

Southern Climate Monitor

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Photos by Katy Strnad



SCIPP

Southern Climate Impacts Planning Program
A NOAA RISA Team

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South Central U.S. Hazard and Climate Change Planning Assessment

Rachel Riley, Renee Edwards, Lynne Carter, Mark Shafer, and Margret Boone

Southern Climate Impacts Planning Program

The six states in the SCIPP region are among the most hazard-prone in the country. The region experiences hurricanes, storm surges, droughts, wildfires, flash floods, tornadoes, hail, ice storms, and more. In light of the impact of these hazards and the importance of planning for them, we sought to better understand local and regional hazard planning across the region.

An online survey was used to assess 1) hazard planning, 2) planning for climate change, and 3) information use and applications across the region. Initially administered in 2009 when SCIPP was first established (see Hocker and Carter 2010), the survey was administered again in early 2013 to determine whether changes have occurred since the first iteration. It was sent to decision makers working at governmental and non-governmental organizations at various levels throughout the SCIPP region that were thought to be involved in weather and climate hazard management, preparedness, or planning. A summary of the findings are discussed below, however a detailed report is available on the SCIPP website at http://www.southernclimate.org/publications/Hazard_Planning_Assessment.pdf.

Survey Demographics

The 342 respondents were fairly well dispersed throughout the SCIPP region with a higher concentration near urban population centers. The respondents were more evenly distributed across the six states in the current survey than in 2009. The average age of the respondents was 49.7 years. Seventy-two percent were male, slightly fewer than in 2009 (76%).

The vast majority were Caucasian and well educated.

Local (49.7%) and state (30.0%) government were the most predominantly represented types of agencies or organizations. About 33% of the respondents were emergency managers and 19.5% were planners. The rest worked in a variety of positions such as extension and administration or were environmentally-related.

Hazard Planning

Over three quarters of the survey respondents (n = 269, 78.7%) were involved in hazard planning, slightly fewer than the 84.4% in 2009. Most of these were involved at the county/parish or city/community level. On average, 3.32 staff shared hazard planning responsibilities in their departments.

The respondents were asked to rate how important it is for them to plan for 14 weather and climate hazards on a scale of 1 “not important at all” to 5 “critically important.” The hazards were then ranked by their average rating. Table 1 shows that across the region, floods ranked the highest (M = 4.17) and were followed closely by tornadoes (M = 4.13). Tornadoes slightly edged out floods in 2009. A significant change was evident by how drought was ranked: 8th in 2009 and 3rd in 2013. Lightning, which ranked 3rd in 2009, slipped to 8th in 2013. Storm surge and inundation, two coastal hazards, ranked 12th and 13th in both iterations among all respondents.

The average planning importance ratings were also computed by state. Not surprisingly, decision makers in different states were concerned about different hazards. For example, hurricane ranked in the top 3 in both Louisiana and Mississippi. Surprisingly,

neither hurricane, inundation nor storm surge ranked in Texas' top 5. This may be due, in part, to Texas being such a large state with a lot of respondents located well away from the coast. Flood ranked the highest in Arkansas and Tennessee, and the only hazard ranked in the top 5 for all states was tornado. Drought was only ranked in the top 5 in 2009 for one state, Texas, but ranked in the top 5 in four states in this round. In terms of the types of hazard plans

the respondents' agencies had, multi-hazard/all hazards plans were the most common; 73.8% of respondents cited having one. At least half of the respondents' organizations had a mitigation plan, response plan, or emergency evacuation plan of some kind. In terms of the specific hazards for which the respondents' agencies or organizations had at least one type of plan (Table 2), floods were most commonly cited followed by tornadoes and severe winter storms. In 2009, the top 3 were tornadoes, floods, and wildfires.

The respondents were asked several questions about the local, regional or state, federal, and non-governmental groups with whom they interact in regards to hazard planning. The local groups with whom the respondents most commonly interacted were county/parish commissioners or township officials (77.4%), public safety agencies (72.9%), and public works (71.4%). For regional or state groups, respondents interacted most commonly with their state department of emergency management (79.0%). The Federal

Hazard	2013		2009	
	Rank	Average Rating	Rank	Average Rating
Flood (from rain or rivers)	1	4.17	2	4.19
Tornado	2	4.13	1	4.21
Drought	3	3.68	8	3.41
Heat Wave	4	3.64	6	3.51
Wildfire	5	3.55	9	3.4
Windstorm	6	3.44	4	3.83
Severe Winter Storm	7	3.42	7	3.43
Lightning	8	3.25	3	3.9
Hurricane	9	3.21	10	2.97
Hail	10	3.1	5	3.7
Extreme Cold	11	2.93	11	2.89
Storm Surge	12	2.89	12	2.61
Inundation (from sea-level rise or land subsidence)	13	2.79	13	2.08
Dust Storm	14	2.16	14	2

Table 1: Rank and average rating for how important planning is for climate hazards across the SCIPP region. The scale ranged from 1 “not important at all” to 5 “critically important”.

