

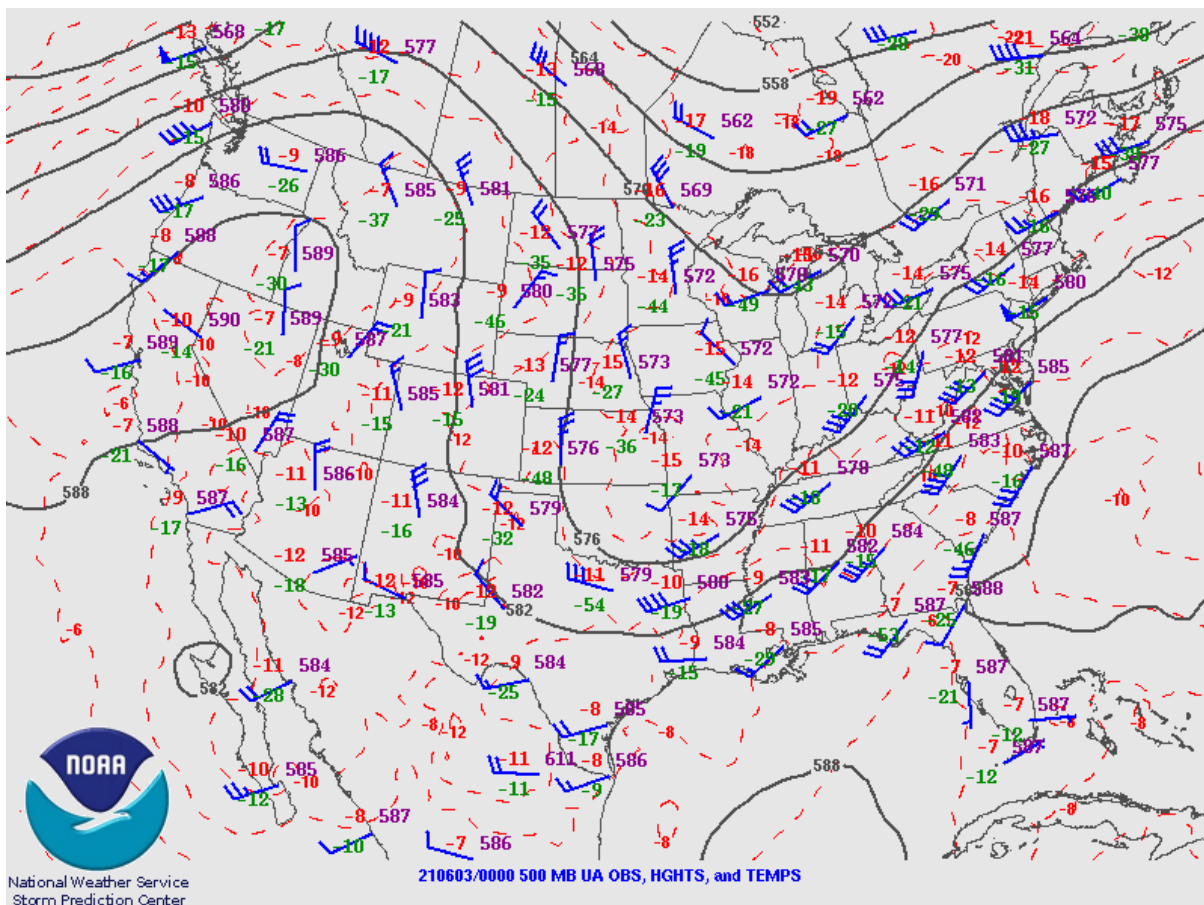
# June 2021 Central NC Climate Summary

*By Phillip Badgett and James Danco*

June rains squash drought in all but the western Piedmont.

Aided by a significant pattern change followed by a remnant tropical storm (Claudette), June 2021 quickly turned wet across much of central and eastern North Carolina. The upper air pattern changed early in the month to a configuration of a deep trough through the Mississippi Valley (see Figure 1). This pattern with the trough just west of NC brought a deep moist southwest flow from the Gulf of Mexico across the Southeast and Mid-Atlantic states. This pattern change occurred just in time to steer several slow moving cold fronts into NC from the north. The fronts practically stalled over the Coastal Plain allowing for several days of showers and thunderstorms with heavy rainfall. Then, later in the month a remnant tropical storm tracked north-northeast from the Gulf of Mexico in the steering flow across southern and eastern NC. This remnant low brought additional heavy rainfall to the eastern two-thirds of the state on June 20-21. The western Piedmont largely missed out on the heavy rainfall during June, but it was still wetter than May.

