SCIPP
A NOAA RISA TEAM

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The Southern Climate Monitor is available at
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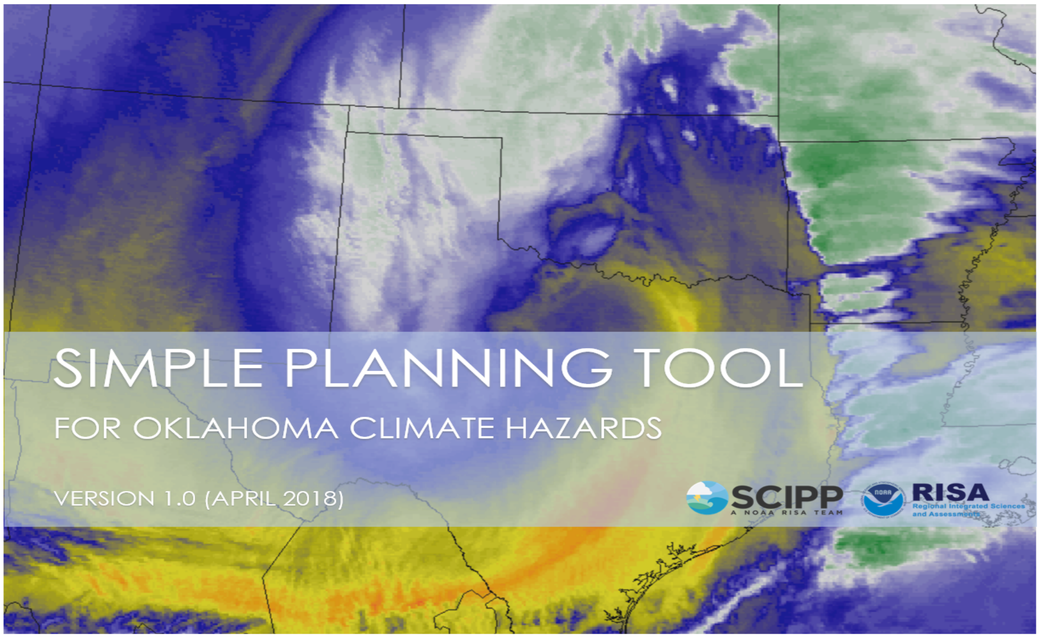
Simple Planning Tool for Oklahoma Climate Hazards

Rachel Riley, Southern Climate Impacts Planning Program



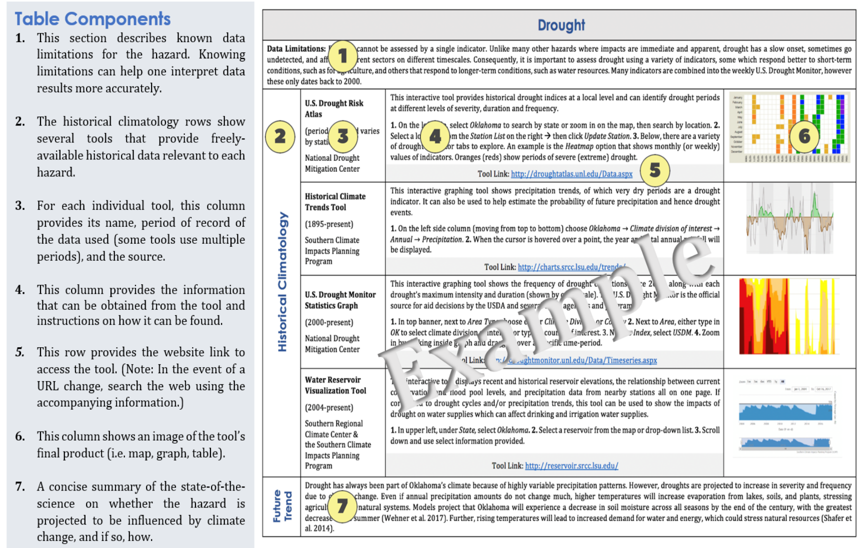
Cover of the Simple Planning Tool for Oklahoma Climate Hazards

The Southern Climate Impacts Planning Program (SCIPP) is pleased to announce a new tool that will assist planners and emergency managers across the state of Oklahoma with assessing their long-term climate risks. It is called the Simple Planning Tool for Oklahoma Climate Hazards. In addition to the previous hyperlink (http://www.southernclimate.org/documents/SPTOK.pdf), the tool is also available by clicking on the Data Tools tab on this website.

