

Implications of Climate Change in North and South Carolina in 1950 - 2016

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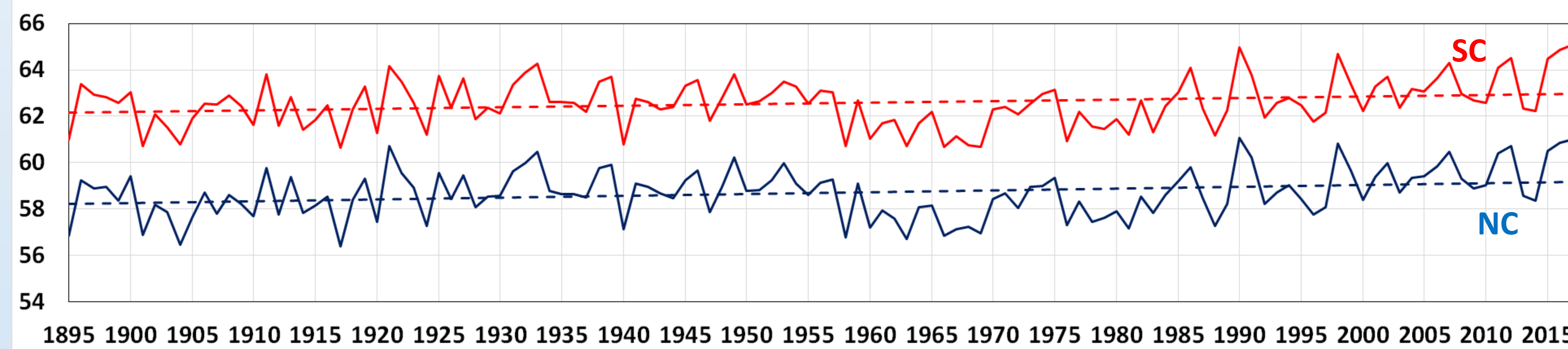
ABSTRACT

This project is to investigate the recent climate change in North and South Carolina. The time series of annual temperature and precipitation of Carolinas from 1895 -2017 are plotted to show the temporal trends of both variables. The drought data are analyzed from 2000 to 2018. Decadal variations of severe weather from 1950 -2106 are spatially illustrated using ArcGIS software. It is noted that there is no significant trends or patterns in these data that indicate any conspicuous shifts of climates in Carolinas. However, climate change does occur, and the short period in this study may obscure the signature of climate change. Nevertheless, the impact of climate change to Carolinas may not be as catastrophic as most people believe.