Emergency Management Agency (82.6%) was the federal federal group with whom the respondents most commonly interacted. In terms of non-governmental groups, the vast majority interacted with the American Red Cross (81.3%).

The respondents were also asked which of seven challenges and limitations, if any, they experience in developing hazard plans for their area of responsibility. The most prominent challenges were “limited or no funds” and “limited or no staff available to support hazard planning”, with slightly more respondents selecting them in 2009. “Higher work priorities in other areas” remained the third most common challenge, but 9.1% more respondents selected it in 2013 than in 2009.

Planning for Climate Change

Climate change may exacerbate some of the hazards faced by the decision makers. Therefore, we asked several questions about whether and how the respondents incorporate climate change into their planning. First, we introduced the concept and gathered data

about their views on climate change. A majority said “Yes” (n = 152, 56.7%), there is solid evidence that the average temperature on Earth has been getting warmer over the past few decades, while 27.2% (n = 73) said “No” and 16.0% (n = 43) said “Don’t Know”. As for the reasoning behind the warming, 42.0% (n = 63) said “mostly because of human activity, such as burning fossil fuels” whereas 29.3% (n = 44) said “mostly because of natural patterns in the Earth’s environment” and 28.6% (n = 43) said “don’t know”. Almost 90% (n = 174) said climate change is at least a “somewhat serious” problem.

In terms of how well informed the respondents felt they were about climate change on a scale of 1 “not at all informed” to 5 “very well informed”, the average of the sample was between “somewhat informed” and “well informed” (M = 3.52). The most commonly chosen statement was “somewhat informed” (n = 128, 54.0%).

The respondents were also asked whether they have ever considered including climate change in the hazard plan for their area of responsibility. About one-third said “yes” and 69.7% said “no.” To find out more information on the reasoning behind their response, respondents were asked about barriers to incorporating climate change into planning activities. A majority said financial constraints (68.0%), higher work priorities (61.0%), lack of community or political interest (56.4%), and staff (55.6%) constraints were barriers. Three of these

Hazard	2013 (N = 245)		2009 (N = 244)	
	Mitigation (%)	Response (%)	Mitigation (%)	Response (%)
Flood (from rain or rivers)	64.5	62.4	57	54.5
Tornado	48.2	58.4	41	59.4
Wildfire	42.4	41.6	31.1	52
Drought	38	35.5	30.7	36.1
Severe Winter Storm	36.3	49	32.4	44.3
Hurricane	33.5	44.1	29.5	34
Heat Wave	29.4	32.7	20.9	36.1
Windstorm	29.4	34.3	30.3	45.9
Extreme Cold	24.1	33.5	18	33.6
Lightning	23.3	26.5	23.8	43.4
Hail	22	23.7	23.4	41.8
Storm Surge	20	24.5	23.4	26.6
Inundation (from sea-level rise/land subsidence)	17.6	19.2	15.2	15.2
Dust Storm	4.9	12.2	6.1	13.9

Table 2: Hazards for which the respondents' agencies and organizations had at least one type of plan, whether mitigation, response, or both.

were also among the top four barriers in 2009; “lack of community or political interest” was the 5th most common barrier in 2009.

Another question asked the respondents to rate their level of concern with several climate changes that are projected to occur on a scale of 1 “not at all concerned” to 5 “extremely concerned”. The three changes about which the respondents were most concerned included “more intense droughts” (M = 3.82), “more intense floods” (M = 3.74), and “changes to rainfall patterns/timing” (M = 3.66). The three most critical needs for including climate change in hazard planning were “more climate information that is applicable to my particular area,” “information pertaining to future anticipated climate hazards,” and “instruction on where to find trustworthy climate information.” These were the most commonly selected needs in 2009 as well.

Information Use and Applications

For climate information to be most useful to decision makers it should be provided on the temporal and spatial scale(s) that are of value

to them. In this study, 62.1% of the respondents' maximum planning timescale was 5 years or less (Figure 1). Only 4.7% planned for greater than 50 years in the future. About 80% most commonly planned out to 5 years or less and only 1.3% commonly planned on a timescale greater than 50 years. The most common spatial scale of interest was "regional within a state" (34.4%) followed by "county scale" (22.4%).

In order to best serve decision makers in the region, we were interested in the types of engagement opportunities that are most useful to them. Respondents rated "hands-on training on how to use information and/or tools in real-life settings" as the most useful (M = 3.96) followed by "routine workshops where presenters illustrate the use of information and tools in real-life settings" (M = 3.81) and "online tutorials on how to use information tools and products" (M = 3.63).

Implications for SCIPP

Understanding hazard planning practices and the issues that are important across the region is essential to the work of SCIPP.

