



Guadalupe Mountains - Texas

SOUTHERN CLIMATE *MONITOR*

MARCH 2012 | VOLUME 2, ISSUE 3

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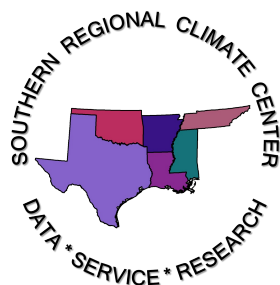
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An Analysis of the 12 March 2012 Flash Flooding Event in South-Central Louisiana

Amanda Billiot, Louisiana State University

The first day of NOAA's 2012 Flood Safety Awareness week (March 12-16) could not have come at a more appropriate time for the residents of Acadia, St. Martin, St. Landry, and Lafayette Parishes in South-Central Louisiana. On March 12, 2012 a localized severe flash flooding event prompted Louisiana Governor Bobby Jindal to declare a state of emergency for these four parishes. According to the National Weather Service (NWS) in Lake Charles, the radar estimated that up to 15 inches of rain fell over a period of about 6 hours at some locations on March 12. However, the event was so localized in nature that only three rain gauges recorded above 3 inches for the event. The United States Geological Survey (USGS) rain gauge at Bayou Vermillion near Carencro, LA recorded a rainfall total of 14.18 inches, the cooperative observer (CO-OP) station in Carencro recorded 13.21 inches, and the Butte La Rose CO-OP station recorded 8.03 inches. The total rainfall at Carencro was the highest 1-day rainfall ever recorded at the CO-OP site, which has a record that extends back to 1986. The second highest rainfall total was 7.71 inches, or 5.50 inches less than what was recorded on March 12.

On the morning of the event, widespread shower and thunderstorm activity developed in the Lake Charles NWS warning area in South-Central Louisiana along an outflow boundary on the backside of a mesoscale convective system (MCS) that moved west to east through the region during the nighttime hours. While some rainfall was expected to occur behind the MCS, rainfall of such an extreme magnitude was not forecast. In fact, the NWS in Lake Charles did not issue a flash flood warning prior to the onset of the event. However, once the rainstorm began, the NWS issued multiple flash flood warnings and

Louisiana: 3/13/2012 1-Day Observed Precipitation
Valid at 3/13/2012 1200 UTC - Created 3/15/12 23:30 UTC

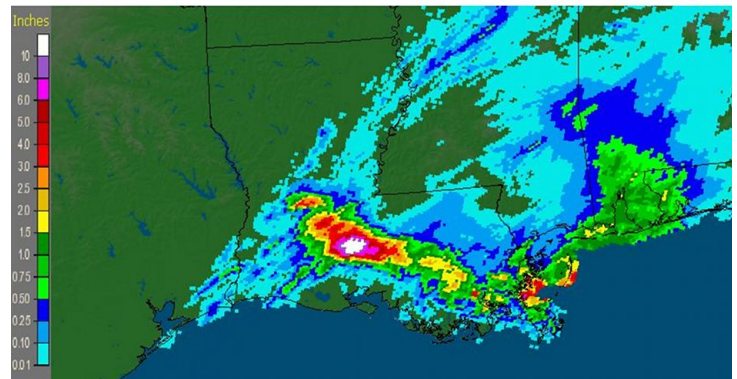


FIGURE 1 Observed Precipitation from March 12 at 07:00 CDT to March 13 at 07:00 CDT. Flash flooding occurred within the bull's-eye of 10+ inches of rainfall in South-Central Louisiana. Source: Advanced Hydrological Prediction Services (AHPS) <http://water.weather.gov/precip/>

statements to inform residents and emergency management of the imminent flooding situation. The thunderstorm development along the outflow boundary was characterized by training, or the repeated occurrence of storms over the same region. The training, combined with slow storm motion and an abundance of moisture in the atmosphere, caused a dangerous situation to develop for the residents of Acadia, St. Martin, St. Landry, and Lafayette Parishes, where the heaviest rainfall occurred.

The rainfall caused severe flash flooding in low-lying areas, and along Bayou Carencro. According to reports from residents and rescue workers, the water level inside homes located near the Bayou was between 2 and 6 feet. The USGS gauge at Bayou Vermillion near Carencro recorded a crest of over 22 feet, which is 5 feet above flood stage. The water level on the bayou during this event broke the previous record of 21.5 feet. The quickly rising water caused dozens of people to be trapped inside their cars and portions of interstate

49 were shut down due to the presence of water on the roadway. The Louisiana Department of Wildlife and Fisheries, the lead agency in charge of search and rescue in Louisiana, rescued at least 80 people from flooded homes and cars. Fortunately, there were no fatalities reported as a result of the flooding. Despite the fact that the event was not forecast in advance, the NWS and emergency management did an exceptional job of keeping the public safe and informed.