**Figure 1: 500 mb Observations, Heights, and Temperatures on June 2**

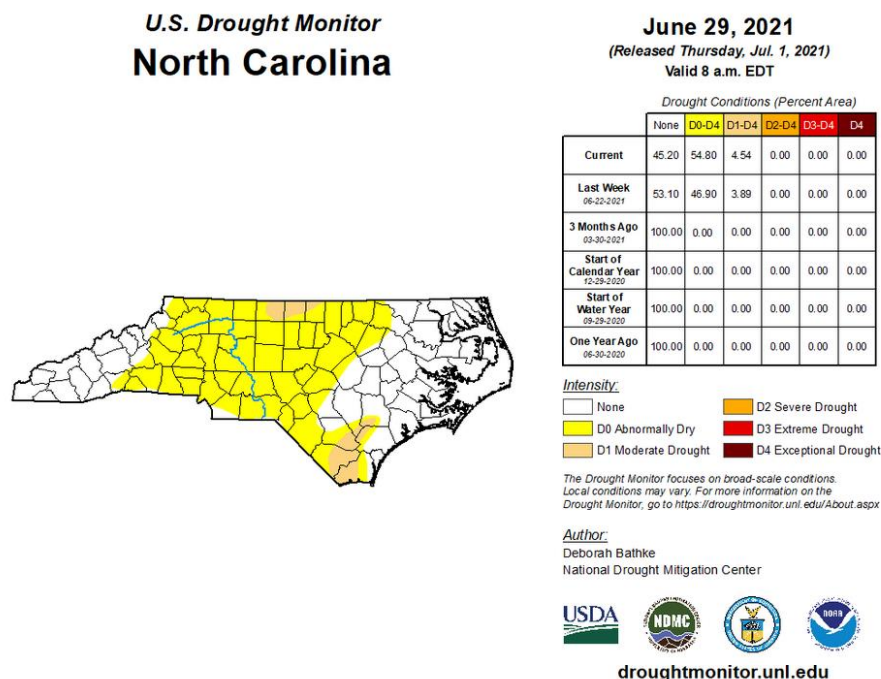


The final monthly rainfall totals for June at the three climate sites are shown in Table 1. Greensboro’s total was 94% of normal, while Raleigh’s total rainfall was nearly double the normal value, and Fayetteville’s rain total was 129% of normal. June 2021 was actually the 13<sup>th</sup>-wettest June on record at Raleigh, with records going back to 1887. This was quite a shift after Raleigh just experienced its driest meteorological spring on record! These rainfall totals certainly knocked back the dry weather in the west and essentially drenched the short-term drought in the east. By the end of May, much of central NC was classified in a Moderate Drought (D1), but by the end of June, only very small areas in the far southern Coastal Plain and far northern Piedmont continued with Moderate Drought conditions. This was surrounded by a shrinking area of Abnormally Dry conditions (D0), though it still covered much of central NC outside of the far east. See Figure 2.

**Table 1: Monthly Precipitation Statistics**

Site	Total precipitation (in.)	Departure from Normal (in.)	Max Daily Precipitation (in.)
Greensboro (GSO)	3.83	-0.26	1.27 on 6/11
Raleigh-Durham (RDU)	7.57	+3.68	2.04 on 6/3
Fayetteville (FAY)	6.32	+1.43	0.99 on 6/2

