

# North American Drought Briefing for December 2012 and OND 2012

Climate Prediction Center/NCEP/NOAA

<http://www.cpc.ncep.noaa.gov/products/Drought>

**Happy New Year!!!**

# Current Partners

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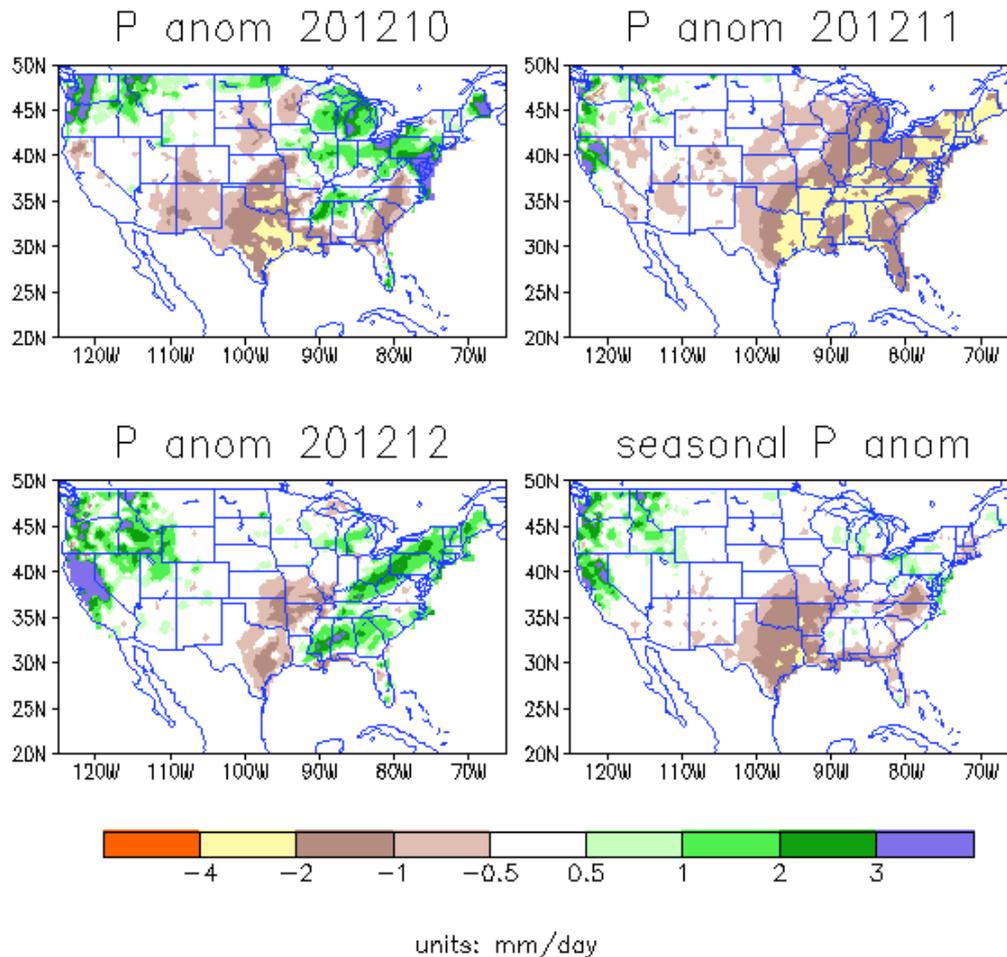
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**RFCs:** James noel, Kevin Werner, Andy Wood, Jeff Dobur

**Project Funded by NOAA MAPP, TRACS & NASA**

# P anomalies over the United States



## High lights:

### December 2012

- rain events : from the Gulf to the areas east of 90W gave relieve to drought
- Texas and the Southern Plains were dry
- **Wet:** West Coast/ Pacific Northwest and California

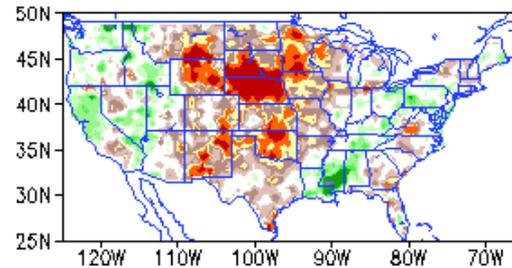
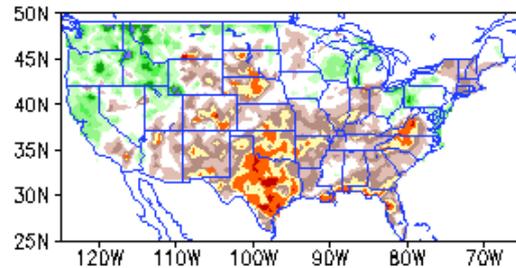
SPI through 06Jan2013

# SPI

- *Some relieve to drought over the western interior states*
- *Drought continues over the Great Plains, where SPI6 is in the D4 category for almost 5 months*
- *Improvements over the Montana and Dakotas for short term SPI3*

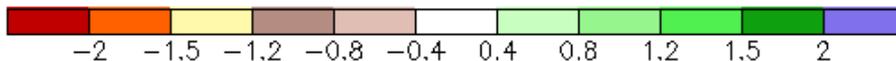
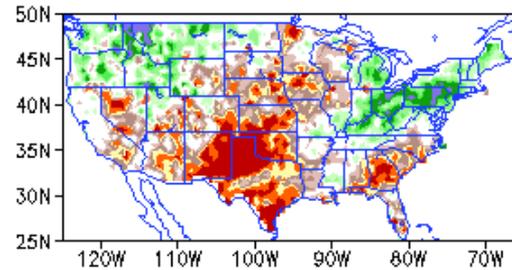
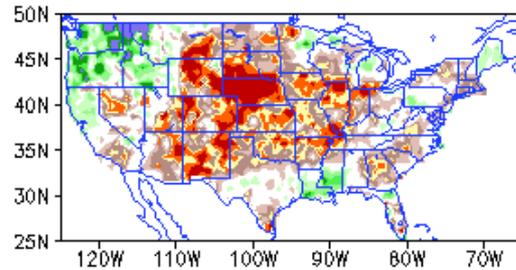
3-month SPI

6-month SPI



12-month SPI

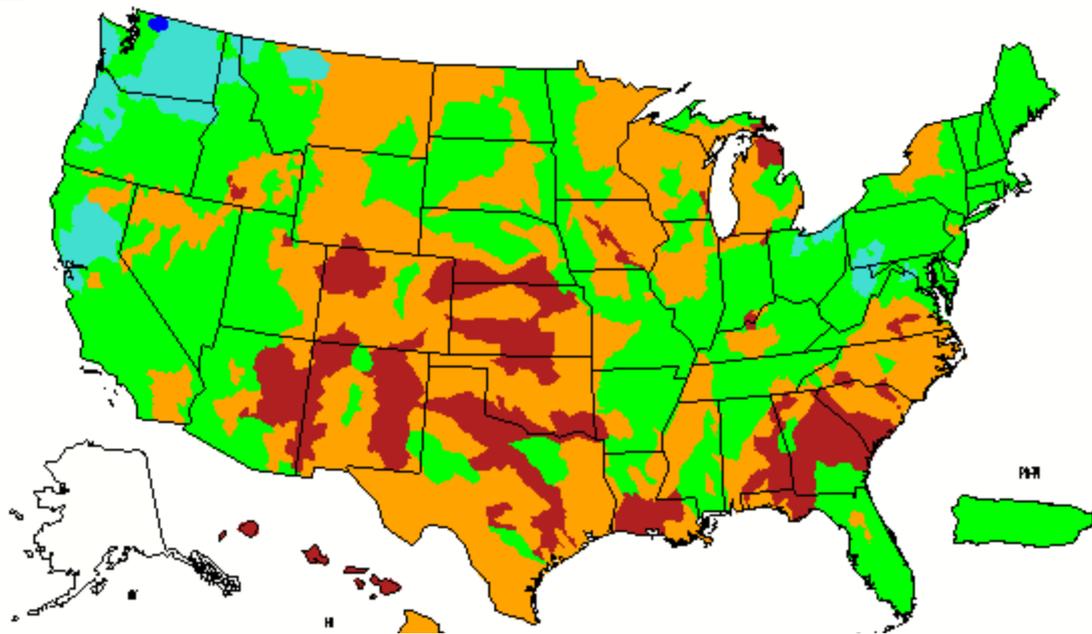
24-month SPI



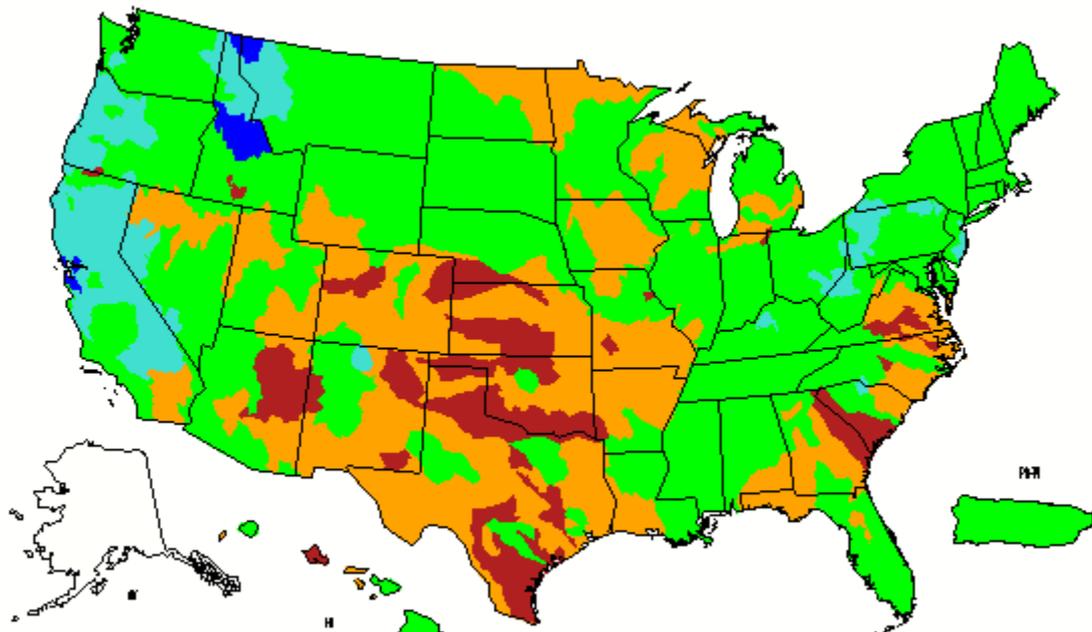
Drought  $SPI < -0.8$  D1:  $-0.9$  to  $-1.2$   
D2:  $-1.3$  to  $-1.5$  D3:  $-1.6$  to  $-1.8$   
D4:  $SPI < -2$ .

data source: Xie unified P from 1950–present

November 2012



December 2012



# Streamflow percentile (USGS)

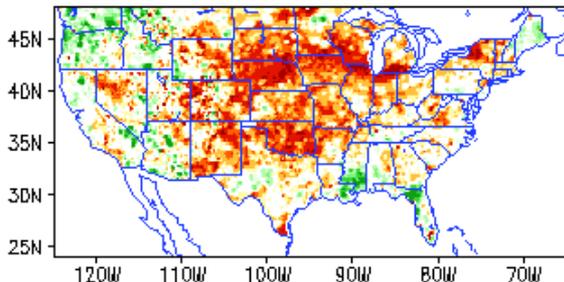
- There was improvement over Montana and Dakotas and the Southeast

