Southern Climate Monitor

September 2013 | Volume 3, Issue 9

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**

Field Photos Weekends

Mark Shafer, Southern Climate Impacts Planning Program

Have you ever wondered how the weather relates to the world around us? Our measurements can tell us a lot about balance. Is there enough rain or too much? Is the hailstorm big enough to cause damage? How is the snowpack doing and what will that mean for next year's water supply? But to truly understand the relationship between weather and our landscape, nothing beats a set of eyes.

In 2012, SCIPP partnered with CoCoRaHS and the Earth Observation and Modeling Facility (EOMF) to launch a "Field Photos Weekend" project to create a national picture of our landscape. The project was to recruit volunteers to take photos of the landscape at roughly the same time – pictures of water bodies, fields, forests, or any other facet of the environment that was representative of the conditions around them. It could be a picture of their favorite fishing hole, a nearby farmer's field, or a nice secluded spot amongst the trees. All of these landscapes are affected by rainfall, or lack thereof.

So why did we do this? First of all, it is wonderful to be able to appreciate nature's beauty and to be able to see the world around us. But having everyone taking pictures at approximately the same time allows us to see the landscape as it relates to the things we measure – how it compares to the amounts of rain that have fallen or if it looks like what we might expect according to the U.S. Drought Monitor.

The Partnership

The goal of the project was to look at the entire nation at once. Obviously, since SCIPP is a regional program, we needed someone with a network of observers across all 50 states. The perfect partner for this was CoCoRaHS (http://www.cocorahs.org/), a grassroots network of more than 16,000 volunteer citizen scientists who provide daily reports on rainfall, snow and hail. By utilizing low-cost measurement tools, stressing training and education, and using an interactive web-site, CoCoRaHS seeks to provide the highest quality data for natural resource, education, and research applications. This existing network of enthusiastic observers was the perfect partner to add a new participatory activity: picture-taking.

With this piece of the puzzle solved, the next issue to tackle was how to archive, process and display thousands of photographs. Again, it turned out that there was a perfect partner: the Earth Observation and Modeling Facility (EOMF; http://www.eomf.ou.edu/) at the

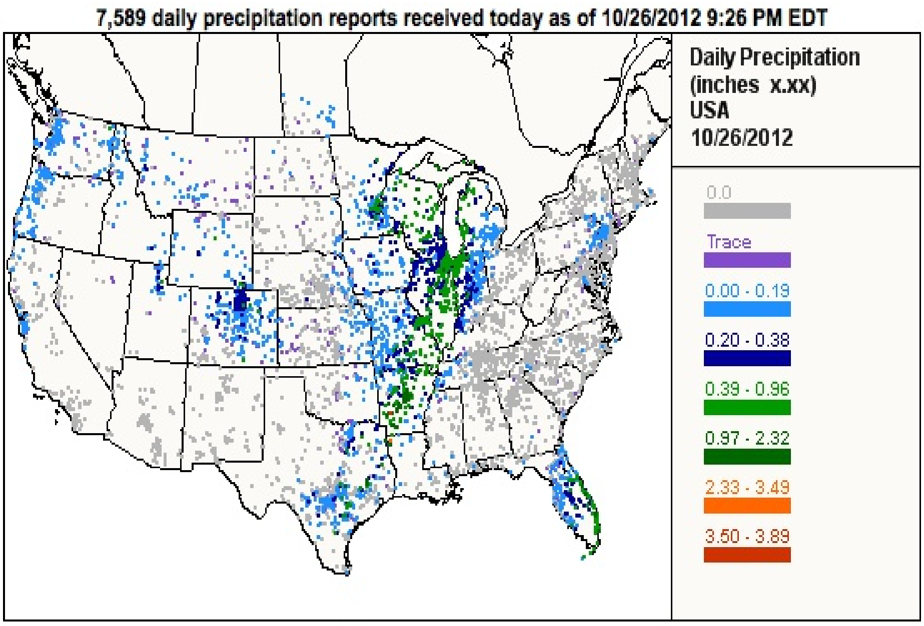


Figure 1: CoCoRaHS observation network. On this particular day, approximately half of the network's observers reported.

University of Oklahoma. EOMF already hosts a geo-referenced field photo library, which they use to provide visual comparison to remote-sensing tools such as satellite assessments of vegetation health and water content (Figure 2).

