

South Carolina's Climate Report Card:

Understanding South Carolina's Climate Trends and Variability



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Topics to be Discussed:

Seasonal Temperature and Precipitation Trends

- NOAA's US Historical Climate Network, 1901-2010
 - Longest period of record, least amount of missing data and station moves
 - Least squares regression for trend

Threshold Parameters and Moving Averages

- NOAA's Cooperative Observation Network, 1900-2011
 - Threshold parameters (i.e temp. ≤ 32 F)

Tornado Climatology

- NOAA's Storm Prediction Ct.'s Severe Wx. Database, 1950-2009

Hurricane Landfalls

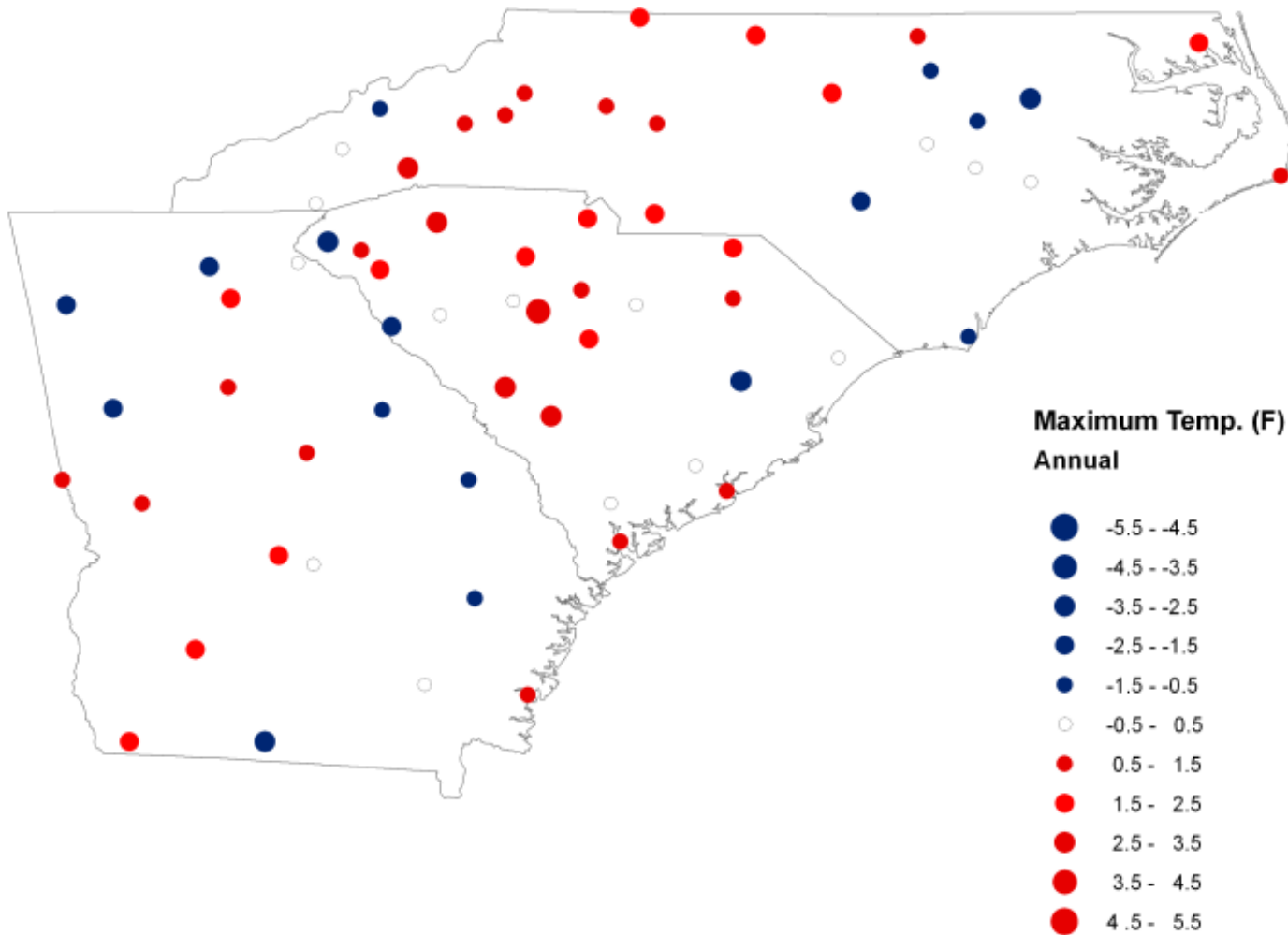
- NOAA's National Hurricane Center Database, 1854-2010



Is the Southeast Getting Warmer or Colder?

