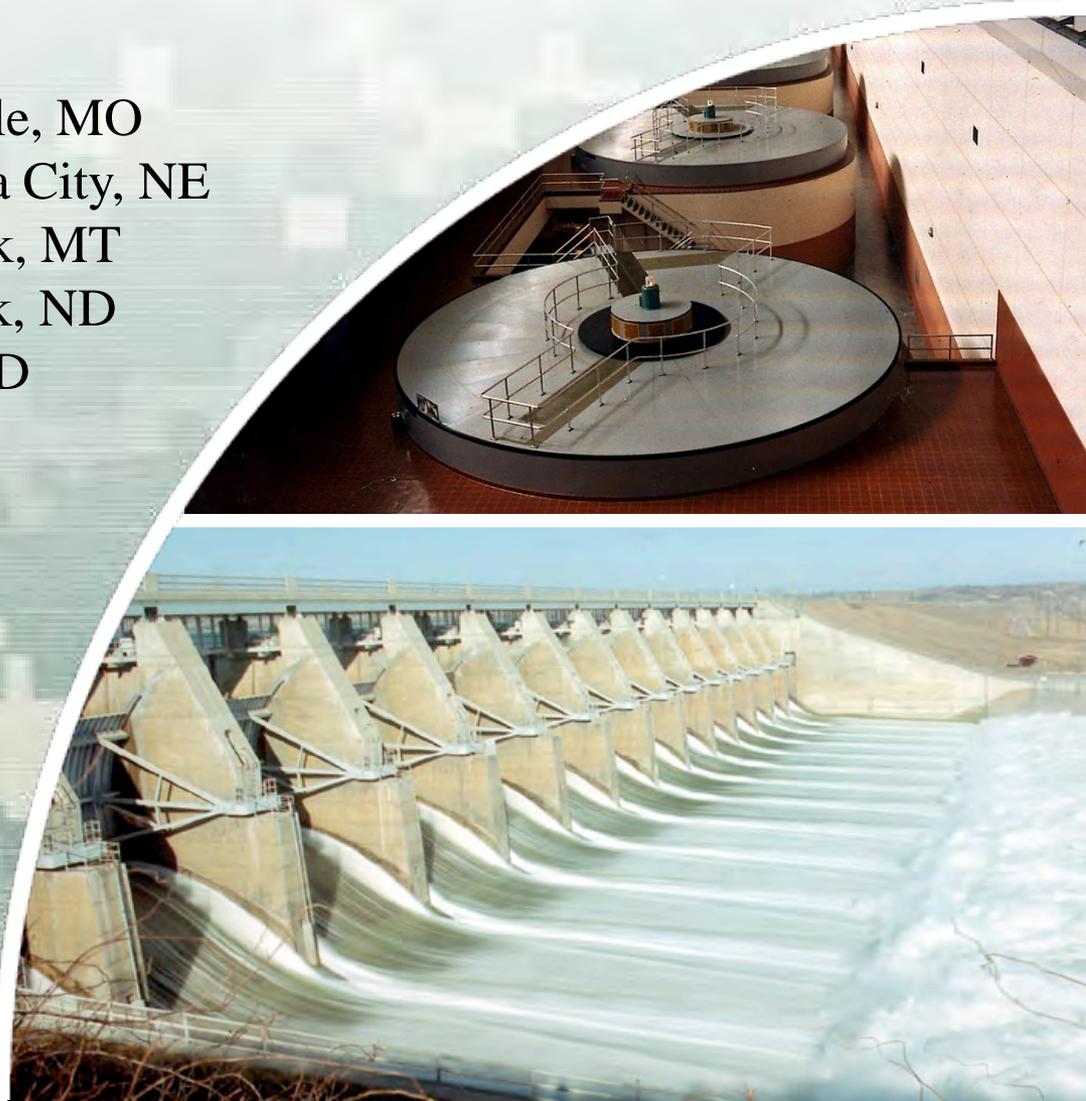
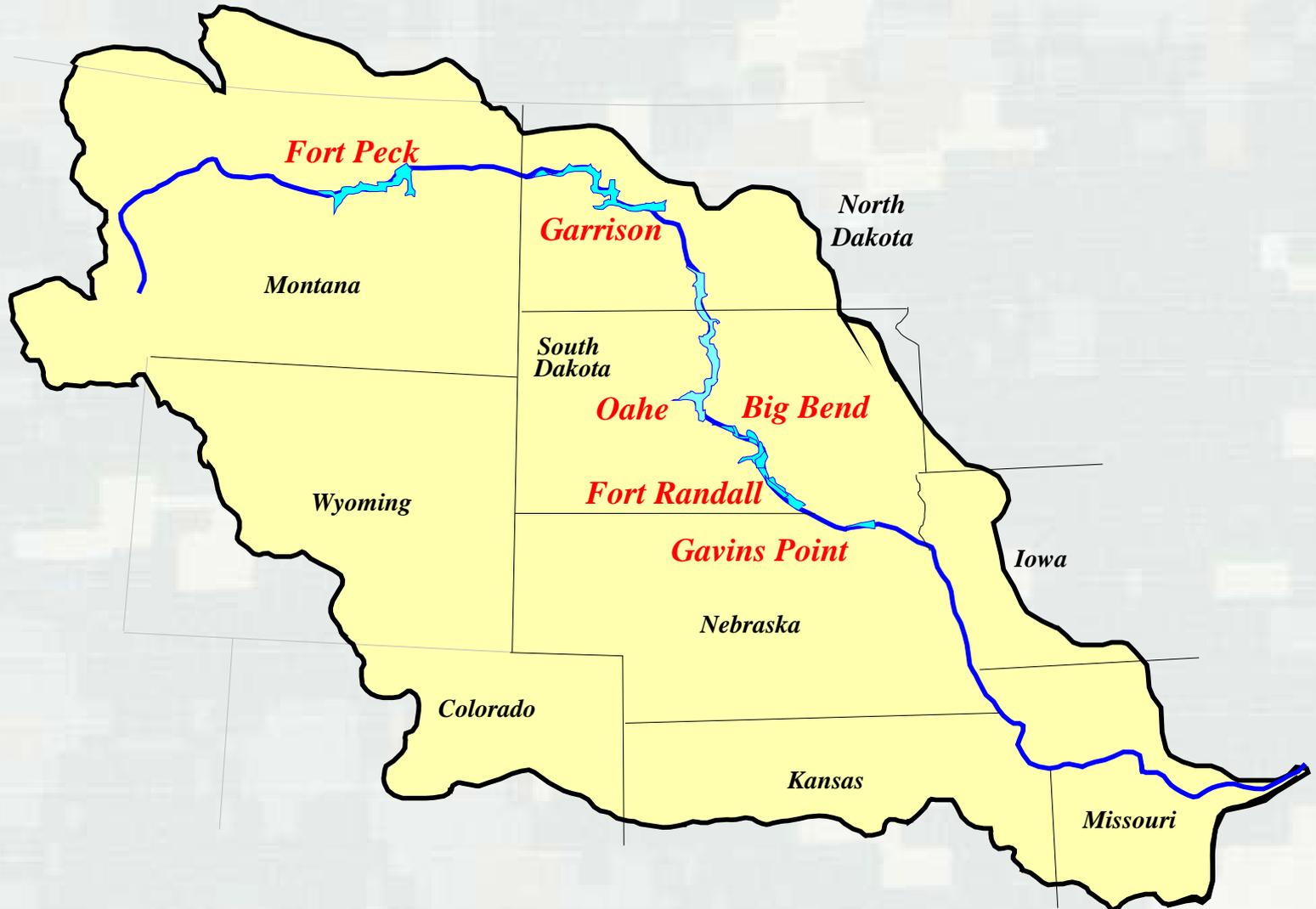


Missouri River Basin Water Management Spring 2016 Public Meetings

April 12 th	11:00 a.m.	Smithville, MO
April 12 th	5:00 p.m.	Nebraska City, NE
April 13 th	11:00 a.m.	Fort Peck, MT
April 13 th	6:00 p.m.	Bismarck, ND
April 14 th	11:00 a.m.	Pierre, SD



