

# **MANAGING DROUGHT**

**IN THE SOUTHERN PLAINS**

October 13, 2011

# Webinar Series Goals

- To improve communication among agencies and organizations in the Southern Plains who are being affected by the historic and exceptional drought
- To provide information on available resources and assistance to help monitor and manage drought
- To understand the impacts of drought in this region from the perspective of those who are tasked with managing it
- To document impacts that will help improve the weekly U.S. Drought Monitor assessment and our understanding of how drought impacts evolve and decay

# Webinar Topics

- Sectors & Impacts
  - Agricultural Impacts
  - Cattle and Livestock
  - Water Supply
  - Wildfire
- Resources & Monitoring
  - Assistance Programs & Tax Deferrals
  - Ranch Drought Planning
  - Reporting on Drought Impacts
  - U.S. Drought Monitor

# Webinar Format

- 2<sup>nd</sup> and 4<sup>th</sup> Thursdays of each month at 11:00 a.m. Central Time
- Overview of regional drought conditions and outlook for next several weeks to months
  - led by the Drought Monitor authors
- Discussion Topic
  - Alternating between an impact type (wildfire, agriculture) and a resource (monitoring tools, assistance programs)
- Comments & Updates from State Climatologists
- Open-ended time for questions and comments
- Total Time Commitment: 25 minutes for presentations, as much time as needed for discussion
- Past webinars, summaries, and Federal/State Assistance links posted on the U.S. Drought Monitor, <http://www.drought.gov> in the Southern Plains Region or directly at [http://www.drought.gov/portal/server.pt/community/southern\\_plains](http://www.drought.gov/portal/server.pt/community/southern_plains)

# **Regional Drought Monitor Update**

**Brian Fuchs, Climatologist**

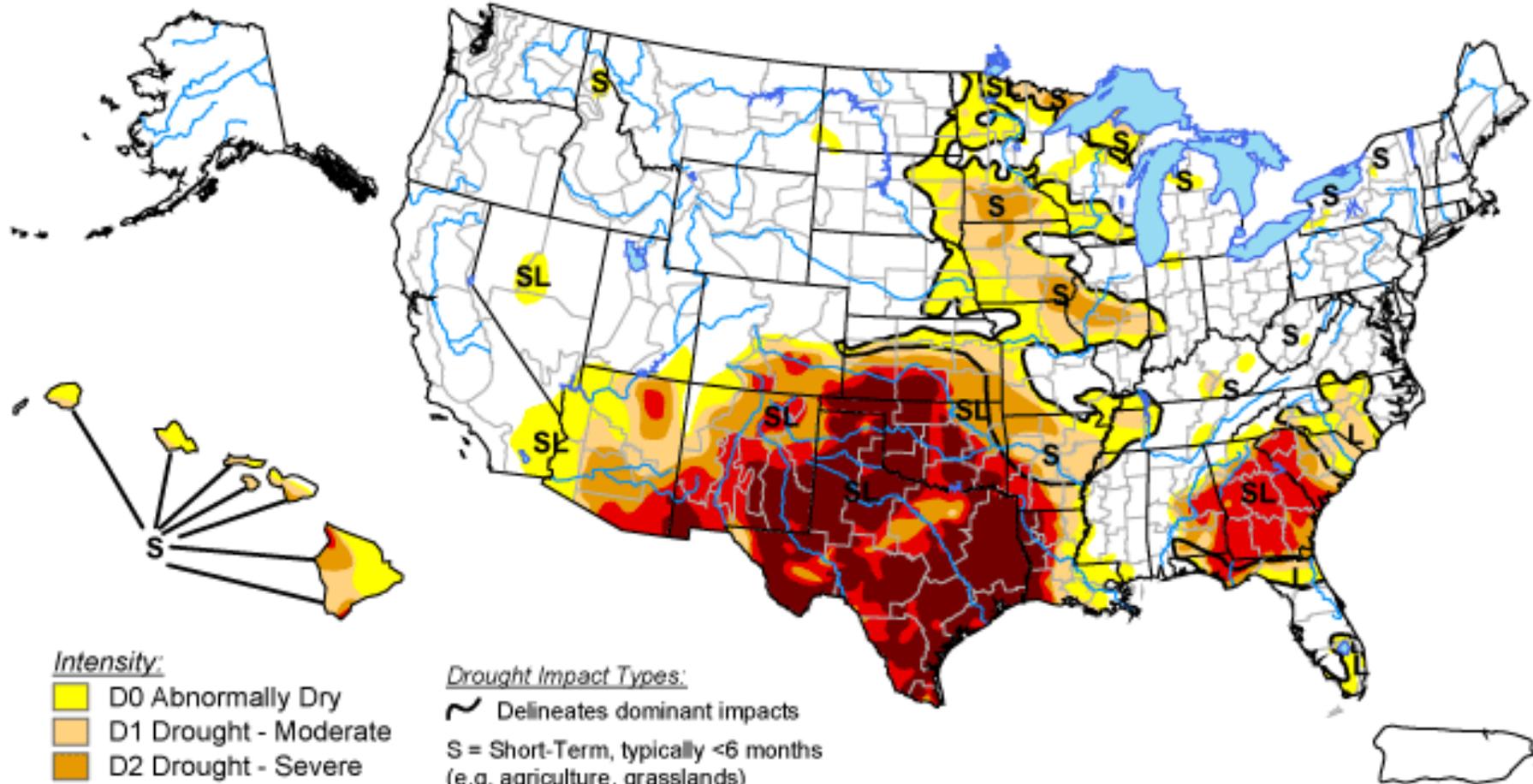
**National Drought Mitigation Center  
School of Natural Resources  
University of Nebraska-Lincoln**

**SCIPP/NIDIS Drought Webinar Series, October 13, 2011**

# U.S. Drought Monitor

October 11, 2011

Valid 8 a.m. EDT



### Intensity:

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

### Drought Impact Types:

-  Delineates dominant impacts
- S = Short-Term, typically <6 months  
(e.g. agriculture, grasslands)
- L = Long-Term, typically >6 months  
(e.g. hydrology, ecology)

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, October 13, 2011

Authors: R. Tinker/M. Rosencrans, NOAA/NWS/NCEP/CPC

# U.S. Drought Monitor

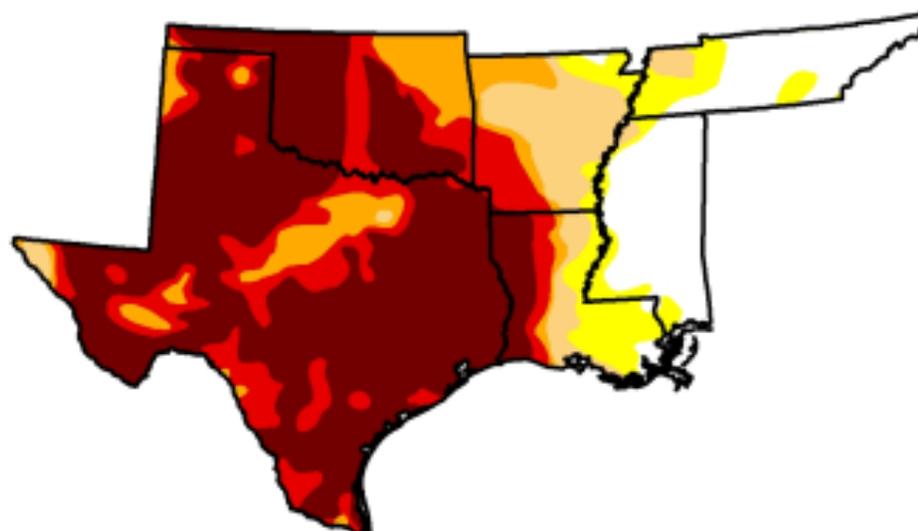
## South

October 11, 2011

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	13.64	86.36	78.80	70.71	62.22	47.03
Last Week (10/04/2011 map)	18.31	81.69	77.36	70.07	63.80	55.39
3 Months Ago (07/12/2011 map)	10.69	89.31	80.67	72.07	64.19	48.35
Start of Calendar Year (12/28/2010 map)	8.86	91.14	67.65	35.21	10.17	0.00
Start of Water Year (09/27/2011 map)	18.34	81.66	76.26	70.61	63.67	53.77
One Year Ago (10/05/2010 map)	54.56	45.44	20.04	7.70	1.40	0.00



Intensity:

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<http://droughtmonitor.unl.edu>



Released Thursday, October 13, 2011

# U.S. Drought Monitor

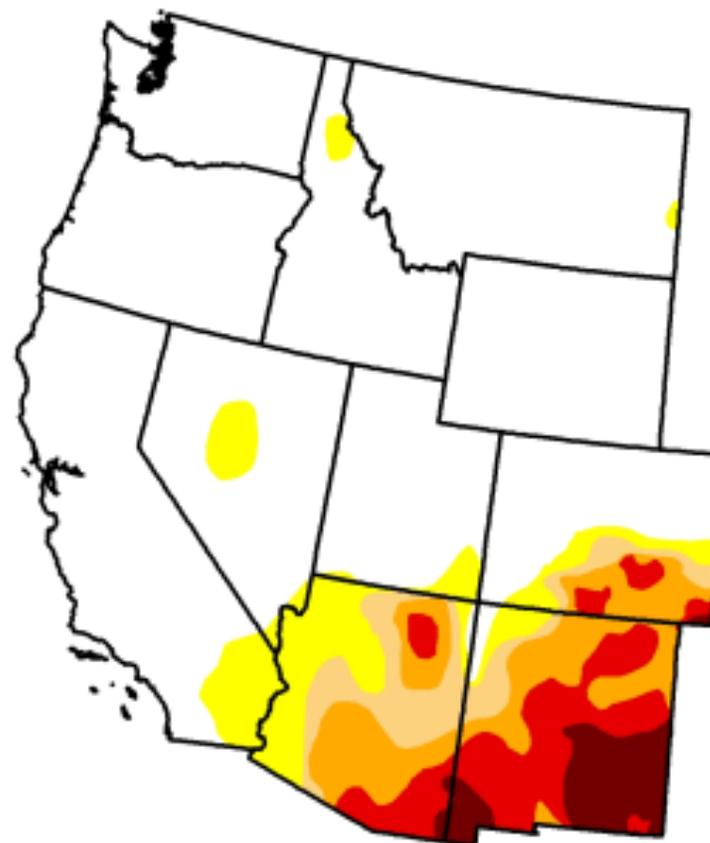
October 11, 2011

Valid 7 a.m. EST

## West

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	74.02	25.98	18.63	14.79	8.48	2.87
Last Week (10/04/2011 map)	66.39	33.61	19.04	14.99	9.30	3.90
3 Months Ago (07/12/2011 map)	75.10	24.90	19.04	15.69	11.02	5.60
Start of Calendar Year (12/28/2010 map)	73.26	26.74	11.98	0.89	0.00	0.00
Start of Water Year (09/27/2011 map)	66.72	33.28	19.04	14.99	9.30	3.81
One Year Ago (10/05/2010 map)	62.50	37.50	8.41	0.56	0.00	0.00



Intensity:

