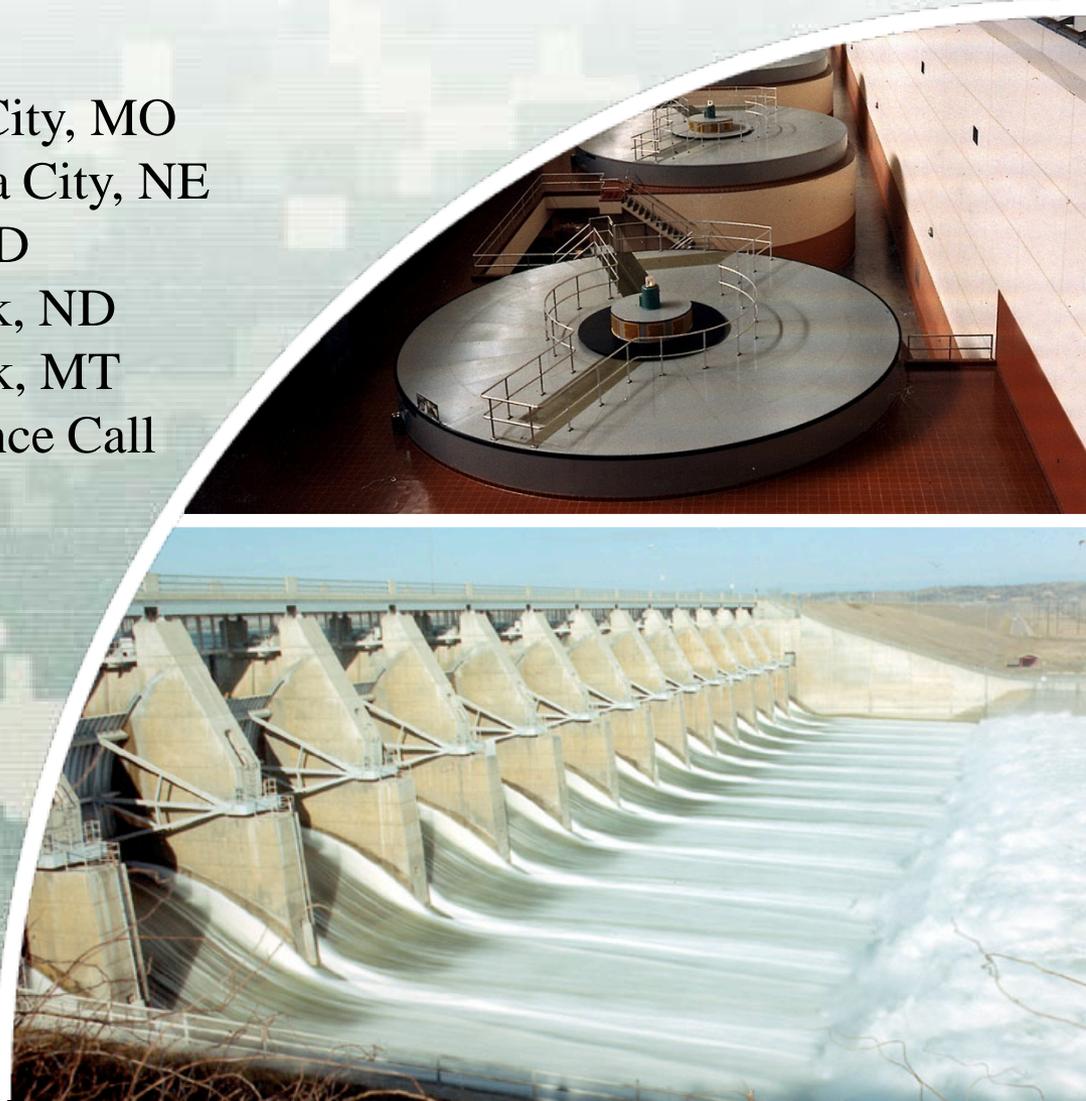


Missouri River Basin Water Management Spring 2014 Public Meetings

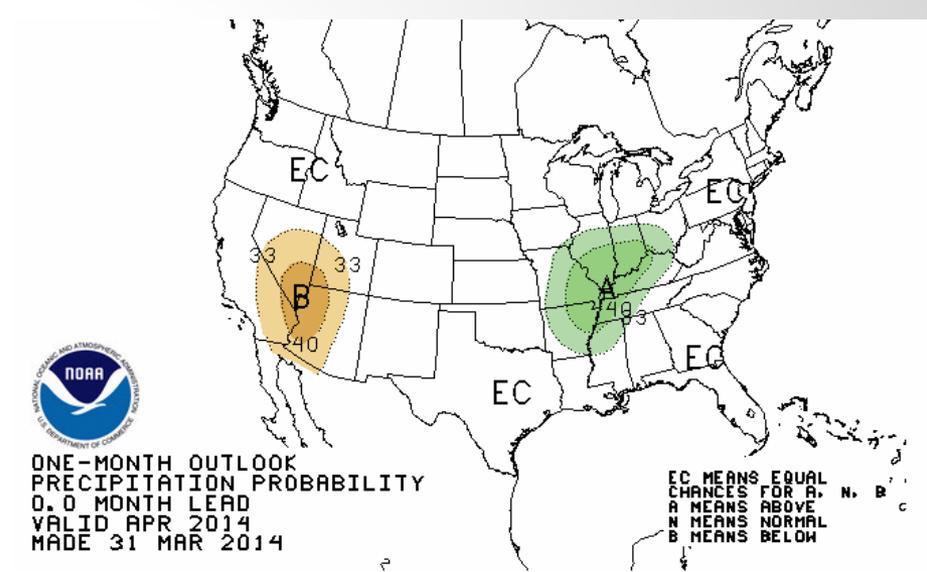
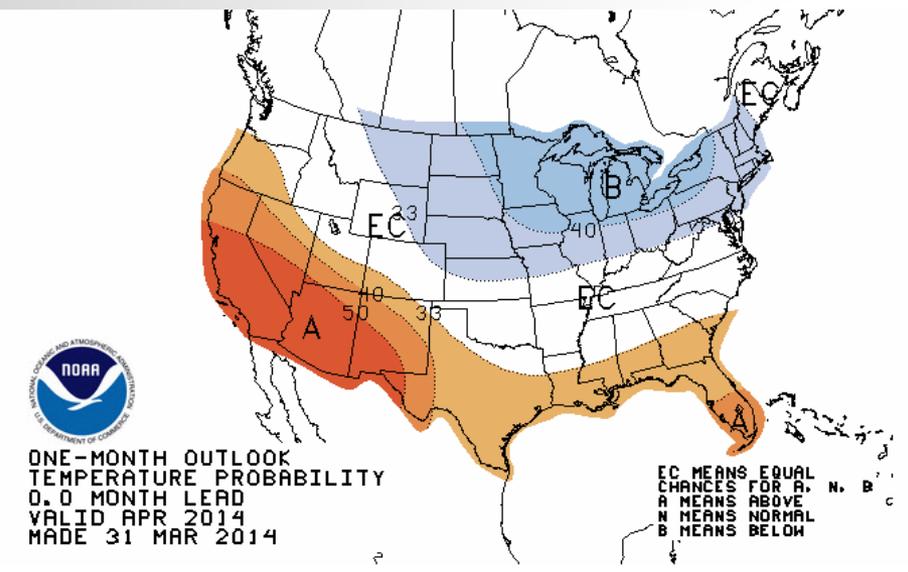
April 8 th	1:00 p.m.	Kansas City, MO
April 8 th	7:00 p.m.	Nebraska City, NE
April 9 th	11:00 a.m.	Pierre, SD
April 9 th	7:00 p.m.	Bismarck, ND
April 10 th	10:00 a.m.	Fort Peck, MT
April 11 th	1:00 p.m.	Conference Call





MISSOURI BASIN

April 30-Day Temp and Precip Outlooks



http://www.cpc.ncep.noaa.gov/products/predictions/30day/off15_prctp.gif



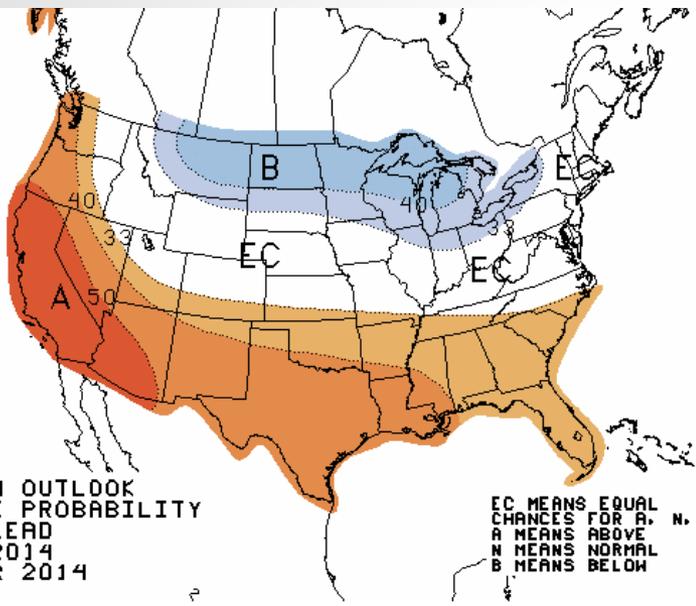
Building a Weather-Ready Nation



MISSOURI BASIN

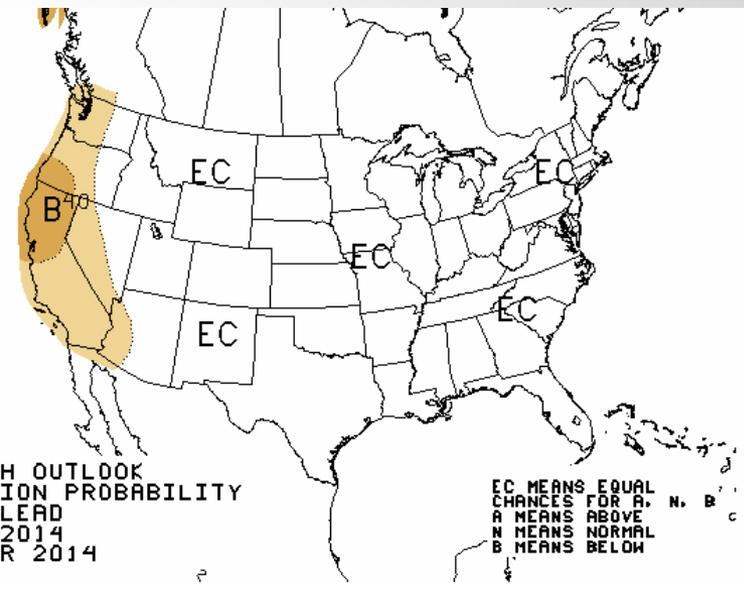


April-May-June Temp and Precip Outlooks



THREE-MONTH OUTLOOK
TEMPERATURE PROBABILITY
0.5 MONTH LEAD
VALID AMJ 2014
MADE 20 MAR 2014

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



THREE-MONTH OUTLOOK
PRECIPITATION PROBABILITY
0.5 MONTH LEAD
VALID AMJ 2014
MADE 20 MAR 2014

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

http://www.cpc.ncep.noaa.gov/products/predictions/long_range/lead01/off01_prctp.gif



