Southern Climate Monitor

May 2014 | Volume 4, Issue 5

Southern Climate Impacts Planning Program
A NOAA RISA Team

In This Issue:

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

"Right Size" Planning: Risk and Building Climate Resilience

Alexander (Sascha) Petersen, Cofounder of Adaptation International

Living in the South Central U.S. means that you know about extreme weather events. Depending on where you live, it isn't uncommon for one location to have to deal with everything from tornadoes and hail storms to flash floods and scorching heat. Being prepared to deal with those events means thinking about ways to reduce risk, decrease vulnerability, and build resilience. *prioritizing climate impacts due to risk?* Or, *Should we use project specific risk tolerance or sensitivity to guide our efforts to build resilience and plan for extreme weather events?*

Let's explore this idea and consider the potential impacts of an extreme precipitation event and the subsequent

		CONSEQUENCE				
		Negligible	Minor	Moderate	Major	Catastrophic
LIKELIHOOD		1	2	3	4	5
Almost Certain	5	Medium	Medium	High	Very High	Very High
Likely	4	Low	Medium	Medium	High	Very High
Possible	3	Low	Low	Medium	High	High
Unlikely	2	Low	Low	Medium	Medium	High
Rare	1	Low	Low	Low	Medium	Medium

Table 1: Priority Risk Ranking Chart, Local Government Cities Climate Adaptation Toolkit, 2008, ICLEI Oceana

Let's take a moment to focus on risk. Climate change and extreme weather planning frameworks from Australia to Canada have used the traditional concept of risk (hazard x likelihood) to help prioritize potential vulnerabilities. For example, ICLEI Oceana's Adaptation Toolkit (2008) has a risk matrix that can be used to categorize climate impacts into 4 different levels.

Climate impacts that are both almost certain and have the potential for major or catastrophic impacts are the most critical and those that are either unlikely or have very low potential impact are the least critical to address. The question then becomes: *Is it enough to focus on*

flooding on two buildings: a gazebo in a park and level one trauma center hospital. Given the uncertainty in the magnitude of future precipitation events, I proposed that risk tolerance or sensitivity should be used in selecting the appropriate scenario for planning.

Keeping in mind that three general categories for response options could be applied to either the gazebo or the hospital. You could: 1) build a wall to protect the building, 2) move the building to higher ground, or 3) relocate the building entirely. For the gazebo, it makes sense to select a lower precipitation threshold that would require limited investment. Although the risk of this precipitation threshold (and the related flood level) being exceeded may be relatively high, the sensitivity of gazebo and risk of potential loss is relatively small. Conversely, the sensitivity of the hospital's critical trauma facility to inundation is quite high and justifies the selection of a higher precipitation scenario for planning, in order to decrease the likelihood of that threshold being exceeded.

The United States has been using a risk based approach to management for a long time. The Federal Emergency Management Agency (FEMA) bases many of its requirements on the 100-year flood plain and, in general, we, as a society, have decided that a 1 in a 100 chance of flooding is worth additional requirements (i.e. more free board, or flood insurance) in order to limit the potential impact of that flooding. Using the higher resolution risk tolerance or sensitivity approach, it would no longer be enough to have two classifications ("in the 100-year flood plain" or "outside the 100-year flood plain") and two sets of requirements. The value of the built infrastructure (or by extension the natural environment) and the potential impact of its loss would determine the level of risk planning required. For the gazebo, perhaps planning for a 50-year flood event would be sufficient. For the hospital, planning for the 1,000-year event may be more important.

Implementing this approach isn't necessarily easy and there are many factors not included in the description above. However, using risk tolerance and sensitivity to "right size" the ways we plan for climate change and extreme weather to the project is a great way to stretch limit resources and get the most out of our adaptation efforts.

