

# North Carolina Climate Resilience DataPalooza

## Historical and future climate data



Kathie Dello, PhD State Climate Office of North Carolina

# The Classics

Historical Observations • NC ECONet • Community Science

FRIDAY

SATURDAY

# The Remixes

Calculated Variables • Gridded Data • US Drought Monitor

# The Future

Downscaled Data • Climate Model Outputs

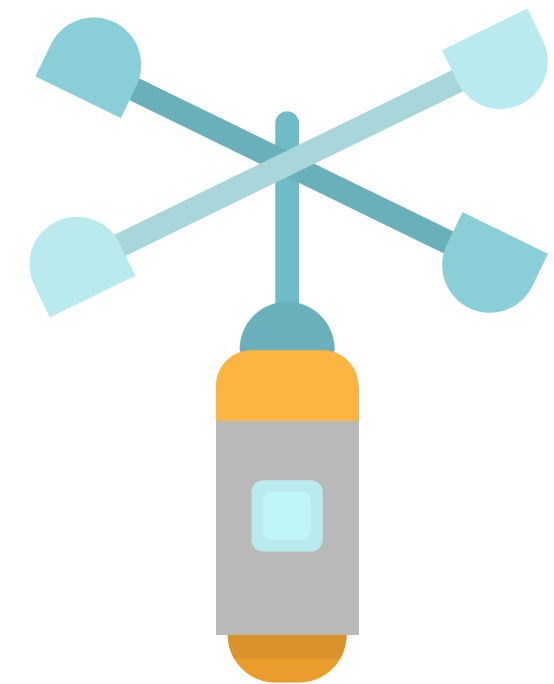
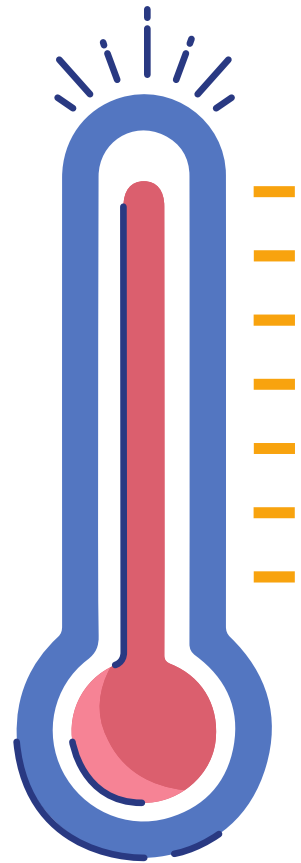
SUNDAY



ALL-ACCESS PASS

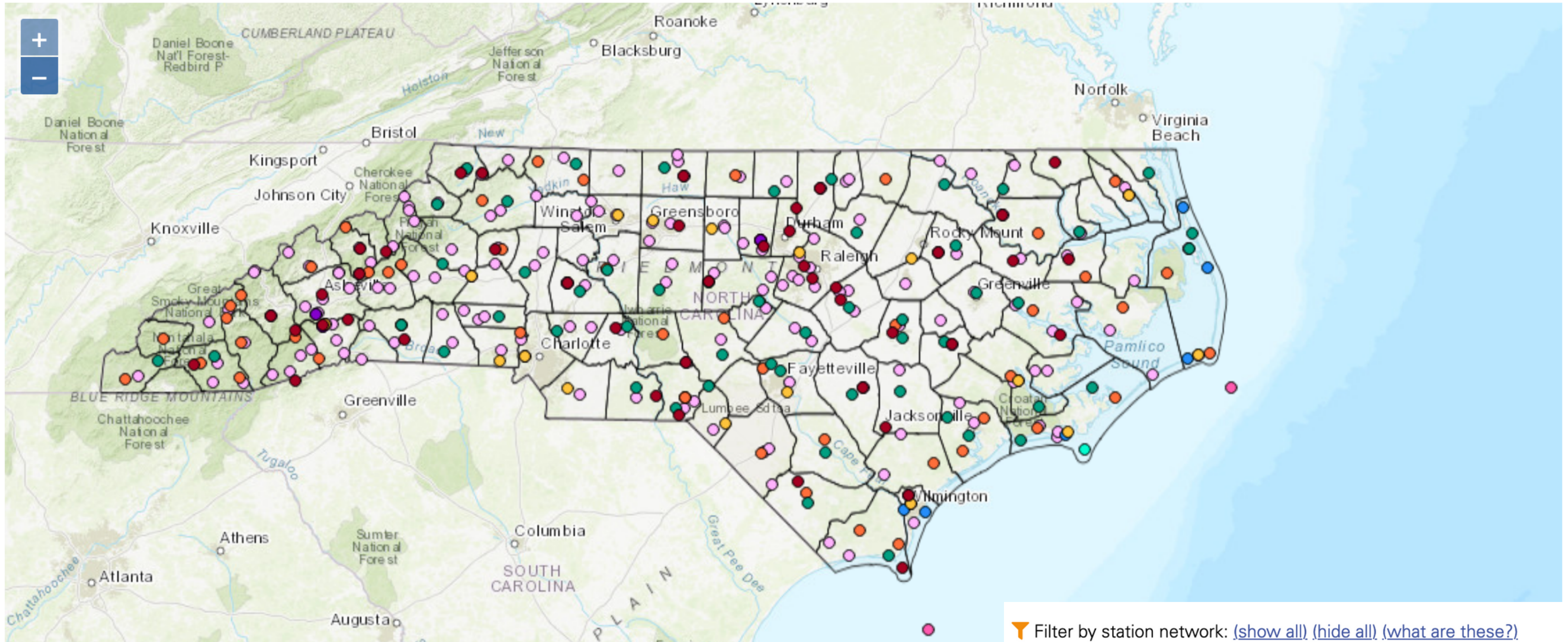
available at [climate.ncsu.edu](https://climate.ncsu.edu)

# historical observations: the classics



these are the meteorological data that we **measure**  
usually **repeatedly**  
in a representative **location**

# Station Map



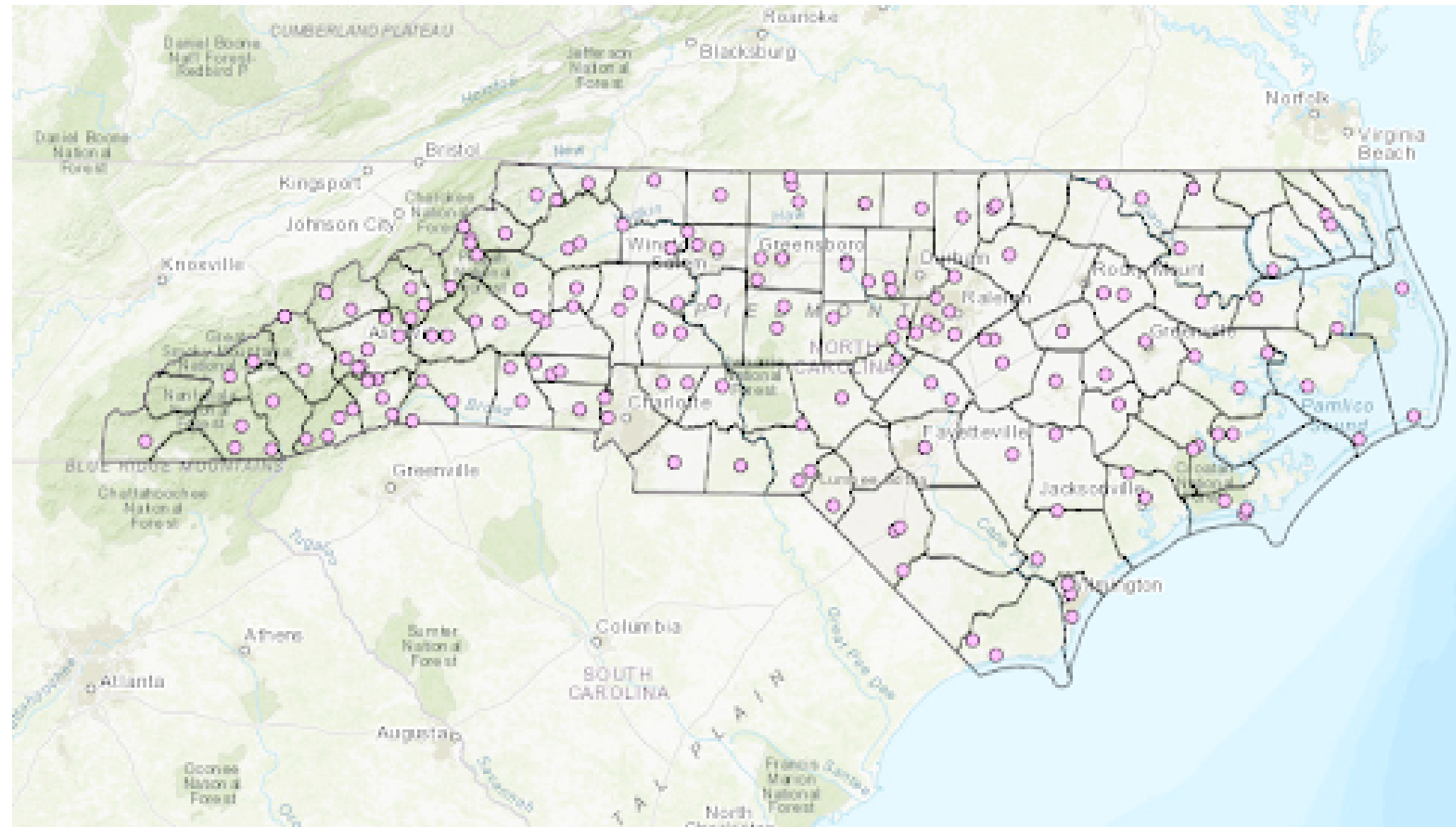
Filter by station network: [\(show all\)](#) [\(hide all\)](#) [\(what are these?\)](#)