Building a Weather-Ready Nation

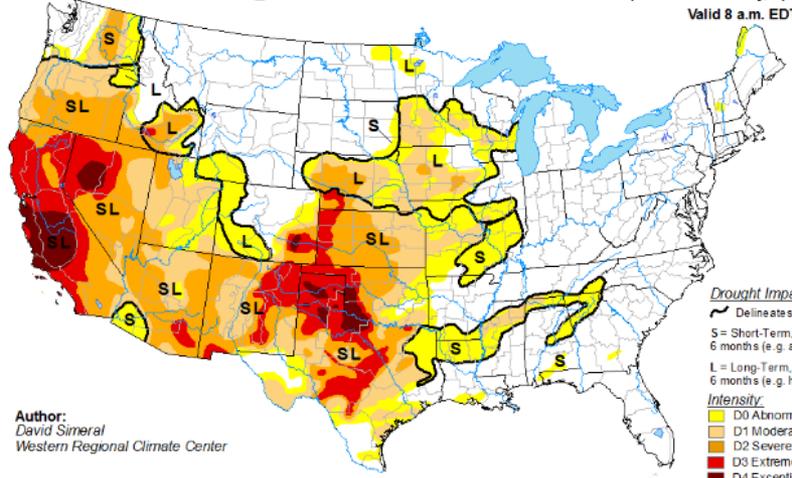


MISSOURI BASIN Drought Conditions



U.S. Drought Monitor

April 1, 2014
(Released Thursday, Apr. 3, 2014)
Valid 8 a.m. EDT



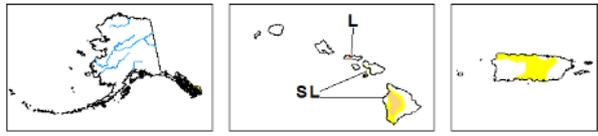
Author:
David Simeral
Western Regional Climate Center

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
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.

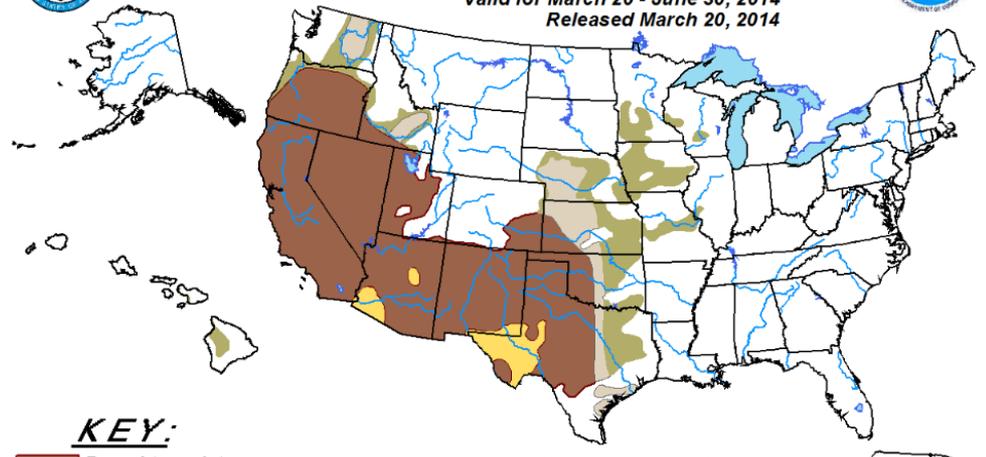
USDA
http://droughtmonitor.unl.edu/



OTE: To view regional drought conditions, click on map above. State maps can be accessed from regional maps



U.S. Seasonal Drought Outlook Drought Tendency During the Valid Period Valid for March 20 - June 30, 2014 Released March 20, 2014



Author: Anthony Artusa, Climate Prediction Center, NOAA
http://www.cpc.ncep.noaa.gov/products/expert_assessment/season_drought.html

KEY:
Drought persists or intensifies
Drought remains but improves
Drought removal likely
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 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)

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



Building a Weather-Ready Nation

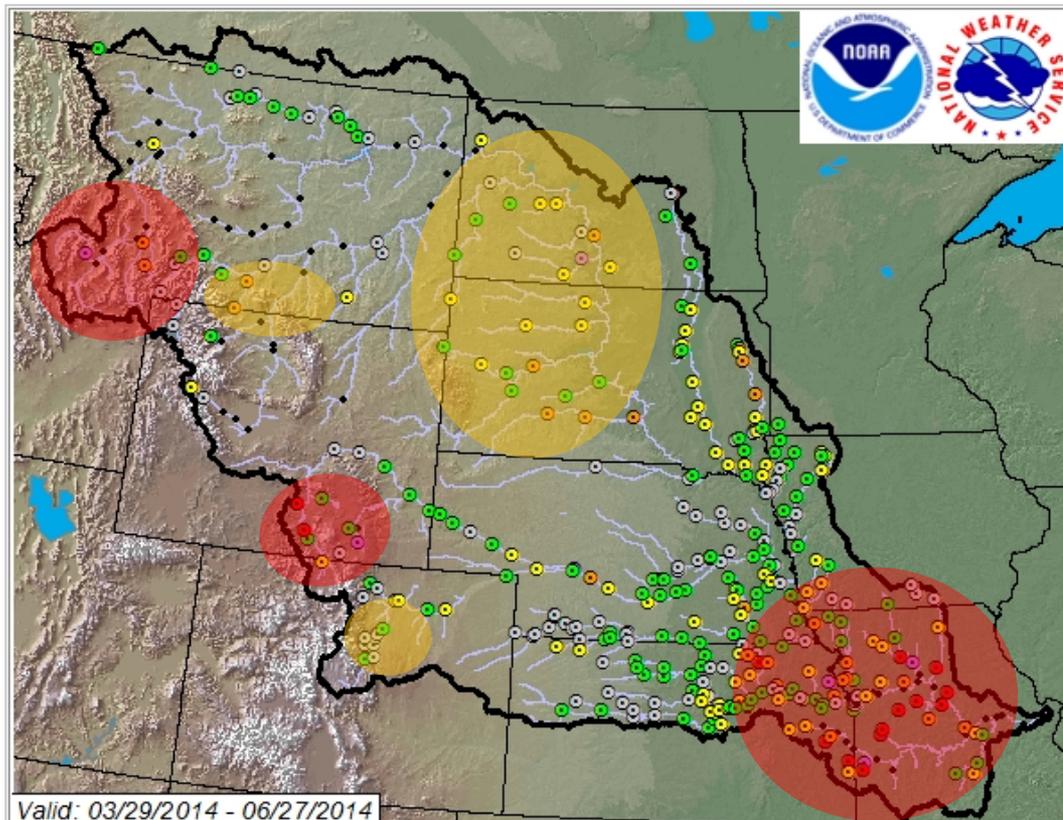


MISSOURI BASIN RIVER FORECAST CENTER



Probabilities of exceeding Minor Flood Levels

(click on specific points to view probabilistic outlooks)



Percent Chance of Minor Flooding

- | | | |
|------------------|-------------|-------------|
| • Not Calculated | ⊙ < 5% | ● 5% - 20% |
| ● 21% - 40% | ● 41% - 60% | ● 61% - 80% |
| ● > 80% | | |

Rivers likely to experience minor (and maybe **moderate**) flooding

- Big Hole River, MT
- Gallatin River, MT
- North Platte, WY
- Laramie, WY
- **Marais des Cygnes—Osage River basin, KS & MO**
- **Grand River, MO**
- Chariton River, MO
- Platte River, MO
- Missouri River, some reaches
- **Smaller streams in MO & extreme eastern KS**

Areas to watch:

- Smaller streams in western Dakotas
- Some tributaries to the Yellowstone, MT
- Colorado foothills