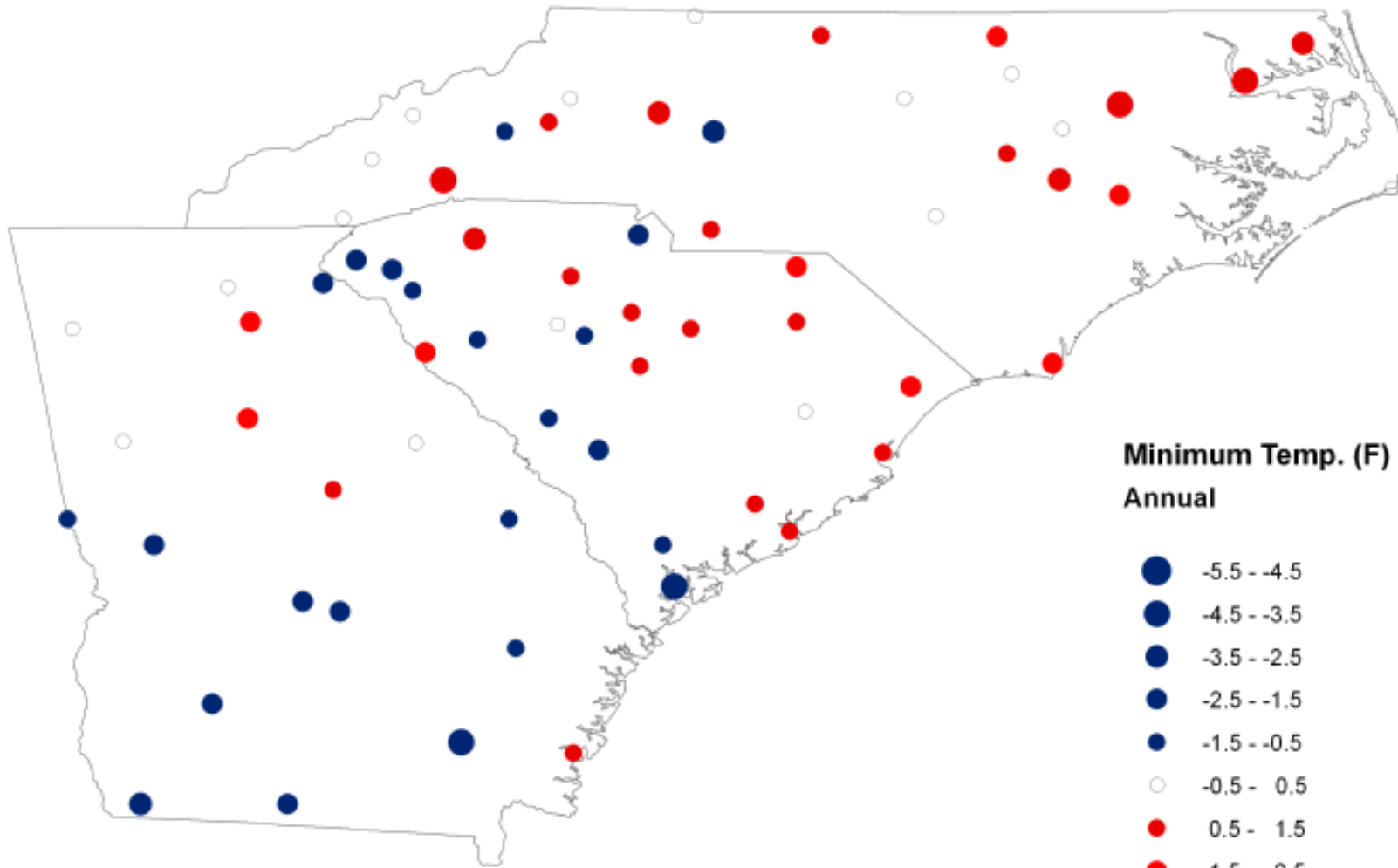


Southeast Annual Maximum Temperature 1901-2010



*NOAA's US Historical Climate Network

Southeast Annual Minimum Temperature 1901-2010

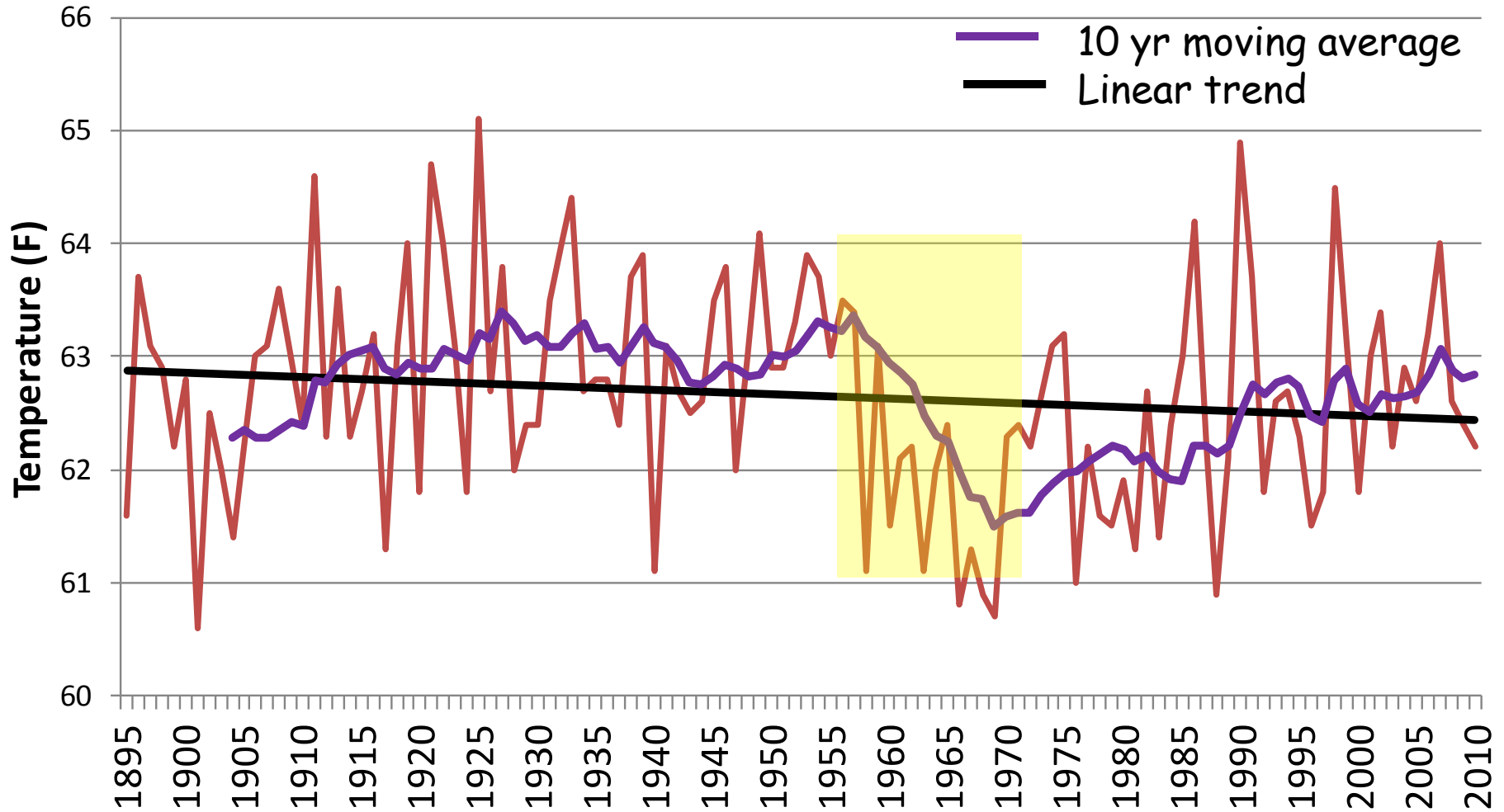


Minimum Temp. (F)
Annual

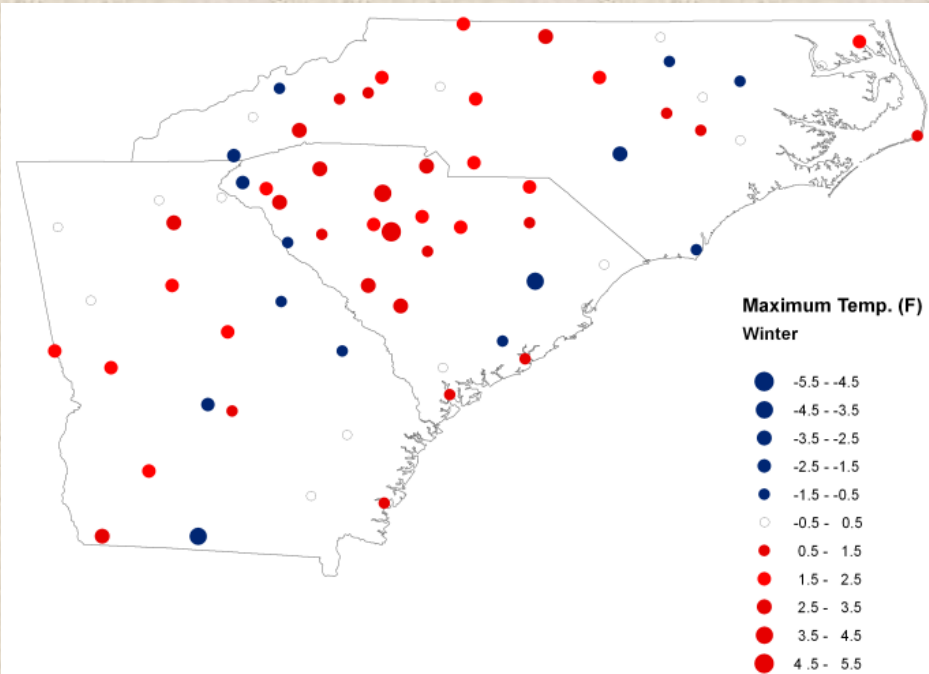
- -5.5 - -4.5
- -4.5 - -3.5
- -3.5 - -2.5
- -2.5 - -1.5
- -1.5 - -0.5
- -0.5 - 0.5
- 0.5 - 1.5
- 1.5 - 2.5
- 2.5 - 3.5
- 3.5 - 4.5
- 4.5 - 5.5

*NOAA's US Historical Climate Network

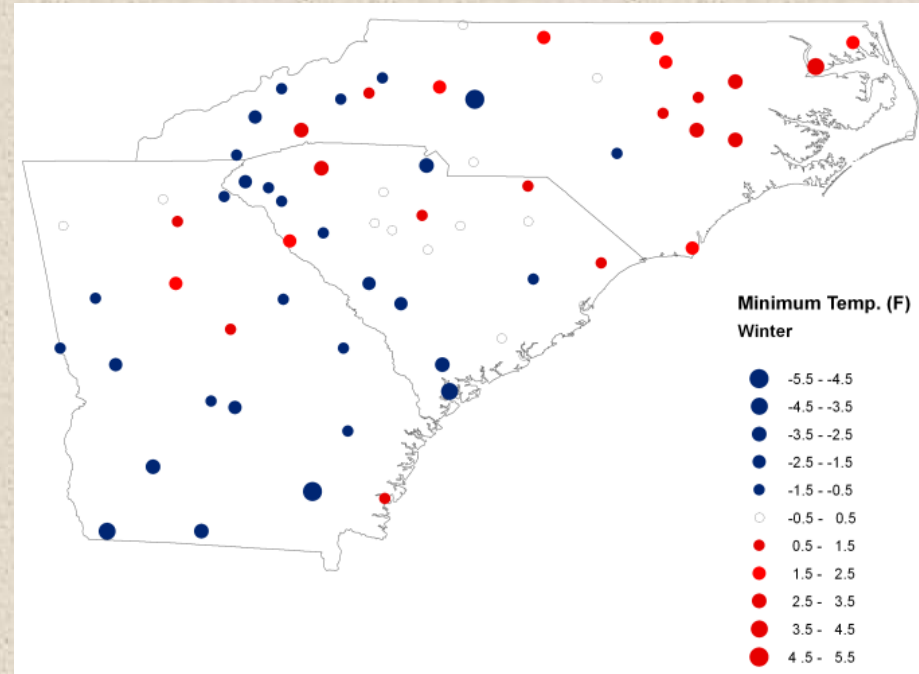
SC Annual Temperature Trend: 1895-2010



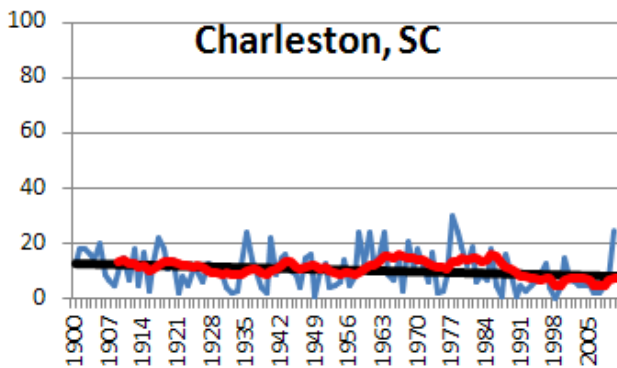
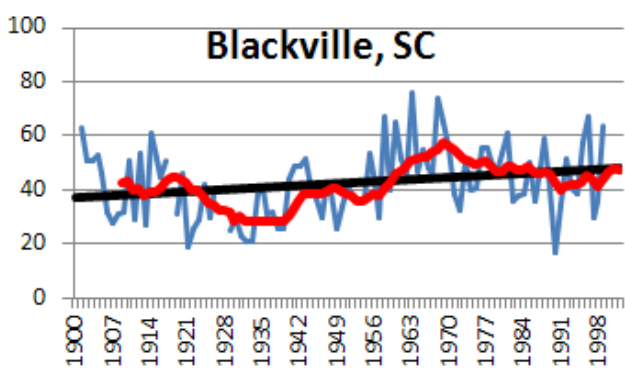
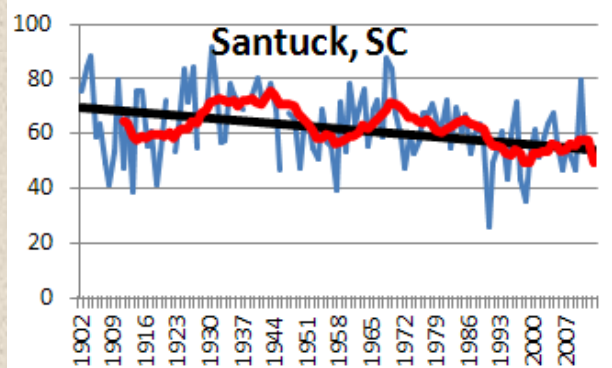
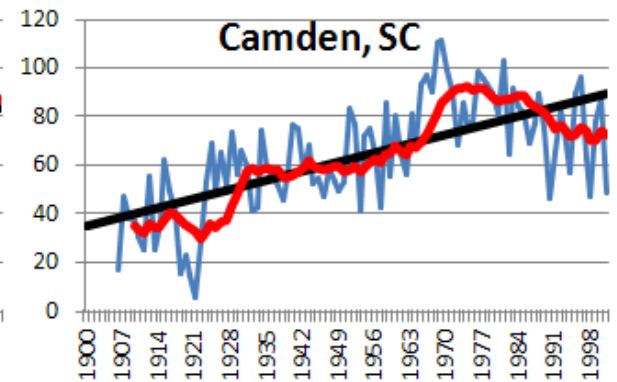
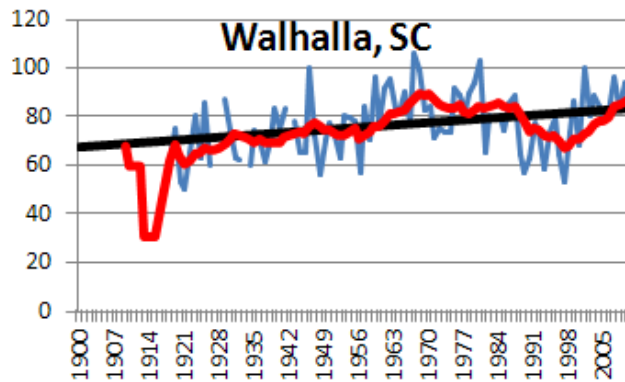
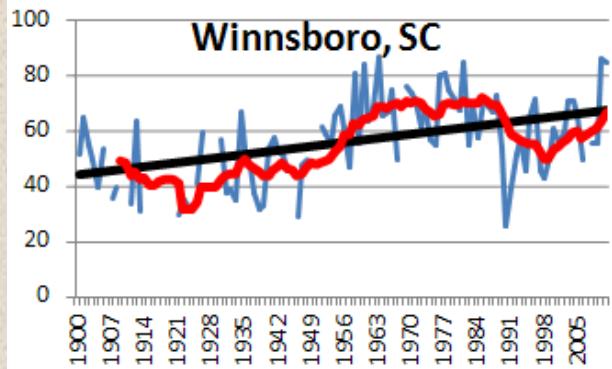
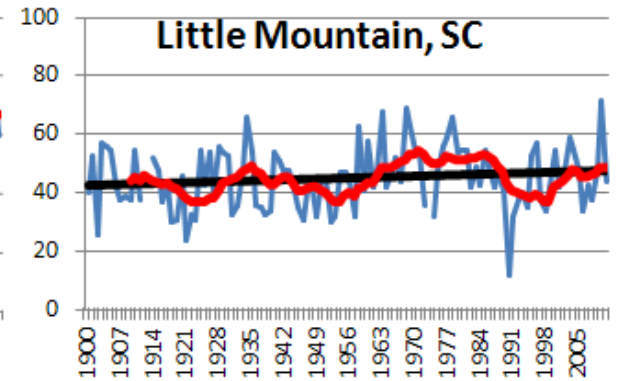
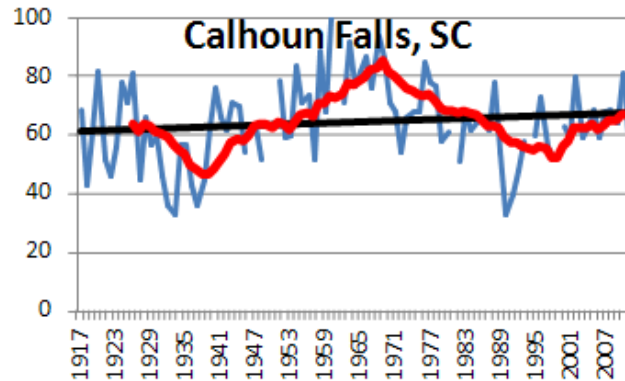
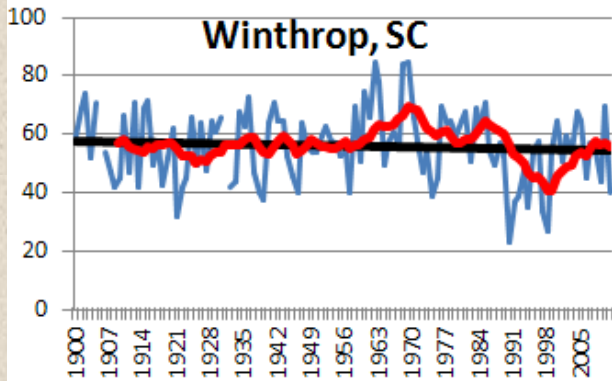
Winter Maximum Temperature 1901-2010



