

Southern Climate Monitor

July 2013 | Volume 3, Issue 7



"Freedom"
By Katy Strnad



SCIPP

Southern Climate Impacts Planning Program
A NOAA RISA Team

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

Monitoring Hazardous Weather in the City: The Dallas - Ft. Worth Urban Demonstration Network

Jerry Brotzge, Center for Analysis and Prediction of Storms

With a majority of the world's population now living in cities, the ability to understand, monitor and predict the urban environment is now more important than ever. Increasingly high population densities pose ever greater vulnerabilities in hazard prone regions, such as the Southern Plains. Tornadoes, large hail, damaging winds, flash flooding, and heat waves can pose a significant threat to life and economic impact. Large urban landscapes can

exacerbate these effects, for example, by channeling winds through street canyons, increasing precipitation runoff, and intensifying high temperatures. Increased surface temperatures in cities, dubbed the Urban Heat Island (UHI) effect, leads to increased ozone production and worsening pollution levels. Global climate change threatens to aggravate these problems even further.

As a first step towards improving our ability to understand and observe the urban environment,

the Engineering Research Center for Collaborative Adaptive Sensing of the Atmosphere (CASA) is establishing a new monitoring and prediction network in the Dallas – Fort Worth (DFW) Metroplex. Known as the DFW Urban Demonstration Network, the system is designed to support

both real-time weather operations as well as basic research. With funding from the National Science Foundation and NOAA, the Network goals are multifaceted: (i) To support real-time weather monitoring of severe and hazardous weather; (ii) To support data collection for basic and applied research; (iii) To demonstrate and test the value of integrated observing systems; and (iv) To build and demonstrate a collaborative, data collection partnership between government, academia, and the private sector.



Fig. 1: Installation of the first X-band radar of the Urban Demonstration Network on October 28, 2012, at the University of Texas at Arlington. Figure courtesy of Ms. Brenda Philips.

The DFW Urban Demonstration Network is a joint academic partnership between the University of Oklahoma, the University of Massachusetts, and Colorado State University. The Network is a 5+ year collaboration with strong support provided by local government (i.e., the North Central Texas Council of Governments (NCTCOG)) and local universities (e.g., University of Texas at Arlington and the University of North Texas). Completion of the testbed is expected by December 2013.

The DFW Metroplex is the ideal location for such a demonstration testbed. The metropolitan population of Dallas-Ft. Worth is nearly 6.5 million, the 4th largest city in America, within an area of 9,286 square miles, and is among the fastest growing major metro areas in the country, adding nearly 1.3 million since 2000. Dallas-Fort Worth is home to two major airports,

Currently, all warnings issued by the National Weather Service are based on weather hazards that are either just developing or in progress, usually observed by storm spotters or inferred from radar. Unfortunately, this limits the amount of lead time warning that can be provided to the general public. However, as numerical weather prediction (NWP) improves, warnings may soon be issued based, at least in part, on NWP output. This is known as “Warn-on-Forecast” and will allow warnings to be issued well in advance of hazard development.

The DFW Urban Network is well-suited for testing Warn-on-Forecast with a demonstration project already underway. All Network data are assimilated into the Advanced Regional Prediction Systems (ARPS), a high-resolution numerical model designed by CAPS for modeling convective storms.

During each storm event, high-resolution (1-km), 3-hr forecasts are generated every 30-min across a domain covering the entire Metroplex. Model output is then distributed to the NWS forecast office and other interested users. This is the first operational test of Warn-on-Forecast and represents the future of public warnings.

The Urban Demonstration Network, through its multi-university, cross-disciplinary partnerships and university-government-private sector collaborations, will lead the nation as a model for how to invest in basic research for the benefit of its citizens’ protection and economic security. If you are interested in receiving this data or would like more information, please contact Dr. Jerry Brotzge (jbrotzge@ou.edu) or visit our website at <http://www.casa.umass.edu>.

