

August 2024 Central NC Climate Summary

By Phillip Badgett and James Danco

Debby brings heavy rainfall, helps keep August heat down.

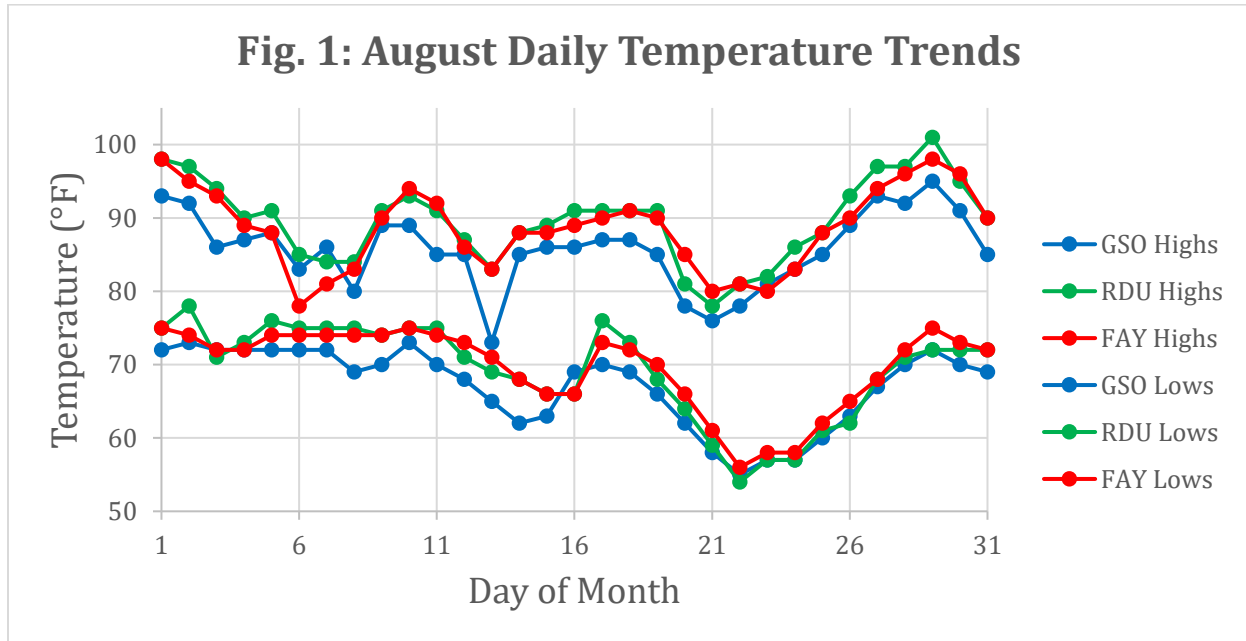
Thunderstorms were again commonplace across NC during August. However, rainfall in a good portion of the state including central and eastern NC was dominated by Tropical Storm Debby. Debby was a tropical storm as it made landfall just north of Charleston SC in the early morning of August 8, then it weakened and moved slowly north-northwest across SC and then NC through early August 9. The rain fell on already nearly saturated ground due to recent thunderstorms and July's heavy rainfall, resulting in flash flooding. In addition, Debby produced severe weather including several tornadoes over central and eastern NC along its outer bands. Tornadoes touched down in Franklin, Nash, Wilson, and Sampson Counties in central NC. In addition, strong winds to 40-50 mph downed numerous trees in the wet ground. Aided by the 3-5 inches of rain that fell from Debby, rainfall amounts around and in excess of 10 inches were reported for August. Greensboro, Raleigh, and Fayetteville all received around 9-10 inches for the month. All the rain in August did keep the heat at bay. The monthly temperatures finished slightly above normal at Raleigh and slightly below normal at Greensboro and Fayetteville.

The National Centers for Environmental Information (NCEI) reported that the average temperature across NC in August was 76.0°F. This made it the 59th-hottest August since 1895. Most of central NC finished the month with an average temperature that was near normal (Table 1). The hottest monthly temperatures occurred on August 29 when Raleigh topped out at 101°F, Fayetteville 98°F, and Greensboro 95°F. The temperatures hit 90+°F on 18 days at Raleigh, 15 days at Fayetteville, and only 7 days at Greensboro. The lowest temperatures recorded this month were all on the 22nd when all three climate sites bottomed out in the mid-50s.

