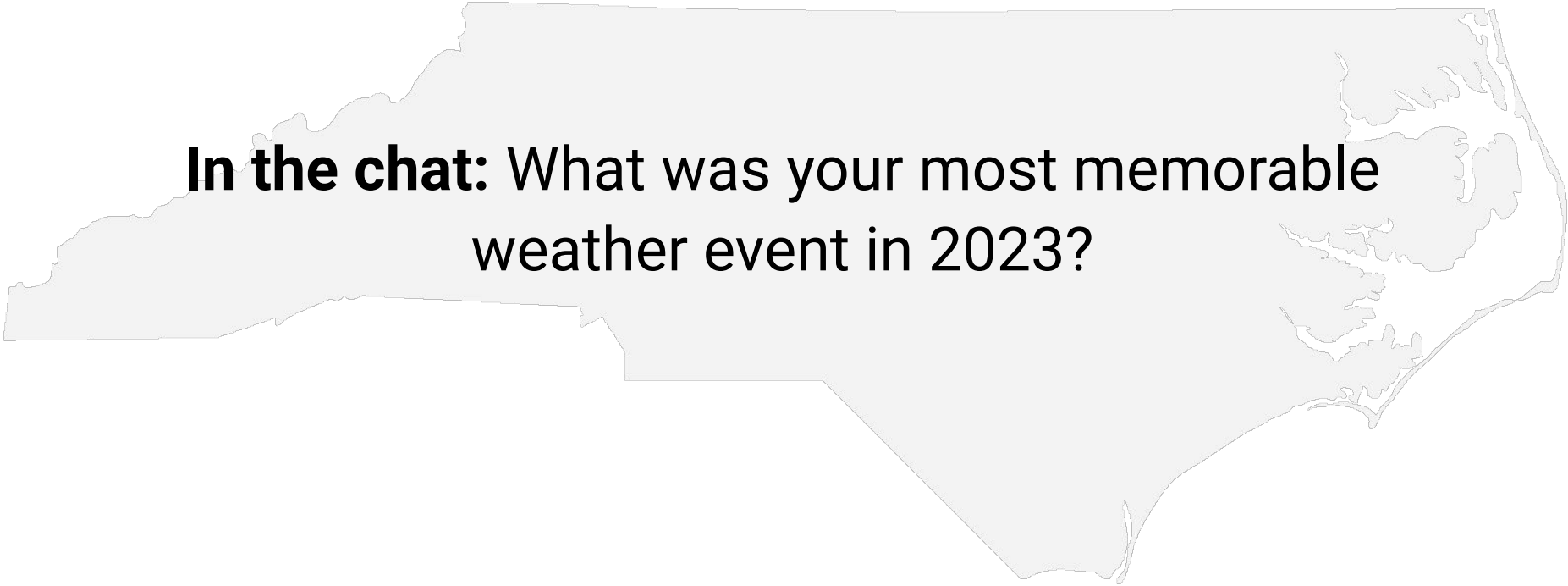


# Welcome!



**In the chat:** What was your most memorable weather event in 2023?

# Our Weather Year in Review: 2023



**Dr. Kathie Dello**

State Climatologist



**Corey Davis**

Assistant State  
Climatologist

# Logistics

- Please mute yourself and turn off video
- Beginning with ~45 minutes of presentation
- Type questions in the chat for a Q&A at the end

# About the State Climate Office

*The State Climate Office of North Carolina is a UNC System **Public Service Center** dedicated to serving the needs of North Carolinians by translating climate information into useful and usable knowledge, and bridging the gap between scientists, decision-makers, and community members.*





# 2023, By the Numbers



# North Carolina in 2023

Tied for the *7th-warmest* year on record since 1895

- Statewide average temperature of **60.7°F**
- **+1.1°F** vs. the 1991-2020 average



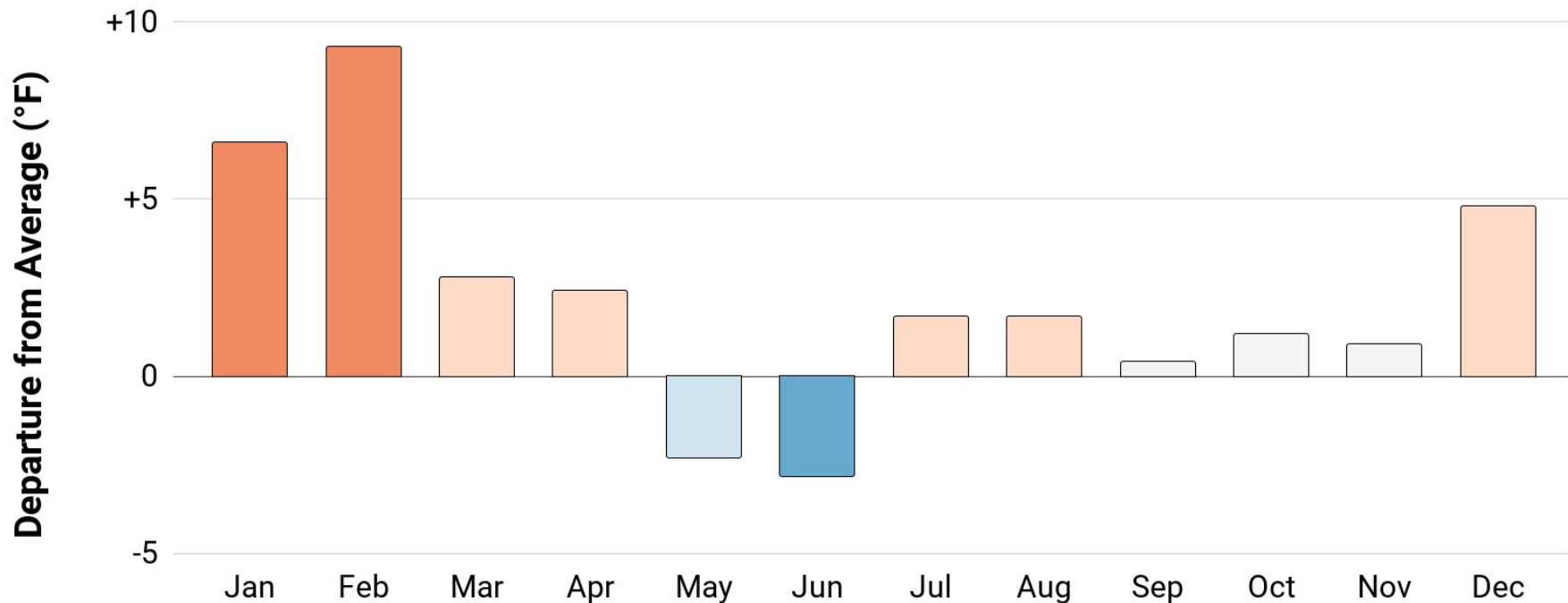
National Centers for  
Environmental Information  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION



