

Missouri River Basin Water Management

US Army
Corps of Engineers

Missouri River Navigator's Meeting

February 12, 2014

Bill Doan, P.E.

Missouri River Basin Water Management



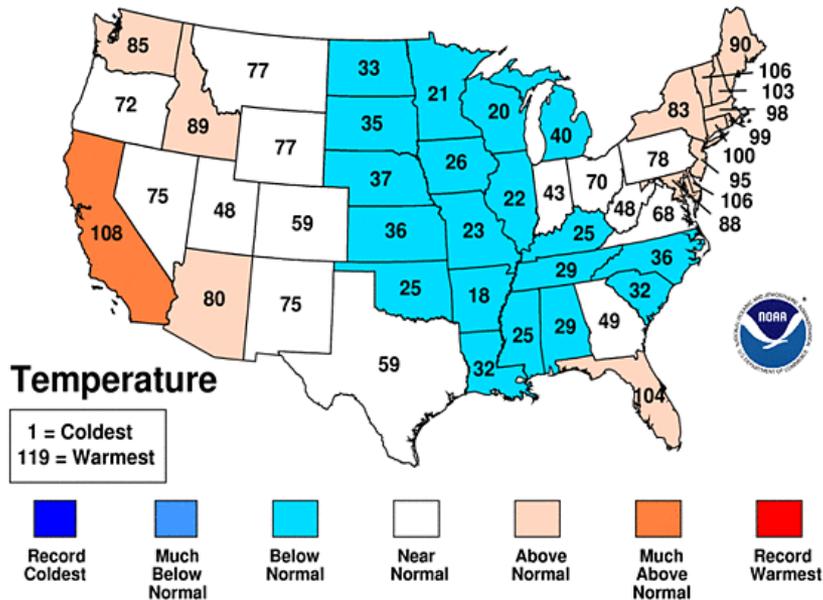
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US Army Corps of Engineers
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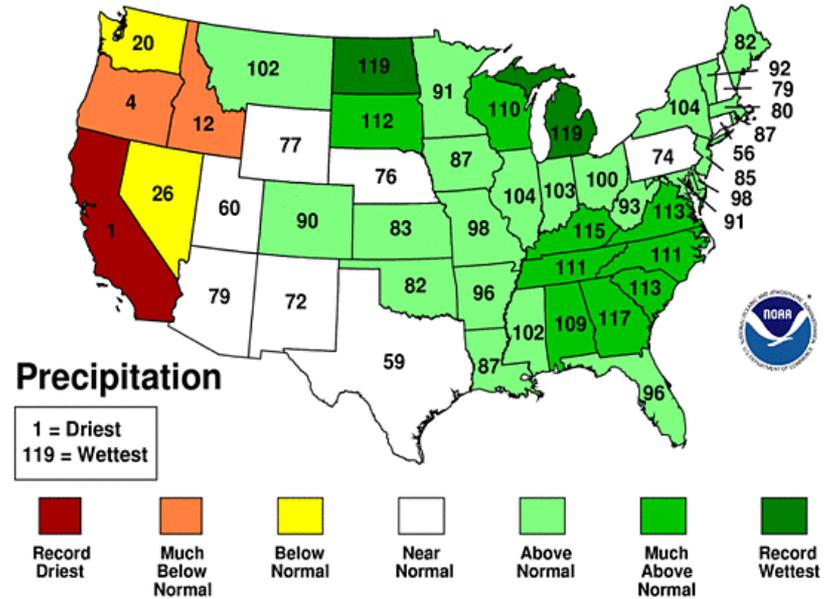


