

February 2023 Central NC Climate Summary

By Phillip Badgett and James Danco

Record Breaking Warmth

February 2023 brought warmth that either challenged or broke February records. Raleigh recorded its warmest February on record with an average temperature of 54.0°F. The old record was 53.3°F and this was a whopping 9°F above the February normal of 45.0°F. In addition, Raleigh reported its all-time record high temperature during February of 85°F on February 23, 2023. This was a whopping 27.4 degrees above normal, which was the second-greatest daily anomaly in Raleigh since 2011, according to the NC state climate office.

Raleigh was not the only spot in central North Carolina with record breaking warmth for February. Greensboro recorded their 2nd-warmest February on record with a monthly average of 50.8°F, which was 7.8°F above normal. Only February 2017 was warmer when the average temperature was 51.0°F. Fayetteville was not going to be outdone. They had their 4th-warmest February on record with an average temperature of 54.9°F, which was 7.9°F above normal. The warmest February on record was 56.4°F set just 5 years before, in 2018. In addition, the highest temperature ever recorded in February was tied at both Greensboro and Fayetteville at 81°F and 85°F respectively. There were also numerous daily record temperatures set throughout the month at all three climate sites. Those can be found at the bottom of the climate summary.

With all the warmth in February 2023, nighttime lows averaged well above normal. It dropped to freezing only 6 days at Greensboro, 5 days at Raleigh, and 3 days at Fayetteville. This is compared to the average number of February freezes of 17 at Greensboro, 14 at Raleigh, and 13 at Fayetteville. Greensboro also tied with 1927 for the lowest number of days reaching freezing in February since records began in 1903.

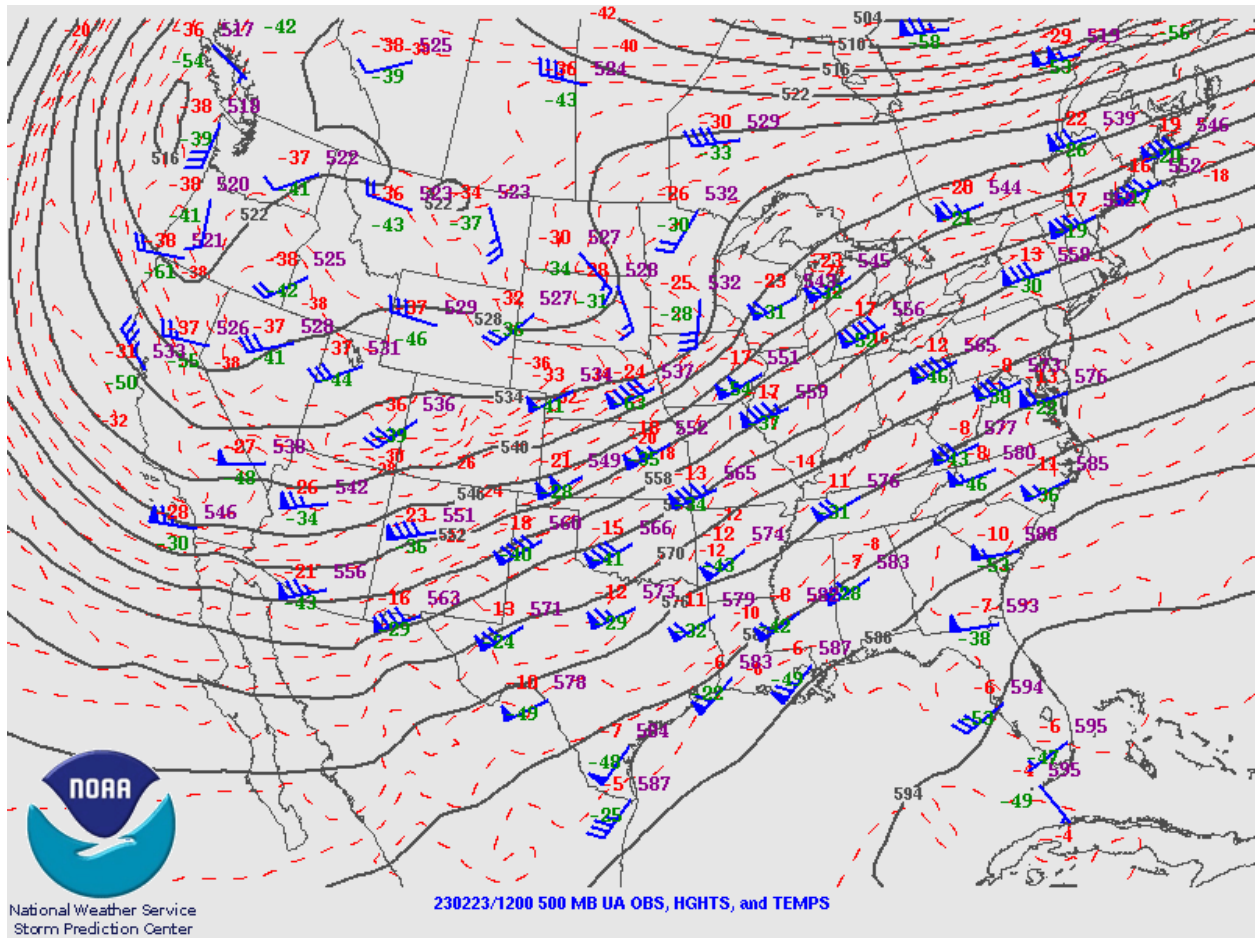
By the time all data was in for the month, temperatures across central NC averaged 7 to 9°F above normal. In fact, they were even above the monthly averages for March! The monthly average temperatures and their departures from normal at the three climate sites are depicted in Table 1. The preliminary monthly temperatures across the state of NC averaged 50.5°F according to NCEI, which ranked February 2023 as the 3rd-warmest in the past 129 years. Interestingly, Februarys have been trending warm recently and this year only fell behind 2018 and 2017 in the all-time warmest rankings.

