

MIDWEST AND GREAT PLAINS DROUGHT AND CLIMATE OUTLOOK

16 JANUARY 2014

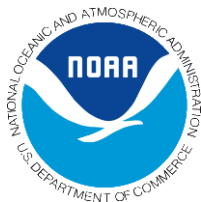
DR. STUART FOSTER

STATE CLIMATOLOGIST FOR KENTUCKY

WESTERN KENTUCKY UNIVERSITY

STUART.FOSTER@WKU.EDU

270-745-5983



GENERAL INFORMATION

Providing climate services to the Midwest and Great Plains
Collaboration Activity Among:

- Doug Kluck and John Eise (NOAA), State Climatologists and the Midwest Regional Climate Center, High Plains Regional Climate Center, NOAAs Climate Prediction Center, Iowa State University, National Drought Mitigation Center

Next Climate/Drought Outlook Webinar

- February 20, 2014 (1 PM CDT)

Access to Future Climate Webinars and Information

<http://www.drought.gov/drought/content/regional-programs/regional-drought-webinars>

<http://mrcc.isws.illinois.edu/webinars.htm>

<http://www.hprcc.unl.edu/webinars.php>

Operator Assistance for questions at the end

CURRENT CONDITIONS AND CONTEXT

Look back at 2012 and 2013

The past month

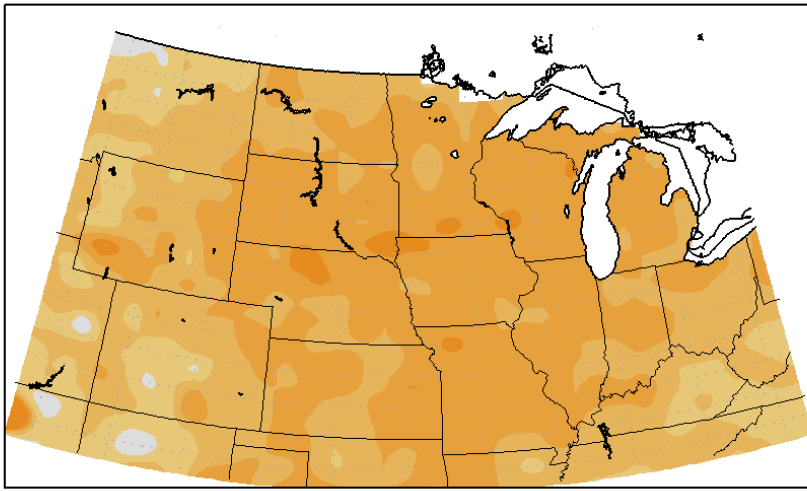
Drought status

Snowpack and runoff

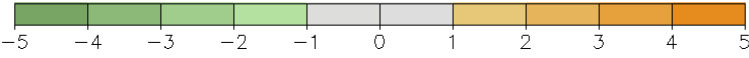
WHAT A DIFFERENCE A YEAR MAKES

TEMPERATURE

Average Temperature (°F): Departure from Mean
January 1, 2012 to December 31, 2012

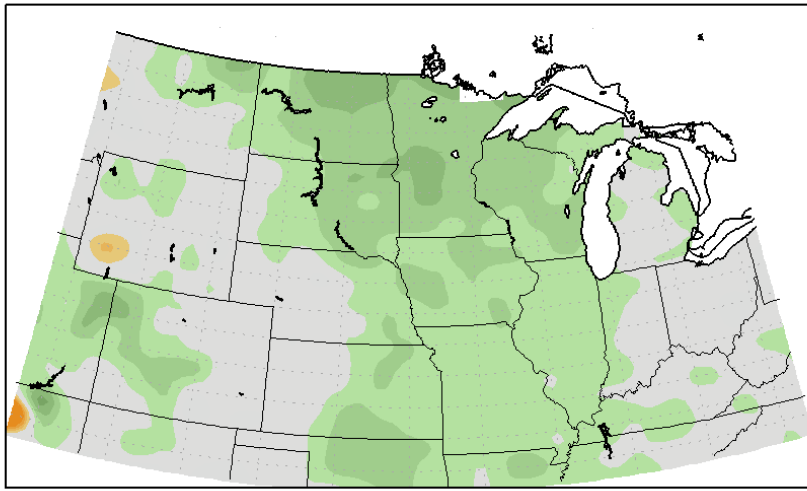


Mean period is 1981-2010.

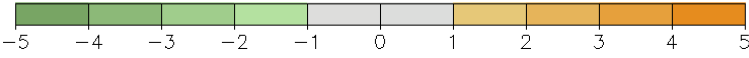


Midwestern Regional Climate Center
cli-MATE: MRCC Application Tools Environment
Generated at: 1/16/2014 10:06:26 AM CST

Average Temperature (°F): Departure from Mean
January 1, 2013 to December 31, 2013



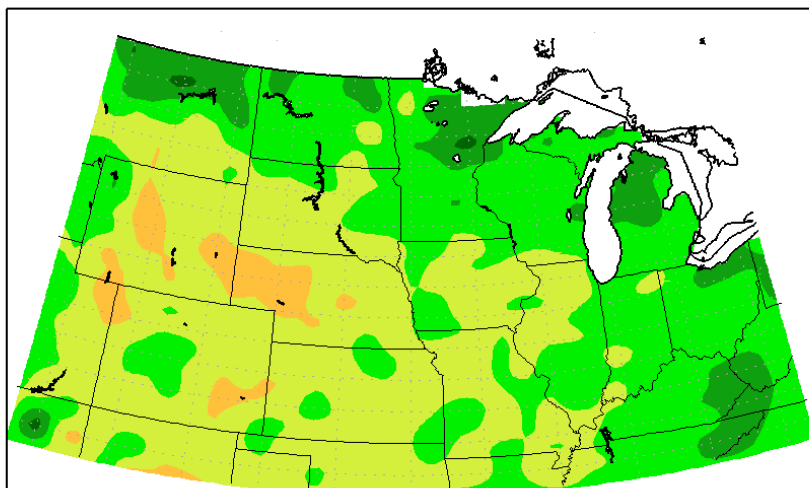
Mean period is 1981-2010.



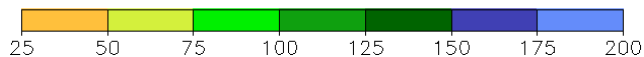
Midwestern Regional Climate Center
cli-MATE: MRCC Application Tools Environment
Generated at: 1/16/2014 10:06:51 AM CST

WHAT A DIFFERENCE A YEAR MAKES *PRECIPITATION*

Accumulated Precipitation: Percent of Mean
January 1, 2012 to December 31, 2012

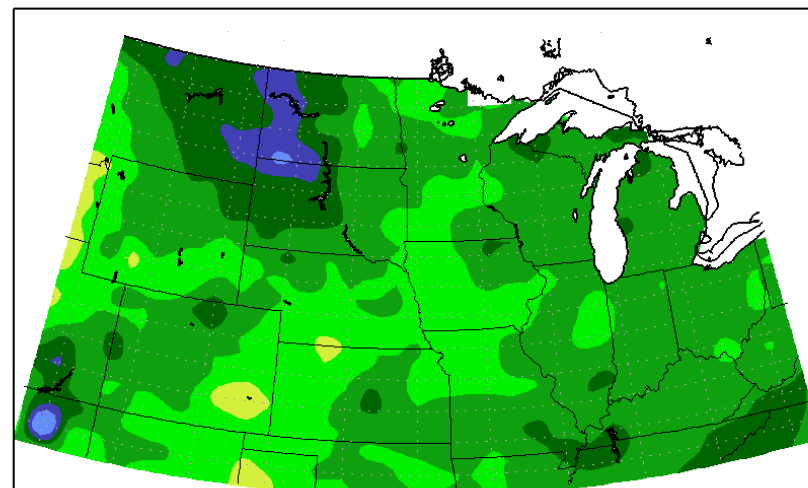


Mean period is 1981-2010.



Midwestern Regional Climate Center
cli-MATE: MRCC Application Tools Environment
Generated at: 1/16/2014 10:10:02 AM CST

Accumulated Precipitation: Percent of Mean
January 1, 2013 to December 31, 2013



Mean period is 1981-2010.



Midwestern Regional Climate Center
cli-MATE: MRCC Application Tools Environment
Generated at: 1/16/2014 10:10:24 AM CST

Significant Events for December 2013



NOAA's
National Climatic Data Center



The contiguous U.S. drought footprint remained virtually unchanged during Dec. Abnormally dry conditions expanded in the Northwest and contracted in the Southeast.



MN and ND had a top 10 cold Dec. with temperatures 8.2°F and 8.4°F below average, respectively.



Several winter storms impacted the nation during Dec. The contiguous U.S. snow cover extent was the 8th largest on record for the month.



CA, OR, WA were top 10 dry. The Pfeiffer Fire in Big Sur, CA burned over 900 acres and destroyed 34 homes.



A severe weather outbreak on Dec. 21 led to 14 preliminary tornado reports in the Mid-South and Ohio Valley. AR and MS each reported a fatality.



The Southeast and Mid-Atlantic were warm and wet. FL was top 10 warm. AL, GA, OH, WV, and VA were top 10 wet.



AK had its 5th wettest Dec. Barrow was record wet.



Windward locations on the Big Island, Maui, and Kauai were wetter than average. Hilo had its 10th wettest Dec. on record.

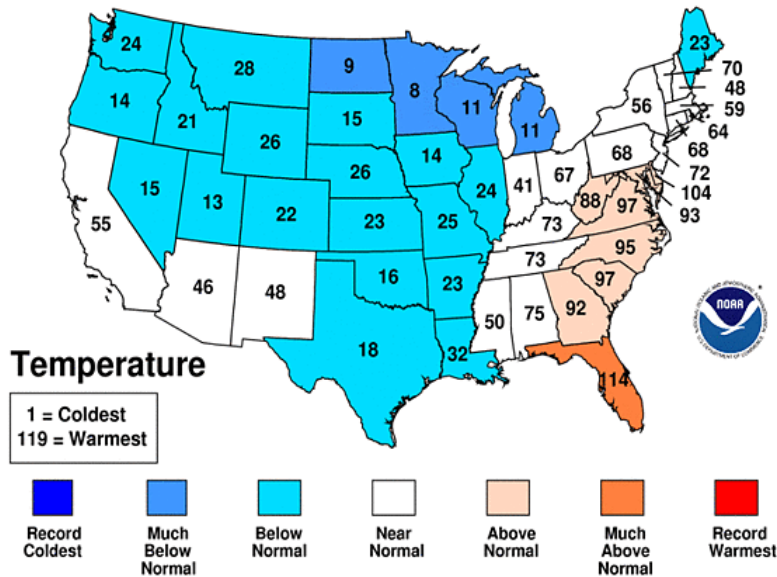
The average U.S. temperature during December was 30.9°F, 2.0°F below the 20th century average. December U.S. precipitation was 2.17 inches, 0.06 inch below the 20th century average.