SCIPP has been actively involved with emergency management and planning sectors throughout the South Central U.S. over the past few years. Workshops and webinars held in Oklahoma and Arkansas brought together the two sectors and enhanced the natural hazard resilience discussions that were taking place at local, tribal and regional levels across each state. In a 2017 meeting in Oklahoma, decision makers identified the need for a tool to help them identify locally-relevant climate information that can be used in plans such as hazard mitigation plans, land use plans, comprehensive plans, etc. Meeting participants said that they did not always know where to find data and/or which organizations to trust. Based on this feedback, SCIPP developed the Simple Planning Tool for Oklahoma Climate Hazards.

The tool is a compilation of relatively easy-to-use online interactive tools, maps, and graphs that depict historical climatologies. It also provides state-of-the-science summaries regarding what is known about how each hazard is being and is expected to be impacted by climate change. It is primarily designed for planners and emergency managers who serve small- to medium-sized communities but may also be of interest to those who serve larger areas. While it may not answer every question one has about hazard climatologies and future trends, it aims to cut through the internet clutter and point to relatively simple data tools that can be used during planning processes and in plans.

SCIPP will now begin developing a version for Arkansas. Following the release of the Arkansas version, SCIPP will conduct research on how the tools are used in planning and decision making processes and their effectiveness in both states. If you are interested in providing information on your experience with the Simple Planning Tool, please contact [scipp@southernclimate.org.](mailto:scipp@southernclimate.org)



The bulk of the tool is comprised of tables for each climate hazard and describe data limitations, historical climatology tools, and projected future trends. The image above describes the tables and how they are organized.

Meetings with planners and emergency managers about increasing resilience led to the development of the Simple Planning Tool for Oklahoma Climate Hazards.

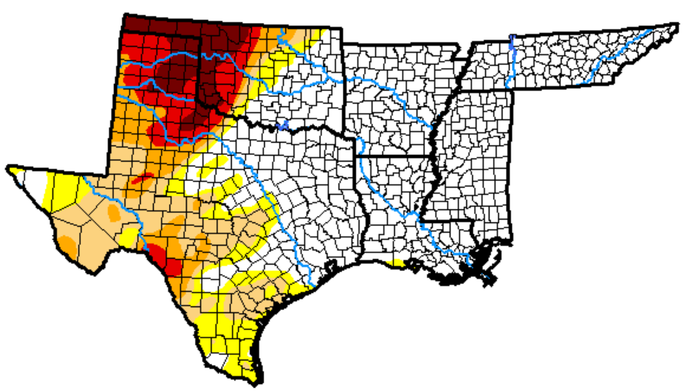
Drought Update

Kyle Brehe and Rudy Bartels,
Southern Regional Climate Center

In April, the exceptional drought classification expanded in western Oklahoma and northern Texas. Extreme drought classification appeared in southwest Texas. The severe drought classification remained through parts of north-central Oklahoma, and central, northern and western Texas. The moderate drought classification remains throughout parts of western, central, northern, and southeast Texas. Drought conditions improved from moderate to abnormally dry conditions in southern Texas. There are currently no drought conditions in Arkansas, Louisiana, Mississippi, and Tennessee.

In April, there were 11 days with severe weather reports throughout the region. There were 696 severe weather events (75 tornado, 203 hail, and 418 wind) reported throughout the Southern Region. Forty-two of the tornado events and 116 of the wind events occurred throughout Texas, Louisiana, Arkansas, Tennessee, and Mississippi on April 13. On April 6, there were 19 tornado events reported throughout Texas, Louisiana, and Mississippi.

