



# SOUTHERN CLIMATE *MONITOR*

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## IN THIS ISSUE:

*Page 2 to 4 - Severe Thunderstorm Climatology in the SCIPP Region*

*Page 4 - Drought Update*

*Page 5 - Southern U.S. Precipitation Summary for March*

*Page 6 - Southern U.S. Temperature Summary for March*

*Page 7- Climate Perspective and Station Summaries Across the South*

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**LSU**



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Southern Climate Impacts Planning Program



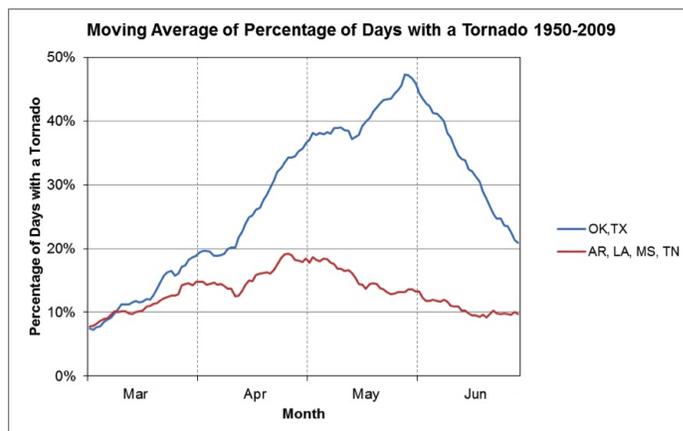
## SEVERE THUNDERSTORM CLIMATOLOGY IN THE SCIPP REGION

*Robert Gottlieb, Southern Climate Impacts Planning Program*

The SCIPP region contains many of the states that experience the greatest numbers of severe thunderstorms and tornadoes in the United States. The peak season for tornadoes in the SCIPP region occurs during the months of March through June, although the threat for widespread tornado outbreaks decreases towards the end of May. The most common time of day for tornadoes is the late afternoon and early evening. However, it is very important to remember that tornadoes can happen during any month and any time of day. Many maps and graphs detailing the past occurrence of severe weather in the months of March through June are presented here to represent the climatology of severe thunderstorms across the south. Although these figures indicate what happens in an average year, it is important to note that one year can be very different from the next and that these data do not necessarily predict what will happen in future years.

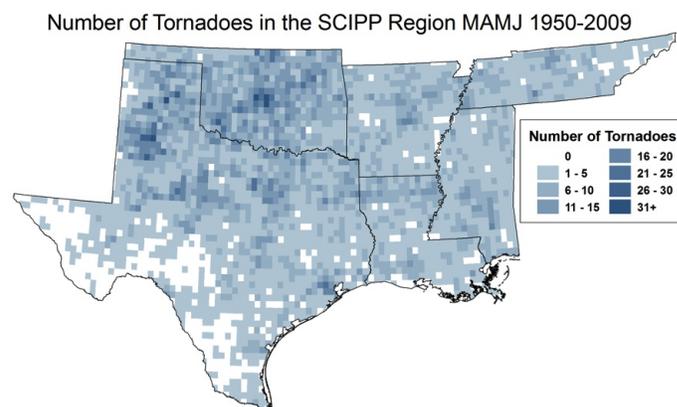
All data is provided by the Storm Prediction Center (SPC) in Norman, Oklahoma. The SPC archives formal records of tornado reports going back to 1950, and severe hail and wind reports going back to 1955. For this article, all data going up to 2009 is used. For these years severe hail was defined by the National Weather Service (NWS) as hail of at least 0.75 inches in diameter. However, in 2010 the definition was changed to include only hail of at least 1 inch in diameter. Severe wind from a thunderstorm is defined as being at least 50 knots, which is approximately 58 mph. In general, the number of reports of severe weather is much higher now than it was in the early record. This is because more people now track and report severe weather, particularly in more rural areas. It does not mean that the actual number of severe thunderstorms has changed.

