

August 2019 Central NC Climate Summary

August 2019 was warm and stormy across central North Carolina. The temperatures averaged slightly above normal, with highly variable rainfall. As depicted in the tables below, temperatures generally averaged within 1 degree of the 30 year mean. Rainfall was highly variable, but it was a month with plenty of thunderstorms. Specifically at the three climate sites, Raleigh was just above normal, with below normal totals recorded at both Greensboro and Fayetteville.

Site	Avg High Temp (°F)	Avg Low Temp (°F)	Avg Temp (°F)	Departure From Normal (°F)	Maximum Temperature (°F)	Minimum temperature (°F)
Greensboro (GSO)	86.9	68.2	77.5	+0.4	95 on 8/19	60 on 8/24, 8/25, 8/30
Raleigh-Durham (RDU)	88.7	68.0	78.4	-0.1	96 on 8/13	57 on 8/30
Fayetteville (FAY)	90.2	70.3	80.2	+0.6	97 on 8/9, 8/13, 8/14	61 on 8/30

Site	Total precipitation (in.)	Departure from Normal (in.)	Max Daily Precipitation (in.)
Greensboro (GSO)	3.40	-0.48	1.22 on 8/24
Raleigh-Durham (RDU)	4.31	0.05	0.87 on 8/1
Fayetteville (FAY)	3.92	-1.57	0.89 on 8/14

The first three weeks of August were dominated by the typical subtropical ridge of high pressure centered over the southwestern United States. The position of the upper-level ridge allowed the typical summer set up over the southeastern United States. This consisted of a persistent "Bermuda" surface high pressure and resultant southerly flow into the region. Several cold fronts were able to penetrate into NC, frequently stalling and providing a focus for showers and thunderstorms. The "Bermuda" high pressure not only provided increased moisture and humidity, but it provided some typical August heat. The hottest period of the month occurred on

August 13 and 14 in many areas of the state. Fayetteville recorded 97 degrees on both of those days, and Raleigh reached 96 on August 13. These highs were not daily records. Greensboro hit 94 on August 13, but its hottest day came on the 19th, during another mini-hot spell.

The aforementioned cold fronts and moisture acted in tandem to produce numerous days of afternoon thunderstorms across central NC. Raleigh reported measurable rain (0.01 of an inch or more) on 16 of the 31 days in August 2019. Thunderstorms were reported on 15 of the 31 days, as well. Just as in July 2019, the distribution of the heavy rain from the storms was often sporadic and highly variable. In general, central North Carolina averaged near to above normal rainfall for the month. Specifically, Raleigh totaled 4.31 inches of rain (0.05 inches above normal). Fayetteville tallied 3.92 inches (1.57 inches below normal). Greensboro was also a bit drier than normal with 3.40 inches reported (0.48 below normal). These final totals at the three main climate sites were not necessarily representative of most of central NC, as these sites were on the lower end of the monthly totals.

Figures 1 and 2 are maps of the radar-estimated rainfall and the departure from normal, throughout central NC for August 2019. Note the wide variability in estimated rainfall totals, even within the same county, typical of summer rainfall due to thunderstorms.