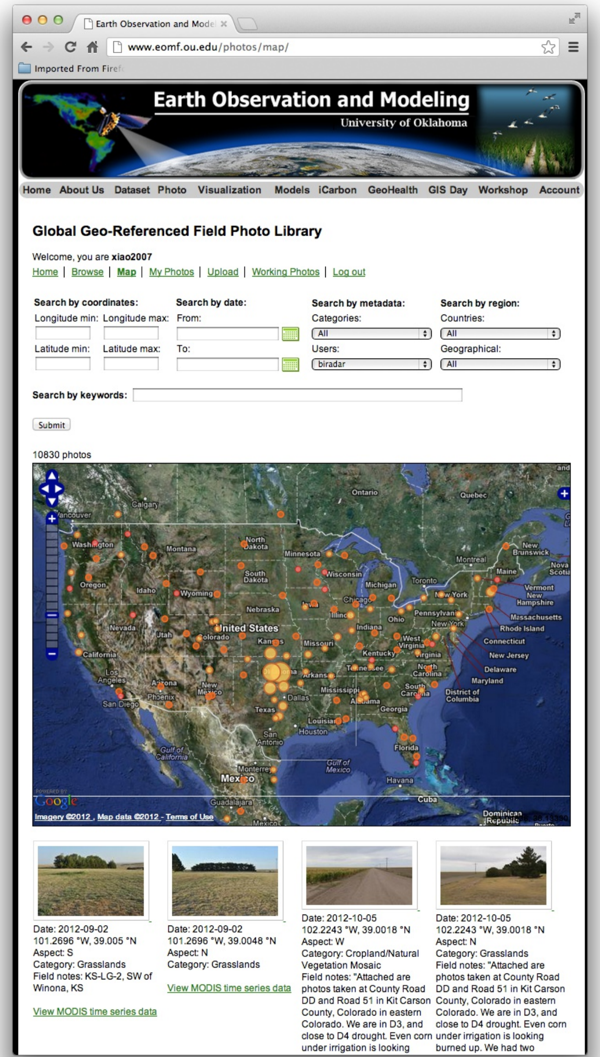


Fig 2: The Earth Observation and Modeling Facility's Geo-Referenced Field Photos website.

EOMF uses this information in studies of land use patterns and landscape changes. Furthermore, EOMF had a challenge: they wanted to increase participation in their photo library in order to have more "ground truth" images for their landscape studies.

Together, SCIPP, CoCoRaHS and EOMF launched a pilot project over Labor Day Weekend in 2012. Messages were sent to CoCoRaHS participants with instructions on how to participate and the partners made some additions to the EOMF website to make it easier to upload and display images. The first field campaign was conducted on September 1-3, 2012 as a demonstration project. Nearly 700 photos were received from CoCoRaHS observers in 45 states plus Canada and the United Kingdom.

The pilot project worked so well that the collaborators decided to try it again at several different times of year. A second field photos weekend was conducted over Presidents Day (February 16-18, 2013) with a similar response. A third event was conducted over Memorial Day (May 25-27, 2013) with another 646 photos. And finally, the event was repeated over Labor Day Weekend 2013 (August 31 – September 2). Each of these were met with similar enthusiasm and participation and several of those who participated in the original project contributed photos to one or more of the subsequent events. All photos are available through the EOMF website:

- Labor Day 2012: http://www.eomf.ou.edu/photos/cocorahssep12/
- Presidents Day 2013: http://www.eomf.ou.edu/photos/cocorahsfeb13/
- Memorial Day 2013: http://www.eomf.ou.edu/photos/cocorahsmay13/
- Labor Day 2013: http://www.eomf.ou.edu/photos/cocorahssep13/

To identify photos related to the project, either those received by email or those posted directly to the EOMF website, photos were tagged with #cocorahsmmmyy in their notes (mmm=month, yy=year, such as sep13). Unfortunately, we did not recognize this challenge at the beginning and are still in the process of going back and tagging some of those earlier photos; consequently, only a portion of the original photos are available through the search page, although all are posted and can be found by searching for date or location.

What do we hope to learn?

Figure 3: An example of grasslands photos received from the Field Photos Weekends pilot project showing varying severity of impacts. These photos were selected from among 167 grasslands photos received.

First of all, it is wonderful to be able to appreciate nature's beauty and to be able to see the world around us. But having everyone taking pictures at approximately the same time allows us to see this landscape as it relates to the things we measure - how it compares to the amounts of rain that have fallen or if it looks like what we might expect according to the U.S. Drought Monitor. Is the land around us as green as the satellite seems to think? Our initial motivation was to develop a consistent visual baseline that could be compared to the U.S. Drought Monitor. Drought pictures often highlight the worst conditions that can be found to underscore severity. By generating a set of photos across such a broad region nearly simultaneously, it was hoped that variations in different land use types, such as pastures, fields, streams and lakes, could be compared in different climate regimes (Figure 3). The impacts of drought in New York may not be the same as the impacts of drought in Texas.

The project originally started out under the “Pictures of Drought” moniker, but the team decided to select a more general category in order to encourage participation among those not experiencing drought at that time. This helps to establish both a baseline for future photo collection efforts as well as a comparison between drought and non-drought areas. So while the objective remained focused on identifying examples of drought, the recruitment was broadened to be less biased and more comprehensive.