*Pasquotank River, by Kathie Dello*



# Monthly Temperature Departures (vs. 1901-2000)



Record Coldest

Coldest 10%

Coldest 33%

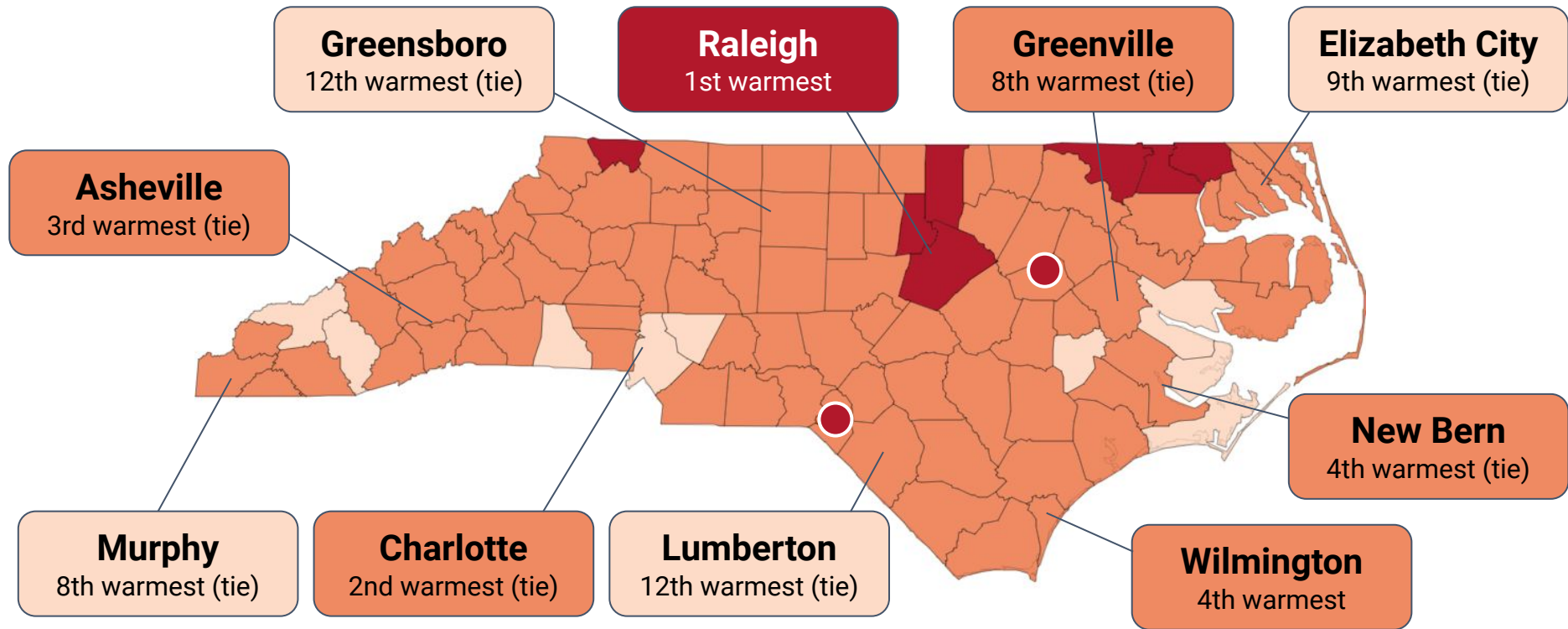
Near-Normal

Warmest 33%

Warmest 10%

Record Warmest

# Annual Mean Temperature Rankings



Record Coldest

Coldest 10%

Coldest 33%

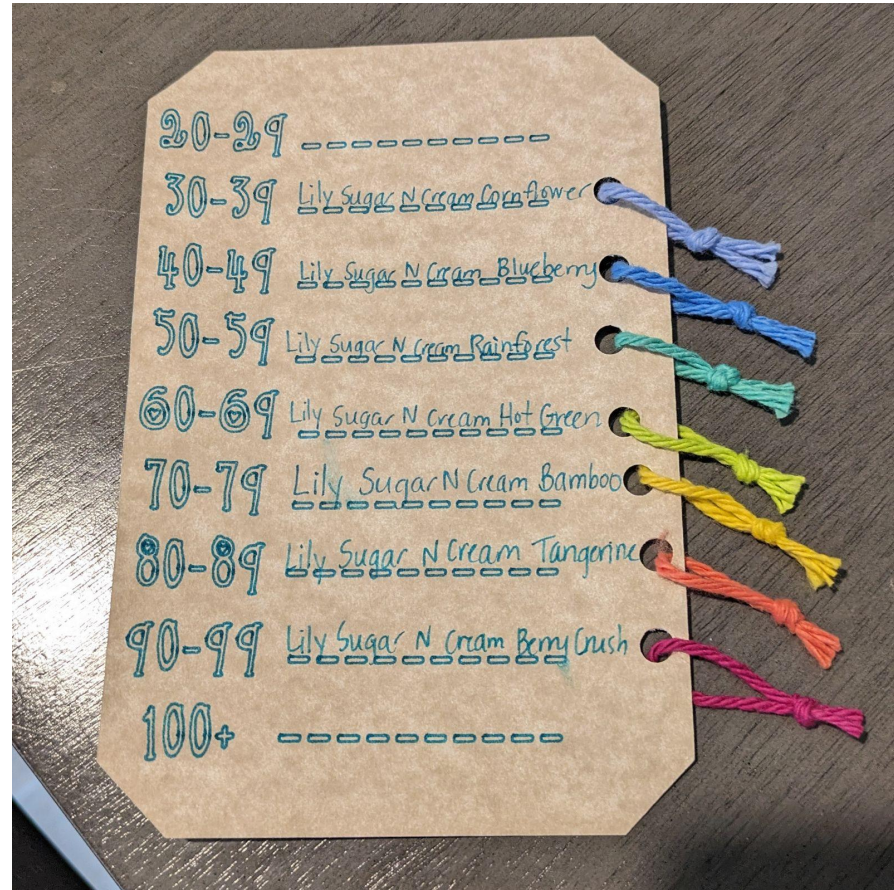
Near-Normal

Warmest 33%

Warmest 10%

Record Warmest







# North Carolina in 2023



*Glassmine Falls overlook, by Corey Davis*

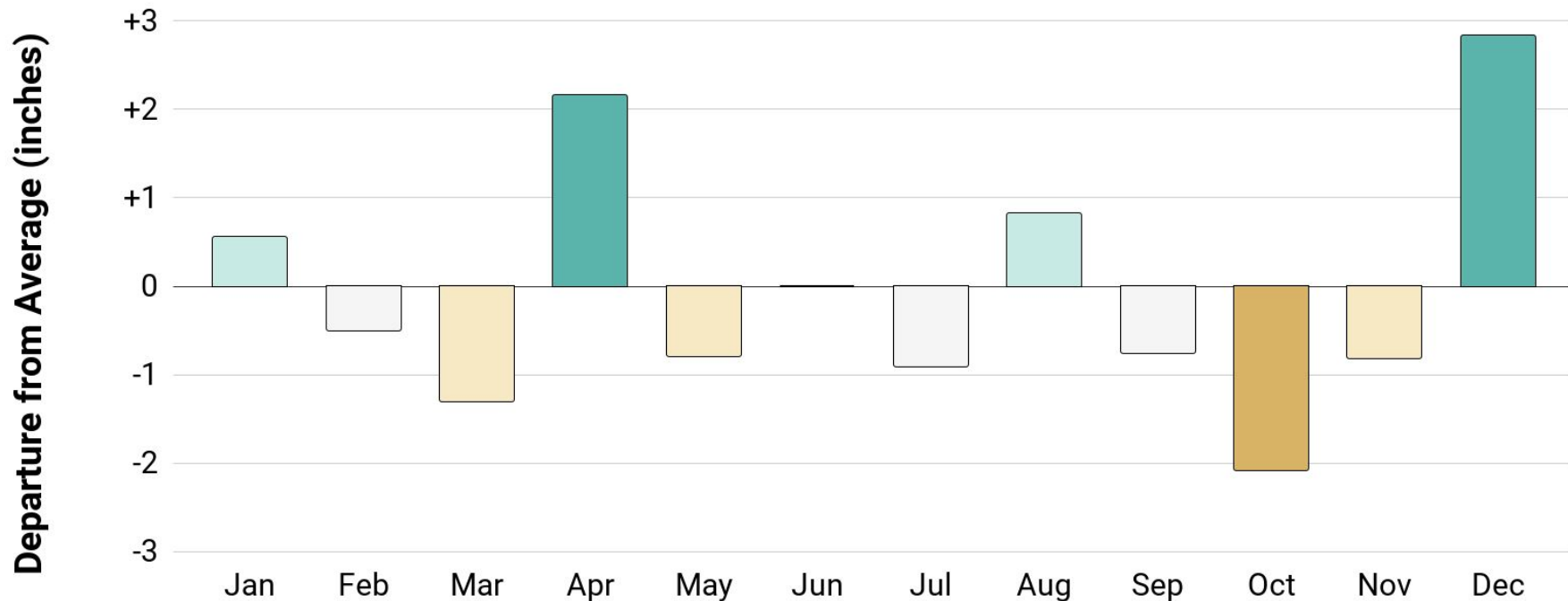
Our **61st-driest** year on record since 1895

- Statewide average precipitation of **48.56"**
- **-2.21"** vs. the 1991-2020 average



National Centers for  
Environmental Information  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