Fig. 1: Radar-Estimated Monthly Precipitation

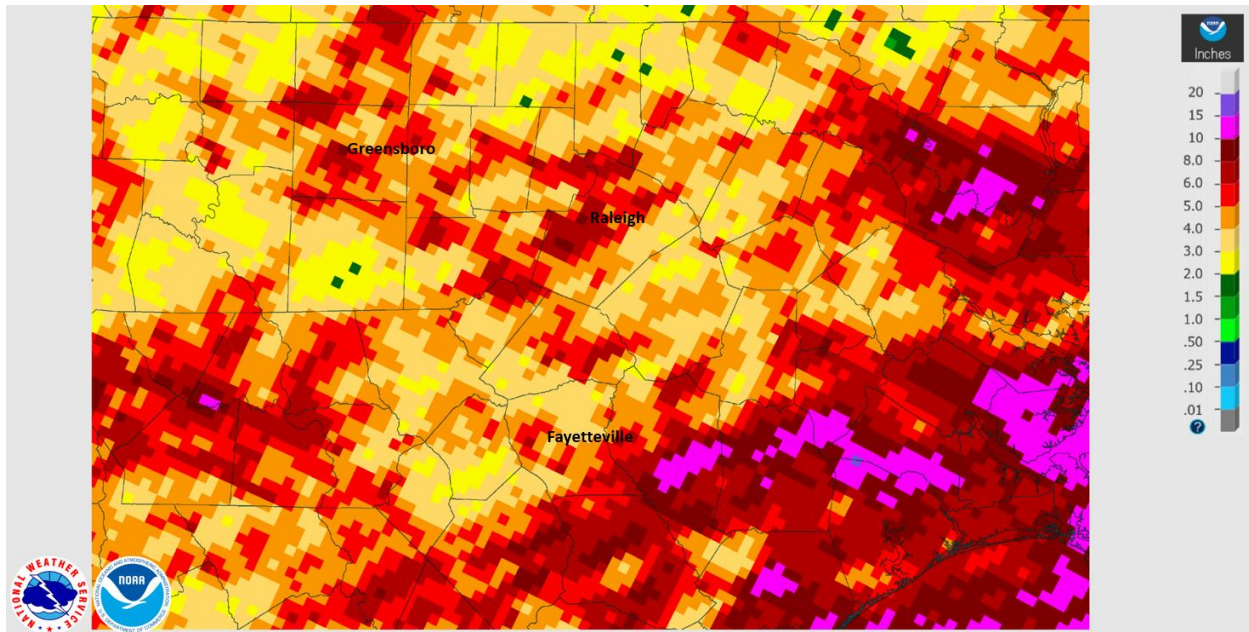
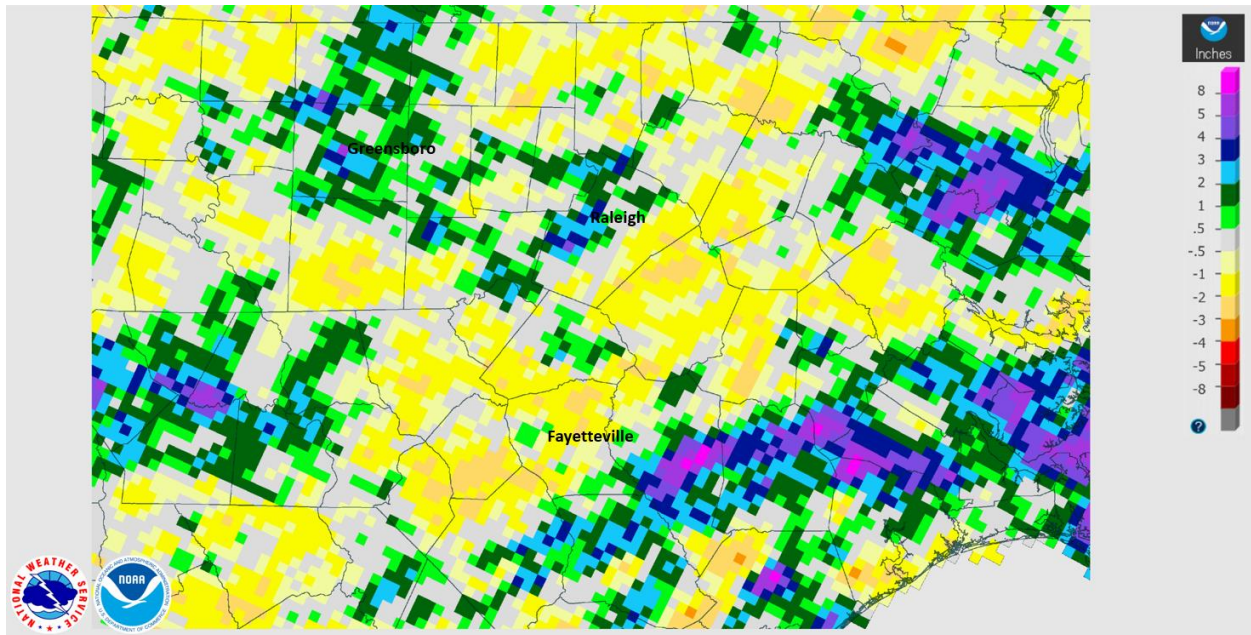
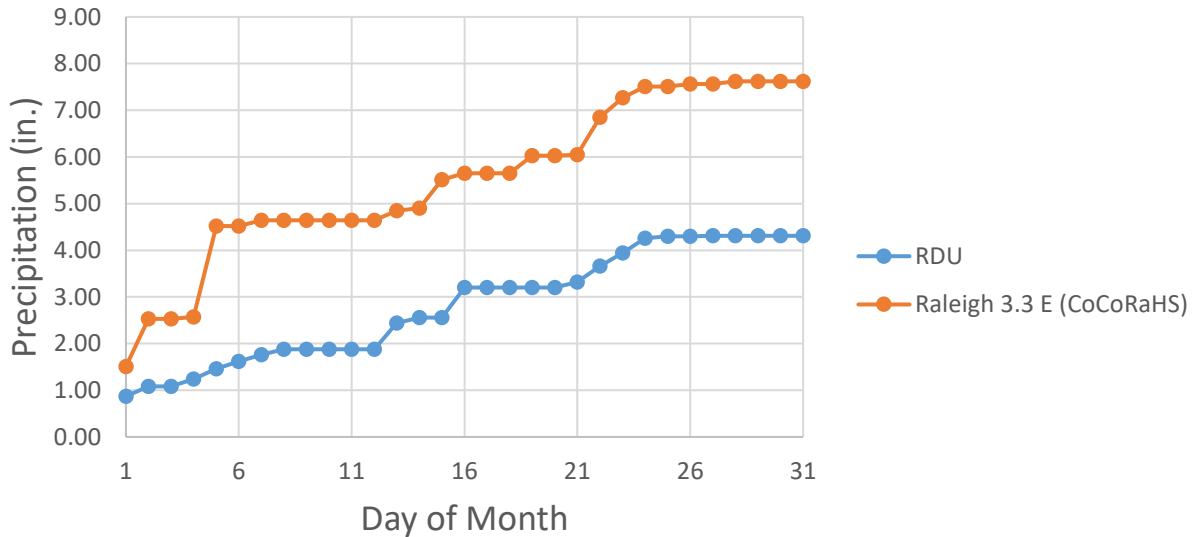


