



Oak Alley Plantation - Louisiana

SOUTHERN CLIMATE *MONITOR*

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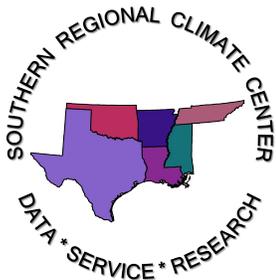
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Southern Climate Impacts Planning Program



DROUGHT IN THE SOUTHERN U.S.

Barry Keim and Mark Shafer, Southern Climate Impacts Planning Program

Drought Among a Record Flood

Thinking back to the extreme weather events of this past year, two things that come immediately to mind are the exceptional drought and extreme temperatures in Texas and Oklahoma and the spring flooding in Louisiana, Mississippi, Arkansas and Tennessee.

Just five months ago, people around Memphis and points southward along the Mississippi River were piling sandbags to hold back the flood waters. The Morganza Spillway in Louisiana was opened, for the first time since 1973, to relieve pressure on the swollen river downstream in Baton Rouge and New Orleans. In May and early June, as the swollen river meandered across this region, much of the south Louisiana landscape was in extreme drought, according the U.S. Drought Monitor (<http://www.drought.gov>). As such, the region was literally in flood and drought at the same time. Today, much of the River's course from Memphis to Natchez is still designated as moderate drought. However, the Mississippi River is now nearing the time of low flows. In addition, drought conditions have intensified across Texas and Oklahoma and are reaching epic proportions. Most of these two States are currently in exceptional drought, and this, coming after a drought-stricken and incredibly hot summer. For example, Grandfield, Oklahoma, recorded 101 days in the triple digits this summer; an area that averages about 30 days per year with highs at or above 100 degrees.

Interestingly, these two events (flood and drought) are interrelated, and are associated with La Niña conditions. La Niña's tend to dry out the Gulf Coast region, including Texas, Oklahoma, Louisiana, etc, by shifting storm tracks to our north across the Ohio River Valley. As storms tracked across the Central portion of the United States -

many producing deadly tornadoes - they bypassed Texas, Oklahoma, Louisiana, and Mississippi leaving it high and dry, thereby producing our drought. However, all of the rainfall in the Midwest, compounded by a large volume of spring snowmelt, then arrived in drought-stricken Tennessee, Arkansas, Mississippi and Louisiana. So, it is therefore possible to have both flood and drought conditions at the same time and at the same place, because the flood waters originated from a different place and were transported in.

NOAA recently announced that La Niña conditions have returned, after a short summer hiatus of ENSO neutral conditions, meaning the absence of either La Niña or El Niño. This is bad news for Texas and Oklahoma, as this is likely to perpetuate their drought. In Louisiana and Mississippi, Tropical Storm Lee in early September produced enough rainfall to dispel some drought-stricken areas, but much of that region is quietly slipping back into drought.

SCIPP has undertaken several activities to support drought management, reporting and planning across the 6-state region. Together these are aimed at every facet of the process, from determining designations in the U.S. Drought Monitor to helping state agencies manage an ongoing event to promoting long-term planning.

Managing Drought in the Southern Plains

Communication among agencies and affected sectors is a key to successful management. Towards this end, SCIPP, in collaboration with the National Integrated Drought Information System (NIDIS), National Oceanic and Atmospheric Administration (NOAA), National Drought Mitigation Center (NDMC), Climate Assessment for the Southwest (CLIMAS, a companion RISA Team), and the region's State Climatologists,

launched a bi-weekly webinar series. The series goals include:

- To improve communication among agencies and organizations in the Southern Plains who are being affected by the historic and exceptional drought;
- To provide information on available resources and assistance to help monitor and manage drought;
- To understand the impacts of drought in this region from the perspective of those who are tasked with managing it; and
- To document impacts that will help improve the weekly U.S. Drought Monitor assessment and our understanding of how drought impacts evolve and decay.

Webinars are held on the 2nd and 4th Thursdays of each month at 11:00 a.m. Central Time. The content is geared toward a general audience – anyone who has responsibility to manage or assist others in managing drought and its related impacts.