More to Learn

-  http://www.youtube.com/watch?v=DPBwkl6i_k&feature=youtube_gdata_player
-  <http://www.ametsoc.org/boardpges/cwce/docs/profiles/PhilipsBrendaJ/2011-08-SCM.pdf>
-  http://www.meteo.fr/cic/meetings/2012/ERAD/extended_abs/QPE_060_ext_abs.pdf
-  <http://journals.ametsoc.org/doi/pdf/10.1175/JTECH-D-11-00076.1>
-  http://www.nssl.noaa.gov/news/factsheets/WoF_09jul2013.pdf

Drought Update

*Luigi Romolo
Southern Regional Climate Center*

Drought conditions changed little over the month of July. Dryness throughout much of Arkansas led to the introduction of some moderate drought. This was also the case for some parishes in west central Louisiana. Drought conditions in Texas and western Oklahoma are relatively unchanged, despite anomalously high precipitation in central Texas.

In Texas, the cooler and wetter weather has helped farmers and ranchers across the state. East Texas vineyard owners are predicting one of their best harvests in years due to perfect conditions. Corn and cotton farmers in central Texas believe the July rains saved several million dollars of crops after the dry June. Still, problems for ranchers persist, but efforts to help the

continually hurting herd numbers are taking place, including hay planting in 197 counties across the state to provide food for cattle.

Unfortunately, reservoirs throughout Texas continue to decline. Many regions across the state have ramped up their water restrictions, including Stage 2 restrictions in Austin and Victoria, Stage 3 in Galveston, and Stage 4 in Marlin after Dow Chemical claimed senior water rights along the Brazos River. To combat this, water reclamation projects are gaining steam in Austin, with an estimated 8.5 billion gallons of reused water possible, and a new pipeline in Dallas from Lake Palestine, costing an estimated \$2.3 billion (Information provided by the Texas State Climate Office).

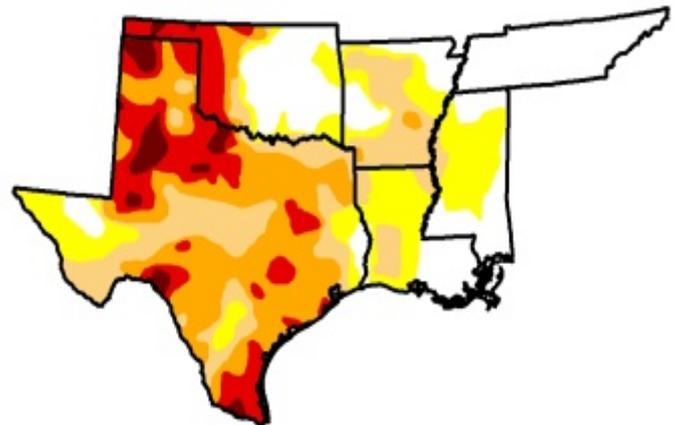
Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	26.19	73.81	56.40	37.58	16.20	3.04
Last Week (07/23/2013 map)	20.13	79.87	60.49	39.97	18.33	3.78
3 Months Ago (04/30/2013 map)	36.44	63.56	56.10	44.27	22.46	5.95
Start of Calendar Year (01/01/2013 map)	21.18	78.82	63.69	50.50	32.80	10.98
Start of Water Year (09/25/2012 map)	24.13	75.87	66.61	51.50	29.86	9.11
One Year Ago (07/24/2012 map)	19.82	80.18	67.23	42.53	20.72	4.30

Intensity:

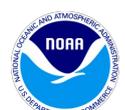
- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

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, August 1, 2013

Brian Fuchs, National Drought Mitigation Center



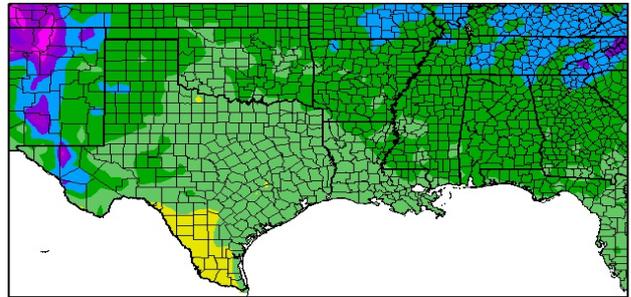
Above: Drought Conditions in the Southern Region. Map is valid for July 30, 2013. Image is courtesy of National Drought Mitigation Center.

