

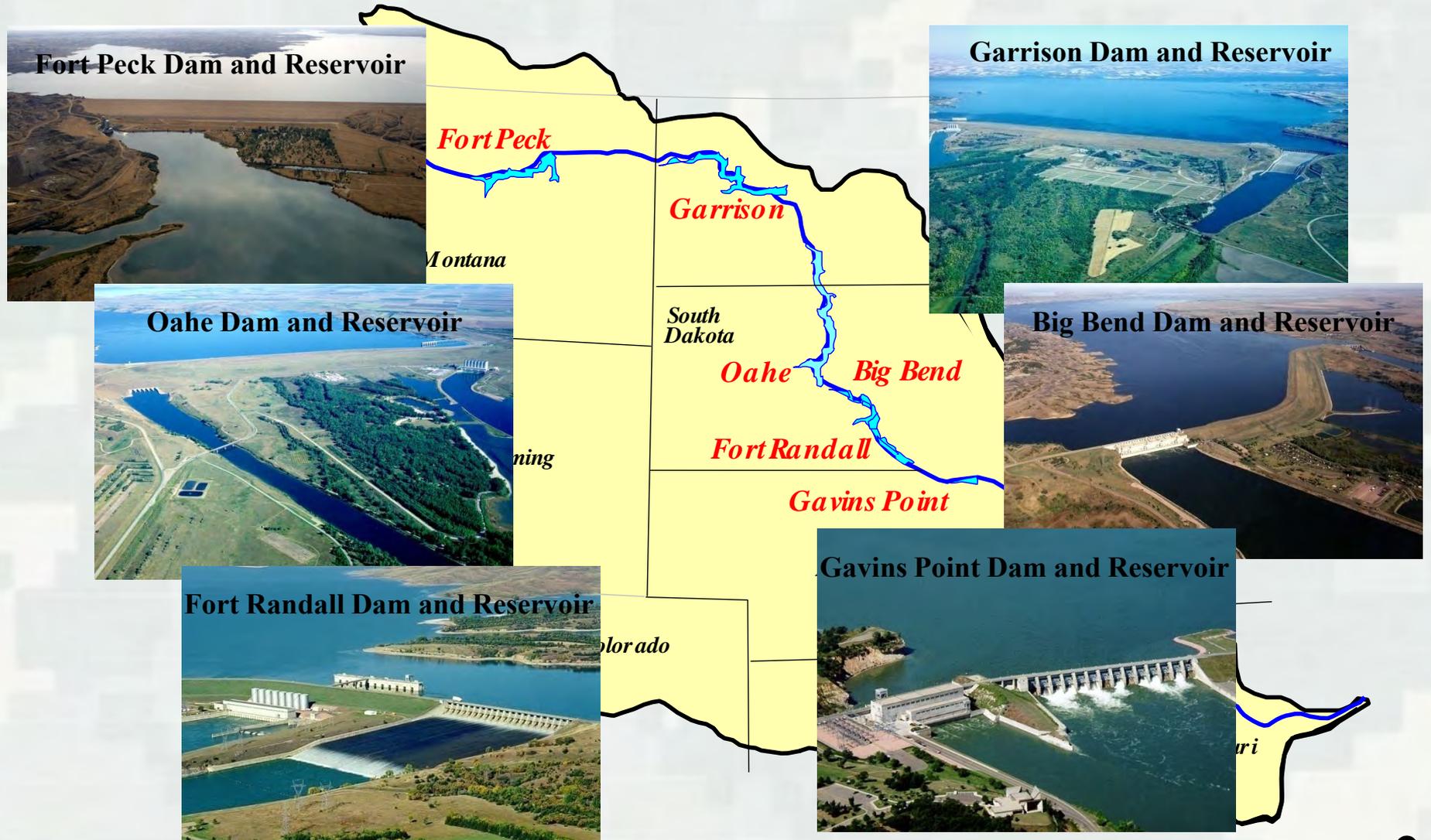
Missouri River Basin Water Management Fall 2012 Annual Operating Plan Public Meetings

October 29 th	7:00 p.m.	Fort Peck, MT
October 30 th	1:00 p.m.	Bismarck, ND
October 30 th	7:00 p.m.	Pierre, SD
October 31 st	11:00 a.m.	Sioux City, IA
November 1 st	1:00 p.m.	St. Joseph, MO
November 1 st	7:00 p.m.	Columbia, MO



US Army Corps of Engineers
BUILDING STRONG[®]

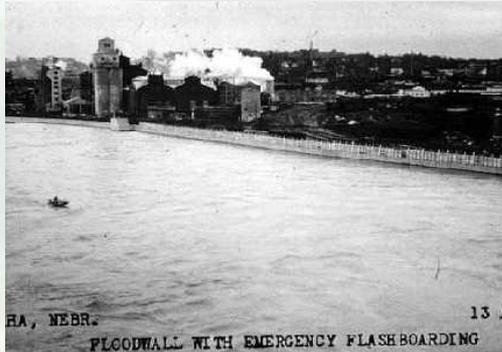
Missouri River Mainstem Reservoir System



Our Mission

Regulate Missouri River Mainstem Reservoirs to Support Congressionally Authorized Purposes

Flood Control



Hydropower



Water Supply



Water Quality Control



Recreation



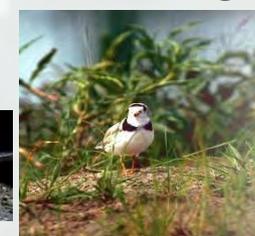
Navigation



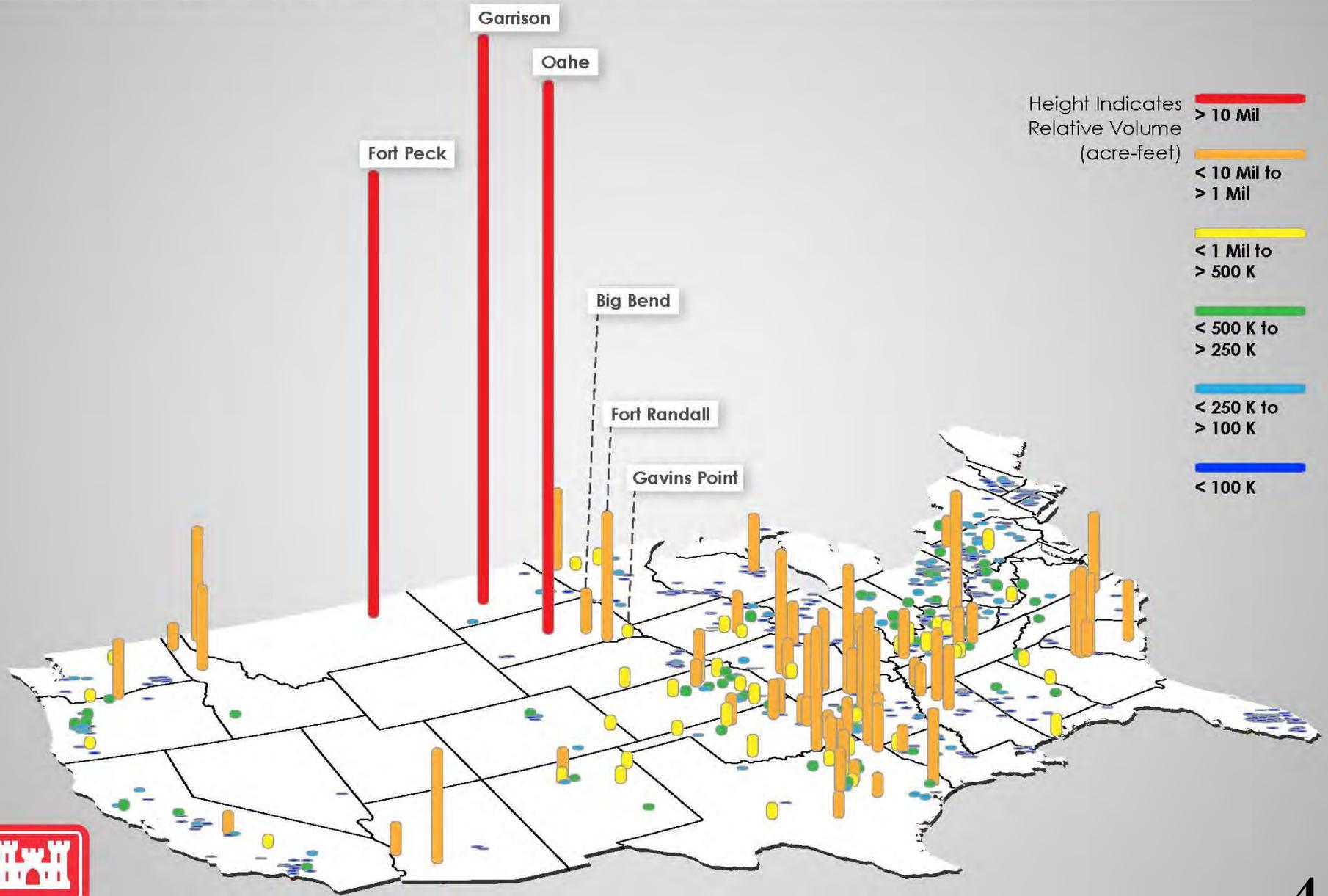
**Fish and Wildlife
Including Threatened and
Endangered Species**