It is helpful to divide the SCIPP region into two sub-regions when looking at severe weather



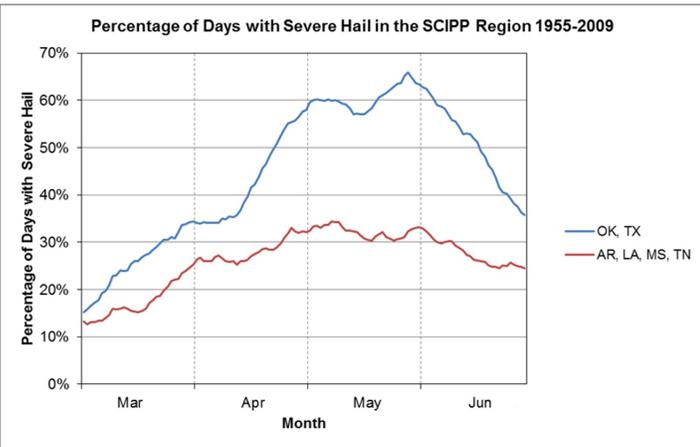
**Figure 1: A two-week moving average of the percentage of days with at least one tornado report for the months of March through June (data from 1950-2009).**

climatology: a western portion (including Oklahoma and Texas) and an eastern region (comprised of Arkansas, Louisiana, Tennessee, and Mississippi). When looking at graphs, keep in mind that the western region is significantly larger than the eastern region. There are two ways to count the number of severe events that occur each day. One way is to count the total number of severe events in the region, and the

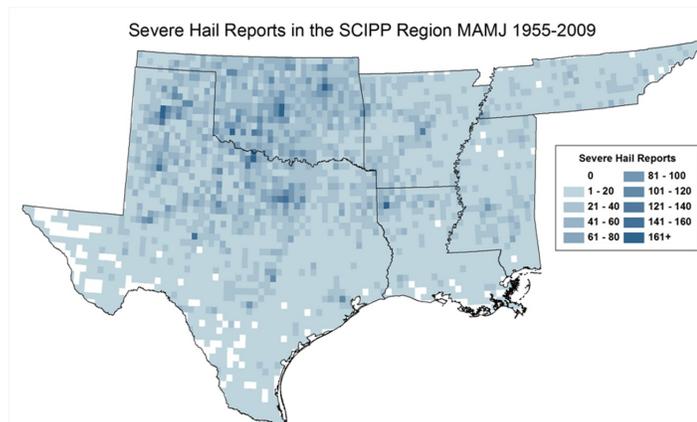


**Figure 2: The number of tornadoes for the months of March through June across the SCIPP region (data from 1950-2009). The grid box has an area of 0.2 degrees by 0.2 degrees (approximately 14 miles by 14 miles).**

other is to count the number of days that had at least one severe event. The number of severe events has been smoothed using a technique called a moving average. This involves averaging the data for the days immediately surrounding each day. For this article this has been done for the seven days before and after each day.



**Figure 3: As Figure 1, but for severe hail reports (data from 1955-2009).**



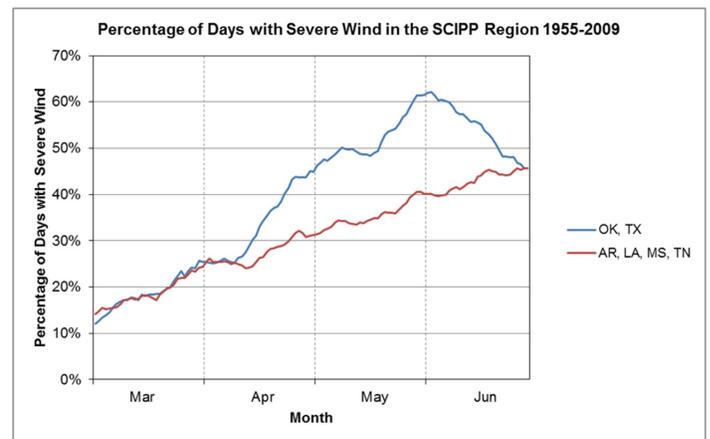
**Figure 4: As Figure 2, but for severe hail reports (data from 1955-2009).**

The number of tornadoes is much higher in Oklahoma and Texas, especially during May and June. The number of tornadoes in Oklahoma and Texas has a major peak, while the number of tornadoes in the eastern region is more constant during the spring (Figure 1). In general

tornadoes are most prevalent in Oklahoma and northern Texas, (Figure 2). The peak time of day for tornadoes in the SCIPP region is approximately 4-8 pm CST. Graphs of the timing of severe events are not shown here.