Temperature Summary

Luigi Romolo
Southern Regional Climate Center

For the Southern Region, the month of July proved to be a cooler than normal month across the board. Temperatures across the six states generally averaged between 0 to 4 degrees F (0 to 2.22 degrees C) below normal, with the highest negative anomalies occurring in northwestern Arkansas and western Tennessee. With the exception of some areas in southern Texas, temperatures were consistently lower than normal over the course of the month. The state average temperatures for the month are as follows: Arkansas with 77.80 degrees F (25.44 degrees C), Louisiana with 80.60 degrees F (27.00 degrees C), Mississippi with 78.60 degrees F (25.89 degrees C), Oklahoma with 79.70 degrees F (26.50 degrees C), Tennessee with 75.00 degrees F (23.89 degrees C), and Texas with 81.30 degrees F (27.39 degrees C). All six states reported temperature averages that were below the 1895-2013 average. For Mississippi, it was the seventh coldest July on record (1895-2013), while Arkansas and Tennessee saw their tenth coldest July on record (1895-2013). Louisiana experienced its sixteenth coldest July on record (1895-2013), while Texas recorded its twenty-sixth coldest July on record (1895-2013). In the case of Oklahoma, it was their thirtieth coldest July on record (1895-2013).

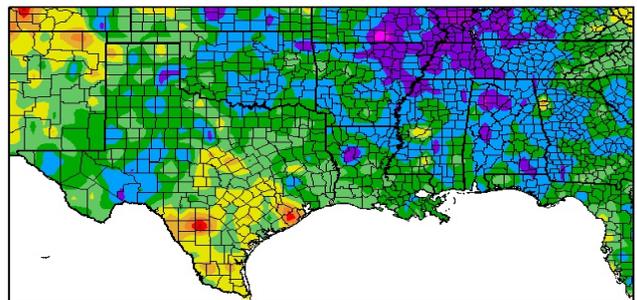
Temperature (F)
 7/1/2013 – 7/31/2013



Generated 8/1/2013 at HPRCC using provisional data. Regional Climate Centers

Average Temperature for July 2013 across the South.

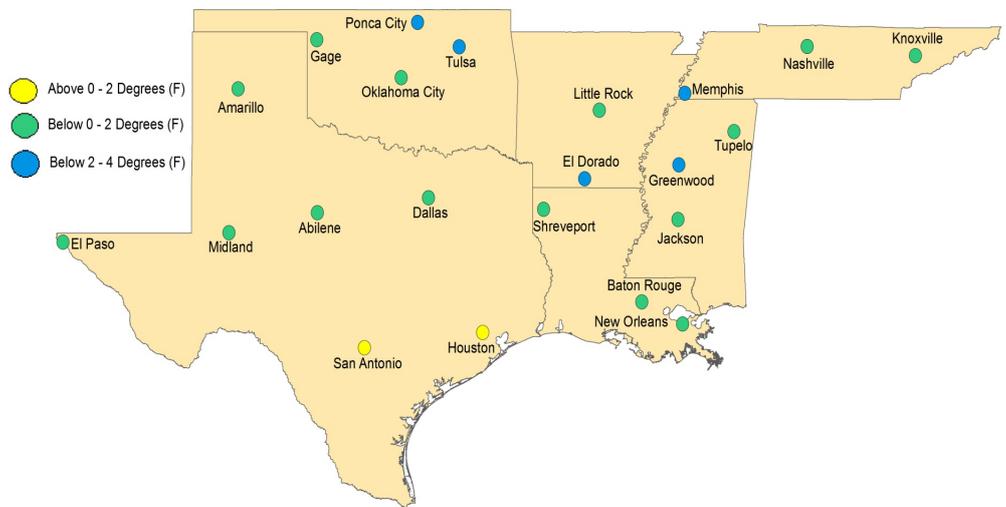
Departure from Normal Temperature (F)
 7/1/2013 – 7/31/2013



Generated 8/1/2013 at HPRCC using provisional data. Regional Climate Centers

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

July Temperature Departure from Normal



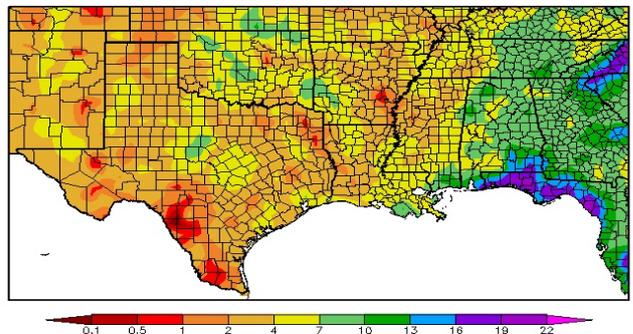
July Temperature Departure from Normal from 1971-2000 for SCIPP Regional Cities

