\NWS Form E-5 (04-2006) (PRES. BY NWS Instruction 10-924)	U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL WEATHER SERVICE	HYDROLOGIC SERVICE AREA (HSA) Columbia, SC
MONTHLY REPORT OF HYDROLOGIC CONDITIONS		REPORT FOR: MONTH July YEAR 2019
TO: Hydrologic Information Center, W/OS31 NOAA's National Weather Service 1325 East West Highway Silver Spring, MD 20910-3283		SIGNATURE Leonard Vaughan DATE 08/11/2019

When no flooding occurs, include miscellaneous river conditions below the small box, such as significant rises, record low stages, ice conditions, snow cover, droughts, and hydrologic products issued (NWS Instruction 10-924).

X An X inside this box indicates that no flooding occurred within this hydrologic service area.

River Conditions for July 2019

Summary

July continued with the typically warm and humid conditions that traditionally occur in South Carolina. However, rainfall varied widely across the Midlands and Central Savannah River Area. Temperatures were near or just slightly above normal for the month, but rainfall fell short across much of the area. Most of the area received between 2 and 4 inches for the month. Due to the convective nature of the rainfall, some areas received 5 to 7 inches while other areas received 2 inches or less. Once again the areas of drought began to expand across South Carolina and east-central Georgia. Due to the lack of any significant rainfall, there was no river flooding during the month.

Precipitation

The total precipitation at Columbia Metro Airport was 4.50 inches. The total precipitation at Augusta Bush Field was 1.39 inches. It was the 4th driest July on record at Augusta. Precipitation records for Columbia began in 1878. Precipitation records for Augusta began in 1871.

Here are a few reports from NWS Coop Stations:

North 5 NE (NRTS1) – 8.21 inches
Sumter (SMRS1) – 6.32 inches
Chesterfield 3 E (CTFS1) – 6.22 inches

Clarks Hill (CHDS1) – 1.46 inches *5th driest July on record (1952-2019)
Lincolnton 4.4 S (LNCG2) – 1.61 inches
Barnwell (BNLS1) – 1.72 inches

Here are a few reports from the CoCoRaHS (Community, Collaborative, Rain, Hail and Snow Network) observers:

South Carolina:

SC-SM-13 Sumter 0.2 NE – 7.95 inches
SC-LX-49 Chapin 1.3 SSE – 7.71 inches
SC-LX-35 Lexington 2.9 NE 0 7.15 inches

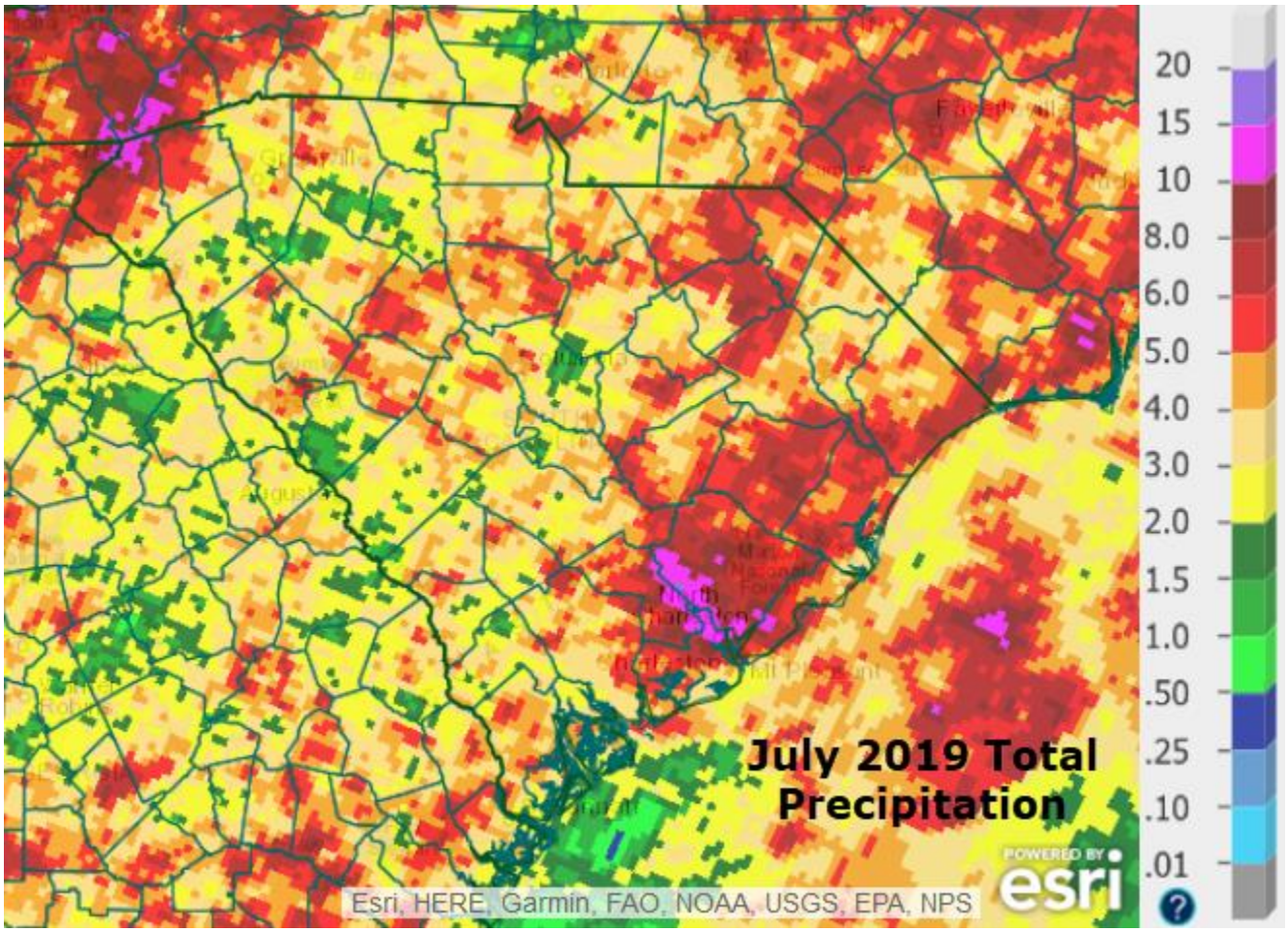
SC-BM-6 Ehrhardt 0.2 SE – 0.88 inches
SC-RC-62 Columbia 7.4 N – 1.18 inches
SC-AK-51 Aiken 8.6 SE – 1.36 inches

Georgia:

GA-LC-2 Tignall 10.2 – 4.99 inches
GA-MD-1 Thomson 2.5 S – 4.68 inches

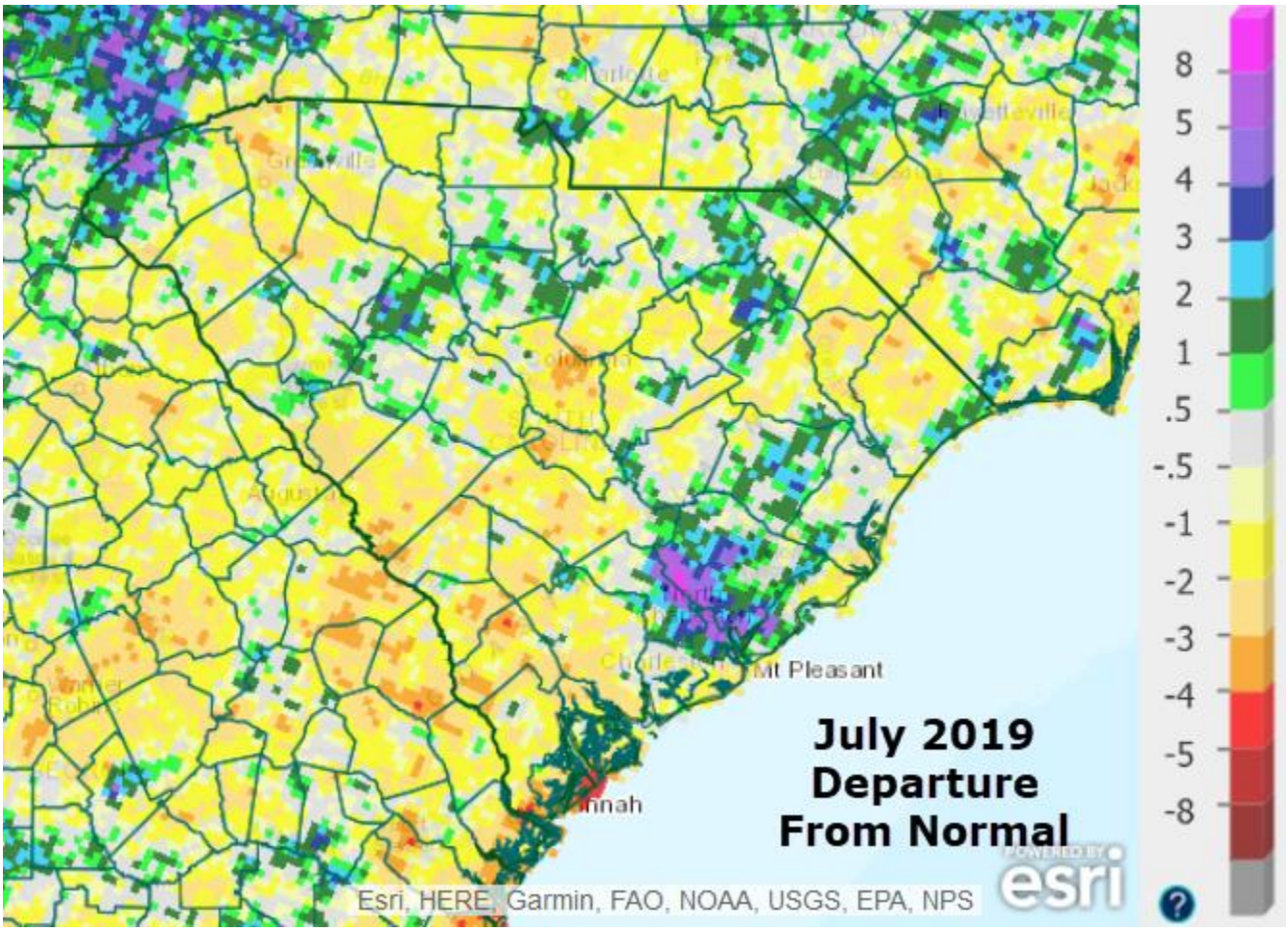
GA-BK-9 Waynesboro 5.3 SE – 1.80 inches
GA-Cu-6 Martinez 0.9 NW – 1.89 inches

(Please see the precipitation maps below).



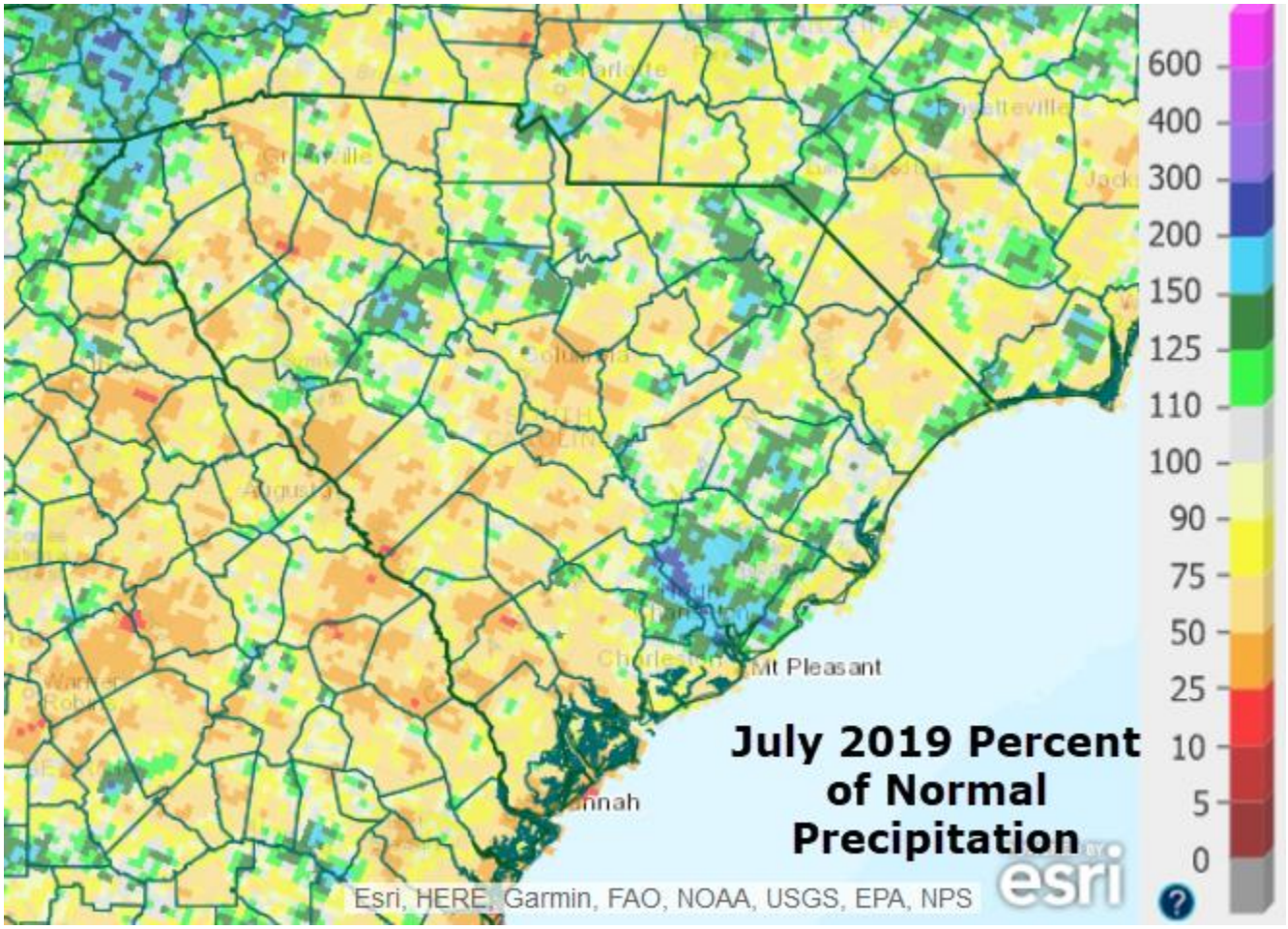
July 2019 Total Precipitation (inches)