As of the end of April, Oklahoma had not had a tornado touchdown in 2018. That broke the record for the longest streak to start a calendar year without a tornado in Oklahoma in recorded history.



Released Thursday, May 3, 2018

David Simeral, Western Regional Climate Center

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	58.62	41.38	31.25	18.48	11.68	5.36
Last Week *04-24-2018*	58.50	41.50	33.20	18.86	11.98	4.56
3 Months Ago *01-30-2018*	16.79	83.21	57.69	29.36	6.74	0.00
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 *05-02-2017*	86.53	13.47	2.43	0.00	0.00	0.00

Intensity:

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

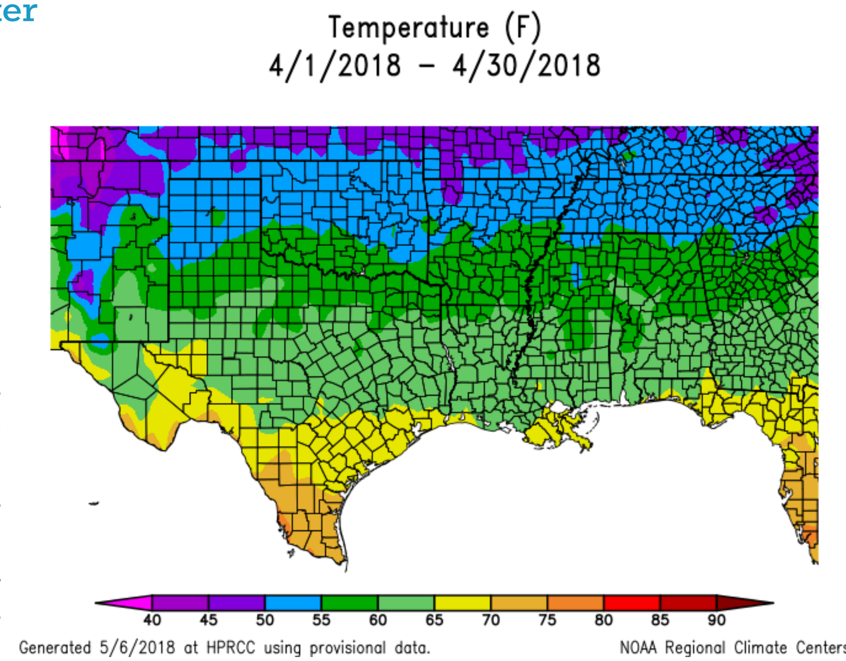
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Above: Drought Conditions in the Southern Region. Map is valid for May 1, 2018. Image is courtesy of the National Drought Mitigation Center.