TEMPERATURE

DEC 2013 & OND 2013

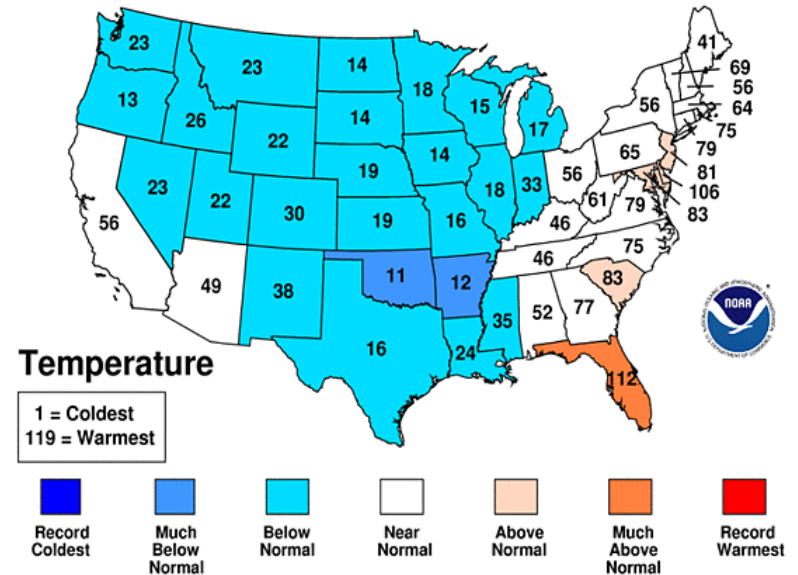
December 2013 Statewide Ranks

National Climatic Data Center/NESDIS/NOAA



October-December 2013 Statewide Ranks

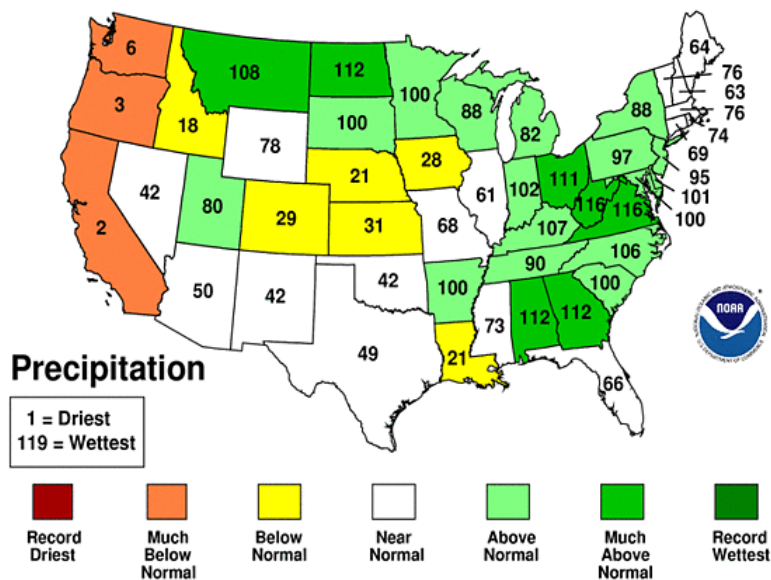
National Climatic Data Center/NESDIS/NOAA



PRECIPITATION DEC 2013 & OND 2013

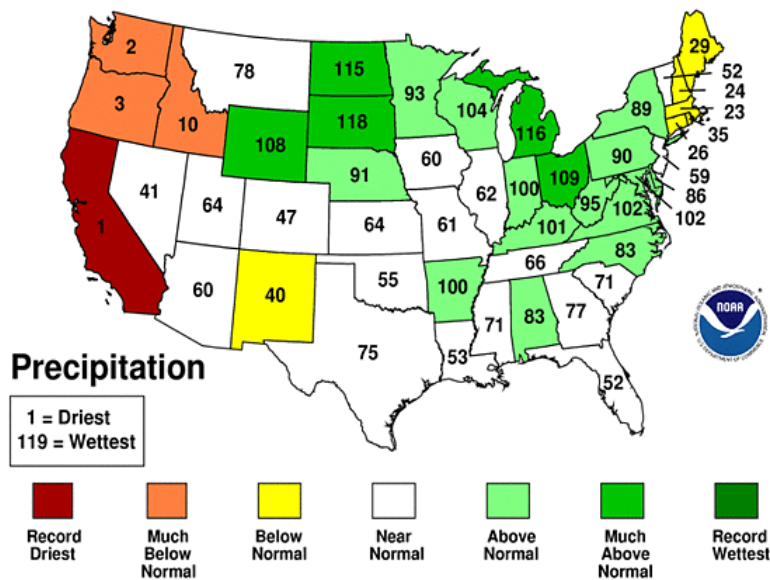
December 2013 Statewide Ranks

National Climatic Data Center/NESDIS/NOAA



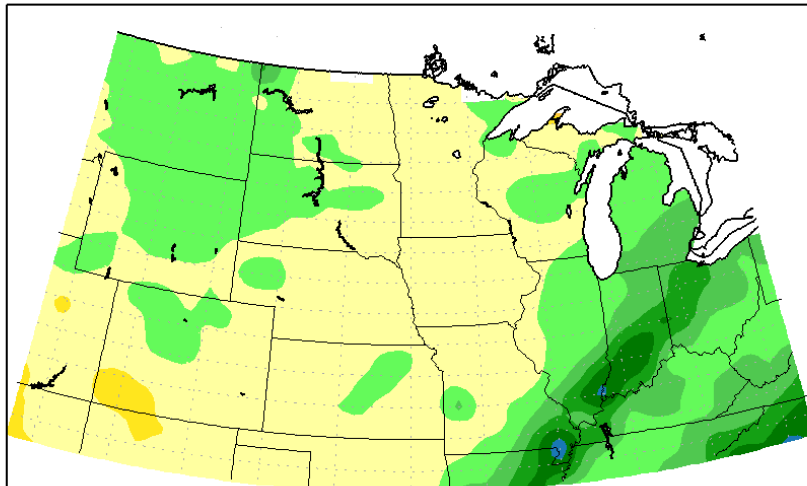
October-December 2013 Statewide Ranks

National Climatic Data Center/NESDIS/NOAA



30-DAY PRECIPITATION

Accumulated Precipitation (in): Departure from Mean
December 18, 2013 to January 16, 2014

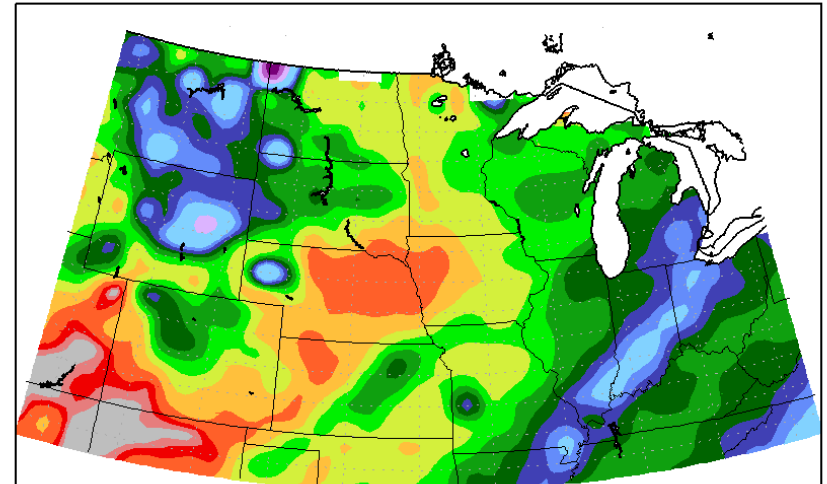


Mean period is 1981-2010.

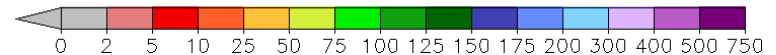


Midwestern Regional Climate Center
cli-MATE: MRCC Application Tools Environment
Generated at: 1/16/2014 9:35:17 AM CST

Accumulated Precipitation: Percent of Mean
December 18, 2013 to January 16, 2014



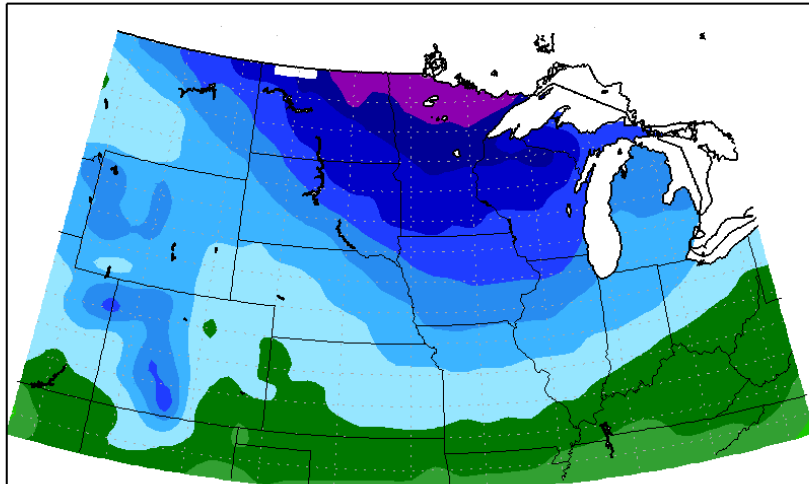
Mean period is 1981-2010.



Midwestern Regional Climate Center
cli-MATE: MRCC Application Tools Environment
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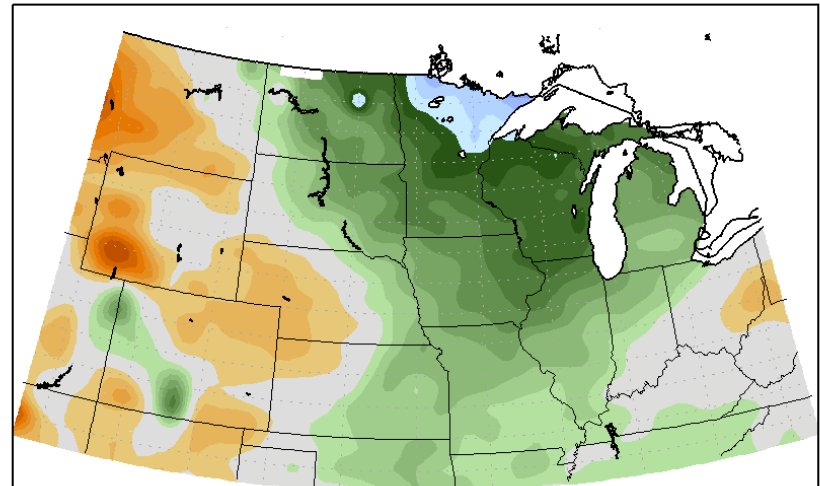
30-DAY TEMPERATURE

Average Temperature (°F)
December 18, 2013 to January 15, 2014



Midwestern Regional Climate Center
cli-MATE: MRCC Application Tools Environment
Generated at: 1/16/2014 9:36:24 AM CST

Average Temperature (°F): Departure from Mean
December 18, 2013 to January 15, 2014



Mean period is 1981-2010.

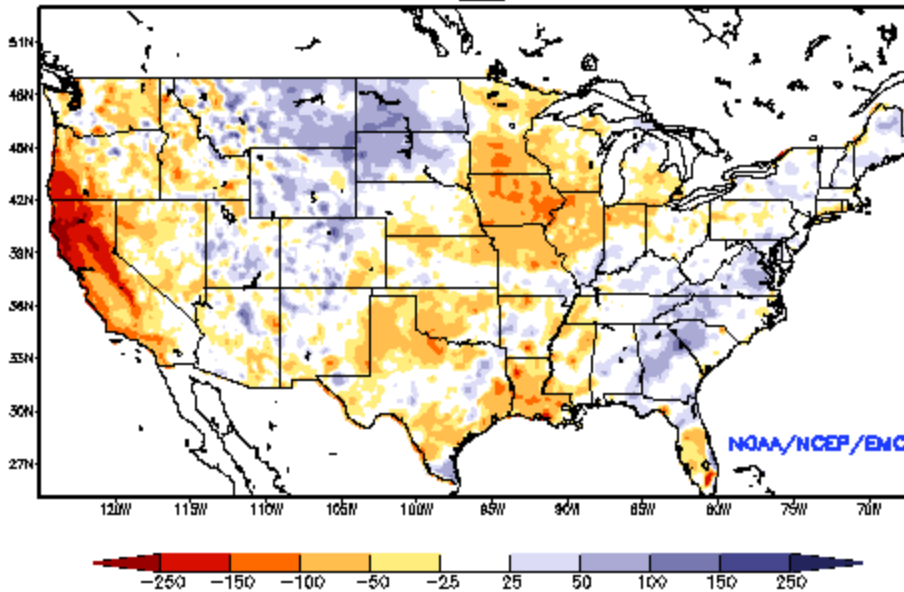


Midwestern Regional Climate Center
cli-MATE: MRCC Application Tools Environment
Generated at: 1/16/2014 9:36:43 AM CST