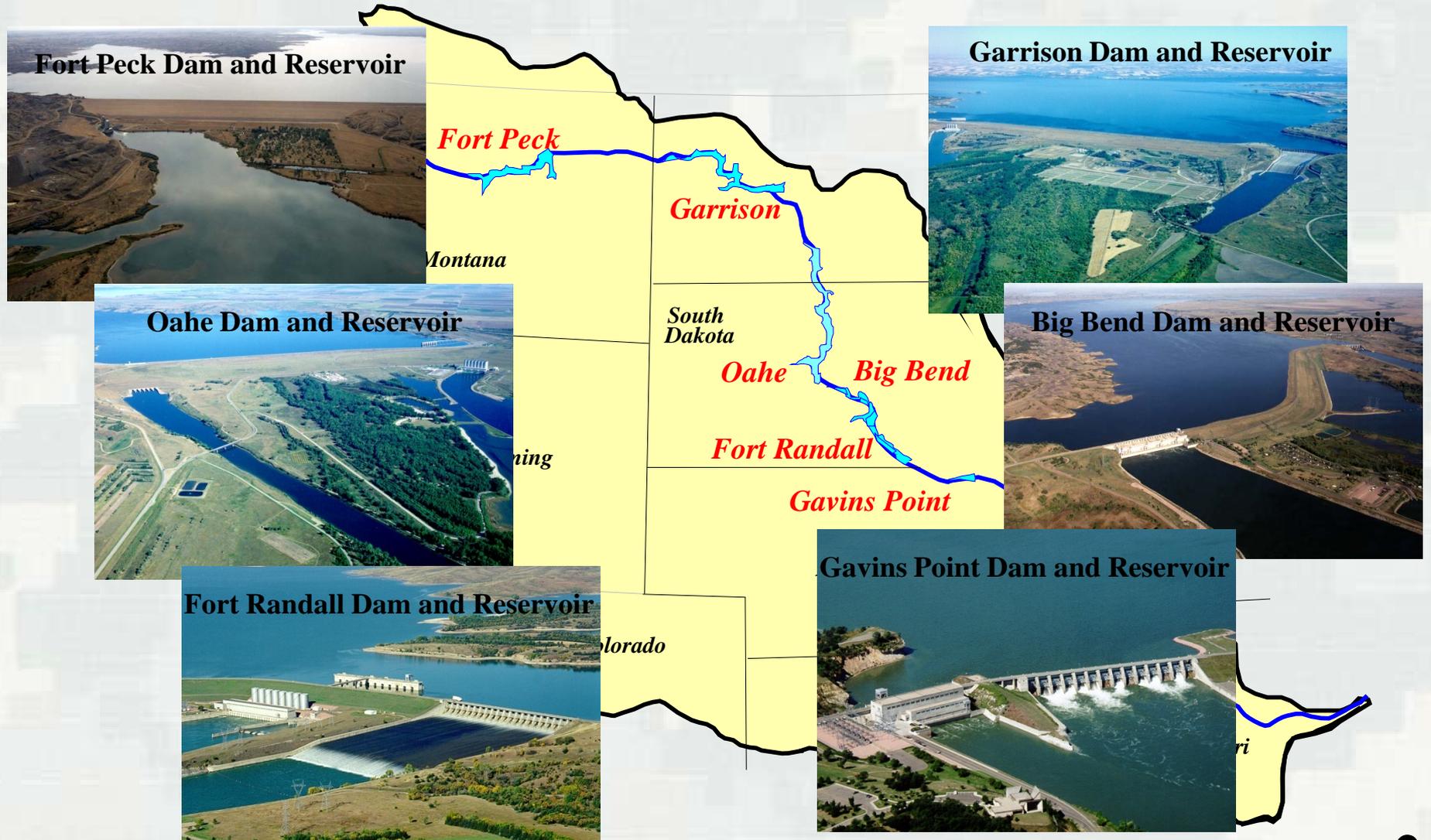
MISSOURI BASIN SPRING FLOOD SUMMARY



- **Above average mountain snowpack. Typical accumulation season nearing end.**
- **Insignificant plains snowpack.**
- **Northern Plains soils beginning to thaw, but very wet.**
- **Significant flooding has already occurred due to lower elevation mountain snowmelt and plains snowmelt. But this flooding was greatly enhanced by ice-covered rivers.**
- **Ice-jam induced flooding is no longer a threat!!!**
- **Only minor and isolated flooding is expected due to the mountain snow runoff alone.**
- **Have to keep watch on western portions of the Dakotas, as rain events could lead to localized minor flooding.**
- **Minor-to-moderate flooding due to thunderstorms highly likely to continue in eastern Kansas and Missouri for next few months. Not atypical!!!!**



Missouri River Mainstem Reservoir System



Our Mission

Regulate Missouri River Mainstem Reservoirs to Support Congressionally Authorized Purposes

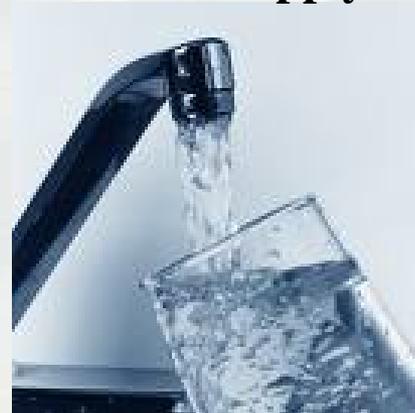
Flood Control



Hydropower



Water Supply



Water Quality Control



Recreation



Navigation



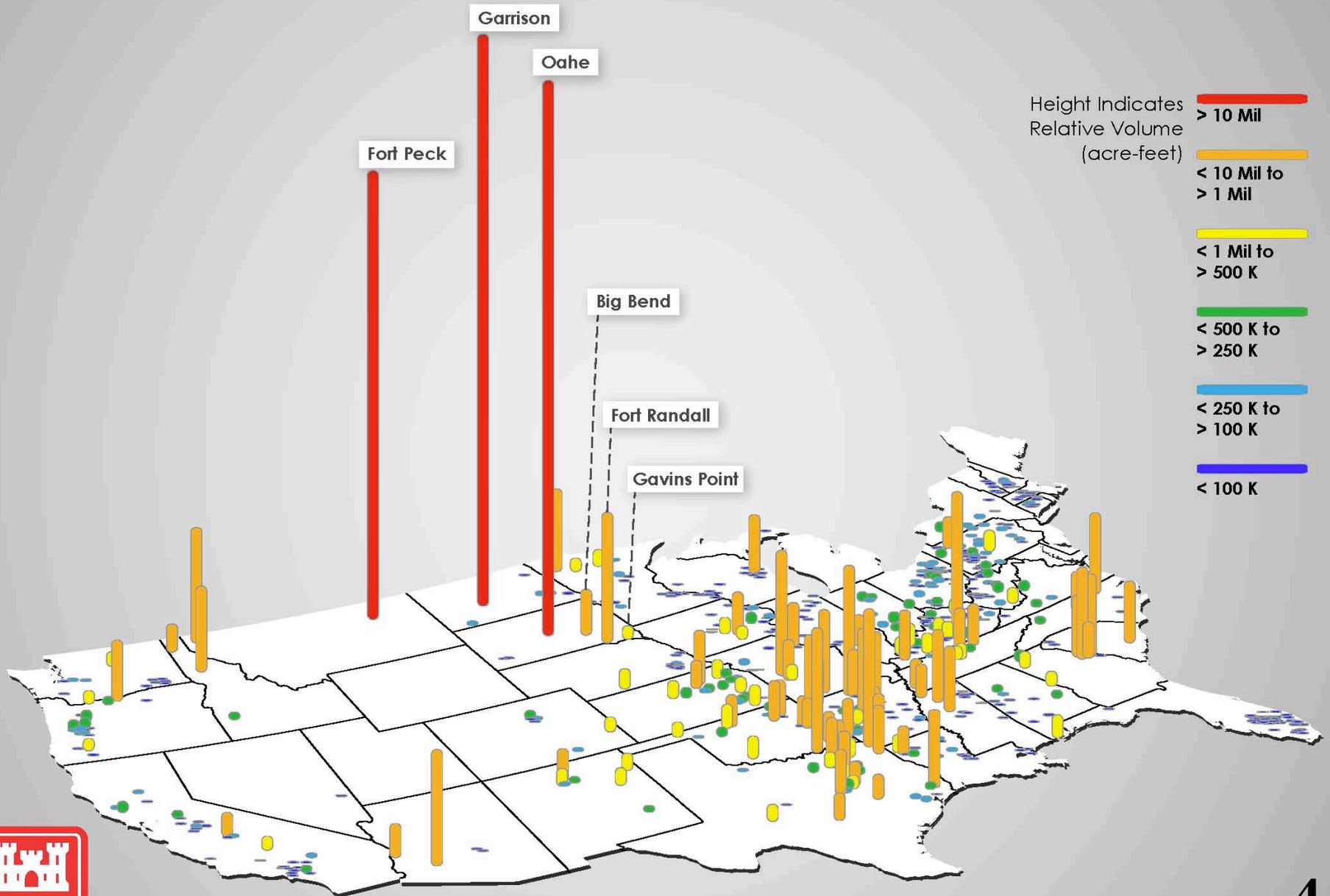
**Fish and Wildlife
Including Threatened and
Endangered Species**