**Fig. 2: U.S. Drought Monitor for North Carolina on June 29**

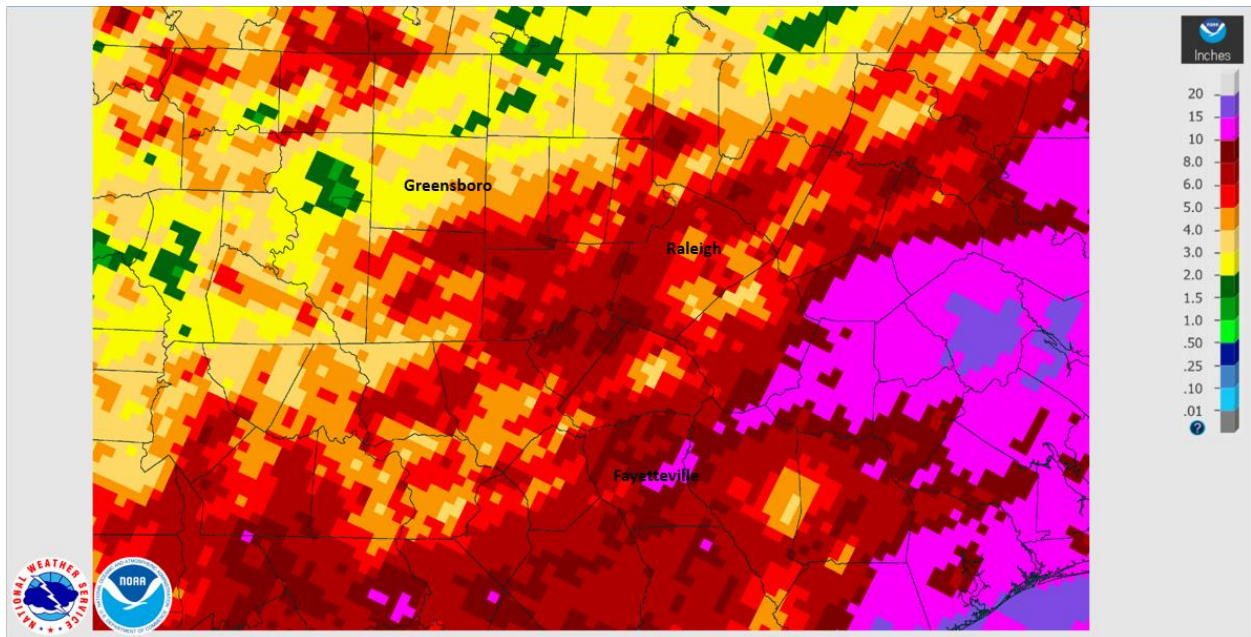


Additional selected ASOS or cooperative observations for June 2021 are listed below. Note that the only below-normal rainfall amounts were generally in the NW Piedmont:

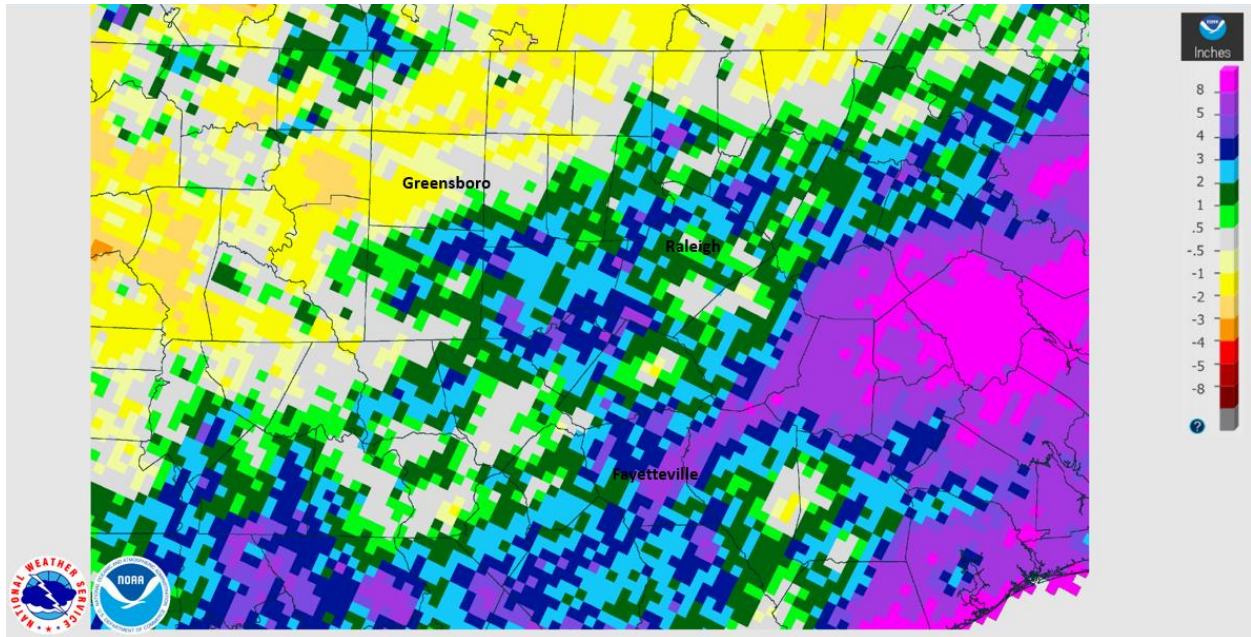
Albemarle (Stanly County) 6.06 inches (1.32 above normal), Winston-Salem (Forsyth County) 1.37 inches (2.27 below normal), Mount Airy (Surry County) 3.47 inches (1.48 below normal), Raleigh (NCSU) 5.30 inches (0.43 below normal), Louisburg (Franklin County) 5.01 inches (0.31 above normal), Rocky Mount (Nash County) 8.22 inches (4.32 above normal), Clinton (Sampson County) 5.61 inches (0.99 above normal), Asheboro (Randolph County) 6.70 inches (2.62 above normal), and Jackson Springs (Montgomery County) 5.95 inches (1.59 above normal).