More to Learn

Adaptation International
www.adaptationinternational.com

FEMA
www.fema.gov

ICLEI
http://oceania.iclei.org

ICLEI's Adaptation Toolkit
http://archive.iclei.org/fileadmin/user_upload/documents/ANZ/CCP/CCP-AU/Projects/AI/AdaptationToolkit/Toolkit_CCPAdaptation_Final.pdf

U.S. Geological Survey
http://water.usgs.gov/edu/100yearflood.html

Drought Update

Luigi Romolo
Southern Regional Climate Center

Drought conditions in the Southern Region did not significantly change in the states of Arkansas, Mississippi, Louisiana, or Tennessee, with all four states remaining relatively drought free. Heavy rains in Texas and north western Oklahoma have led to a dramatic reduction in areal coverage of exceptional drought over the past month. There was also a significant reduction in the amount of severe and extreme drought in central Texas. Despite these improvements, approximately one fifth of the Southern Region (mostly Oklahoma and northern Texas) is still experiencing extreme to exceptional drought. Almost half the region (46.47 percent) is currently experiencing some form of drought.

The drought in Texas, continues to have heavy impacts. Wichita Falls, despite the recent rains, officially began Stage 5, Drought Catastrophe water restrictions this month. Several small communities across the state are in danger of running out of drinking water within 45-90 days, leading small loans to be given out by the Texas Department of Agriculture, such as the $350,000 well loan for Pebble Beach in Bandera County. As planning for the future of Texas's water supply continues, debate on the true number for future water use falls under scrutiny, as new reports argue that less than half of 2.7 trillion estimated gallons of water would be needed; this would encompass all of the controversial $3.3 billion reservoir proposed for the Dallas-Fort Worth metropolitan area (Information Provided by the Texas Office of State Climatology).

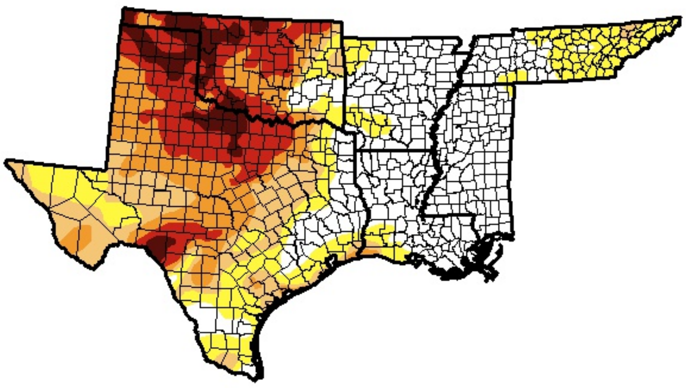
Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	35.49	64.51	46.42	32.93	18.82	5.67
Last Week *6/3/2014*	31.04	68.96	46.47	33.59	21.79	7.22
3 Months Ago *3/11/2014*	33.75	66.25	42.47	21.55	7.74	1.34
Start of Calendar Year *12/31/2013*	55.85	44.15	27.23	13.21	3.58	0.72
Start of Water Year *10/1/2013*	26.20	73.80	50.11	17.90	3.16	0.25
One Year Ago *6/11/2013*	43.19	56.81	49.58	35.15	19.85	9.00

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**



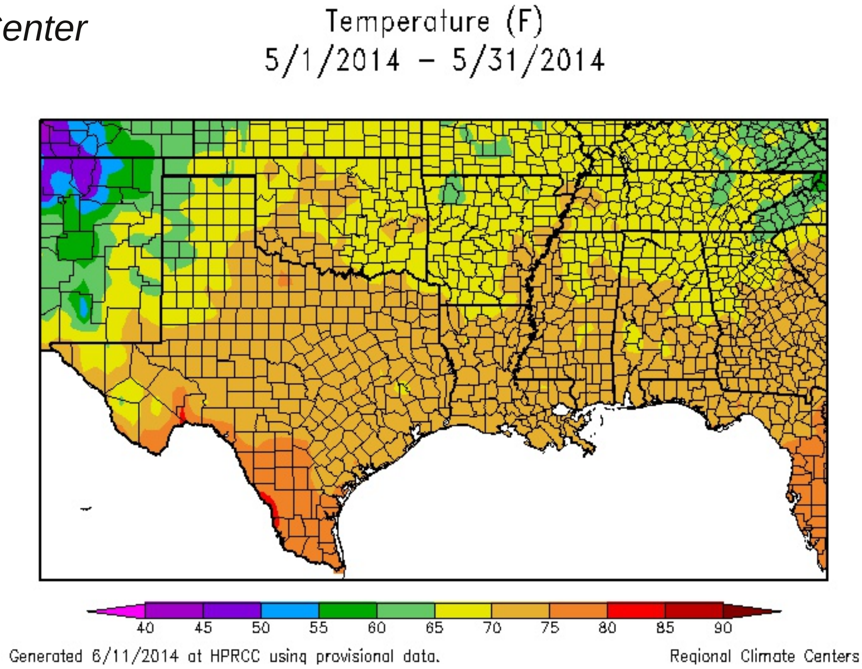
Released Thursday, June 5, 2014.
Richard Tinker, CPC/NOAA/NWS/NCEP

Above: Drought Conditions in the Southern Region. Map is valid for June 3, 2014. Image is courtesy of National Drought Mitigation Center.

