

# Weather Hazards and Hazard Climatology

Extreme Events in Louisiana

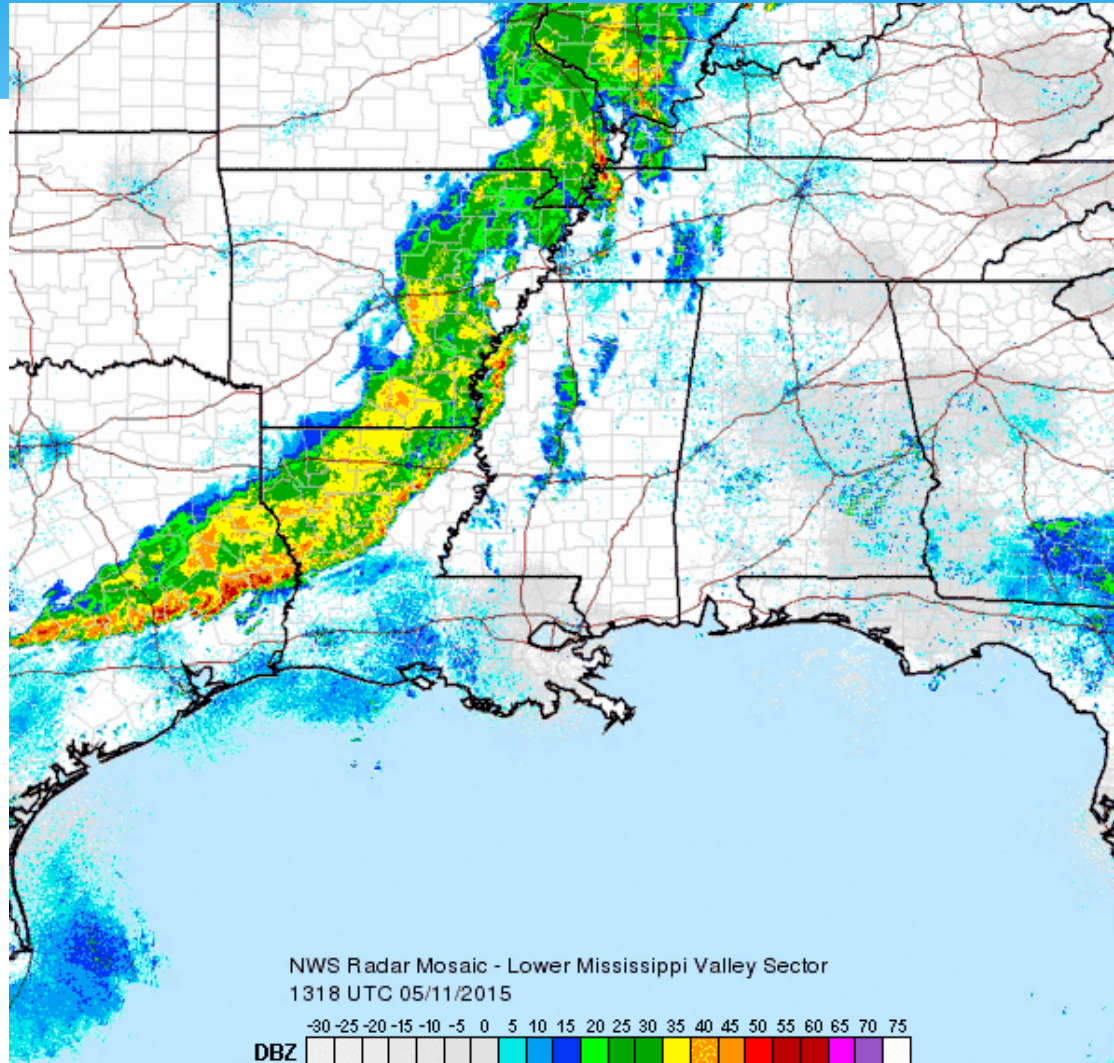
What extreme weather events have you experienced?  
What can you tell us about them?

# What do we mean “Extreme Events?”

- Severe Thunderstorms
- Tornadoes
- Extreme Heat
- Tropical Storms/Hurricanes
- Flooding
- Drought
- Winter Weather



# Severe Thunderstorms





Specific criteria:

**Hail one inch in diameter or larger**

**Winds of 58 mph or greater**

A supercell is a rotating thunderstorm with a strong, sustained updraft. These storms produce most tornadoes.

