

Climatology of South Carolina

Upper Savannah River Basin Council

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 South Carolina State Climatology Office
 SC Department of Natural Resources
 October 11th, 2023

BAROMETER		THERMOMETER				WIND				DEW POINT		WEATHER		REMARKS		
NO.	RED.	W.	S.	N.	E.	DIR.	VEG.	NO.	DIR.	VEG.	NO.	DIR.	VEG.	NO.	DIR.	VEG.
2021	30.2	64	62	58	65	53	66	54.0	S.E. 2	S.E. 3	Cloudy					
2022	30.1	61	72	68	62	74	63	59.2	N. 1	S.E. 2	Fair					
2023	30.0	62	57	53	62	57	57	55.7	S.E. 2	N.E. 3	Rain 0.18					
2024	30.0	57	56	53	57	56	47	47.2	S.E. 2	N.E. 3	Cloudy					
2025	30.0	56	61	57	54	61	57	50.8	S.E. 2	N.E. 3	Cloudy					
2026	30.0	58	62	57	58	62	57	53.3	E. 2	N.E. 3	Rain 0.75					
2027	30.0	61	61	62	61	62	52	55.7	S. 1	S.E. 2	Rain 1.64					
2028	30.0	58	61	58	61	61	53	56.8	S.E. 1	N.E. 2	Rain 2.07					
2029	30.0	51	59	51	62	58	46	45.7	N.W. 2	N.N. 3	Fair					
2030	30.0	54	65	61	54	65	48	48.3	N.W. 2	N.W. 2	Fair					
2031	30.0	53	60	52	61	60	47	48.0	E. 2	S.E. 3	Cloudy					
2032	30.0	63	67	63	72	64	55	60.2	S.E. 2	S.E. 3	Rain 0.55					
2033	30.0	63	70	64	63	72	64	60.2	N.W. 1	N.W. 2	Fair					
2034	30.0	56	64	56	71	64	50	49.2	N.W. 1	E. 2	Fair					
2035	30.0	60	75	70	61	75	70	57.7	S.E. 1	E. 2	Rain 0.35					
2036	30.0	67	70	58	67	70	56	61.8	S. 2	N.W. 3	Rain 0.42					
2037	30.0	55	53	49	58	43	53	43.3	N.W. 3	N.W. 4	Cloudy					
2038	30.0	65	66	50	64	66	44	44.3	S.W. 2	S.W. 4	Fair					
2039	30.0	64	66	61	64	65	60	57.7	N.W. 1	N.W. 3	Cloudy					
2040	30.0	65	65	48	62	55	62	40.0	S.E. 2	S.W. 3	Fair					
2041	30.0	62	62	53	67	62	45	64.0	S. 2	S. 2	Fair					
2042	30.0	58	76	69	58	77	65	54.0	S.W. 1	S.W. 2	Fair					
2043	30.0	64	75	70	65	79	69	61.0	S.W. 1	S.W. 2	Fair					
2044	30.0	67	82	73	67	83	73	60.7	N. 1	S.W. 2	Fair					
2045	30.0	65	73	66	65	73	66	60.0	S.E. 2	E. 3	Fair					
2046	30.0	60	74	71	61	75	71	58.7	E. 1	E. 2	Fair					
2047	30.0	70	80	73	71	81	73	66.5	S.W. 1	S. 2	Cloudy					
2048	30.0	70	76	68	70	76	67	64.8	N. 1	N.W. 2	Rain 0.16					
2049	30.0	69	75	69	60	76	69	54.3	E. 2	S.E. 2	Fair					
2050	30.0	68	75	69	62	75	63	61.7	S.W. 1	S.W. 2	Fair					

Abstracts for	Barometer	Thermometer	Register	Dew Point	Winds	Remarks
1. Cloudy most of the day & at night.						
2. Pleasant and clear day.	Maximum					
3. Cloudy and cold - Rain before daylight.	Minimum					
4. Cloudy and disagreeable day.	Range					
5. Cloudy and unpleasant day.						
6. Cloudy morning - Rain after 3 P.M.						
7. Rain all day - very disagreeable.	Thermometer					
8. Rain all day - Heavy and continued showers.	Mean, 7 P.M. 59.20 - 2 P.M.					
9. Clear, cool and cloudless day.	Hottest Day, 24th - 6					
10. Beautiful and pleasant day.						
11. Cloudy most of the day.						
12. Rain most of the day - Bombardment of Sumter!	Thermometer					
13. Cloudless day - Surrender of Fort Sumter!	Mean, 7 P.M. 59.50 - 2 P.M.					
14. Bright & cloudless Sabbath - Evacuation of F Sumter!	Maximum, 7 P.M. 71.20					
15. Bright morning - Cloudy & rain after 4 P.M.	Minimum, 7 P.M. 48.0					
16. Rain, disagreeable but windy after 4 P.M.						
17. Cloudy most of the day - wind high.						
18. Bright and pleasant day - high wind.	Register					
19. Cloudy most of the day - clear after 4 P.M.	Mean Night, 53.76 -					
20. Cloudless and beautiful day.						
21. Beautiful and cloudless Sabbath day.	Dew Point					
22. Clear and delightful day.	Mean					
23. Bright and pleasant day.						
24. Cloudless and warm day.						
25. Clear and pleasant day.	Winds					
26. Bright and cloudless day.	Winds					
27. Cloudy with light shower in morning - Clear afterwards.	North 0.					
28. Rain at 4 A.M. - Clear & cloudless afterwards.	South east 7.					
29. Cloudless and delightful day.	South west 6.					
30. Warm and cloudless day.	South 3.					
	South east 2.					
	South west 5.					
	East 4.					
	West 3.					
	Weather					
	Fair, 15 days - Cloudy, 7					
	Variable months -					
	Quantity of					
	Inches					

April 1861
 Charleston Board of Health Daily Weather Observations

from the "remarks" column:
 April 12-"Rain most of the day, Bombardment of Sumter!"
 April 13-"Cloudless day, Surrender of Fort Sumter!"
 April 14-"Bright and cloudless Sabbath, Evacuation of F Sumter!"



SC State Climatology Office Team



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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

Coordinate and collect weather observations for the purpose of climate monitoring

2

Summarize and disseminate weather and climate information

3

Perform climate and weather impact assessments

4

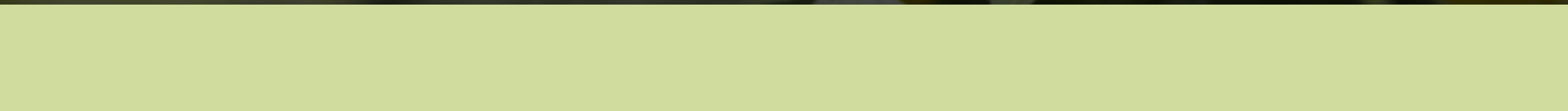
Demonstrate the value of climate information in the decision-making process

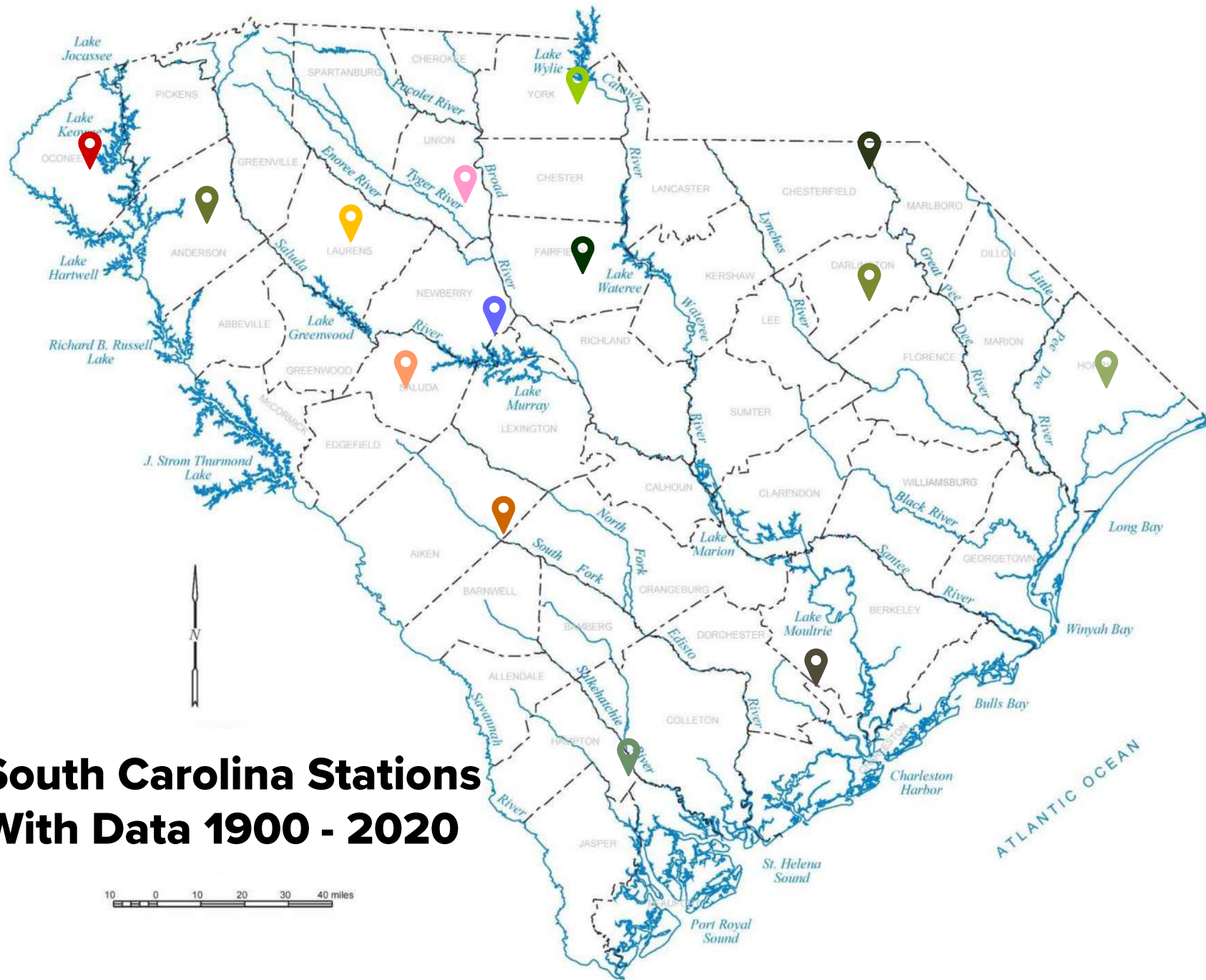
5

Conduct applied climate research



Temperatures





Anderson

Blackville

Cheraw

Conway

Darlington

Laurens

Little Mountain

Saluda

Santuck

Summerville

Walhalla

Winnsboro

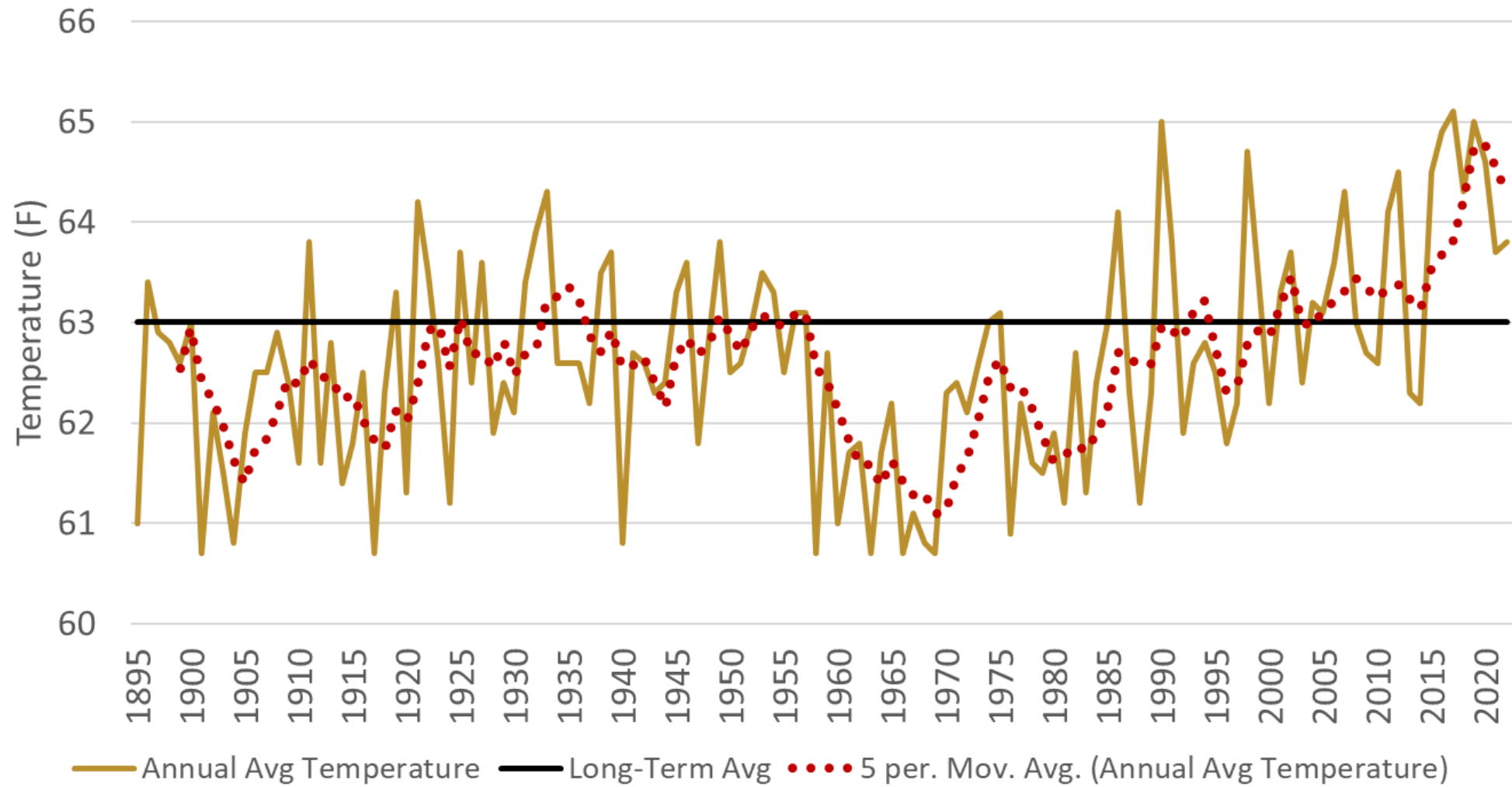
Winthrop University

Yemassee

South Carolina Stations With Data 1900 - 2020

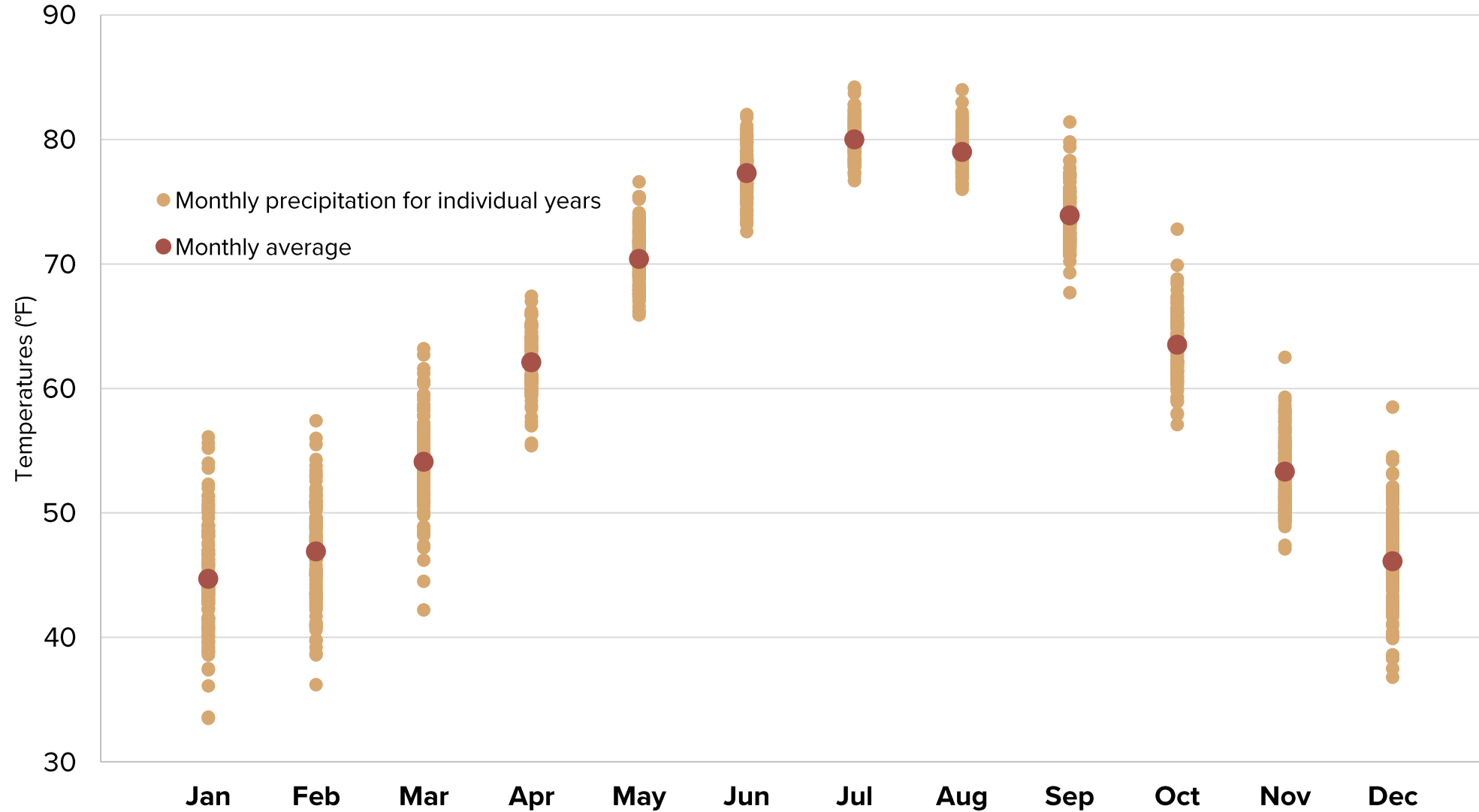
0 10 20 30 40 miles

South Carolina Annual Average Temperature (1895-2022)