Fig. 2: Radar-Estimated Monthly Departure from Normal Precipitation



An example of the high variability of summer thunderstorm rainfall distribution is illustrated in Figure 3. A comparison of the August daily rainfall reports and totals of two stations in Wake County is presented. Station 1 is the official Raleigh Area Climate reporting site located at the Raleigh-Durham International Airport (RDU). Station 2 is an official CoCoRaHS reporting site in the city of Raleigh. These two reporting sites are located 10 miles apart. The RDU site is located about 10 miles WNW of the city of Raleigh. Station 2 is located 3.3 miles east of downtown Raleigh, or about 10 miles due east of RDU. Of note, the August totals at RDU were several inches lower than that observed at Raleigh 3.3 E. RDU totaled 4.31 inches, while Raleigh 3.3 E reported 7.62. Even though the stations were only 10 miles apart, there were several days in which one station was hit with heavy rain while the other was either grazed or missed. Examples include: August 2nd when RDU reported 0.21 while Raleigh 3.3 E reported 1.02, and on August 5, when RDU reported 0.22, while Raleigh 3.3 E reported 1.95. Other examples including those in which RDU tallied more for the day. One example included August 16. RDU tallied 0.64 and Raleigh 3.3 E totaled 0.14. For more information on the CoCoRaHS program, please visit www.CoCoRaHS.org.