Winter Minimum Temperature 1901-2010



Number of Days Min Temperature $\leq 32^{\circ}\text{F}$

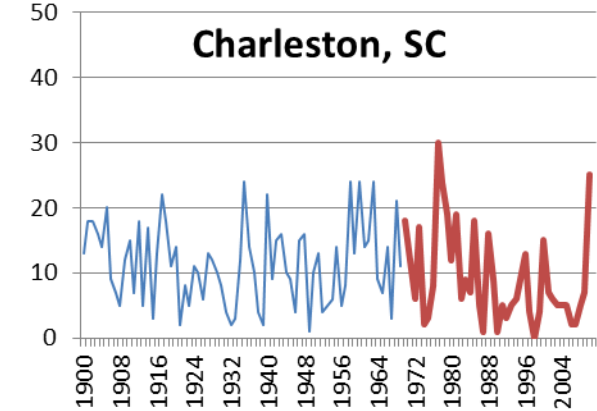
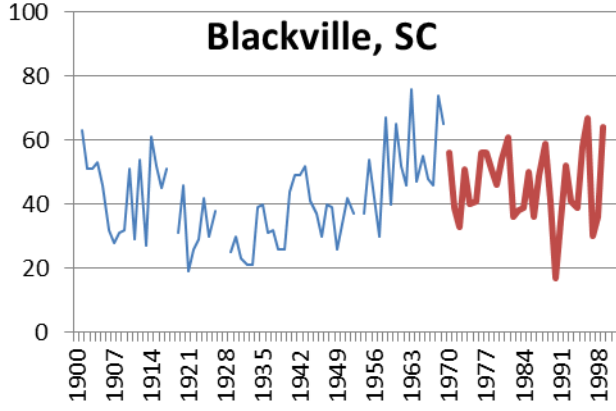
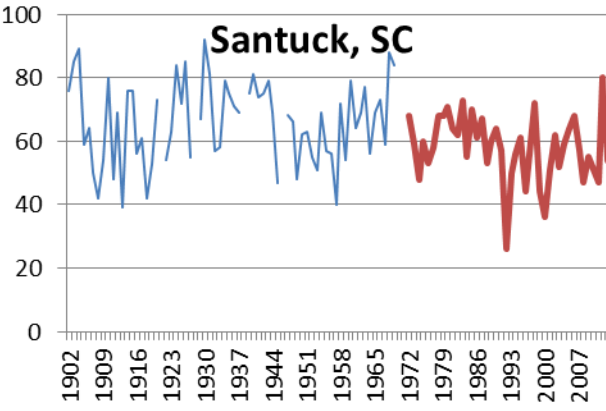
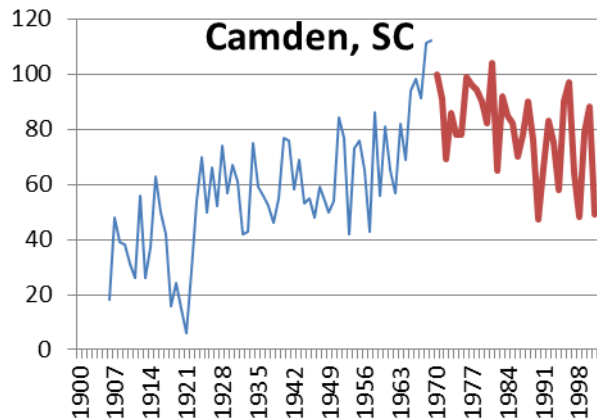
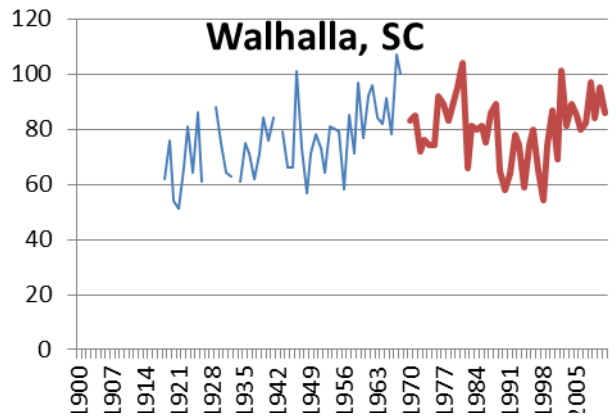
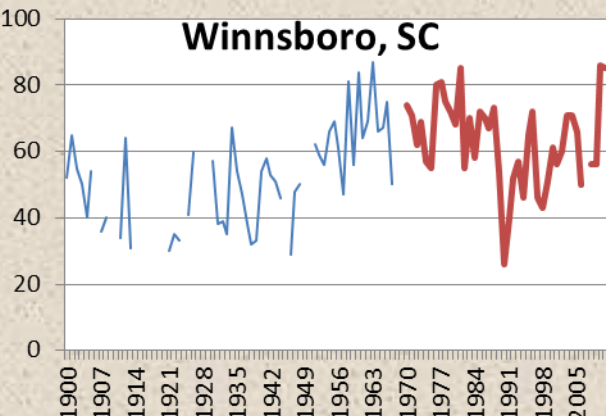
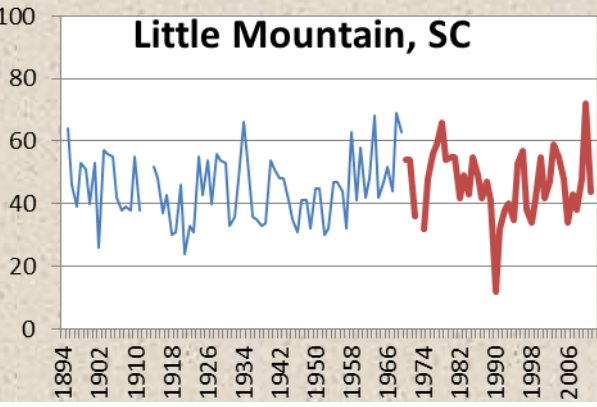
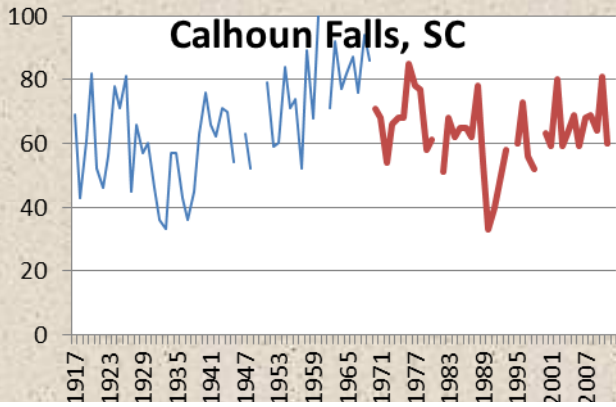
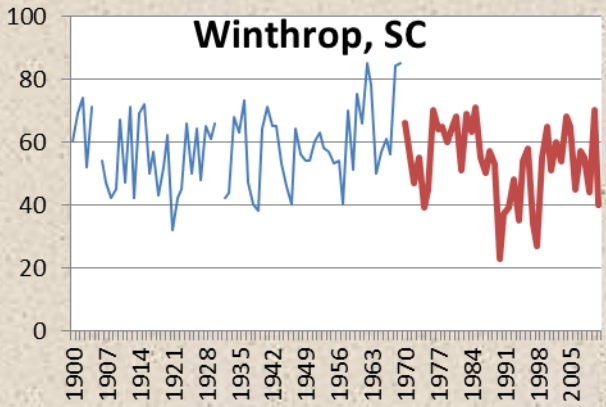


— # of days minimum temp ≤ 32

— Linear (# of days minimum temp ≤ 32)

— 10 per. Mov. Avg. (# of days minimum temp ≤ 32)

Number of Days Min Temperature $\leq 32^{\circ}\text{F}$

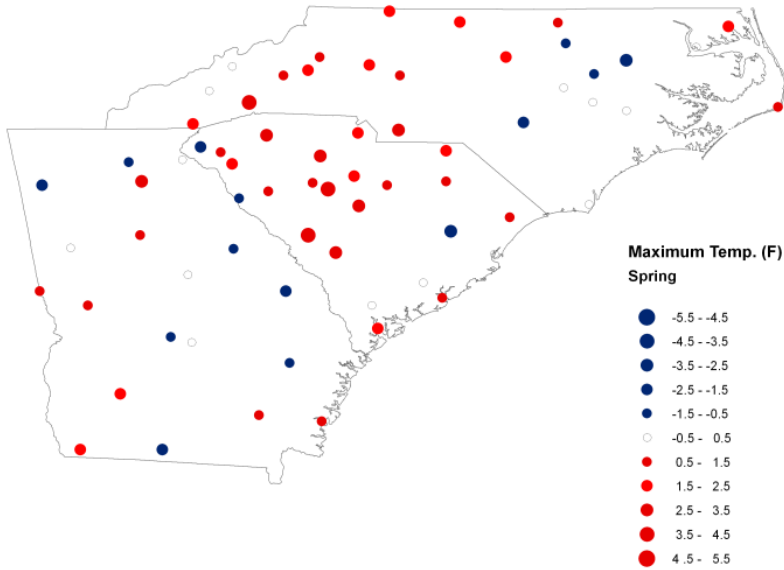


— # of days minimum temp ≤ 32

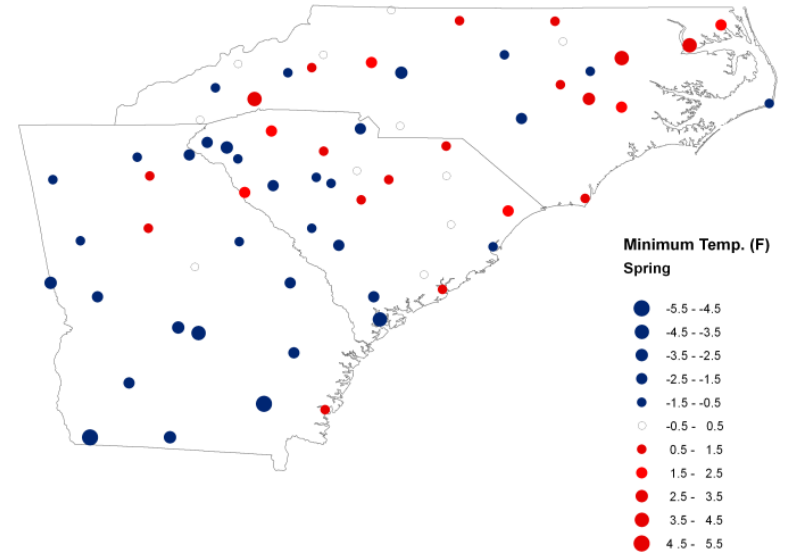
— Linear (# of days minimum temp ≤ 32)

— 10 per. Mov. Avg. (# of days minimum temp ≤ 32)