Source: Advanced Hydrologic Prediction Service, NWS



July 2019 Precipitation Departure from Normal (inches)

Source: Advanced Hydrologic Prediction Service, NWS



July 2019 Percent of Normal Precipitation

Source: Advanced Hydrologic Prediction Service, NWS

July 2019 precipitation at observation sites was as follows:

Station	Rainfall	Normal	Departure From Normal
Augusta (AGS)	1.39	4.33	-2.94
Augusta (DNL)	1.48	5.27	-3.79
Columbia (CAE)	4.50	5.46	-0.96
Columbia (CUB)	2.82	5.18	-2.36
Orangeburg (OGB)	1.88	5.29	-3.41

River/Flood Conditions

Rainfall on average was below normal for the month across the area. Pockets of heavier rainfall totals fell, but not widespread enough to produce any river flooding across the region.

There were two locally heavy rainfall events that produced some minor flooding in the Columbia Metropolitan Area. During the evening of July 13th, slow moving thunderstorms produced locally heavy rainfall over downtown Columbia. Nearly 1 inch of rain fell in 45 minutes. The stream gage along Rocky Branch near Whaley and Main Streets crested at 7.6 feet. Flood stage is 7.2 feet.

The second event occurred during the afternoon of the 23rd. Once again slow moving thunderstorms produced locally heavy rainfall across cities of West Columbia, Cayce and downtown Columbia. Over ¾ of an inch of rain fell in just 30 minutes. The stream gage along

Rocky Branch near Whaley and Main Streets crested at 7.1 feet. Flood stage is 7.2 feet.

Attached are 5 minute rainfall readings and rainfall totals from the City of Columbia rain gage located at Dr. Martin Luther King Park near the 5 Points area of downtown Columbia. This gage is near the headwaters of Rocky Branch. Also included are the hydrographs from each event.

