



*US Army  
Corps of Engineers*



# **Missouri River Mainstem System**

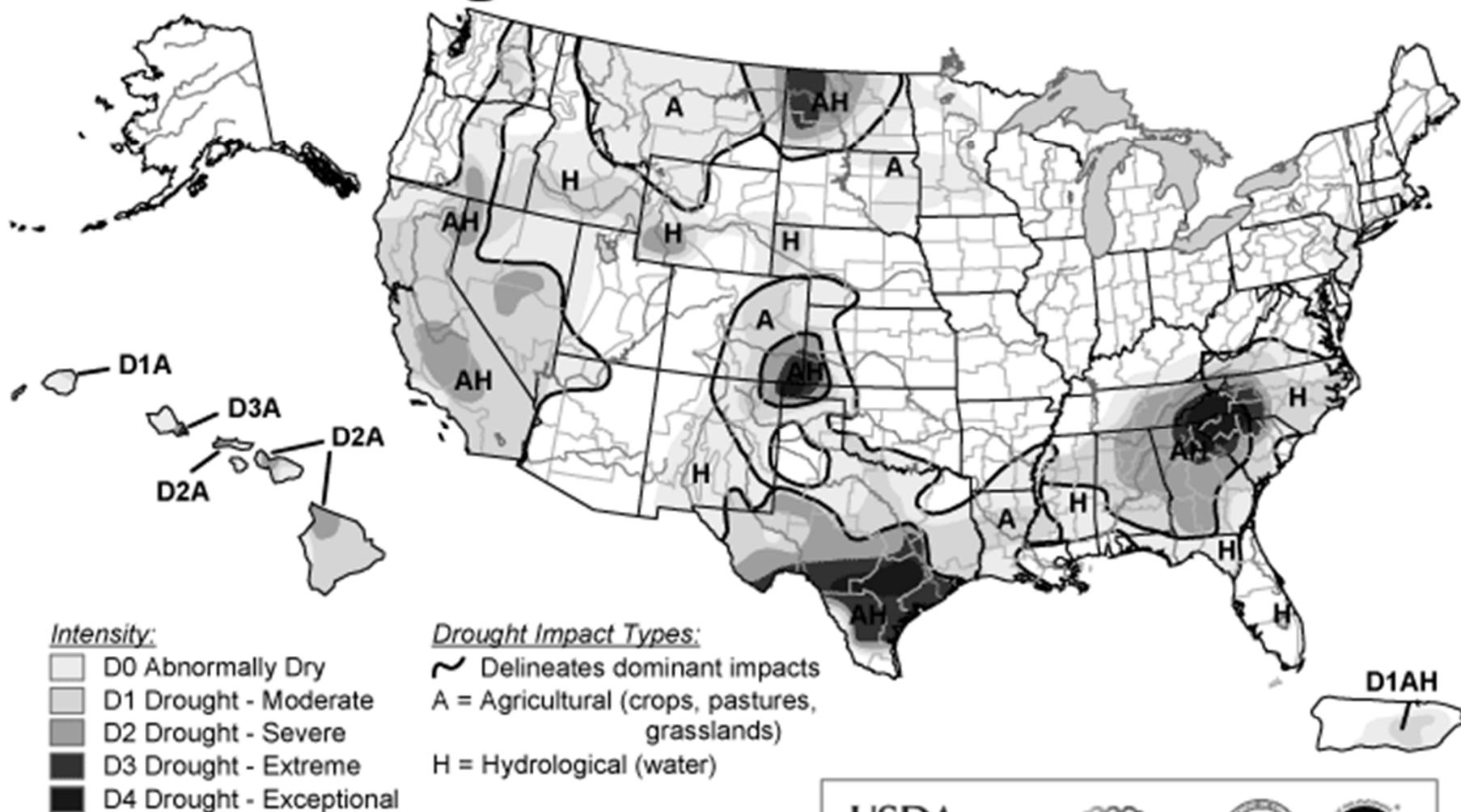
**Preliminary Draft Annual Operating Plan**

