SCIPP
A NOAA RISA TEAM

Southern Climate Monitor

August 2018 | Volume 8, Issue 8

In This Issue:

The Southern Climate Monitor is available at
www.srcc.lsu.edu & www.southernclimate.org

Creating More Resilient Cities

Danielle Barker, Development Director, City of Bethany, OK
President, American Planning Association – Oklahoma Chapter

A CHANGING CLIMATE

Scientists across the globe have shown that the climate is changing. Current models indicate further changes are expected to occur including sea level rise and changes in surface, atmospheric and oceanic temperatures. An example can be seen within the Climate Science Special Report, where the global annual surface air temperature has increase by 1.8°F over the last 115 years from 1901 through 2016. This is now considered the warmest period in the history of modern civilization. Figure 1 depicts a more local look at the temperature change as presented within the report. This same report is predicting further change in temperatures, sea level rise, and more frequent/intense heavy rain events in some regions[1]. To further support this study, the National Aeronautics and Space Administration (NASA) has stated that global effects of climate change include longer periods of drought in some regions and an increase in number, duration and intensity of tropical storms in other regions[2].

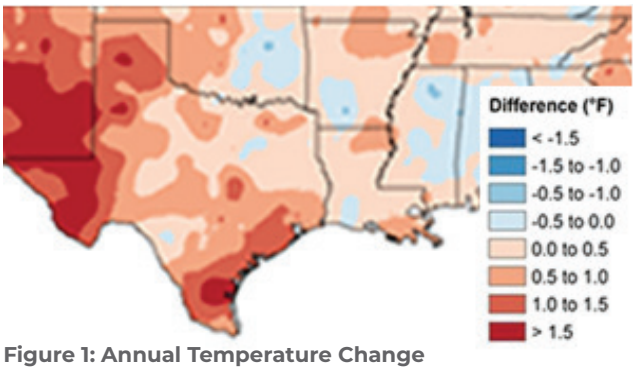


Figure 1: Annual Temperature Change

Nationally, many agencies are looking at data, working with how climate change will impact them, and issuing further tools for everyone within their agency to become better prepared. For example, the Federal Emergency Management Agency (FEMA) has issued reports with tools, data, and information that can further help emergency managers better prepare their communities and their response to disasters as they occur[3]. Additionally, the American Planning Association (APA) has issued reports and policy guides for city planners to use in order to think through and work with climate change information and the impacts that are expected so that they are better equipped to plan for the future of their communities[4]. Closer to home, over the last couple years the Science Climate Impacts Planning Program (SCIPP) began conversations with emergency managers and city planners within Arkansas and Oklahoma. SCIPP then brought together city planners and emergency managers from Oklahoma to work together with various scenarios focused on hazards with the hope to bridge a communication gap that has long been present. Through this effort the Simple Planning Tool for Oklahoma Hazards was created and featured in the Southern Climate Monitor in April 2018.

COLLABORATION FOR RESILIENCE

With scientists continuing to indicate that the impacts of climate change could include an overall increase in the severity of events, it is becoming more important that attention is brought to long range planning and resiliency. This effort will need to include additional collaboration among various professionals including scientists, meteorologists, emergency managers and city planners. This article will focus primarily on the emergency management and city planning perspective and will indicate the importance as well as provide some ideas how these two groups of professionals can contribute to assist communities become more resilient.

Emergency managers are historically known for being the responders immediately after a disaster. As time went on, focus shifted to mitigating and lessening the impacts of disasters. However, over the past couple of

decades we have seen a movement to planning for disasters, focusing on resiliency becoming a part of emergency management. Emergency managers have expertise in the federal and state requirements for hazard mitigation and disaster response plans. They have the tools and knowledge of local hazards and the possible impacts on the community; they can put together plans that address these hazards. City planners are typically thought of as the people needed for the rebuilding process, for example, to check zoning, land use compatibility or assist with building permits after the disaster occurred. Over the last couple of decades there have been more city planners involved in pre-disaster planning, hazard mitigation and resiliency efforts. APA created a division specifically for city planners that have interest or involvement with hazard mitigation or disaster recovery. City planners offer crucial skill sets to hazard mitigation and disaster recovery including having the ability and knowledge to create and work with comprehensive plans, land use compatibility, and citizen engagement. Comprehensive plans help look long term (i.e. 15-20 years) at land use, help create vision/goals for the community, and provides steps to accomplish that goal.