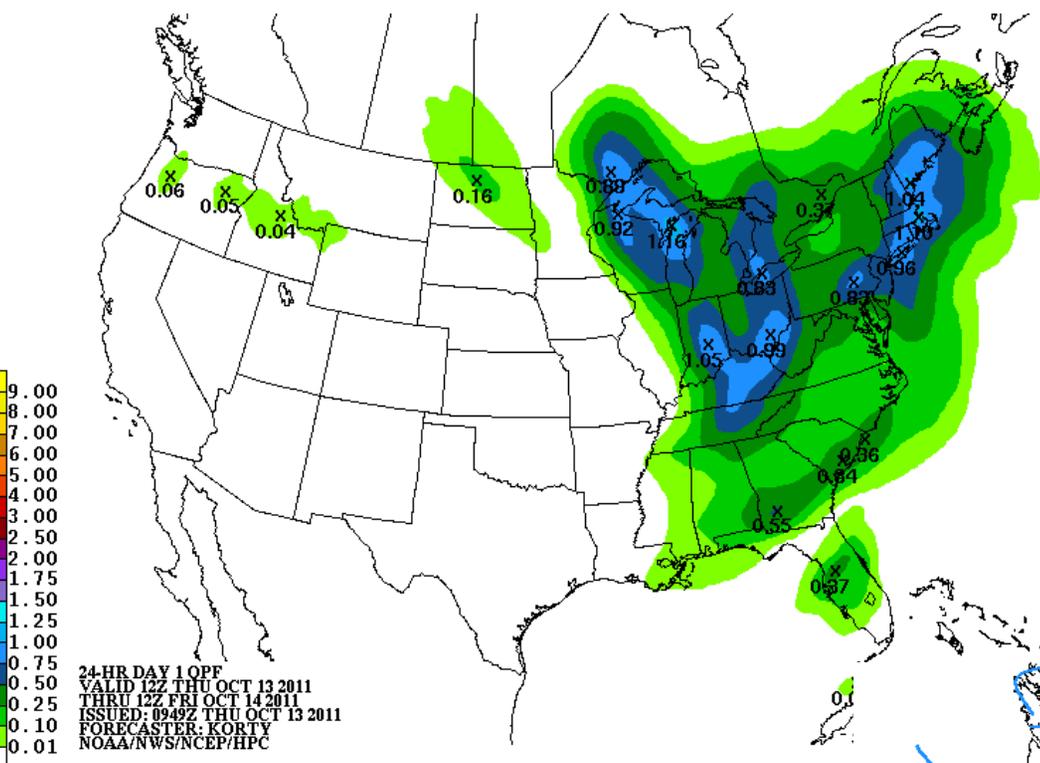
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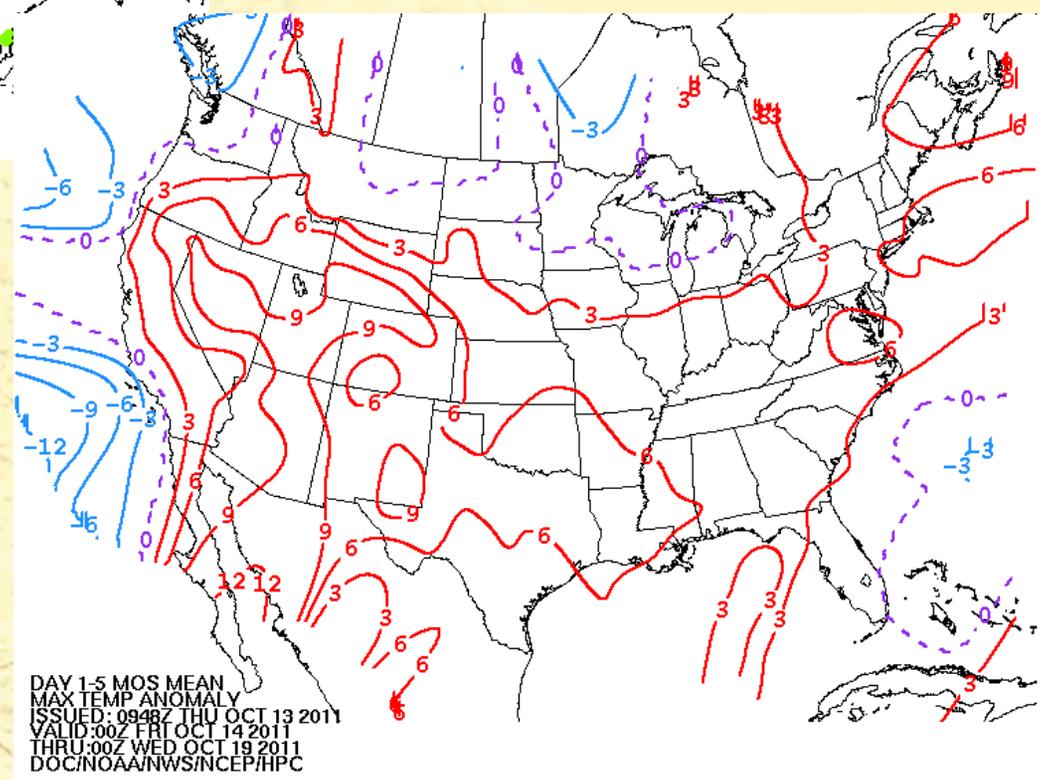
<http://droughtmonitor.unl.edu>



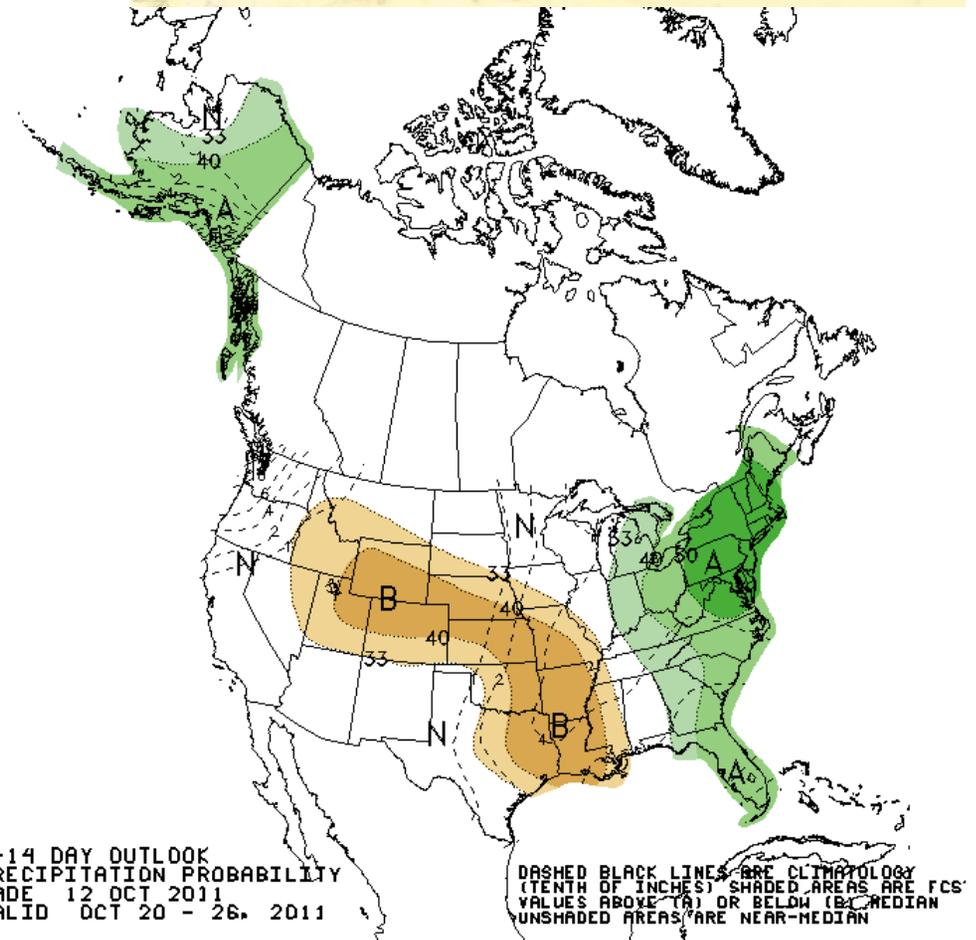
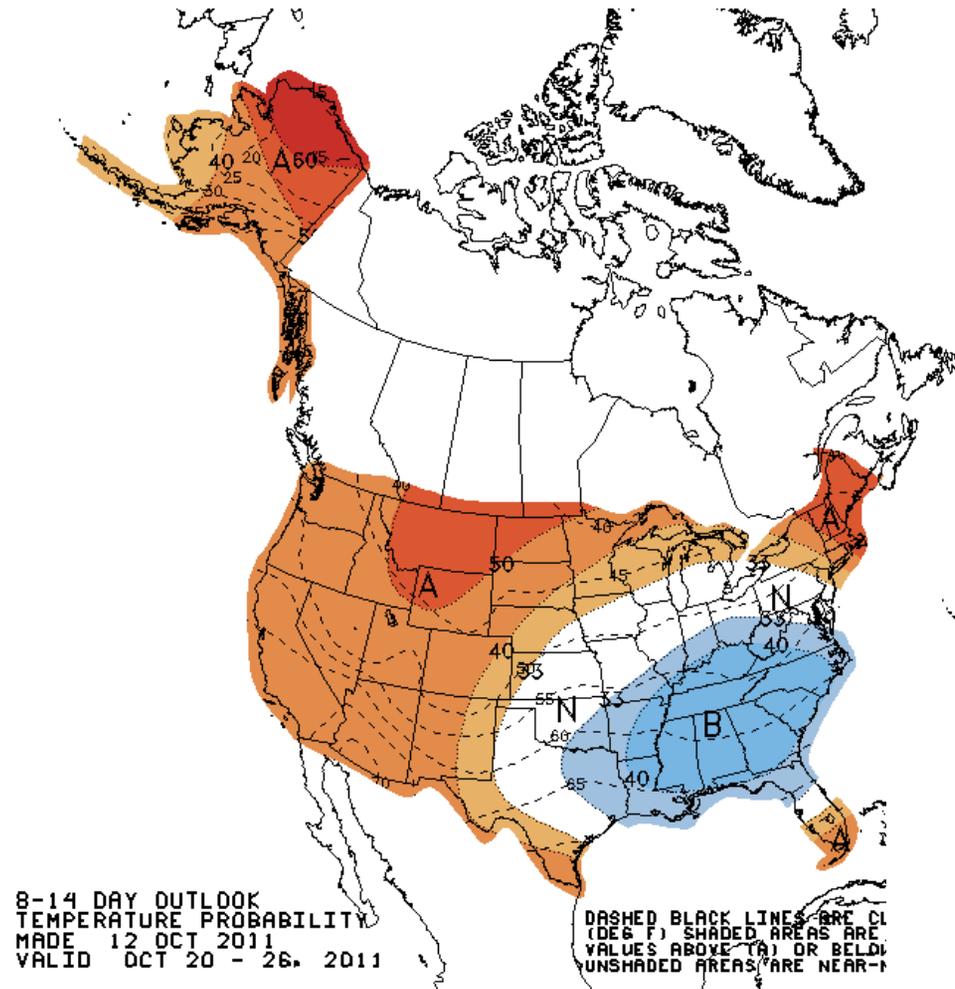
Released Thursday, October 13, 2011

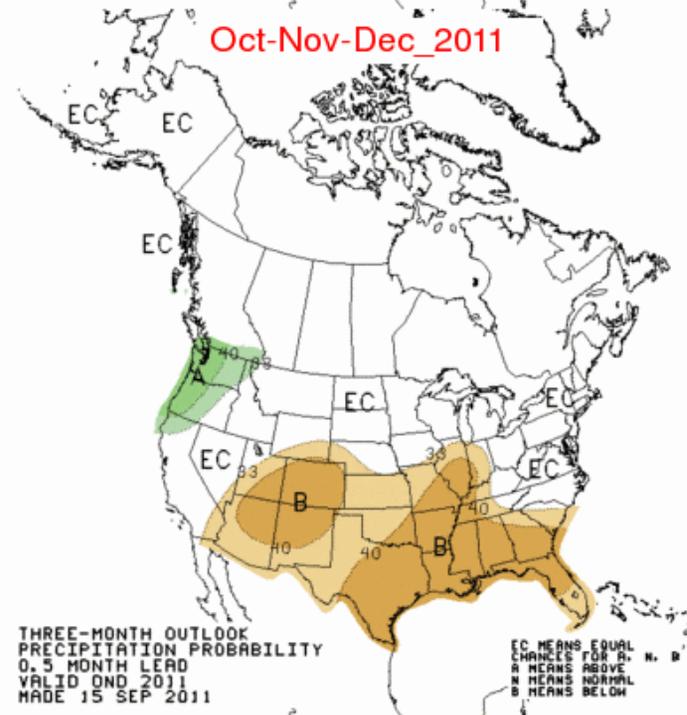
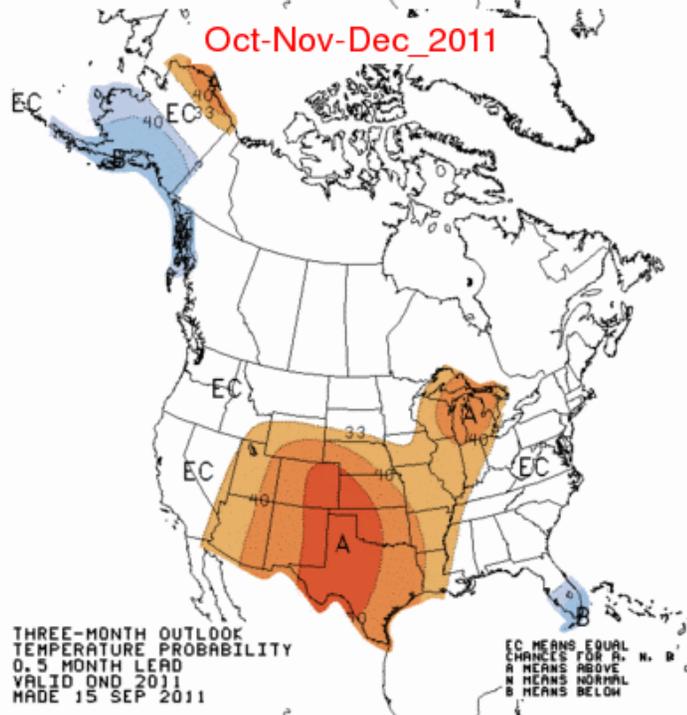
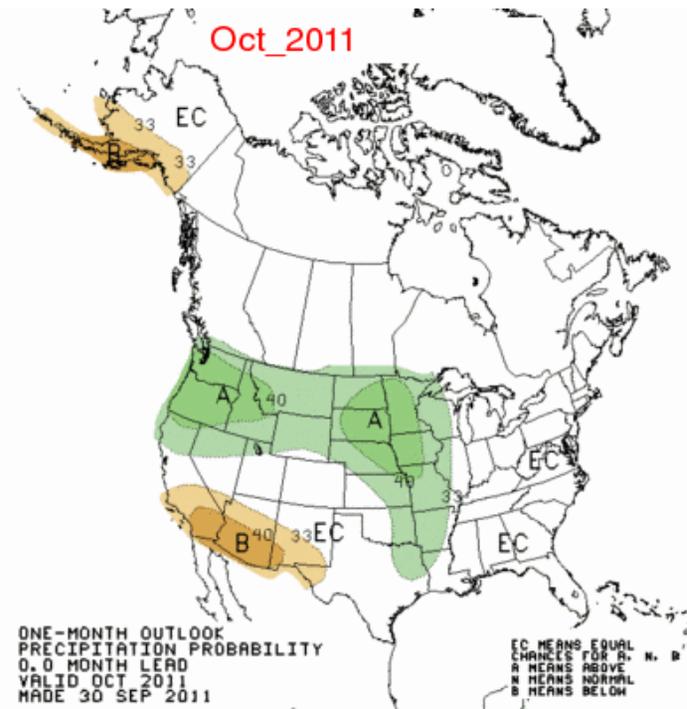
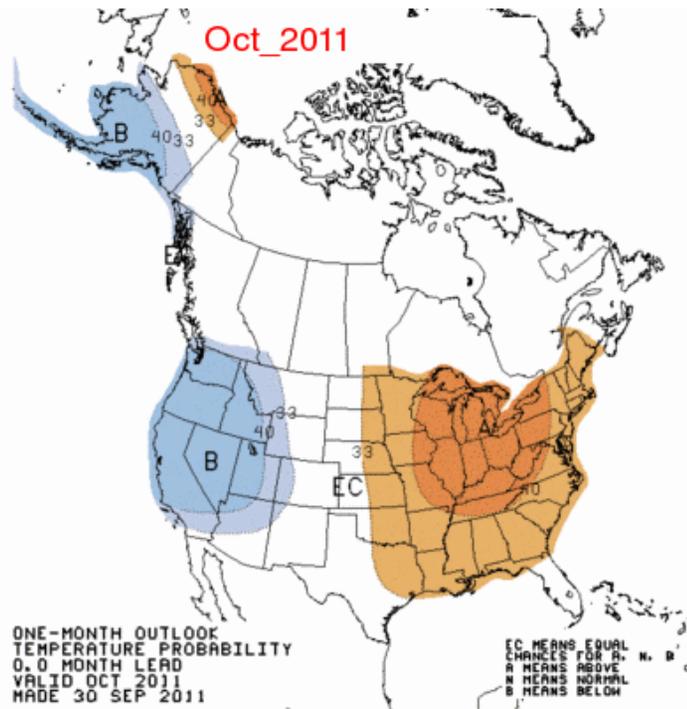


