

August 2022 Central NC Climate Summary

By Phillip Badgett and James Danco

Scattered thunderstorms were the rule in August.

After a wet July, the thunderstorms in August were much more scattered in nature. There was also a complete lack of rain from tropical systems. In fact, August 2022 was only the third August since 1950 with no named tropical systems in the entire Atlantic, the last one being in 1997. There were a few portions of central NC that did have above normal rainfall including the Sandhills and the northwest Piedmont. Other areas were not as lucky and largely missed out on the beneficial rain that thunderstorms can bring. This included a good portion of the Piedmont from Charlotte to just west of Raleigh. The more widespread thunderstorms occurred on or around August 5-9, August 14-17, and August 19-22. Even though it didn't rain on every one of those days at all locations, there were thunderstorms reported or nearby on nearly all those days. By month's end, rainfall totals generally averaged near to slightly below normal. An exception to the rule was Raleigh which tallied only 0.91 inches of rain (3.80 inches below the normal of 4.71 inches). This total tied the 2nd-driest August on record at Raleigh dating back to 1887, quite a shift from the 13th-wettest July on record the previous month. The other two climate reporting sites were drier than normal also, but not nearly as dry as Raleigh. According to NCEI, the state of NC had a preliminary average rainfall of 4.43 inches. This made it the 47th-driest August since 1895. Some of the cooperative station reports from around central NC included: Lexington 1.88 inches, Winston-Salem 3.93 inches, Mount Airy 5.58 inches, Danbury 4.74 inches, Yanceyville 6.47 inches, Henderson 5.31 inches, Carthage 3.59 inches, Cary 3.44 inches, Raleigh (NCSU) 5.16 inches, Louisburg 6.33 inches, Apex 2.71 inches, Chapel Hill 4.25 inches, Jackson Springs 3.53 inches, Clayton 4.95 inches, Laurinburg 5.45, Rocky Mount 1.96 inches, Tarboro 4.53 inches, and Clinton 3.95 inches. The August 2022 monthly precipitation totals are found in Table 1.

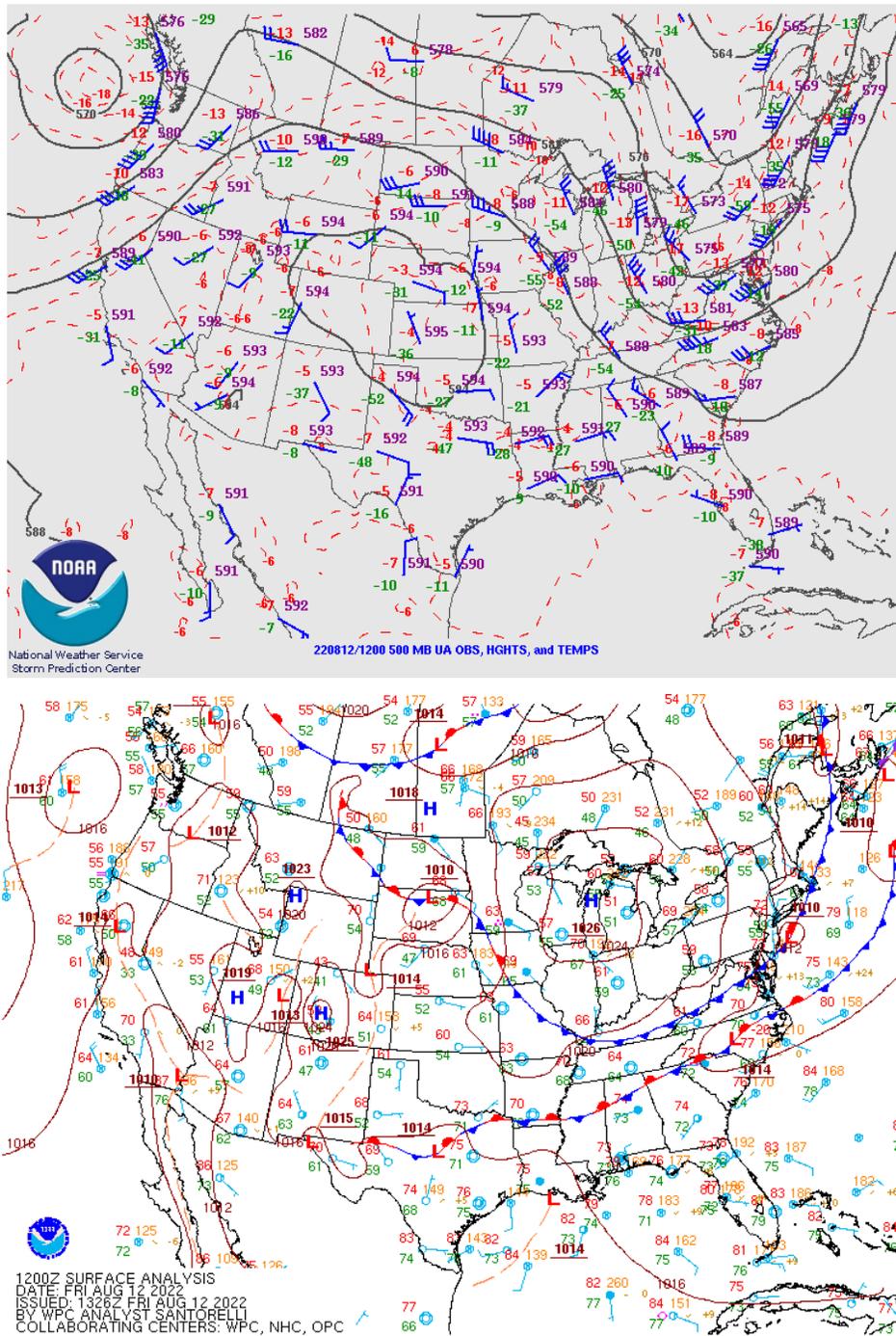
Table 1: Monthly Precipitation Statistics