Precipitation Summary

Luigi Romolo
Southern Regional Climate Center

For some parts of the Southern Region, July was a much wetter than normal month, while other areas in the region experienced a much drier than normal month. The drier than normal areas of the region extended over much of the Texas and Louisiana gulf coast zones, and through eastern Arkansas and northern Mississippi. The wettest areas of the region included much of central Tennessee, central Texas, and Oklahoma, where precipitation totals ranged from one and a half to over three times the monthly normal. The state average precipitation totals are as follows: Arkansas with 4.34 inches (110.24 mm), Louisiana with 4.38 inches (111.25 mm), Mississippi with 4.35 inches (110.49 mm), Oklahoma with 5.41 inches (137.41 mm), Tennessee with 7.16 inches (181.86 mm), and Texas with 3.36 inches (85.34 mm). Tennessee experienced its sixth wettest July on record (1895-2013), while for Oklahoma, it was the tenth wettest July on record (1895-2013). Texas reported its twenty-fifth wettest July on record (1895-2013), where as Louisiana experienced its twenty-ninth driest July on record (1895-2013). All other state rankings fell within the two middle quartiles.

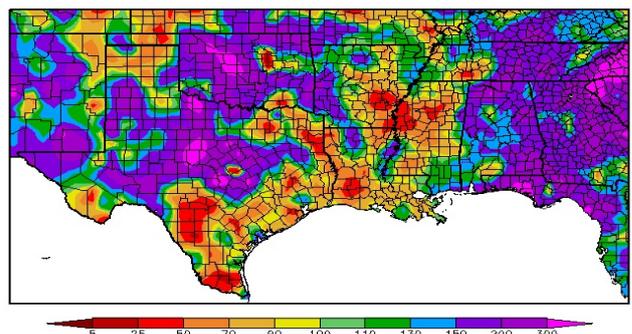
Precipitation (in)
 7/1/2013 - 7/31/2013



Generated 8/1/2013 at HPRCC using provisional data. Regional Climate Centers

Total precipitation values for July 2013 across the South.

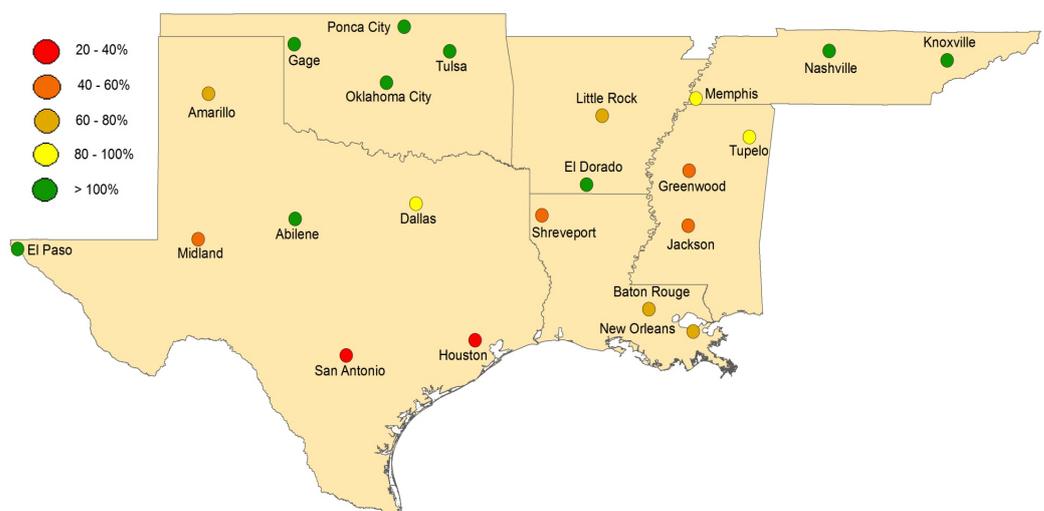
Percent of Normal Precipitation (%)
 7/1/2013 - 7/31/2013