# Monthly Precipitation Departures (vs. 1901-2000)



Record Driest

Driest 10%

Driest 33%

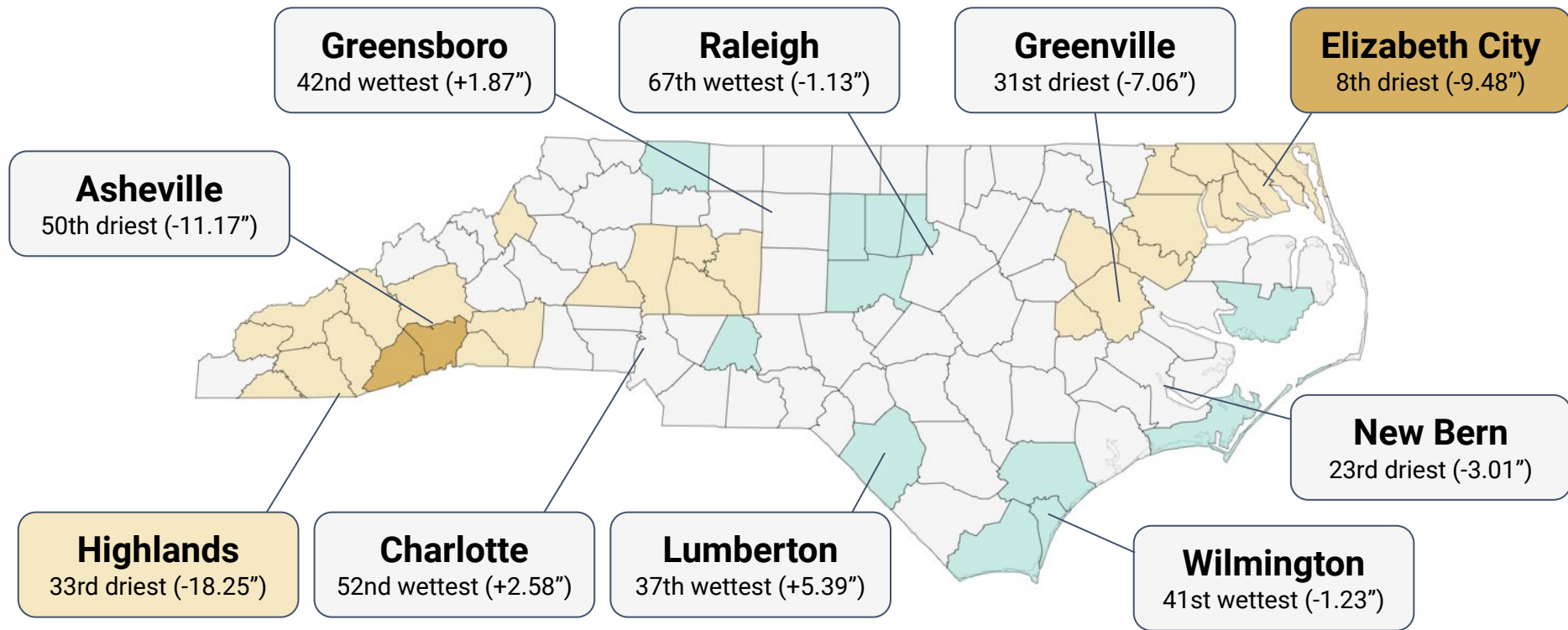
Near-Normal

Wettest 33%

Wettest 10%

Record Wettest

# Annual Precipitation Rankings





# Season by Season



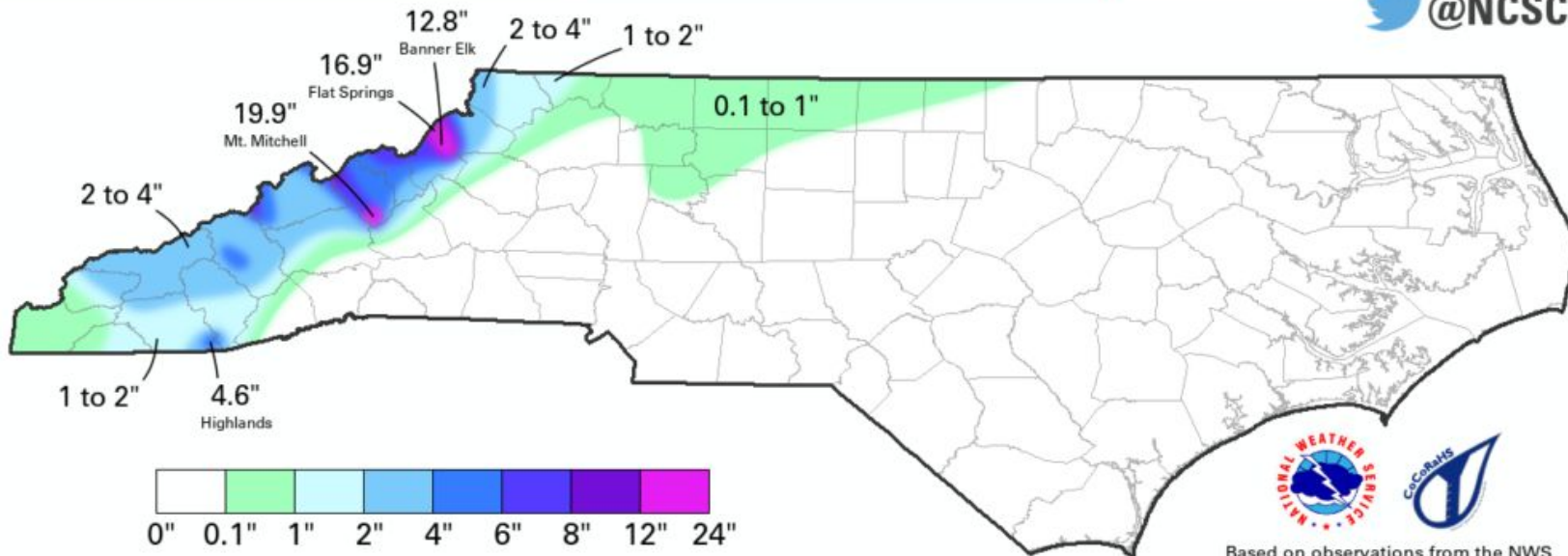
# Winter: Snow Stays Away

5th warmest

62nd wettest

## Total Snowfall

Nov. 2022 to Mar. 2023



NATIONAL WEATHER SERVICE  
CoCoRaHS  
Based on observations from the NWS Cooperative Observer network and CoCoRaHS

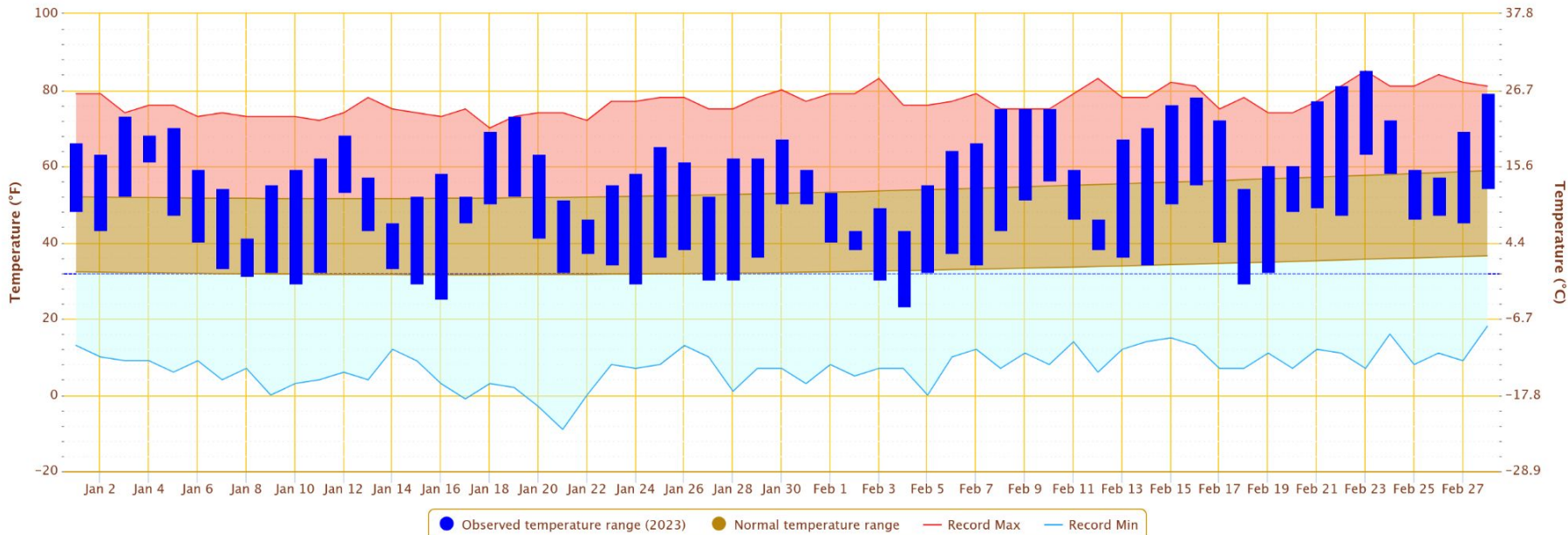


# Winter: An Early Warm-Up

5th warmest  
62nd wettest

Daily Temperature Data – RALEIGH-DURHAM INTERNATIONAL AIRPORT, NC

Period of Record – 1944-05-18 to 2024-01-09. Normals period: 1991-2020. Click and drag to zoom chart.