Across the country reports of severe hail and wind associated with thunderstorms are far more common than tornadoes. The numbers of hail and wind reports are almost the same. Note that the scales of the graphs for tornadoes and other events are not the same because their numbers are so different (Figures 1 and 3). In the SCIPP region during the months of March through June, hail is much more common in the west than the east (Figures 3 and 4). The peak month for hailstorms in Oklahoma and Texas is May. In the eastern part of the region, the peak for the raw number of hail storms occurs in April, while the peak in the number of days with at least one hail report occurs in May. The peak of hail reports occurs approximately between 3 pm and 8 pm for both regions.

Unlike hail, the numbers of severe wind reports in the western and eastern parts of the SCIPP region are similar, but the western region has had slightly more reports during the time period detailed here. Wind reports are more evenly



**Figure 5: As Figure 3, but for severe wind reports.**

distributed throughout the SCIPP region than tornadoes or hail reports (Figure 5).

The peak in total reports occurs around June 1 in both regions. The percentage of days with at least one wind report in the two regions is nearly identical through mid-April, but the western part of the region takes the lead after that. Like the total number of reports, the peak in days with a report Oklahoma and Texas occurs around June 1, but the peak in the eastern part of the region occurs in late June. The hourly timing of wind reports varies between the two regions. The western region has its peak in wind reports between 6 and 9 pm, while the eastern region has its peak between 2 and 8 pm.

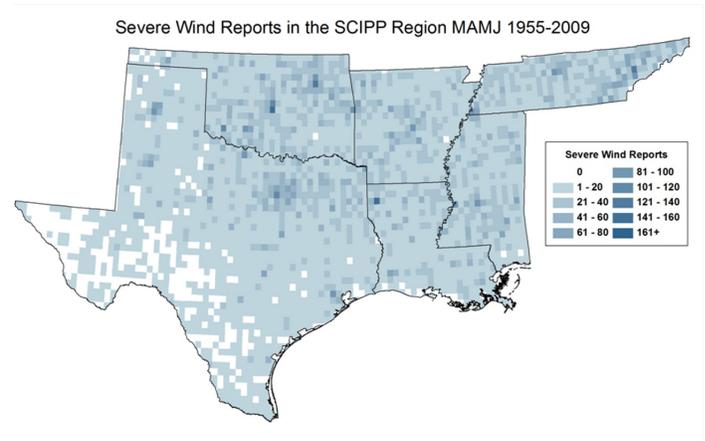


Figure 6: As Figure 4 but for severe wind reports.

## DROUGHT CONDITIONS

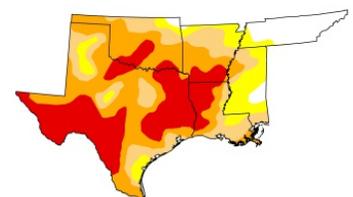
*Luigi Romolo, Southern Regional Climate Center*

Extreme March dryness in Oklahoma and Texas has led to dramatic changes in drought conditions over the past month. As of March 1, 2011, only 10.76 percent of the Southern Region was classified as extreme drought. As of March 29, 2011, that value is now 28.53 or almost three times as high. Most of the extreme drought expansion occurred in southwestern Texas, where precipitation totals for the month of March ranged from 0 to 25 percent of normal, with a majority of stations receiving less than one tenth of an inch (2.54 mm) of precipitation for the month. A new section of extreme drought has emerged in north central Texas and south central Oklahoma. Similarly, new extreme drought was introduced into northeastern Texas, and southern Arkansas. In addition, a majority of the northeast section of the Southern Region is now experiencing severe drought or worse, as opposed to last month, where much of the northeast was showing just abnormally dry or moderate drought conditions. In Mississippi and Tennessee, drought conditions

## U.S. Drought Monitor South

March 29, 2011  
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	8.33	91.67	79.16	60.10	28.53	0.00
Last Week (03/22/2011 map)	8.76	91.24	77.39	50.26	20.47	0.00
3 Months Ago (12/28/2010 map)	8.86	91.14	67.65	35.21	10.17	0.00
Start of Calendar Year (12/28/2010 map)	8.86	91.14	67.65	35.21	10.17	0.00
Start of Water Year (09/28/2010 map)	54.23	45.77	20.04	6.79	0.83	0.00
One Year Ago (03/23/2010 map)	98.24	1.76	0.00	0.00	0.00	0.00



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

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



Released Thursday, March 31, 2011  
Eric Luebbehusen, United States Department of Agriculture

<http://drought.unl.edu/dm>

**Drought conditions in the Southern Region. Map is valid for March 2011. Image courtesy of the National Drought Mitigation Center.**

have improved over the past month. Tennessee is now drought free, while Mississippi has seen a one category improvement to mostly abnormally dry with pockets of moderate to severe drought.