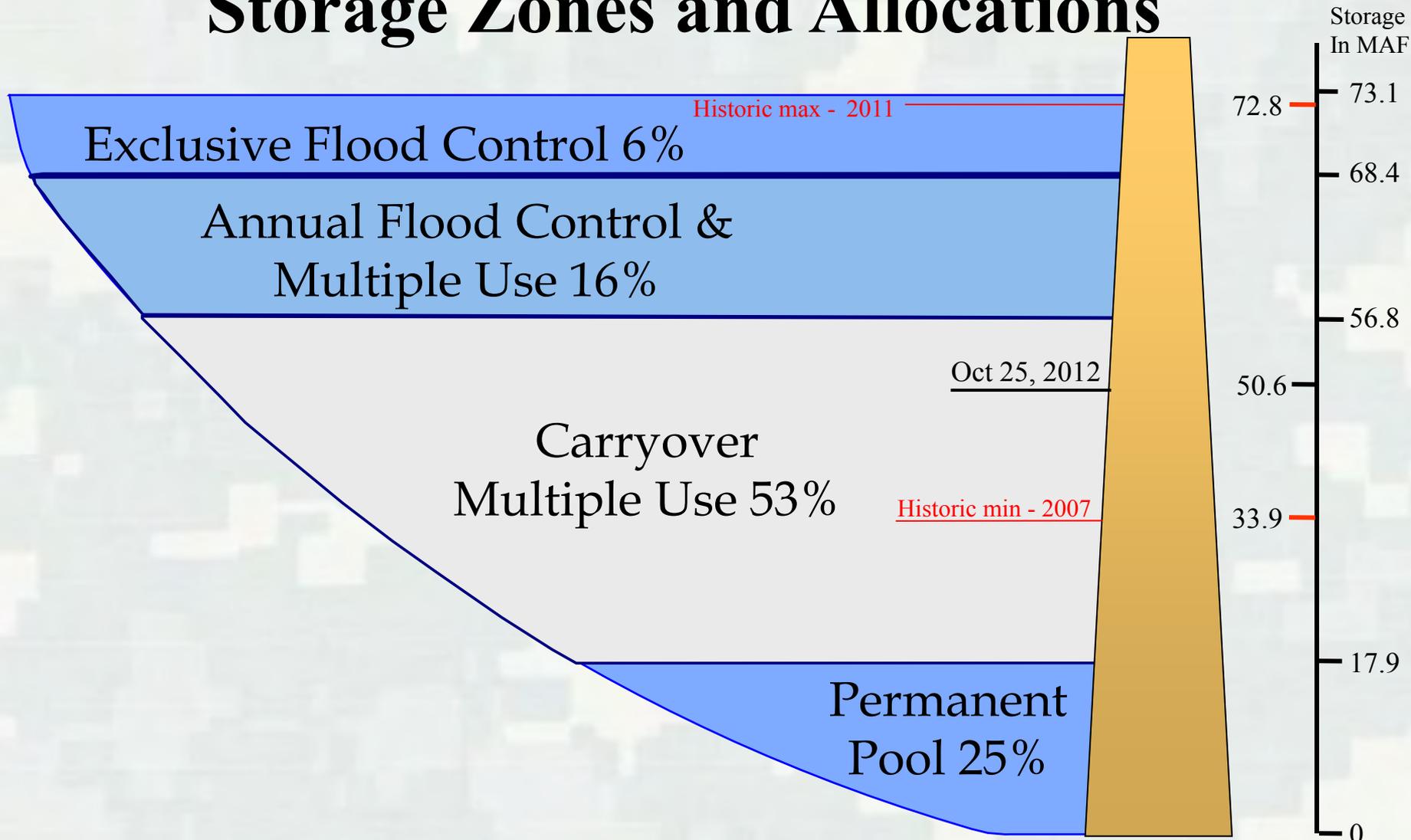
Irrigation



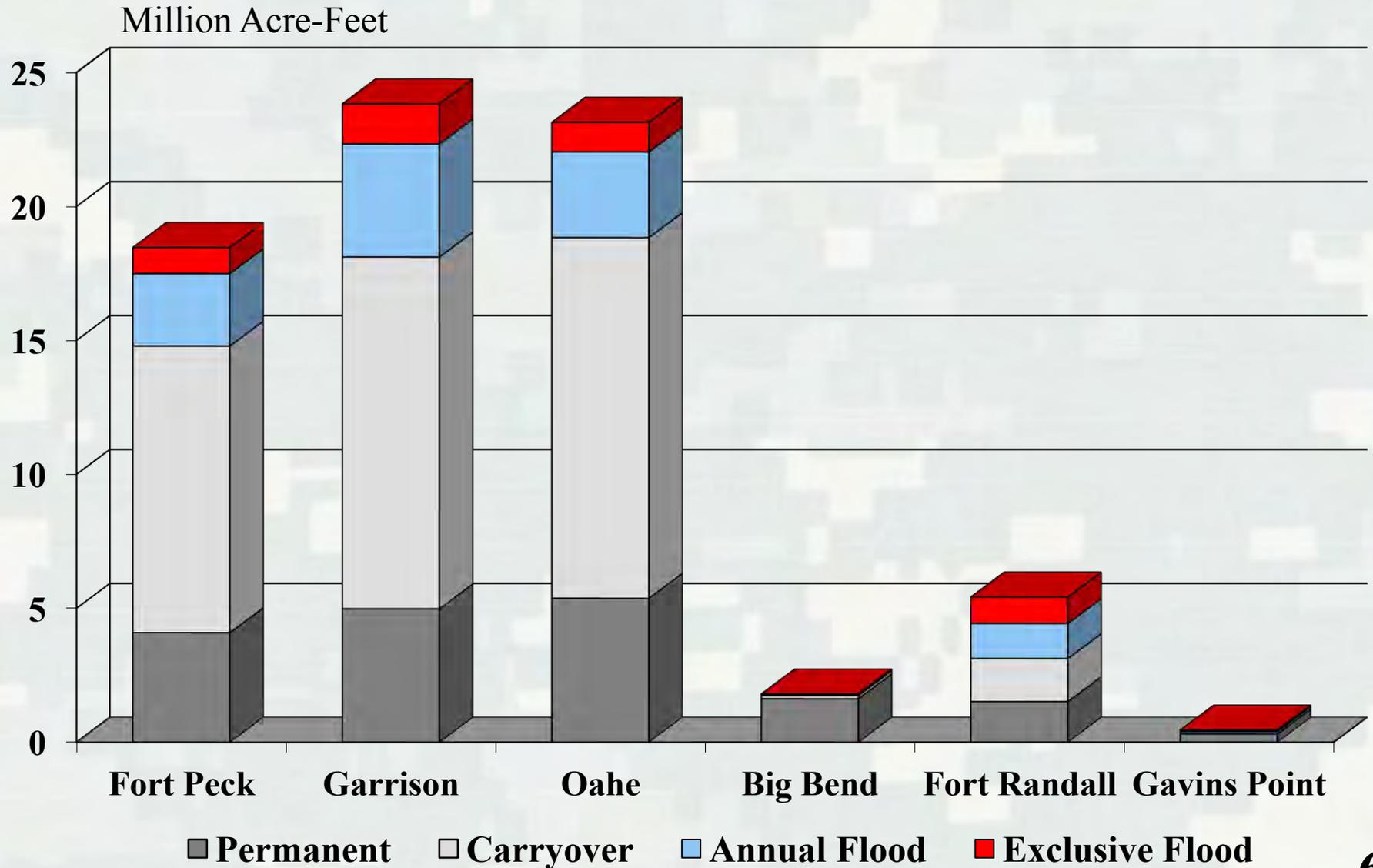
Storage Capacity of Corps Reservoirs



Missouri River Mainstem System Storage Zones and Allocations

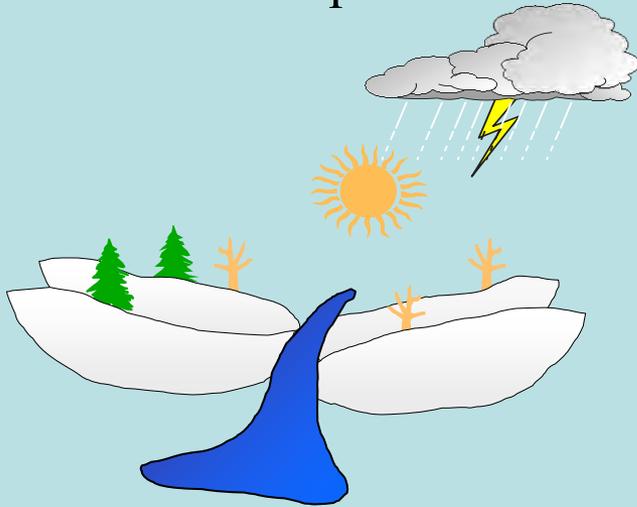


Mainstem Reservoir Storage Capacity

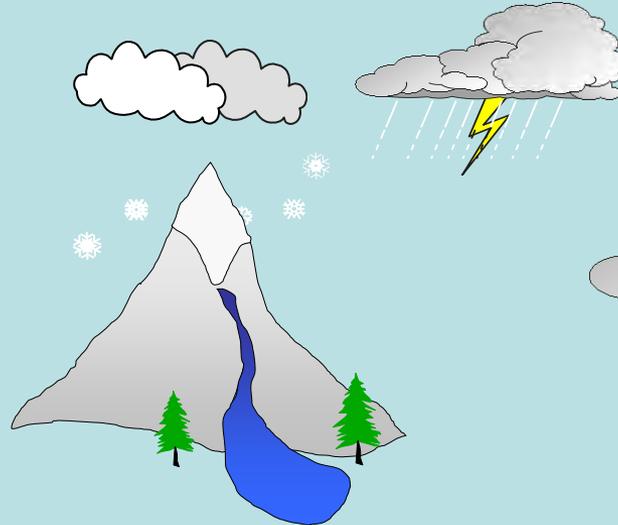


Runoff Components

Plains Snowpack



Mountain Snowpack



Rainfall



March and
April

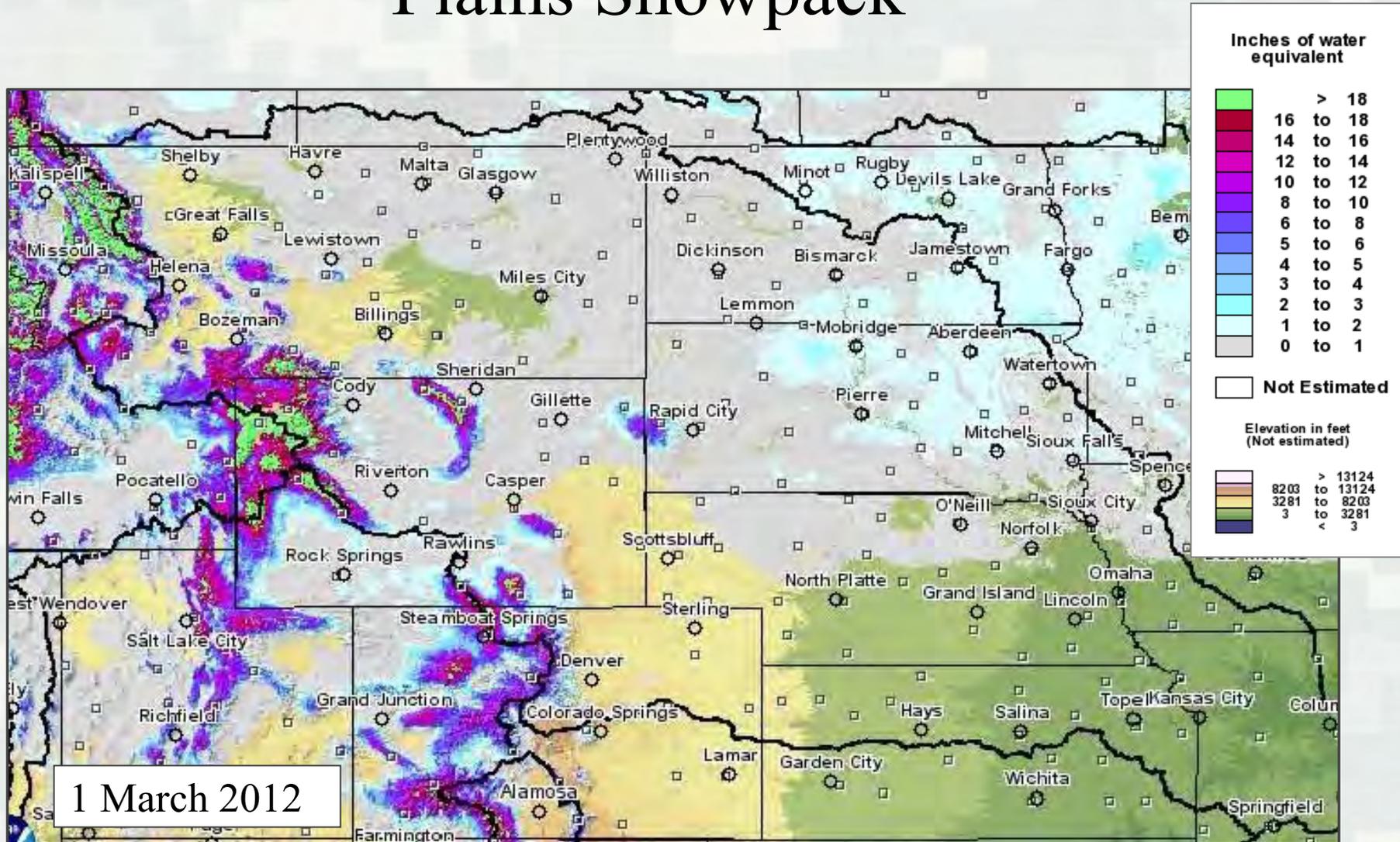
May, June
and July

March through
October

2012 Forecast = 19.0 MAF*

*October 1 forecast

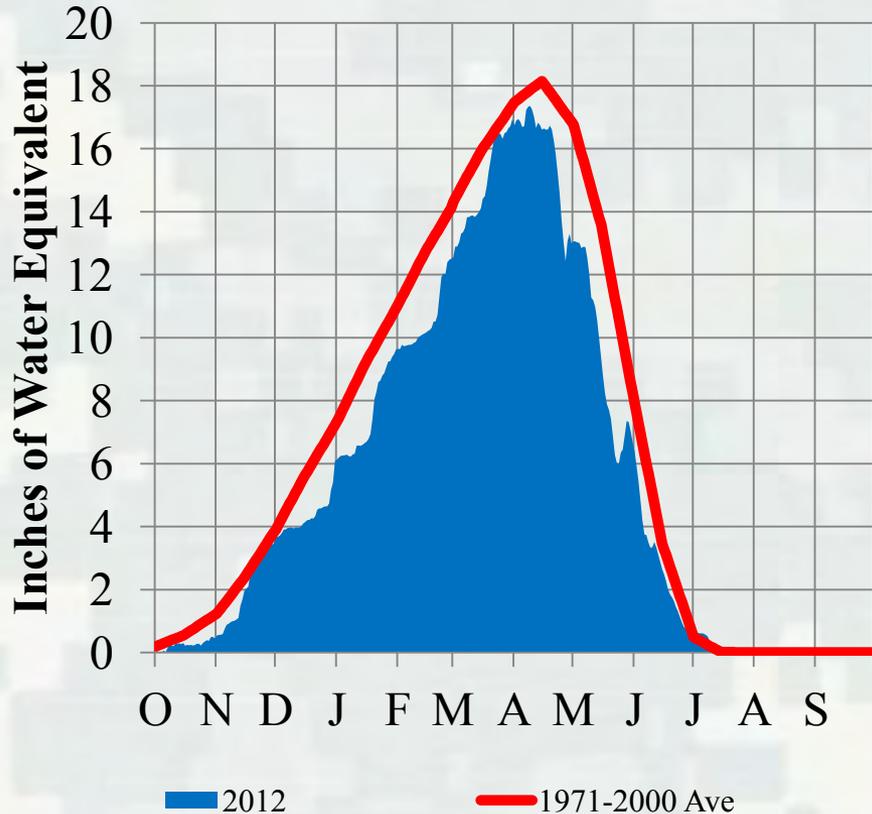
Plains Snowpack



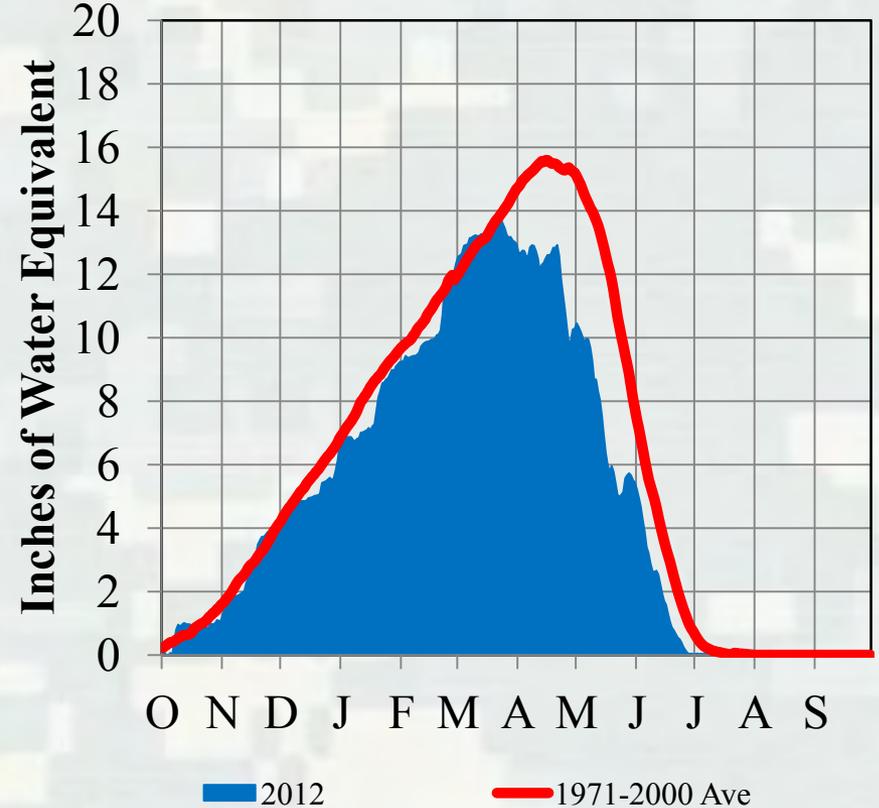
Missouri River Basin

2011-2012 Mountain Snowpack Water Content