Other thunderstorm hazards: lightning, heavy rain and low visibility.

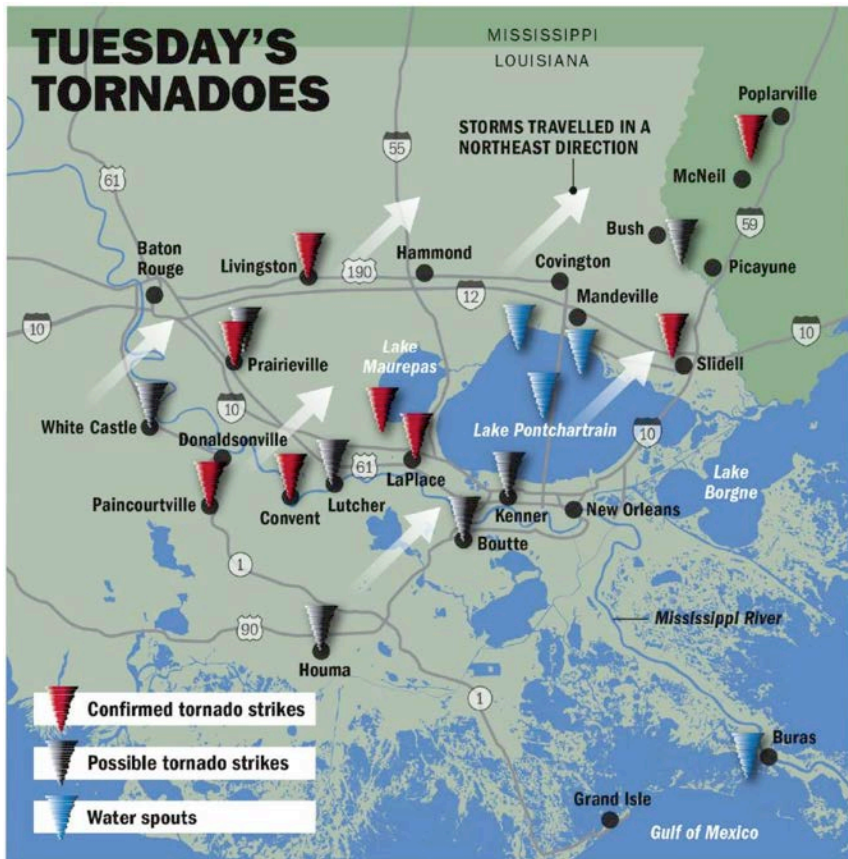


# Tornadoes

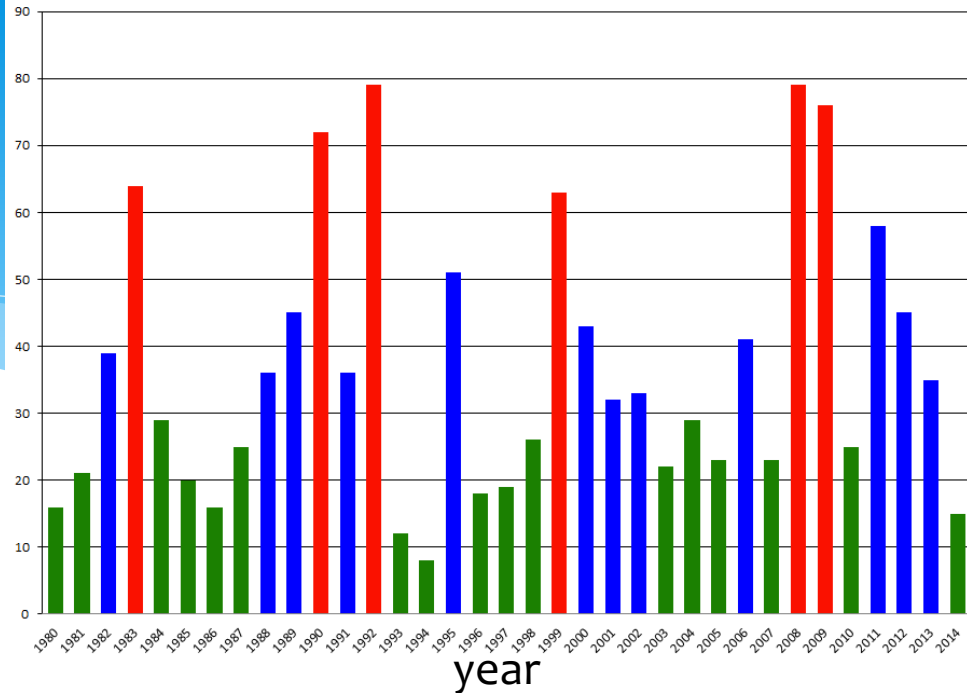
EF Rating	Wind Speeds	Expected Damage		
<b>EF-0</b>	65-85 mph	'Minor' damage: shingles blown off or parts of a roof peeled off, damage to gutters/siding, branches broken off trees, shallow rooted trees toppled.		
<b>EF-1</b>	86-110 mph	'Moderate' damage: more significant roof damage, windows broken, exterior doors damaged or lost, mobile homes overturned or badly damaged.		
<b>EF-2</b>	111-135 mph	'Considerable' damage: roofs torn off well constructed homes, homes shifted off their foundation, mobile homes completely destroyed, large trees snapped or uprooted, cars can be tossed.		
<b>EF-3</b>	136-165 mph	'Severe' damage: entire stories of well constructed homes destroyed, significant damage done to large buildings, homes with weak foundations can be blown away, trees begin to lose their bark.		
<b>EF-4</b>	166-200 mph	'Extreme' damage: Well constructed homes are leveled, cars are thrown significant distances, top story exterior walls of masonry buildings would likely collapse.		
<b>EF-5</b>	> 200 mph	'Massive/incredible' damage: Well constructed homes are swept away, steel-reinforced concrete structures are critically damaged, high-rise buildings sustain severe structural damage, trees are usually completely debarked, stripped of branches and snapped.		