Each webinar includes an overview of the current drought assessment and outlook, summary of impacts across the region, and a topic or resource, such as La Niña or wildfire conditions. During each webinar, attendees will be able to vote on the next topic they would like to see as well as suggest new topics. Anyone interested in participating should register via the SCIPP website: <http://www.southernclimate.org> or e-mail

How does drought compare in your area?

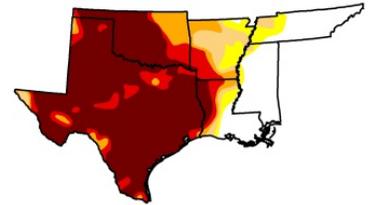
SCIPP Provides tables and maps showing rainfall departures and comparisons to the past. From the main SCIPP page, www.southernclimate.org, go to “Data Products” and select “Southern U.S. Drought Tool”. These tables are produced for Climate Divisions (<http://www.esrl.noaa.gov/psd/data/usclimdivs/data/map.html>) for all six states in the SCIPP region. The drought tool will show you the climate division’s precipitation total, departure from normal, percent of normal, and historical rank, along with several other indices. You can select time periods ranging from 30 to 365 days and turn back the date to look at these same values for previous years or months.

U.S. Drought Monitor

September 27, 2011
Valid 7 a.m. EST

South

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	18.34	81.66	76.26	70.61	63.67	53.77
Last Week (09/20/2011 map)	18.41	81.59	76.35	69.79	64.54	53.61
3 Months Ago (06/28/2011 map)	25.52	74.48	59.82	53.42	47.27	47.27
Start of Calendar Year (12/28/2010 map)	8.86	91.14	67.65	35.21	10.17	0.00
Start of Water Year (09/26/2010 map)	54.23	45.77	20.04	6.79	0.83	0.00
One Year Ago (09/21/2010 map)	58.00	42.00	12.70	5.13	0.83	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.

<http://droughtmonitor.unl.edu>



Released Thursday, September 29, 2011
Michael Brewer, National Climatic Data Center, NOAA

Drought Conditions in the Southern Region. Map is valid for September 27, 2011. Image is courtesy of the National Drought Mitigation Center.

scipp@southernclimate.org. Information from each webinar, including the presentations and a 2-page summary in pdf format, is posted on the NIDIS Drought Portal <http://www.drought.gov> in the Southern Plains section.

State Drought Planning Workshop

In May, state drought planners along with SCIPP, the NDMC, NOAA and NIDIS, convened a meeting to discuss drought planning at the state level. Within the SCIPP region, three states (Louisiana, Arkansas and Mississippi) have no drought plans and Oklahoma’s is more than ten years old (adopted in 1997). To encourage them to create or update plans, SCIPP hosted a drought planning workshop, convened, ironically, in

Memphis during the peak of the Mississippi River flooding.

In preparation for the workshop, SCIPP identified current or potential leadership on drought issues within each state. These officials were invited to the regional workshop along with drought experts in their respective states, primarily the State Climatologists and representatives from the Southern Regional Climate Center. In addition, national experts from the National Drought Mitigation Center, NOAA and NIDIS attended and presented on a range of topics from the Drought Monitor development process to planning resources.

Workshop goals were to:

- 1) Introduce participants to the Drought Monitor process and NIDIS;
- 2) Briefly discuss strengths and weaknesses of various monitoring tools;
- 3) Provide examples of good structure of state drought plans, including monitoring, communication, impact reporting and connections to local communities; and
- 4) Give them ample time to work with "experts" in outlining elements of their own (future) state plans.

Challenges and opportunities identified during the workshop included a need for more monitoring tools and predictions; more analysis and coordination between sectors and agencies, even in the best prepared states; integrating drought into state water and hazard plans; and revisiting who and what agencies were involved in the original plan and any necessary changes. A particular challenge was noted by one of the Mississippi participants: "In the West, they have spent 150 years trying to move water to where it is needed. In the Mississippi Delta, we've spent 150 years trying to move water away."

