

Spring 2016 Missouri River Basin Flood Outlook

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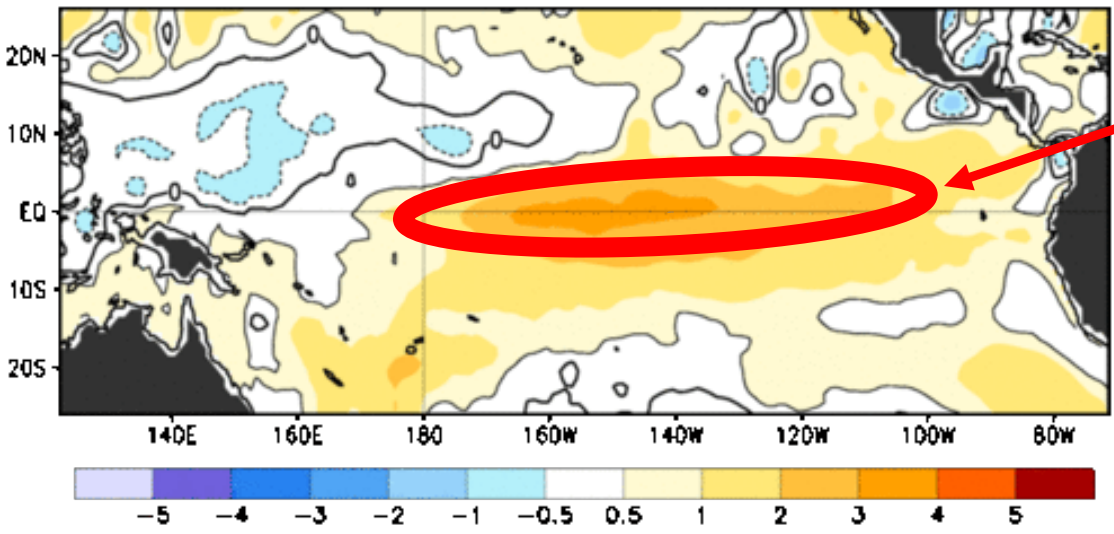
23 February 2016



US Army Corps of Engineers
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Who is El Niño ?? What's going on ??

Observed Sea Surface Temperature Anomalies (°C)

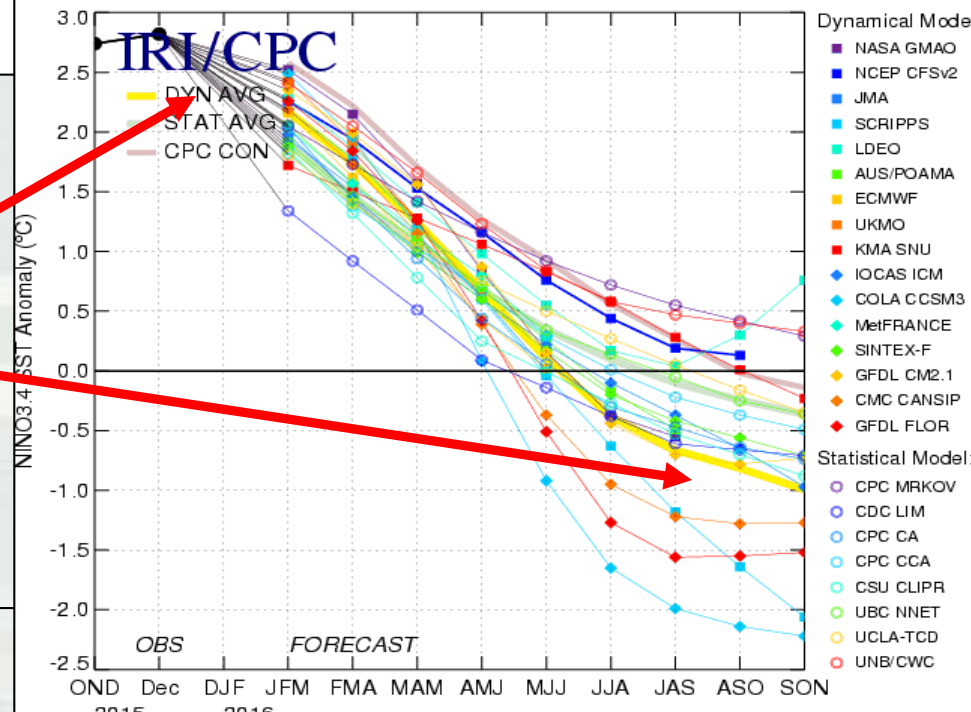


Above normal sea surface temperatures along the equatorial Pacific Ocean

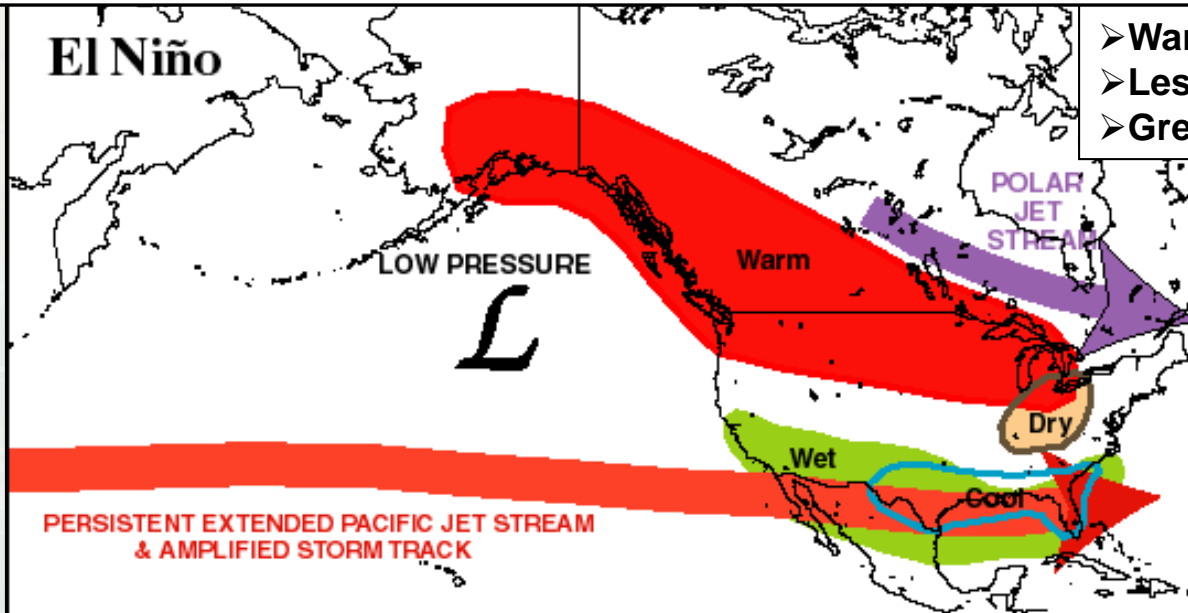
7-day Average Centered on 10 February 2016

Current El Niño event is forecasted to gradually weaken; computer models indicate the potential for a La Niña episode developed during the upcoming fall