Explanation - Percentile classes

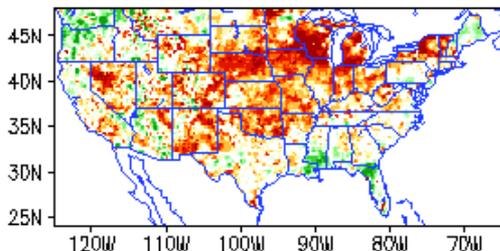
Flow	<10	10-24	25-75	76-90	>90	High	No Data	
	Much below normal	Below normal	Normal	Above normal	Much above normal			

Standardized runoff index SRI3 Dec 2012

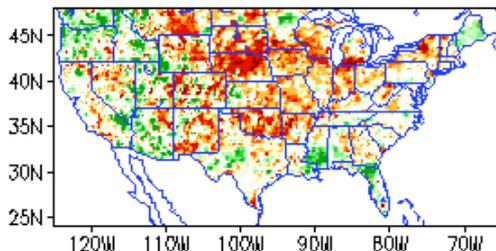
Ensemble



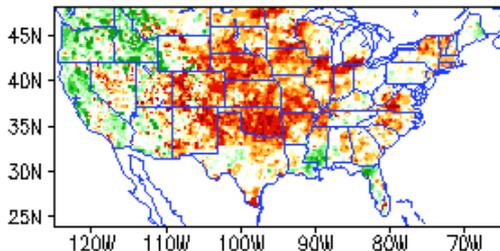
Noah



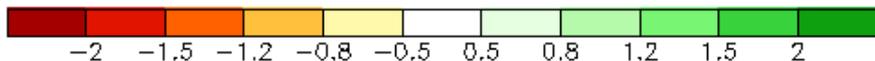
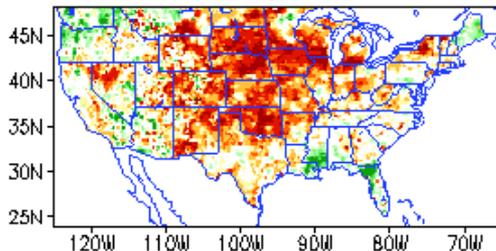
Mosaic



SAC



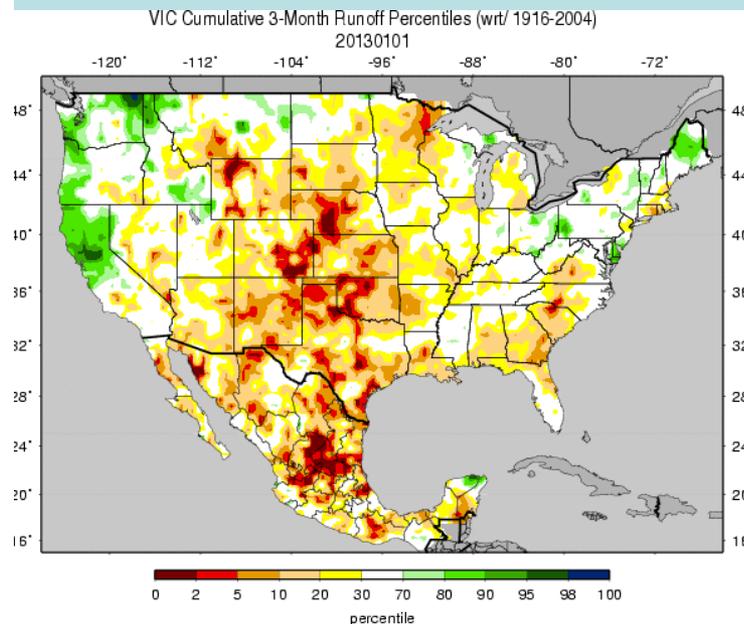
VIC



# RUNOFF percentiles

U Washington

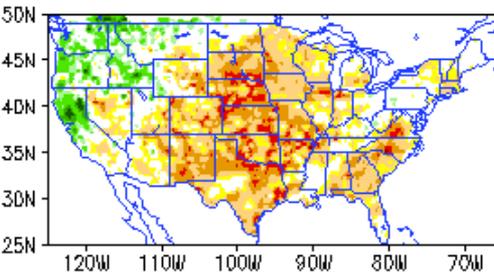
3-month accumulation



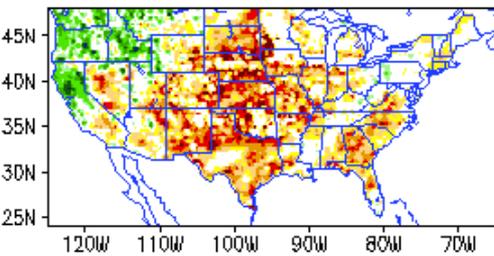
Both UW and EMC show the Central U. S. is under severe drought. The improvement : 6 was over the areas east of 90W

SM percentiles Dec 2012

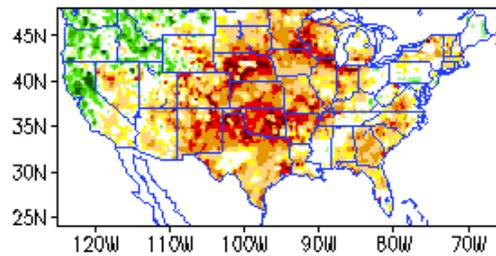
Ensemble



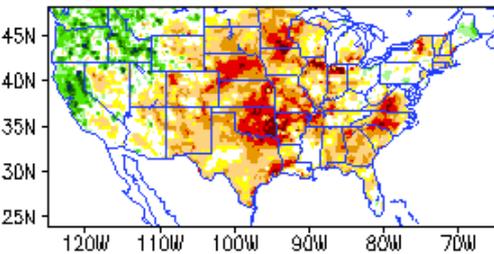
Noah



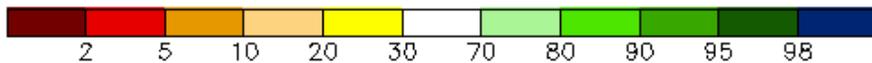
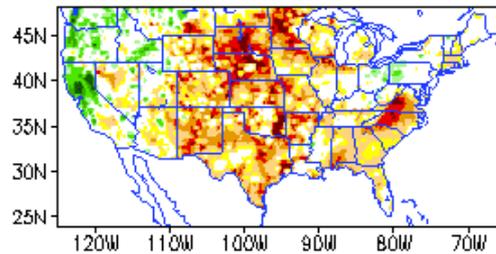
Mosaic