IMAGE 1 Flooded homes along Bayou Carencro in Lafayette Parish, LA. Image courtesy of the Louisiana Department on Wildlife and Fisheries (LDWF).

DROUGHT CONDITIONS

Luigi Romolo, Southern Regional Climate Center

Drought conditions in the Southern Region improved for the second consecutive month. Anomalously high precipitation in March has led to the removal of all drought in Louisiana. Arkansas, Mississippi and Tennessee are also drought-free. In Oklahoma, drought remains in the west, while the east has now been replenished with enough rainfall to eradicate drought there. Similar

improvements occurred in eastern Texas. Drought remains a big factor in western and northwestern Texas, where March rainfall totals were relatively lower than normal.

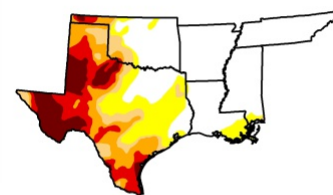
U.S. Drought Monitor South

March 27, 2012
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	49.24	50.76	37.09	29.54	19.03	9.19
Last Week (03/20/2012 map)	44.96	55.04	46.94	30.12	19.46	9.47
3 Months Ago (12/27/2011 map)	26.47	73.53	69.01	54.81	39.11	17.15
Start of Calendar Year (12/27/2011 map)	26.47	73.53	69.01	54.81	39.11	17.15
Start of Water Year (09/27/2011 map)	18.34	81.66	76.26	70.61	63.67	53.77
One Year Ago (03/22/2011 map)	8.76	91.24	77.39	50.26	20.47	0.00

Intensity:

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



To the Right: Drought conditions in the Southern Region. Map is valid for March 2012. Image courtesy of the National Drought Mitigation Center.

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, March 29, 2012
Eric Luebbehusen, USDA

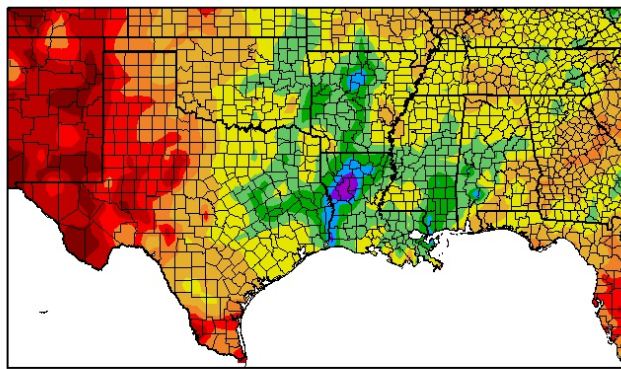
PRECIPITATION SUMMARY

Luigi Romolo, Southern Regional Climate Center

With the exception of Tennessee, and much of eastern Texas, March was generally a wet month for the Southern Region. Precipitation values for the month ranged from five to fifty percent of normal in western Texas and central Tennessee to over two hundred percent of normal in eastern Texas, northern Louisiana, and northwestern Arkansas. Texas recorded 3.15 inches (80.01 mm) for the month, making it their eighth wettest March on record (1895-2012). It also marks the first time since September of 2010, that the state averaged over 3 inches (76.20 mm) of precipitation. Louisiana also recorded its eighth wettest March on record (1895-2012) with a state average

precipitation total of 8.56 inches (217.42 mm). Arkansas received slightly less, reporting 7.03 inches (178.56 mm), making it their fifteenth wettest March on record (1895-2012). Oklahoma experienced its sixth wettest March on record, with a state wide average precipitation of 4.89 inches (124.21 mm). Mississippi reported 6.94 inches (176.28 mm) of precipitation for the month, which was their twenty-seventh wettest March on Record (1895). The only drier than normal state for the month was Tennessee, which reported a state average precipitation of 4.96 inches (125.98 mm); their fifty-fourth driest March on record (1895-2012).