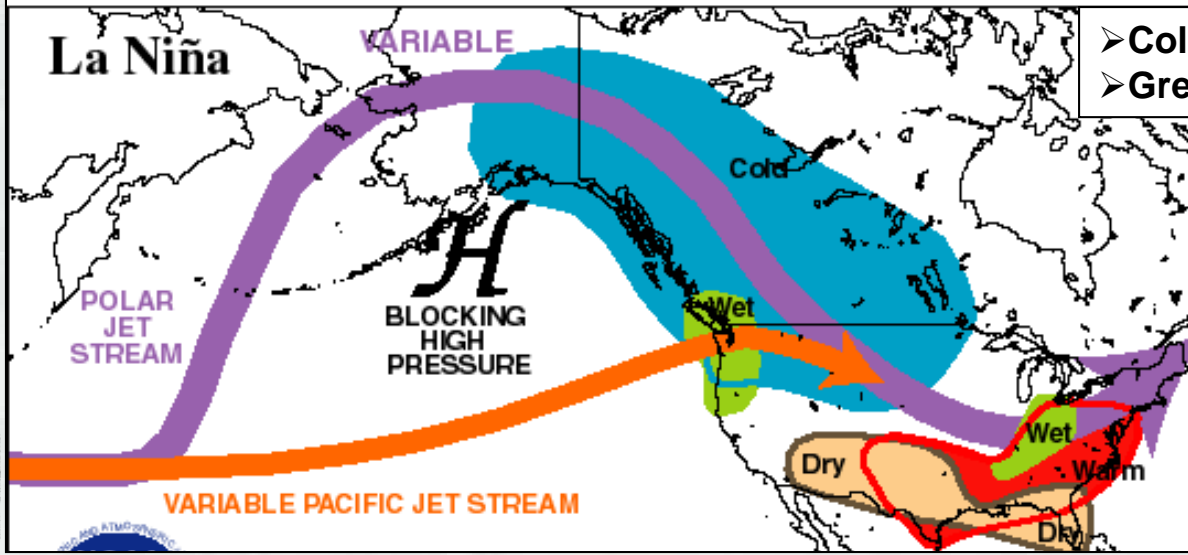
Mid-Jan 2016 Plume of Model ENSO Predictions



Typical El Niño and La Niña Winter Weather Patterns



- Warmer Than Normal
- Less upper basin snowfall
- Greater lower basin moisture

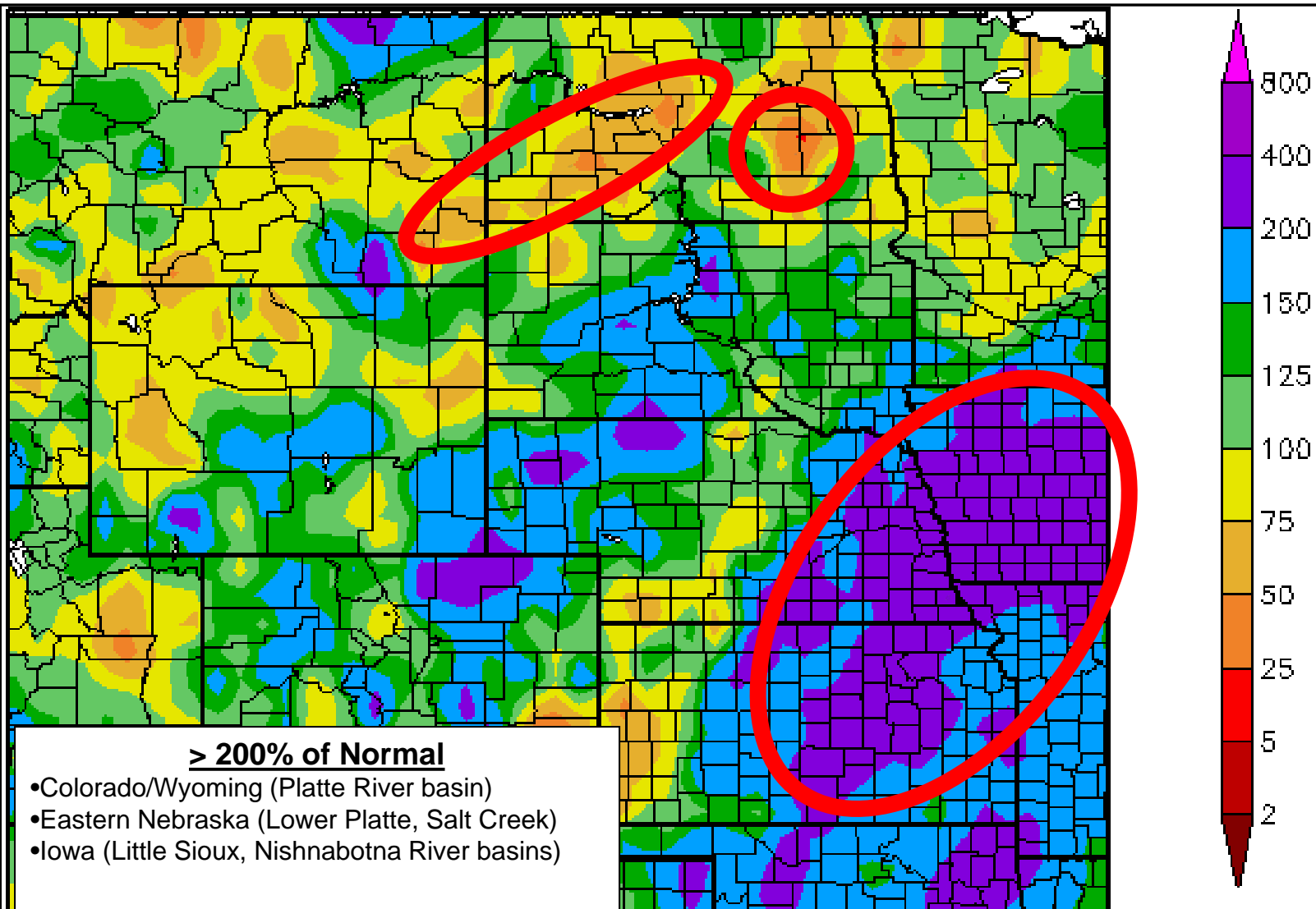


- Colder Than Normal
- Greater upper basin snowfall



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Percent of Normal Precipitation (24 November – 21 February)



> 200% of Normal

- Colorado/Wyoming (Platte River basin)
- Eastern Nebraska (Lower Platte, Salt Creek)
- Iowa (Little Sioux, Nishnabotna River basins)

< 50% of Normal

- Eastern Montana (Lower Yellowstone)
- North Dakota (Heart, Cannonball, upper James)