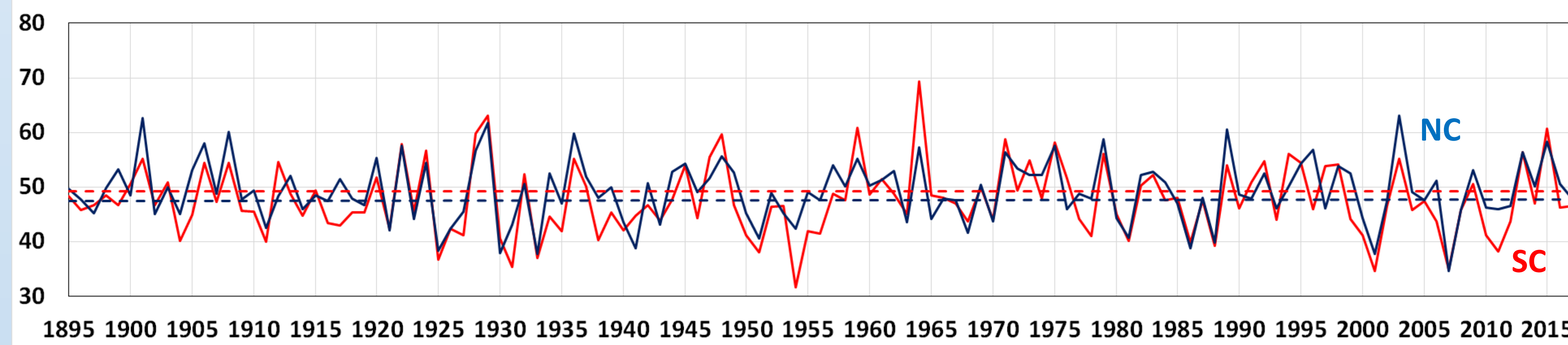
CONCLUDING REMARKS

- No significant trends in annual temperature and precipitation in 1895 – 2017;
- Severe droughts have not occurred since 2008;
- Number of landfalling tropical cyclones has decreased;
- Tornadoes occur mostly in Eastern North Carolina and Central South Carolina, the statistics do not show an increase in frequency;
- More tornadoes occur in South Carolina than North Carolina;
- Hail and wind reports have been increasing in the last two decades due to advanced observational platforms and techniques;
- Hail and strong wind events concentrate in Western North Carolina and Upstate South Carolina;
- Population continues to grow especially in North Carolina.

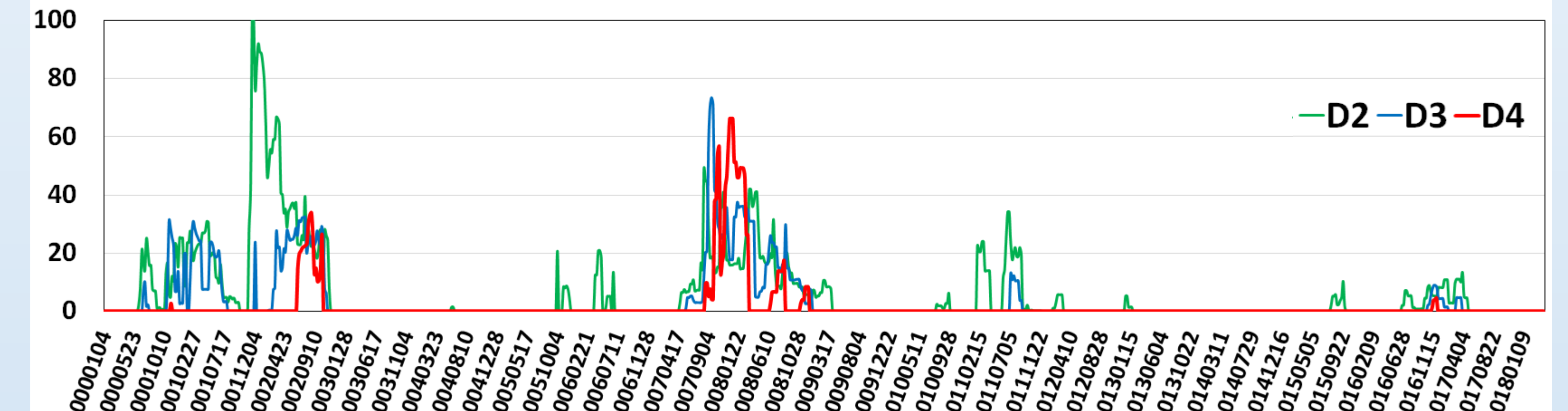
NC and SC Annual Average Temperature (°F) , 1895 - 2017



