



A Look Back at 2011/ What's Next in 2012

John Lewis, Senior Forecaster
National Weather Service
Little Rock, Arkansas

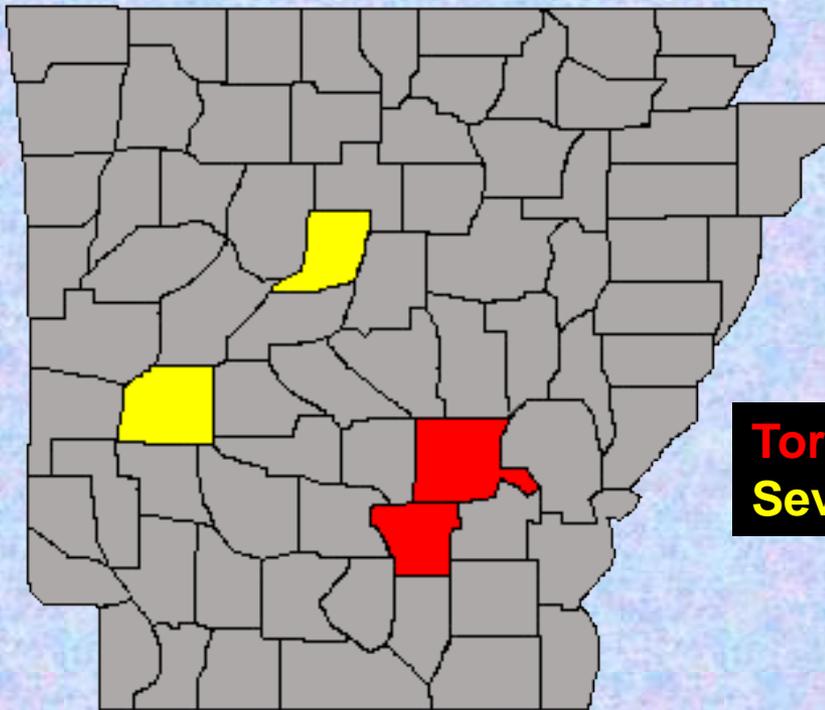
John.lewis@noaa.gov



Quick Introduction



Our mission is to protect life and property by issuing timely warnings (i.e. for tornadoes, severe thunderstorms, flash flooding, etc).



Tornado Warning
Severe Thunderstorm Warning



Quick Introduction



Weather never stops, so we are open 24 hours a day/7 days a week (even on Christmas, Thanksgiving, etc).





Quick Introduction





Quick Introduction



My Area





Quick Introduction





2011/2012



For much of the two year period, La Niña conditions (cooler than normal water in the equatorial Pacific Ocean) were present.

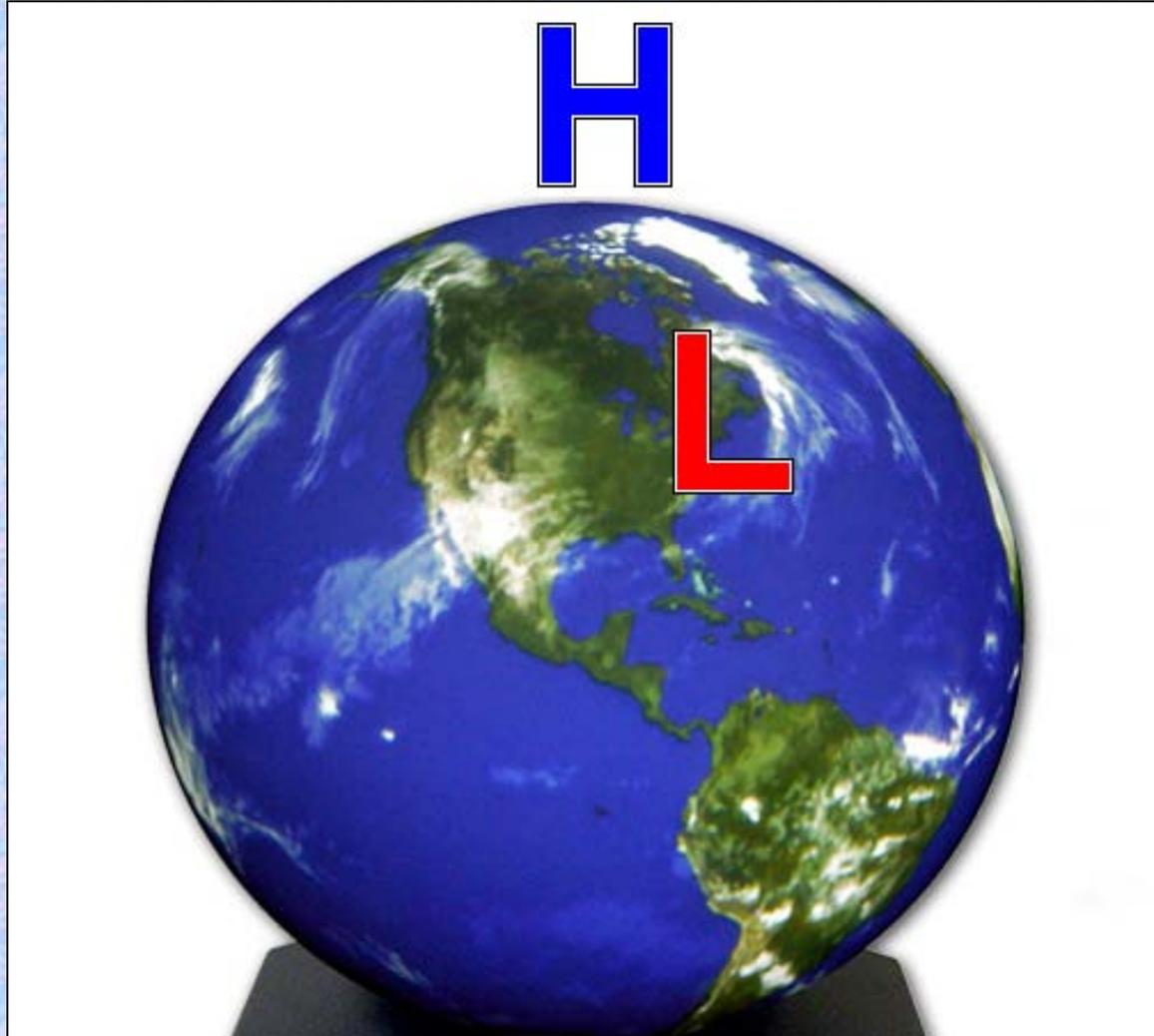
The Arctic Oscillation (AO) has played a significant role in temperature trends and precipitation amounts.

There have been a lot of extremes, with either feast (i.e. very active weather) or famine (i.e. little rain/heat/drought) and not much in-between.



Arctic Oscillation (AO)

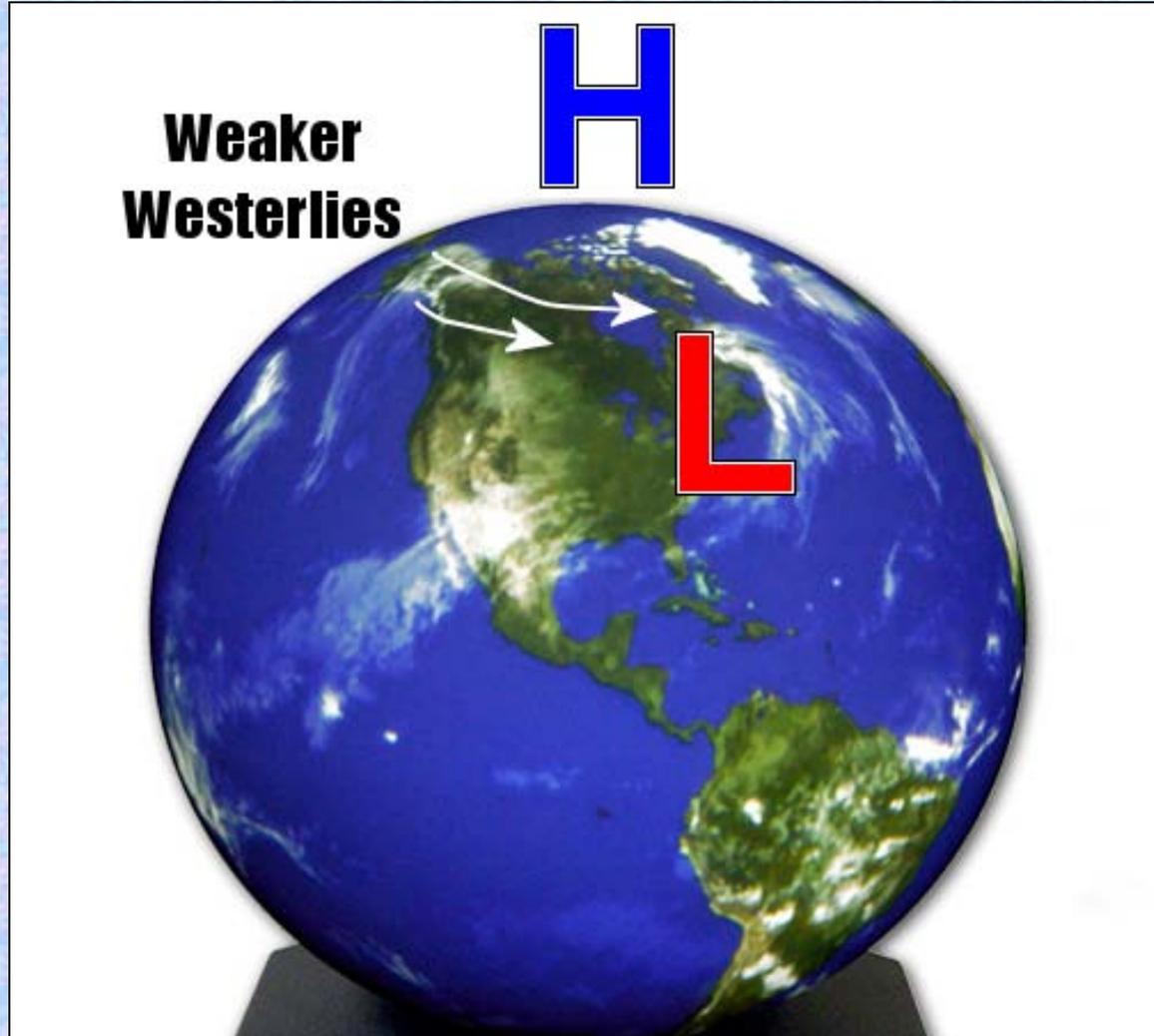
Negative in 2011





Arctic Oscillation (AO)

Negative in 2011





Arctic Oscillation (AO)

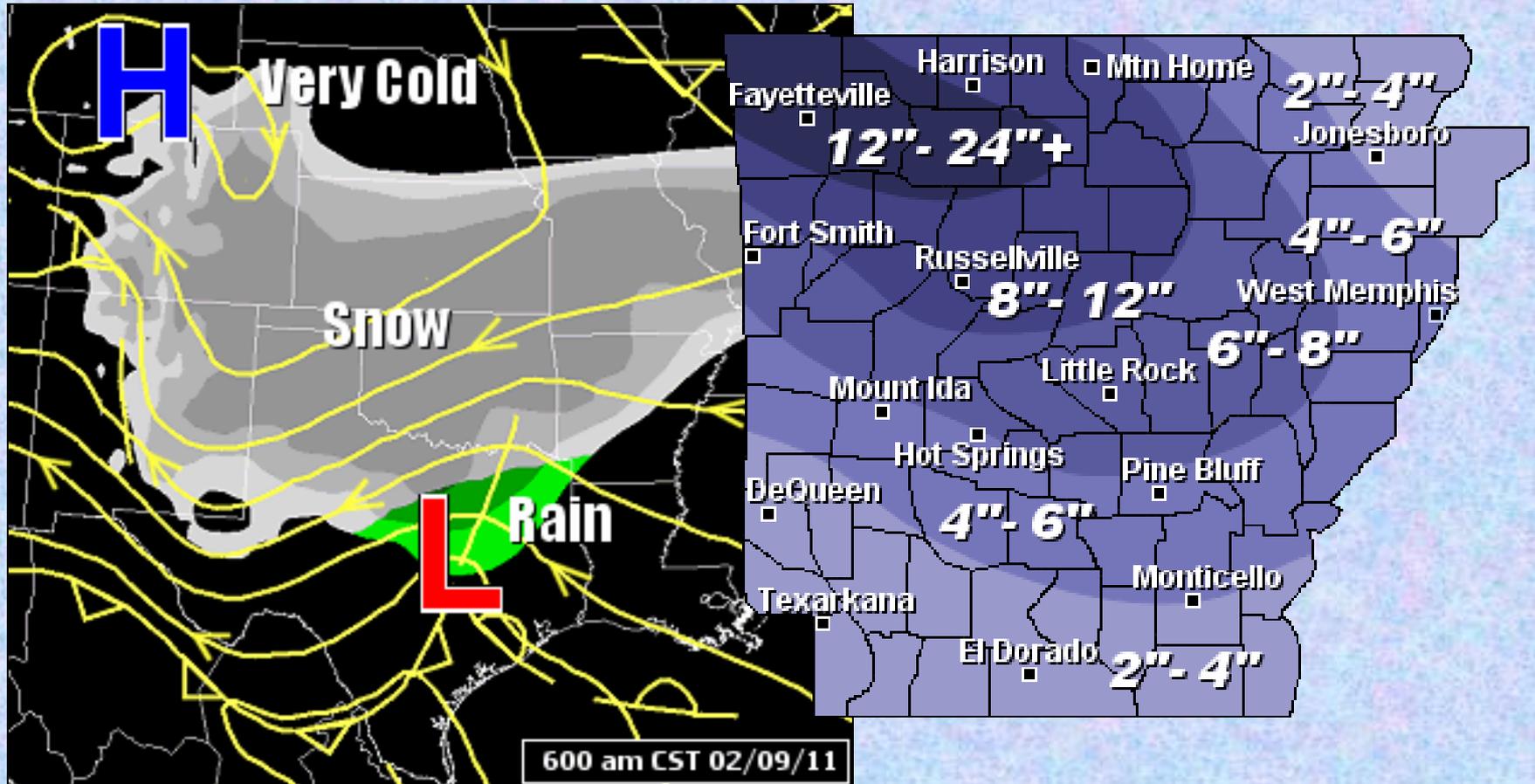
Negative in 2011





Heavy Snow

February 9, 2011





Arctic Oscillation (AO)

Positive in 2012





Arctic Oscillation (AO)

Positive in 2012





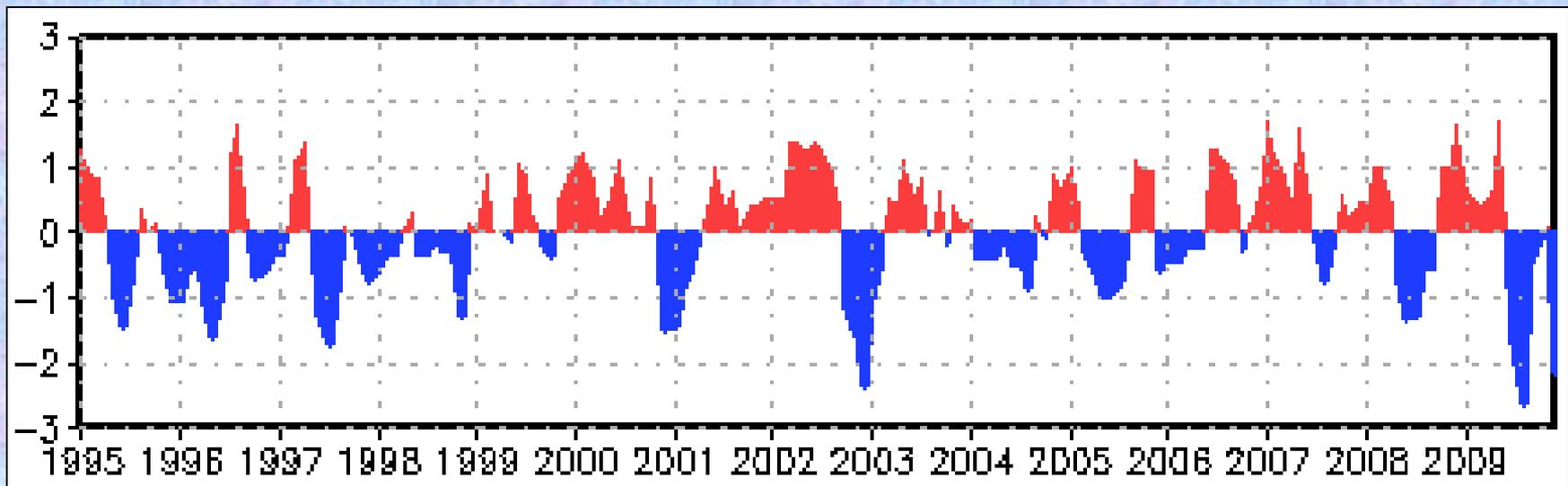
Arctic Oscillation (AO)

Positive in 2012





A Closer Look at AO





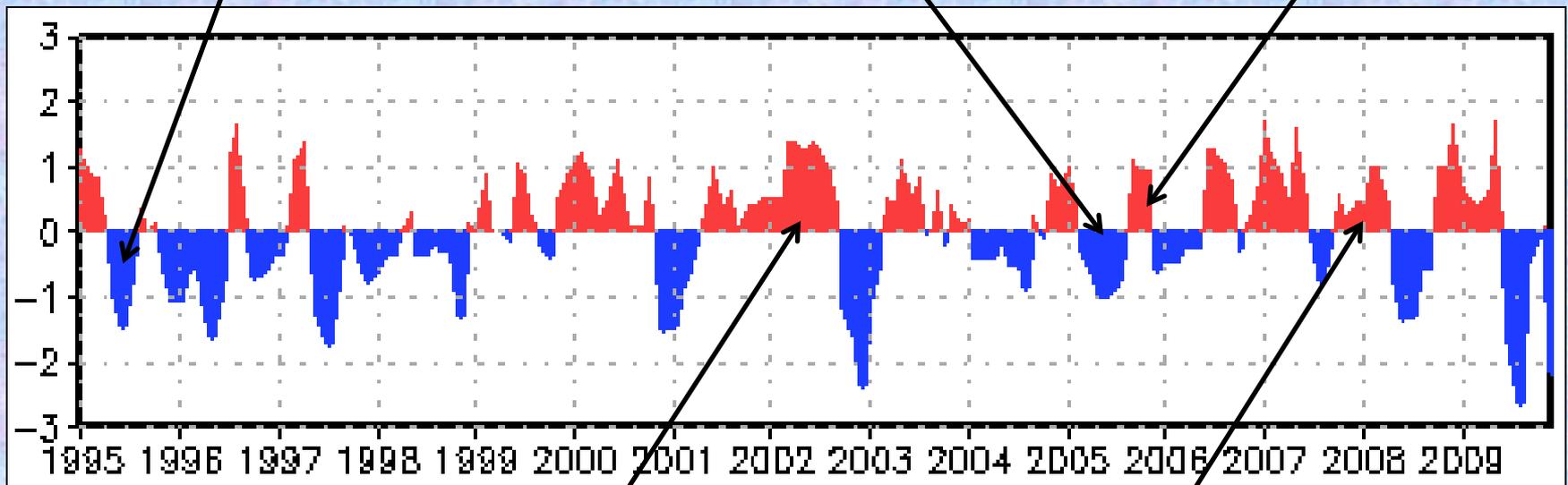
A Closer Look at AO



1995: 6th Driest
Summer at Little
Rock (4.84")

Early 2005:
Very Dry

Late 2005: A Wet
Period (Rita)

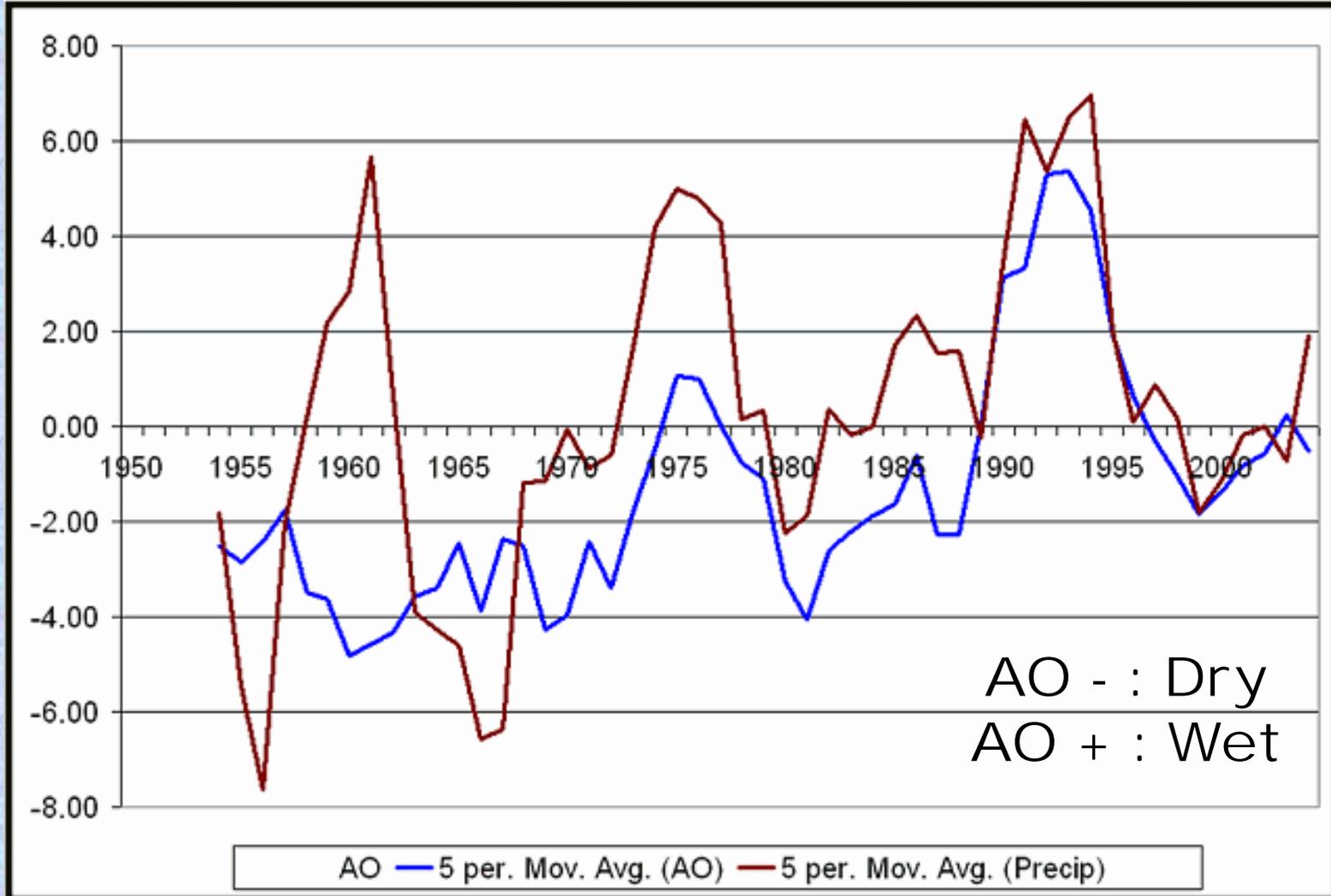


Late 2001/Early 2002:
Widespread Flooding

Early 2008: Tornadoes,
Flooding & Heavy Snow



A Closer Look at AO





Rain (Jan - Mar)



Precipitation Statistics

Site	Jan-Mar, 2011	Jan-Mar, 2012
Harrison (NC AR)	7.03	11.26
Little Rock (C AR)	9.16	14.64
El Dorado (SC AR)	6.26	13.97



Wildfires (Jan - Mar)



In 2011, there were 21,000 acres burned in January through March due to dry conditions. During the same time in 2012, there were 9,000 acres burned.