While thousands of photos have been collected, the systematic effort to compare the photos to the U.S. Drought Monitor and other indicators is in its infancy. SCIPP is still in the process of cataloging the earlier photos and uploading the last of the photos from the latest campaign. EOMF is working on some changes to its processes to make it easier to upload photos and consequently easier to participate in future campaigns, including developing a smart phone app that will allow uploading pictures directly from the phone. CoCoRaHS and EOMF are pursing opportunities to develop training modules to improve consistency in how the photos are taken and documented.

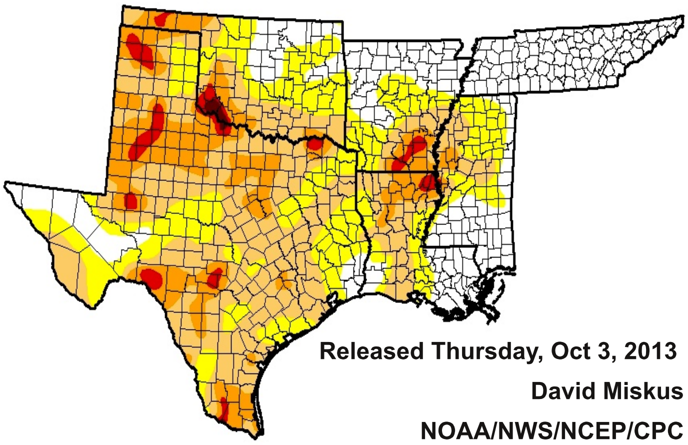
So while much of the science and technology is still on the “to do” list, it is easy to browse the photos that have already been collected and tagged through those four web links, directly to each field campaign. These photos reveal extreme differences in our landscape, from pictures reminiscent of the dust bowl in southeastern Colorado to flooding in South Texas. As for how well this compares to the Drought Monitor – we’ll get back to you on that. In the meantime, enjoy nature’s beauty.

Drought Update

Luigi Romolo
Southern Regional Climate Center

Drought conditions significantly improved over the month of September. Anomalously high precipitation in southern Texas and in Louisiana has helped reduce the amount of severe drought conditions (or worse) from 42.02 percent of the Southern Region to just 17.90 percent. There was also a significant reduction in the amount of extreme drought conditions (or worse). As of September 3, extreme drought (or worse) covered 10.78 percent of the Southern Region. By October 1, this value was reduced to just 3.16 percent. Much of this reduction occurred in the extreme southern tip of Texas and in east central Texas. In addition, the Oklahoma panhandle saw one category improvement from extreme drought to severe drought conditions. Elsewhere, drought conditions remained relatively unchanged.

In Texas, extreme rainfall caused flooding in Houston, Austin, Tyler, Corpus Christi, and all the cities in between. The weekend of the 28th and 29th brought torrential rain to many parts of the state. The biggest flooding event of the month occured in El Paso on the 10th and 11th, when heavy rains overwhelmed the city's drainage system in many areas, flooding homes and even shutting down the westbound lanes of Interstate 10. The ample precipitation helped bring the statewide reservoir storage to around 60% of conservation storage. This is notable because, for the first time since late January, statewide reservoirs are not setting daily records for low storage but are merely tying them (Information provided by the Texas Office of State Climatology).



Above: Drought Conditions in the Southern Region. Map is valid for October 1, 2013. Image is courtesy of the National Drought Mitigation Center.

Week	Date	Nothing	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	10/1/13	26.2	73.8	50.11	17.9	3.16	0.25
Last Week	9/24/13	22.83	77.17	57.61	32.18	4.82	0.34
3 Months Ago	7/2/13	39.8	60.2	49.62	39.59	20	7.32
Start of Calendar Year	1/1/13	21.18	78.82	63.69	50.5	32.8	10.98
Start of Water Year	10/1/13	26.2	73.8	50.11	17.9	3.16	0.25
One Year Ago	9/25/12	24.13	75.87	66.61	51.5	29.86	9.11

Intensity:

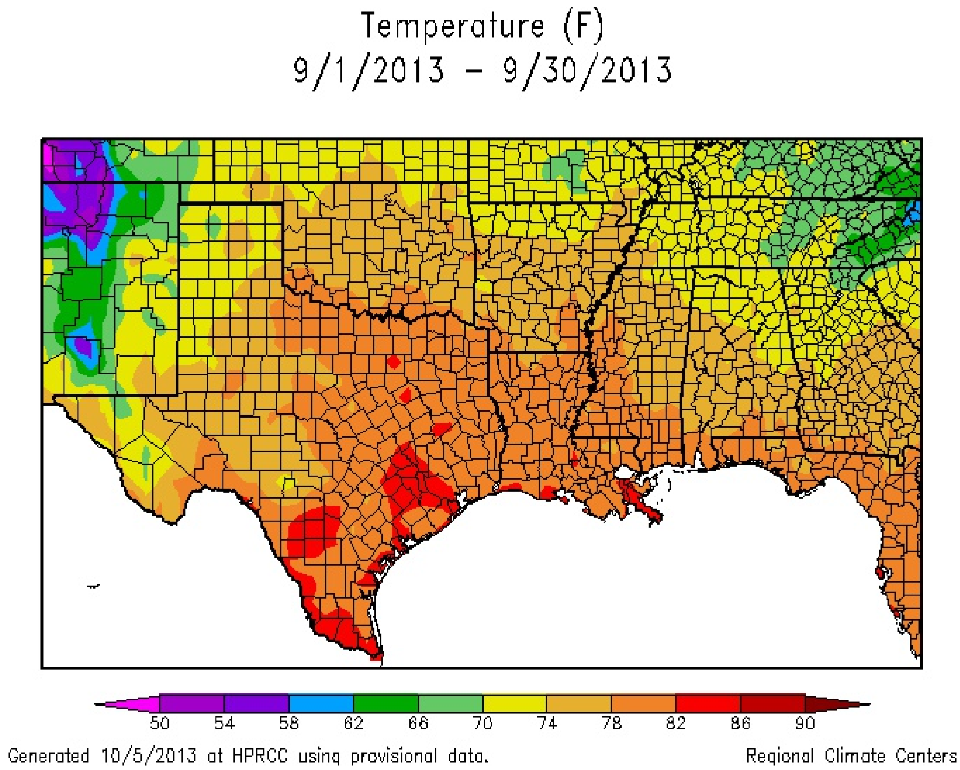
- *D0 Abnormally Dry*
- *D1 Drought - Moderate*
- *D2 Drought - Severe*
- *D3 Drought - Extreme*
- *D4 Drought - Exceptional*

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

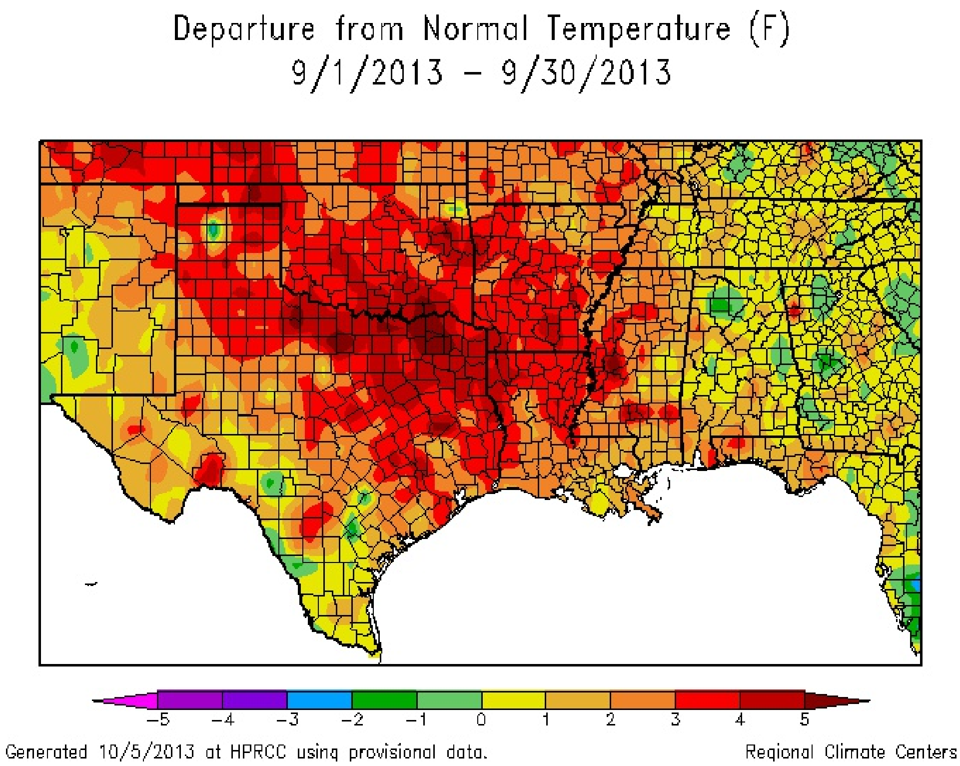
Temperature Summary

Luigi Romolo
Southern Regional Climate Center

The month of September proved to be a warmer than normal month for all six states within the Southern Region. The highest departures from normal were observed in the central and west central counties of the region, with stations averaging between 3-5 degree F (1.67- 2.78) degrees C) above normal. This area includes: southern Oklahoma, north eastern Texas, northern Louisiana, and southern Arkansas. Elsewhere, temperatures averaged between 1-3 degrees F (0.56-1.67 degrees C) above normal.