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



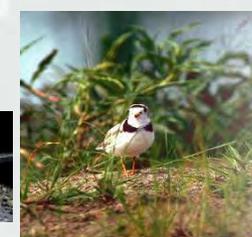
Navigation



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



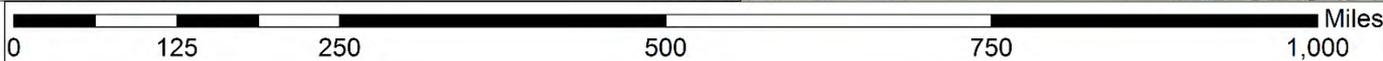
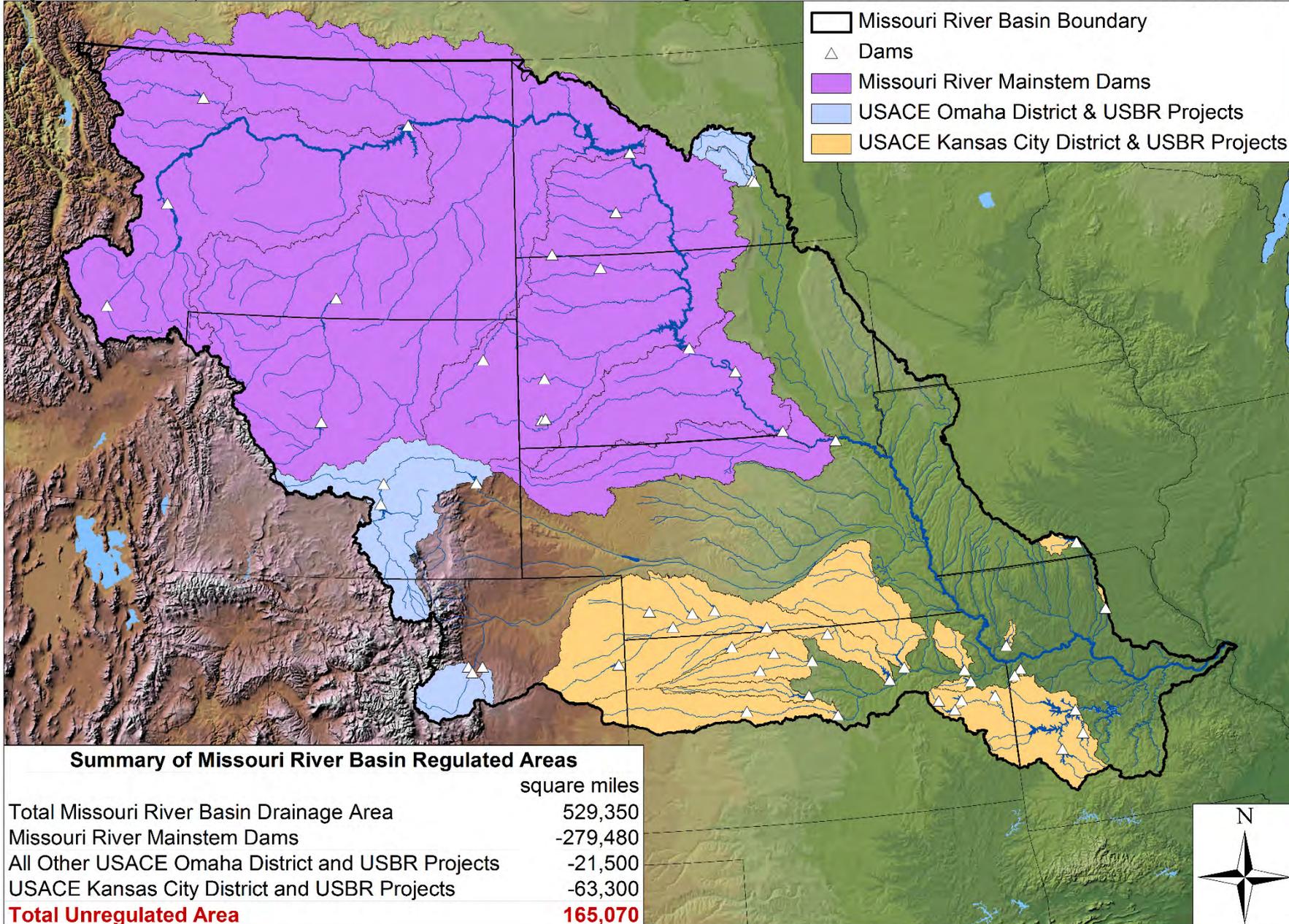
Irrigation



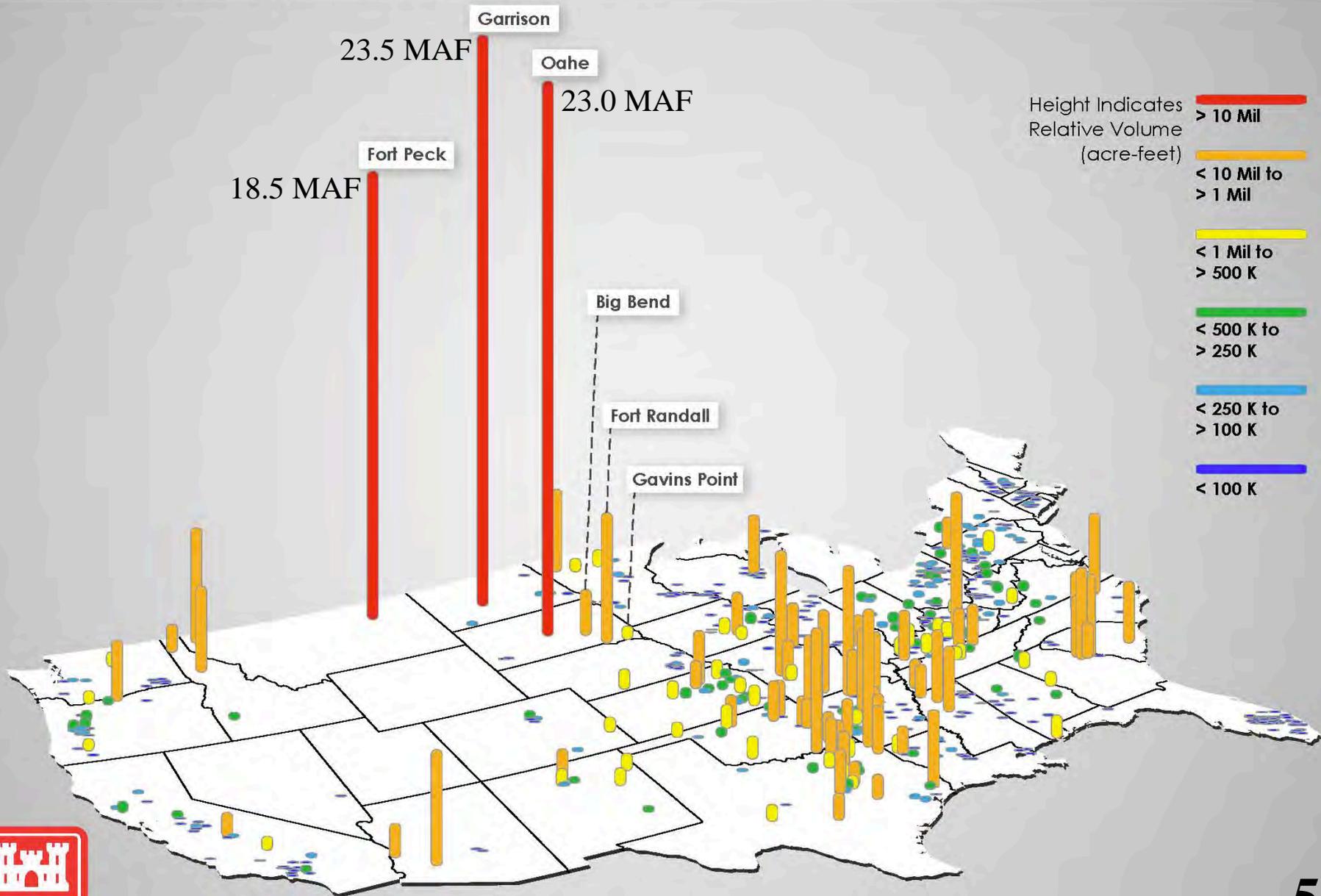
Missouri River Basin Regulated Watersheds