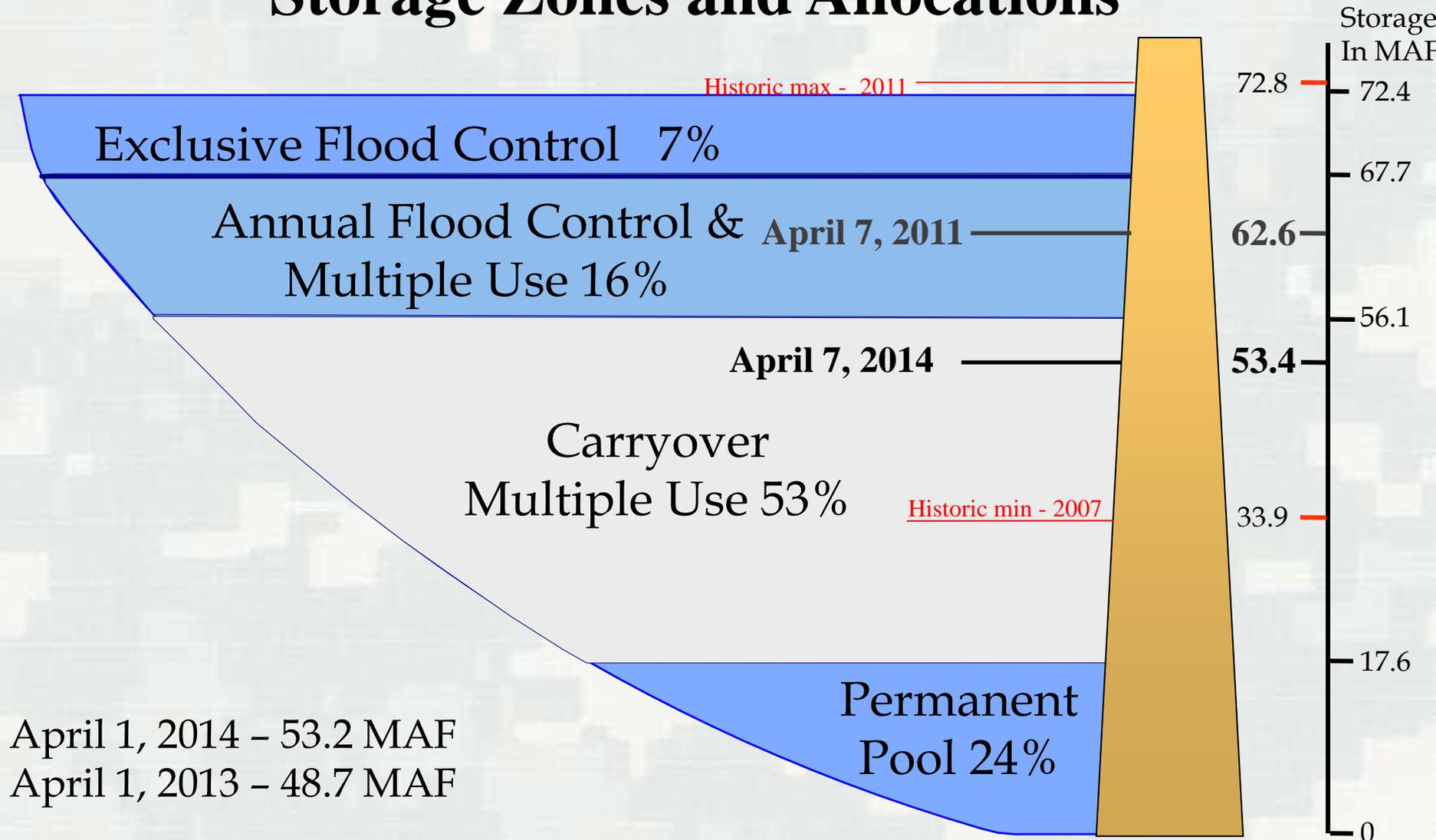
Irrigation



Storage Capacity of Corps Reservoirs

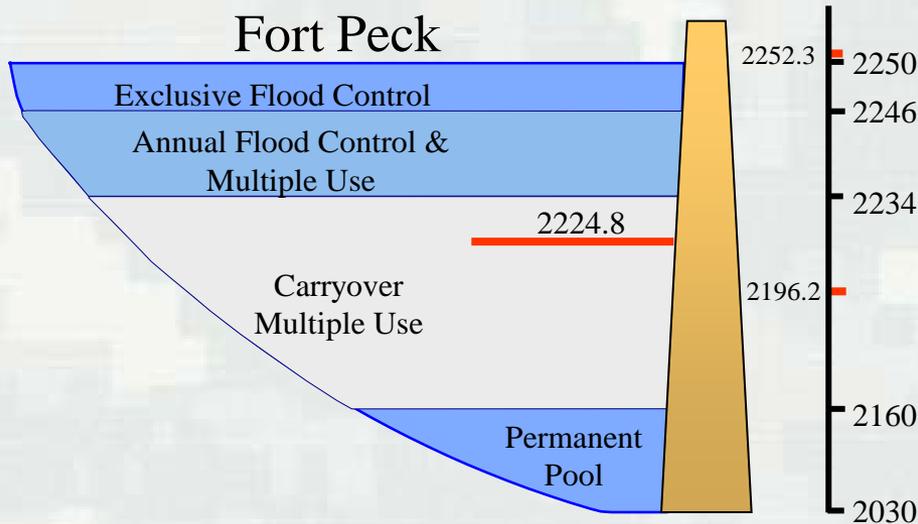


Missouri River Mainstem System Storage Zones and Allocations

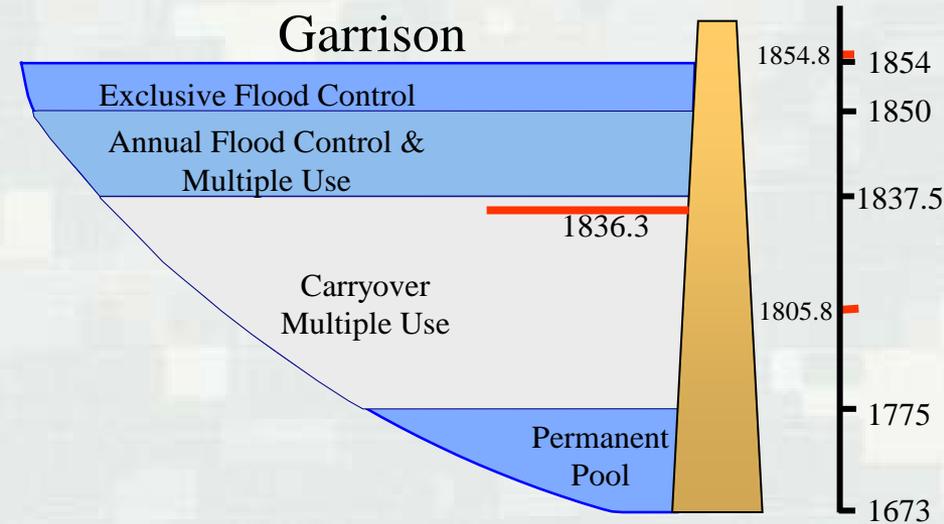


Current Reservoir Levels – Apr 7, 2014

Fort Peck



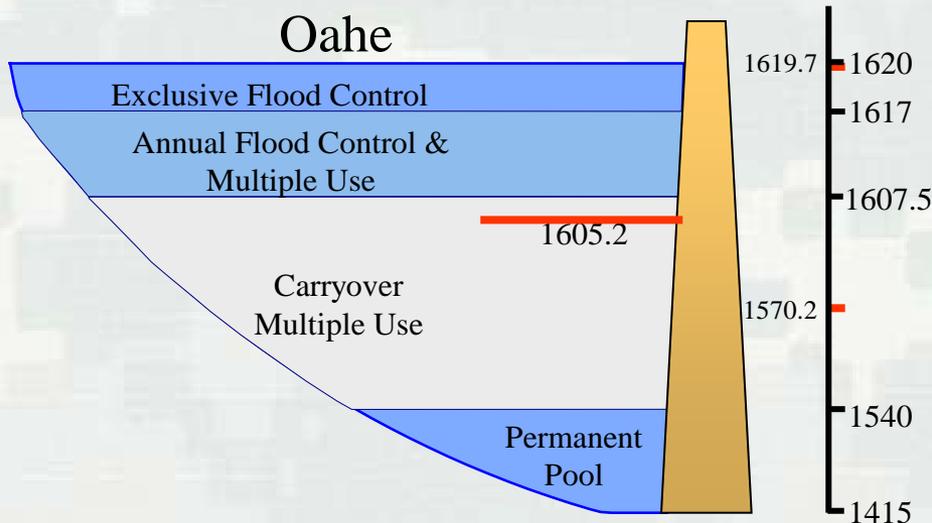
Garrison



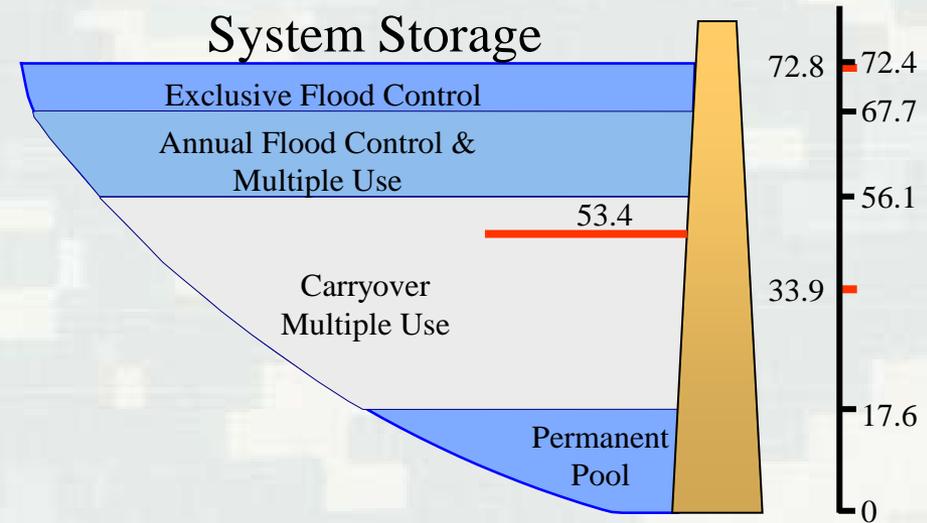
9.2 feet into Carryover Multiple Use Zone.
14.5 feet below 2011 level.

1.2 feet into Carryover Multiple Use Zone.
5.2 feet below 2011 level.

Oahe



System Storage

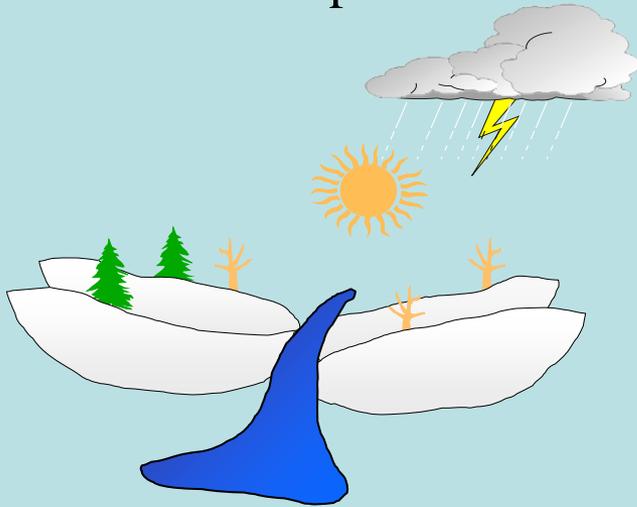


2.3 feet into Carryover Multiple Use Zone.
10.4 feet below 2011 level.

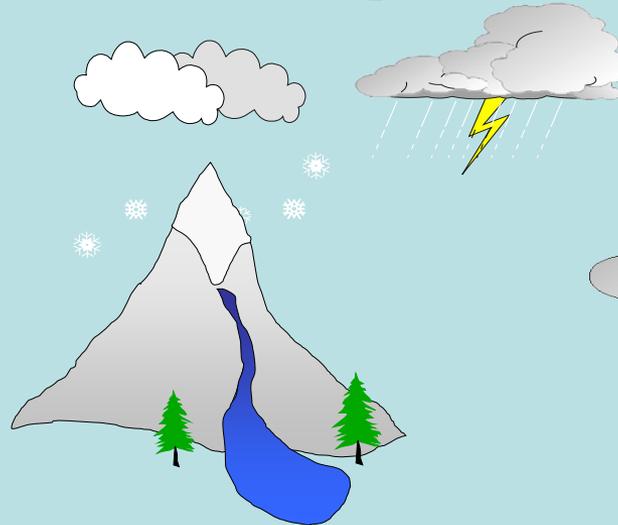
2.7 MAF into Carryover Multiple Use Zone.
9.2 MAF below 2011 level.