State Officials who participated in the Memphis drought planning meeting

- Arkansas: Ken Brazil - Arkansas Natural Resources Commission
- Louisiana: Brad Spicer - Louisiana Department of Ag & Forestry
- Mississippi: Jamie Crawford - Mississippi Department of Environmental Quality & Dean Pennington - Yazoo Mississippi Delta Water Management Group
- Oklahoma: Julie Cunningham, OK Water Resources Board
- Tennessee: Lee Keck & Scotty Sorrells, TN Dept of Environment & Conservation
- Texas: Mario Chapa, Texas Division of Emergency Management

Outcomes from the workshop laid a firm foundation for further collaboration. Participants learned from each other. There was as much conversation among the state participants as there was between them and the "drought experts." Attention was paid to the diversity of local sectors and resources. Most importantly, participants now know counterparts working with drought issues in nearby states and sources of expertise in regional and national organizations. Several participants participated in additional, national meetings and are working to improve drought management even in places where a formal planning process is in its infancy. SCIPP remains engaged with these participants, helping them identify counterpart plans, conduct surveys of agencies, and collecting drought impacts information.

Improving Drought Reporting

Another way SCIPP has been working to improve drought management is through collection of drought impact reports. The reason impact reports are important is that they are a critical factor in the Drought Monitor, which in turn is used as an eligibility criterion for several federal assistance programs and state drought response plans.

A prime example of how impact information can

be used occurred recently in Arkansas. Like the pattern in Texas, Oklahoma and Louisiana, Arkansas was affected by extreme drought conditions during fall and winter of 2010-2011. In much of the state, drought conditions ended abruptly in April and May as excessive rainfall produced the flood-of-record in much of the state, including along the White River east of Little Rock. However, by June, rainfall essentially shut off and temperatures soared. The rainfall was quickly depleted from the soils and reservoirs began to fall.

Yet many of the indices used in the Drought Monitor calculations each week are based upon precipitation departures over various time periods. Because of the heavy rainfall, these indicators looked by no means to match up with severe drought conditions. The higher evapo-transpiration rates (uptake of water from the soils by plants and loss to the atmosphere), driven by the high temperatures, are usually not included directly into the Drought Monitor, although their influence is apparent in several other indicators. With many indices pointing toward normal conditions and

memories of the recent flooding, drought designations were gradually introduced into the state but remained, in most of the state, moderate (D1).

Working with Mike Borengasser, Arkansas State Climatologist, an effort was launched to improve reports from district Farm Service Agency offices and irrigation districts. These reports pointed toward conditions similar to those seen further westward in the severe and extreme drought areas in Oklahoma, including nearly-dry farm ponds, lack of forage for cattle, and stunted crop development. These reports were provided to the Drought Monitor authors and subsequently helped to reassess conditions and align the depiction more closely to the reported impacts. Consequently, this should make it easier for counties to gain access to federal assistance programs in the areas most severely impacted by the drought.

Does the Drought Monitor not look right to you? Tell us!

- Drought Impacts Reporter (<http://droughtreporter.unl.edu/>): Anyone, from a state or county office to media reports to an individual producer, can submit a report. You can even include pictures. The DIR is consulted by Drought Monitor authors, the media, and a host of supporting agencies. It creates a permanent, searchable archive for comparison with past droughts and reference point for those that occur in the future.
- Contact your State Climatologist: Look up your State Climatologist on <http://www.stateclimate.org>. You can e-mail or call the office. Most State Climatologists participate in the Drought Monitor discussion list each week, and are experts on placing events in historical context, and can help find assistance.
- E-mail the Drought Monitor Authors at droughtmonitor@unl.edu. This will go directly to those developing the Drought Monitor and will be archived in the Drought Impact Reporter.
- E-mail SCIPP at drought@southernclimate.org. We will relay reports to the Drought Monitor authors, your State Climatologist and post it to the Drought Impacts Reporter. SCIPP can also help connect you to experts on drought management, drought planning, and assistance programs.