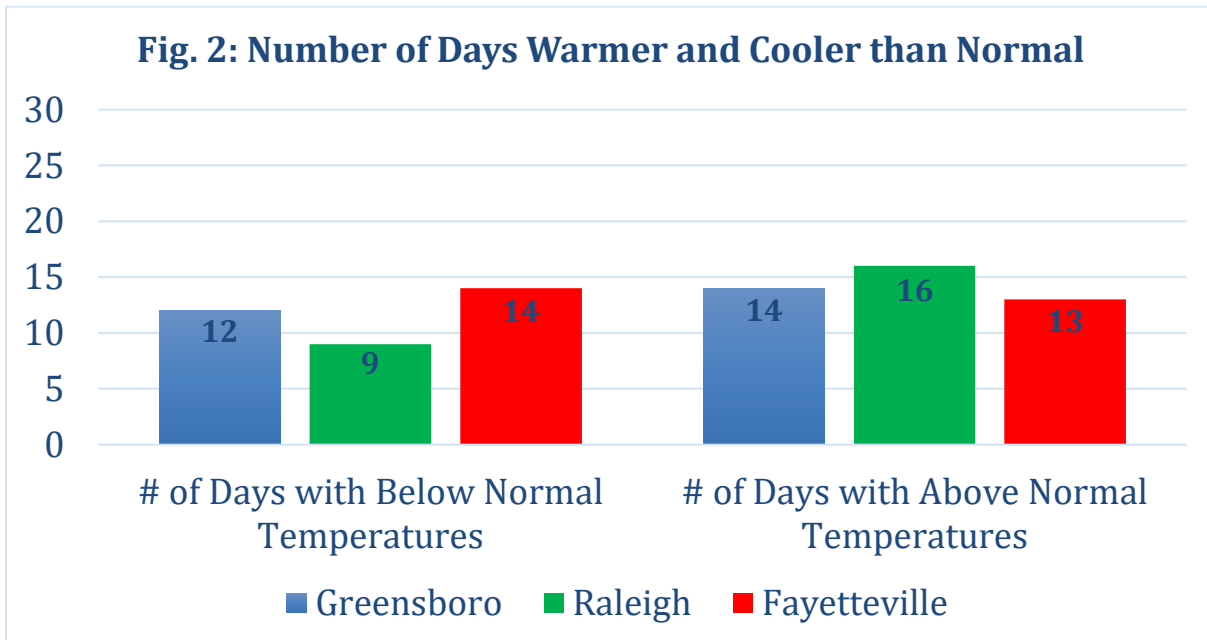
Table 1: Monthly Temperature Statistics

Site	Avg High Temp (°F)	Avg Low Temp (°F)	Avg Temp (°F)	Departure From Normal (°F)	Maximum Temperature (°F)	Minimum temperature (°F)
Greensboro (GSO)	86.2	67.1	76.7	-0.6	95 on 8/29	55 on 8/22
Raleigh-Durham (RDU)	89.6	69.3	79.5	+0.7	101 on 8/29	54 on 8/22
Fayetteville (FAY)	88.6	69.6	79.1	-0.7	98 on 8/1 and 8/29	56 on 8/22

The time series of daily temperature for the month at the three climate sites can be found in Figure 1. Cool temperatures were found for a good portion of early and mid August, including during Debby and after a cold frontal passage on the 20th. Fayetteville even broke a daily record low maximum temperature record on the 6th, and on the 21st much of central NC only reached the 70s. But this was at least partially offset by heat at the end of the month, as highs were mostly in the 90s from the 26th onward.



As shown in Figure 2, there were roughly equal numbers of warmer and cooler than normal days at Greensboro and Fayetteville. But at Raleigh, slightly over half of days had above-normal temperatures, and less than 30% were below normal.

