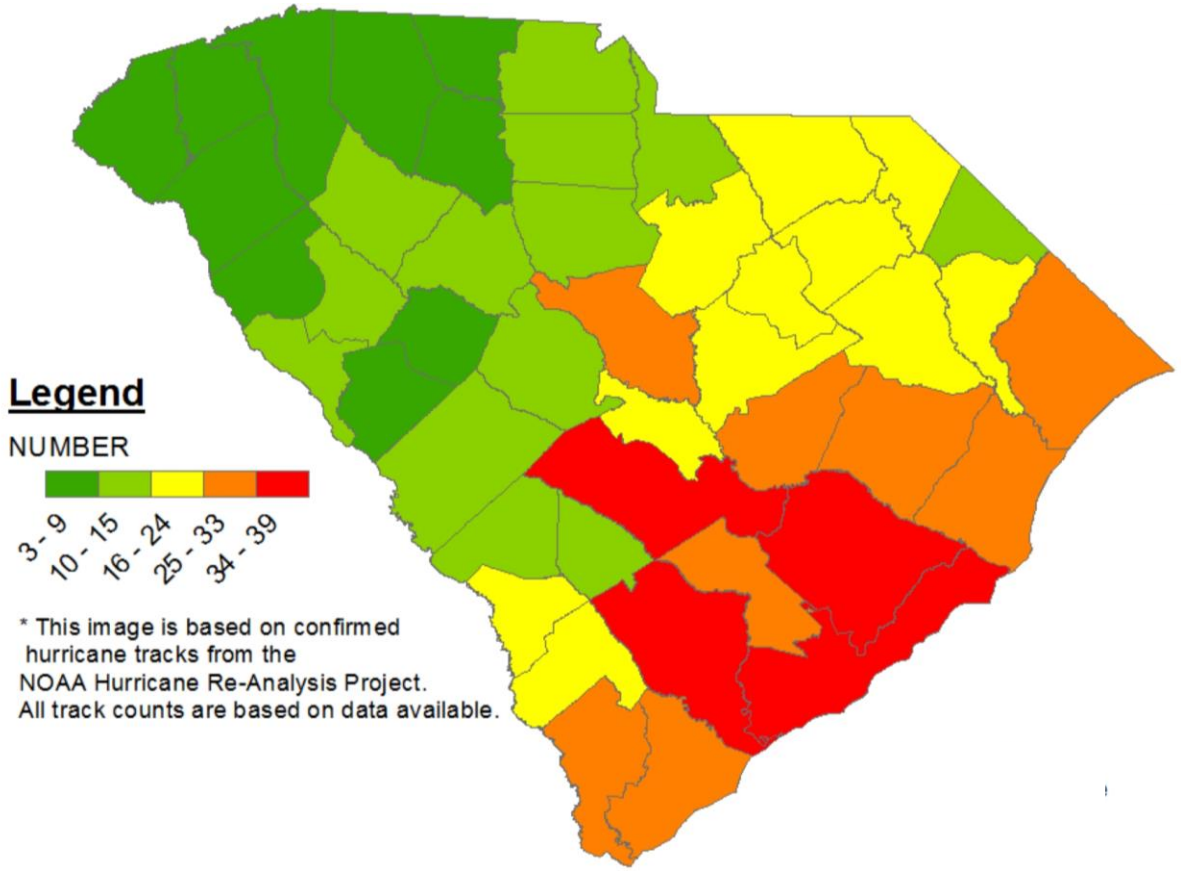
Tracks Of Tropical Cyclones To Impact South Carolina



SOUTH CAROLINA TROPICAL CYCLONES BY THE NUMBERS

*based on
1851-2021 period of record



THE BREAKDOWN:

260 SYSTEMS HAVE IMPACTED SC

138 HAVE TRACKED INTO THE STATE

60 WERE CATEGORY 1 OR HIGHER

44 MADE DIRECT LANDFALL ON THE COAST

4 MAJOR (CAT. 3+) LANDFALLS

Thank you

Email: wickhame@dnr.sc.gov Cell: 803-465-1098