

October 2023 Central NC Climate Summary

By Phillip Badgett and James Danco

Fall-like temperatures arrive, but drought expands in one of the driest Octobers on record across the state.

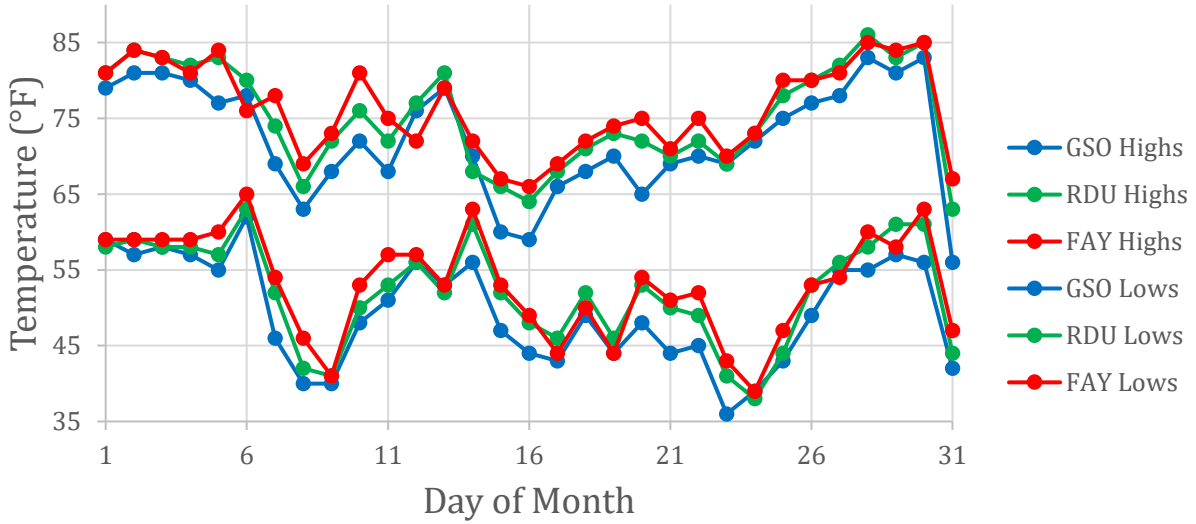
Even though there were plenty of warm days, they were balanced by some very cool nights during October. All in all, the temperatures for the month across the state of NC averaged right on the 30-year historical statewide average of 60.4°F, according to preliminary data from the NCEI. This made October 2023 the 54th-warmest October out of the past 129 years. The monthly average temperatures and their departures from normal at the three climate sites are depicted in Table 1. Most of central NC finished the month with an average temperature that was within a degree above normal. The warmest days occurred on the 28th and the 30th when Raleigh hit 86°F, Greensboro 83°F, and Fayetteville 85°F. The 86°F at Raleigh on the 28th was the latest occurrence of temperatures that warm since November 1, 2004 and tied a daily record high, as did the 83°F at Raleigh on the 29th. Temperatures did not fall to freezing at any of the three major reporting sites during the month; however, a few rural stations did.

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)	72.3	49.5	60.9	+0.7	83 on 10/28 and 10/30	36 on 10/23
Raleigh-Durham (RDU)	75.3	52.0	63.6	+1.9	86 on 10/28	38 on 10/24
Fayetteville (FAY)	76.2	53.1	64.6	+0.8	85 on 10/28 and 10/30	39 on 10/24