2013 – Climate Summary

January-December 2013 Statewide Ranks
National Climatic Data Center/NESDIS/NOAA



January-December 2013 Statewide Ranks
National Climatic Data Center/NESDIS/NOAA

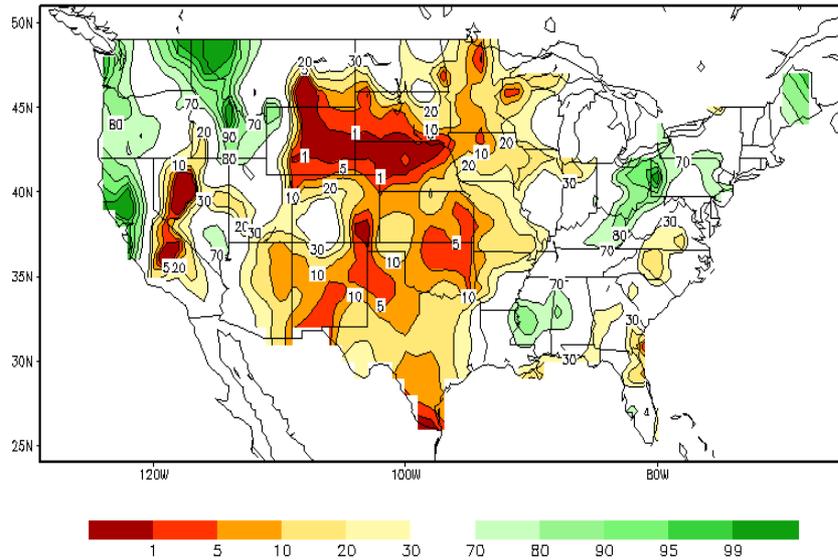


Cooler & Very Wet

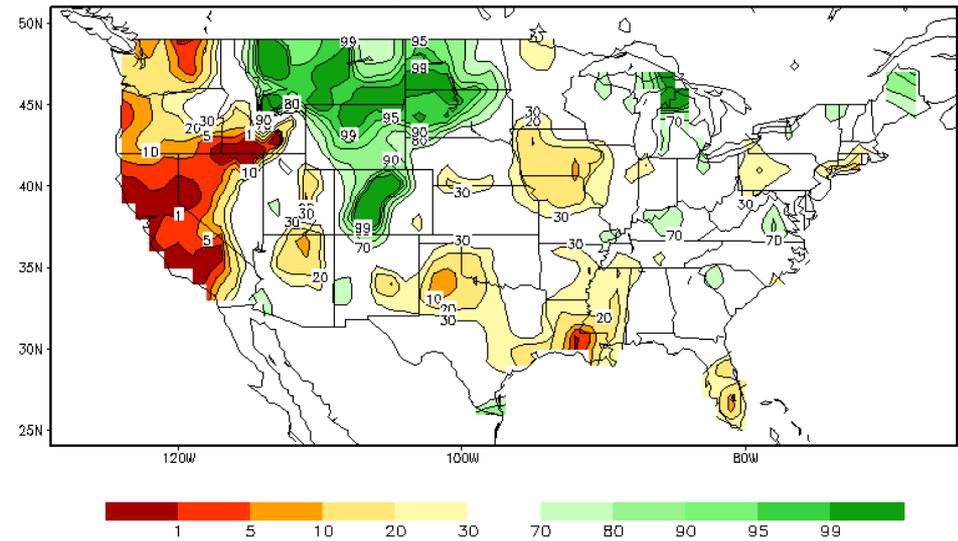
Yet 2013 Runoff was essentially normal

U.S. Soil Moisture Percentage

Calculated Soil Moisture Ranking Percentile
JAN 01, 2013



Soil Moisture Ranking Percentile Last day of JAN, 2014

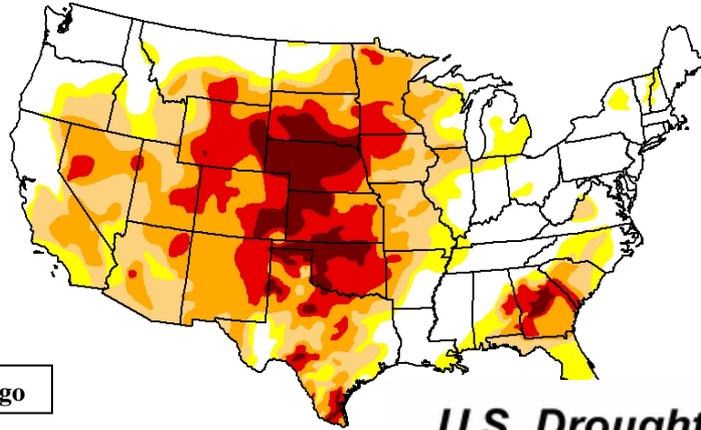


- High Precipitation in Upper Great Plains replenished soil moisture
- Very dry to very wet

U.S. Drought Monitor (comparison)

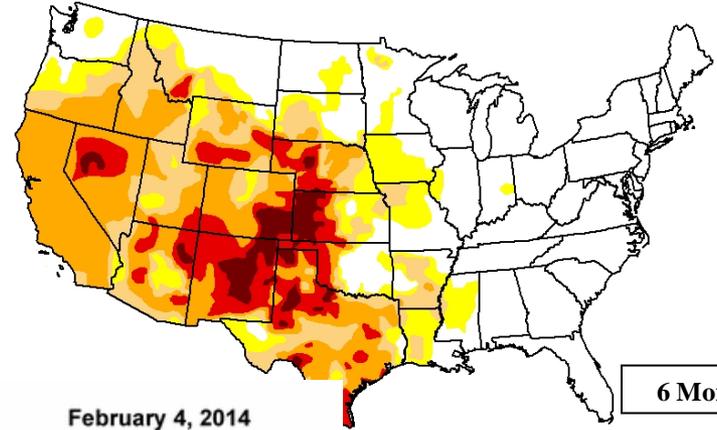
U.S. Drought Monitor
CONUS

January 29, 2013
(Released Thursday, Jan. 31, 2013)
Valid 7 a.m. EST



U.S. Drought Monitor
CONUS

July 30, 2013
(Released Thursday, Aug. 1, 2013)
Valid 7 a.m. EST

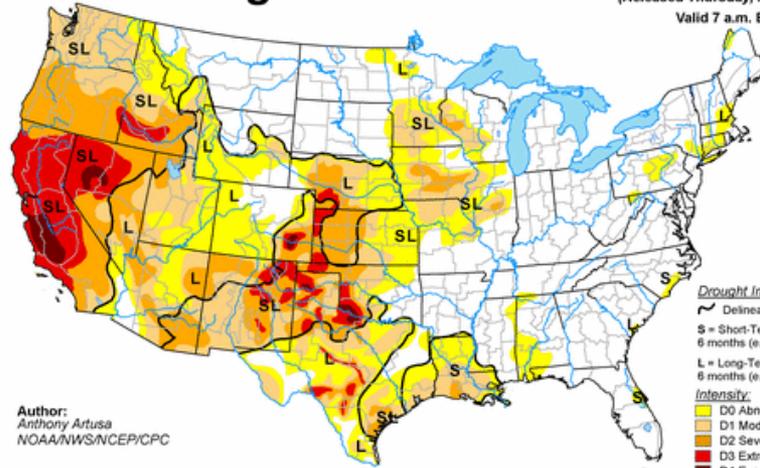


1 Year ago

6 Months ago

U.S. Drought Monitor

February 4, 2014
(Released Thursday, Feb. 6, 2014)
Valid 7 a.m. EST



Author:
Anthony Artusa
NOAA/NWS/NCEP/CPC

Author:
Brian Fuchs
National Drought Mitigation Center

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

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.

Drought Impact Types:

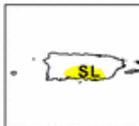
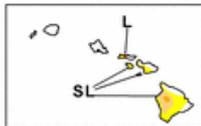
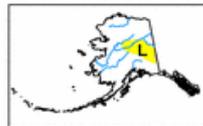
- Delineates dominant impacts
- S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
- L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
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USDA
<http://droughtmonitor.unl.edu/>



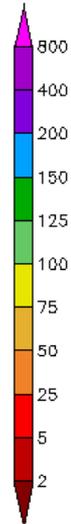
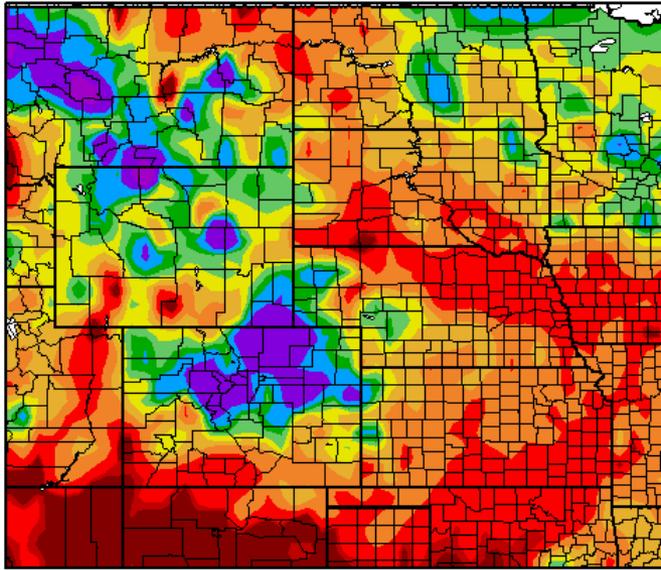
Graphics courtesy of National Drought Mitigation Center

Most recent...