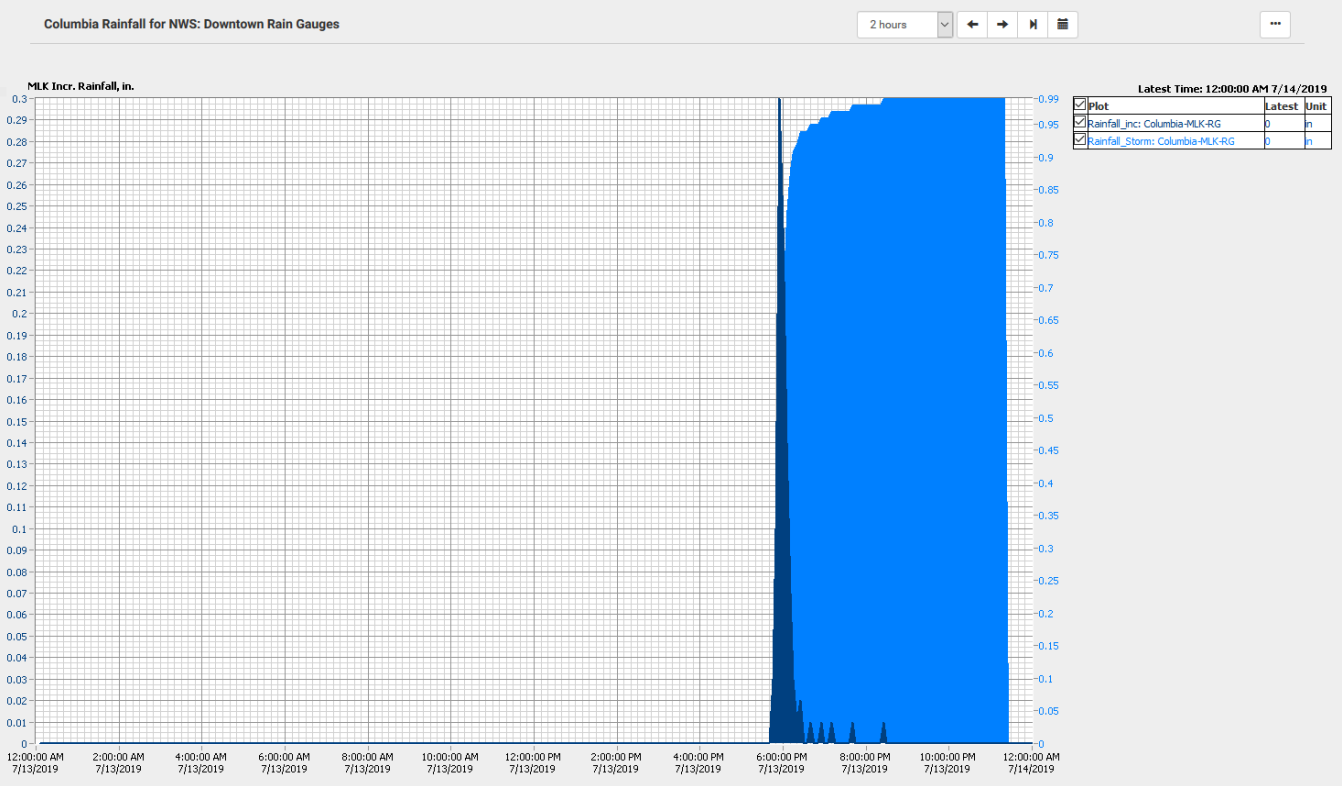


*Image courtesy of the City of Columbia

Columbia Rainfall for NWS: Downtown Rain Gauges

2 hours

Time	Columbia-MLK-RG: Rainfall_inc [in]	Columbia-MLK-RG: Rainfall_Storm [in]
2019-07-13 17:10:00	0	0
2019-07-13 17:15:00	0	0
2019-07-13 17:20:00	0	0
2019-07-13 17:25:00	0	0
2019-07-13 17:30:00	0	0
2019-07-13 17:35:00	0	0
2019-07-13 17:40:00	0	0
2019-07-13 17:45:00	0.03	0.03
2019-07-13 17:50:00	0.1	0.13
2019-07-13 17:55:00	0.3	0.43
2019-07-13 18:00:00	0.24	0.67
2019-07-13 18:05:00	0.14	0.81
2019-07-13 18:10:00	0.07	0.88
2019-07-13 18:15:00	0.03	0.91
2019-07-13 18:20:00	0.01	0.92
2019-07-13 18:25:00	0.02	0.94
2019-07-13 18:30:00	0	0.94
2019-07-13 18:35:00	0	0.94
2019-07-13 18:40:00	0.01	0.95
2019-07-13 18:45:00	0	0.95
2019-07-13 18:50:00	0	0.95
2019-07-13 18:55:00	0.01	0.96
2019-07-13 19:00:00	0	0.96
2019-07-13 19:05:00	0	0.96
2019-07-13 19:10:00	0.01	0.97