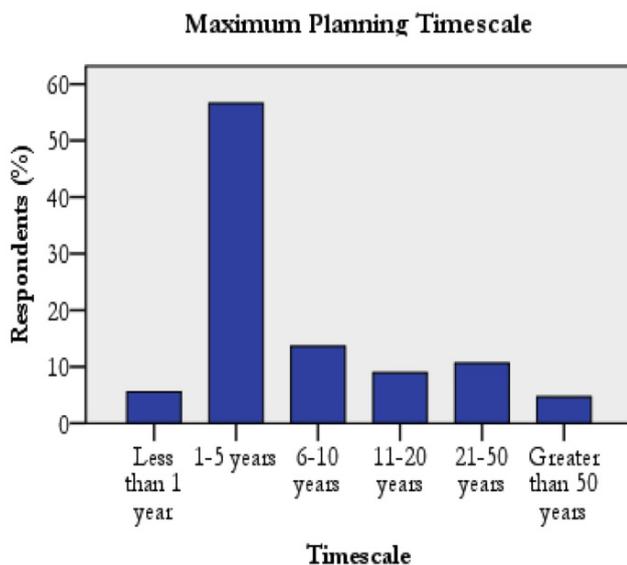


Figure 1: Respondent's maximum planning timescale.

The ratings for how important the respondents think it is to plan for particular hazards provides direction for the hazards on which to spend our time engaging with decision makers. Furthermore, knowing the groups with whom hazard planners most commonly interact gives us direction for other agencies and organizations with which to collaborate on hazard planning initiatives.

Knowing the challenges to hazard planning such as limited staffing and funding is important because in some instances we may be able to help alleviate those challenges. We can also help fill the knowledge and expertise gap that exists among some of those involved in hazard planning. The results also highlight the need for continued improvement in engagement between decision makers and scientists, a relevant message to all climate service providers across the region.

Reference

Hocker, J. E., and L. M. Carter, 2010: Southern U.S. Regional Hazards and Climate Change Planning Assessment. A summary report based on a regional survey conducted by the Southern Climate Impacts Planning Program (SCIPP).

[Available online at:

http://www.southernclimate.org/publications/SCIPP_Hazards_Survey_Report_Final.pdf.]

More to Learn:

The full length report can be found on the SCIPP website in the *Publications* section or http://www.southernclimate.org/publications/Hazard_Planning_Assessment.pdf

FEMA Disaster Declarations:

<http://www.fema.gov/disasters>

USDA Drought Disaster:

http://www.usda.gov/wps/portal/usd/usdahome?navid=DISASTER_ASSISTANCE

Drought Update

*Luigi Romolo
Southern Regional Climate Center*

Drought conditions over the month of October changed only slightly. Heavy rains in southern Arkansas and in northern Louisiana resulted in a one category improvement. There was also some minor improvements in southern Oklahoma and central Texas.

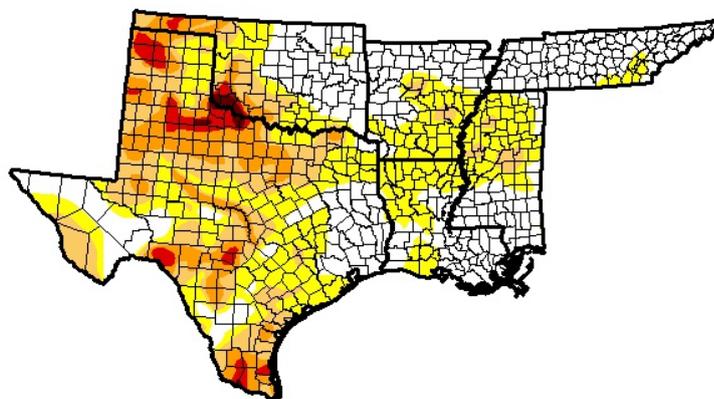
In Texas, the month of October brought many short rain events, however, two particular events stand out. On October 13, and then again on October 31, torrential rains fell across central and south Texas causing extreme flooding. The Austin area received nearly 12 inches (304.80 mm) of rain on the fourteenth of the month.

Just two weeks later, another rainstorm hit the Austin area on the last day of the month, flooding over 1,000 homes and causing many high water rescues to be made all across the state. Storms in the Houston Area also caused over 100,000 people to lose power. (Information provided by the Texas Office of State Climatology).

An early season freeze occurred for the south plains on October 19, worrying farmers of decreased cotton yields; this comes in addition to heavy rainfalls earlier in the month, which delayed the cotton harvest and caused some damage as well. In other areas of the state, yields were the highest in years because of better rainfall, and heavy fall rainfall has winter wheat planters optimistic.