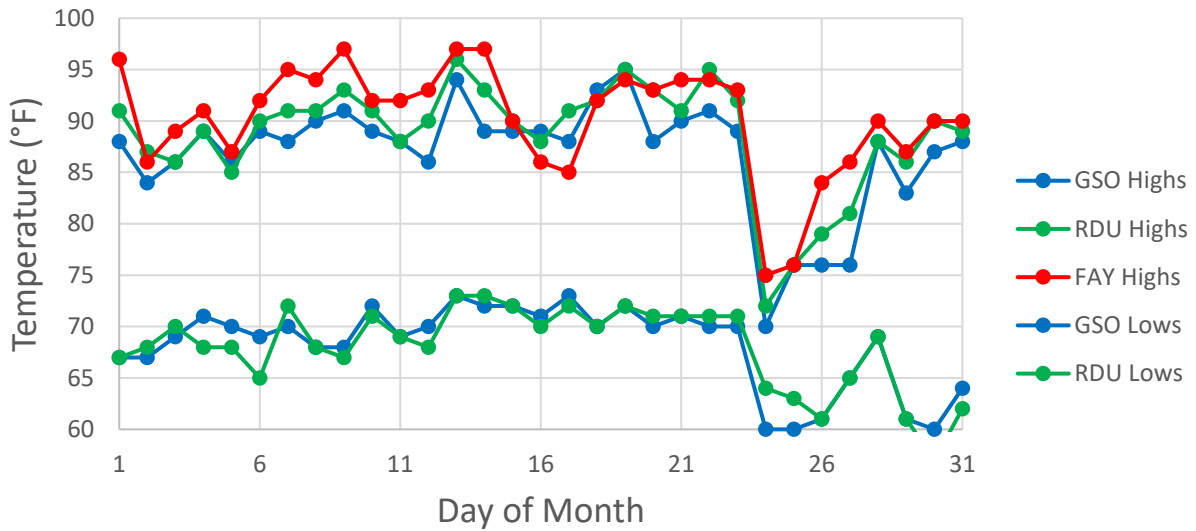
Fig. 3: A Wake County August Rainfall Comparison



Interestingly, just as in July 2019 a huge pattern change from high heat and humidity to drier and cooler conditions occurred late in the month of August 2019. A deep trough of low pressure developed over the eastern United States which pushed a surface cold front through North Carolina on August 23 and 24. This pattern change was accompanied by strong to locally severe thunderstorms on August 23. Once the front pushed south of the region, a northeast flow along with showers and considerable cloudiness sent temperatures plummeting 30 degrees on August 24. Greensboro and Raleigh fell into the 60's during the day on Saturday, August 24 with periods of rain adding to the coolness. Greensboro set a daily low maximum temperature of 70 degrees (which actually occurred at midnight). The previous record for the day was 74 degrees.

Cool and dry weather settled over central North Carolina during the last week of the month, when many areas especially in the northern Piedmont fell into the 50's at night. High temperatures recovered from the 70's on the 25th into the upper 80's to lower 90's by August 30 and 31. The daily high and low temperatures at Greensboro, Raleigh, and Fayetteville for the month of August are graphed in Figure 4. The remarkable cooling following the cold front on August 23 is clearly evident.

Fig. 4: August Temperature Trends



The number of days in August with above and below normal temperatures are also shown in Figure 5. The mean temperature was above normal for 50 to 70 percent of days, with fewer days (mainly during the first and last weeks of the month) below normal.