As displayed by the radar-estimated precipitation and the radar-estimated precipitation departure from normal in Figures 3 and 4, there was a sharp gradient across central NC, with southern and eastern parts of the region receiving much more rain than the north and west. Some parts of the Coastal Plain had as much as 8 to in excess of 10 inches for the month, which was 4 to 8 inches above normal. Meanwhile the far northern and western Piedmont was the only part of the region that was slightly drier than normal, with around 2 to 4 inches of rain (and a pocket of just 1 to 2 inches in Forsyth County).

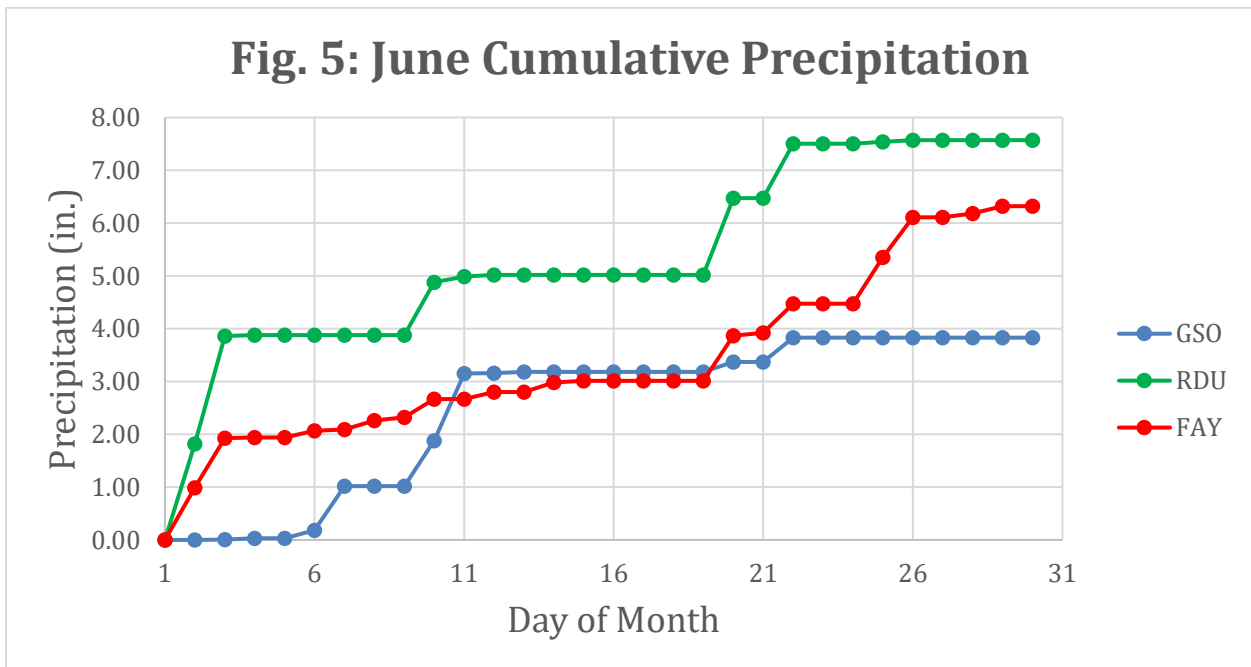
**Fig. 3: Radar-Estimated Monthly Precipitation**