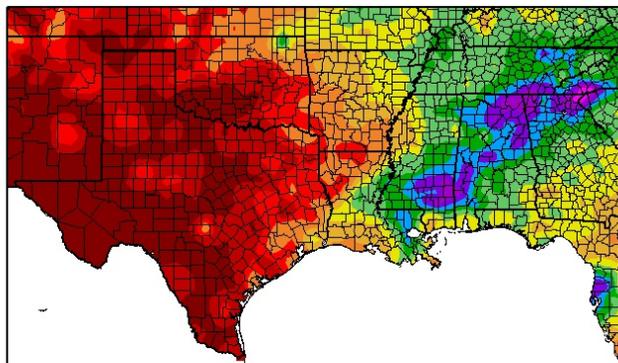
## PRECIPITATION SUMMARY

*Luigi Romolo, Southern Regional Climate Center*

March precipitation was quite variable throughout the Southern Region, with extreme dryness in Texas and Oklahoma, drier than normal conditions in Arkansas and Louisiana, and wetter than normal conditions in Mississippi and Tennessee. Tennessee averaged a total of 6.56 inches (166.62 mm) of precipitation, while Mississippi averaged a total of 6.29 inches (159.77 mm). It should be noted for Mississippi, however, that precipitation totals in the southern half of the state ranged between 100 to 200 percent of normal, while in the north, precipitation totals ranged from 70 to 100 percent of normal. Similarly for Tennessee, conditions were near normal in the central and western counties, however, it was much wetter in the eastern portion of the state with most stations reporting between 150 to 200 percent of normal precipitation. Arkansas and Louisiana experienced a drier than normal month with state

average precipitation totals of 2.75 inches (69.85 mm) and 3.56 inches (90.42 mm), respectively. Oklahoma averaged only 0.72 inches (18.29 mm) of precipitation. This was the tenth driest March on record (1895-2011) for the state. A majority of stations in Oklahoma averaged less than one inch (25.40 mm), and less than a quarter of expected monthly normals. In Texas, conditions were even drier. The state average precipitation total was only 0.27 inches (6.86 mm), which is the driest March on record (1895-2011) for the state. The previous record for the state was set in 1971, with a precipitation total of 0.28 inches (7.11 mm). Precipitation totals throughout the state ranged mostly between 0 and 25 percent of normal. In the Trans Pecos climate division, 39 stations reported no precipitation. This was also the case for approximately half of the stations in the Lower Valley and Southern climate divisions.

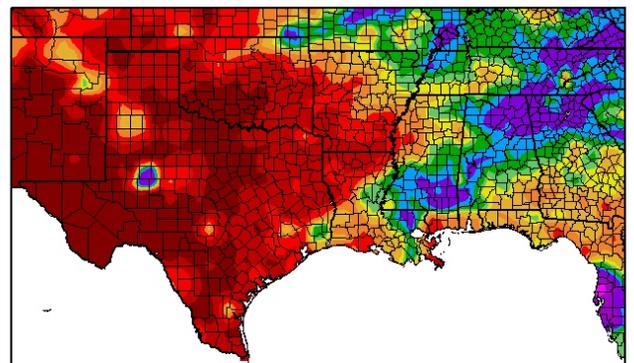
Precipitation (in)  
3/1/2011 – 3/31/2011



Generated 4/2/2011 at HPRCC using provisional data.

Regional Climate Centers

Percent of Normal Precipitation (%)  
3/1/2011 – 3/31/2011



Generated 4/2/2011 at HPRCC using provisional data.