# HPC 5-Day Outlook



# CPC 8-14-Day Outlooks





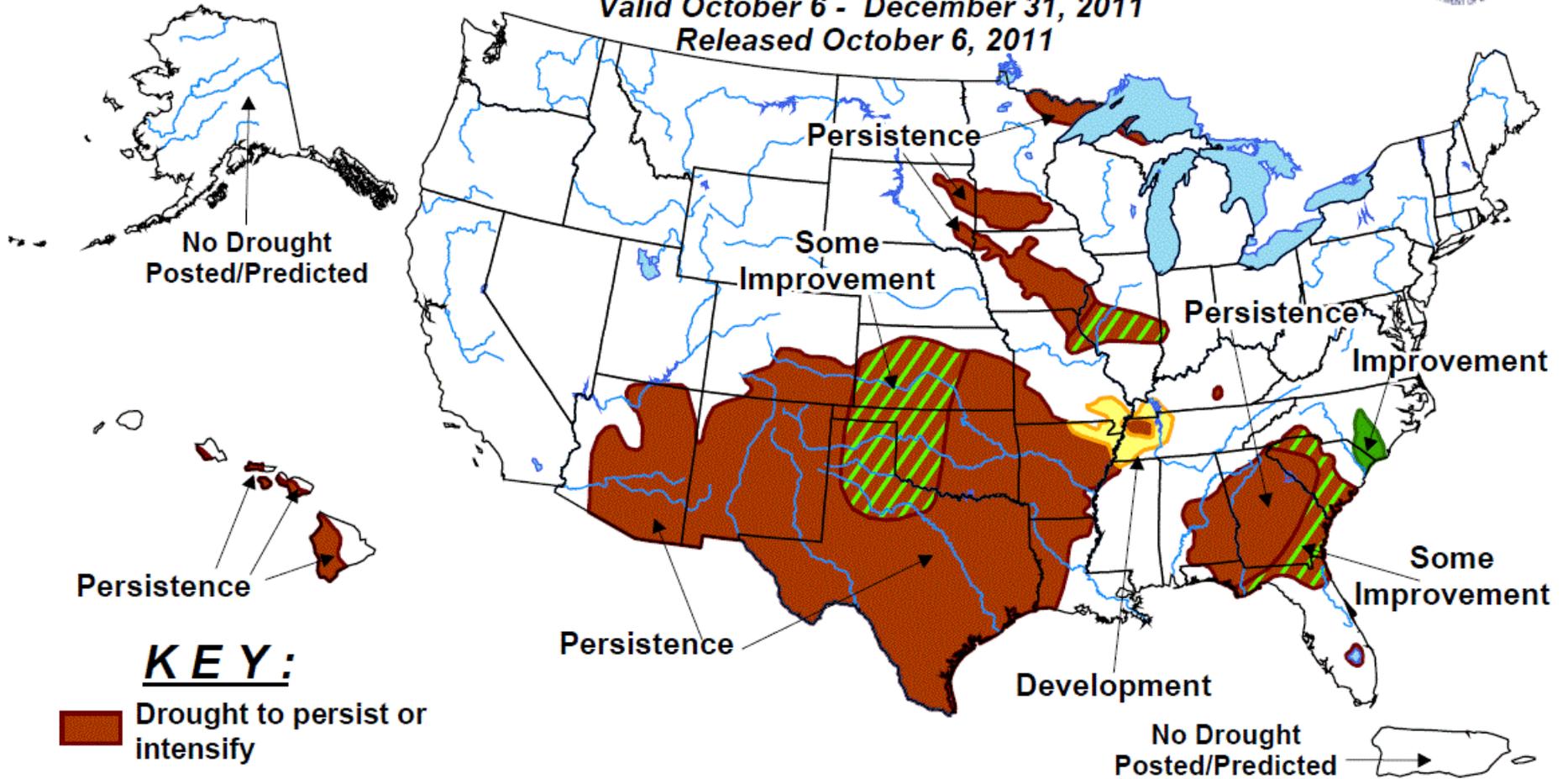


# U.S. Seasonal Drought Outlook

## Drought Tendency During the Valid Period

Valid October 6 - December 31, 2011

Released October 6, 2011



### KEY:

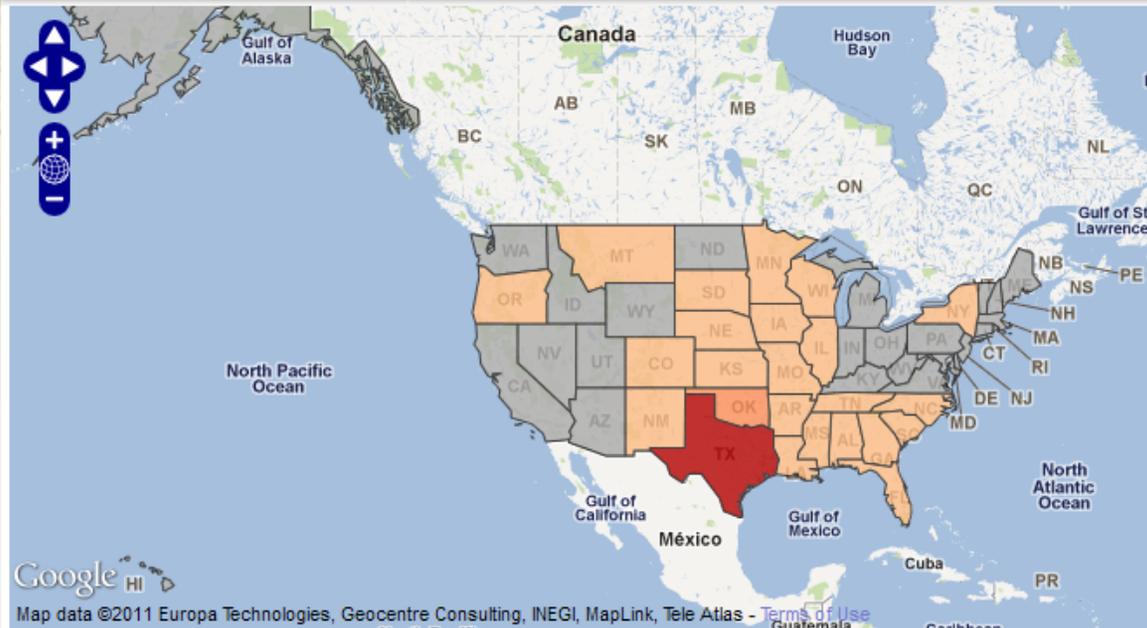
-  Drought to persist or intensify
-  Drought ongoing, some improvement
-  Drought likely to improve, impacts ease
-  Drought development likely

Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Short-term events -- such as individual storms -- cannot be accurately forecast more than a few days in advance. Use caution for applications -- such as crops -- that can be affected by such events. "Ongoing" drought areas are approximated from the Drought Monitor (D1 to D4 intensity). For weekly drought updates, see the latest U.S. Drought Monitor. NOTE: the green improvement areas imply at least a 1-category improvement in the Drought Monitor intensity levels, but do not necessarily imply drought elimination.

## **Featured USDM Product**

**Did you know there is a new and improved Drought Impact Reporter (DIR) available from the NDMC ?**

**<http://droughtreporter.unl.edu>**



Refresh

**Impacts & Reports**    Overlays

Impacts

Opacity: 80%

**Legend**

- 0
- 1 - 12
- 13 - 24
- 25 - 35
- 36 - 46
- 47 - 57

Reports

Time Period

Location

Categories

Report Types

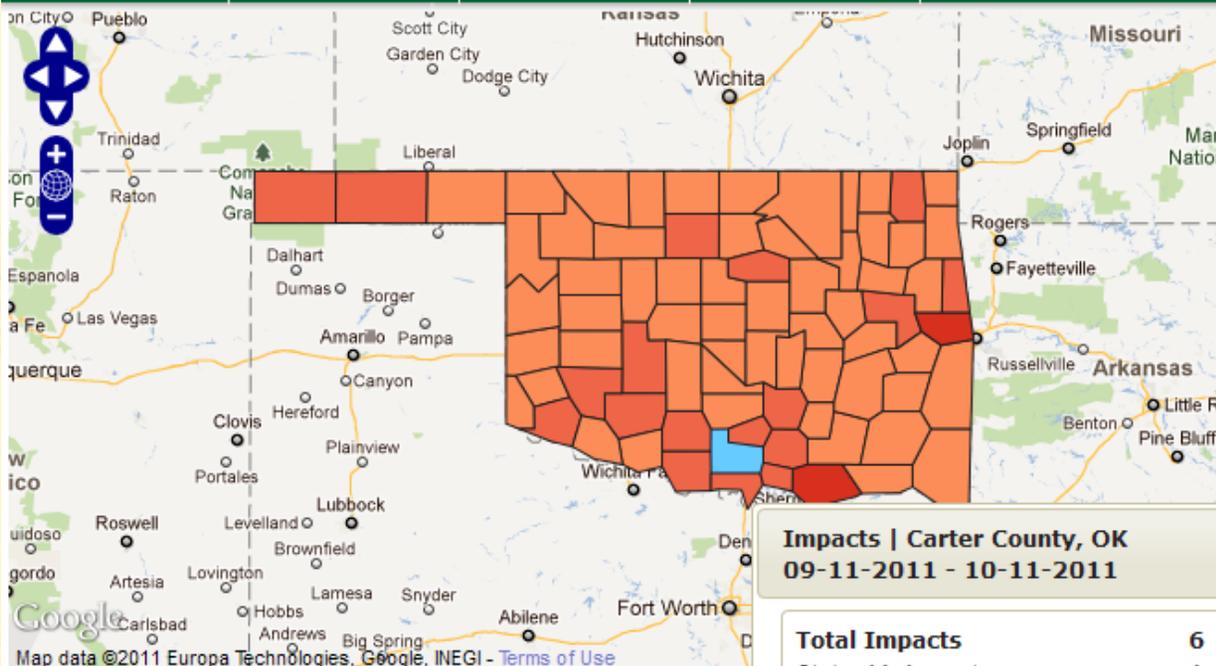
All States | 09-11-2011 - 10-11-2011 | [Color Selection Icons]

Impact Counts    Impacts List | Page 1/14    Report Counts    Reports List | Page 1/39

**Total Impacts | All States** 139

Category			
<span style="color: green;">●</span> Agriculture	71	<span style="color: brown;">●</span> Business & Industry	6
<span style="color: lightblue;">●</span> Energy	1	<span style="color: darkred;">●</span> Fire	25
<span style="color: green;">●</span> Plants & Wildlife	24	<span style="color: orange;">●</span> Relief, Response & Restrictions	24
<span style="color: purple;">●</span> Society & Public Health	23	<span style="color: yellow;">●</span> Tourism & Recreation	16
<span style="color: blue;">●</span> Water Supply & Quality	34		