Average September 2013 Temperature across the South.

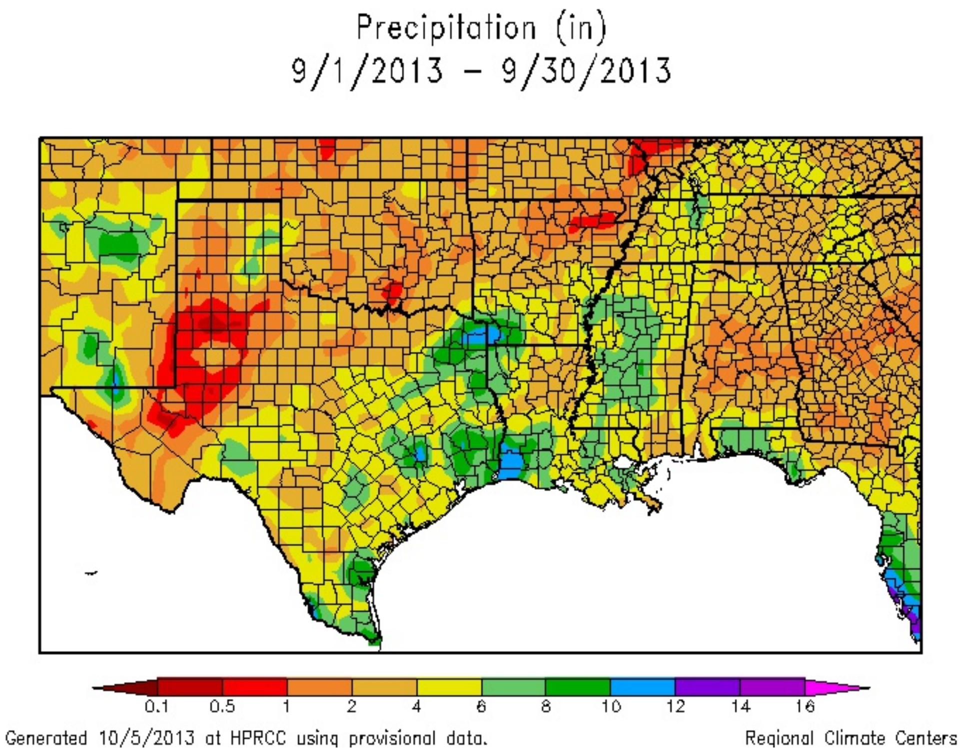


Average Temperature Departures from 1971-2000 for September 2013 across the South.

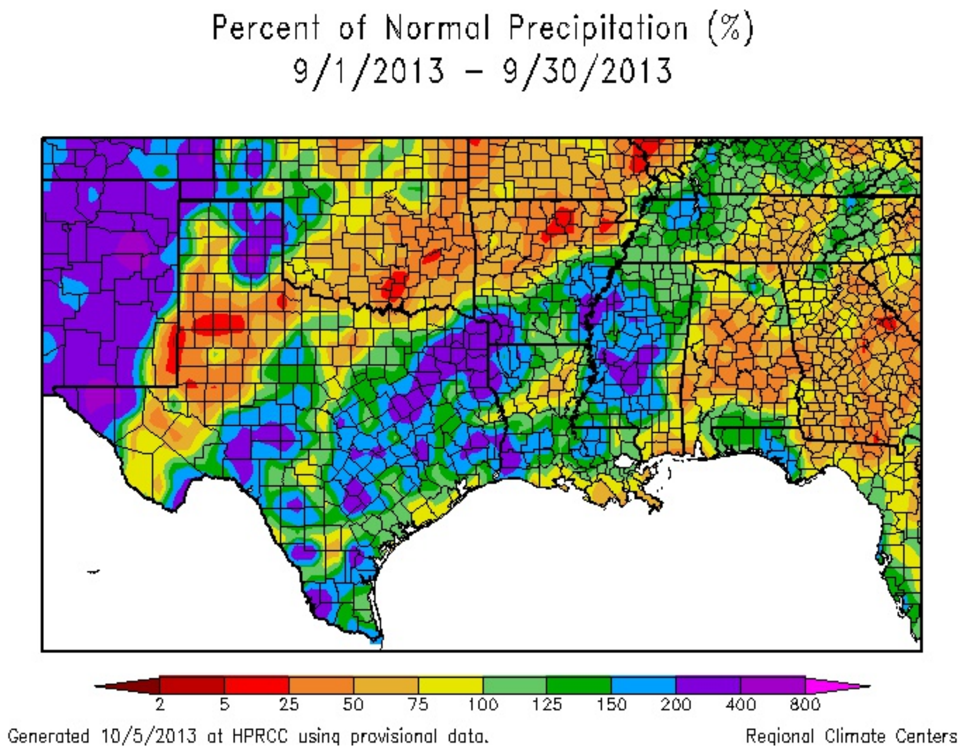
Precipitation Summary

Luigi Romolo
Southern Regional Climate Center

Precipitation totals for the month of September varied spatially over the Southern Region. Much of Oklahoma and northern Arkansas reported below normal precipitation for the month, with monthly totals ranging from approximately 20 to 75 percent of normal. This was also the case in parts of northwestern Texas. Southern Texas, southern Arkansas, Louisiana and Mississippi experienced a wetter than normal month, with precipitation totals ranging from 100 to over 200 percent of normal. The highest anomalies were observed in the Arkansas-Texas-Louisiana border counties, and in the extreme western counties of the Texas Trans Pecos Climate Division.