Regional Climate Centers

**Total precipitation values (left) and the percent of 1971-2000 normal precipitation totals (right) for March 2011.**

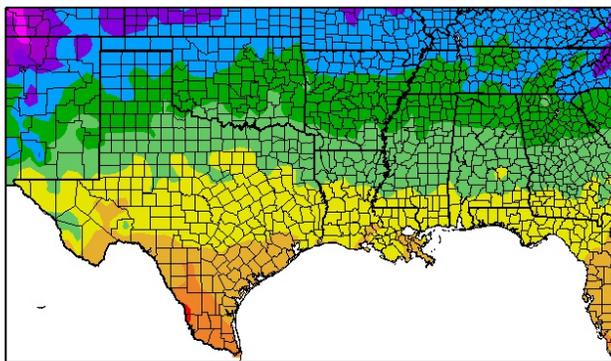
## TEMPERATURE SUMMARY

*Luigi Romolo, Southern Regional Climate Center*

March average temperatures were generally above normal for the majority of the Southern Region. The state of Texas showed the highest variation from expected values. Throughout most of the state, temperatures averaged between 2 to 6 degrees F (1.11 to 3.33 degrees C) above normal. Anomalies were even higher in western portions of the state, including the Trans Pecos Climate Division, where stations averaged between 6 to 10 degrees F (3.33 to 5.56 degrees C) above normal. The state average March temperature was 61.70 degrees F (16.50 degrees C), which makes it the seventeenth warmest March on record (1895-2011). With the exception of Arkansas, average temperatures for the remainder of the region averaged between 0

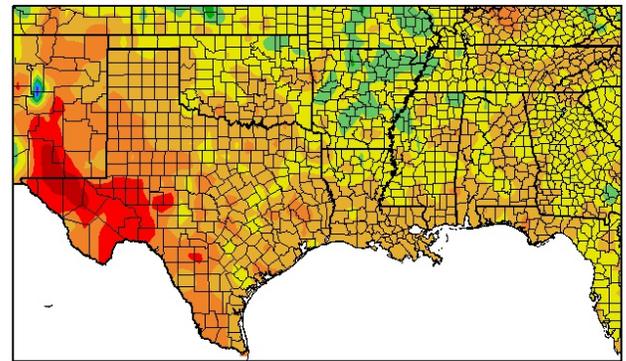
and 4 degrees F (0 to 2.22 degrees C) above normal. In Arkansas, small pockets in the central and northern counties experienced a slightly cooler than normal month, however, for the most part most stations reported within approximately 2 degrees F (1.11 degrees C) of normal. Louisiana averaged 62.10 degrees F (16.72 degrees C) for the month, which was the twenty-eighth warmest March on record (1895-2011). The other state average temperatures include: Oklahoma at 51.80 degrees F (11.00 degrees C), Mississippi at 57.80 degrees F (14.33 degrees C), Arkansas at 52.10 degrees F (11.17 degrees C), and Tennessee at 50.70 degrees F (10.39 degrees C).

Temperature (F)  
3/1/2011 – 3/31/2011



Generated 4/2/2011 at HPRCC using provisional data. Regional Climate Centers

Departure from Normal Temperature (F)  
3/1/2011 – 3/31/2011



Generated 4/2/2011 at HPRCC using provisional data. Regional Climate Centers

**Average temperatures (left) and departures from 1971-2000 normal average temperatures (right) for March 2011, across the South.**

## CLIMATE PERSPECTIVE

State	Temperature	Rank	Precipitation	Rank
Arkansas	52.1	51 <sup>st</sup> Warmest	2.75	22 <sup>nd</sup> Driest
Louisiana	62.1	28 <sup>th</sup> Warmest	3.56	44 <sup>th</sup> Driest
Mississippi	57.5	37 <sup>th</sup> Warmest	6.29	38 <sup>th</sup> Wettest
Oklahoma	51.8	36 <sup>th</sup> Warmest	0.72	10 <sup>th</sup> Driest
Tennessee	50.7	38 <sup>th</sup> Warmest	6.56	30 <sup>th</sup> Wettest
Texas	61.7	17 <sup>th</sup> Warmest	0.27	Driest on Record

State temperature and precipitation values and rankings for March 2011. Ranks are based on the National Climatic Data Center's Statewide, Regional and National Dataset over the period 1895-2011.