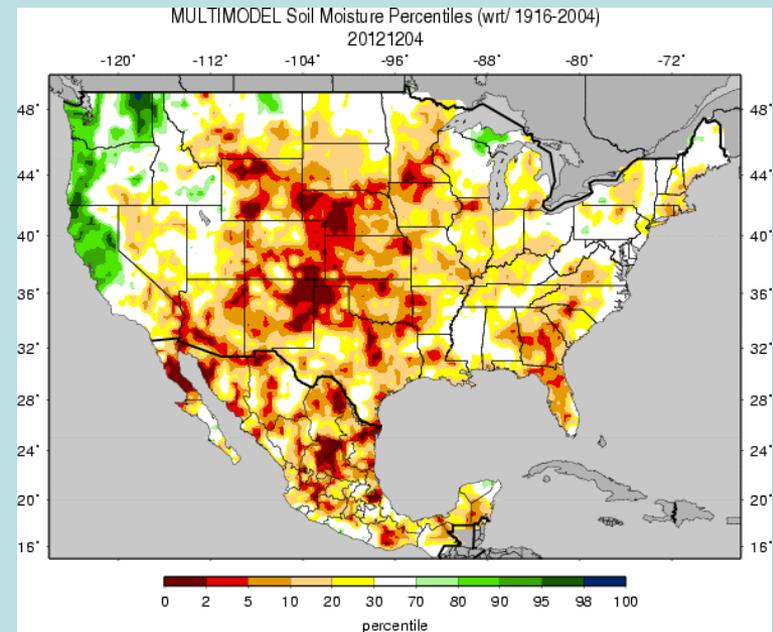
SAC



VIC

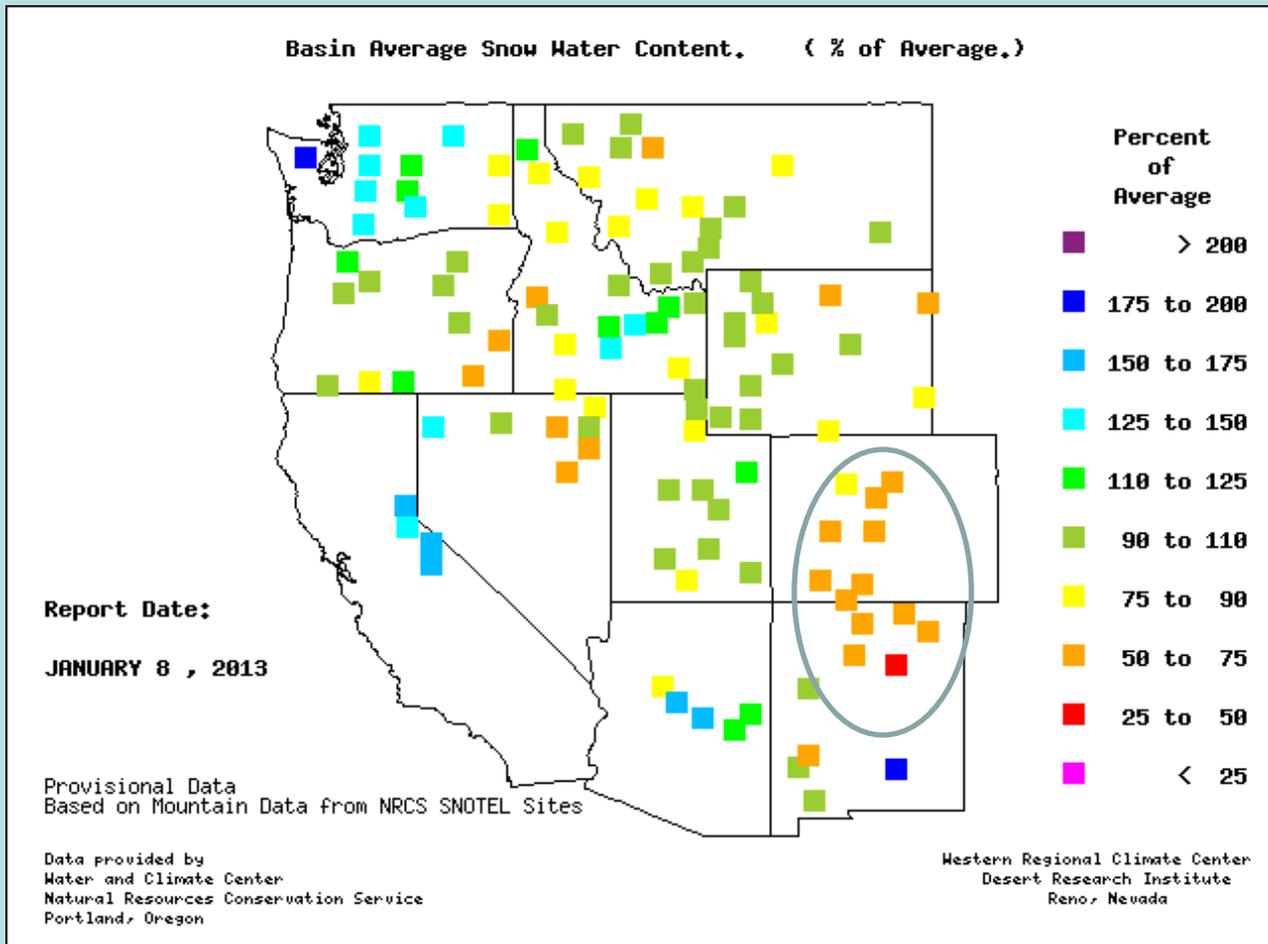


# U Washington



**A very dry picture:**  
Both total soil moisture percentiles show dryness over the Central U. S.

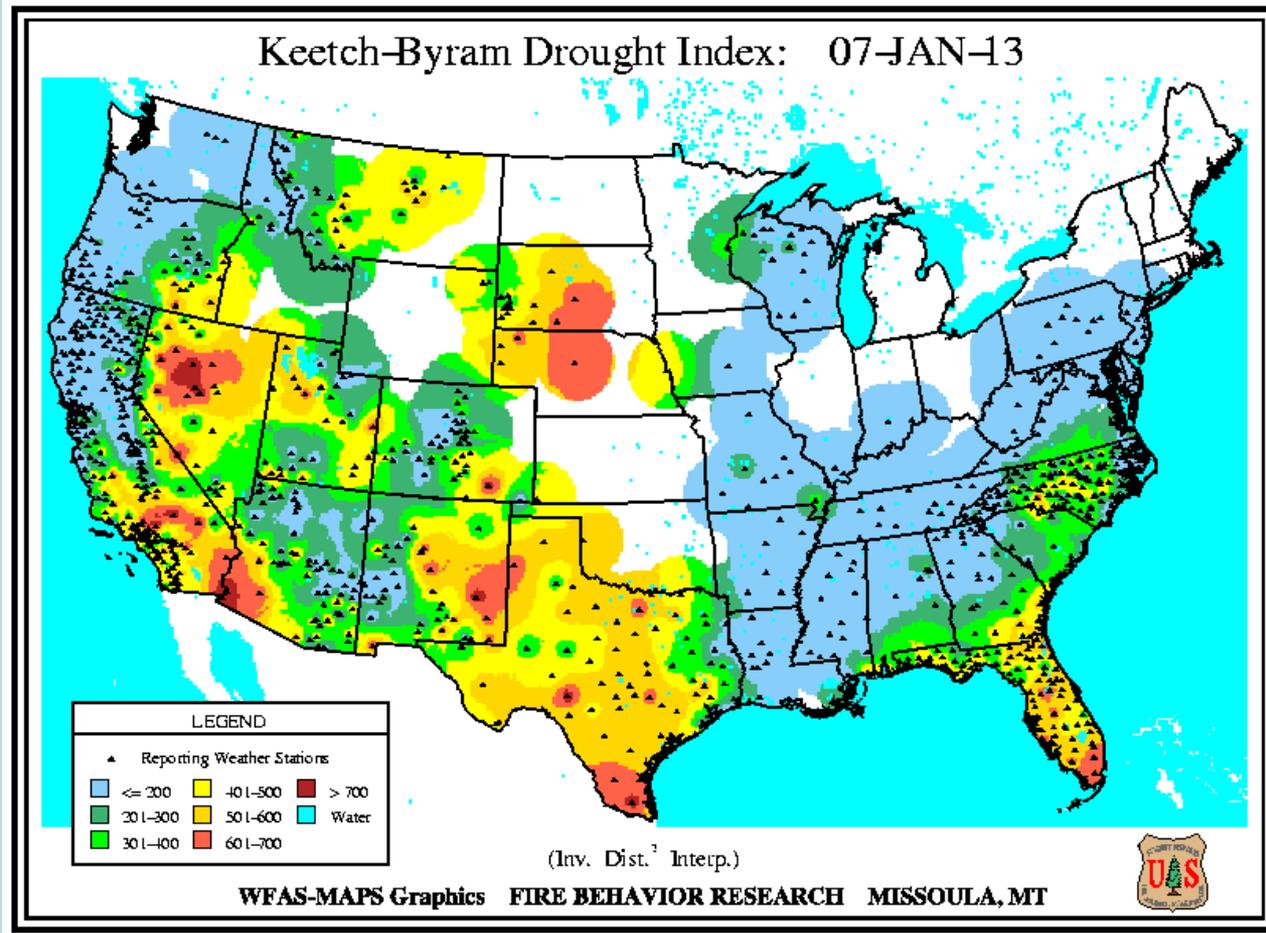
# Snotel (SWE)



Most western states had normal or above normal SWE except Colorado and northern New Mexico