Generated 8/1/2013 at HPRCC using provisional data. Regional Climate Centers

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

July Precipitation Departure from Normal



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

Southern Climate Monitor, July 2013

Climate Perspective

State	Temperature	Rank (1895-2011)	Precipitation	Rank (1895-2011)
Arkansas	77.80	10 th Coldest	4.34	43 rd Wettest
Louisiana	80.60	16 th Coldest	4.38	29 th Driest
Mississippi	78.60	7 th Coldest	4.35	48 th Driest
Oklahoma	79.70	30 th Coldest	5.41	10 th Wettest
Tennessee	75.00	10 th Coldest	7.16	6 th Wettest
Texas	81.30	26 th Coldest	3.36	25 th Wettest

State temperature and precipitation values and rankings for July 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 Name	Temperatures (degrees F)								Precipitation (inches)		
	Averages				Extremes				Totals		
	Max	Min	Mean	Depart	High	Date	Low	Date	Obs	Depart	%Norm
El Dorado, AR	91.5	67.9	79.7	-2.3	98	07/18	59	7/5+	4.56	0.43	110
Little Rock, AR	91.5	69.9	80.7	-1.7	100	07/10	61	07/04	2.19	-1.12	66
Baton Rouge, LA	90.5	72.1	81.3	-0.4	96	07/12	67	07/02	4.65	-1.31	78
New Orleans, LA	89.1	75.6	82.3	-0.4	93	7/31+	73	7/21+	3.97	-2.23	64
Shreveport, LA	92.9	71.1	82.0	-1.4	98	7/18+	62	07/03	2.18	-1.81	55
Greenwood, MS	89.3	68.5	78.9	-3.5	95	07/17	60	07/03	2.27	-1.92	54
Jackson, MS	90.0	70.3	80.1	-1.2	96	07/30	63	07/03	2.66	-2.03	57
Tupelo, MS	88.9	70.2	79.6	-1.0	97	07/10	62	7/13+	2.94	-0.71	81
Gage, OK	92.3	67.2	79.7	-0.9	105	07/13	51	07/02	4.32	2.50	237
Oklahoma City, OK	92.2	71.1	81.6	-0.4	103	07/10	60	07/02	9.84	6.90	335
Ponca City, OK	91.2	68.9	80.0	-2.9	103	07/10	53	07/03	5.03	1.60	147
Tulsa, OK	92.2	70.0	81.1	-2.4	102	7/11+	57	07/03	4.93	1.97	167
Knoxville, TN	84.4	67.8	76.1	-1.6	93	07/17	59	7/30+	7.37	2.66	156
Memphis, TN	89.1	71.8	80.5	-2.1	96	7/17+	64	07/02	3.73	-0.49	88
Nashville, TN	87.3	68.3	77.8	-1.3	97	07/17	60	07/29	6.60	2.83	175
Abilene, TX	92.7	71.7	82.2	-1.3	102	07/13	57	07/02	4.44	2.74	261
Amarillo, TX	89.8	65.9	77.9	-0.3	100	07/13	55	07/02	1.86	-0.82	69
El Paso, TX	92.9	71.6	82.3	-1.0	102	07/07	64	07/25	3.13	1.64	210
Dallas, TX	94.8	74.1	84.4	-0.6	102	7/31+	65	07/03	2.05	-0.07	97
Houston, TX	93.9	75.6	84.8	0.2	101	07/13	71	07/17	1.58	-2.78	36
Midland, TX	92.4	70.5	81.5	-0.2	102	07/30	62	7/15+	0.98	-0.91	52
San Antonio, TX	96.9	75.4	86.1	1.8	103	7/31+	65	07/02	0.73	-1.30	36

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

Teeth of Hurricane Season Starts Now

Barry Keim, Louisiana State Climatologist, Louisiana State University

Hurricane season officially begins on June 1st and ends on November 30th, hence we're in the season for half the year! However, the most active part of hurricane season is just beginning now. Starting around mid-August and extending through the first couple of weeks of October is the busiest time of the season, as shown in Figure 1 below. The reason for this uptick in tropical storms and hurricanes at this time is tied to the sea surface temperatures of the tropical Atlantic, the Caribbean, and the Gulf of Mexico. Sea surface temperatures reach their peak near September 10th, and the period from mid-August to early October is the 3 to 4 week window on either side of this peak date. As such, the warm sea surfaces at this time can provide lots of fuel to power many hurricanes, and more powerful hurricanes.