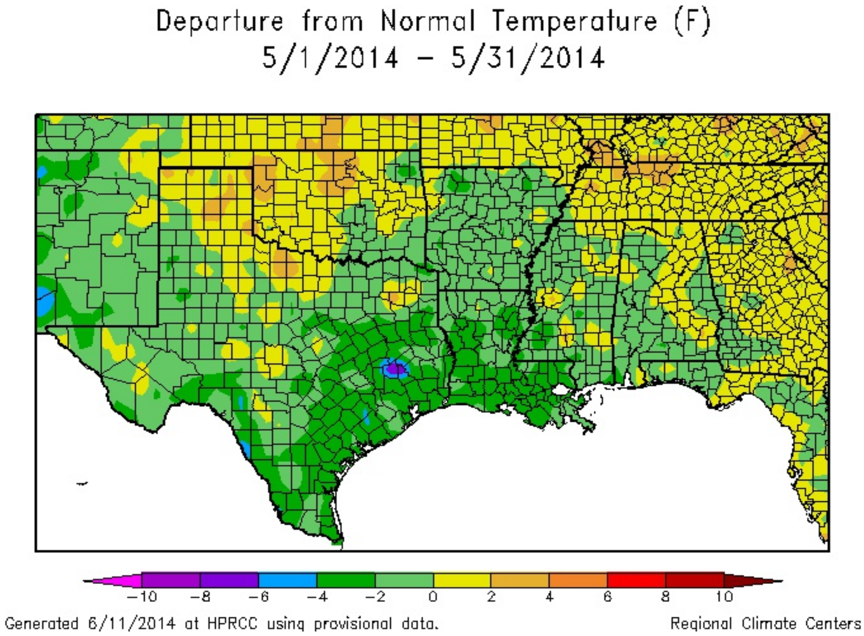
Temperature Summary

Luigi Romolo
Southern Regional Climate Center

May temperatures across the Southern Region averaged quite close to normal, with departures at most stations averaging within just 2 degrees F (1.11 degrees C) of normal. The lowest departures occurred along the Texas and Louisiana coastline, where most stations averaged between 2 and 4 degrees F (1.11 and 2.22 degrees C) below expected values. The statewide average temperatures are as follows: Arkansas averaged 68.10 degrees F (20.06 degrees C), Louisiana averaged 71.90 degrees F (22.17 degrees C), Mississippi averaged 70.70 degrees F (21.50 degrees C), Oklahoma averaged 68.90 degrees F (20.50 degrees C), Tennessee averaged 67.20 degrees F (19.56 degrees C), and Texas averaged 72.10 degrees F (22.78 degrees C). For Louisiana, it was the twenty-second coldest May on record (1895-2014). All other state rankings fell within the two middle quartiles.