Background: North America Relief Map

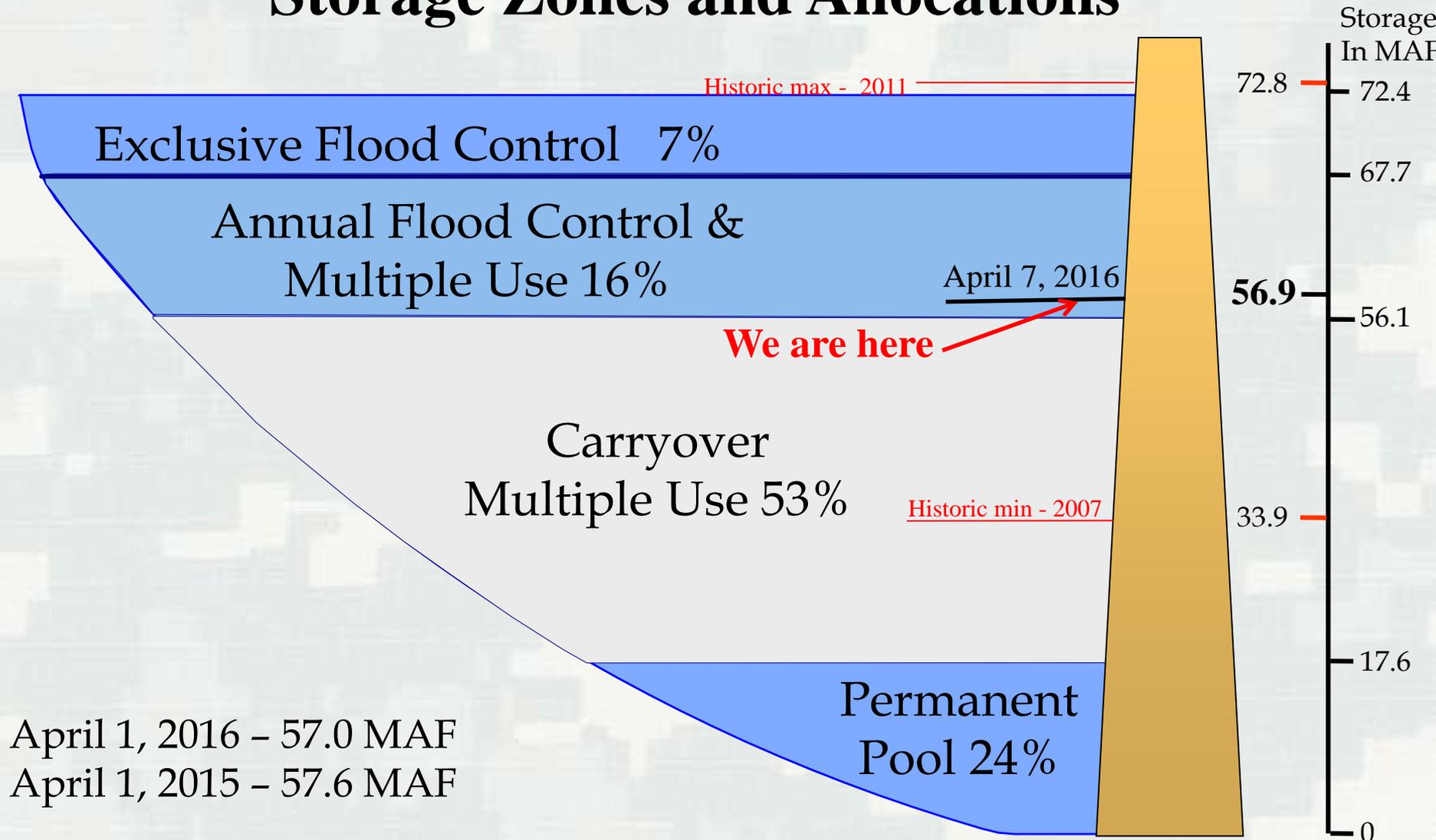
USACE NWO March 2016



Storage Capacity of Corps Reservoirs

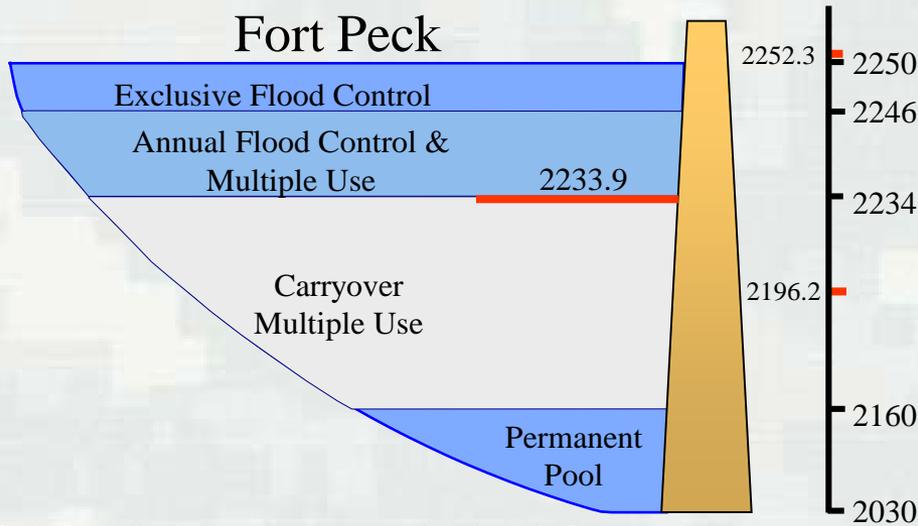


Missouri River Mainstem System Storage Zones and Allocations

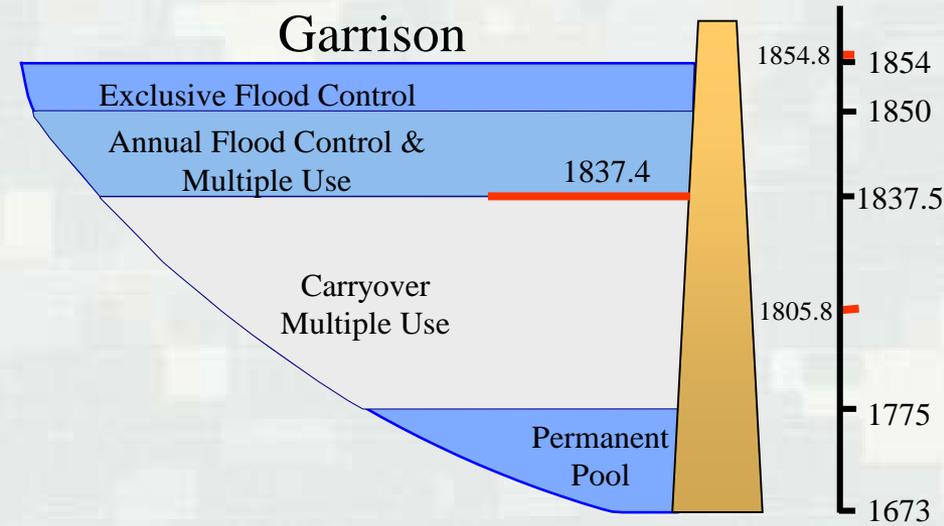


Current Reservoir Levels – Apr 7, 2016

Fort Peck



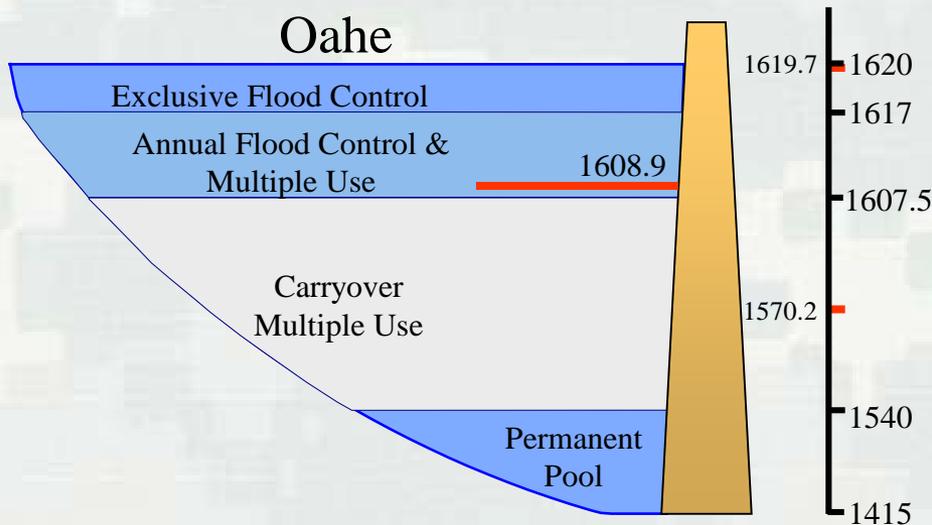
Garrison



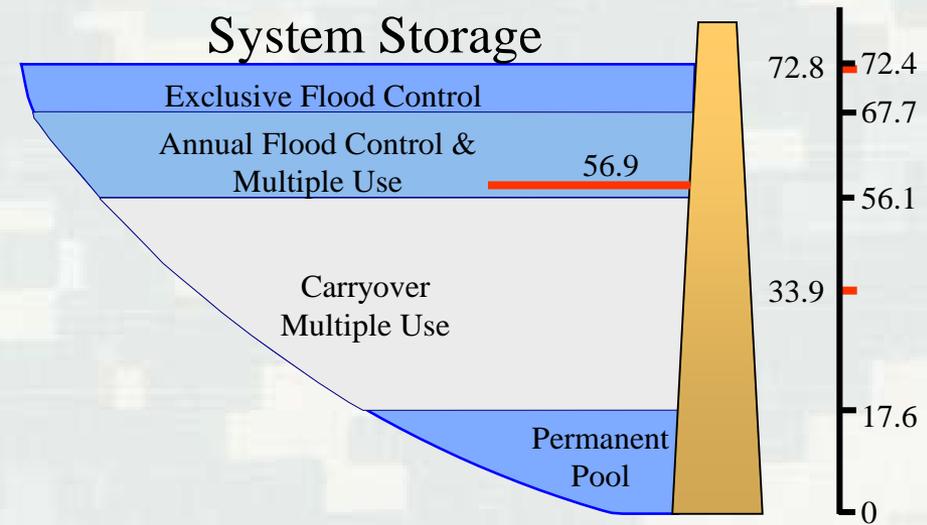
0.1 feet below the Annual Flood Control Zone.

0.1 feet below the Annual Flood Control Zone.

Oahe



System Storage

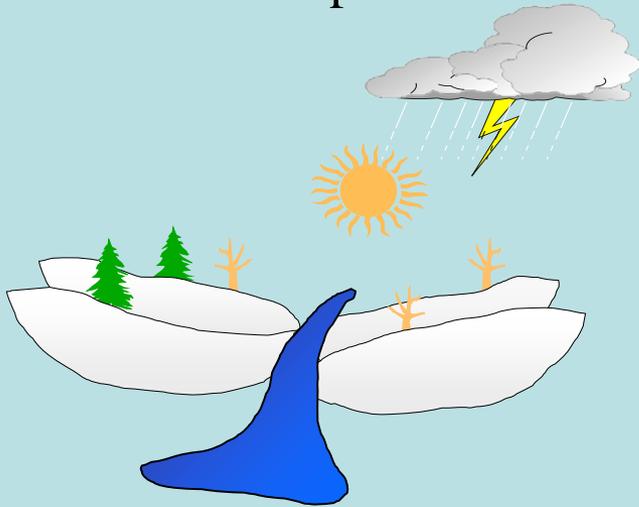


1.4 feet into Annual Flood Control Zone.

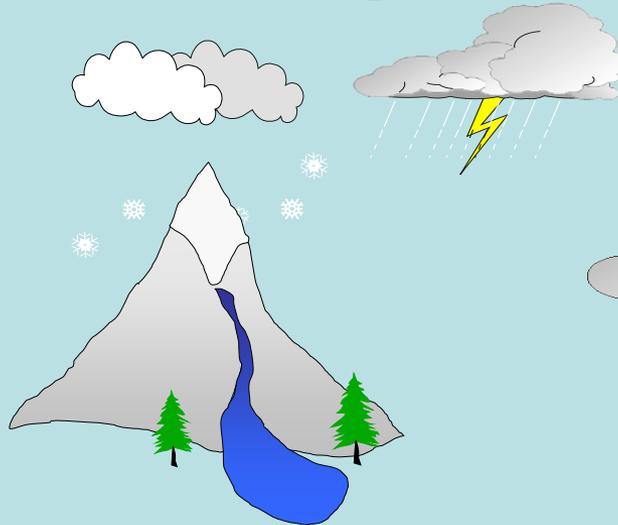
0.8 MAF into Annual Flood Control Zone.