Total above Fort Peck



Total Fort Peck to Garrison

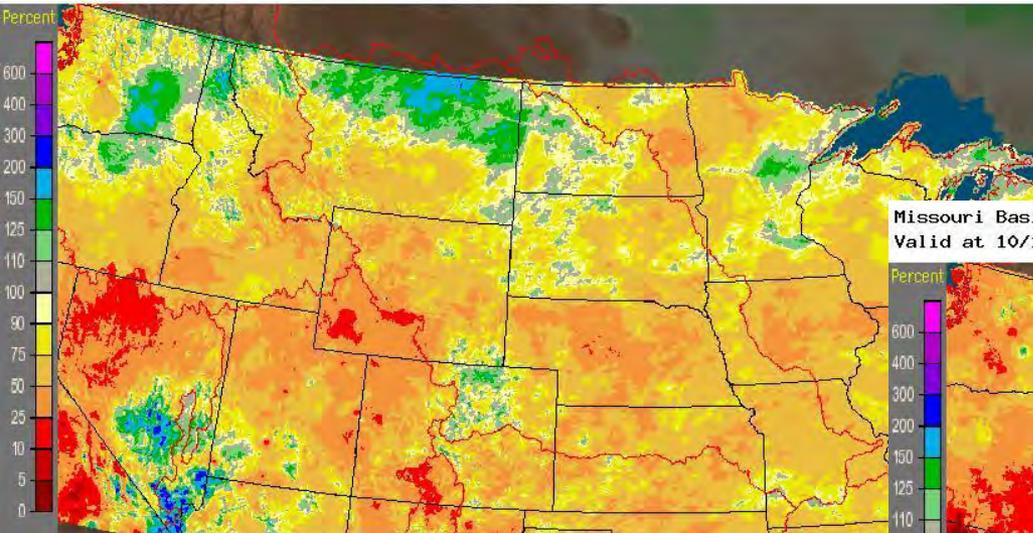


The Missouri River basin mountain snowpack normally peaks near April 15. The snowpack peaked in the “Total above Fort Peck” reach on April 9 at 97% of the normal April 15 peak. The snowpack peaked in the “Total Fort Peck to Garrison” reach on March 22 at 88% of the normal April 15 peak.

Precipitation Percent of Normal

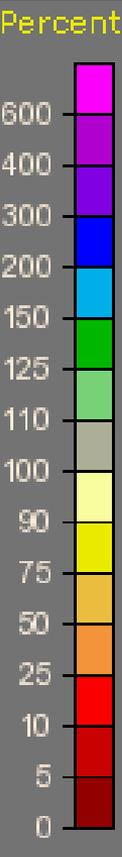
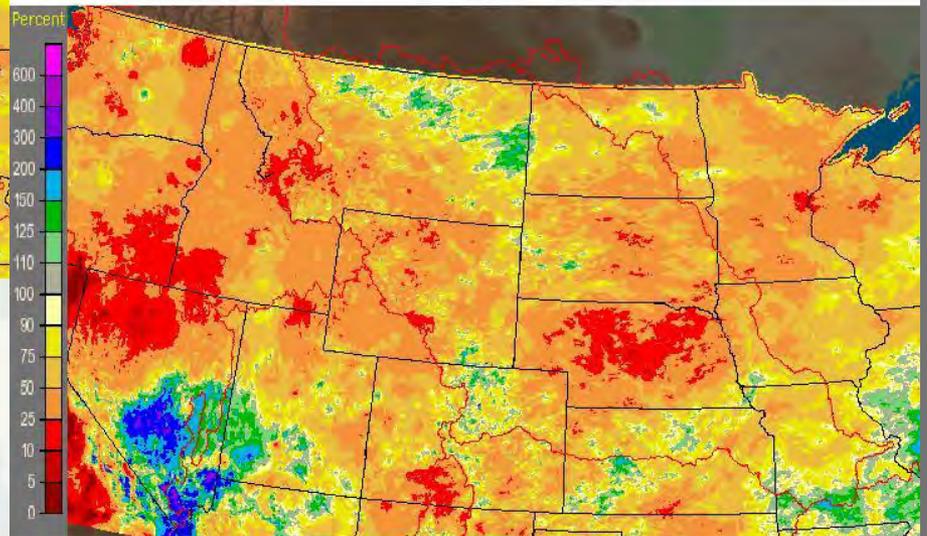
Previous 180 Days

Missouri Basin RFC Pleasant Hill, MO: Current 180-Day Percent of Normal Precipitation
Valid at 10/18/2012 1200 UTC- Created 10/18/12 18:22 UTC