## STATION SUMMARIES ACROSS THE SOUTH

Station Name	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	%Norm
El Dorado, AR	69.3	44.2	56.7	0.3	88.0	3/26	29.0	3/11	0.74	-4.41	14
Little Rock, AR	63.3	44.7	54.0	0.6	83.0	3/23	32.0	3/11	4.18	-0.7	86
Baton Rouge, LA	75.4	52.3	63.8	3.5	86.0	3/26	38.0	3/11+	6.93	1.86	137
New Orleans, LA	75.8	57.6	66.7	4.3	85.0	3/27	45.0	3/11	10.48	5.24	200
Shreveport, LA	72.2	48.4	60.3	1.8	88.0	3/26	33.0	3/11	1.84	-2.34	44
Greenwood, MS	67.8	43.8	55.8	-0.5	84.0	3/26	28.0	3/11	2.69	-3.1	46
Jackson, MS	70.9	47.0	59.0	2.1	85.0	3/26+	33.0	3/11	8.72	2.98	152
Tupelo, MS	65.6	43.7	54.6	1.5	84.0	3/20	29.0	3/11	6.60	0.3	105
Oklahoma City, OK	65.6	41.6	53.6	2.6	88.0	3/17	25.0	3/6	0.03	-2.87	1
Ponca City, OK	62.0	39.4	50.7	1.5	85.0	3/22+	23.0	3/5	1.61	-1.33	55
Tulsa, OK	62.6	42.4	52.5	1.1	84.0	3/20	24.0	3/6	1.00	-2.6	28
Knoxville, TN	62.4	43.4	52.9	3.2	81.0	3/22	33.0	3/7	6.38	1.21	123
Memphis, TN	63.0	45.5	54.2	0.7	82.0	3/20	31.0	3/11	4.95	-0.6	89
Nashville, TN	61.0	41.7	51.3	1.2	84.0	3/22	31.0	3/25+	4.59	-0.28	94
Amarillo, TX	66.8	35.2	51.0	3.1	89.0	3/17	26.0	3/9+	0.06	-1.07	5
El Paso, TX	78.1	48.3	63.2	6.2	87.0	3/21	34.0	3/6+	0.00	-0.26	0
Dallas, TX	72.5	50.1	61.3	3.9	85.0	3/26+	30.0	3/6	0.07	-2.99	2
Houston, TX	76.9	56.2	66.5	4.3	86.0	3/26	37.0	3/11	0.78	-2.58	23
San Antonio, TX	78.5	55.2	66.8	4.7	86.0	3/26+	33.0	3/6	0.01	-1.9	1

Summary of temperature and precipitation information from around the region for March 2011. 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. Blue-shaded boxes represent cooler than normal temperatures; red-shaded boxes denote warmer than normal temperatures; tan shades represent drier than normal conditions; and green shades denote wetter than normal conditions.

## SOUTHERN CLIMATE 101

*Have a question about Southern U.S. climate? Let us know and we may feature the answer in a future issue of the Monitor!*

In future issues of the Monitor, we will select a user submitted climate question and provide a reply, to appear in this spot on the back page of the Monitor. Though any aspect of climate is fair game, we will give greatest consideration to questions pertaining to extreme weather & climate events, recent conditions, and climate-related issues relevant to the South Central U.S. - specifically the states of Oklahoma, Texas, Arkansas, Louisiana, Tennessee, and Mississippi. For instance, perhaps you recently experienced a significant winter storm and you were curious how rare it was from a historical perspective. Contact us at [monitor@southernclimate.org](mailto:monitor@southernclimate.org) and we will consider your question among all the others we receive. In the subject line of your message, please use "Southern Climate 101." We look forward to your submissions!

Have a climate question, but do not want it to be answered in a public forum? No problem! Feel free to contact us at one of the options listed below, and we will do our best to address your question.

## CONTACT US

The *Monitor* is an experimental climate outreach and engagement product of the Southern Regional Climate Center and Southern Climate Impacts Planning Program. To provide feedback or suggestions to improve the content provided in the *Monitor*, please contact us at [monitor@southernclimate.org](mailto: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](http://www.srcc.lsu.edu) and [www.southernclimate.org](http://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 225-578-502. For questions or inquiries regarding research, experimental tool development, and engagement activities at the Southern Climate Impacts Planning Program, please contact us 405-325-7809 or 225-578-8374.

## SOUTHERN CLIMATE MONITOR TEAM:

Luigi Romolo, Regional Climatologist  
Southern Regional Climate Center (LSU)

Charlotte Lunday, Student Assistant  
Southern Climate Impacts Planning Program (OU)

James Hocker, Program Manager  
Southern Climate Impacts Planning Program (OU)

Lynne Carter, Program Manager  
Southern Climate Impacts Planning Program (LSU)

Rachel Riley, Research Associate  
Southern Climate Impacts Planning Program (OU)

Hal Needham, Research Associate  
Southern Climate Impacts Planning Program (LSU)

Barry Keim, State Climatologist for Louisiana  
Co-PI, Southern Climate Impacts Planning Program (LSU)

Mark Shafer, Principal Investigator  
Southern Climate Impacts Planning Program (OU)

Gary McManus, Associate State Climatologist for  
Oklahoma  
Southern Climate Impacts Planning Program (OU)

Kevin Robbins, Director  
Southern Regional Climate Center (LSU)