Runoff Components

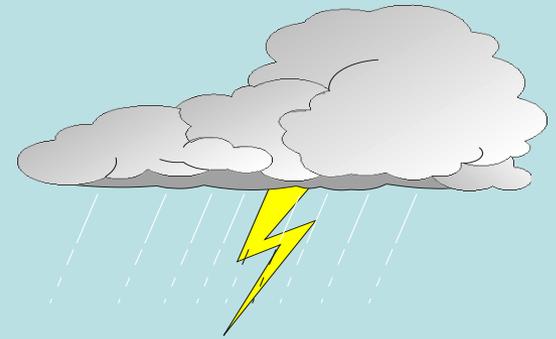
Plains Snowpack



Mountain Snowpack



Rainfall



March and
April

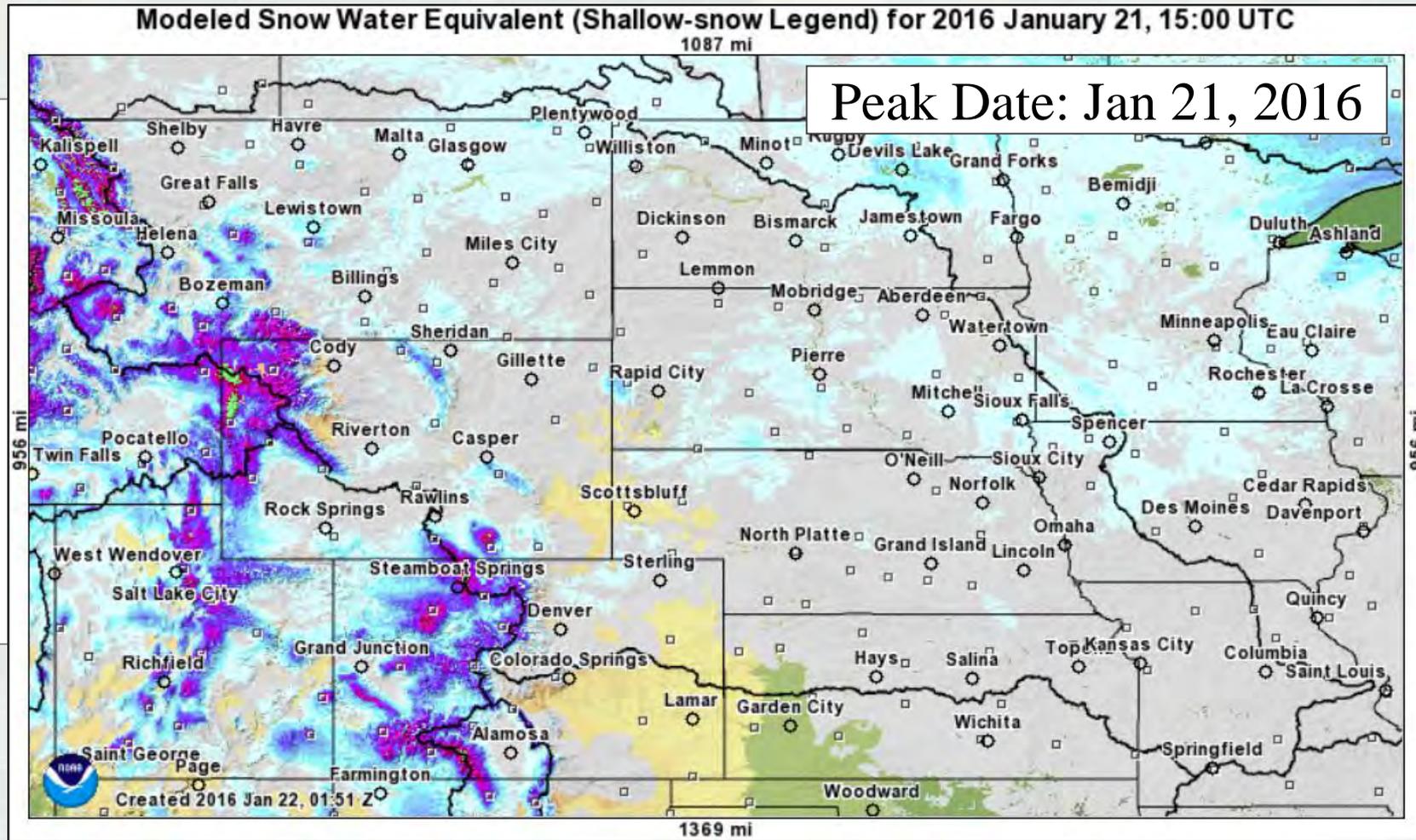
May, June
and July

Throughout
Year

2016 Forecast* = 21.7 MAF

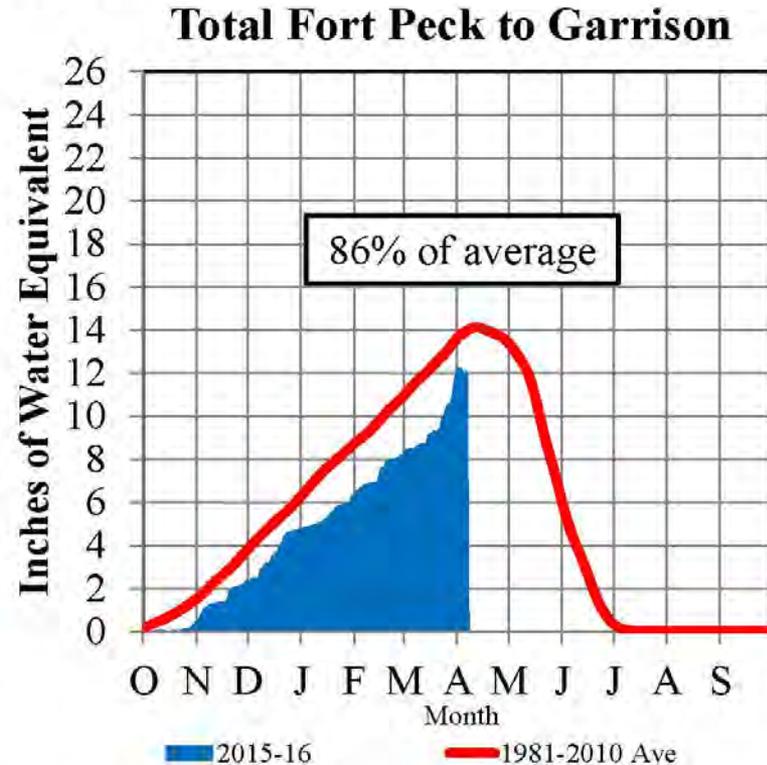
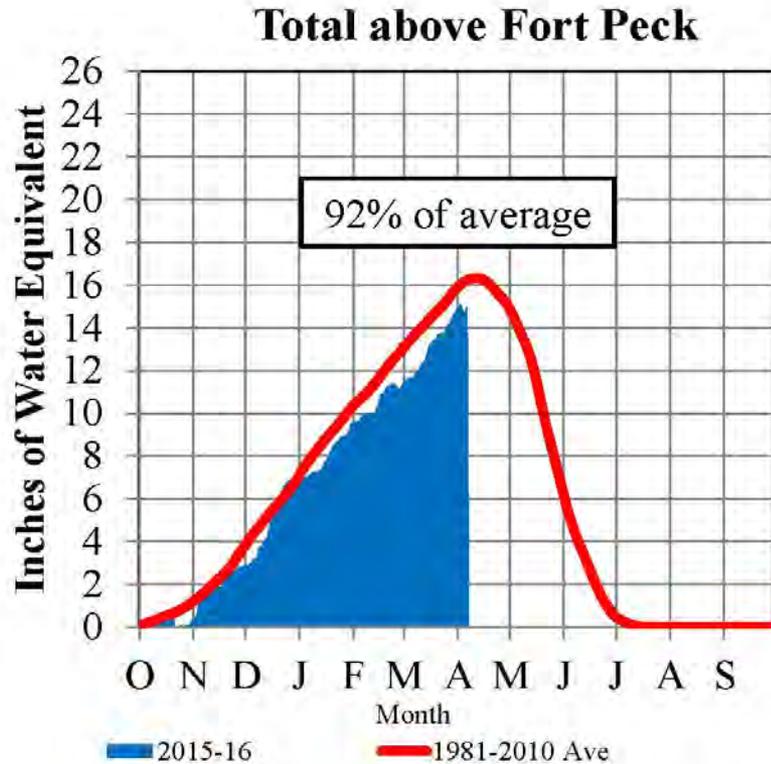
*April 1 Forecast – 86% of average

Plains Snowpack



Mountain Snowpack

April 6, 2016



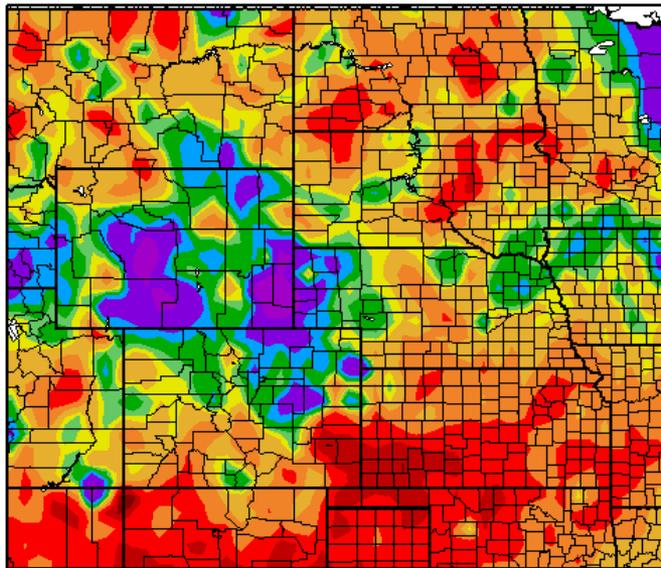
The Missouri River Basin mountain snowpack normally peaks near April 15.