**July 2009**

# U.S. Drought Monitor

July 22, 2008

Valid 8 a.m. EDT



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

<http://drought.unl.edu/dm>



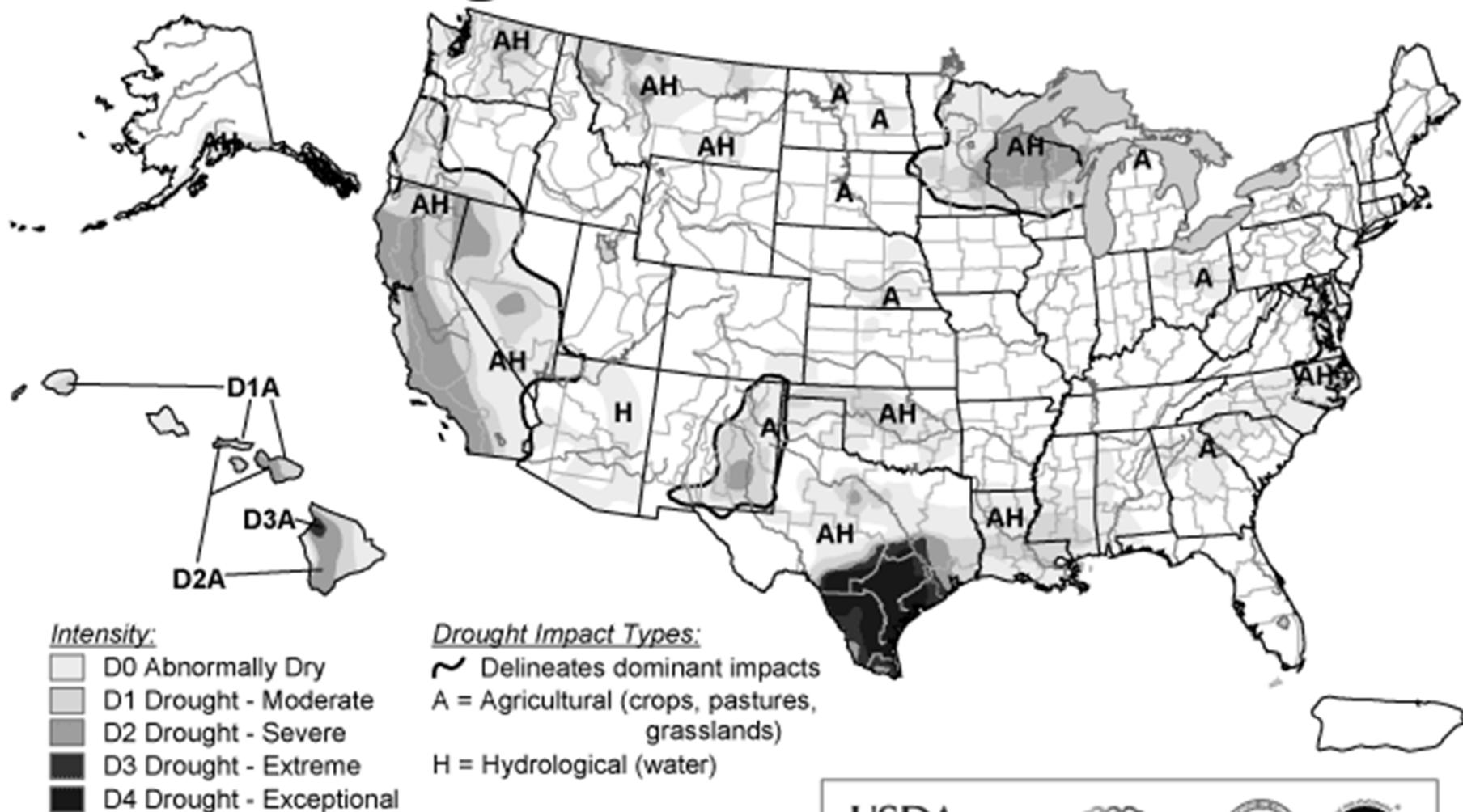
Released Thursday, July 24, 2008

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

# U.S. Drought Monitor

July 21, 2009

Valid 8 a.m. EDT