Temps (Jan - Mar)



Temperature Statistics

Site	Jan-Mar, 2011	Jan-Mar, 2012
Harrison (NC AR)	41.0°	48.9°
Little Rock (C AR)	46.5°	53.5°
El Dorado (SC AR)	48.6°	53.6°



AO Weakness



Long range forecasting, at least beyond a few weeks, is difficult to impossible with the AO.

There is usually too much fluctuation between positive and negative over several months.

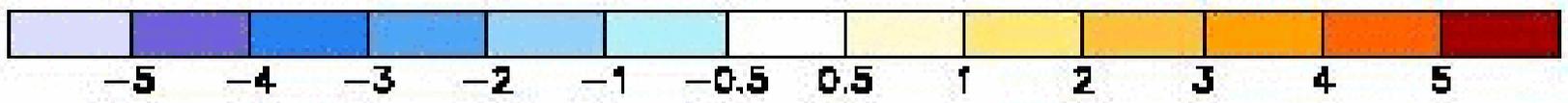
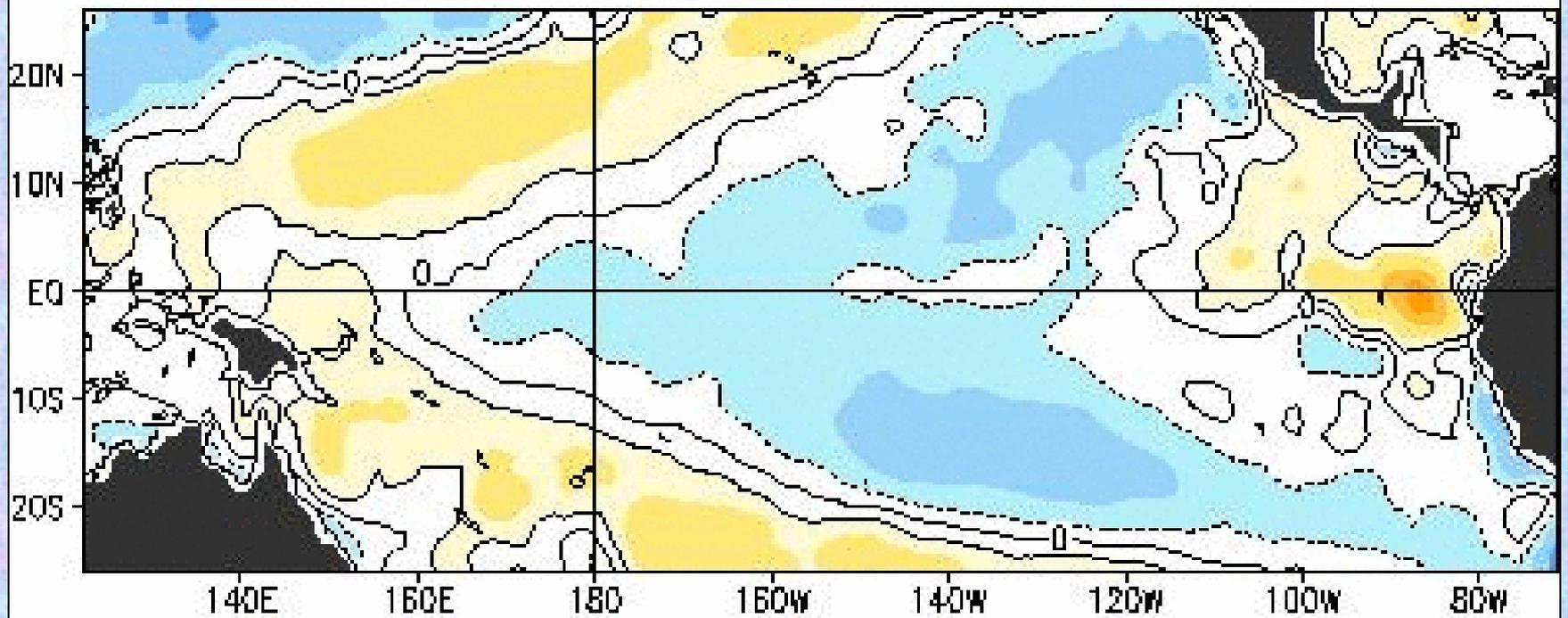


Status of La Niña

April 27, 2011



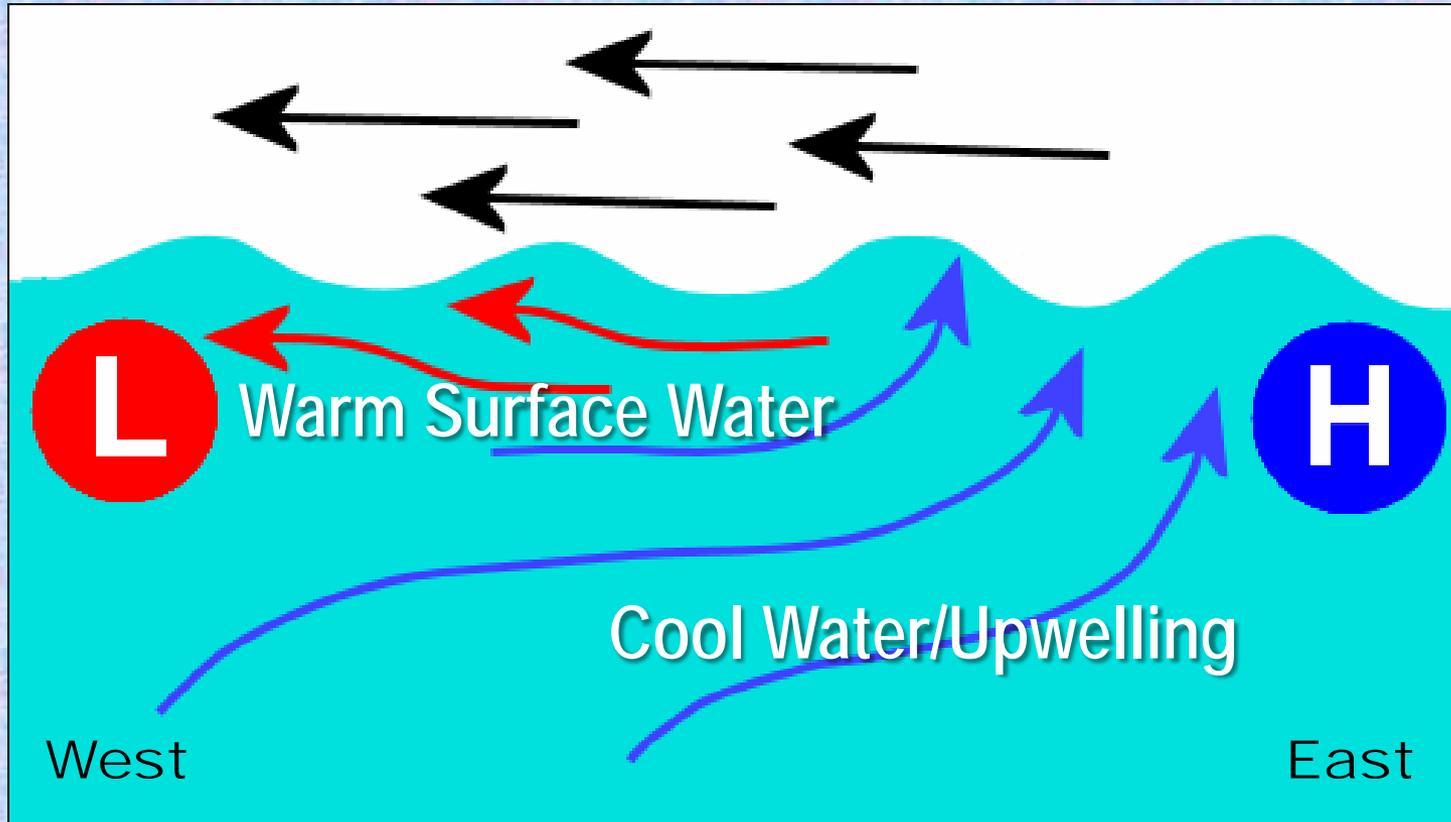
Observed Sea Surface Temperature Anomalies (°C)



7-day Average Centered on 27 April 2011



La Niña Setup





ENSO Strength



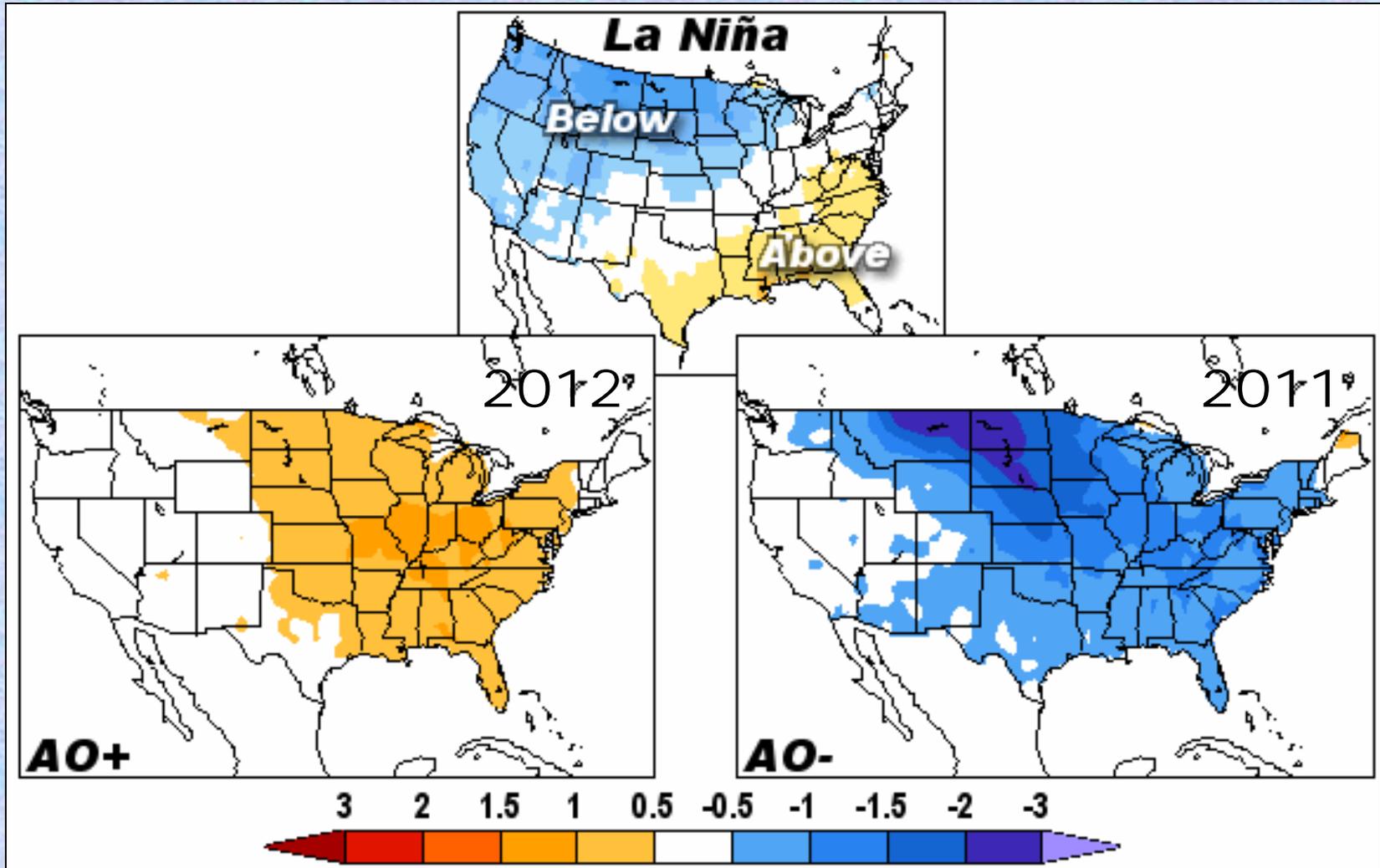
There is at least some confidence in a long term forecast when keying on La Niña/El Niño conditions.

While there may be strengthening or weakening over several months, the state (La Niña/El Niño) is fairly steady.



Combine La Niña/AO

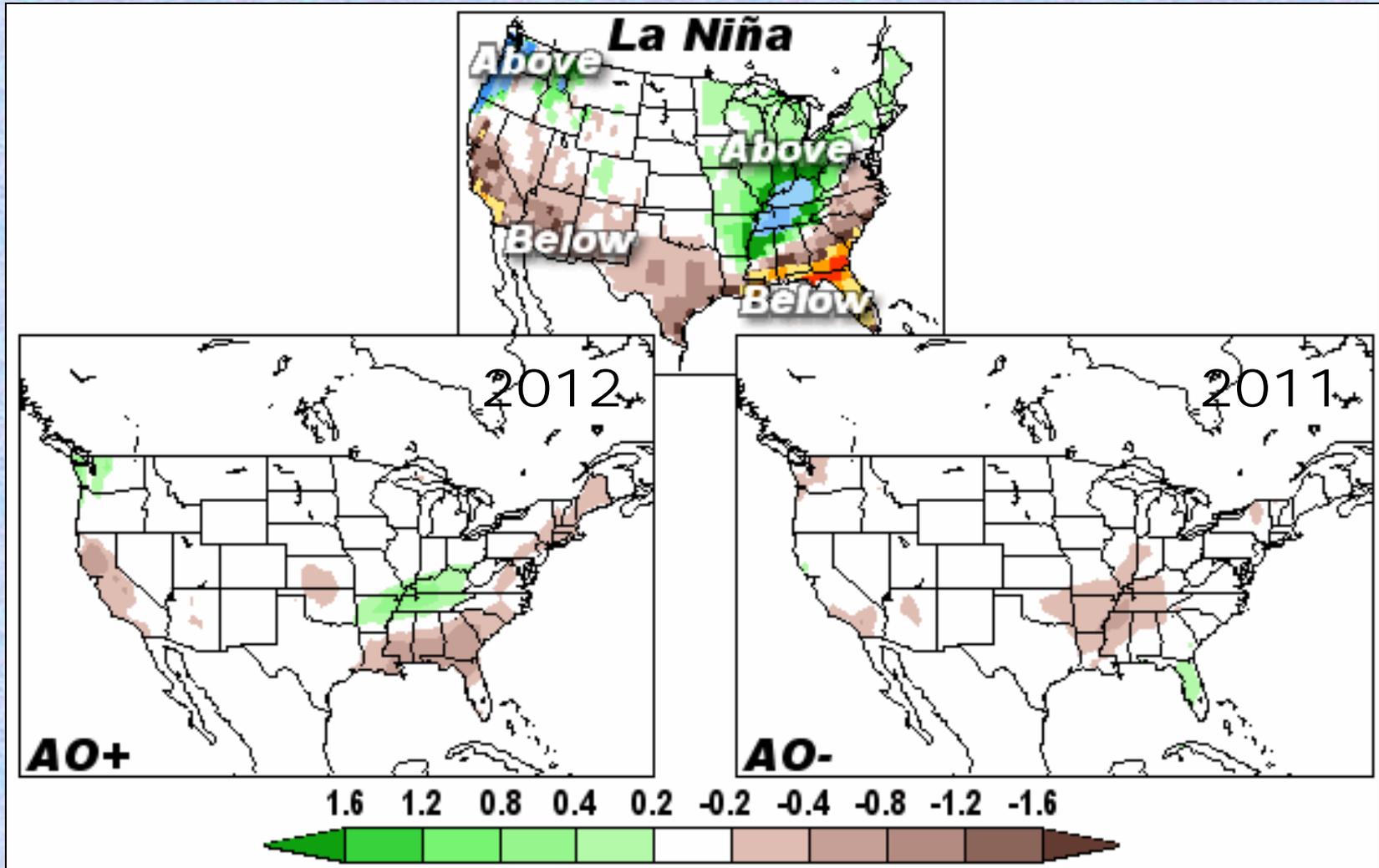
Temperature (Jan - Mar)





Combine La Niña/AO

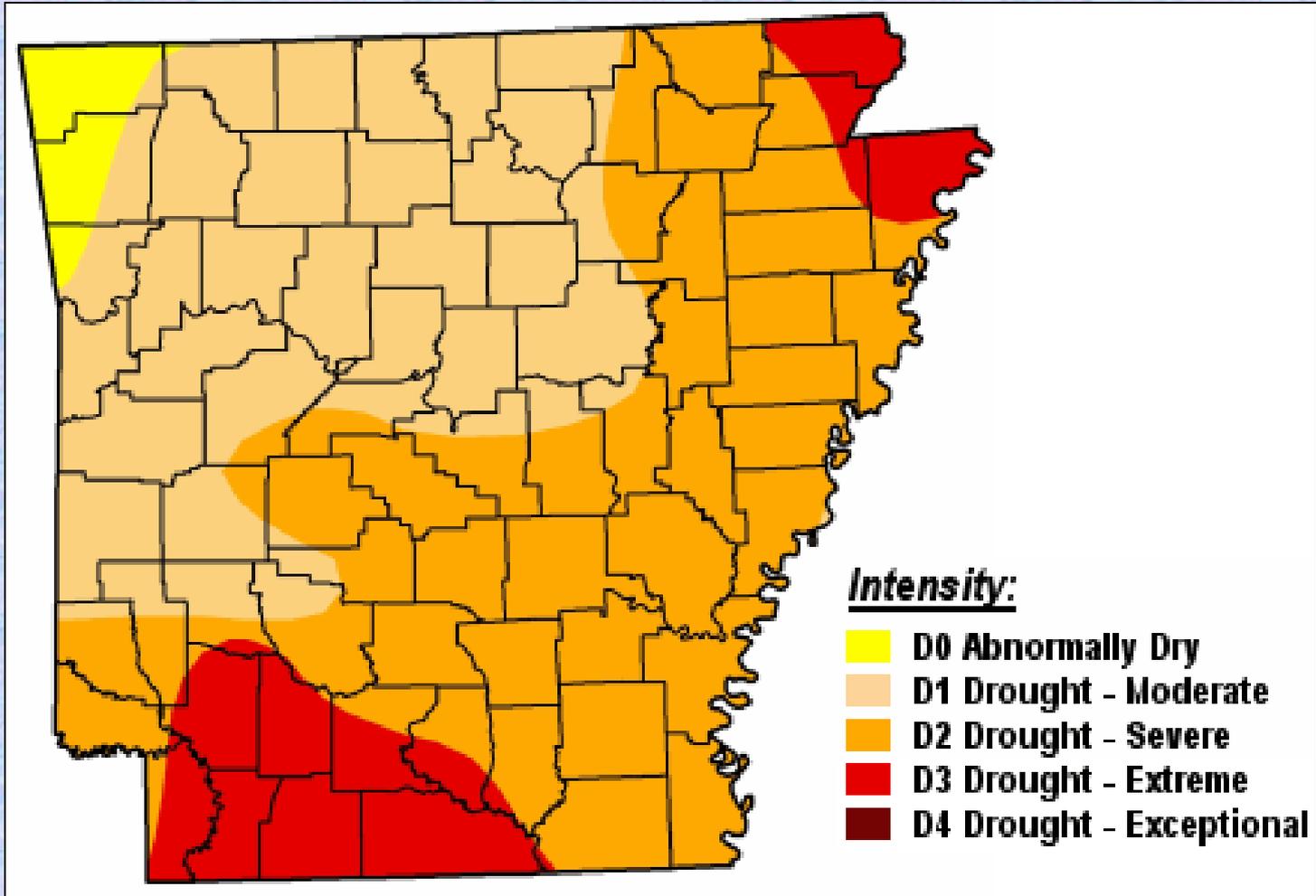
Precipitation (Jan - Mar)