Fig. 5: Number of Days Above and Below Normal

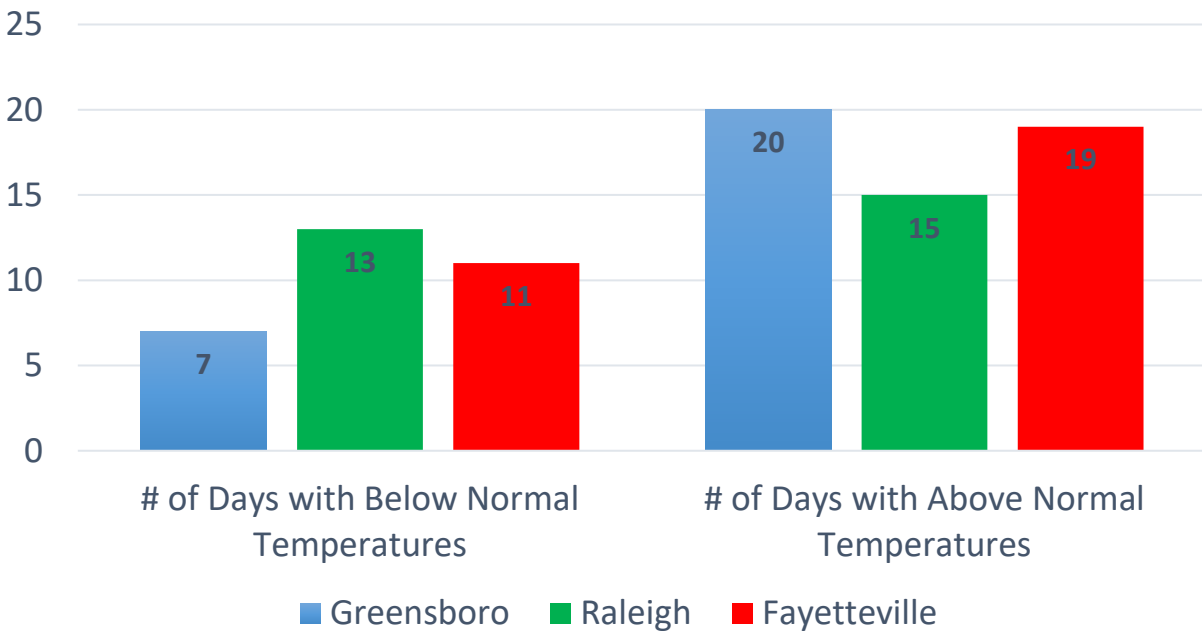
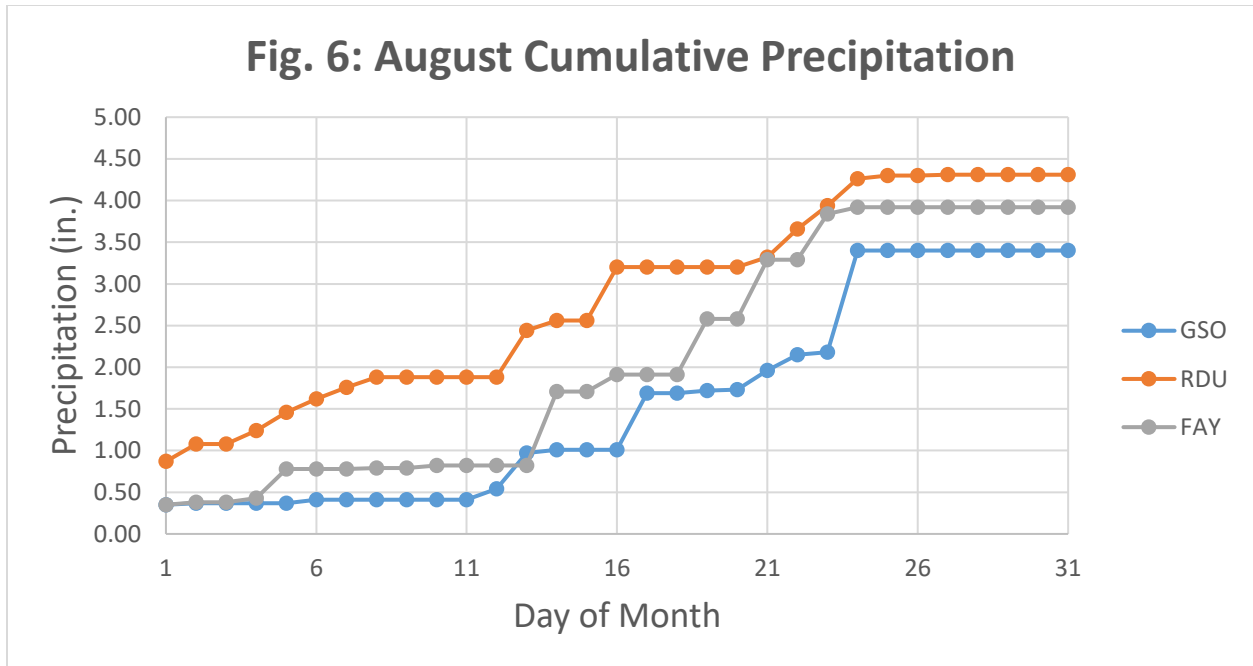


Figure 6 shows the cumulative precipitation for August 2019 at the three climate sites. Raleigh measured rainfall on 16 of the 31 days, totaling 4.31 inches (0.05 inches above normal). Greensboro measured rainfall on 13 days, while Fayetteville recorded rainfall on 12 days. Note that rainfall was frequent until the last week of the month.