As can be seen, both of these professionals have skill sets that ultimately benefit a community's ability to be more resilient to disasters. Imagine if you will, city planners having at minimum a basic understanding of the types and location of hazards/disasters that a particular community has or may have. City planners can then use that knowledge to create a comprehensive plan that can help prepare for or mitigate against these hazards long term. The flip side can also be seen, where if an emergency manager has at least a minimum understanding of the long-range plans and goals for the community, they can better create a hazard mitigation plan that looks long term. This collaboration would help the community to create better strategies, leading to a community being better equipped at handling disasters long-term.

BENEFITS

There are many benefits of becoming a resilient community, including saving tax payer dollars that could further benefit the community in other capacities. This is shown within the National Institute of Building Sciences, Natural Hazard Mitigation Save: 2017 Interim Report estimates that overall hazard mitigation saves $6 for every $1 spent through hazard mitigation grant funds and investments that exceeded the 2015 model building codes saved $4 for every $1 spent[5]. Figure 2 shows the national cost benefit of using hazard mitigation grant funds and exceeding building codes per peril that was pulled from the report. With the cost of disasters reaching into the billions of dollars, having and implementing a collaborative and fully thought out plan could not only save lives and property but also save money.

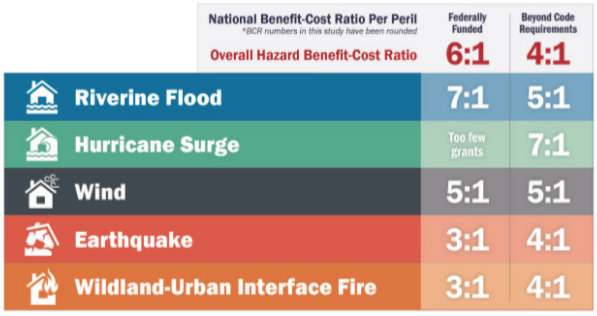


Figure 2: National Cost Benefit per peril

Further social and economic benefits include; preventing loss of life and injury, reducing property damage, reducing business interruption, lowering emergency response and disaster recovery costs, protecting cultural / historical assets and reducing environmental damage[6]. Through combined efforts of city planning and emergency management there could be a long-term benefit that helps improve not only the financial standing but also the human and social capacity of a community.

Both groups of professionals have the goal of creating a community that people will want to live, work, and visit on a daily basis for many years to come. Inevitably, a disaster of some

type will occur, but if planning occurs with careful thought and collaboration the ability for the community to bounce back will be far greater than if no planning at all occurs. Thus, this collaboration and planning effort will only further increase the durability of the community.

REFERENCES

[1]APA Policy Guide on Climate Change. (2018, September 10). Retrieved from APA: https://www.planning.org/policy/guides/adopted/climatechange.htm

[2]Building Community Resilience by Integrating Hazard Mitigation. (2018, September 10). Retrieved from FEMA: https://www.fema.gov/media-library-data/20130726-1908-25045-9184/factsheet3.pdf

[3]Climate Change. (2018, September 8). Retrieved from FEMA: https://www.fema.gov/climate-change

[4]Climate Change: Vital Signs of the Planet: Effects. (2018, September 7). Retrieved from NASA: https://climate.nasa.gov/effects/?Print=Yes

[5]Climate Science Special Report (NCA4). (2018, September 9). Retrieved from Fourth National Climate Assessment (NCA4), Volume I: https://science2017.globalchange.gov/

[6]National Institute of Building Sciences. (2018, September 10). Retrieved from Natural Hazard Mitigation Saves: 2017 Interim Report: https://www.nibs.org/page/ms2_dwnload