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	38.54	61.46	30.79	13.87	3.34	0.52
Last Week <i>10/29/2013</i>	35.07	64.93	40.03	13.59	2.74	0.31
3 Months Ago <i>8/6/2013</i>	25.56	74.44	56.46	38.82	15.95	3.75
Start of Calendar Year <i>1/1/2013</i>	21.18	78.82	63.69	50.50	32.80	10.98
Start of Water Year <i>10/1/2013</i>	26.20	73.80	50.11	17.90	3.16	0.25
One Year Ago <i>11/6/2012</i>	25.43	74.57	55.44	29.57	11.20	0.28



Released Thursday, Nov. 7, 2013

David Simeral

Western Regional Climate Center

Intensity:

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

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompany text summary for forecast statements. <http://droughtmonitor.unl.edu>



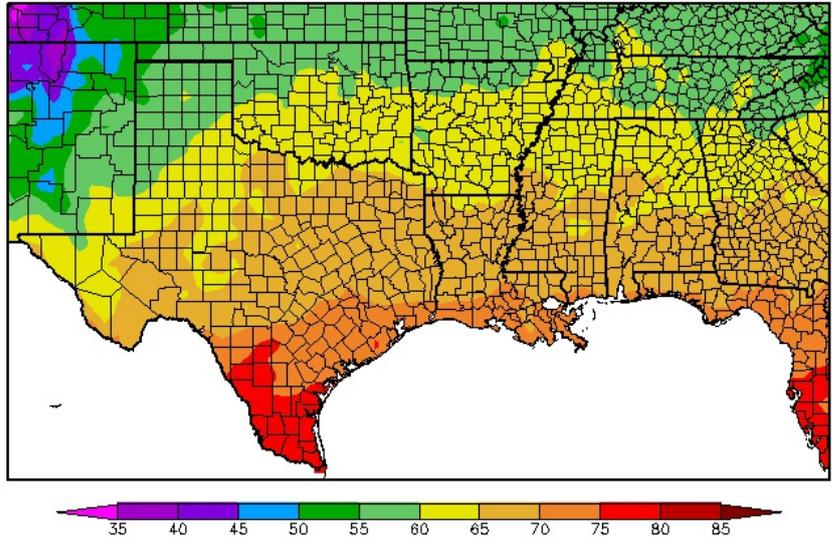
Above: Drought Conditions in the Southern Region. Map is valid for November 5, 2013. Image is courtesy of National Drought Mitigation Center.

Temperature Summary

Luigi Romolo
Southern Regional Climate Center

October temperatures in the Southern Region were generally near normal, with values ranging within 2 degrees F (1.11 degrees C) of normal. Much of the state of Oklahoma experienced a slightly cooler than normal month. This was also the case for counties in northwestern Texas and northwestern Arkansas. Elsewhere, most stations reported monthly temperature averages that were only slightly warmer than normal. The statewide average monthly temperatures for October are as follows: Arkansas averaged 61.20 degrees F (16.22 degrees C), Louisiana averaged 68.20 degrees F (20.11 degrees C), Mississippi averaged 65.30 degrees F (18.50 degrees C), Oklahoma averaged 60.50 degrees F (15.83 degrees C), Tennessee averaged 59.40 degrees F (15.22 degrees C), and Texas averaged 66.60 degrees F (19.22 degrees C). All state temperature rankings fell within the two middle quartiles.

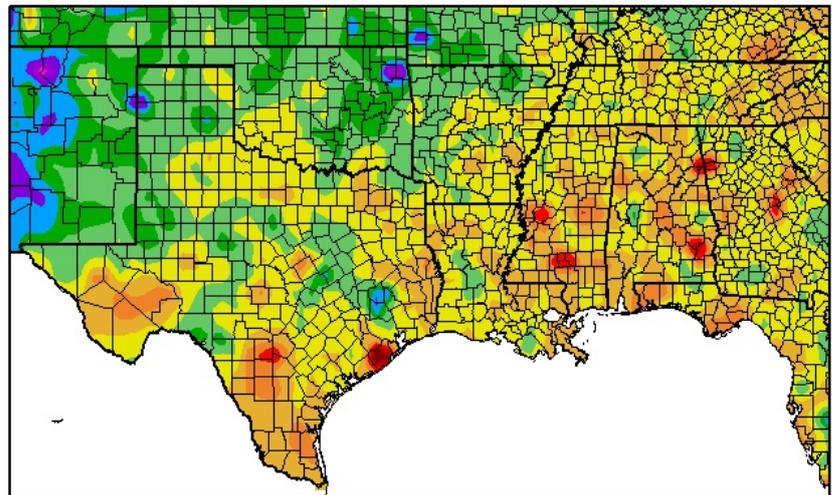
Temperature (F)
 10/1/2013 – 10/31/2013



Generated 11/2/2013 at HPRCC using provisional data. Regional Climate Centers

Average October 2013 Temperature across the South.