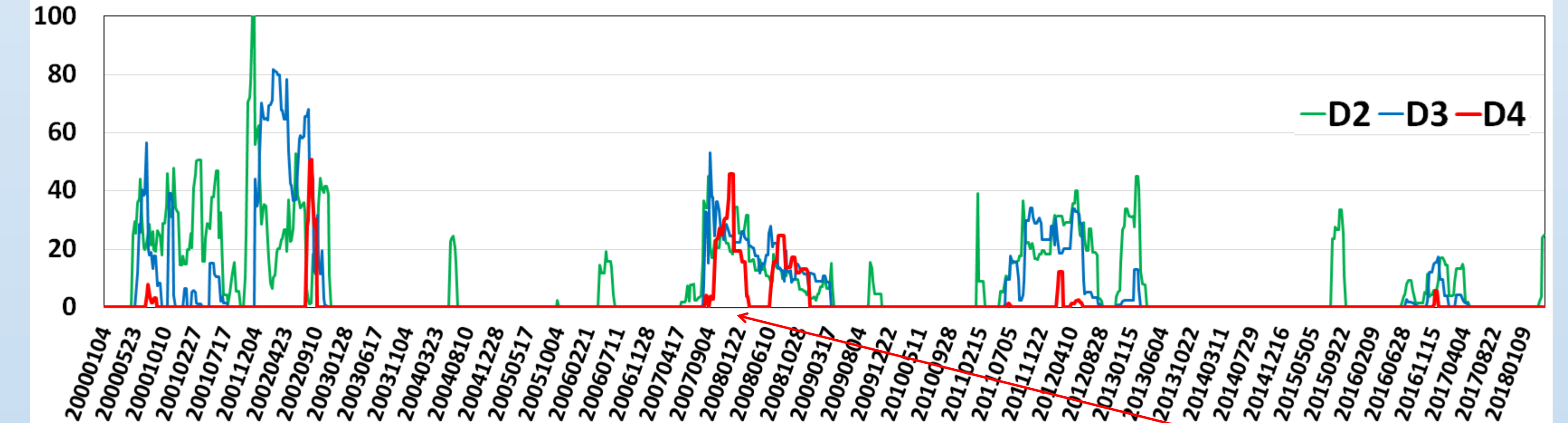
NC and SC Annual Precipitation (inches), 1895 - 2017



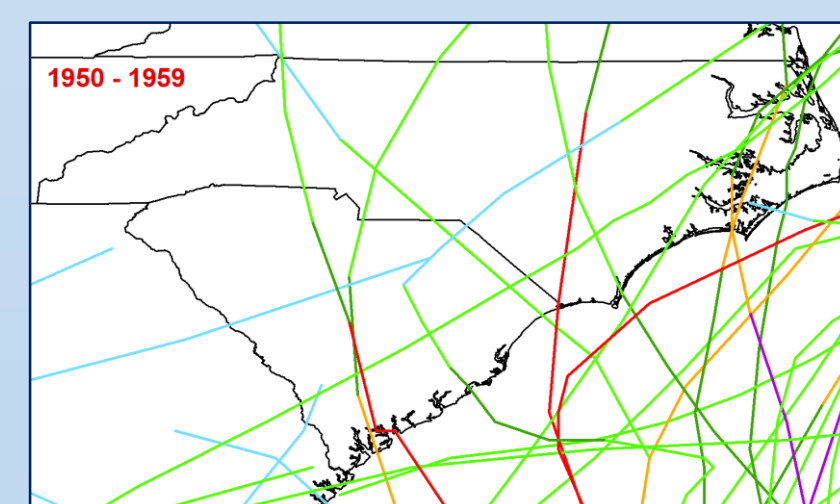
NC Weekly Drought Spatial Coverage (%), 2000 - 2018