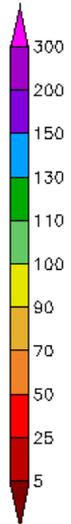
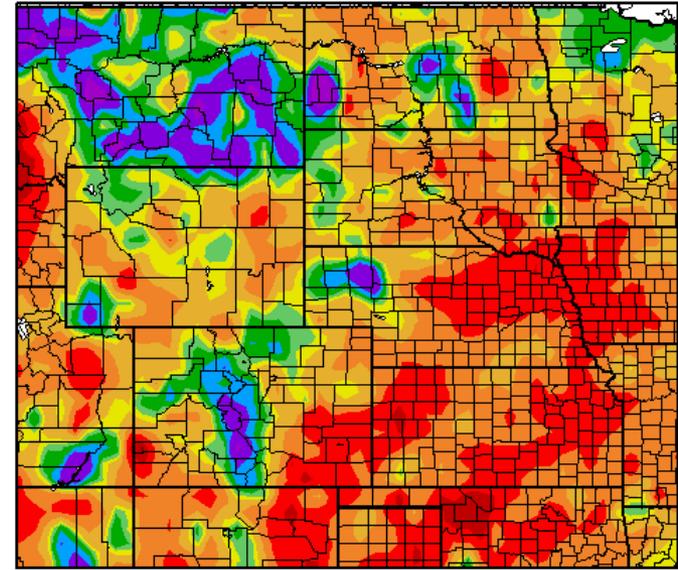
Drought conditions have improved throughout the Missouri River Basin over the past 12 months.

Recent Precipitation (Percent of Normal)

Percent of Normal Precipitation (%)
1/1/2014 – 1/31/2014



Percent of Normal Precipitation (%)
11/1/2013 – 1/31/2014



Generated 2/2/2014 at HPRCC using provisional data.

Regional Climate Centers Generated 2/5/2014 at HPRCC using provisional data.

Regional Climate Centers

January 1 – January 31

November 1 – January 31

> 150% of normal

- Western and central Montana
- Northwest Wyoming

< 50% of normal

- Large portions of central and northern plains

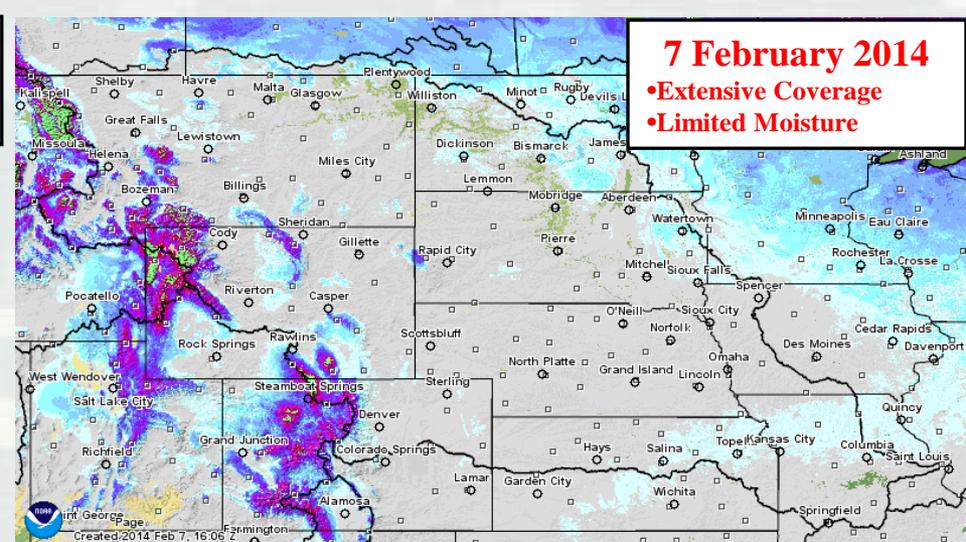
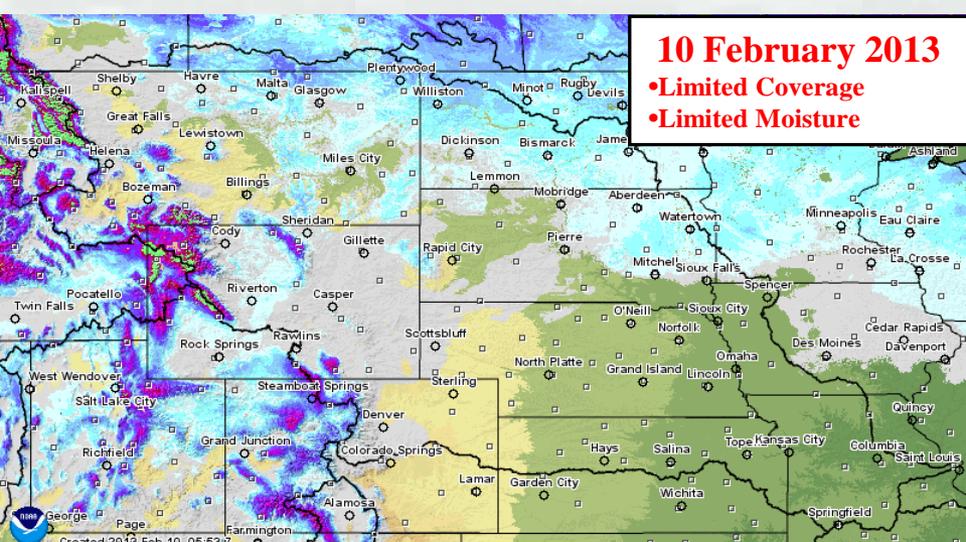
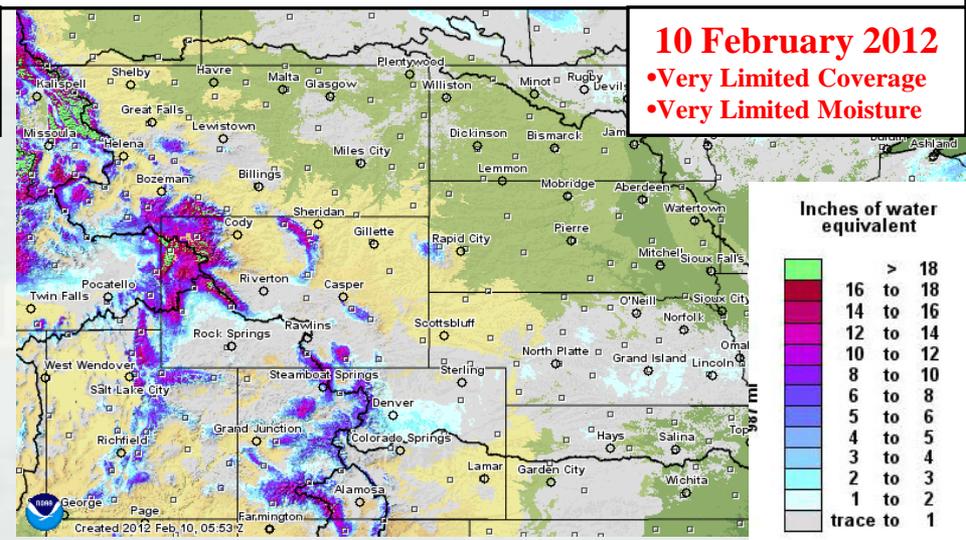
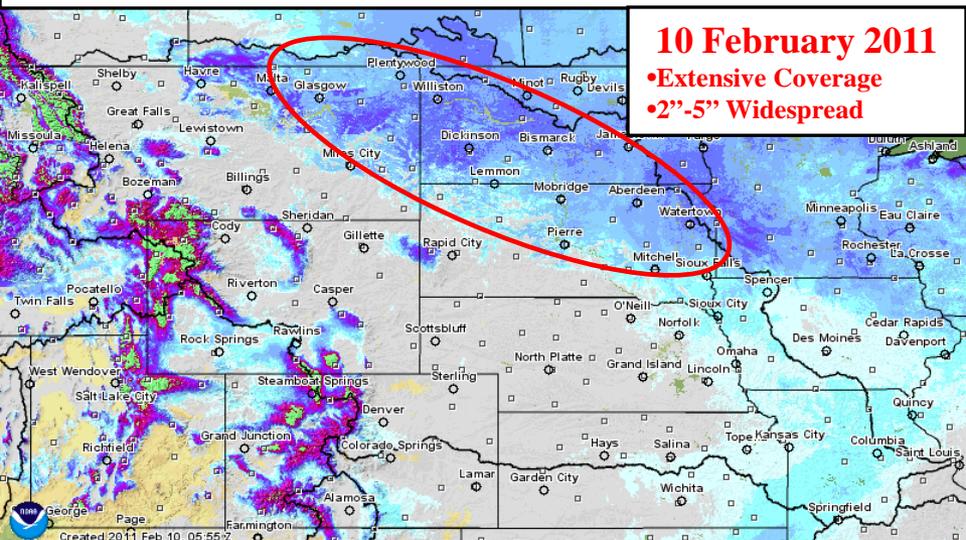
> 150% of normal