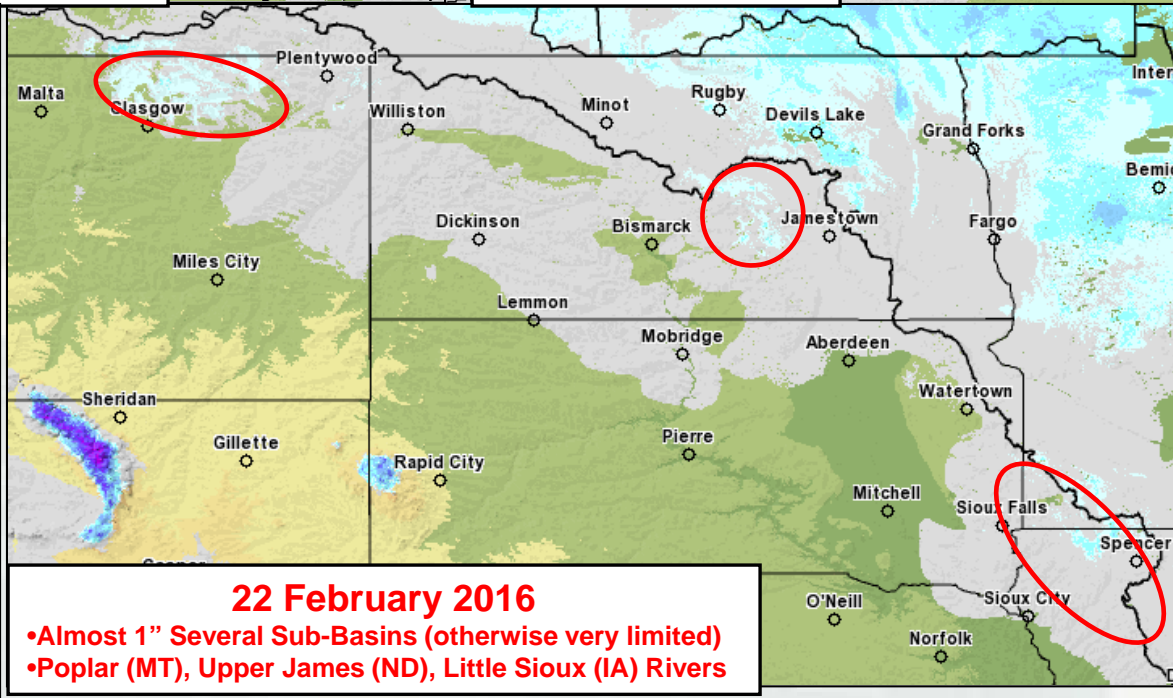
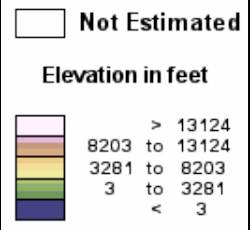
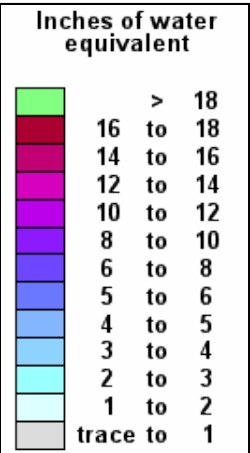
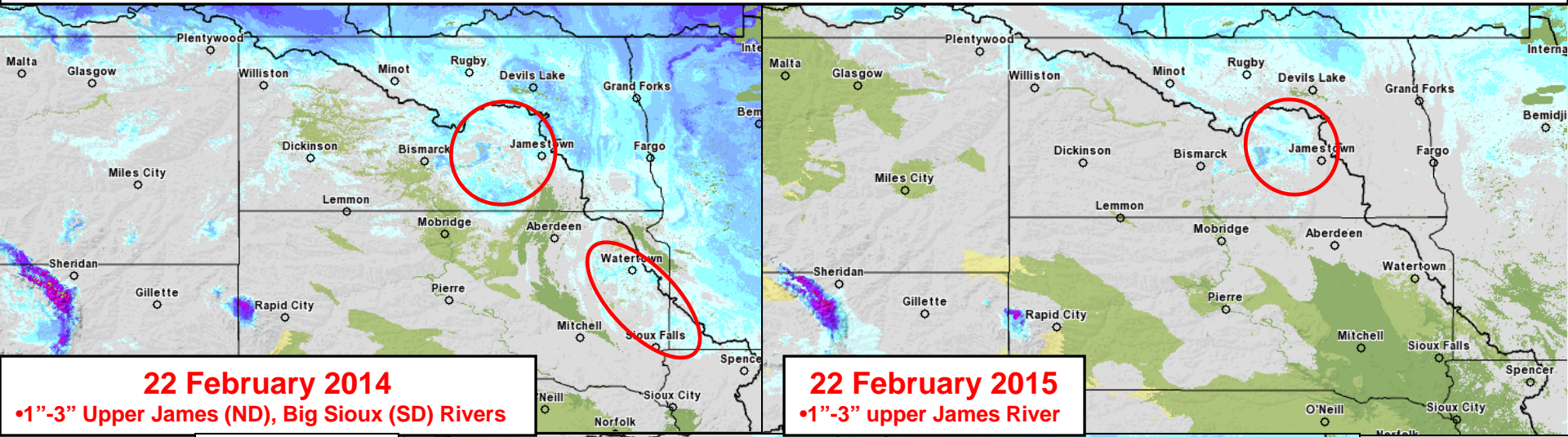


U.S. ARMY



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Plains Snowpack (comparison)



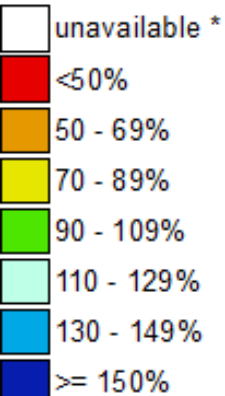
Graphics courtesy of National Weather Service NOHRSC
(National Operational Hydrologic Remote Sensing Center)

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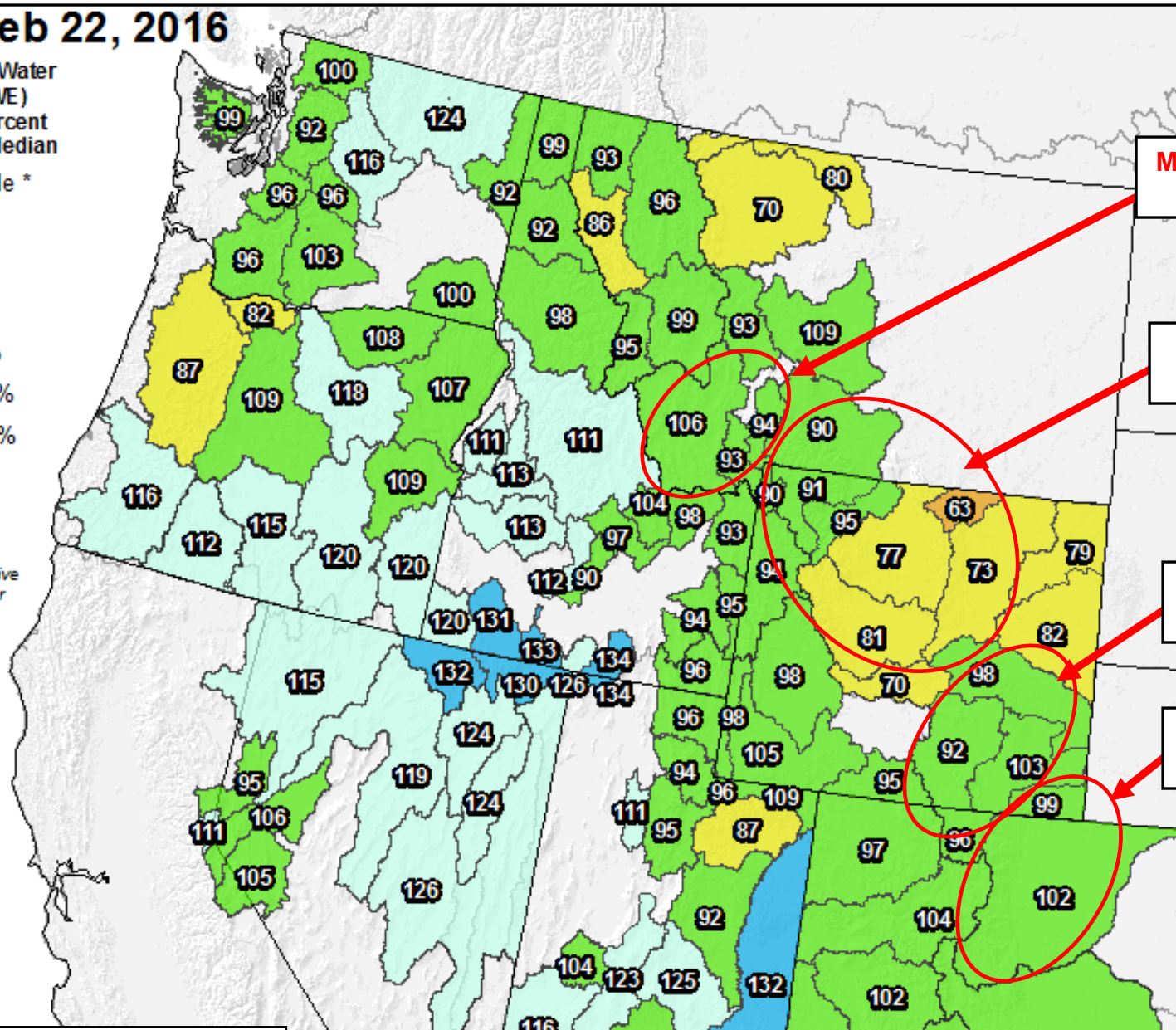
Mountain Snowpack (Estimated)-22 February 2016