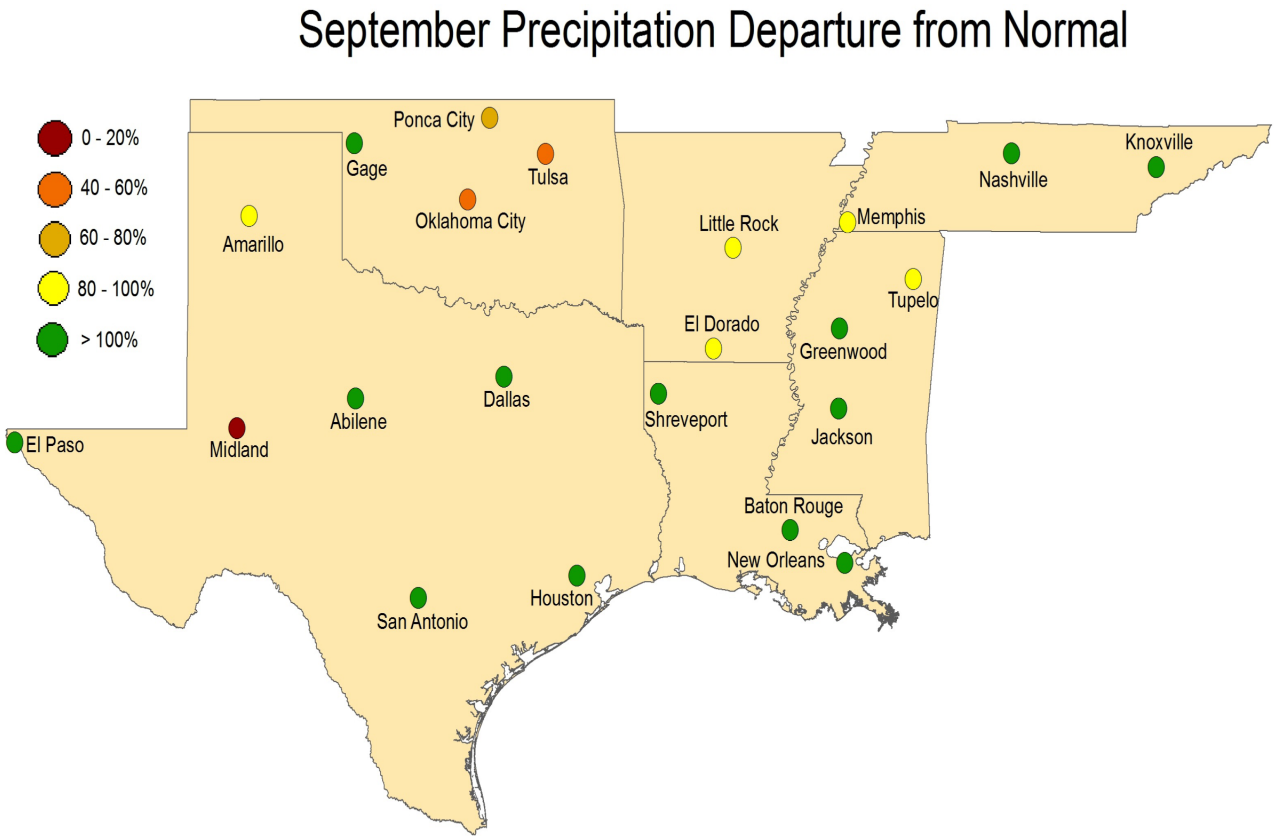


Total precipitation values for September 2013 across the South.