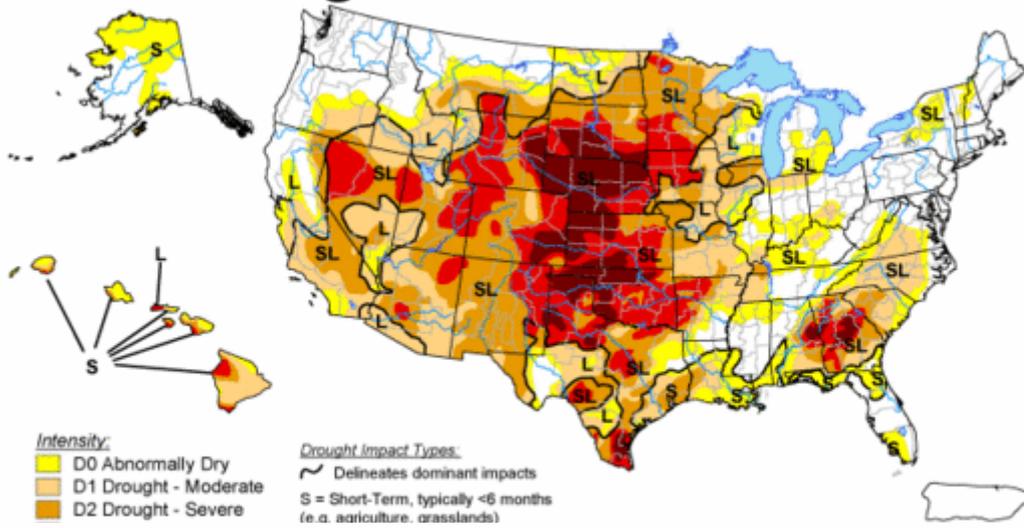
# Keetch-Byram Drouught index

Please update



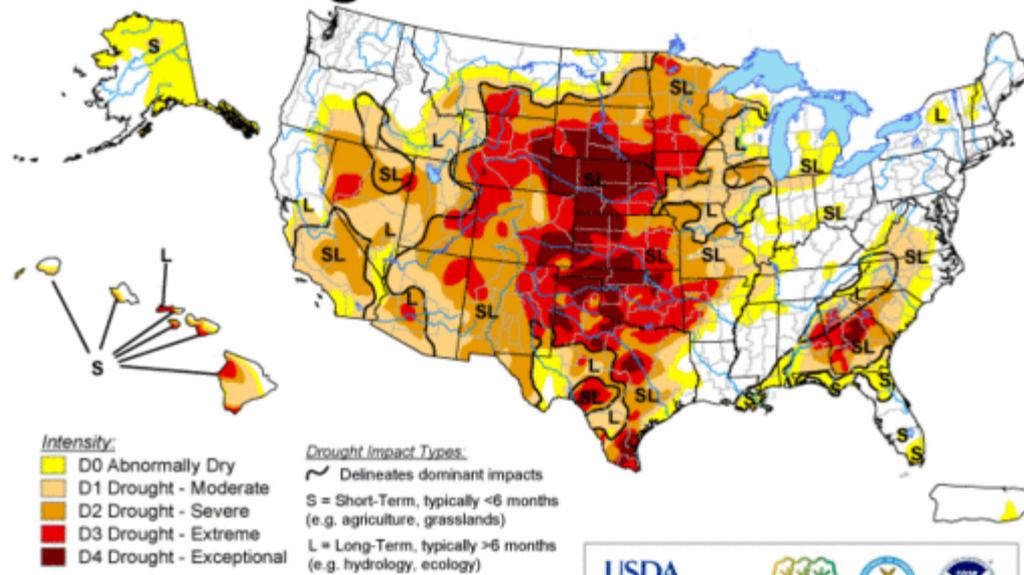
# U.S. Drought Monitor

December 4, 2012  
Valid 7 a.m. EST



# U.S. Drought Monitor

January 8, 2013  
Valid 7 a.m. EST



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, January 10, 2013

Author: David Simeral, Western Regional Climate Center

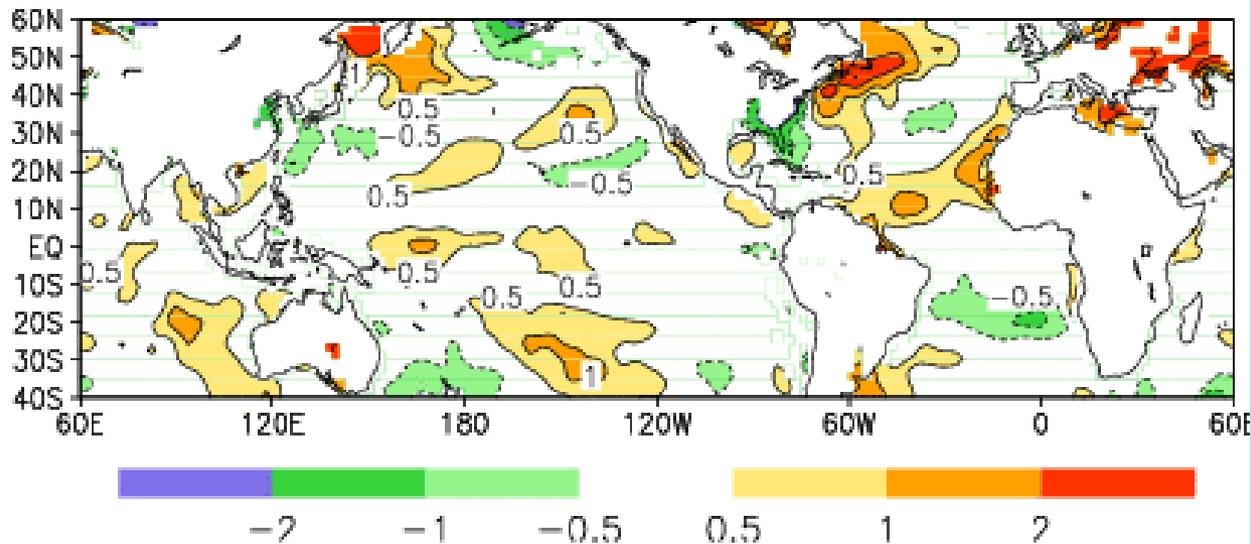
## Drought monitor

The Drought Monitor  
similar to the Drought  
Monitor issued on Dec 4

## SSTA Nov 2012

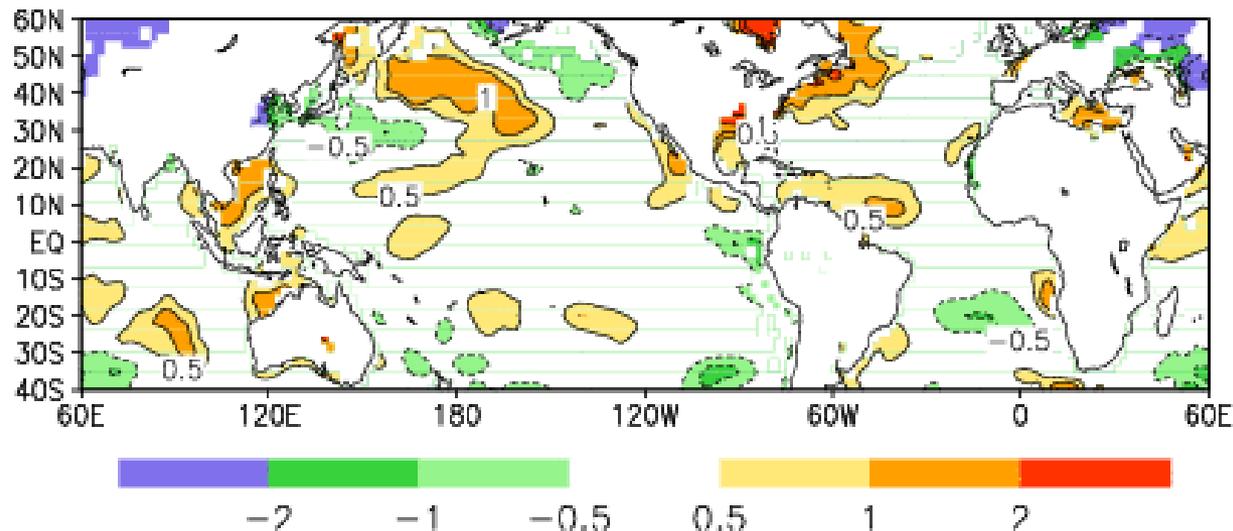
## SSTA

ENSO neutral  
condition in the  
Tropical Pacific,  
No ENSO alert



## SSTA Dec 2012

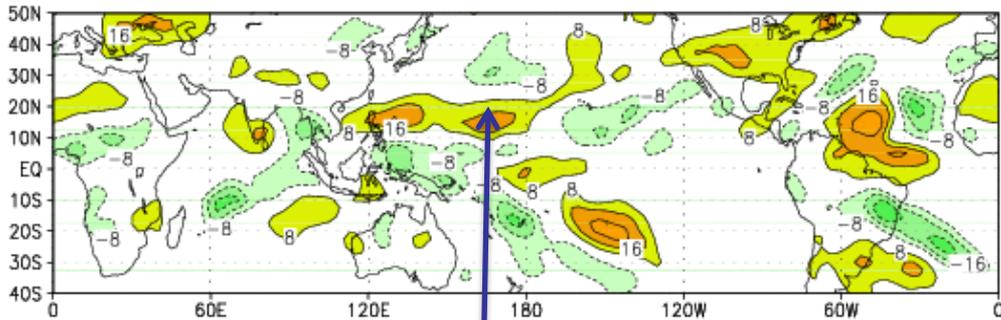
- No coherent SSTA pattern in the Pacific
- Warm SSTAs along the eastern coast of North America
- SSTAs in the North Tropical Atlantic are weaker than Nov



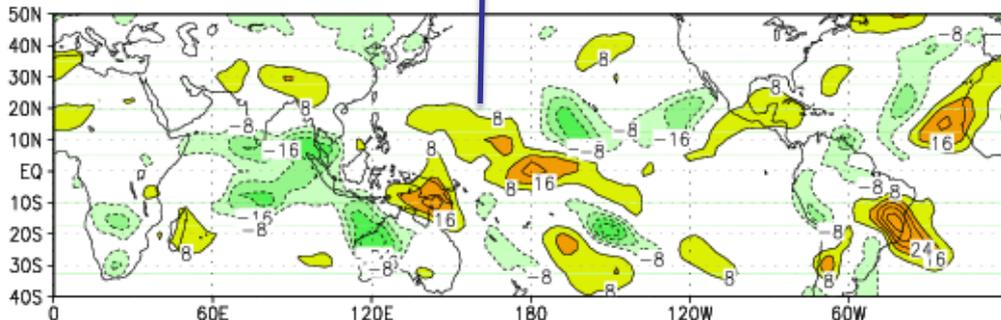
# OLRA and 200hPa streamfn

Nov and Dec are nearly in quadrature of each other in the Pacific North America suggesting the MJO influence