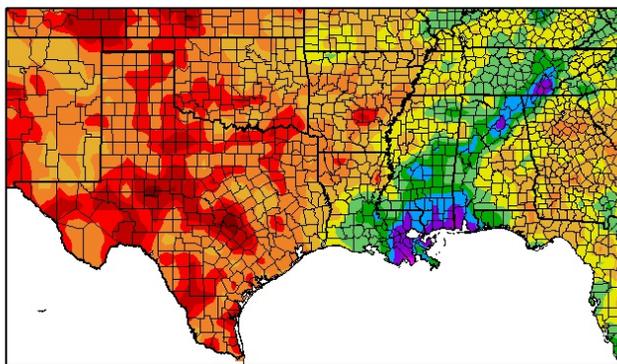
PRECIPITATION SUMMARY

Luigi Romolo, Southern Regional Climate Center

September precipitation totals in the Southern Region varied dramatically from west to east. Conditions were quite dry in Texas, Oklahoma and Arkansas, with most stations reporting only between 5 to 50 percent of normal. By contrast, conditions were quite wet in Tennessee, Mississippi, and Louisiana, with a bulk of stations reporting between 150 to 200 percent of normal precipitation. This was primarily due to Tropical Storm Lee, which stalled off the Gulf Coast in the early part of the month and eventually made its way inland across the eastern half of the Southern Region. The storm dumped copious amounts of rainfall. Areas within the Florida parishes of Louisiana reported up to 10 inches (254.00 mm) of rainfall, however, most of the values reported in the Southern Region varied from 3 to 7 inches (76.20 to 177.80 mm). By month's end, Louisiana recorded a state average precipitation value of 6.93 inches (176.60 mm). This equates to the

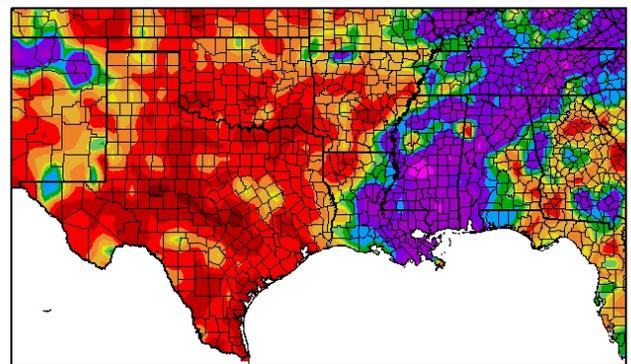
tenth wettest September for the state on record (1895-2011). Both Mississippi and Tennessee reported their seventh wettest September on record (1895-2011). Mississippi averaged 7.67 inches (194.82 mm) for the month, while Tennessee averaged 6.73 inches (170.94 mm) for the month. Drought ridden Texas remained dry for the month. The state averaged 1.08 inches (27.43 mm), which is the first time since May that the state averaged more than an inch of precipitation. However, it was still the seventh driest September on record (1895-2011) for the state. For Oklahoma, it was the twentieth driest September on record (1895-2011) with a state average precipitation value of 1.72 inches (43.69 mm). Arkansas experienced its thirty-seventh driest September on record (1895-2011) with a state average precipitation value of 2.63 inches (66.81 mm).

Precipitation (in)
9/1/2011 – 9/30/2011



Generated 10/5/2011 at HPRCC using provisional data. Regional Climate Centers

Percent of Normal Precipitation (%)
9/1/2011 – 9/30/2011



Generated 10/5/2011 at HPRCC using provisional data. Regional Climate Centers

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

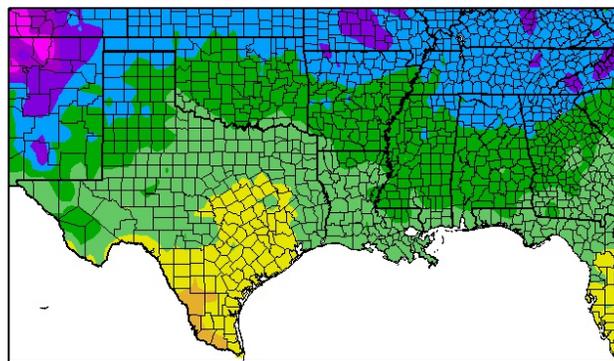
TEMPERATURE SUMMARY

Luigi Romolo, Southern Regional Climate Center

With the exception of Texas, fall in the Southern Region began as a contrast to the past several months, in that most of the region experienced cooler than normal temperatures. The state average September temperature in Texas was 77.80 degrees F (25.44 degrees C), or the nineteenth warmest on record (1895-2011). Stations in the southern half of the state averaged between 2 to 5 degrees F (1.11 to 2.78 degrees C) above normal, while stations in the northern half of the state averaged between 0 to 3 degrees F (0 to 1.67 degrees C) above normal. The highest negative temperature anomalies were observed in northern Arkansas, where many stations averaged between 2 and 5 degrees F (1.11 to 2.78 degrees C) below monthly expected values. This was also the case in central Mississippi and in northeastern Oklahoma. Elsewhere, temperatures were only slightly cooler