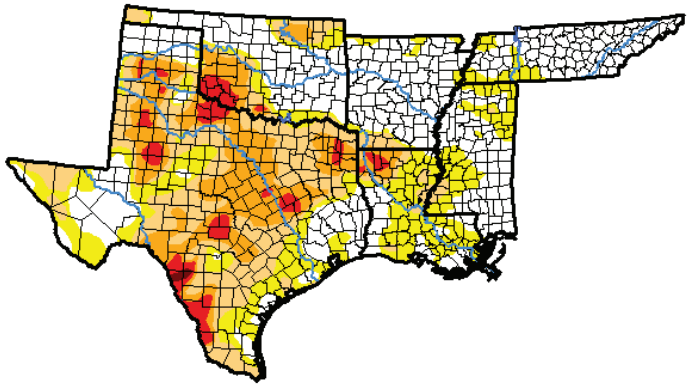
Drought Update

Kyle Brehe and Derek Thompson,
Southern Regional Climate Center

At the end of August, exceptional drought conditions were present in southwestern Texas. Extreme drought classifications were present in southwestern and southern Oklahoma, southwestern, northern, central, and eastern Texas; and northwestern Louisiana. Severe drought classifications were present throughout parts of northern, central, southwestern, and northeastern Texas; southwestern and northeastern Oklahoma, southwestern Arkansas, and northwestern Louisiana. Moderate drought classification was present throughout extreme western, northern, central, southern, and eastern Texas; extreme western, southwestern, southeastern, and northeastern Oklahoma; southwestern and northwestern Arkansas, eastern, northwestern, and part of southwestern Louisiana; and parts of southwestern and northeastern Mississippi. There were no drought conditions in Tennessee.

On August 14, 2018, tennis ball sized hail was reported near Pampa, Texas. Also, a wind gust of 67 mph (107.83 kph) was reported near Mangum, Oklahoma.

On August 20, 2018, a tornado was reported near Walcott, Arkansas. A fatality was reported near Spearsville, Louisiana, after strong winds downed a tree on a mobile home. A wind gust of 76 mph (122.31 kph) was reported near Monroe, Louisiana.



Released Thursday, August 30, 2018
Jessica Blunden, NCEI/NOAA

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	40.21	59.79	38.33	18.89	4.43	0.15
Last Week *08-21-2018*	36.45	63.55	37.64	17.38	3.60	0.32
3 Months Ago *05-29-2018*	51.74	48.26	26.46	16.47	7.90	1.90
Start of Calendar Year *01-02-2018*	31.09	68.91	42.64	15.33	0.30	0.00
Start of Water Year *09-26-2017*	72.17	27.83	2.38	0.02	0.00	0.00
One Year Ago *08-29-2017*	97.51	2.49	0.44	0.00	0.00	0.00

Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

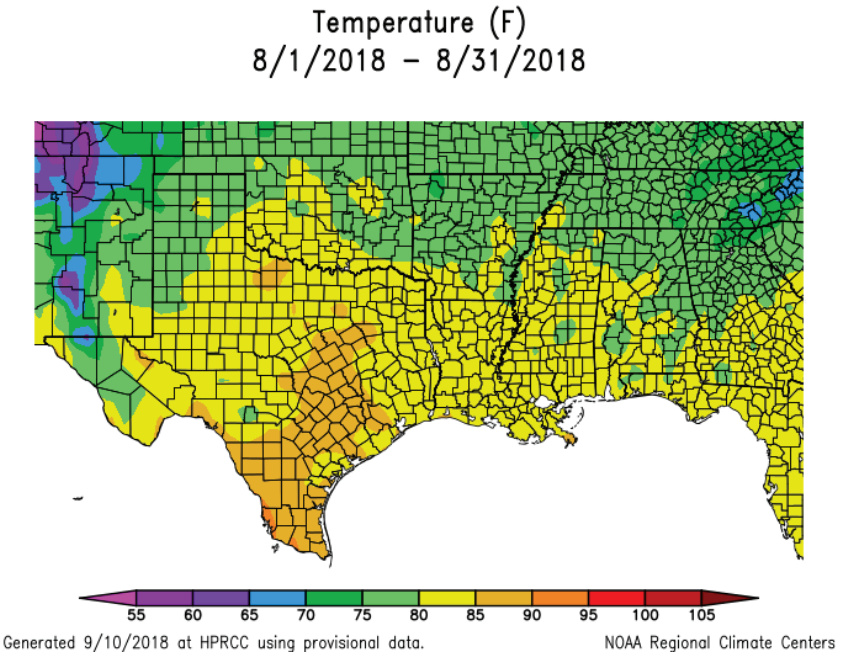
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Above: Drought Conditions in the Southern Region. Map is valid for August 28, 2018. Image is courtesy of the National Drought Mitigation Center.