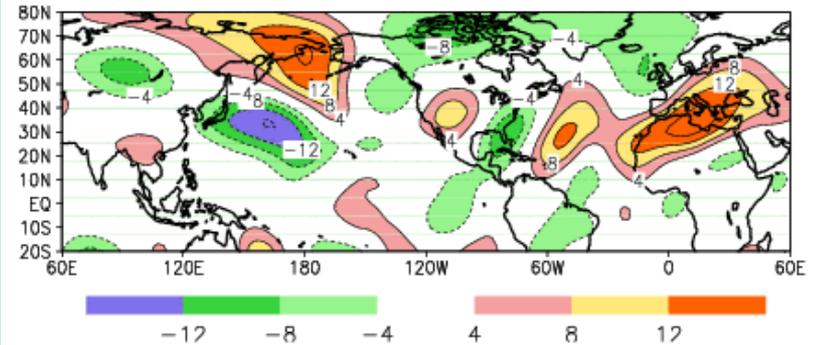
OLRA Nov 2012



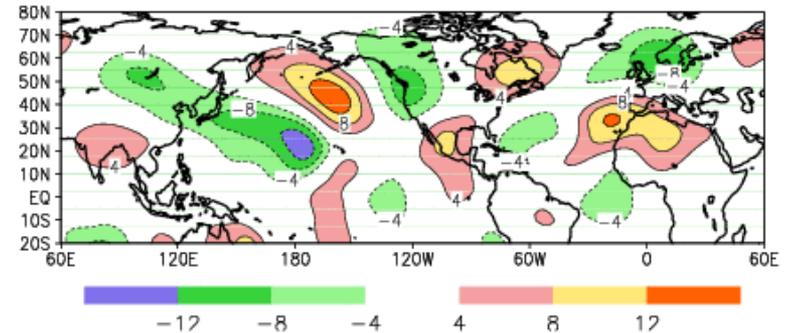
OLRA Dec 2012



strm anom 200hPa Nov 2012

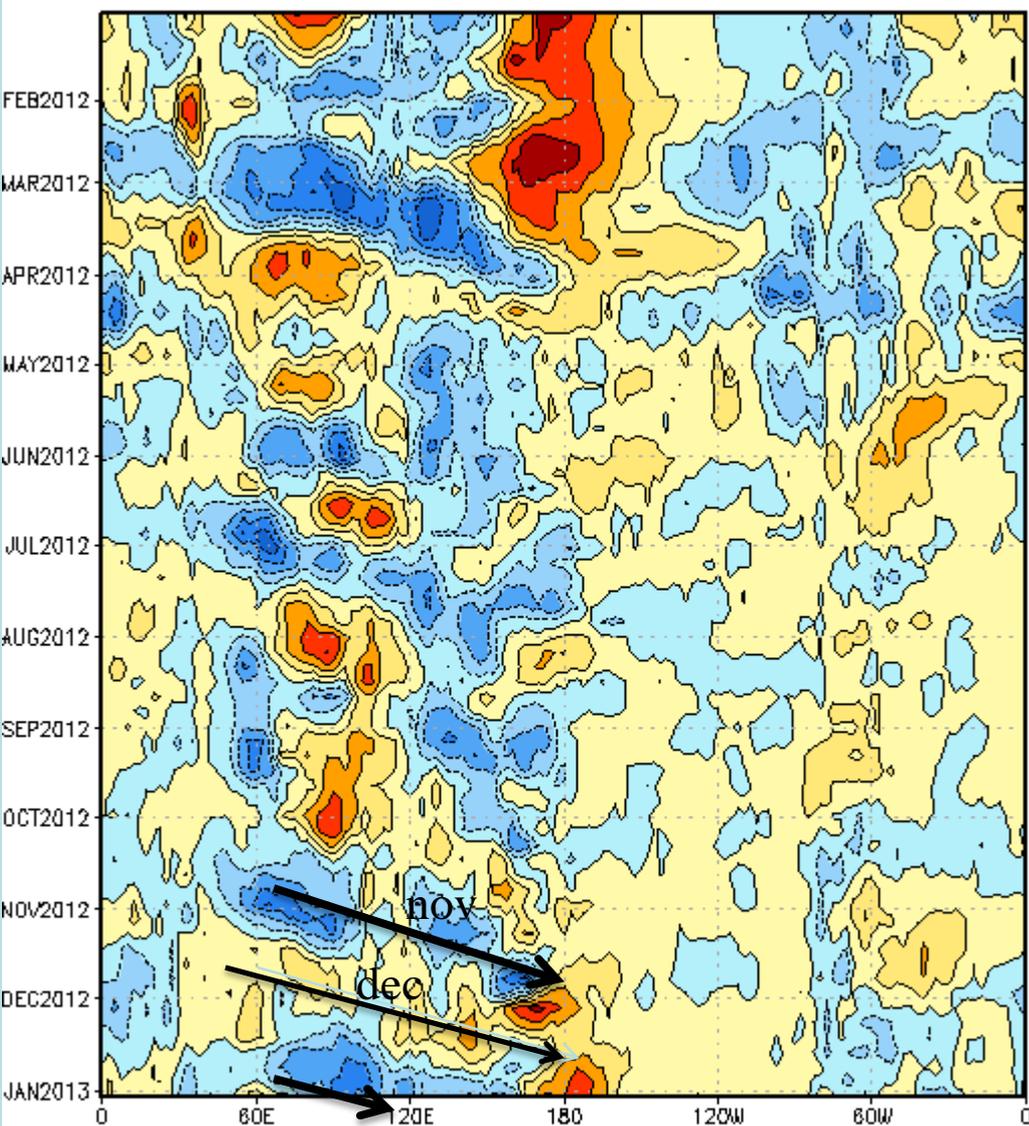


strm anom 200hPa Dec 2012



# Outgoing Longwave Radiation (OL R) Anomalies

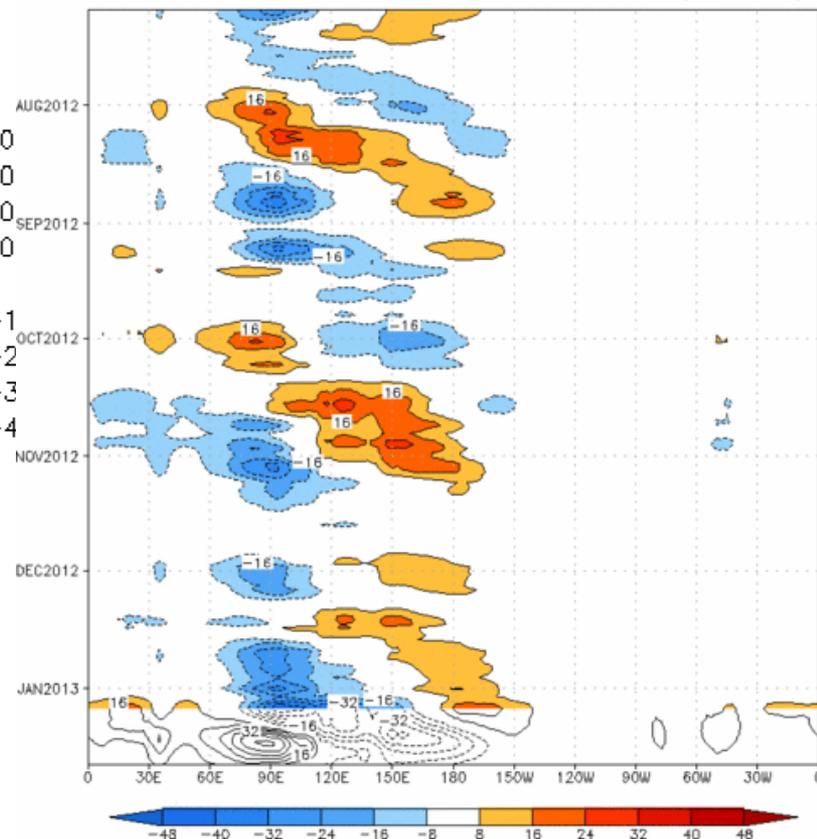
OLR Anomalies 5N-5S



Data updated through 03 JAN 2013

forecast

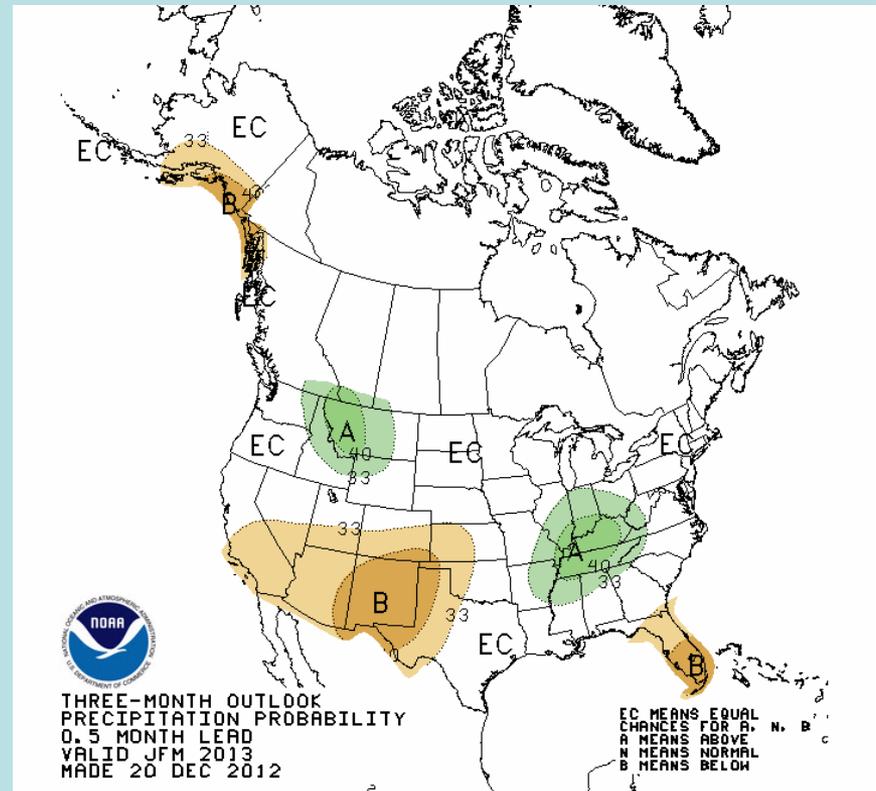
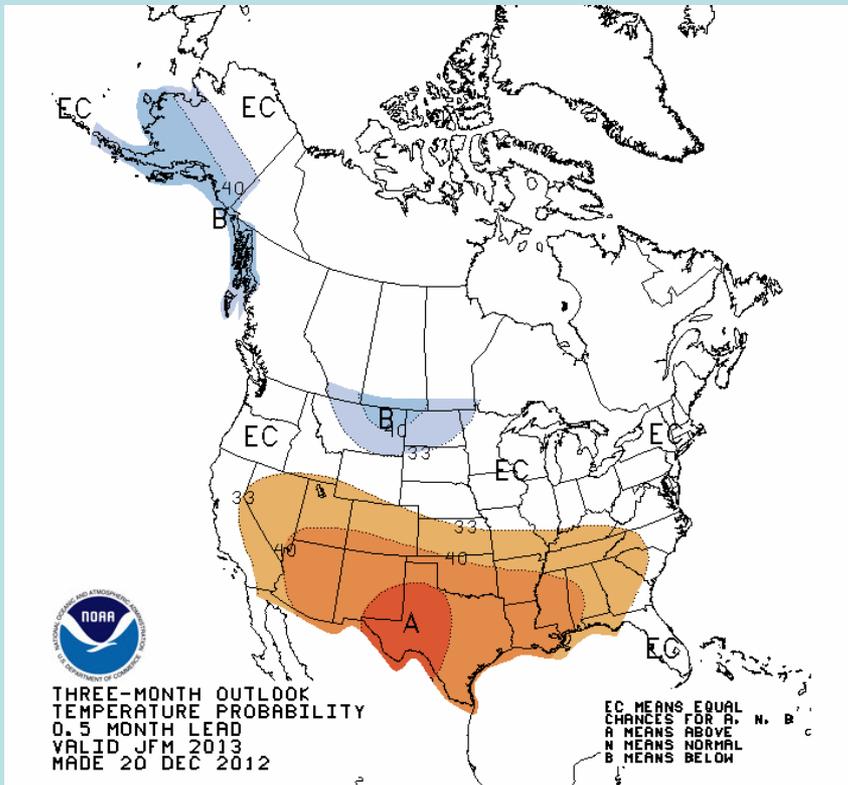
Reconstructed anomaly field associated with the MJO using RMM1 & RMM2  
 OLR [7.5°S,7.5°N] (cont:4Wm<sup>-2</sup>) Period:07-Jul-2012 to 06-Jan-2013  
 The unfilled contours are GEFS forecast reconstructed anomaly for 15 days



# T and P fcsts for JFM 2013

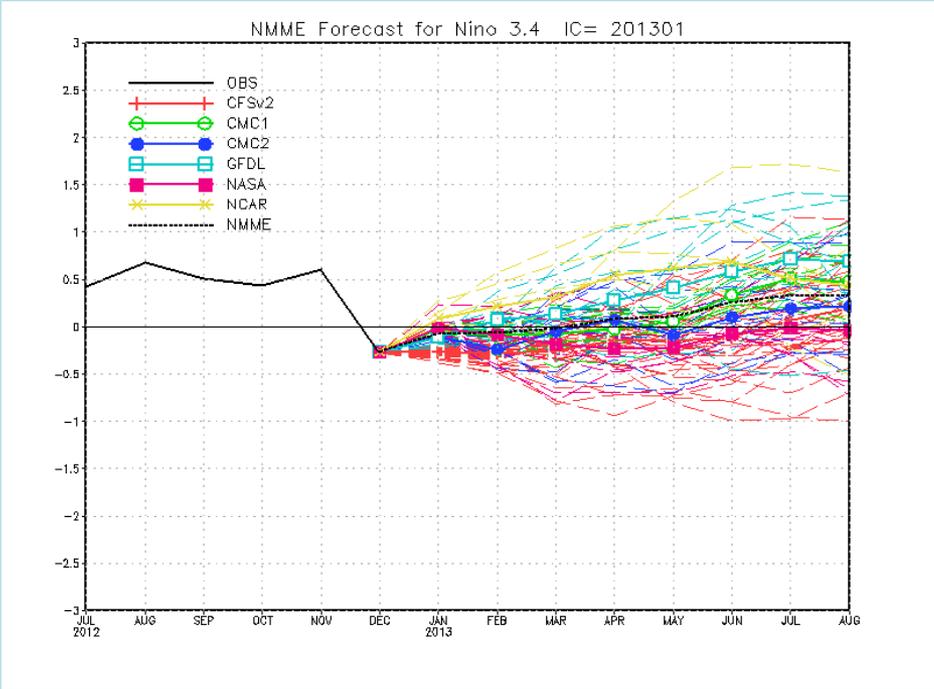
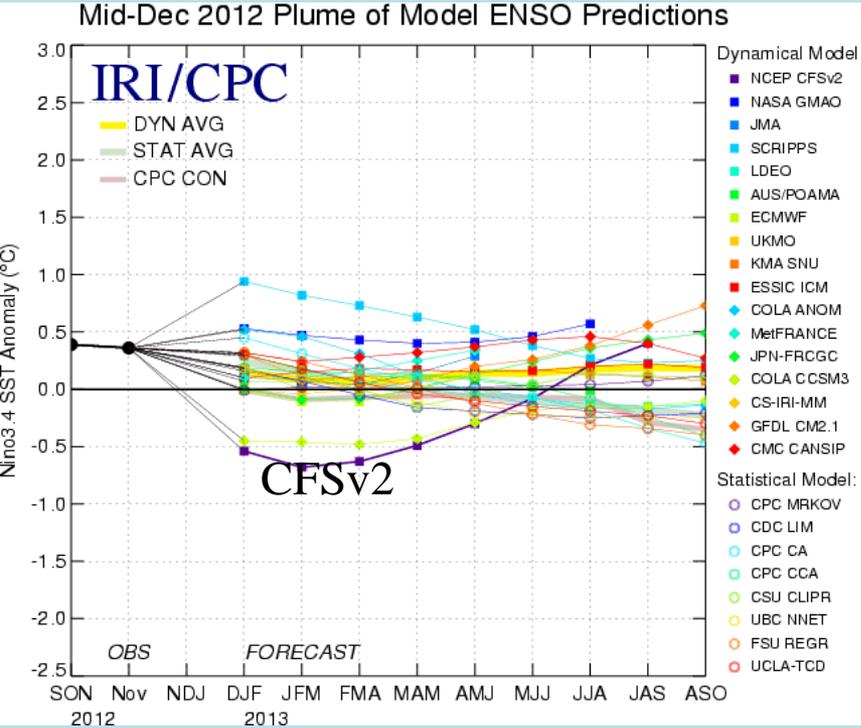
Temp