- ASOS
- AWOS
- BUOY
- CMAN
- COOP
- ECONET
- NOS
- RAWS
- USCRN



# National Weather Service Cooperative Observer Network (COOP)

- **measurements:**  
min&max temperature,  
24-h precipitation,  
snowfall & snow depth
- **time interval:** daily
- **location:** changes infrequently

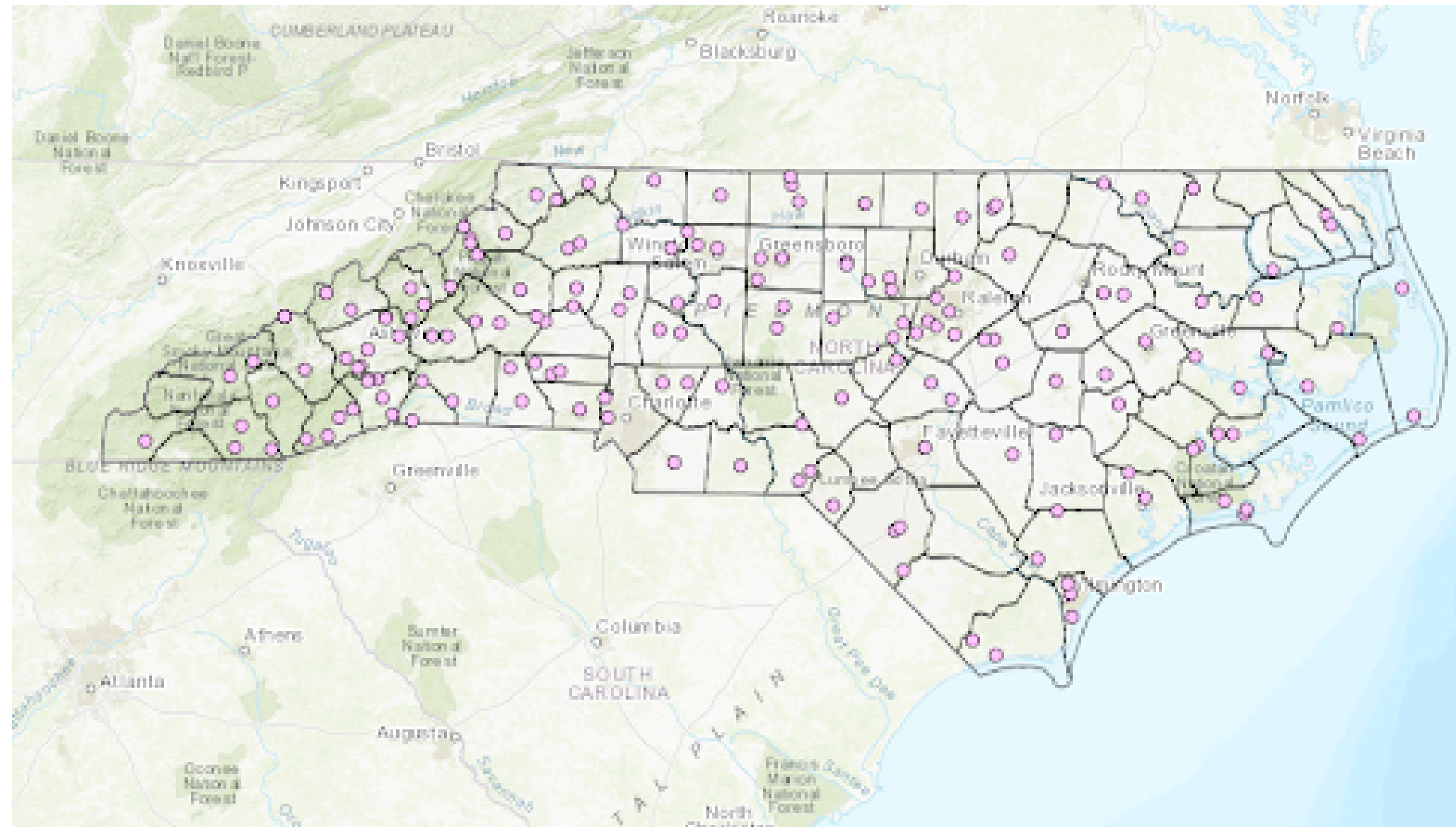




# National Weather Service Cooperative Observer Network (COOP)

**PROS:** great for climate  
long-term records  
high-quality  
decent spatial  