Runoff Components

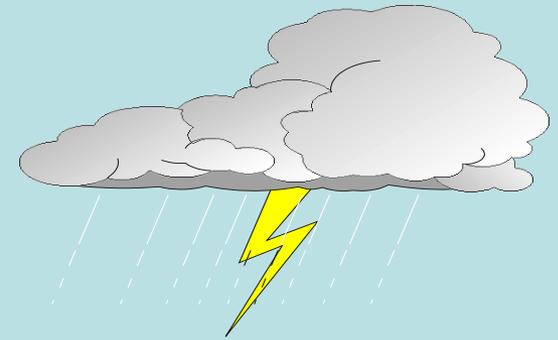
Plains Snowpack



Mountain Snowpack



Rainfall



March and
April

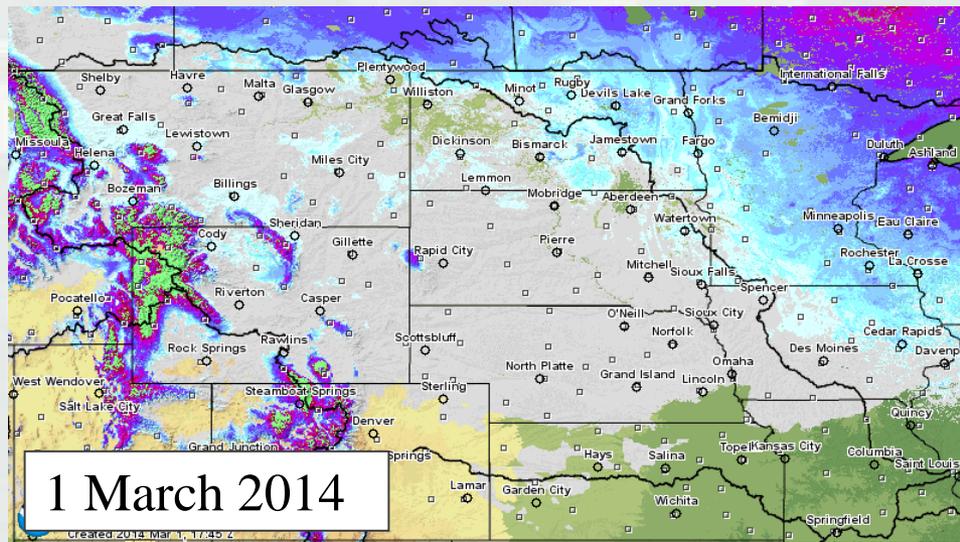
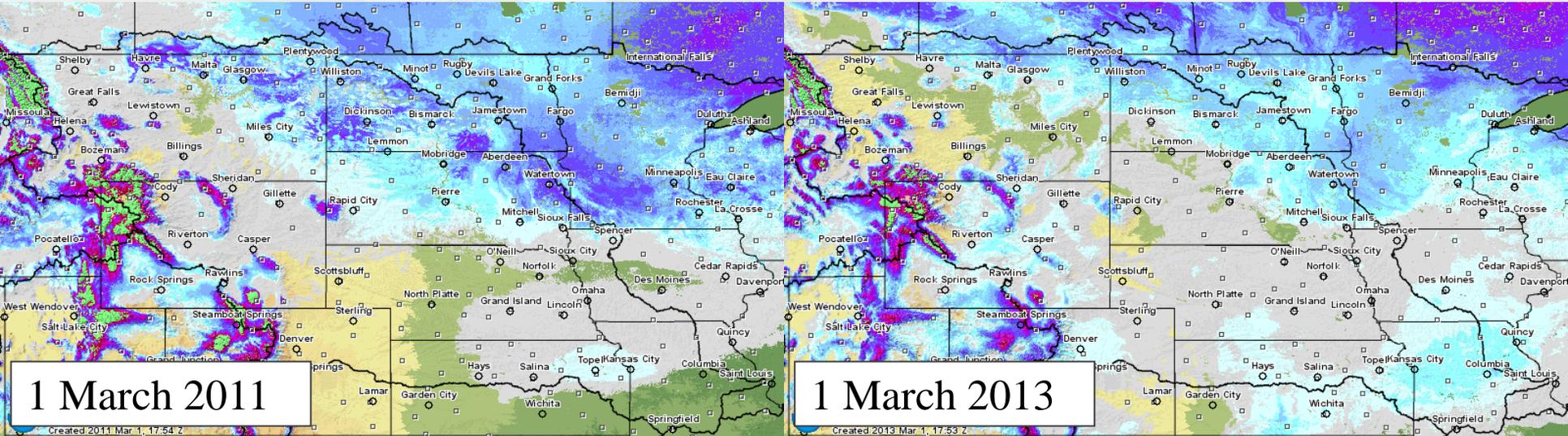
May, June
and July

March through
October

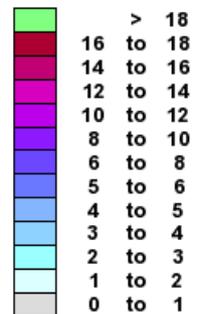
2014 Forecast* = 32.0 MAF

*April 1 Forecast

Plains Snowpack

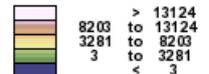


Inches of water equivalent



Not Estimated

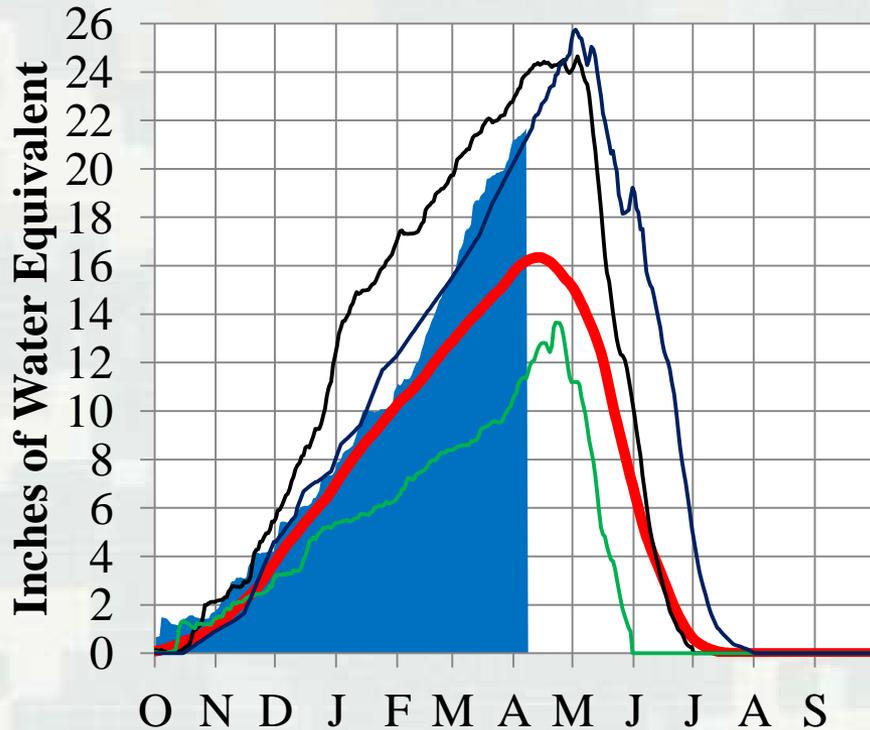
Elevation in feet (Not estimated)



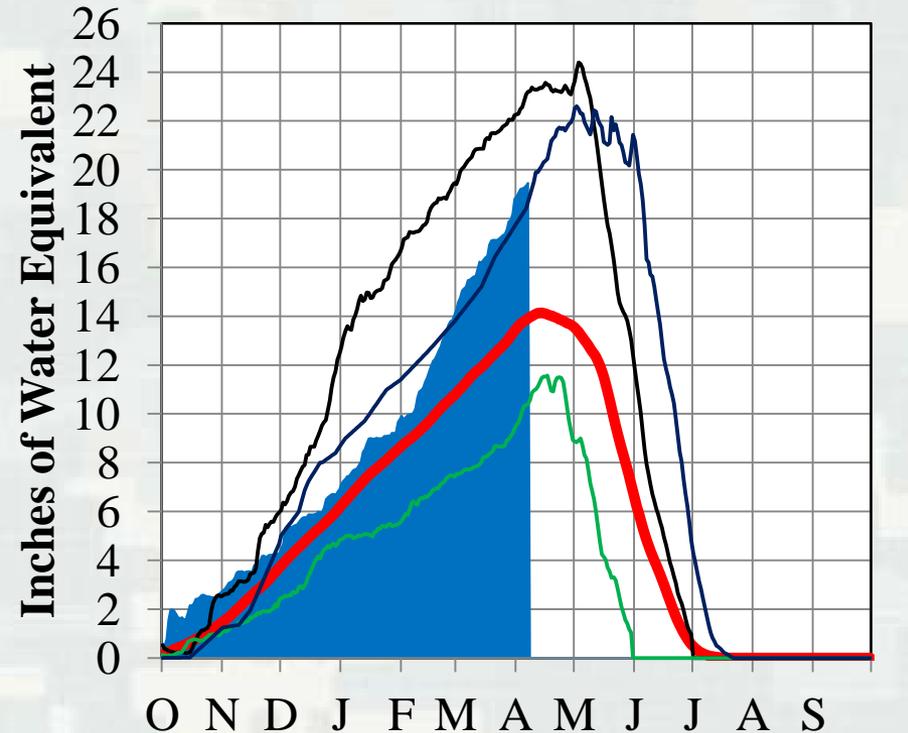
Missouri River Basin – Mountain Snowpack Water Content 2013-2014 with comparison plots from 1997*, 2001*, and 2011

April 7, 2014

Total above Fort Peck



Total Fort Peck to Garrison



■ 2013-14 ■ 1981-2010 Ave — 1997 — 2001 — 2011

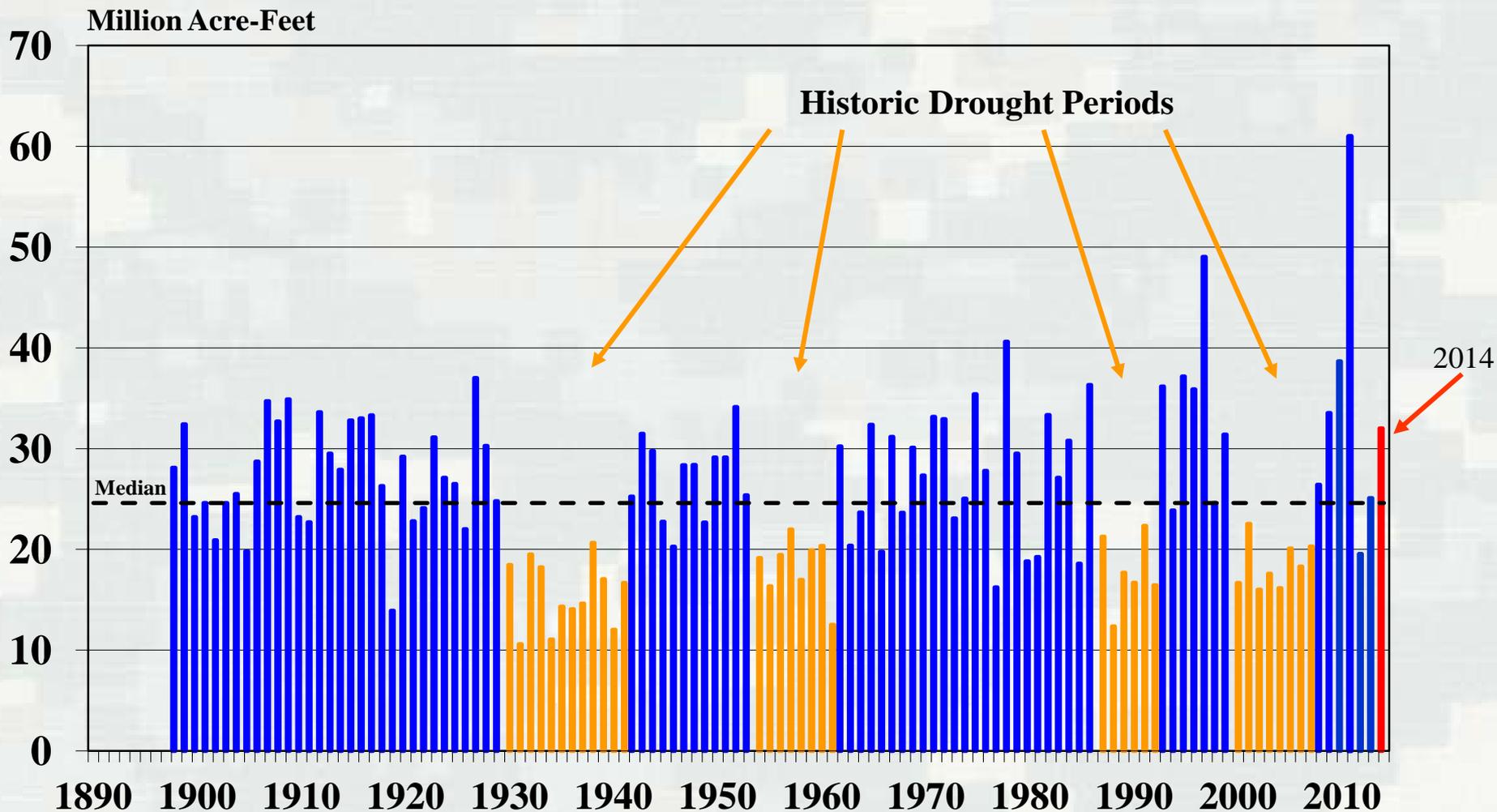
■ 2013-14 ■ 1981-2010 Ave — 1997 — 2001 — 2011

On April 7, 2014 the mountain snowpack in the “Total above Fort Peck” reach was 133% of average. The mountain snowpack in the “Total Fort Peck to Garrison” reach was 139% of average. The Missouri River basin mountain snowpack normally peaks near April 15.