Departure from Normal Temperature (F)
 10/1/2013 – 10/31/2013



Generated 11/2/2013 at HPRCC using provisional data. Regional Climate Centers

Average Temperature Departures from 1971-2000 for October 2013 across the South.

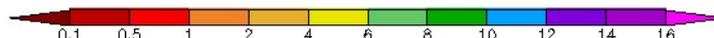
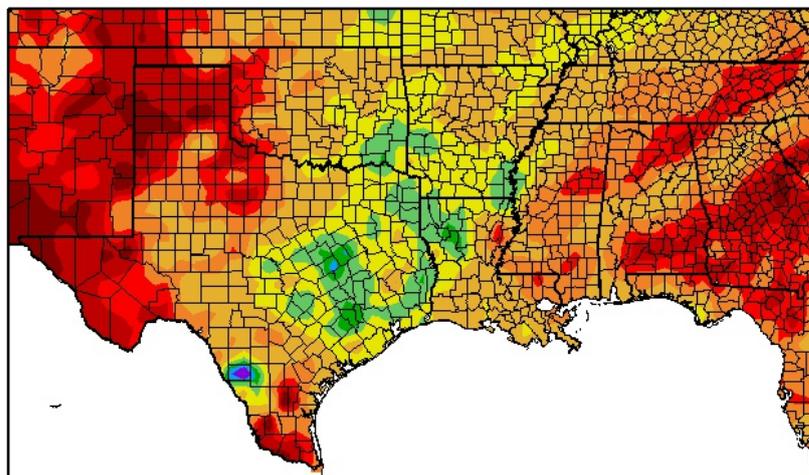
Precipitation Summary

Luigi Romolo
 Southern Regional Climate
 Center

Precipitation totals varied significantly this month over the Southern Region. Mississippi and Tennessee remained quite dry with most stations reporting less than 70 percent of normal precipitation. In fact, only slightly less than half the stations reported less than half of normal. This was also the case for northwestern Texas, the western Texas panhandle, and the southern most counties of Texas. Conversely, the central and east central portions of Texas were quite wet, with precipitation totals ranging from near normal to over 200 percent of expected monthly values. Conditions were also quite wet in northern Louisiana, and in southern Arkansas. The statewide averaged precipitation totals for the month are as follows: Arkansas reported 5.09 inches (129.29 mm), Louisiana reported 4.12 inches (104.65 mm), Mississippi reported 2.01 inches (51.05 mm), Oklahoma reported 3.16 inches (80.26 mm), Tennessee reported only 1.79 inches (45.47 mm), while Texas reported 3.53 inches (89.66 mm). For Arkansas, it was twenty-second wettest

October on record (1895-2013), while for Texas, it was their thirty-third wettest October (1895-2013). The state of Tennessee recorded its twenty-seventh driest October on record (1895-2013). All remaining state rankings fell within the middle two quartiles.

Precipitation (in)
 10/1/2013 – 10/31/2013

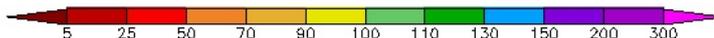
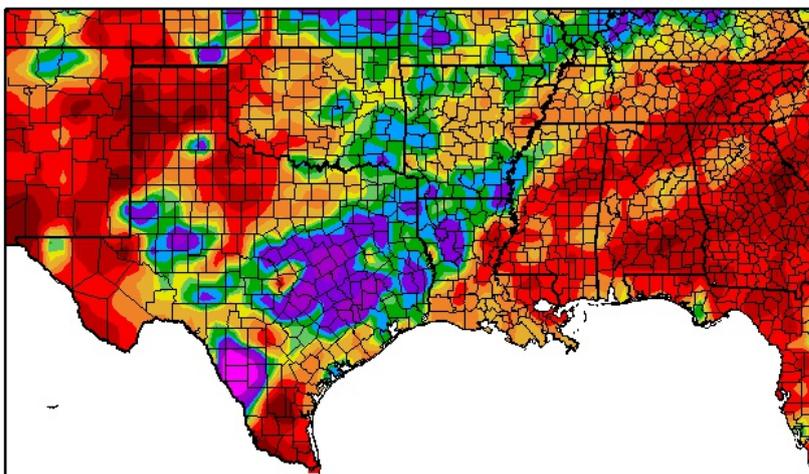


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Regional Climate Centers

October 2013 Total Precipitation across the South.