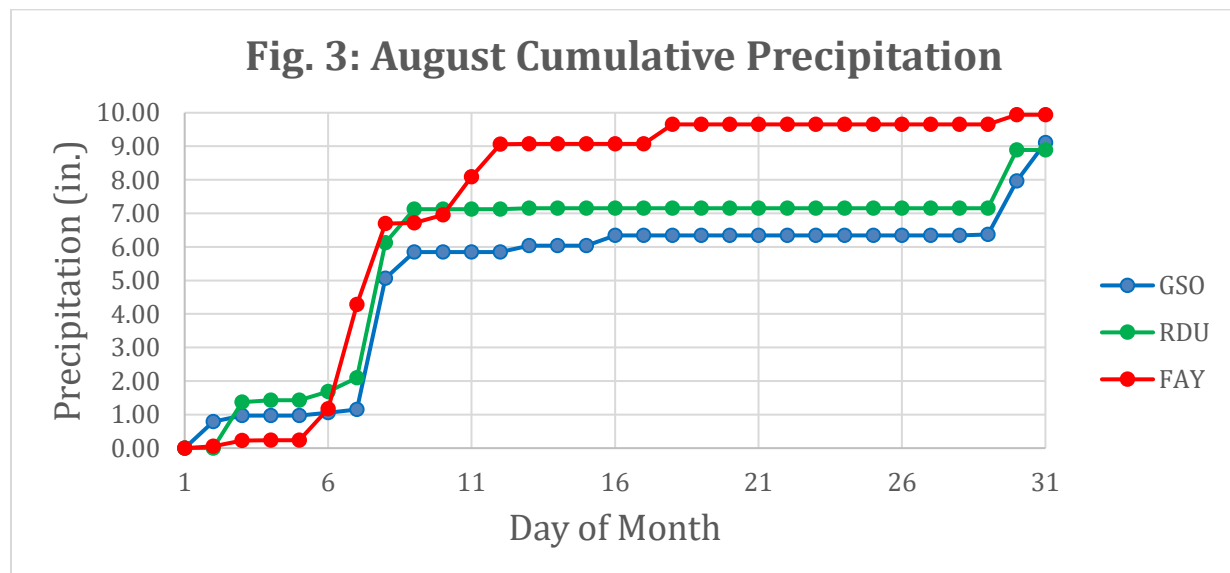


The combination of Debby and thunderstorms during the month kept our region wet. August will be remembered for the “big” rainfall events. If “big” is defined as a day in which at least 1 inch of rain was recorded, Raleigh tallied 4 such days, and Greensboro and Fayetteville both reported 3 days. Fayetteville reported 10 days with a thunderstorm, while Greensboro had 9 and Raleigh had 7. Across the state, NCEI reported a statewide average of 6.84 inches of rainfall. This made August 2024 the 23rd-wettest August since 1895. Both Greensboro and Raleigh had their 11th-wettest Augusts on record, while Fayetteville had its 8th-wettest. This combined with the wet July brought a huge turnaround from the very dry June to bring the 15th-wettest meteorological summer (June-July-August) on record at Greensboro and the 12th-wettest at Raleigh. The August 2024 monthly precipitation totals at the three climate sites are found in Table 2.