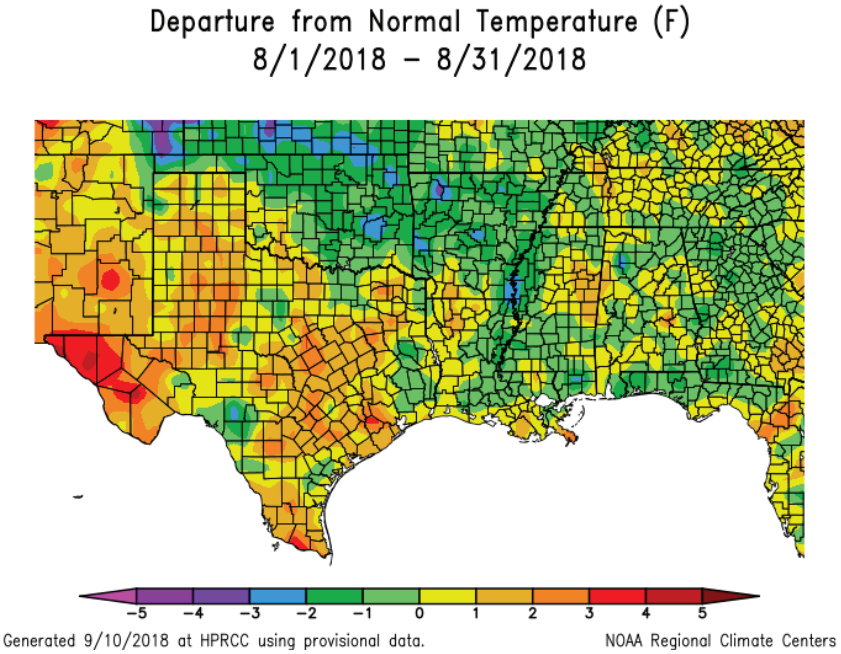
Temperature Summary

Kyle Brehe and Derek Thompson,
Southern Regional Climate Center

Temperatures for the month of August varied spatially throughout the Southern Region. Parts of extreme northwestern Oklahoma and northwestern Arkansas experienced temperatures 3 to 4 degrees F (1.67 to 2.22 degrees C) below normal. Parts of northeastern, eastern, and northwestern Oklahoma; northwestern, western, central, northeastern, and southeastern Arkansas; western and southern Mississippi, northeastern Louisiana, and southwestern Texas experienced temperatures 2 to 3 degrees F (1.11 to 1.67 degrees C) below normal. Northern and southeastern Louisiana, eastern Mississippi, northwestern and part of southwestern Tennessee, southwestern Oklahoma, and much of Texas experienced temperatures 1 to 3 degrees F (0.56 to 1.67 degrees C) above normal. Far southern, southeastern, and far western Texas experienced temperatures 3 to 5 degrees F (1.67 to 2.78 degrees C) above normal. The statewide monthly average temperatures were as follows: Arkansas – 78.80 degrees F (26.00 degrees C), Louisiana – 82.10 degrees F (27.83 degrees C), Mississippi – 80.40 degrees F (26.89 degrees C), Oklahoma – 79.80 degrees F (26.56 degrees C), Tennessee – 76.50 degrees F (24.72 degrees C), and Texas – 83.10 degrees F (28.39 degrees C). The statewide temperature rankings for August were as follows: Arkansas (fifty-second coldest), Louisiana (forty-second warmest), Mississippi (fifty-fourth warmest), Oklahoma (forty-fifth coldest), Tennessee (fifty-first warmest), and Texas (thirty-third warmest). All state rankings are based on the period spanning 1895-2018.