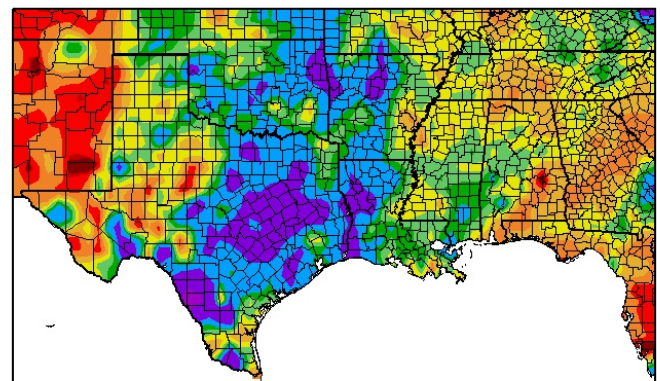
Precipitation (in)
3/1/2012 - 3/31/2012



Generated 4/1/2012 at HPRCC using provisional data.

Regional Climate Centers

Percent of Normal Precipitation (%)
3/1/2012 - 3/31/2012



Generated 4/1/2012 at HPRCC using provisional data.

Regional Climate Centers

Total precipitation values (left) and The percent of 1971-2000 normal precipitation totals (right) for March 2012.

EQUINOX STARTS SPRING, HELPS SET RELIGIOUS CALENDAR

Barry D. Keim, Louisiana State Climatologist

The spring, or vernal, equinox is now upon us. It occurs at precisely at 12:14 am on March 20, 2012. The word equinox literally means equal days and equal nights. On this day, in theory, every location on the surface of the earth experiences 12 hours of daylight and 12 hours of darkness - not taking into account twilight. This occurs because on this day, the earth's tilt relative to the sun is zero. Note that the earth is always tilted on its axis by 23.5 degrees, but the axial tilt leans neither away from, nor toward the sun, and all regions of the earth face the sun for 12 hours. This only occurs on two days of the year - the equinoxes in late March and late September. Otherwise, the number of daylight hours vary across earth, with higher latitudes having the biggest extremes between winter and summer daylight hours. In South Louisiana, daylight hours range from about 14 hours in late June to about 10 hours in late December, with 12 hours occurring at the equinoxes. At Norman, Oklahoma, daylight hours are a bit longer in June at about 14.5 hours and a bit shorter at 9.5 hours in December, with 12 hours occurring on the equinoxes.

The equinox is used in the Iranian calendar, and others, to mark the beginning of the new year, and is a holiday in many countries around the world. The equinox also has a special place in the Christian calendar. Easter Sunday is set on the



This image is in the public domain and can be found at:

<<http://www.photos.creativeuncut.com/viewimage/flowers-daffodils.html>>

first Sunday after the first full moon after the March equinox. And of course, Mardi Gras and Ash Wednesday are then set accordingly. It also marks the first day of astronomical Spring, a time to for planting, including in your garden. So break out the shovels and enjoy this glorious time of year in South Louisiana.

If you have any comments, complaints, or compliments, feel free to e-mail me at keim@lsu.edu.

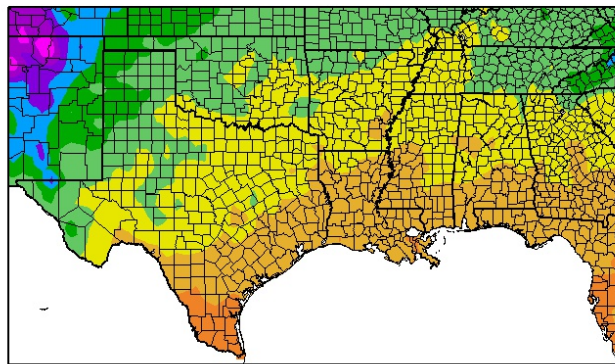
TEMPERATURE SUMMARY

Luigi Romolo, Southern Regional Climate Center

March was an extremely warm month for the Southern Region, with mean temperatures for the month ranging from 3 to 15 degrees F (1.67 to 8.33 degrees C) above normal. The highest anomalies occurred in northern Oklahoma and throughout much of Arkansas and Tennessee. The average mean temperature for the region was 62.79 degrees F (17.11 degrees C), which makes it the second warmest March on record (1895-2012). This value is not surprising when considering that four of the six states experienced their warmest March since records began in 1895. These states include: Arkansas, which had an average March temperature of 62.00 degrees F

(16.67 degrees C), Mississippi, which had an average March temperature of 65.10 degrees F (18.39 degrees C), Oklahoma, which had an average March temperature of 59.30 degrees F (15.17 degrees C), and Tennessee, which had an average March temperature of 59.80 degrees F (15.44 degrees C). Louisiana experienced its third warmest March on record (1895-2012), while Texas experienced its sixth warmest March on record (1895-2012). The average March temperature for Louisiana was 67.30 degrees F (19.61 degrees C), while for Texas it was 63.10 degrees F (17.28 degrees C).