Source: USDA, Natural Resources Conservation Service

Observed Precipitation

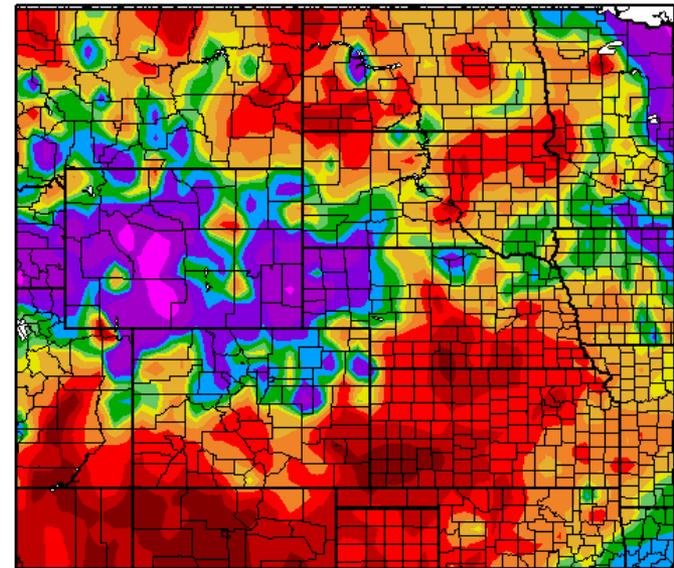
last 90 days

Percent of Normal Precipitation (%)
1/1/2016 – 3/31/2016



last 30 days

Percent of Normal Precipitation (%)
3/1/2016 – 3/31/2016



Generated 4/5/2016 at HPRCC using provisional data.

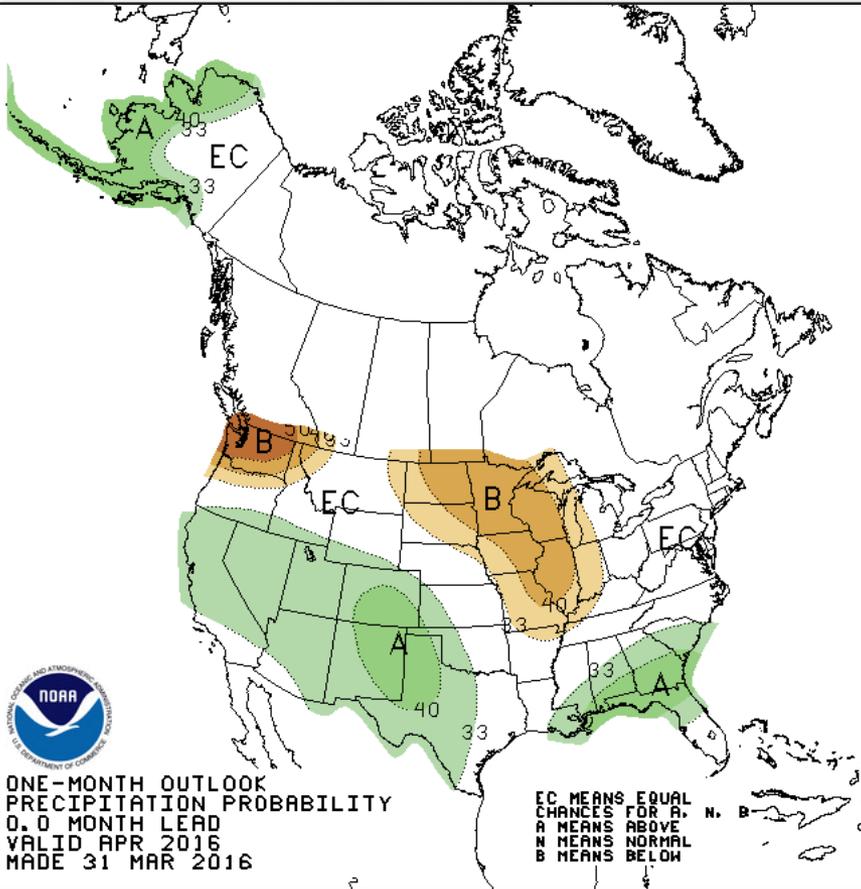
Regional Climate Centers

Generated 4/5/2016 at HPRCC using provisional data.

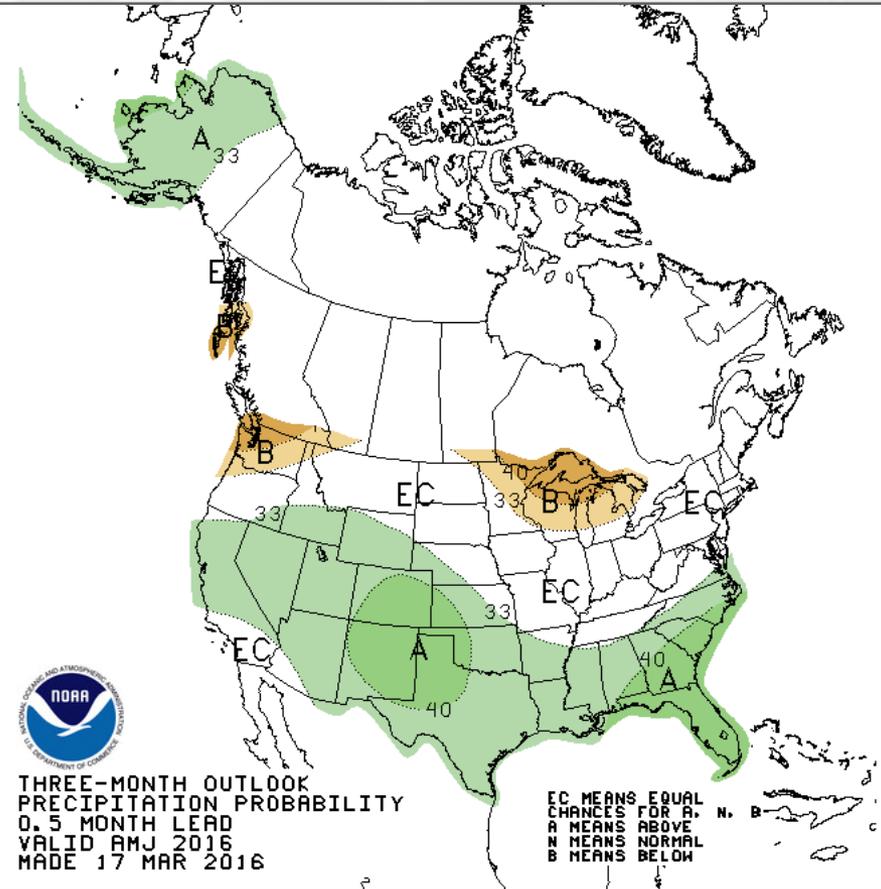
Regional Climate Centers

Precipitation Outlooks

April



Apr – May - Jun

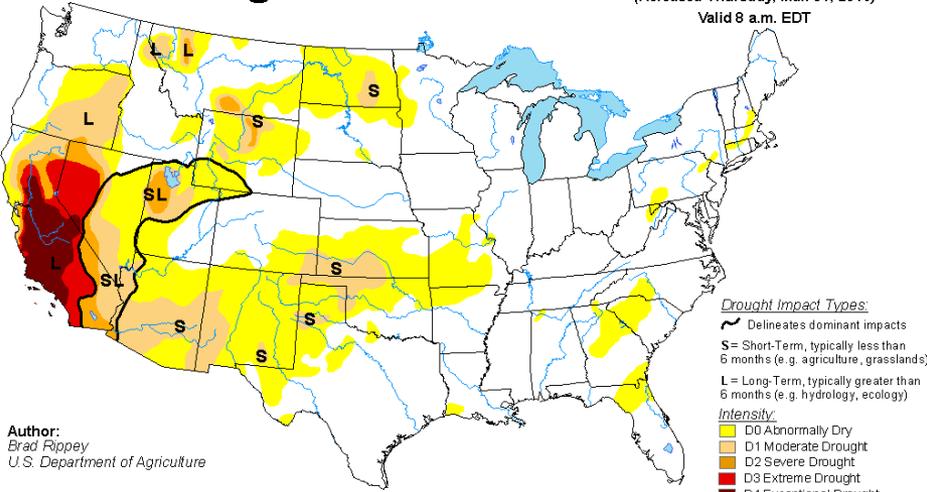


Drought

Current Conditions and Outlook

U.S. Drought Monitor

March 29, 2016
(Released Thursday, Mar. 31, 2016)
Valid 8 a.m. EDT



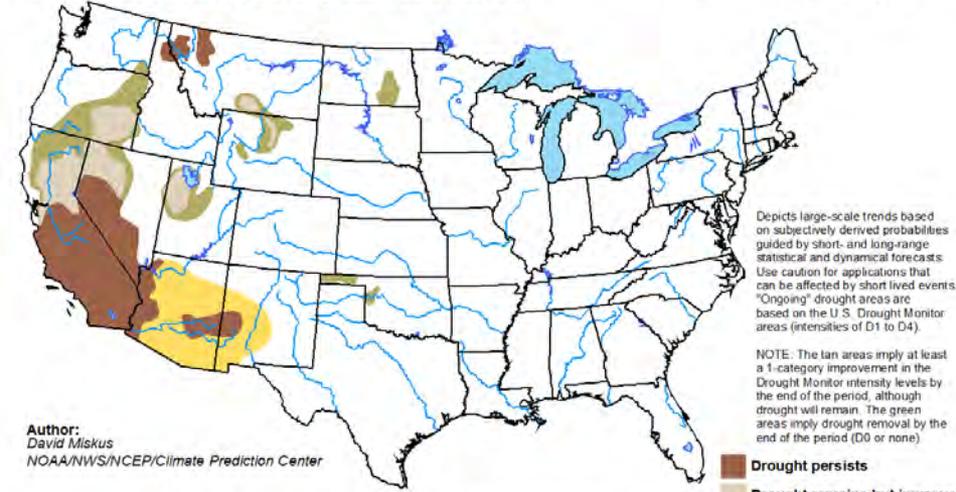
Author:
Brad Rippey
U.S. Department of Agriculture