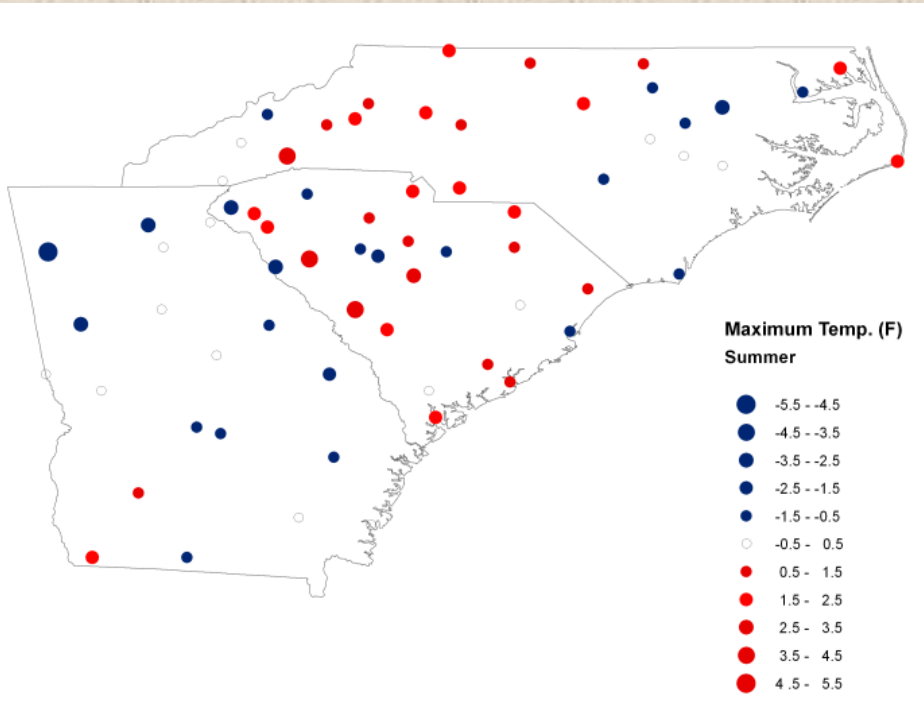
Spring Maximum Temperature 1901-2010



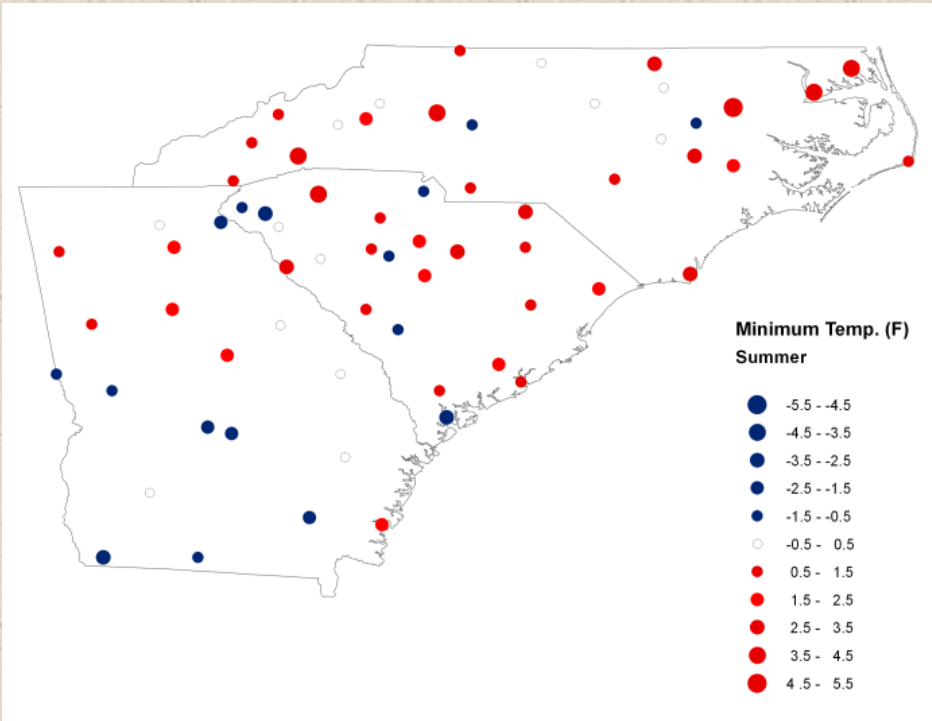
Spring Minimum Temperature 1901-2010



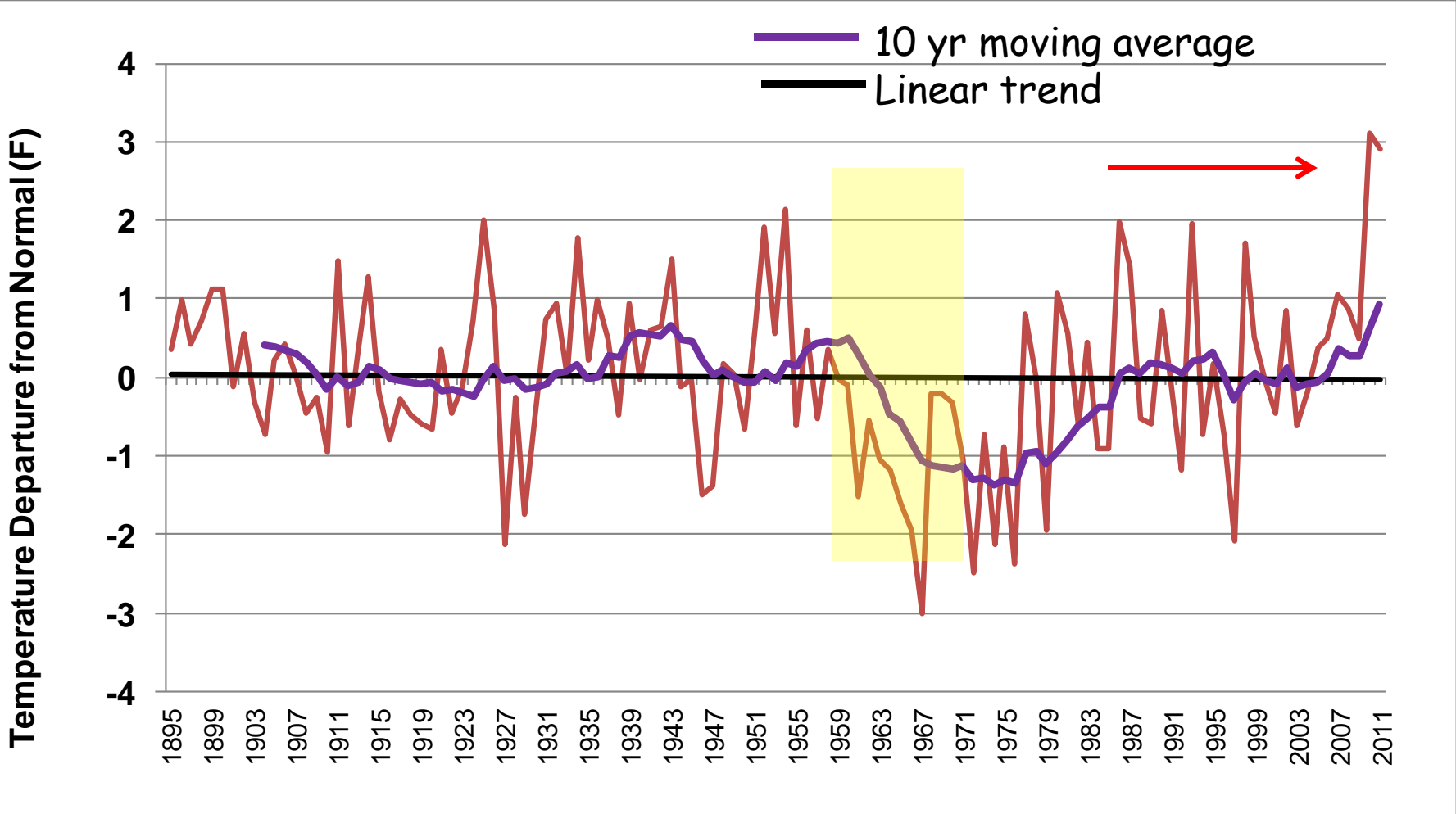
Summer Maximum Temperature 1901-2010



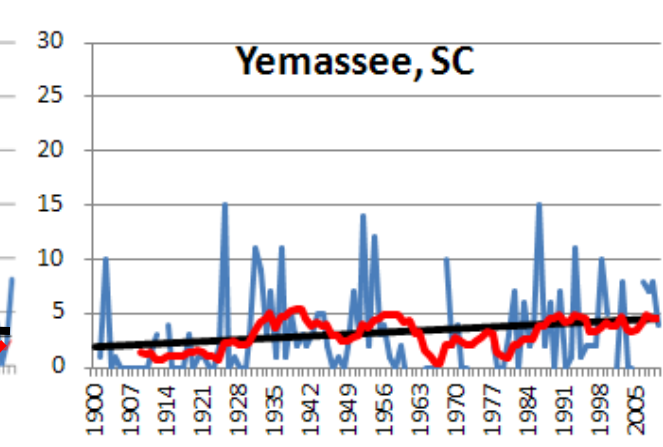
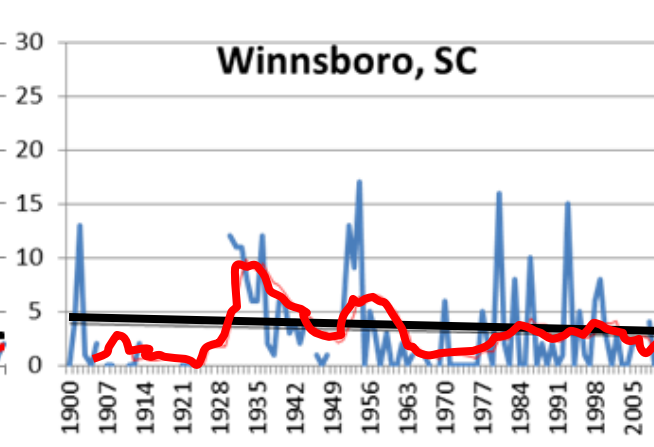
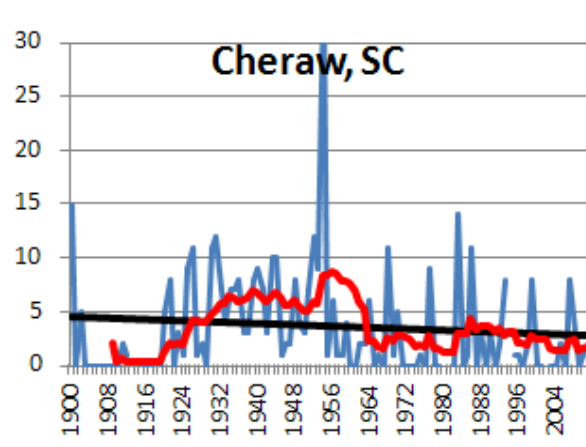
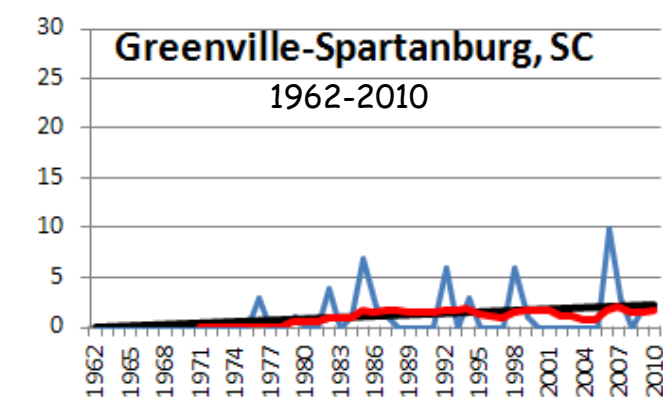
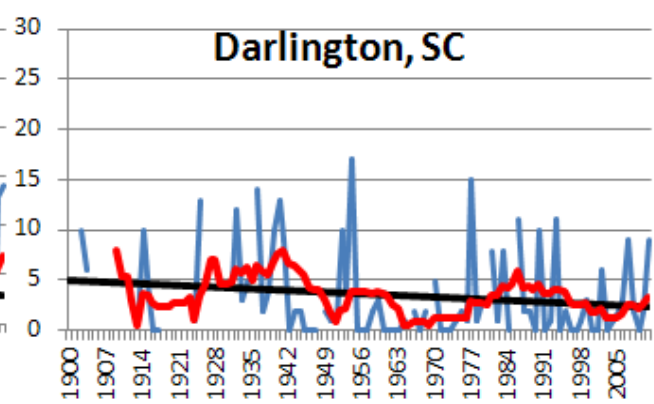
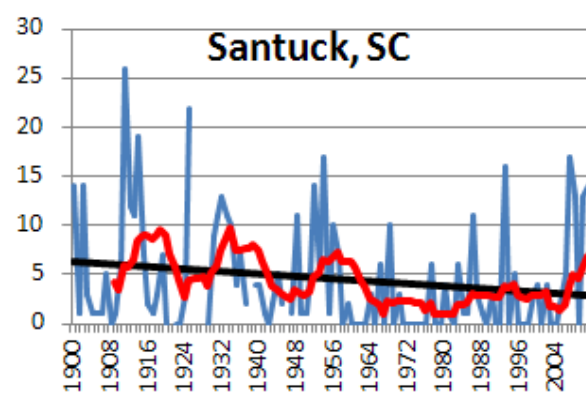
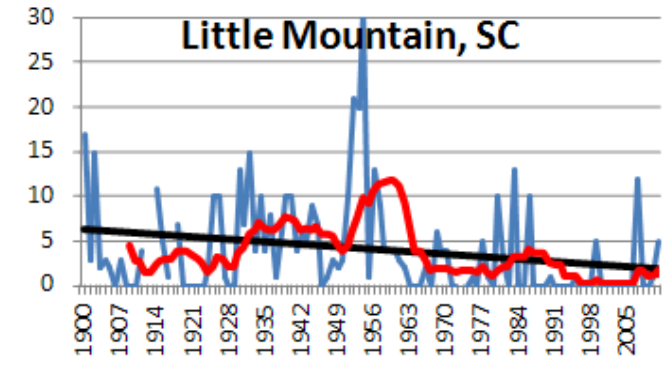
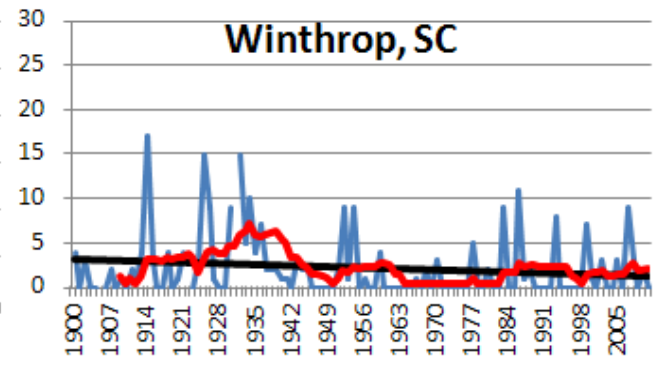
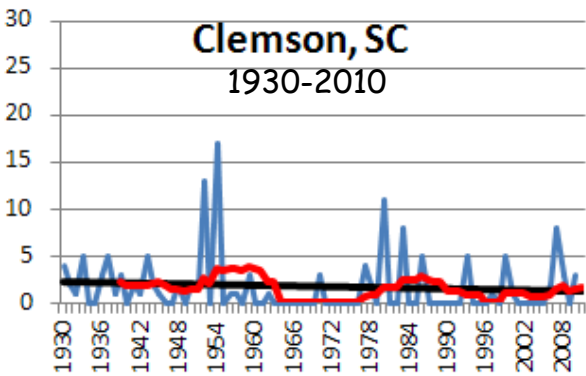
Summer Minimum Temperature 1901-2010