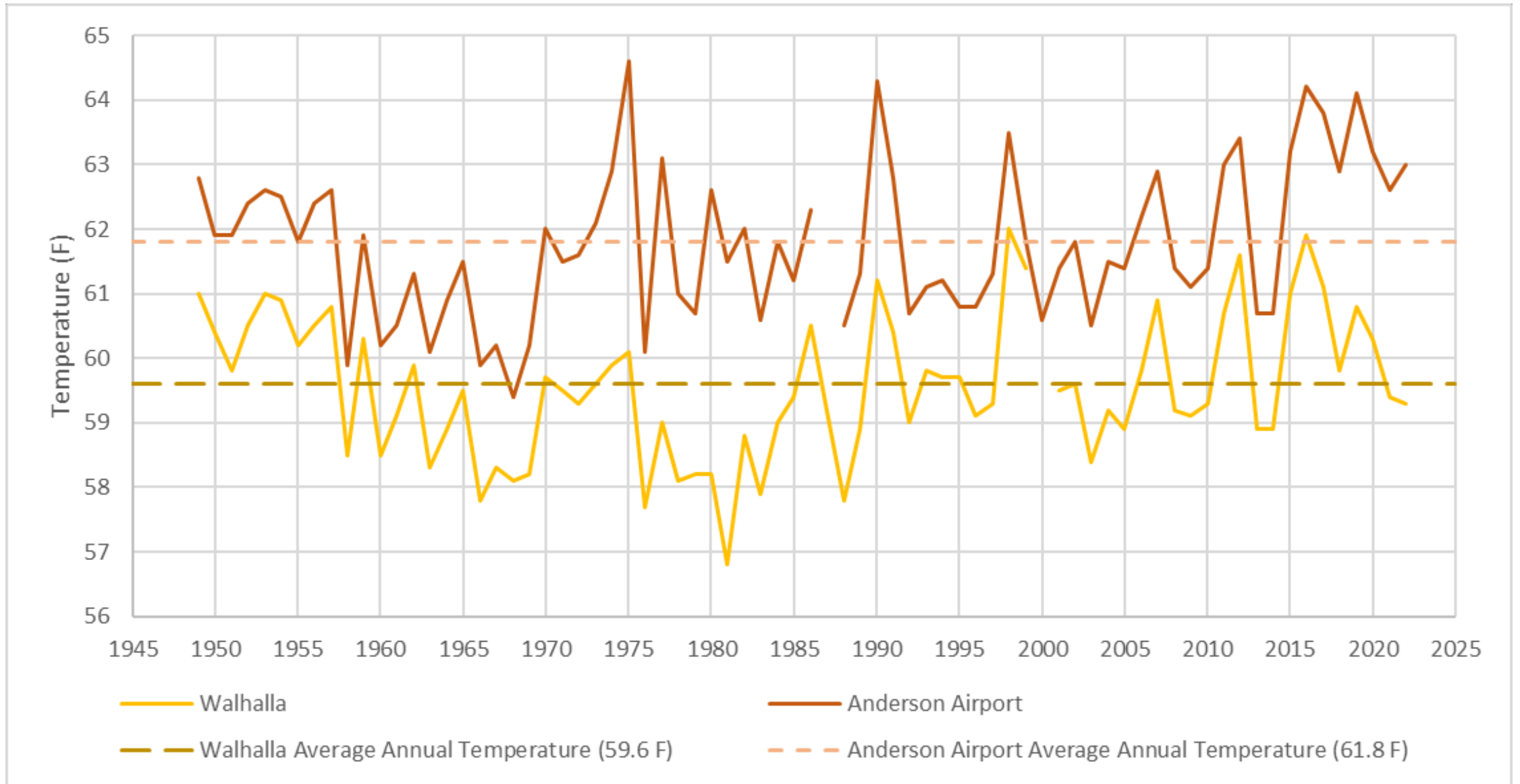


**SC has warmed one degree Fahrenheit over the past 120 years.
This is less than Earth as a whole, which has warmed nearly two degrees.**

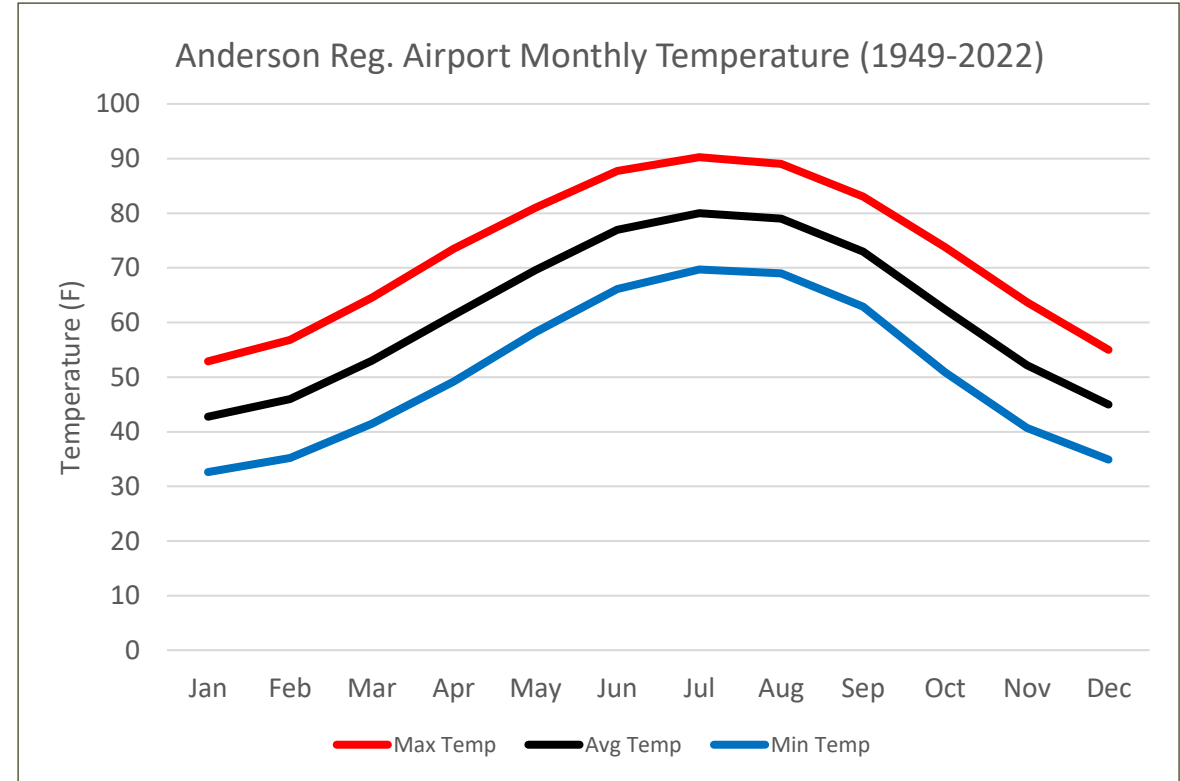
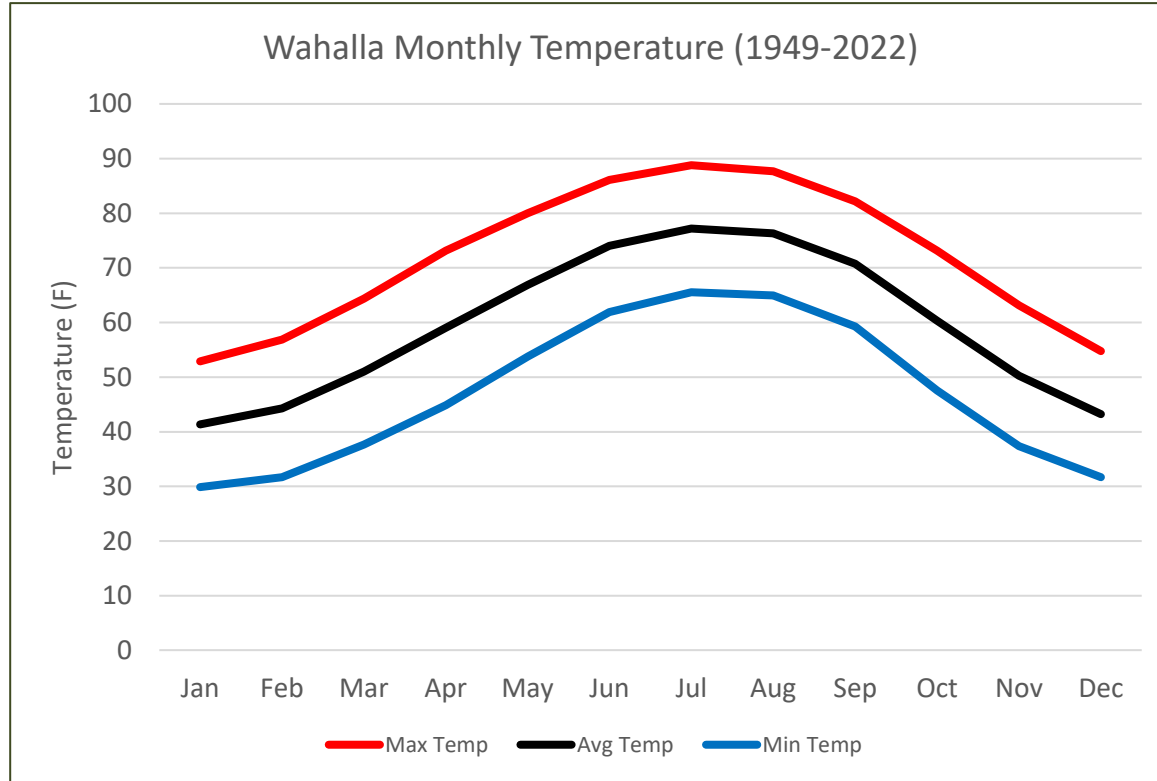
South Carolina Monthly Average Temperature (1895 – 2022)



Walhalla and Anderson Regional Airport Annual Average Temperature (1949 – 2022)



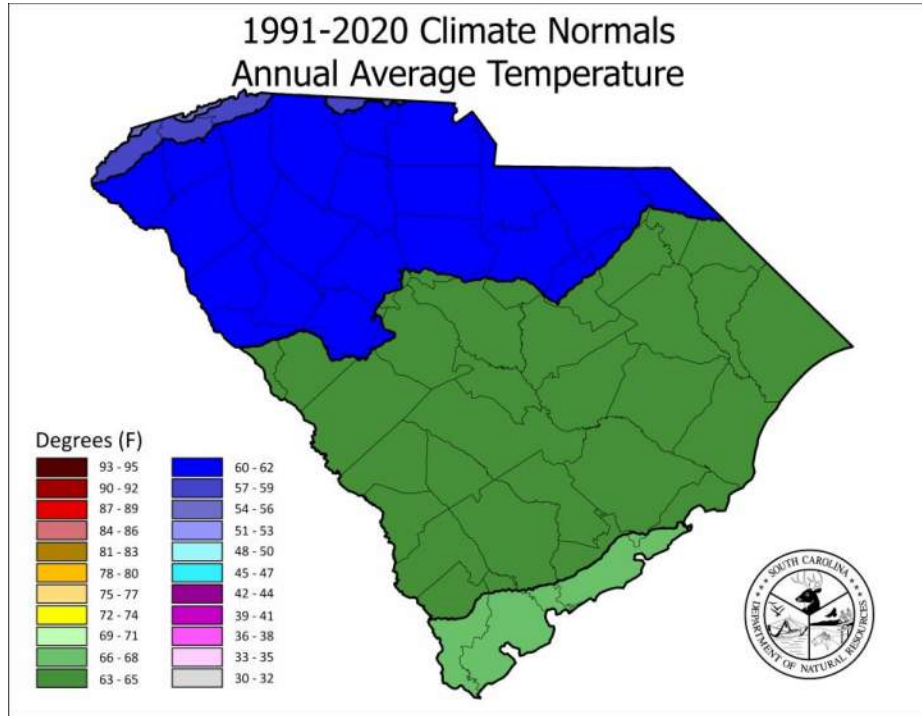
Monthly Temperature Comparison Walhalla & Anderson Regional Airport



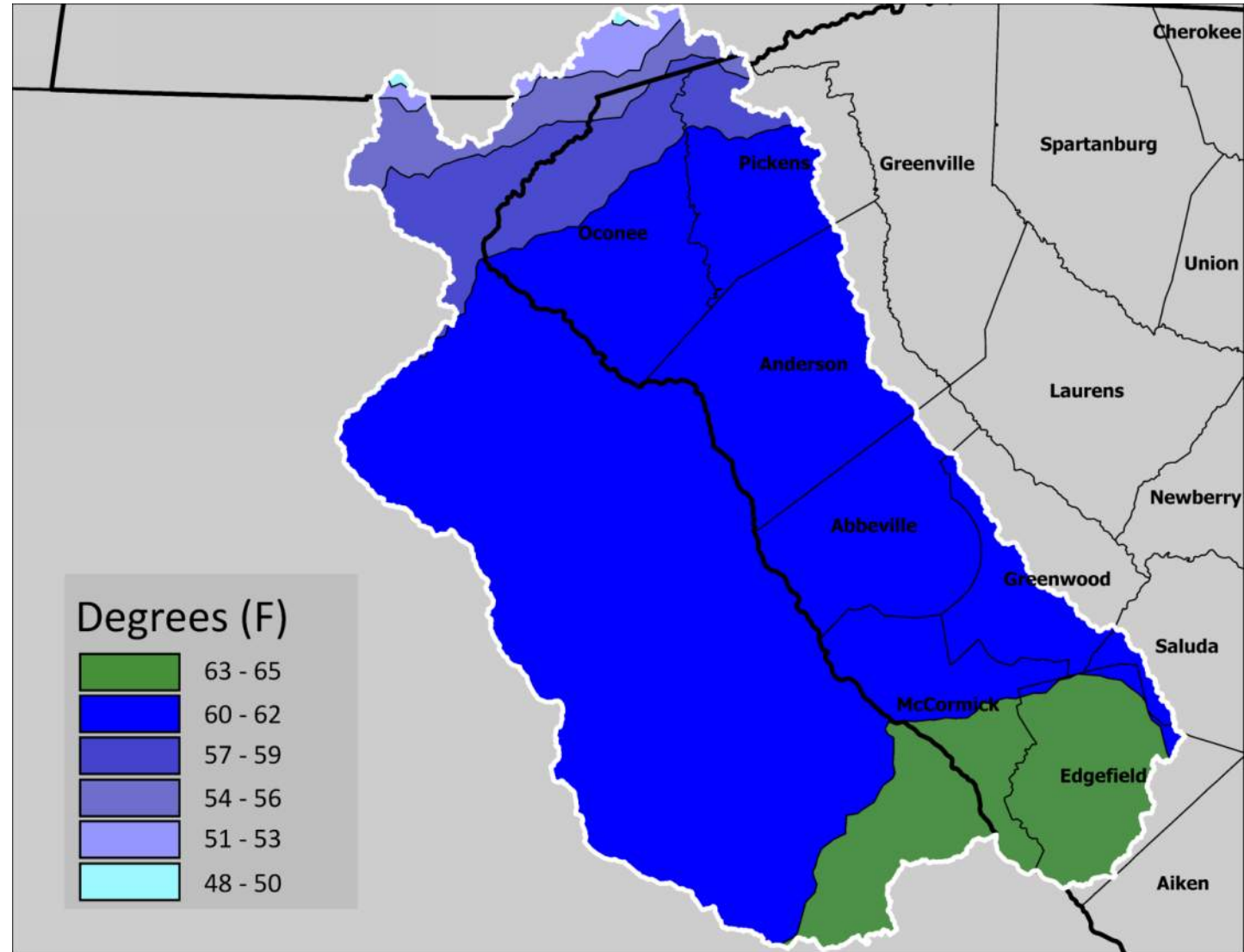
Minimum temperatures are the biggest differences between these two stations

- Minimum temperatures at Anderson Airport are 3 to 4.5 degrees higher than Walhalla