Drought Conditions

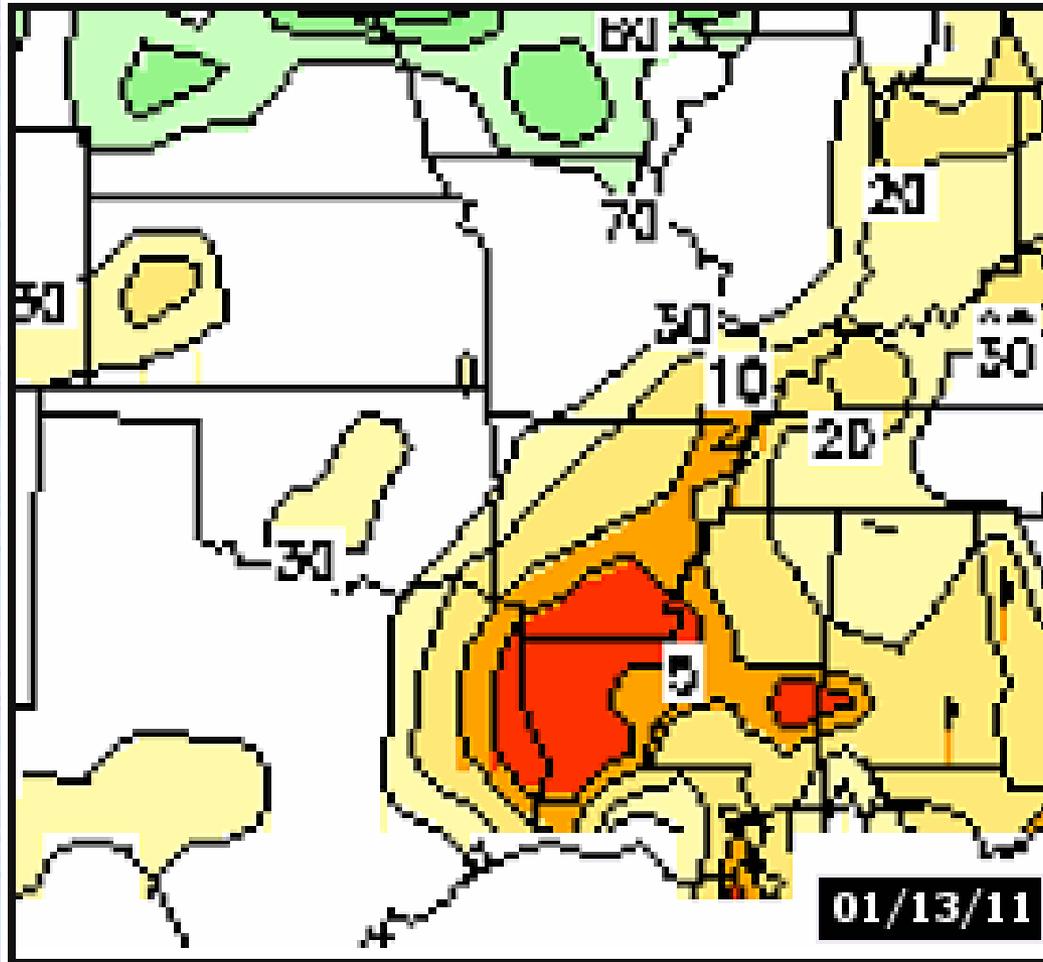
January 11, 2011





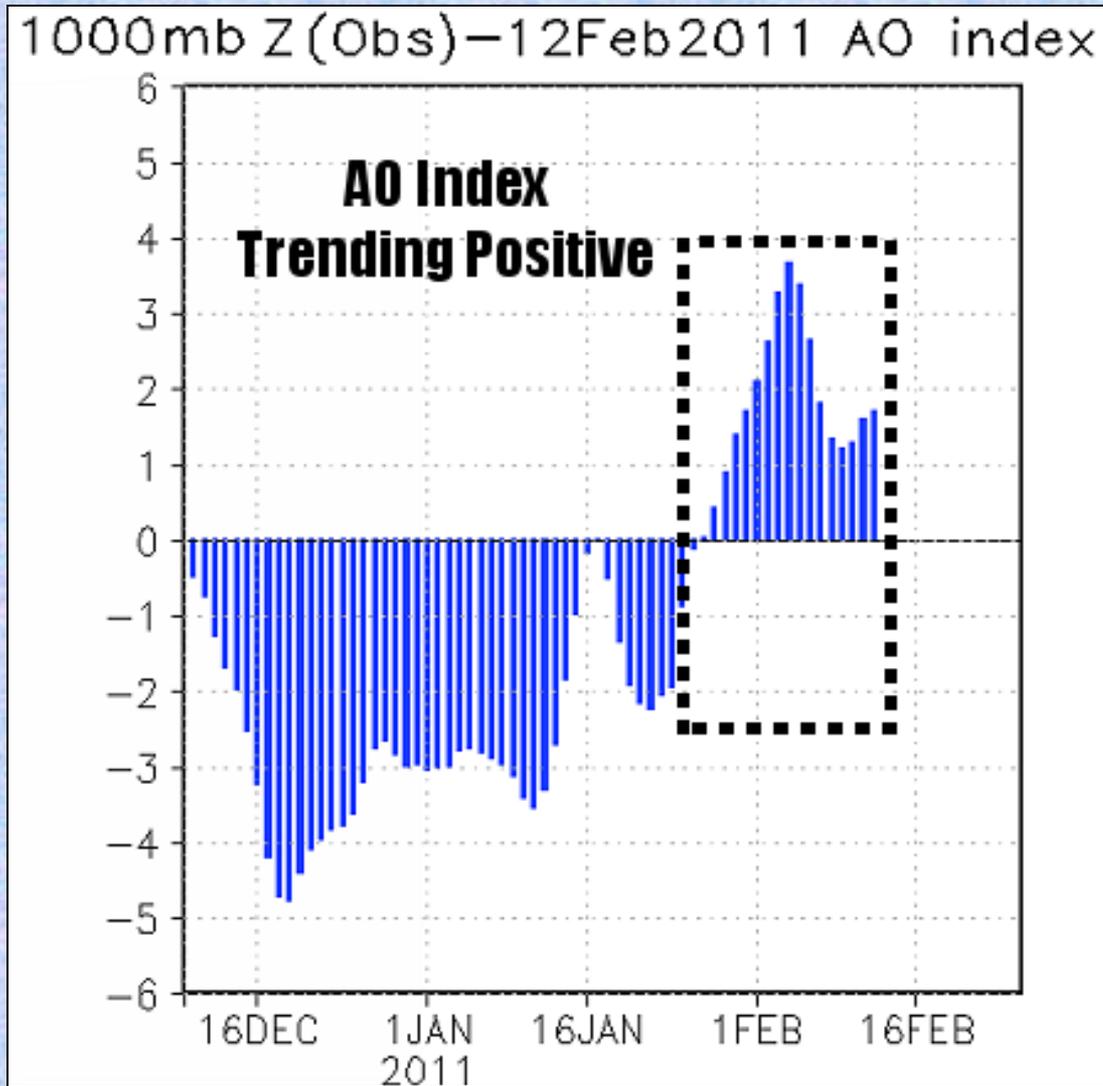
Soil Moisture

January 13, 2011





Arctic Oscillation (AO)





AO in 2011



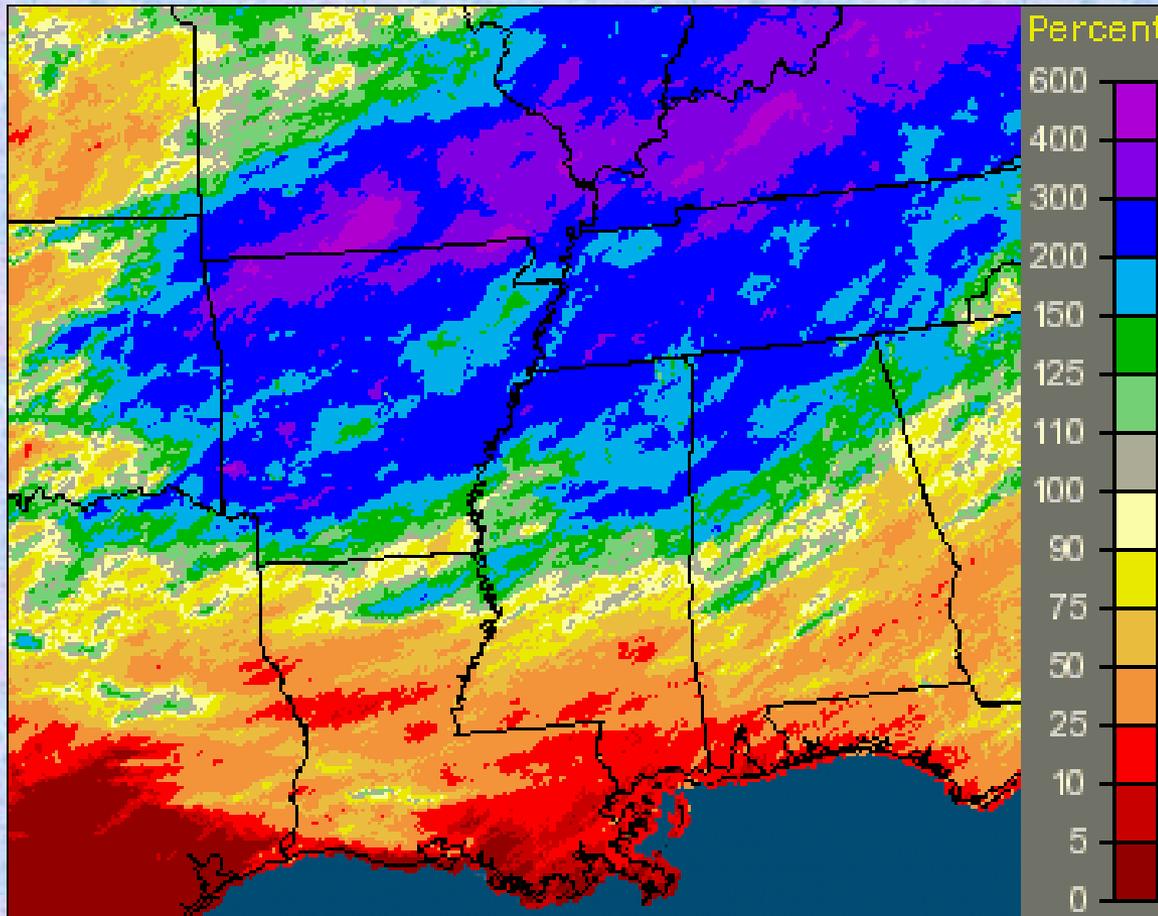
	<i>Jan</i>	<i>Feb</i>	<i>Mar</i>	<i>Apr</i>	<i>May</i>	<i>Jun</i>	<i>Jul</i>	<i>Aug</i>	<i>Sep</i>	<i>Oct</i>	<i>Nov</i>	<i>Dec</i>
<i>2011</i>	-1.68	+1.58	+1.42	+2.28	-0.04	-0.86	-0.47	-1.06	+0.67	+0.80	+1.46	+2.22

The AO Index was mostly negative, with a strong positive surge in the spring of 2011 and again late in the year.



Big Time Rain

April, 2011



Percent
of normal
rainfall.



Big Time Rain

April, 2011

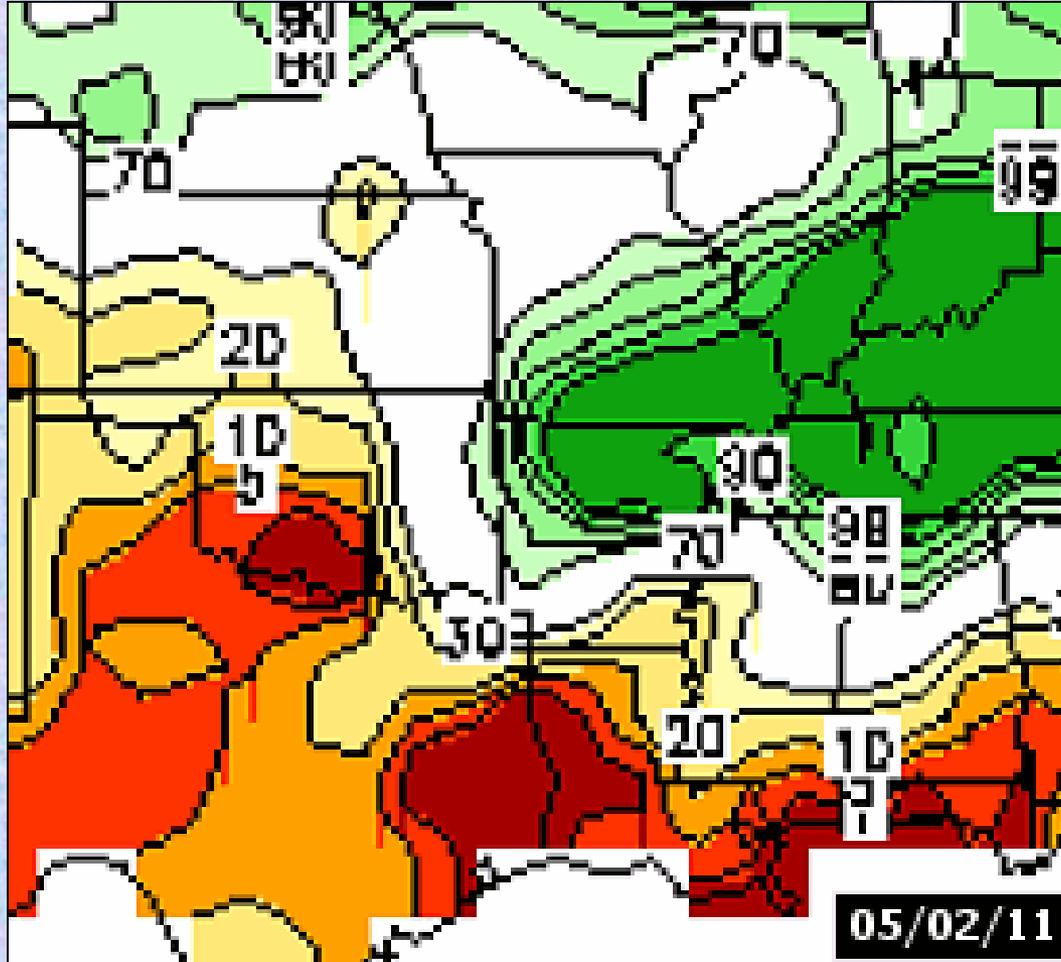


Precipitation in April, 2011				
Site	Amount	Normal	+/-	% of Normal
Fayetteville (NW AR)	15.28	4.33	+10.95	353%
Harrison (NC AR)	14.73	4.10	+10.64	359%
Jonesboro (NE AR)	8.15	4.99	+3.16	163%
Fort Smith (WC AR)	9.55	3.91	+5.64	244%
Little Rock (C AR)	7.23	5.47	+1.76	132%
West Memphis (EC AR)	7.48	5.46	+2.02	137%
Texarkana (SW AR)	5.94	3.95	+1.99	150%
El Dorado (SC AR)	8.29	4.55	+3.74	182%
Pine Bluff (SE AR)	13.26	5.14	+8.12	258%



Soil Moisture

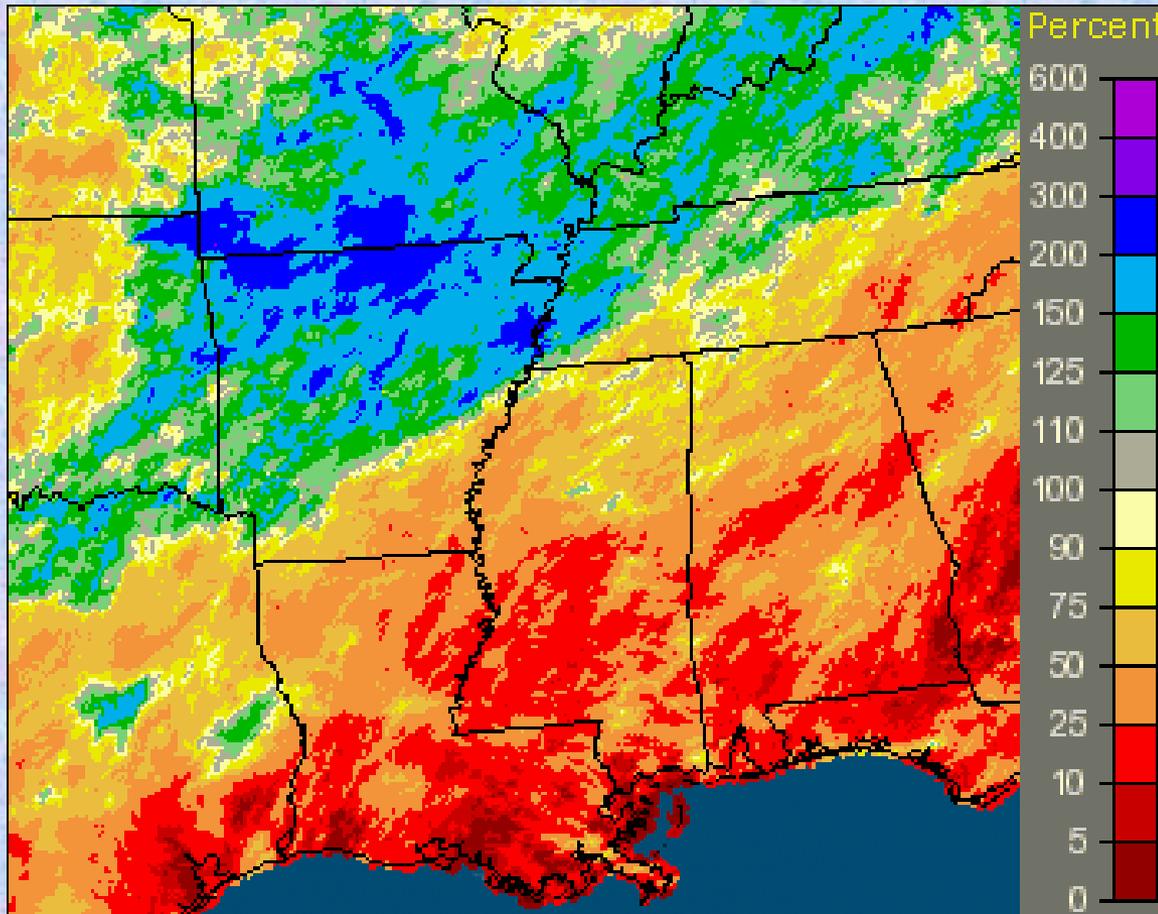
April 26, 2011





Big Time Rain

May, 2011



Percent
of normal
rainfall.



Interesting Fact

April/May, 2011



At Fayetteville (Washington County) and Harrison (Boone County), more rain fell in this two month period than Texarkana (Miller County) all year through October!



Interesting Fact

April/May, 2011



<u>Site</u>	<u>Amount (Apr/May)</u>
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Fayetteville	26.78
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Harrison	24.24
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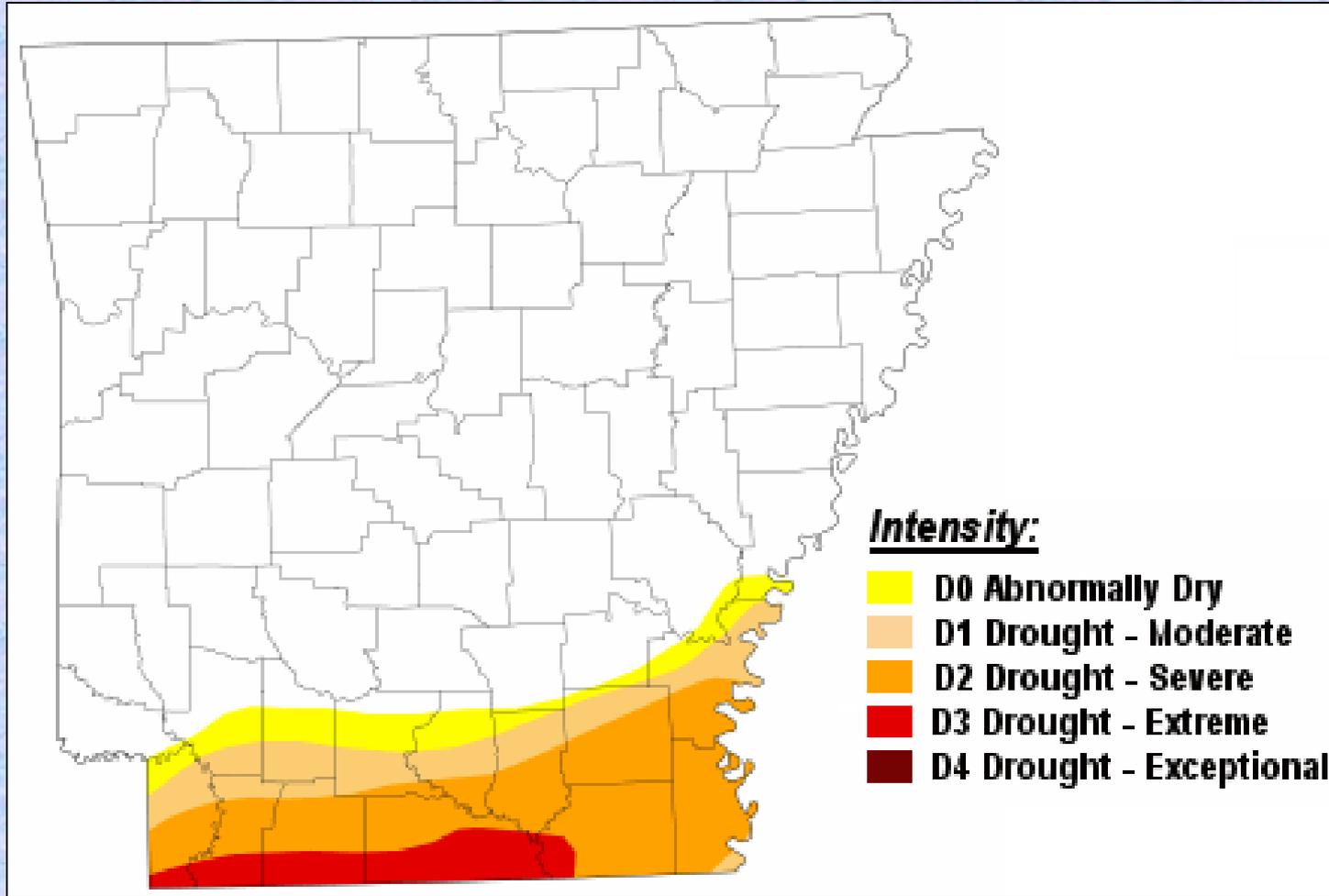
<u>Site</u>	<u>Amount (Thru Oct)</u>
-------------	--------------------------

Texarkana	22.12
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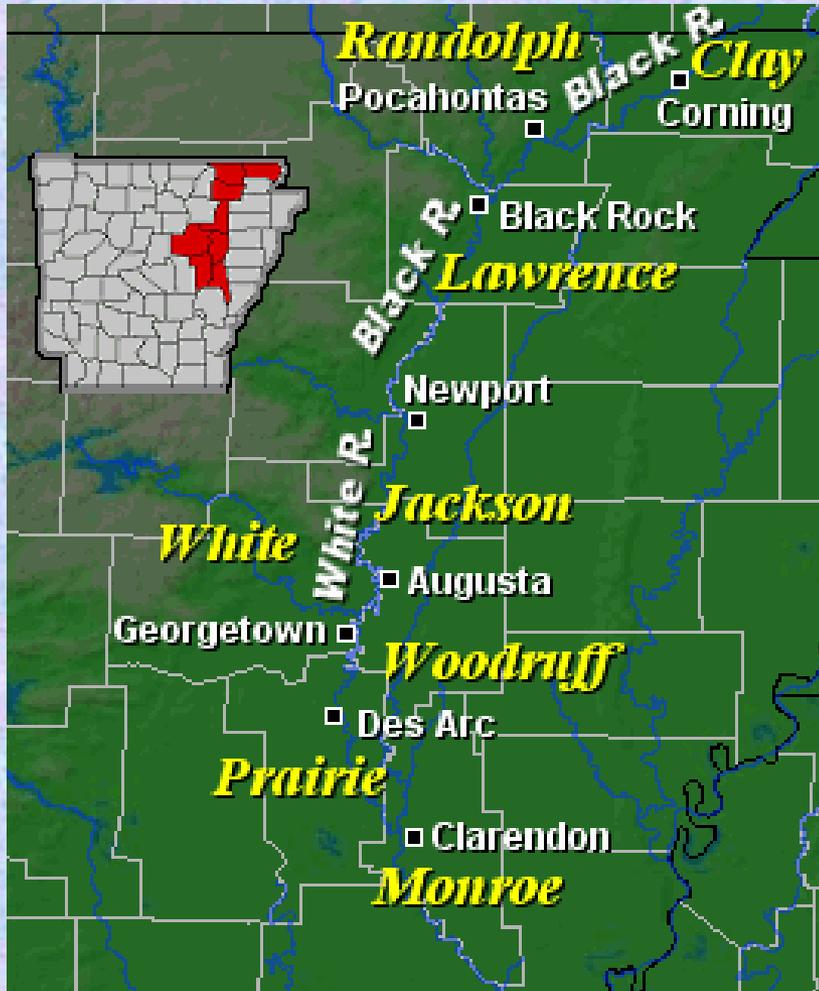
Drought Conditions

May 31, 2011





Widespread Flooding



Record flooding occurred along portions of the Black and lower White Rivers in late April and early May, 2011.