*Image courtesy of the City of Columbia

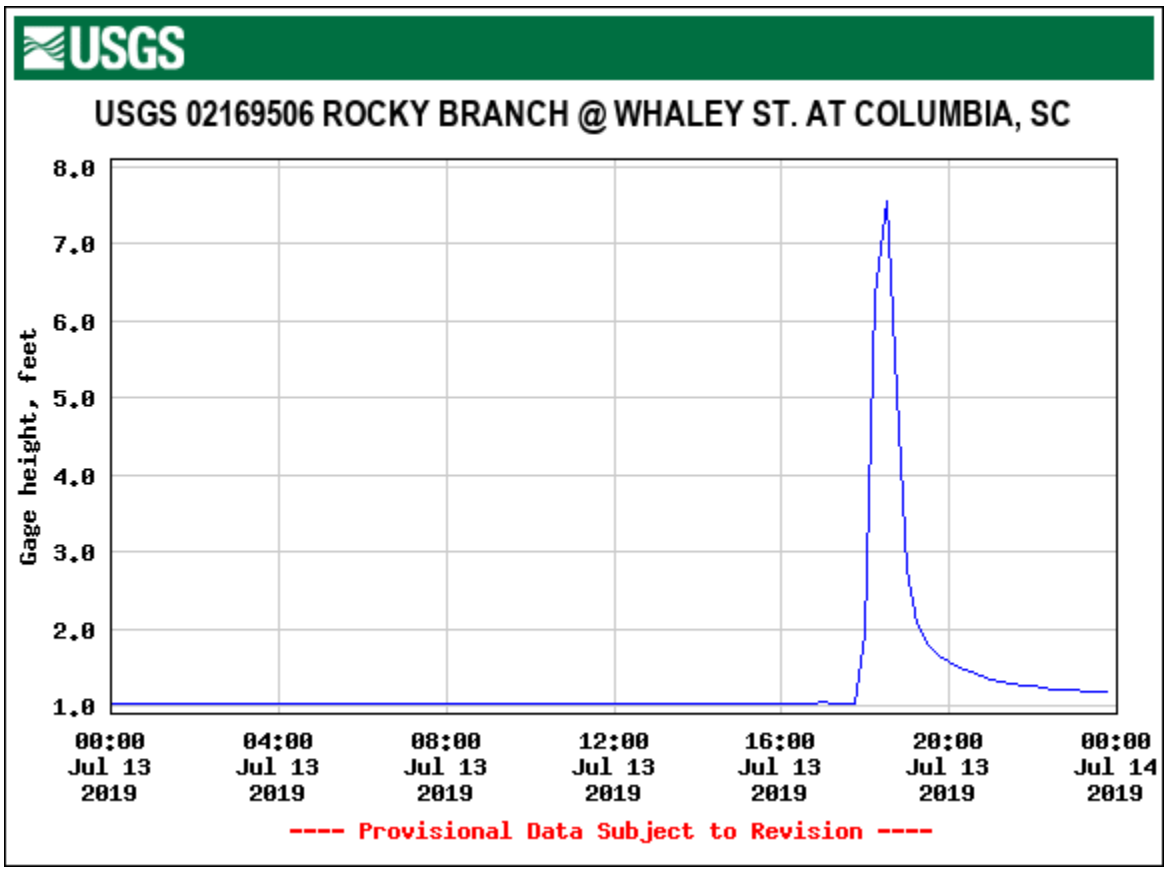


*Image courtesy of the U.S. Geological Survey

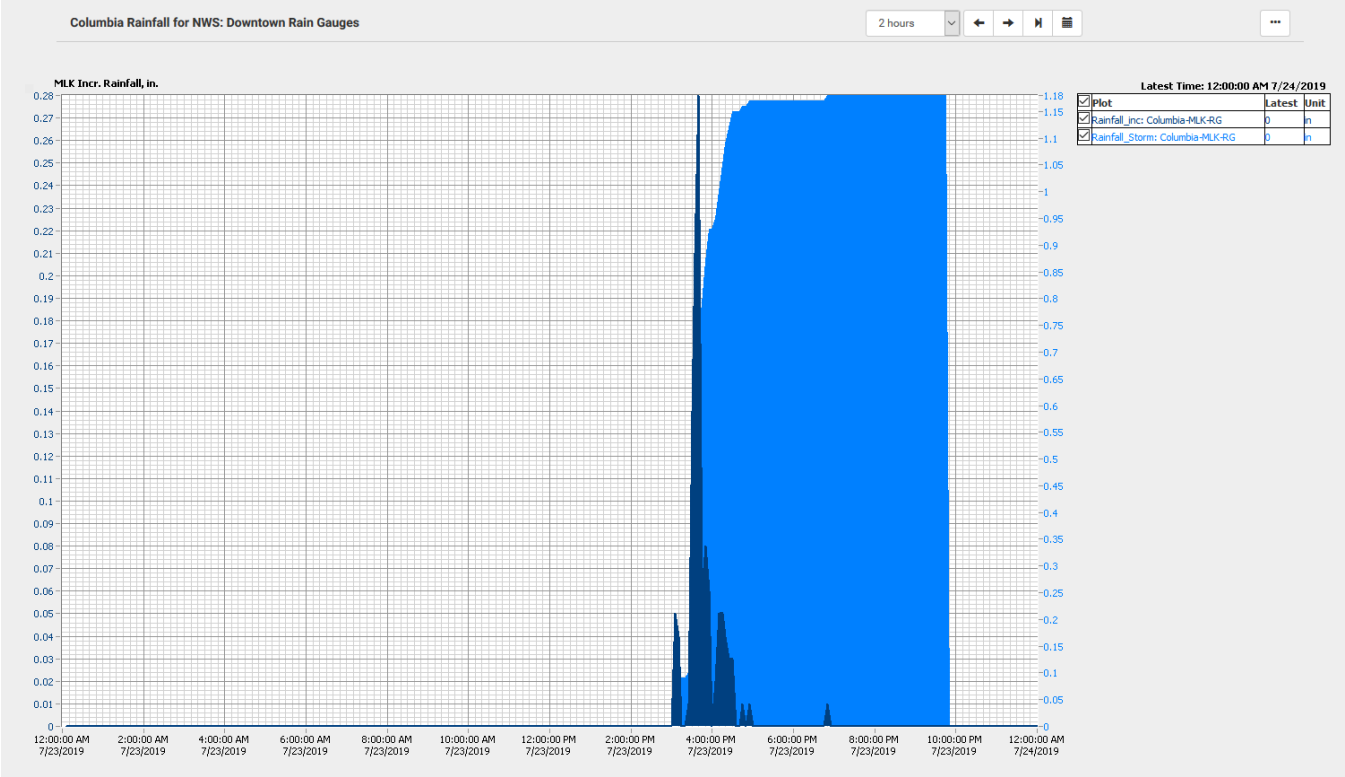
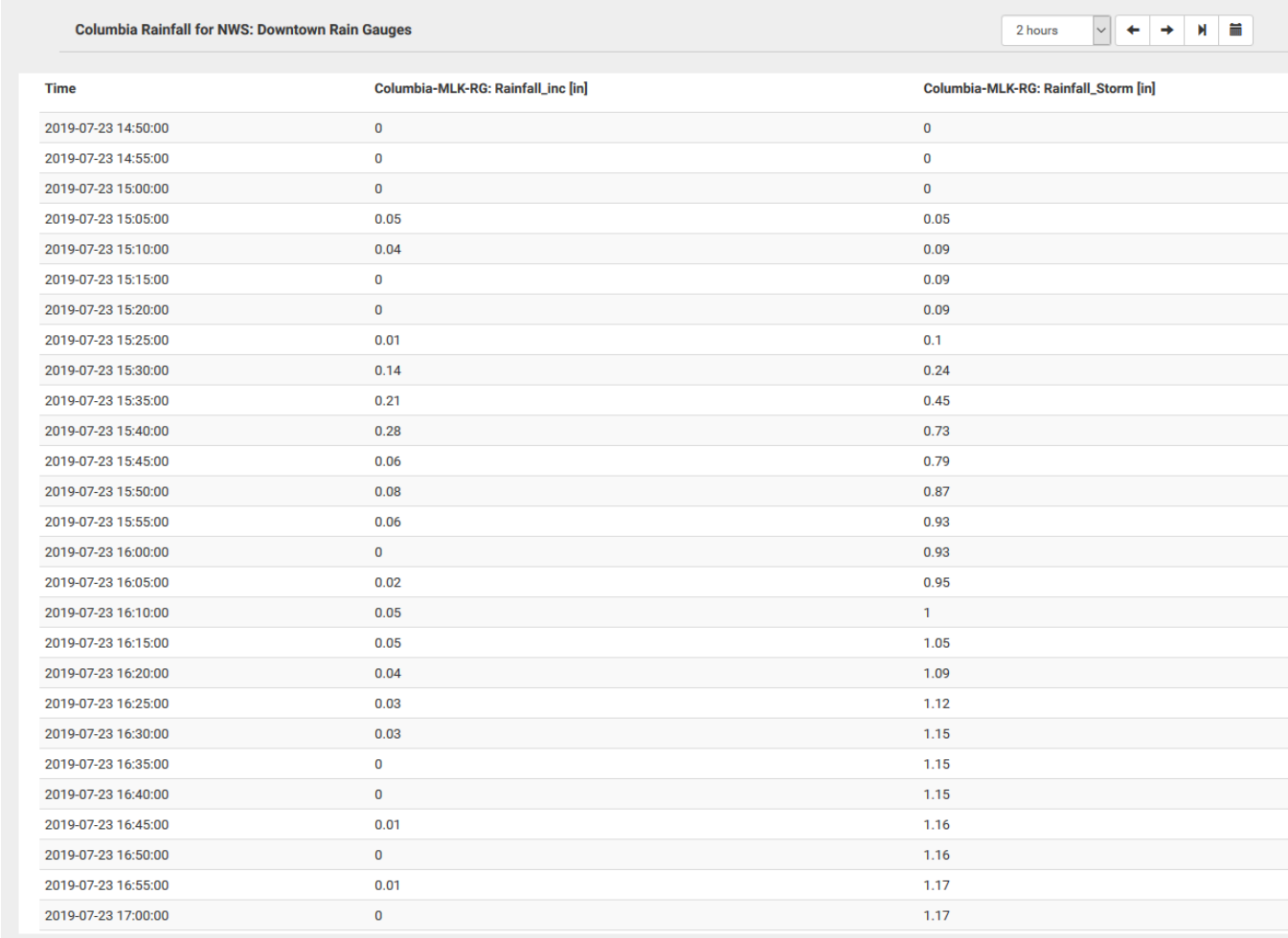