Report Source



Refresh

Impacts & Reports **Overlays**

Drought Monitor

Opacity  50%

**Legend**

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

Date: 09-29-2011  
Drought Monitor Date: 09-27-2011

Hydrologic Unit Codes

Climate Divisions

Congressional Districts

RMA Regions

Impacts List All-States View

**Impacts | Carter County, OK**  
09-11-2011 - 10-11-2011

<b>Total Impacts</b>	6
<b>Statewide Impacts</b>	4
<b>Category</b>	
Agriculture	3
Fire	2
Plants & Wildlife	1
Relief, Response & Restrictions	1
Society & Public Health	1
Tourism & Recreation	1
<b>Report Source</b>	
Media	4
User	2

Oklahoma | 09-11-2011 - 10-11-2011

Impact Counts Impacts List | Page 1/3 Report Counts

**Total Impacts | Oklahoma**  
Statewide Impacts

<b>Category</b>			
Agriculture	16	Business	1
Fire	3	Plants & Wildlife	1
Relief, Response & Restrictions	2	Society & Public Health	1
Tourism & Recreation	2	Water	1
<b>Report Source</b>			
Media	4		
User	2		

<http://droughtreporter.unl.edu>



Map

Submit a Report

About the DIR

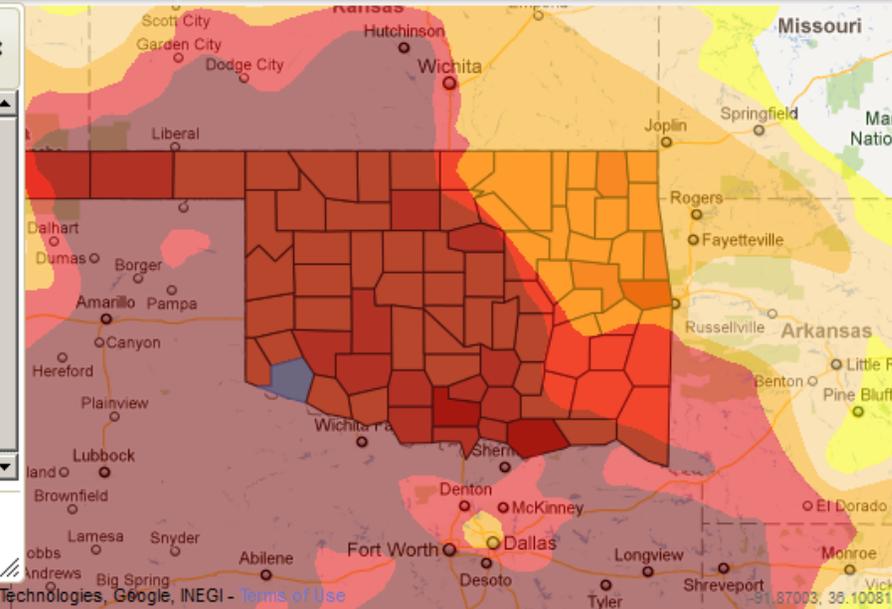
Help

Impacts | Jackson County, OK  
09-11-2011 - 10-11-2011

<b>Total Impacts</b>	5
<b>Statewide Impacts</b>	4
<b>Category</b>	
● Agriculture	3
● Fire	1
● Plants & Wildlife	1
● Society & Public Health	1
● Tourism & Recreation	1
<b>Report Source</b>	
Media	3
User	2

Impacts List

All-States View



Refresh

Impacts & Reports    Overlays

Drought Monitor

Opacity  
50%

- Legend**
- D0 Abnormally Dry
  - D1 Drought - Moderate
  - D2 Drought - Severe
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Date: 09-29-2011  
Drought Monitor Date: 09-27-2011

Oklahoma | 09-11-2011 - 10-11-2011

Impact Counts    Impacts List | Page 1/3    Report Counts    Reports List | Page 1/3

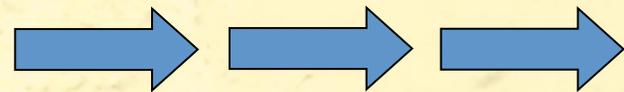
<b>Total Impacts   Oklahoma</b>		22	
<b>Statewide Impacts</b>		4	
<b>Category</b>			
● Agriculture	16	● Business & Industry	2
● Fire	3	● Plants & Wildlife	3
● Relief, Response & Restrictions	2	● Society & Public Health	1
● Tourism & Recreation	2	● Water Supply & Quality	3
<b>Report Source</b>			

- Hydrologic Unit Codes
- Climate Divisions
- Congressional Districts
- RMA Regions

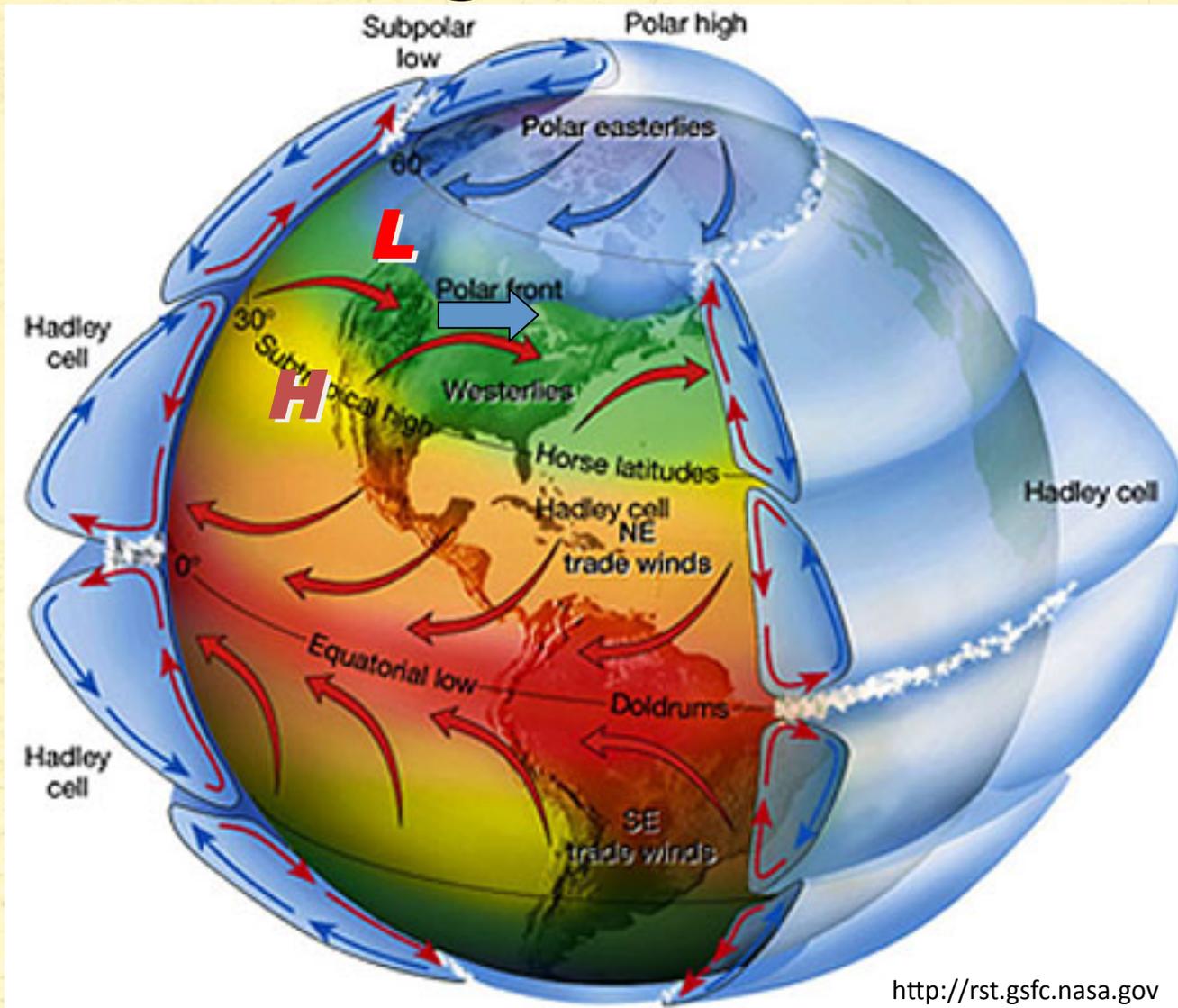


# Weather 101

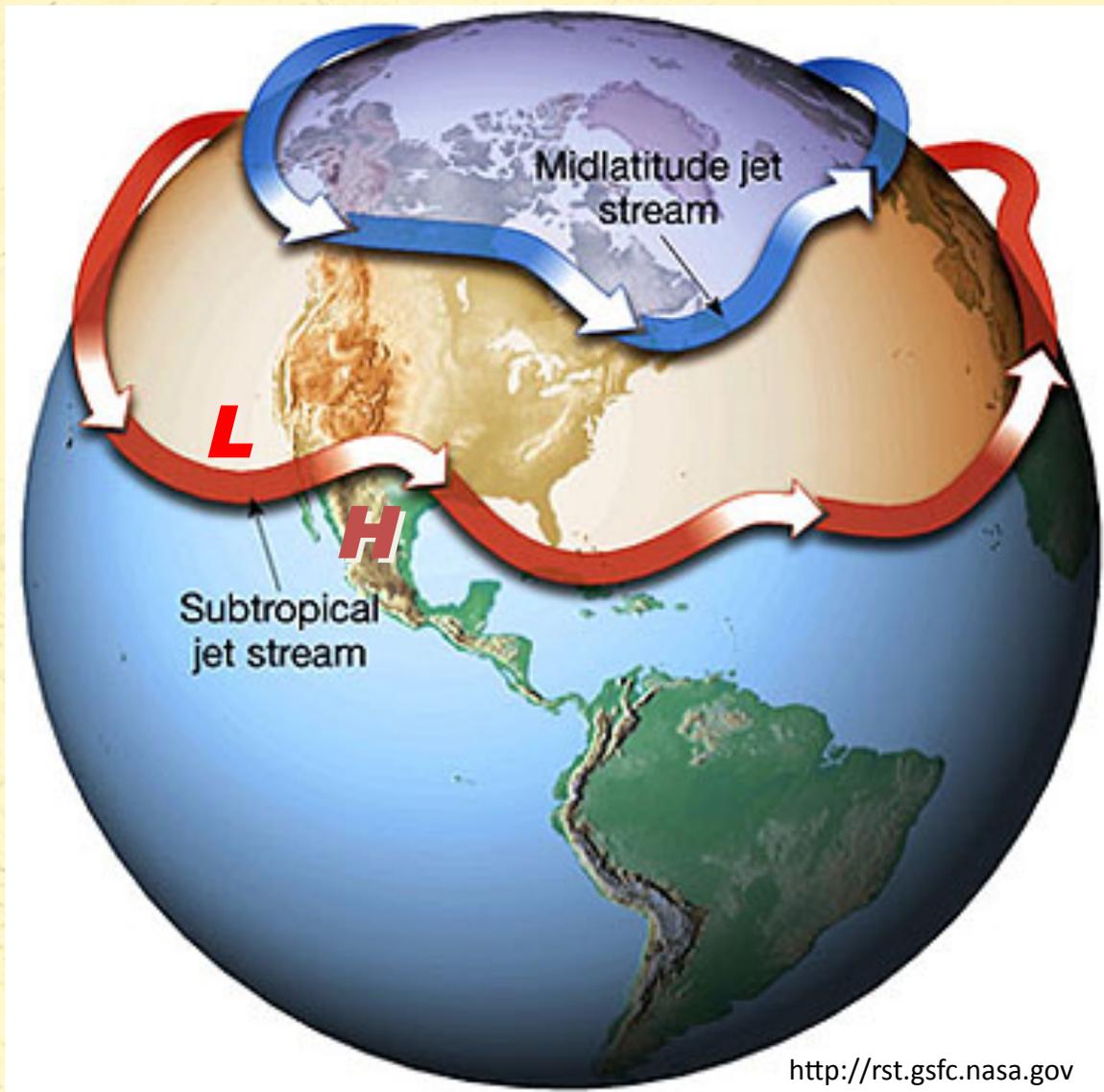
- Low Pressure System
  - Rising air
  - Counter-clockwise circulation
  - Can produce precipitation if moisture is available
- Jet Stream
  - High winds at ~30,000 ft between cold/warm air
  - Provides energy for low pressure systems; helps steer storms (storm track)
- High Pressure System
  - Sinking air
  - Clockwise circulation
  - Typically associated with dry conditions