Feb 22, 2016

Current Snow Water Equivalent (SWE)
Basin-wide Percent of 1981-2010 Median



* Data unavailable at time of posting or measurement is not representative at this time of year



Missouri Headwaters
(101% overall)

Yellowstone Basin
(85% overall)

North Platte Basin
(93% overall)

South Platte Basin
(101% overall)



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Graphics courtesy of USDA NRCS
(Natural Resources Conservation Service)

Northeastern South Dakota Lakes

Lake	Fall 2015 Elevation (NGVD29)	Fall 2014 Elevation (NGVD29)	Fall 2013 Elevation (NGVD29)	Record Elevation (NGVD29)
Waubay Lake	1801.76	1802.37	1802.53	1805.4 (July 2011)
Blue Dog Lake	1801.78	1802.49	1802.54	1805.8 (June 2011)
Rush Lake	1801.86	1802.44	1802.68	1805.8 (June 2011)
Bitter Lake	1801.70	1802.05	1802.10	1803.0 (July 2011)
Lake Poinsett	1651.29	1650.74	1650.93	1657.4 (April 2011)
Lake Thompson	1687.13	1688.05	1688.76	1694.07 (April 2011)



•Below 2011's Record Elevations
•Still Elevated... Susceptible to Heavy Rain Events





Major Flood Stage

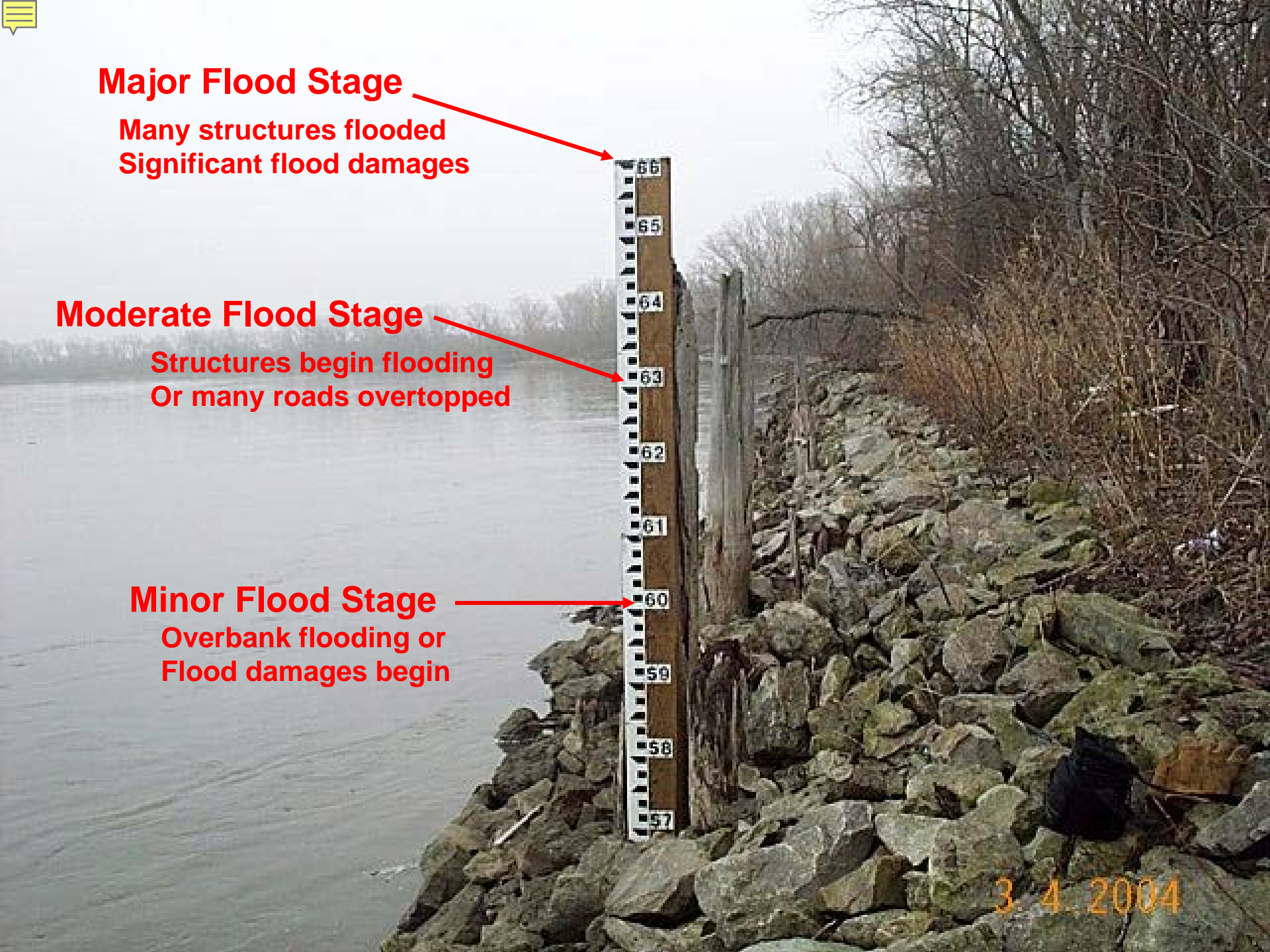
Many structures flooded
Significant flood damages