*Image courtesy of the City of Columbia



Columbia Rainfall for NWS: Downtown Rain Gauges

2 hours

Time	Columbia-MLK-RG: Rainfall_inc [in]	Columbia-MLK-RG: Rainfall_Storm [in]
2019-07-23 14:50:00	0	0
2019-07-23 14:55:00	0	0
2019-07-23 15:00:00	0	0
2019-07-23 15:05:00	0.05	0.05
2019-07-23 15:10:00	0.04	0.09
2019-07-23 15:15:00	0	0.09
2019-07-23 15:20:00	0	0.09
2019-07-23 15:25:00	0.01	0.1
2019-07-23 15:30:00	0.14	0.24
2019-07-23 15:35:00	0.21	0.45
2019-07-23 15:40:00	0.28	0.73
2019-07-23 15:45:00	0.06	0.79
2019-07-23 15:50:00	0.08	0.87
2019-07-23 15:55:00	0.06	0.93
2019-07-23 16:00:00	0	0.93
2019-07-23 16:05:00	0.02	0.95
2019-07-23 16:10:00	0.05	1
2019-07-23 16:15:00	0.05	1.05
2019-07-23 16:20:00	0.04	1.09
2019-07-23 16:25:00	0.03	1.12
2019-07-23 16:30:00	0.03	1.15
2019-07-23 16:35:00	0	1.15
2019-07-23 16:40:00	0	1.15
2019-07-23 16:45:00	0.01	1.16
2019-07-23 16:50:00	0	1.16
2019-07-23 16:55:00	0.01	1.17
2019-07-23 17:00:00	0	1.17

*Image courtesy of the City of Columbia

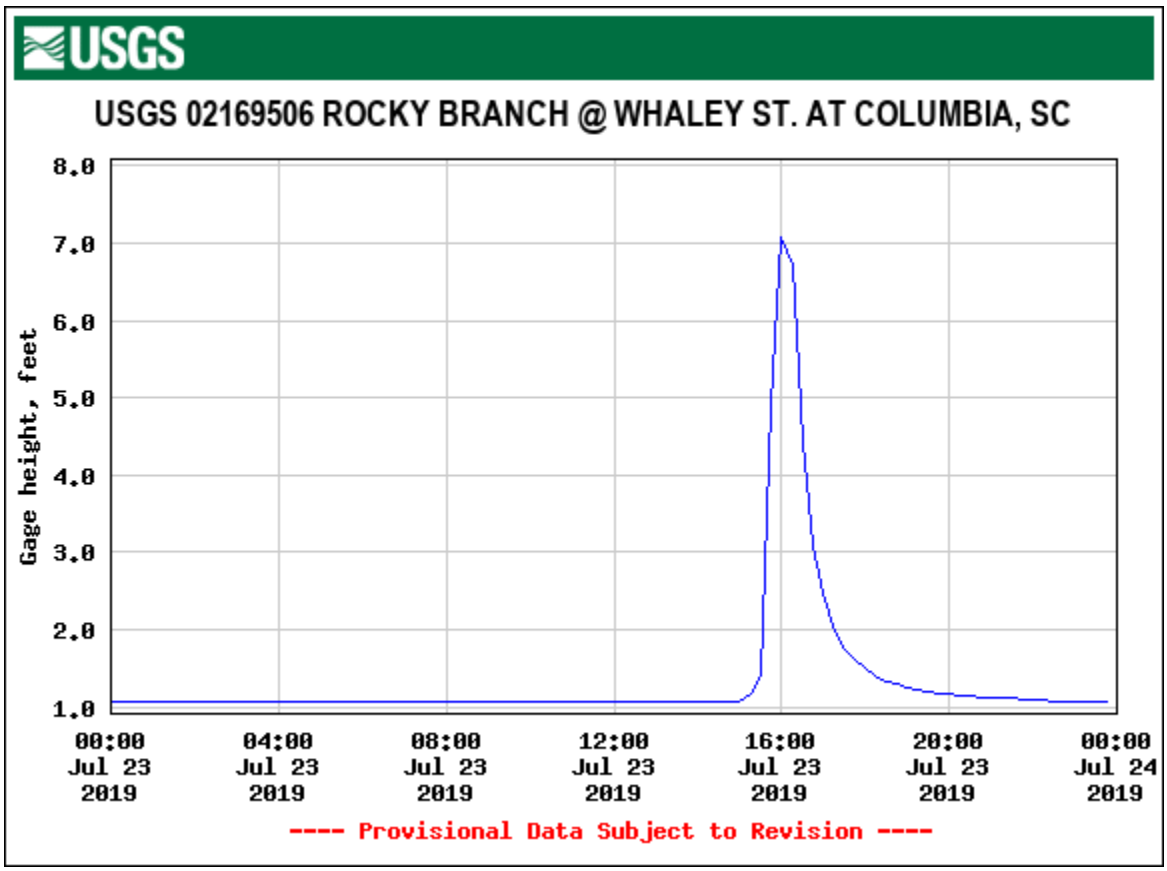


*Image courtesy of the U.S. Geological Survey

Drought Conditions

Rainfall was below normal for much of the Midlands and Central Savannah River Area during the month of July. Due to the rainfall from the middle of June into early July, much of the areas of D0 (Abnormally Dry) and D1 (Moderate Drought) had been reduced to a small area of the Pee Dee and Piedmont. By the end of July into early August the areas of D0 and D1 continued to increase in size across the Piedmont, Pee Dee, and southern Midlands and into the central and southern areas of the CSRA.

(Please see the maps below).

Drought in South Carolina

Residents in drought:
245,000

2,053,000 more in abnormally dry areas.

This is:
5%

of the state's population,
46% more in abnormally dry areas.

Report Your Drought Impacts

Last Month | Last Week | Current

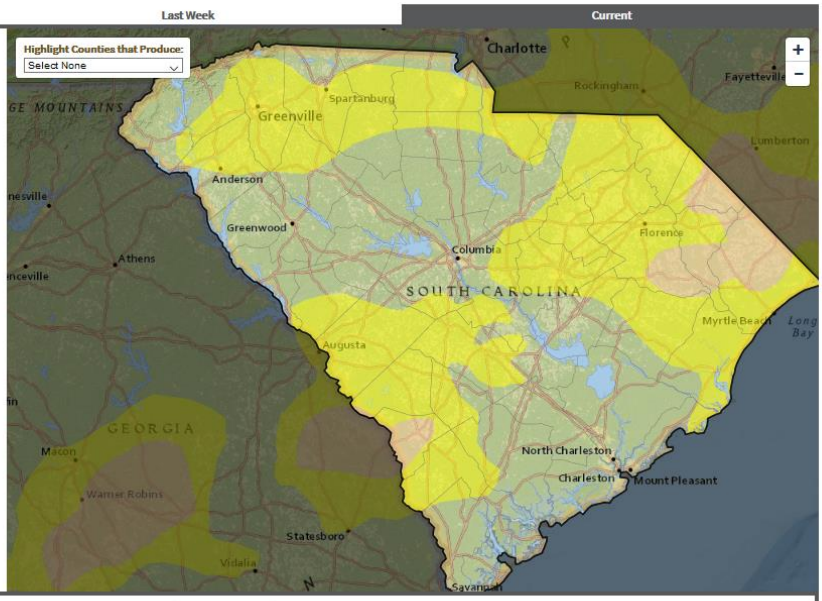
Enter a city or zip code to add location to map