precip



# Plume diagram

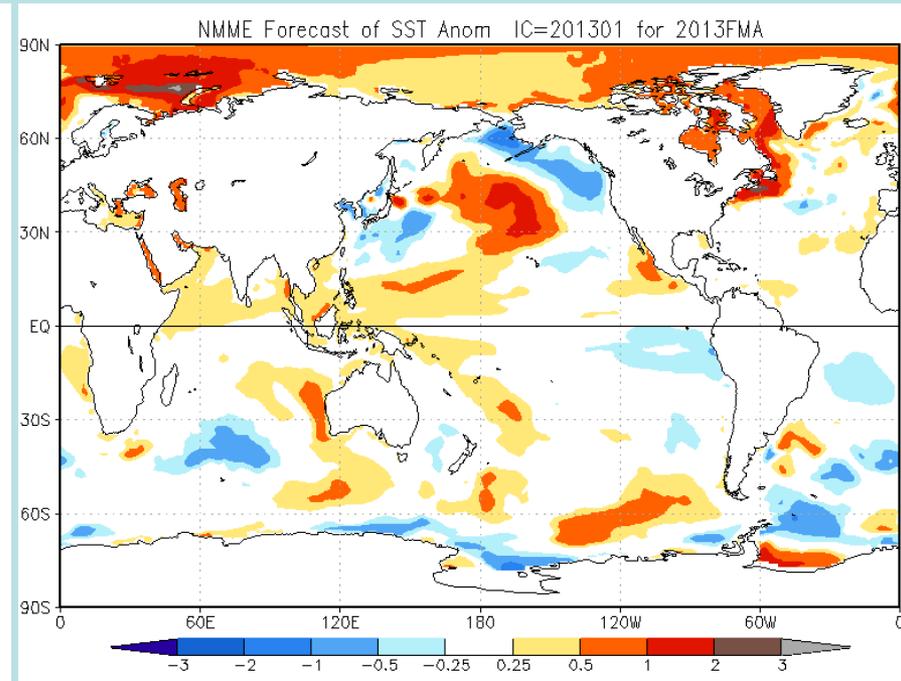
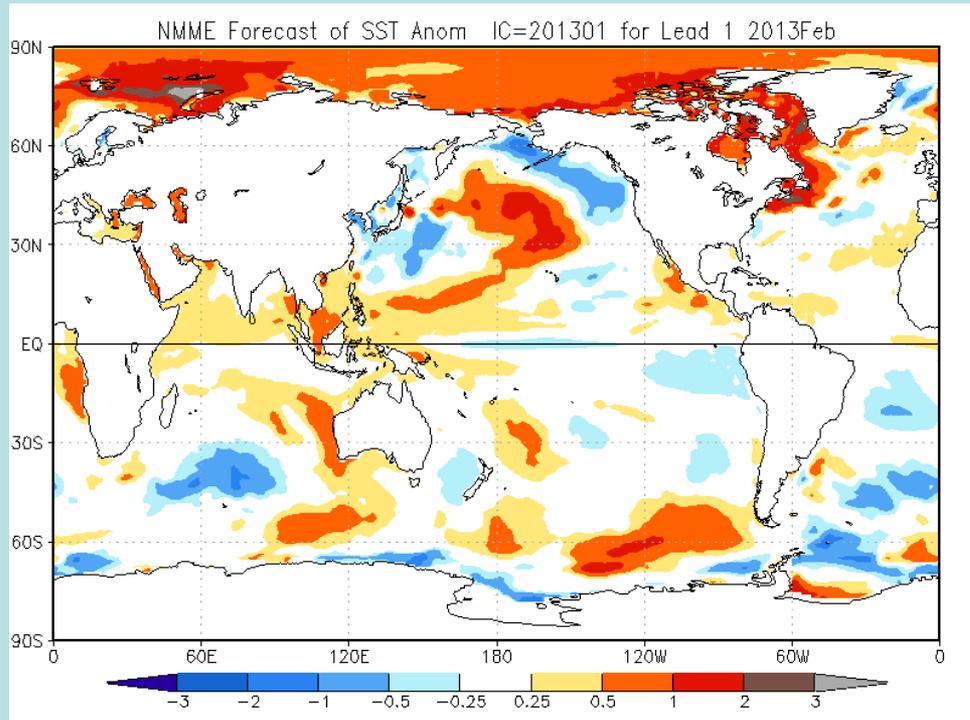
## NMME Nino34 index



# SSTA NMME FCSTs

Feb 2013

FMA 2013



A possible negative phase of the PDO  
ENSO neutral

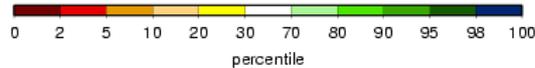
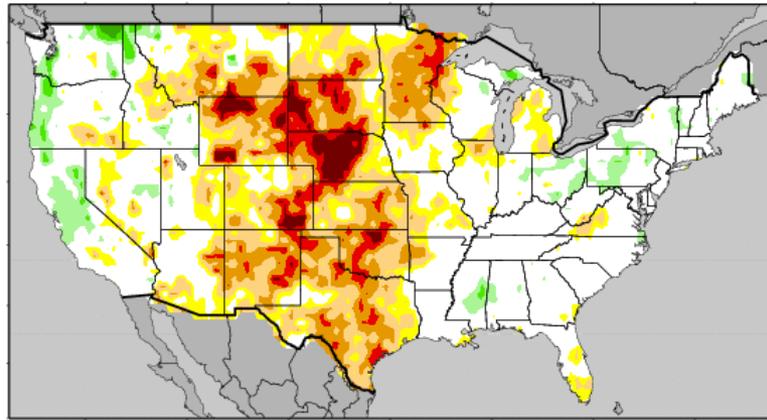
# ESP FCST UW ICs=4Jan2013

Jan2013

**VIC Predicted Soil Moisture Percentiles**  
based on ranking of climatological ESP median

Initialized 20130104 -- 1 month lead

-120° -112° -104° -96° -88° -80° -72°



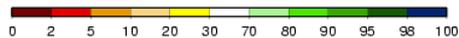
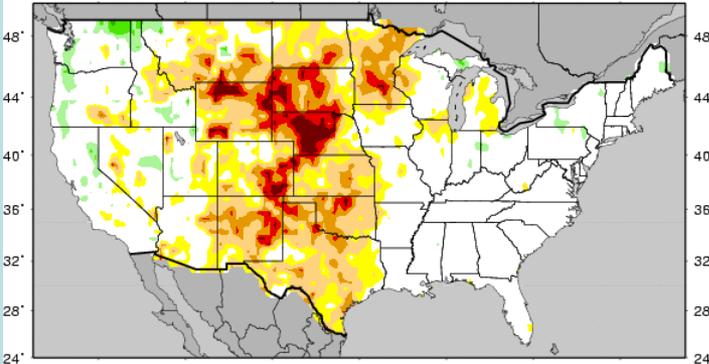
percentile

Feb 2013

**VIC Predicted Soil Moisture Percentiles**  
based on ranking of climatological ESP median

Initialized 20130104 -- 2 month lead

-120° -112° -104° -96° -88° -80° -72°



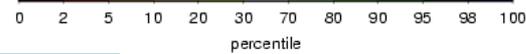
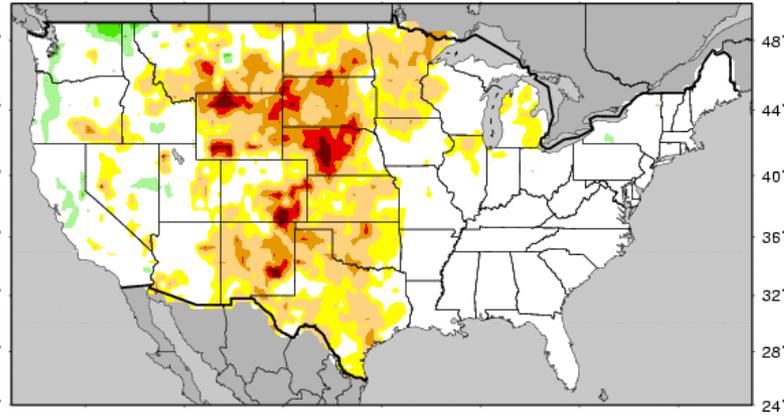
percentile

Mar 2013

**VIC Predicted Soil Moisture Percentiles**  
based on ranking of climatological ESP median

Initialized 20130104 -- 3 month lead

-120° -112° -104° -96° -88° -80° -72°



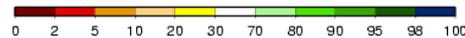
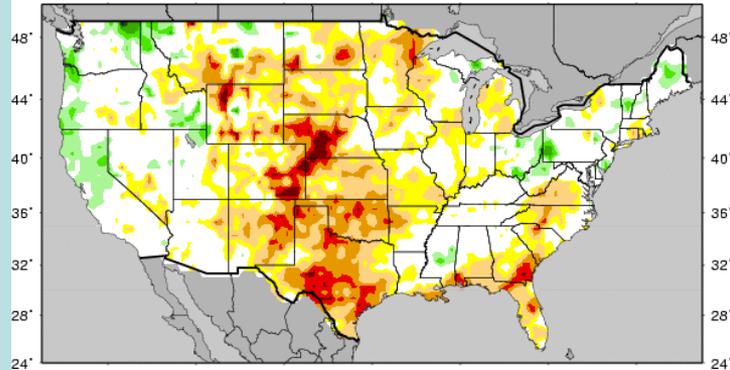
percentile

Runoff Jan

**VIC Predicted Cumulative 3-month Runoff Percentiles**  
based on ranking of ESP ENSO-Subset median

Initialized 20130104 -- 1 month lead

-120° -112° -104° -96° -88° -80° -72°

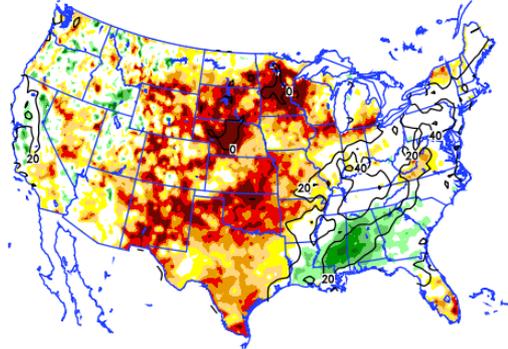


percentile

# SM fcsts from MSU (Lifeng Luo)

1/31/2013(4-week lead)

Predicted Daily Soil Moisture Percentile on 20130131  
(wrt samples within a 49-day window in 1979-2011)



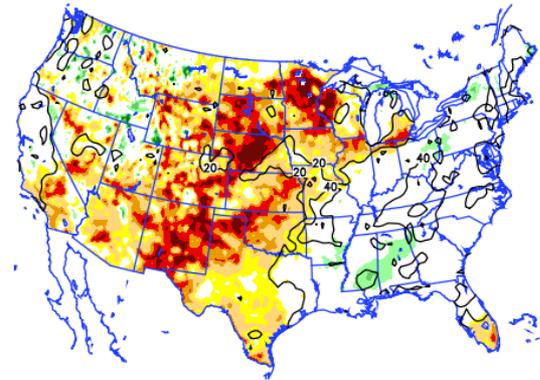
CFSv2-VIC-based ensemble forecast initialized on 20130104  
Shaded: median of 20-member ensemble; Contours: interquartile range

2013-01-08-02:02

Princeton-MSU Fcst  
from 01/04/2013

3/28/2013 (12-week lead)

Predicted Daily Soil Moisture Percentile on 20130328  
(wrt samples within a 49-day window in 1979-2011)

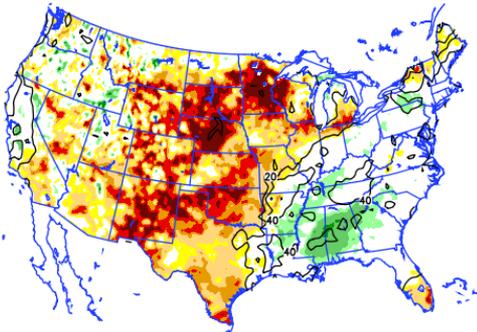


CFSv2-VIC-based ensemble forecast initialized on 20130104  
Shaded: median of 20-member ensemble; Contours: interquartile range