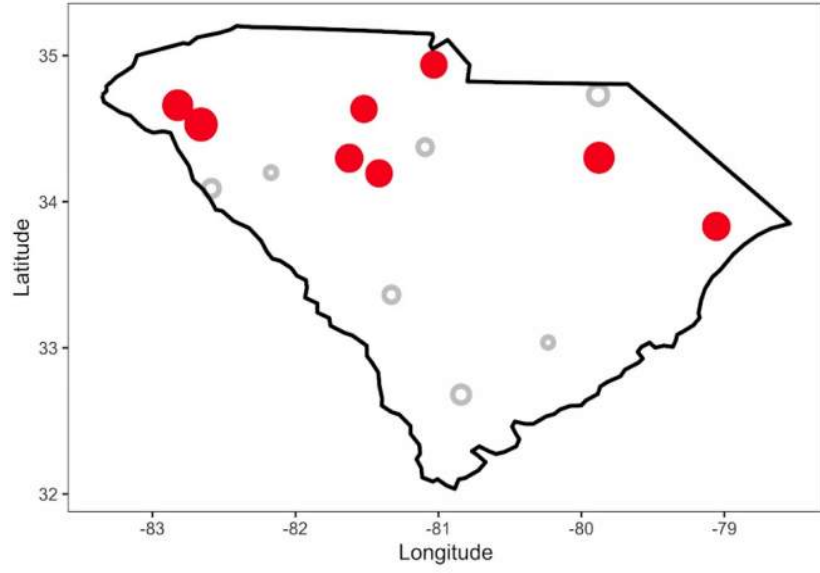
Upper Savannah Basin Annual Average Temperature



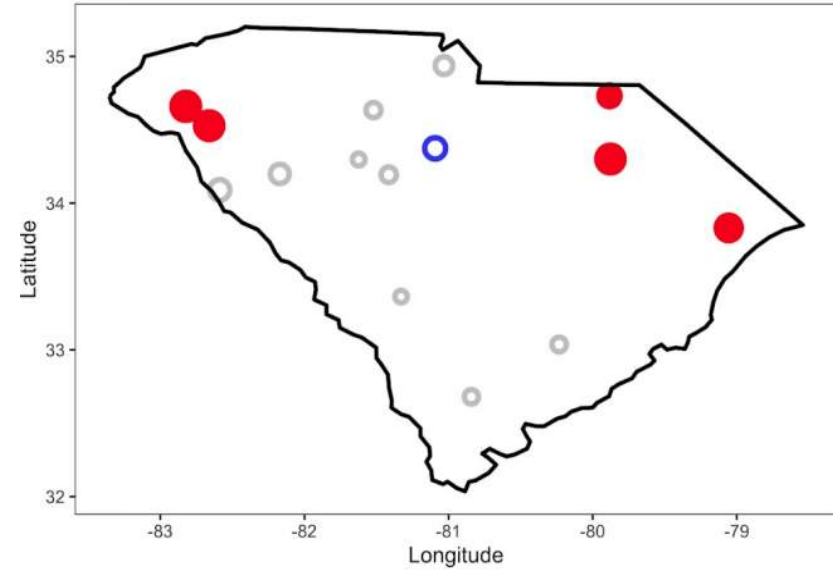
[South Carolina Climate Normal Maps](#)



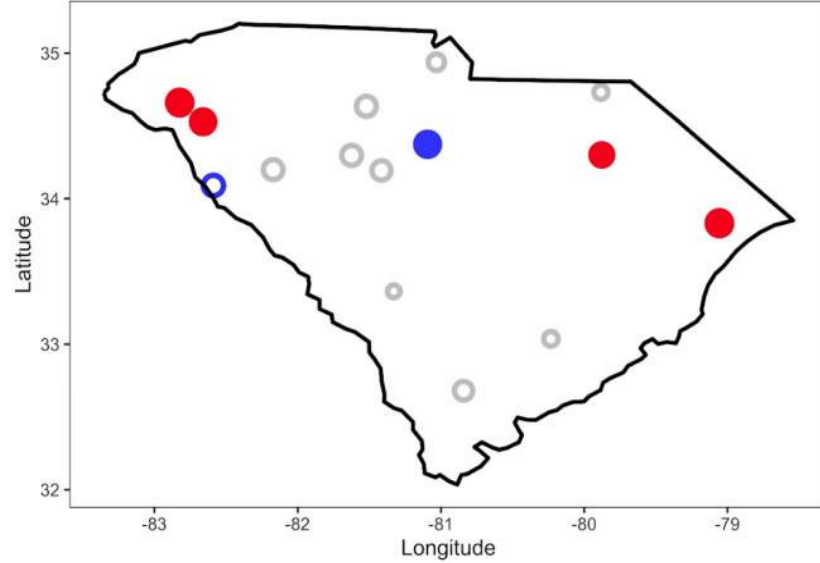
Trend of Maximum Temperature, Spring



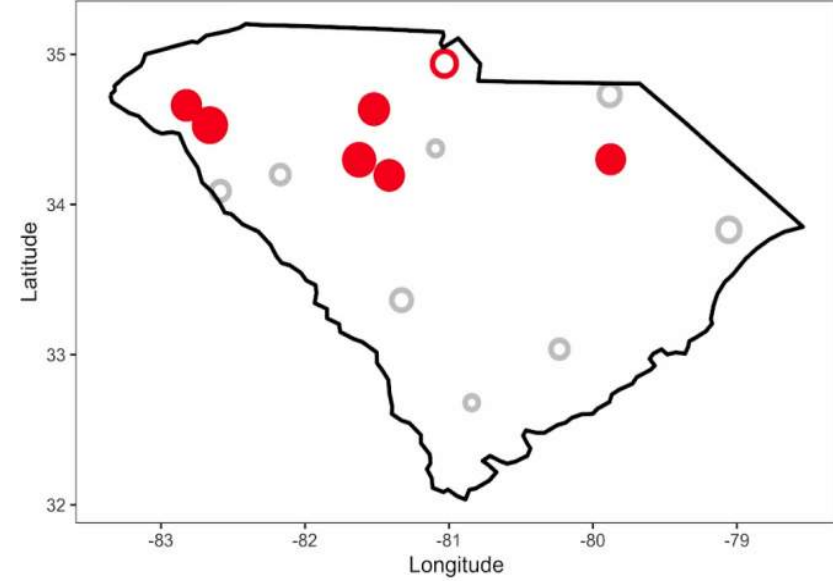
Trend of Maximum Temperature, Summer



Trend of Maximum Temperature, Fall



Trend of Maximum Temperature, Winter

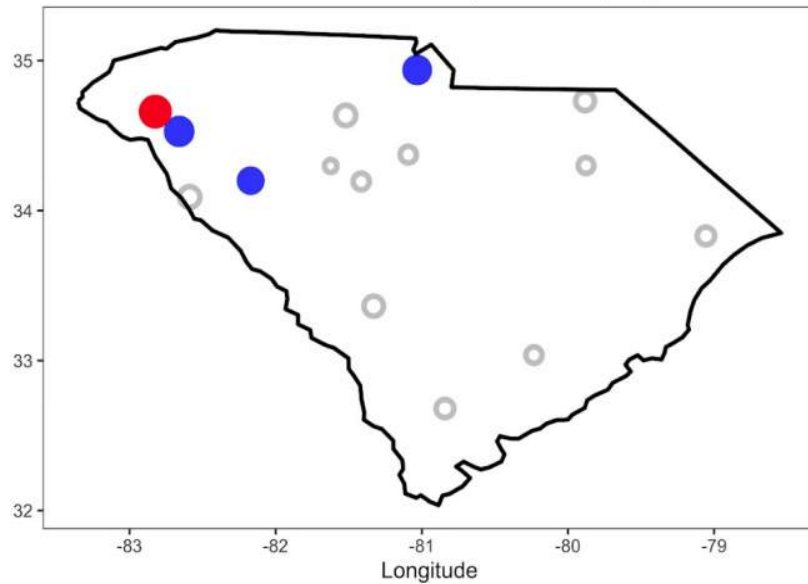


- Decrease
- Statistically-significant decrease

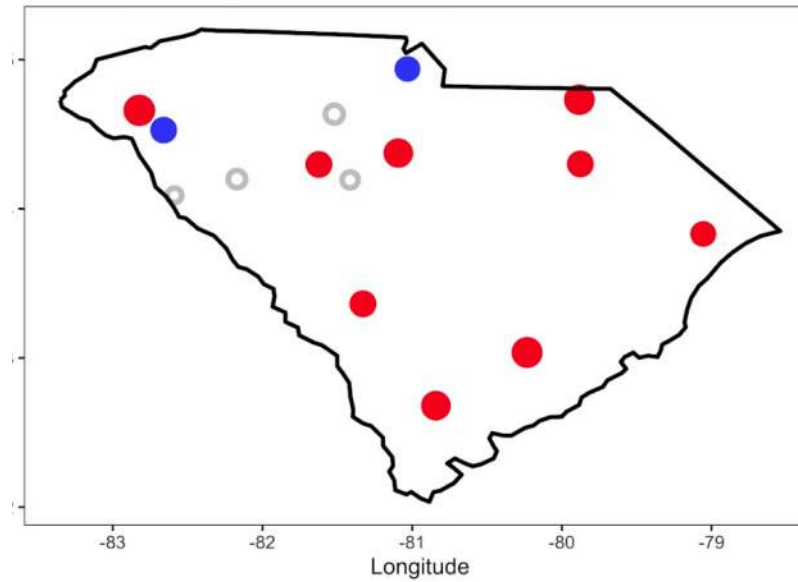
- Increase
- Statistically-significant increase



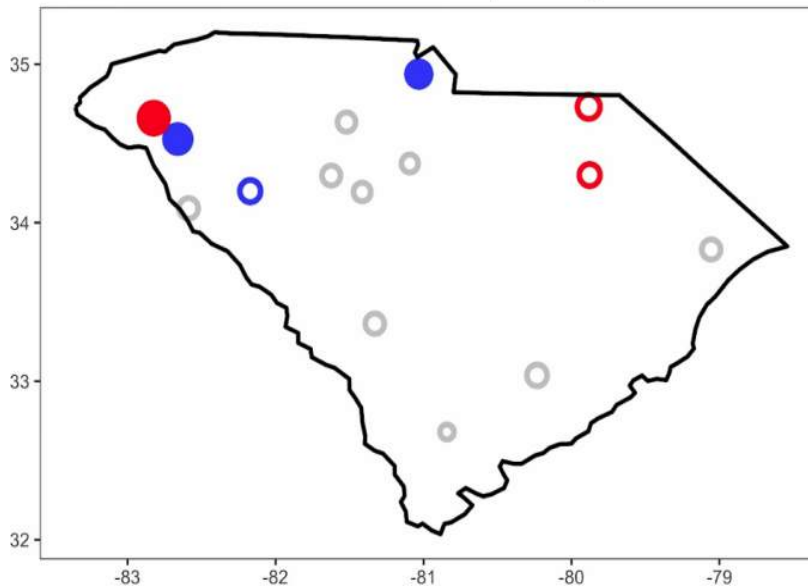
Trend of Minimum Temperature, Spring



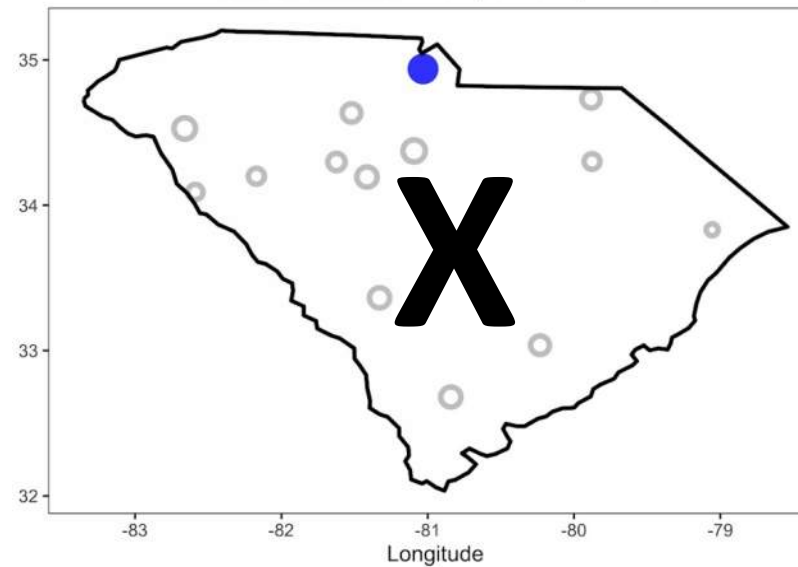
Trend of Minimum Temperature, Summer



Trend of Minimum Temperature, Fall



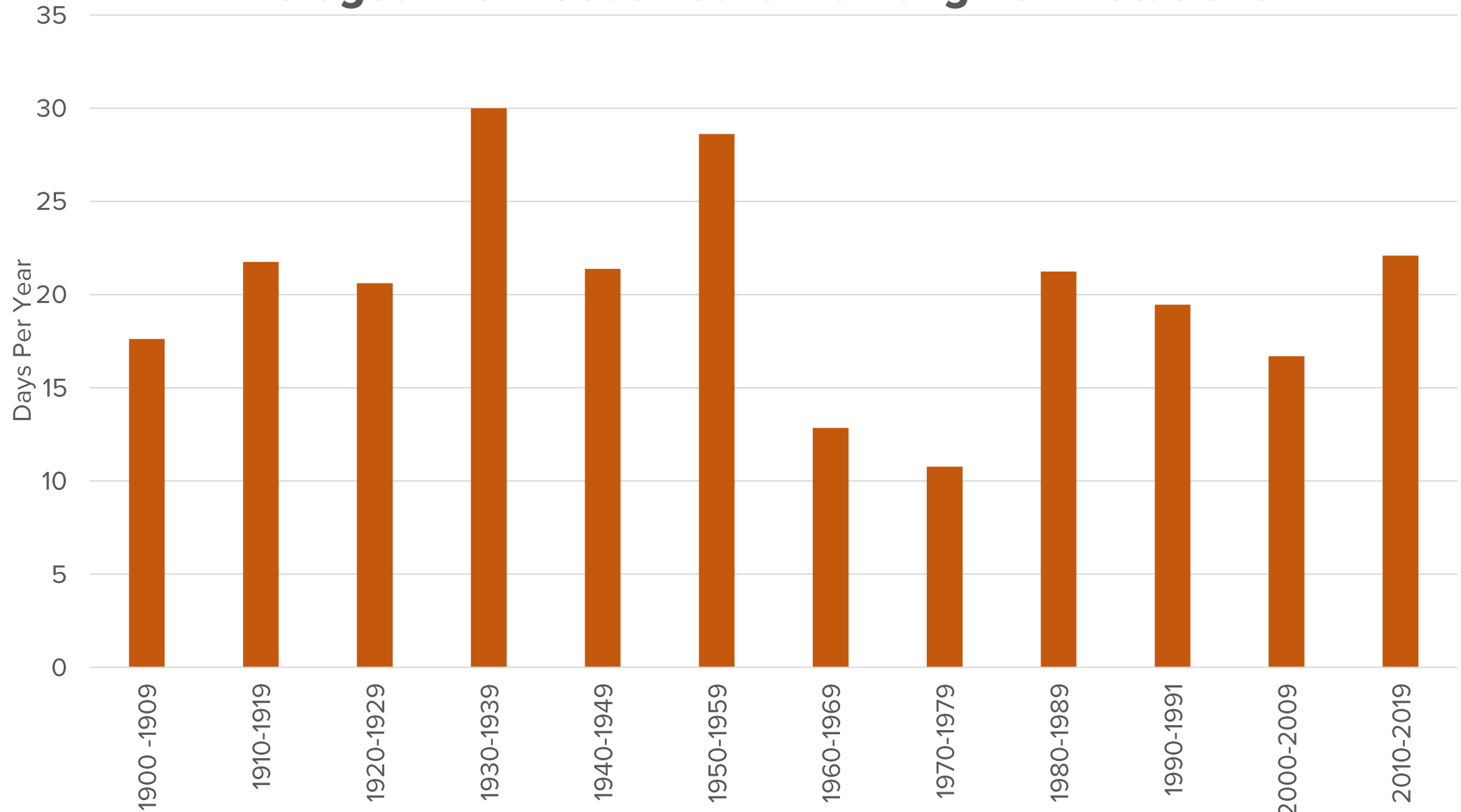
Trend of Minimum Temperature, Winter



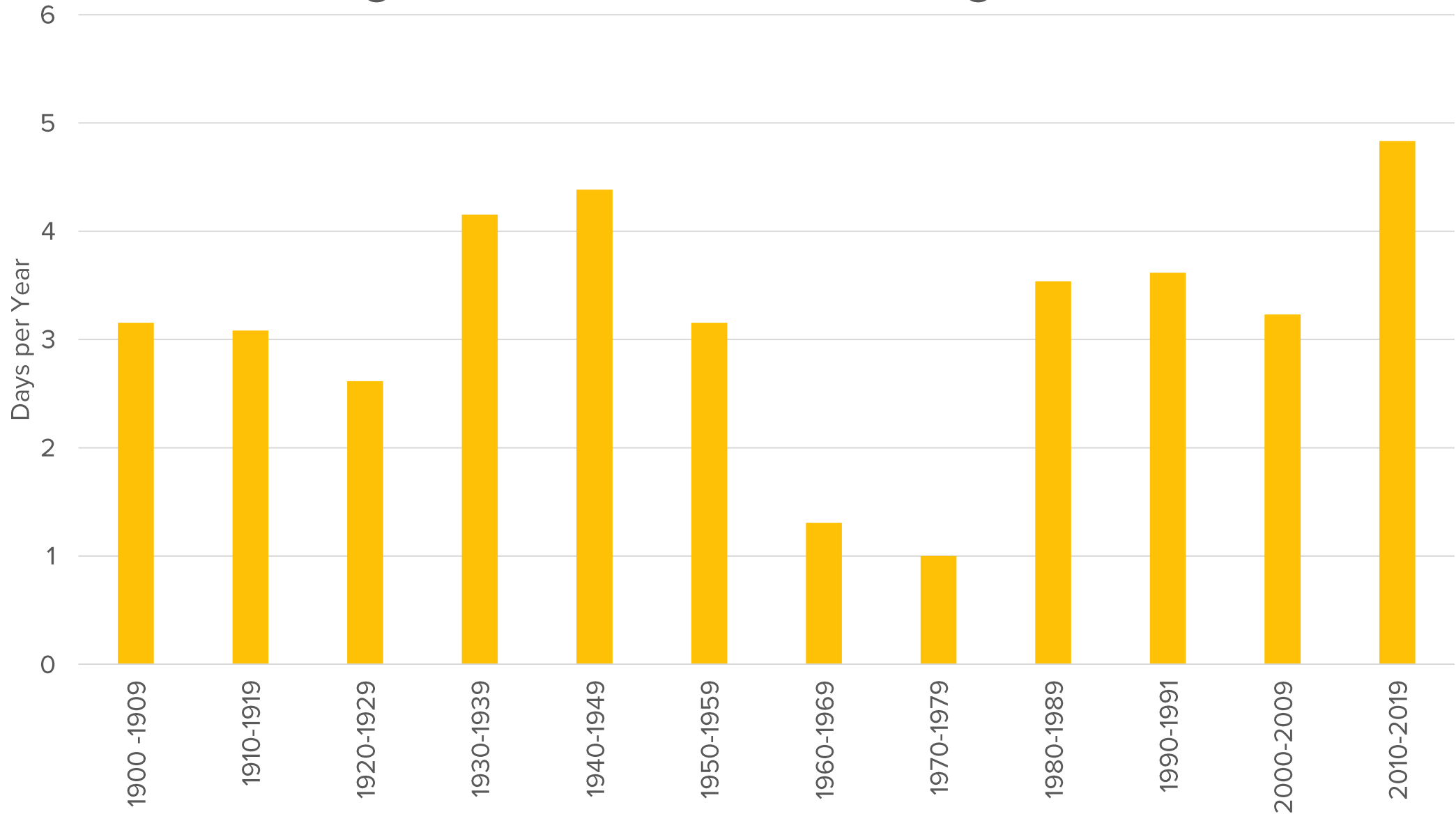
- Statistically-significant decrease
- Decrease