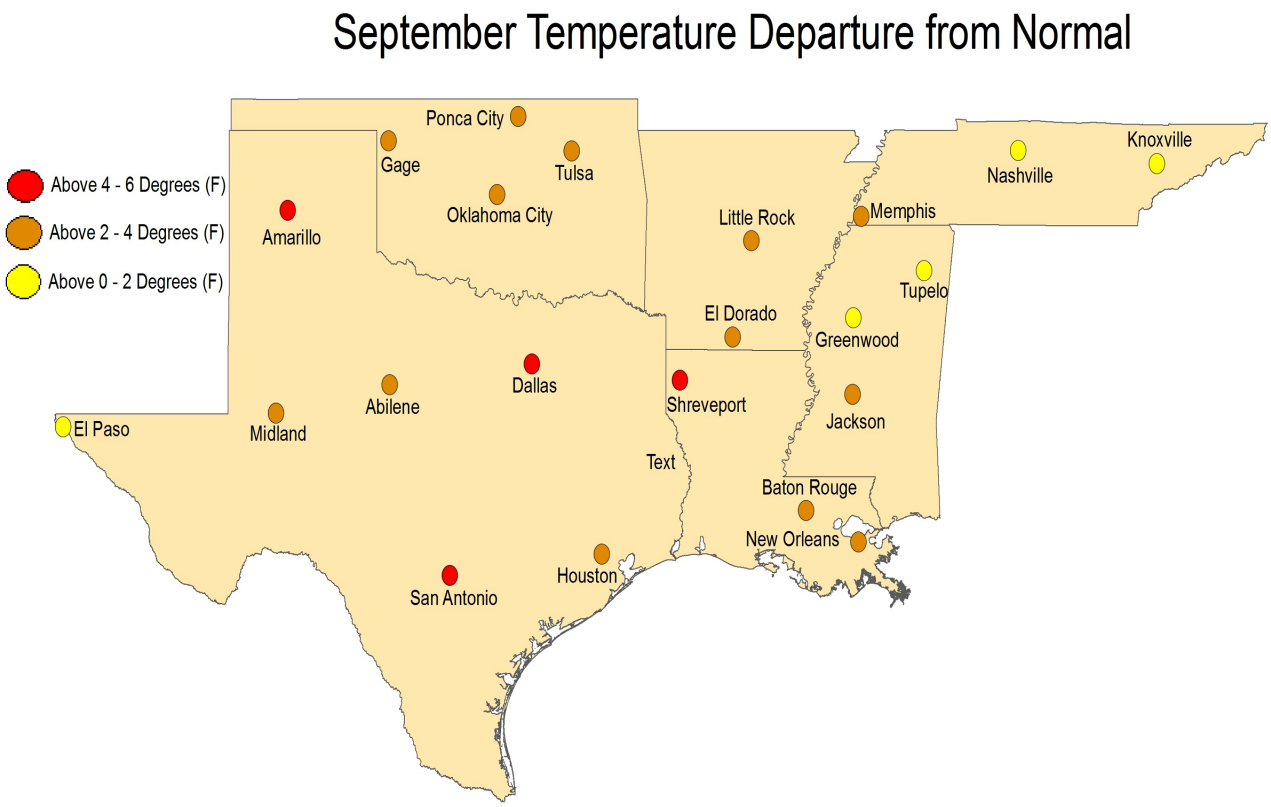


Percent of 1971-2000 normal precipitation totals for September 2013 across the South.

Regional Climate Perspective in Pictures



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



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

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	91.2	65.1	78.1	3.0	99	9/3+	50	09/15	3.10	-0.19	94
Little Rock, AR	89.9	66.4	78.1	3.7	101	09/08	54	09/15	3.21	-0.50	87
Baton Rouge, LA	90.7	70.5	80.6	3.1	95	09/03	63	09/26	6.89	2.05	142
New Orleans, LA	89.5	73.9	81.7	2.8	94	09/13	67	09/29	8.68	3.13	156
Shreveport, LA	93.9	69.7	81.8	4.8	104	09/03	57	09/23	9.31	6.10	290
Greenwood, MS	89.2	64.3	76.7	1.0	96	9/10+	53	9/23+	8.10	4.85	249
Jackson, MS	90.7	67.0	78.8	3.3	97	9/9+	55	09/23	7.37	4.14	228
Tupelo, MS	86.6	64.2	75.4	1.7	96	9/10+	52	9/22+	3.99	-0.09	98
Gage, OK	88.0	60.6	74.3	3.7	100	09/07	43	09/29	2.61	0.64	132
Oklahoma City, OK	88.9	64.5	76.7	3.5	98	09/07	49	09/29	1.95	-2.03	49
Ponca City, OK	87.5	63.0	75.3	2.3	100	09/07	45	09/29	2.89	-0.78	79
Tulsa, OK	88.4	64.3	76.3	2.8	99	9/8+	50	09/30	2.51	-2.25	53
Knoxville, TN	81.7	60.5	71.1	0.9	90	09/01	51	09/14	5.12	1.87	158
Memphis, TN	87.4	68.9	78.2	3.4	98	09/08	59	9/23+	2.70	-0.61	81
Nashville, TN	84.0	62.2	73.1	1.8	94	09/09	51	09/22	4.51	0.92	126
Abilene, TX	90.4	66.8	78.6	3.1	102	09/01	54	09/22	3.18	0.27	109
Amarillo, TX	86.6	60.8	73.7	4.6	96	9/7+	44	9/30+	1.83	-0.05	97
El Paso, TX	86.0	66.1	76.0	0.6	98	09/01	49	09/29	3.85	2.24	239
Dallas, TX	93.1	71.6	82.4	4.9	104	09/01	59	09/23	2.72	0.30	113
Houston, TX	91.8	73.0	82.4	3.5	100	09/03	63	09/22	5.09	0.76	118
Midland, TX	89.4	65.7	77.5	3.6	99	09/01	50	09/29	0.27	-2.04	12
San Antonio, TX	94.4	72.3	83.4	4.0	101	9/4+	57	09/23	3.70	0.70	123