Previous 90 Days

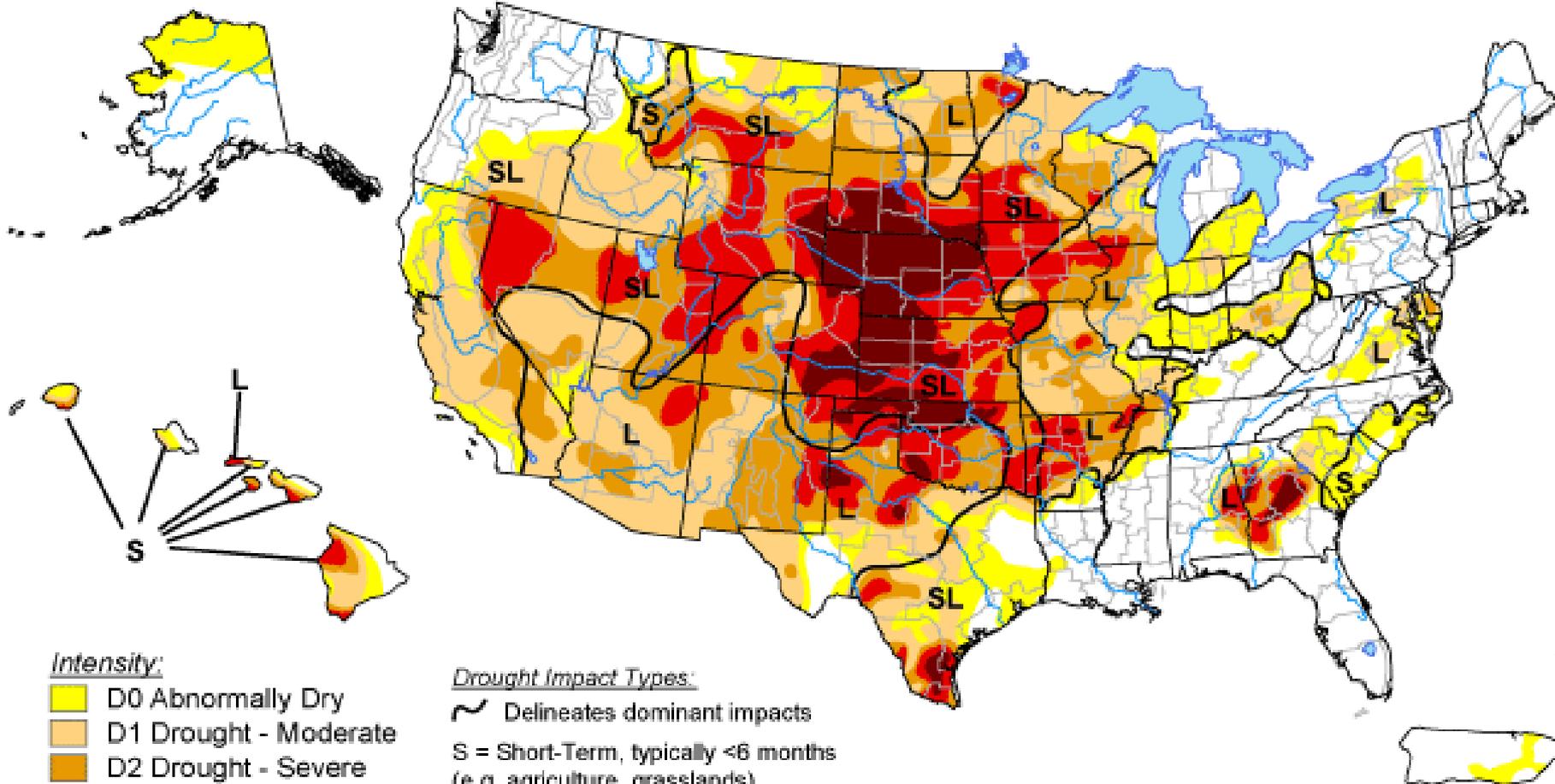
Missouri Basin RFC Pleasant Hill, MO: Current 90-Day Percent of Normal Precipitation
Valid at 10/18/2012 1200 UTC- Created 10/18/12 18:18 UTC



U.S. Drought Monitor

October 23, 2012

Valid 7 a.m. EDT



Intensity:

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

Drought Impact Types:

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

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, October 25, 2012

Author: Brad Rippey, U.S. Department of Agriculture

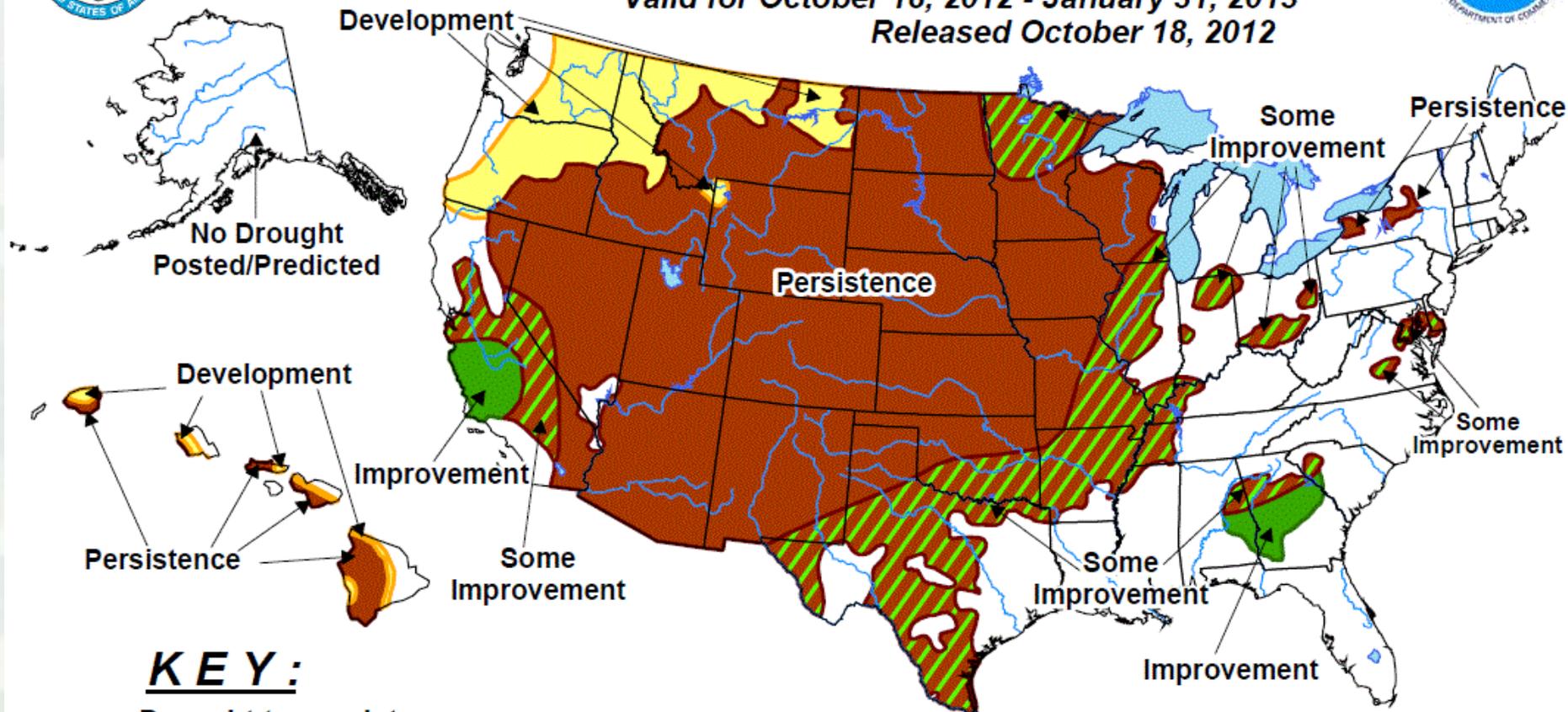


U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid for October 18, 2012 - January 31, 2013

Released October 18, 2012



KEY:

-  Drought to persist or intensify
-  Drought ongoing, some improvement
-  Drought likely to improve, impacts ease
-  Drought development likely

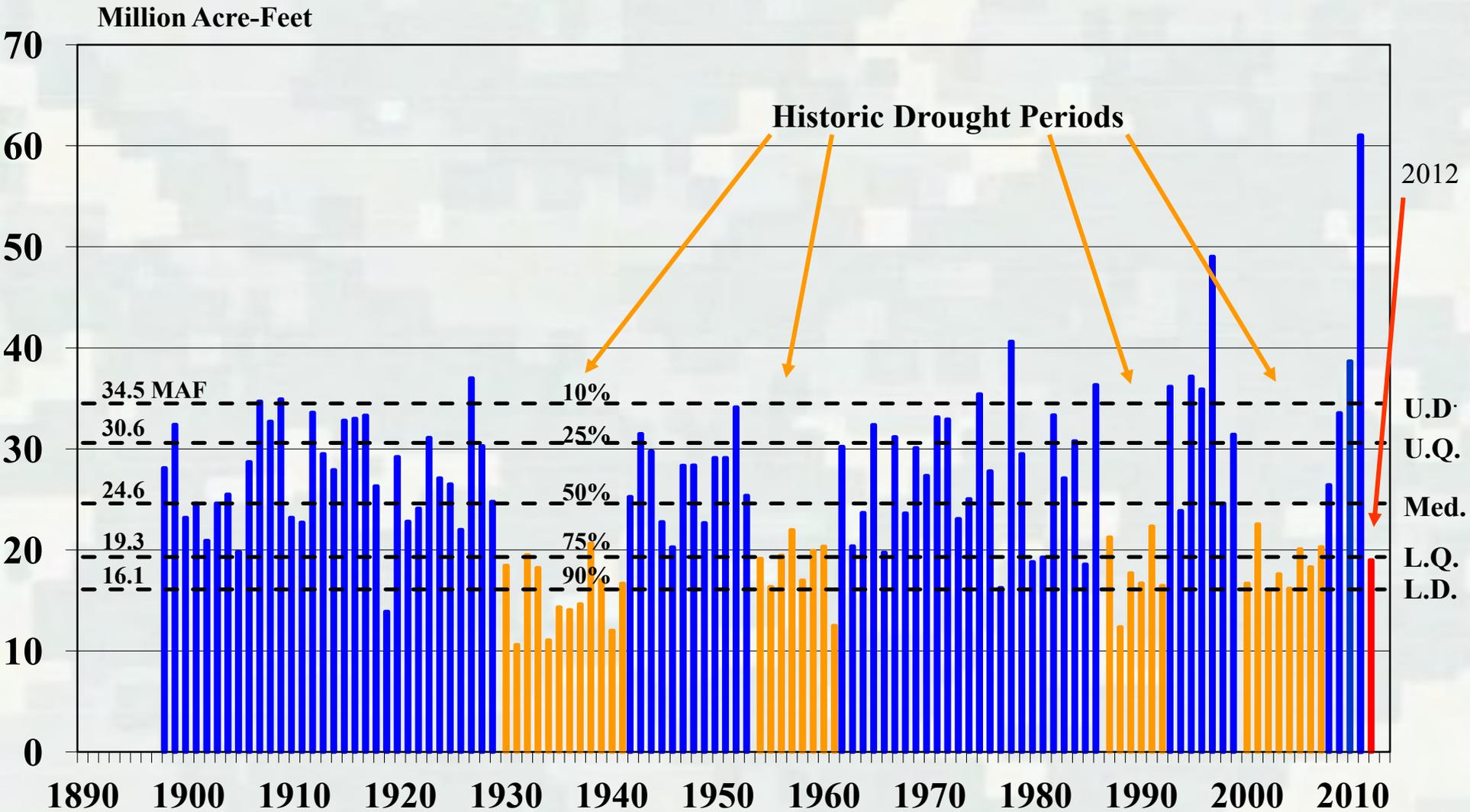
No Drought Posted/Predicted 

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 green improvement areas imply at least a 1-category improvement in the Drought Monitor intensity levels, but do not necessarily imply drought elimination.