- Increase
- Statistically-significant increase

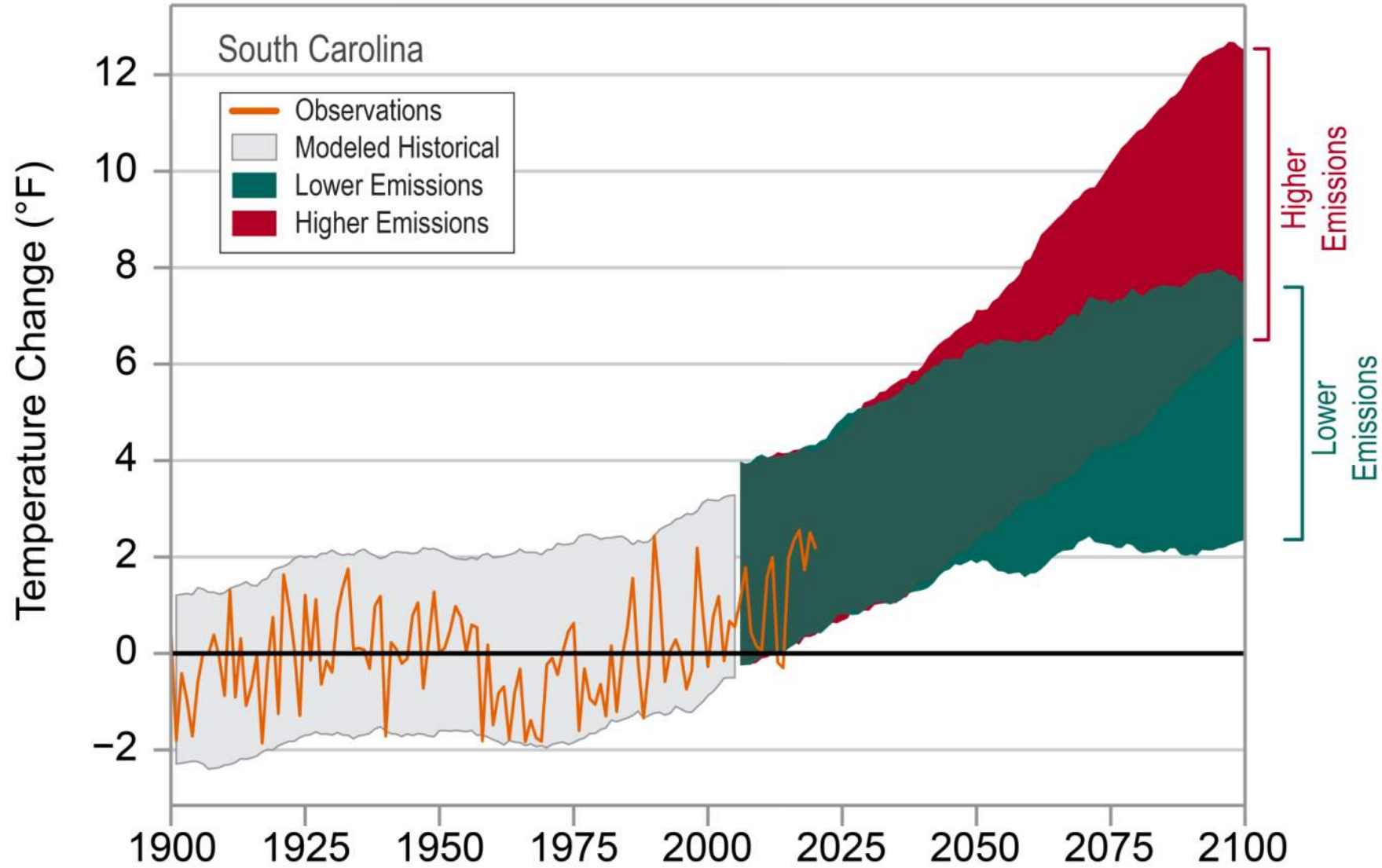
Number of Days Maximum Temperature Above 95°F Averaged From South Carolina Long-Term Stations

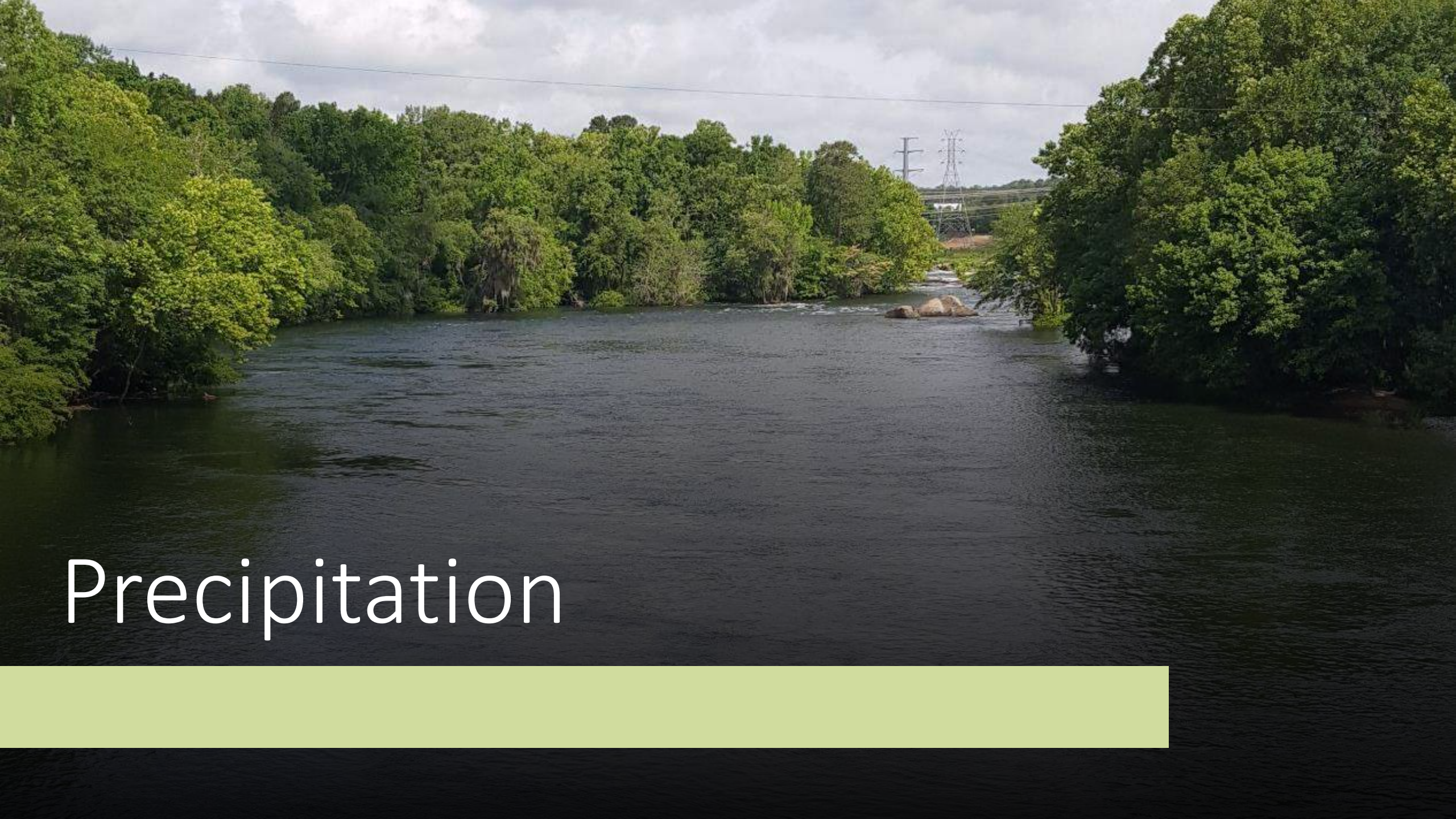


Number of Days Minimum Temperature Above 75°F Averaged From South Carolina Long-Term Stations