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

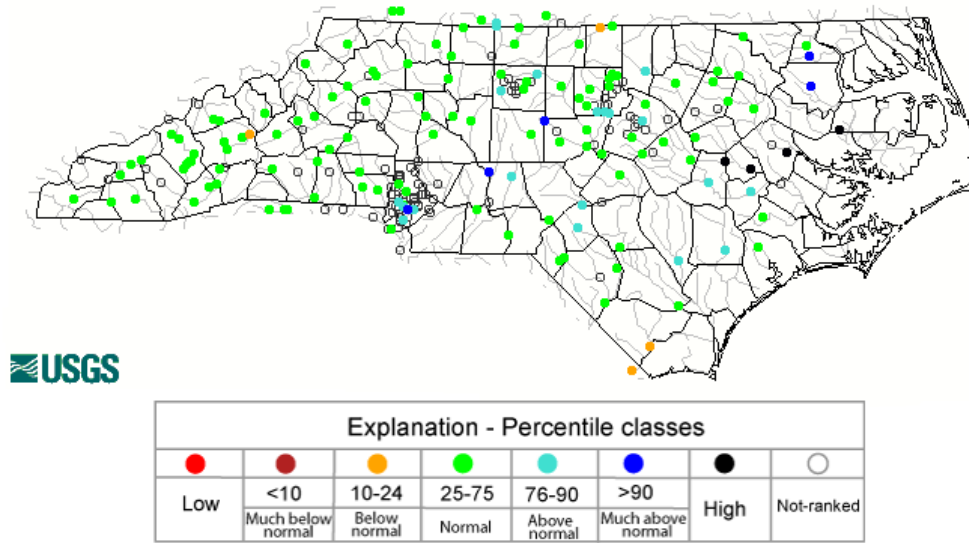


The cumulative precipitation at the three climate sites for the month of June is shown in Figure 5. The early and late parts of the month were especially wet, with the middle of the month fairly dry.