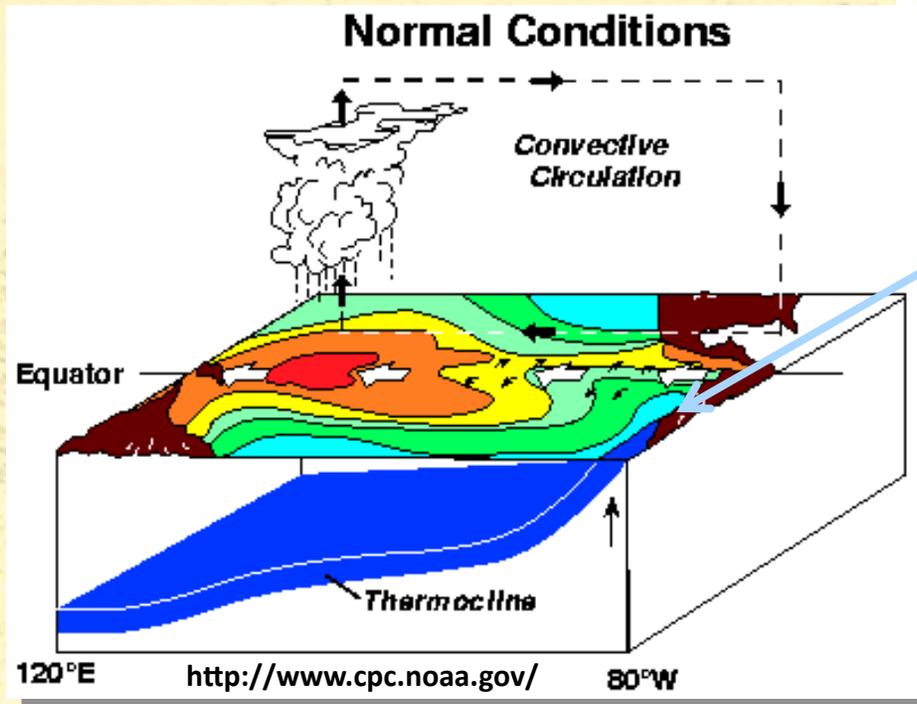
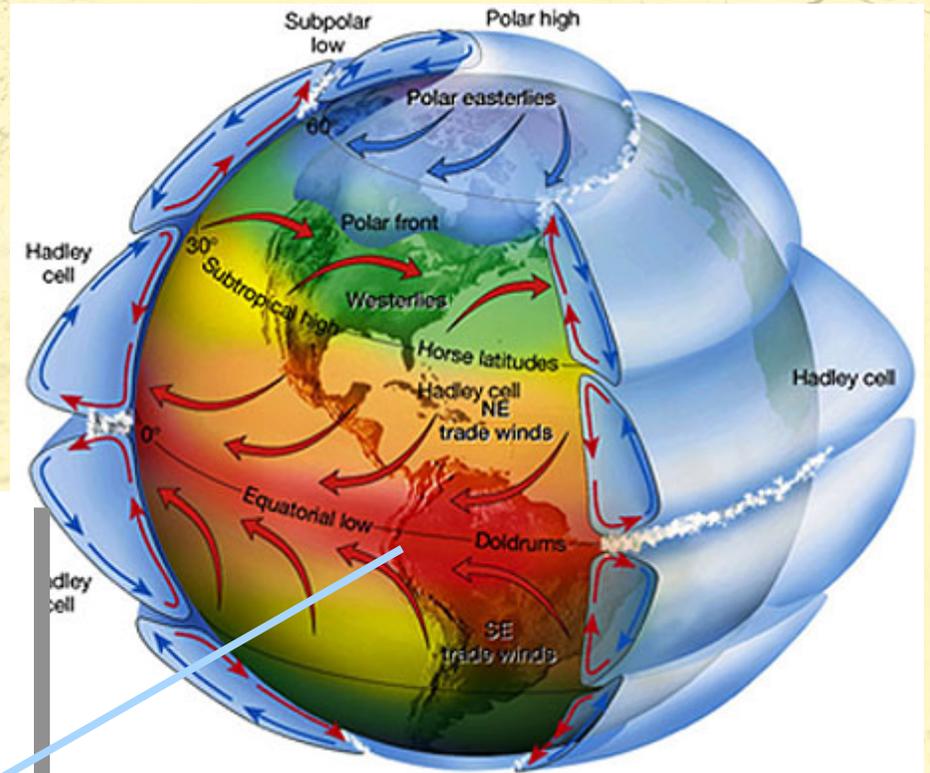
# Idealized global circulation



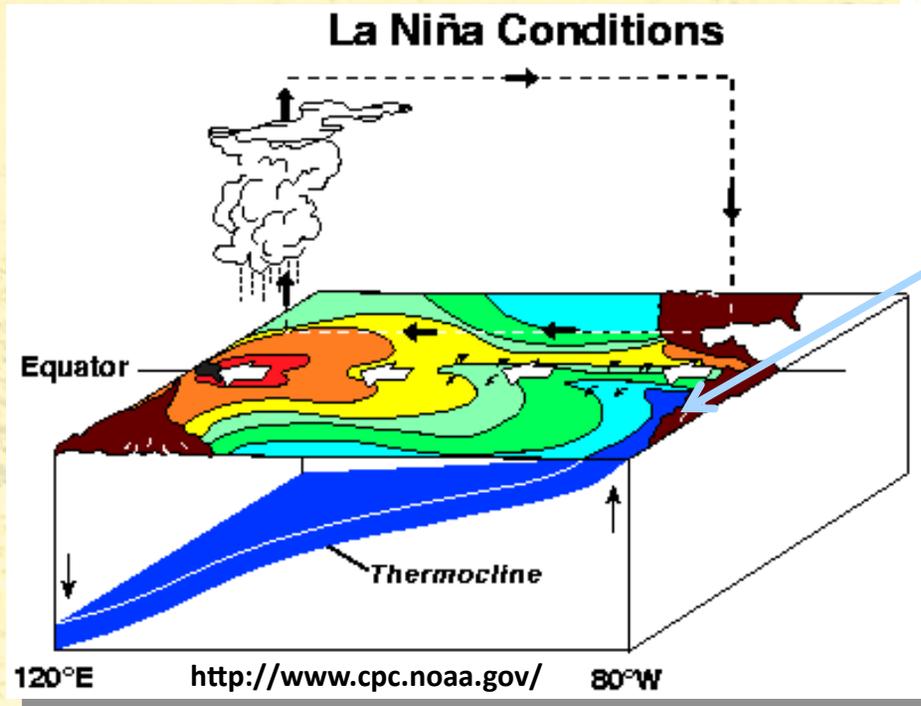
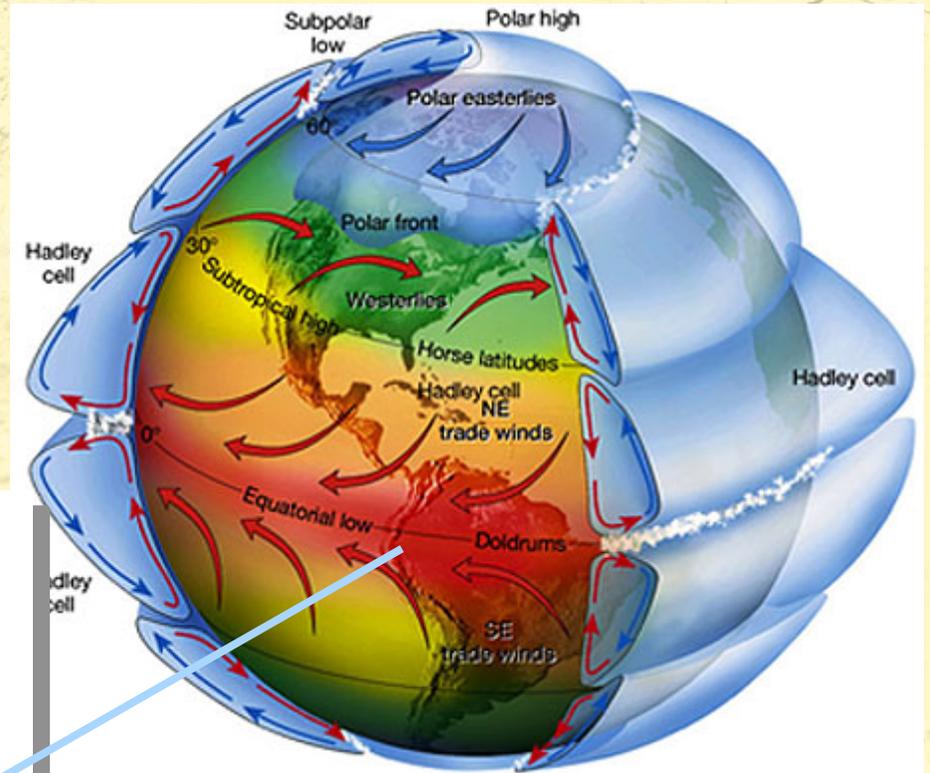
# Jet Streams