02/23/2016

number



Louisiana Tornadoes 1980-2014



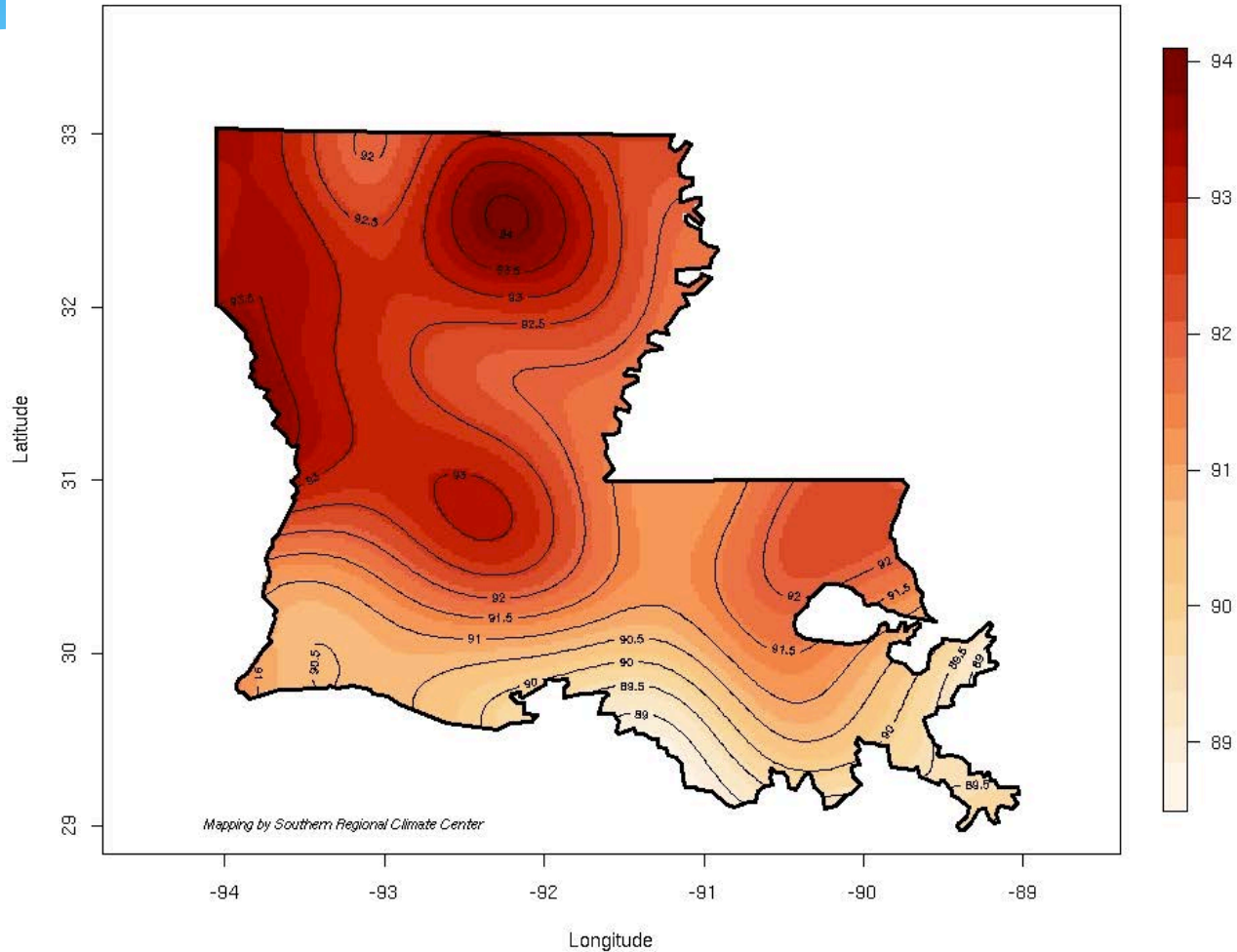
May last only a few seconds but can go over an hour.