Percent of Normal Precipitation (%)
 10/1/2013 – 10/31/2013



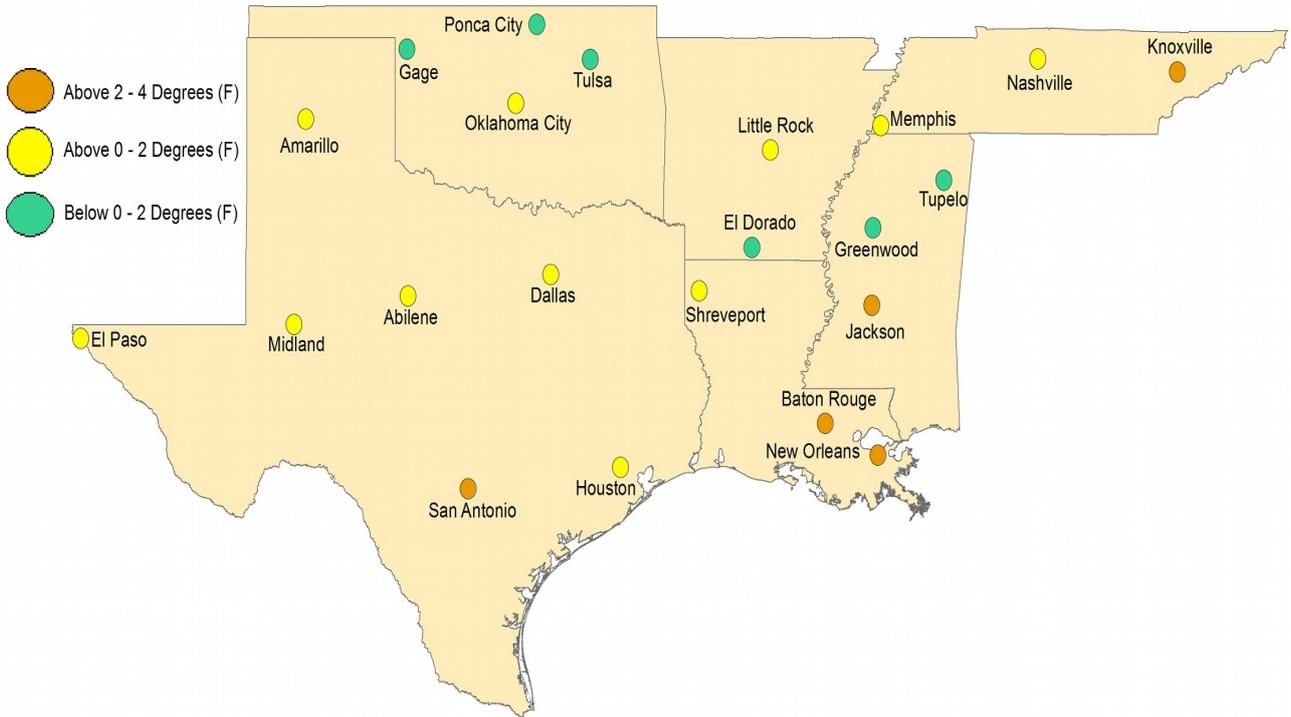
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Regional Climate Centers

Percent of 1971-2000 normal precipitation totals for October 2013 across the South.

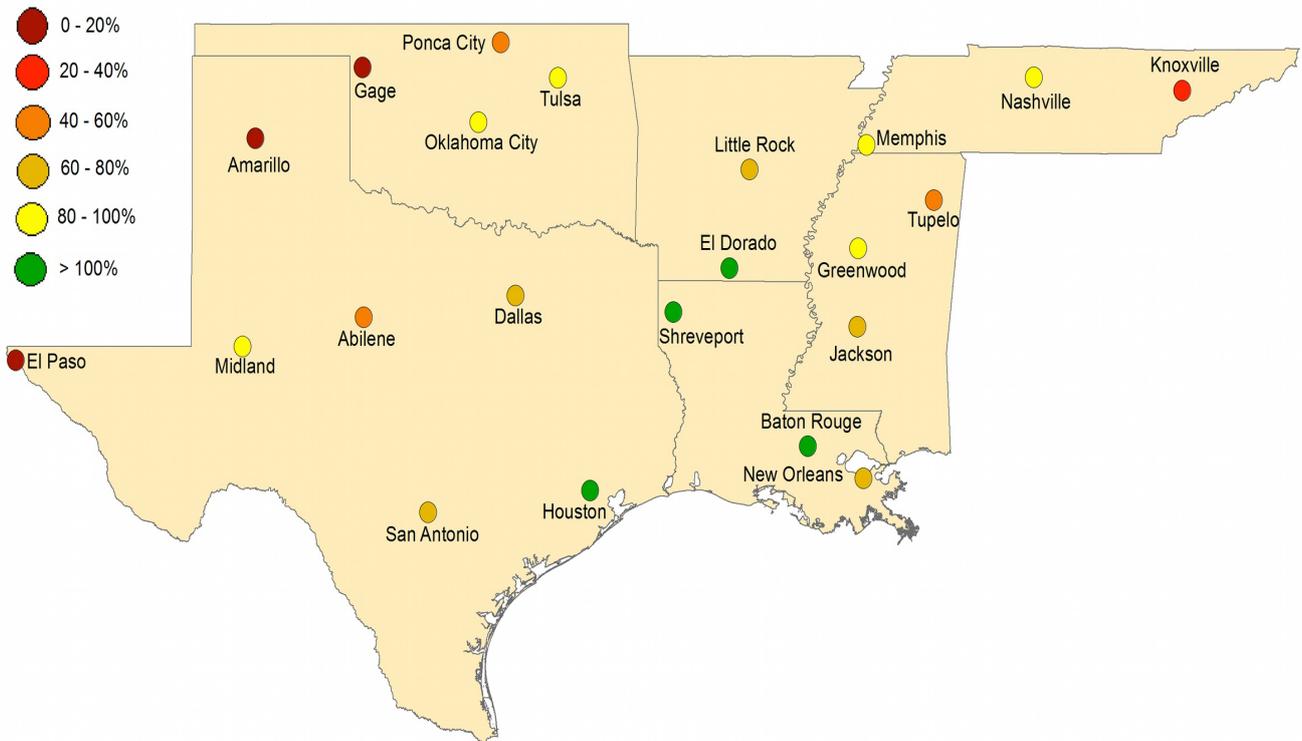
Regional Climate Perspective in Pictures