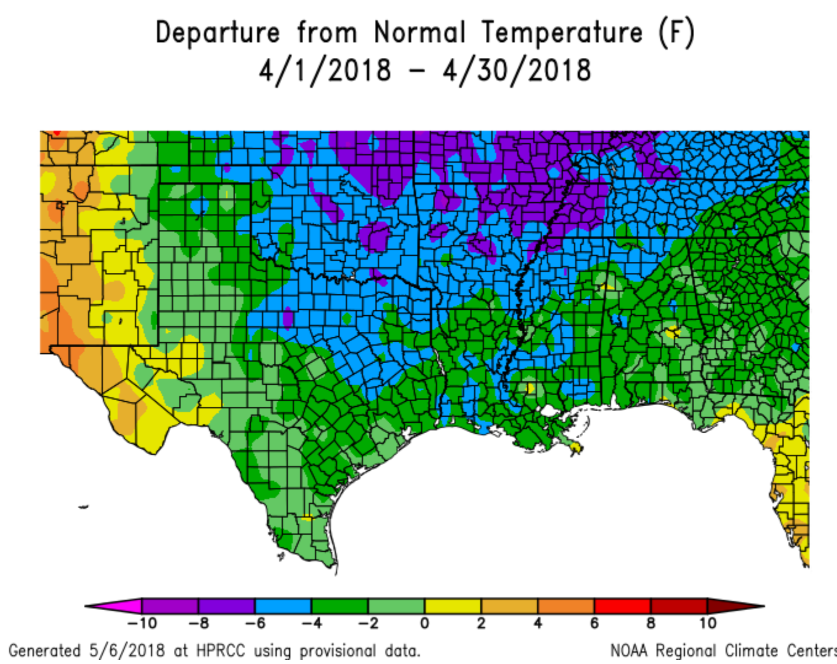
Temperature Summary

Kyle Brehe and Rudy Bartels,
Southern Regional Climate Center

April temperatures were below normal throughout most of the Southern Region. Western Tennessee, north and central Arkansas, central and northeastern Oklahoma, and an area in central Texas experienced temperatures 6 to 8 degrees F (3.33 to 4.44 degrees C) below normal. Most of Arkansas and Oklahoma, central and western Tennessee, northern, central, and southeast Mississippi, central and southern Louisiana, and northeastern Texas were 4 to 6 degrees F (2.22 to 3.33 degrees C) below normal. The only area above normal for April was western Texas which experienced 2 to 6 degrees F (1.11 to 3.33 degrees C) above normal temperatures. The statewide monthly average temperatures were as follows: Arkansas – 55.10 degrees F (12.83 degrees C), Louisiana – 62.40 degrees F (16.89 degrees C), Mississippi – 59.10 degrees F (15.06 degrees C), Oklahoma – 53.80 degrees F (12.11 degrees C), Tennessee – 52.80 degrees F (11.56 degrees C), and Texas – 62.90 degrees F (17.17 degrees C). The statewide temperature rankings for April were as follows: Arkansas (third coldest), Louisiana (fifth coldest), Mississippi (third coldest), Oklahoma (second coldest), Tennessee (fourth coldest), and Texas (twentieth coldest). All state rankings are based on the period spanning 1895-2018.