Average May 2014 Temperature across the South

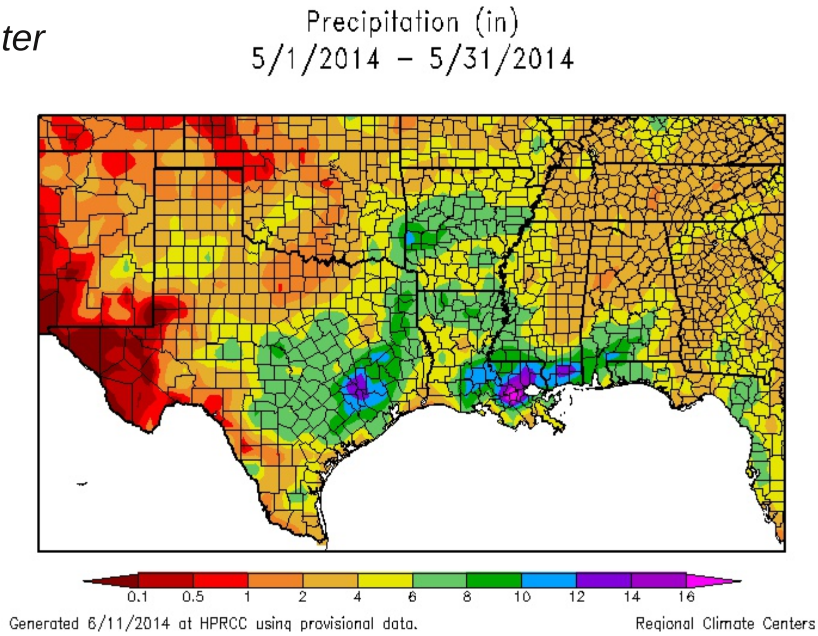


Average Temperature Departures from 1971-2000 for May 2014 across the South

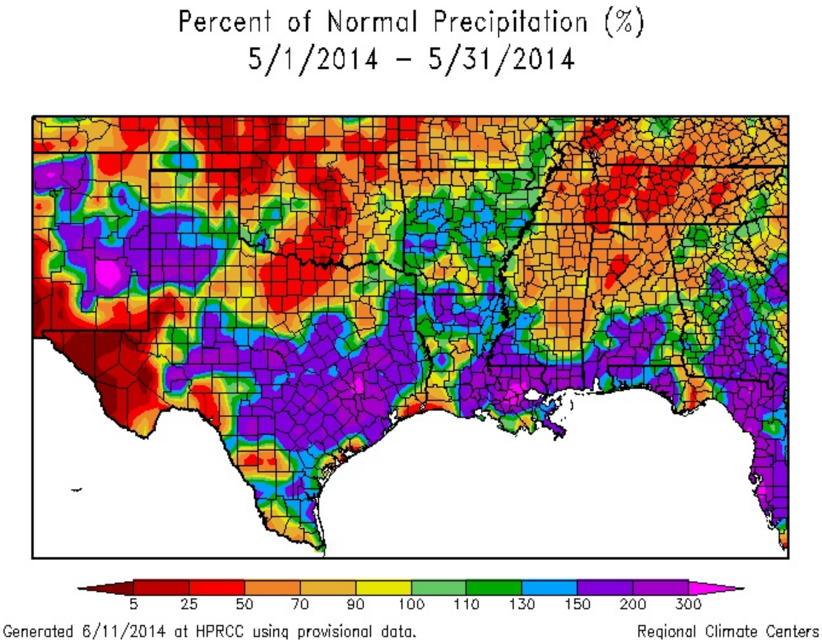
Precipitation Summary

Luigi Romolo
Southern Regional Climate Center

Precipitation totals for the month of May illustrate that for parts of the Southern Region, it was a very wet month, while for other areas, it was very much the opposite. In Texas, central and southern counties received between two and three times the normal amount of precipitation. This was also the case for the south central and south eastern Louisiana, and southern Mississippi. In central Arkansas, precipitation totals varied from near normal to approximately one and a half times normal. Elsewhere, precipitation was scarce. The western panhandle of Texas, for instance, averaged between zero and fifty percent of normal, with most stations averaging near one quarter of normal precipitation. This was also the case in central Tennessee, and in east central and northern Oklahoma. The statewide average precipitation totals are as follows: Arkansas averaged 5.87 inches (149.10 mm), Louisiana averaged 7.33 inches (186.18mm), Mississippi averaged 5.13 inches (130.30mm), Oklahoma averaged 2.99 inches (75.95mm), Tennessee average 2.89 inches (73.41mm) and Texas averaged 4.03 inches (102.36mm). For Louisiana it was the seventeenth wettest May on record (1895-2014), while for Texas, it was their thirtieth wettest May (1895-2014). Conversely, Oklahoma experienced its twenty-eighth driest May on record (1895-2014), while for Tennessee, it was their twenty-first driest May (1895-2014). All other state rankings fell within the two middle quartiles.