Observed and Projected Temperature Change

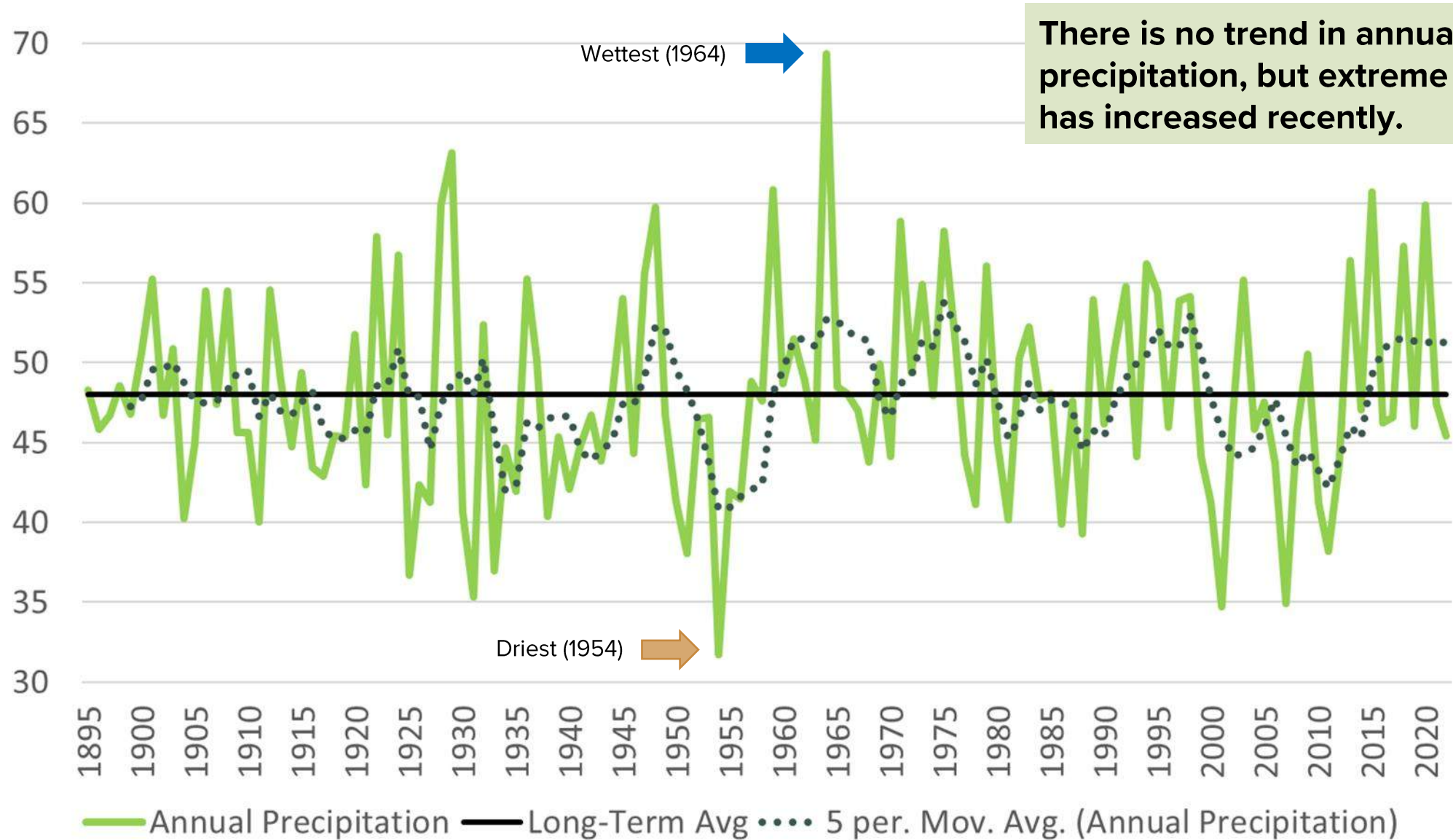




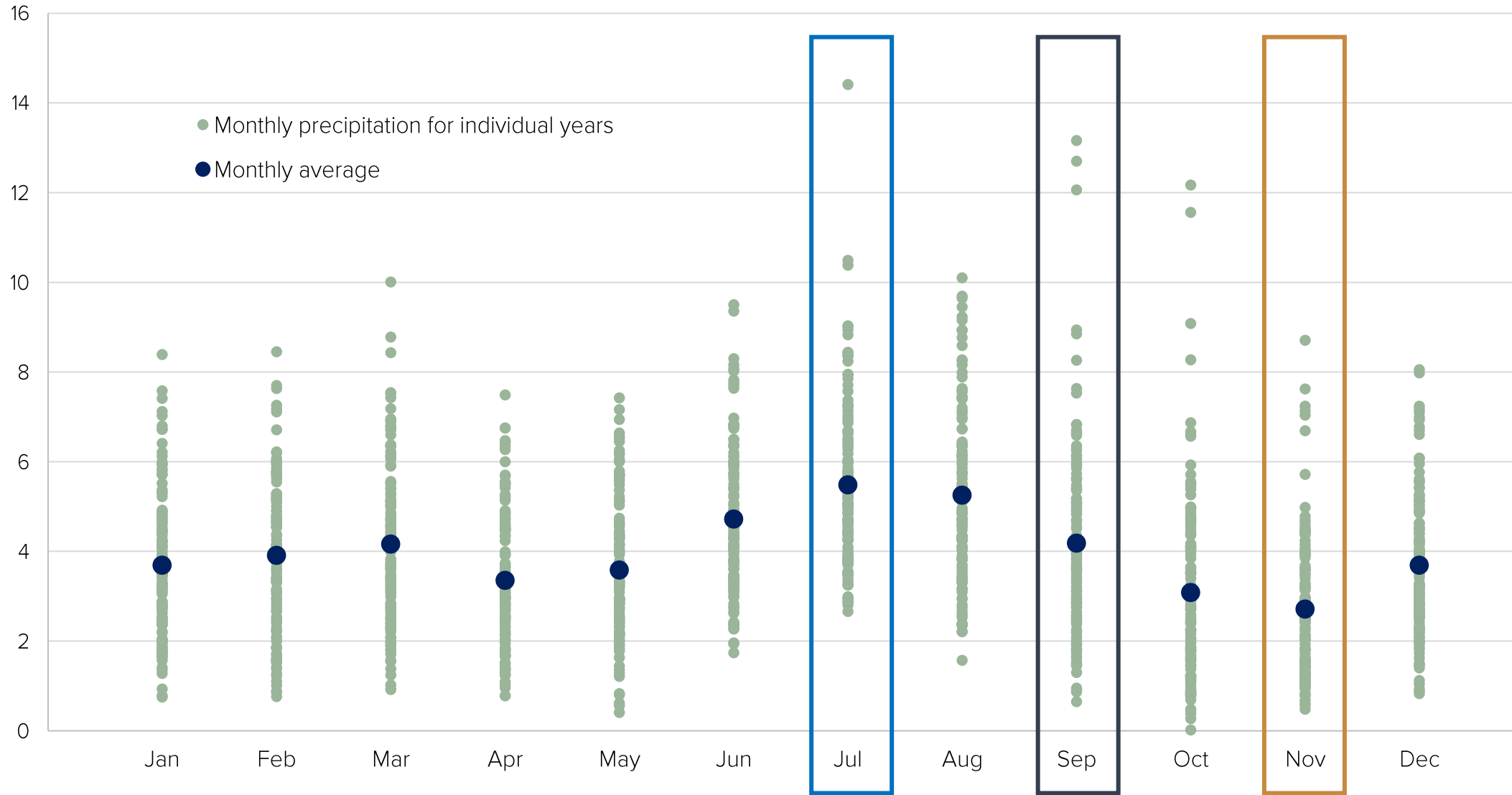
Precipitation



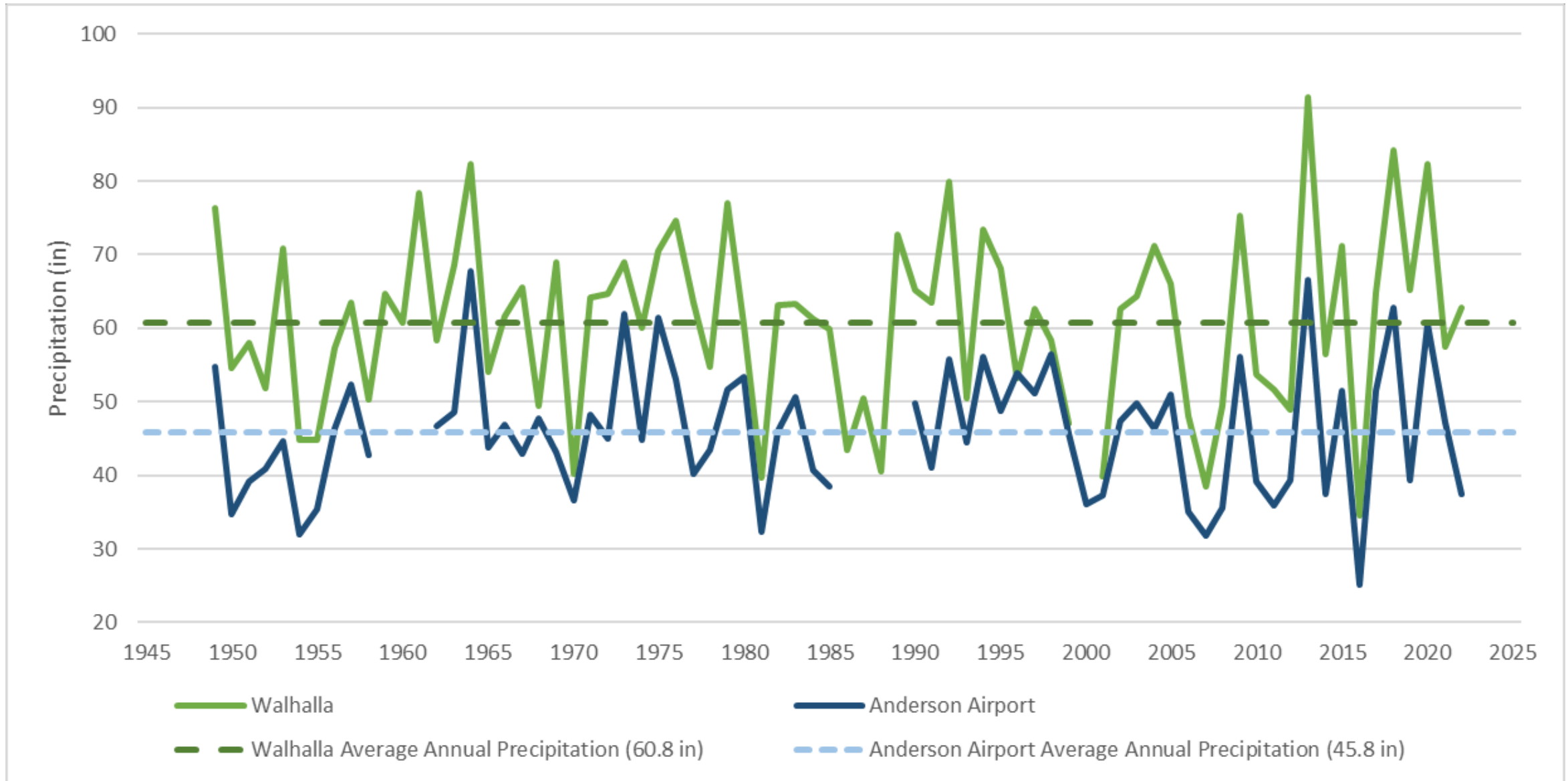
South Carolina Annual Precipitation (1895-2022)



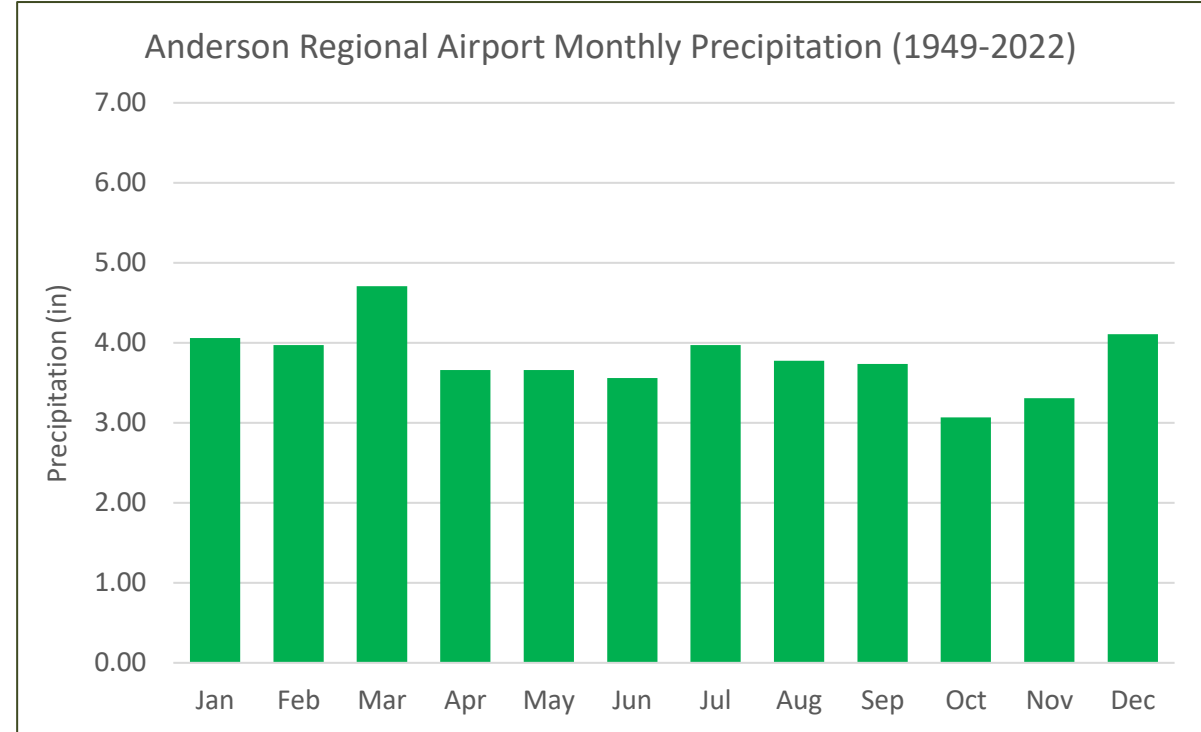
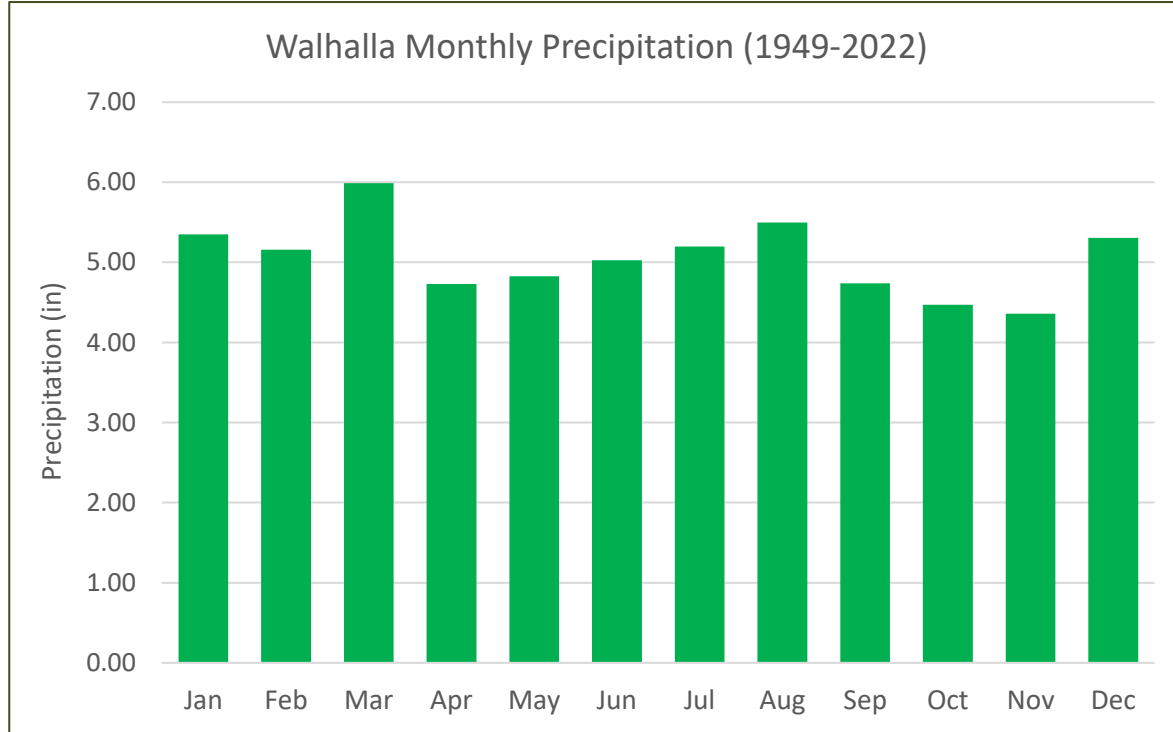
South Carolina Monthly Precipitation (1895 – 2022)



Walhalla and Anderson Regional Airport Annual Average Precipitation (1949 – 2022)



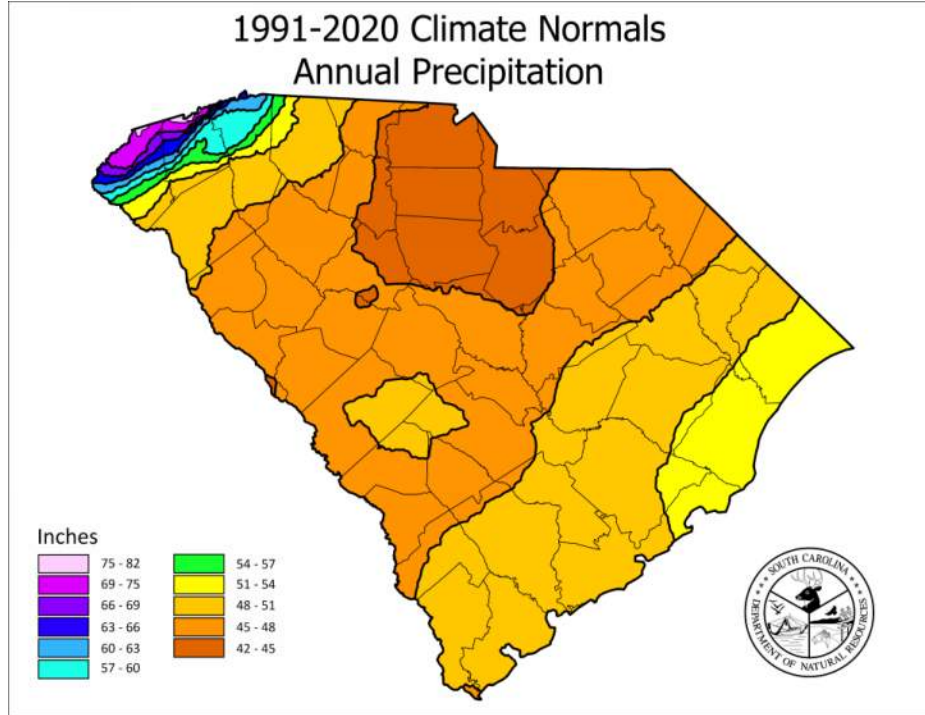
Monthly Precipitation Comparison Walhalla & Anderson Regional Airport



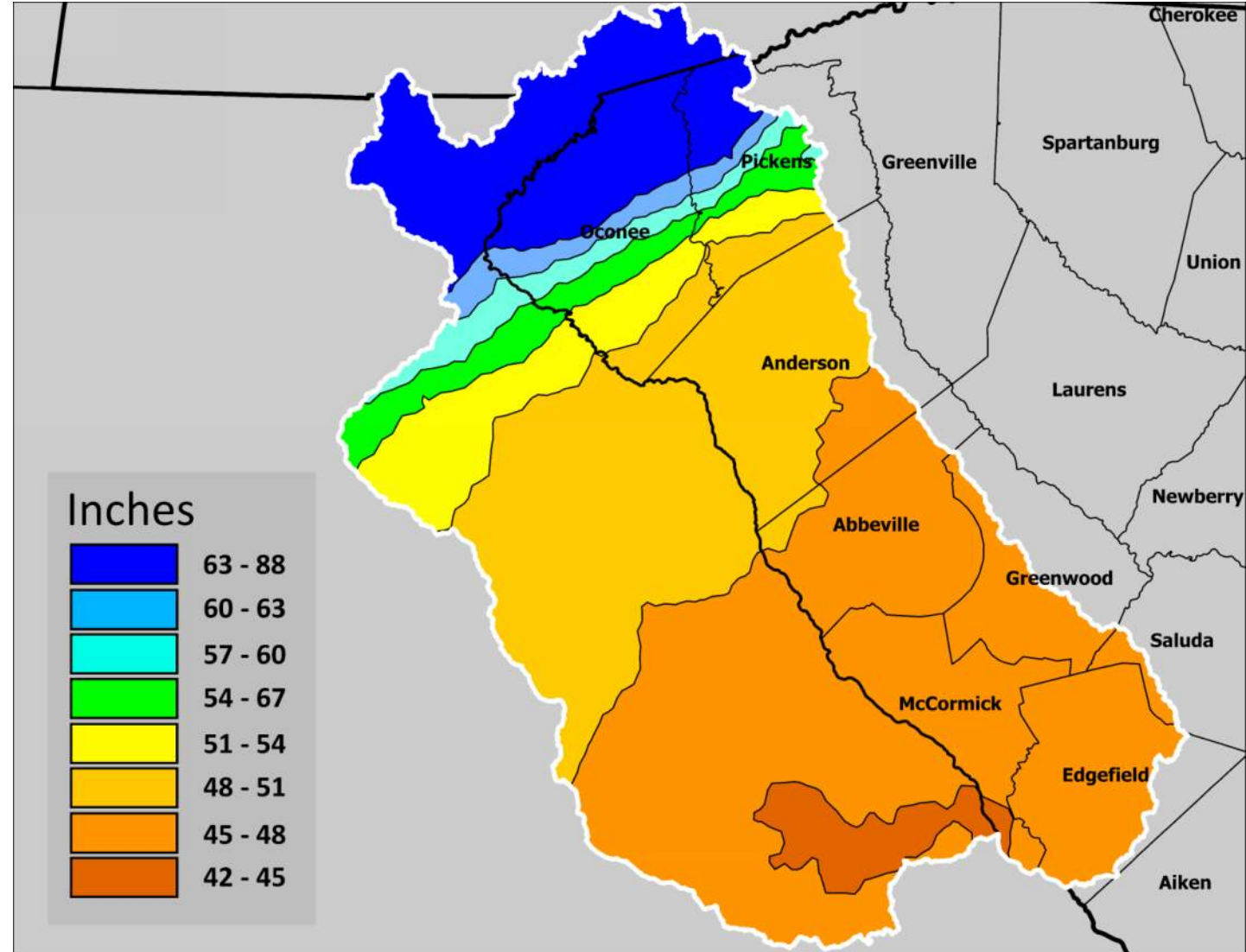
Walhalla receives more rain than Anderson Airport

- Walhalla receives roughly 1 to 1.5 inches more rain each month

Upper Savannah Basin Annual Average Precipitation



[South Carolina Climate Normal Maps](#)



Five Driest Years for Walhalla and Anderson Regional Airport (1949 – 2022)

	Walhalla Annual Average 60.80 inches		Anderson Regional Airport Annual Average 45.80 in	
Rank	Year	Precipitation (in)	Year	Precipitation (in)
1	2016	34.60	2016	25.07
2	2007	38.49	2007	31.80
3	1981	39.67	1954*	31.95
4	2001	39.89	1988	32.25
5	1970	40.23	1981	32.32