Moderate Flood Stage

Structures begin flooding
Or many roads overtopped

Minor Flood Stage

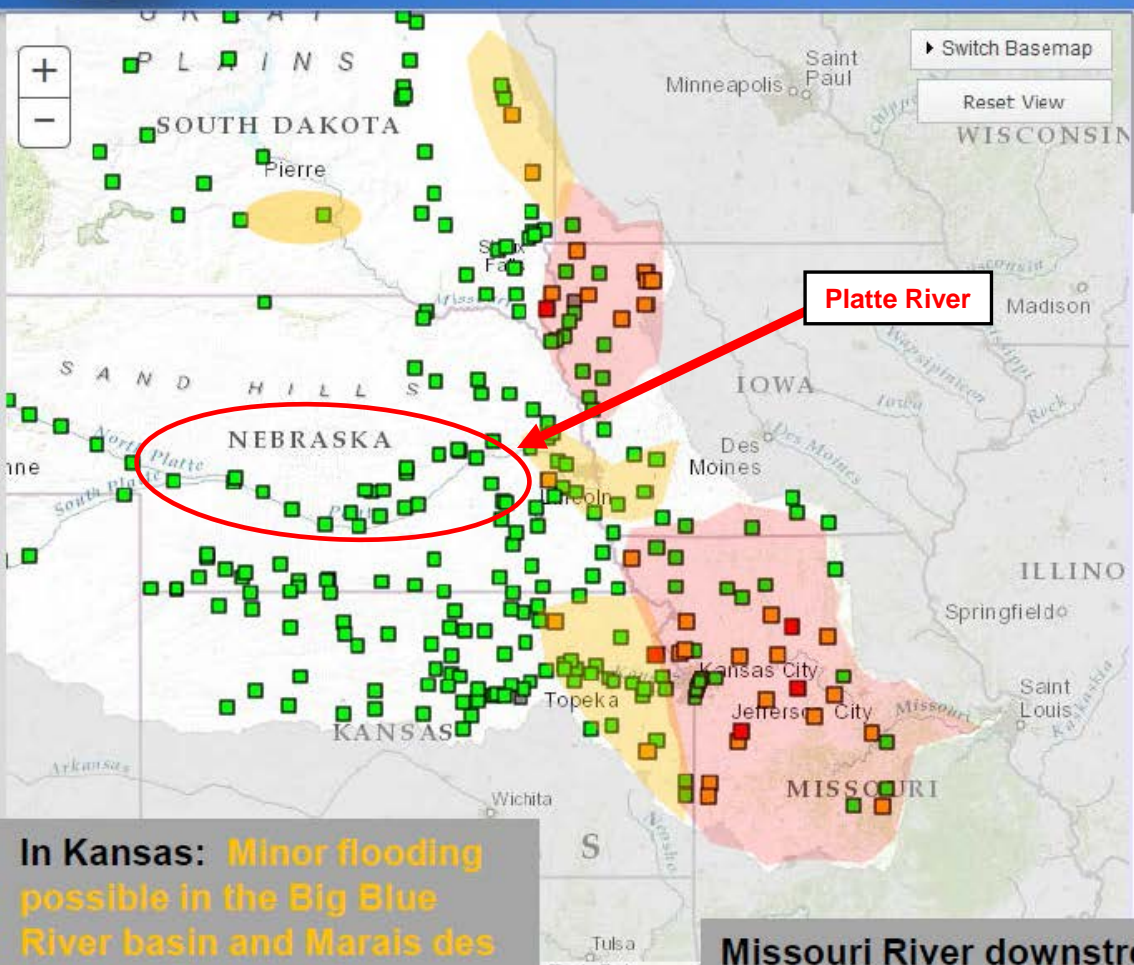
Overbank flooding or
Flood damages begin



3.4.2004



MISSOURI BASIN FLOOD POTENTIAL OUTLOOK



In South Dakota: Minor flooding possible in the Big Sioux and White River basins.

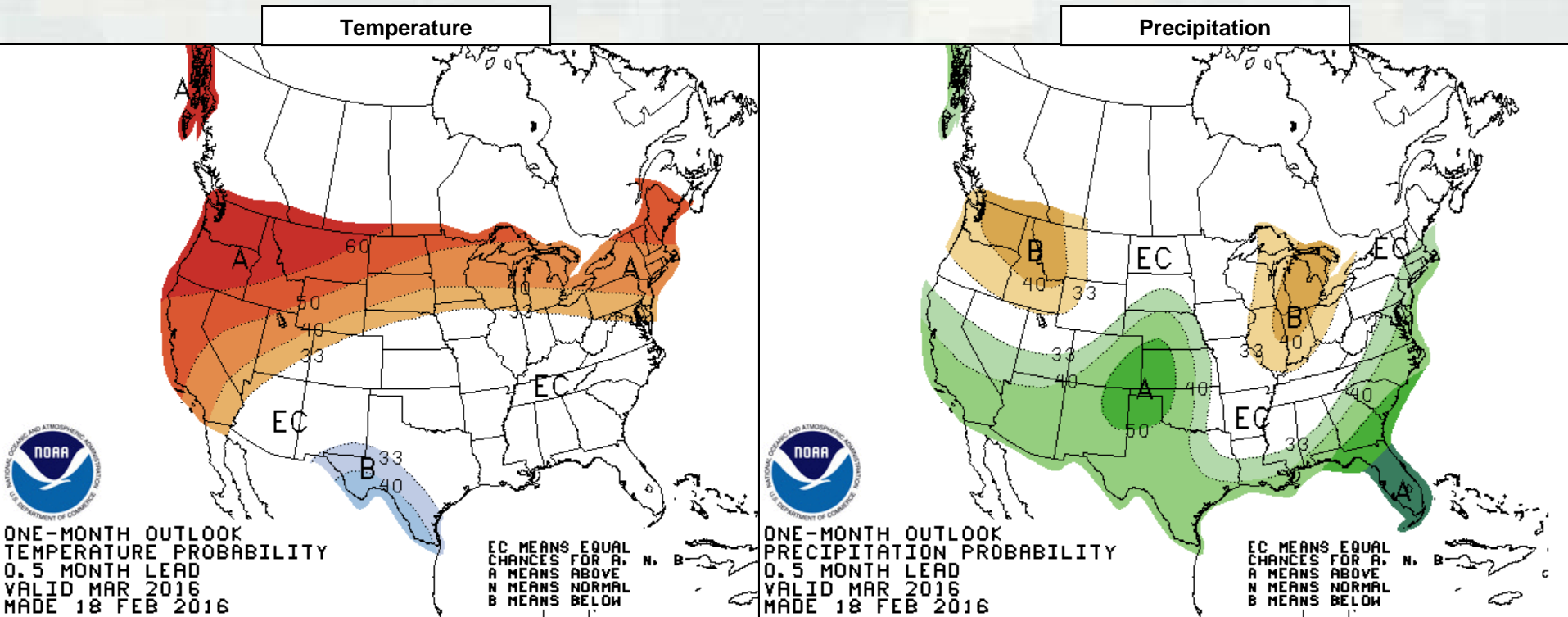
In Iowa: Minor flooding possible in the Floyd, Rock and Nishnabotna River basins, and moderate flooding possible in the Little Sioux and Big Sioux basins.

In Missouri: Minor flooding possible along the Chariton River. Moderate flooding possible in the Grand, Platte, Gasconade, and Osage River basins, and along many of the smaller streams feeding the Missouri River downstream of Kansas City.

In Kansas: Minor flooding possible in the Big Blue River basin and Marais des Cygnes River basin.