SC's Summer Average Temperature Departure from Normal 1895-2011



Number of Days Max Temperature $\geq 100^{\circ}\text{F}$

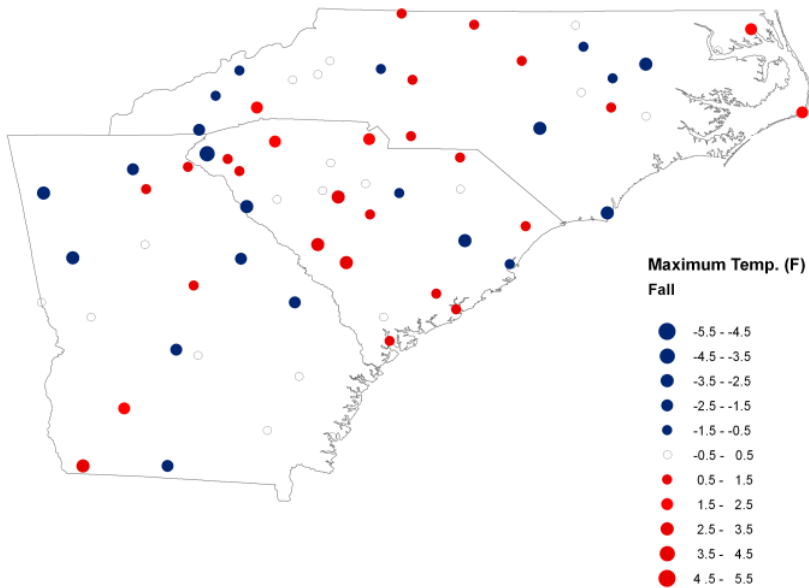


— # of days maximum temp ≥ 100

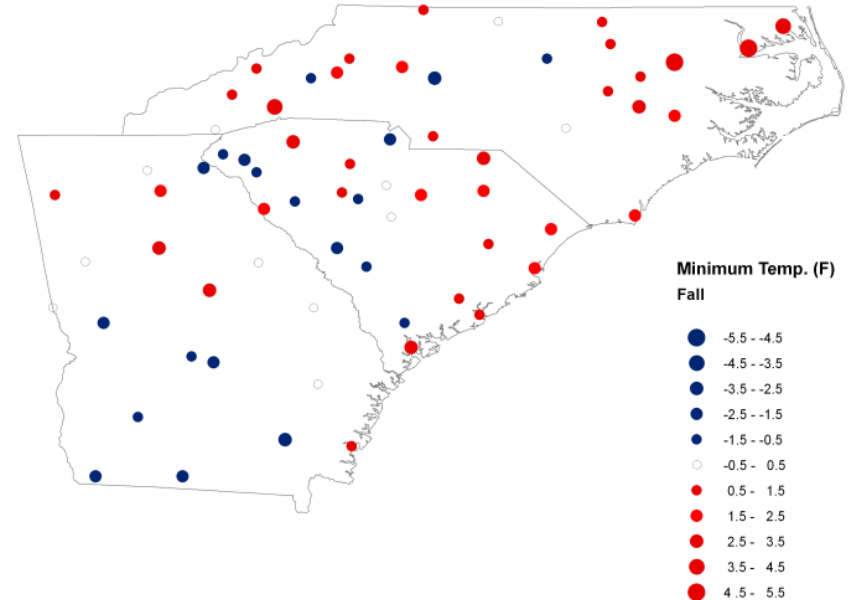
— Linear (# of days maximum temp ≥ 100)

— 10 per. Mov. Avg. (# of days maximum temp ≥ 100)

Fall Maximum Temperature 1901-2010



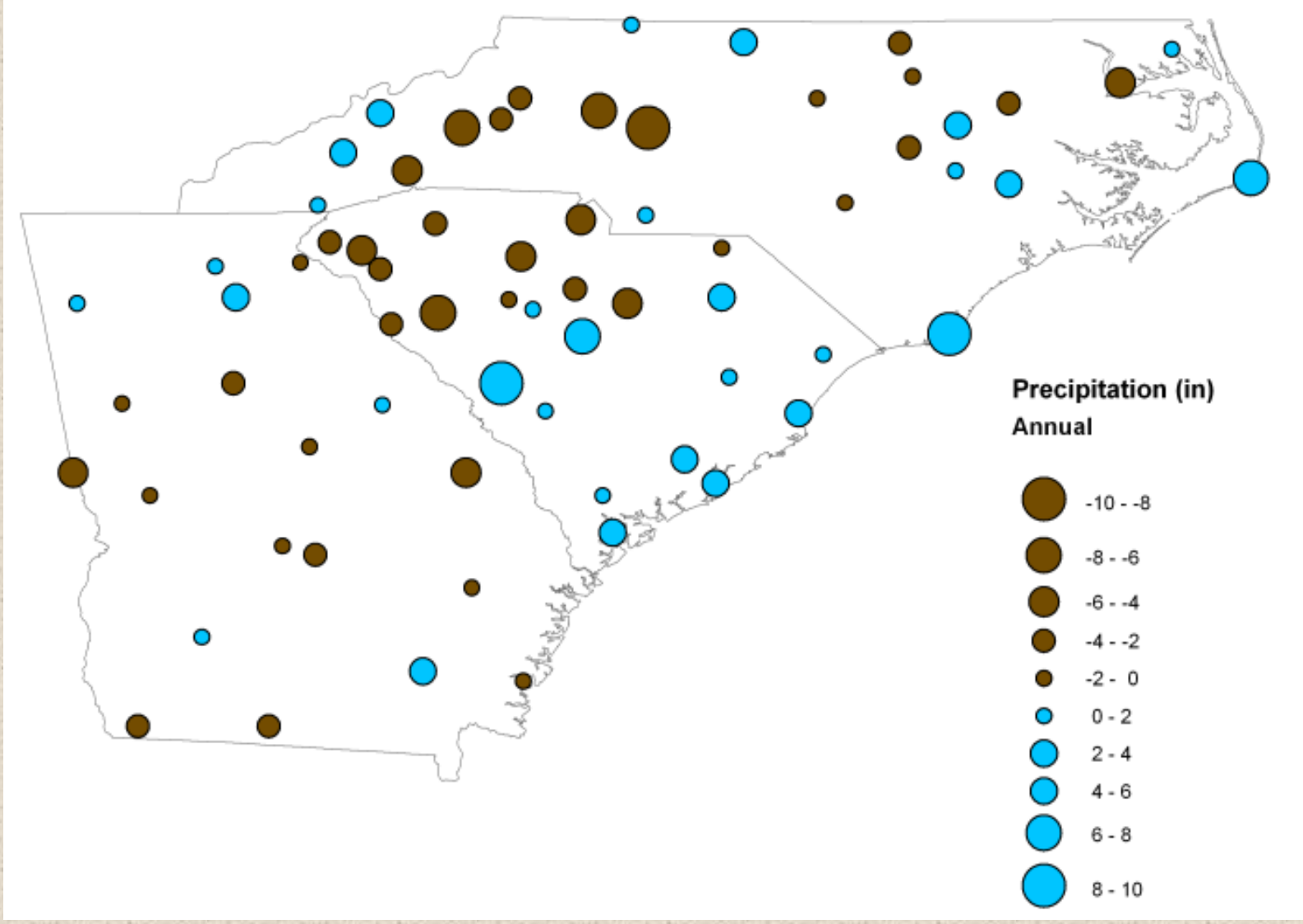
Fall Minimum Temperature 1901-2010



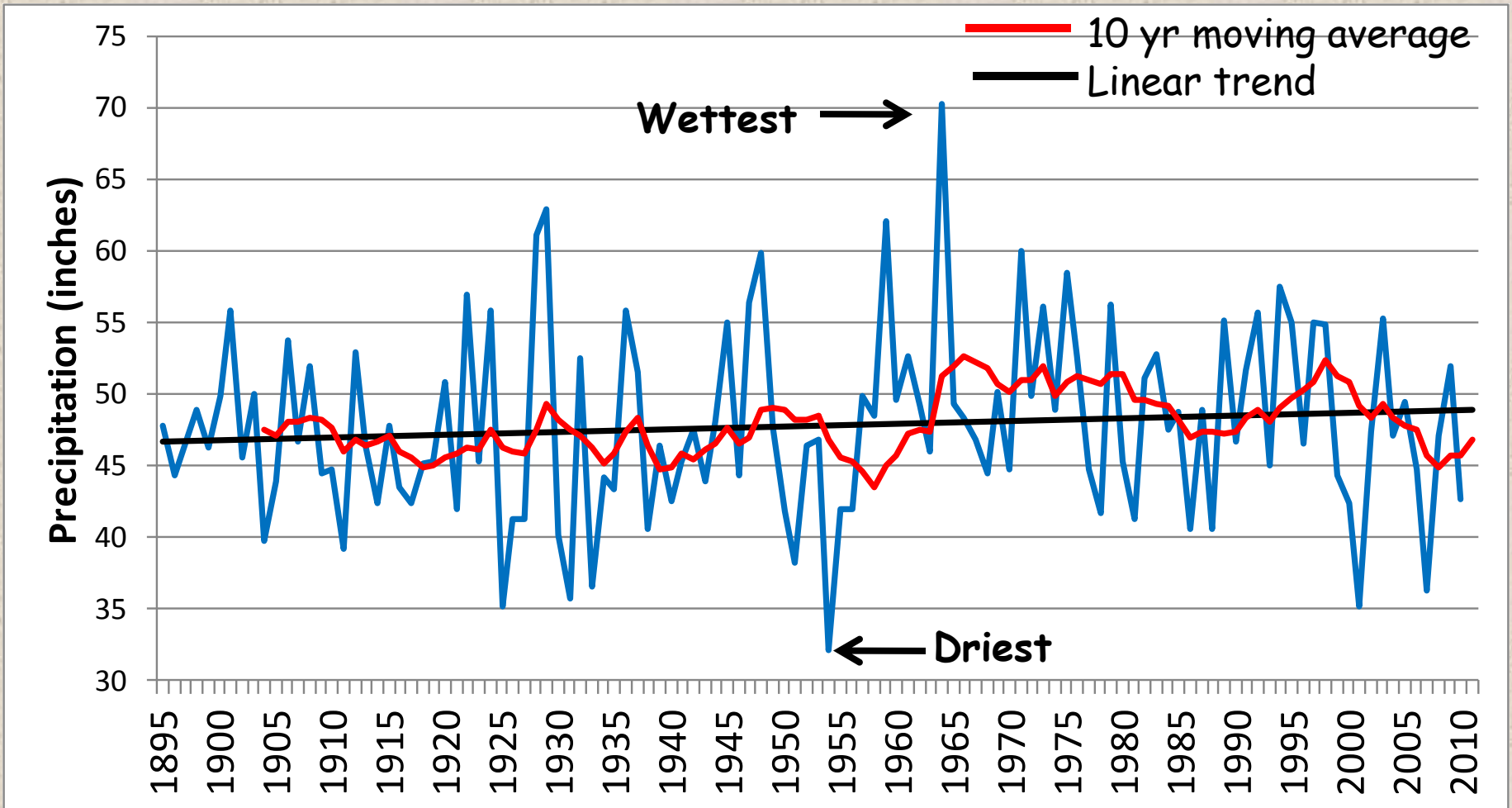
Is it Wetter or Drier?