SOIL MOISTURE ANOMALY

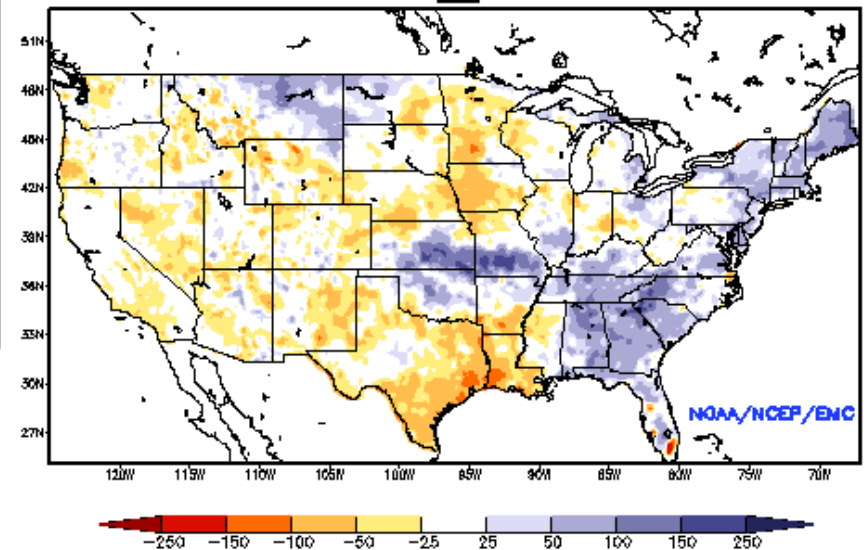
January 11, 2014

Ensemble-Mean - Current Total Column Soil Moisture Anomaly (mm)
NCEP NLDAS Products Valid: JAN 11, 2014



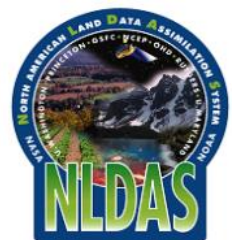
August 10, 2013

Ensemble-Mean - Current Total Column Soil Moisture Anomaly (mm)
NCEP NLDAS Products Valid: AUG 10, 2013



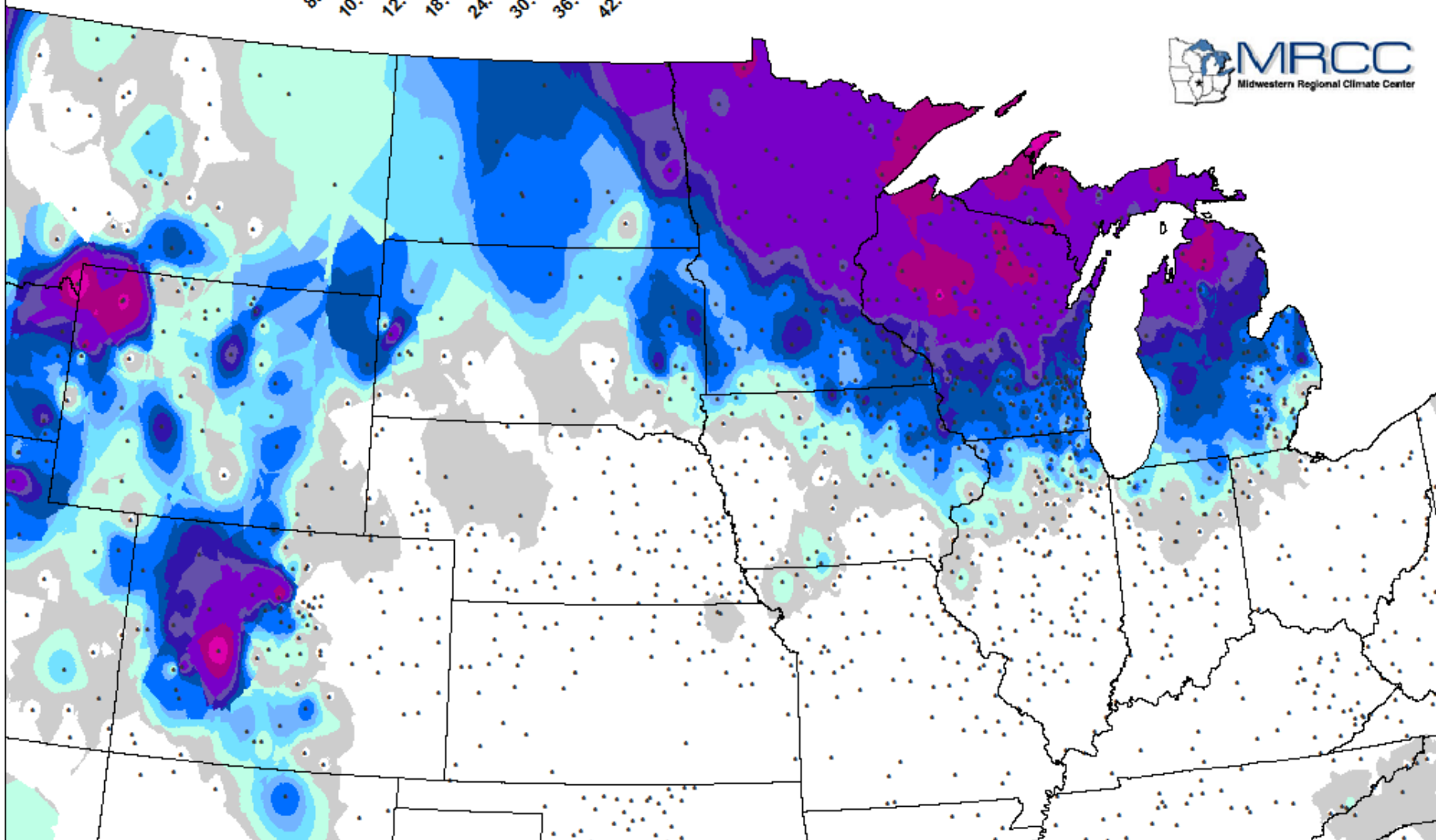
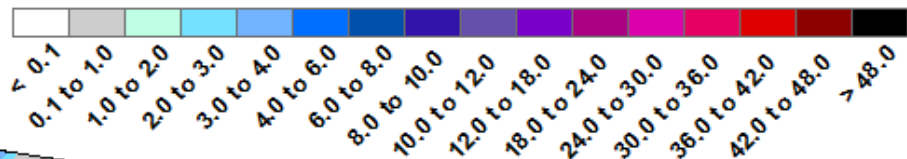
Soil Moisture Anomaly in
millimeters

<http://www.emc.ncep.noaa.gov/mmb/nldas/drought/>



Daily Station Snow Depth (inches)

24-Hour Period Ending the Morning of 1/15/2014

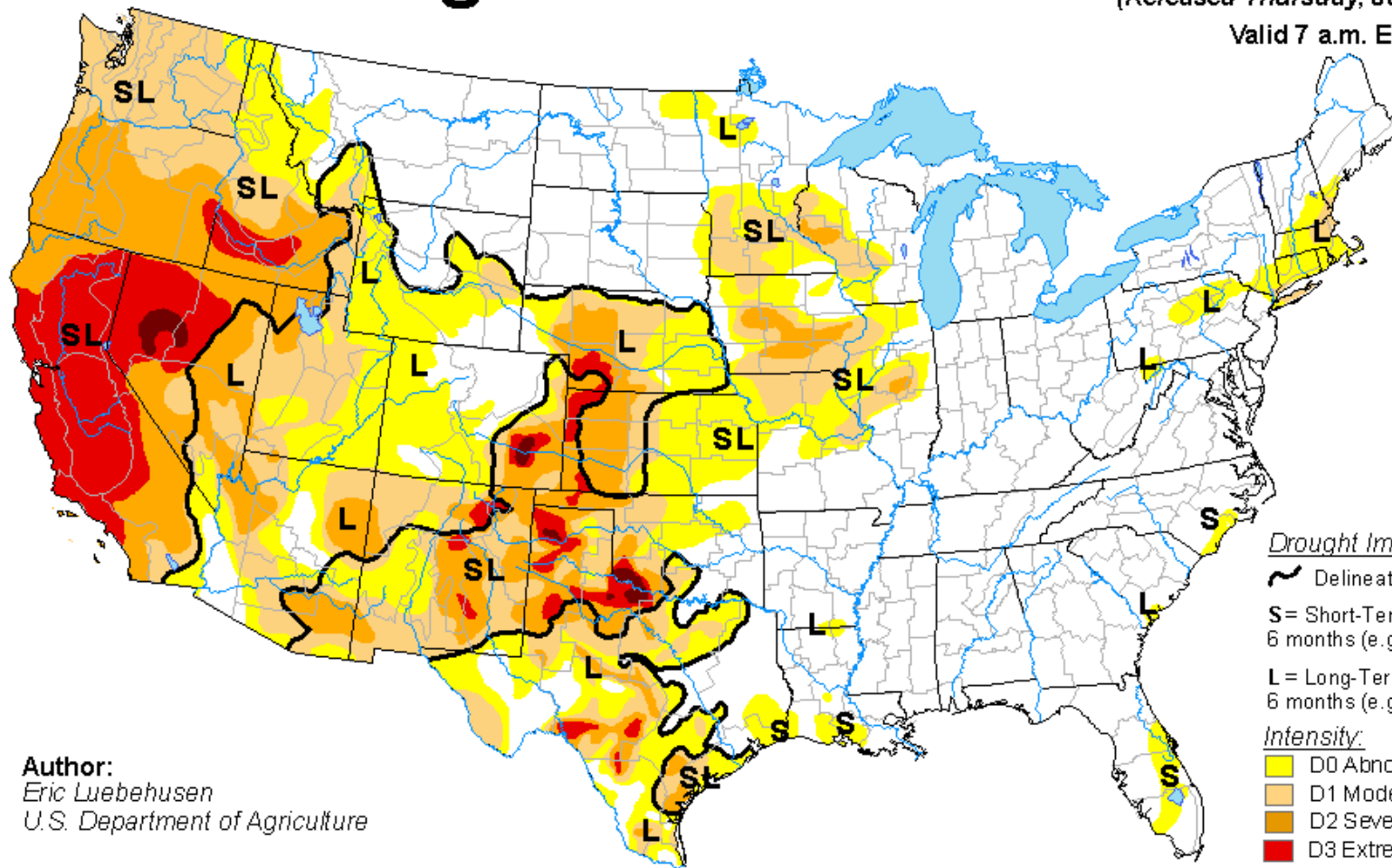


U.S. Drought Monitor

January 14, 2014

(Released Thursday, Jan. 16, 2014)

Valid 7 a.m. EST



Author:
Eric Luebehusen
U.S. Department of Agriculture

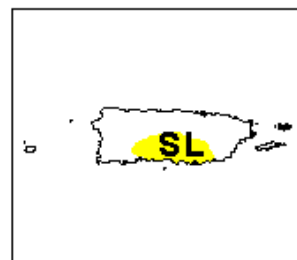
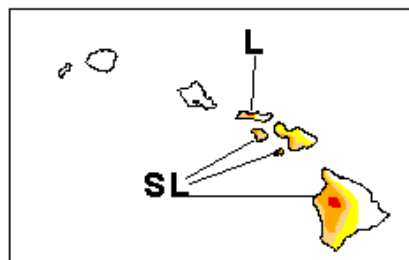
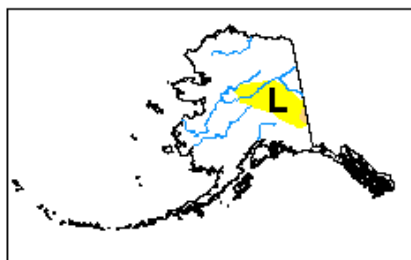
Drought Impact Types:

- ~ Delineates dominant impacts
- S= Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
- L= Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

Intensity:

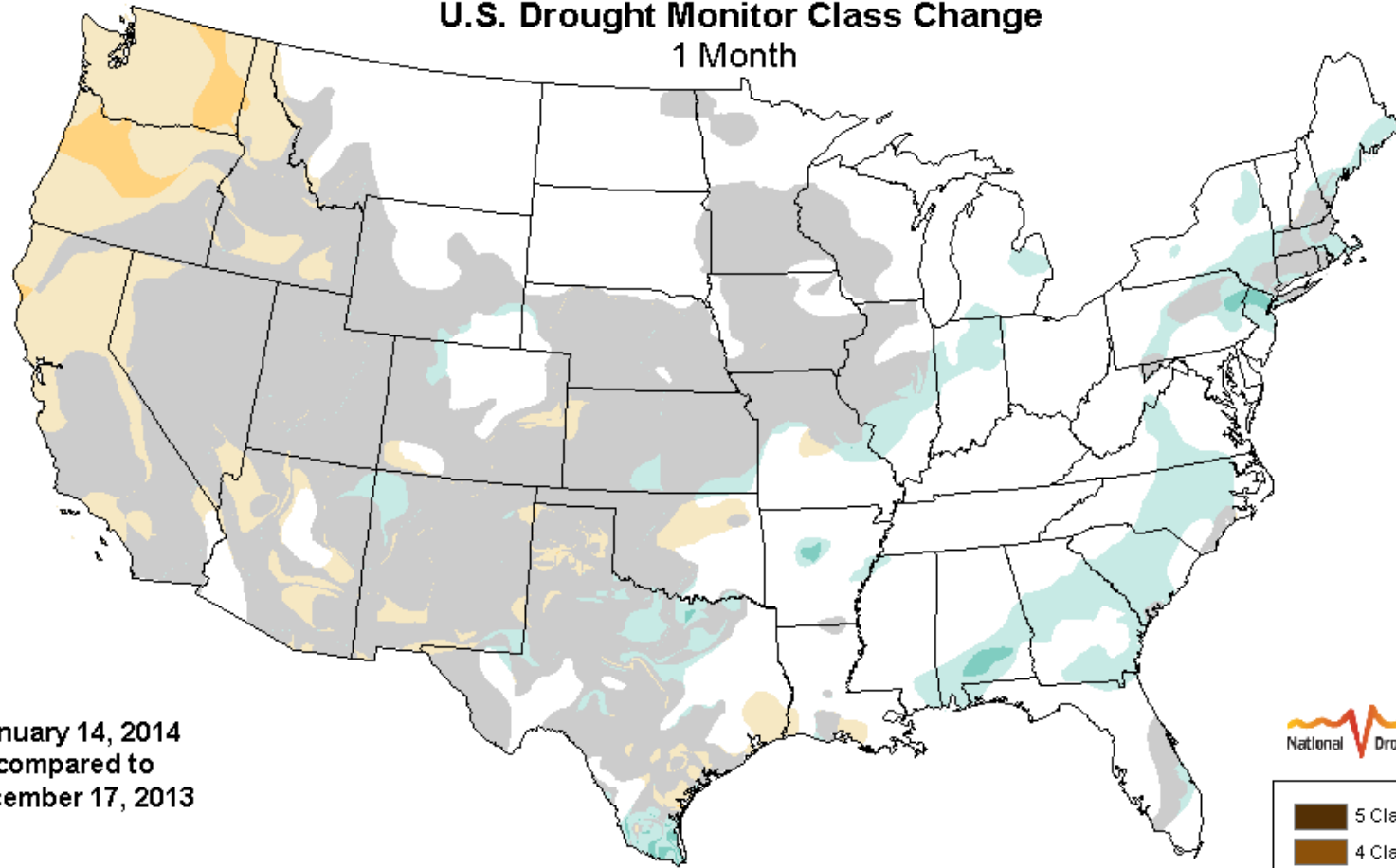
- Yellow: D0 Abnormally Dry
- Light Orange: D1 Moderate Drought
- Dark Orange: D2 Severe Drought
- Red: D3 Extreme Drought
- Dark Red: D4 Exceptional Drought

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



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

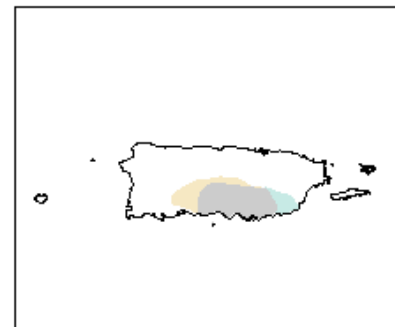
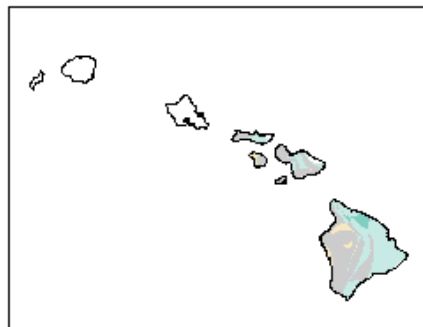
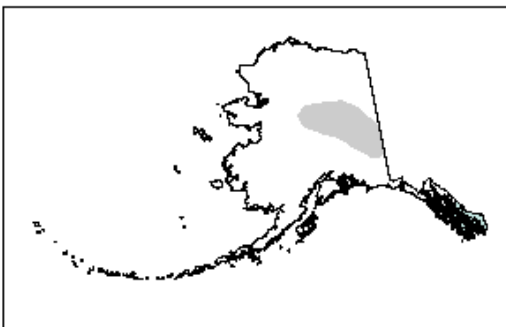
U.S. Drought Monitor Class Change 1 Month



January 14, 2014
compared to
December 17, 2013

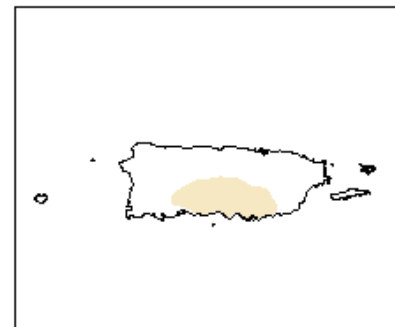
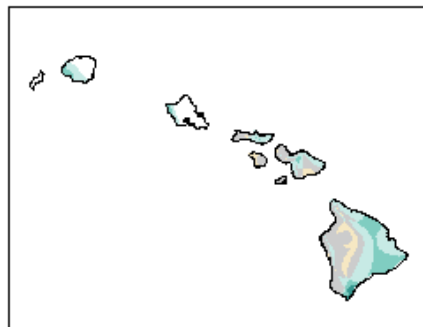
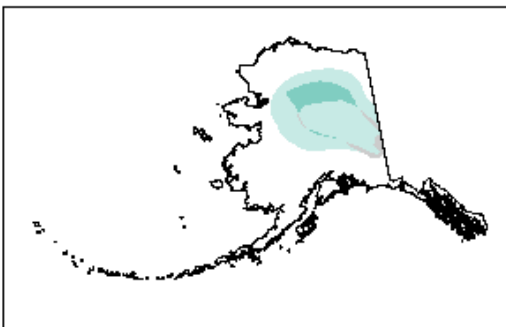
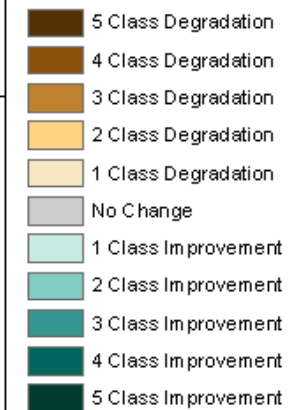


- 5 Class Degradation
- 4 Class Degradation
- 3 Class Degradation
- 2 Class Degradation
- 1 Class Degradation
- No Change
- 1 Class Improvement
- 2 Class Improvement
- 3 Class Improvement
- 4 Class Improvement
- 5 Class Improvement



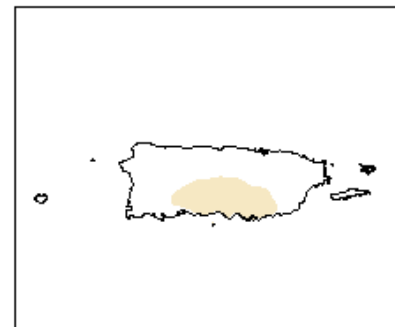
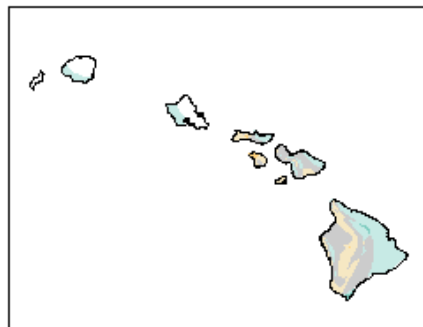
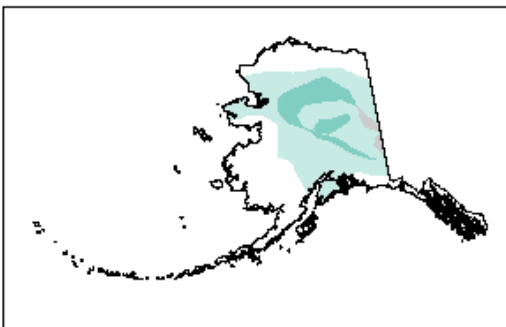
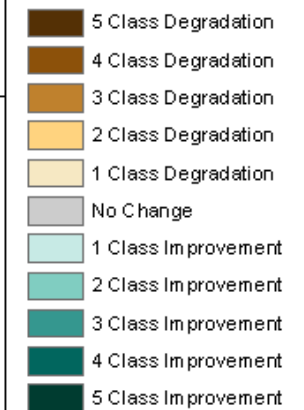
U.S. Drought Monitor Class Change 3 Months

January 14, 2014
compared to
October 22, 2013

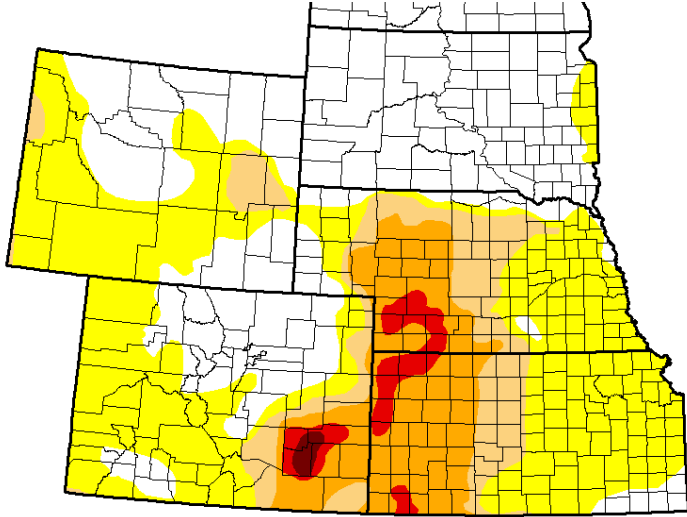


U.S. Drought Monitor Class Change 6 Months

January 14, 2014
compared to
July 30, 2013



THE REAL QUESTION: WESTERN KANSAS AND NEBRASKA

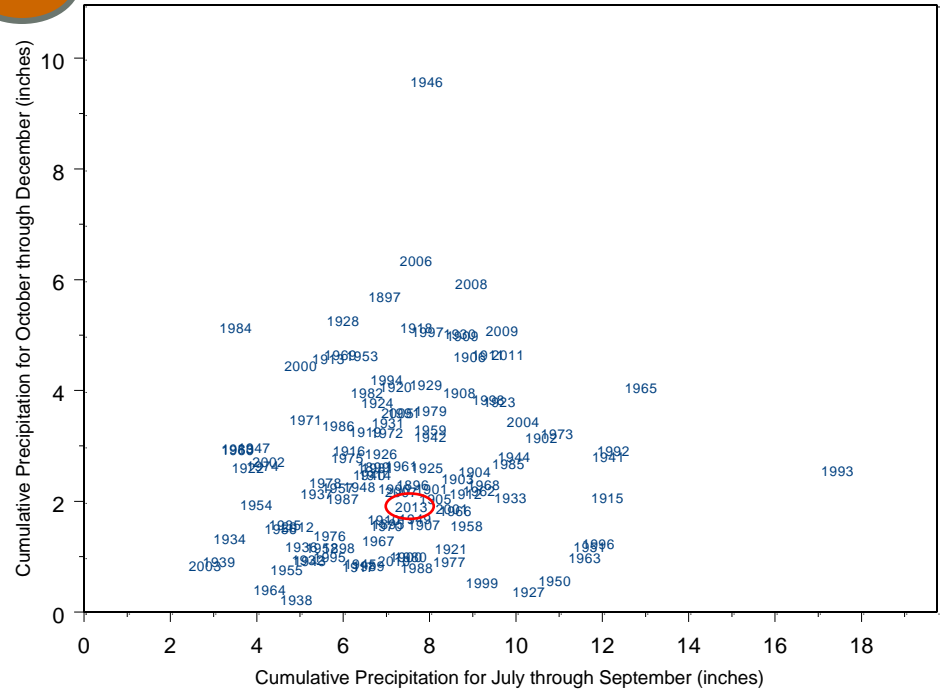


2

Period	Total Precipitation (in)
1955-56	24.68
1954-55	26.89
1934-35	27.47
2002-03	27.52
1936-37	28.54
1935-36	28.91
2012-13	28.97