coverage

**CONS:**  
no-sub daily data  
decent spatial  
coverage



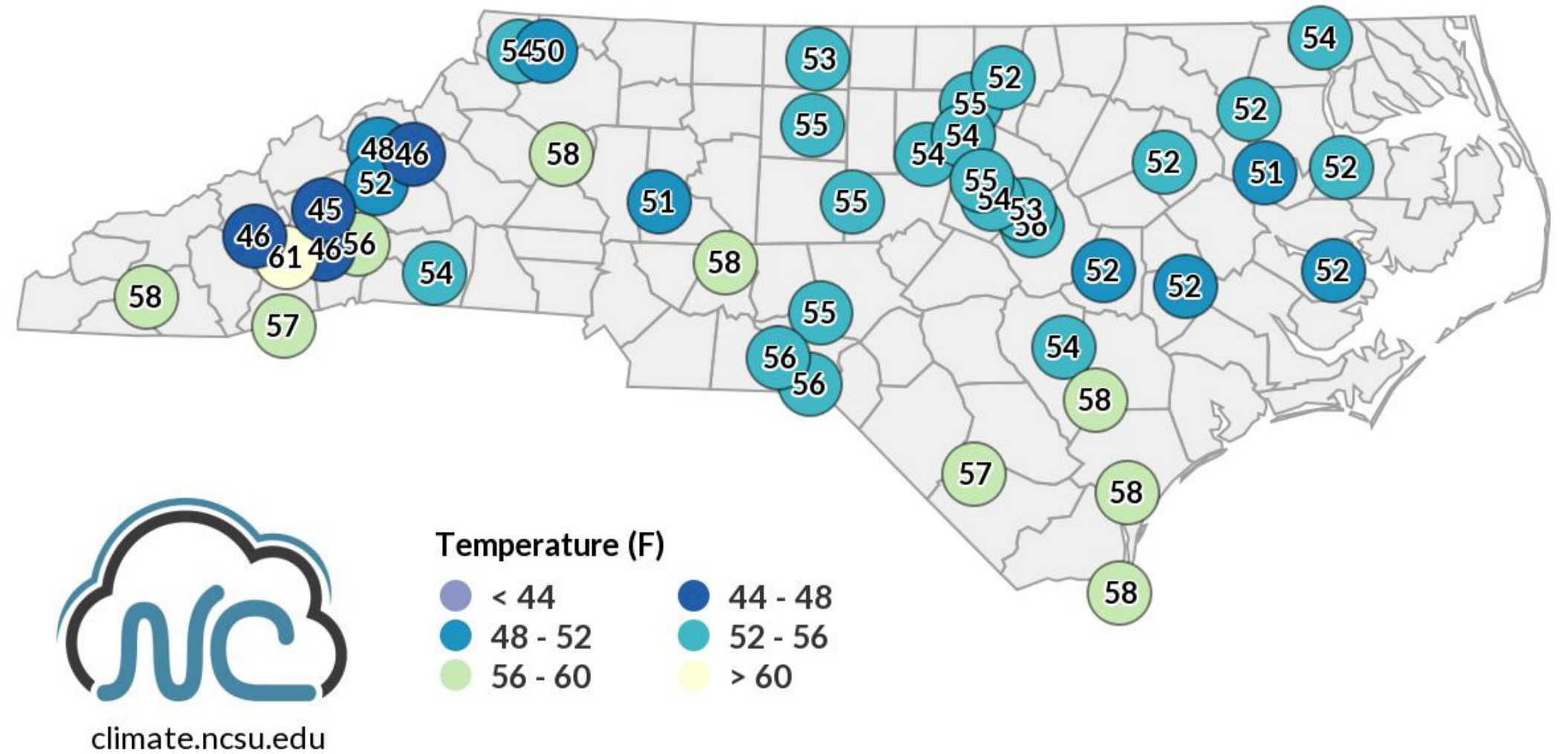


# North Carolina ECONet

Current Conditions from the NC ECONet

43 out of 43 stations reporting at 11:01 AM

- **measurements:** 16 environmental parameters
- **time interval:** 1-min
- **location:** changes infrequently





# North Carolina ECONet

## Pros:

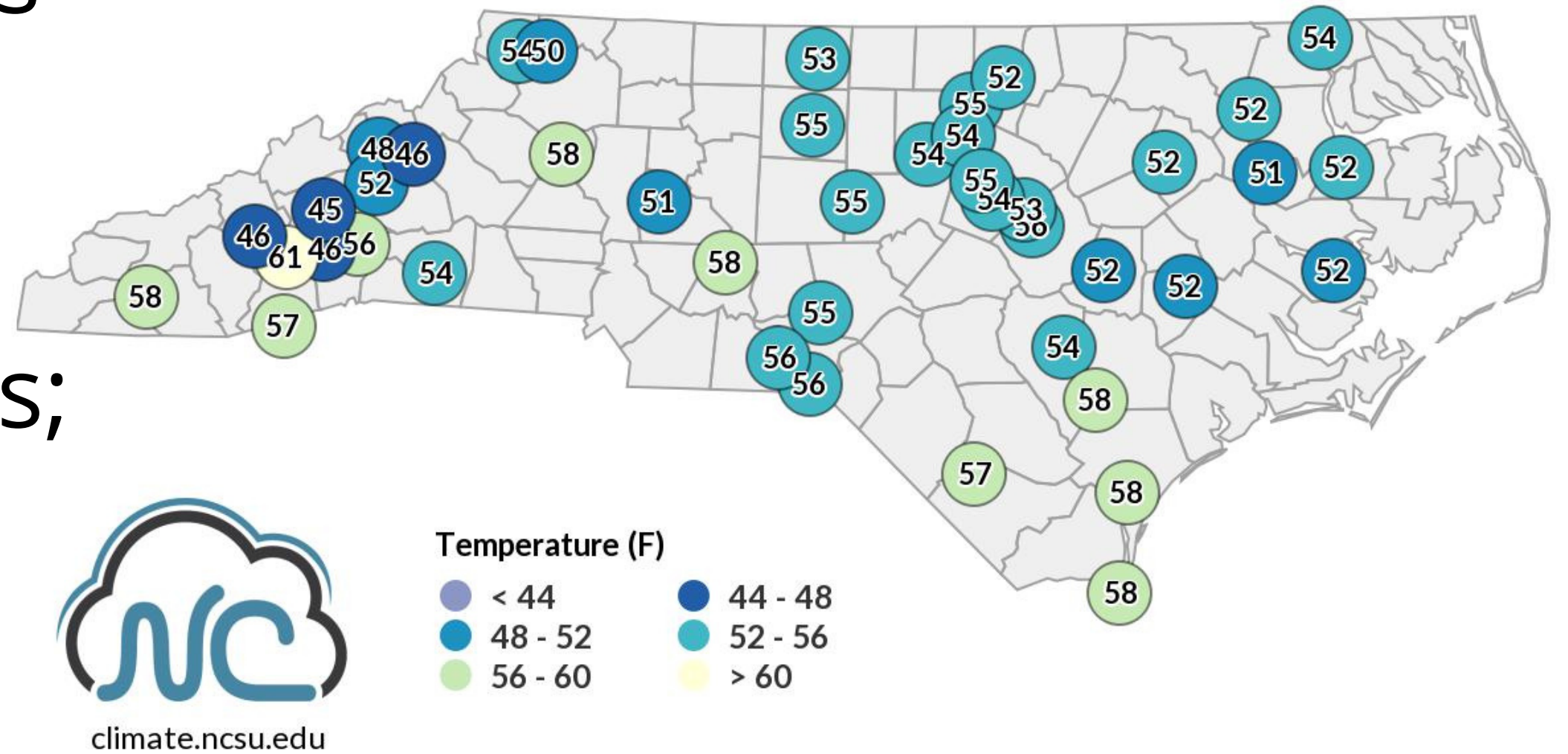
- large amounts of data
- unique measurements
- sited well/fills gaps