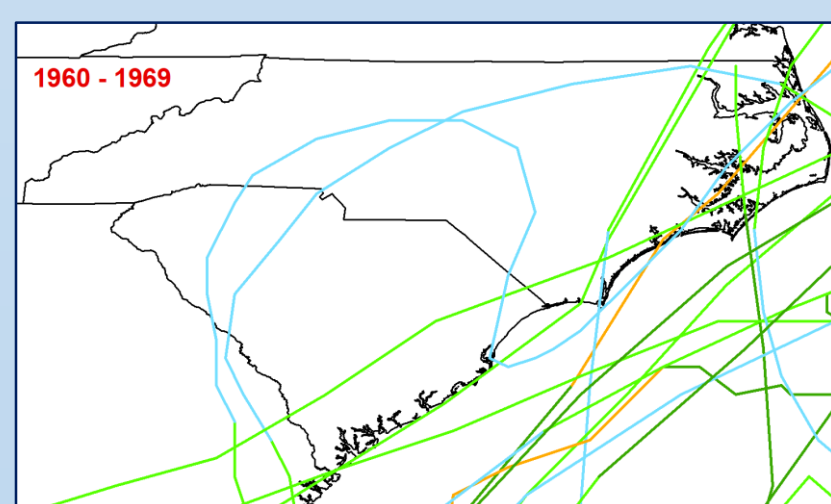
SC Weekly Drought Spatial Coverage (%), 2000 - 2018