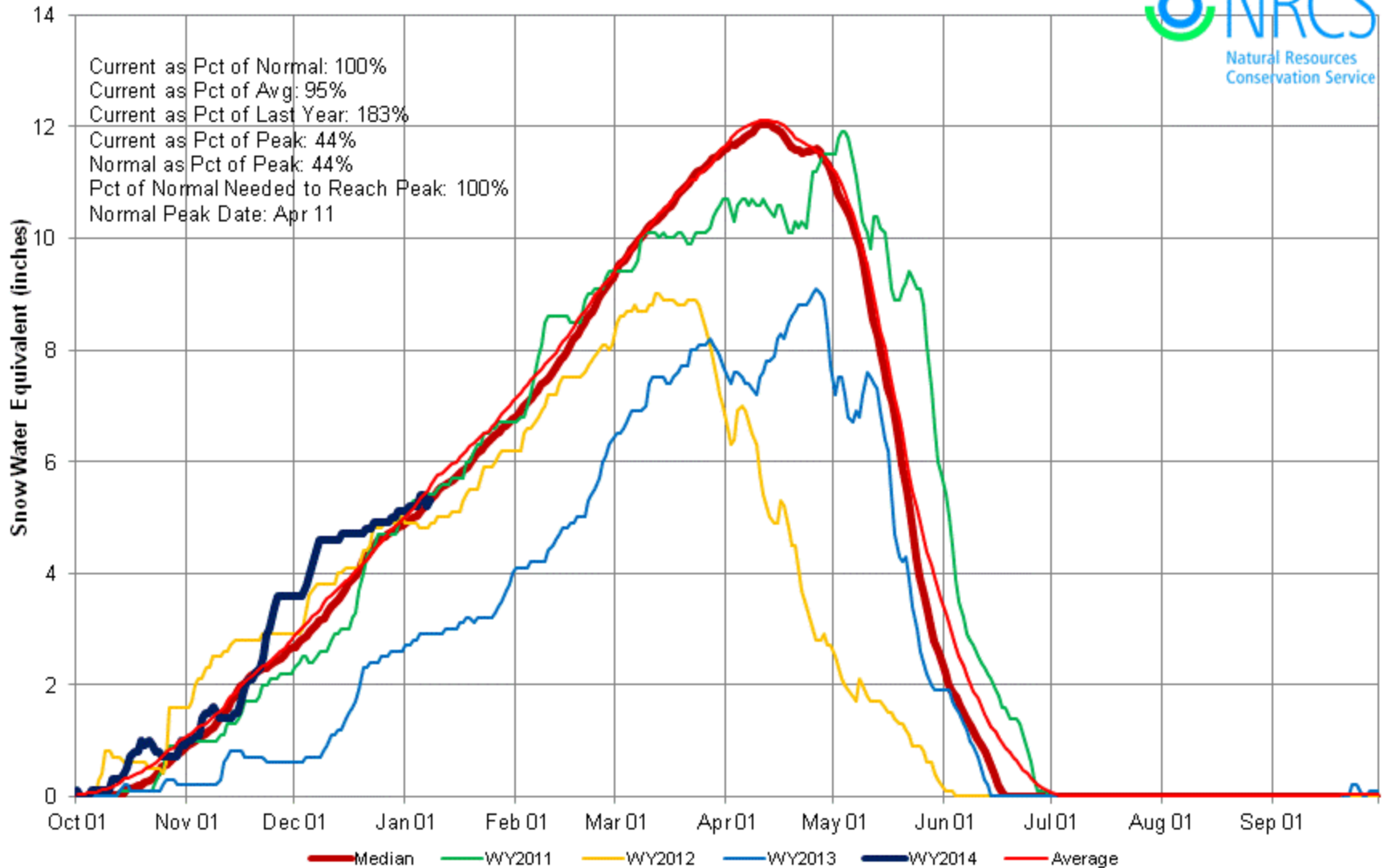
1

Historical Persistence of the Precipitation Pattern, JAS and OND
Kansas Northwest (01) Climate Division



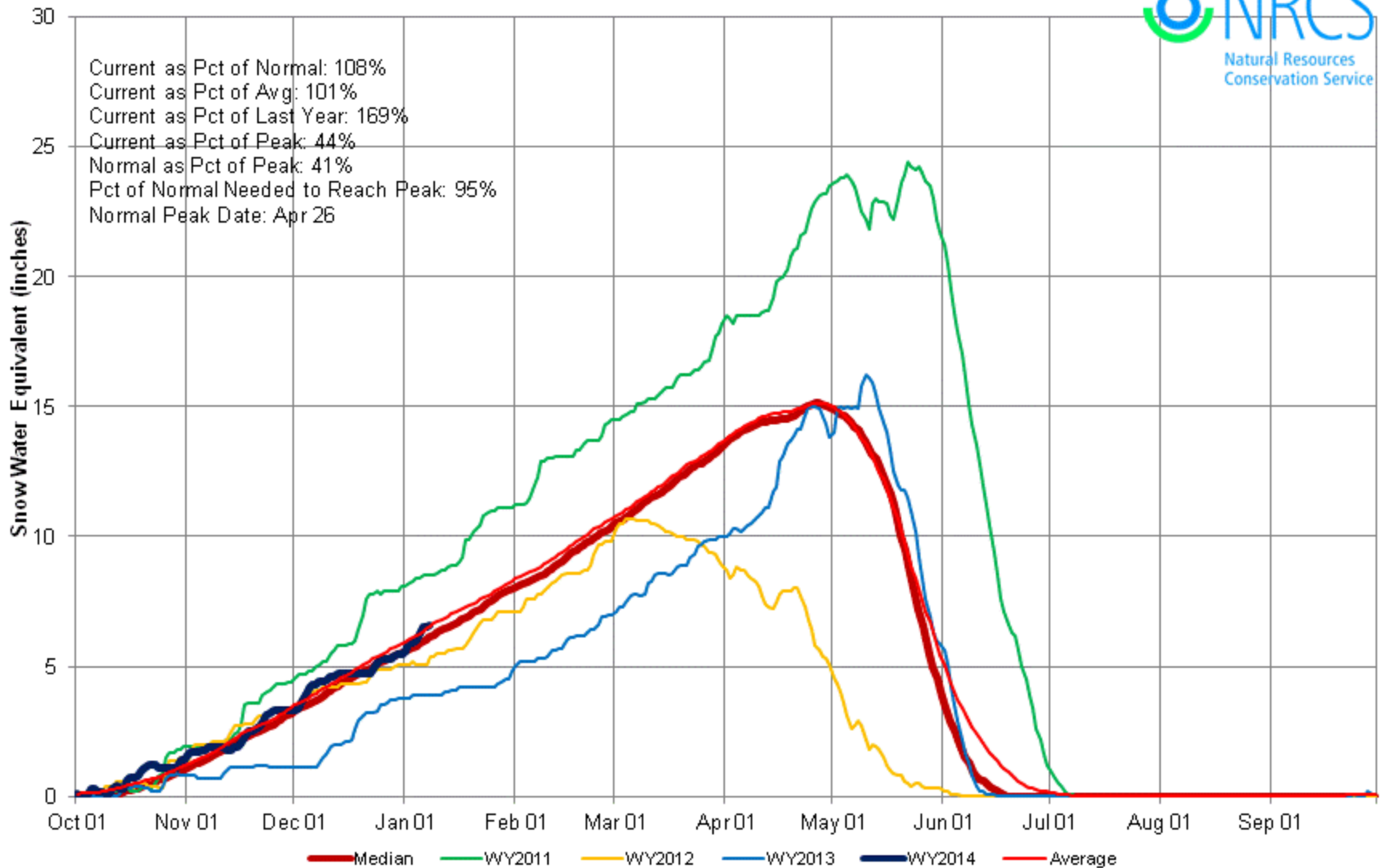
Arkansas River Basin Time Series Snowpack Summary

Based on Provisional SNOTEL data as of Jan 08, 2014



South Platte River Basin Time Series Snowpack Summary

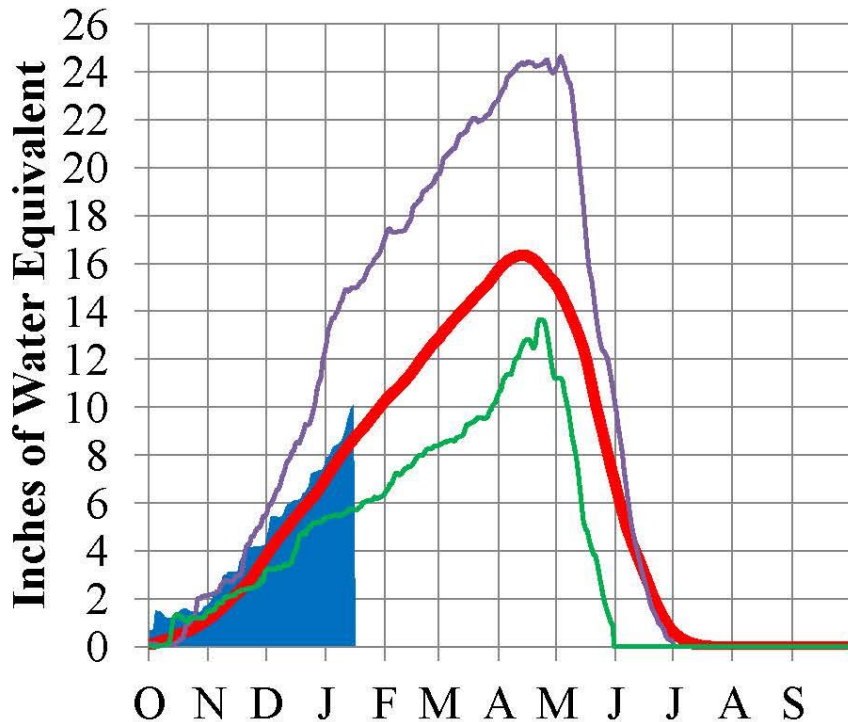
Based on Provisional SNOTEL data as of Jan 08, 2014