- Portions of Montana

< 50% of normal

- Portions of the lower Basin below Sioux City
- Isolated areas in the upper Basin

Plains Snowpack (comparison)



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

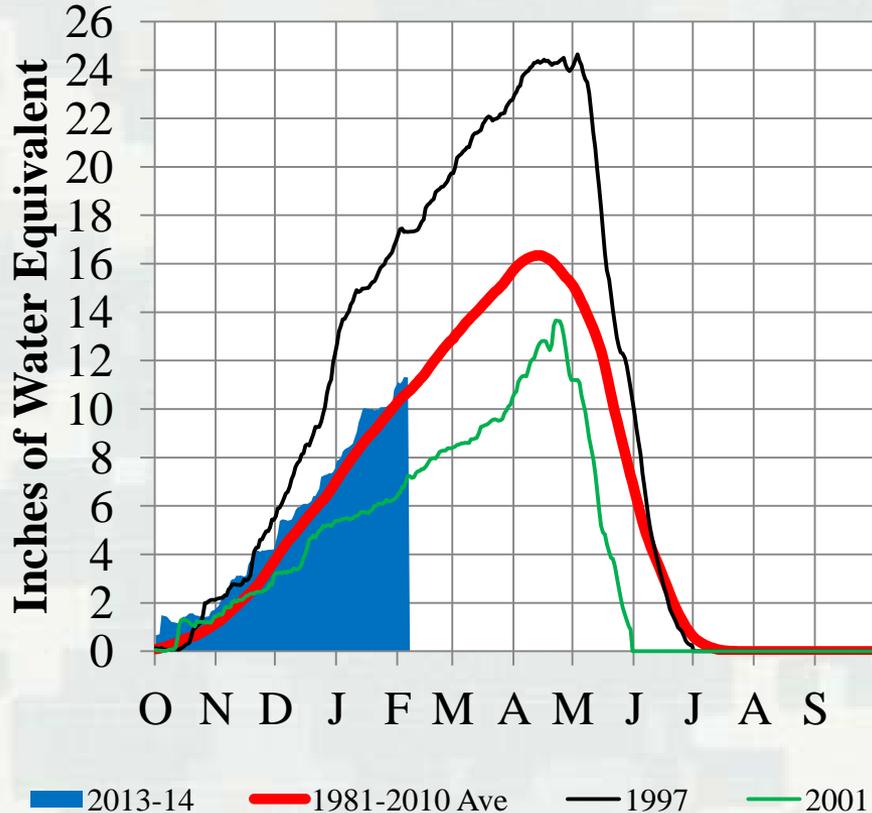


Missouri Basin

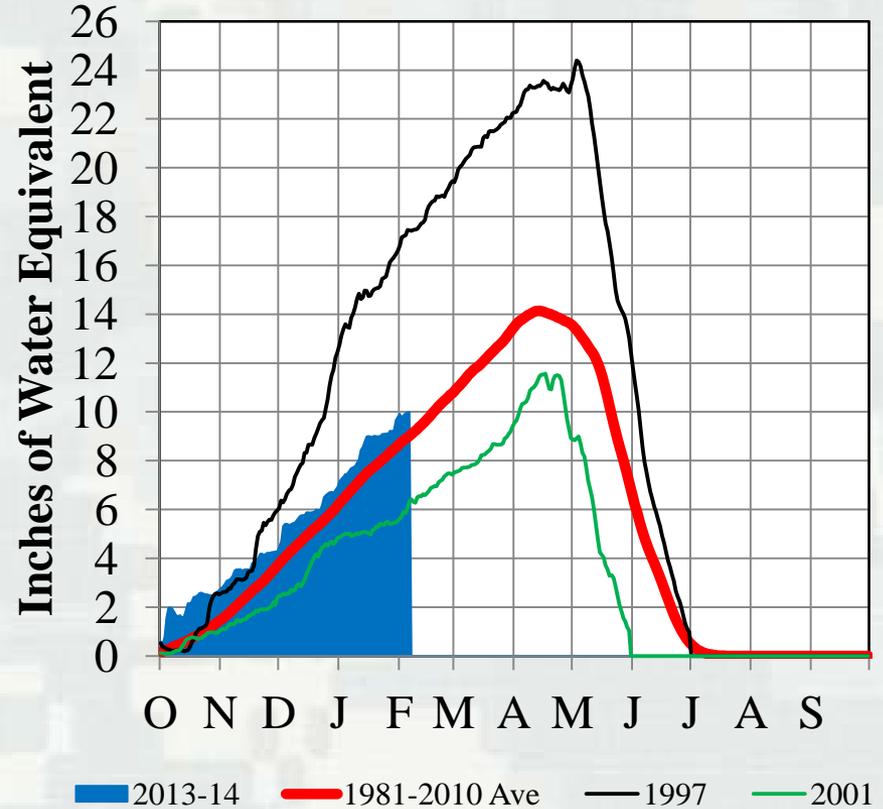
Mountain Snowpack Water Content

February 7, 2014

Total above Fort Peck



Total Fort Peck to Garrison



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



Provisional data. Subject to revision.