Average April 2018 Temperature across the South

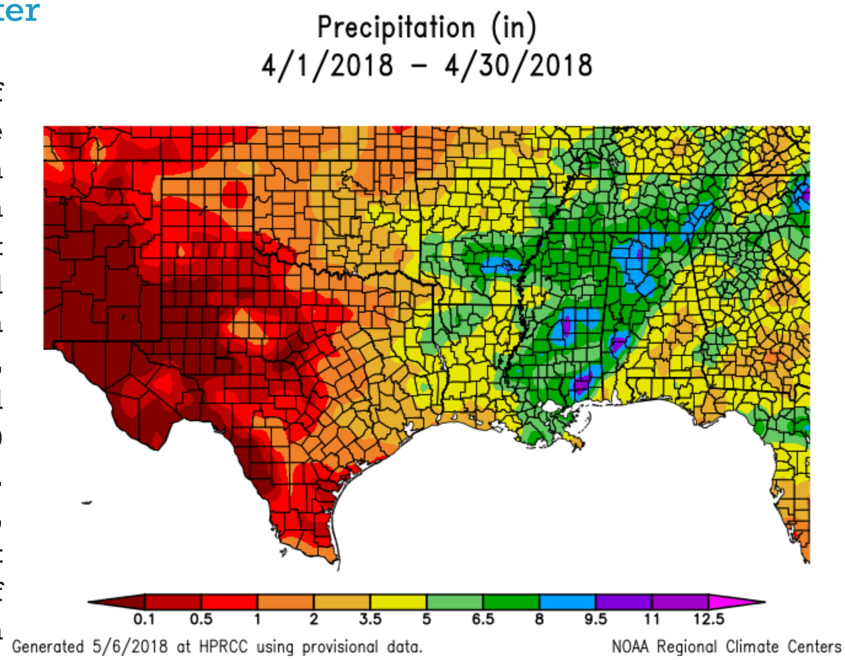


Average Temperature Departures from 1981-2010 for April 2018 across the South

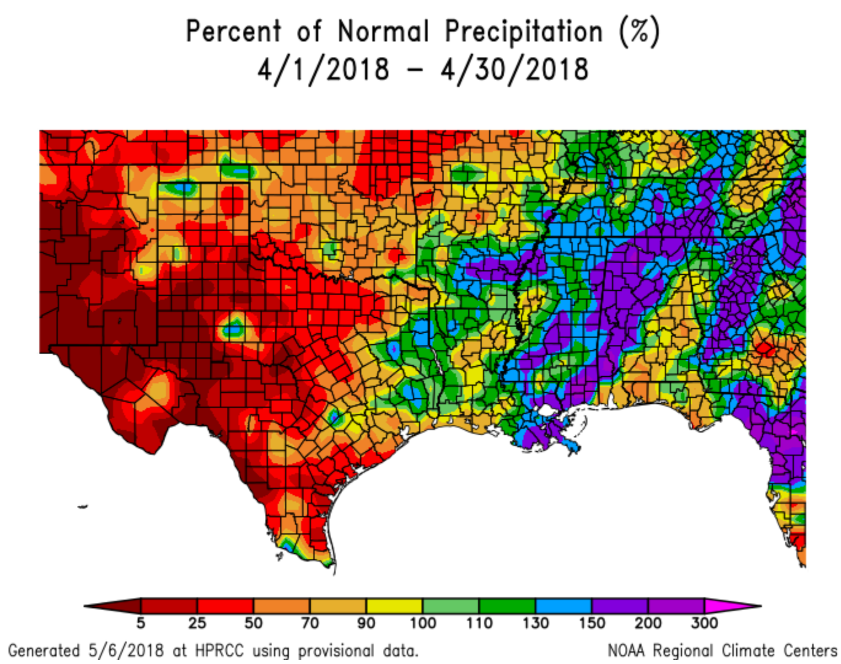
Precipitation Summary

Kyle Brehe and Rudy Bartels,
Southern Regional Climate Center

Precipitation values for the month of April varied spatially throughout the Southern Region. Parts of southeastern Mississippi and extreme eastern Tennessee received 200 – 300 percent of normal precipitation. Central and eastern Tennessee, southeastern Arkansas, southeastern Louisiana, and parts of southern, central, and northwestern Mississippi received 150 – 200 percent of normal precipitation. In contrast, parts of northern, central, and western Texas received 5 percent or less of normal precipitation. Areas of northern, western, central, and southern Texas, southwest and northeastern Oklahoma, and north and northwestern Arkansas received 50 percent or less of normal precipitation. The state-wide precipitation totals for the month were as follows: Arkansas – 4.89 inches (124.21 mm), Louisiana – 4.92 inches (124.97 mm), Mississippi – 6.80 inches (172.72 mm), Oklahoma – 2.07 inches (52.58 mm), Tennessee – 5.76 inches (146.30 mm), and Texas – 1.02 inches (25.91 mm). The state precipitation rankings for the month were as follows: Arkansas (fifty-eighth wettest), Louisiana (fifty-fifth wettest), Mississippi (thirty-third wettest), Oklahoma (twenty-second driest), Tennessee (twenty-sixth wettest), and Texas (fourteenth driest). All state rankings are based on the period spanning 1895-2018.