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

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

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

Valid for March 17 - June 30, 2016
Released March 17, 2016



Author:
David Miskus
NOAA/NWS/NCEP/Climate Prediction Center

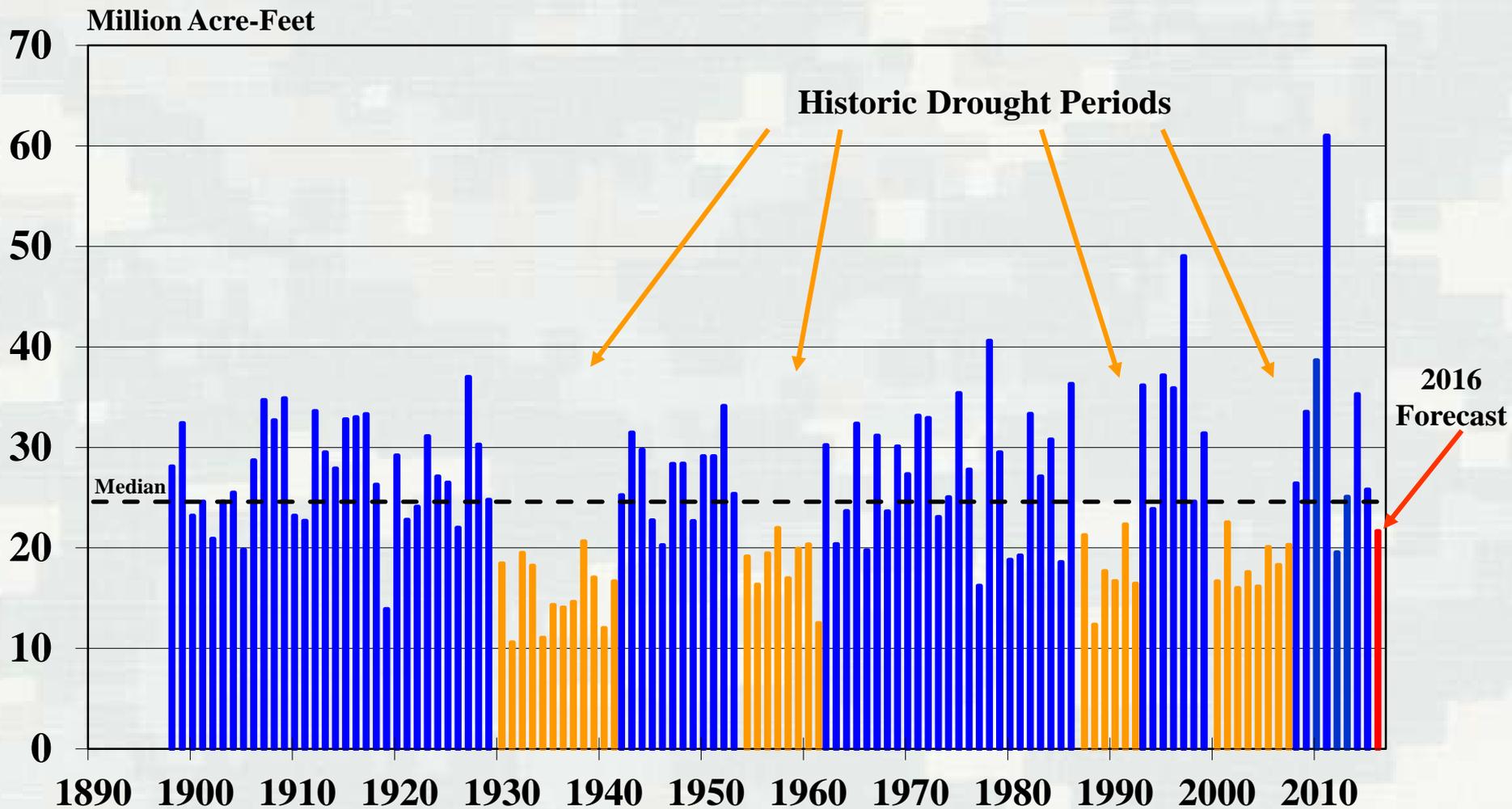
Drought persists
 Drought remains but improves
 Drought removal likely
 Drought development likely

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

Source: National Drought Mitigation Center

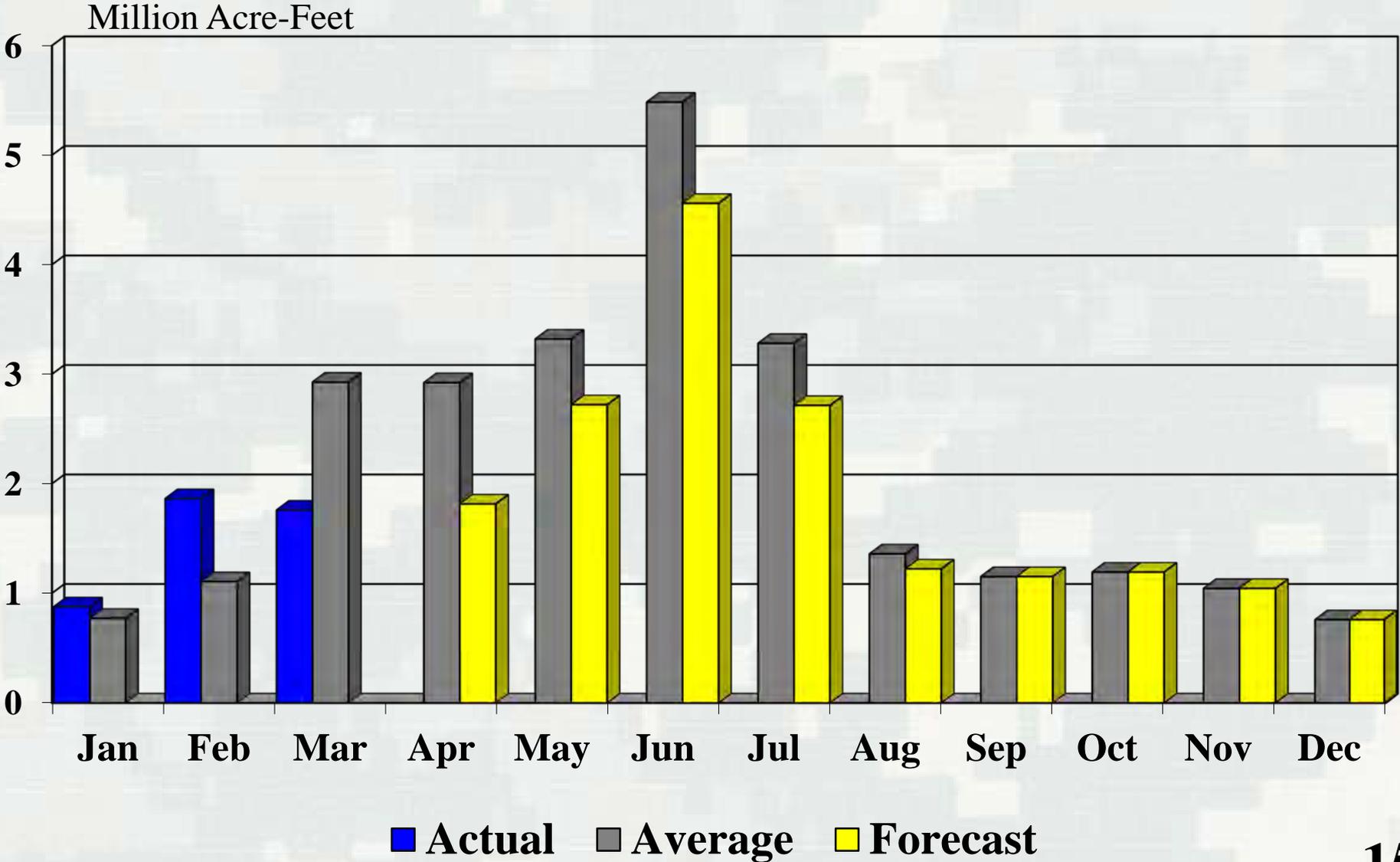
Source: NOAA Climate Prediction Center

Annual Runoff above Sioux City, IA



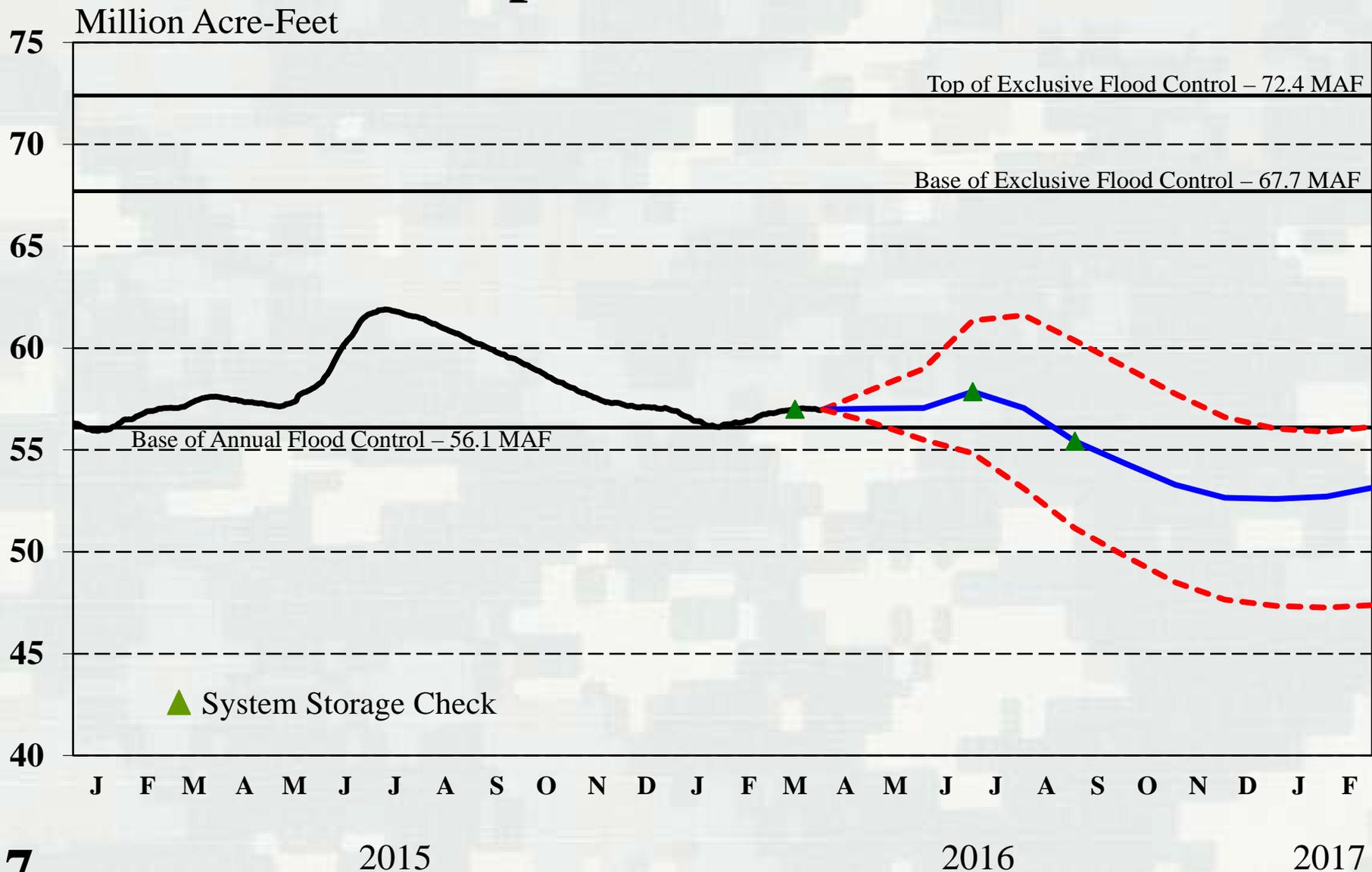
Missouri River Runoff above Sioux City, IA