An anomalously strong upper level ridge centered over Florida and extending over the SE United States was responsible for all the warmth, as seen in Figure 1. This was the 500 MB height contour pattern at 700 AM on February 23, 2023. Note all the cold air associated with upper level troughs was located from the Pacific NW northeast across the north-central United States into Canada. Warmth was located from Mexico across the Gulf of Mexico to Florida and the Caribbean.

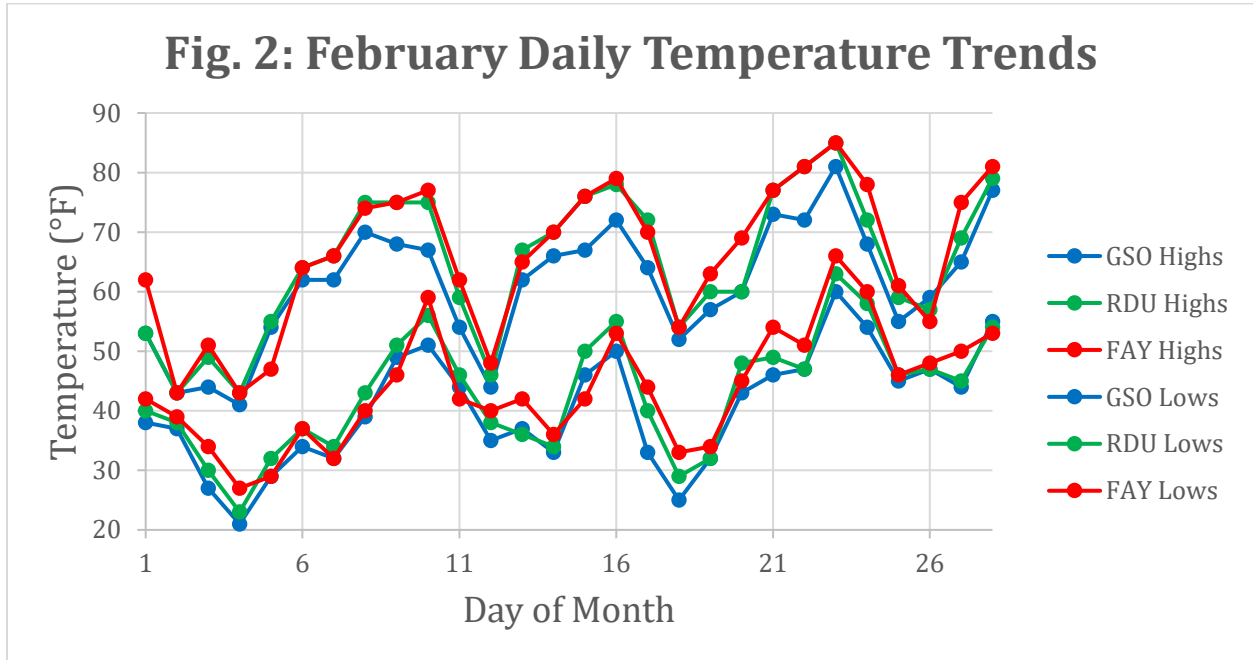
Table 1: Monthly Temperature Statistics