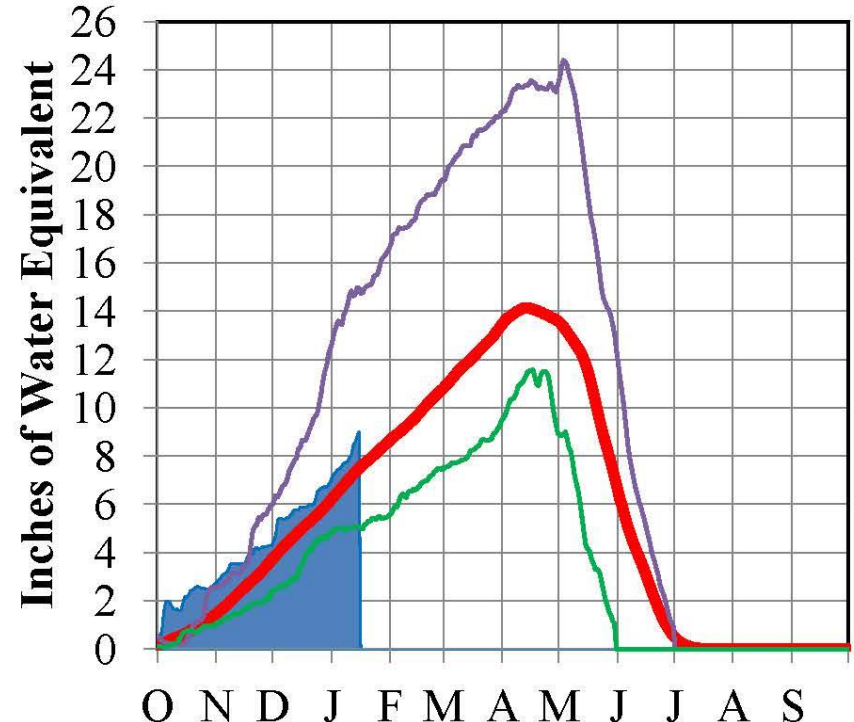
Missouri River Basin – Mountain Snowpack Water Content 2013-2014 with comparison plots from 1997* and 2001*

January 15, 2014

Total above Fort Peck



Total Fort Peck to Garrison



■ 2013-14 ■ 1981-2010 Ave ■ 1997 ■ 2001

■ 2013-14 ■ 1981-2010 Ave ■ 1997 ■ 2001

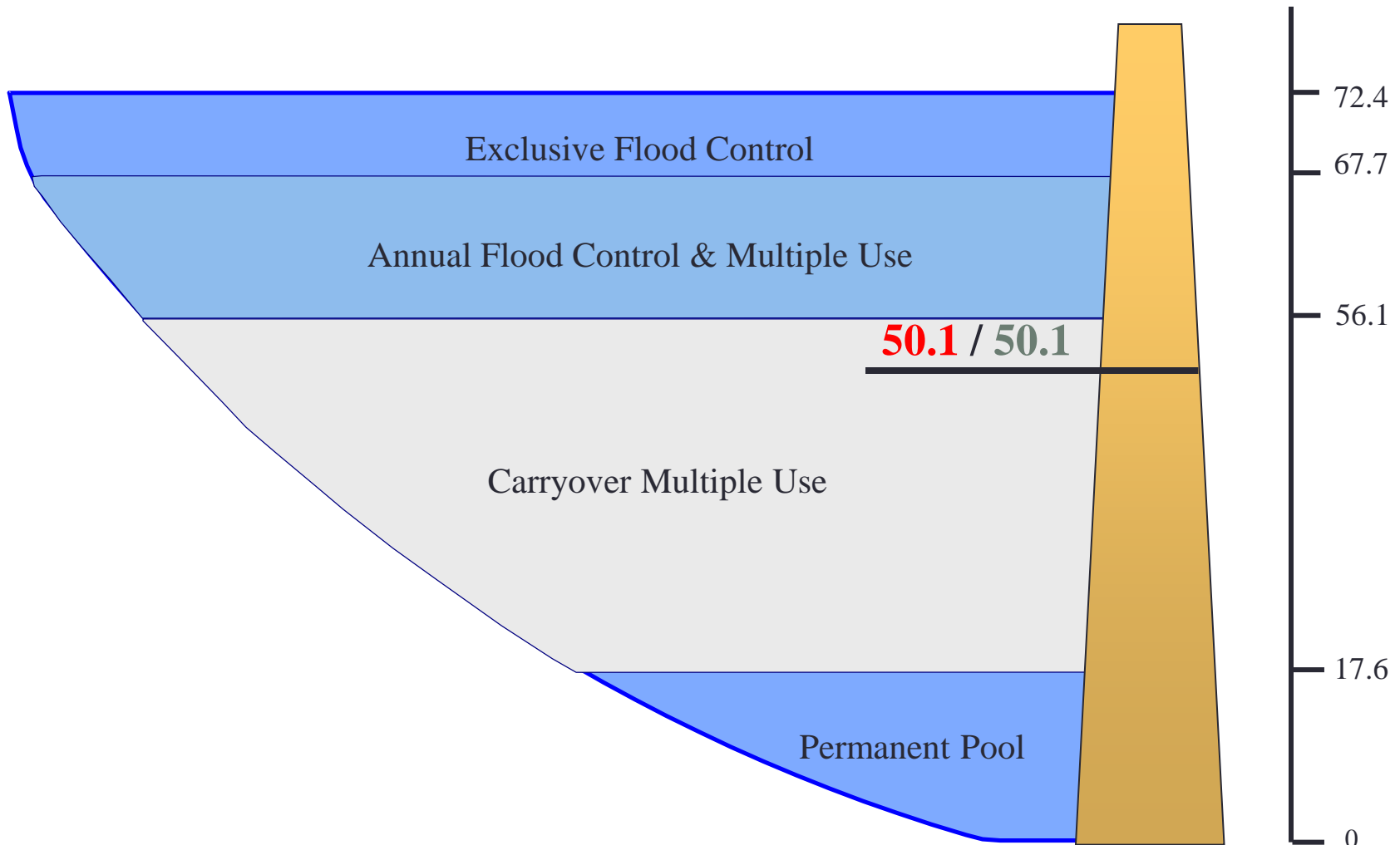
The Missouri River basin mountain snowpack normally peaks near April 15. By January 15 normally 54% of the peak has accumulated. On January 15, 2014 the mountain snowpack in the “Total above Fort Peck” reach is currently 10”, 115% of the 1981-2010 30-year average. The mountain snowpack in the “Total Fort Peck to Garrison” reach is currently 9.0”, 119% of the 1981-2010 30-year average.

*Generally considered the high and low year of the last 20-year period.

Provisional data. Subject to revision.

Missouri River Mainstem Reservoir System Current and Forecast Reservoir Levels **January 15, 2014** and March 1, 2014

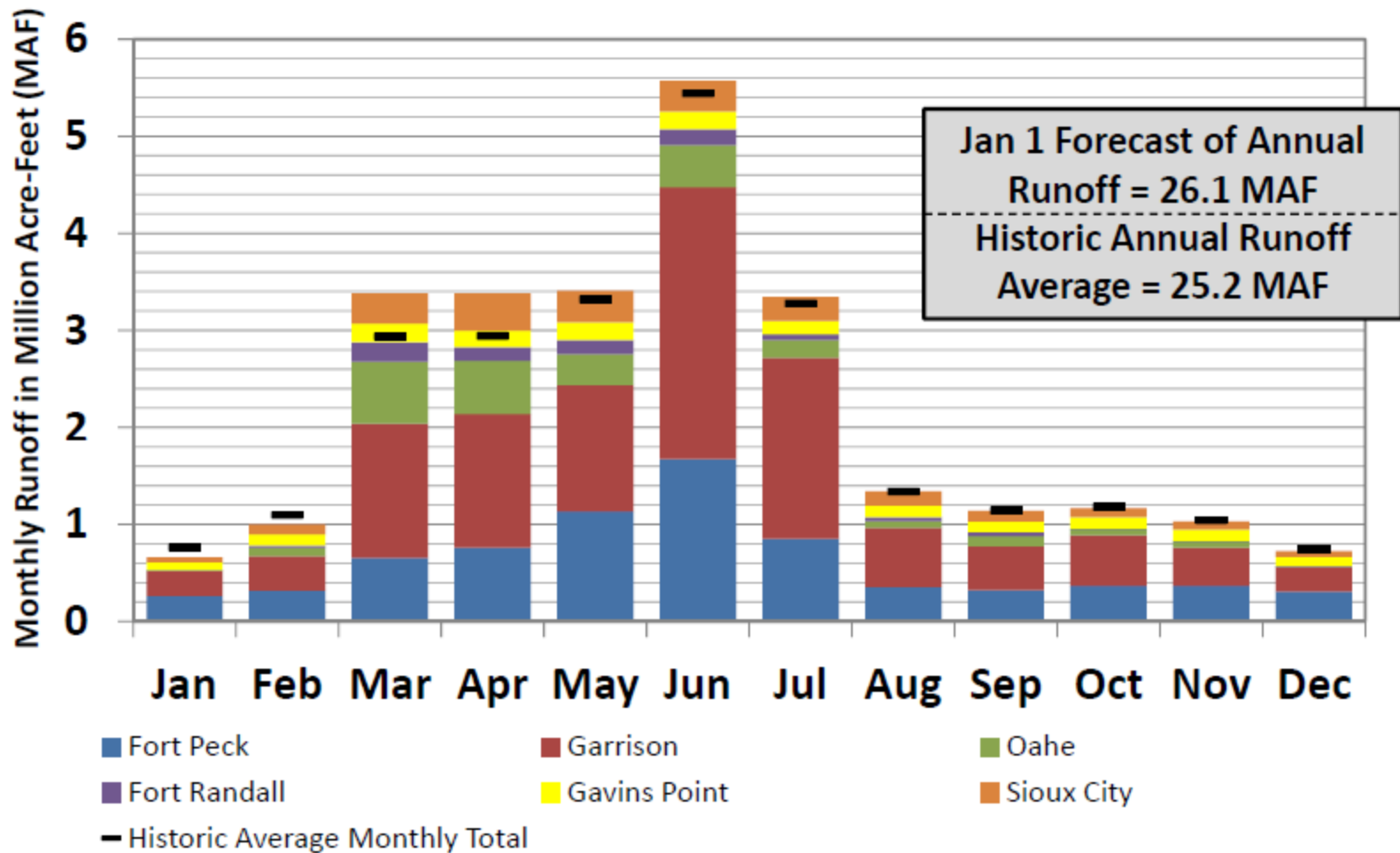
System Storage
million acre feet (MAF)