Table 2: Monthly Precipitation Statistics

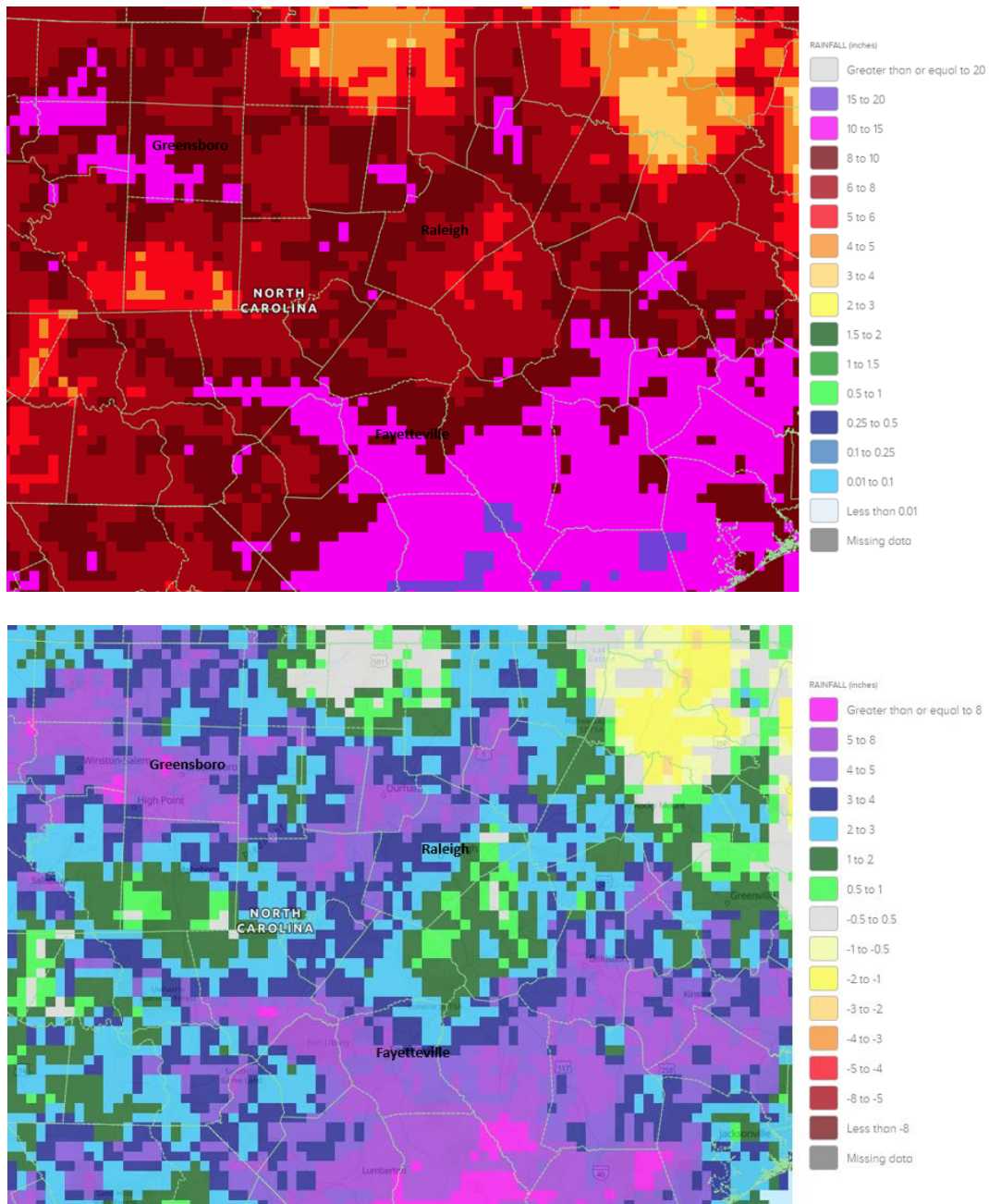
Site	Total precipitation (in.)	Departure from Normal (in.)	Max Daily Precipitation (in.)
Greensboro (GSO)	9.11	+4.75	3.91 on 8/8
Raleigh-Durham (RDU)	8.89	+4.18	4.02 on 8/8
Fayetteville (FAY)	9.94	+4.58	3.11 on 8/7

The cumulative precipitation at the three climate sites for the month of August is shown in Figure 3. After all the rain from Debby, the rest of August was pretty dry until the last couple days of the month when a backdoor cold front resulted in 1.74 inches of rain at Raleigh. This was after a 20 day period from the 10th to the 29th that only 0.03 inches fell. Greensboro received a total of 2.74 inches on the 30th and 31st.



As displayed by the radar-estimated precipitation and precipitation departure from normal in Figure 4, the final monthly totals were mostly in the 6 to 10 inch range across central NC, but some small areas of the NW Piedmont, eastern Sandhills and southern Coastal Plain exceeded 10 inches. These totals were anywhere from 2 to as much as 8 inches above normal. There were isolated areas of the western and NE Piedmont that had 4 to 6 inches, which was near to slightly above normal. The only drier-than-normal spot was in the northern Coastal Plain (mainly Halifax County), which missed out on the heaviest rain from Debby and only received 3 to 4 inches.