Missouri River downstream of Nebraska City: Minor flooding possible.

CPC 1-Month Outlook (March 2016)



- Central Rockies/Plains: Near average temps
- Otherwise: Warmer than normal

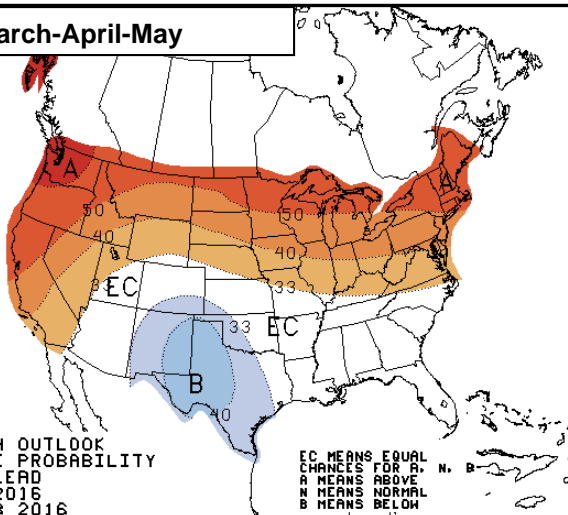
- Central Rockies/Plains: Wetter than normal
- Northern Rockies: Drier than normal
- Otherwise: Near average moisture



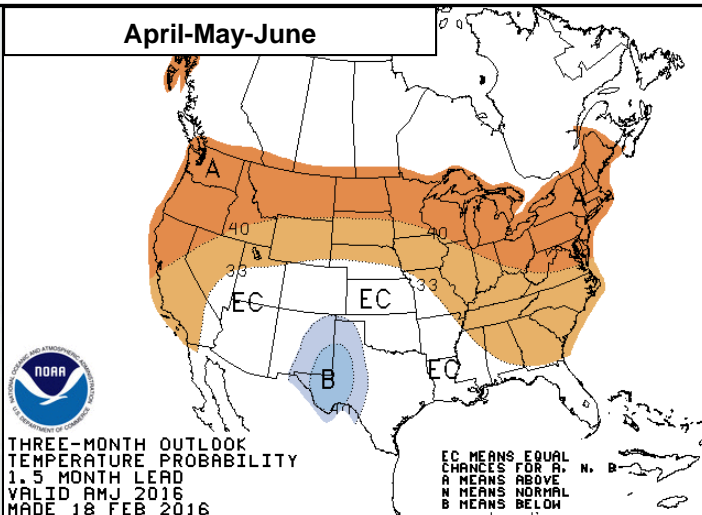
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CPC 3-Month Temperature Outlooks (18 February 2016 update)

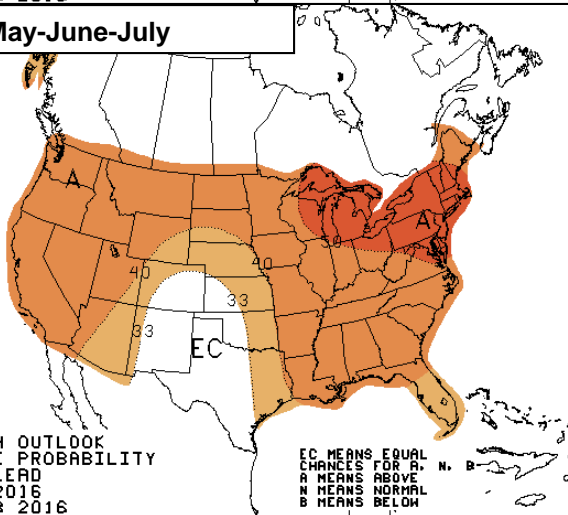
March-April-May



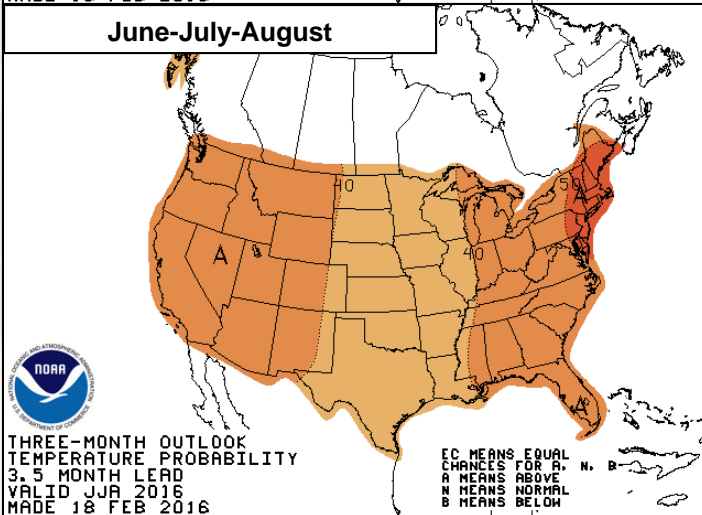
April-May-June



May-June-July



June-July-August



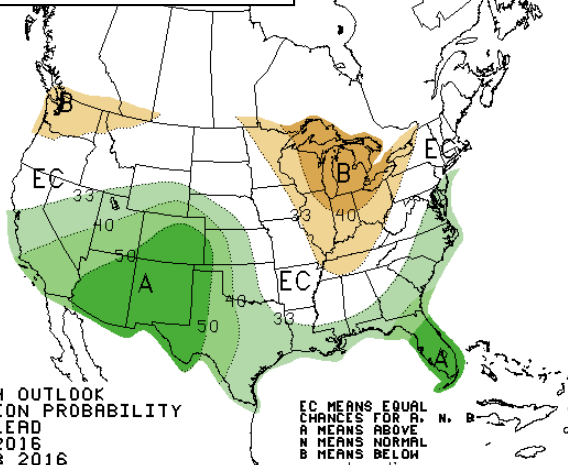
- Colorado/Kansas: Near average
- Elsewhere: Warmer than normal



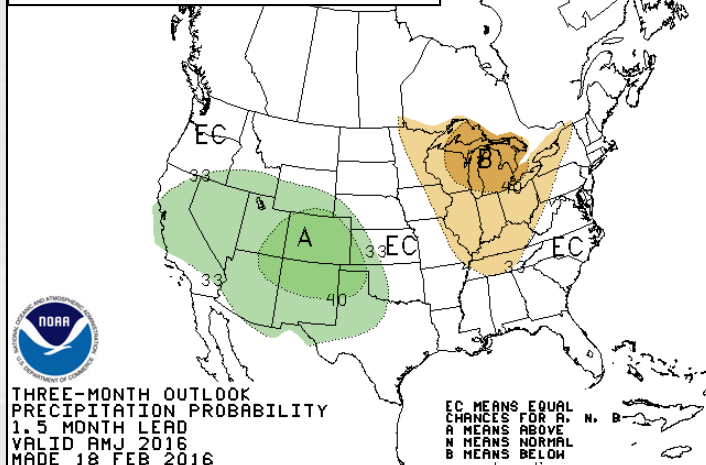
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CPC 3-Month Precipitation Outlooks (18 February 2016 update)