Variety of shapes and sizes from thin ropelike circulations to large wedge shapes over a mile wide.

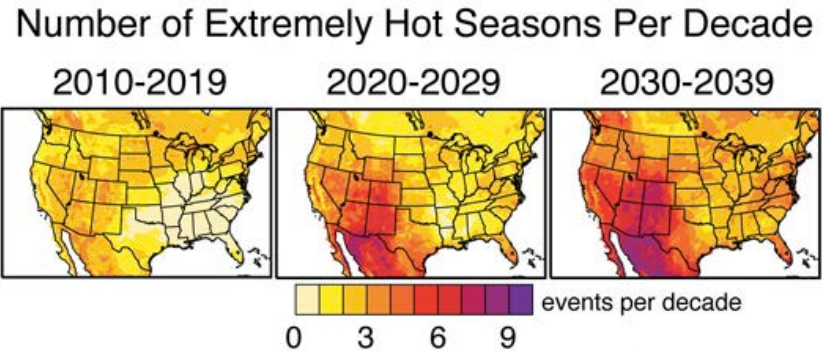
May move with very slow or quick forward speeds.

# Extreme Heat

JULY - TMAX based on 1971-2000 normals



Those most at risk include people without access to air conditioning, chronically ill, elderly, very young, socially isolated and disabled.



By 2039, most of the U.S. could experience at least four seasons equally as intense as the hottest season ever recorded from 1951-1999, according to Stanford University climate scientists. In most of Utah, Colorado, Arizona and New Mexico, the number of extremely hot seasons could be as high as seven.

## NOAA's National Weather Service

### Heat Index

Temperature (°F)

	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

Caution     
  Extreme Caution     
  Danger     
  Extreme Danger

**Heat index-** A measure of the apparent temperature the human body experiences due to high humidity and lack of cooling by evaporation.