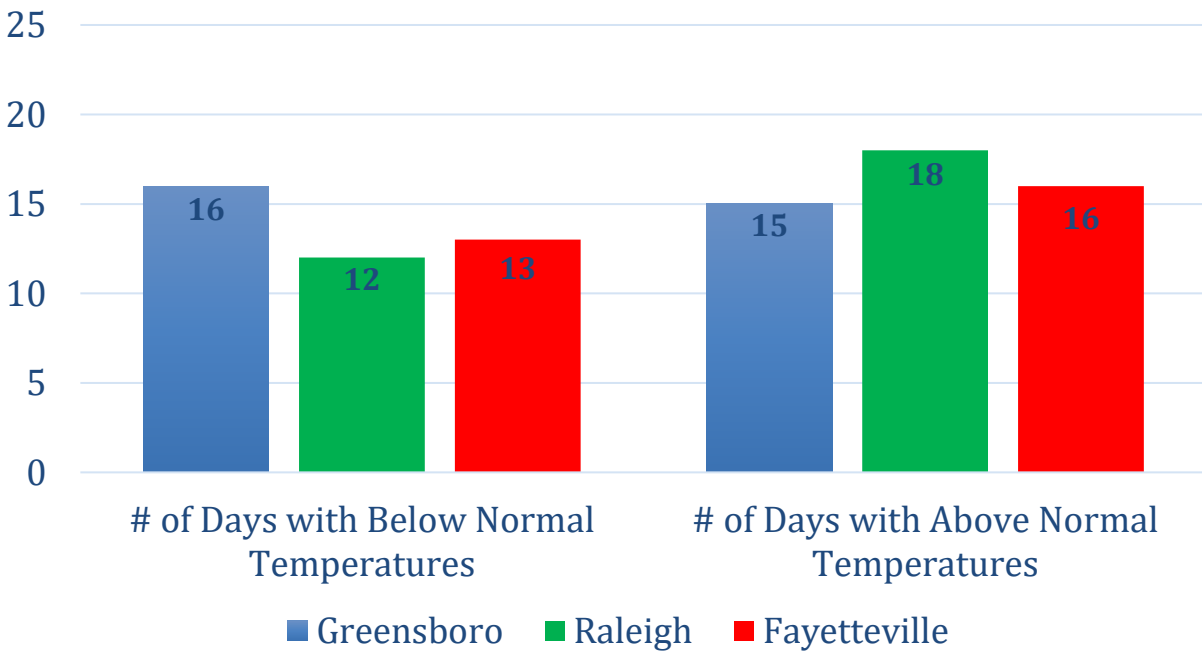
The time series of daily temperature for October at Greensboro, Raleigh, and Fayetteville can be found in Figure 1. The month was bookended with warmth, as both Raleigh and Fayetteville had stretches from the 1st-5th and 26th-30th when every day reached the 80s. The last day of the month turned sharply cooler when highs fell 20-30°F from the previous day. The middle of the month was also mostly cool. During the 18-day period from the 7th through the 24th, 13 days were cooler than normal at Greensboro, 10 were cooler than normal at Raleigh, and 11 were cooler than normal at Fayetteville. The dryness during October caused large diurnal ranges in temperature, sometimes by as much as 30-35°F.

Fig. 1: October Daily Temperature Trends



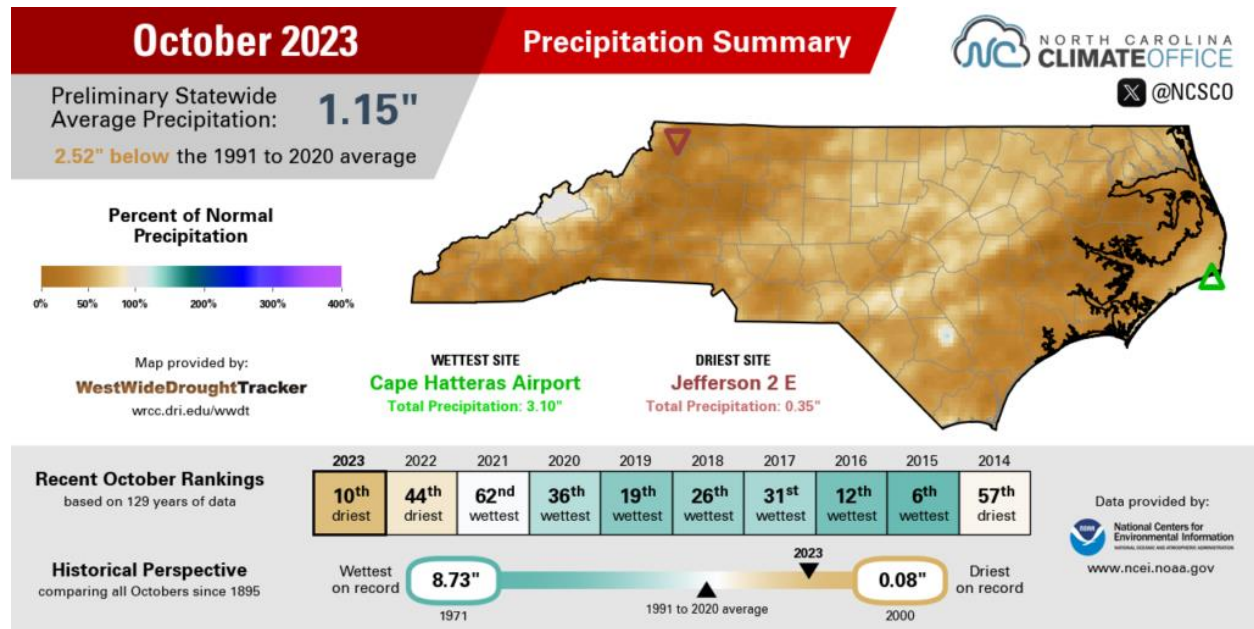
As shown in Figure 2, the number of warmer and cooler than normal days in October was close to the same at Greensboro and Fayetteville. At Raleigh, close to 60% of days were warmer than normal.