6.0 / 6.0 MAF into Carryover Multiple Use Zone

Missouri River Basin

2014 Runoff Forecast above Sioux City*



* Forecast as of January 1, 2014

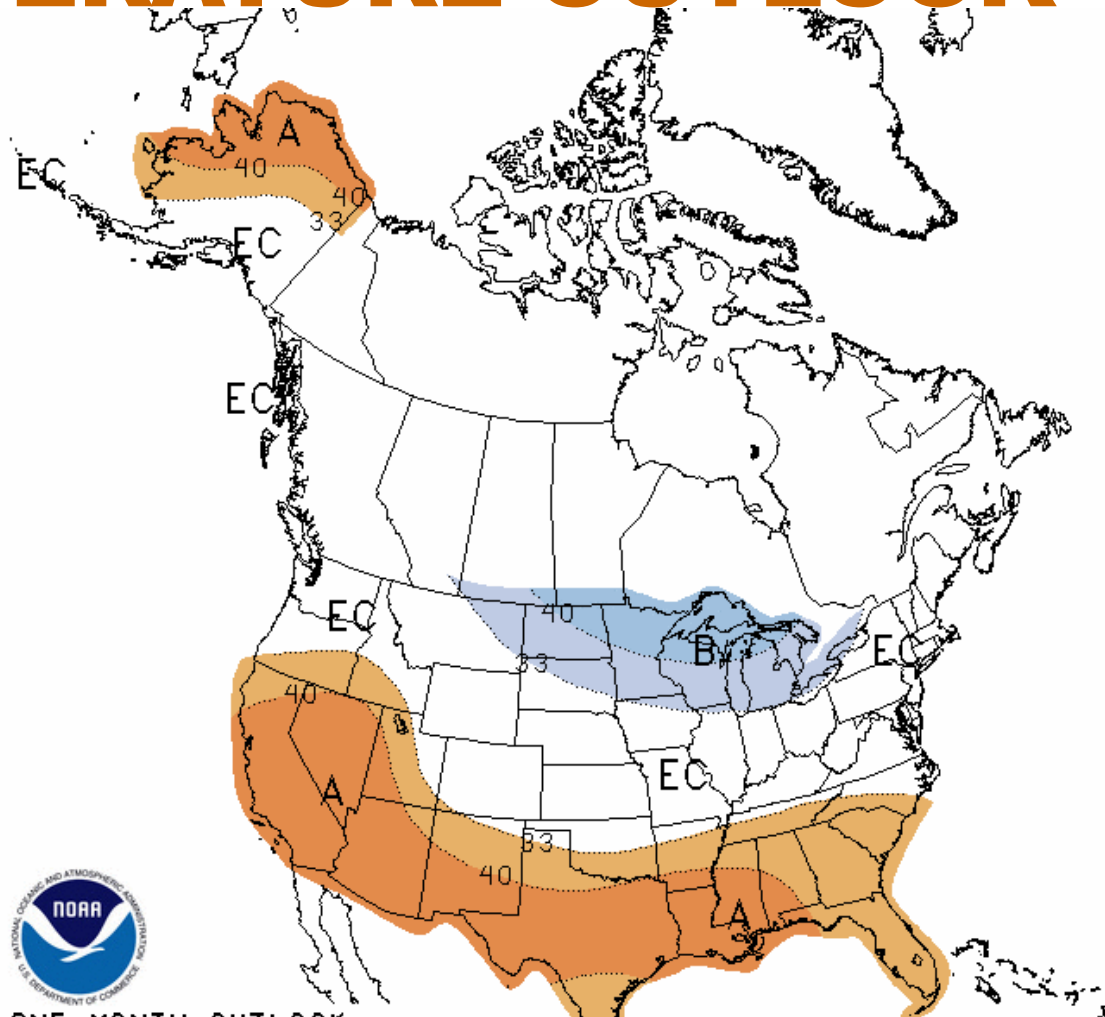
CLIMATE OUTLOOKS

Monthly

Seasonal

Drought

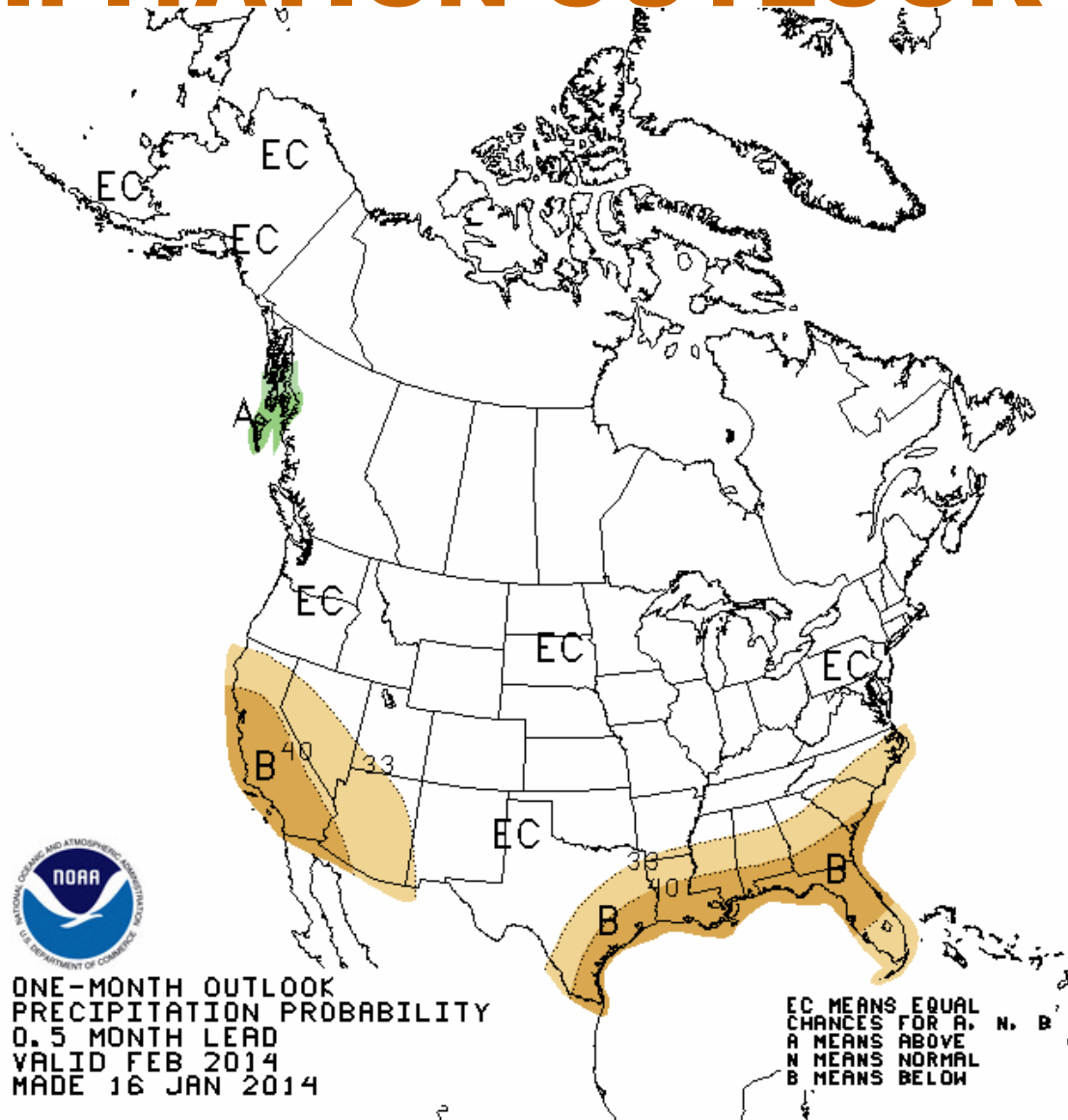
FEBRUARY TEMPERATURE OUTLOOK



ONE-MONTH OUTLOOK
TEMPERATURE PROBABILITY
0.5 MONTH LEAD
VALID FEB 2014
MADE 16 JAN 2014

EC MEANS EQUAL
CHANCES FOR A, N, B
A MEANS ABOVE
N MEANS NORMAL
B MEANS BELOW

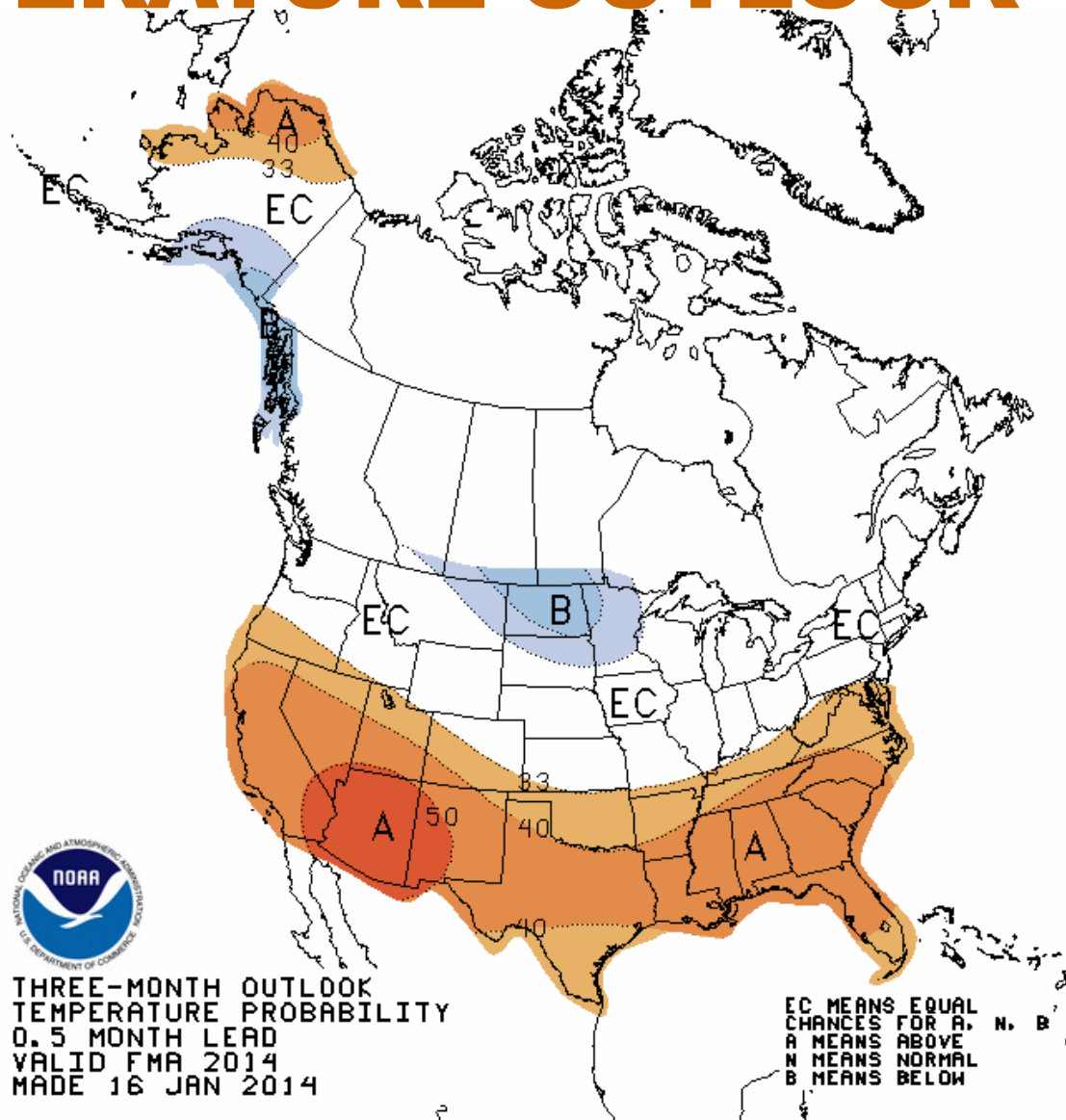
FEBRUARY PRECIPITATION OUTLOOK



ONE-MONTH OUTLOOK
PRECIPITATION PROBABILITY
0.5 MONTH LEAD
VALID FEB 2014
MADE 16 JAN 2014

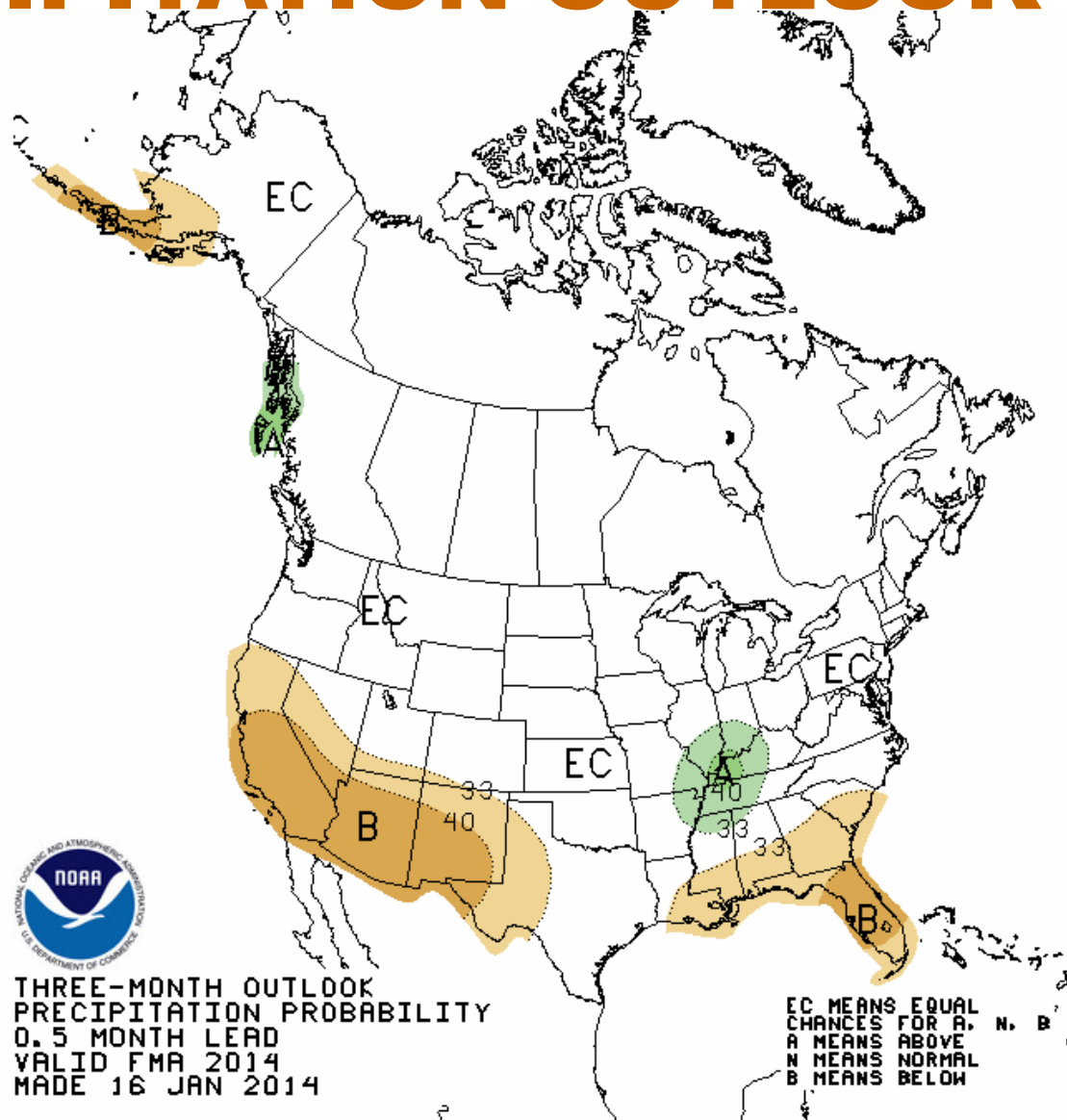
EC MEANS EQUAL
CHANCES FOR A, N, B
A MEANS ABOVE
N MEANS NORMAL
B MEANS BELOW

3-MONTH TEMPERATURE OUTLOOK



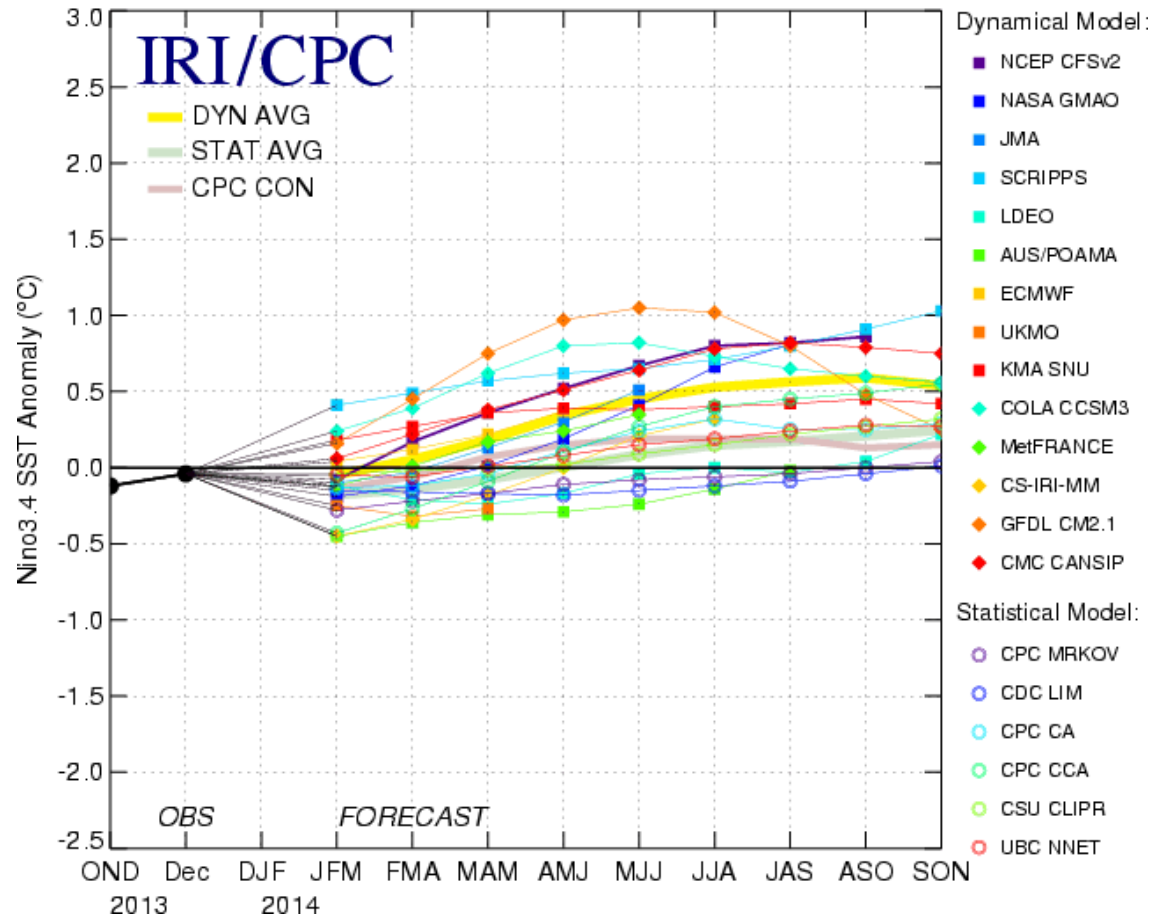
THREE-MONTH OUTLOOK
TEMPERATURE PROBABILITY
0.5 MONTH LEAD
VALID FMA 2014
MADE 16 JAN 2014

3-MONTH PRECIPITATION OUTLOOK



ENSO OUTLOOK

Mid-Jan 2014 Plume of Model ENSO Predictions



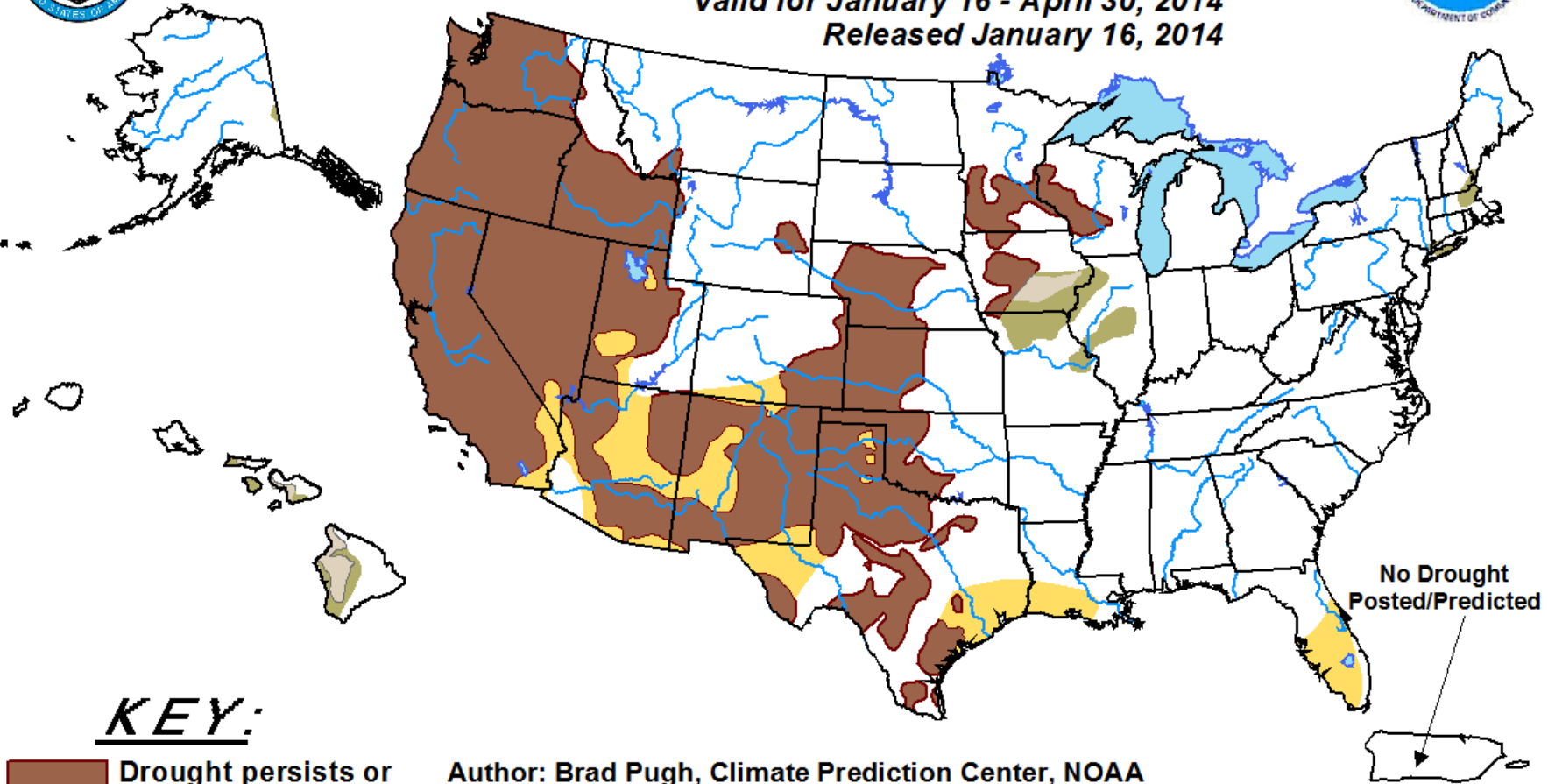


U.S. Seasonal Drought Outlook





Drought Tendency During the Valid Period

Valid for January 16 - April 30, 2014

Released January 16, 2014



KEY:

-  Drought persists or intensifies
-  Drought remains but improves
-  Drought removal likely
-  Drought development likely

Author: Brad Pugh, Climate Prediction Center, NOAA

http://www.cpc.ncep.noaa.gov/products/expert_assessment/season_drought.html

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 tan area areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period although drought will remain. The Green areas imply drought removal by the end of the period (D0 or none)