Powered by ACIS



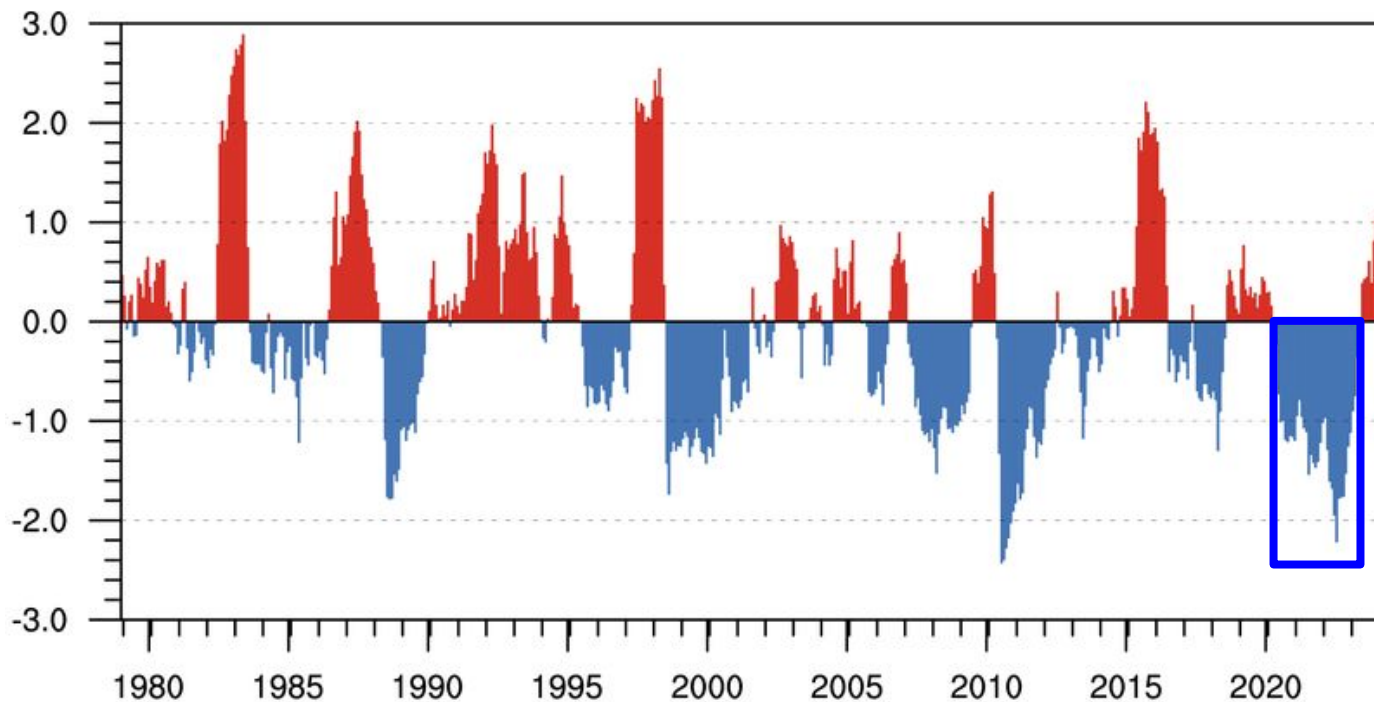


# Winter: So Long, La Niña!

5th warmest

62nd wettest

Multivariate ENSO Index Version 2





# Spring: Warm Weather Blossoms

43rd warmest

60th wettest

NC STATE

Observations from CAST  
Horticultural Crops Res Stn



 @NCSCO  
climate.ncsu.edu



By NWS Wilmington

# Spring: A Rainfall Turn-Around

43rd warmest

60th wettest



*Great Lakes wildfire, from InciWeb*



*Sunset Beach, by Anne Sigmon Del Tufo*

# Spring: Wet Weekends Abound











43rd warmest

60th wettest

## Weekend Precipitation Totals

Jan. to Apr. 2023



Location					 													
	Jan. 7-8	Jan. 14-15	Jan. 21-22	Jan. 28-29	Feb. 4-5	Feb. 11-12	Feb. 18-19	Feb. 25-26	Mar. 4-5	Mar. 11-12	Mar. 18-19	Mar. 25-26	Apr. 1-2	Apr. 8-9	Apr. 15-16	Apr. 22-23	Apr. 29-30	
Asheville	0.33	Trace	0.40	0.07	0	0.89	0	0.09	0	0.51	0	0.24	0.29	1.05	0.03	0.59	0.31	
Charlotte	0.26	0	1.11	0.19	0	1.76	0	0.05	0	0.46	0.06	0.25	0.13	1.35	0.01	0.33	0.21	
Greensboro	0.18	Trace	0.78	0.12	0	1.29	0	0.02	0	0.30	0.03	0.28	0.25	0.59	Trace	0.20	0.57	
Raleigh	0.12	0.01	0.71	0.04	Trace	1.34	0.01	0.12	0	0.57	0.20	0.28	0.02	1.44	Trace	0.66	1.36	
Wilmington	0	0	1.79	0.02	0.23	2.19	0	0.08	Trace	0.42	0.20	0.59	0	2.14	Trace	0.82	0.82	
Hatteras	0.16	0.02	1.17	0	0.08	2.33	0.02	0.14	0	0.11	0.22	0.59	Trace	1.77	0.49	0.45	2.83	