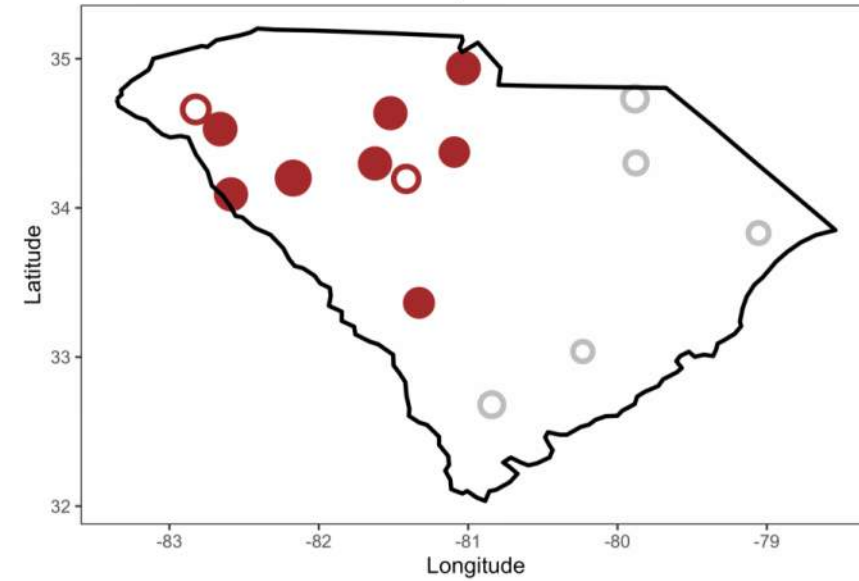
Five Wettest Years for Walhalla and Anderson Regional Airport (1949 – 2022)

	Walhalla Annual Average 60.80 inches		Anderson Regional Airport Annual Average 45.80 in	
Rank	Year	Precipitation (in)	Year	Precipitation (in)
1	2013	91.36	1964*	67.79
2	2018	84.27	2013	66.59
3	2020	82.37	2018	82.74
4	1964*	82.26	1973	61.91
5	1992	79.95	1975	61.40

Trend of Precipitation, Spring



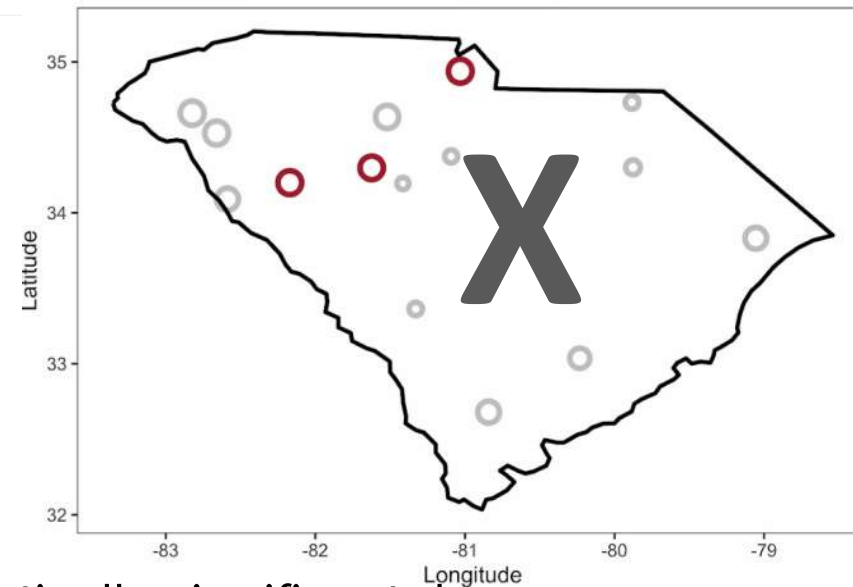
Trend of Precipitation, Summer



Trend of Precipitation, Fall



Trend of Precipitation, Winter



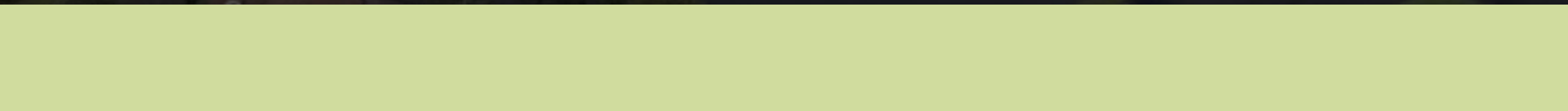
○ Decrease

● Statistically-significant decrease

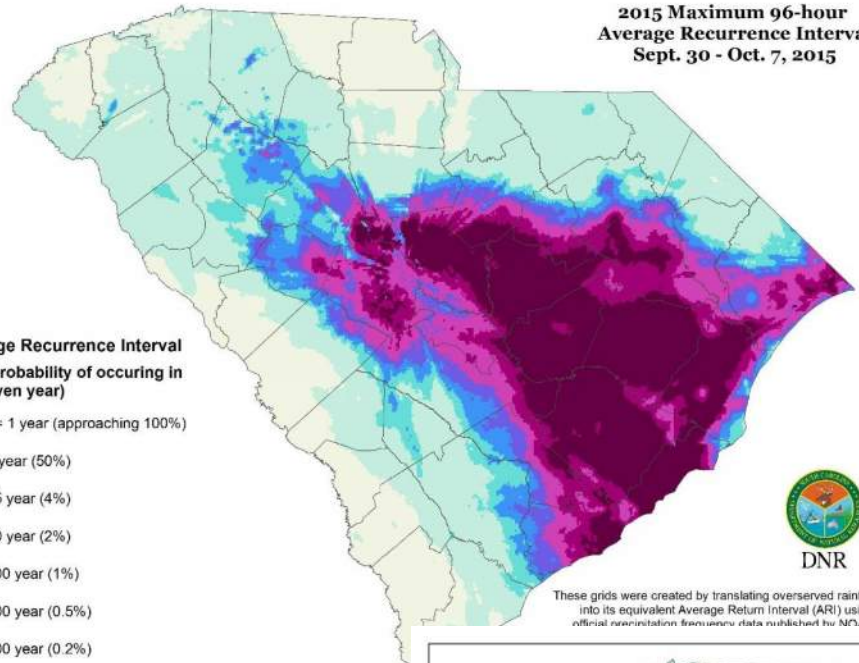
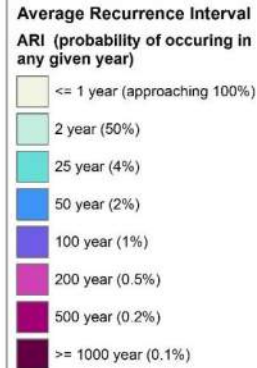
○ Increase



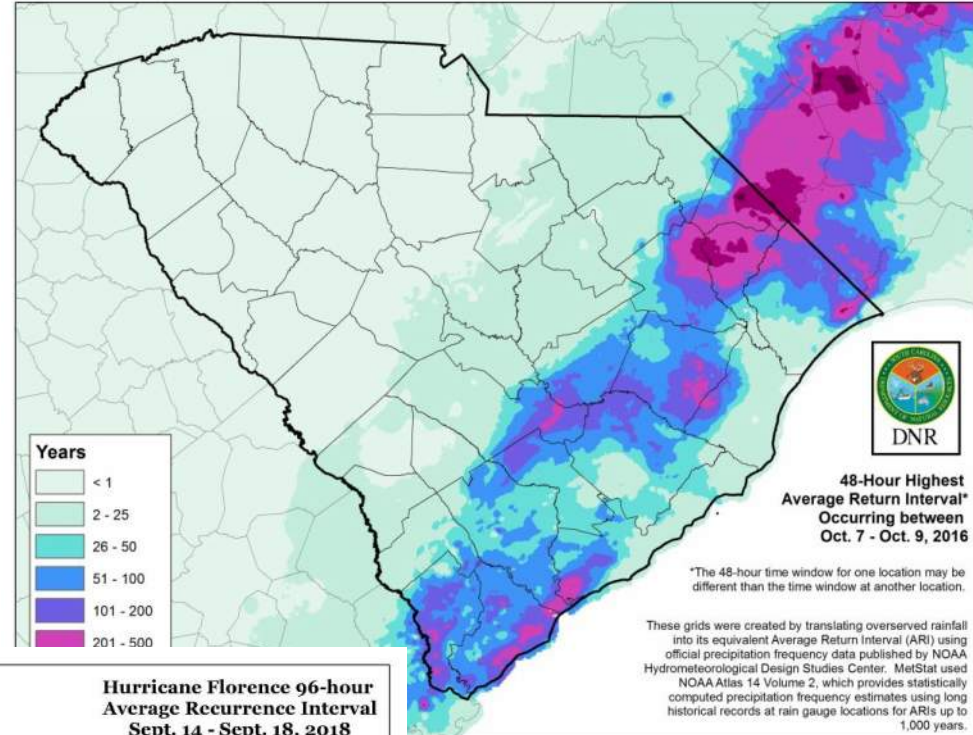
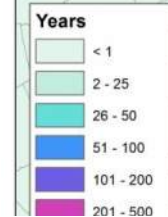
Extreme Rainfall



2015 Maximum 96-hour Average Recurrence Interval Sept. 30 - Oct. 7, 2015



These grids were created by translating overserved rainfall into its equivalent Average Return Interval (ARI) using official precipitation frequency data published by NOAA

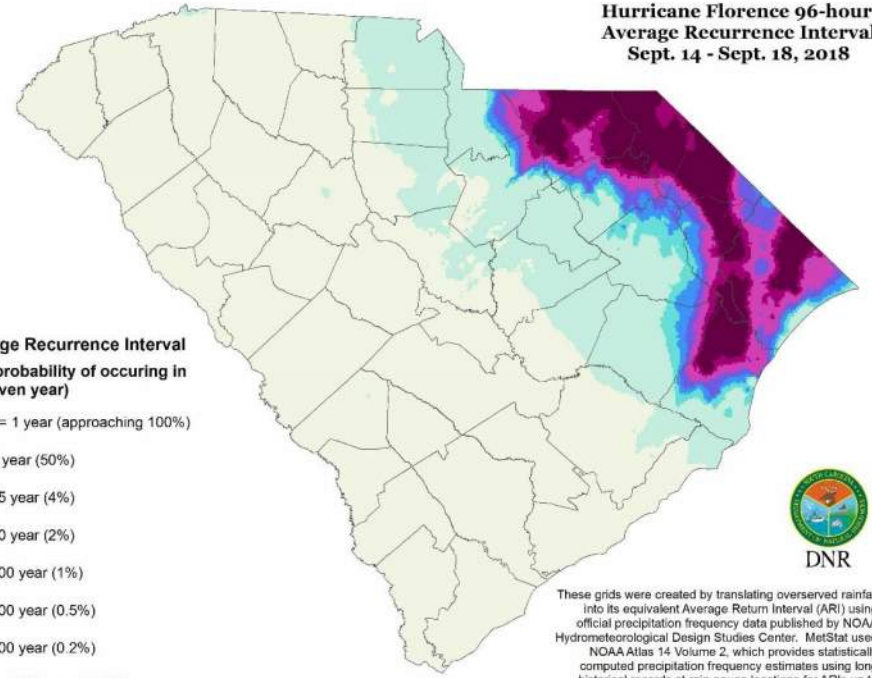
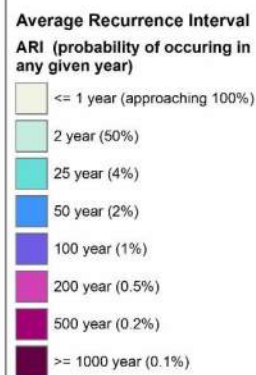


48-Hour Highest Average Return Interval* Occurring between Oct. 7 - Oct. 9, 2016

*The 48-hour time window for one location may be different than the time window at another location.

These grids were created by translating overserved rainfall into its equivalent Average Return Interval (ARI) using official precipitation frequency data published by NOAA Hydrometeorological Design Studies Center, MetStat used NOAA Atlas 14 Volume 2, which provides statistically computed precipitation frequency estimates using long historical records at rain gauge locations for ARIs up to 1,000 years.

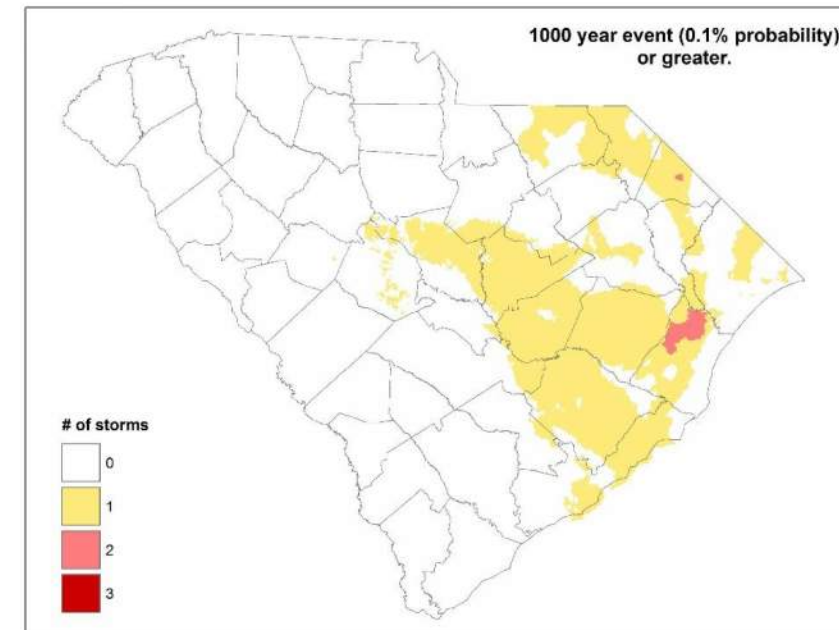
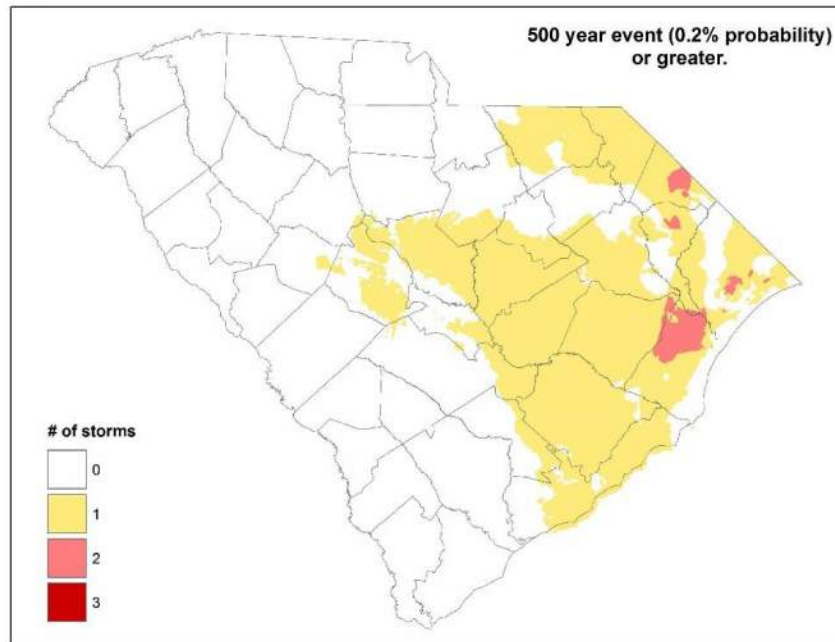
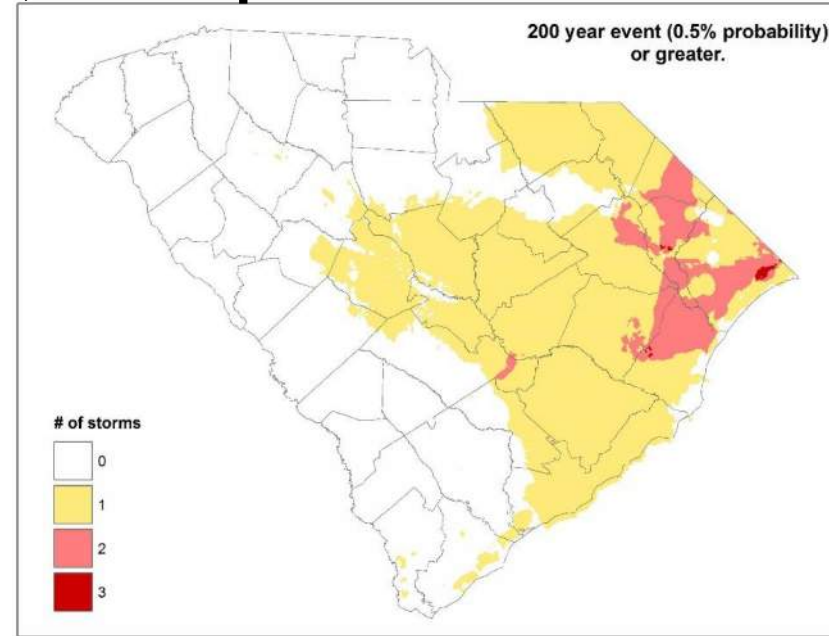
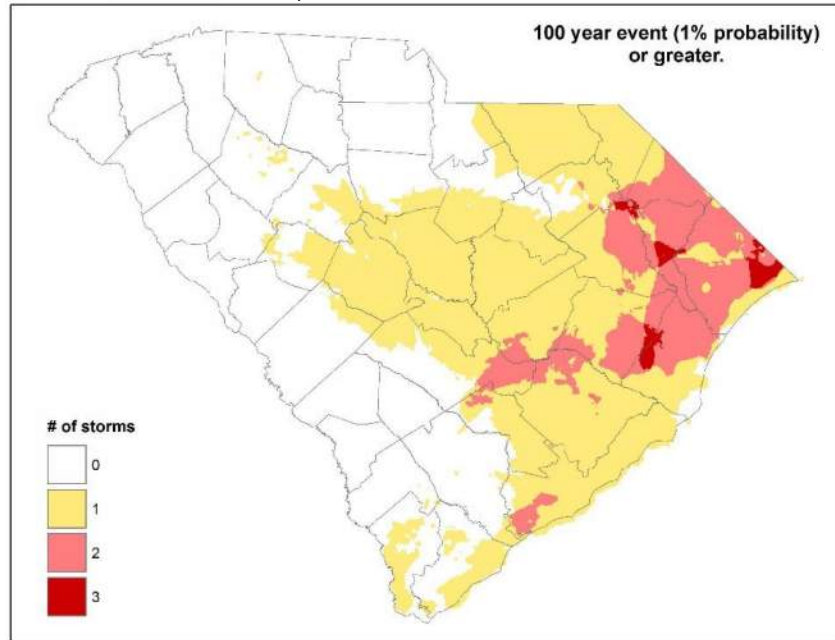
Hurricane Florence 96-hour Average Recurrence Interval Sept. 14 - Sept. 18, 2018