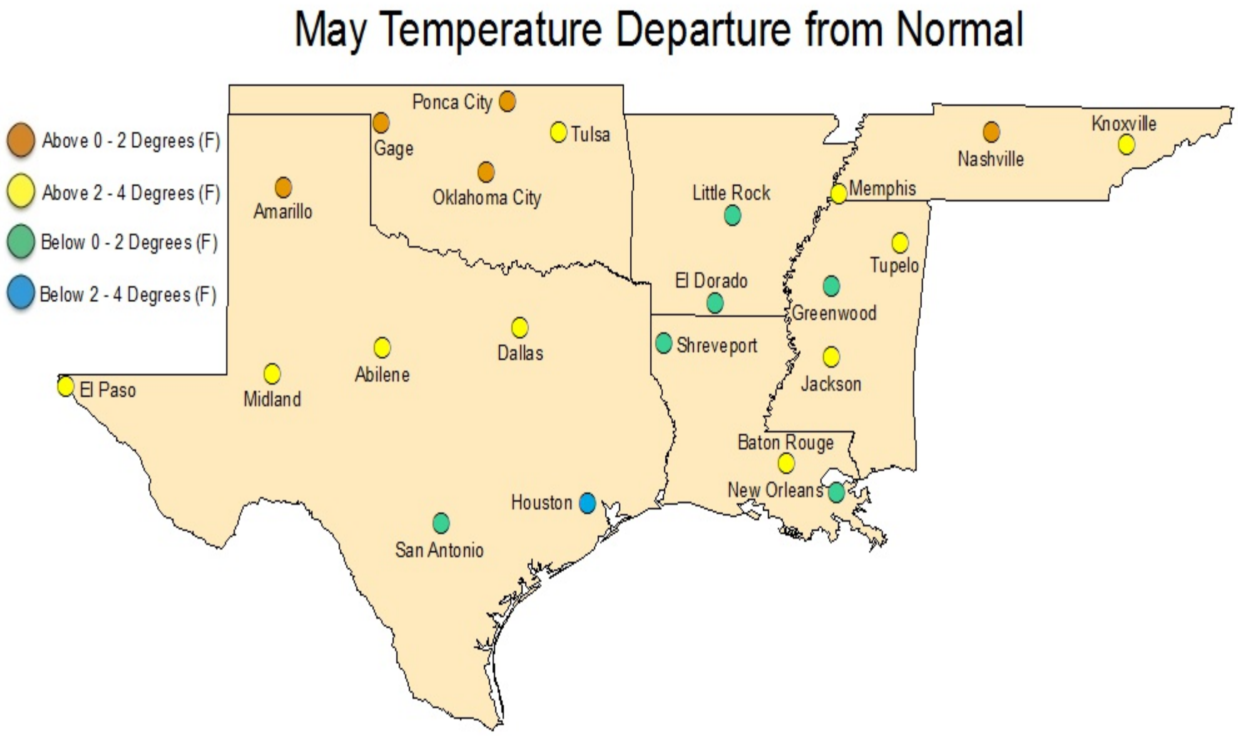


May 2014 Total Precipitation across the South

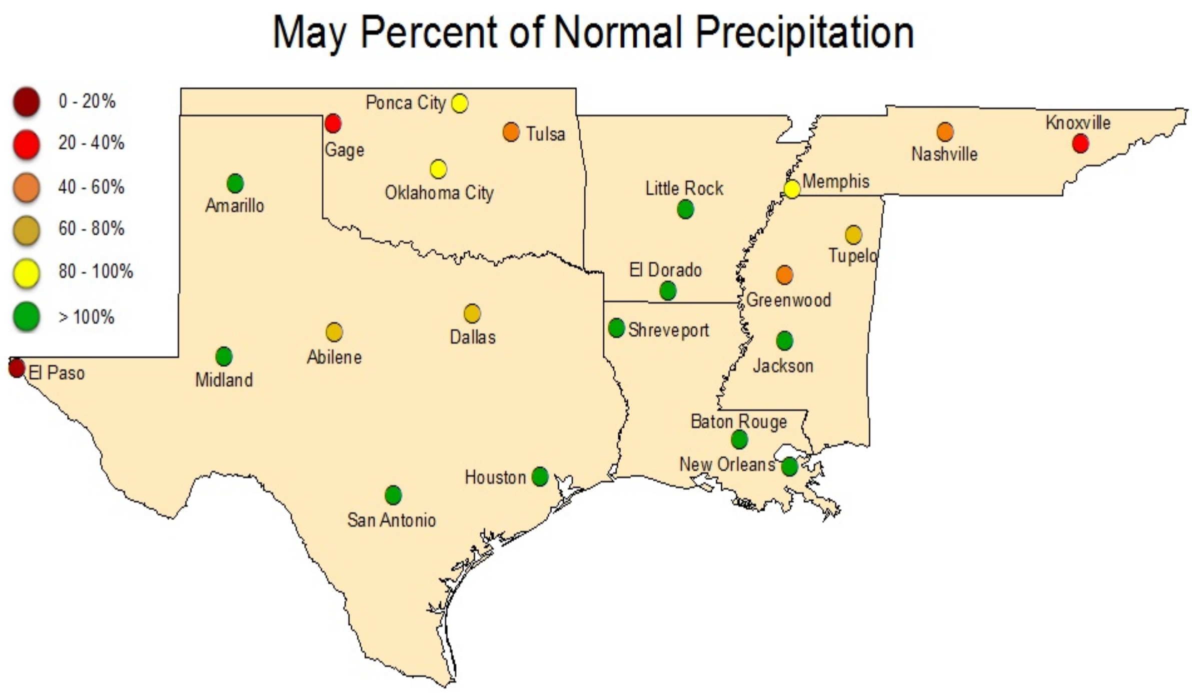


Percent of 1971-2000 normal precipitation totals for May 2014 across the South

Regional Climate Perspective in Pictures



May 2014 Temperature Departure from Normal from 1971-2000 for SCIPP Regional Cities



May 2014 Percent of 1971-2000 Normal Precipitation Totals for SCIPP Regional Cities

Climate Perspective

State	Temperature	Rank (1895-2011)	Precipitation	Rank (1895-2011)
Arkansas	68.10	45th Coldest	5.87	44th Wettest
Louisiana	71.90	22nd Coldest	7.33	17th Wettest
Mississippi	70.70	47th Coldest	5.13	48th Wettest
Oklahoma	68.90	40th Warmest	2.99	28th Driest
Tennessee	67.20	42nd Warmest	2.89	21st Driest
Texas	72.10	49th Coldest	4.03	30 Wettest

State temperature and precipitation values and rankings for May 2014. 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								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	%Norm
El Dorado, AR	80.9	58.7	69.8	-1.7	89	5/4	38	5/1	7.63	2.14	139
Little Rock, AR	80.1	59.8	70.0	-0.1	90	5/4	41	5/15	6.61	1.56	131
Baton Rouge, LA	84.8	63.1	74.0	0.0	89	5/26+	49	5/1	8.32	2.98	156