## Cons:

- period of record varies;
- some gaps
- not good for trends analysis

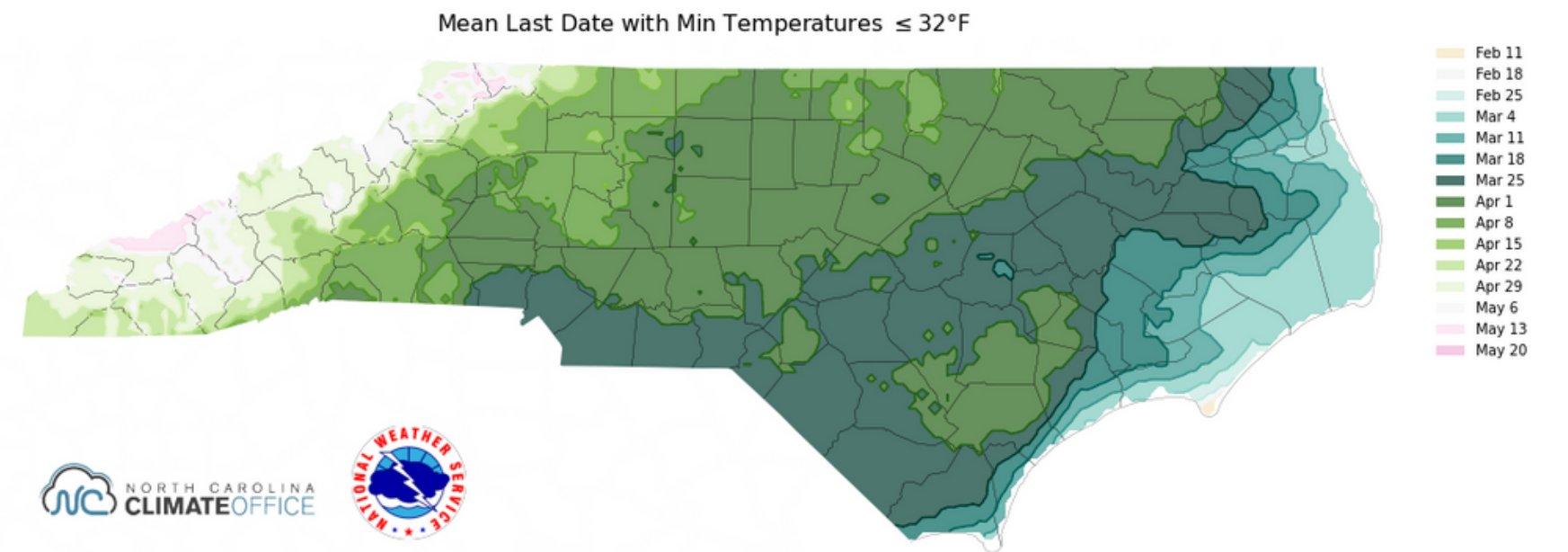
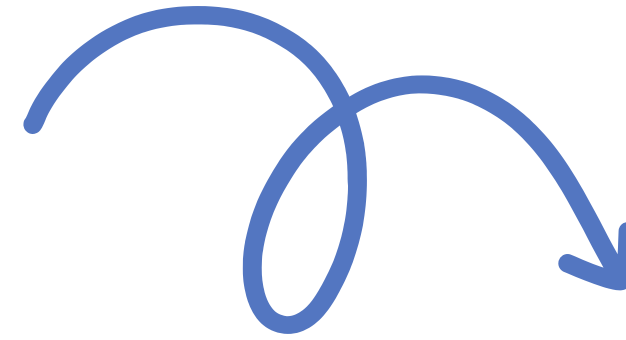
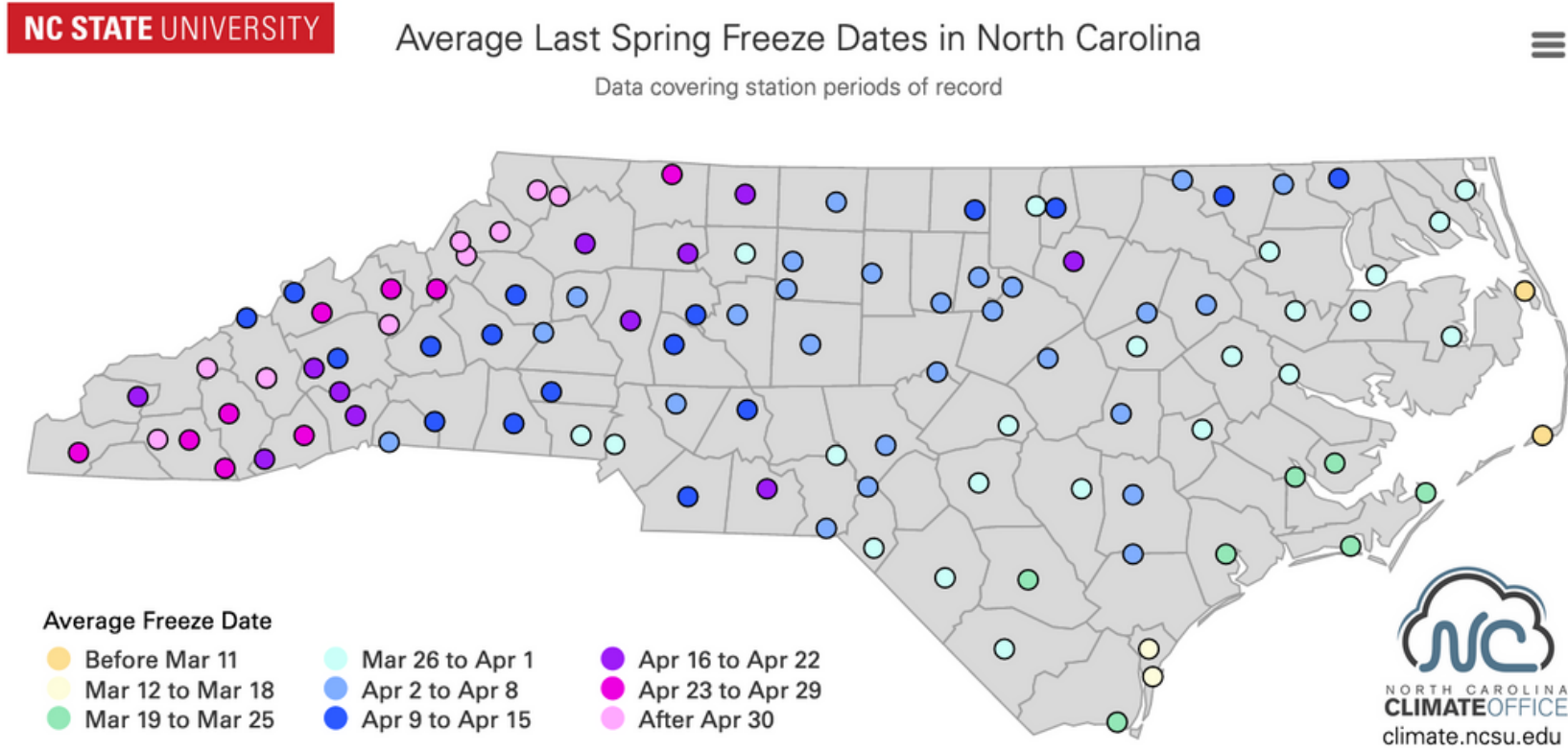
Current Conditions from the NC ECONet