October Temperature Departure from Normal



October Temperature Departure from Normal from 1971-2000 for SCIPP Regional Cities

October Precipitation Departure from Normal



October Percent of 1971-2000 Normal Precipitation Totals for SCIPP Regional Cities

Climate Perspective

State	Temperature	Rank (1895-2011)	Precipitation	Rank (1895-2011)
Arkansas	61.20	48 th Coldest	5.09	22 nd Wettest
Louisiana	68.20	45 th Warmest	4.12	40 th Wettest
Mississippi	65.30	44 th Warmest	2.01	49 th Driest
Oklahoma	60.50	37 th Coldest	3.16	45 th Wettest
Tennessee	59.40	51 st Warmest	1.79	27 th Driest
Texas	66.60	53 rd Warmest	3.53	33 rd Wettest

State temperature and precipitation values and rankings for October 2013. 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 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	73.9	53.1	63.5	-0.9	85	10/03	38	10/20	5.99	1.66	138
Little Rock, AR	73.6	53.8	63.7	0.4	87	10/4+	38	10/25	3.31	-0.94	78
Baton Rouge, LA	80.4	59.8	70.1	2.0	89	10/13+	44	10/26	3.87	0.06	102
New Orleans, LA	80.6	65.4	73.0	3.0	90	10/03	51	10/26	2.29	-0.76	75
Shreveport, LA	77.9	57.5	67.7	1.0	89	10/04	42	10/20	7.02	2.57	158
Greenwood, MS	75.6	53.8	64.7	-0.2	90	10/05	36	10/26+	3.38	-0.18	95
Jackson, MS	77.8	55.8	66.8	2.4	90	10/04	37	10/26	2.10	-1.32	61
Tupelo, MS	72.1	51.2	61.6	-1.0	86	10/06	34	10/25	1.49	-1.88	44
Gage, OK	72.6	42.7	57.7	-1.1	89	10/04	26	10/27	0.16	-1.53	9
Oklahoma City, OK	73.3	51.2	62.3	0.3	90	10/03	32	10/19	3.42	-0.22	94
Ponca City, OK	71.2	47.3	59.2	-2.0	89	10/4+	29	10/27	1.68	-1.55	52
Tulsa, OK	71.8	50.6	61.2	-1.4	88	10/04	34	10/25+	3.52	-0.53	87
Knoxville, TN	72.2	51.1	61.7	2.9	86	10/05	30	10/26	0.91	-1.74	34
Memphis, TN	73.7	55.6	64.6	0.8	88	10/05	37	10/25	3.30	-0.01	100
Nashville, TN	72.2	51.5	61.8	1.9	89	10/05	28	10/26	2.34	-0.53	82
Abilene, TX	78.2	55.2	66.7	0.7	90	10/4+	36	10/19	1.41	-1.49	48
Amarillo, TX	73.5	43.0	58.3	0.1	91	10/03	27	10/19	0.18	-1.32	12
El Paso, TX	78.6	52.3	65.5	0.5	89	10/01	38	10/20	0.00	-0.81	0
Dallas, TX	78.8	57.6	68.2	1.0	93	10/12	43	10/19	3.13	-0.98	76
Houston, TX	81.5	61.1	71.3	0.9	93	10/05	46	10/20	7.09	2.59	157
Midland, TX	79.0	53.5	66.3	1.9	96	10/01	38	10/19	1.66	-0.11	94
San Antonio, TX	83.9	63.0	73.5	2.7	93	10/4+	46	10/20	2.81	-1.05	73

Summary of temperature and precipitation information from around the region for October 2013. 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.