Site	Avg High Temp (°F)	Avg Low Temp (°F)	Avg Temp (°F)	Departure From Normal (°F)	Maximum Temperature (°F)	Minimum temperature (°F)
Greensboro (GSO)	61.1	40.5	50.8	+7.8	81 on 2/23	21 on 2/4
Raleigh-Durham (RDU)	65.0	42.9	54.0	+9.0	85 on 2/23	23 on 2/4
Fayetteville (FAY)	66.1	43.7	54.9	+7.9	85 on 2/23	27 on 2/4

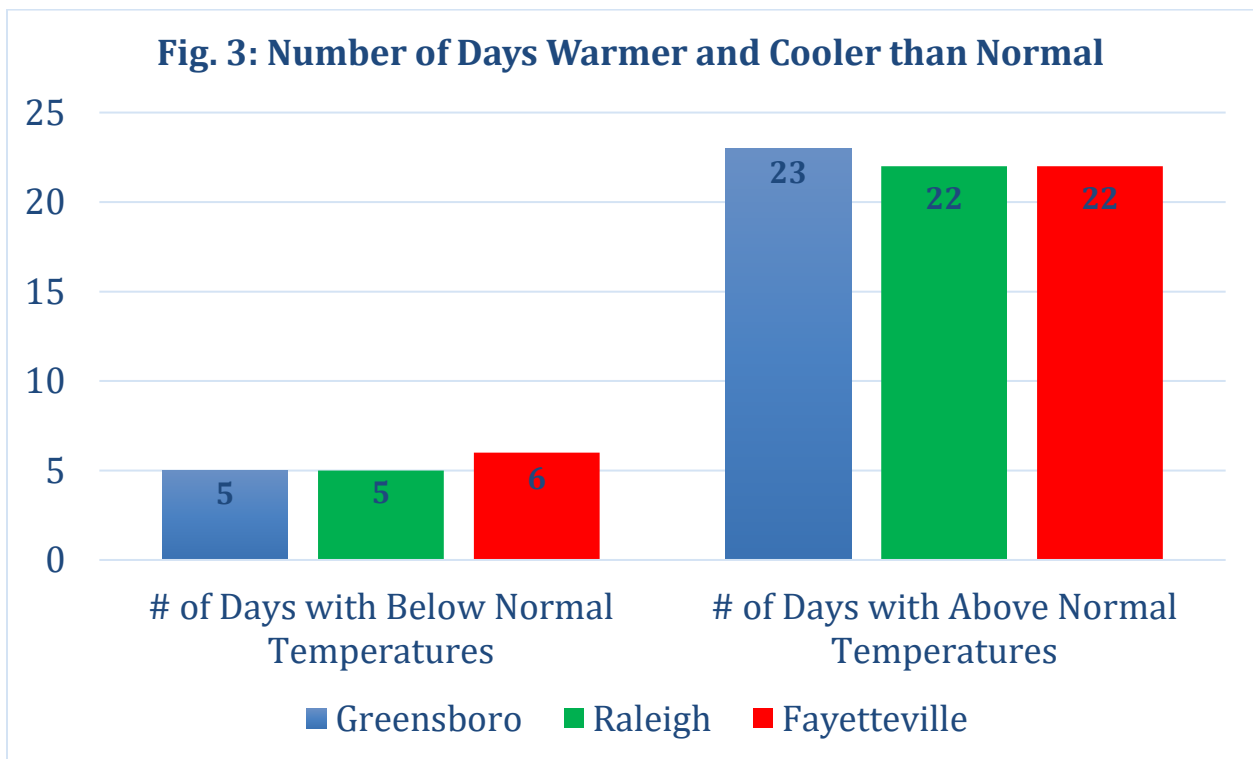
Figure 1: Upper Air Analysis at 12z on February 23, 2023



The time series of daily temperature for the month at Greensboro, Raleigh, and Fayetteville can be found in Figure 2.