2013-01-08-02:14

2/28/2013 8- week lead

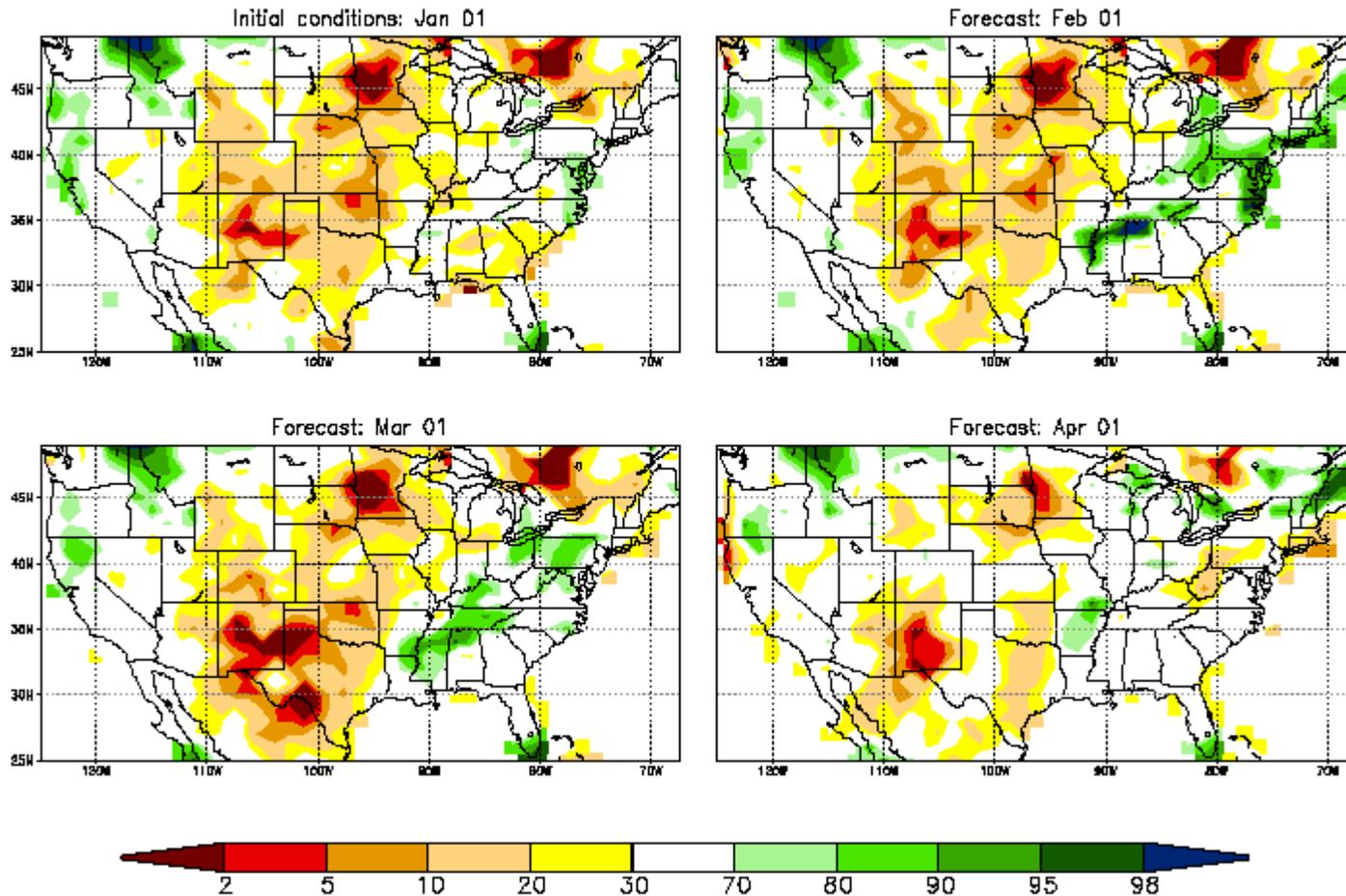
Predicted Daily Soil Moisture Percentile on 20130228  
(wrt samples within a 49-day window in 1979-2011)



CFSv2-VIC-based ensemble forecast initialized on 20130104  
Shaded: median of 20-member ensemble; Contours: interquartile range