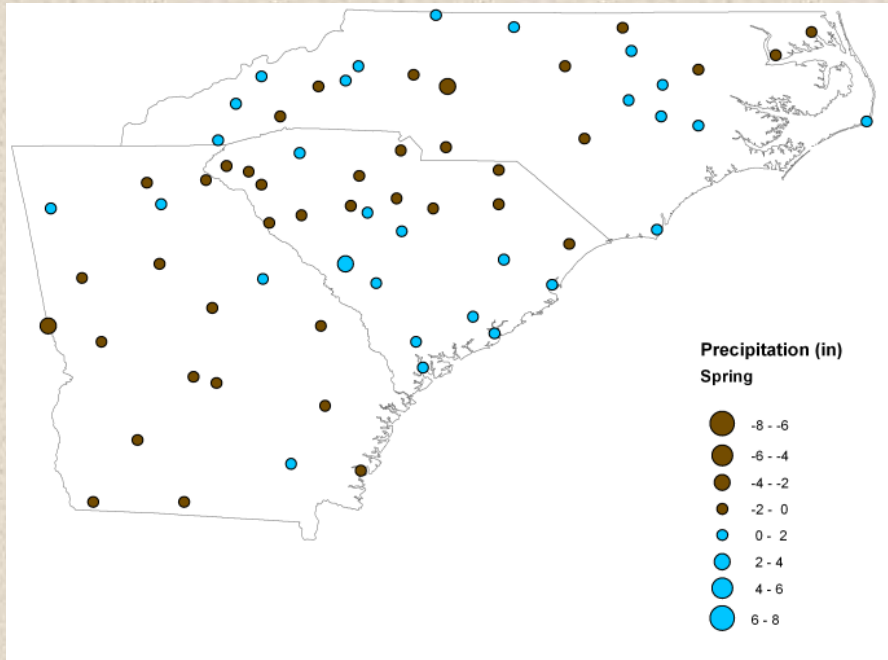
Southeast Average Annual Precipitation Trends 1901 - 2010



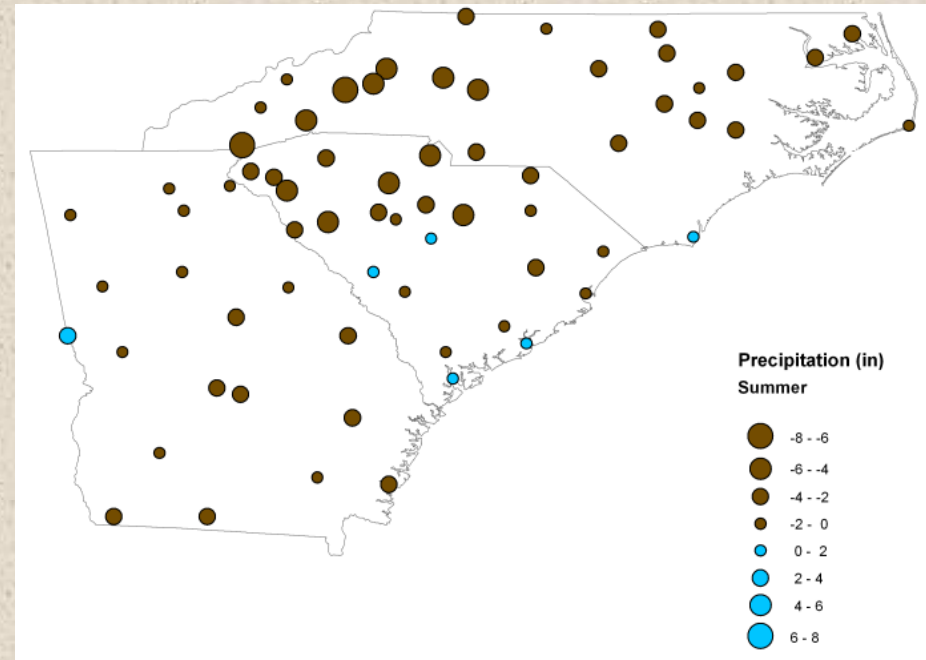
SC Annual Precipitation Trend: 1895-2010