Site	Total precipitation (in.)	Departure from Normal (in.)	Max Daily Precipitation (in.)
Greensboro (GSO)	3.57	-0.79	0.78 on 8/9
Raleigh-Durham (RDU)	0.91	-3.80	0.56 on 8/21
Fayetteville (FAY)	3.53	-1.83	1.23 on 8/19

The system of the month for August was the upper-level trough that developed over the Great Lakes into the Mid-Atlantic states during the week of August 10-17. This trough allowed

surface high pressure to build from the Great Lakes region southward into the state August 13-14, ending the hot period that had persisted since July. The trough and pair of cold fronts helped the second half of the month to be wetter and somewhat cooler than the first half of the month. Figure 1 shows the 500 mb pattern and surface features (including cold frontal position) on August 12.

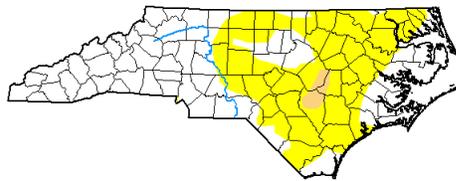
Fig. 1: SPC 500 mb Analysis (top) and WPC Surface Analysis (bottom) at 12z on 8/12



As shown in Figure 2, there was still enough rain to remove some of the D0 (Abnormally Dry) and all of the D1 (Moderate Drought) conditions that were in eastern NC at the beginning of the month. The D0 conditions in the NW Piedmont were also mostly removed. There was only an area of D0 conditions over portions of the SW Piedmont, Sandhills, and Coastal Plain regions. So by the end of August, there were no drought areas (D1 or greater) noted in NC, which ended 43 consecutive weeks with drought present in NC. This was the 5th-longest streak since records began in 2000, according to the NC state climate office.

Fig. 2: U.S. Drought Monitor for North Carolina on August 2 (top) and August 30 (bottom)

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



August 2, 2022
(Released Thursday, Aug. 4, 2022)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	53.93	46.07	1.63	0.00	0.00	0.00
Last Week 07-26-2022	52.29	47.71	6.45	0.00	0.00	0.00
3 Months Ago 05-03-2022	54.16	45.84	26.62	11.02	0.00	0.00
Start of Calendar Year 01-04-2022	2.84	97.16	60.20	2.76	0.00	0.00
Start of Water Year 09-28-2021	91.27	8.73	0.00	0.00	0.00	0.00
One Year Ago 08-03-2021	81.81	18.19	0.00	0.00	0.00	0.00

Intensity:
 None (white) D2 Severe Drought (dark orange)
 D0 Abnormally Dry (yellow) D3 Extreme Drought (red)
 D1 Moderate Drought (light orange) D4 Exceptional Drought (dark red)