NOAA Outlooks for Winter/Spring for the Missouri River Basin

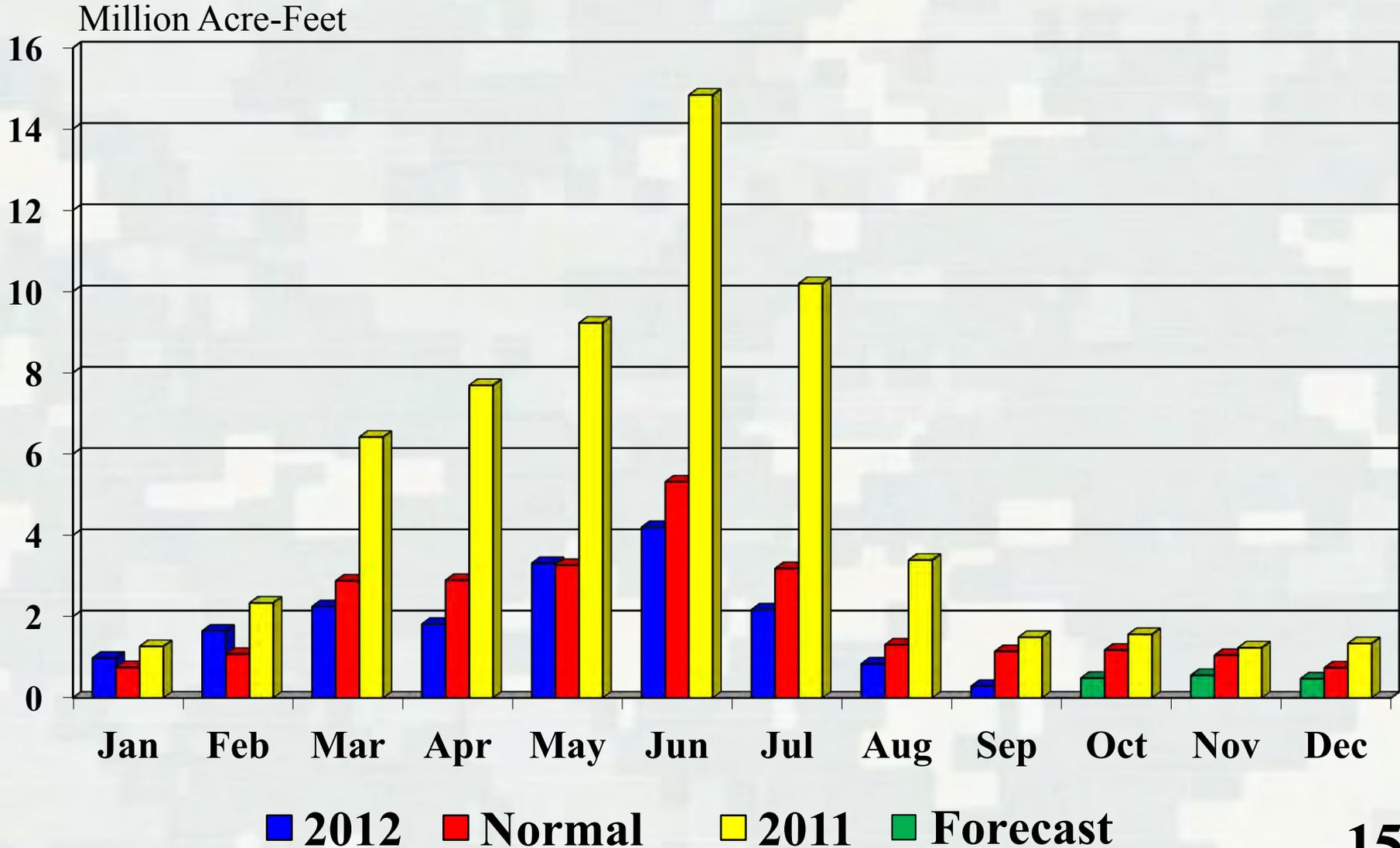
- Continued drought conditions at least through January 2013; likely that conditions will persist at least through Spring for most areas
- “Neutral” climate conditions most likely for Winter – uncertain regarding snow accumulation in mountains and plains
- Temperature Outlook – slightly better chances of above normal temperatures for most of the winter and early spring
- Precipitation Outlook – equal chances for above normal, normal and below normal precipitation for the foreseeable future
- Drought Outlook - uncertain to when it will end; possibility of a multi-year drought does exist

Missouri River Mainstem System Annual Runoff above Sioux City, IA



Missouri River Runoff above Sioux City

2011, 2012 Actual and Forecast

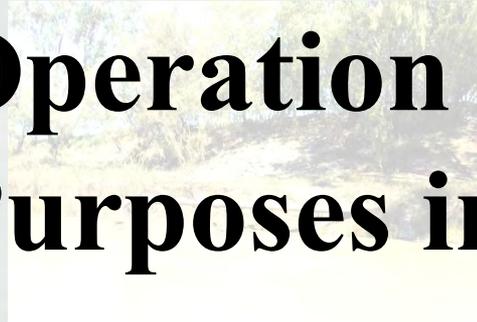
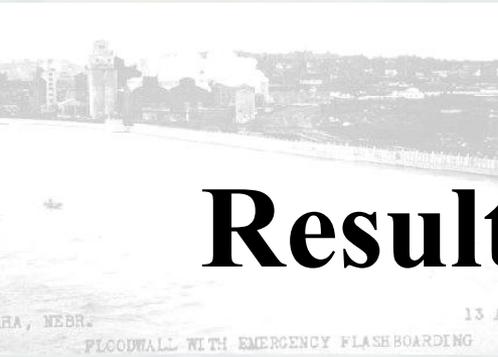


Fall / Winter Releases

- Begin reducing to Gavins Point winter releases on November 21st
- Will closely monitor channel conditions between reservoirs and downstream of Gavins Point
- Per September 1 storage check, minimum winter releases from Gavins Point dam
- Expected releases in kcfs

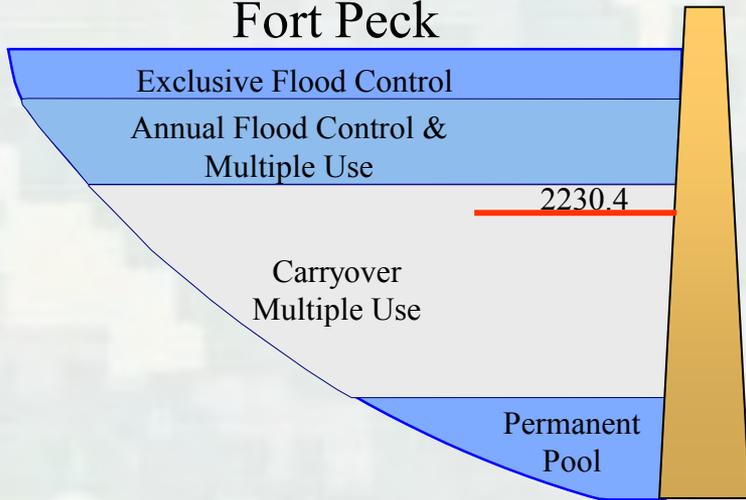
	<u>Dec</u>	<u>Jan</u>	<u>Feb</u>
Fort Peck	10.5	12.5	12.5
Garrison	18.5	22.5	22.5 (target)
Gavins	12.5	12.5	12.5 (target)

Results of 2012 Regulation and Planned Operation for Authorized Purposes in 2013



Current Reservoir Levels – October 25, 2012

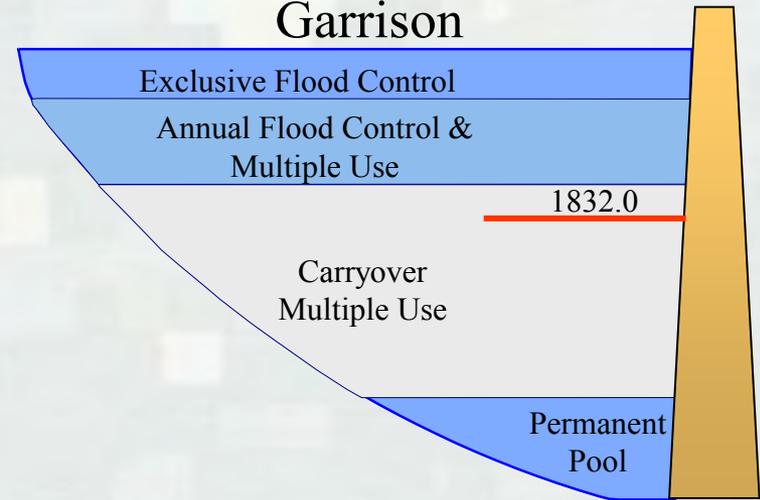
Fort Peck



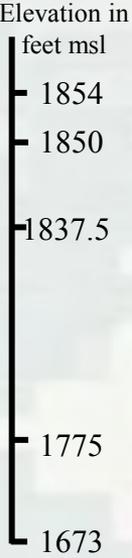
3.6 feet below base of Flood Control zone



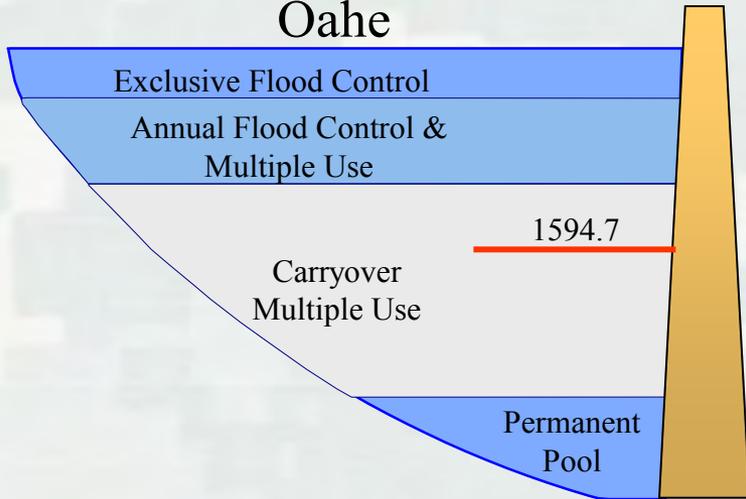
Garrison



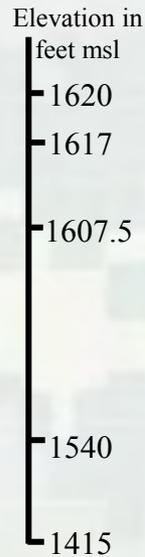
5.5 feet below base of Flood Control zone



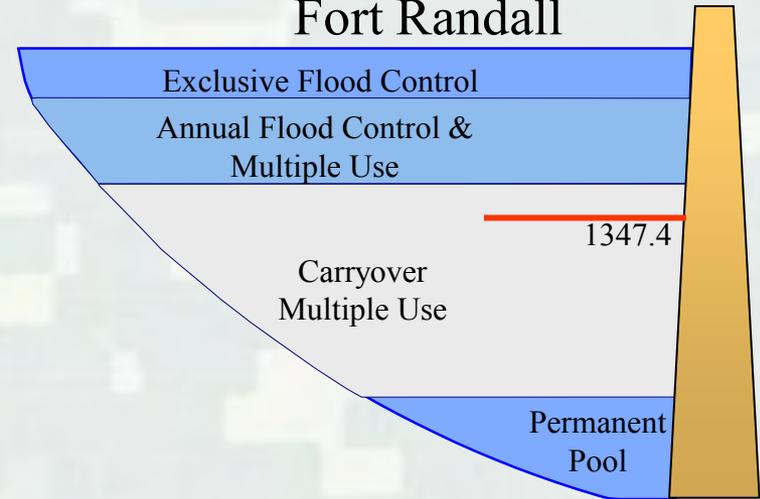
Oahe



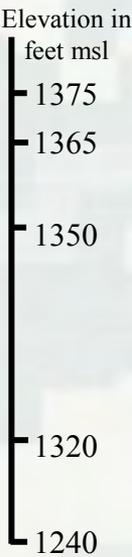
12.8 feet below base of Flood Control zone