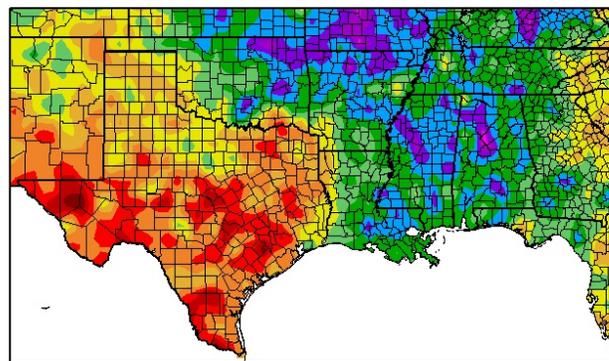
than normal. For Arkansas, it was the twentieth coolest September on record (1895-2011) with a state average temperature for the month of 70.30 degrees F (21.28 degrees C). In Mississippi, it was the ninth coolest September on record (1895-2011), with a state average temperature of 72.30 degrees F (22.39 degrees C). Tennessee and Louisiana reported state average temperatures of 68.30 degrees F (20.17 degrees C) and 75.90 degrees F (24.39 degrees C), respectively. Oklahoma recorded a state average temperature of 71.4 degrees F (21.89 degrees C). State rankings for Oklahoma, Tennessee and Louisiana are as follows: thirty-sixth coolest on record (1895-2011) for Oklahoma, thirtieth coolest on record (1895-2011) for Tennessee, and thirty-second coolest on record (1895-2011) for Louisiana.

Temperature (F)
9/1/2011 – 9/30/2011



Generated 10/5/2011 at HPRCC using provisional data. Regional Climate Centers

Departure from Normal Temperature (F)
9/1/2011 – 9/30/2011



Generated 10/5/2011 at HPRCC using provisional data. Regional Climate Centers

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

CLIMATE PERSPECTIVE

State	Temperature	Rank	Precipitation	Rank
Arkansas	70.3	20 th Coldest	2.62	37 th Driest
Louisiana	75.9	32 nd Coldest	6.93	10 th Wettest
Mississippi	72.3	9 th Coldest	7.67	7 th Wettest
Oklahoma	71.4	36 th Coldest	1.72	20 th Driest
Tennessee	68.3	30 th Coldest	6.73	7 th Wettest
Texas	77.8	19 th Warmest	1.08	7 th Driest