# Tropical Storms/Hurricanes



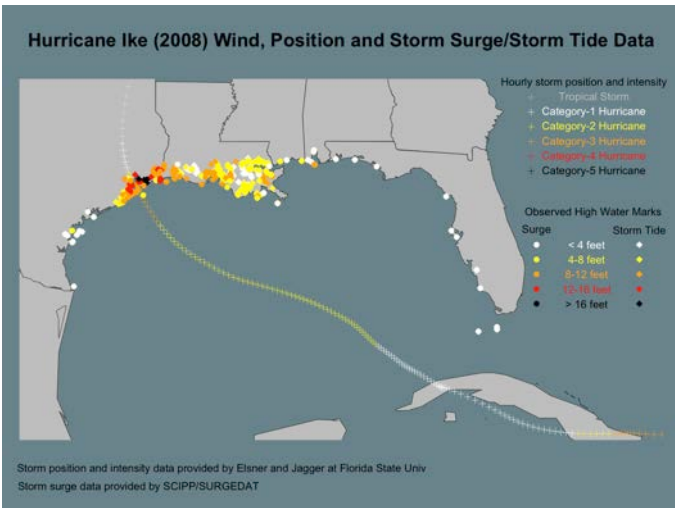
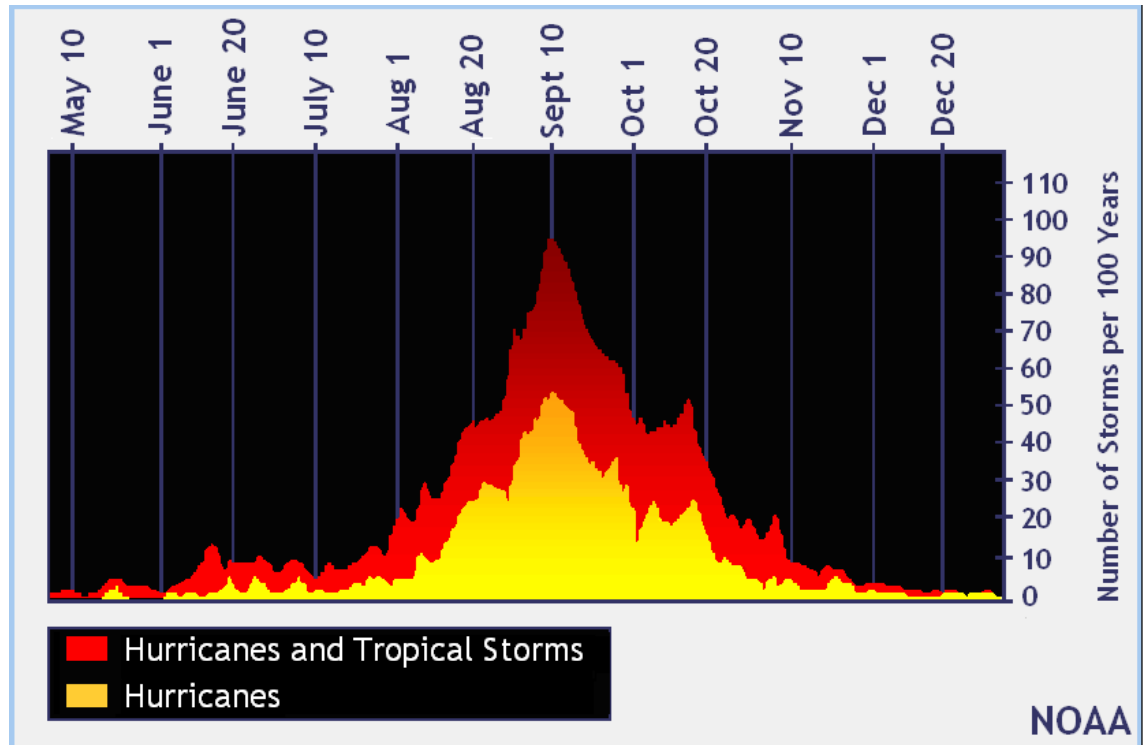
### Saffir-Simpson Hurricane Wind Scale

Category	Sustained Winds	Description	Example
1	74-95 mph	Very dangerous winds will produce some damage	Dolly (2008)
2	96-110 mph	Extremely dangerous winds will cause extensive damage	Ike (2008)
3	111-130 mph	Devastating damage will occur	Katrina (2005)
4	131-155 mph	Catastrophic damage will occur	Audrey (1957)
5	155+ mph	Catastrophic damage will occur	Camille (1969)