It is no accident that most of the famous hurricanes in the Gulf of Mexico have occurred within this mid-August to early October window of time, and include the following and their dates of landfall: the Galveston Hurricane of 1900 (September 9), Hurricane Betsy in 1965 (September 10) Hurricane Camille in 1969 (August 18), Hurricane Andrew in 1992 (August 24 in Florida and August 26 in Louisiana), Hurricane Katrina in 2005 (August 29), Hurricane Rita in 2005 (September 24), Hurricane Isaac in 2012 (August 29). There are a few exceptions to this rule – Hurricane Audrey on June 27, 1957 comes to mind – but these are few and far between. So hold on to your hats, as the next 7-8 weeks could provide for a bumpy ride. If you have any questions, feel free to contact me at keim@lsu.edu.

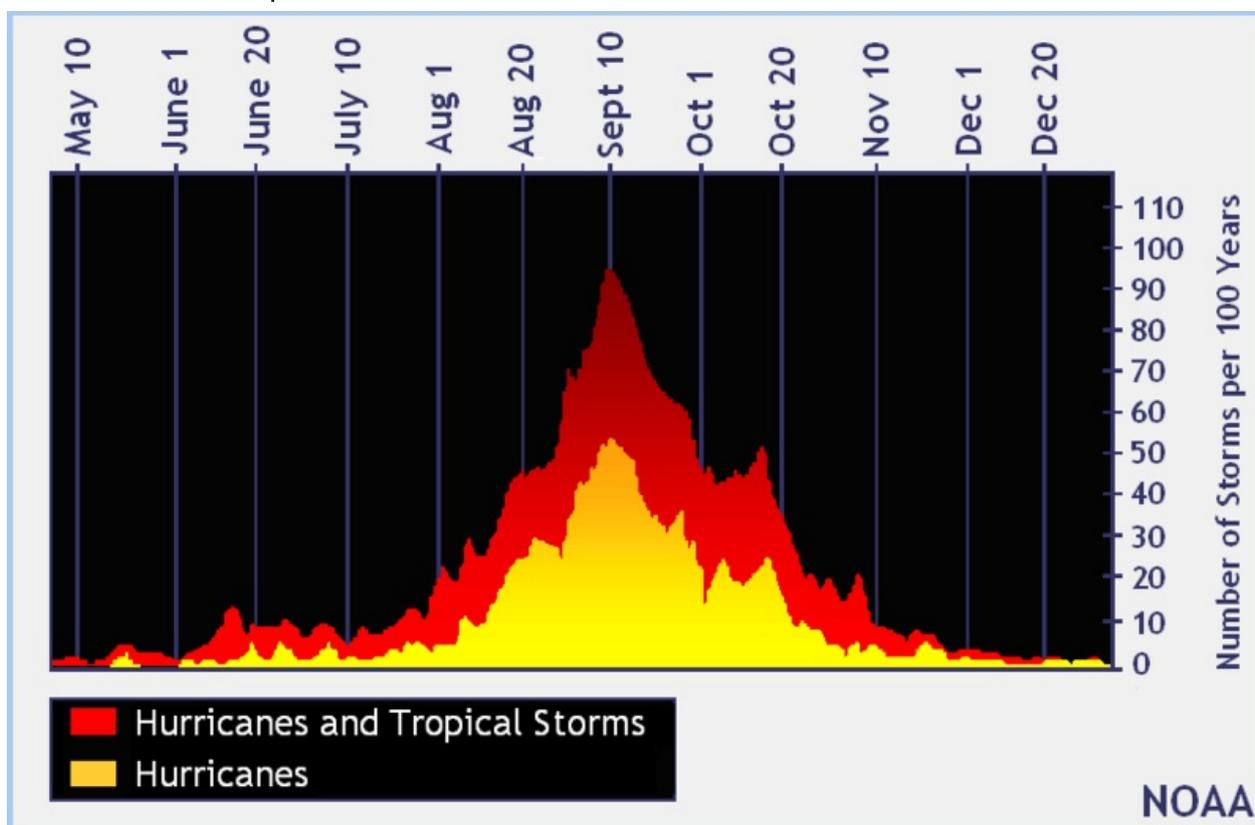


Figure 1. Seasonality of hurricanes and tropical storms. Graphic is from the NOAA and can be found at http://en.wikipedia.org/wiki/File:North_Atantic_Tropical_Cyclone_Climatology_by_Day_of_Year_Graph.PNG

Monthly Comic Relief



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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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