Widespread Flooding





Widespread Flooding





Widespread Flooding





Widespread Flooding



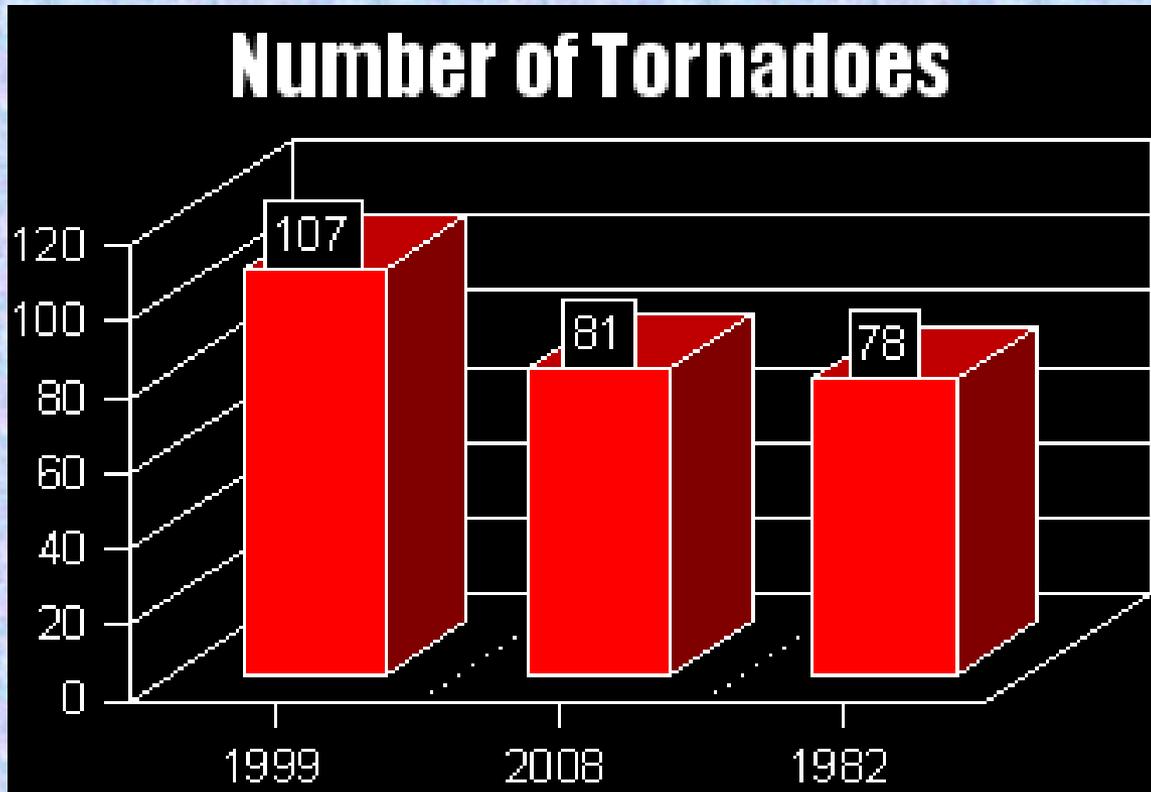
Crests Along Black and White Rivers

Location	River	Crest (ft)	Flood Stage (ft)	Date	Crest (ft)	Date
Corning (Clay Co)	Black	15.92	15	03/22/2008	18.12R	04/28/2011
Pocahontas (Randolph Co)	Black	26.56	17	03/22/2008	28.47R	04/28/2011
Black Rock (Lawrence Co)	Black	29.71	14	03/20/2008	30.45	04/26/2011
Newport (Jackson Co)	White	33.87	26	03/21/2008	34.17	05/04/2011
Augusta (Woodruff Co)	White	38.41	26	03/22/2008	40.80	05/05/2011
Georgetown (White Co)	White	30.18	21	03/24/2008	33.95R	05/06/2011
Des Arc (Prairie Co)	White	33.74	24	03/25/2008	39.43R	05/07/2011
Clarendon (Monroe Co)	White	33.04	26	03/29/2008	37.54	05/10/2011

Note: "R" is record crest.



Biggest Tornado Years



The most tornadoes were spawned in La Niña years (1999 and 2008).



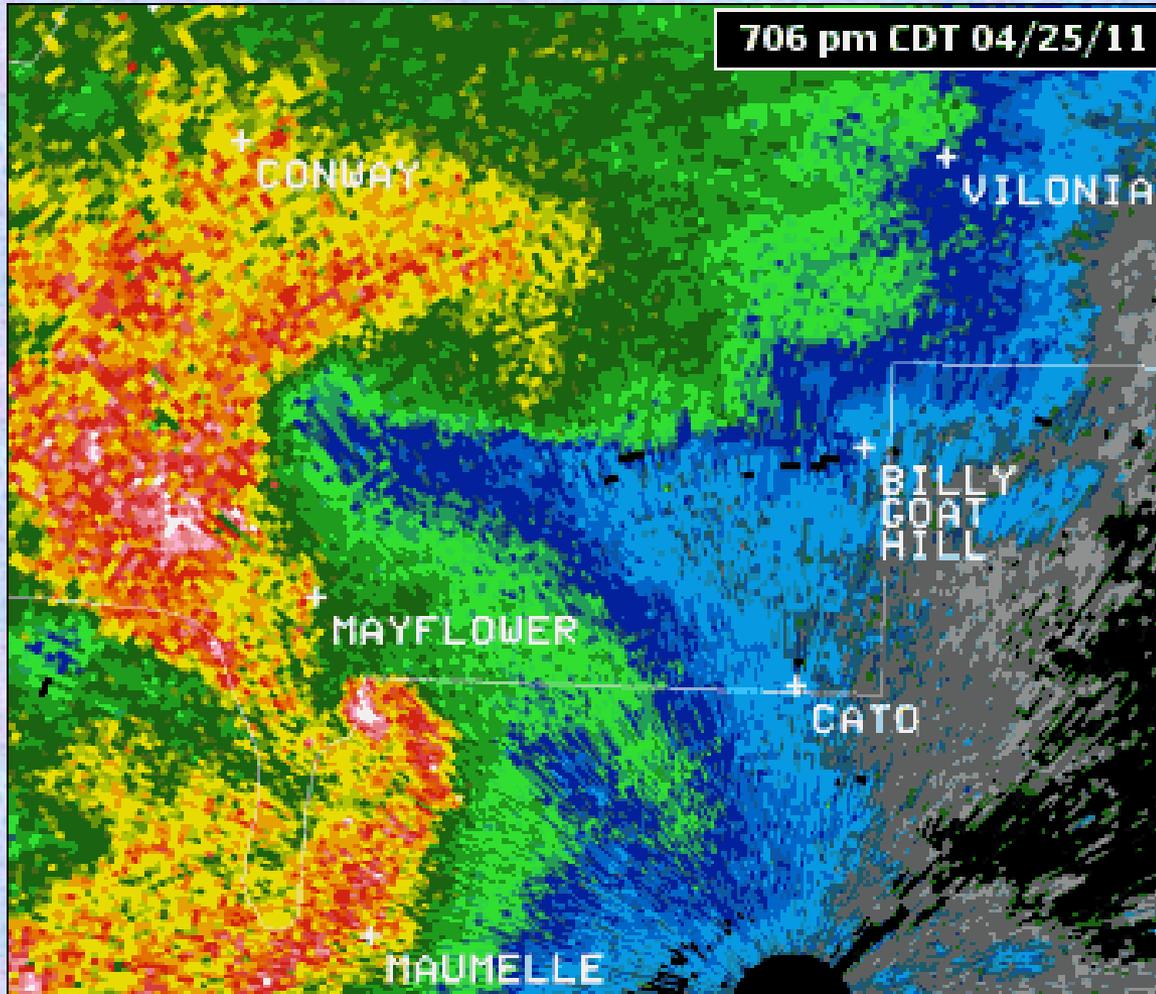
Storms Stats in 2011



Month	Tornadoes	Tornado Deaths	Dmg Wind Deaths	Flood/Flash Flood Deaths	Lightning Deaths
Jan	0	0	0	0	0
Feb	3 (EF1: 3)	0	0	0	0
Mar	0	0	0	1	0
Apr	56 (EF0: 10, EF1: 38, EF2: 7, EF3: 1)	7	6	6	0
May	11 (EF0: 3, EF1: 5, EF2: 1, EF3: 1, EF4: 1)	5	0	11	0
Jun	2 (EF0: 1, EF1: 1)	0	1	0	0
Jul	0	0	0	0	0
Aug	0	0	0	0	1
Sep	1 (EF0: 1)	0	0	0	0
Oct	1 (EF0: 1)	0	0	0	0
Nov	1 (EF0: 1)	0	0	0	0
Dec	0	0	0	0	0
Total	75	12	7	18	1



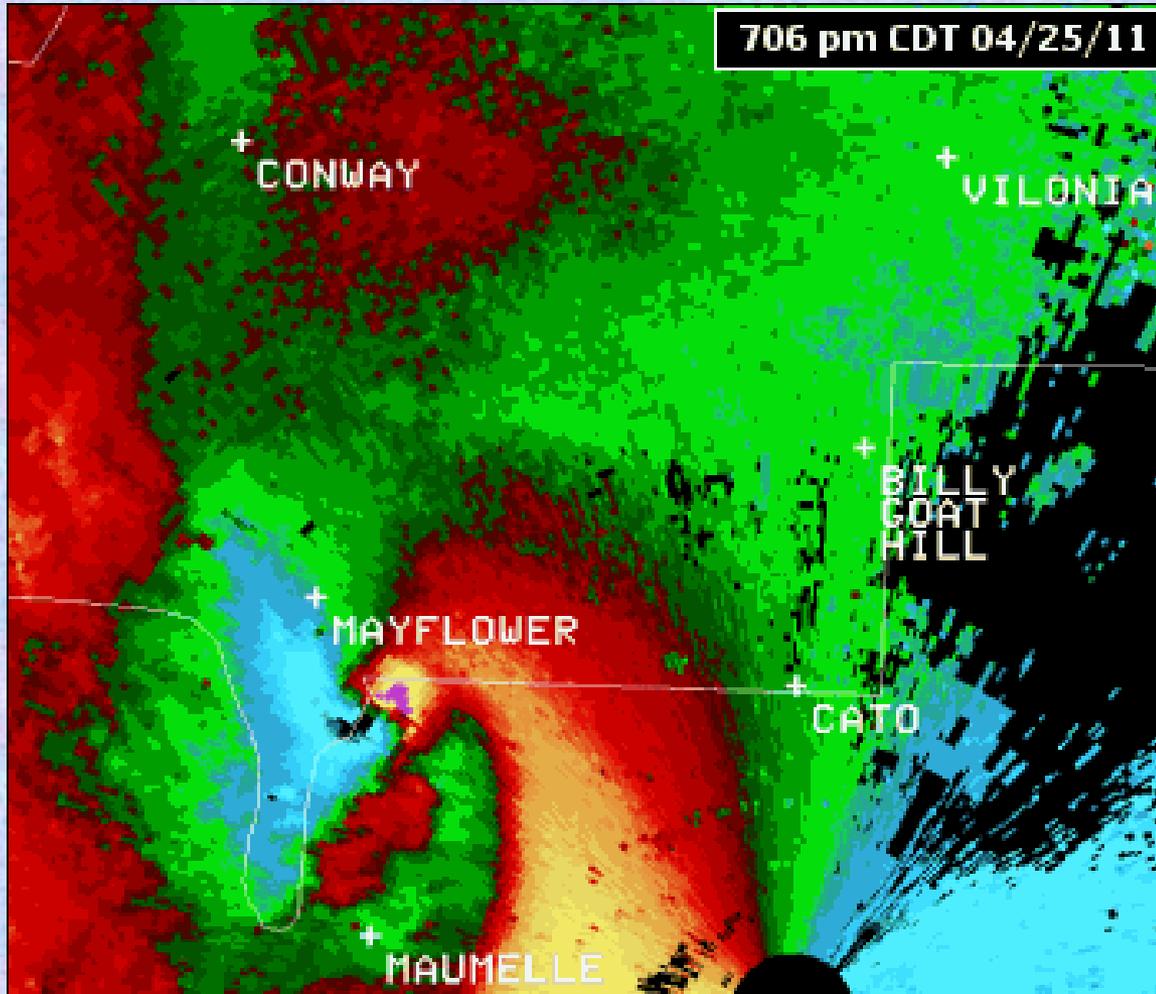
Deadliest Tornado



A tornado (rated EF2) killed 4 people just southwest of Vilonia (Faulkner County) on April 25, 2011.



Deadliest Tornado



A tornado (rated EF2) killed 4 people just southwest of Vilonia (Faulkner County) on April 25, 2011.



Deadliest Tornado

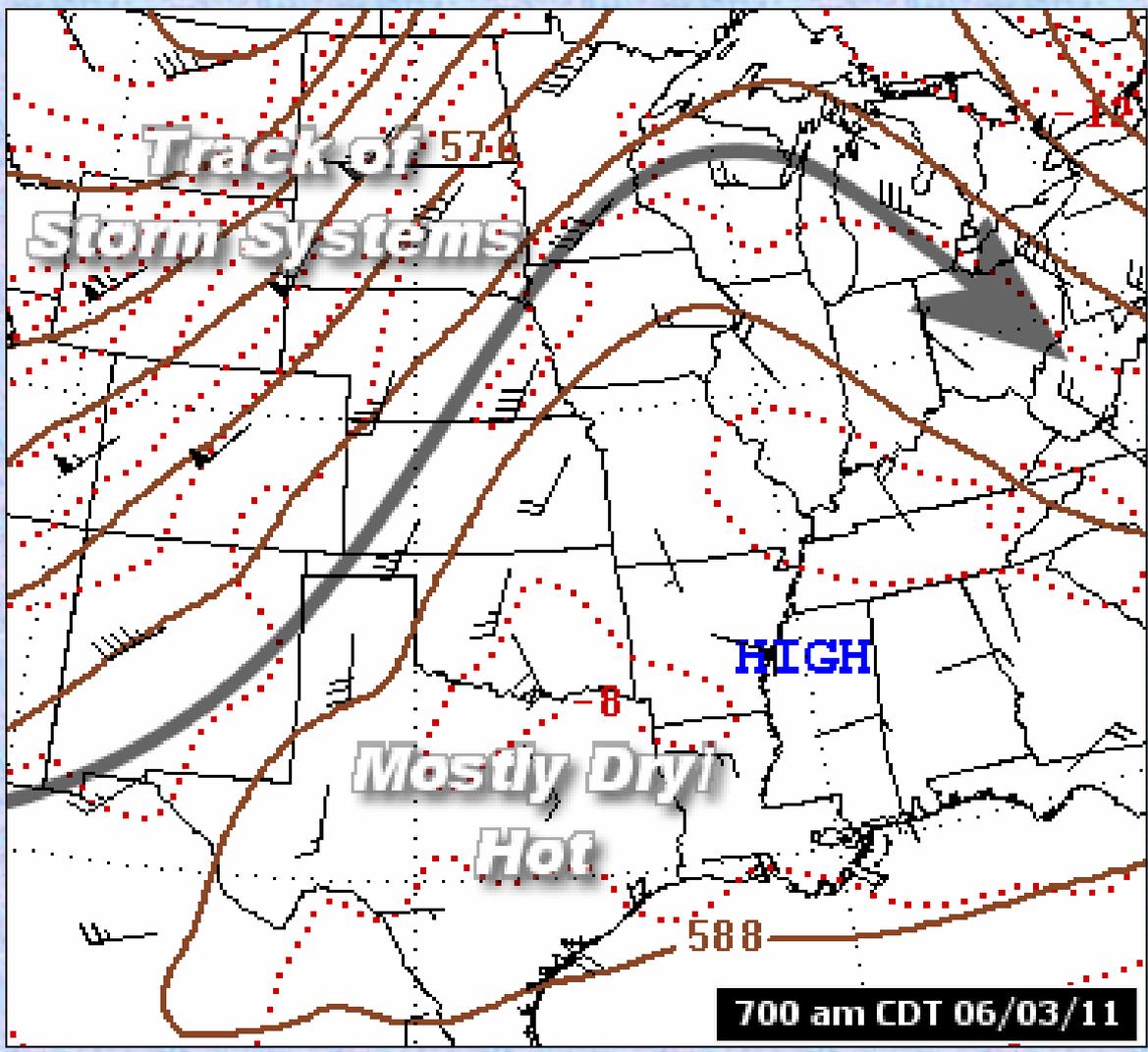


Roof gone, some damage to outer walls...





The Dreaded High

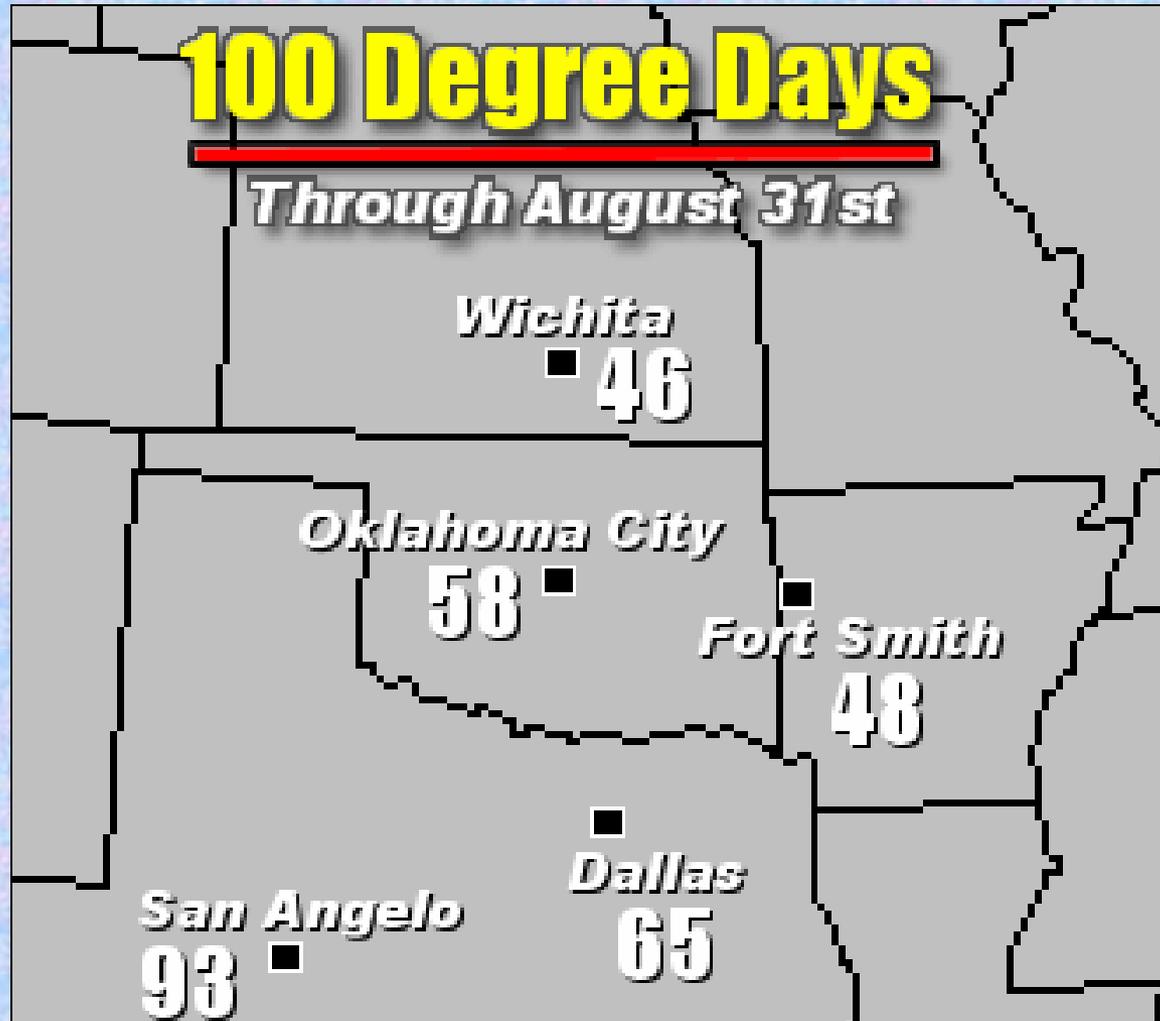


A ridge of high pressure built over Arkansas in June, and was a frequent visitor through July.