2016 Actual and Forecasted



Expected Results for Authorized Purposes in 2016

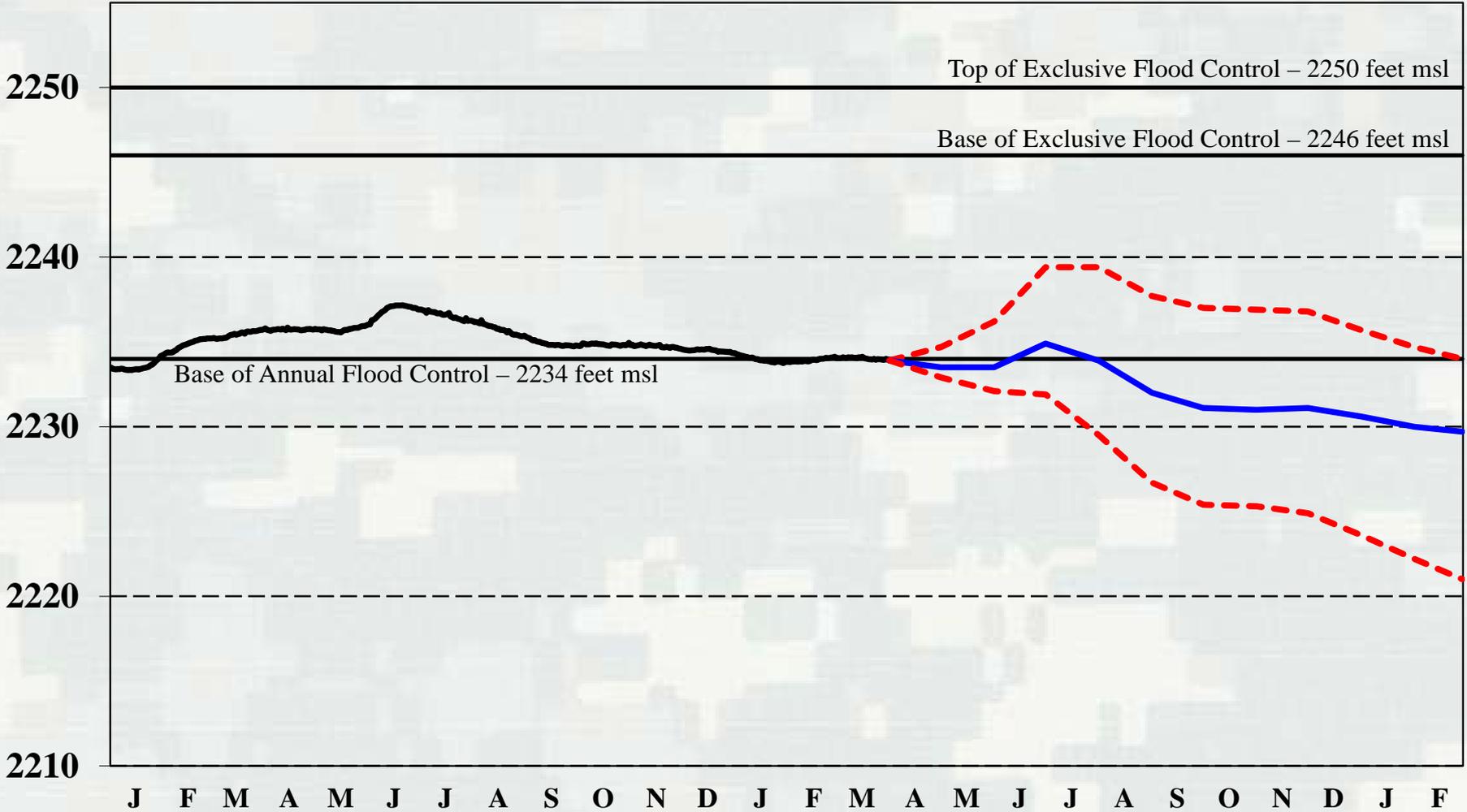
System Storage April 1 Forecast



Fort Peck

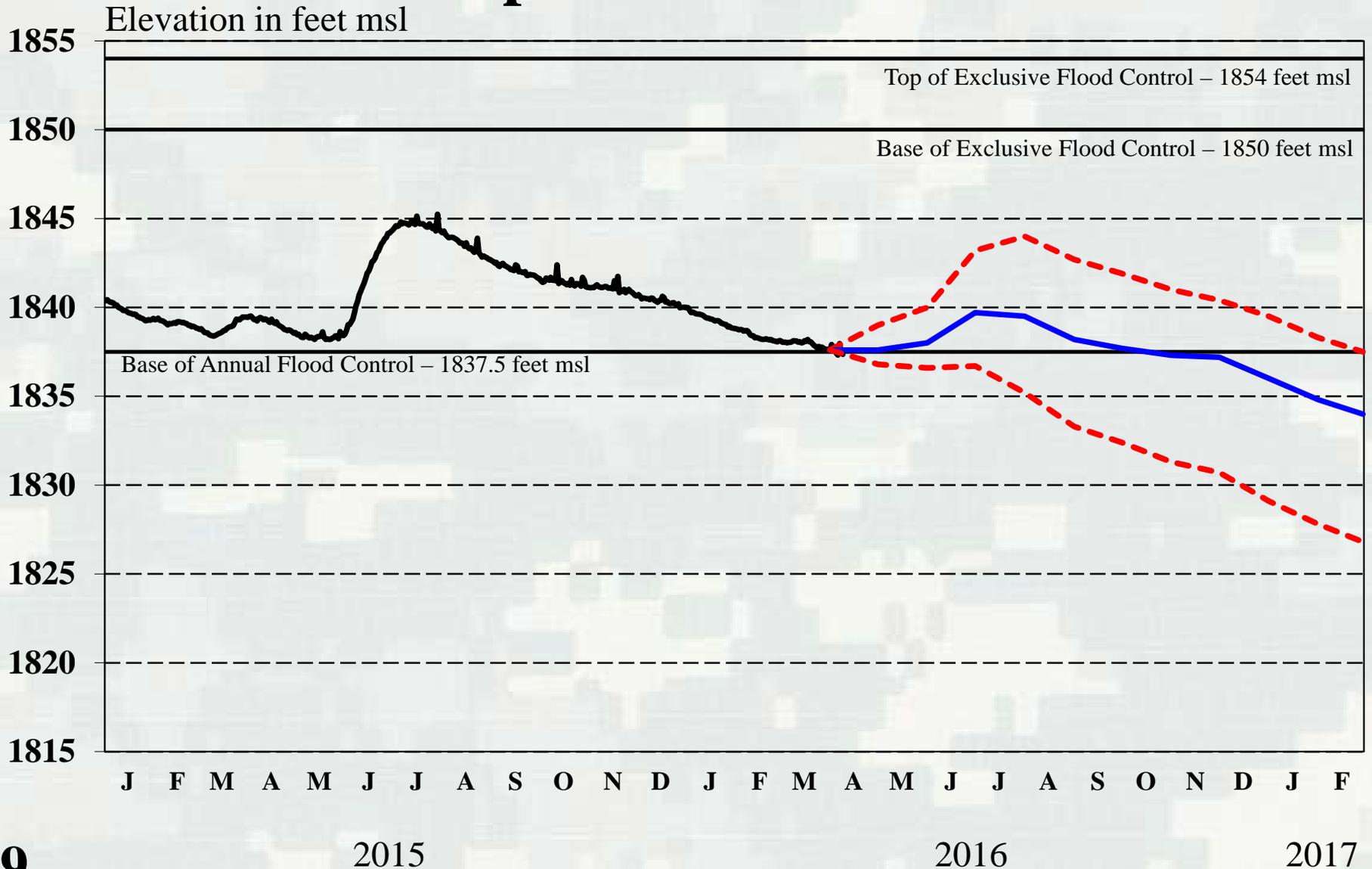
April 1 Forecast

Elevation in feet msl



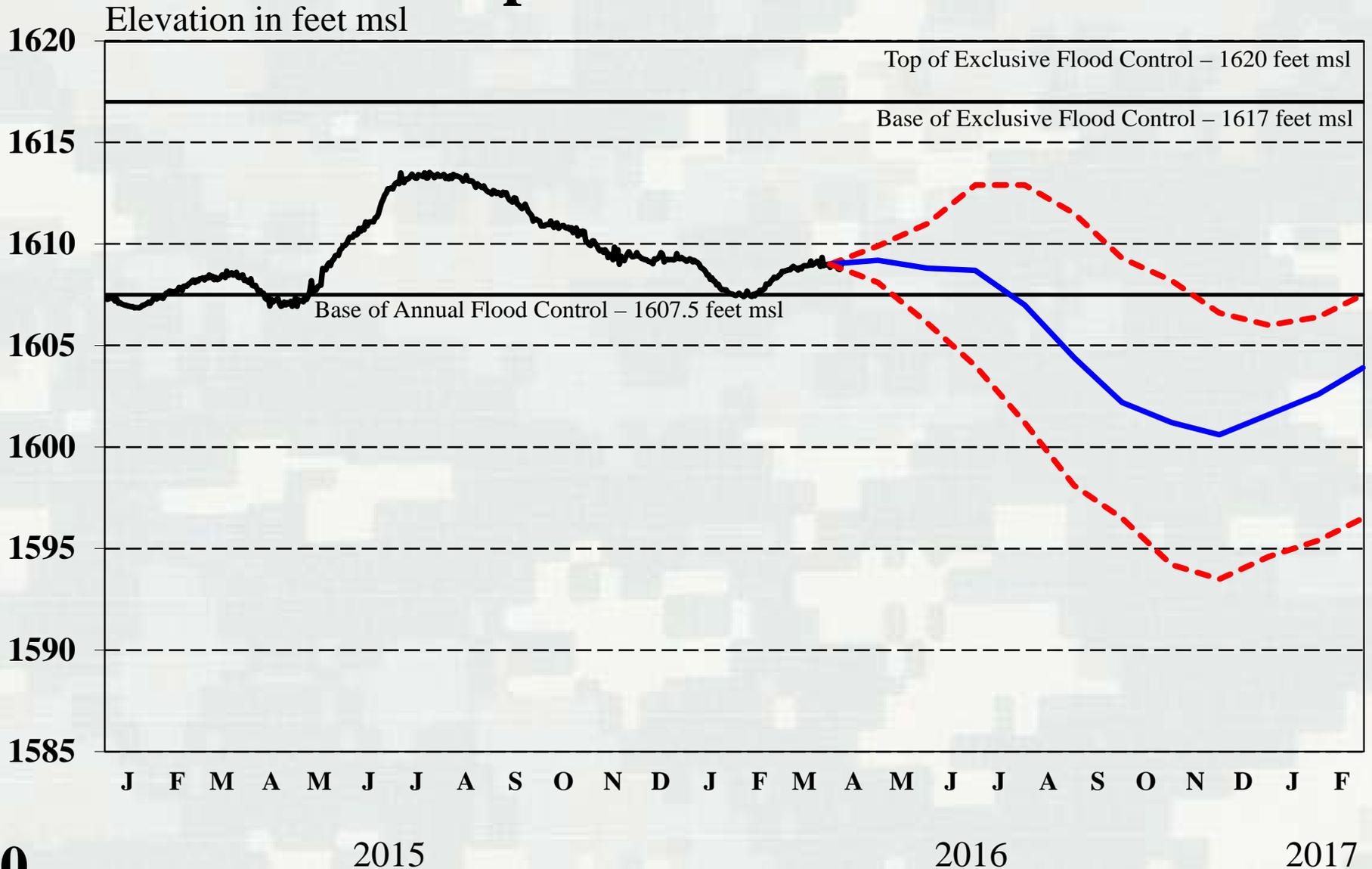
Garrison

April 1 Forecast



Oahe

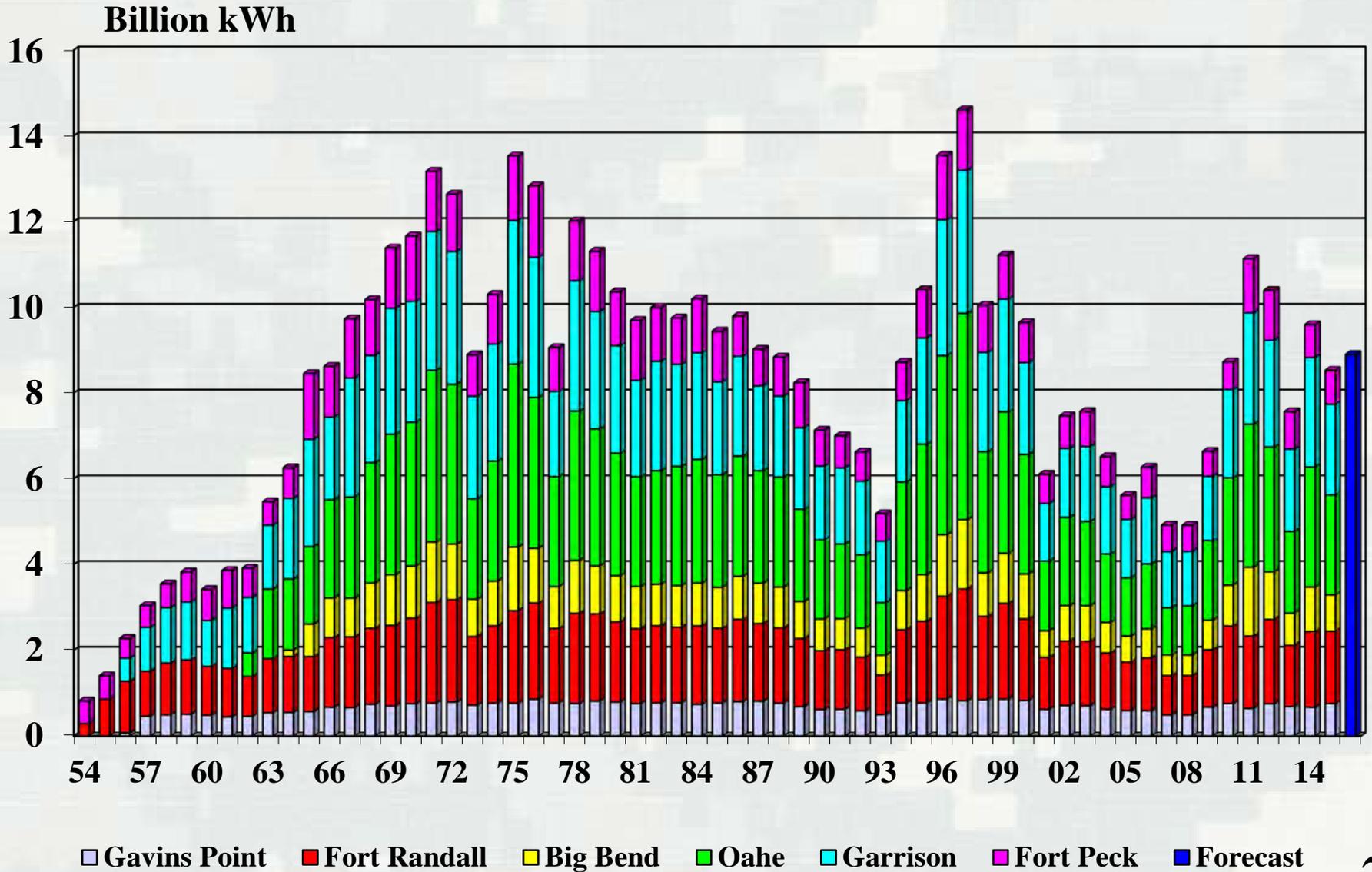
April 1 Forecast



Flood Control

- All 2015 flood water evacuated from reservoir system by late January
- Storage space available to capture runoff and reduce releases for downstream events
- Flooding can still occur due to rainfall
 - ▶ Ability to reduce downstream stages diminishes as you move further from the control point due to increased travel times

Hydropower



Navigation

- March 15 storage check
 - ▶ Full service flow support
 - ▶ Target locations: Sioux City, Omaha, Nebraska City and Kansas City
- July 1 storage check
 - ▶ Full service flow support except for Lower Basic
 - ▶ Full length navigation
- Conservation measures

Water Supply – Water Quality

Irrigation – Recreation

- Normal to slightly below normal elevations and releases
- Lower pools not expected to affect recreation this year