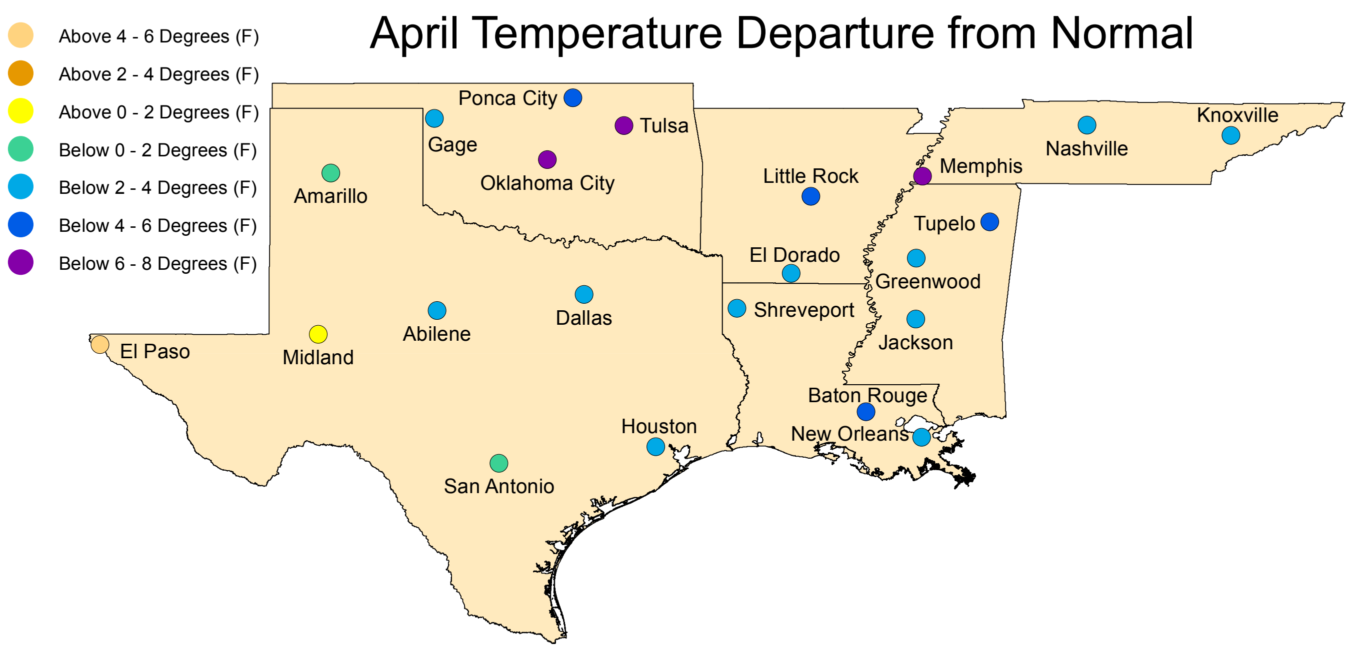


April 2018 Total Precipitation across the South

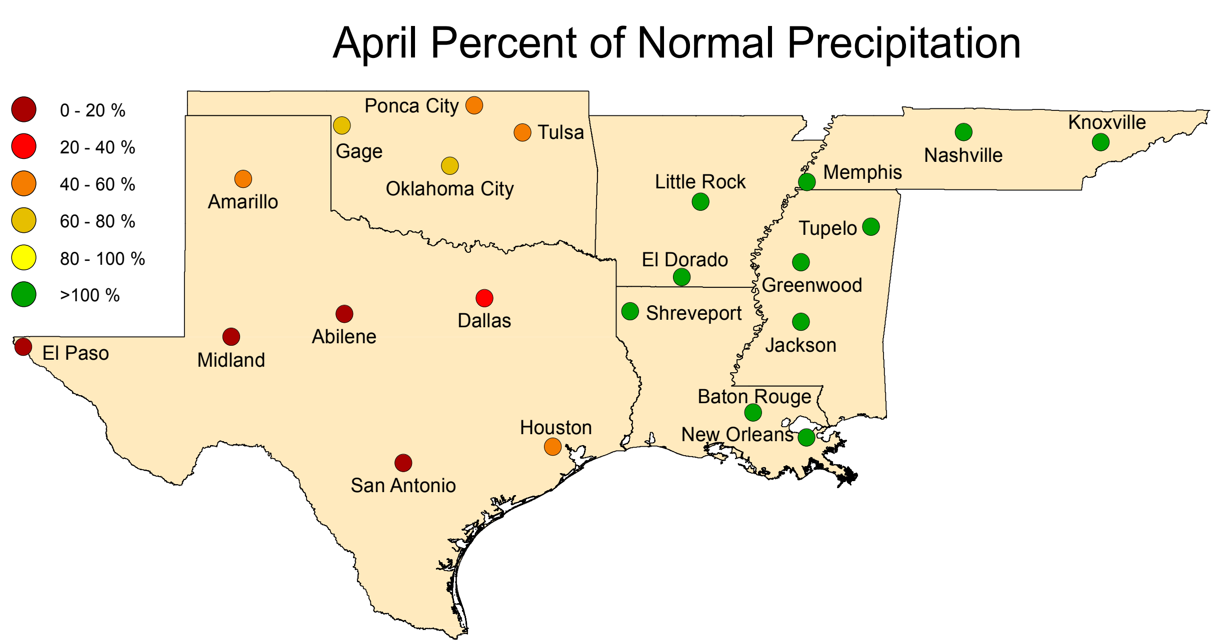


Percent of 1981-2010 normal precipitation totals for April 2018 across the South

Regional Climate Perspective in Pictures



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



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

Climate Perspective

State	Temperature	Rank (1895-2018)	Precipitation	Rank (1895-2018)
Arkansas	55.10	3rd Coldest	4.89	58th Wettest
Louisiana	62.40	5th Coldest	4.92	55th Wettest
Mississippi	59.10	3rd Coldest	6.80	33rd Wettest
Oklahoma	53.80	2nd Coldest	2.07	22nd Driest
Tennessee	52.80	4th Coldest	5.76	26th Wettest
Texas	62.90	20th Coldest	1.02	14th Driest

State temperature and precipitation values and rankings for April 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
El Dorado, AR	72.6	46.4	59.5	-3.9	84	04/30+	31	04/08	4.46	0.37	109
Little Rock, AR	68.5	44.0	56.3	-5.8	85	04/17	28	04/08	5.97	0.83	116
Baton Rouge, LA	76.2	51.7	64.0	-4.1	85	04/29+	42	04/16+	5.45	0.99	122
New Orleans, LA	76.5	57.5	67.0	-2.1	85	04/29	46	04/16	5.82	1.21	126
Shreveport, LA	74.3	49.4	61.9	-3.4	85	04/30+	34	04/16	5.77	1.58	138