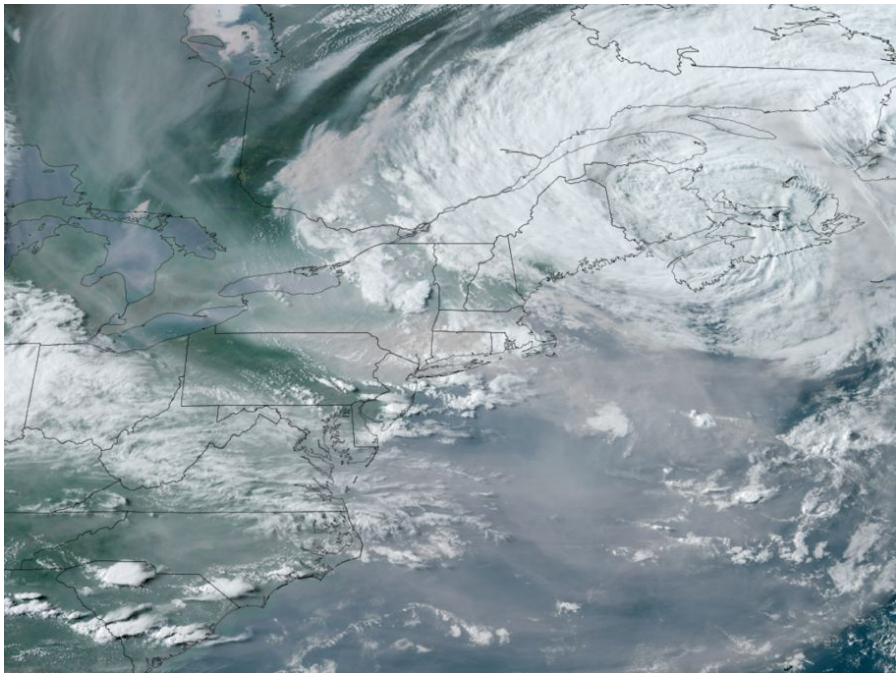




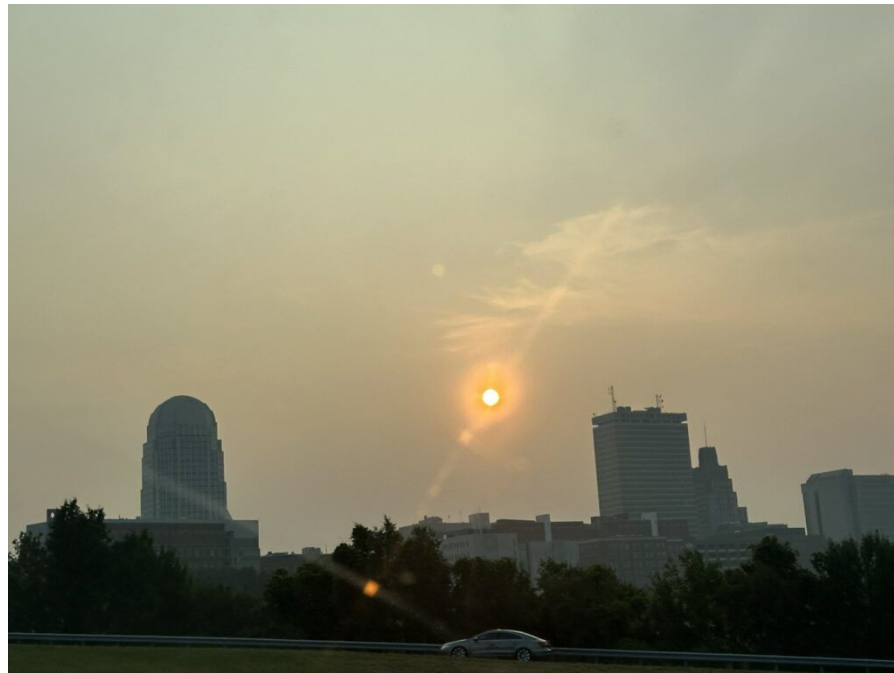
# Summer: A Cool, Smoky Start

61st coolest

64th wettest



By CIRA/NOAA



By @ac\_maestro

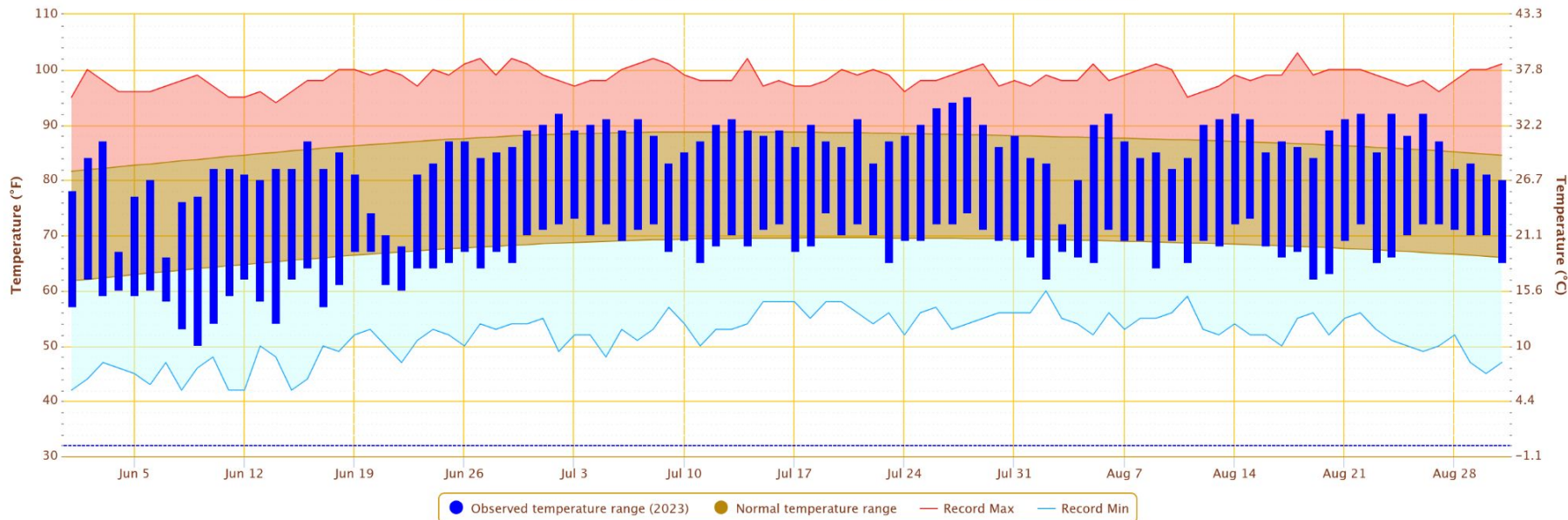
# Summer: Heat Finally Arrives

61st coolest

64th wettest

Daily Temperature Data – GREENSBORO/PIEDMONT TRIAD INTERNATIONAL AIRPORT, NC

Period of Record – 1928–11-01 to 2024-01-09. Normals period: 1991–2020. Click and drag to zoom chart.



Powered by ACIS



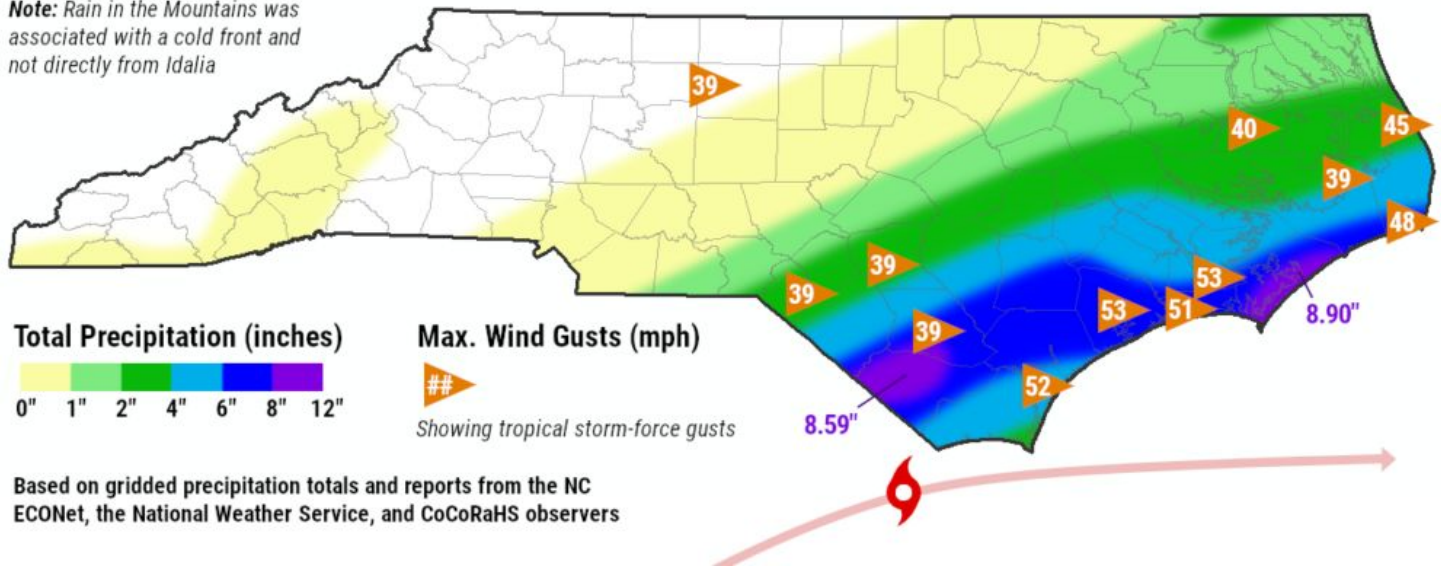
# Summer: The Tropics Awaken

61st coolest
64th wettest

## Tropical Storm Idalia August 30-31, 2023



*Note: Rain in the Mountains was associated with a cold front and not directly from Idalia*



# Fall: Tropical Storm Ophelia

29th warmest

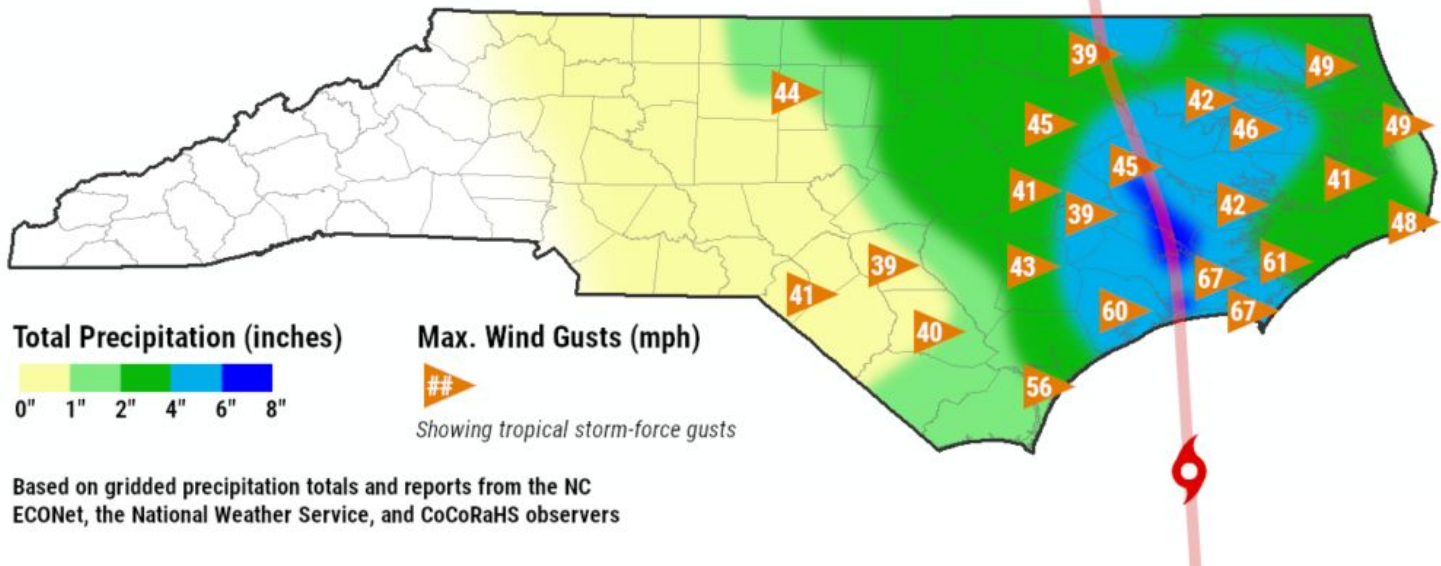
16th driest

Tropical Storm Ophelia

Sep. 22-23, 2023



@NCSCO

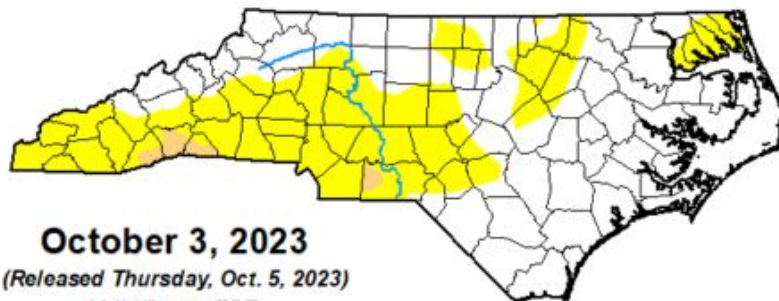




# Fall: A Flash Drought

29th warmest

16th driest



**October 3, 2023**

*(Released Thursday, Oct. 5, 2023)*

Valid 8 a.m. EDT



**October 31, 2023**

*(Released Thursday, Nov. 2, 2023)*

Valid 8 a.m. EDT

**U.S. Drought Monitor  
North Carolina**

Intensity:

-  D0 Abnormally Dry
-  D1 Moderate Drought
-  D2 Severe Drought

-  D3 Extreme Drought
-  D4 Exceptional Drought



<http://droughtmonitor.unl.edu/>

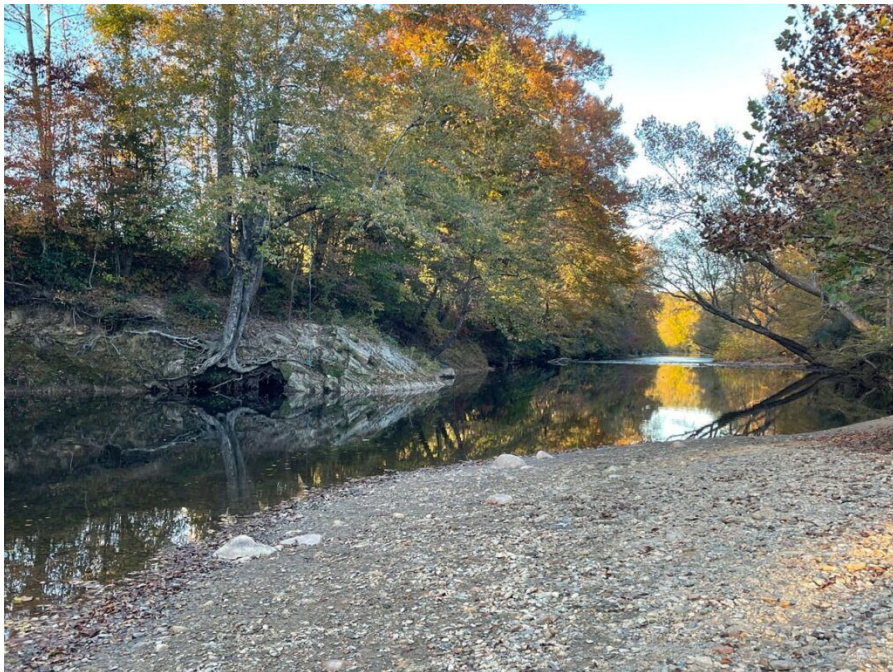




# Fall: Drought's Impacts Emerge

29th warmest

16th driest



*Catawba River, by Dan Crawley/The McDowell News*



*Collett Ridge wildfire, by US Forest Service*

# Fall: Drought's Impacts Emerge

29th warmest

16th driest



Jordan Lake, by Klaus Albertin

**ATTENTION**

**STAGE 1  
WATER SHORTAGE  
ADVISORY**

**VOLUNTARY WATER CONSERVATION**  
[WWW.HVLNC.GOV/WATERSHORTAGE](http://WWW.HVLNC.GOV/WATERSHORTAGE)

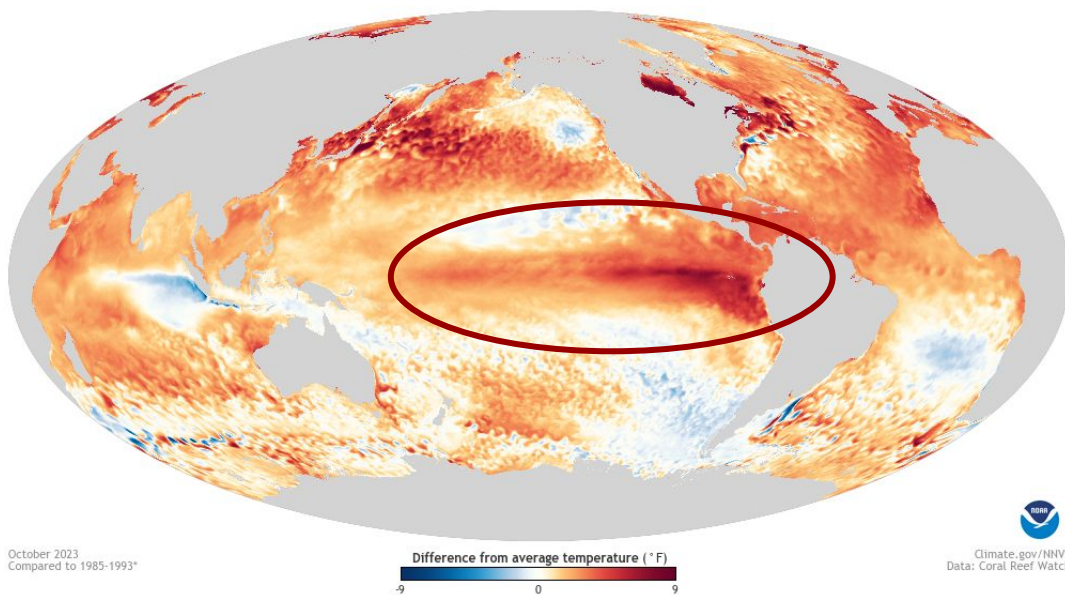
Hendersonville  
Water Sewer



# December: El Niño Brings the Rain

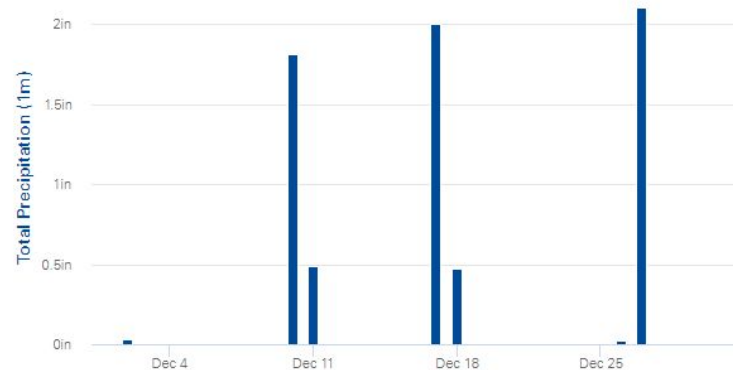
19th warmest

7th wettest



NC STATE

Observations from 316108  
New Bern - Asos



Climate.gov/NHVL  
Data: Coral Reef Watch



