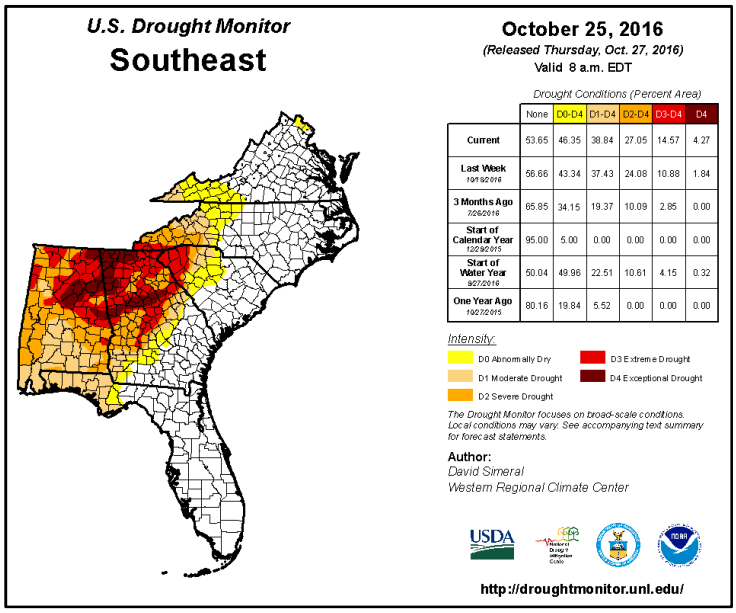
The Southeast U.S. Drought of 2016: Evolution, Climate Perspectives, and Impacts

How did the drought evolve?

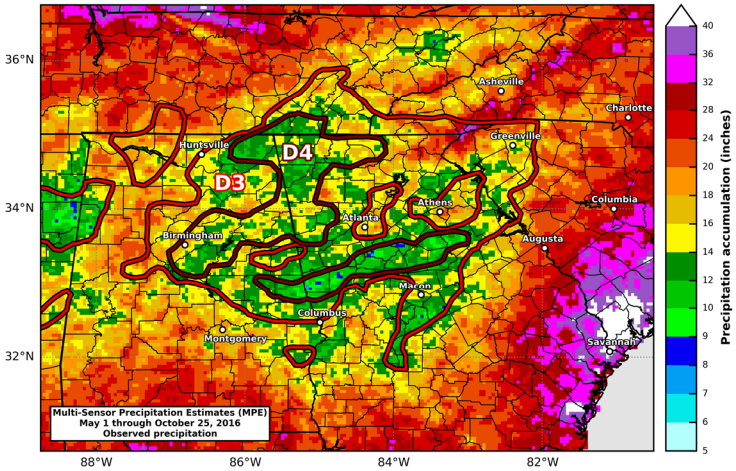


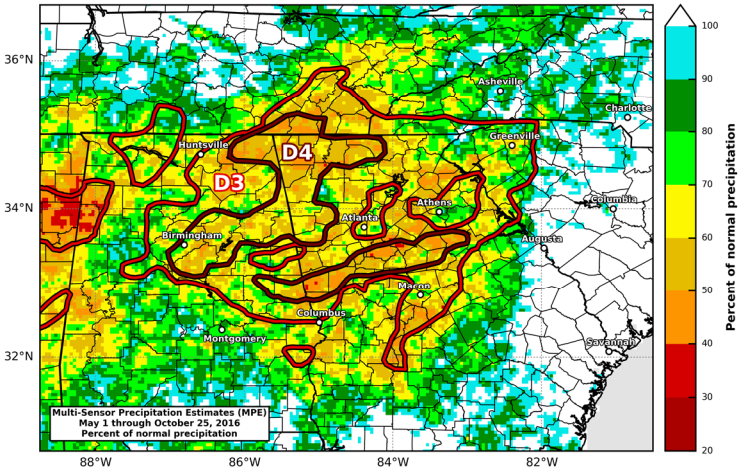
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	53.65	46.35	38.84	27.05	14.57	4.27
Last Week 10/18/2016	56.66	43.34	37.43	24.08	10.88	1.84
3 Months Ago 7/26/2016	65.85	34.15	19.37	10.09	2.85	0.00
Start of Calendar Year 12/29/2015	95.00	5.00	0.00	0.00	0.00	0.00
Start of Water Year 9/27/2016	50.04	49.96	22.51	10.61	4.15	0.32
One Year Ago 10/27/2015	80.16	19.84	5.52	0.00	0.00	0.00

U.S. Drought Monitor: www.droughtmonitor.unl.edu

The latest U.S. Drought Monitor, released on October 25th, indicates that nearly 40% of the Southeast region was classified in moderate-to-exceptional (D1–D4) drought conditions. Moderate drought developed initially over portions of northeast Georgia in late April. Drought conditions intensified and expanded in coverage across northern and central Georgia, northern Alabama, and western areas of the Carolinas during the late spring, summer, and early autumn months. By late October, severe-to-exceptional (D2–D4) drought covered about 73% of Alabama, 50% of Georgia, 16% of South Carolina, and 12% of North Carolina. Well-above-average temperatures and a persistent lack of rainfall produced a shorter-term meteorological drought in these areas during summer, with widespread agricultural and livestock impacts. Drought conditions were exacerbated by high rates of evapotranspiration from crops and other vegetation as well as rapid drainage from soils with a generally poor water-holding capacity. As dry weather has lingered into autumn (the driest season of the year climatologically), a longer-term hydrological drought has begun to emerge across the region.