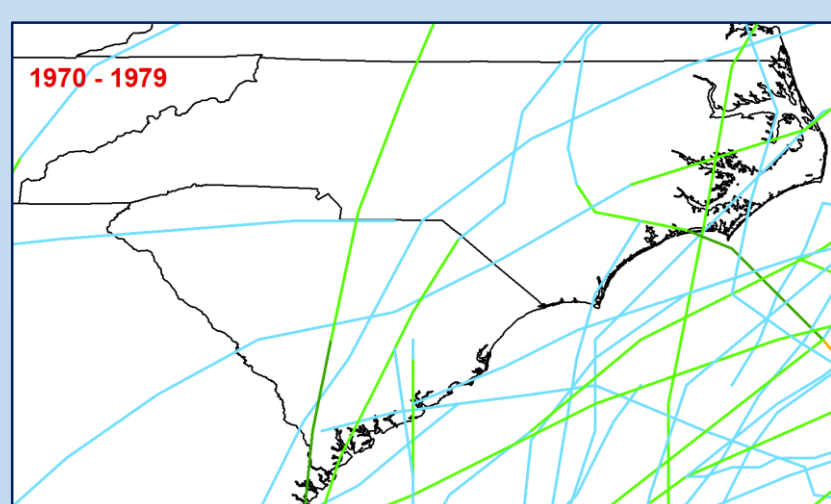
1950 - 1959



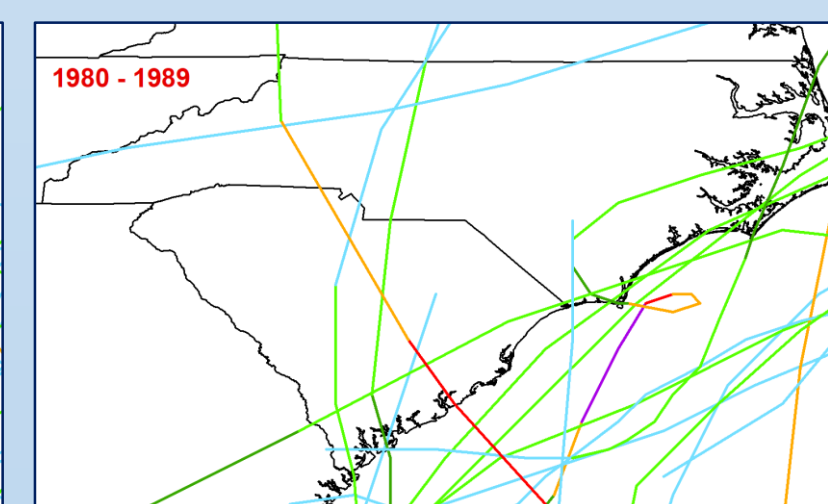
1960 - 1969



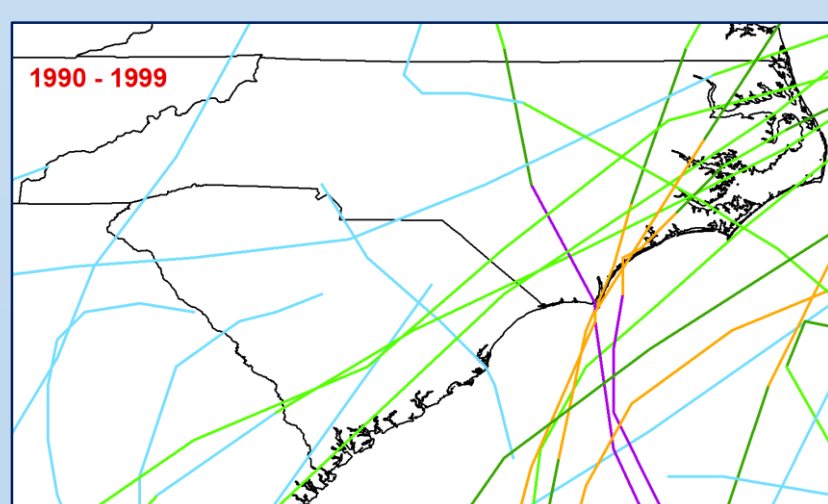
1970 - 1979



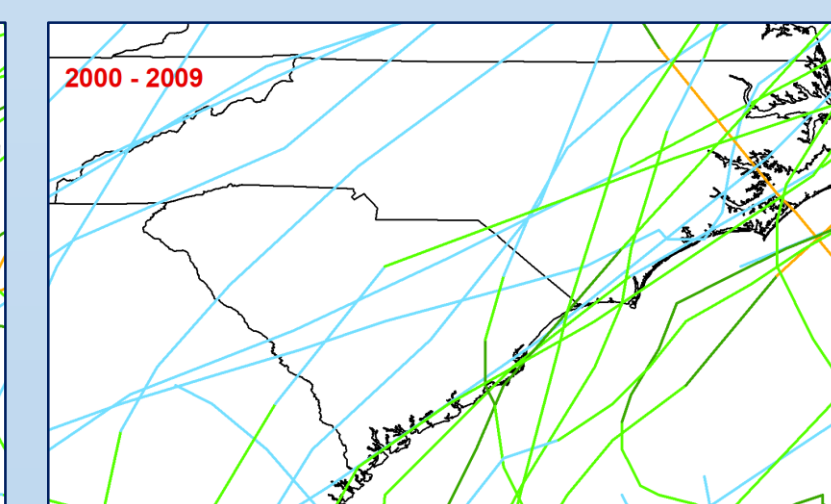
1980 - 1989



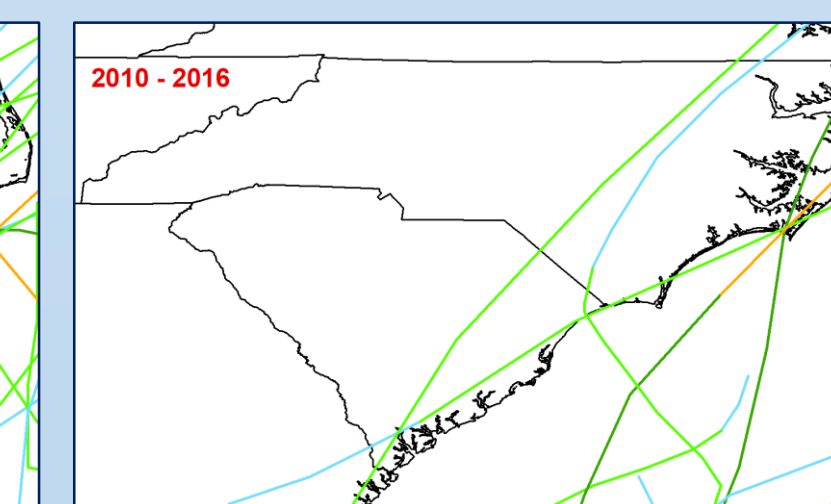
1990 - 1999