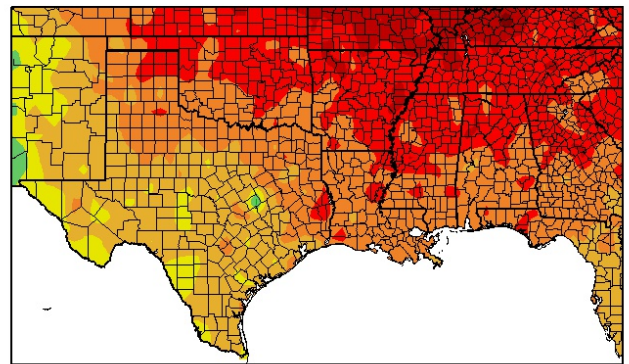
Temperature (F)
3/1/2012 – 3/31/2012



Generated 4/1/2012 at HPRCC using provisional data.

Regional Climate Centers

Departure from Normal Temperature (F)
3/1/2012 – 3/31/2012



Generated 4/1/2012 at HPRCC using provisional data.

Regional Climate Centers

Average temperatures (left) and departures from 1971-2000 normal average temperatures (right) for March 2012, across the South.

CLIMATE PERSPECTIVE

State	Temperature	Rank	Precipitation	Rank
Arkansas	62.0	Warmest Ever	7.03	15 th Wettest
Louisiana	67.3	3 rd Warmest	8.56	8 th Wettest
Mississippi	65.1	Warmest Ever	6.94	27 th Wettest
Oklahoma	59.3	Warmest Ever	4.89	6 th Wettest
Tennessee	59.8	Warmest Ever	4.96	54 th Driest
Texas	63.1	6 th Warmest	3.15	8 th Wettest

State temperature and precipitation values and rankings for March 2012. 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	75.4	50.5	63.0	6.6	84.0	3/31	30.0	3/4	8.77	3.62	170
Little Rock, AR	76.1	52.4	64.3	10.9	87.0	3/31	36.0	3/4	8.05	3.17	165
Baton Rouge, LA	79.4	58.1	68.7	8.5	85.0	3/31+	38.0	3/4	6.42	1.35	127
New Orleans, LA	79.6	61.8	70.7	8.3	85.0	3/31+	41.0	3/4	8.10	2.86	155
Shreveport, LA	78.3	56.4	67.3	8.8	85.0	3/26+	38.0	3/4	7.94	3.76	190
Greenwood, MS	76.4	53.2	64.8	8.5	85.0	3/19	30.0	3/4	4.42	-1.37	76
Jackson, MS	77.3	55.4	66.3	9.5	85.0	3/15	34.0	3/4	7.06	1.32	123
Tupelo, MS	75.5	52.1	63.8	10.7	85.0	3/20	33.0	3/10+	7.71	1.41	122
Oklahoma City, OK	71.8	49.8	60.8	9.8	83.0	3/31	29.0	3/4	5.03	2.13	173
Ponca City, OK	71.3	48.1	59.7	10.5	84.0	3/31+	27.0	3/4+	3.21	0.27	109
Tulsa, OK	72.6	50.3	61.5	10.1	85.0	3/31	30.0	3/9	6.24	2.67	175
Knoxville, TN	71.6	49.1	60.4	10.6	85.0	3/20	26.0	3/6	6.06	0.89	117
Memphis, TN	75.2	54.5	64.8	11.3	85.0	3/31+	34.0	3/4	4.35	-1.23	78
Nashville, TN	73.4	48.8	61.1	11.0	85.0	3/28	28.0	3/4	3.11	-1.76	64
Amarillo, TX	72.3	40.5	56.4	8.5	89.0	3/31	21.0	3/3	1.16	0.03	103
El Paso, TX	74.2	42.7	58.4	1.4	90.0	3/25	29.0	3/4	0.08	-0.18	31
Dallas, TX	73.9	54.6	64.3	6.9	86.0	3/25	35.0	3/4	5.74	2.68	188
Houston, TX	78.4	59.7	69.0	6.8	86.0	3/31+	42.0	3/4	7.14	3.78	212
San Antonio, TX	76.2	56.5	66.4	4.3	88.0	3/31	37.0	3/4	3.24	1.35	171

Summary of temperature and precipitation information from around the region for March 2012. 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.

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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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.