Add to Map Clear All

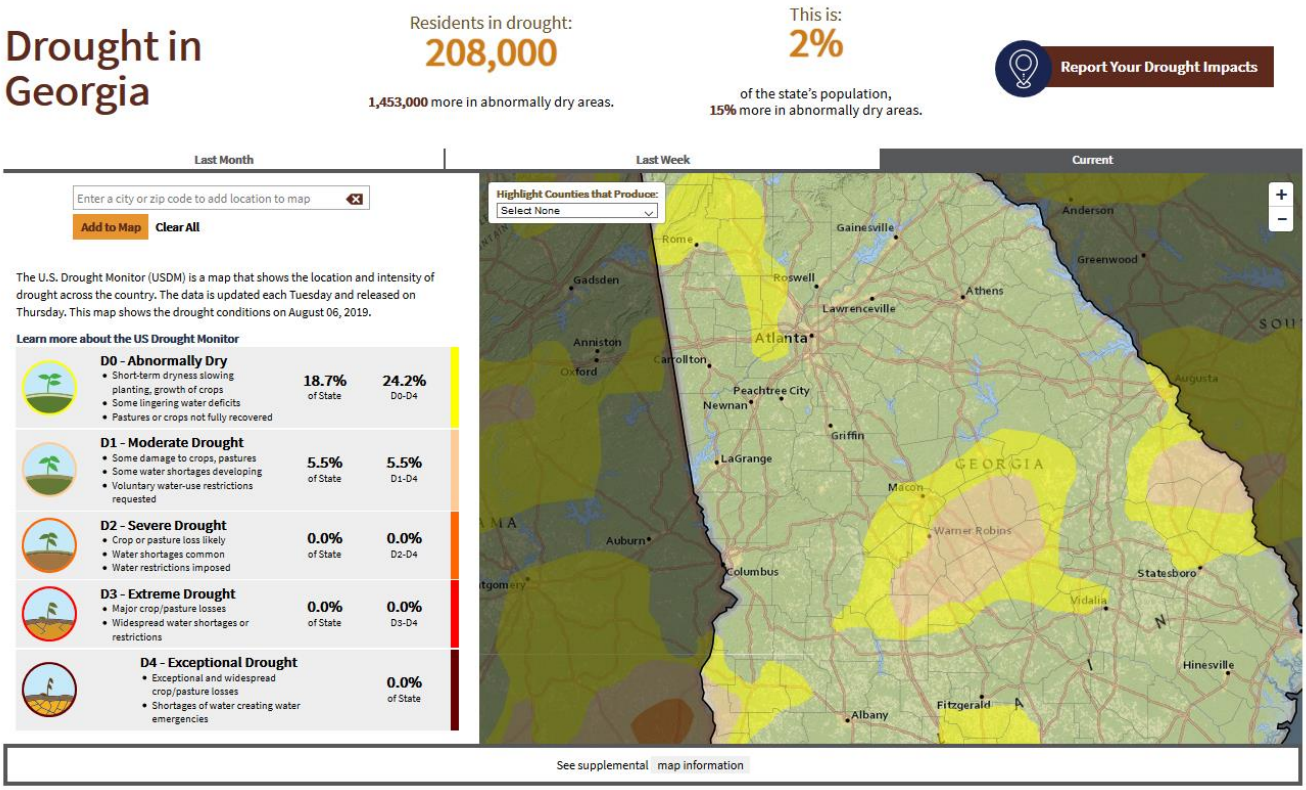
The U.S. Drought Monitor (USDM) is a map that shows the location and intensity of drought across the country. The data is updated each Tuesday and released on Thursday. This map shows the drought conditions on August 6, 2019.

Learn more about the US Drought Monitor

D0 - Abnormally Dry • Short-term dryness slowing planting, growth of crops • Some lingering water deficits • Pastures or crops not fully recovered	**44.8%** of State	**50.3%** D0-D4
D1 - Moderate Drought • Some damage to crops, pastures • Some water shortages developing • Voluntary water-use restrictions requested	**5.5%** of State	**5.5%** D1-D4
D2 - Severe Drought • Crop or pasture loss likely • Water shortages common • Water restrictions imposed	**0.0%** of State	**0.0%** D2-D4
D3 - Extreme Drought • Major crop/pasture losses • Widespread water shortages or restrictions	**0.0%** of State	**0.0%** D3-D4
D4 - Exceptional Drought • Exceptional and widespread crop/pasture losses • Shortages of water creating water emergencies		**0.0%** of State