Brutal Heat

Summer, 2011





Brutal Heat

Summer, 2011



Record Heat on August 3, 2011

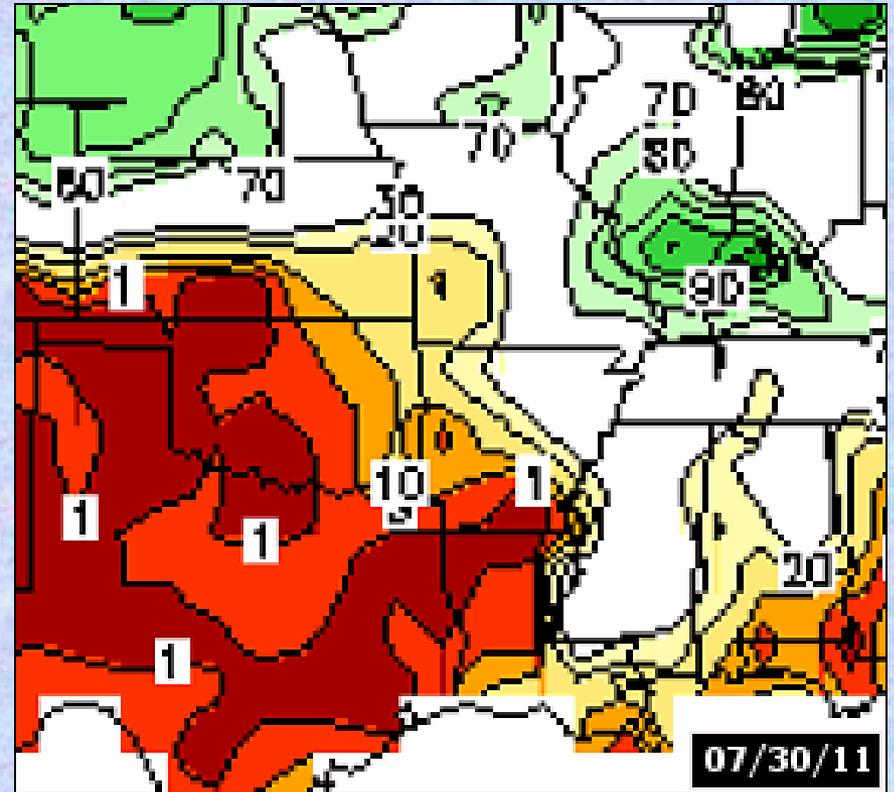
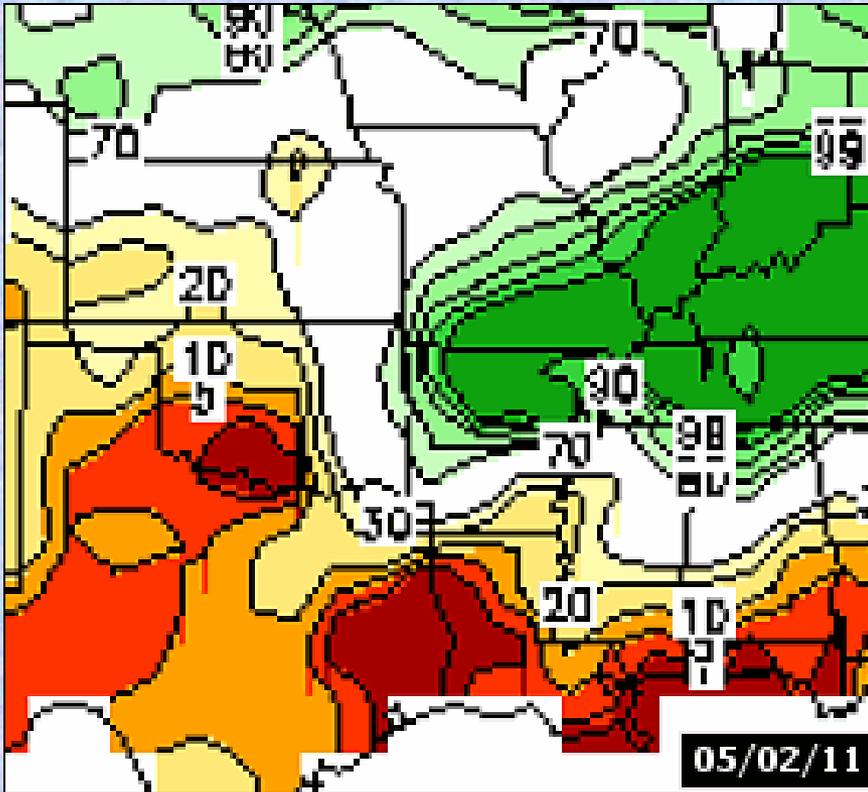
Site	High Temp	Site	High Temp
Fayetteville (NW AR)	110°!	Mount Ida (WC AR)	112°
Harrison (NC AR)	112°!	Hot Springs (C AR)	108°
Mountain Home (NC AR)	114°	Pine Bluff (SE AR)	110°
Jonesboro (NE AR)	107°	Texarkana (SW AR)	111°
Fort Smith (WC AR)	115°!	El Dorado (SC AR)	108°
Little Rock (C AR)	114°!	Monticello (SE AR)	107°

Note: "!" is all-time record high temperature.



Soil Moisture

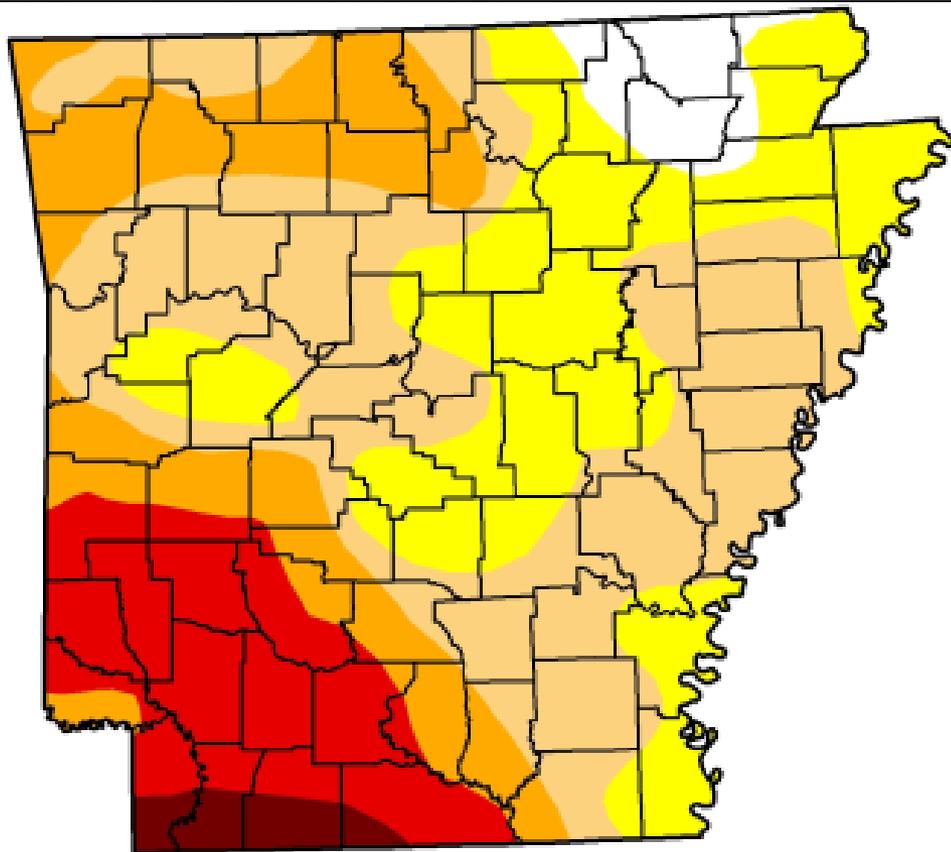
May 2 – July 30, 2011





Drought Status

October 25, 2011



Intensity:

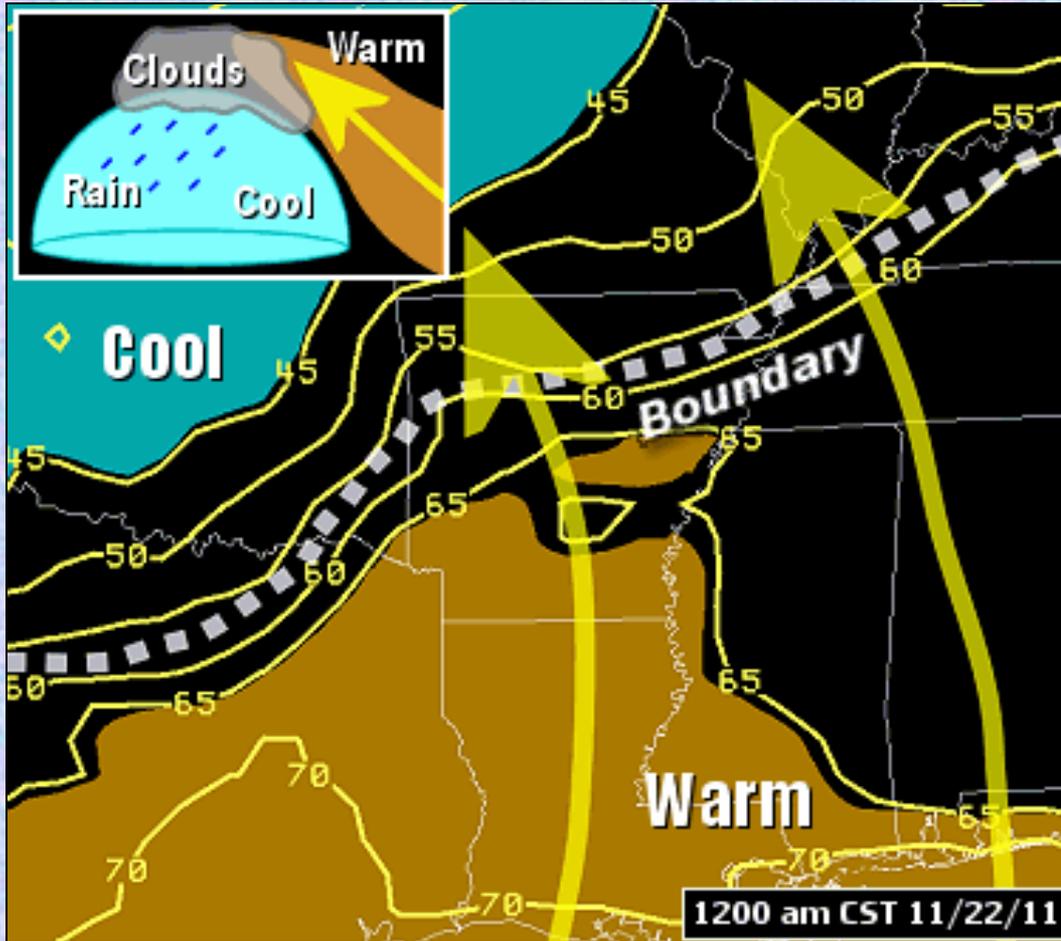
- | | |
|-----------------------|--------------------------|
| D0 Abnormally Dry | D3 Drought - Extreme |
| D1 Drought - Moderate | D4 Drought - Exceptional |
| D2 Drought - Severe | |

An extreme to exceptional drought was noted in much of southwest Arkansas.



Wet Pattern

November/Early December, 2011

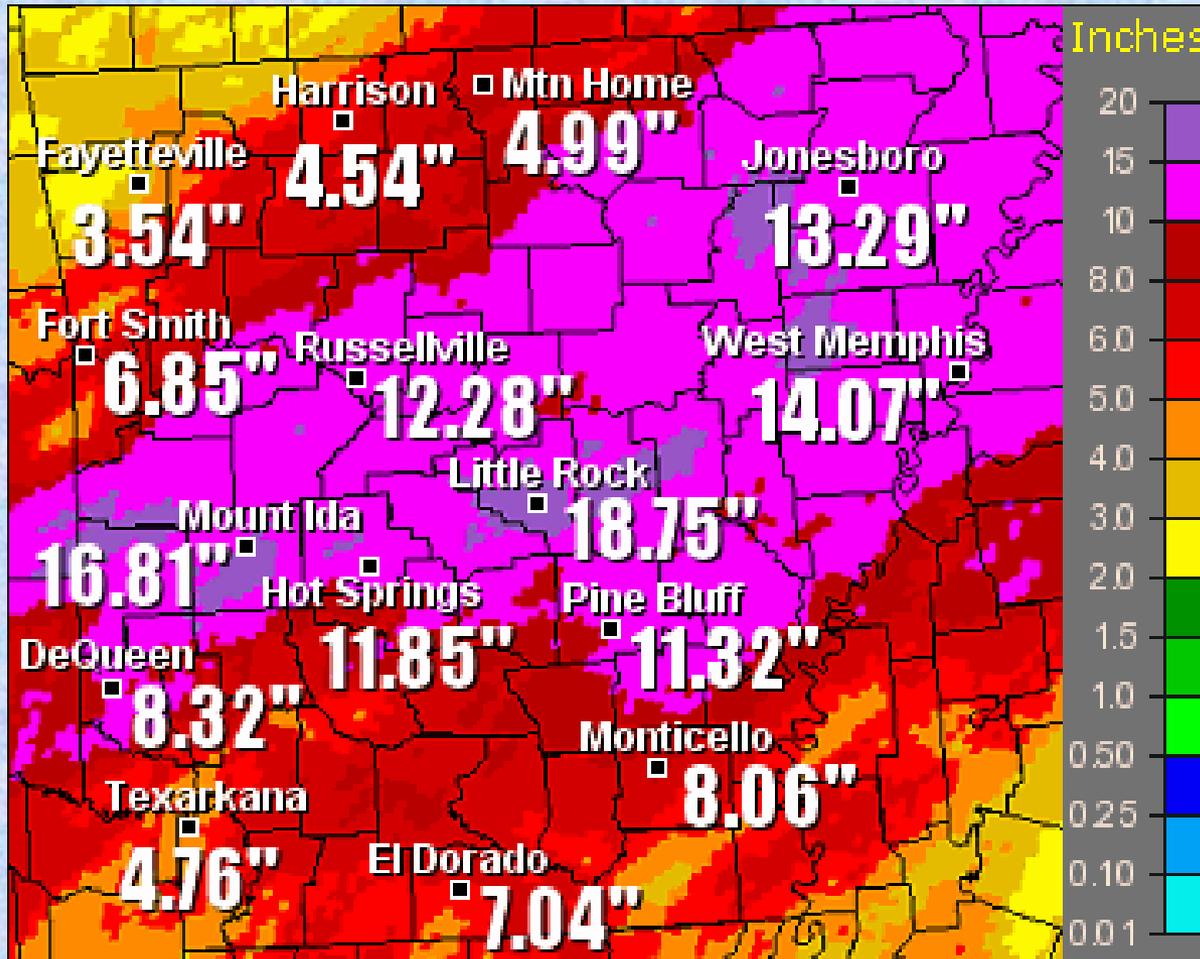


Fronts (boundaries) moved into Arkansas from the northwest and stalled. Heavy rain focused along and north of the fronts.



A Lot of of Rain

Nov 12 – Dec 11, 2011

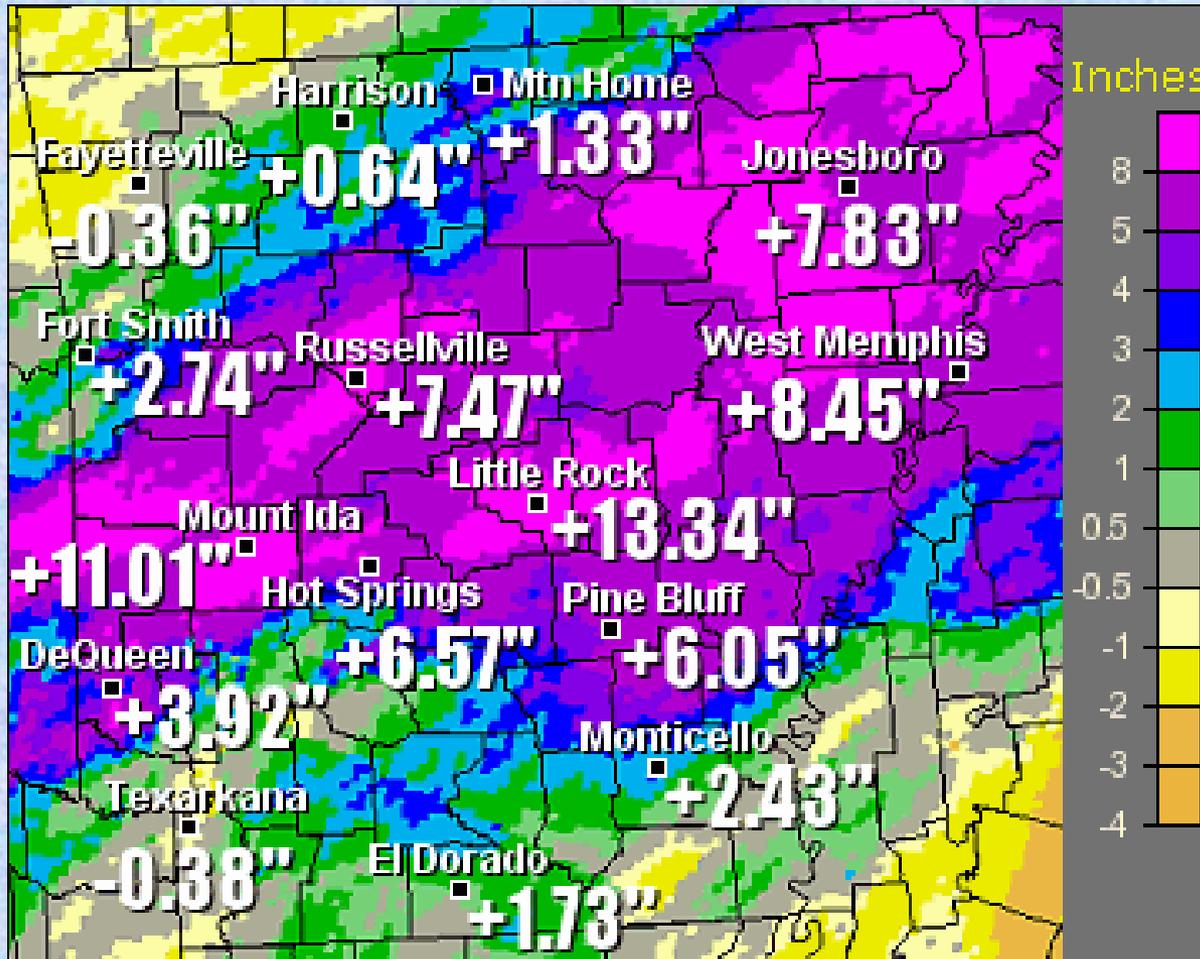


Rainfall



A Lot of of Rain

Nov 12 – Dec 11, 2011

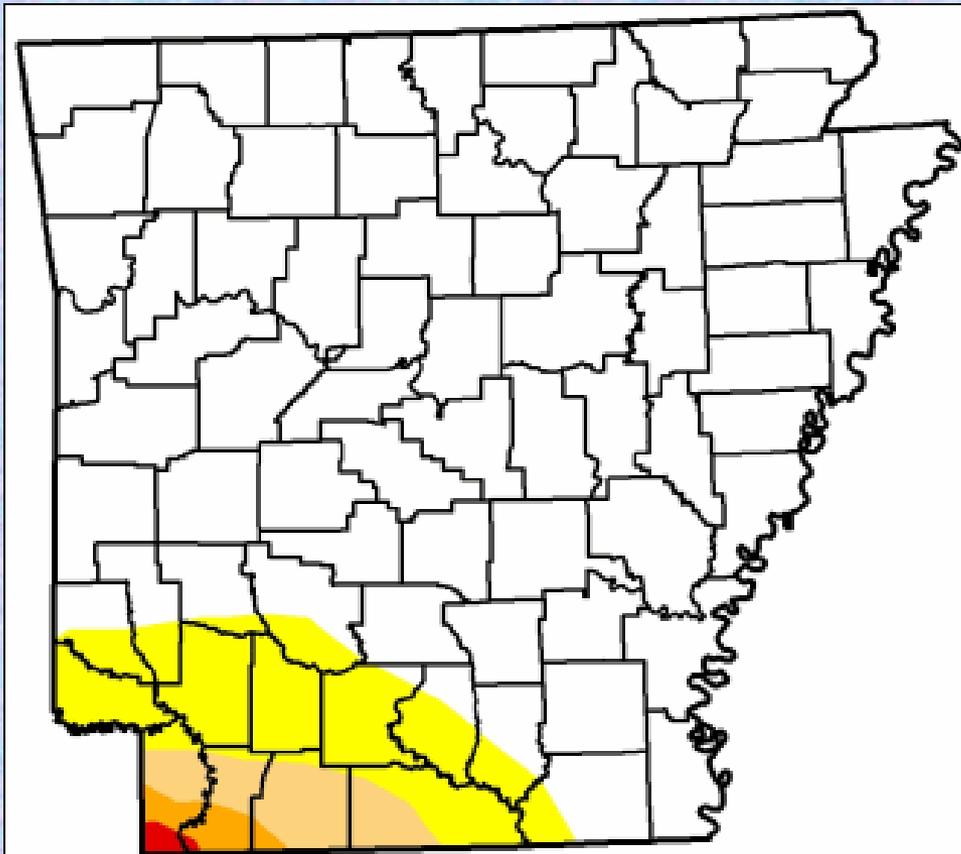


Departure (+/-)



Drought Status

December 27, 2011



Intensity:

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

A severe to extreme drought remained in the far southwest, but was over elsewhere.



Good/Bad Timing



The deluge to end 2011 plus a wet start in 2012 helped charge the soil with water at a time when vegetation was dormant.

The rain stopped coming in April, with well below normal amounts measured.