43 out of 43 stations reporting at 11:01 AM





# the remixes: gridded and calculated data



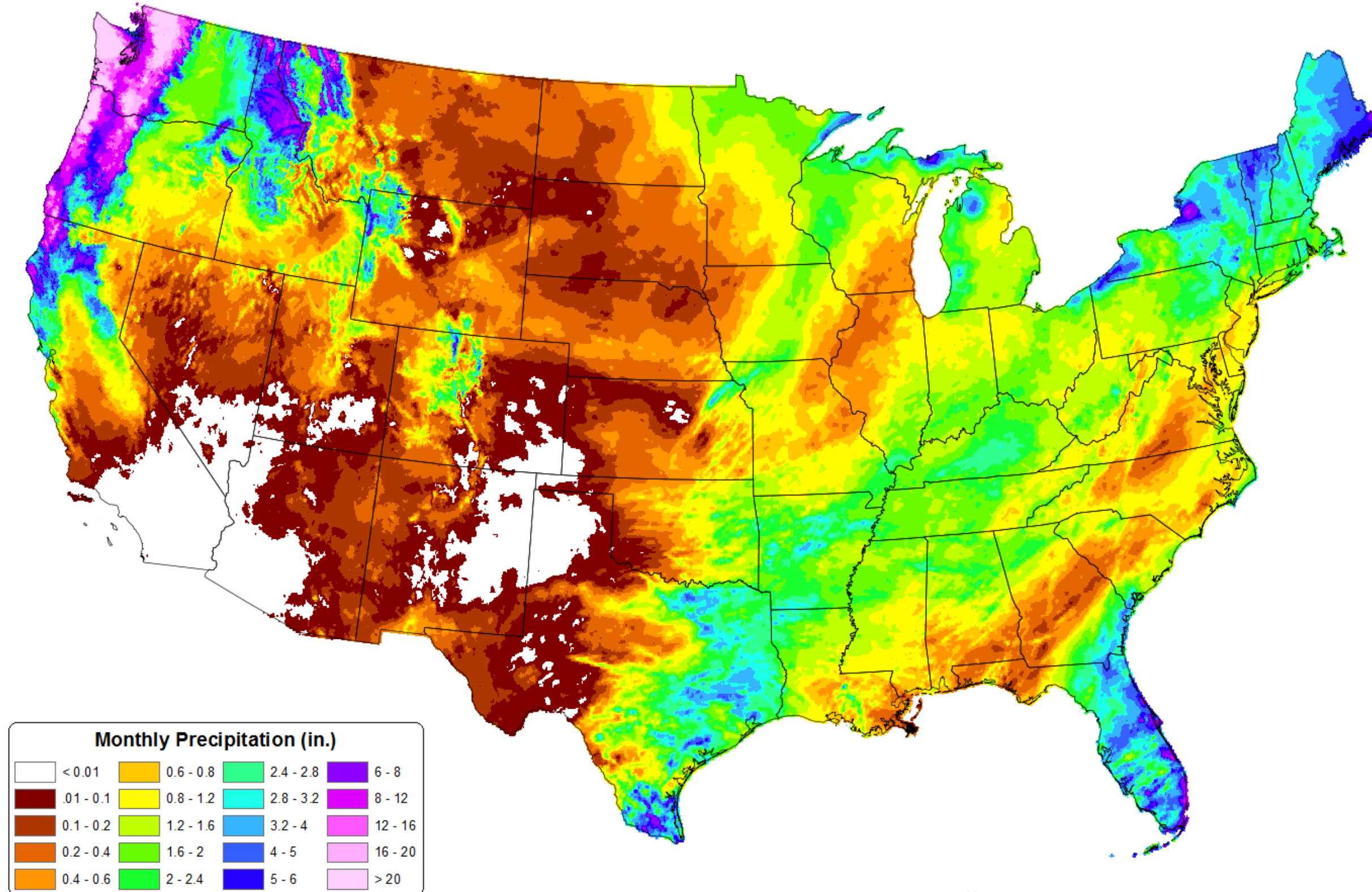


# PRISM gridded climate data

Total Precipitation: Nov 2021

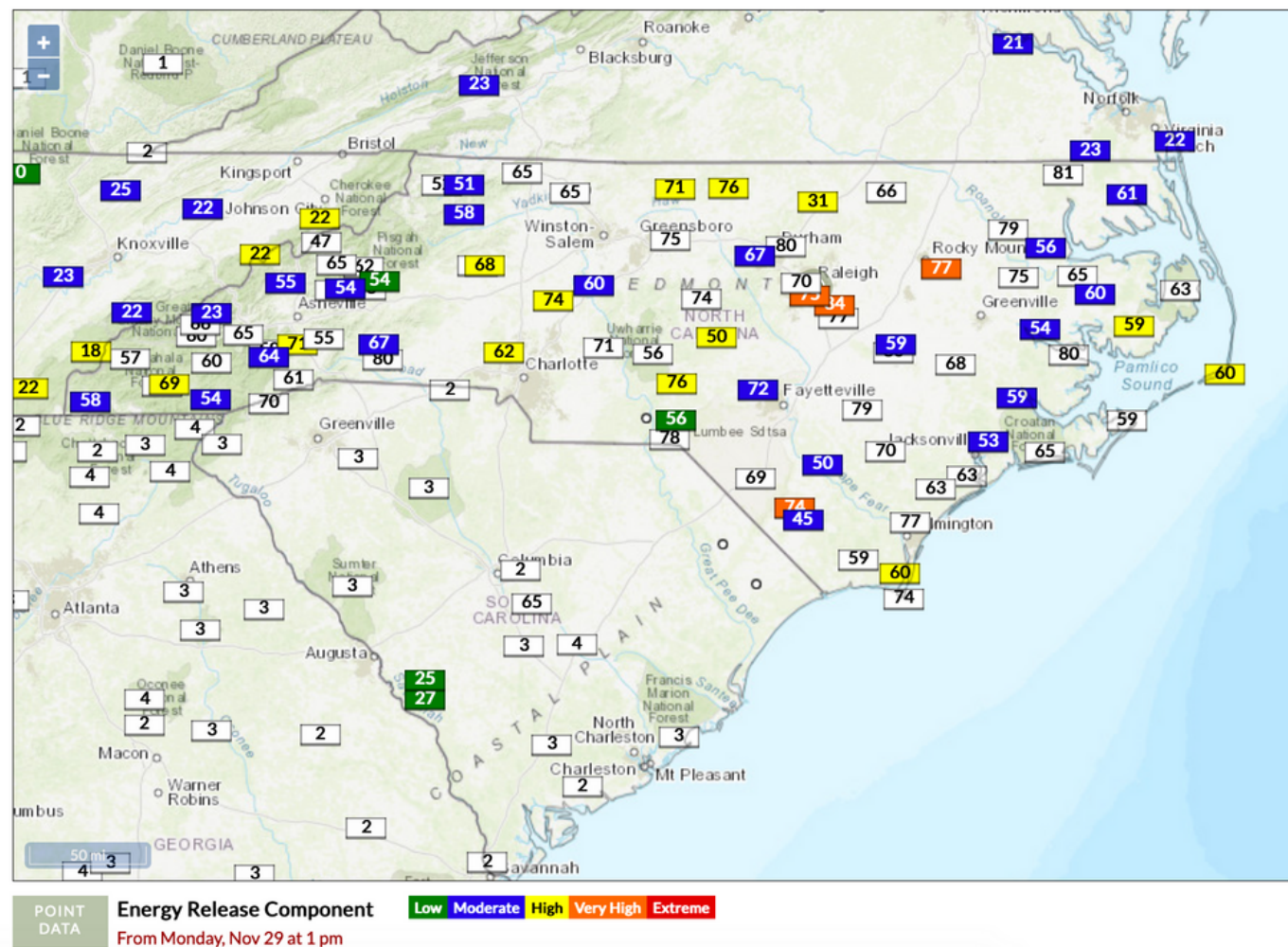
Period ending 30 Nov 2021

(Map created 02 Dec 2021)

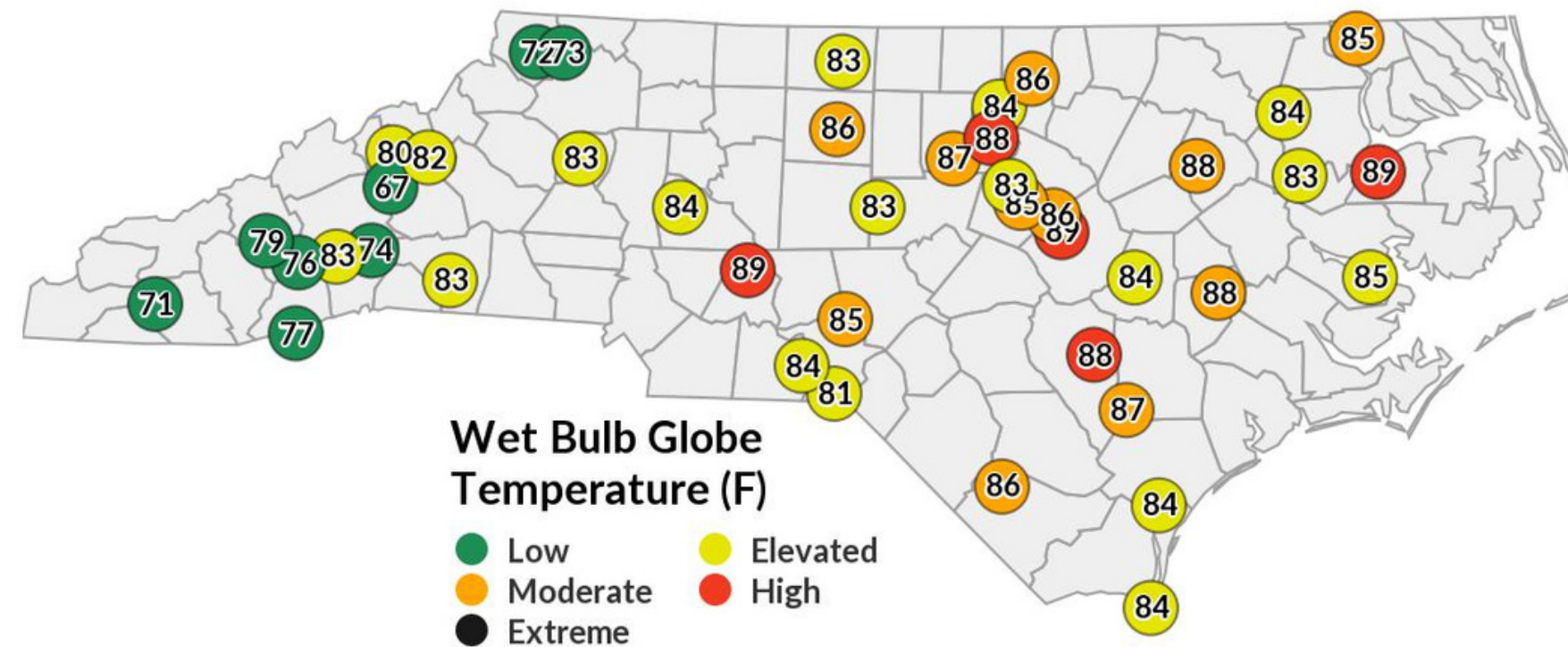


# calculated data: things we can't measure

Wet Bulb Globe Temperature of ECONET stations  
08/24/2021 2:00 PM  
42 active ECONet stations