Fort Randall

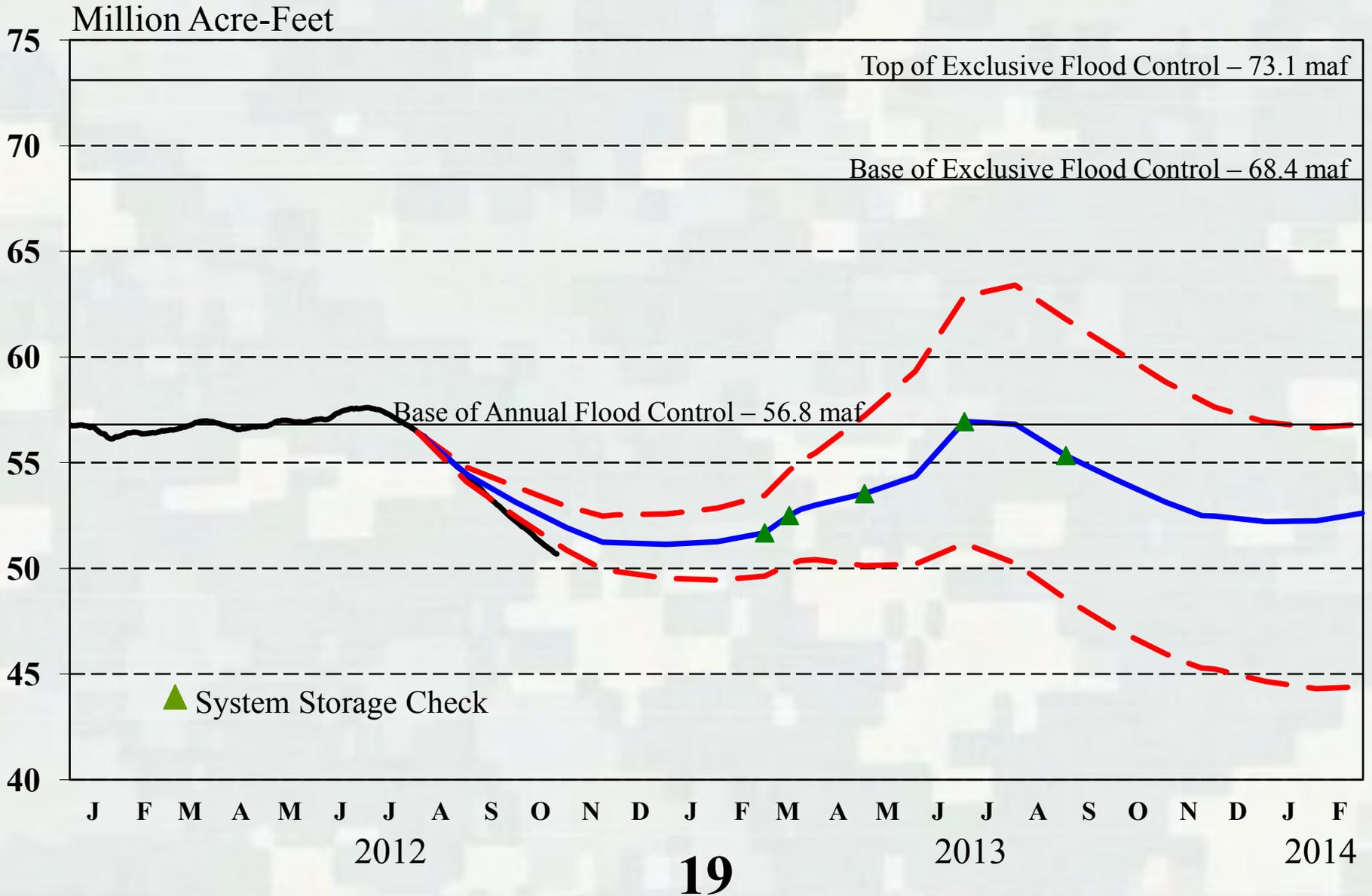


2.6 feet below base of Flood Control zone



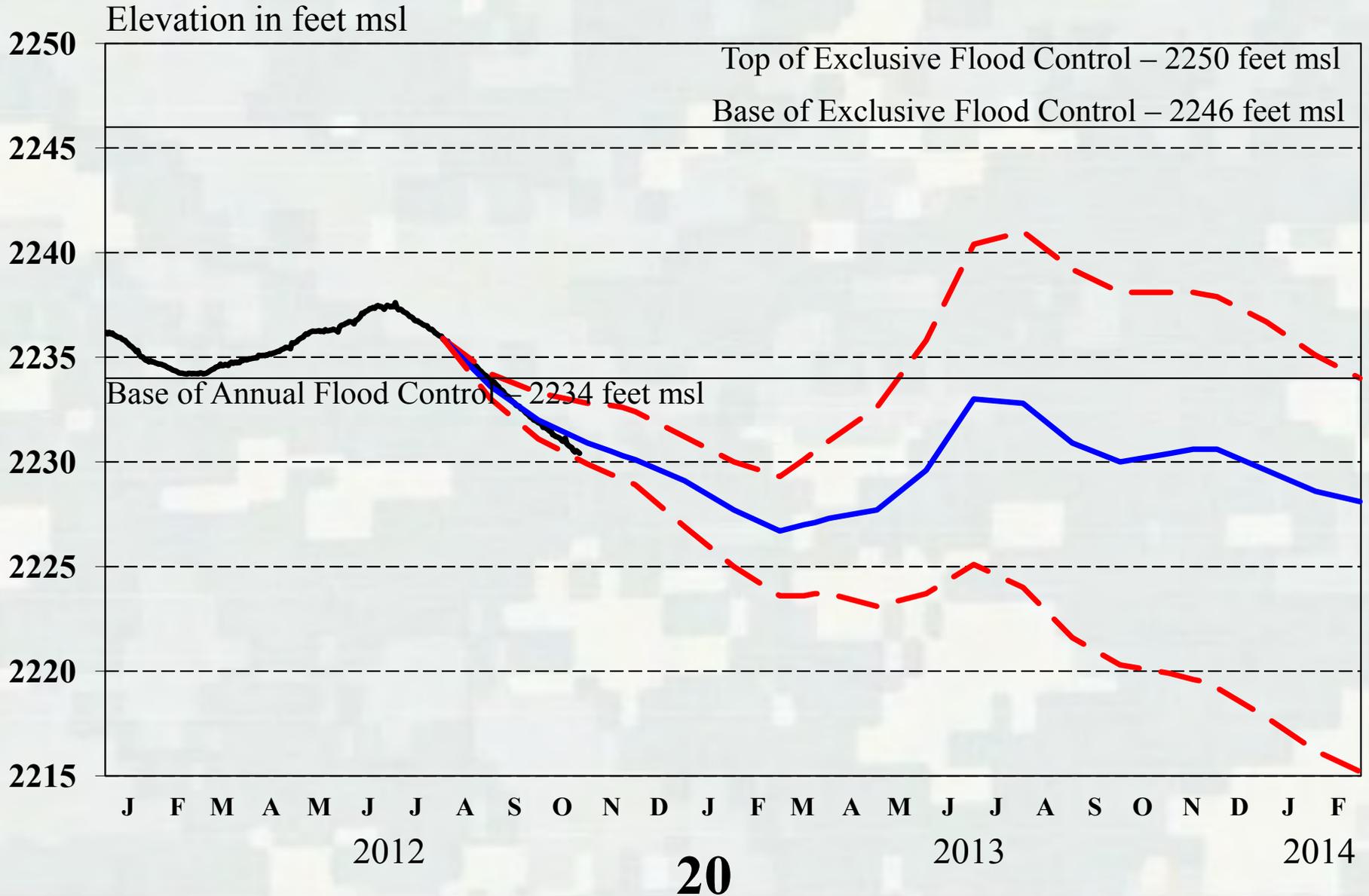
System Storage

2012-2013 Draft AOP



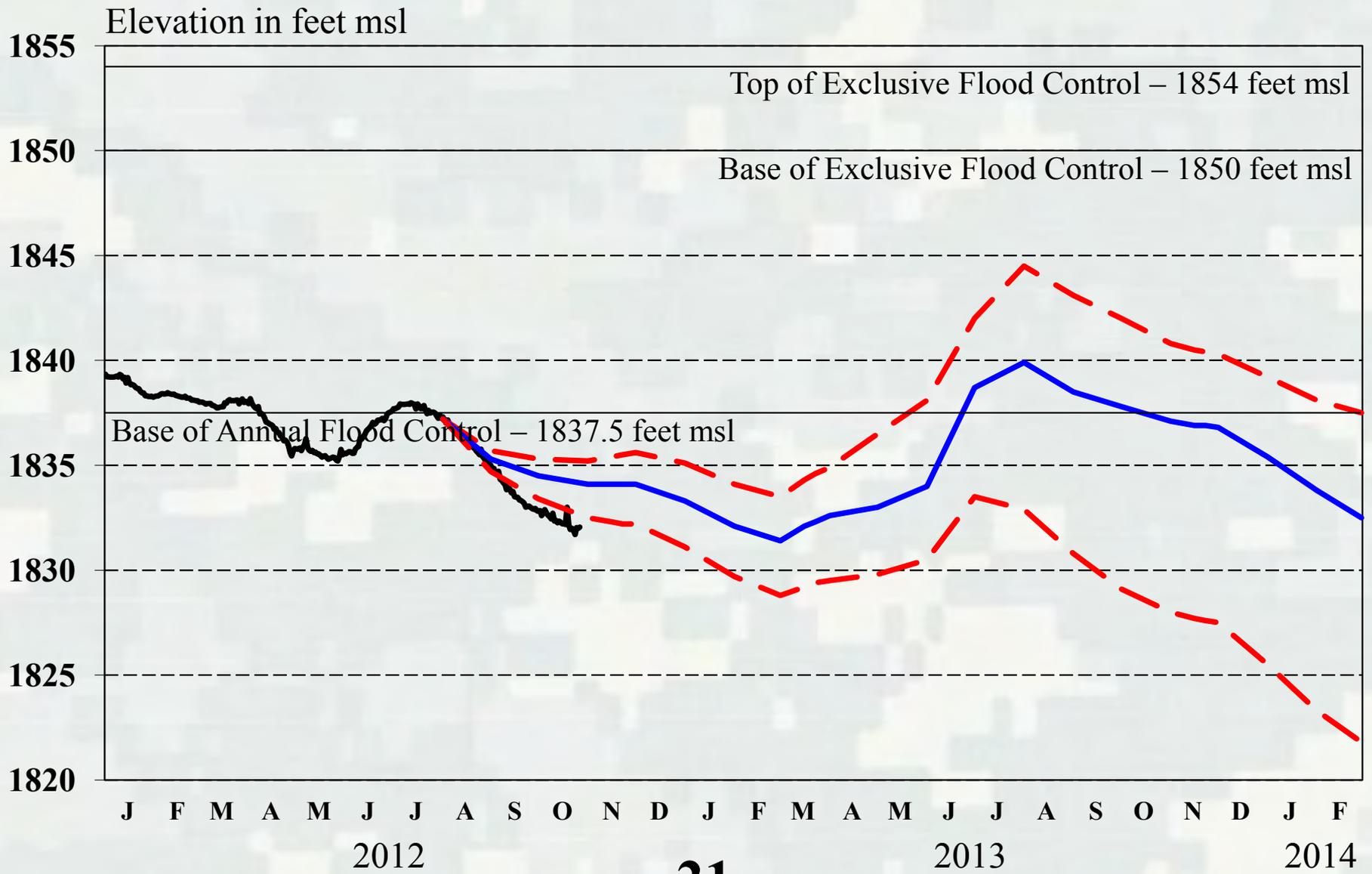
Fort Peck

2012-2013 Draft AOP



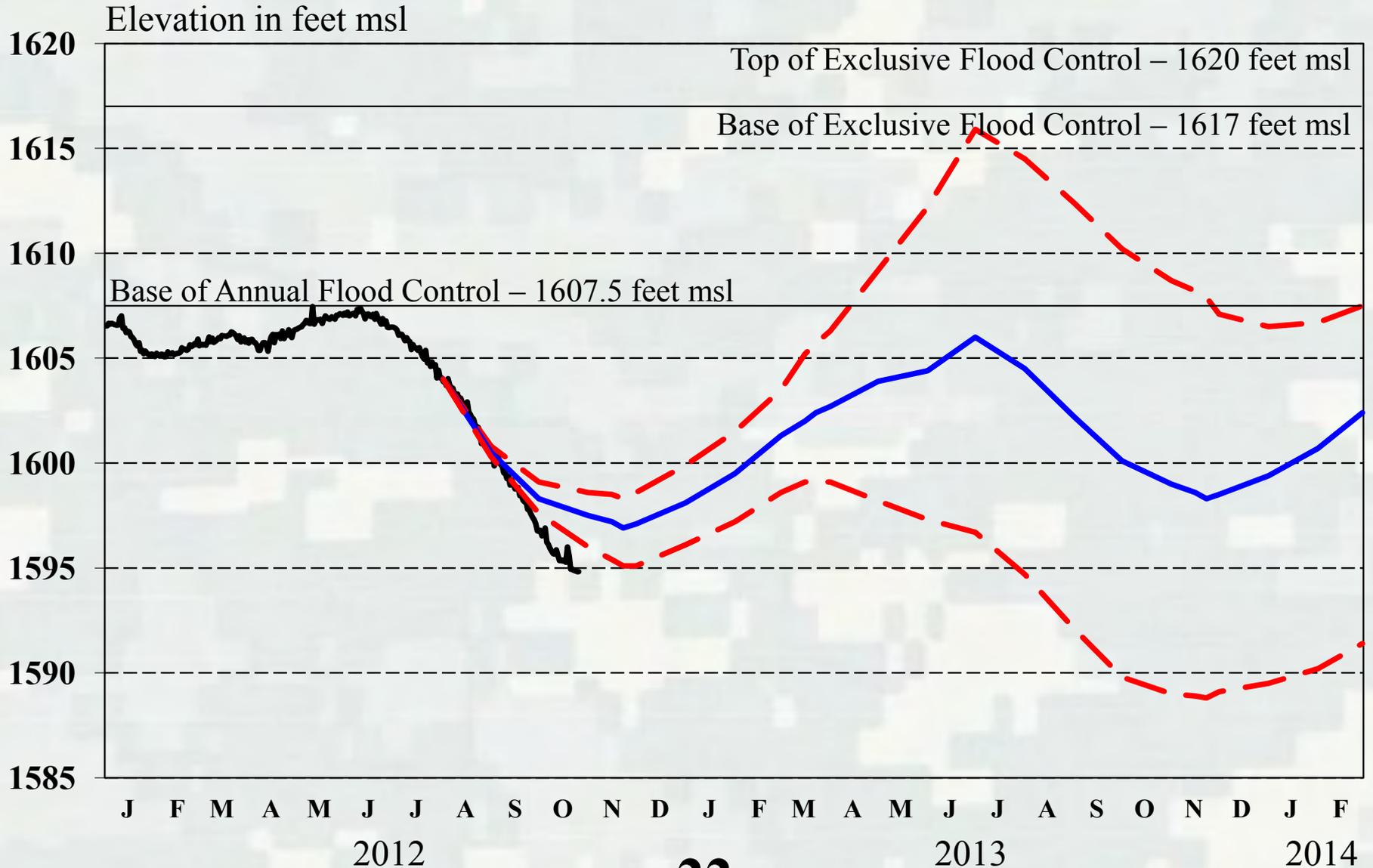
Garrison

2012-2013 Draft AOP

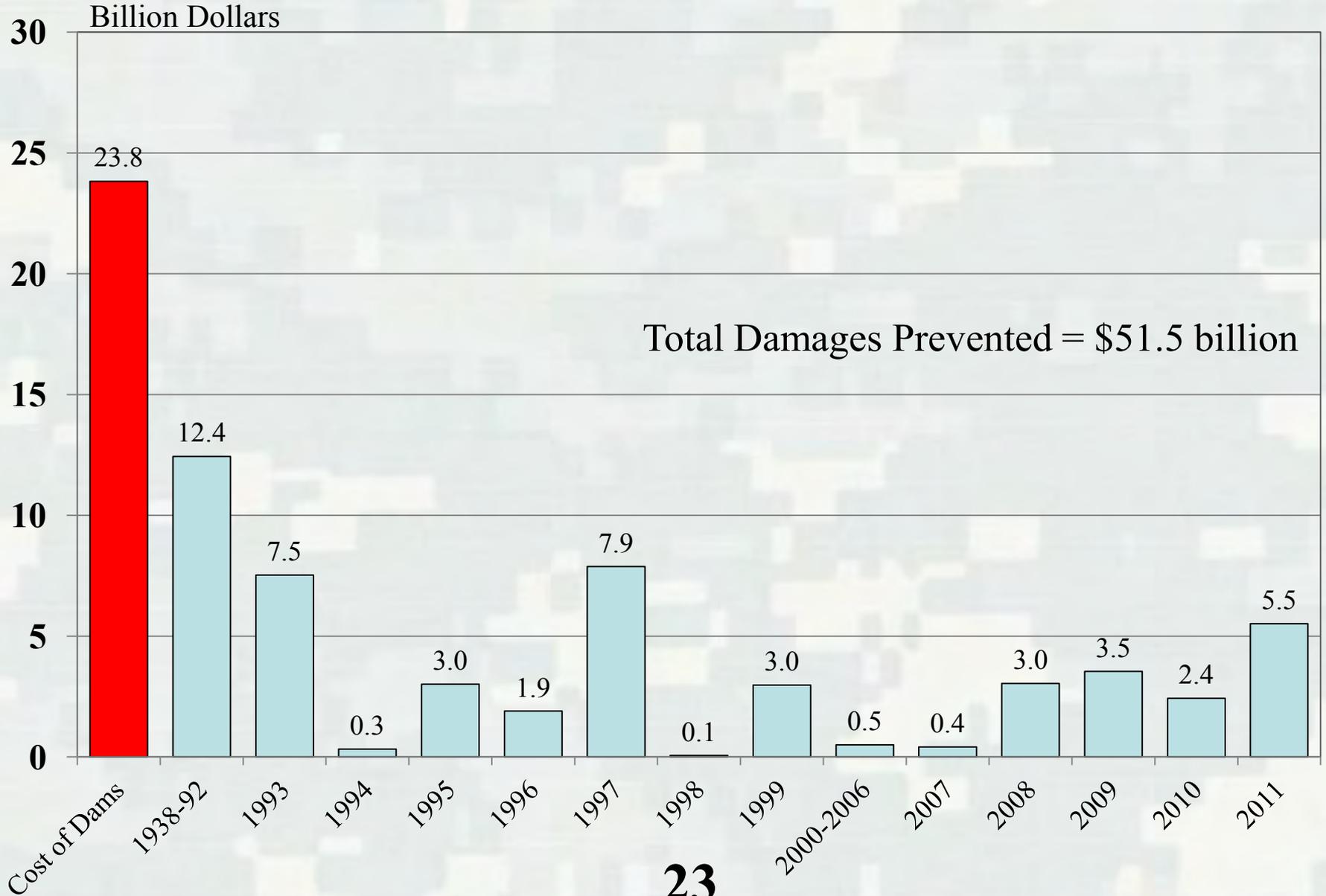


Oahe

2012-2013 Draft AOP