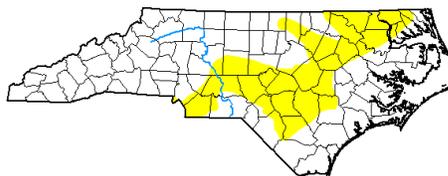
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

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droughtmonitor.unl.edu

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



August 30, 2022
(Released Thursday, Sep. 1, 2022)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	71.07	28.93	0.01	0.00	0.00	0.00
Last Week 08-23-2022	71.07	28.93	0.00	0.00	0.00	0.00
3 Months Ago 05-31-2022	60.56	39.44	25.77	11.52	0.00	0.00
Start of Calendar Year 01-04-2022	2.84	97.16	60.20	2.76	0.00	0.00
Start of Water Year 09-28-2021	91.27	8.73	0.00	0.00	0.00	0.00
One Year Ago 08-31-2021	94.97	5.03	0.00	0.00	0.00	0.00

Intensity:
 None (white) D2 Severe Drought (dark orange)
 D0 Abnormally Dry (yellow) D3 Extreme Drought (red)
 D1 Moderate Drought (light orange) D4 Exceptional Drought (dark red)

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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Radar-estimated precipitation and the radar-estimated precipitation departure from normal are depicted in Figures 3 and 4. The highest totals of 5-8 inches were over parts of the far NW Piedmont, Sandhills, and southern Coastal Plain. Meanwhile, most of the rest of the Piedmont and northern Coastal Plain only had 1-4 inches for the month, which was near to as much as 3-4 inches drier than normal.