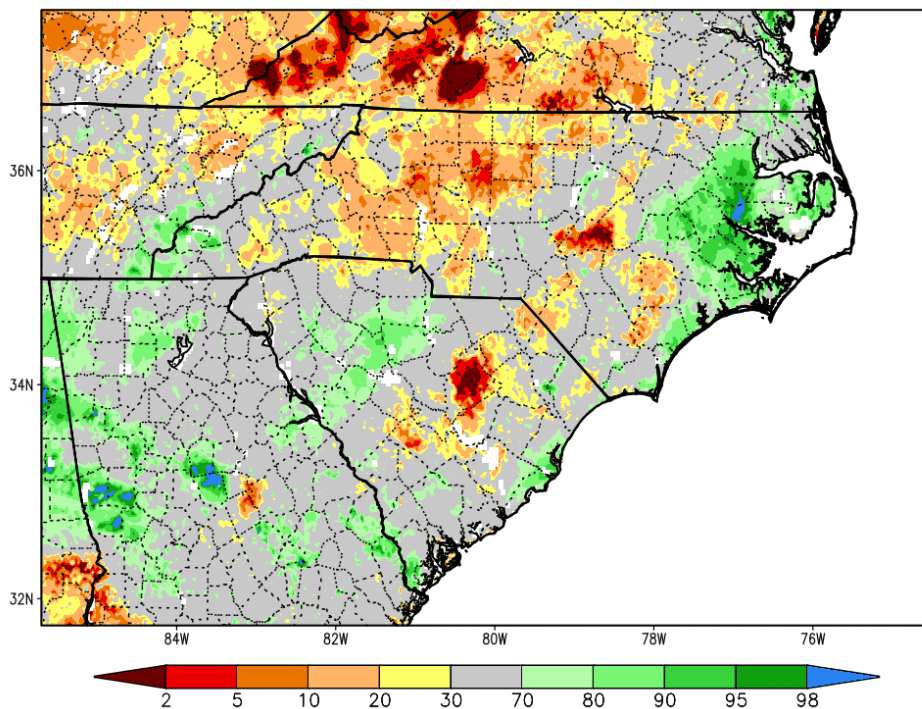


The wetter weather resulted in improvements to the streamflow and soil moisture across NC compared to May, as shown in Figures 6 and 7 below. Streamflows were near to above normal by the end of the month, after being below to much below normal in central and eastern parts of the state at the end of May.

**Fig. 6: 28-day Average Streamflow in North Carolina Compared to Historical Streamflow for 6/30/21**



**Fig. 7: NASA SPoRT-LIS 0-100 cm Soil Moisture percentile valid 6/30/21**



There continued to be good news for those that don't like very hot temperatures in June. Along with the much-needed rainfall came extensive periods of cloudiness, which helped keep the daily temperatures in check. The June averages ended mostly 0.5-1°F below normal. It was the daily highs that were knocked back the most by the rain and clouds. This kept the daily high temperatures 1-2°F below normal for the month, while lows were near normal. A great example was at Raleigh where several days did not get out of the 70s. Raleigh only hit 79°F on the 3rd, 22nd, 23rd, and 24th. This is very unusual as the average highs in June are in the upper 80s.

In addition to several cool, rainy and cloudy days, there were several nights that actually fell into the 50s behind the slow-moving cold fronts. Raleigh recorded a monthly low of 53°F on June 1. Raleigh also fell into the 50s on the 16th, 17th, 18th, 23rd, and 24th! Greensboro and Fayetteville both fell to 54°F on the 1st, which were monthly low temperatures for both sites.

There were some “hot” days felt throughout the month, but many less 90-degree days than in some Junes. The highest temperature recorded for the entire month was only 92°F at both Greensboro and Raleigh. In addition, Greensboro only recorded 2 days in which the temperatures hit 90°F. Raleigh had only 7 such days, while Fayetteville recorded 10.

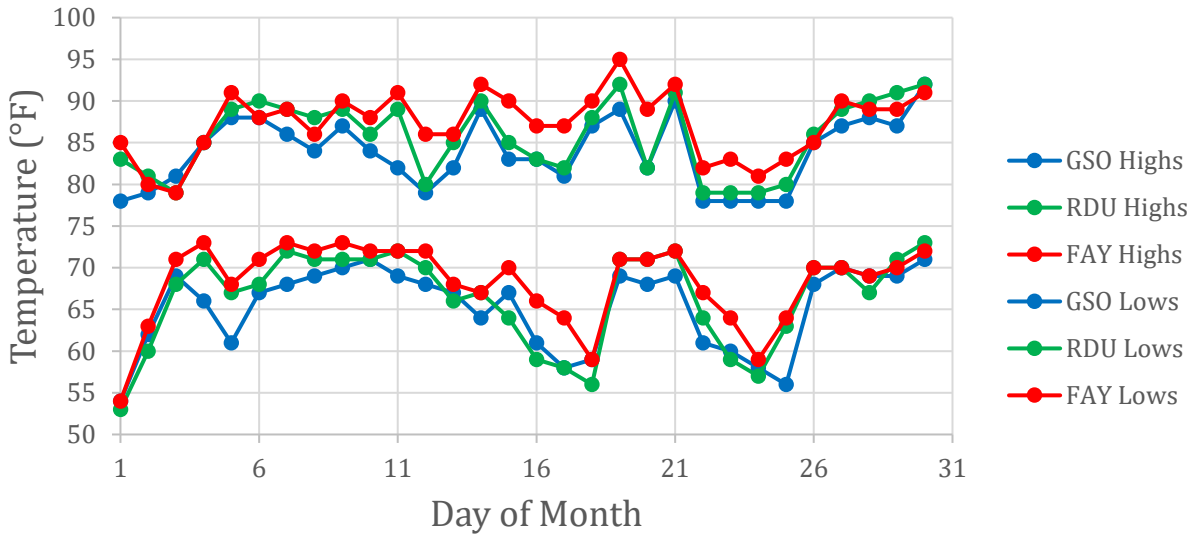
The June monthly average temperatures and their departures from normal at the three climate sites are depicted in Table 2.