- No impacts expected to irrigation
- Water supply
 - ▶ Gavins Point winter releases near 12,000 cfs under basic and lower basic
 - ▶ Reservoir levels above historic lows
 - ▶ Releases adequate between reservoirs



Fish and Wildlife

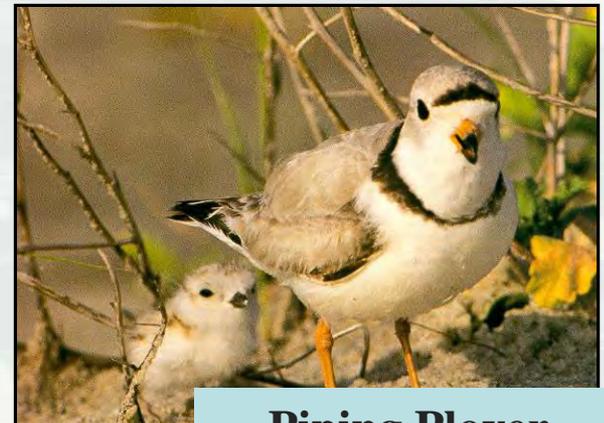
- Steady to rising levels at upper three reservoirs during forage fish spawn
 - ▶ Favor Garrison if runoff not sufficient
 - ▶ May be difficult to accomplish this year without additional rainfall in the basin
- Minimize hours of zero releases at Fort Randall to the extent possible

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 2016
 - ▶ Independent science advisory panel (ISAP) determined implemented pulses not accomplishing intended outcomes
 - ▶ Forego 2016 spring pulse while pursuing ISAP recommendations



Summary

- Below average runoff forecast
- Reservoir levels expected to decline; begin next year below base of flood control zone (basic runoff)
- Good service to all authorized purposes in 2016; impacts likely beginning next winter unless basin conditions improve

Thank You!

Missouri.Water.Management@usace.army.mil

Website: www.nwd-mr.usace.army.mil/rcc/
Or Google Corps Missouri River