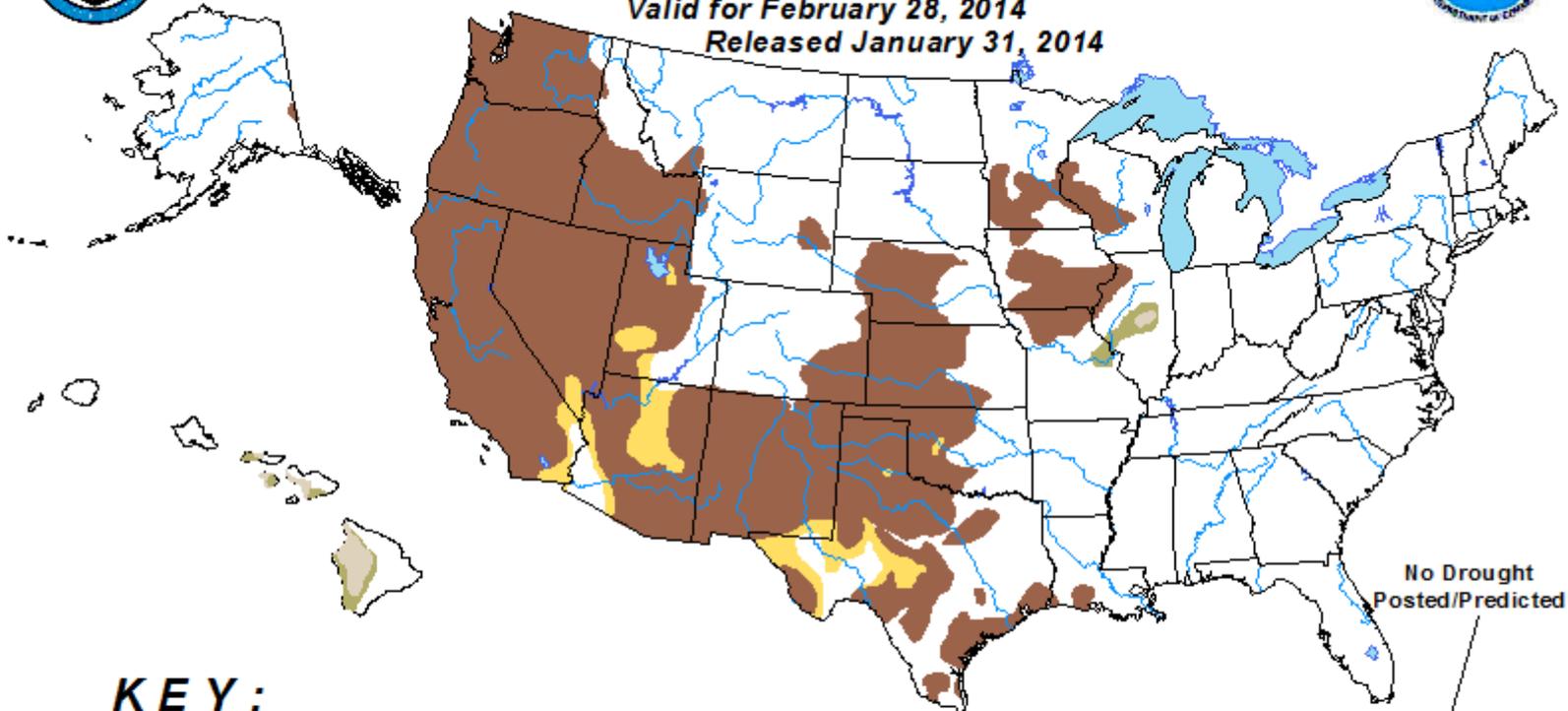
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U.S. Drought Forecast

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

Valid for February 28, 2014

Released January 31, 2014



KEY:

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

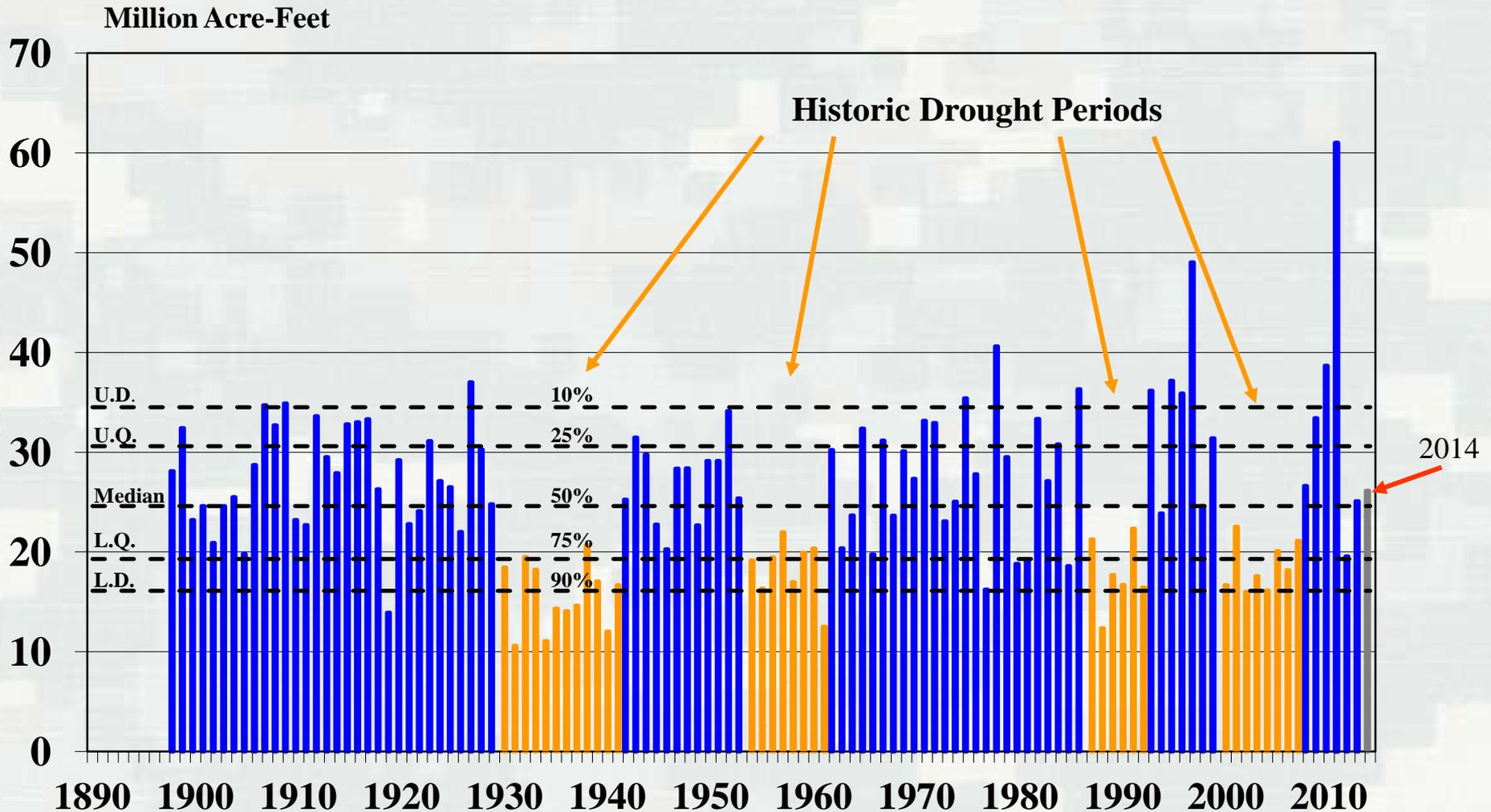
Author: Brad Pugh, Climate Prediction Center, NOAA