The Green areas imply drought removal by the end of the period (D0 or none)

SUMMARY

* **Recent Conditions**

- * Colder than normal
- * Drought issues persist in portions of Great Plains and Midwest
- * Wet conditions persist over eastern portion of the Midwest
- * Snowpack is normal to good in areas feeding rivers of the Great Plains

SUMMARY

* Outlooks

- * ENSO is neutral, but some indication of El Nino conditions developing into Summer 2014
- * Drought conditions expected to persist or intensify in portions of the Great Plains and Midwest
- * Cooler than normal pattern likely to persist across northern areas
- * Week indication of above normal precipitation in portions of central Mississippi and lower Ohio River Valleys, otherwise no clear signals regarding precipitation

Further Information - Partners

Today's and Past Recorded Presentations and :

<http://mrcc.isws.illinois.edu/webinars.htm>

<http://www.hprcc.unl.edu>

- **NOAA's National Climatic Data Center:** www.ncdc.noaa.gov
 - Monthly climate reports (U.S. & Global):
www.ncdc.noaa.gov/sotc/
- **NOAA's Climate Prediction Center:** www.cpc.ncep.noaa.gov
- **Climate Portal:** www.climate.gov
- **U.S. Drought Portal:** www.drought.gov
- **National Drought Mitigation Center:** <http://drought.unl.edu/>
- **State climatologists**
 - <http://www.stateclimate.org>
- **Regional climate centers**
 - <http://mrcc.isws.illinois.edu>
 - <http://www.hprcc.unl.edu>

THANK YOU AND QUESTIONS?

Questions:

- **Climate:**

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- John Eise: john.eise@noaa.gov, 816-268-3144
- Mike Timlin: mtimlin@illinois.edu; 217-333-8506
- Natalie Umphlett: numphlett2@unl.edu ; 402 472-6764
- Brian Fuchs: bfuchs2@unl.edu 402 472-6775

- **Weather:**

- crhroc@noaa.gov