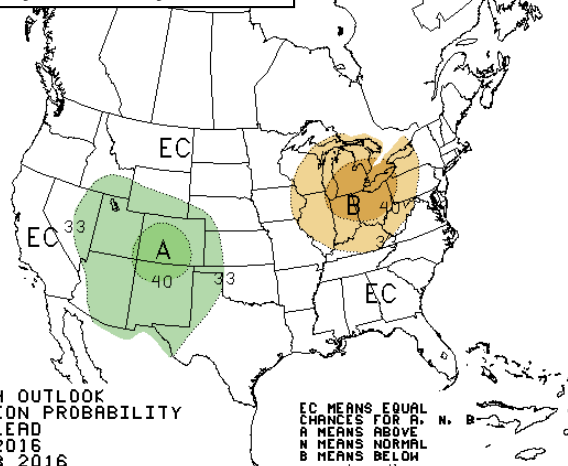
March-April-May



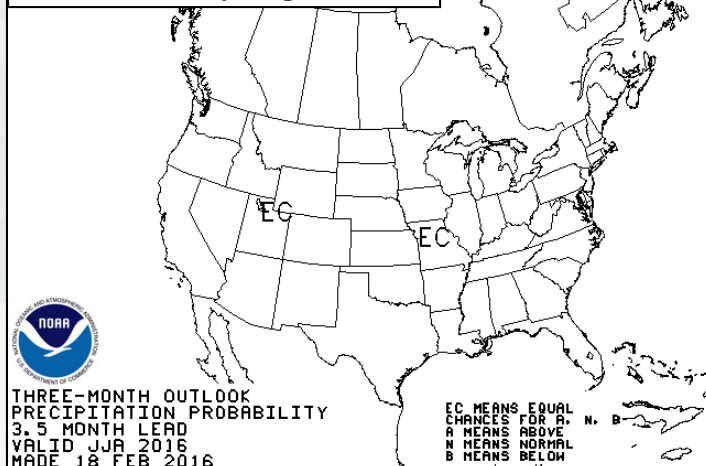
April-May-June



May-June-July



June-July-August



- Central Rockies/High Plains: Above normal moisture
- Elsewhere: Near normal moisture

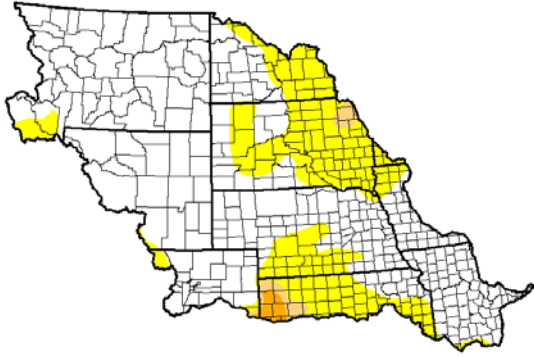


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U.S. Drought Monitor (comparison)

U.S. Drought Monitor Missouri Watershed

February 17, 2015
(Released Thursday, Feb. 19, 2015)
Valid 7 a.m. EST

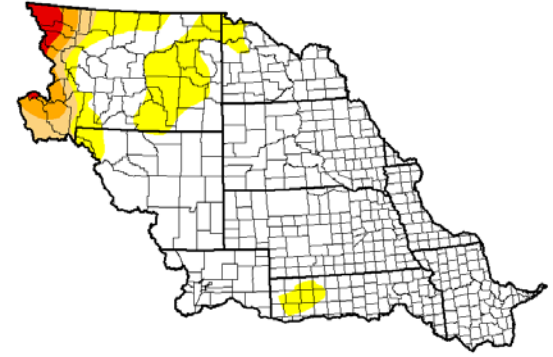


Author:
Richard Heim
NCDC/NCEP



U.S. Drought Monitor Missouri Watershed

August 25, 2015
(Released Thursday, Aug. 27, 2015)
Valid 8 a.m. EDT



Author:
Anthony Artusa
NOAA/NWS/CPC/CRPC



Intensity:

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

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

Intensity:

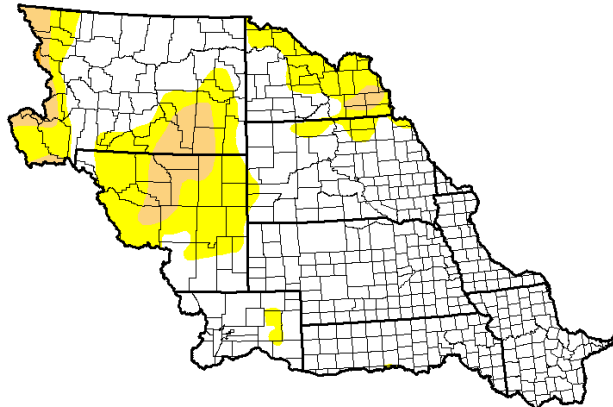
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

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

1 Year ago

U.S. Drought Monitor Missouri Watershed

February 16, 2016
(Released Thursday, Feb. 18, 2016)
Valid 7 a.m. EST



Author:
Eric Liebshusen
U.S. Department of Agriculture



Intensity:

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

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

6 Months ago

Moderate drought conditions have developed in Wyoming and the upper James River basin, and persist across much of western Montana.

Most recent...



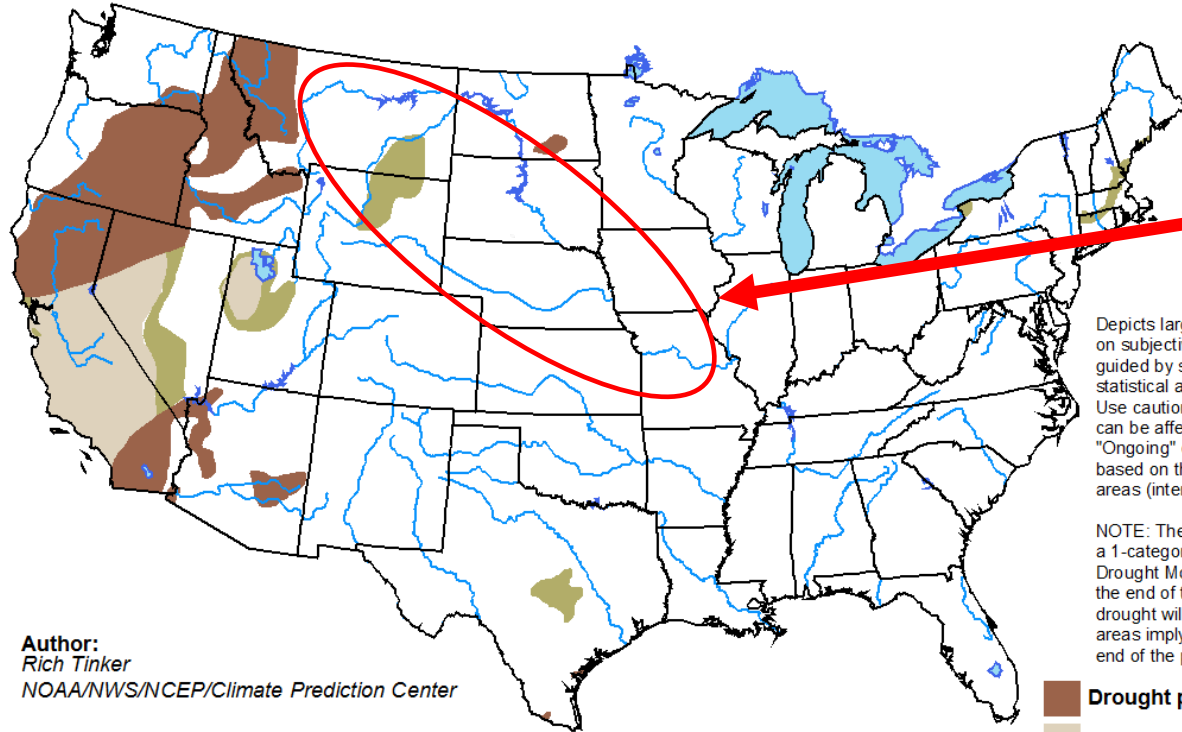
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Graphics courtesy of National Drought Mitigation Center

U.S. Drought Forecast

U.S. Seasonal Drought Outlook Drought Tendency During the Valid Period

Valid for February 18 - May 31, 2016
Released February 18, 2016



Drought conditions remain limited in coverage across the Missouri River basin.