Fig. 3: Radar-Estimated Monthly Precipitation

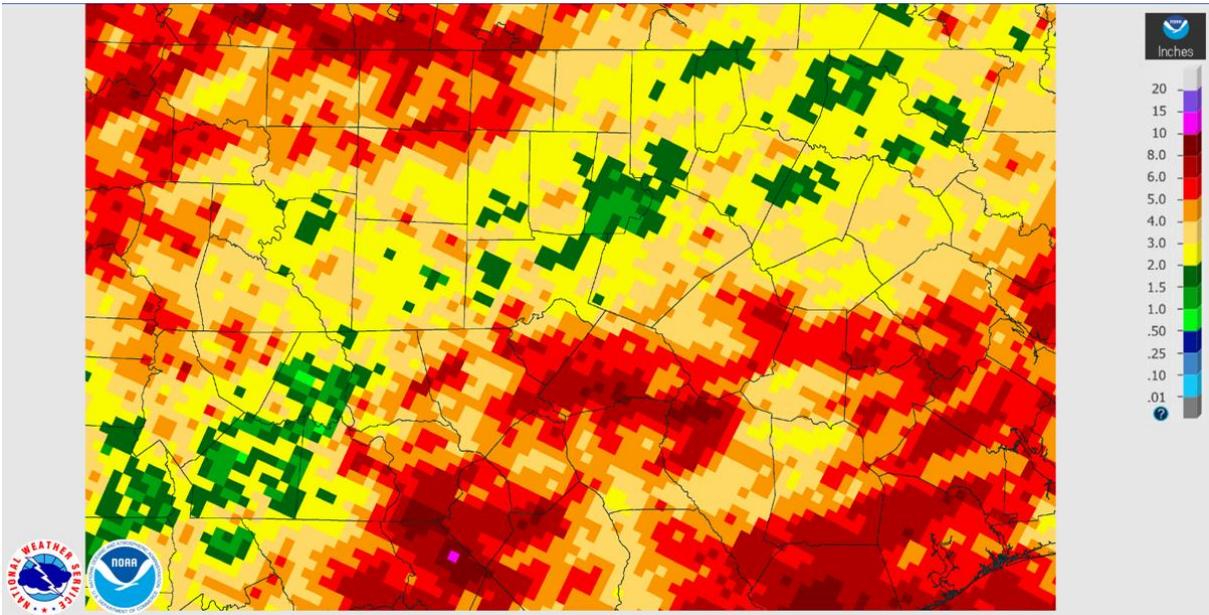