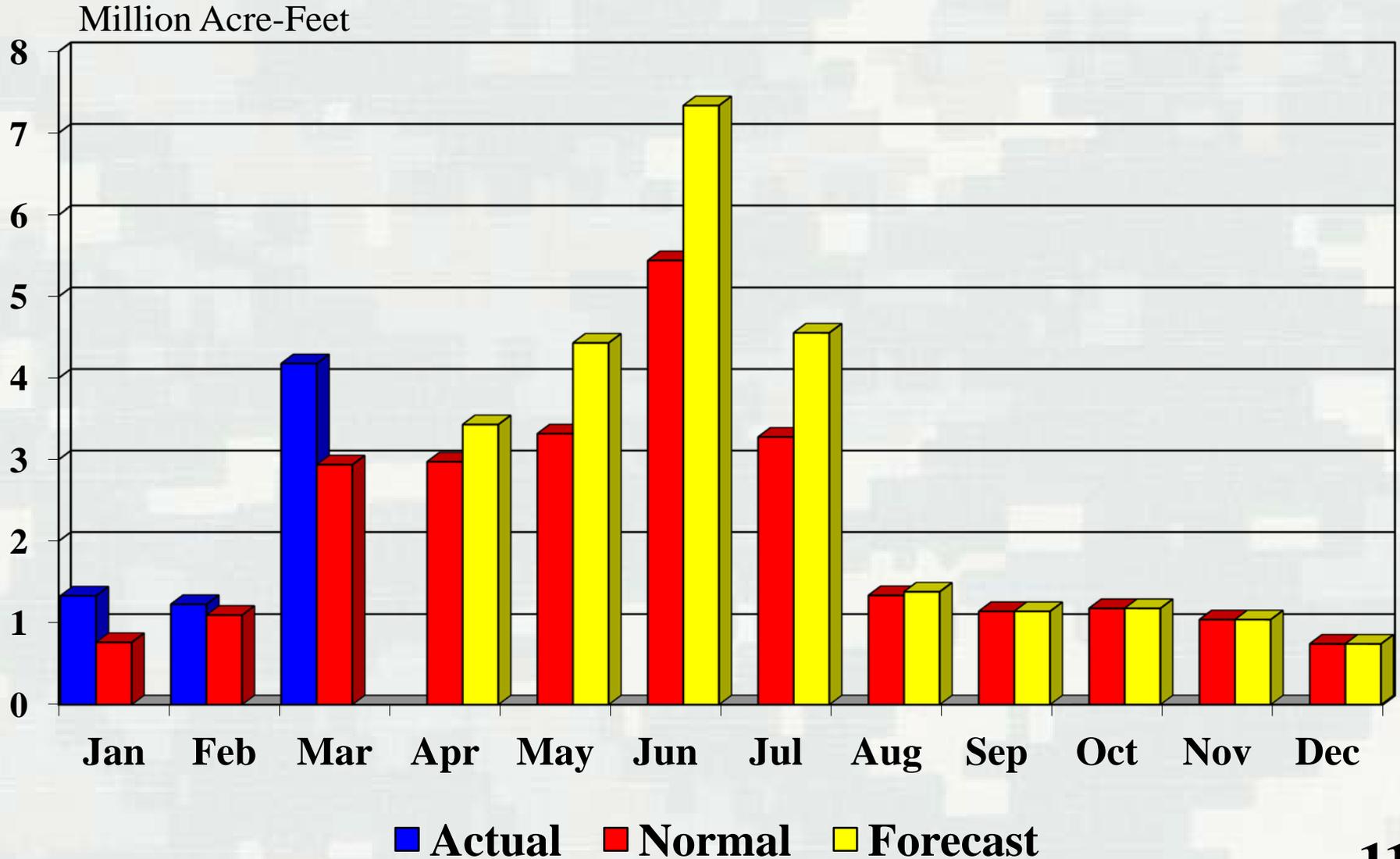
*Generally considered the high and low year of the last 20-year period.

Provisional data. Subject to revision.

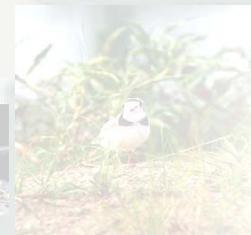
Annual Runoff above Sioux City, IA



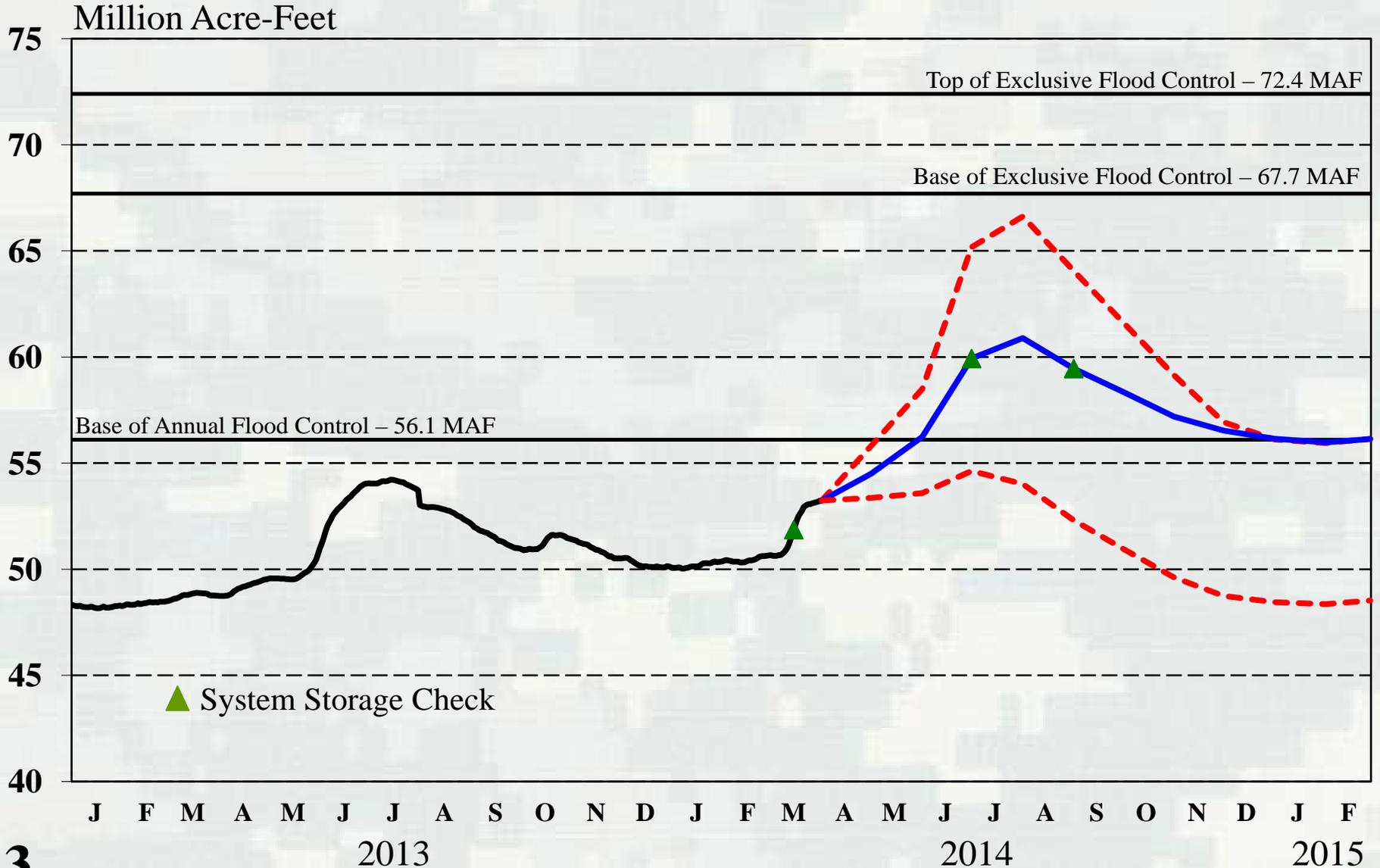
Missouri River Runoff above Sioux City, IA 2014 Actual and Forecasted