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

Wind Shear Kept Tropical Storm Karen in Check

Barry Keim, Louisiana State Climatologist, Louisiana State University

We just dodged a bullet, as Tropical Storm Karen could have ravaged southeastern Louisiana under different circumstances. We basically have “wind shear” to thank for Louisiana being spared. Everything was more-or-less in place for the formation of a hurricane, and potentially a major hurricane. The National Hurricane Center even thought this storm would reach Category 1 Hurricane strength while over the Gulf. We had very warm sea surface temperatures in the Caribbean and Gulf – plenty warm enough to support a hurricane, and we’re certainly within the window of time when hurricanes and major hurricanes form. However, our little friend called “wind shear” was there to throw on the brakes. Wind shear refers to strong winds that blow at high elevation over the hurricane. When the shear is strong – blowing fast – it does not allow the hurricane to vent in these upper levels, which basically supresses the storm’s development. That is mostly what kept this tropical storm from graduating up to a hurricane. In addition, Tropical Storm Karen was ingesting relatively dry from the west and northwest – air that originated from over North America - which also helped starve the storm of moisture and condensation. Note the satellite image of Tropical Storm Karen while it was out over the Gulf (Figure 1). The center of the storm is actually located to the left (west) of the large mass of cloud cover that is apparent in the image – south of Morgan City. As a result of the wind shear and the ingestion of dry air from the west, the storm’s development was inhibited, mostly on the west side. Asymetrical storms like this do not generally get all that stong. So, as you waltz around the Parish this week, while enjoying the cool, crisp, clear weather, make certain to thank your new friend – Mr. Wind Shear. Without it, we might be having very different thoughts about Mother Nature right now. Feel free to contact me at keim@lsu.edu with any questions or comments.

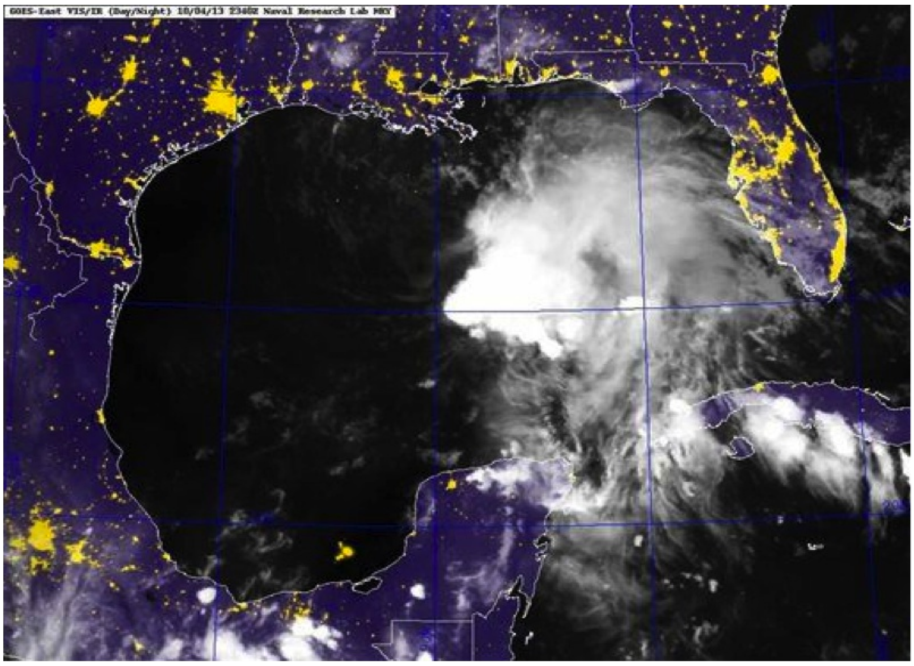


Figure 1: GOES-East VIS/IR satellite image of Tropical Storm Karen on 4 October 2013. Image provided by the Naval Research Laboratory.

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 this 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.

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.

Southern Climate Monitor Team

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

Katy Strnad, Student Assistant
Southern Climate Impacts Planning Program (OU)

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

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

Rachel Riley, Associate Program Manager
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)