Greenwood, MS	71.8	47.3	59.6	-3.8	87	04/03	31	04/08	5.60	0.47	109
Jackson, MS	73.1	48.0	60.5	-3.6	87	04/03	35	04/08	9.04	4.08	182
Tupelo, MS	69.9	45.5	57.7	-4.4	85	04/03	29	04/08	7.49	2.71	157
Gage, OK	70.7	37.4	54.1	-2.7	101	04/12	18	04/07	1.40	-0.34	80
Oklahoma City, OK	67.7	41.2	54.4	-6.6	87	04/17+	24	04/07	2.28	-0.79	74
Ponca City, OK	66.6	38.5	52.6	-5.8	89	04/17+	22	04/16+	2.08	-1.36	60
Tulsa, OK	66.6	41.6	54.1	-6.5	86	04/17	25	04/07	1.76	-2.03	46
Knoxville, TN	67.2	43.9	55.5	-3.3	81	04/14+	31	04/08	4.28	0.27	107
Memphis, TN	67.0	45.7	56.3	-6.6	80	04/12	30	04/08	7.86	2.36	143
Nashville, TN	66.4	44.1	55.3	-3.7	83	04/03	30	04/17+	5.56	1.56	139
Abilene, TX	76.4	45.6	61.0	-3.6	94	04/12	28	04/07	0.30	-1.34	18
Amarillo, TX	71.7	38.2	55.0	-1.4	93	04/12+	20	04/07	0.60	-0.80	43
El Paso, TX	83.9	57.3	70.6	6.0	94	04/11	46	04/15+	T	-0.23	0
Dallas, TX	74.4	48.9	61.6	-3.9	88	04/13	34	04/07	0.77	-2.26	25
Houston, TX	77.9	55.9	66.9	-2.6	86	04/25	43	04/16	1.90	-1.41	57
Midland, TX	82.0	48.6	65.3	1.1	98	04/12	35	04/07	T	-0.65	0
San Antonio, TX	79.1	56.9	68.0	-1.3	87	04/13+	41	04/15	0.36	-1.74	17

Summary of temperature and precipitation information from around the region for April 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.