Expected Results for Authorized Purposes in 2014



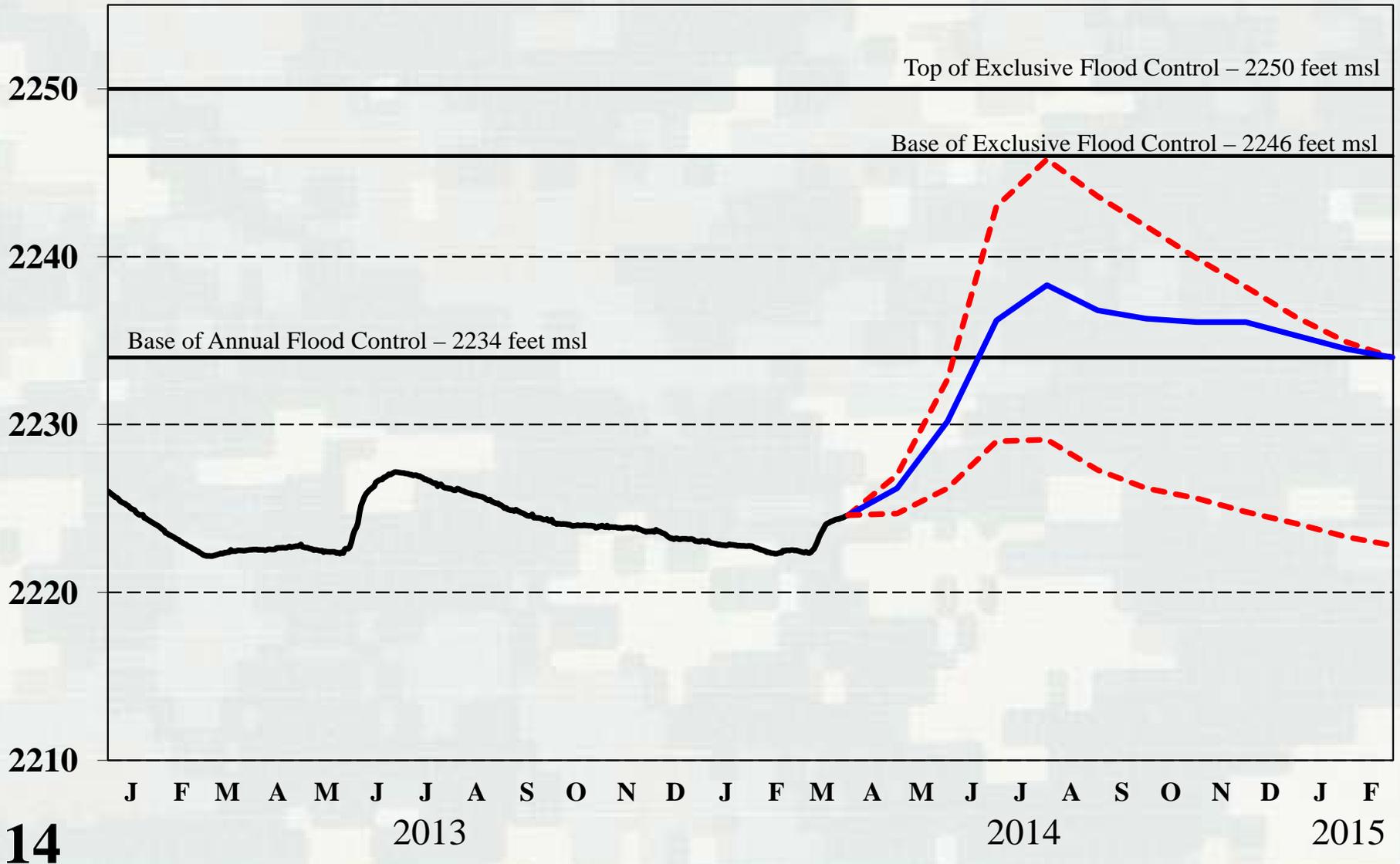
System Storage April 1 Forecast



Fort Peck

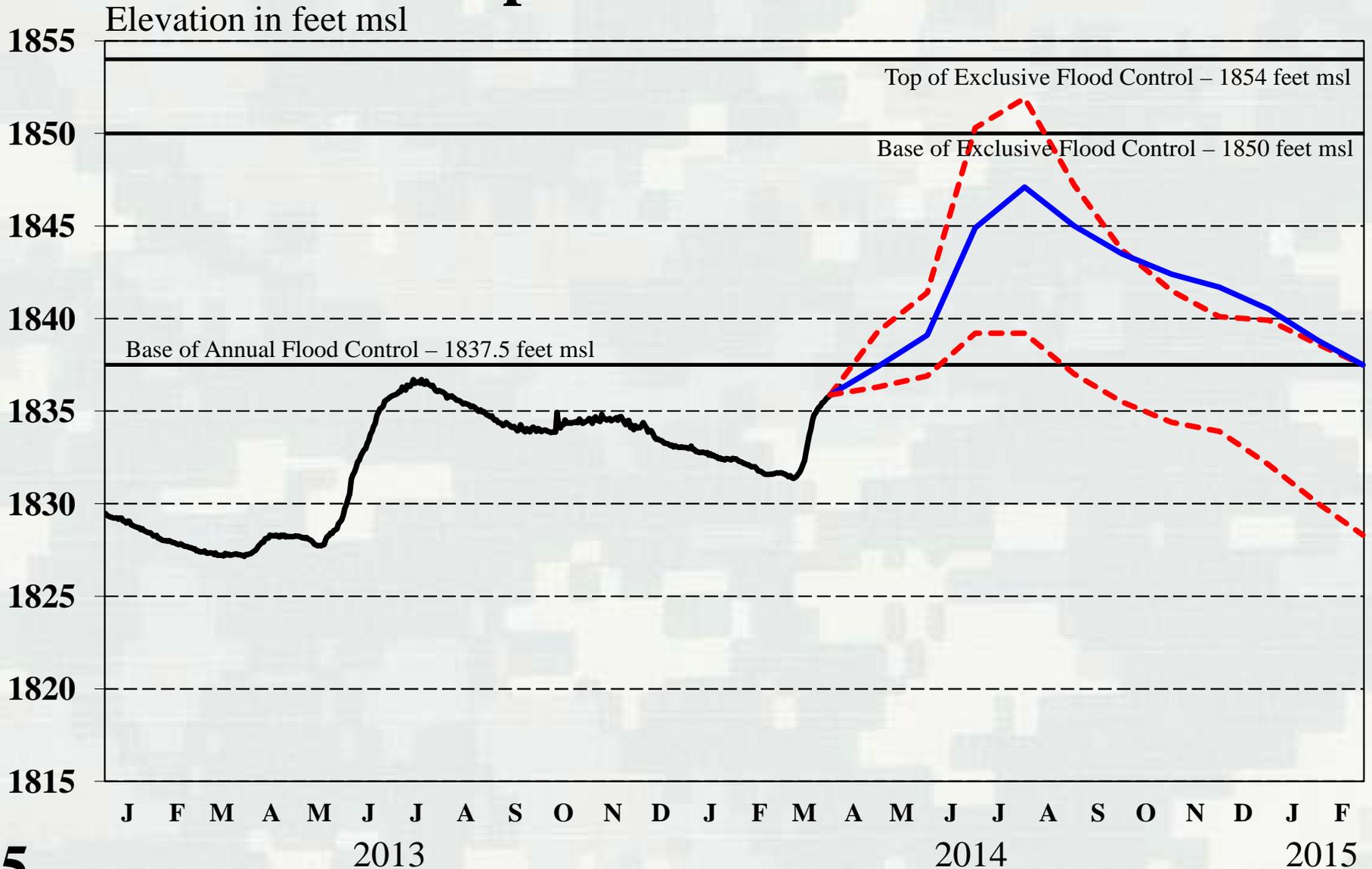
April 1 Forecast

Elevation in feet msl



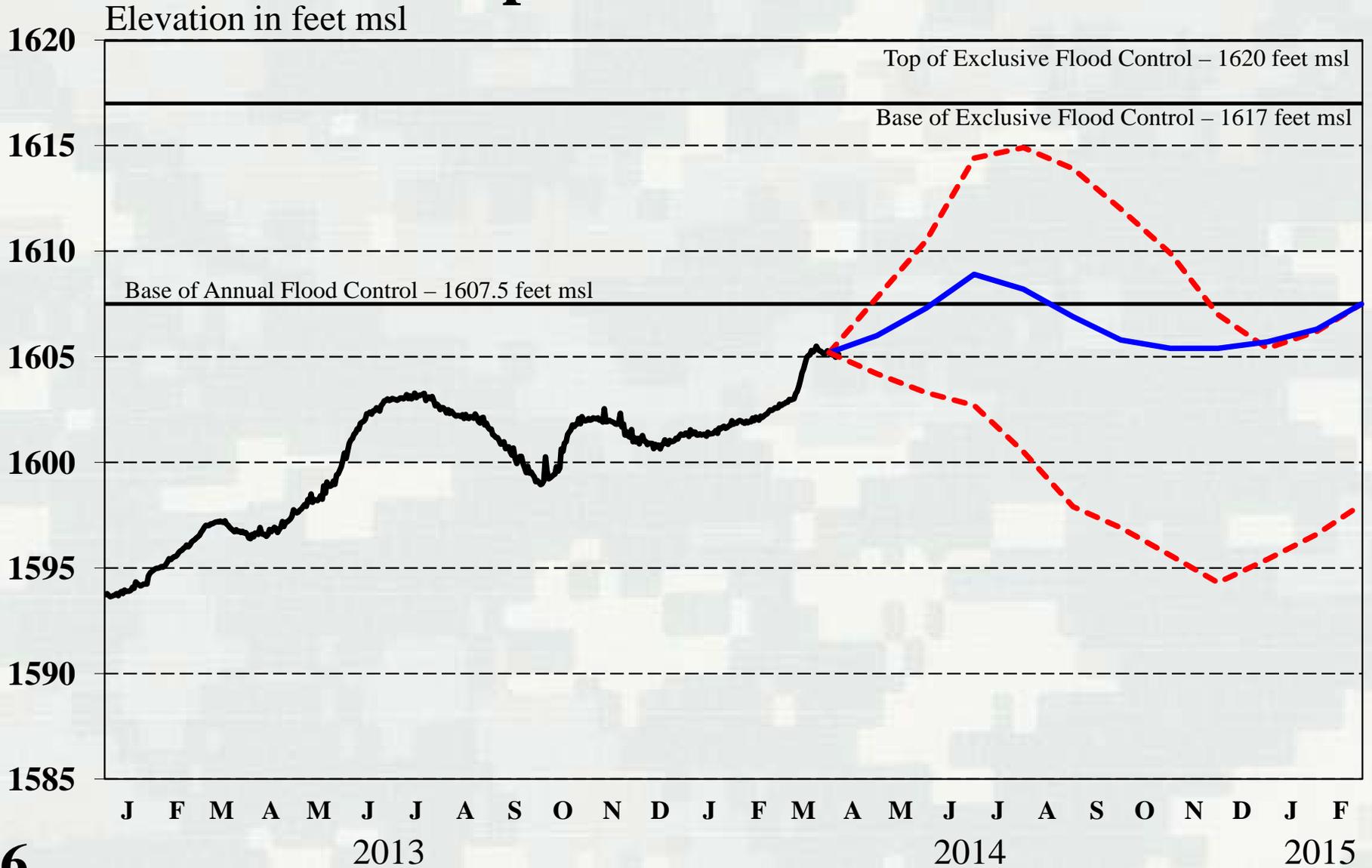
Garrison

April 1 Forecast



Oahe

April 1 Forecast



Flood Control

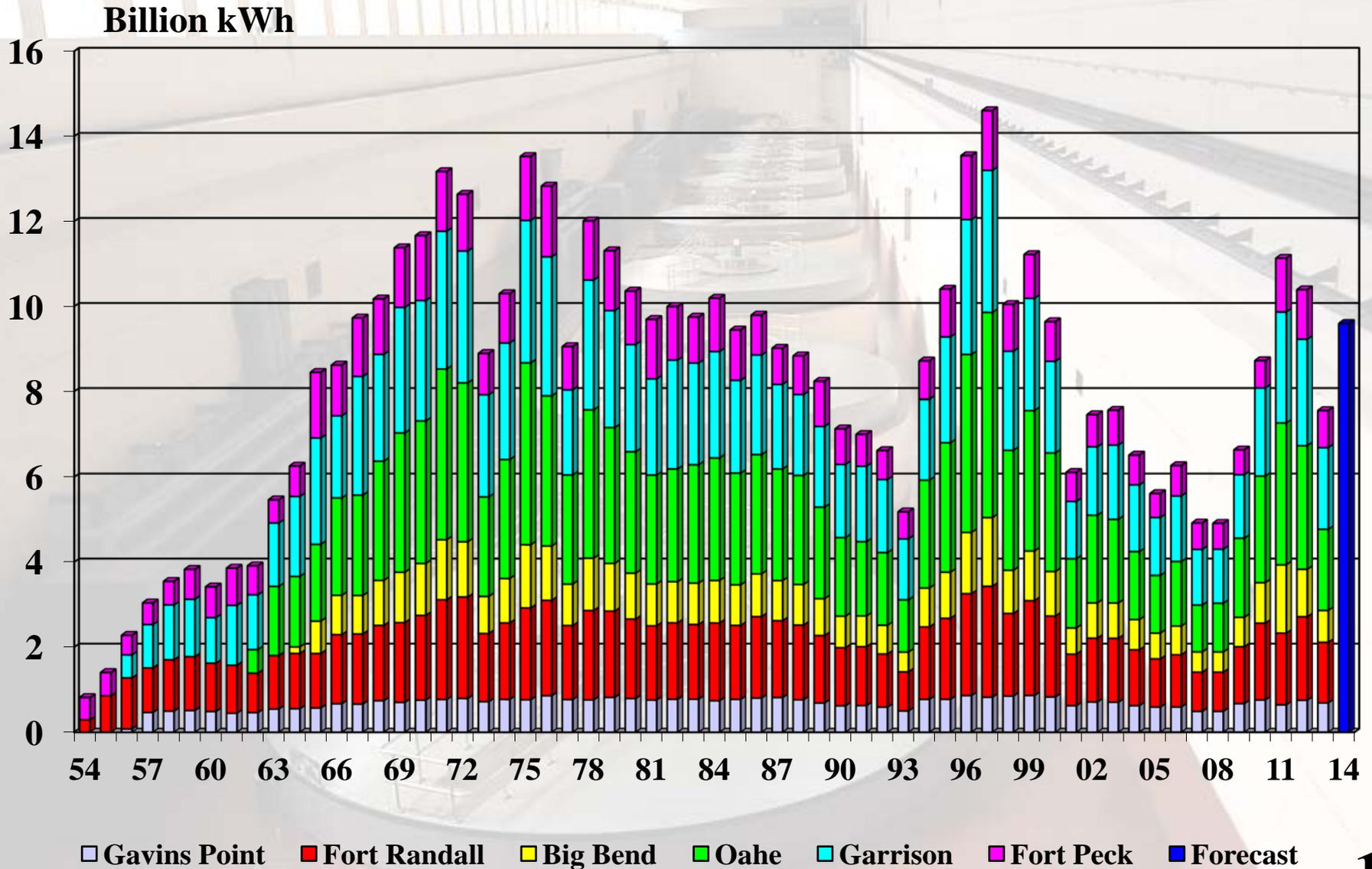
- Started runoff season with additional 5.5 MAF of flood control storage available due to 2012 drought
- Fort Peck, Garrison and Oahe currently 1-9 feet below base of flood control zone
- Flooding can still occur due to downstream rainfall

RA, NEBR.

13

FLOODWALL WITH EMERGENCY FLASH BOARDING

Hydropower



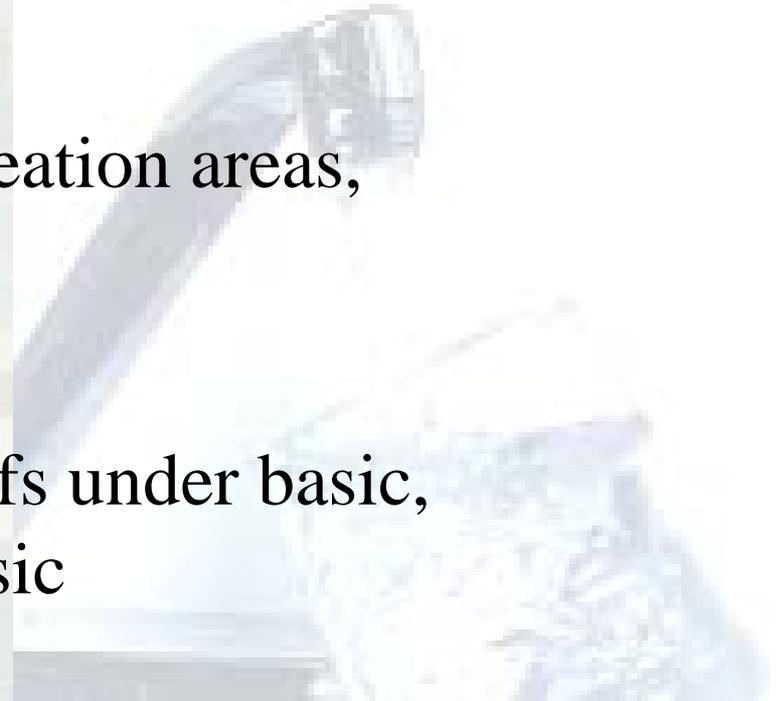
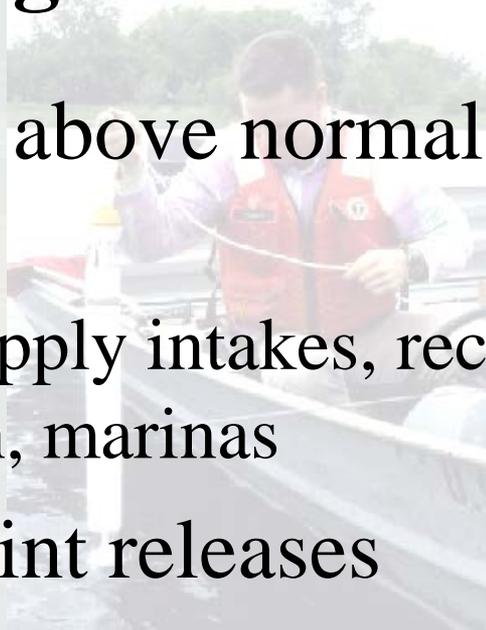
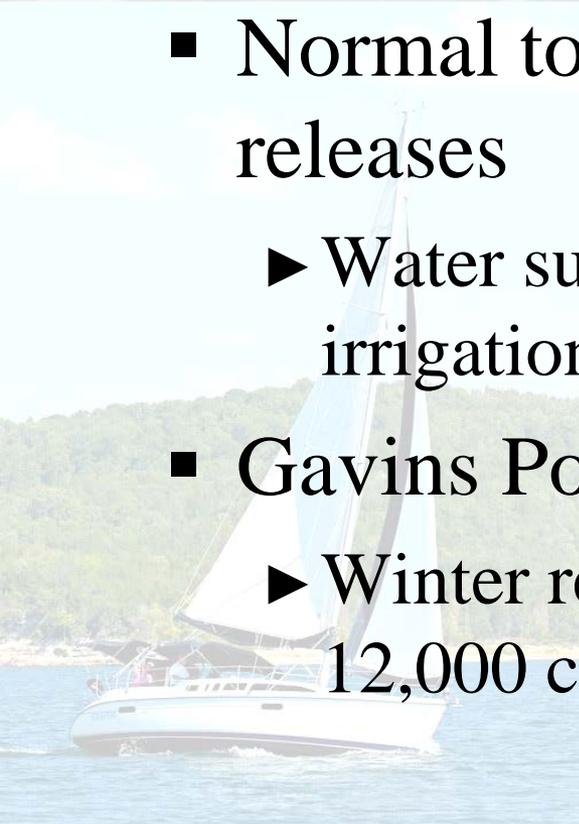
Navigation

- March 15 storage check
 - ▶ Halfway between minimum and full service (3 kcfs under full service)
 - ▶ Target locations: Sioux City, Omaha, Nebraska City and Kansas City
- July 1 storage check
 - ▶ Full service support except for Lower Basic
 - ▶ Full length navigation

Water Supply – Water Quality

Irrigation – Recreation

- Normal to above normal elevations and releases
 - ▶ Water supply intakes, recreation areas, irrigation, marinas
- Gavins Point releases
 - ▶ Winter release of 17,000 cfs under basic, 12,000 cfs under lower basic



Fish and Wildlife

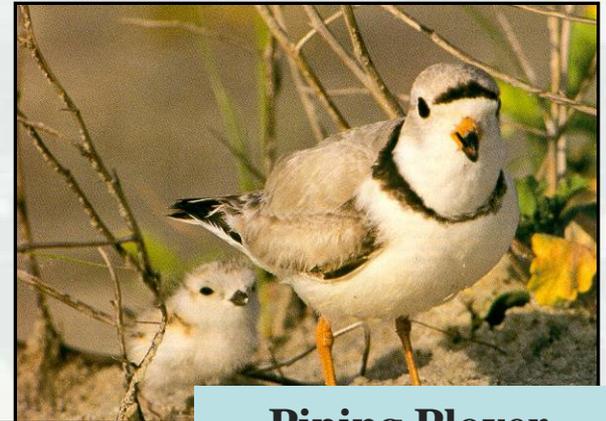