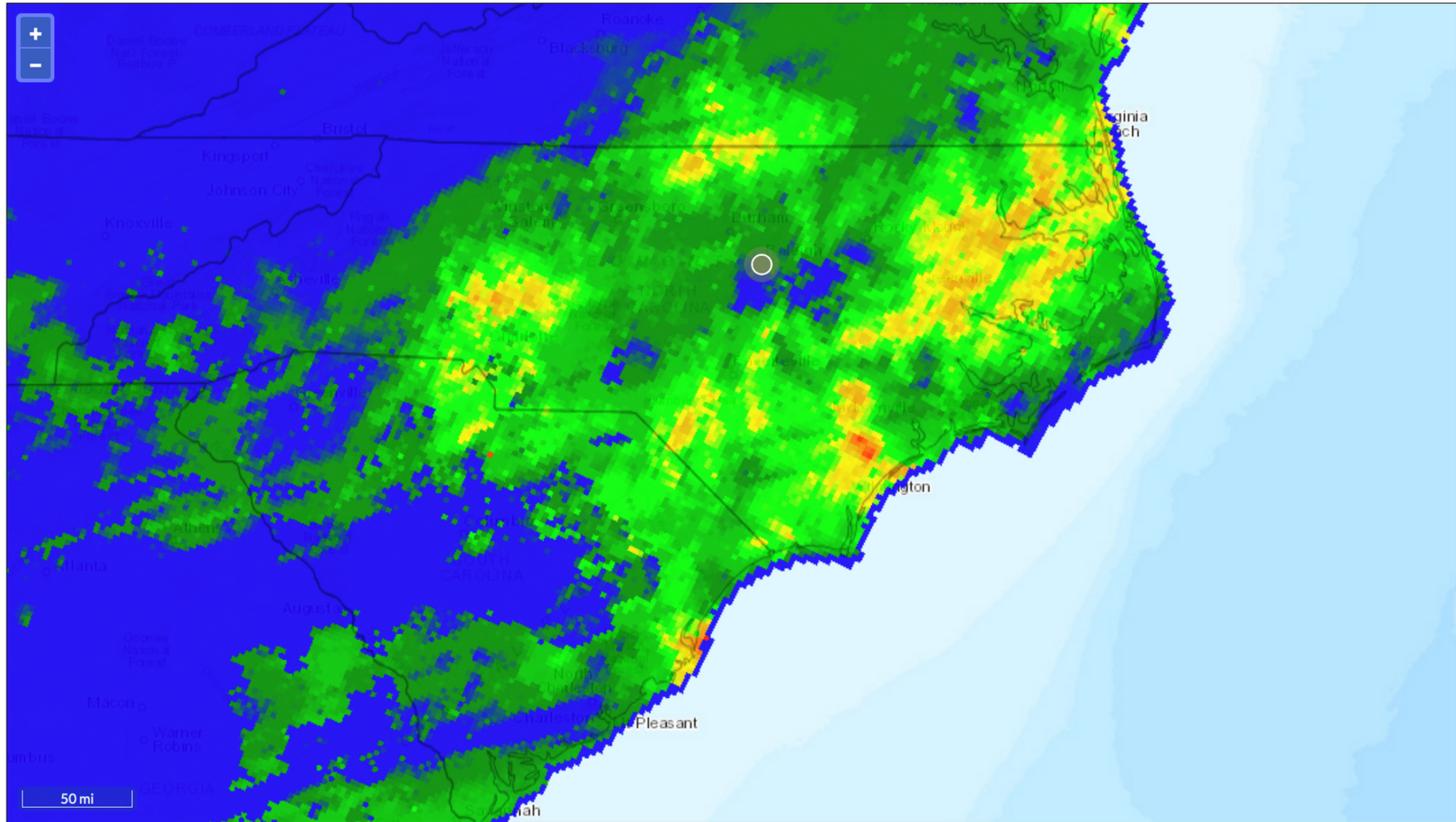


**fire danger**



**heat stress**

# calculated & gridded data



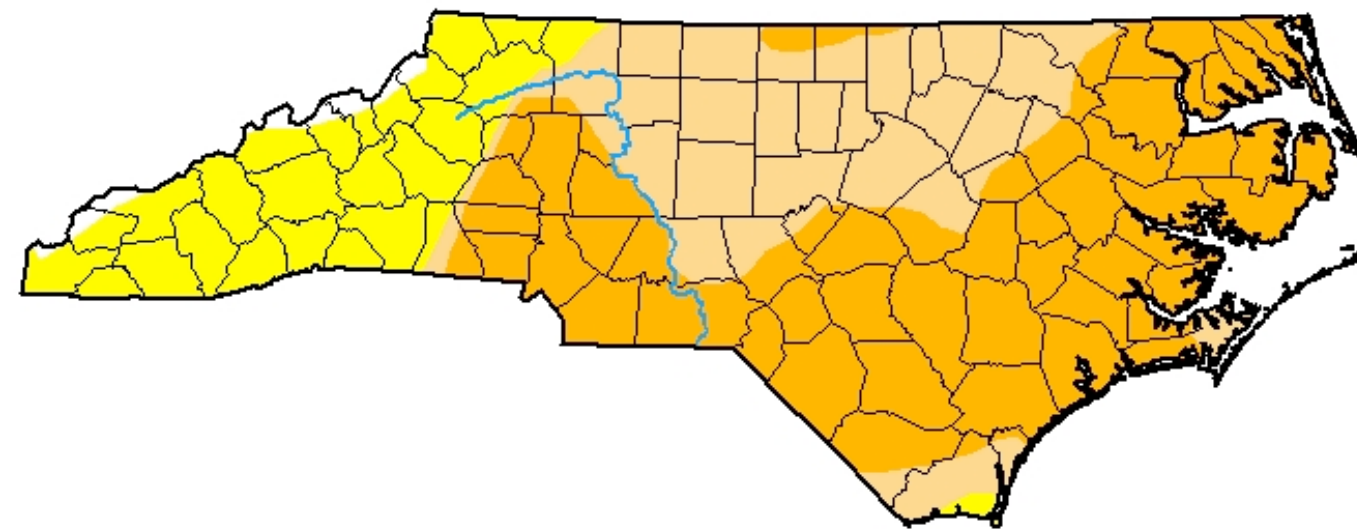
GRIDDED DATA Keetch-Byram Drought Index  
From today (Dec 14) at 7 am

100 200 300 400 450 500 550 600 650 700 750







# objective + subjective data: a little bit of science & art

## U.S. Drought Monitor North Carolina

December 7, 2021  
(Released Thursday, Dec. 9, 2021)  
Valid 7 a.m. EST



### *Intensity:*

-  None
-  D0 Abnormally Dry
-  D1 Moderate Drought
-  D2 Severe Drought
-  D3 Extreme Drought
-  D4 Exceptional Drought

*The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <http://droughtmonitor.unl.edu/About.aspx>*

### *Author:*

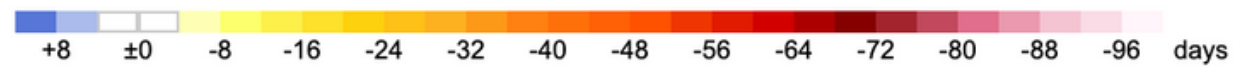
David Simeral  
Western Regional Climate Center



[droughtmonitor.unl.edu](http://droughtmonitor.unl.edu)

# Projected Change in the Average Number of Days Per Year with Minimum Temperatures < 32°F

Time Period: 2020 to 2039 (compared with 1950 to 2005) Future Emissions: Current Levels (High)