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

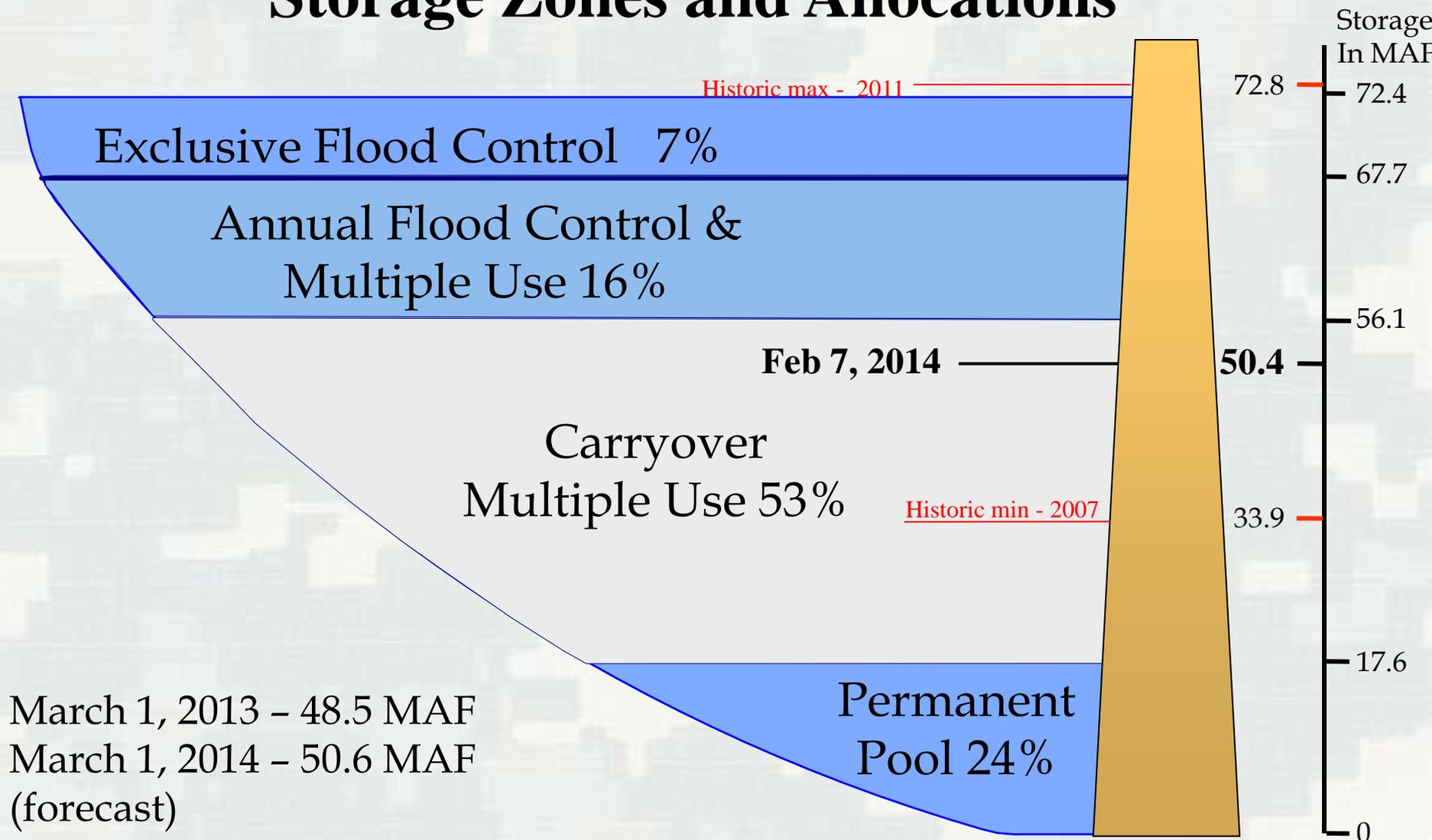
Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Short-term events – such as individual storms – cannot be accurately forecast more than a few days in advance. Use caution for applications – such as crops – that 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 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)