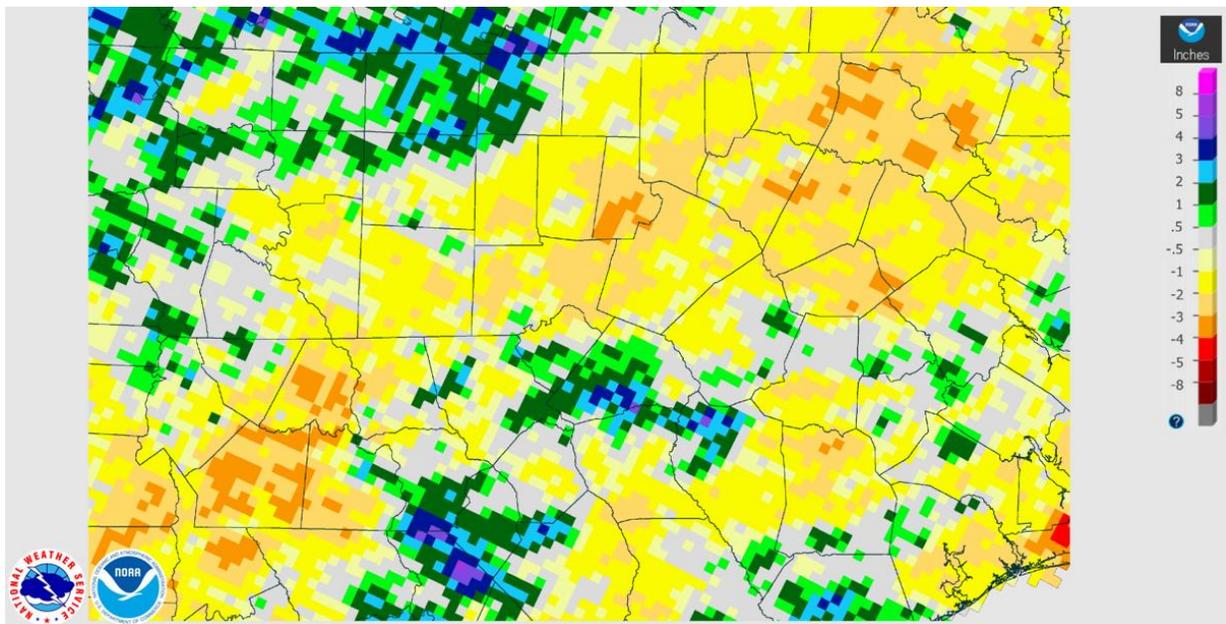
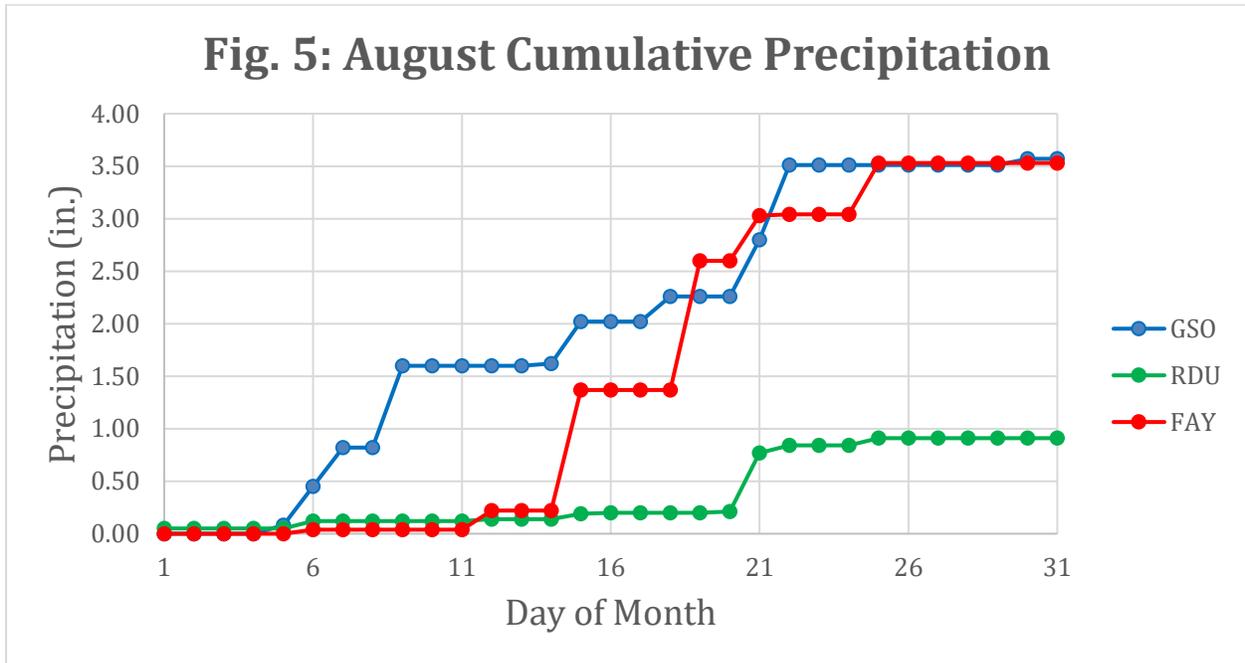