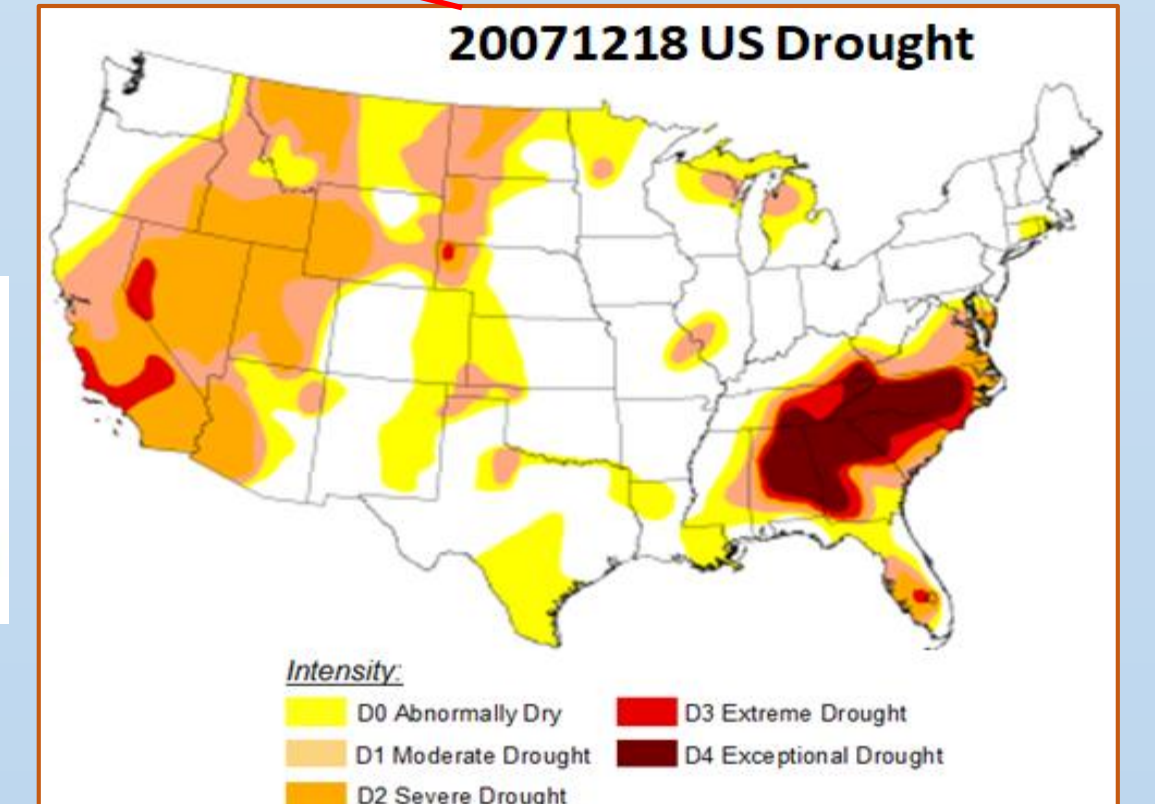
2000 - 2009



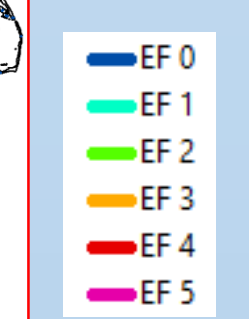
2010 - 2016



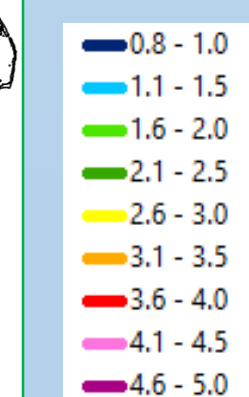
Hurricane



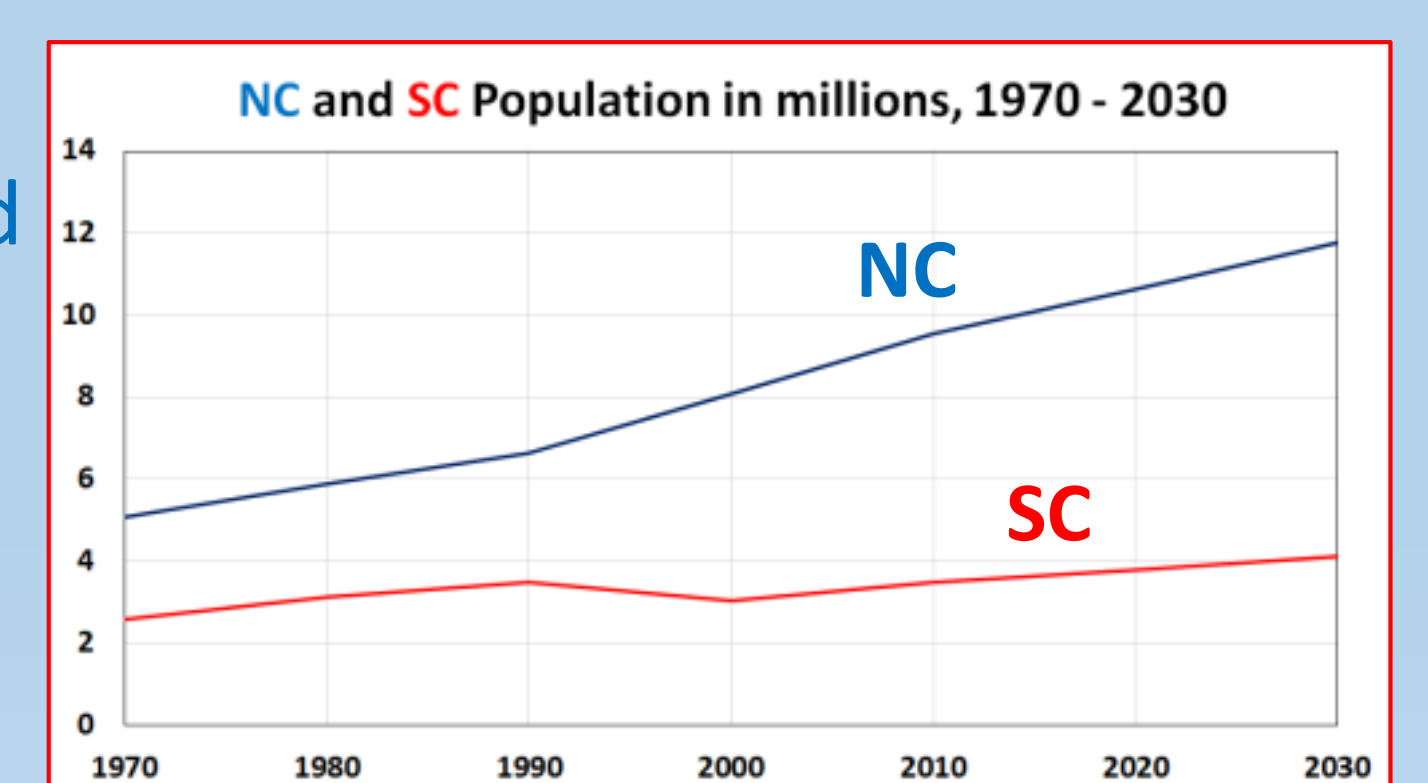
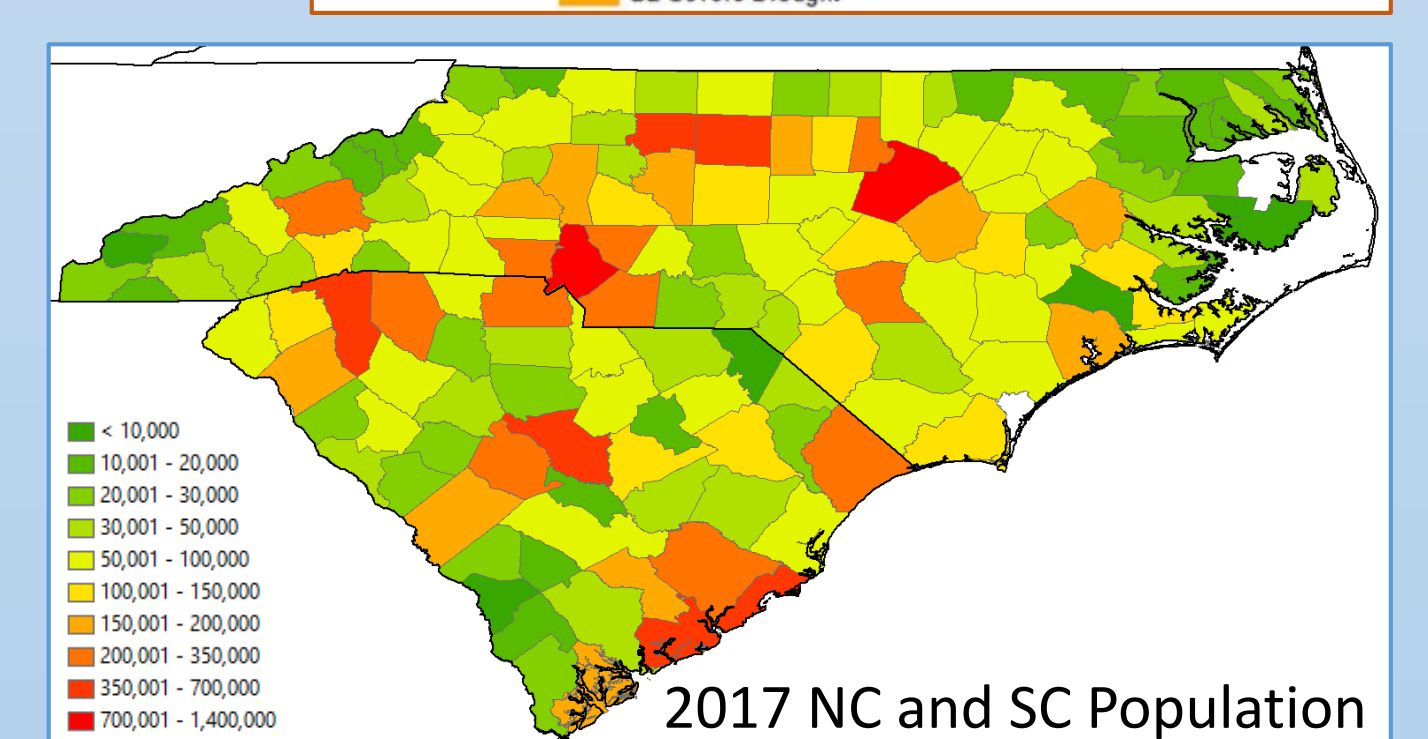
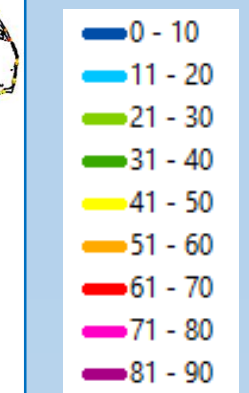
Tornado



Hail



Wind



Data Sources:

- Temperature and precipitation data from National Centers for Environmental Information, NOAA.
- Drought data from United States Drought Monitor, University of Nebraska-Lincoln.
- Severe Weather (tornado, hail, wind) Reports from Storm Prediction Center of NOAA.
- Tropical cyclone data (IBTrACS) from National Centers for Environmental Information, NOAA.
- Population data from US Census Bureau, NC Budget and Management Office, and South Carolina Revenue and Fiscal Affairs Office.