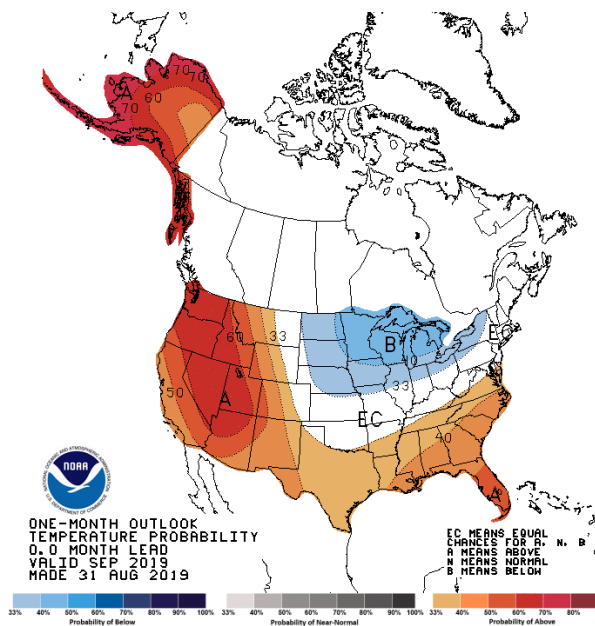
September Outlook

The latest outlook from the Climate Prediction Center indicates increased probabilities of above normal rainfall in the SE part of the U.S., including much of eastern NC. This probability was enhanced by the potential for Hurricane Dorian to affect this region during the first week of the month. Above normal temperatures are also more likely for the month.

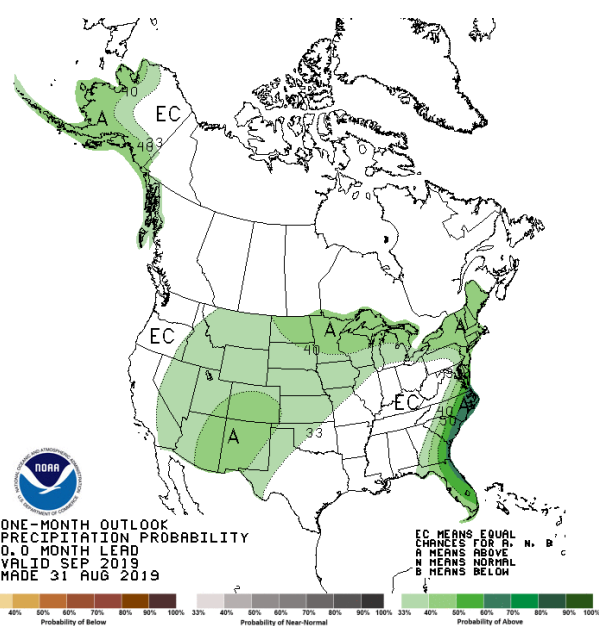
Site	Normal High Temp (°F)	Normal Low Temp (°F)	Normal Avg Temp (°F)
Greensboro (GSO)	79.7	60.6	70.2
Raleigh-Durham (RDU)	82.1	61.7	71.9
Fayetteville (FAY)	83.6	63.7	73.6

Site	Normal precipitation (in.)
Greensboro (GSO)	4.19
Raleigh-Durham (RDU)	4.36
Fayetteville (FAY)	4.40

Temperature Outlook



Precipitation Outlook



Other Notes

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

Fayetteville: 21
Raleigh: 18
Greensboro: 7

Number of days with high temperatures at or above 90°F this year so far:

Fayetteville: 76
Raleigh: 61
Greensboro: 42

Strongest wind gusts (all associated with thunderstorms):

Fayetteville, North at 46 mph on August 19
Raleigh, Southeast at 50 mph on August 1
Greensboro, West at 58 mph on August 22

Hottest temperatures:

Fayetteville 97 on August 9, 13, and 14
Raleigh 96 on August 13
Greensboro 95 on August 19

Coollest temperatures:

Raleigh 57 on August 30
Greensboro 60 on August 24, 25, and 30
Fayetteville 61 on August 30

Records:

A record low maximum temperature of 70 degrees was set at the Piedmont Triad International Airport on August 24th. This broke the old record of 74, last set in 1985.