Average August 2018 Temperature across the South

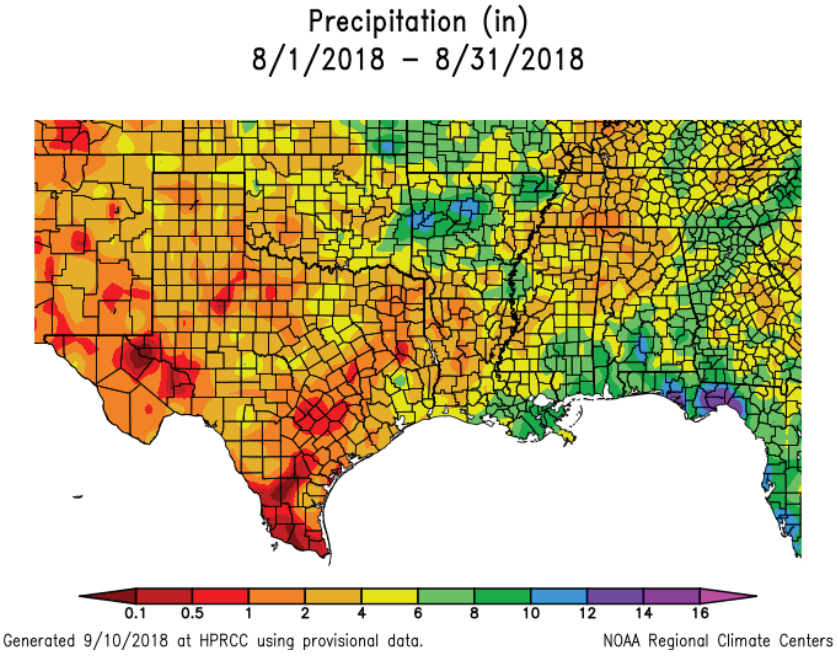


Average Temperature Departures from 1981-2010 for August 2018 across the South

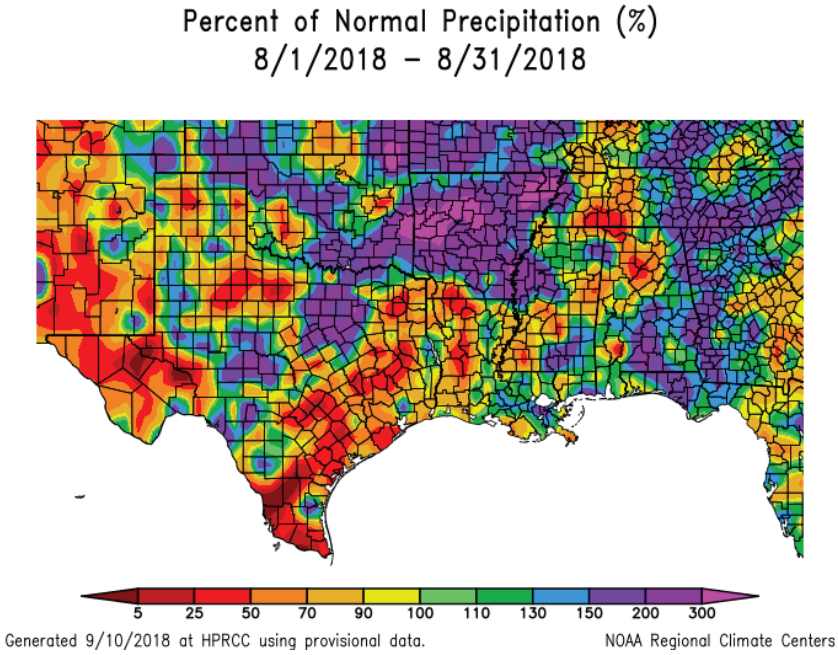
Precipitation Summary

Kyle Brehe and Derek Thompson, Southern Regional Climate Center

Precipitation values for the month of August varied spatially throughout the Southern Region. Parts of western and southern Texas received 5 percent or less of normal precipitation. Northern, northeastern, eastern, southeastern, southern, western, and central Texas; areas in southwestern and eastern Oklahoma, northern, central, and part of eastern Louisiana; southwestern Arkansas, southwestern Tennessee, and areas in northeastern and southwestern Mississippi received 50 percent or less of normal precipitation. In contrast, parts of western, southwestern, southern, central, and northeastern Texas; western, central, southern, southeastern, eastern, and northeastern Oklahoma; extreme southeastern Louisiana, most of Arkansas, southern, northwestern and northeastern Mississippi; and parts of western, northern, southeastern, and northeastern Tennessee received 150 percent or more of normal precipitation. Parts of northeastern Texas, eastern and northeastern Oklahoma, western, central, northeastern, and southeastern Arkansas; and part of northwestern Tennessee received 300 percent or more of normal precipitation. The state-wide precipitation totals for the month were as follows: Arkansas – 6.40 inches (162.56 mm), Louisiana – 4.46 inches (113.28 mm), Mississippi – 4.64 inches (117.86 mm), Oklahoma – 4.29 inches (108.97 mm), Tennessee – 4.16 inches (105.66 mm), and Texas – 2.23 inches (56.64 mm). The state precipitation rankings for August were as follows: Arkansas (eighth wettest), Louisiana (fifty-ninth driest), Mississippi (thirty-seventh wettest), Oklahoma (twentieth wettest), Tennessee (fifty-second wettest), and Texas (fifty-ninth wettest). All state rankings are based on the period spanning 1895-2018.