Fig. 2: Number of Days Warmer and Cooler than Normal



High pressure and moisture-starved cold fronts dominated the month of October. According to the NCEI, October 2023 was the driest October for NC since 2000. In addition, the state's average rainfall was only 1.15 inches, which ranked as the 10th-driest since 1895. Central NC fared a bit better in the rainfall department than locations to the west and to the east, as depicted by the map of percent of normal precipitation from the NC state climate office in Figure 3.

Fig. 3: October 2023 NC Precipitation Statistics

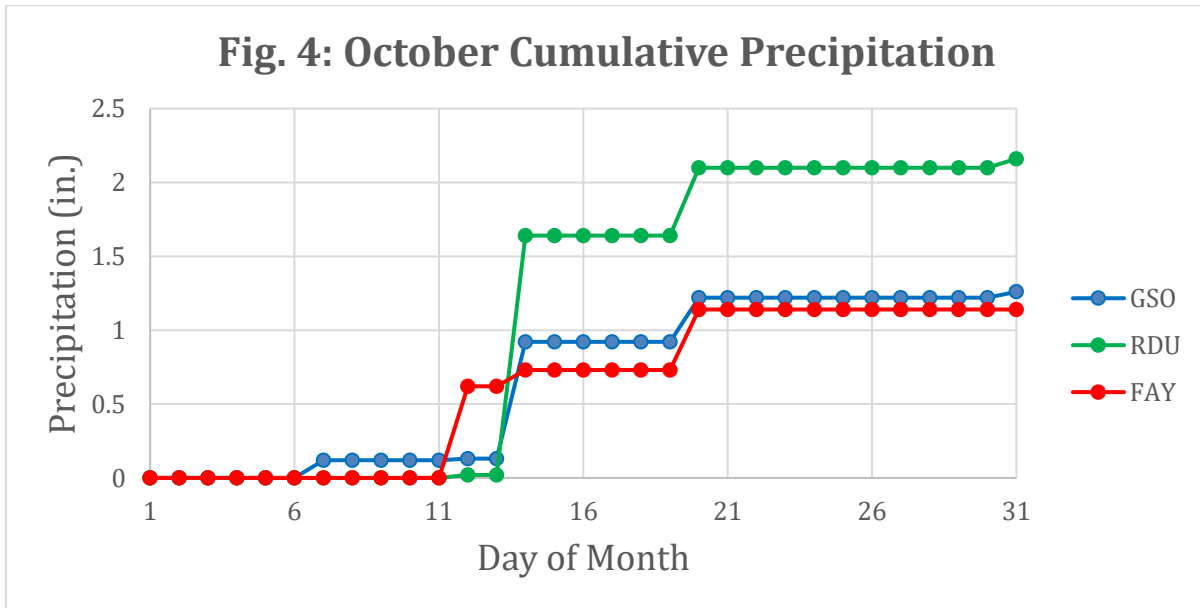


Even still, by month's end, most of central NC had tallied only about one fourth to one half of normal rainfall. The final rainfall tallies for October 2023 from the three central NC climate reporting sites depicted the more extreme dryness in the northwest and southeast, with a bit more rainfall over the middle of the region. Both Greensboro and Fayetteville only had slightly over an inch for the whole month, which was around 2 inches below normal. Raleigh, however, had just over 2 inches. The monthly precipitation totals are found in Table 2.

Table 2: Monthly Precipitation Statistics

Site	Total precipitation (in.)	Departure from Normal (in.)	Max Daily Precipitation (in.)
Greensboro (GSO)	1.26	-1.84	0.79 on 10/14
Raleigh-Durham (RDU)	2.16	-1.21	1.62 on 10/14
Fayetteville (FAY)	1.14	-2.09	0.62 on 10/12