New Orleans, LA	83.9	66.2	75.0	-0.6	89	5/26+	54	5/16+	8.35	3.73	181
Shreveport, LA	83.0	61.1	72.0	-1.0	90	5/11	41	5/1	6.52	1.27	124
Greenwood, MS	82.4	59.8	71.1	-1.3	90	5/23+	43	5/1	3.14	-2.21	59
Jackson, MS	83.2	60.6	71.9	0.4	90	5/23+	42	5/1	6.38	1.52	131
Tupelo, MS	82.4	60.2	71.3	1.9	91	5/26+	44	5/1	4.40	-1.40	76
Gage, OK	85.0	53.9	69.4	3.8	101	5/6+	33	5/1	0.78	-2.94	21
Oklahoma City, OK	83.0	58.4	70.7	2.3	97	5/5+	40	5/1	4.44	-1.00	82
Ponca City, OK	83.5	58.1	70.8	2.6	100	5/4	33	5/2	4.27	-0.65	87
Tulsa, OK	81.6	59.5	70.5	1.2	94	5/4	37	5/2	3.51	-2.60	57
Knoxville, TN	79.2	54.3	66.7	1.6	88	5/29+	41	5/17+	1.22	-3.76	24
Memphis, TN	80.8	62.0	71.4	0.8	89	5/26+	44	5/1	4.33	-0.82	84
Nashville, TN	81.9	58.8	70.4	3.3	91	5/31	43	5/2	2.47	-2.60	49
Abilene, TX	88.0	60.2	74.1	1.3	104	5/5	38	5/1	2.22	-0.61	78
Amarillo, TX	83.3	52.7	68.0	2.8	98	5/19+	38	5/14+	3.55	1.05	142
El Paso, TX	87.4	60.1	73.7	0.0	102	5/31	45	5/2	0.01	-0.37	3
Dallas, TX	85.5	63.3	74.4	1.3	96	5/4	42	5/1	3.41	-1.74	66
Houston, TX	83.2	65.2	74.2	-2.8	88	5/30+	50	5/15	10.37	5.26	203
Midland, TX	87.4	60.2	73.8	1.0	99	5/20+	43	5/14	2.26	0.47	126
San Antonio, TX	86.9	64.5	75.7	-0.1	95	5/30	47	5/15	4.97	0.25	105