Flood Damages Prevented by Mainstem Dams Indexed to 2011 Levels



Flood Control

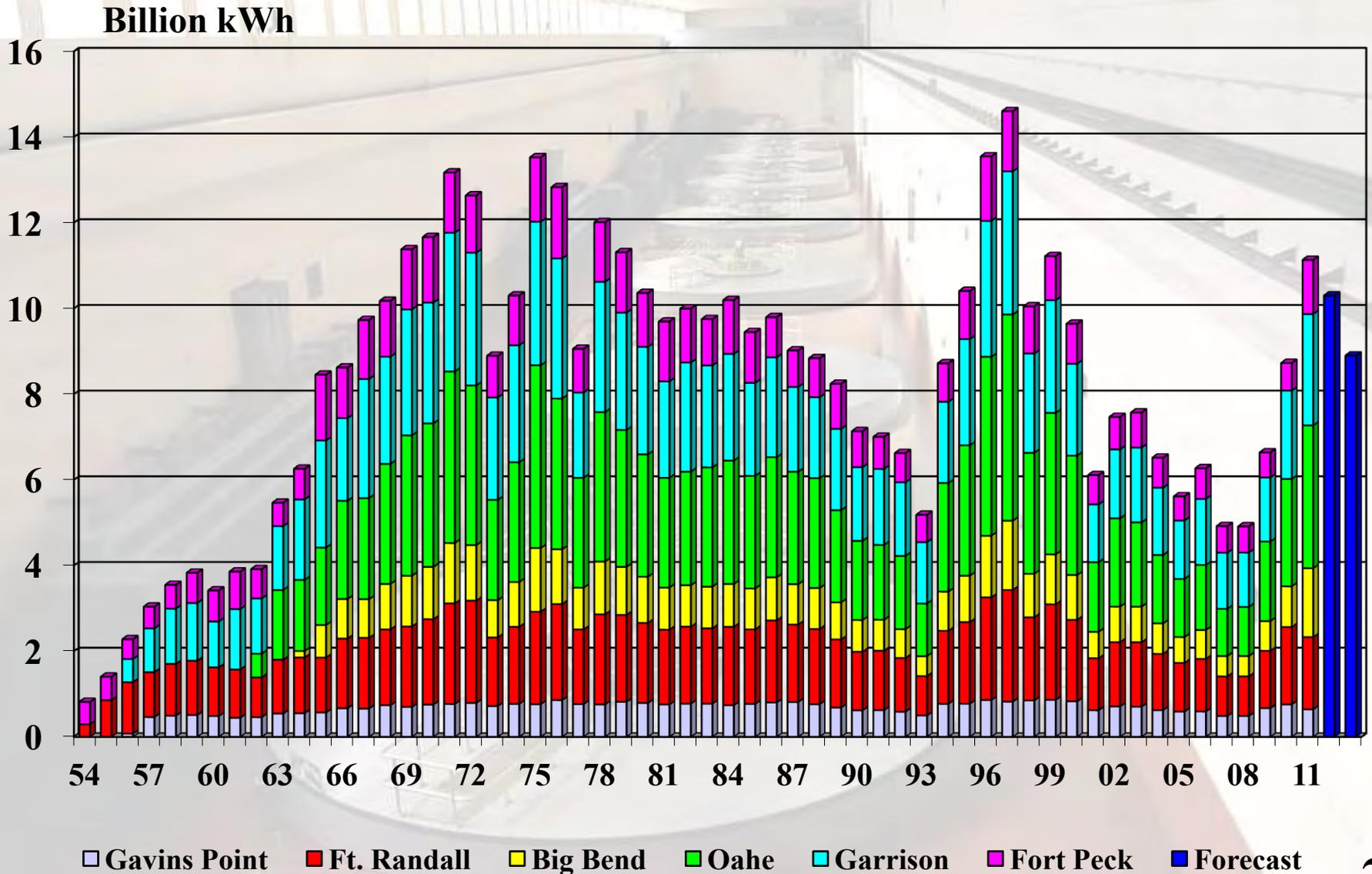
- All scenarios start the runoff year below the base of the annual flood control zone
 - ▶ Fort Peck, Garrison and Oahe 10-12 feet below base of flood control zone
 - ▶ System storage 8 MAF below base of flood control zone
- Downstream flooding can still occur even during droughts

HA, NEBR.