Rainfall

April, 2012



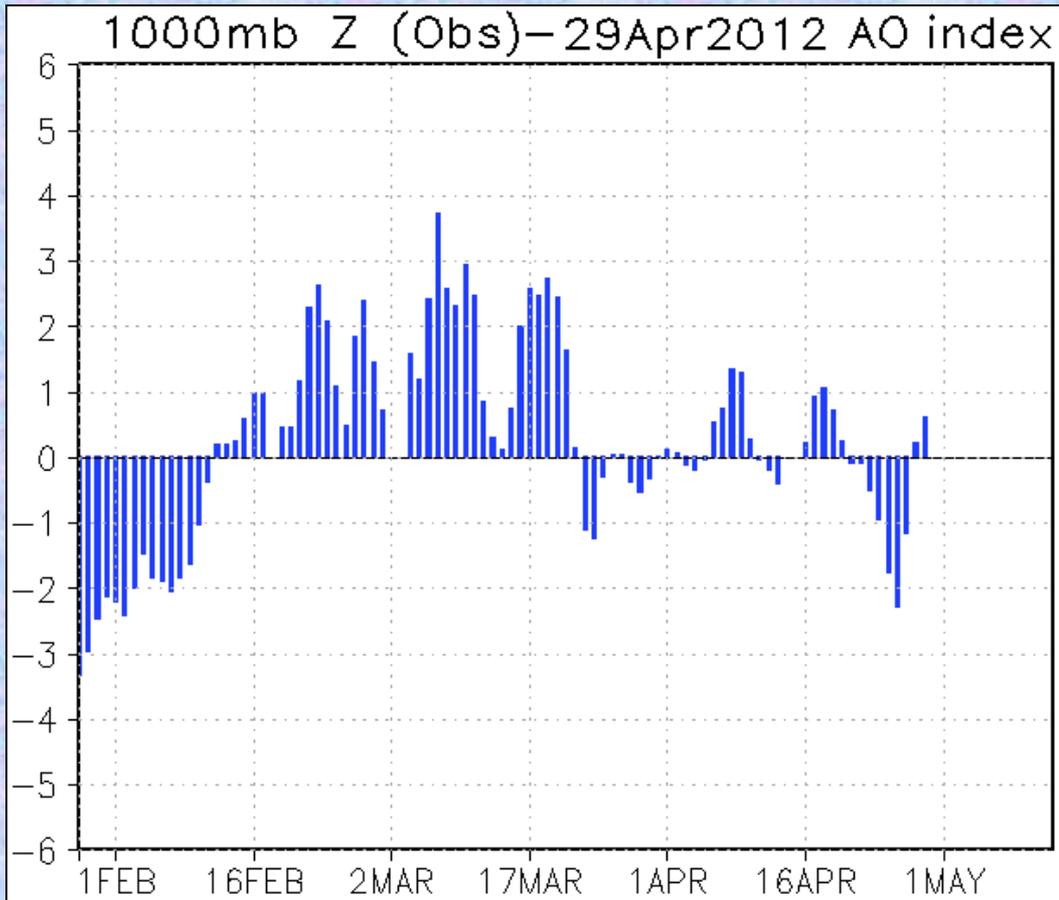
Precipitation in April, 2012

Site	Amount	Normal	+/-	% of Normal
Fayetteville (NW AR)	2.15	4.60	-2.45	47%
Harrison (NC AR)	1.64	4.32	-2.68	38%
Jonesboro (NE AR)	1.22	5.02	-3.80	24%
Fort Smith (WC AR)	2.99	4.30	-1.31	70%
Little Rock (C AR)	2.84	5.14	-2.30	55%
West Memphis (EC AR)	1.87	5.38	-3.51	35%
Texarkana (SW AR)	3.87	3.94	-0.07	98%
El Dorado (SC AR)	4.37	4.09	+0.28	107%
Pine Bluff (SE AR)	2.62	4.93	-2.31	53%

0.82" at Blytheville (NE AR), 0.97" at Greers Ferry Lake (NE AR) and 0.99" at Batesville Lock and Dam (NE AR).



Arctic Oscillation (AO)



A largely positive AO from January through March went flat in April.



Declining La Niña



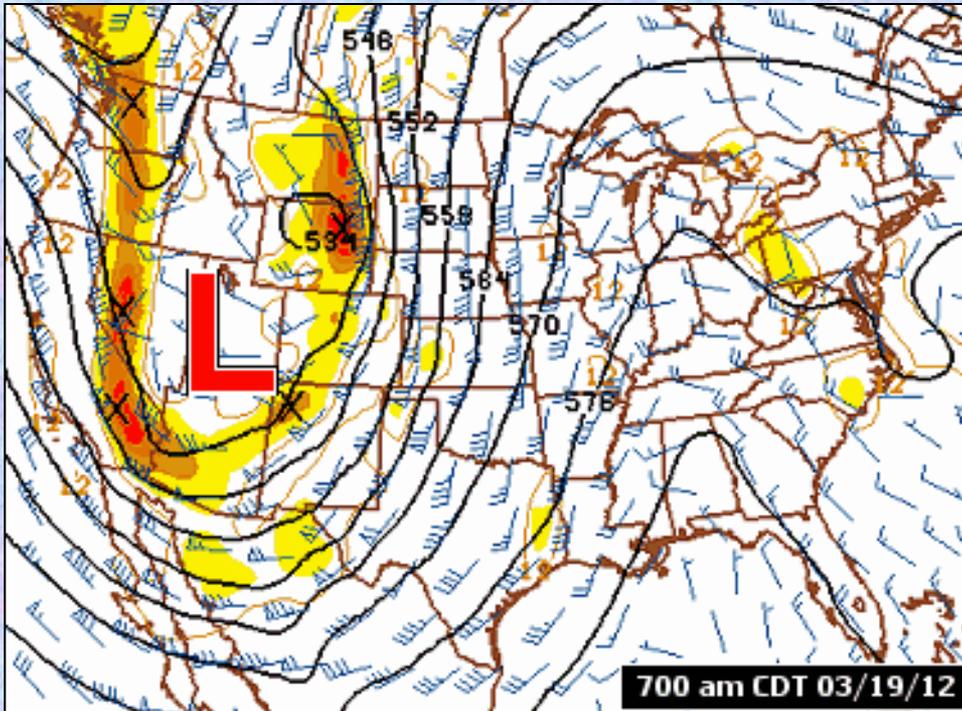
	<i>DJF</i>	<i>JFM</i>	<i>FMA</i>
<i>2011</i>	-1.4	-1.3	-1.0
<i>2012</i>	-0.9	-0.7	-0.4

La Niña was not as strong this year (as in 2011), and was pretty much gone by the end of April.



The Pattern

March - April, 2012

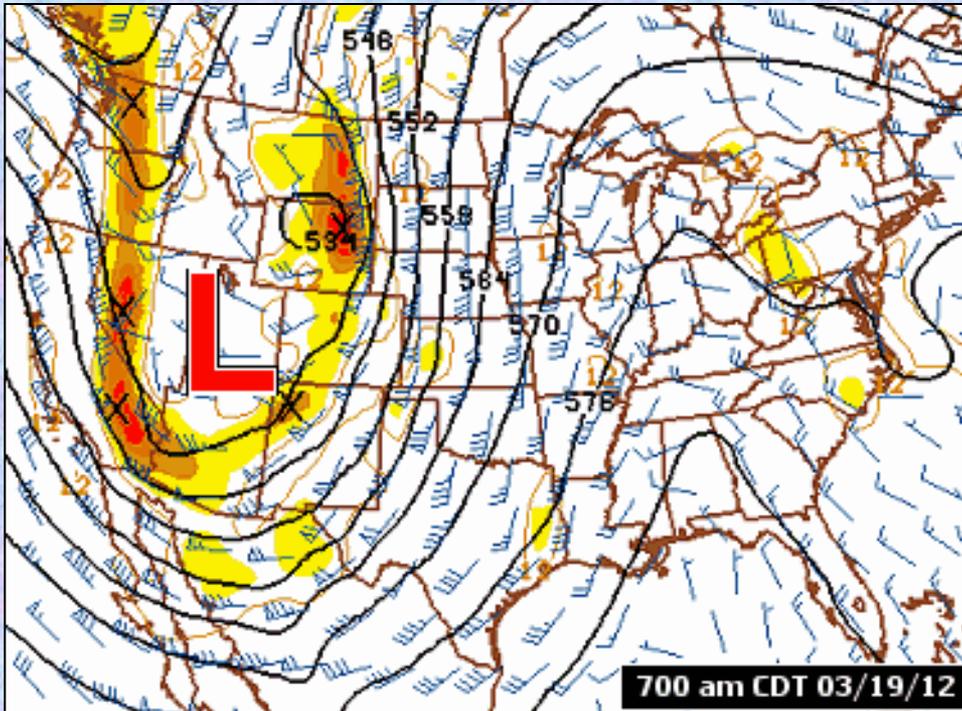


We were left with a pseudo-summertime pattern with storm systems forced (by high pressure) to bypass Arkansas to the north and west.



The Pattern

March - April, 2012



Rain became more spotty and it was much warmer than normal.



Record Warmth

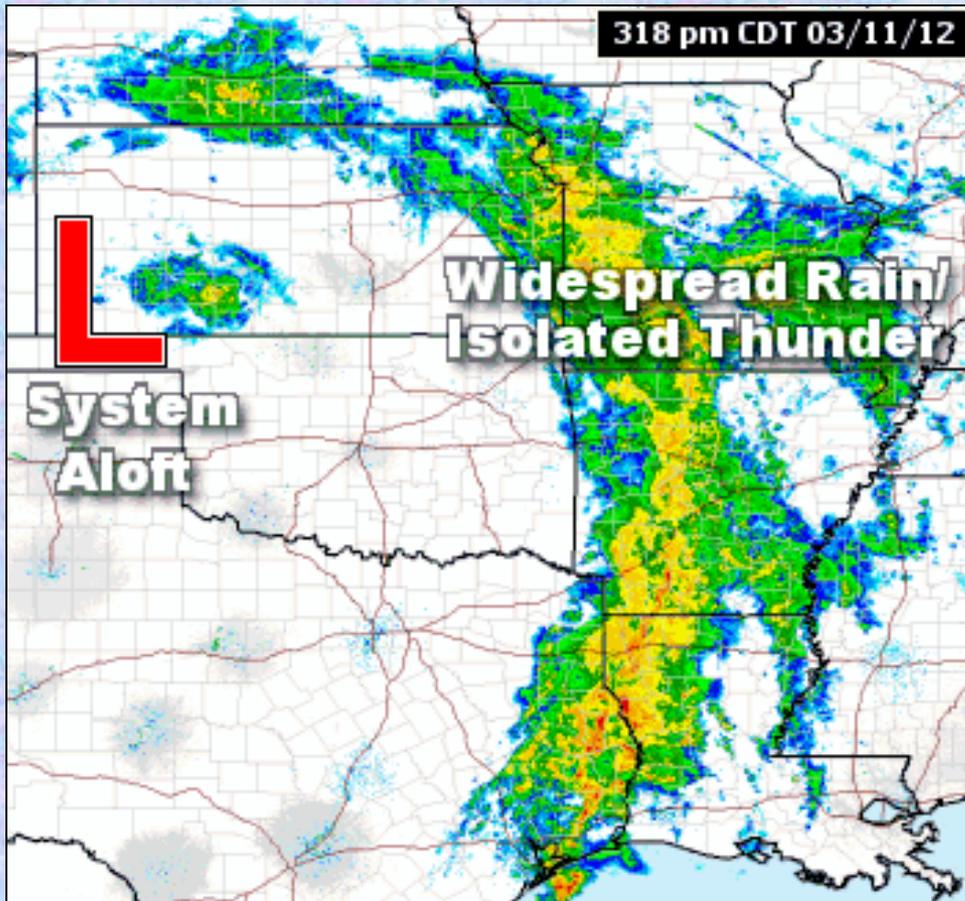


Average Temperatures in March, 2012

Site	Avg Temp	+/-
Fayetteville (NW AR)	57.9°	+9.8°
Harrison (NC AR)	60.5°	+11.7°
Jonesboro (NE AR)	62.8°	+12.6°
Fort Smith (WC AR)	63.6°	+10.7°
Little Rock (C AR)	64.3°	+10.9°
West Memphis (EC AR)	62.5°	+11.0°
Texarkana (SW AR)	64.8°	+8.9°
El Dorado (SC AR)	63.0°	+7.2°
Pine Bluff (SE AR)	64.6°	+10.2°



Rain Favors the West

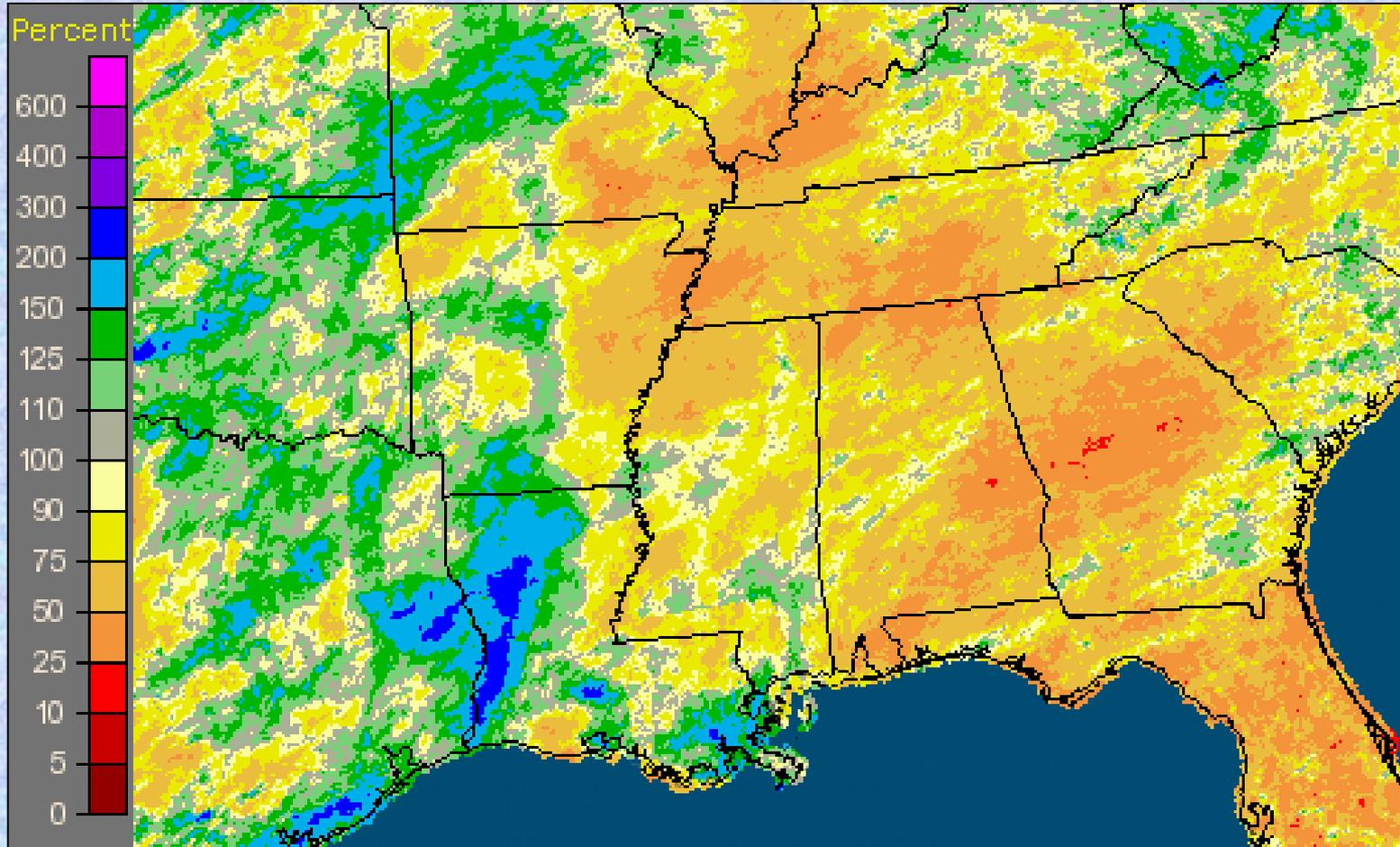


When it rained, appreciable amounts were mostly confined to the western counties.



Percent of Normal Rain

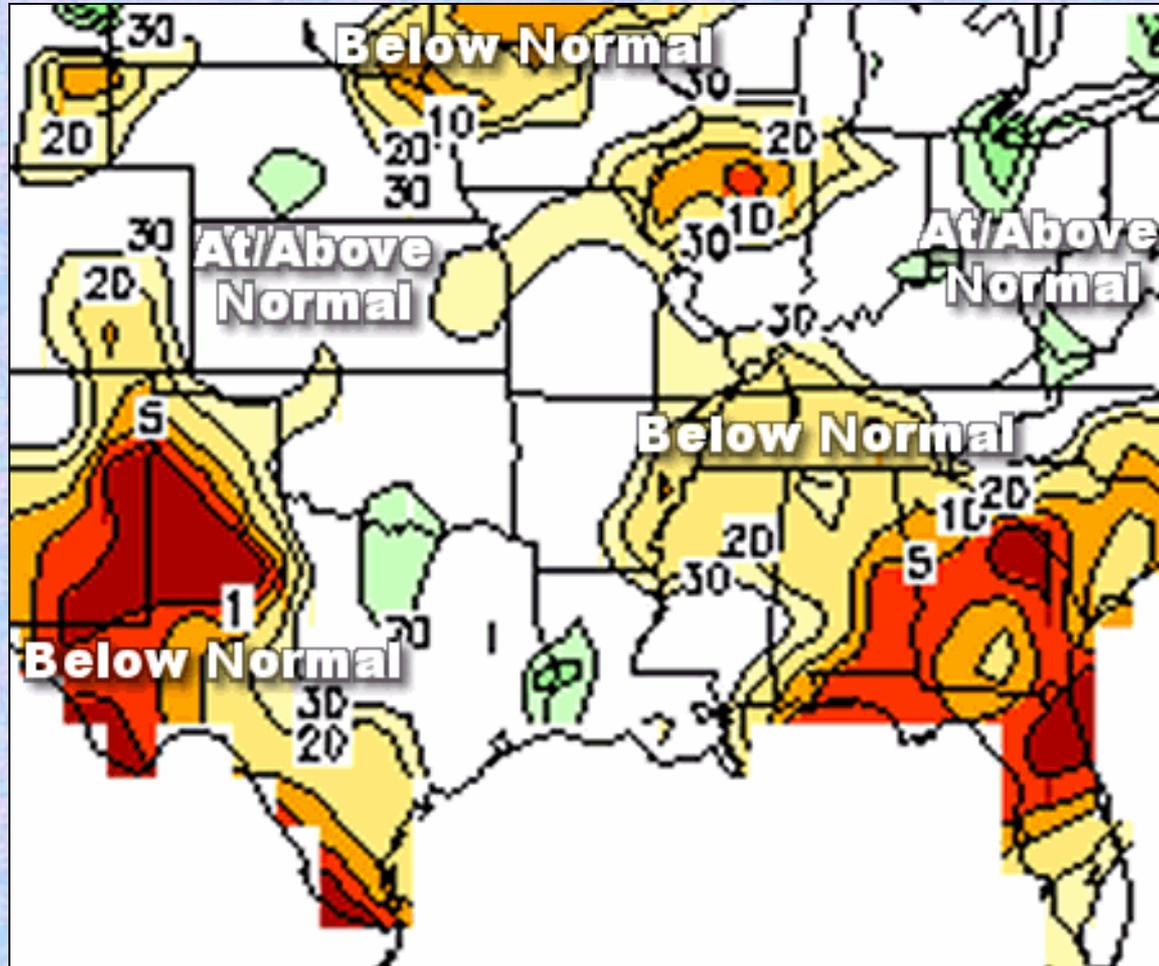
March/April, 2012





Soil Moisture

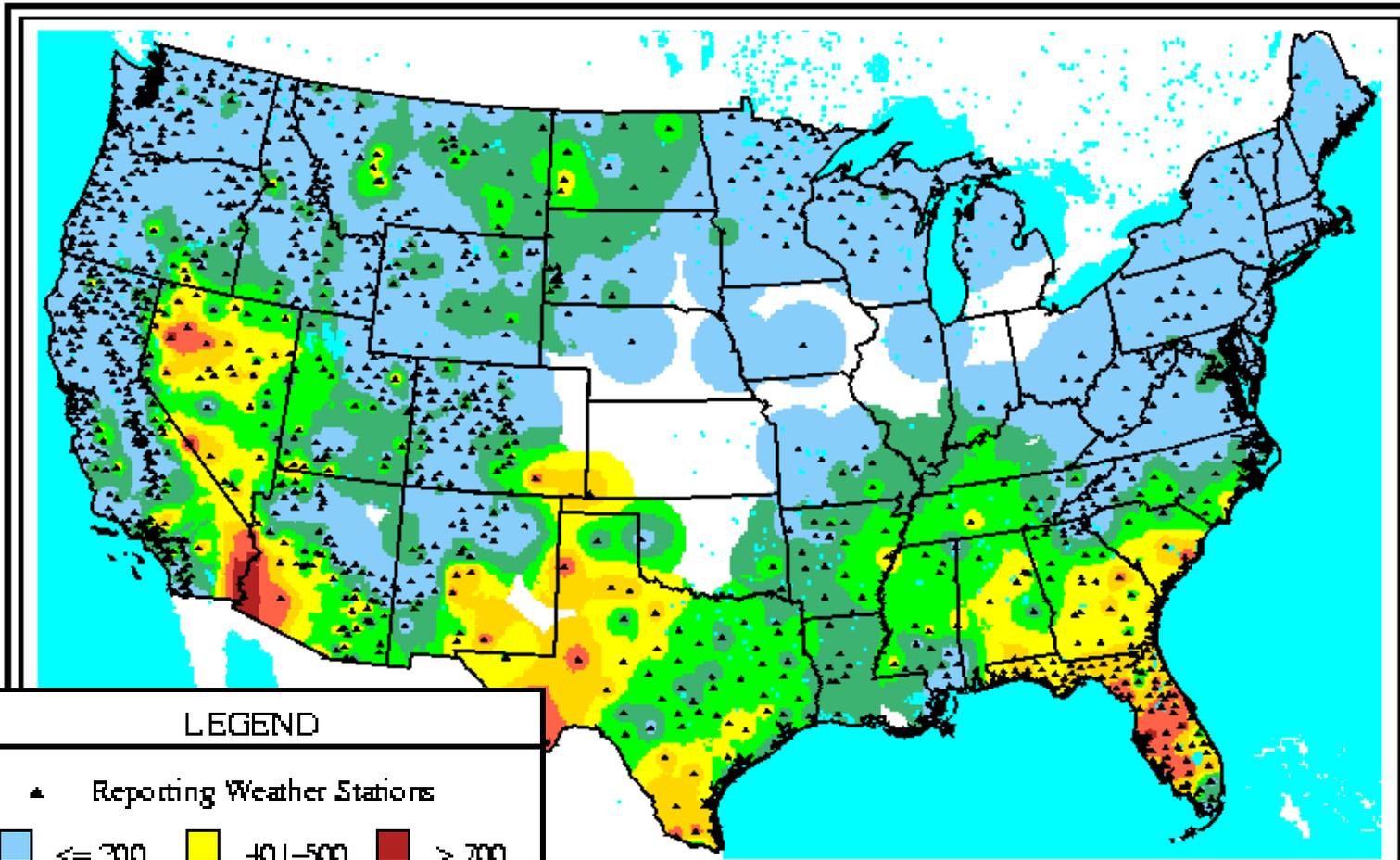
April 28, 2012





Keetch-Byram Index

May 2, 2012



LEGEND

▲ Reporting Weather Stations

Light Blue	≤ 200	Yellow	401-500	Dark Red	> 700
Green	201-300	Orange	501-600	Cyan	Water
Light Green	301-400	Red-Orange	601-700		

(Inv. Dist.² Interp.)