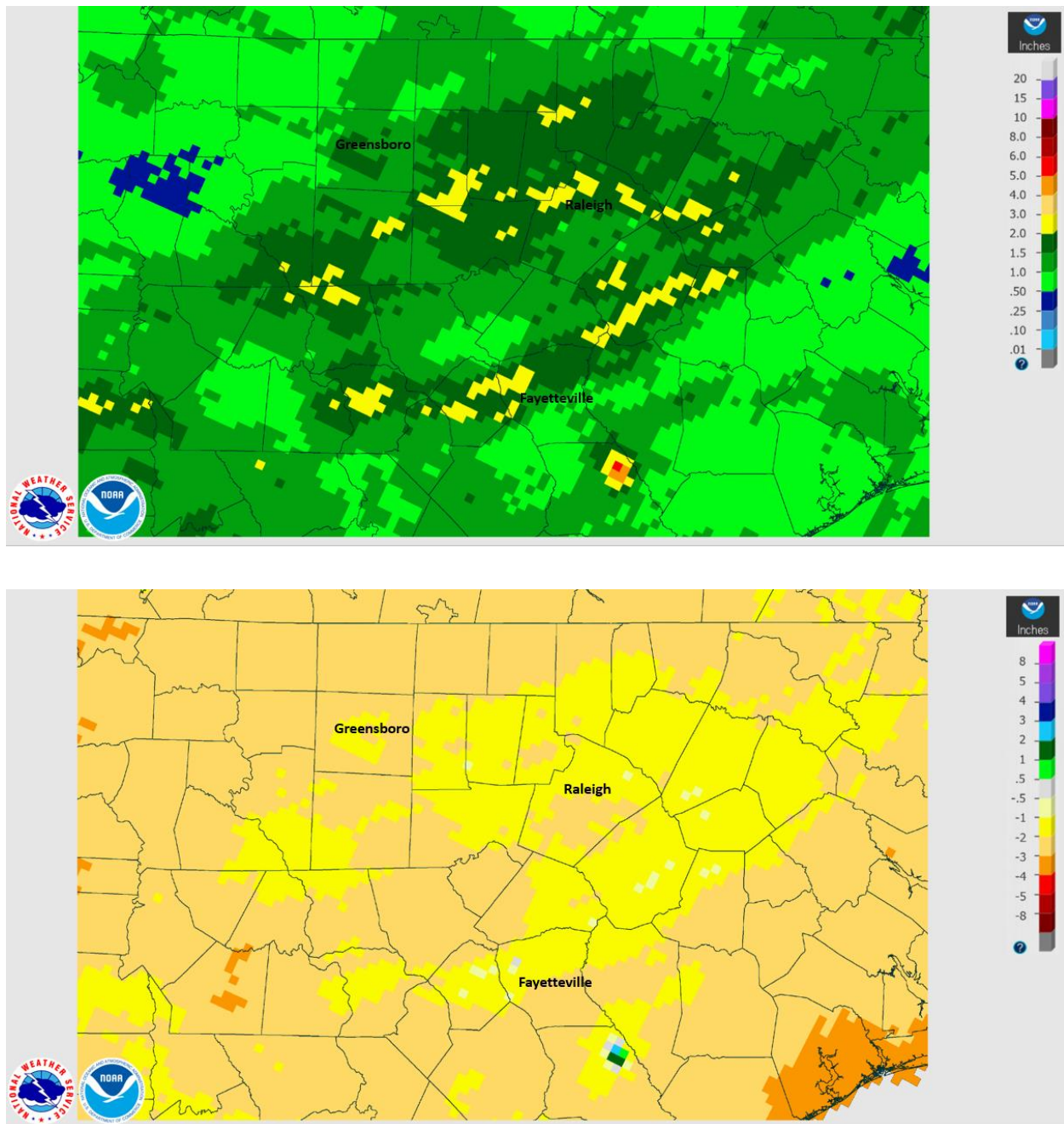
The cumulative precipitation at the three climate sites for the month of October is shown in Figure 4. The system of the month was a coastal low on October 14 that brought the only significant rainfall to the region during the month. This system did bring rainfall amounts of an inch or more over portions of the northeastern Piedmont and northern Coastal Plain. Raleigh measured 1.62 inches. However, other places largely missed out with only around a quarter inch or less. Furthermore, this system brought Raleigh 75% of its rain for the entire month, as only three other days in October had any measurable rain at all, and none more than half an inch. Only three out of the 31 days had any measurable rain at Fayetteville, and five did at Greensboro.



Some of the cooperative station rainfall reports from around central NC from October 2023 included: Sparta 0.86 inches (-3.66), Lexington 1.31 inches (-1.74), Winston-Salem 1.03 inches (-2.25), Burlington 1.63 inches (-1.46), Mount Airy 0.77 inches (-2.77), Danbury 0.78 inches (-2.71), Yanceyville 1.63 inches (-1.94), Eden 1.09 inches (-2.63), Henderson 1.55 inches (-2.02), Carthage 0.85 inches (-2.53), Cary 1.30 inches (-2.24), Raleigh (NCSU) 1.51 inches (-2.39), Louisburg 1.60 inches (-1.94), Apex 1.54 inches (-2.17), Chapel Hill 1.80 inches (-1.97), Jackson Springs 1.22 inches (-2.48), Laurinburg 0.72 inches (-2.47), Rocky Mount 1.49 inches (-1.67), Tarboro 1.35 inches (-2.00), and Clinton 1.27 inches (-2.00).