Missouri River Mainstem System Annual Runoff above Sioux City, IA

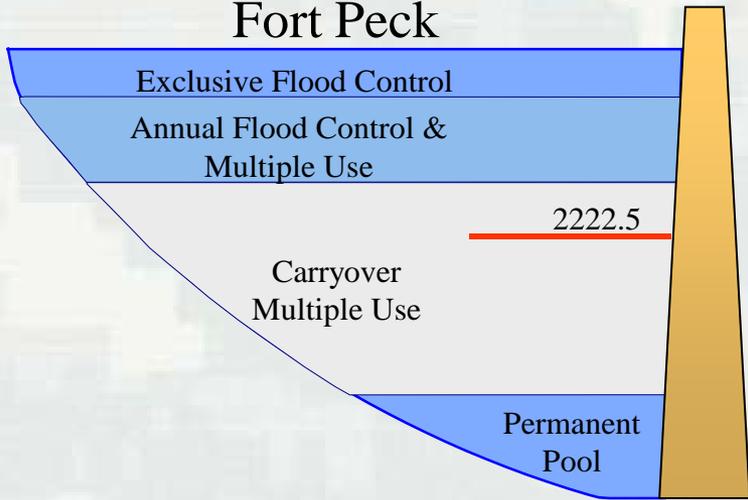


Missouri River Mainstem System Storage Zones and Allocations



Current Reservoir Levels – February 7, 2014

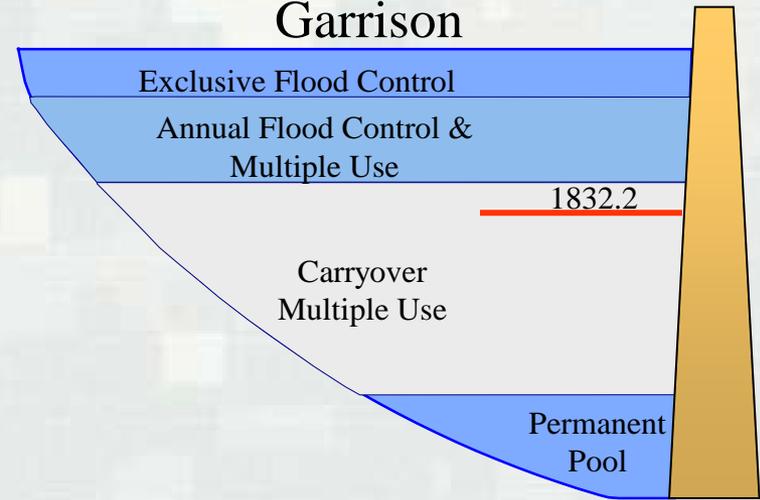
Fort Peck



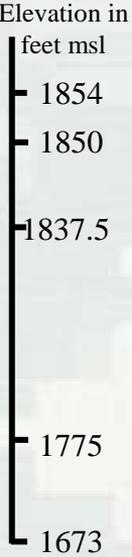
11.5 feet below base of Flood Control zone



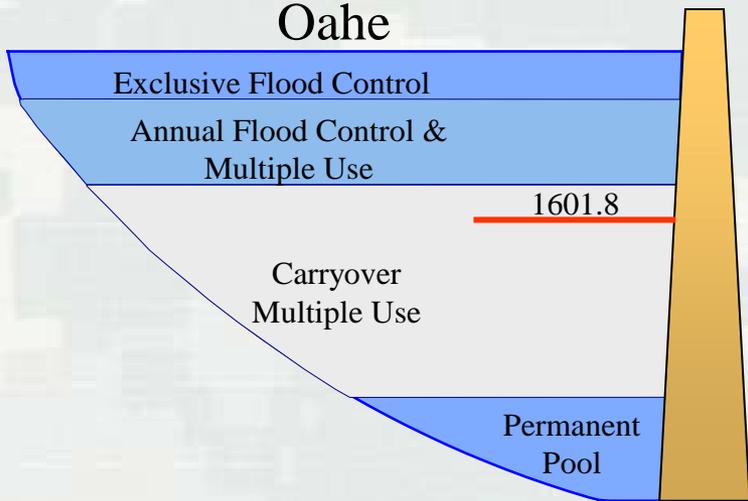
Garrison



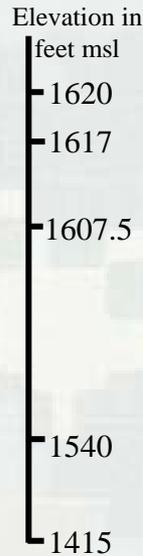
5.3 feet below base of Flood Control zone



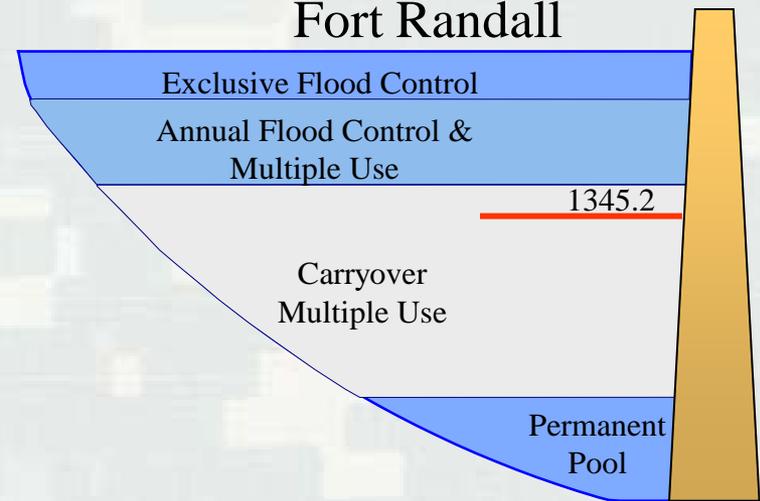
Oahe



5.7 feet below base of Flood Control zone



Fort Randall



4.8 feet below base of Flood Control zone



Planned Operation for 2014

- 2014 Runoff Forecast = 26.7 MAF (106% of normal)
- 5.5 MAF below the base of the Annual Flood Control zone at the start of the 2014 runoff season
 - ▶ Carryover/Multiple Use Zone will be 85% full
- Drought conservations measures implemented
 - ▶ Minimum winter releases
 - ▶ Reduced support for navigation
 - ▶ Missing navigation targets in reaches without commercial navigation
 - ▶ Use of the Kansas Basin reservoirs for navigation support
 - ▶ Cycling Gavins Point releases

Planned Operation for 2014 (cont'd)

- Missouri River navigation flow support forecast
 - ▶ 1st half of season: 3,300 cfs below Full Service support level
 - ▶ 2nd half of season: slightly below Full Service support level

- Full Season Length

- Season Open
 - ▶ Sioux City, IA – March 23
 - ▶ Omaha, NE – March 25
 - ▶ Kansas City, MO – March 28
 - ▶ Mouth of Missouri – April 1

Planned Operation for 2014 (cont'd)

- No Gavins Point spring pulse in 2014
- Favor Garrison during the forage fish spawn if inflows are not sufficient to keep all three upper reservoirs rising
- Public meetings scheduled April 8-10, 2014
- Monthly calls with Congressional delegations, Tribes, states, local officials and media
 - ▶ Audio file available on website or as podcast on iTunes



Thank You!

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<http://www.nwd-mr.usace.army.mil/rcc/>

Or Google “Corps Missouri River”



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Independent External Review Panel

- Panel Recommendations

1. Support a program of infrastructure enhancement
 - *Vulnerability Report released October 12, 2012*
2. Update hydrologic studies to include 2011
 - *Ongoing; critical studies updated prior to 2013 AOP*
3. Review of System storage allocations
 - *Report released April 13, 2012*
4. Improved cooperation/collaboration with NWS, USGS & NRCS on water supply forecasting; improved communication with tribal, state, local officials
 - *Ongoing coordination on runoff forecasts*
 - *Fusion Forecasting Team (Corps, NWS, USGS) coordinating on river forecasts*
 - *Monthly calls with Congressional delegations, Tribes, state and local government and the press began again in January 2013*
 - *Public meetings, press releases, speaking engagements, agency and interest group meetings, etc*