13

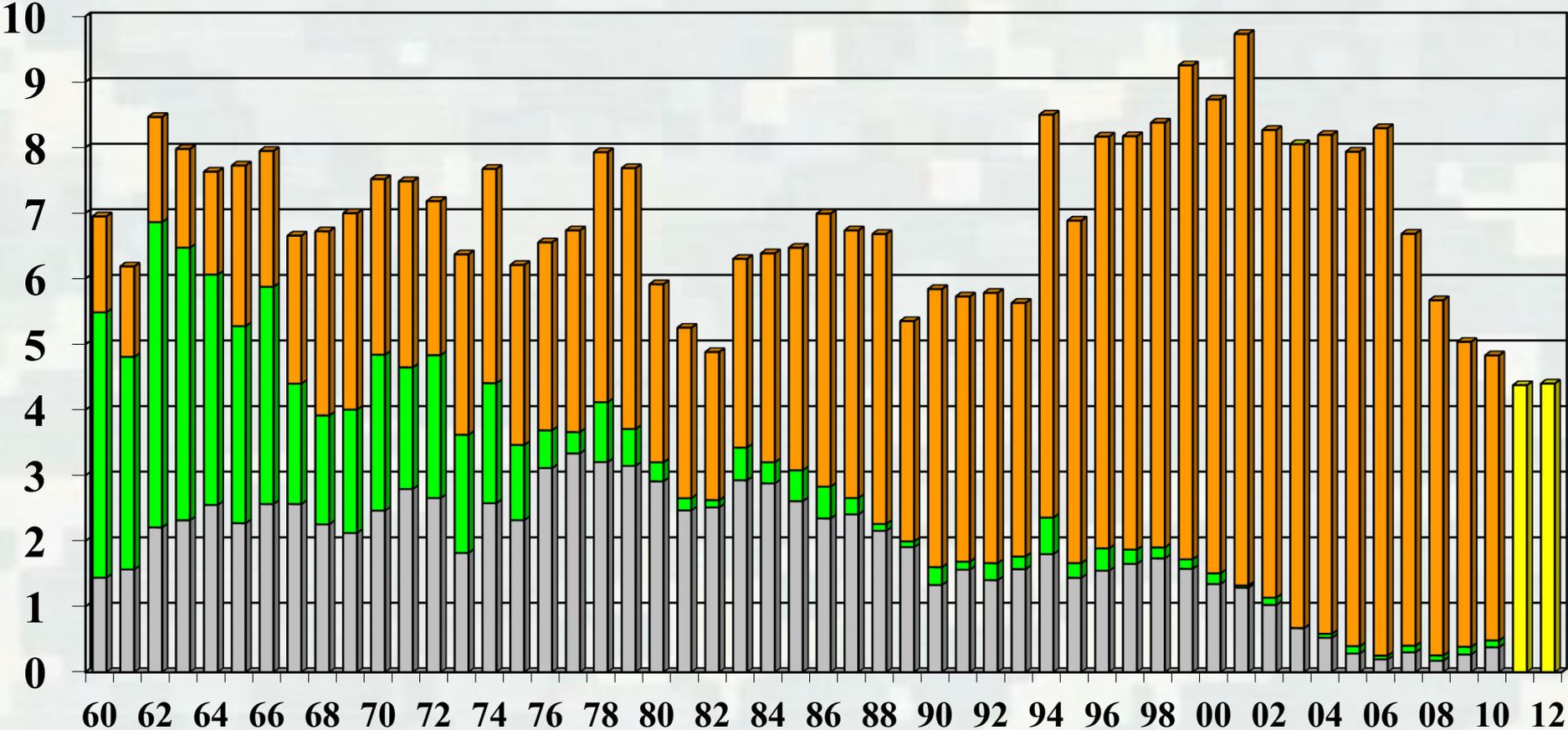
FLOODWALL WITH EMERGENCY FLASH BOARDING

Hydropower



Missouri River Total Navigation Tonnage

Million Tons



Commercial Waterway Materials Sand and Gravel Estimated

Navigation

- 2012 – Full service flow support & full length season
 - ▶ Flows to support 9x300 ft channel
 - ▶ Eight month season from April 1 to December 1
- 2013 March 15 Storage Check
 - ▶ Below full service level flow support
 - ▶ Target locations: Sioux City, Omaha, Nebraska City and Kansas City
- 2013 July 1 Storage Check
 - ▶ Upper Decile: full service, full season + 10 days
 - ▶ Lower Decile: 5 kcfs below full service, 2-day season shortening

Water Supply – Water Quality

Irrigation – Recreation

- 2012

- ▶ Recreation impacts at upper three reservoirs due to low elevations
- ▶ Minimum Gavins Point winter releases

- 2013

- ▶ Upper Decile, Upper Quartile and Median: Near normal pool levels and releases
- ▶ Lower Quartile and Lower Decile: Some access issues due to lower pools

Fish and Wildlife

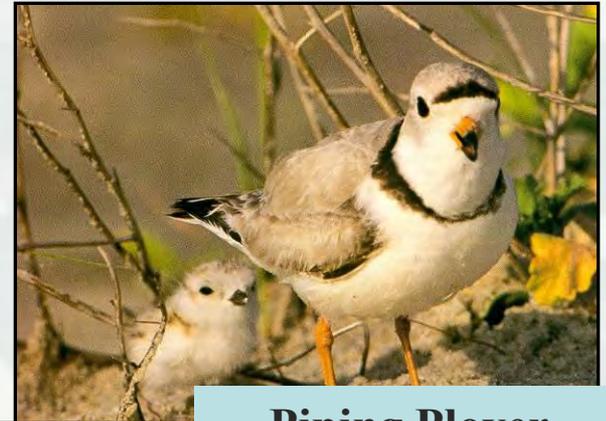
- Steady to rising levels at upper three reservoirs during forage fish spawn
 - ▶ Favor Oahe if runoff below normal per MoRAST recommendation
 - ▶ Note: this is a change from the draft AOP
- Minimize periods of zero releases at Fort Randall
- Cold water habitat will be monitored

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



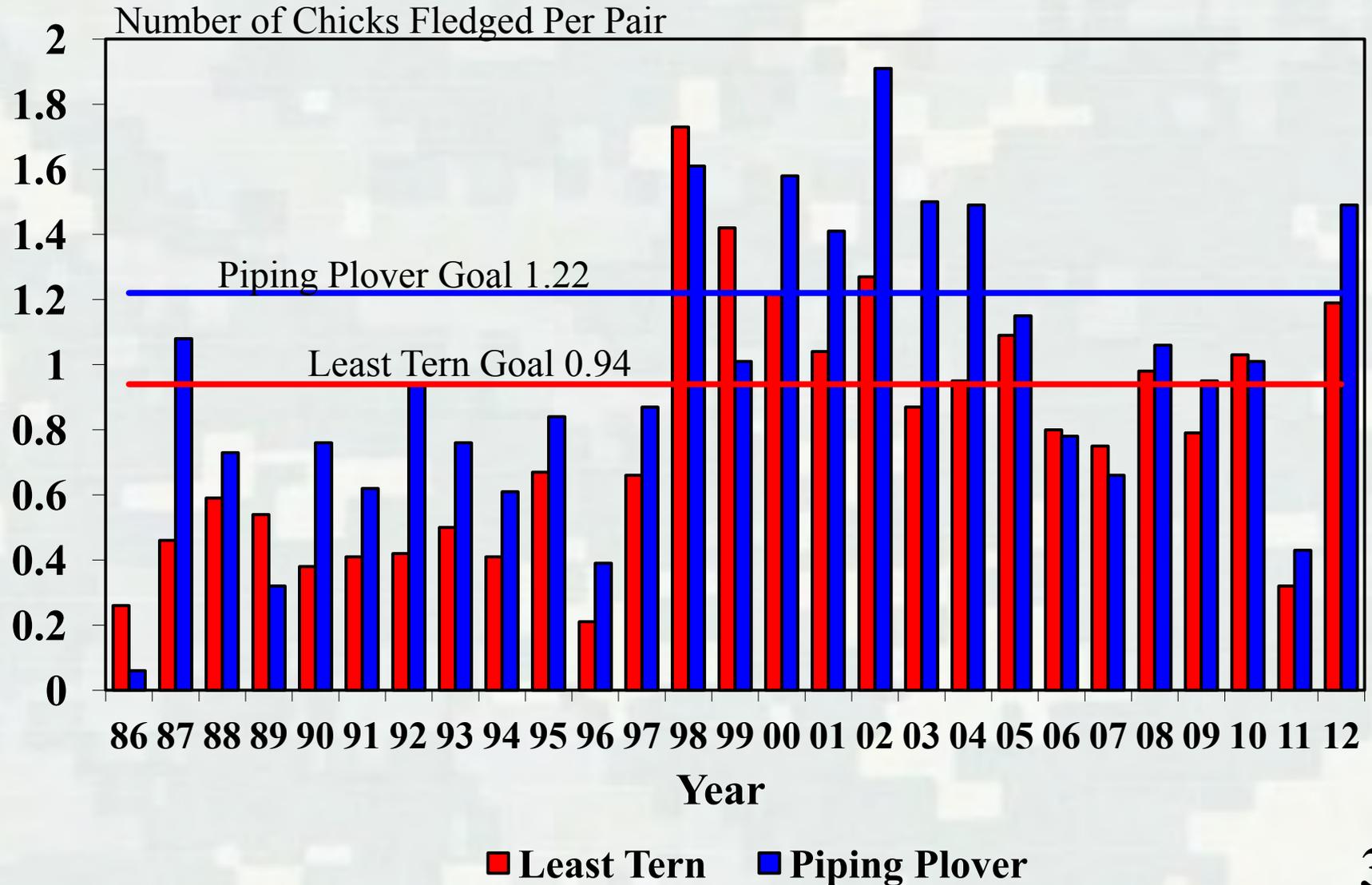
Piping Plover
Listed "Threatened" 1986



Pallid Sturgeon
Listed "Endangered" 1990

Fish and Wildlife

Threatened and Endangered Species



Threatened and Endangered Species

Piping Plover and Least Tern

- 2013 Gavins Point
 - ▶ Steady release – flow to target
 - ▶ Cycle Gavins Point releases
- Intra-day peaking patterns – Garrison & Fort Randall
- Measures to minimize take
 - ▶ Utilize Kansas River projects for navigation support
 - ▶ Target flows may not be met in reaches without commercial navigation

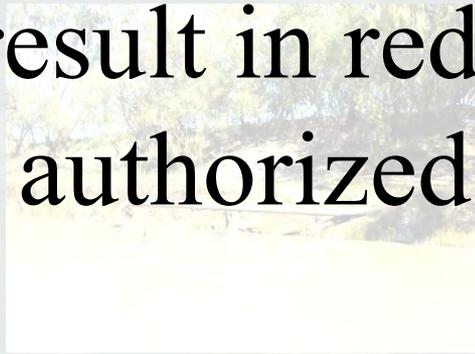
Threatened and Endangered Species

Bi-Modal Spring Pulse – Pallid Sturgeon

- 2003 Amended Biological Opinion – Reasonable and Prudent Alternative
- Neither pulse conducted in 2012
- Neither pulse planned in 2013
 - ▶ Implemented pulses not accomplishing intended outcomes
 - ▶ Forego spring pulse while pursuing independent science advisory panel (ISAP) recommendations

Summary

- Continued drought conditions possible next year
- Dry conditions result in reduced service levels to authorized purposes



Thank You!

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