As displayed by the radar-estimated precipitation and the radar-estimated precipitation departure from normal in Figure 5, the final monthly totals ranged from as little as 0.5-1 inches on the outer edges of the area to as much as 1.5-2+ inches in the interior. This was 1-3 inches drier than normal.

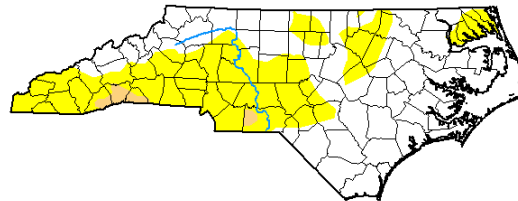
Fig. 5: Radar-Estimated Monthly Precipitation and Precipitation Departure from Normal



These paltry rainfall amounts led to a rapid expansion of drought across NC. Note the October 3 and October 31 U.S. Drought Monitor maps for NC in Figure 6. The D0 (Abnormally Dry) conditions spread eastward into the Coastal Plain while D1 (Moderate Drought) conditions spread east to cover most of the western half of the state, with D2 (Severe Drought) in the far SW part of NC. According to the NC climate office, the 50.59% of the state in D1 or D2 conditions by the end of the month was the greatest areal coverage since July 5, 2022.

Fig. 6: US Drought Monitor for NC on October 3 (top) and October 31 (bottom)

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



October 3, 2023

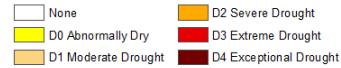
(Released Thursday, Oct. 5, 2023)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	58.93	41.07	1.56	0.00	0.00	0.00
Last Week 09-26-2023	82.24	17.76	0.36	0.00	0.00	0.00
3 Months Ago 07-04-2023	92.11	7.89	0.00	0.00	0.00	0.00
Start of Calendar Year 01-01-2023	56.06	43.94	24.97	0.00	0.00	0.00
Start of Water Year 09-26-2022	82.24	17.76	0.36	0.00	0.00	0.00
One Year Ago 10-04-2022	97.55	2.45	0.00	0.00	0.00	0.00

Intensity:



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>

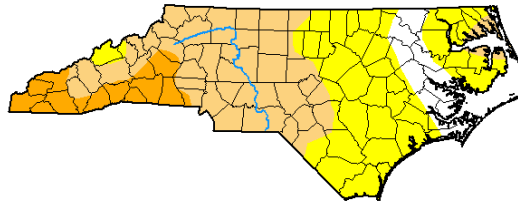
Author:

Brad Pugh
CPC/NOAA



droughtmonitor.unl.edu

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



October 31, 2023

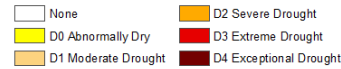
(Released Thursday, Nov. 2, 2023)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	8.60	91.40	50.59	10.38	0.00	0.00
Last Week 10-24-2023	41.25	58.75	19.78	1.53	0.00	0.00
3 Months Ago 08-01-2023	90.35	9.65	0.00	0.00	0.00	0.00
Start of Calendar Year 01-01-2023	56.06	43.94	24.97	0.00	0.00	0.00
Start of Water Year 09-26-2022	82.24	17.76	0.36	0.00	0.00	0.00
One Year Ago 11-01-2022	16.29	83.71	19.46	1.79	0.00	0.00

Intensity:



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>

Author:

Brian Fuchs
National Drought Mitigation Center



droughtmonitor.unl.edu

Other notes:

Days with thunderstorms this month:

Greensboro: 1
Raleigh: 1
Fayetteville: 1

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

Greensboro: 0
Raleigh: 1
Fayetteville: 4

Strongest wind gusts and direction:

Greensboro: W (290 degrees) at 45 mph on October 20
Raleigh: W (250 degrees) at 39 mph on October 20
Fayetteville: W (290 degrees) at 40 mph on October 20

Daily records:

Greensboro:

None.

Raleigh:

A daily record high temperature of 86°F was tied on October 28. This record was previously set in 1919.

A daily record high temperature of 83°F was tied on October 29. This record was previously set in 1922 and 1950.

Fayetteville:

None.

Monthly records:

None at any of the three climate sites.