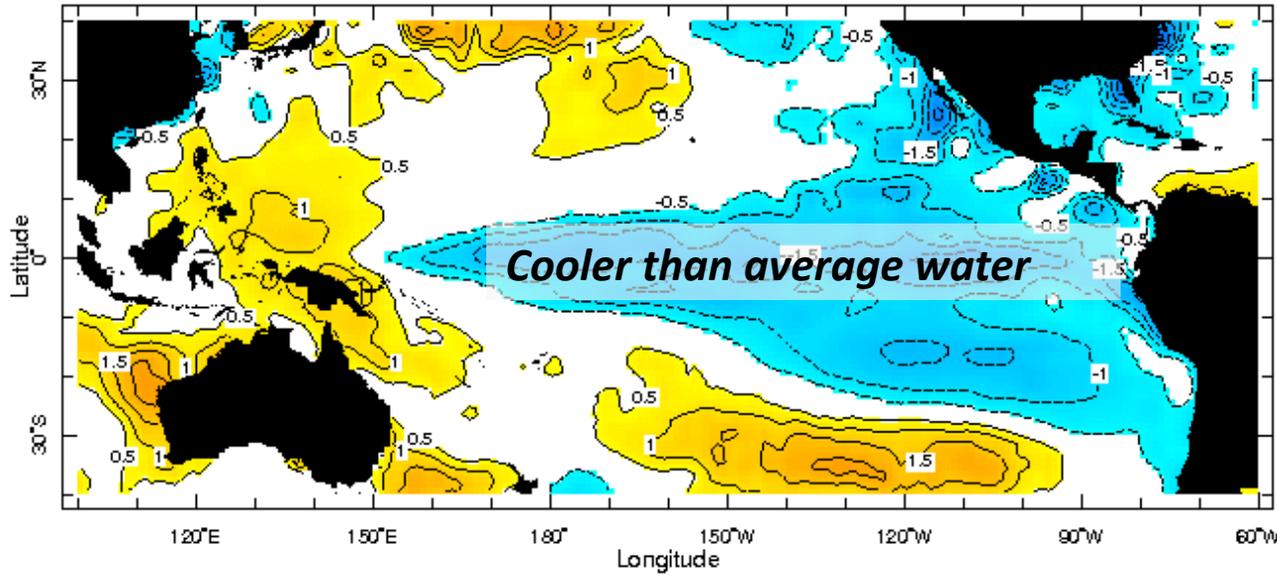
# Ocean-Atmosphere Connection



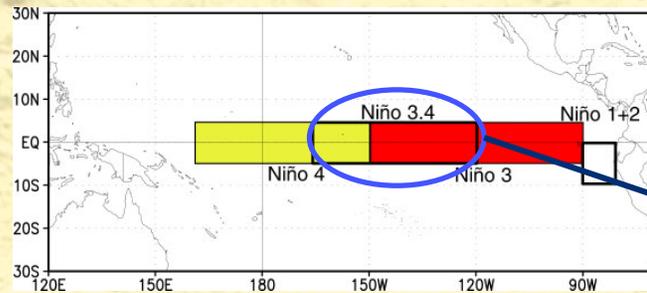
# Ocean-Atmosphere Connection



# La Niña 2010-2011

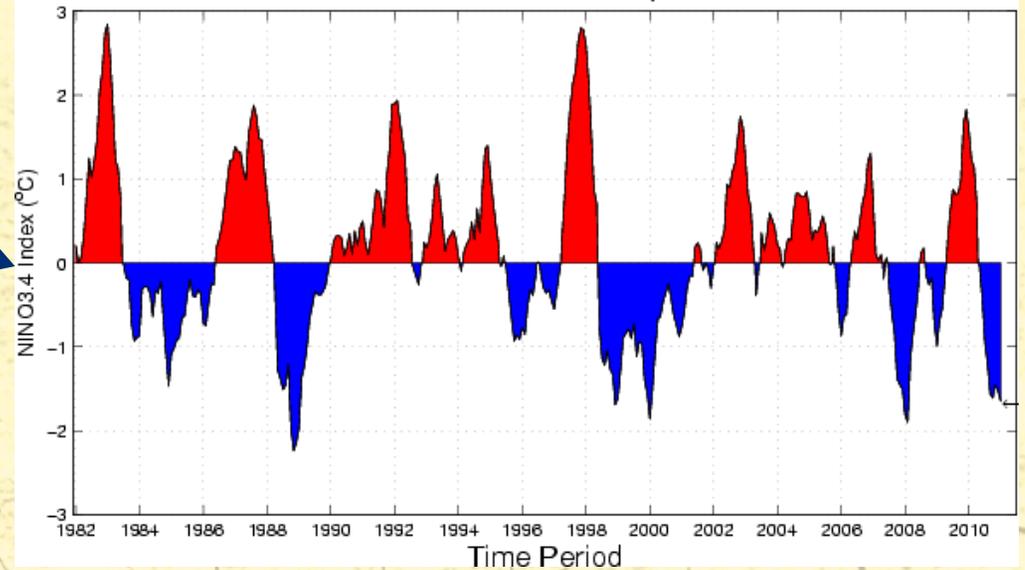


Nov 2010 - Jan 2011

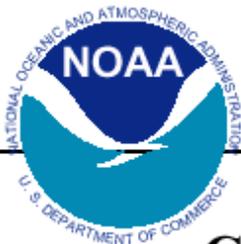
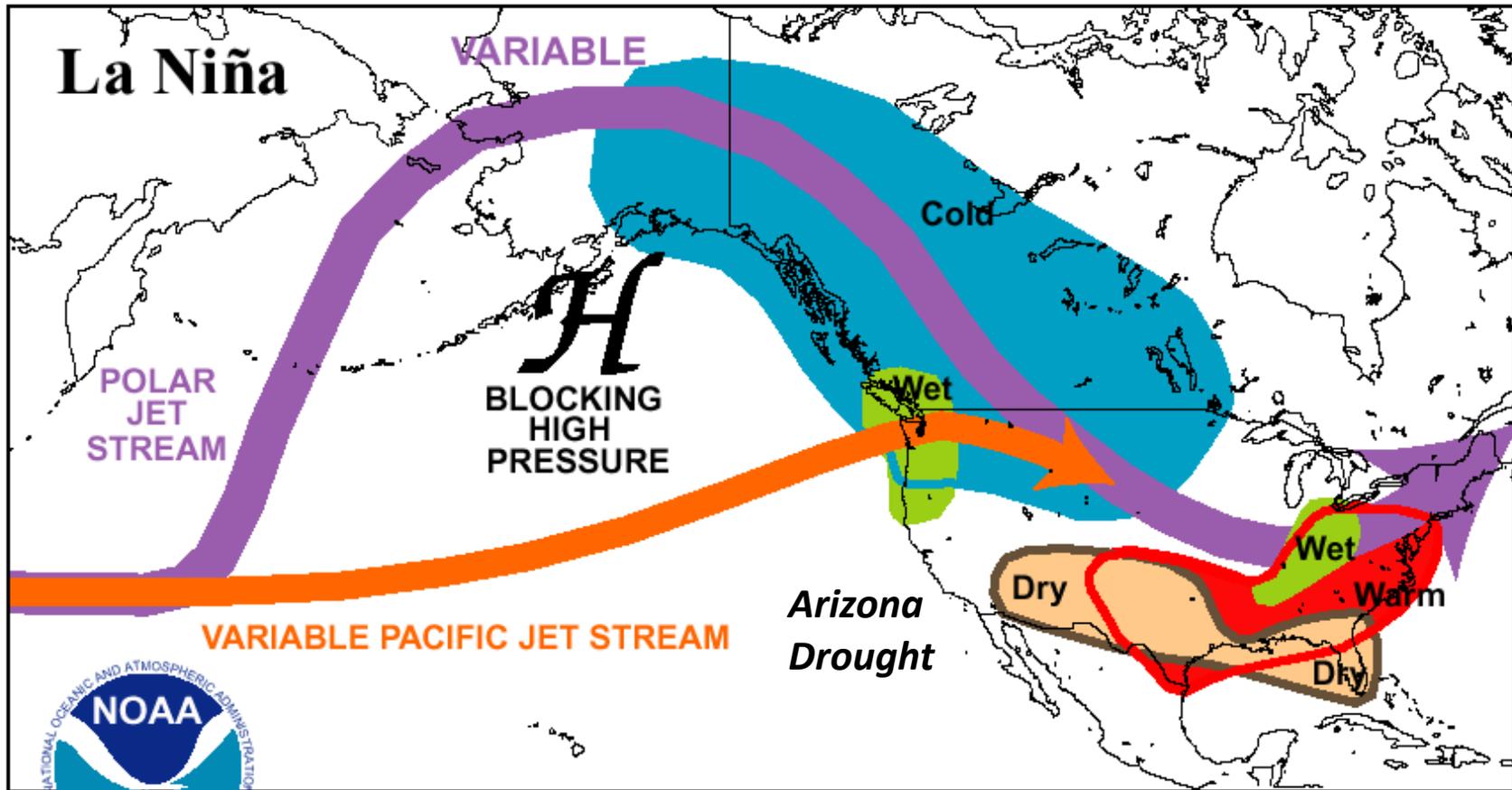


<http://iri.columbia.edu/climate/ENSO>

### Historical Sea Surface Temperature Index



# Dominant Circulation Pattern: La Nina Winter



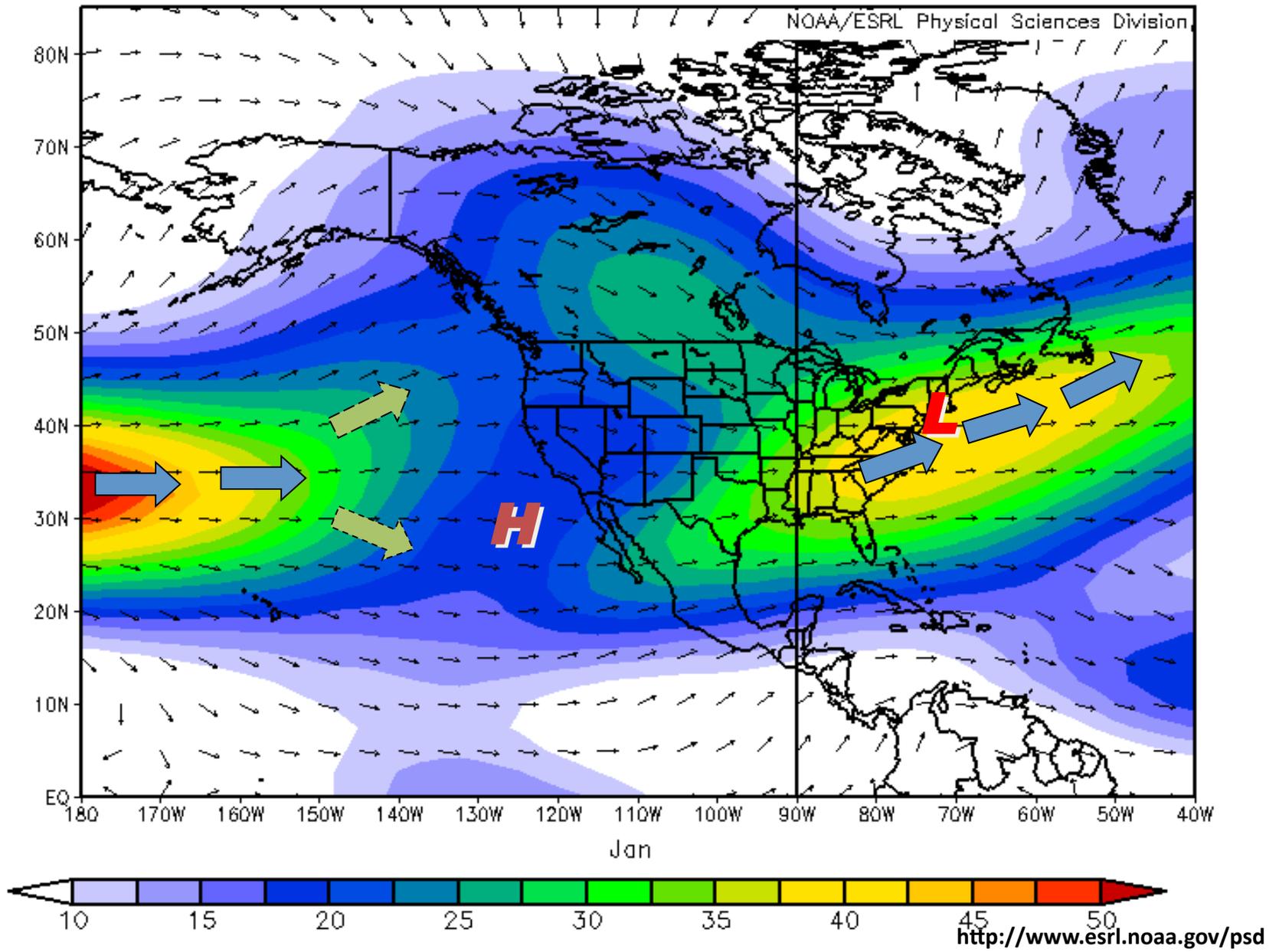
**Climate Prediction Center/NCEP/NWS**

# Average Jet stream winds (~30,000 ft) - January

NCEP/NCAR Reanalysis

300mb Vector Wind (m/s) Climatology 1981-2010 clima

NOAA/ESRL Physical Sciences Division

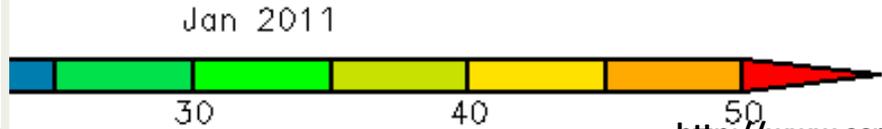
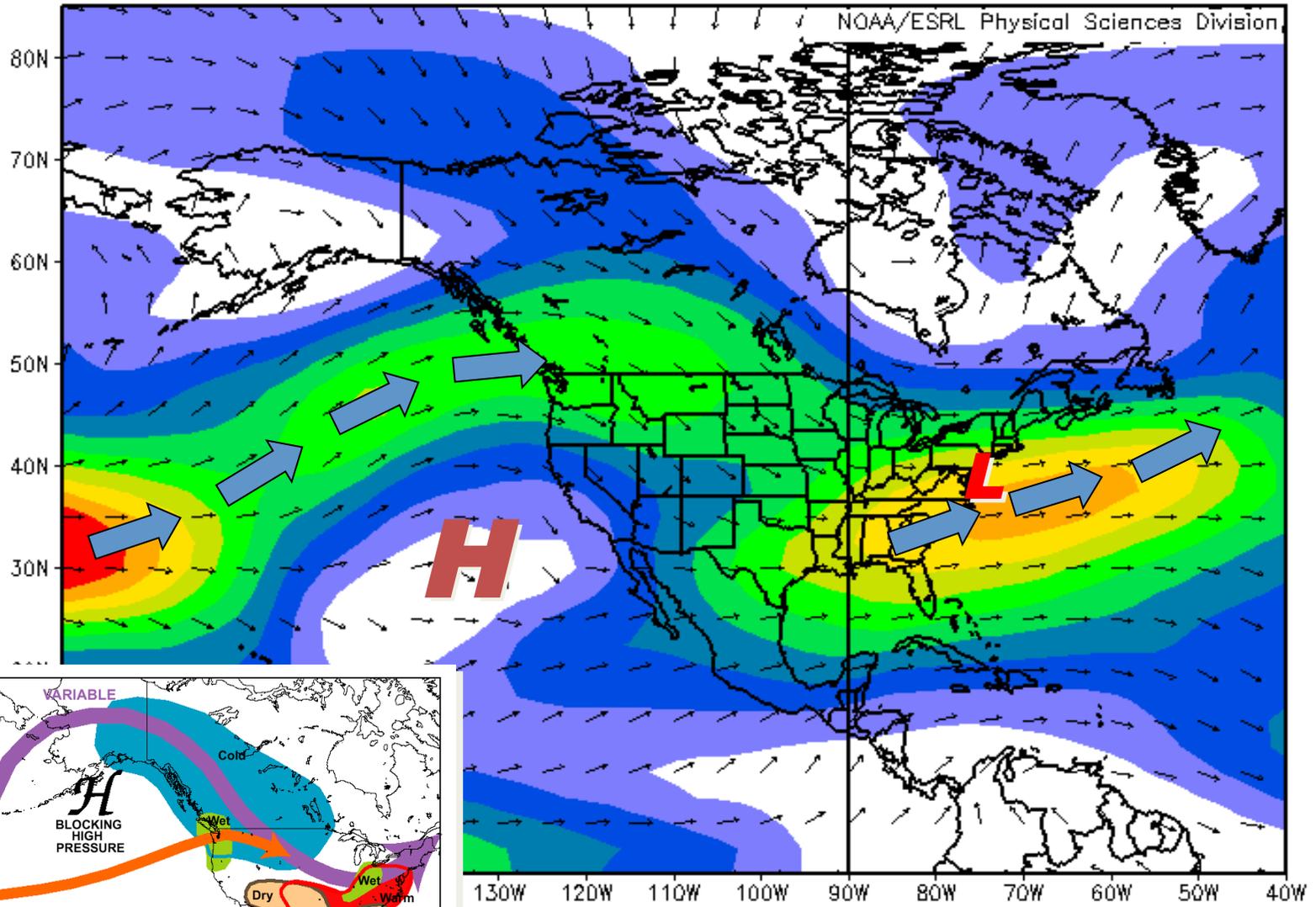