A Warm and Wet November 2013 is Forecast

Barry Keim, Louisiana State Climatologist, Louisiana State University

October 2013 is now in the record books. Preliminary climate data indicate that the month averaged 69 degrees across the state of Louisiana, which was 2 degrees above normal. Precipitation averaged 4.20 inches, which was 0.16 inches above

normal. All in all, October was a pretty average month, with no tropical storm or hurricane landfalls, though Tropical Storm Karen did have our attention during the first week of the month, and October ended with a very wet Halloween night. So what's ahead for November? Well,

the Climate Prediction Center is calling for above normal temperatures and above normal rainfall for our region – warm and wet! The primary reason for this forecast is because the experts have indicated that the jet stream pattern will remain far north of Louisiana, especially during the first half of the month. This encourages airflow to Louisiana from the Gulf of Mexico, which means it will likely be warm. This doesn't mean that we won't get any surges of cooler air, but when we add it all up at the end of the month, there is a greater chance it will be warmer than normal. This pattern also will encourage additional rainfall opportunities. But, with any forecast for our region, take it with a grain of salt! Feel free to contact me at keim@lsu.edu with any questions or comments.

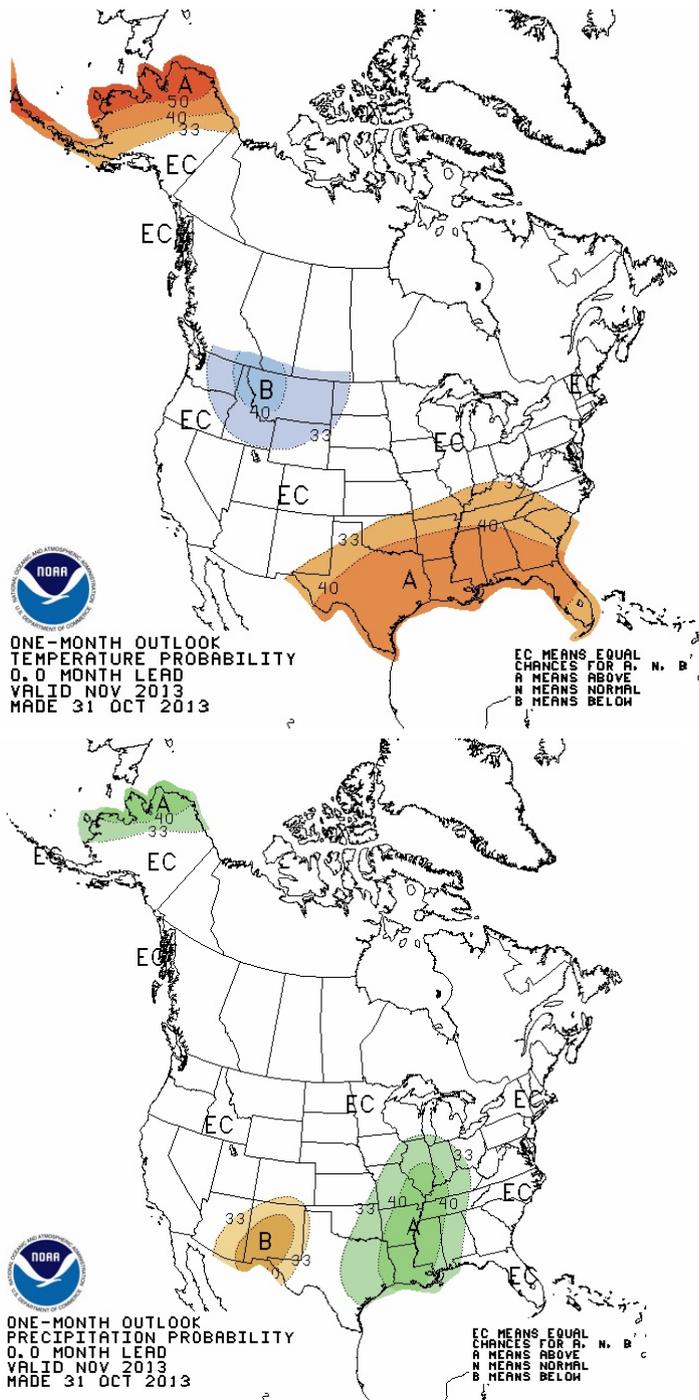


Figure 1. Climate forecast for November 2013 from the Climate Prediction Center. Image found at <http://www.cpc.ncep.noaa.gov/products/predictions/30day/>

Monthly Comic Relief



Disclaimer: This is an experimental climate outreach and engagement product. While we make every attempt to verify this information, we do not warrant the accuracy of any of these materials. The user assumes the entire risk related to the use of these data. This publication was prepared by SRCC/SCIPP with support in part from the U.S. Department of Commerce/NOAA. The statements, findings, conclusions, and recommendations are those of the author(s) and do not necessarily reflect the views of NOAA.

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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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