Unsurprisingly, Figure 3 shows the vast majority of days during February, roughly 4 out of 5, were warmer than normal.



February 2023 had a mixture of slightly drier than normal to near normal rainfall amounts across the region. According to NCEI, the statewide average rainfall was 2.96 inches. This made it the 39th-driest February in the past 129 years. The final rainfall tallies for February 2023 from the three main climate reporting sites were around 2-3 inches. Greensboro was slightly wetter than normal while Raleigh and Fayetteville were slightly drier than normal. There was no snowfall reported during the month.

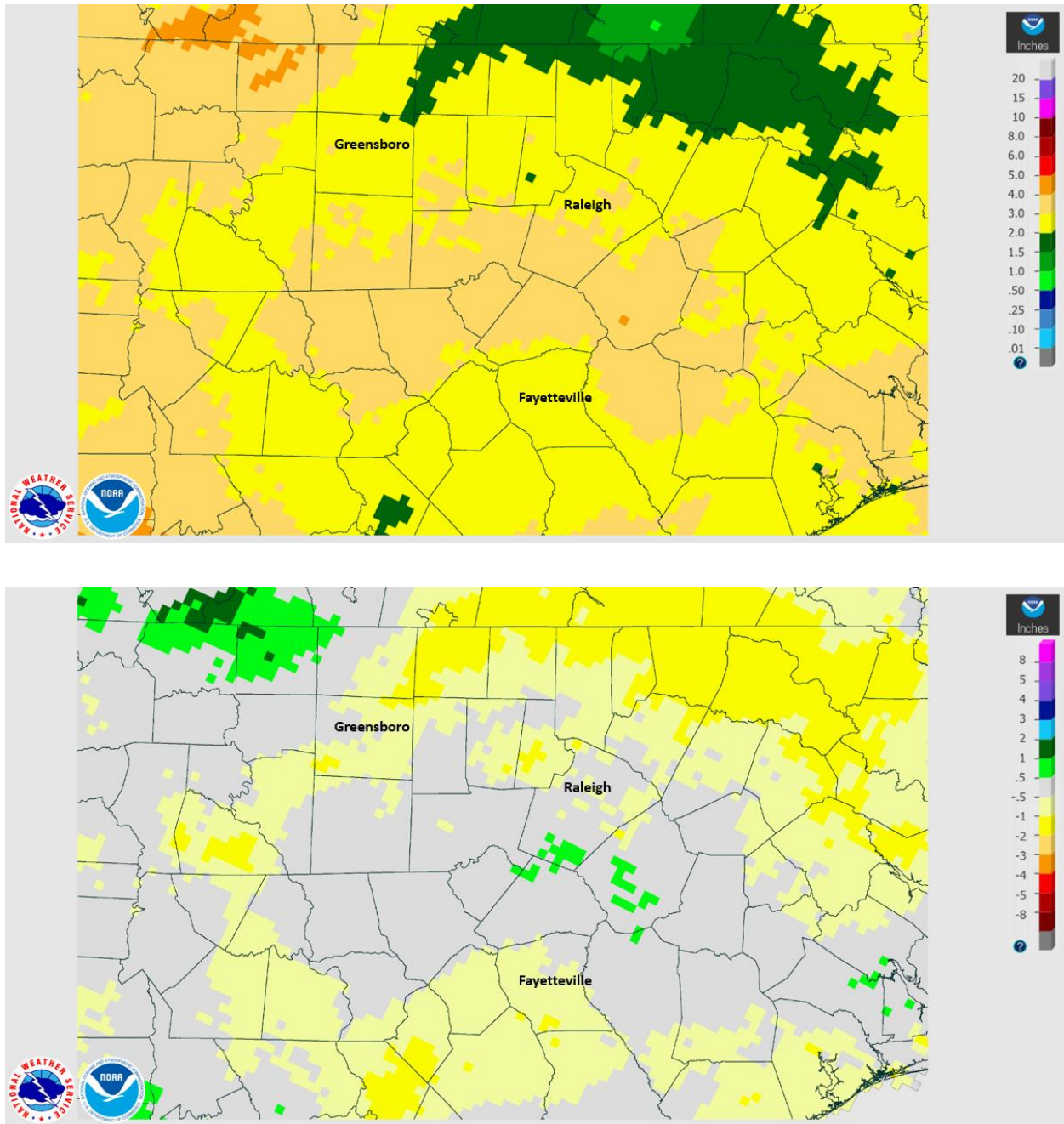
Table 2: Monthly Precipitation Statistics