Tropical Storm: Winds 39-73 mph

Tropical Depression: Winds 38 mph or less

Atlantic Season:  
June 1<sup>st</sup> – November 30<sup>th</sup>



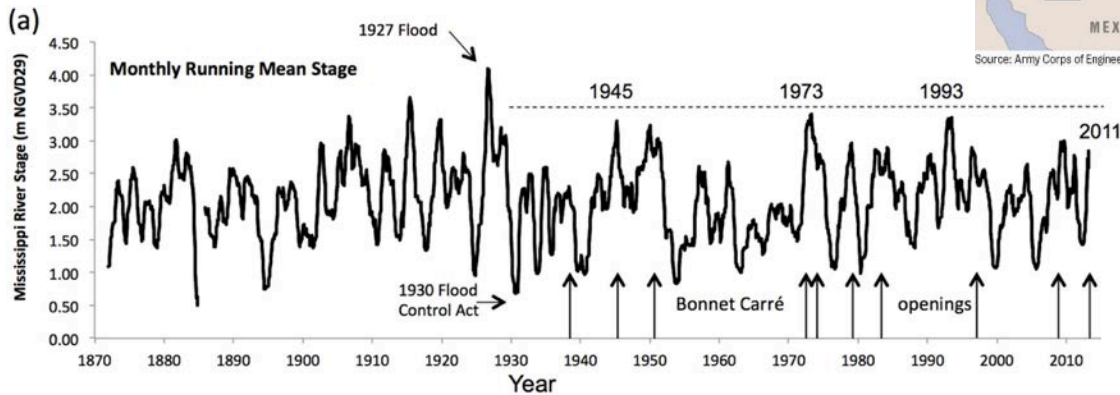
# Flooding



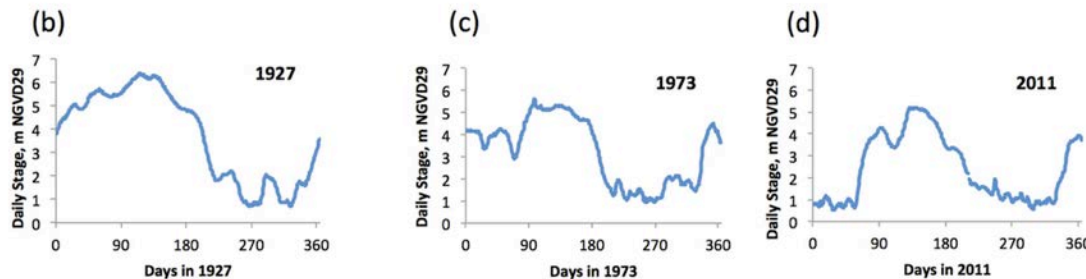
On average over the past 30 years in the US flooding results in about \$8.17 billion in damages and 89 deaths per year.

## THE MISSISSIPPI RIVER WATERSHED

The Mississippi River drainage basin covers 41 percent of the lower 48 states. It includes all or parts of 31 states and 2 Canadian provinces. It's the third largest in the world, exceeded in size only by the watersheds of the Amazon and Congo rivers.



The 100 year flood is a 1% probability that a flood of a certain magnitude will occur (25 year flood: once every 25 years or 4% chance in a given year).

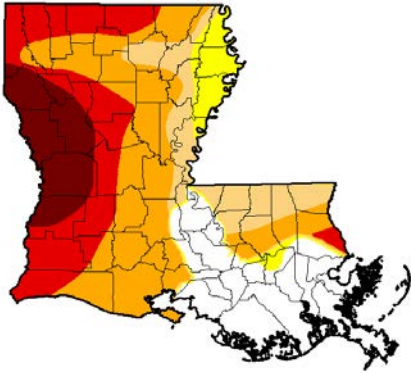


This parameter is just based on the frequency and magnitude of prior events, so a flooding event is still equally likely to occur at any time.

# Drought



**U.S. Drought Monitor  
Louisiana**



**May 10, 2011**  
(Released Thursday, May. 12, 2011)  
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	20.78	79.22	73.26	61.27	31.10	11.15
Last Week 4/30/11	0.00	100.00	95.34	81.91	41.58	9.51
3 Months Ago 2/9/11	8.72	91.28	75.16	43.65	16.89	0.00
Start of Calendar Year 1/1/11	8.59	91.41	80.05	56.05	35.57	0.00
Start of Water Year 3/16/10	6.40	93.51	85.44	35.29	9.18	0.00
One Year Ago 5/11/10	0.04	98.96	73.28	0.00	0.00	0.00

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

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:  
Richard Tinker  
CPC/NOAA/NWS/NCEP



<http://droughtmonitor.unl.edu/>

A normal and recurrent feature of our climate, which consists of a deficiency in precipitation over an extended period of time.

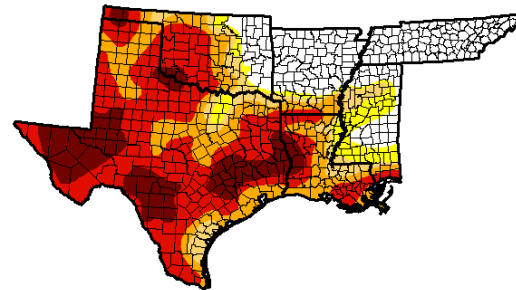
**Meteorological Drought** - below normal precipitation.