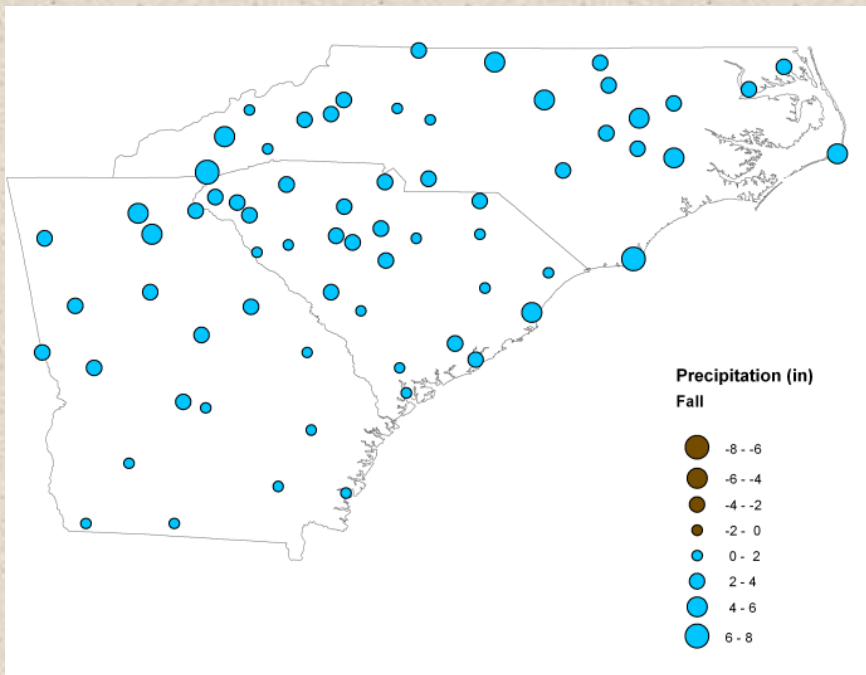
Spring Precipitation 1901-2010



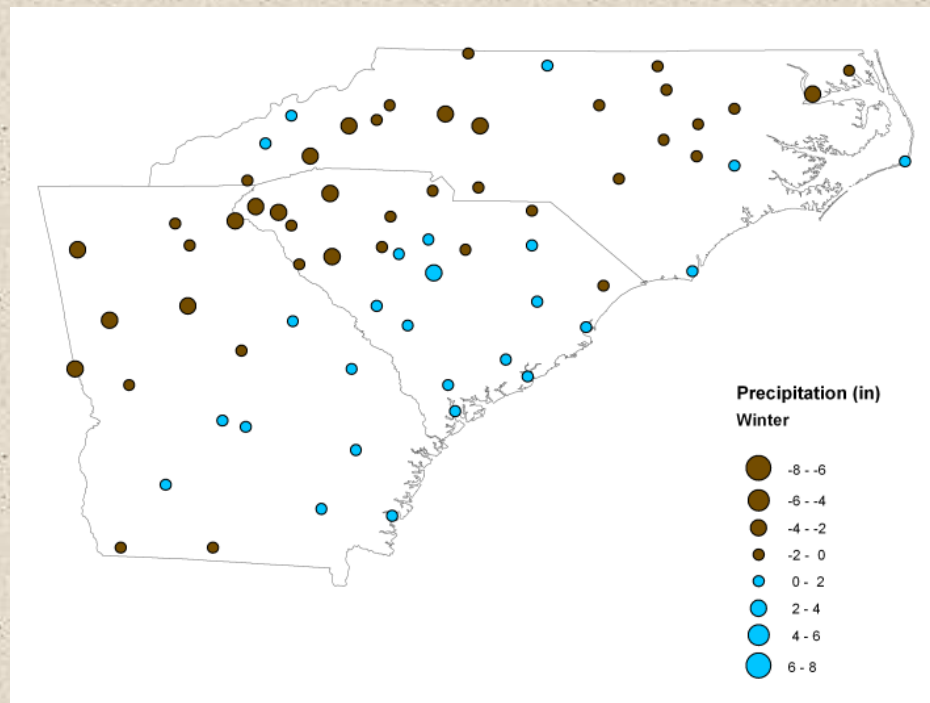
Summer Precipitation 1901-2010



Fall Precipitation 1901-2010



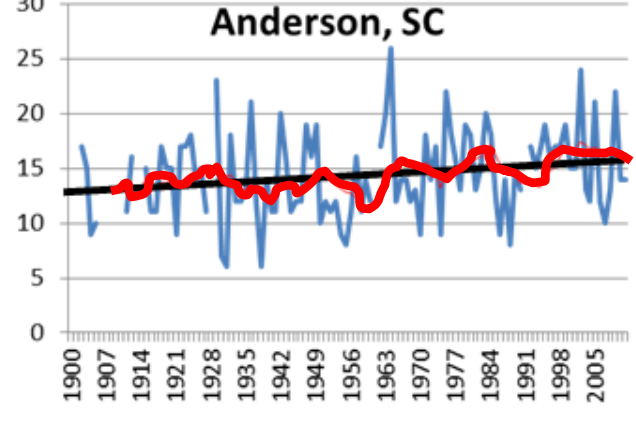
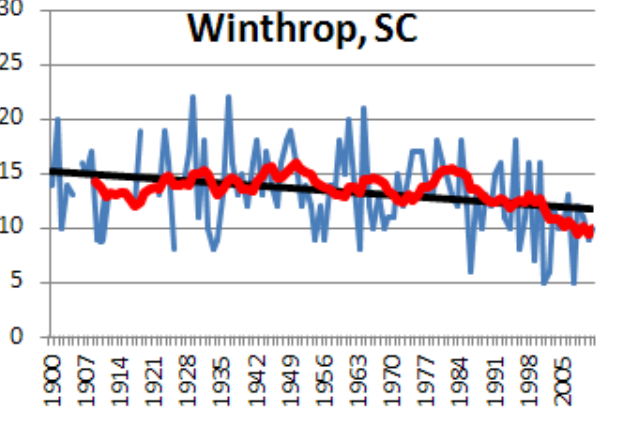
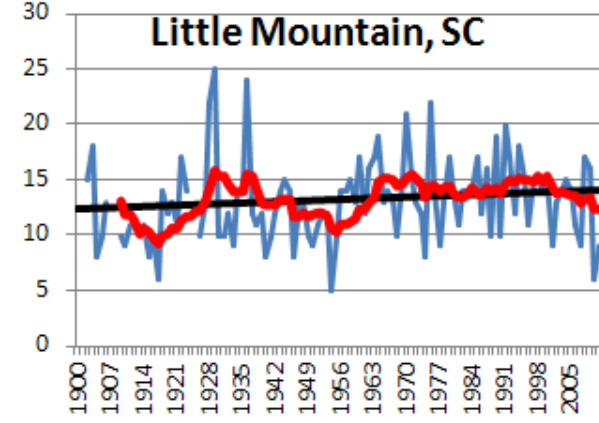
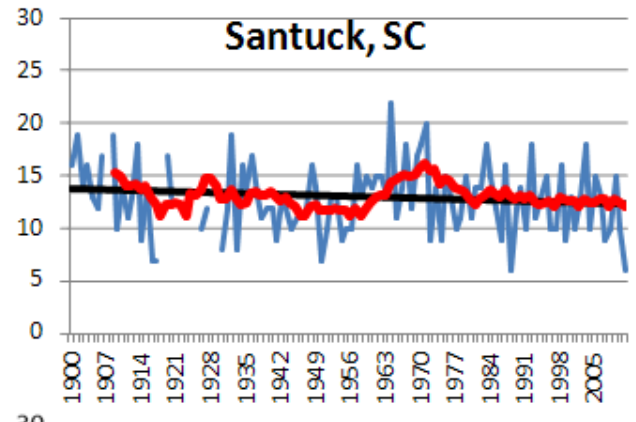
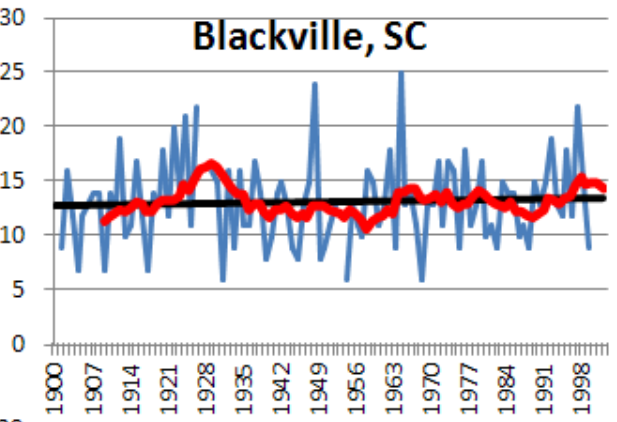
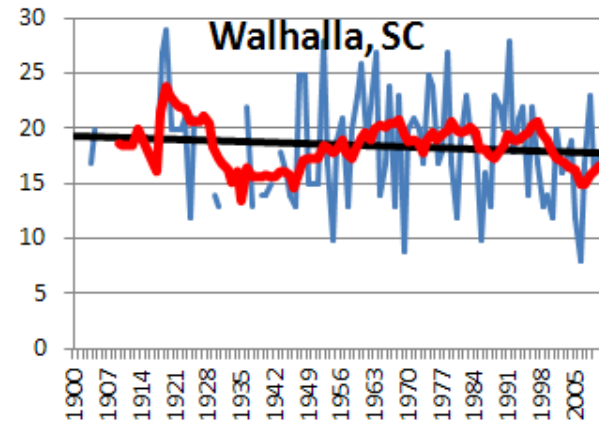
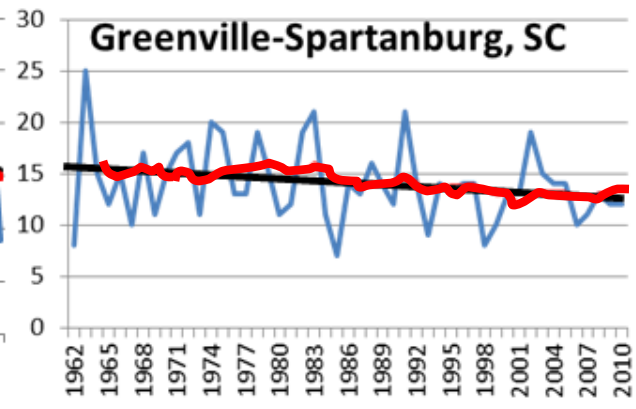
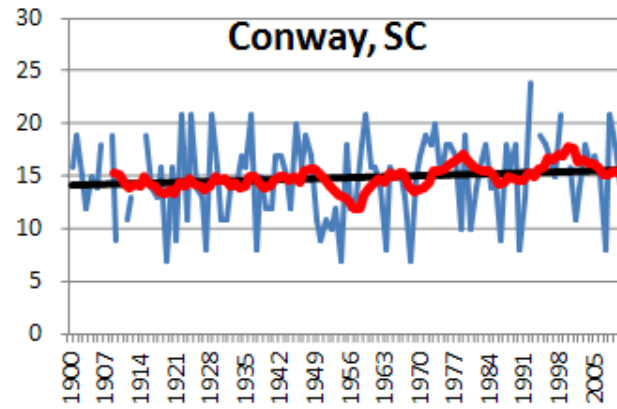
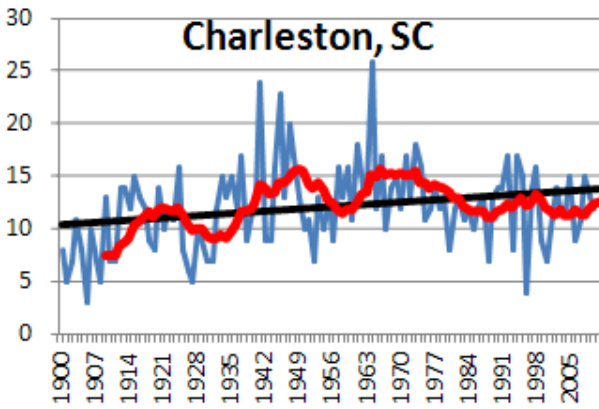
Winter Precipitation 1901-2010



SC Precipitation Trends

Station	Spring	Summer	Fall	Winter
Walhalla	-0.3	-2.8	3.4	-2.4
Clem Univ	-0.7	-3.3	2.3	-2.9
Anderson	-0.7	-4.8	3.9	-1.4
Calhoun Falls	-1.3	-2.5	1.9	-1.5
Greenwood	-0.5	-5.8	1.4	-2.8
Grvl/Spbg	0.1	-2.6	2.3	-2.2
Aiken	2.8	1.9	2.8	1.7
Blackville	0.1	-1.2	0.6	1
Newberry	-0.3	-2.8	3.8	-1.6
Lil Mtn	0.2	-1.6	2.9	0.4
Columbia	1.4	0.6	3	2.1
Santuck	-0.6	-4.7	2.5	-1.8
Winnsboro	-0.6	-3.9	2.4	0
Camden	-1.3	-4.1	1.4	-1.3
Winthrop	-0.9	-4.6	3.1	-1.6
Cheraw	-0.8	-3	2.3	-0.4
Darlington	-0.2	-0.4	1.5	1.4
Kingstree	1.7	-3.9	1.8	1.5
Conway	-0.1	-1.3	1.9	-0.3
Georgetown	0.2	-1.7	4.5	0.2
Charleston	0.8	0.9	3.5	0.5
Summerville	1	-1	3.3	0.5
Beaufort	0.9	0.8	3.2	0.1
Yemassee	0.4	-1.9	1.4	1.6

Number of Days Precipitation ≥ 1.00 inch



— # of days precip ≥ 1.00 in

— Linear (# of days precip ≥ 1.00 in)

— 10 per. Mov. Avg. (# of days precip ≥ 1.00 in)

Tornadoes



SOUTH CAROLINA TORNADOES 1950-2009



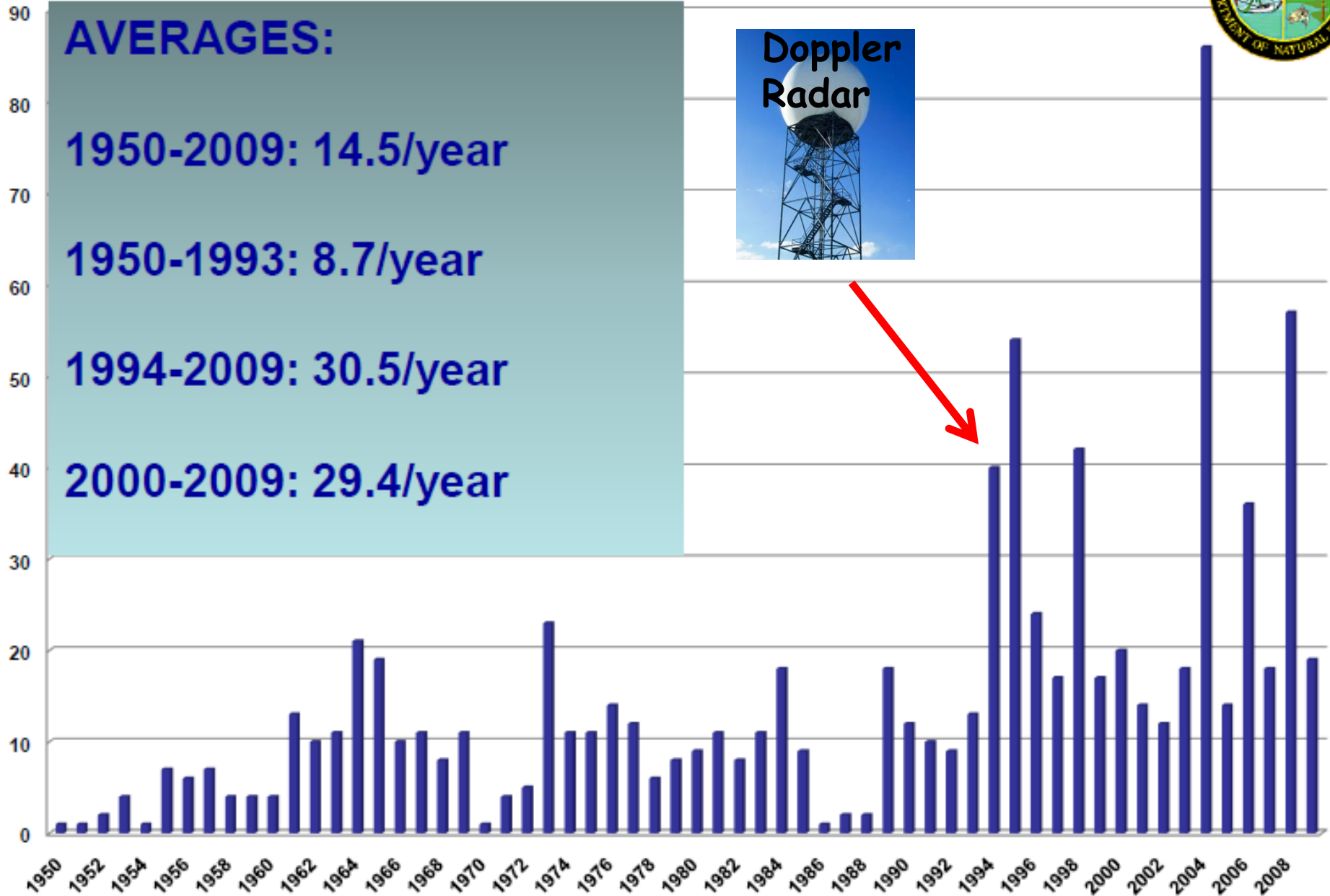
AVERAGES:

1950-2009: 14.5/year

1950-1993: 8.7/year

1994-2009: 30.5/year

2000-2009: 29.4/year



EF2, 3, 4 TORNADOES



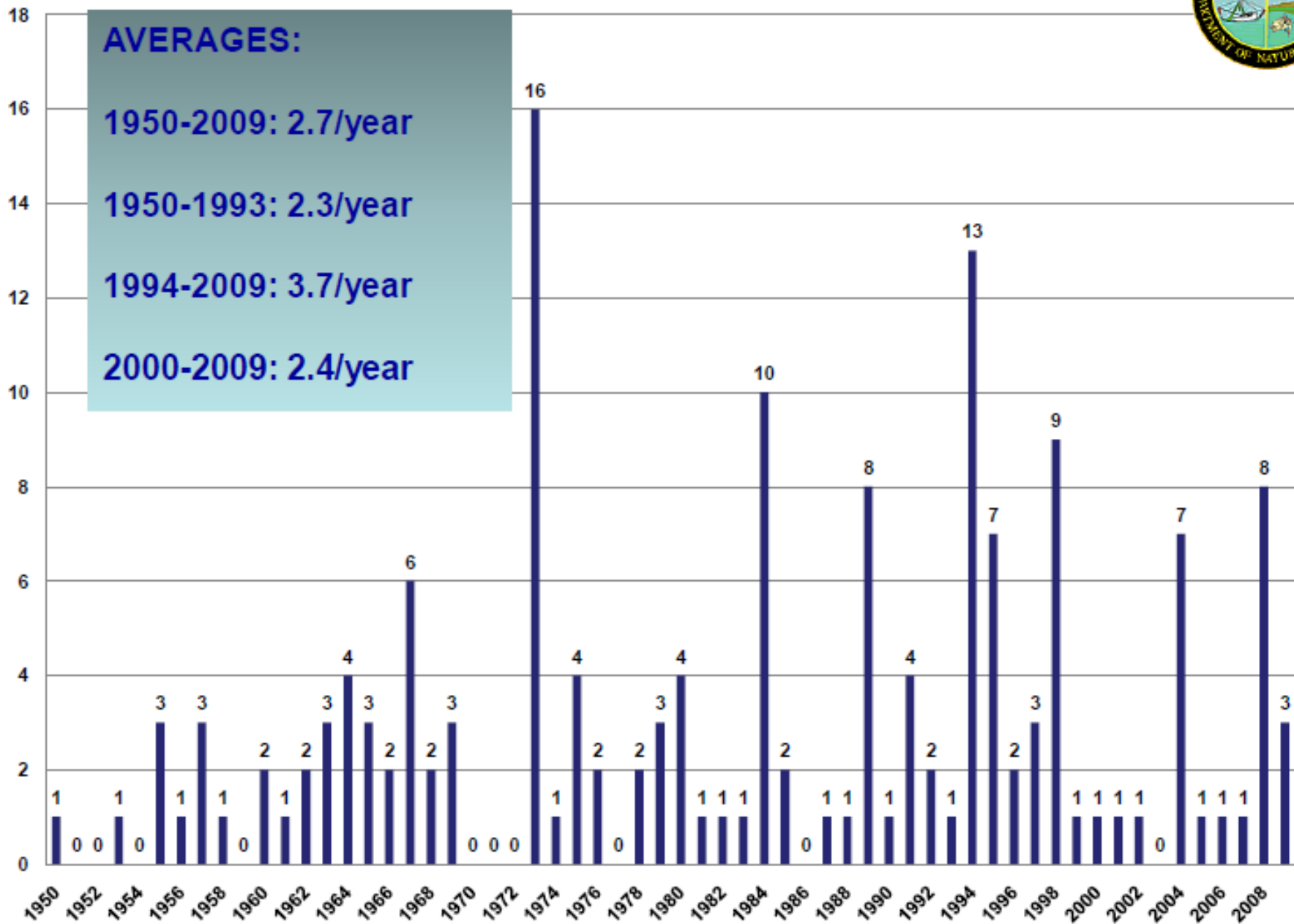
AVERAGES:

1950-2009: 2.7/year

1950-1993: 2.3/year

1994-2009: 3.7/year

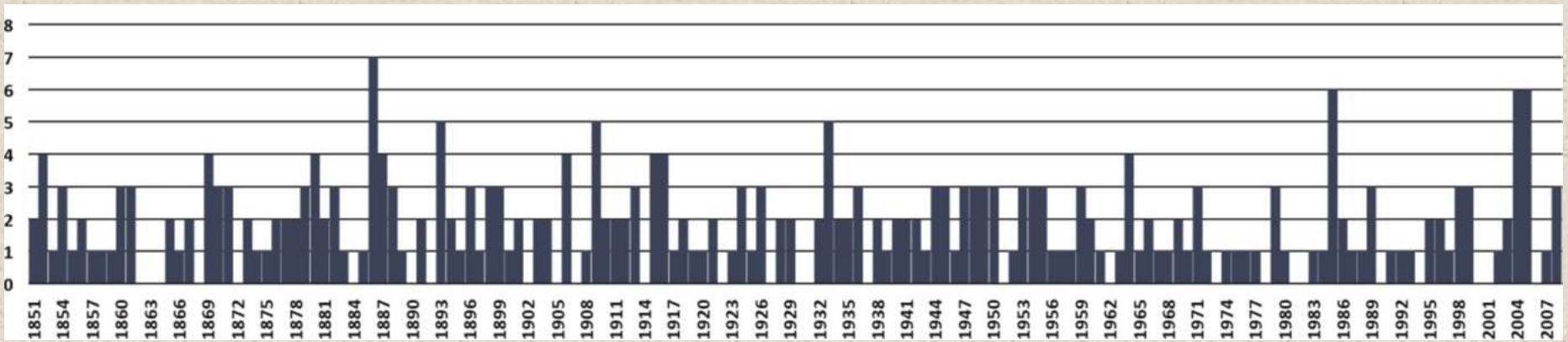
2000-2009: 2.4/year



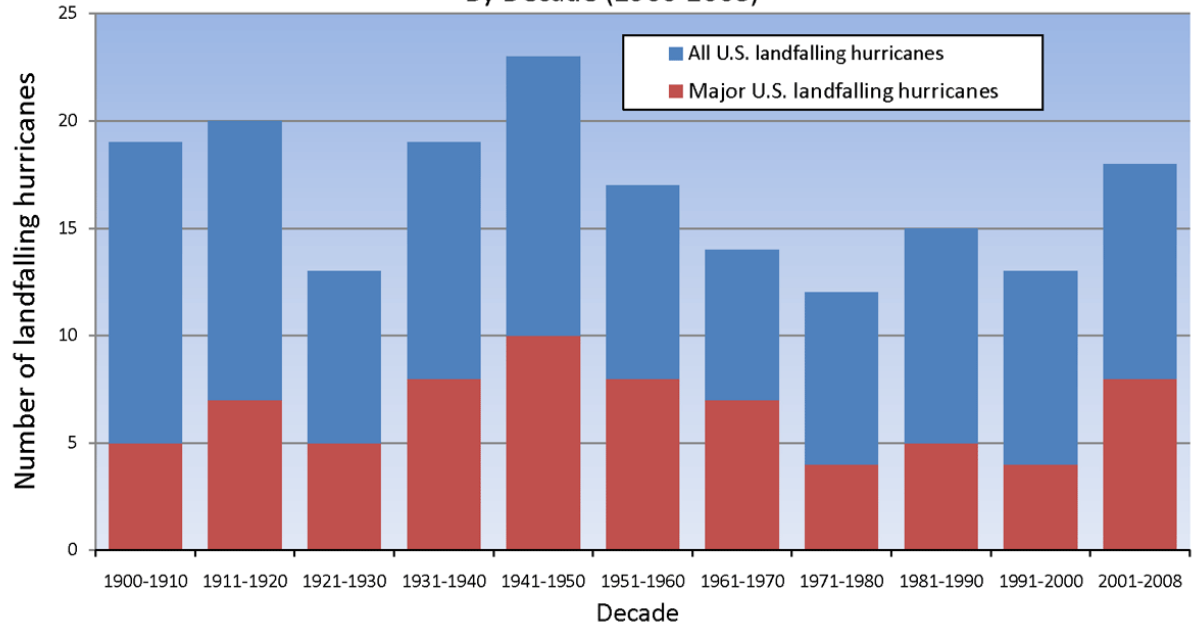
Hurricanes



U.S. Hurricane Landfalls

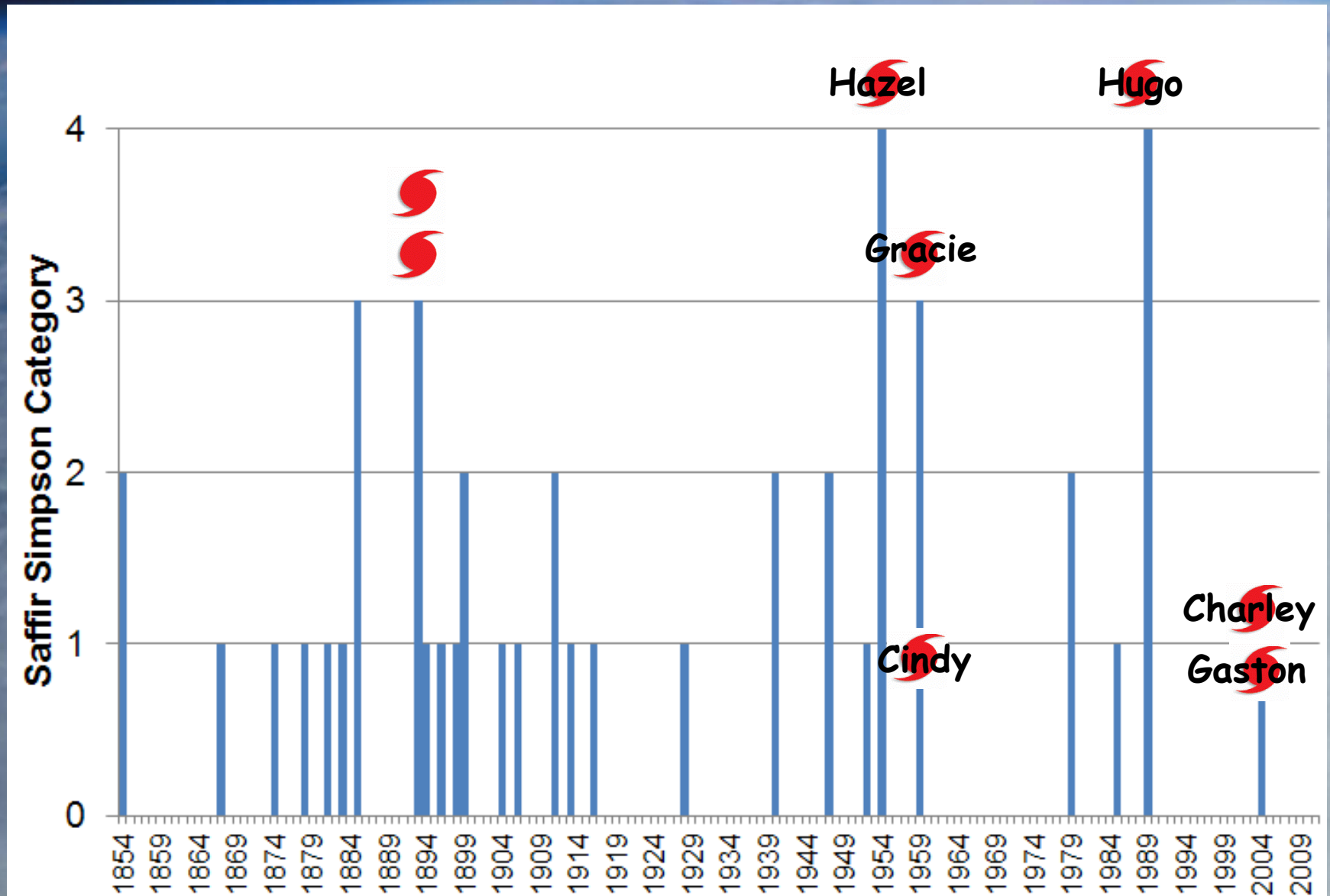


Number of Hurricanes and Major Hurricanes (cat. 3-5) Landfalling in the U.S.
By Decade (1900-2008)



Impact of Hurricanes on SC

Based on Saffir-Simpson Hurricane Wind Scale



Thank you

Hope Mizzell, Ph.D.

SC State Climatologist

SC Department of Natural Resources

<http://www.dnr.sc.gov/climate/sco/>