Site	Total precipitation (in.)	Departure from Normal (in.)	Max Daily Precipitation (in.)
Greensboro (GSO)	3.14	+0.33	1.25 on 2/12
Raleigh-Durham (RDU)	2.52	-0.26	1.33 on 2/12
Fayetteville (FAY)	2.09	-0.69	0.70 on 2/12

Some of the cooperative station rainfall reports from around central NC from February 2023 included: Sparta 3.37 inches (+0.22 compared to normal), Lexington 2.43 inches (-0.75), Winston-Salem 2.75 inches (-0.14), Burlington 2.88 inches (+0.07), Mount Airy 4.37 inches (+1.23), Danbury 4.12 inches (+1.19), Yanceyville 3.12 inches (+0.10), Eden 3.28 inches (+0.19), Henderson 2.80 inches (-0.31), Carthage 3.30 inches (+0.21), Cary 2.33 inches (-0.57), Raleigh (NCSU) 2.99 inches (+0.11), Louisburg 2.54 inches (-0.32), Apex 3.09 inches (+0.09), Chapel Hill 2.85 inches (-0.32), Jackson Springs 3.82 inches (+0.52), Clayton 3.40 inches (+0.33), Laurinburg 2.51 inches (-0.75), Rocky Mount 2.94 inches (+0.07), Tarboro 3.08 inches (+0.09), and Clinton 3.55 inches (+0.44).

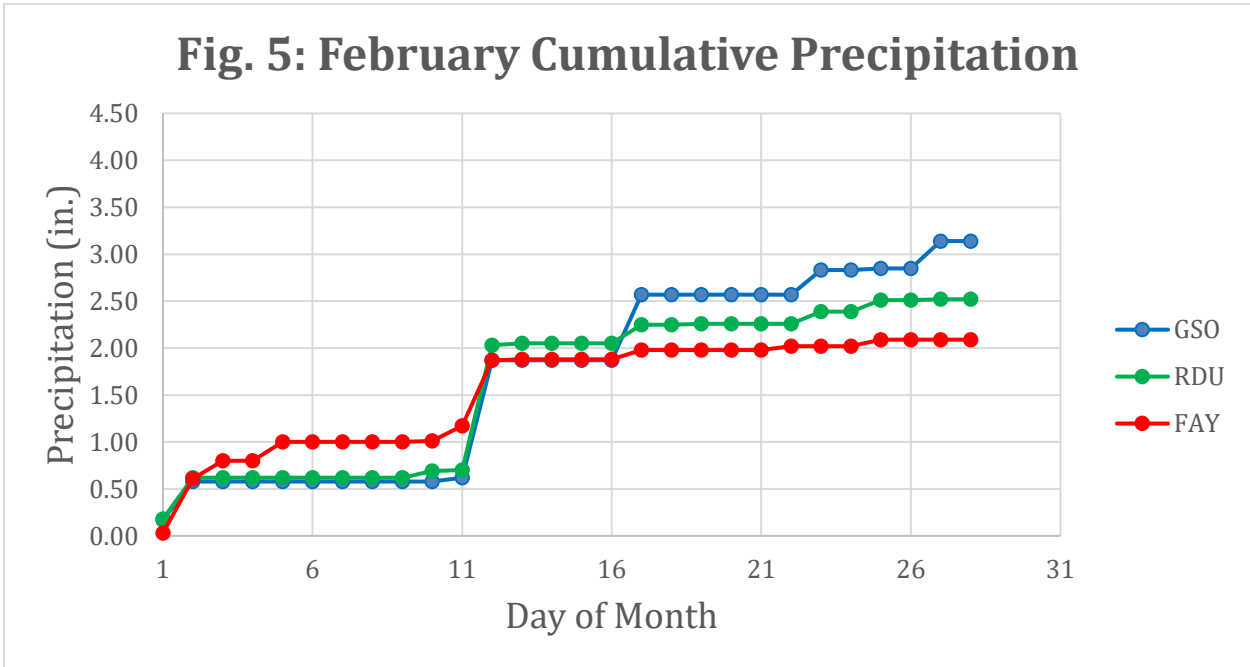
Radar-estimated precipitation and the radar-estimated precipitation departure from normal for the month are shown in Figure 4. The lowest amounts of 1-2 inches (1-2 inches below normal) are in the far NE. A band of 3-4 inch amounts (near normal) ran across the middle of the region, with slightly lower amounts to the north and south.