**Agricultural Drought** - low soil moisture affects vegetation health.

**Hydrologic Drought** - runoff and streamflow in watersheds and rivers greatly reduced.

**Socioeconomic Drought** - a disparity between the supply and demand for water.

**U.S. Drought Monitor  
South**



**May 3, 2011**  
(Released Thursday, May. 5, 2011)  
Valid 7 a.m. EST

	Drought Conditions (Percent Area)					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	22.71	77.29	71.52	64.13	46.58	14.68
Last Week 4/26/11	17.47	82.53	74.25	64.80	44.26	9.51
3 Months Ago 2/1/11	14.66	85.34	58.97	31.56	6.59	0.00
Start of Calendar Year 1/4/11	12.28	87.72	58.95	31.71	11.37	0.00
Start of Water Year 3/25/10	54.23	45.77	20.04	6.79	0.83	0.00
One Year Ago 5/4/10	74.83	25.17	13.95	4.09	0.00	0.00

**Intensity:**  
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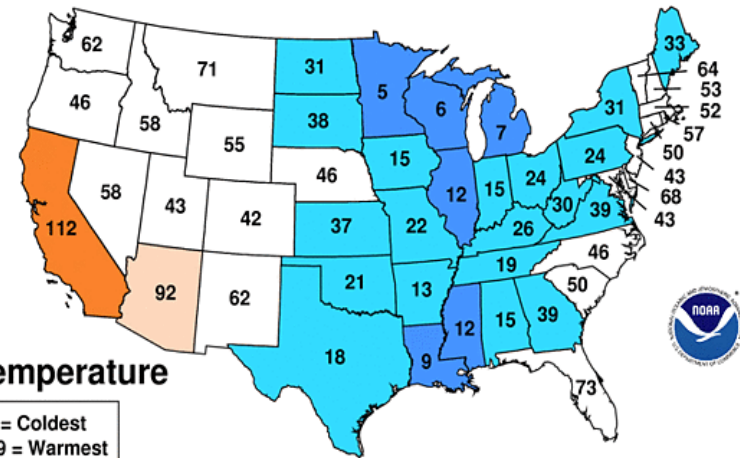
# Winter Weather



Winter weather can cause disruption to travel and damage to infrastructure due to snow or ice.

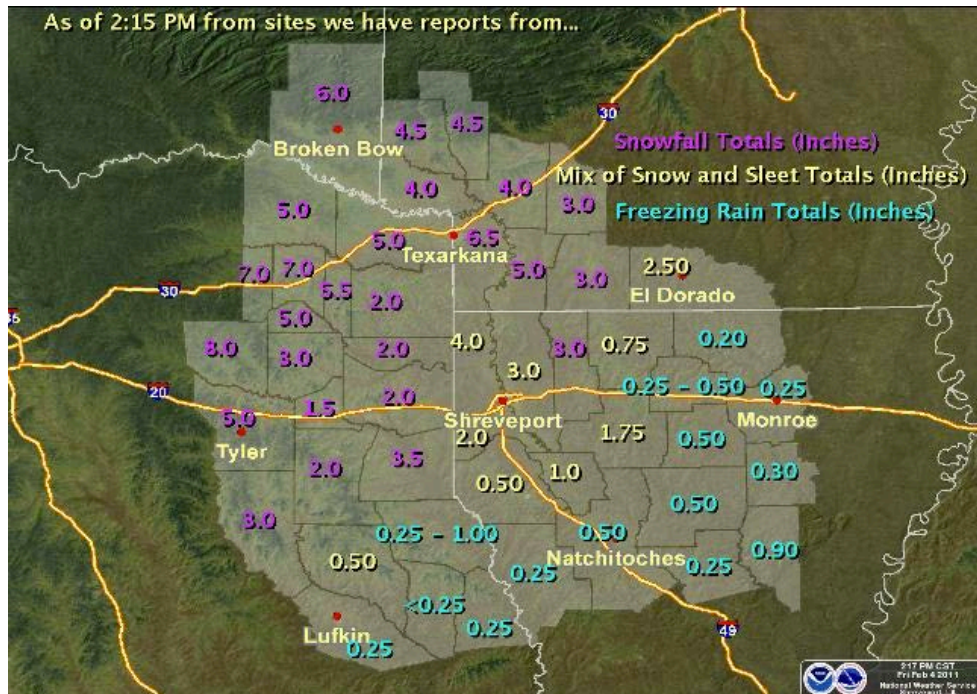
## Dec 2013-Jan 2014 Statewide Ranks

National Climatic Data Center/NESDIS/NOAA



### Temperature

1 = Coldest  
119 = Warmest



Snow is so rare here (0.2" annual average), that any snow event causes traffic accidents, interstate shutdowns, and other issues.