State temperature and precipitation values and rankings for September 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	87.8	58.2	73.0	-2.1	102.0	9/13	46.0	9/7	1.36	-1.93	41
Little Rock, AR	83.7	60.3	72.0	-2.4	96.0	9/1	53.0	9/23	1.17	-2.54	32
Baton Rouge, LA	86.6	65.2	75.9	-1.6	93.0	9/27+	54.0	9/7	9.90	5.06	205
New Orleans, LA	86.6	70.2	78.4	-0.5	93.0	9/28	62.0	9/10	13.27	7.72	239
Shreveport, LA	92.5	64.8	78.6	1.6	107.0	9/13	53.0	9/7	1.05	-2.16	33
Greenwood, MS	83.5	58.4	71.0	-4.7	99.0	9/1	45.0	9/30	3.16	-0.09	97
Jackson, MS	84.6	62.5	73.5	-2.0	98.0	9/1	50.0	9/7	12.72	9.49	394
Tupelo, MS	83.0	59.7	71.4	-1.9	99.0	9/1	50.0	9/16	8.33	4.98	249
Oklahoma City, OK	85.9	58.9	72.4	-0.8	102.0	9/13+	46.0	9/23	1.60	-2.38	40
Ponca City, OK	83.2	55.7	69.5	-3.5	103.0	9/1	44.0	9/30	2.40	-1.27	65
Tulsa, OK	83.4	57.9	70.7	-2.8	102.0	9/1	47.0	9/26	2.58	-2.18	54
Knoxville, TN	79.5	60.2	69.9	-0.9	98.0	9/3+	52.0	9/30+	8.74	5.70	287
Memphis, TN	83.6	62.9	73.3	-1.5	99.0	9/1	55.0	9/27+	2.56	-0.75	77
Nashville, TN	79.7	58.6	69.1	-2.2	99.0	9/3+	48.0	9/27	6.20	2.61	173
Amarillo, TX	84.8	56.5	70.7	1.6	97.0	9/12+	48.0	9/5	0.92	-0.96	49
El Paso, TX	91.1	67.0	79.1	3.7	101.0	9/3	61.0	9/23	0.43	-1.18	27
Dallas, TX	92.5	67.5	80.0	2.5	107.0	9/13	57.0	9/23	0.66	-1.76	27
Houston, TX	95.5	70.2	82.9	4.0	102.0	9/13+	59.0	9/7+	1.28	-3.05	30
San Antonio, TX	96.2	69.5	82.9	3.5	103.0	9/3	59.0	9/7+	2.93	-0.07	98

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

AN INTRODUCTION

Margret Boone, Southern Climate Impacts Planning Program

The one-year anniversary for our experimental climate outreach publication, the Southern Climate Monitor, is almost upon us. As the newest member of the team, I would like to personally introduce myself, and also thank you for being a part of our effort to spotlight the past, present, and future climate events that affect our region.

Born and raised in Oklahoma, I grew up with an innate love of meteorology. At the young age of 5, I had already chosen my career path: meteorologist. After graduating high school, I attended the University of Oklahoma, where I majored in Meteorology, with minors in mathematics and history. During my undergraduate studies, I had the opportunity to experience several different venues of meteorology. I spent several summers interning with KTUL Channel 8 in Tulsa. I also spent a summer volunteering with the NWS in Tulsa. My senior year, I, along with former SCIPP Program Manager James Hocker, were selected as student interns with the NWS Storm Prediction Center, where my research was focused on reviewing extreme wind events, derechos, which occurred over the Great Lakes region.

I received my Bachelors of Science in Meteorology in 2005, and transitioned quickly into the University of Oklahoma graduate school program. Working with Dr. Renee McPherson of the Oklahoma Climatological Survey, I completed my Masters of Science in Meteorology in the summer of 2007. My Masters research consisted of studying the spatial coherence of rainfall variations using the Oklahoma Mesonet. In March of 2011, a condensed version of this research was published online in the *International Journal of Climatology*.

After a brief period as an Operational Meteorologist with Weathernews, Inc., I spent the last four years with the Oklahoma Department of Environmental Quality as a Water Quality Specialist. My area of expertise included monitoring the quality of water discharged from all permitted industrial facilities in the southern region of Oklahoma. Similarly, I worked closely with EPA Region 6 in Dallas, as the state coordinator for the Discharge Monitoring Report (DMR) Quality Assurance (QA) program, which verifies the accuracy of water quality testing. I also maintained an email notification list and database regarding all fish kills in the state. There has been a small rise in reported fish kills across the state of Oklahoma this year, due mostly to the intense heat and lack of substantial rainfall during the late spring and summer months.

With the ongoing drought across our SCIPP region, it will be more important than ever to continue providing vital updates to our stakeholders and resource managers. The SCIPP team will continue to update the most recent drought conditions, current and anticipated impacts, and future outlooks. Emphasis will also be placed this upcoming year on activities related to the National Climate Assessment (NCA).

Though my recent background is diverse, I've never traveled far from my original love of meteorology. I am looking forward to being a part of the Southern Climate Impacts Planning Program (SCIPP) team, and joining in the efforts of engaging our stakeholders in preparing and planning for current and future climate events.

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 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. 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 and 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 at 405-325-7809 or 225-578-8374.

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