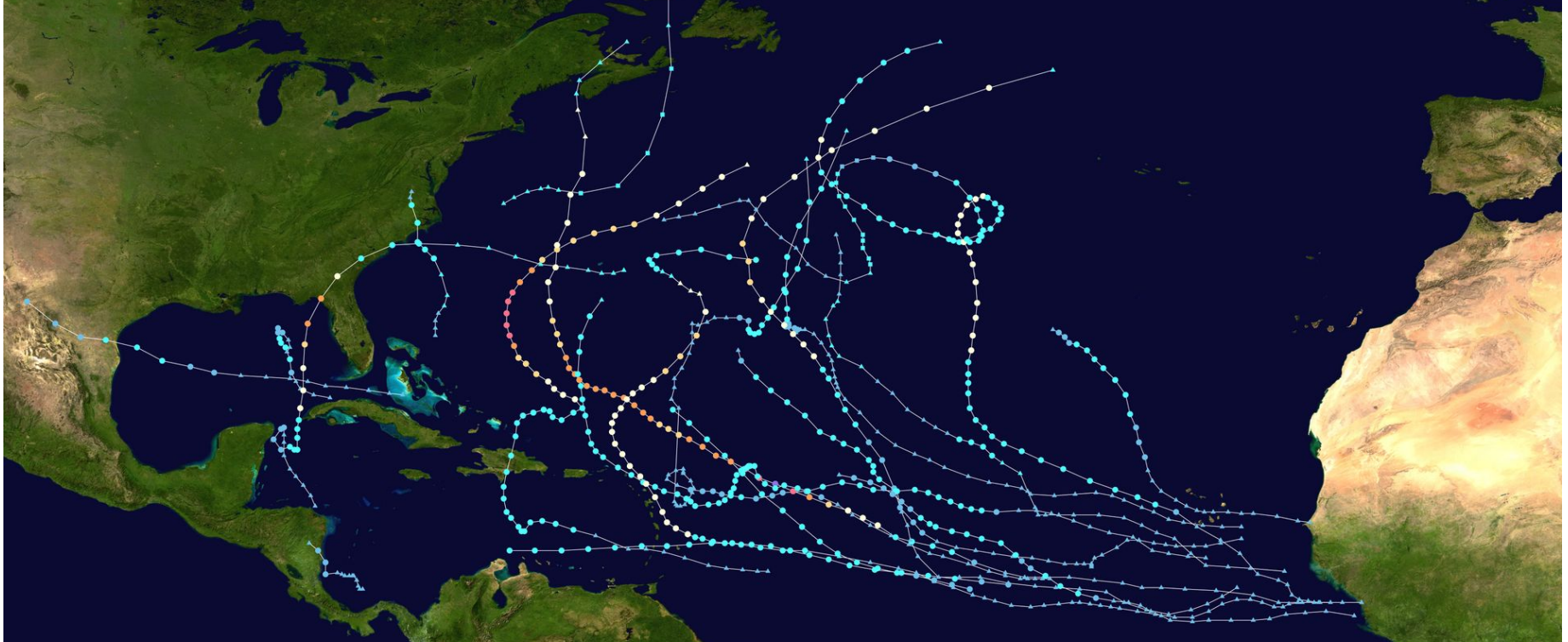
@NCSCO  
climate.ncsu.edu





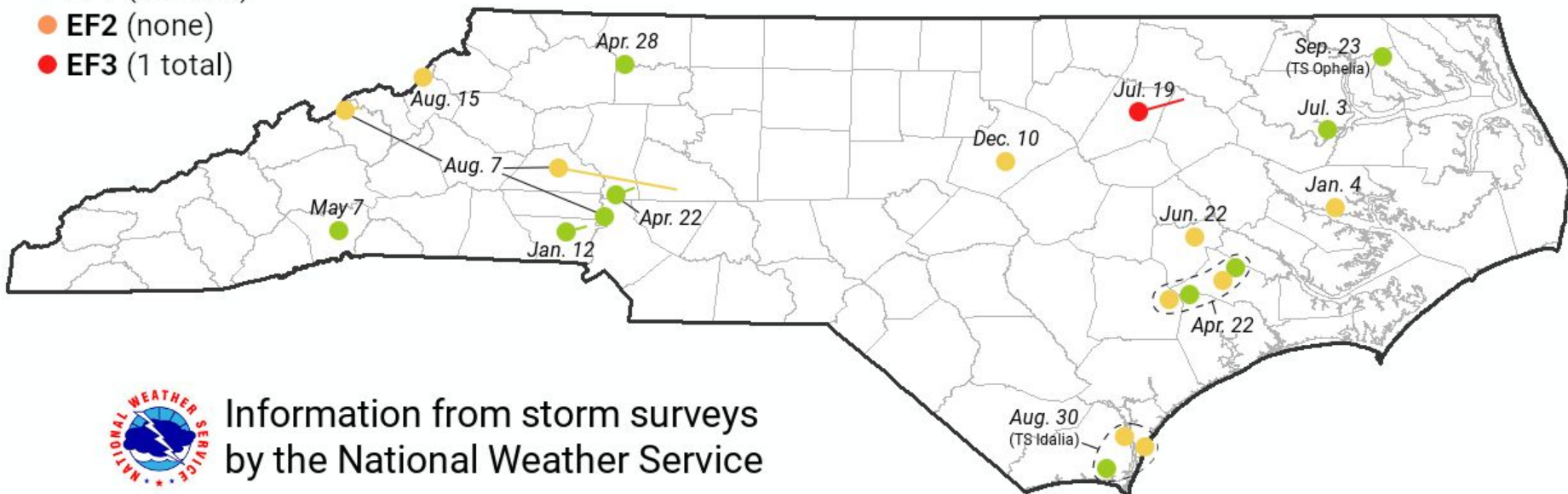
# Notable Hazards

# Tropical Systems



# Confirmed Tornadoes in 2023

- EF0 (10 total)
- EF1 (10 total)
- EF2 (none)
- EF3 (1 total)





# Flooding

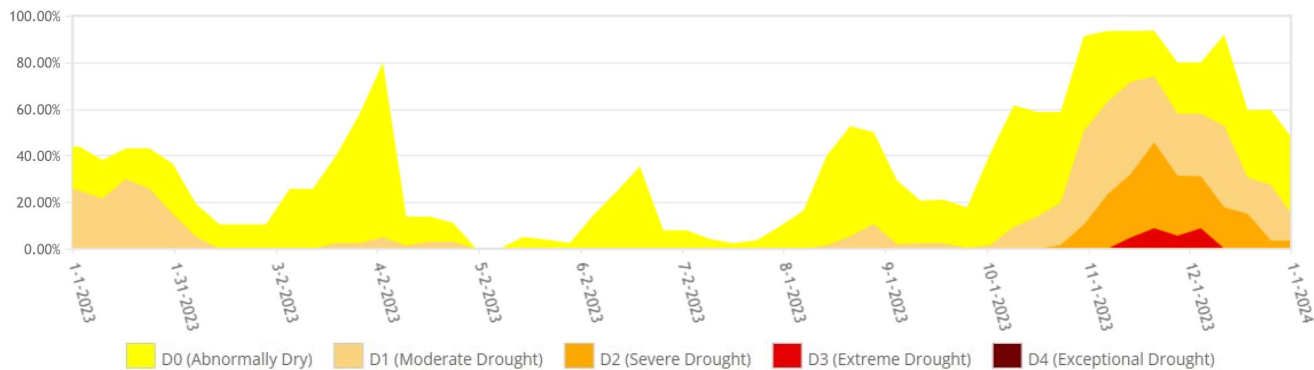
- **Late April:** along the Neuse River in Johnston County
- **Late June:** in the Foothills and Charlotte area
- **Mid-July:** in Alexander and Caldwell counties
- **Late August:** TS Idalia
- **Late September:** TS Ophelia



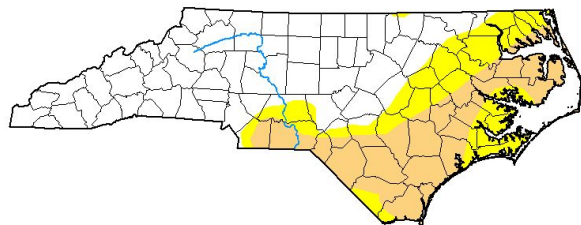
*Whiteville after Idalia, by NC Division of Aviation*

# Drought

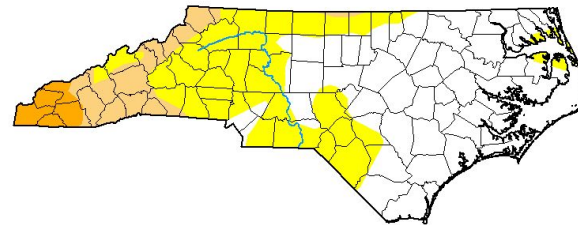
North Carolina Percent Area in U.S. Drought Monitor Categories



January 3, 2023



January 2, 2024





# Wildfires



Preliminary total of **5,491 fires** across **76,063 acres** on state and private lands\*