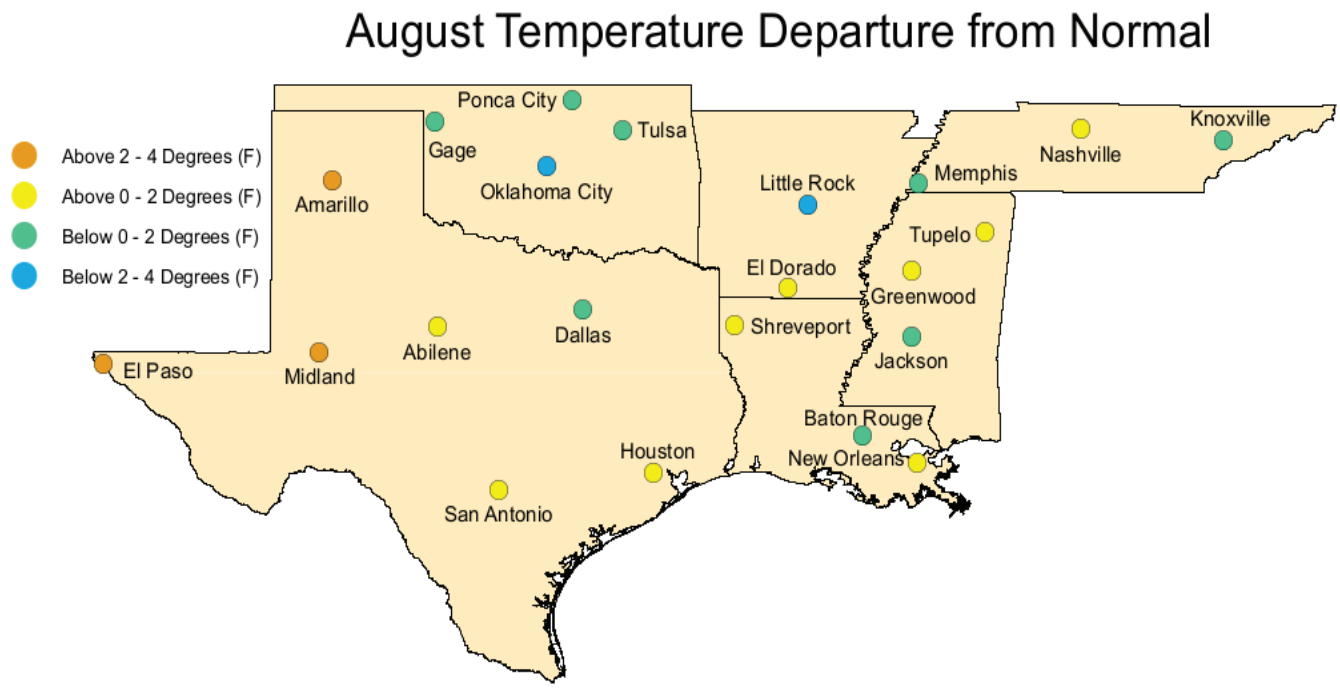


August 2018 Total Precipitation across the South

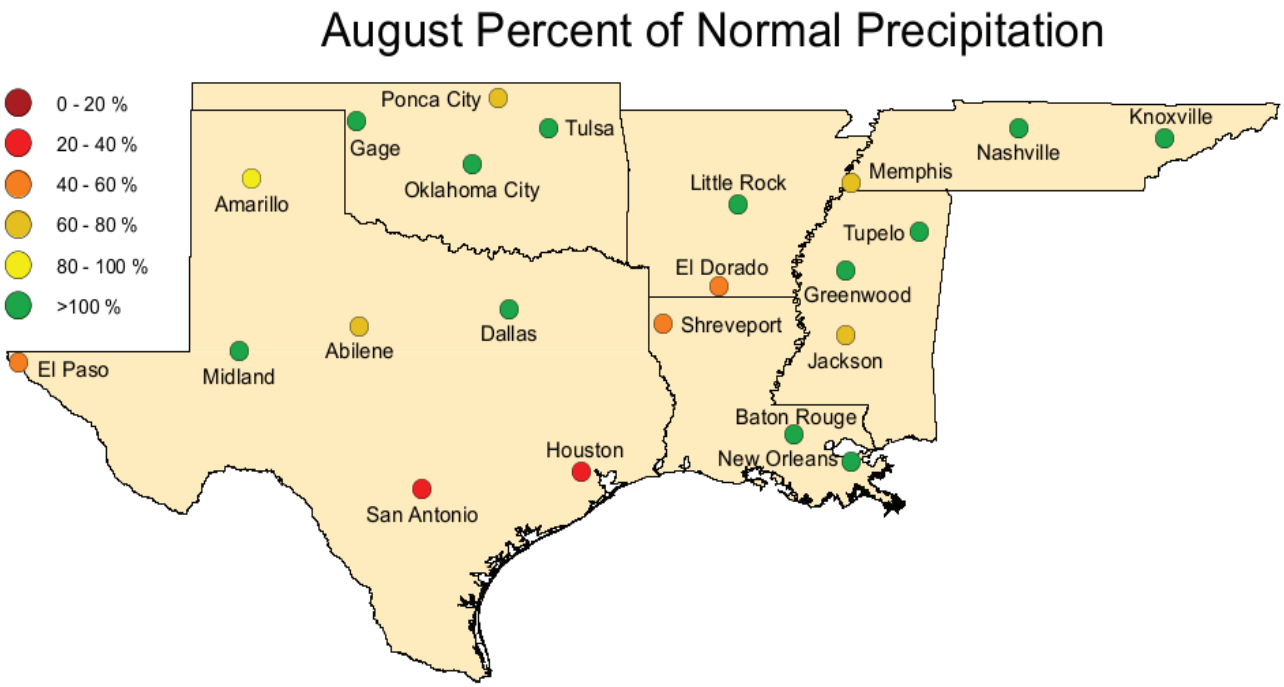


Percent of 1981-2010 normal precipitation totals for August 2018 across the South

Regional Climate Perspective in Pictures



August 2018 Temperature Departure from Normal from 1981-2010 for SCIPP Regional Cities



August 2018 Percent of 1981-2010 Normal Precipitation Totals for SCIPP Regional Cities

Climate Perspective

State	Temperature	Rank (1895-2018)	Precipitation	Rank (1895-2018)
Arkansas	78.80	52nd Coldest	6.40	8th Wettest
Louisiana	82.10	42nd Warmest	4.46	59th Driest
Mississippi	80.40	54th Warmest	4.64	37th Wettest
Oklahoma	79.80	45th Coldest	4.29	20th Wettest
Tennessee	76.50	51st Warmest	4.16	52nd Wettest
Texas	83.10	33rd Warmest	2.23	59th Wettest
Regional	**80.12**	**60th Warmest**	**4.36**	**27th Wettest**

State temperature and precipitation values and rankings for August 2018. Ranks are based on the National Climatic Data Center's Statewide, Regional, and National Dataset over the period 1895-2018.