Drought conditions are forecast to persist and expand across Montana and northern Wyoming through spring.

Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).

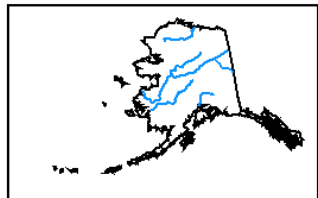
NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

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



<http://go.usa.gov/3eZ73>

Author:
Rich Tinker
NOAA/NWS/NCEP/Climate Prediction Center



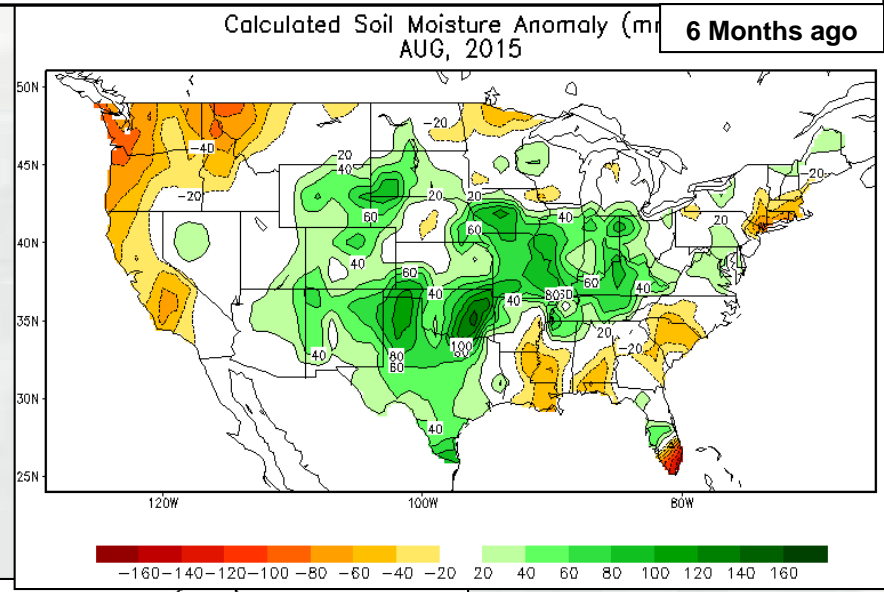
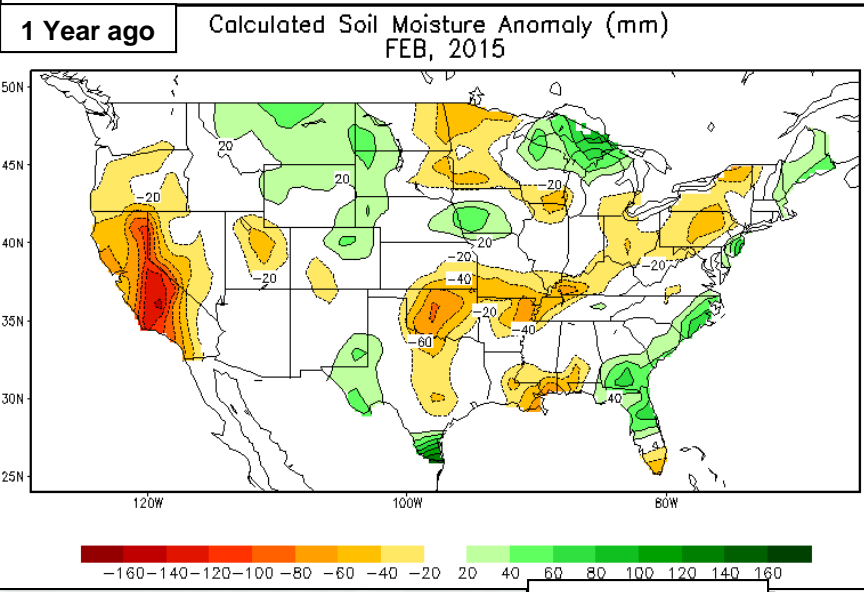
Most recent...



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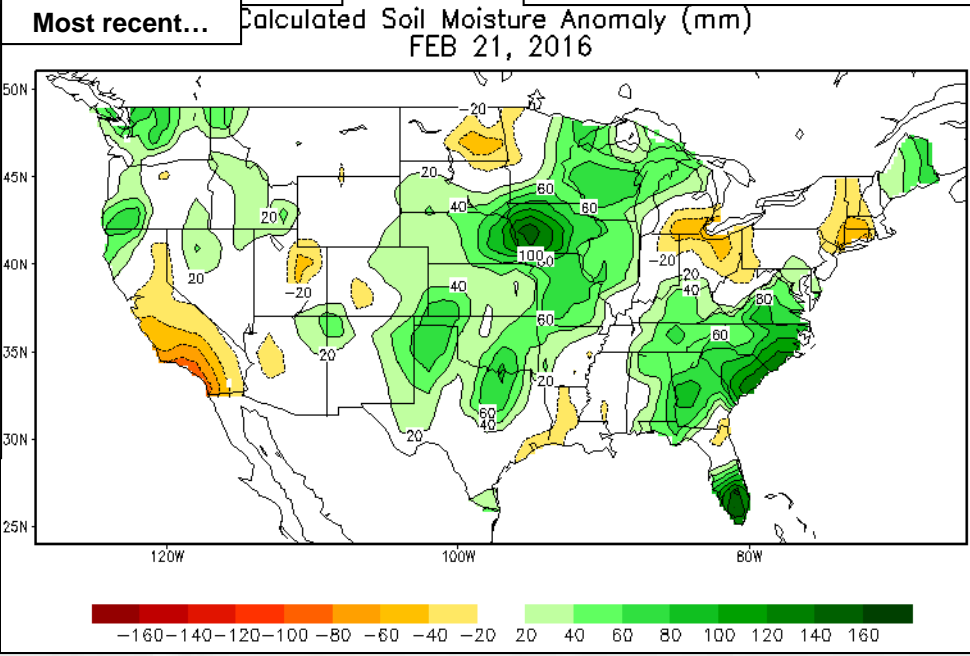
Graphics courtesy of NOAA

U.S. Soil Moisture Anomaly (comparison)



Low soil moisture content at this time is most prevalent in the upper James River basin.

But well above normal soil moisture content in eastern Nebraska, Iowa, and Missouri indicates an increased threat of flooding during the spring or summer from seasonal thunderstorms



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