Fig. 4: Radar-Estimated Monthly Precipitation (top) and Monthly Departure from Normal Precipitation (bottom)



The cumulative precipitation at the three climate sites for the month of February is shown in Figure 5. The month started off wet thanks to a stalled front off the NC coast. The day with the heaviest rain was from a coastal low pressure system on February 12 when both Greensboro and Raleigh received over an inch. The rest of the month was fairly dry.

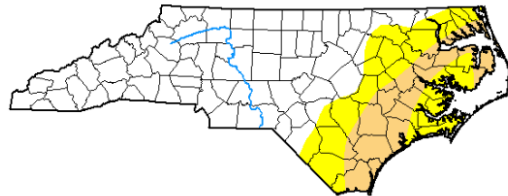
Fig. 5: February Cumulative Precipitation



The US Drought Monitor maps from January 31, 2023 and February 28, 2023 are shown in Figure 6. The near-normal rainfall amounts in eastern NC were enough to reduce the drought conditions there by about one category, such that only an area in SE NC (about 10% of the whole state) was in D0 conditions by the end of the month.

Fig. 6: US Drought Monitor for NC on January 31 (top) and February 28 (bottom)

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



January 31, 2023
(Released Thursday, Feb. 2, 2023)
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	63.40	36.60	14.97	0.00	0.00	0.00
Last Week <small>01-24-2023</small>	56.85	43.15	25.79	0.00	0.00	0.00
3 Months Ago <small>11-01-2022</small>	16.29	83.71	19.46	1.79	0.00	0.00
Start of Calendar Year <small>01-01-2023</small>	56.06	43.94	24.97	0.00	0.00	0.00
Start of Water Year <small>09-27-2022</small>	38.94	61.06	15.04	0.00	0.00	0.00
One Year Ago <small>02-01-2022</small>	33.44	66.56	14.22	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

Daily records:

Greensboro:

A record high minimum temperature of 51°F was set on February 10. This broke the old record of 50°F set in 1960.

A record rainfall of 1.25 inches was set on February 12. This broke the old record of 0.86 inches set in 1993.

A record high temperature of 81°F was set on February 23. This broke the old record of 74°F set in 2017.

A high minimum temperature of 60°F was set on February 23. This broke the old record of 55°F set in 2022.

Raleigh:

A record high temperature of 75°F was tied on February 8. This record was first set in 2019.

A record high temperature of 75°F was set on February 9. This broke the old record of 74°F set in 1994.

A record high temperature of 75°F was tied on February 10. This record was last set in 1938.

A record high temperature of 77°F was tied on February 21. This record was last set in 2018.

A record high temperature of 81°F was set on February 22. This broke the old record of 78°F set in 2018.

A record high temperature of 85°F was set on February 23. This broke the old record of 79°F set in 1980.

A record high minimum temperature of 63°F was set on February 23. This broke the old record of 57°F set in 1962.

A record high minimum temperature of 58°F was tied on February 24. This record was last set in 1985.

Fayetteville:

A record high temperature of 75°F was tied on February 9. This record was originally set in 1925 and tied in 1937.

A record high temperature of 81°F was set on February 22. This broke the old record of 79°F set in 2018.

A record high temperature of 85°F was set on February 23. This broke the old record of 80°F set in 2018.

A record high minimum temperature of 66°F was set on February 23. This broke the old record of 60°F set in 2022.

Monthly records:

Greensboro:

The all-time monthly record high temperature for February of 81°F was tied on February 23, 2023. The record was previously set on February 12, 2017.

The average February 2023 temperature was 50.8°F. This made it the 2nd-warmest February on record. The warmest on record was 51.0°F set in 2017.

Raleigh:

The all-time monthly record high temperature for February of 85°F was set on February 23, 2023. This broke the old monthly record of 84°F set on February 26, 1977.

The average February 2023 temperature was 54.0°F. This was the warmest February on record. The old record was 53.3°F set in 2017.

Fayetteville:

The all-time monthly record high temperature of 85°F was tied on February 23, 2023. This record was originally set on February 25, 1930.

The average February 2023 temperature was 54.9°F. This was the 4th-warmest February on record. The warmest on record was 56.4°F set in 2018.