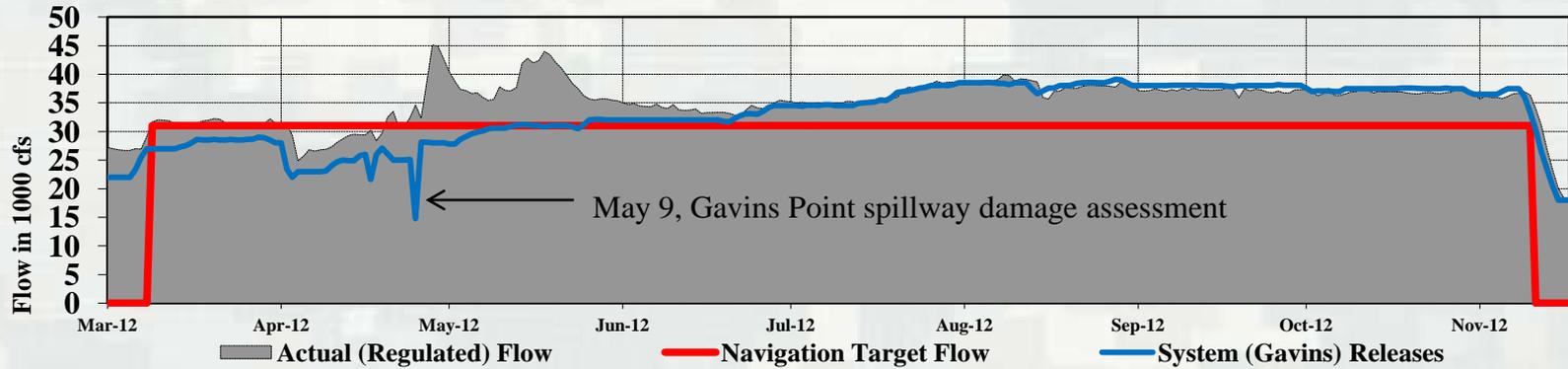
Independent External Review Panel (cont'd)

• Panel Recommendations

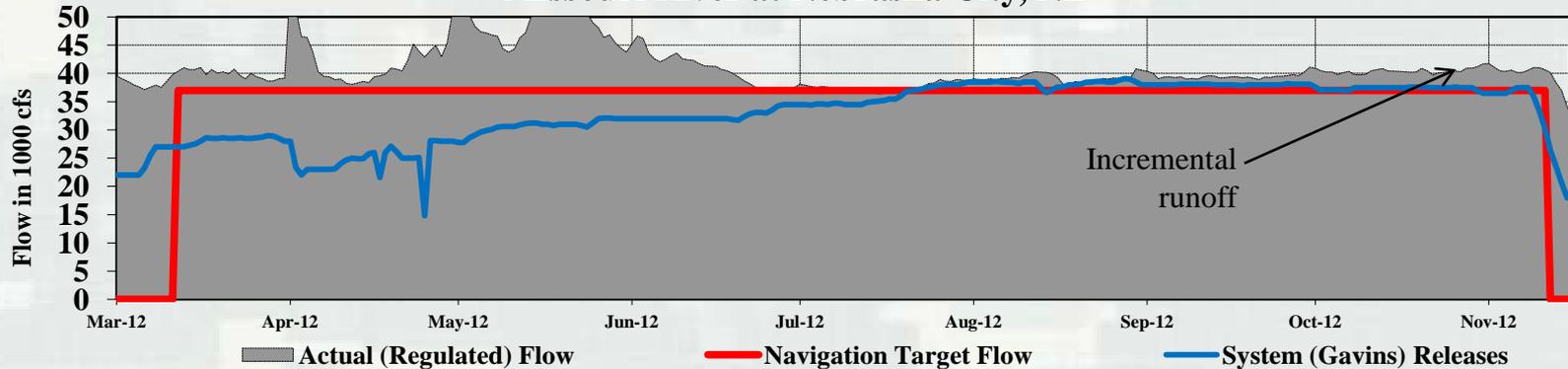
5. Studies to enhance data collection and forecasting especially plains snow
 - *Meeting held with Federal, state and other officials in Bismarck on 18 & 19 September 2012.*
 - *Participation by NOAA (River Forecast Centers, Weather Forecast Offices,, National Operational Hydrologic Remote Sensing Center), NRCS, USGS, Corps (NWD & Cold Regions Research and Engineering Laboratory), States of ND, SD, MT and WY, High Plains Regional Climate Center, National Drought Mitigation Center, Western Governors Association, Missouri River Basin Interagency Roundtable.*
 - *Focus on plains snow water content and basin conditions (soil moisture, frost depths, temperature and precipitation forecasts).*
 - *High Plains Regional Climate Center will be repository for all data.*
 - *Currently scoping project grid, equipment types, costs of installation, operation and maintenance.*
 - *Several states have committed financial support*
 - *Corps expanding snowmelt models for upper basin*
6. Implement modern interactive, graphics decision support system
 - *Website enhancements ongoing, Corps Water Management System (CWMS) development, update legacy models, reservoir simulation model development*



Missouri River at Sioux City, IA



Missouri River at Nebraska City, NE



Missouri River at Kansas City, MO

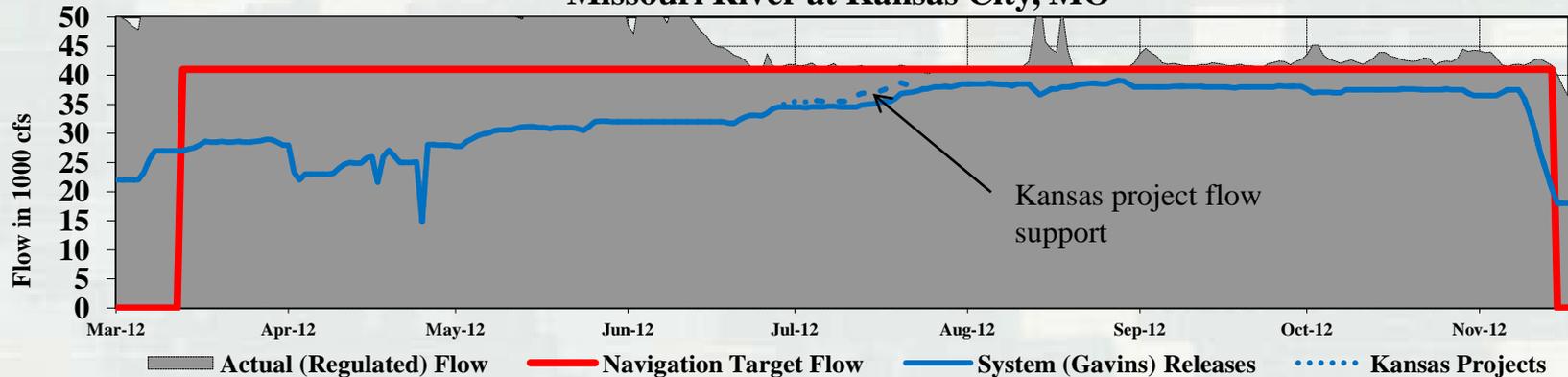


Figure 13a. Actual flow, System releases and navigation target flows – Sioux City, IA; Nebraska City, NE and Kansas City, MO.