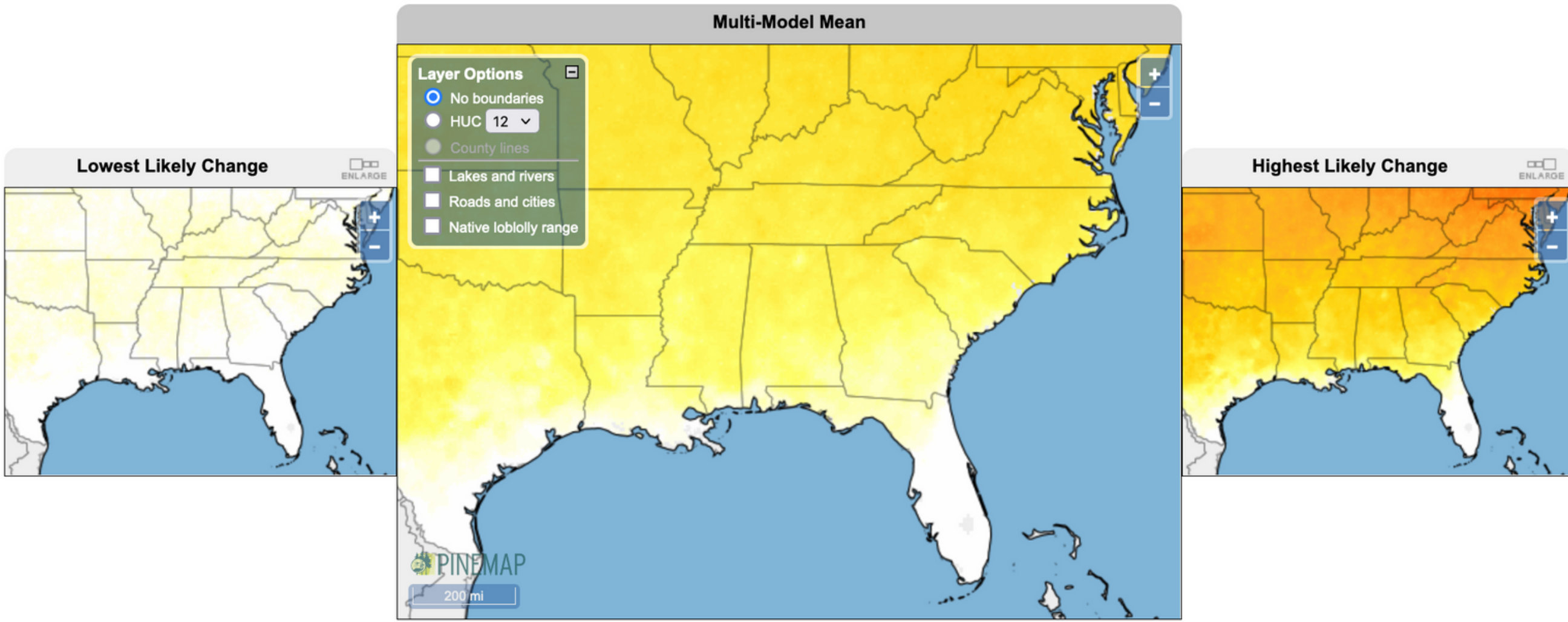


Location: none selected

To select a location, click on the map or enter your coordinates: Latitude °N, Longitude °W Go

? Map Help

? About the Side Maps



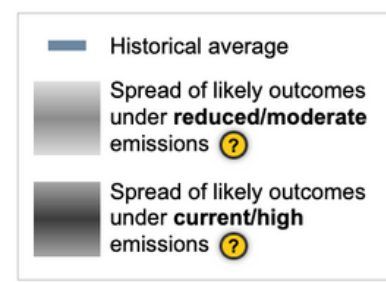
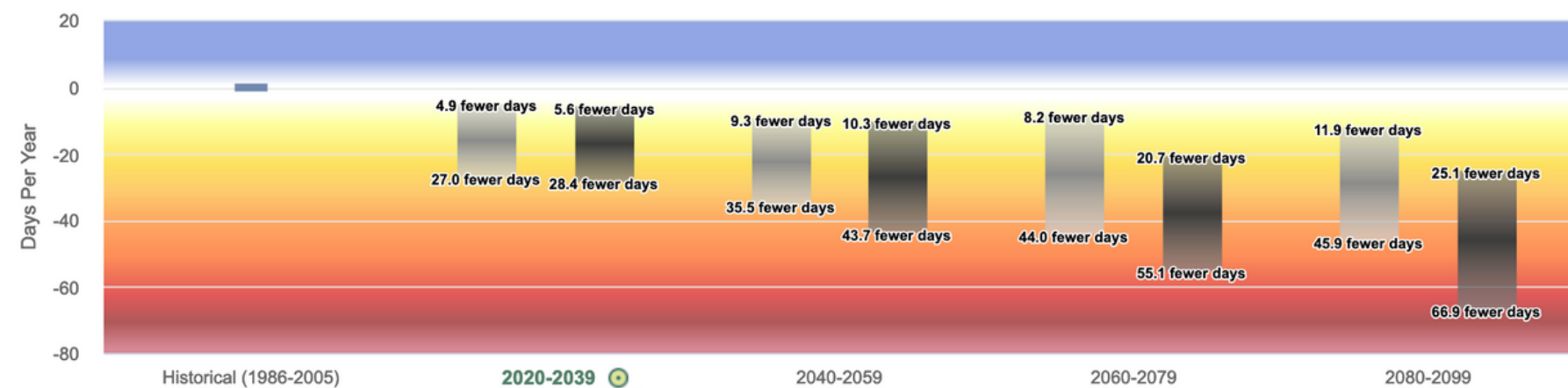
# downscaled data from climate models

## Change in Average Number of Days Per Year with Minimum Temperatures < 32°F



Location: In Alamance County, NC (35.88°N 79.36°W)

? About The Time Series



# Cardinal & Station Scout

one-stop shop for (most of) your North Carolina climate data needs

Products | North Carolina State Climate Office

Home Data Weather Climate Agriculture NCSCO

**Cardinal: Station Scout**

Explore weather stations across North Carolina using the search tool and map below, and click on a station to view more information including recent observations.

### Search for Stations

Find stations near a location: [\(detect my location\)](#)

Find stations by name or ID:

Find stations in a county:

**SEARCH**

Show:  Active stations only  All stations

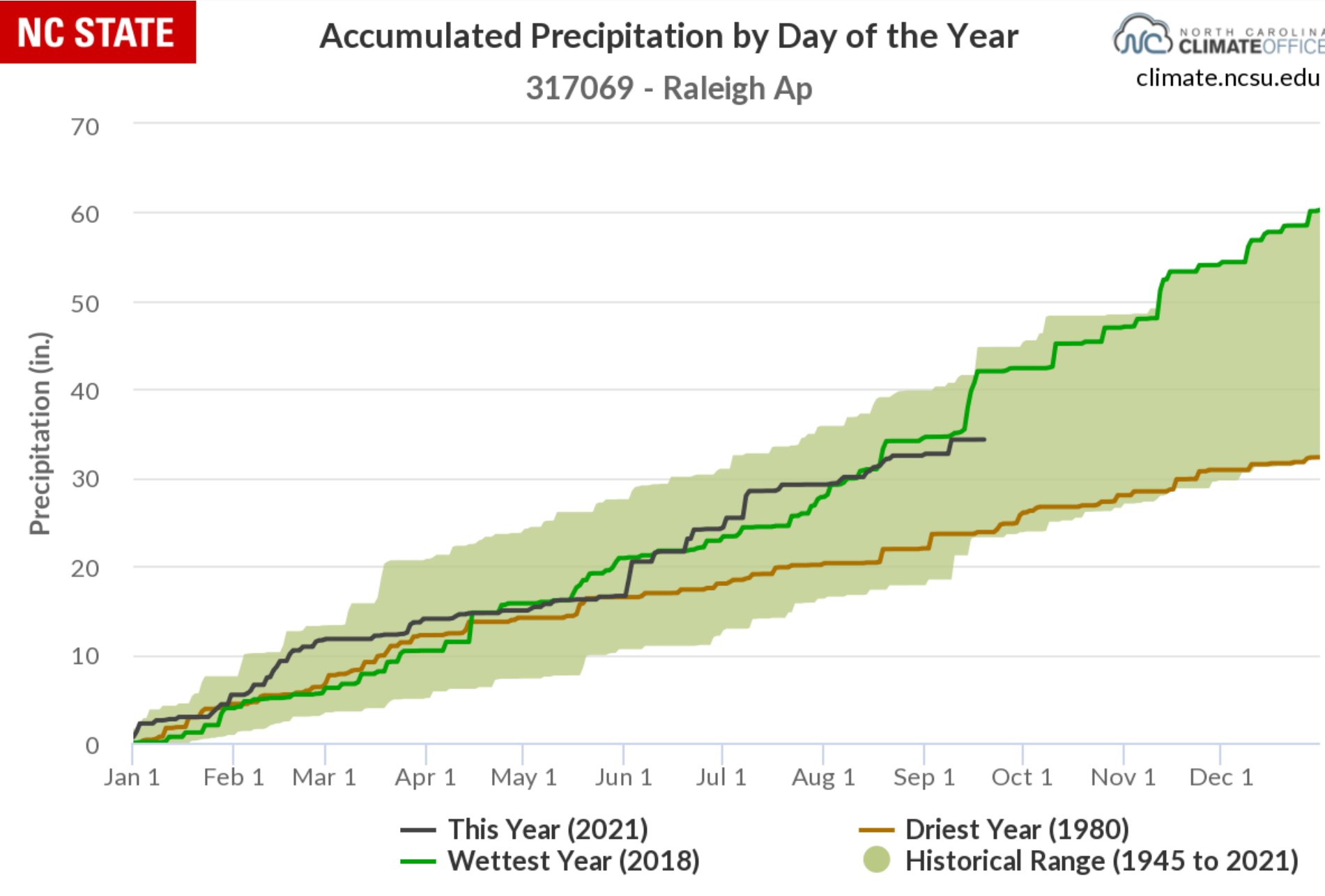
Filter by station network: [\(show all\)](#) [\(hide all\)](#) [\(what are these?\)](#)