# Jet stream winds (~30,000 ft) – January 2011

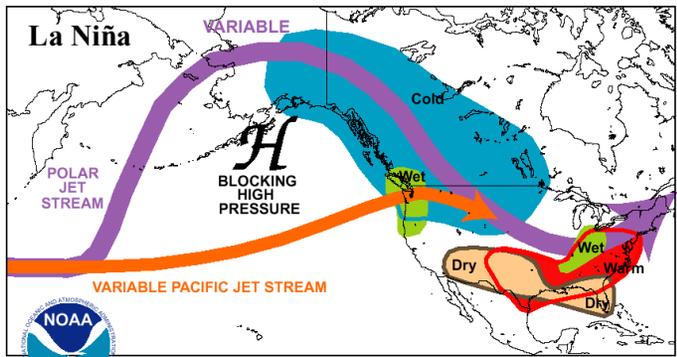
NCEP/NCAR Reanalysis

300mb Vector Wind (m/s) Composite Mean

NOAA/ESRL Physical Sciences Division



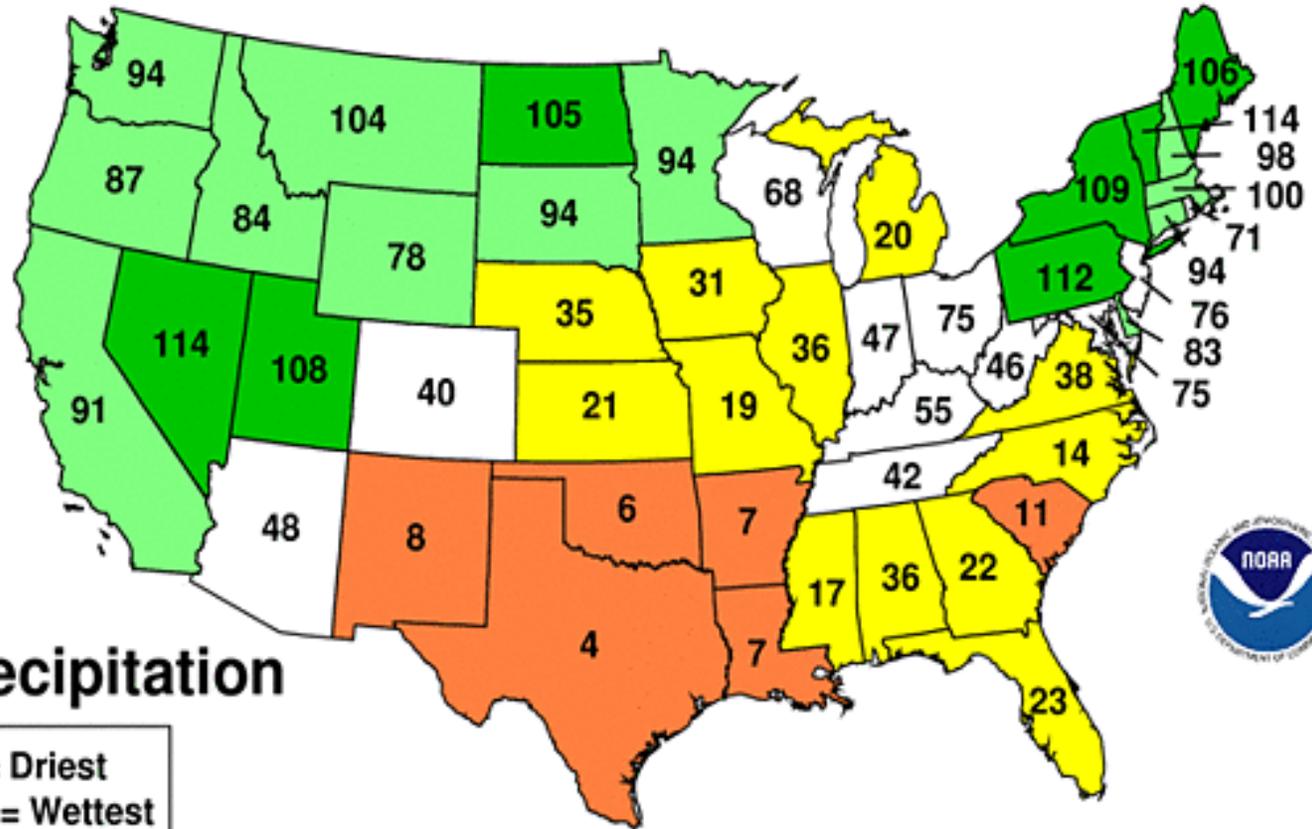
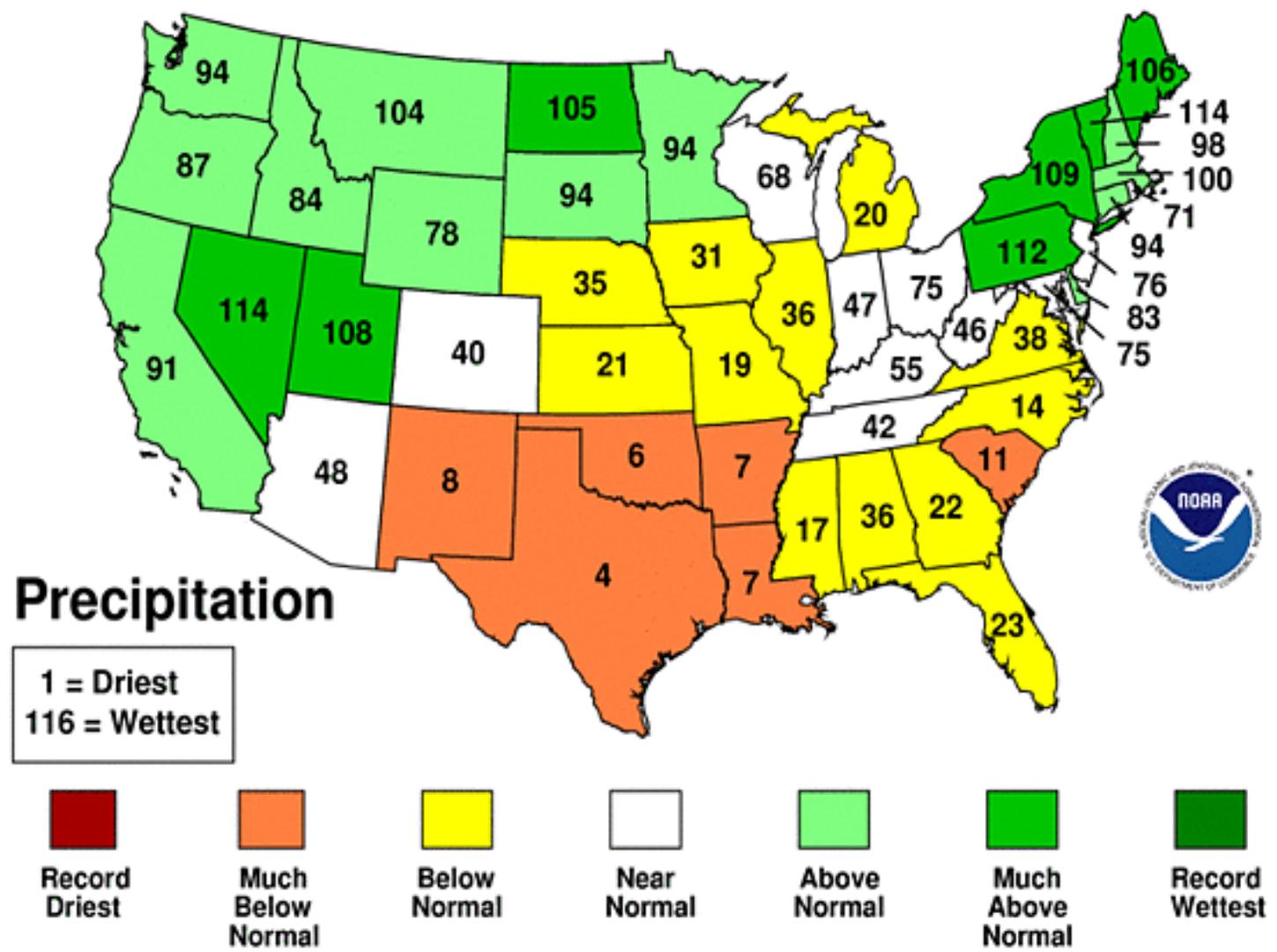
<http://www.esrl.noaa.gov/psd>



Climate Prediction Center/NCEP/NWS

# Oct 2010-Mar 2011 Statewide Ranks

National Climatic Data Center/NESDIS/NOAA





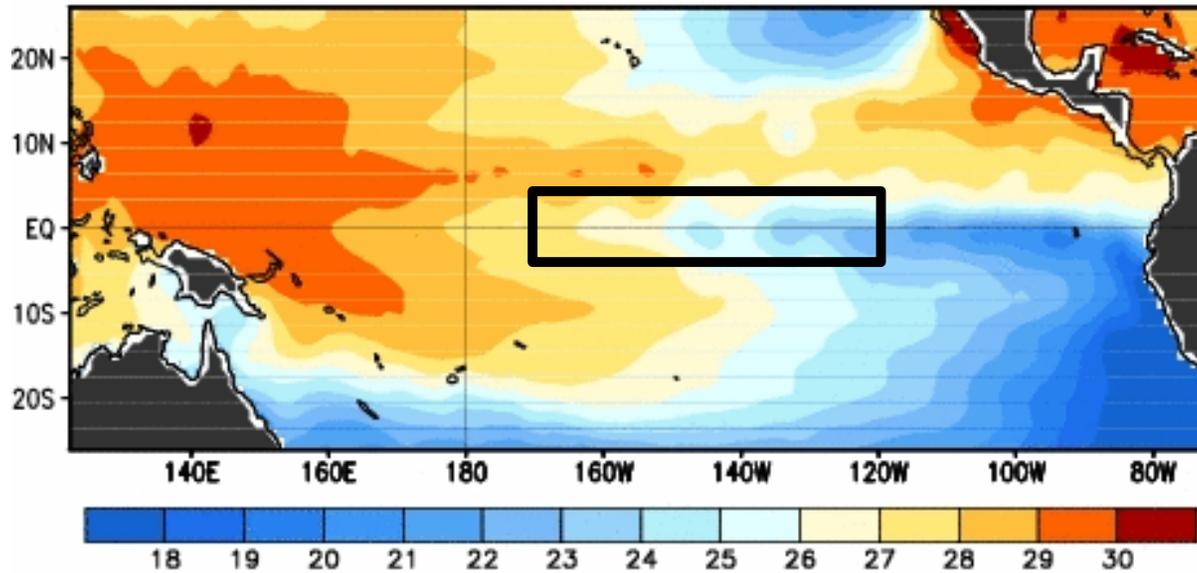
# **ENSO, PDO, AMO and alphabet soup**

**John Nielsen-Gammon**

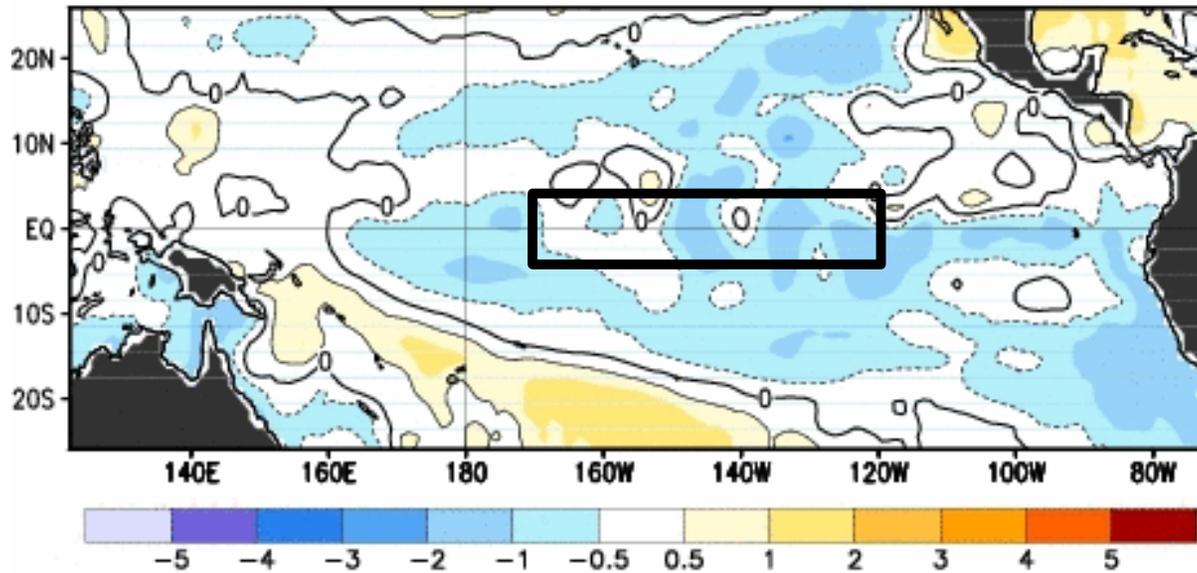
**Texas State Climatologist**

**Office of the State Climatologist**

Observed Sea Surface Temperature (°C)



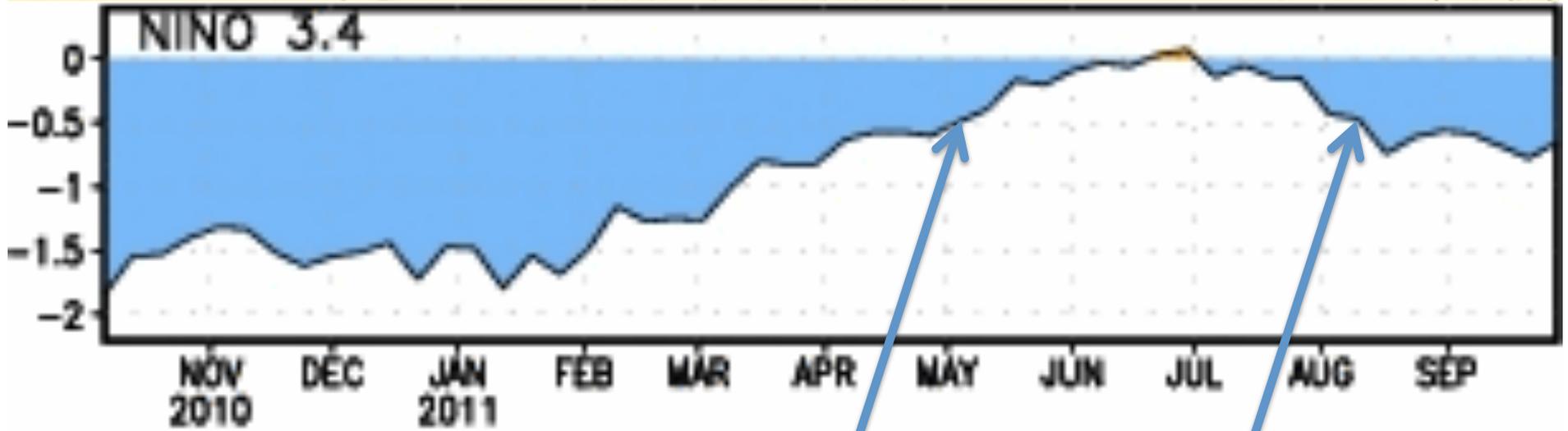
Observed Sea Surface Temperature Anomalies (°C)