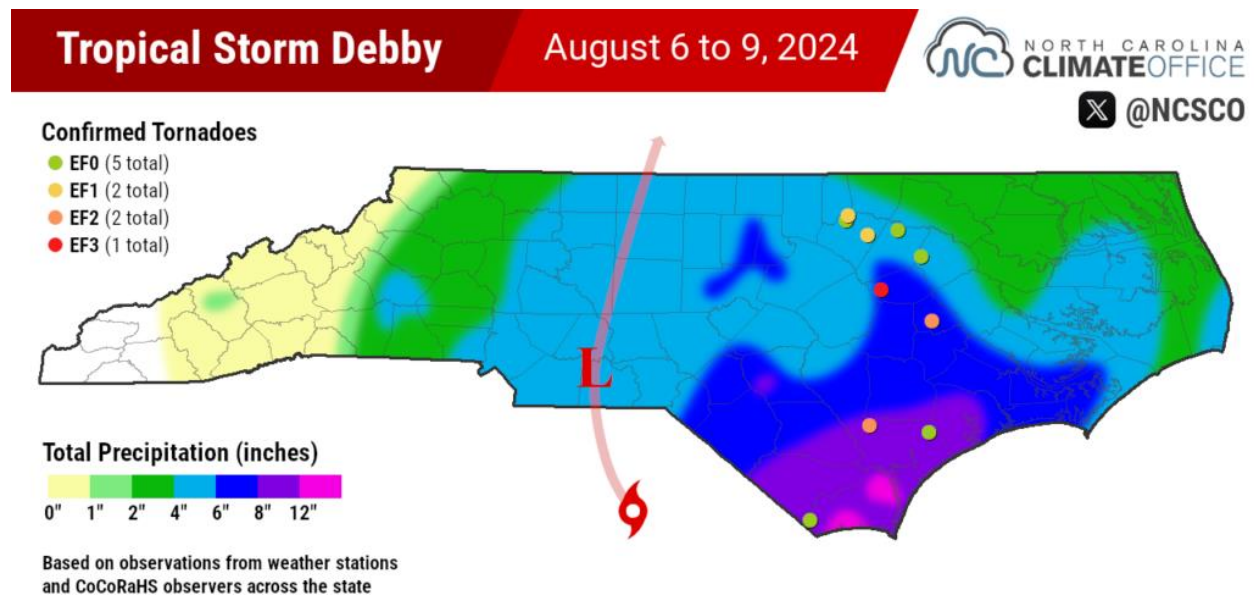
Fig. 4: Radar-Estimated Monthly Precipitation and Precipitation Departure from Normal



Some of the cooperative station rainfall reports from around central NC from August 2024 included: Sparta 4.26 inches (-0.67), Winston-Salem 7.21 inches (+2.70), Lexington 6.93 inches (+2.49), Burlington 7.24 inches (+3.71), Mount Airy 4.29 inches (-0.40), Danbury 9.31 inches (+4.95), Henderson 6.58 inches (+1.45), Cary 6.36 inches (+1.55), Raleigh (NCSU) 5.36 inches (+0.65), Louisburg 10.05 inches (+4.54), Apex 9.48 inches (+4.84), Laurinburg 12.35 inches (+8.02), Rocky Mount 7.09 inches (+2.17), and Clinton 11.12 inches (+5.11).

Figure 5 from the NC Climate Office shows the total precipitation across NC from Tropical Storm Debby. Much of central NC received 4 to 6 inches, with 6 to 8 inches over the eastern Sandhills and central and southern Coastal Plain. There were also 10 confirmed tornadoes across NC from Debby, including 7 in central NC and 3 in Franklin County alone. The tornado in Wilson County reached EF3 strength with 140 mph winds. That was only the third F3 or EF3 tornado on record in NC from a tropical system, according to the NC Climate Office.

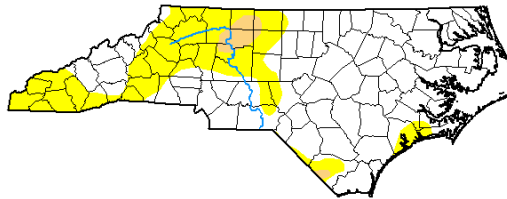
Fig. 5: Total Precipitation and Confirmed Tornadoes across NC from Tropical Storm Debby



While there was still some lingering Moderate Drought (D1) over the far NW Piedmont at the beginning of August, all the rainfall from Debby completely wiped away even Abnormally Dry (D0) conditions over all of central and eastern NC (Figure 6). This clean slate continued through the end of the month, with only some D0 and D1 conditions over far western NC.

Fig. 6: US Drought Monitor for NC on August 6 (top) and August 27 (bottom)

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



August 6, 2024
(Released Thursday, Aug. 8, 2024)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	71.20	28.80	2.40	0.00	0.00	0.00
Last Week 07-30-2024	55.55	44.45	6.11	0.32	0.00	0.00
3 Months Ago 05-07-2024	64.68	35.32	0.00	0.00	0.00	0.00
Start of Calendar Year 01-02-2024	53.95	46.05	13.26	3.54	0.00	0.00
Start of Water Year 09-26-2023	82.24	17.76	0.36	0.00	0.00	0.00
One Year Ago 08-08-2023	83.57	16.43	0.00	0.00	0.00	0.00

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

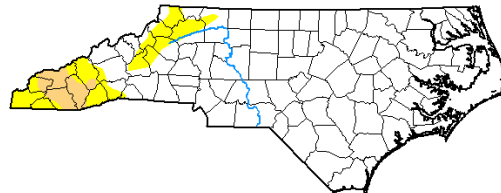
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