- ASOS  AWOS  BUOY  CMAN
- COOP  ECONET  NOS  RAWS
- USCRN

### Search Results

Results near **nc state university:**

Network	ID	Station Name	Distance	Per. of Record
COOP	317079	Raleigh State Univ	1.2 mi.	1892-2021
ECONET	REED	Reedy Creek Field Laborat...	3.8 mi.	1998-2021
ECONET	LAKE	Lake Wheeler Rd Field Lab	3.9 mi.	1982-2021
COOP	311535	Cary	7.5 mi.	2000-2021
COOP	313238	Garner	8.0 mi.	1981-2021
COOP	317069	Raleigh Ap	8.0 mi.	1944-2021
COOP	310212	Apex	9.2 mi.	1993-2021
ASOS	KRDU	Raleigh-Durham Internatio...	9.3 mi.	1948-2021
ECONET	CLAY	Central Crops Research St...	13.3 mi.	1978-2021
COOP	312993	Falls Lake	13.7 mi.	2000-2021
COOP	316122	New Hill	15.0 mi.	2003-2021
COOP	311820	Clayton Wtn	15.8 mi.	1955-2021



products.climate.ncsu.edu

# Trends plotter

Year Range <sup>?</sup>  
1940 2020

Variable Selection <sup>?</sup>  
Average Temperature

Time Frame <sup>?</sup>  
Annual

Trend Range <sup>?</sup>  
Per Decade

Trend <sup>?</sup>      -      0      +

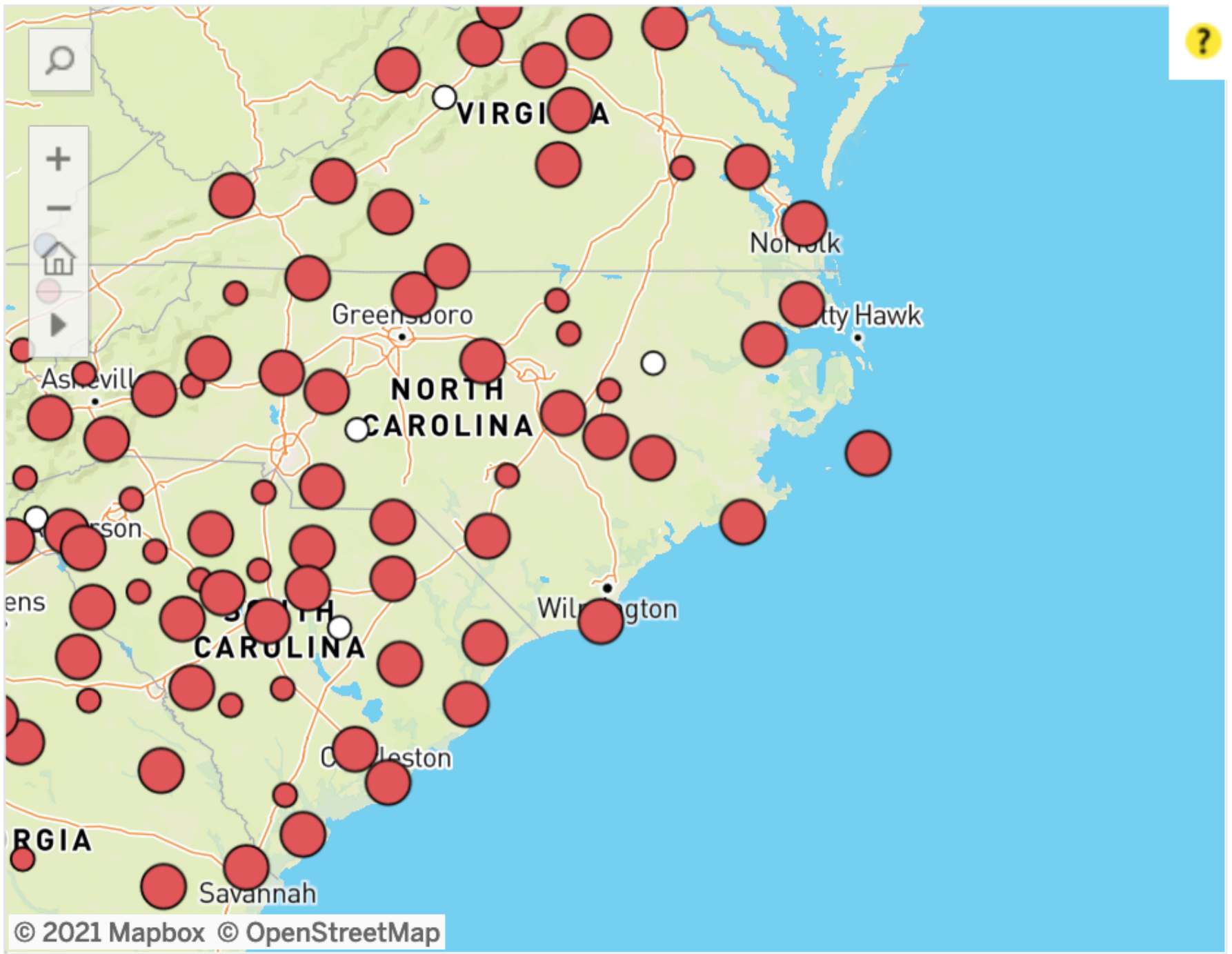
Significant (S)      ●      ○      ●

Not Significant (NS)      ●      ○      ●

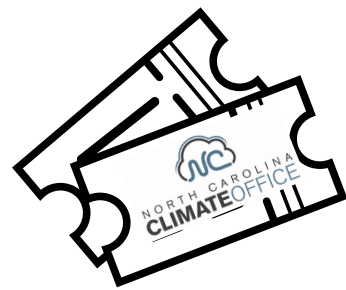
Insufficient Data (I)      ●      ●      ●

Add to Graph <sup>?</sup>

- None
- Average
- Statewide Average
- Trend Line

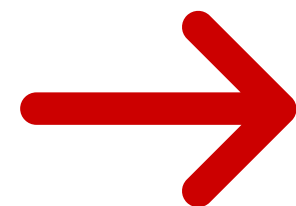






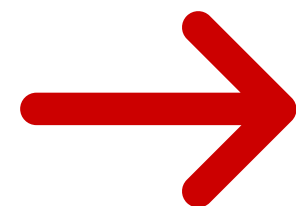
## HOW DO I ACCESS THESE DATA?

**look at historical point data**



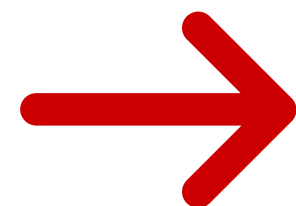
**Station Scout**

**download point data**



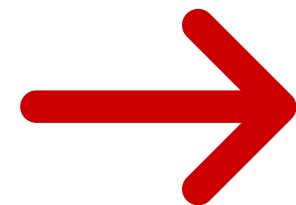
**Cardinal**

**access gridded historical/  
future climate data**



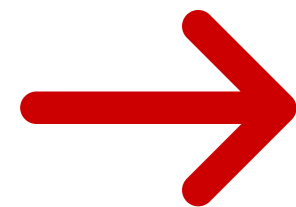
**e-mail us  
([sco@climate.ncsu.edu](mailto:sco@climate.ncsu.edu))**

**I'm a super user**



**Clouds API**

**read about data**



**climate blog**

# upcoming!



- **1/31 (pm) and 2/1 (am): SE Chapter of the National Climate Assessment public workshop**
- **2/3: Raleigh and Durham Urban Heat Island data release**
- **March 2022: virtual open climate data workshop (email [ssaia@ncsu.edu](mailto:ssaia@ncsu.edu))**



NORTH CAROLINA  
**CLIMATE OFFICE**

**climate.ncsu.edu**

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