**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)	83.9	65.3	74.6	-0.7	92 on 6/30	54 on 6/1
Raleigh-Durham (RDU)	85.7	66.4	76.1	-0.6	92 on 6/19, 6/30	53 on 6/1
Fayetteville (FAY)	87.3	68.2	77.8	-0.5	95 on 6/19	54 on 6/1

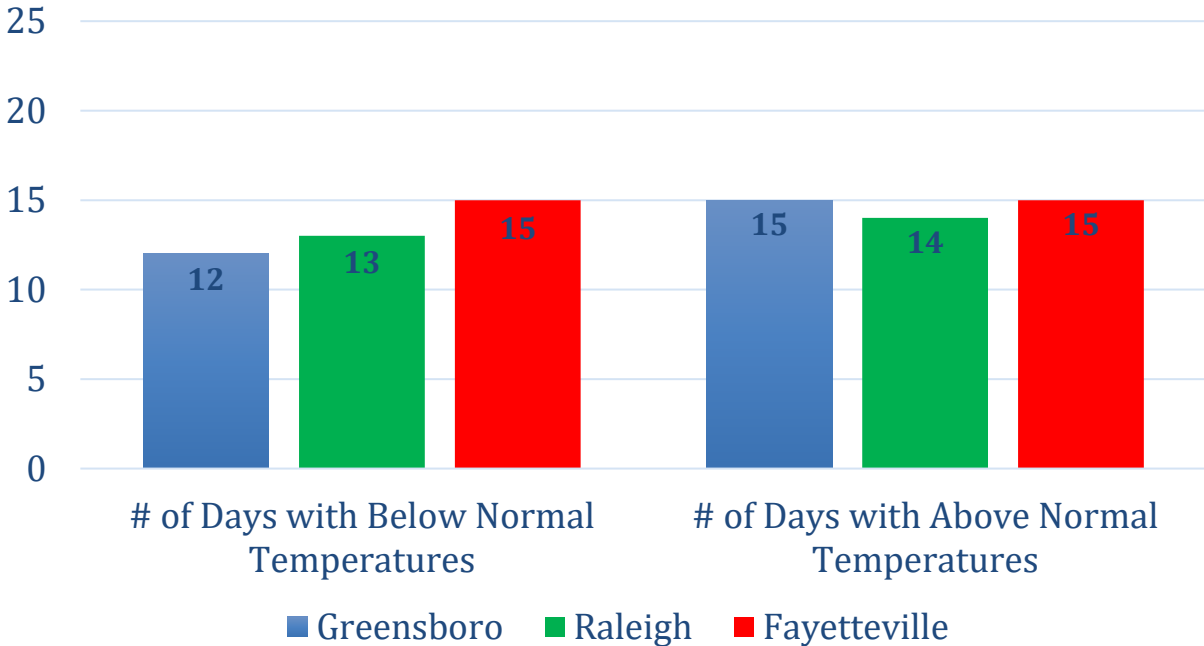
The time series of daily temperature for the month at Greensboro, Raleigh, and Fayetteville can be found in Figure 8. Note the rather unusual dips into the 50s behind several cold fronts during the month.

**Fig. 8: June Daily Temperature Trends**



The number of days with above and below normal temperatures in June was roughly the same, as seen in Figure 9.

**Fig. 9: Number of Days Warmer and Cooler than Normal**



## **Other notes:**

### **Days with thunderstorms this month:**

Greensboro: 6  
Raleigh: 6  
Fayetteville: 12

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

Greensboro: 0  
Raleigh: 0  
Fayetteville: 4

### **Strongest wind gusts and direction:**

Greensboro: S at 35 mph on June 6  
Raleigh: SW at 32 mph on June 19  
Fayetteville: SW at 35 mph on June 19 and 20

### **Daily records:**

#### **Greensboro:**

None.

#### **Raleigh:**

None.

#### **Fayetteville:**

A daily record high minimum temperature of 73°F was tied on June 4. This record was last set in 2016.

### **Monthly records:**

There were no monthly records of note at any of the three climate sites this month.