Summary of temperature and precipitation information from around the region for May 2014. 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.

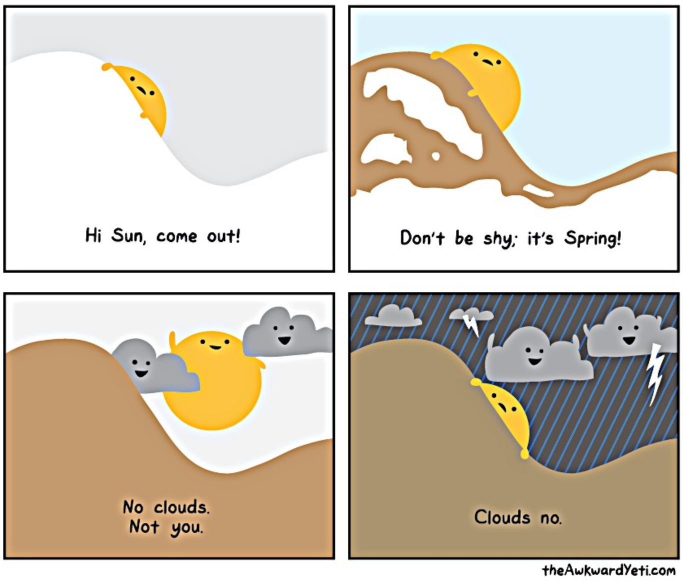
Early Forecasts for the 2014 Hurricane Season

Barry D. Keim- Louisiana State Climatologist, Louisiana State University

Hurricane season is right around the corner and forecasts for this hurricane will be forthcoming from several different forecasting operations. Several weeks ago, the research team at Colorado State University issued an Atlantic Basin forecast calling for 9 named storms, of which 3 will become hurricanes and 2 of these will be major hurricanes (Category 3-5). Just last week, Accuweather issued their forecast and they are calling for 10 named storms, 5 hurricanes, and 2 major hurricanes. Note that the average number of storms for a season is 12 named storms, 7 hurricanes, and 2 major hurricanes. As a result, both groups are forecasting below normal activity for this upcoming season. The primary reason for these below-normal forecasts is the expectation that an El Nino will develop in the tropical Pacific Ocean later this summer. El Nino's tend to create an upper air circulation pattern over the hurricane breeding grounds in the Atlantic Basin that mitigate storm formation through wind shear at high elevations, which prevents potential hurricanes from venting aloft. However, every hurricane season has its ebbs and flows and occasionally, even during a season with low expectations, all the ingredients can come together to produce a hurricane and occasionally a major hurricane. A great example of this occurred during the El Nino year of 1992 when Hurricane Andrew came together which struck south Florida, and then later made landfall near Morgan City, Louisiana (Figure 1). So, despite the forecasts, we always need to have our guard up in Da Parish. I'll give an update in a couple of weeks, as the Colorado State group will update their forecast, and NOAA will issue theirs as well. Please contact me with any questions or complaints at keim@lsu.edu.

Figure 1: Hurricane Andrew at various stages on 23-25 August 1992.

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.

Southern Climate Monitor Team

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

Christine Kuhn, Student Assistant
Southern Climate Impacts Planning Program (OU)

Margret Boone, Program Manager
Southern Climate Impacts Planning Program (OU)

Hal Needham, Acting Program Manager
Southern Climate Impacts Planning Program (LSU)

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

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

Kevin Robbins, Director
Southern Regional Climate Center (LSU)

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.