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droughtmonitor.unl.edu

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



August 27, 2024
(Released Thursday, Aug. 29, 2024)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	88.21	11.79	3.26	0.00	0.00	0.00
Last Week 08-20-2024	89.38	10.62	0.00	0.00	0.00	0.00
3 Months Ago 05-28-2024	98.89	1.11	0.00	0.00	0.00	0.00
Start of Calendar Year 01-02-2024	53.95	46.05	13.26	3.54	0.00	0.00
Start of Water Year 09-26-2023	82.24	17.76	0.36	0.00	0.00	0.00
One Year Ago 08-29-2023	49.94	50.06	10.60	0.00	0.00	0.00

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 <https://droughtmonitor.unl.edu/About.aspx>

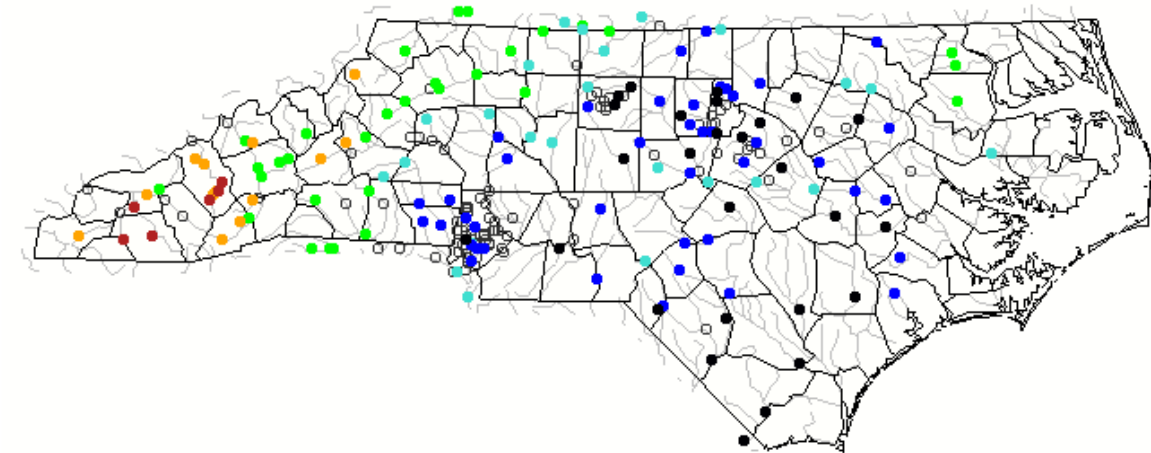
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droughtmonitor.unl.edu

As shown in Figure 7, streamflows across central NC during August were largely much above normal.

Fig. 7: Monthly Streamflow compared to Historical Streamflow across NC in August 2024



Explanation - Percentile classes							
●	●	●	●	●	●	●	○
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		

Other notes:

Days with thunderstorms this month:

Greensboro: 9
Raleigh: 7
Fayetteville: 10

Days with dense fog (visibility of ¼ mile or less):

Greensboro: 0
Raleigh: 3
Fayetteville: 3

Strongest wind gusts and direction:

Greensboro: NE (050 degrees) at 52 mph on August 8 (Debby)
Raleigh: NE (030 degrees) at 50 mph on August 30 (thunderstorm)
Fayetteville NE (030 degrees) 52 mph on August 7 (thunderstorm)

Number of days with high temperatures at 90°F or above:

Greensboro: 7
Raleigh: 18
Fayetteville: 15

Daily records:

Greensboro:

A daily rainfall record of 3.91 inches was set on August 8. This broke the previous record of 3.18 inches set in 1998.

Raleigh:

A daily record high minimum temperature of 78°F was tied on August 2. This record was last set in 1942.

A daily record rainfall of 4.02 inches was set on August 8. This broke the old record of 2.63 inches set in 1928.

A daily record high minimum temperature of 76°F was set on August 17. This broke the old record of 75°F set in 2017.

A daily record high temperature of 101°F was set on August 29. This broke the previous record of 100°F set in 1948.

Fayetteville:

A daily record low maximum temperature of 78°F was set on August 6. This broke the previous record of 79°F set in 1974.

A daily record rainfall of 3.11 inches was set on August 7. This broke the old record of 1.50 inches set in 1910.

Monthly records:

Greensboro:

August 2024 was the 11th-wettest August on record with a total of 9.11 inches.

Raleigh:

August 2024 was the 11th-wettest August on record with a total of 8.89 inches.

Fayetteville:

August 2024 was the 8th-wettest August on record with a total of 9.94 inches.