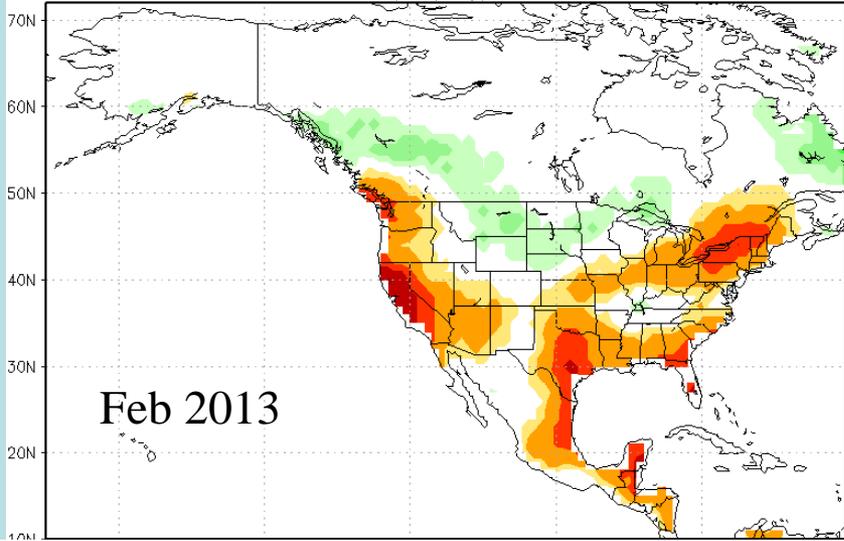
1 5 10 20 30 70 80 90 95 99

## Soil moisture percentile from NASA GEOS-5 forecast system



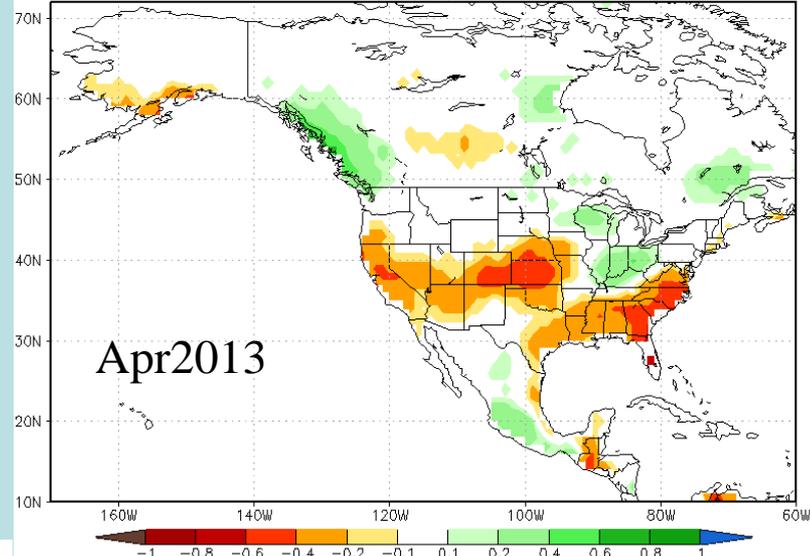
# NMME precip fcsts

NMME Forecast of Prate Anom (mm/day) IC=201301 for Lead 1 2013Feb



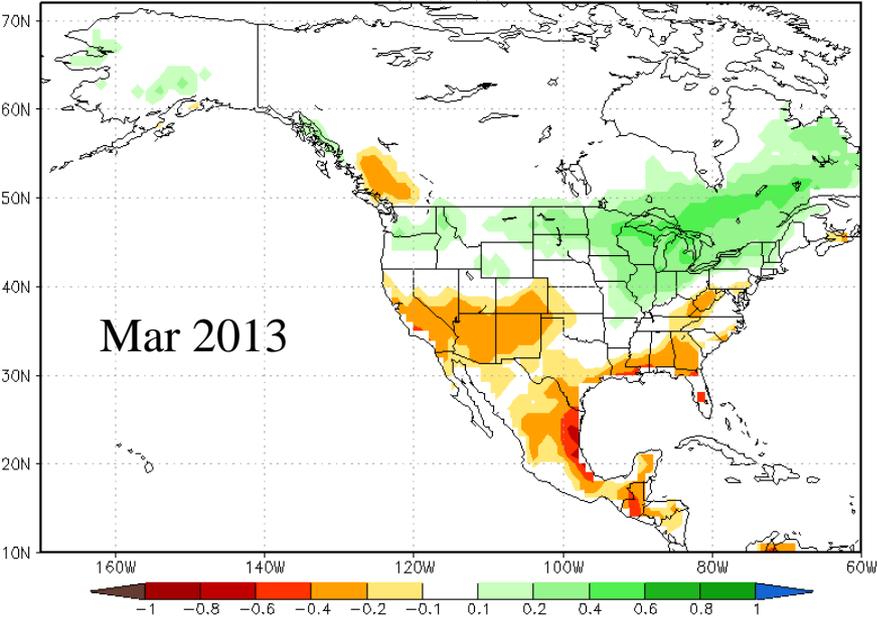
Feb 2013

NMME Forecast of Prate Anom (mm/day) IC=201301 for Lead 3 2013Apr



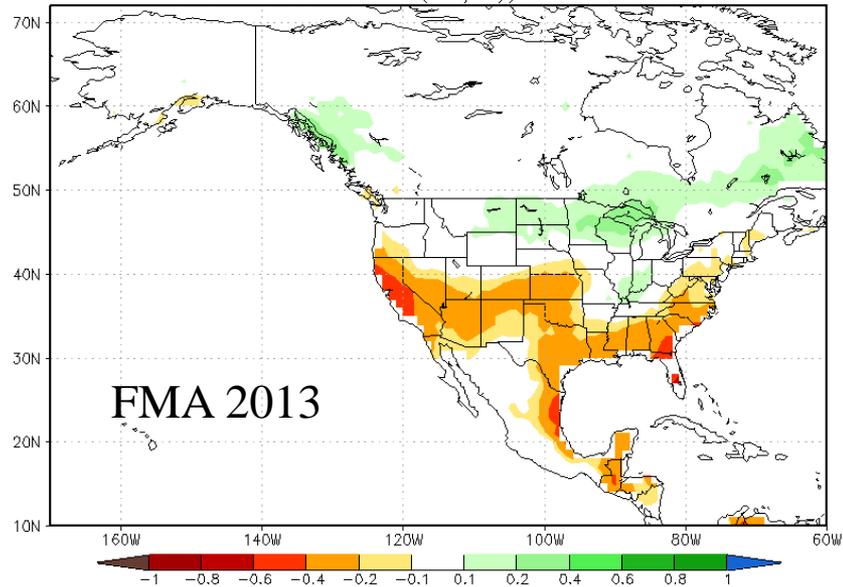
Apr 2013

NMME Forecast of Prate Anom (mm/day) IC=201301 for Lead 2 2013Mar



Mar 2013

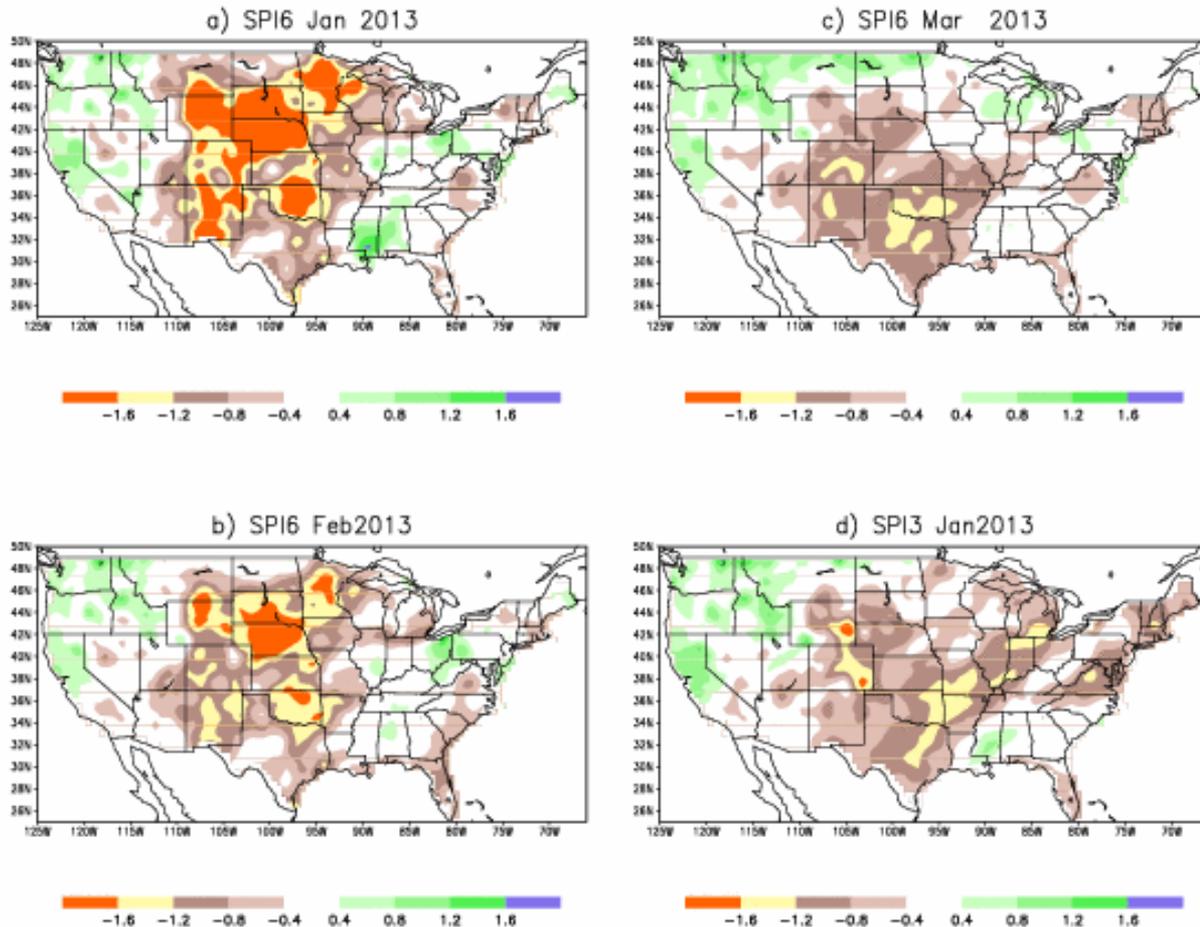
NMME Forecast of Prate Anom (mm/day) IC=201301 for 2013FMA



FMA 2013

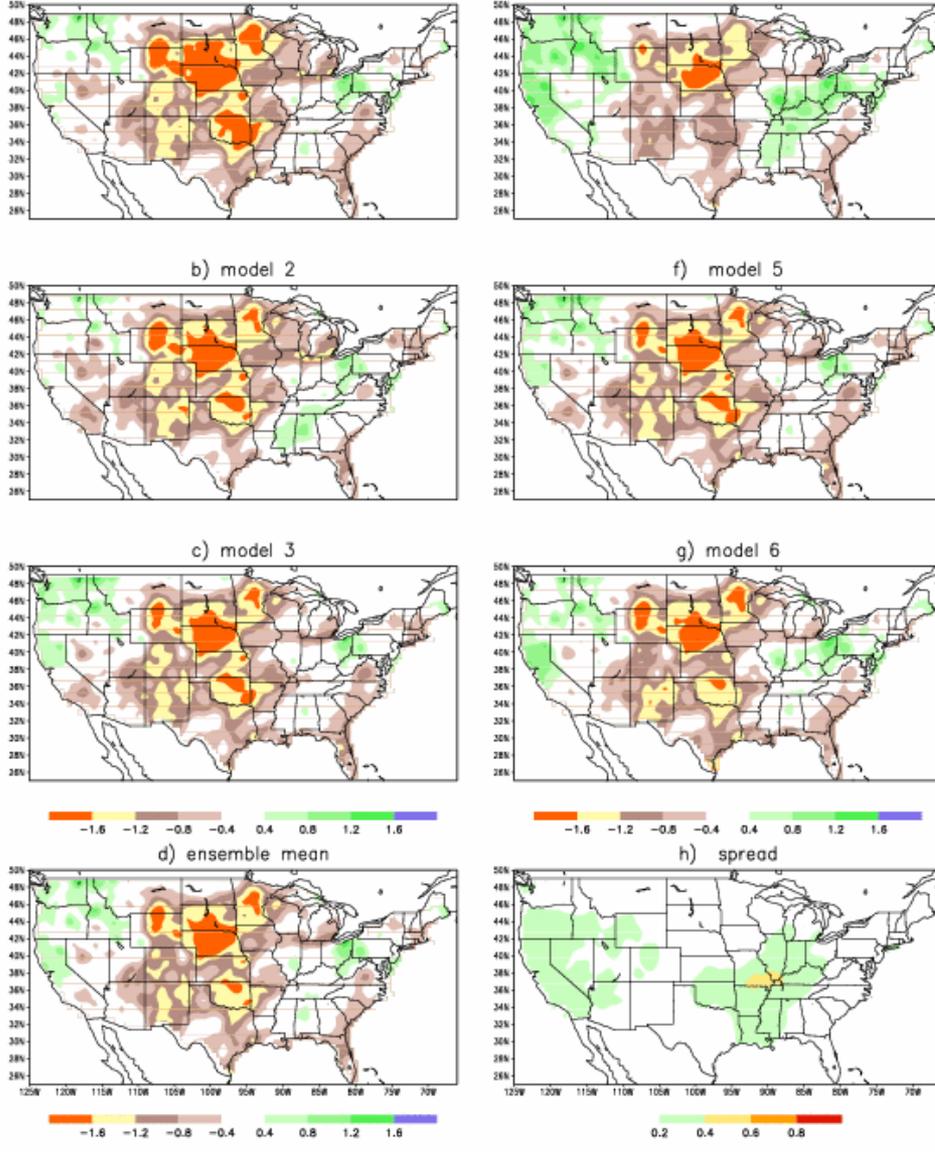
# SPI Fcst Ics Jan 2013

NMME SPI Fcst (ICs=Jan 2013)



# SPI6 Lead 2 Feb 2013

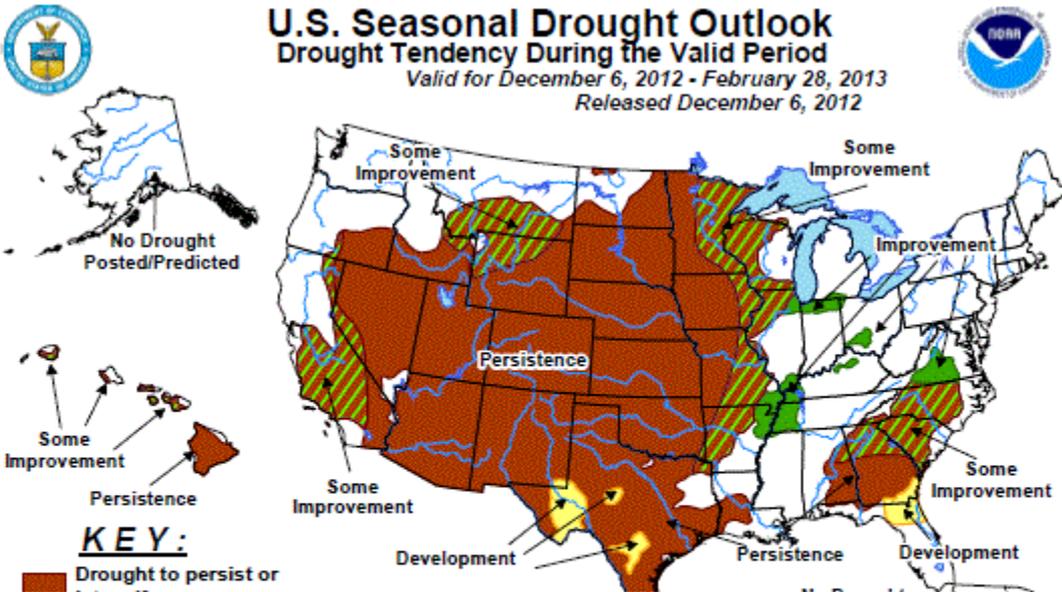
NMME SPI6 Feb Fcst (ICs=Jan 2013)



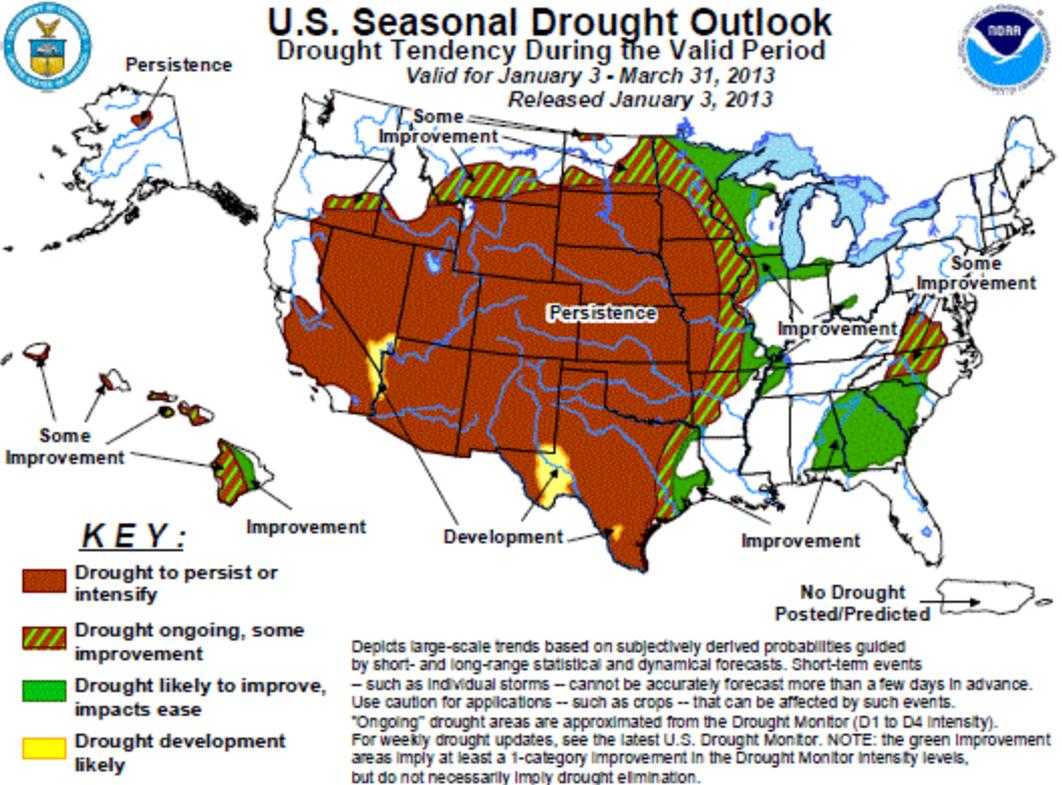
Low spread

# seasonal Drought outlook

**U.S. Seasonal Drought Outlook**  
**Drought Tendency During the Valid Period**  
 Valid for December 6, 2012 - February 28, 2013  
 Released December 6, 2012



**U.S. Seasonal Drought Outlook**  
**Drought Tendency During the Valid Period**  
 Valid for January 3 - March 31, 2013  
 Released January 3, 2013



← Jan 3 release

# Conclusions

## **Ocean conditions :**

**ENSO : Neutral**

**With warm SSTAs along the Atlantic coast and tropical north Atlantic**

## **Current conditions:**

**Drought continues over most United States with the center located over the Great plains .**

**Drought over the Southeast had some relieve**

# Prediction

- Oceanic conditions
- ENSO normal
- Warm SSTAs along the Atlantic coast
- Drought
- All forecasts indicate that drought over the Central United States will continue for 2-3 months.