Station Summaries Across the South

Station Summaries Across the South

Station Name	Temperatures								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	%Norm
Little Rock, AR	89.4	70.1	79.7	-2.8	97	08/07	65	08/24+	6.59	4.00	254
Baton Rouge, LA	92.3	72.9	82.6	-0.3	96	08/15	70	08/23+	6.96	1.14	119
New Orleans, LA	91.1	76.4	83.8	0.5	97	08/15	74	08/11+	9.88	3.90	165
Shreveport, LA	96.0	72.7	84.3	1.2	101	08/20	63	08/03+	1.15	-1.58	42
Greenwood, MS	91.4	70.8	81.1	0.1	97	08/16	64	08/23	6.07	3.24	214
Jackson, MS	91.6	70.3	81.0	-0.3	96	08/15	64	08/24	2.97	-1.27	70
Tupelo, MS	90.9	71.4	81.2	0.4	96	08/15+	63	08/24+	5.02	1.57	145
Gage, OK	91.4	67.1	79.2	0.0	98	08/27	55	08/21	7.46	5.07	312
Oklahoma City, OK	89.1	69.0	79.1	-3.3	97	08/07	62	08/01	9.04	5.76	275
Ponca City, OK	90.9	69.7	80.3	-0.7	99	08/06+	60	08/01	2.35	-0.90	72
Tulsa, OK	91.0	71.3	81.2	-1.0	98	08/06	64	08/01	4.85	1.95	167
Knoxville, TN	86.1	68.1	77.1	-0.7	92	08/28	57	08/24	4.66	1.39	142
Memphis, TN	90.3	72.4	81.3	-0.7	95	08/16+	65	08/23	2.07	-0.81	71
Nashville, TN	90.1	70.2	80.1	1.4	96	08/06	60	08/24	4.90	1.73	154
Abilene, TX	95.2	73.1	84.1	1.3	102	08/28	63	08/01	1.67	-0.92	64
Amarillo, TX	93.0	65.0	79.0	2.2	99	08/28	59	08/21+	2.78	-0.13	95
El Paso, TX	96.6	73.5	85.1	4.0	103	08/02	65	08/11	1.16	-0.85	57
Dallas, TX	95.0	75.5	85.2	-0.4	101	08/18	68	08/01	2.99	1.08	156
Houston, TX	95.0	75.6	85.3	0.7	100	08/21	71	08/02	0.85	-2.91	22
Midland, TX	95.5	73.0	84.2	3.0	102	08/27	67	08/09	3.24	1.40	176
San Antonio, TX	97.6	75.6	86.6	1.3	101	08/22	69	08/02	0.62	-1.47	29

Summary of temperature and precipitation information from around the region for August 2018. Data provided by the Applied Climate Information System. On this chart, "depart" is the average's departure from the normal average, and "% norm" is the percentage of rainfall received compared with normal amounts of rainfall. Plus signs in the dates column denote that the extremes were reached on multiple days. Blueshaded boxes represent cooler than normal temperatures; redshaded boxes denote warmer than normal temperatures; tan shades represent drier than normal conditions; and green shades denote wetter than normal conditions.

Southern Climate Monitor Team

Kyle Brehe, Regional Climatologist
Southern Regional Climate Center (LSU)

James Cuellar, Student Assistant SCIPP (OU)

Margret Boone, Program Manager SCIPP (OU)

From Our Partners

Managing for a Changing Climate Fall Courses

The DOI South Central Climate Adaptation Science Center (managed by USGS and hosted at OU) is launching an updated version of its popular free online course "Managing for a Changing Climate" this Fall (see attached flyer). The course will be offered as four short courses, allowing participants to focus on specific topics with a much shorter time commitment.

Short courses being offered:
Introduction to the climate system (August 27 - September 10, 2018)
Climate models, downscaling, and assessments (September 10 - October 1, 2018)
Societal impacts of climate change (October 1 - October 22, 2018)
Physical impacts of climate change & adaptation strategies (October 22 - November 26, 2018)

The courses will use the janux.ou.edu platform. To sign up for a short course, please complete this online form.

For additional information: http://www.southcentralclimate.org/index.php/pages/calendar#927

If you have any questions, please contact Emma Kuster (emmakuster@ou.edu).

Contact Us

To provide feedback or suggestions to improve the content provided in the Monitor, please contact us at monitor@southernclimate.org. We look forward to hearing from you and tailoring the Monitor to better serve you. You can also find us online at www.srcc.lsu.edu & www.southernclimate.org.

For any questions pertaining to historical climate data across the states of Oklahoma, Texas, Arkansas, Louisiana, Mississippi, or Tennessee, please contact the Southern Regional Climate Center at (225)578-5021.

For questions or inquiries regarding research, experimental tool development, and engagement activities at the Southern Climate Impacts Planning Program, please contact us at (405)325-7809 or (225)578-8374.

Monthly Comic Relief