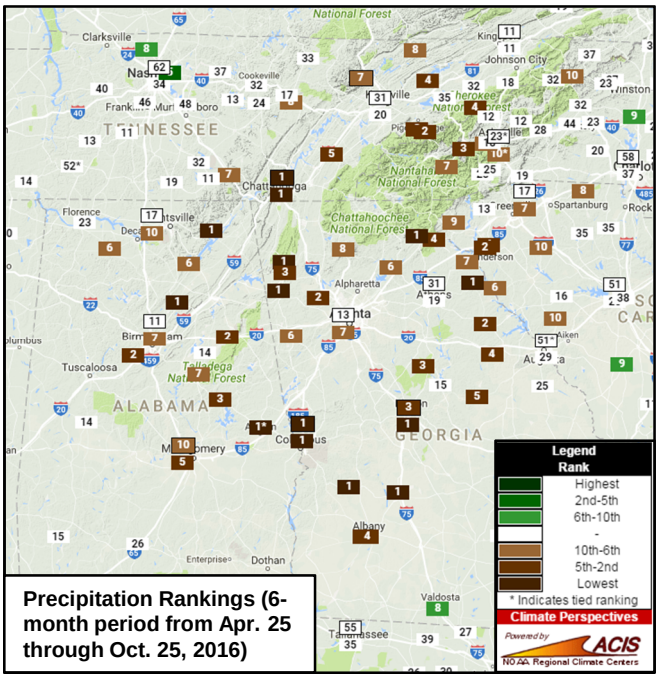
How did precipitation compare to climatology?





During the 6-month period from May 1st through October 25th, a broad interior portion of the Southeast region received less than 15 inches of precipitation. When compared to the short-term climatological average from 2002–2015, much of this region observed only 30 to 70% of normal precipitation. For many locations, no measurable precipitation was recorded on 70 to 80% of the days during this period, which is 5 to 15% higher than the short-term climatological average. With a few exceptions, the latest designations of extreme (D3) and exceptional (D4) drought from the U.S. Drought Monitor correspond well to the areas with the greatest precipitation deficits. However, it is also important to note the significant amount of spatial variability in precipitation totals within the most drought-stricken portions of the region. For example, some locations in the vicinity of Atlanta and Athens were much wetter than surrounding areas, while parts of central Georgia extending into east-central Alabama were exceptionally dry. Much of this localized variability can be attributed to the vagaries of thunderstorm activity during the summer. As autumn progresses, the driest locations will continue to act as the “epicenters” of further drought intensification and expansion. Hydrological impacts will likely be maximized near these areas, with some effects extending into the regional-scale drainage basins.

Precipitation totals from a station perspective



Precipitation Rankings (6-month period from Apr. 25 through Oct. 25, 2016)

Precipitation extremes for selected long-term stations during the 6-month period from April 25 through October 25, 2016					
Station	**Period of Record (yrs)**	**2016 Precipitation**	**Avg. Precipitation**	**Departure from Avg.**	**% of Avg.**
Chattanooga, TN	138	9.34”	23.41”	-14.07”	40%
Huntsville, AL	108	17.49”	23.49”	-6.00”	74%
Birmingham, AL	122	16.54”	24.90”	-8.36”	66%
Anniston, AL	78	11.33”	23.11”	-11.78”	49%
Montgomery, AL	143	15.21”	22.91”	-7.70”	66%
Rome, GA	97	12.62”	24.75”	-12.13”	51%
Atlanta, GA	138	15.48”	22.81”	-7.33”	68%
Athens, GA	124	20.12”	24.06”	-3.94”	84%
Columbus, GA	118	12.22”	22.96”	-10.74”	53%
Macon, GA	120	10.89”	21.73”	-10.84”	50%
Anderson, SC	61	11.95”	22.12”	-10.17”	54%

SERCC Climate Perspectives tool: www.sercc.com/perspectivesmap

Numerous stations across drought-stricken portions of the region observed exceptionally low precipitation totals during the 6-month period from late April to late October. Seventeen long-term stations (i.e., period of record exceeding 50 years) observed 6-month precipitation totals that were ranked within the top 3 driest values on record, including the major cities of Chattanooga, TN, Columbus, GA, and Macon, GA. Precipitation departures exceeded 10 inches below average at several locations, with a maximum departure of 14.07 inches below average in Chattanooga. However, precipitation deficits were relatively modest at a few stations, which reflects localized variability in convective precipitation amidst a pattern of regional-scale dryness. For example, Athens, GA recorded 84% of its average precipitation over the past 6 months, with a precipitation deficit of only 3.94 inches.

Agricultural, water resource, and fire impacts

- During summer, dryland (i.e., non-irrigated) crops (corn, cotton, soybeans, peanuts, and tobacco) were severely stressed by a persistent lack of rainfall and high evapotranspiration rates due to excessive heat. Substantial losses in corn yields were reported in many Georgia and Alabama fields during the latter half of summer, and farmers struggled to dig up peanuts from hard, parched soils in early autumn. Winter wheat planting was delayed across the region in October due to excessively low soil moisture.
- Pastures and hay fields were in very poor condition from the drought, as well as a widespread infestation of fall armyworms. Livestock producers had to purchase hay and begin a supplemental feeding for their herds due to a shortage of forage grasses, with some producers having to sell off their cattle.
- By late October, streamflows across the region were declining rapidly, with over 50% of USGS gages in Alabama and Georgia recording well-below-normal (i.e., less than the 10th percentile) streamflows. The effects have extended further downstream, as several rivers in the Florida Panhandle (notably the Apalachicola) are also observing well-below-normal flows. Lake levels have declined significantly, with Lake Lanier (a major reservoir for Atlanta’s water supply) currently about 8 feet below its summer pool level.
- Numerous wildfires have erupted across Alabama and northwestern Georgia, with over 1,000 fires occurring in Alabama since late September. Outdoor burning was banned in 46 Alabama counties beginning on October 12th, as the governor signed a drought emergency declaration for the first time since 2007.

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