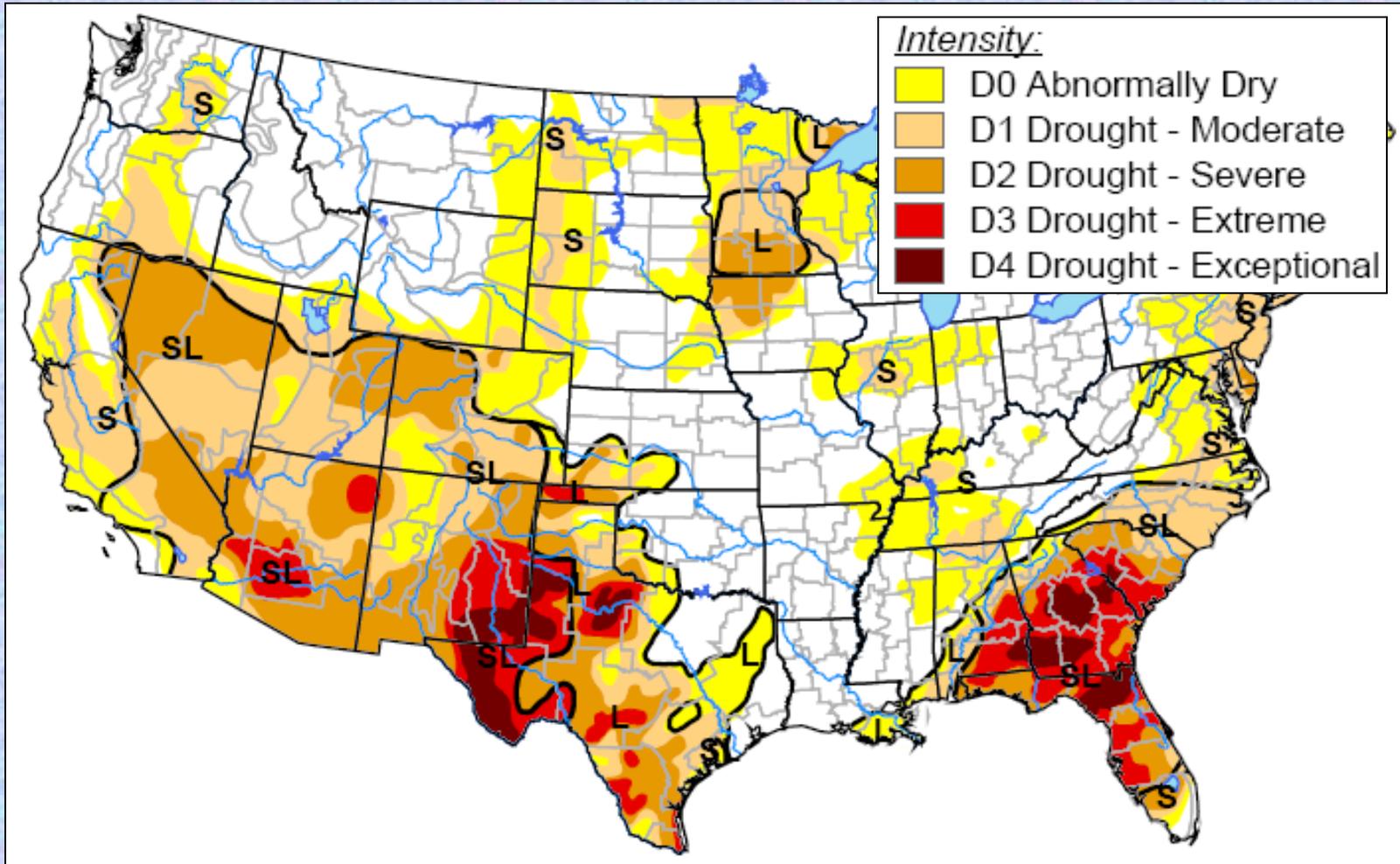
FIRE BEHAVIOR RESEARCH MISSOULA, MT





Drought Status

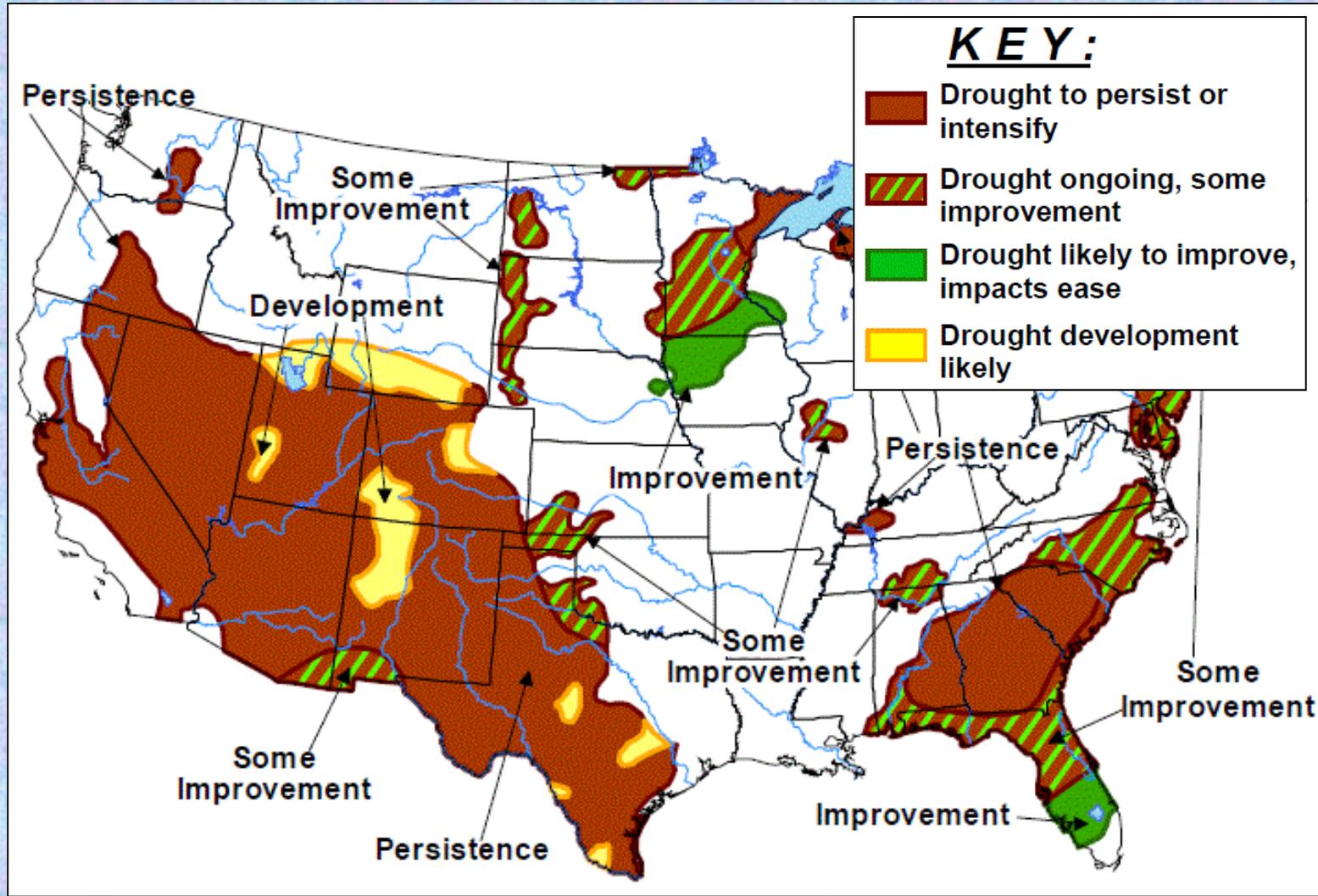
April 24, 2012





Drought Outlook

Through July, 2012





Drought Outlook

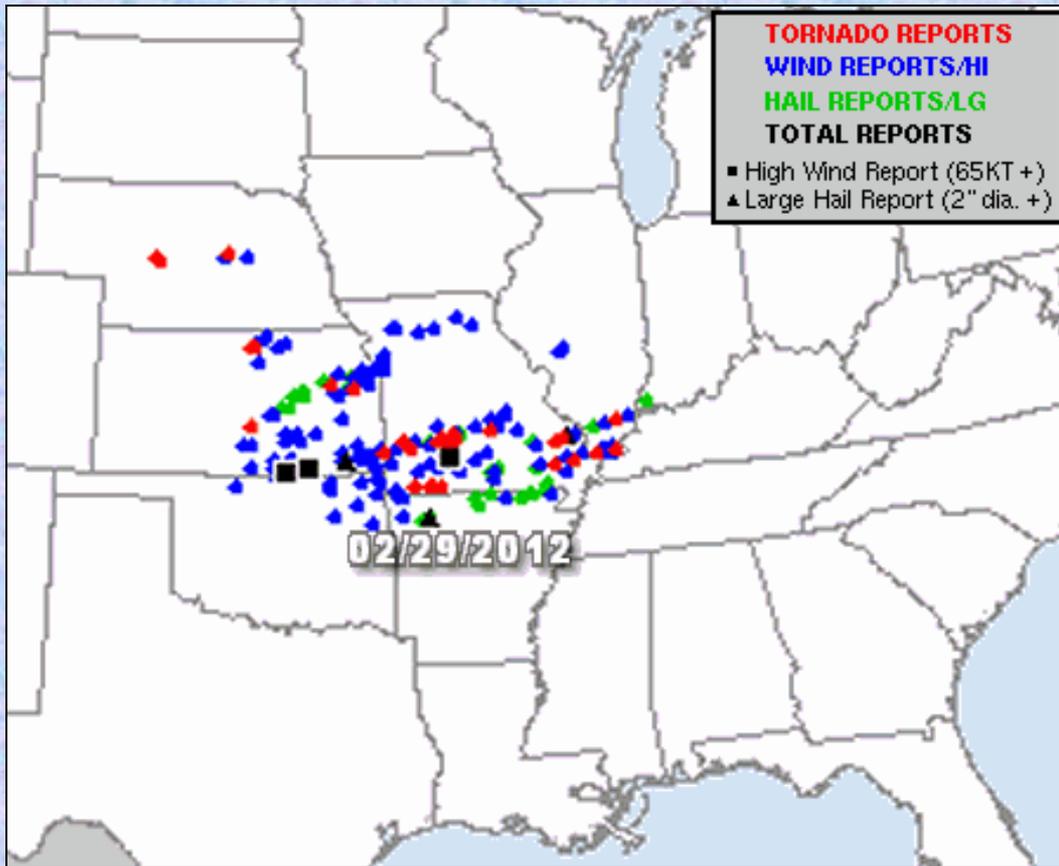
Through July, 2012



If drought conditions develop in Arkansas, they would be most likely in the eastern counties (where soil moisture values are declining).



Tornado Outbreaks 2012



Numerous tornadoes were spawned from late February through April, but not here.



Severe Storms

January 22, 2012



Tornadoes swept across southern Arkansas, with damage to a clubhouse at Fordyce (Dallas County).



Severe Storms

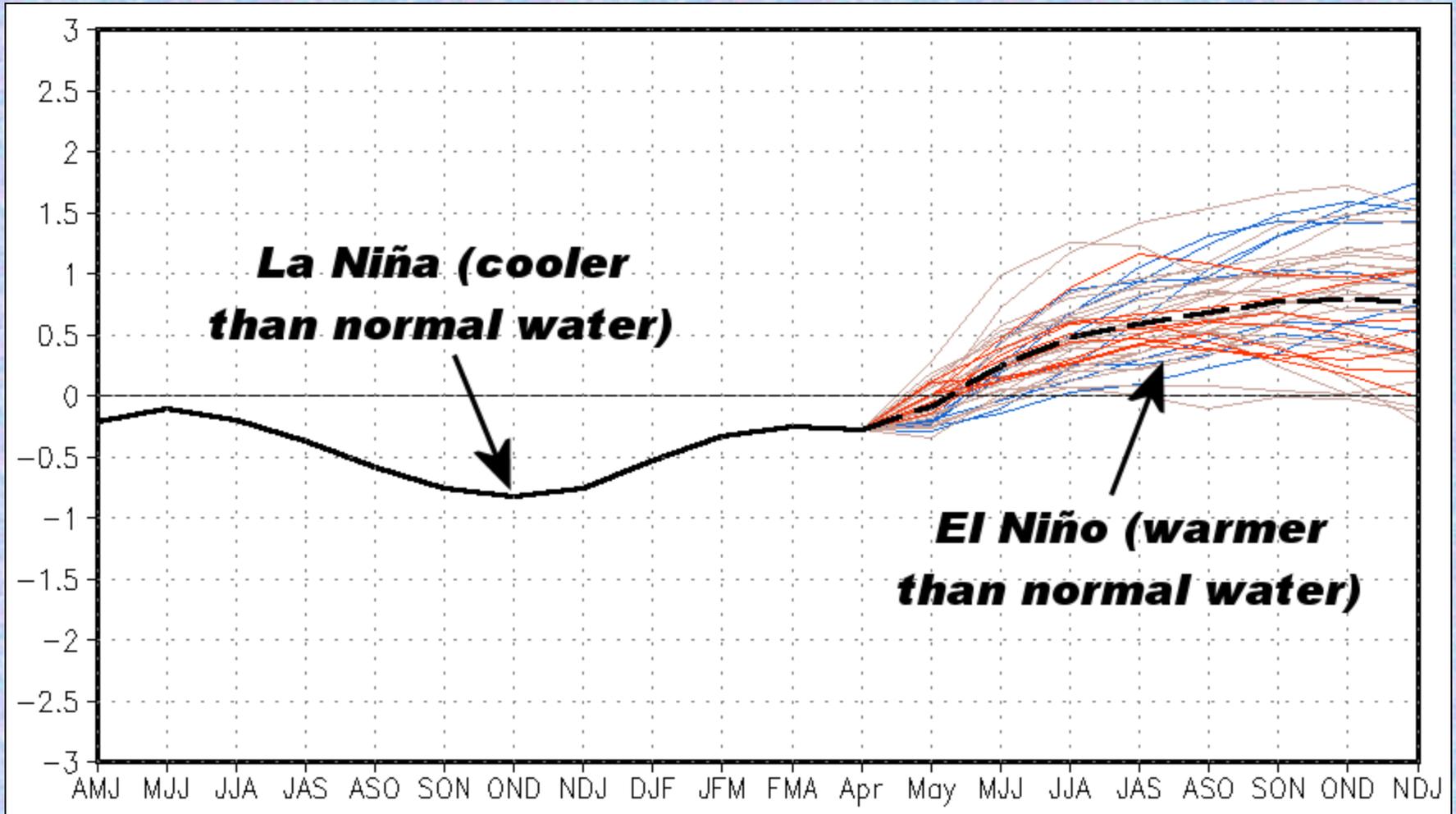
January 22, 2012



There were seven tornadoes that day. There have been two tornadoes since.



The Forecast





The Forecast



We will be in ENSO neutral conditions heading into the first part of the summer.

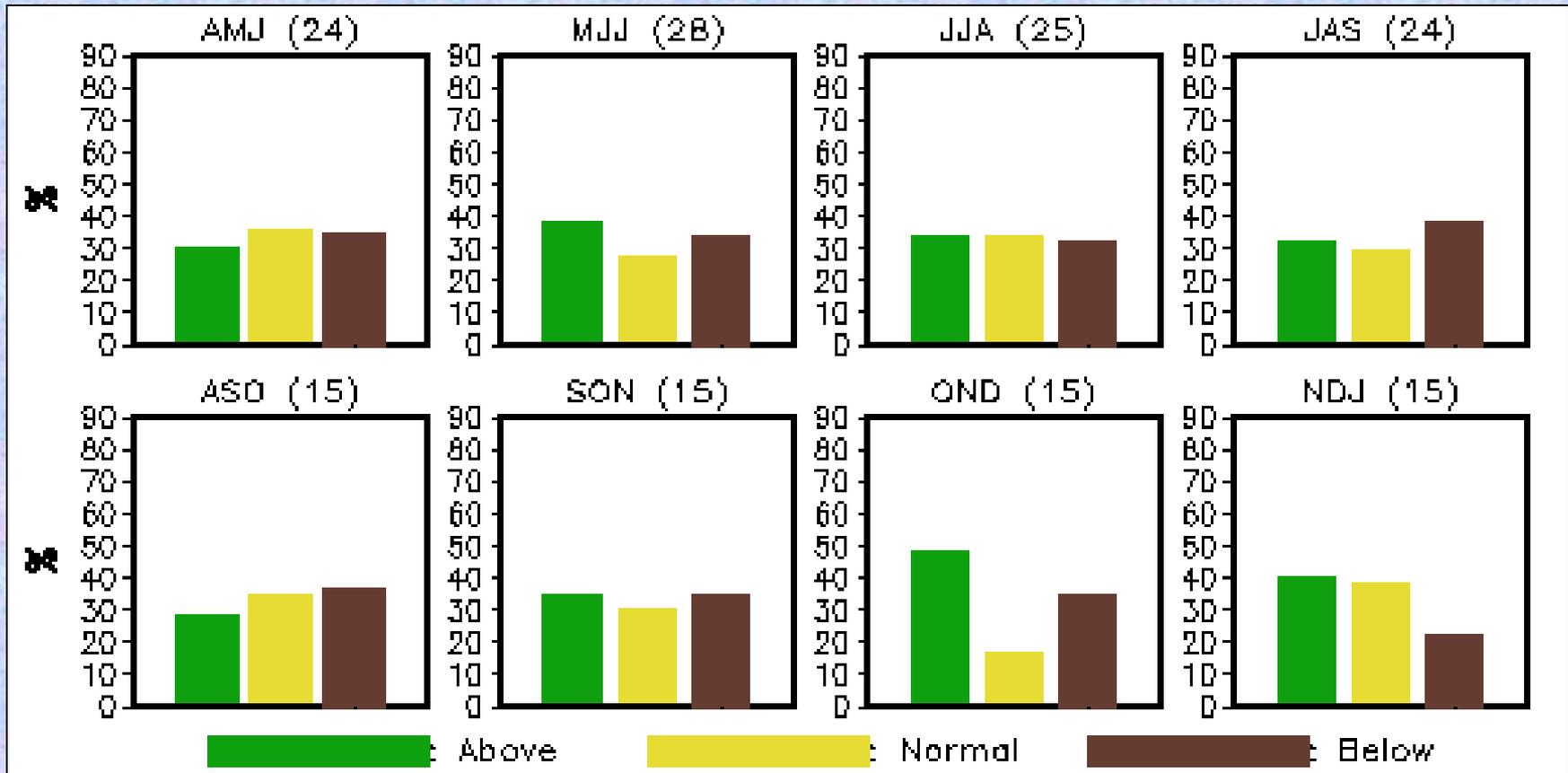
Later in the summer and continuing into fall, a weak El Niño should be observed.

This may lead to a summer that is not so oppressive, a less than active tropical season, a dry fall and a wet winter.



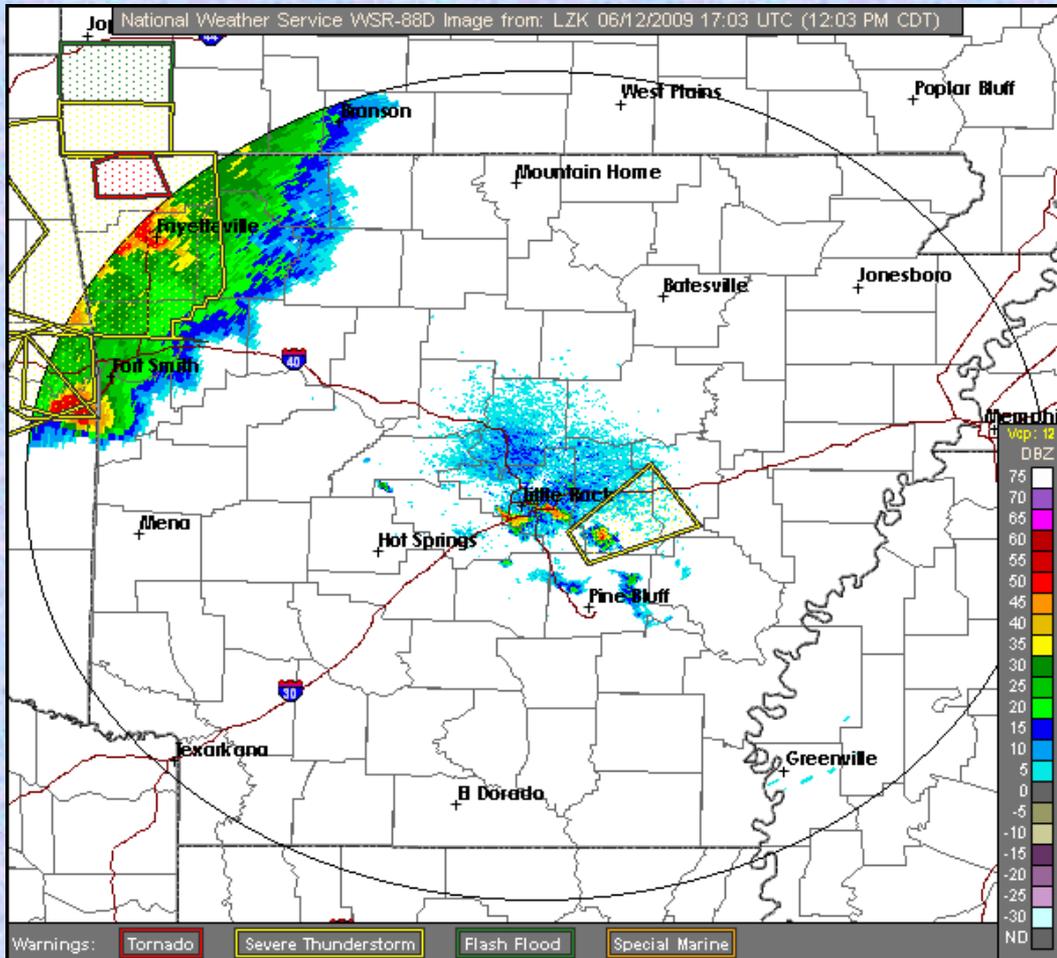
The Forecast

Precipitation





The MCS



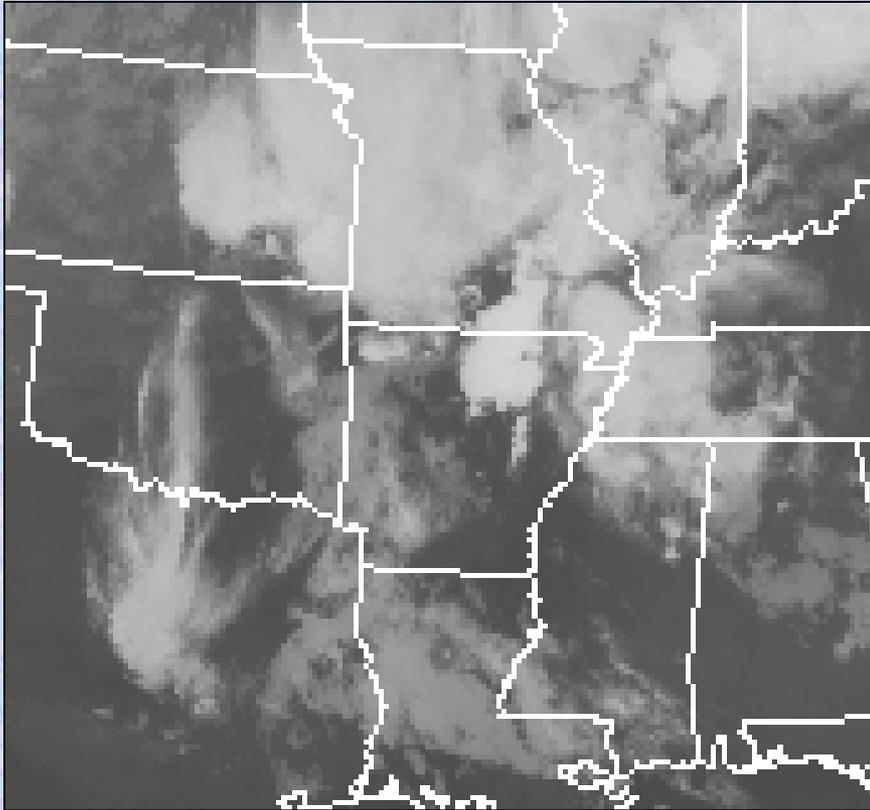
Mesoscale convective systems are most common in Arkansas in the late spring/early summer. They can bring a quick inch or two of rain (sometimes more) to a large area.