7-day Average Centered on 28 September 2011

[http://  
www.cpc.ncep.noaa.gov/](http://www.cpc.ncep.noaa.gov/)  
(click on "El Niño/La Niña")

Niño 3.4 Index: Average SST  
anomaly within box

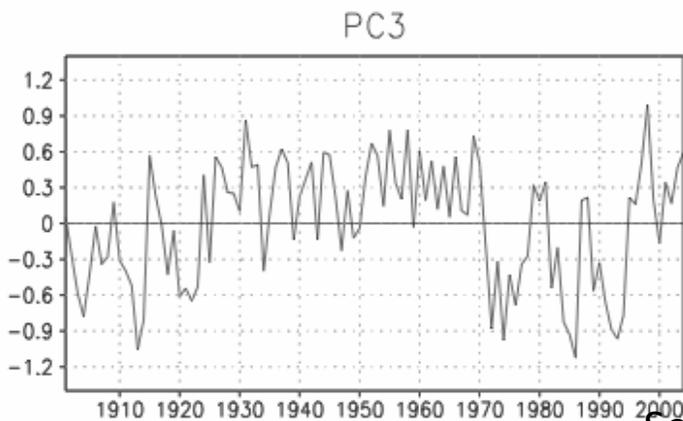
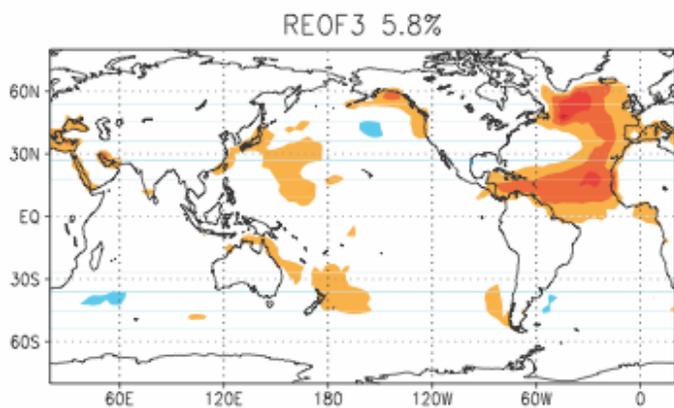
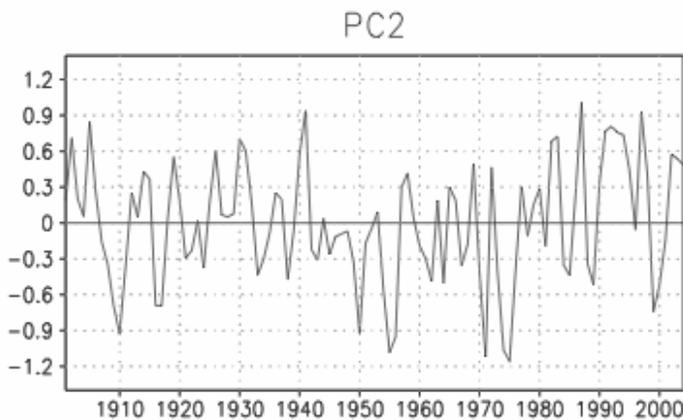
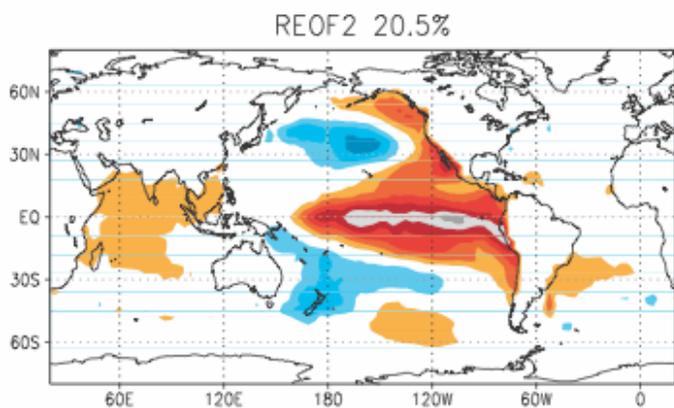
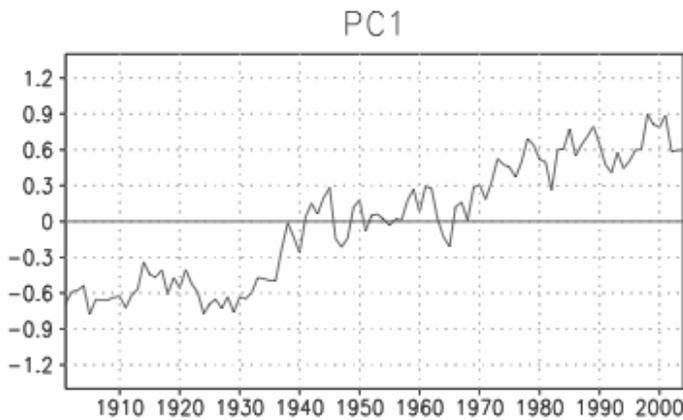
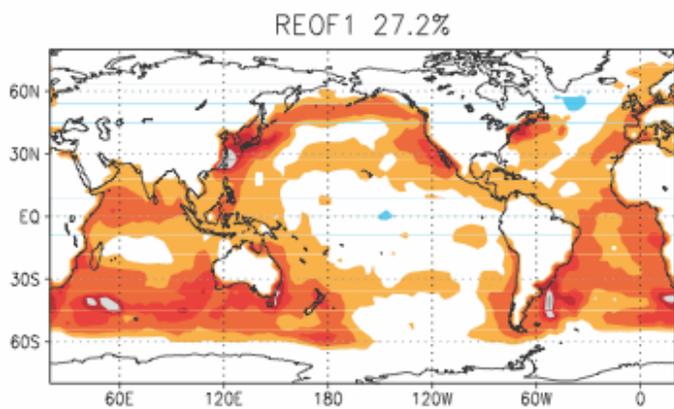


End of 2010-2011 La Niña

Start of 2011-2012 La Niña?

If you're guessing that the outlook for the next several months is for a tendency for warm and dry conditions across the southern United States...you're right. CPC's detailed Winter Outlook will be released in one week.

So...continued drought is likely. But for how long?



Long-term trend

Pacific Decadal  
Oscillation (PDO)

negative = dry SP  
like La Niña

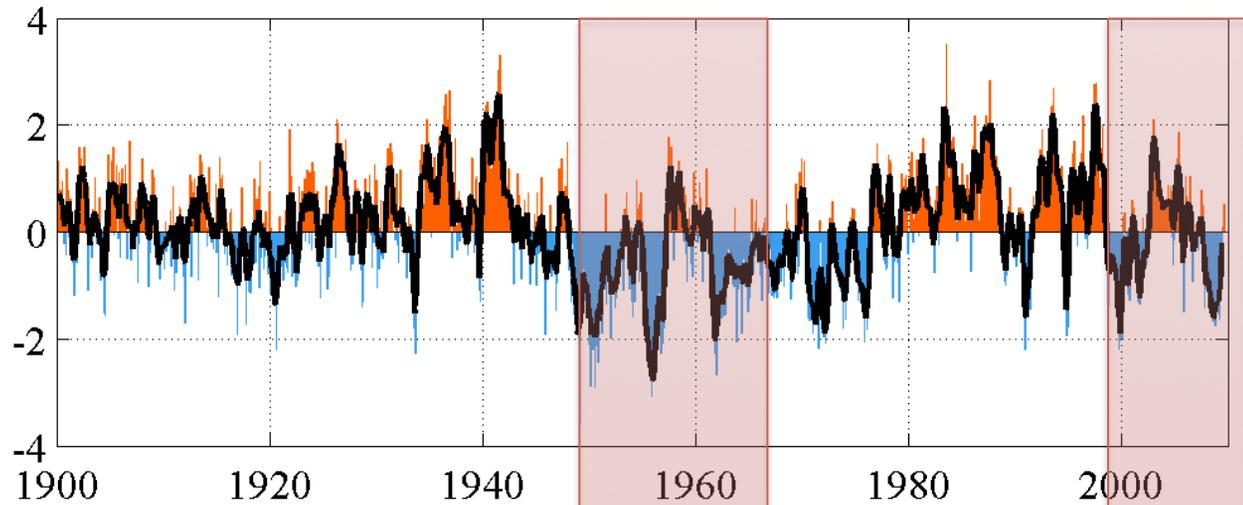
Atlantic  
Multidecadal  
Oscillation (AMO)

Positive = dry SP

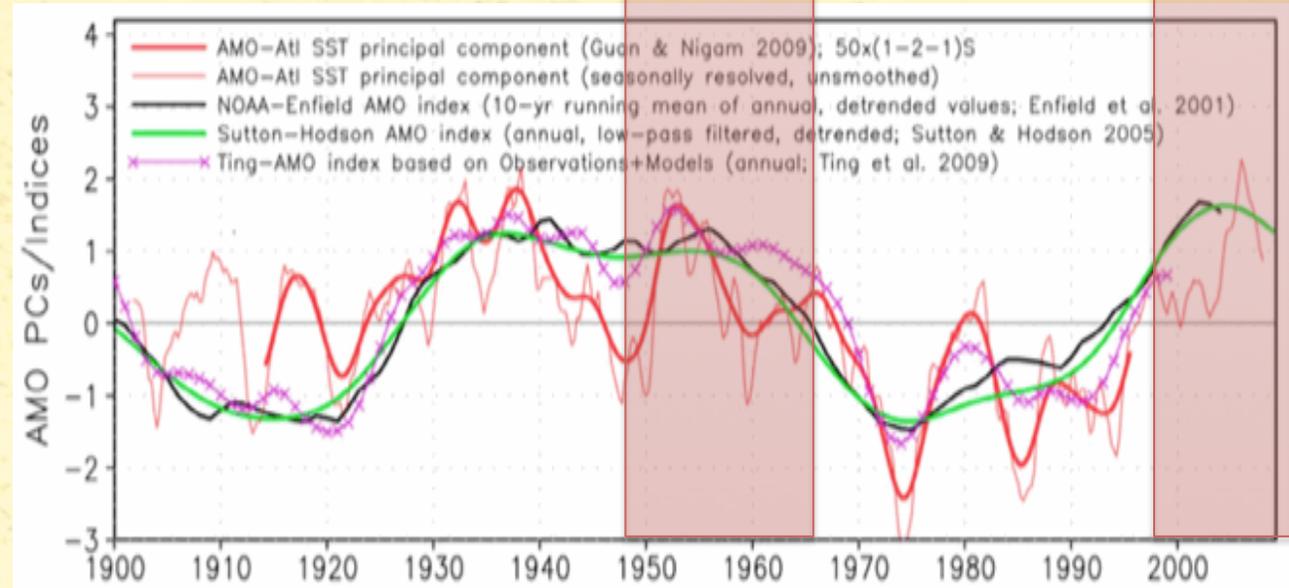
Schubert et al. (2009)

PDO

monthly values for the PDO index: 1900-September 2009



AMO



# My Drought Outlook

- Returning La Niña
  - Drought likely to continue over most of Southern Plains
- Period of drought susceptibility
  - Ocean temperature patterns favor drought
  - Period will last another 3-15 years
    - Come back in five years for a better forecast
- Recent past: dry years interspersed with very wet years
  - Same thing going forward, or drought that lasts several years?

# Resources

- U.S. Drought Portal
  - <http://www.drought.gov>
- Past webinars, summaries, and Federal/State Assistance
  - [http://www.drought.gov/portal/server.pt/community/southern\\_plains](http://www.drought.gov/portal/server.pt/community/southern_plains)
- Drought Impact Reporter
  - <http://droughtreporter.unl.edu/>
- State Climatologists
  - <http://www.stateclimate.org/>
- National Drought Mitigation Center
  - <http://drought.unl.edu/>
- Southern Climate Impacts Planning Program (SCIPP)
  - <http://www.southernclimate.org/>
- Climate Assessment for the Southwest (CLIMAS)
  - <http://www.climas.arizona.edu/>

Is drought properly classified in your region? If not, let us know!

- Drought Impact Reporter
- Contact your State Climatologist
- E-mail the DM Authors:  
[droughtmonitor@unl.edu](mailto:droughtmonitor@unl.edu)