New Research: Primary Atmospheric Drivers of Pluvial Years in the United States Great Plains

Margret Boone, SCIPP Program Manager

Researchers from the University of Oklahoma recently published a new study relating to the causes of persistent heavy rainfall patterns in the Great Plains. The article, "Primary Atmospheric Drivers of Pluvial Years in the United States Great Plains", which appeared in the April 2018 American Meteorological Society Journal of Hydrometeorology, discusses periods of excessive precipitation, also known as pluvials, and how precipitation variability is changing (and what is driving the change) over the Great Plains.

The Great Plains, defined as Texas, Oklahoma, Kansas, Nebraska, South Dakota and North Dakota, has seen both years of drought and years of excessive precipitation in recent history. Because of the extensive agricultural development over the region, precipitation deficits and excesses are extremely important to the region. Previous studies have focused on sea surface temperature patterns associated with drought (precipitation deficits) events, and other forcing mechanisms. This study, instead, focuses on understanding the atmospheric drivers and forcing mechanisms of pluvial years across the Great Plains.

For this study, the Great Plains was divided into two sections: the Northern Great Plains (NGP) and the Southern Great Plains (SGP), to account for greater precipitation and variability in the Southern Great Plains. Analysis of numerical weather models were used to determine large-scale weather features which may have impacted the pluvial periods from the NGP and SGP.

Results indicate that as a whole, persistent heavy rainfall patterns are more dependent on storm systems, rather than longer time-scale features such as ocean temperatures like El Nino, across both the NGP and the SGP. In the Southern Great Plains, a more active southern jet stream increases storm activity, leading to heavy rainfall. For the Northern Great Plains, an extension of the northern jet stream facilitates more storm systems to move across the region, leading to heavy rainfall. For the SGP, the frequency of storm systems and precipitation tends be to the greater factor, whereas the intensity of the storm systems is more effective in the NGP. Temperatures in the lower atmosphere also appear play a role in pluvial patterns across both the SGP and NGP.

The result of this study was to help expand understanding of the changing nature of precipitation across the Great Plains in the past and under future climate change. This also helps water resource managers understand what brings excessive rainfall to a region.

If you are interested in reading this publication, the manuscript can be found online at the following link: https://journals.ametsoc.org/doi/10.1175/JHM-D-17-0148.1

This work was supported, in part, by the Agriculture and Food Research Initiative Competitive Grant (2013-69002) from the USDA National Institute of Food and Agriculture and National Science Foundation Grant ICER1663840. For more information about this research, contact Paul Flanagan, pxfl1@ou.edu

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From Our Partners

South Central Climate Science Center: Regional Climate Projections for the Transportation Sector

Extreme weather, including severe storms, droughts, floods, and extreme temperatures, poses hazards to transportation safety and state of repair. Future temperature and precipitation trends are likely to be outside of the range of historical environmental conditions on which many transportation design standards are currently based. Understanding regional climate hazards is the first step in adequately adapting to these changes and reducing potential social, economic, and environmental impacts to the transportation system.

A recently completed project funded in part by the Southern Plains Transportation Center (SPTC) and in partnership with the South Central Climate Adaptation Science Center uses multiple climate datasets to identify historical trends and future climate scenarios for the 5-state region of Oklahoma, Texas, Arkansas, Louisiana, and New Mexico. The project explores specific weather and climate hazards identified as important by transportation decision-makers and describes how changes in these hazards may impact the transportation sector in each state.

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

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