06/12/2009

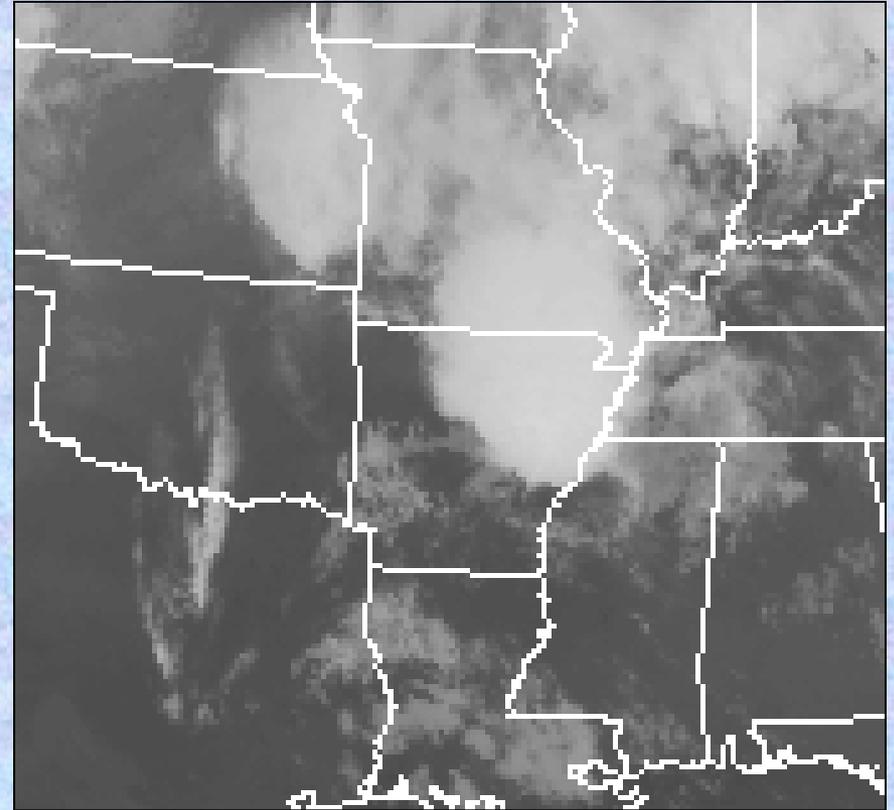


The MCS

May 7, 2012



415 am CDT

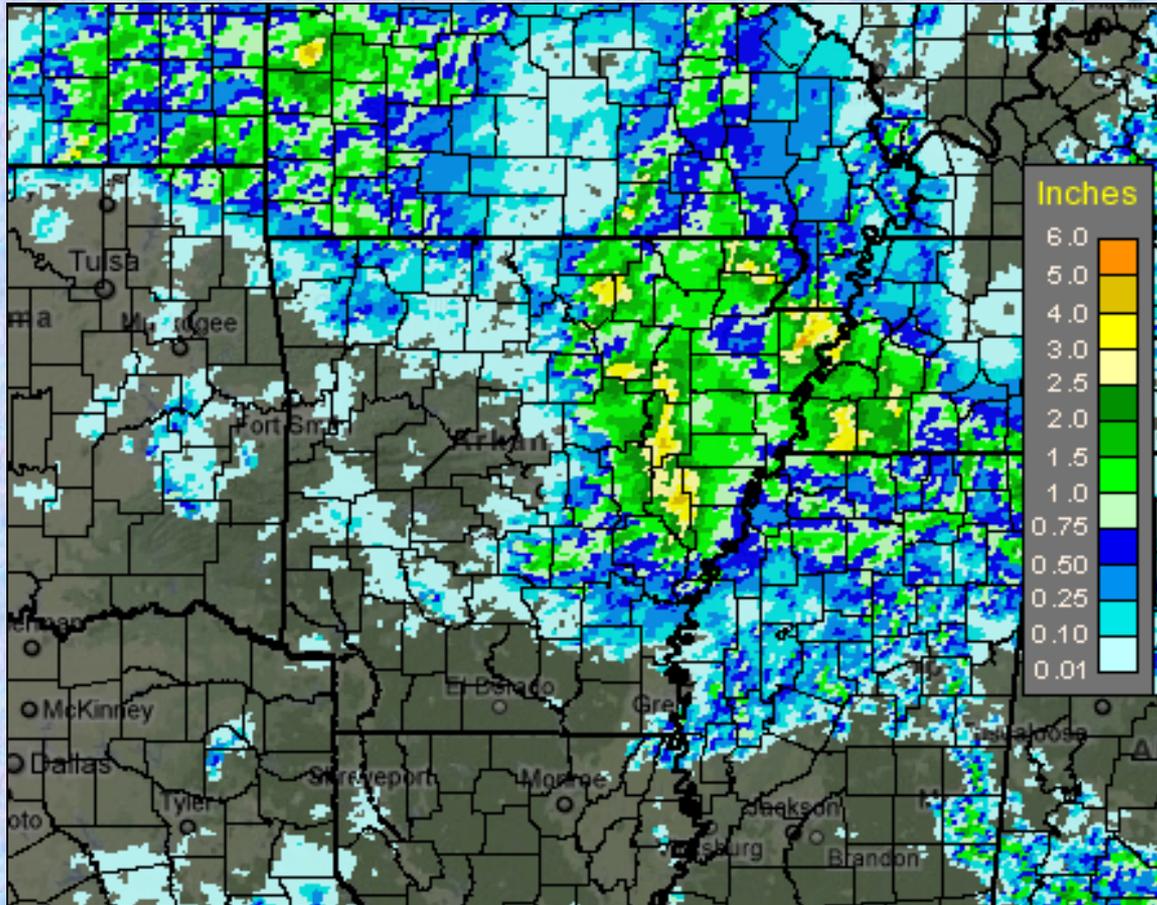


615 am CDT



The MCS

May 7, 2012

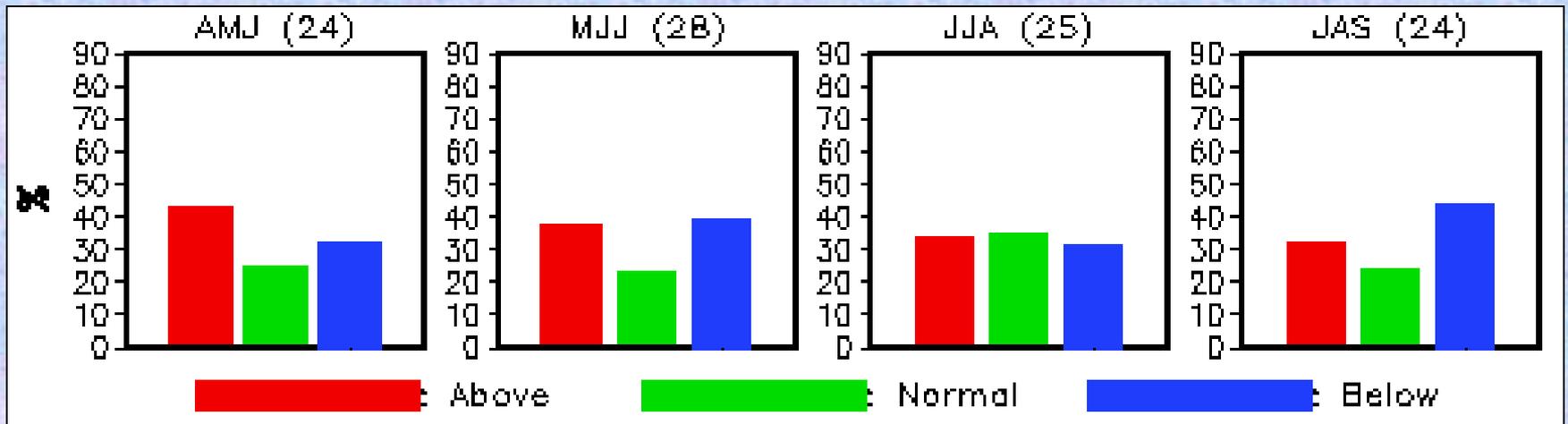


Amounts included 4.40" at Clarendon (Monroe County), 3.64 inches at Blytheville (Mississippi County) and 2.90 inches at Des Arc (Prairie County).



The Forecast

Temperature





The Forecast

Temperature



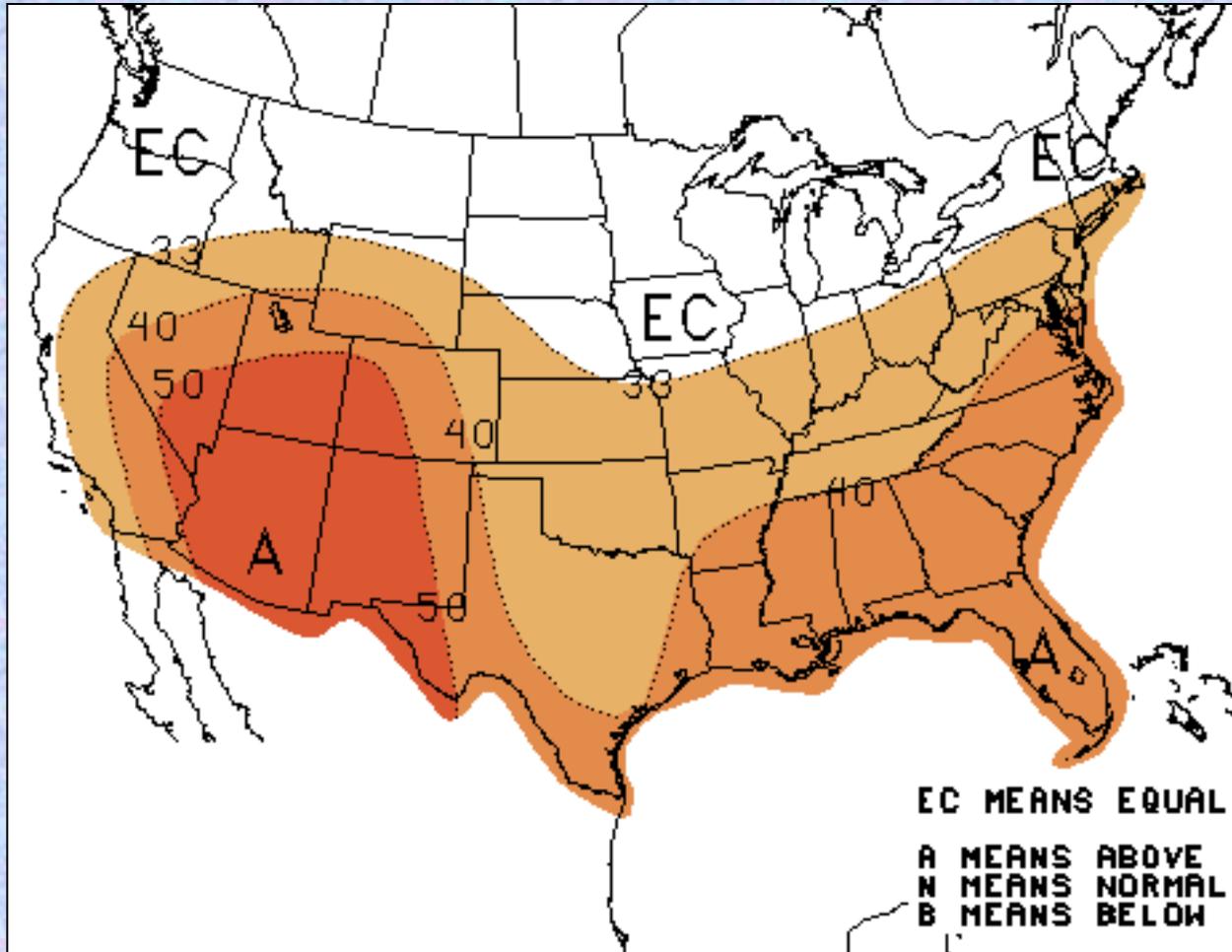
It was one of the warmest January through March periods on record this year at Little Rock...easily on the Top 25 list.

Only 12 of the remaining 24 years on that list were followed by a Top 25 warm summer.



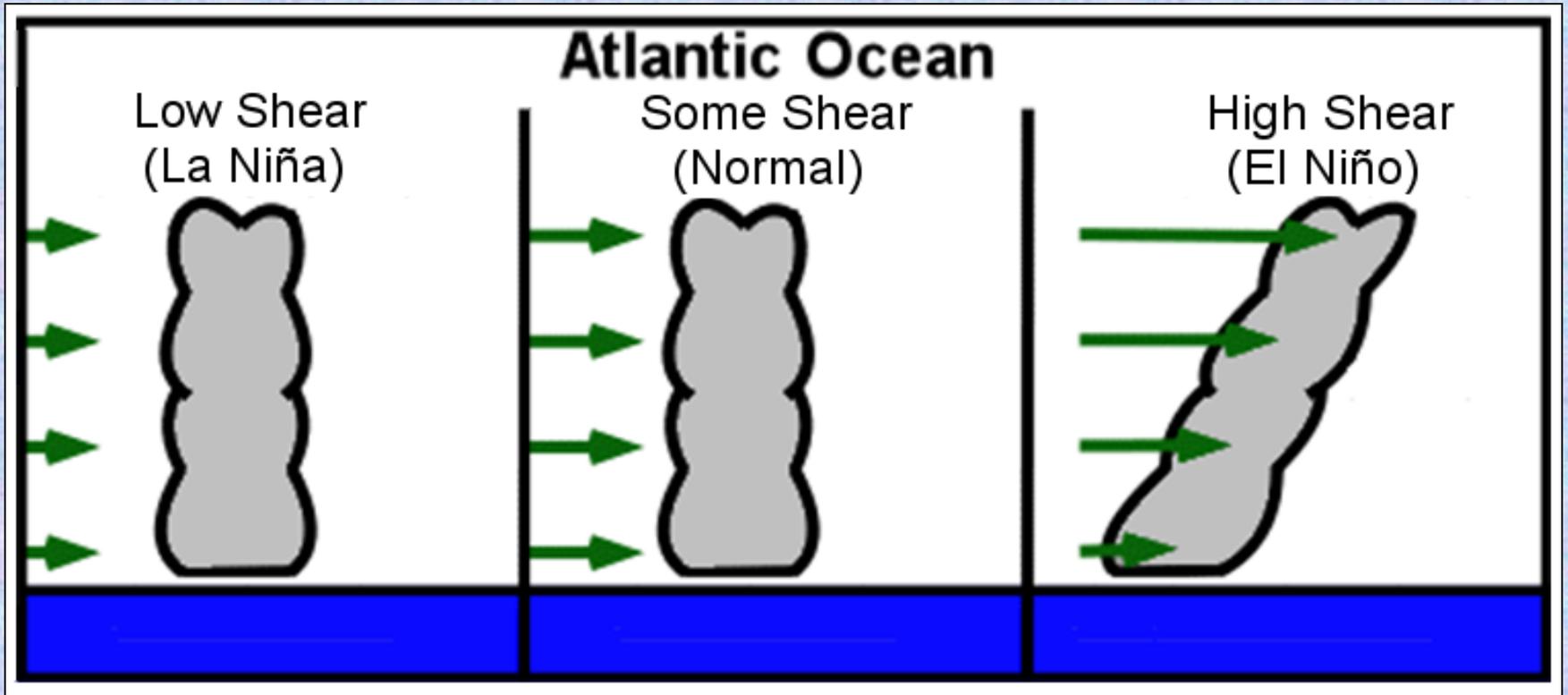
Official Forecast

Summer, 2012





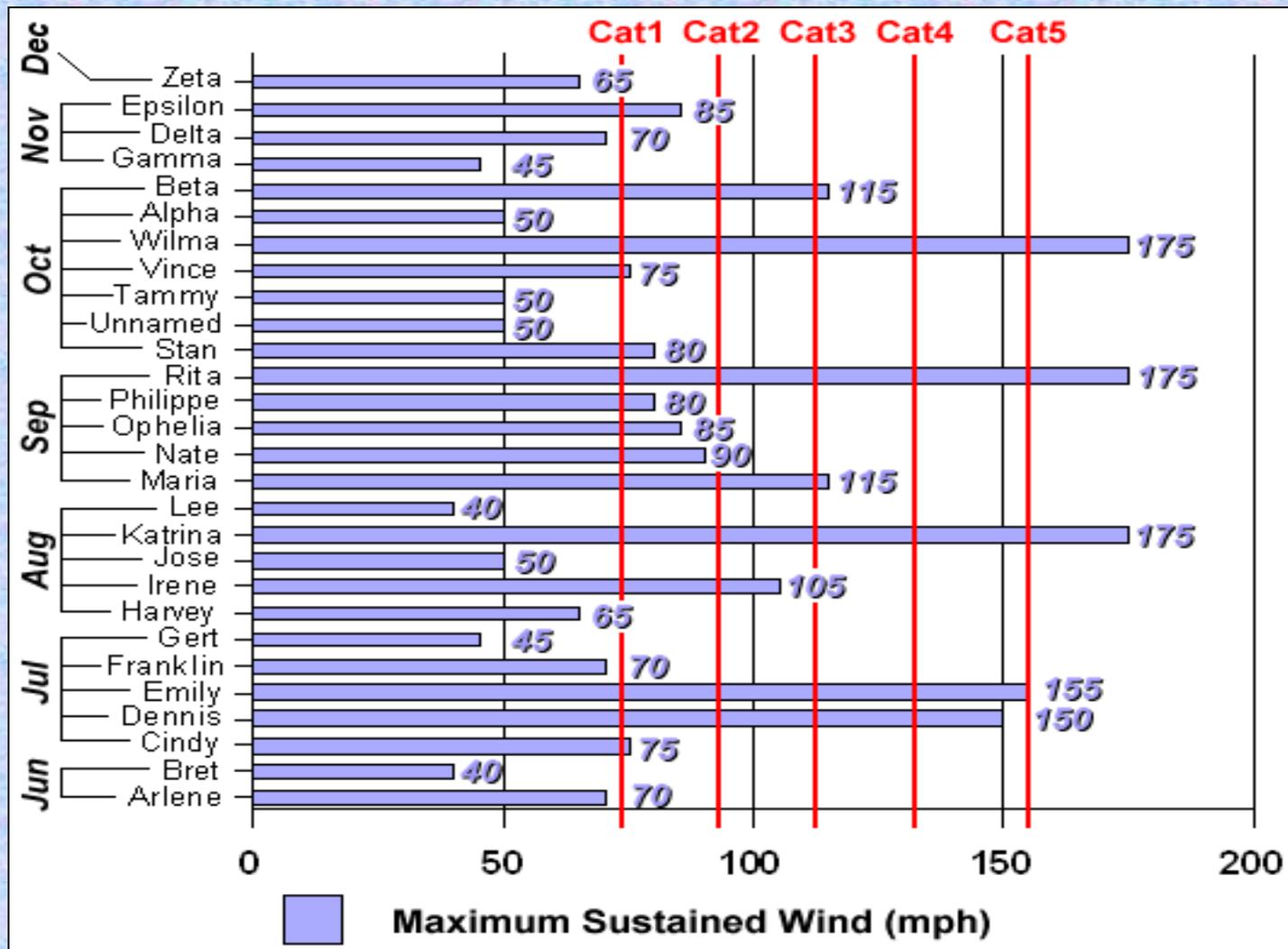
El Niño/Tropics





La Niña/Tropics

2005





El Niño/Tropics

2006



After a record 28 named storms in 2005, there were only 10 named storms a year later.



Drought Frequency

Little Rock



Norm Precip = 50"

<45" <40"

1920s	6	3
1930s	3	1
1940s	3	2
1950s	4	1
1960s	3	2
1970s	2	0
1980s	1	1
1990s	5	1
2000s	4	2

Since the 1870s...

Three Consecutive Years

< 45"

5 times (last 1998-2000)

Three Consecutive Years

< 40"

Never



On the Web



Visit the National Weather Service Little Rock website at this address...

<http://www.srh.noaa.gov/lzk>

or Google...

National Weather Service Little Rock



The End



Thanks for coming!