Fig. 4: Radar-Estimated Monthly Departure from Normal Precipitation



The cumulative precipitation at the three climate sites for the month of August is shown in Figure 5.

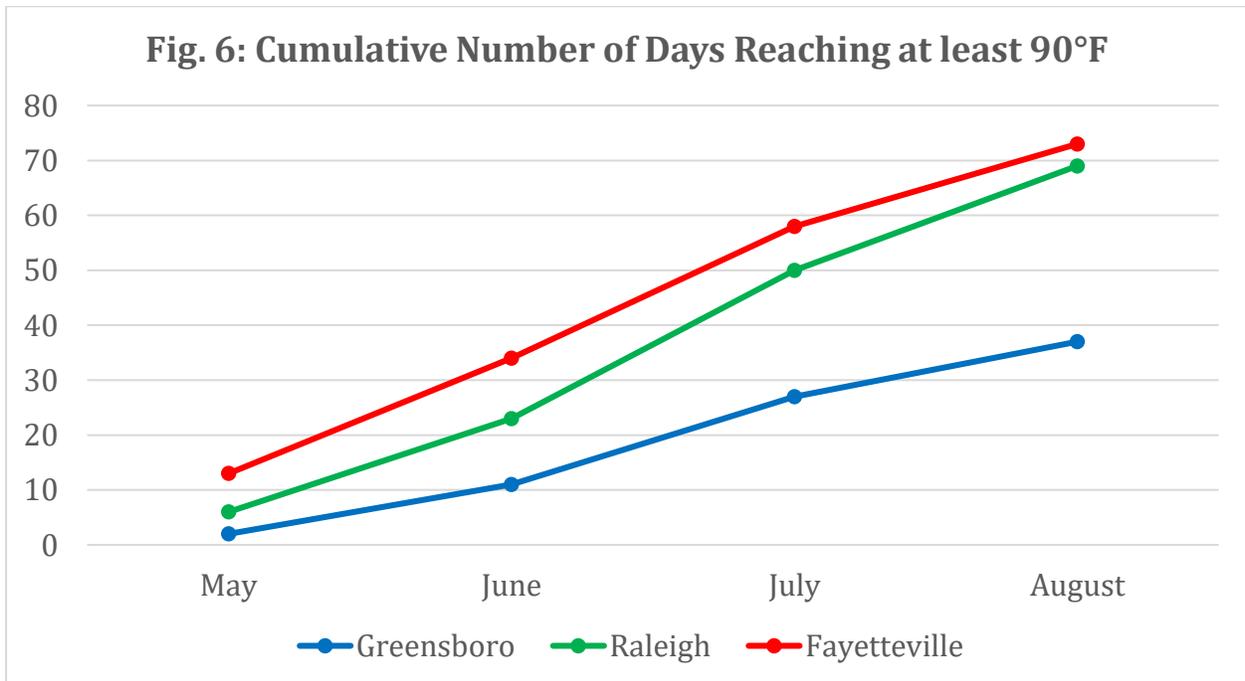


August temperatures started hot before cooling during the middle of the month with the aforementioned pattern change. Raleigh hit a monthly high of 97°F on both August 9 and 10 under high pressure. Greensboro reached 92°F and Fayetteville soared to 98°F on August 10, both monthly highs. The hot weather was then followed by a thundery and cooler period August 11-17 under upper-level troughing. Raleigh dipped to a monthly low of 61°F on August 13, Fayetteville dropped to 61°F on August 14, and Greensboro dipped to 62°F on August 13 and 14. In fact, every day from August 12-21 was cooler than normal at all three climate sites. August then finished on the hot side during the last week of the month with temperatures back in the 90s. By month's end, the temperatures generally averaged within 1°F of normal. Raleigh was 1.1°F warmer than normal, which was enough to make this meteorological summer (June through August) the 3rd-warmest of all time there with an average temperature of 80.4°F. This summer also tied for the 6th-warmest at Fayetteville with an average temperature of 81.1°F. The preliminary monthly average temperature across the state of NC for August was 76.6°F according to NCEI, which ranked August 2022 as the 45th-warmest since 1895. This was also the 15th-warmest summer on record according to NCEI. The August monthly average temperatures and their departures from normal at the three climate sites are depicted in Table 2.

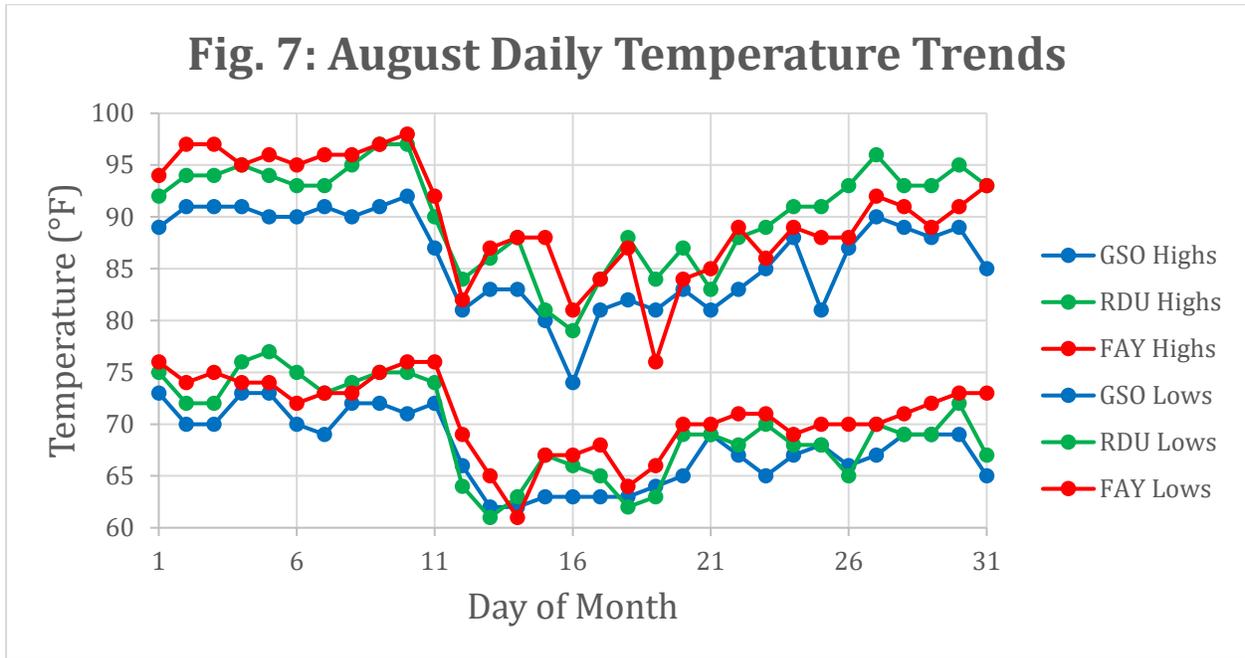
Table 2: Monthly Temperature Statistics

Site	Avg High Temp (°F)	Avg Low Temp (°F)	Avg Temp (°F)	Departure From Normal (°F)	Maximum Temperature (°F)	Minimum temperature (°F)
Greensboro (GSO)	86.0	67.6	76.8	-0.5	92 on 8/10	62 on 8/13 and 8/14
Raleigh-Durham (RDU)	90.3	69.5	79.9	+1.1	97 on 8/9 and 8/10	61 on 8/13
Fayetteville (FAY)	90.0	70.8	80.4	+0.6	98 on 8/10	61 on 8/14