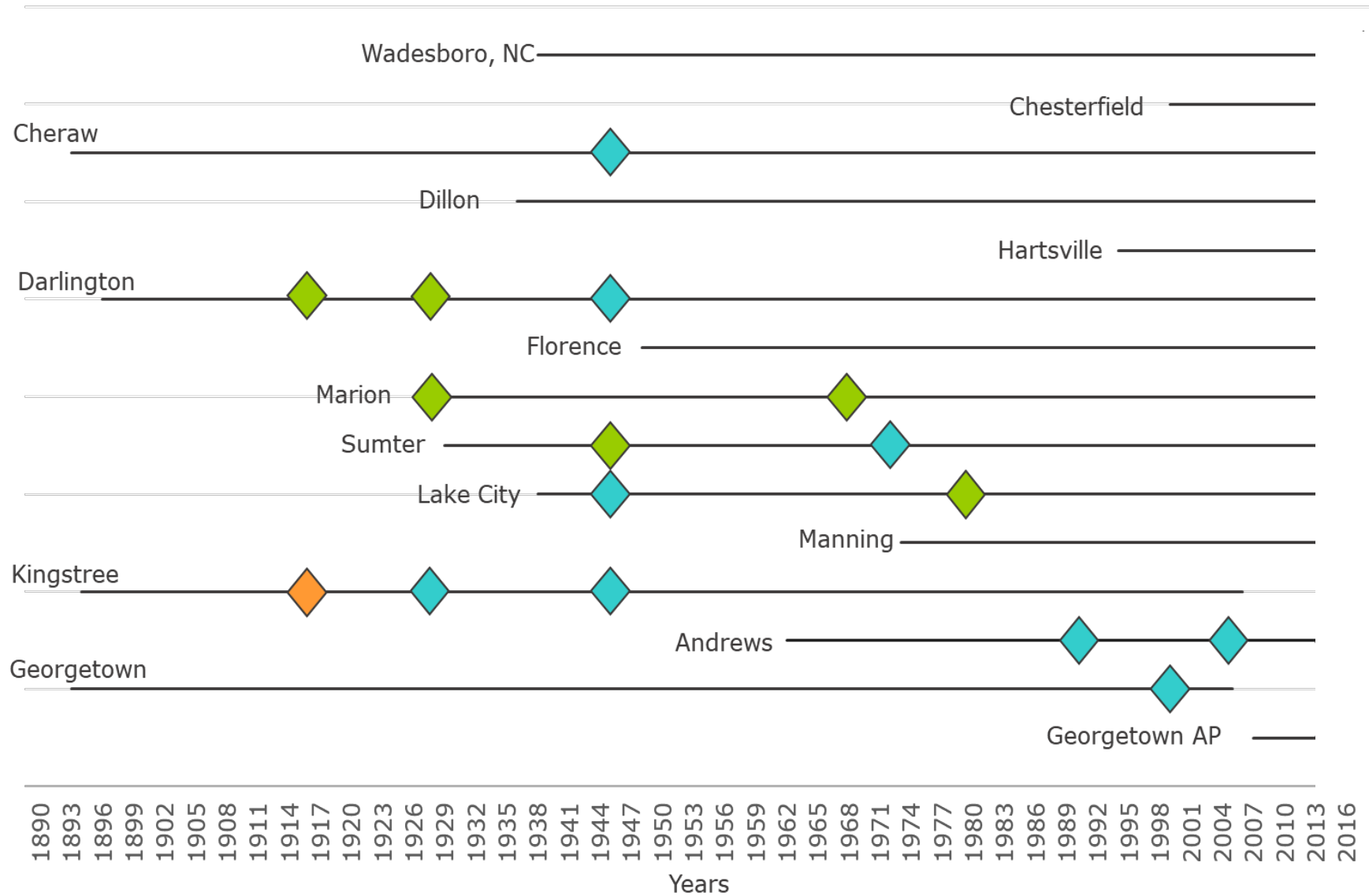
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Areas in purple met or exceeded the 500-year event, a probability of 0.2% happening each year

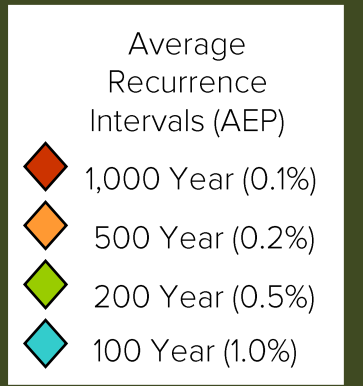
Areas impacted by one or more of the recent extreme storms (October 2015, Hurricane Matthew 2016, and Tropical Storm Florence 2018)



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 report



(Ending 2014)

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



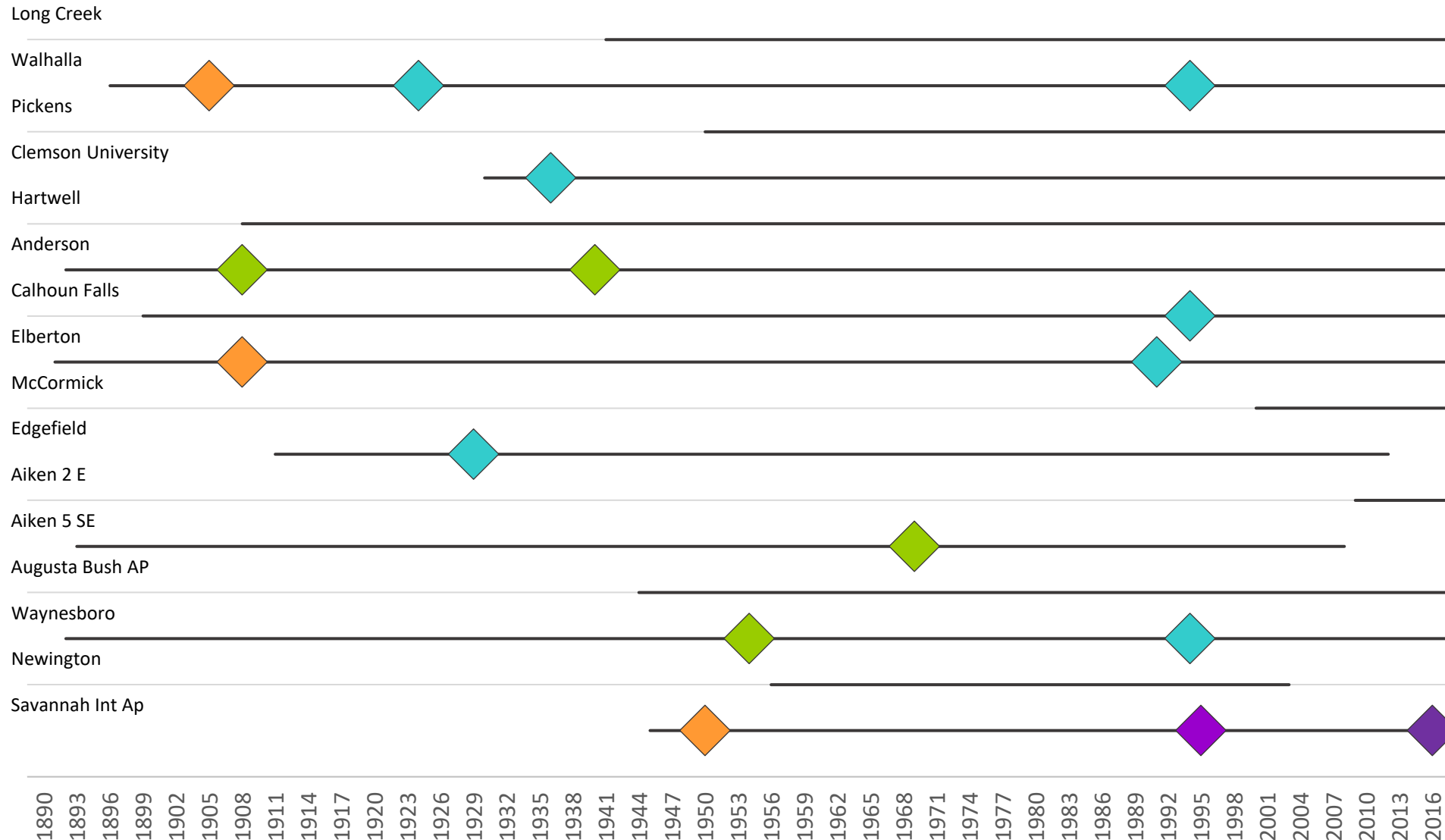
The purposes of ARI/AEP analysis, the following scale will be used in this report

Average Recurrence Intervals (AEP)

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

(Ending 2020)

Timeline of 4-day Rainfall Events along the Savannah River



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

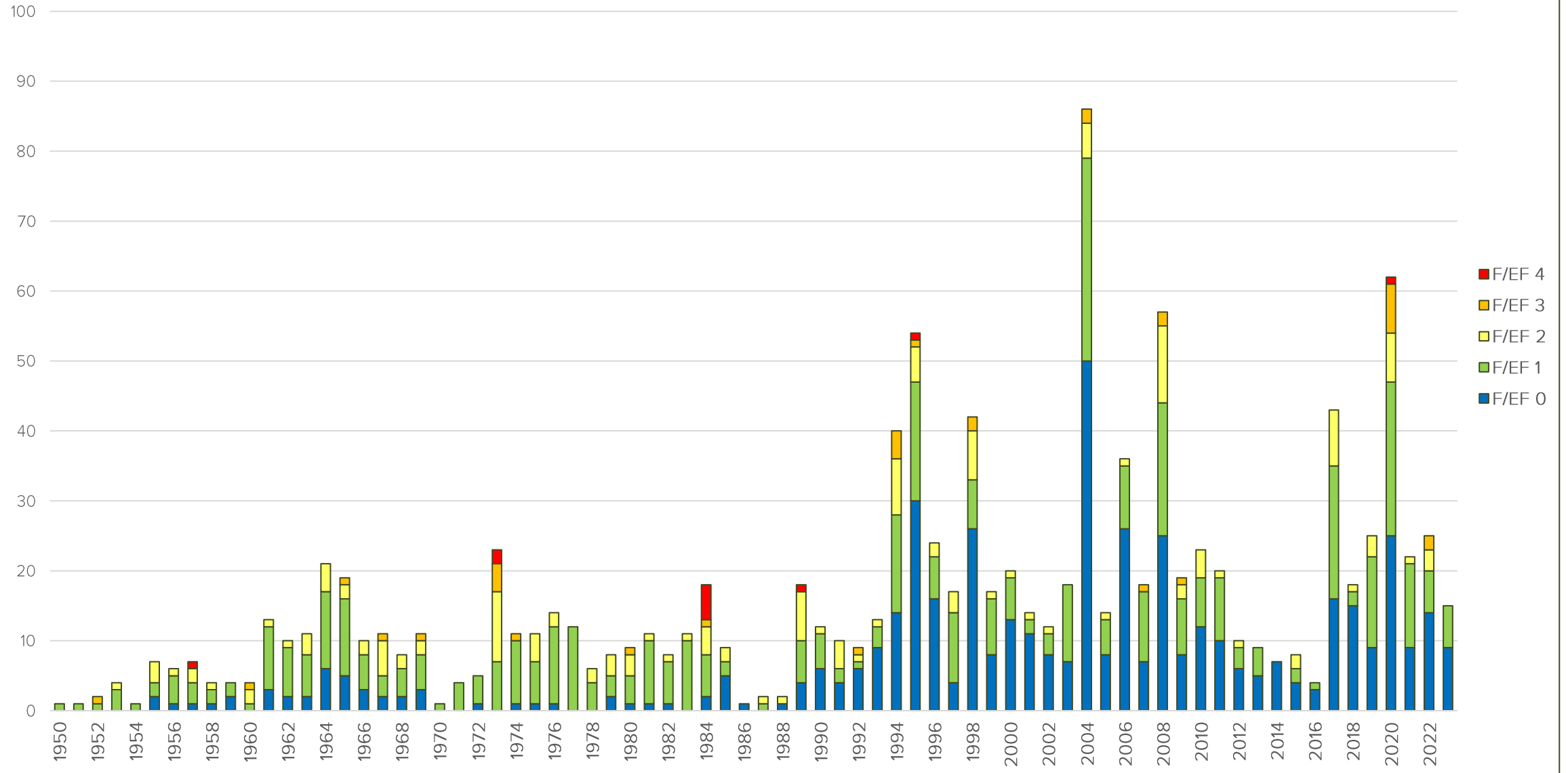
Average Recurrence Intervals (AEP)

- 1,000 Year (0.1%)
- 500 Year (0.2%)
- 200 Year (0.5%)
- 100 Year (1.0%)
- 50 Year (2.0%)