- Steady to rising levels at upper three reservoirs during forage fish spawn
 - ▶ Favor Garrison if runoff not sufficient
- Minimize hours of zero releases at Fort Randall to the extent possible

Endangered Species Act of 1973

Each Federal Agency shall... ensure that any action authorized, funded, or carried out by such agency... is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of habitat...



Interior Least Tern
Listed "Endangered" 1986



Piping Plover
Listed "Threatened" 1986



Pallid Sturgeon
Listed "Endangered" 1990

Threatened and Endangered Species

Piping Plover and Least Tern

- Gavins Point releases
 - ▶ Steady release – flow to target
 - ▶ Daily release cycle
- Intra-day peaking patterns – Garrison & Fort Randall
- Measures to minimize take

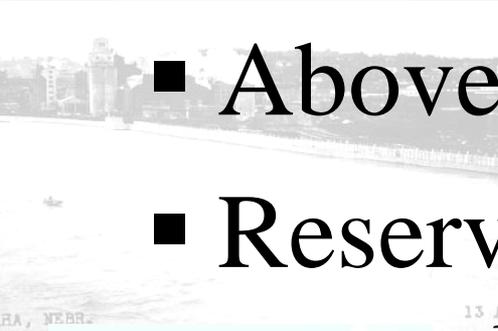
Threatened and Endangered Species

Bi-Modal Spring Pulse – Pallid Sturgeon

- 2003 Amended Biological Opinion – Reasonable and Prudent Alternative
- March and May spring pulses – not implemented in 2014
 - ▶ Independent science advisory panel (ISAP) determined implemented pulses not accomplishing intended outcomes
 - ▶ Forego 2014 spring pulse while pursuing ISAP recommendations

Summary

- Above normal runoff forecast
- Reservoir levels and releases normal to above normal
- Serve all authorized purposes



Thank You!

Missouri.Water.Management@usace.army.mil

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