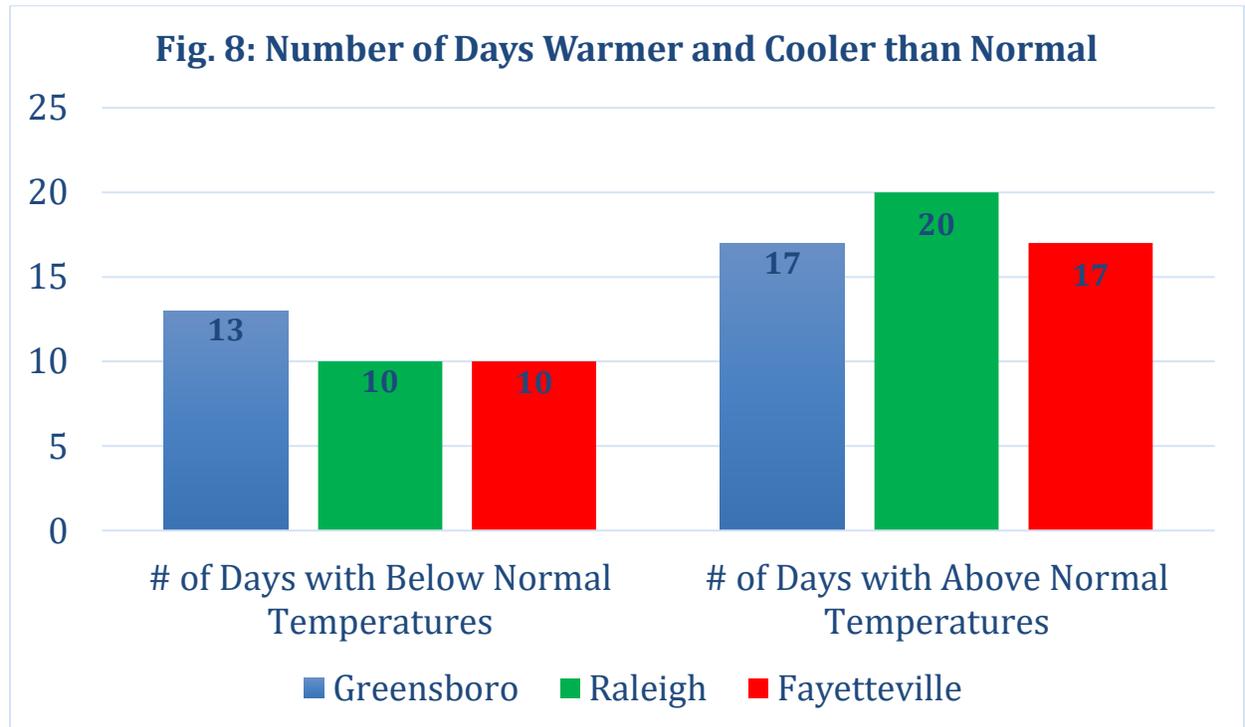
The number of 90+°F days continued to increase rapidly in August, as shown in Figure 6. Raleigh had 19 days with a high of 90°F or greater, while Fayetteville recorded 15 such days and Greensboro totaled 10. In fact, the 69 days with temperatures reaching at least 90°F was the 2nd-highest on record through the end of August at Raleigh.



The time series of daily temperature for the month at Greensboro, Raleigh, and Fayetteville can be found in Figure 7. The large cooldown on August 11-12, which lasted for most of the remainder of the month, is evident.



The number of warmer-than-normal days was higher than the number of cooler-than-normal days during August (Figure 8).



Other notes:

Days with thunderstorms this month:

Greensboro: 11
Raleigh: 8
Fayetteville: 8

Days with dense fog (visibility of $\frac{1}{4}$ mile or less) included:

Greensboro: 1
Raleigh: 1
Fayetteville: 2

Strongest wind gusts and direction:

Greensboro: SW (240 degrees) at 31 mph on August 21
Raleigh: E (80 degrees) at 30 mph on August 27
Fayetteville: W (260 degrees) at 30 mph on August 1, W (250 degrees) at 30 mph on August 10

Daily records:

Greensboro:

None.

Raleigh:

A record high minimum temperature of 77°F was set on August 5. This broke the old record of 76°F set in 2011.

Fayetteville:

None.

Monthly records:

Greensboro:

None.

Raleigh:

August 2022 tied with 2007 for the 2nd-driest August on record with a rainfall total of 0.91 inches.

Fayetteville:

None.