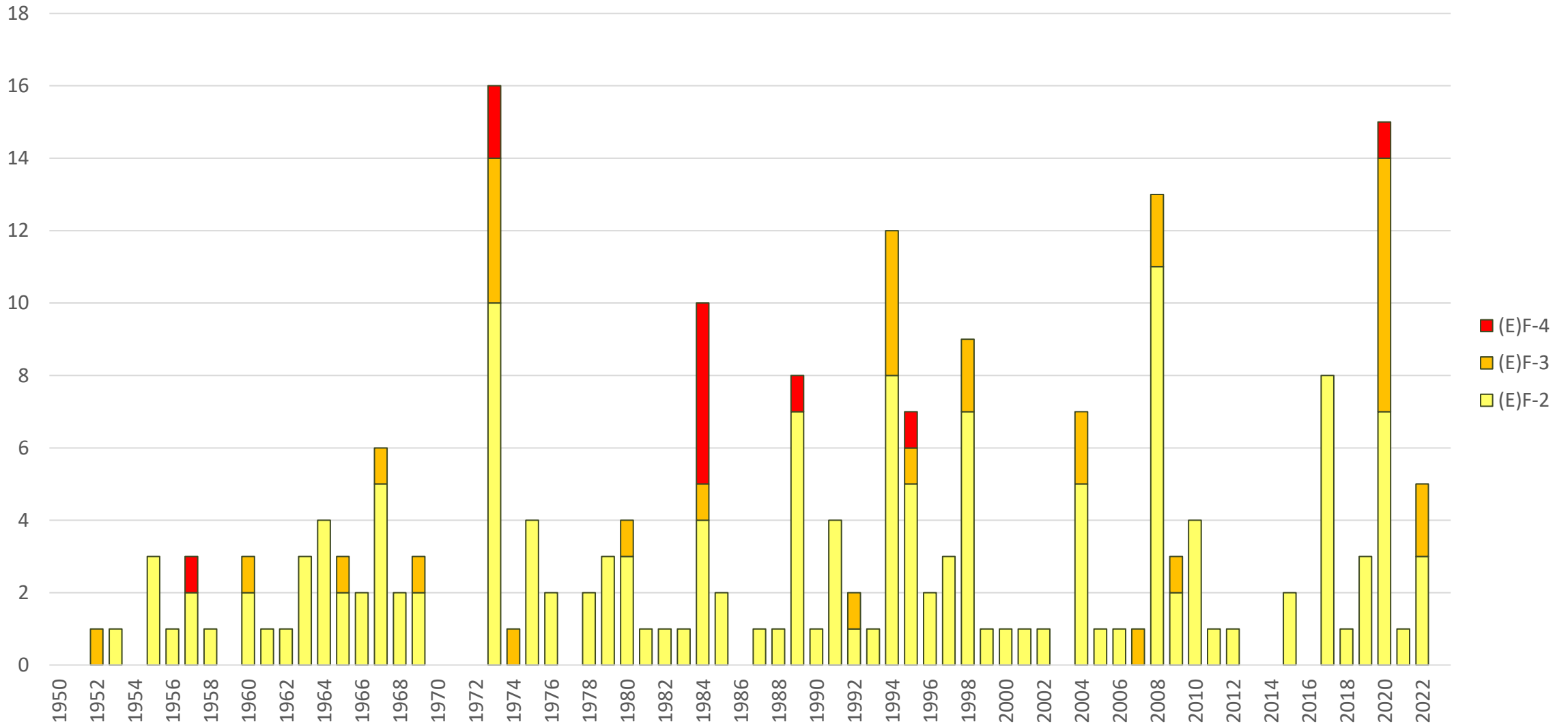


Tornadoes

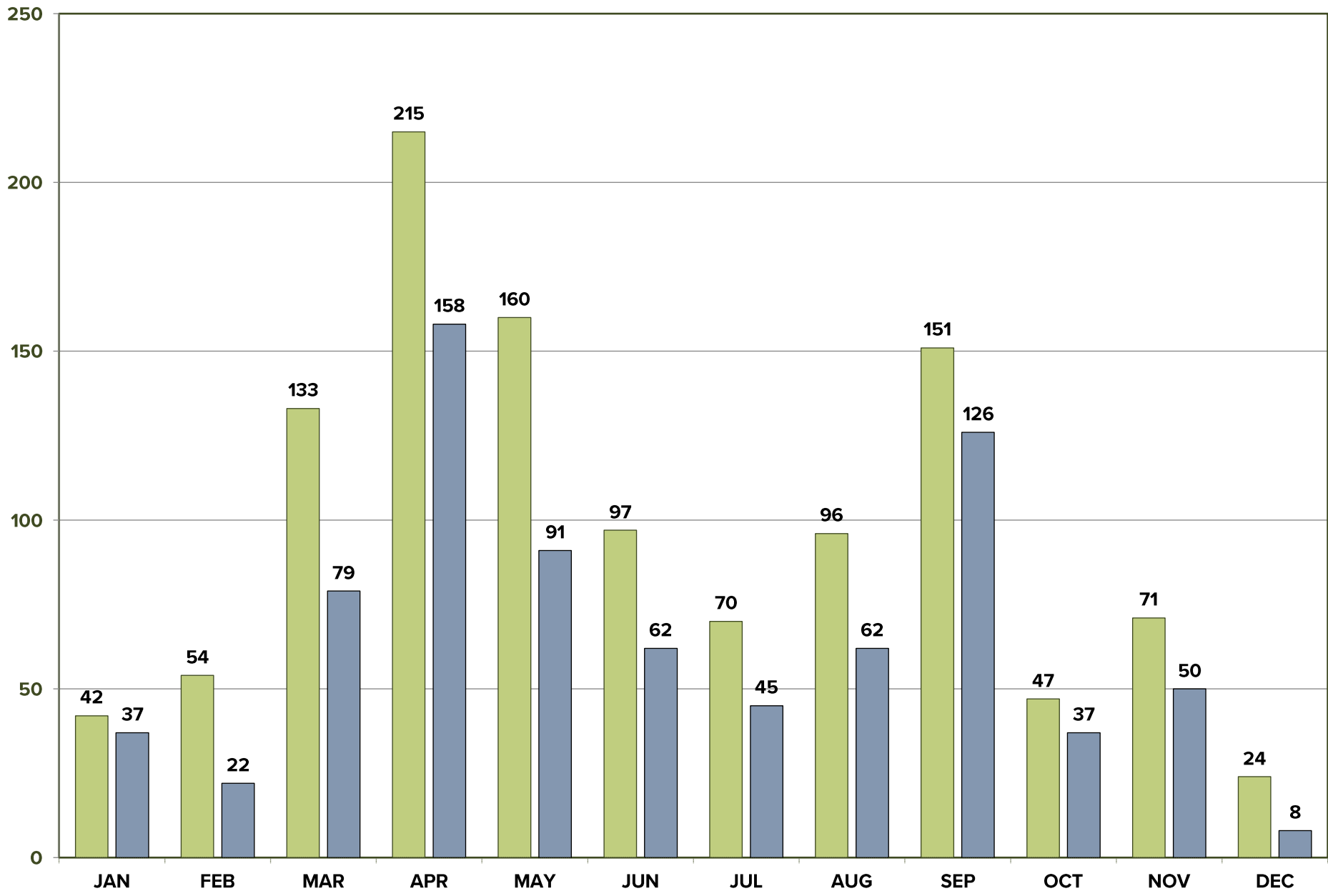
South Carolina Tornadoes (1950 to Present)

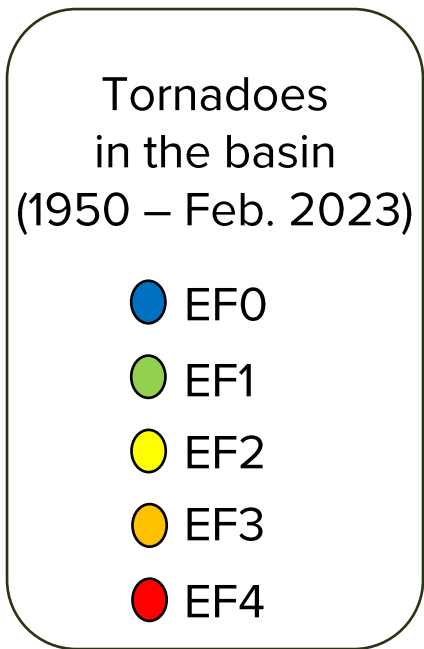


Significant Tornadoes, Rated (E)F-2 Or Higher In South Carolina 1950-Present



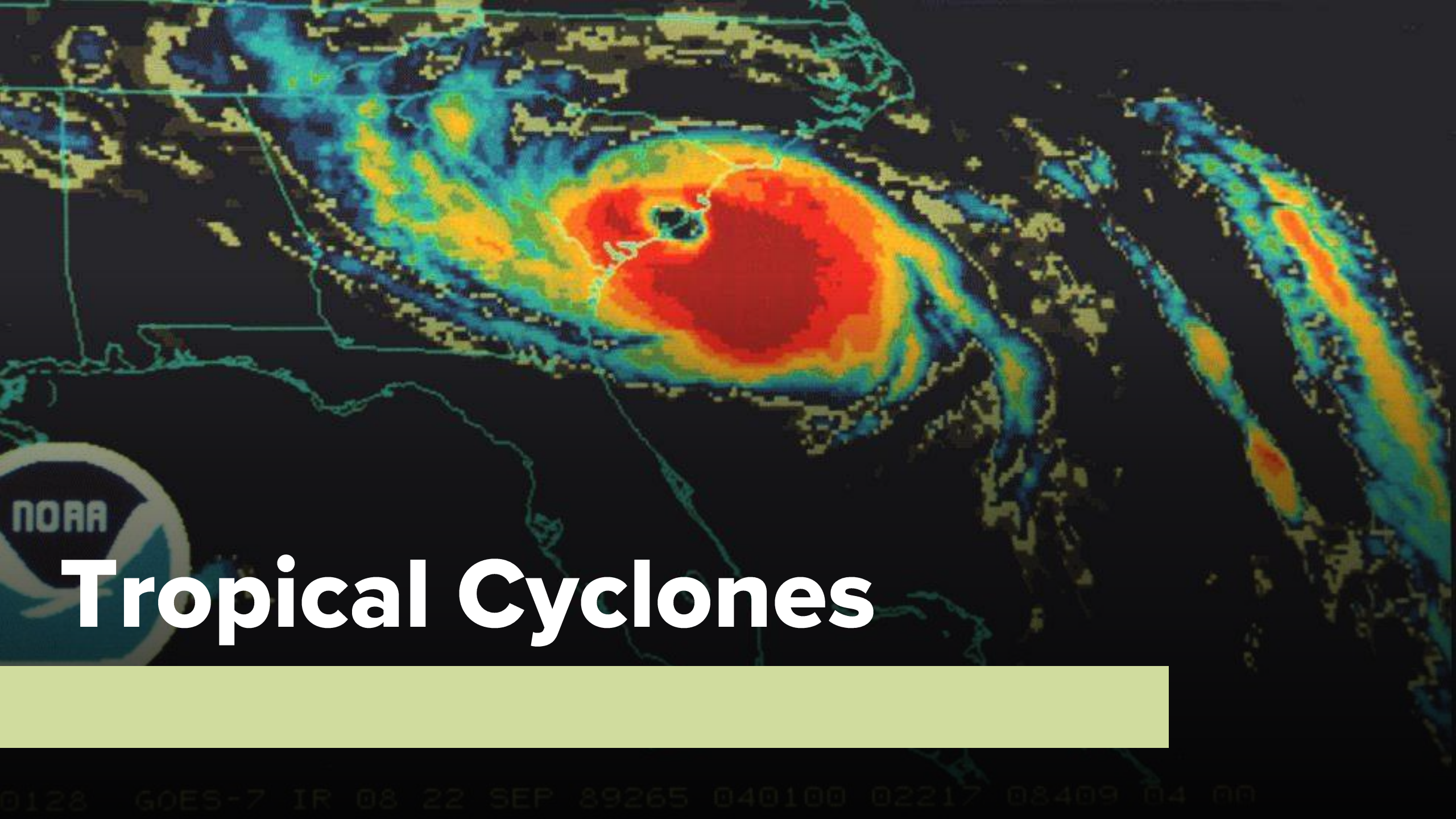
South Carolina Tornadoes By Month





Tornado numbers for the basin

- 139 tornadoes have affected the basin
- Of that, 134 tornadoes have spawned inside the basin
- By Category (tracking through the basin)
 - 56 EF0s
 - 53 EF1s
 - 23 EF2s
 - 7 EF3s
 - 1 EF4s



Tropical Cyclones



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



Impacts are not limited to the coast.

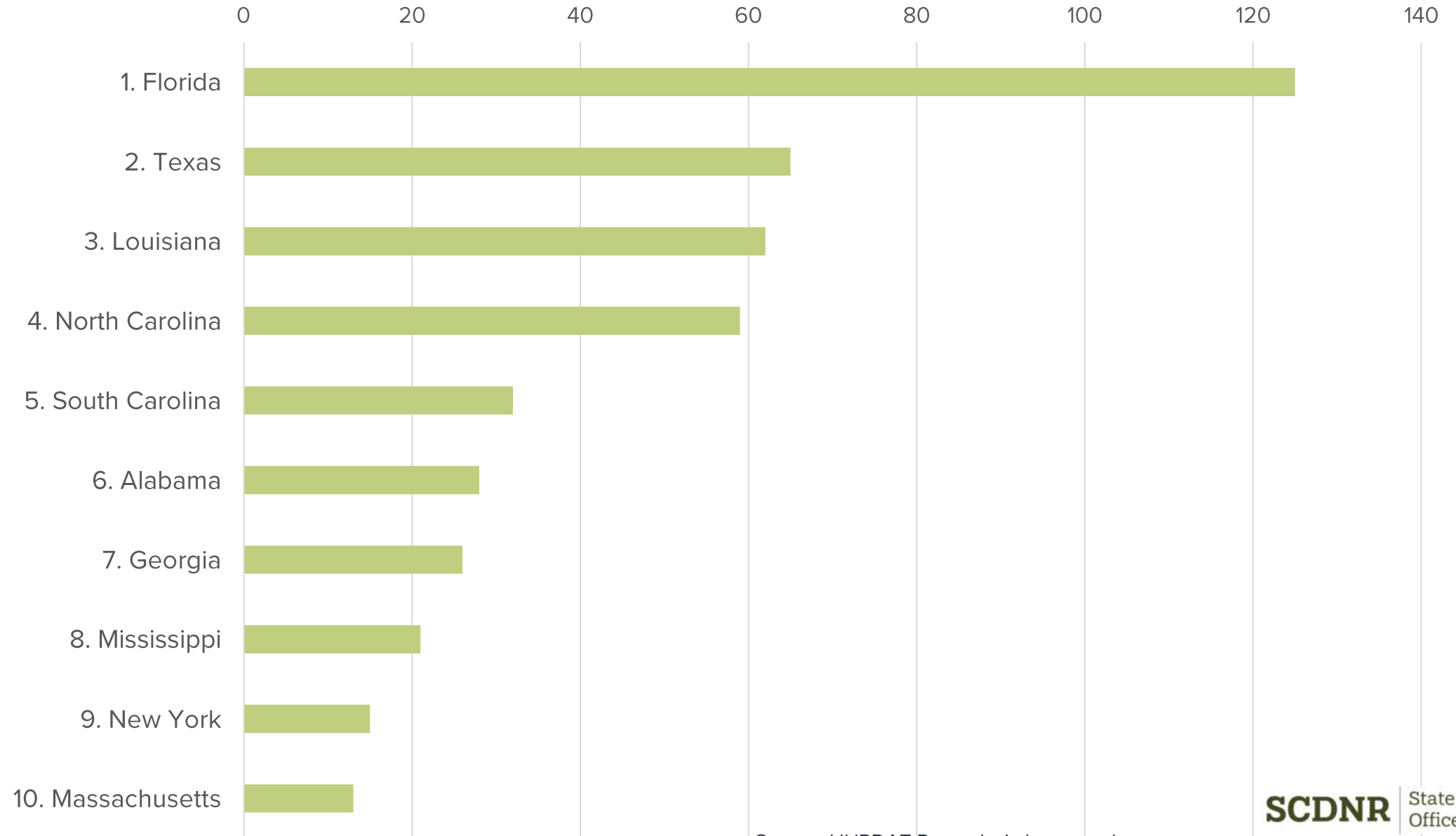


Inland portions of the state have been affected by:

- Heavy rains
- Flooding
- High winds
- Tornadoes



10 States Where Hurricanes Hit the Most



Source: [HURDAT Re-analysis \(noaa.gov\)](https://www.noaa.gov/hurricane/hurdat)

Tracks Of Tropical Cyclones To Impact South Carolina



80%

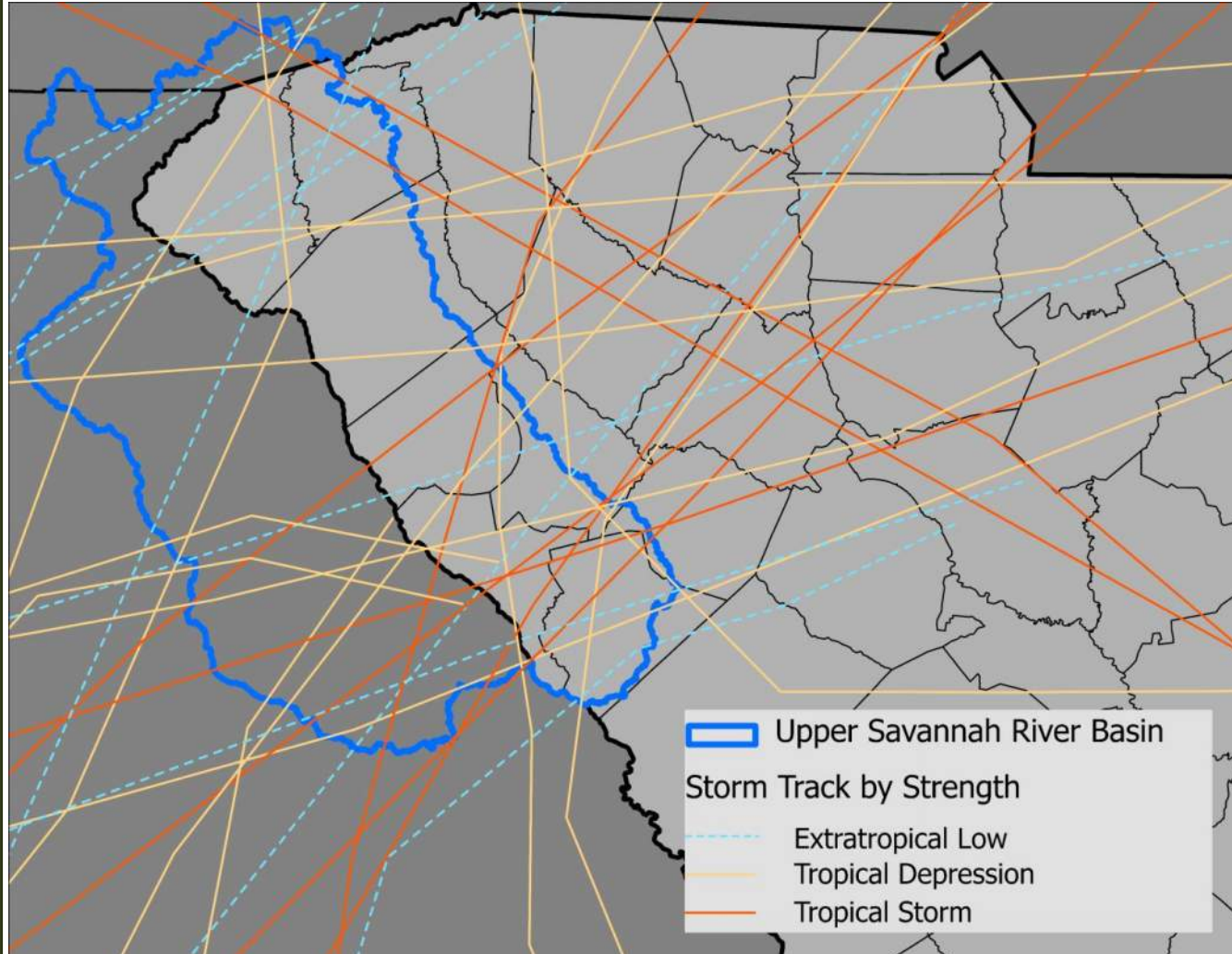
**CHANCE OF BEING
IMPACTED BY A TROPICAL
SYSTEM EACH YEAR**

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

UPPER SAVANNAH BASIN TROPICAL CYCLONES BY THE NUMBERS

*based on
1851-2021 period of record



THE BREAKDOWN:

- 31** HAVE TRACKED INTO THE BASIN
- 9** WERE EXTRATROPICAL LOW STRENGTH
- 14** WERE TROPICAL DEPRESSION STRENGTH
- 8** WERE TROPICAL STORM STRENGTH

For Reference:

- Tropical Depression: max wind of 38 mph
- Tropical Storm: max winds of 39-73 mph

Thank you

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