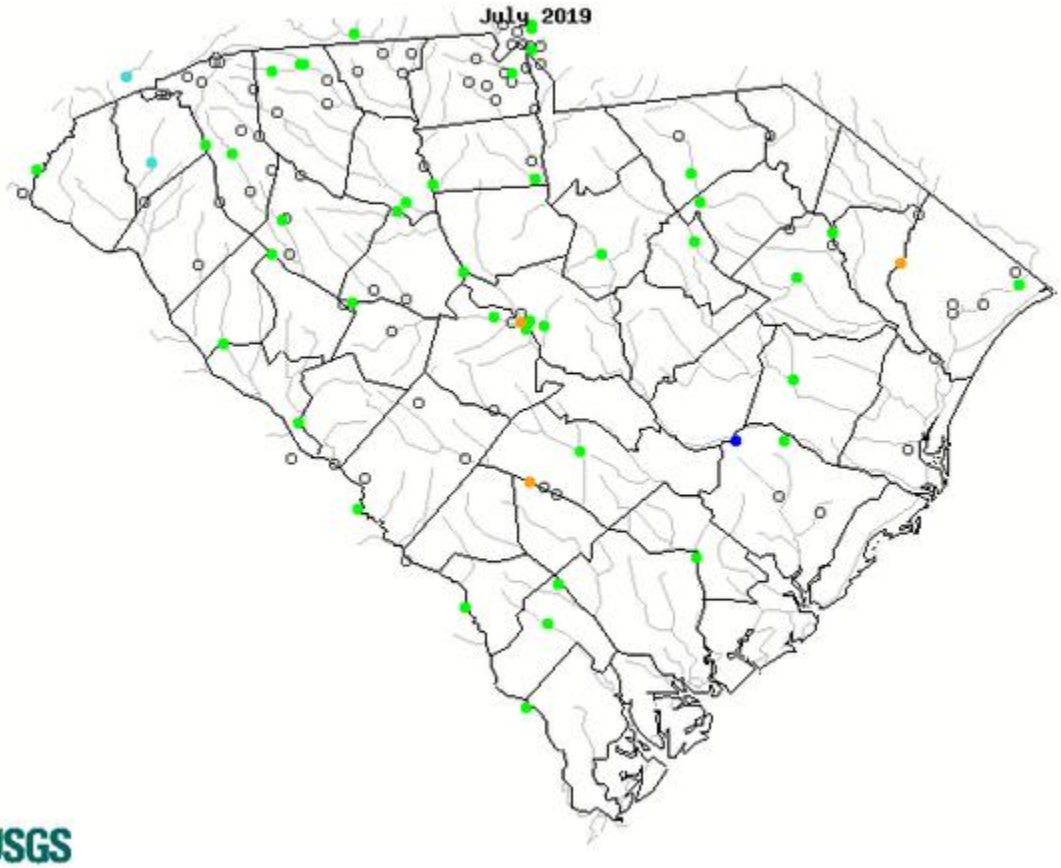
See supplemental map information



Streamflow Conditions

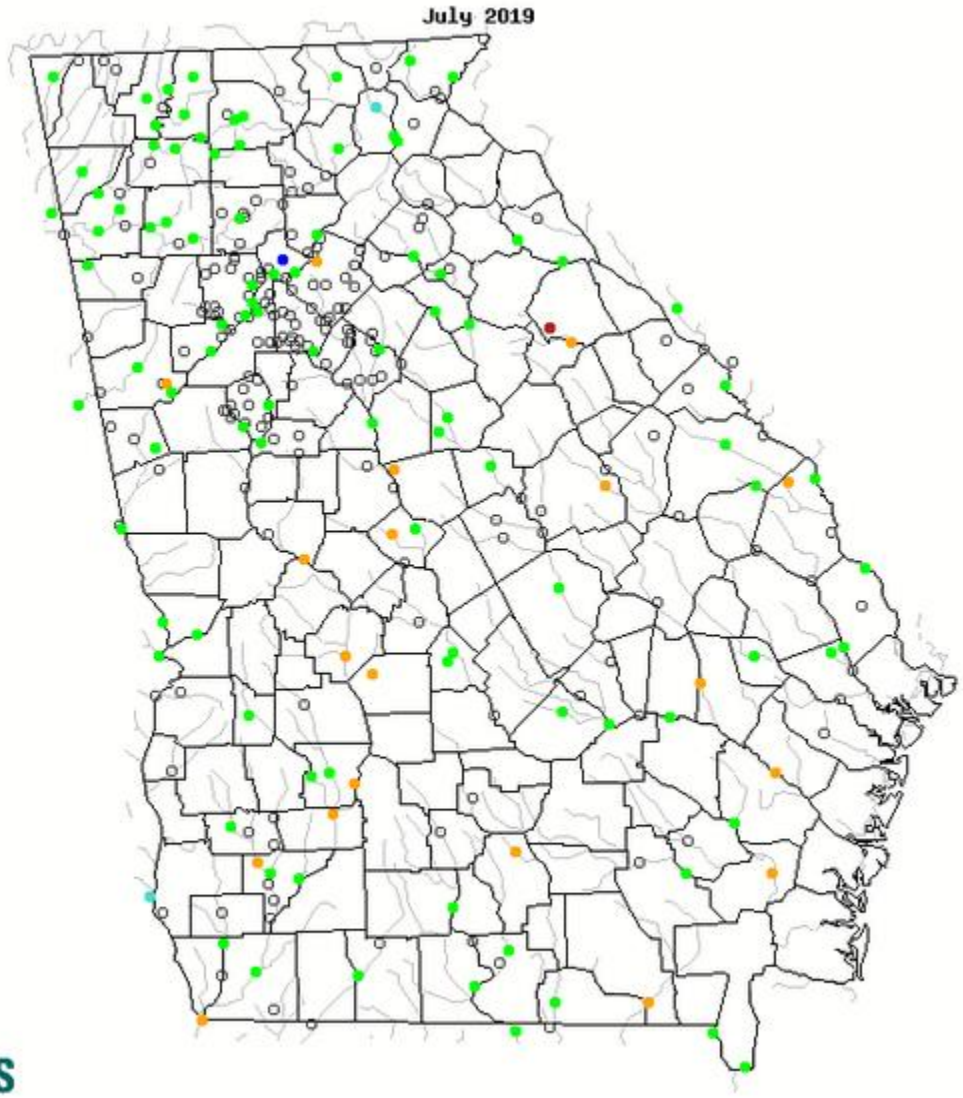
Monthly average stream flows for July across the Midlands and Central Savannah River Area remained in good condition despite the lack of any widespread rainfall during the month. Average stream flows for July ranged from Much Above Normal to Below Normal across the region. Above Normal conditions were noted along the Santee River Basin. Normal conditions were noted along the Savannah River Basin, the North Fork of the Edisto River, Saluda River Basin, Broad River Basin, Wateree River Basin and the Pee Dee River Basin. Below Normal conditions were observed along the South Fork of the Edisto River.

Stream Flow Compared to Historical Stream Flow for the Month



USGS

Explanation - Percentile classes							
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		



USGS

Explanation - Percentile classes							
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		

Temperatures

July 2019 temperatures were near normal for the month.

The monthly average temperature at Columbia (CAE) was 82.7 degrees. This value was 0.5 degrees above the normal of 82.2 degrees. The highest temperature during the month was 98 degrees reached on the 3rd and 17th. The lowest temperature was 63 degrees that occurred on the 27th.

The average temperature for the month at Augusta (AGS) was 83.7 degrees. This value was 2.1 degrees above the normal of 81.6 degrees. The highest temperature during the month was 101 degrees reached on the 17th and 18th. The lowest temperature was 62 degrees that occurred on the 27th and 28th.

The average temperature for the month at Orangeburg (OGB) was 82.3 degrees. This value was 0.5 degrees above the normal of 81.8 degrees. The highest temperature during the month was 99 degrees reached on the 16th, 17th and 18th. The lowest temperature was 64 degrees that occurred on the 30th.

Hydrological Products

The following products were issued during July 2019.

DGT	Drought Statements	0
ESF	Hydrologic Outlooks	0
FFA	Flash Flood Watches	0
FFS	Flash Flood Statements	2
FFW	Flash Flood Warnings	2
FLS	Flood Statements	0
FLW	Flood Warnings	0
FLS	Areal Flood Advisories	20