- Most acreage since 2016



*Sauratown Mountain fire, by the Winston-Salem Journal*



# 2023 in Perspective



# The Yin and Yang of 2023

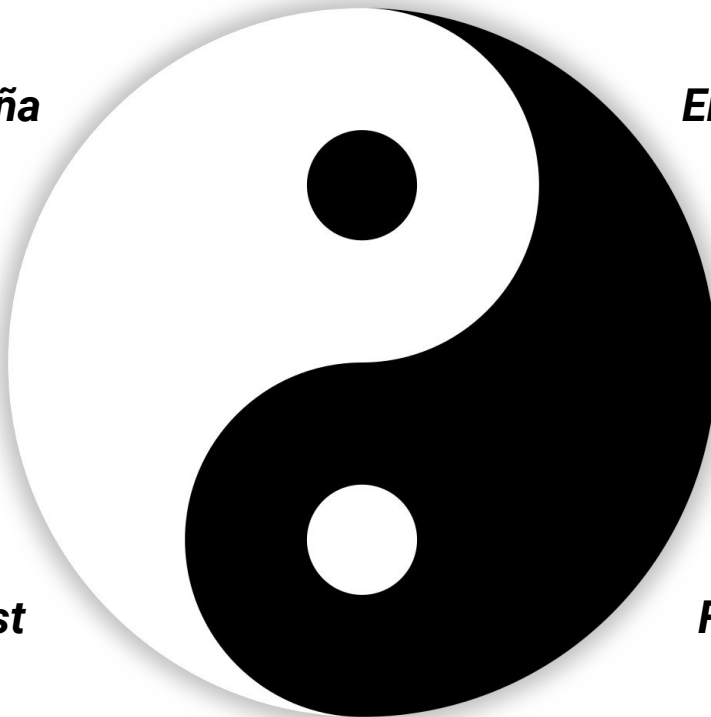
*Starting with La Niña*

*Cool seasons were warm*

*Rain every weekend*

*Tropical torrents*

*Winter drought in the east*



*Ending with El Niño*

*Warm season started cool*

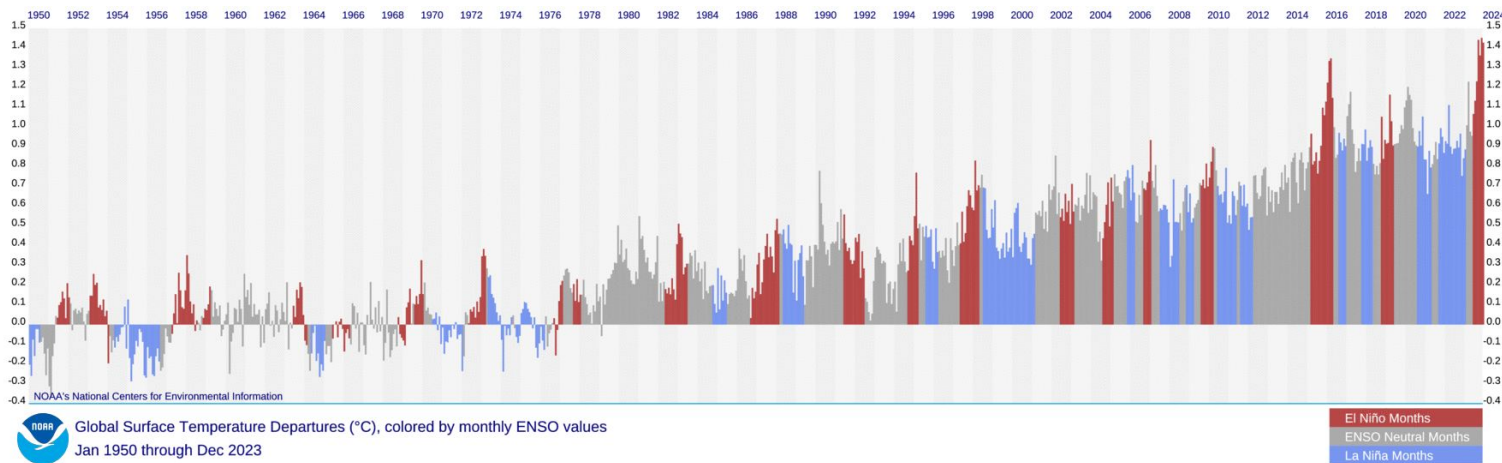
*Then no rain at all*

*As drought was emerging*

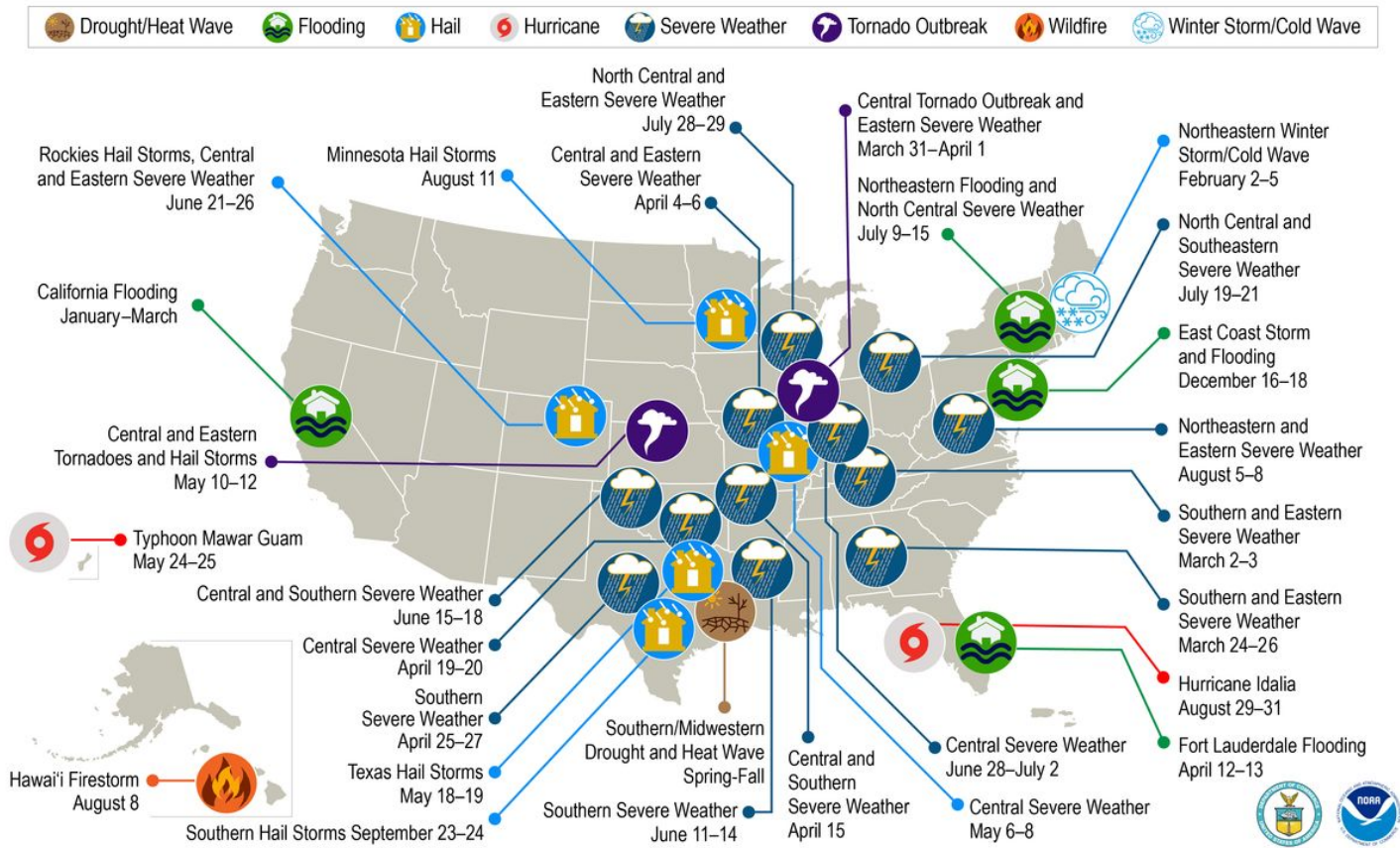
*Fall drought in the west*

# Warmest Year on Record Globally

- The last ten years have been the ten warmest years on record, since 1880 (NASA)
- El Niño played a role, but all years/ENSO phases are warming



# U.S. 2023 Billion-Dollar Weather and Climate Disasters

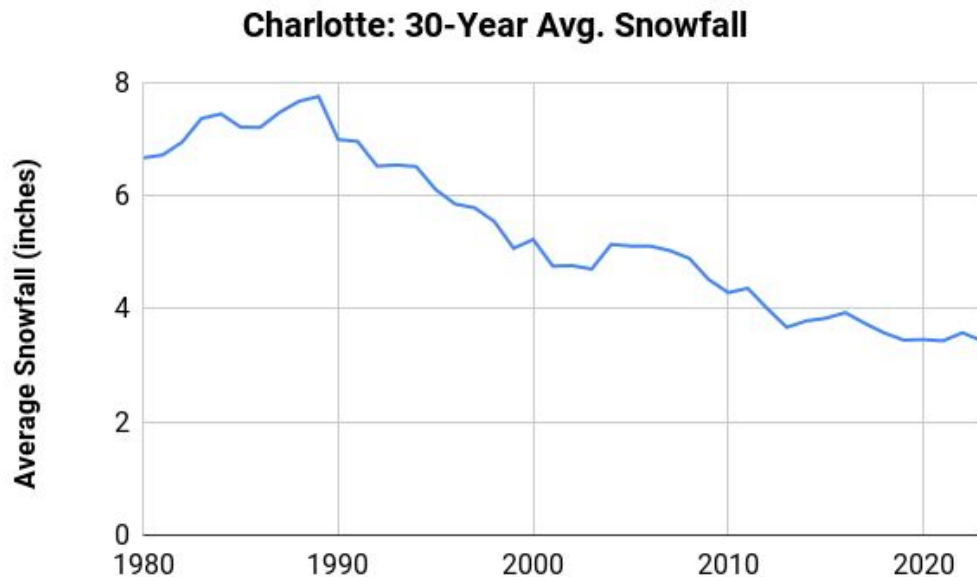


This map denotes the approximate location for each of the 28 separate billion-dollar weather and climate disasters that impacted the United States in 2023.



# Fingerprints of Climate Change in 2023

- Lack of snowfall
- Warm cool-season temperatures
- Hot summer temps
- Wintertime severe weather
- Precipitation swings: flooding *and* drought



# For More on Climate Change Impacts

Join us for the Southeast Chapter  
of the 5th National Climate  
Assessment webinar series



First webinar is Thursday, January 18 at 11 am:

<https://climate.ncsu.edu/sencawebinar/>

# Thank you!

- Post questions in the chat
- Climate Blog summary published at noon
- Recording will be posted on <https://www.youtube.com/ncsco>