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

<http://drought.unl.edu/dm>



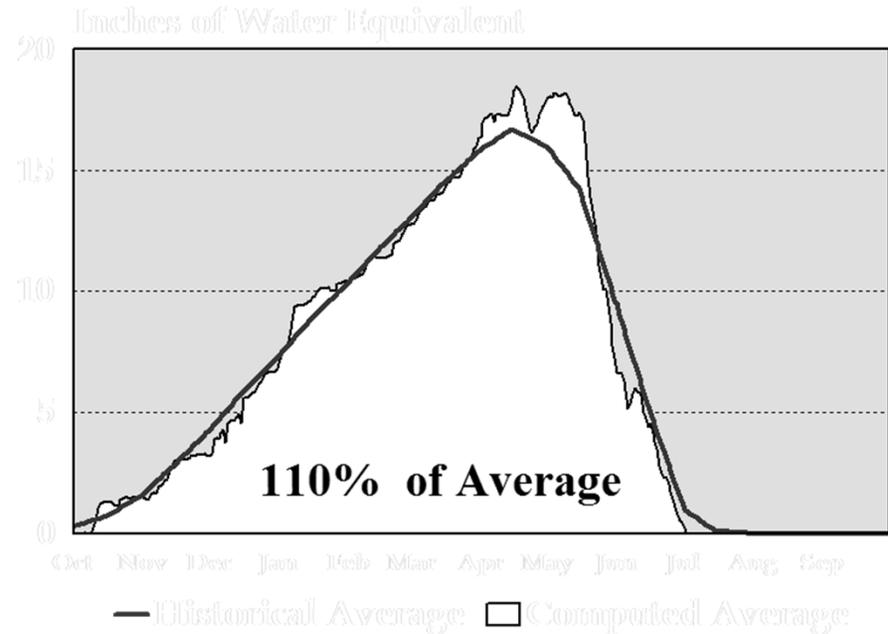
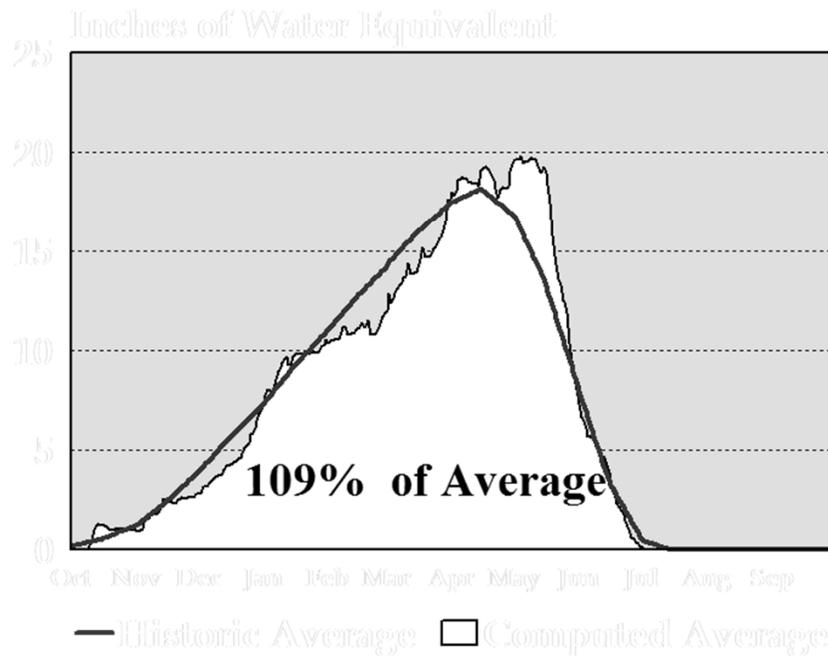
Released Thursday, July 23, 2009

Author: Eric Luebehusen, U.S. Department of Agriculture

# Missouri River Basin Mountain Snowpack Water Content 2008-2009

*Total Above Fort Peck*

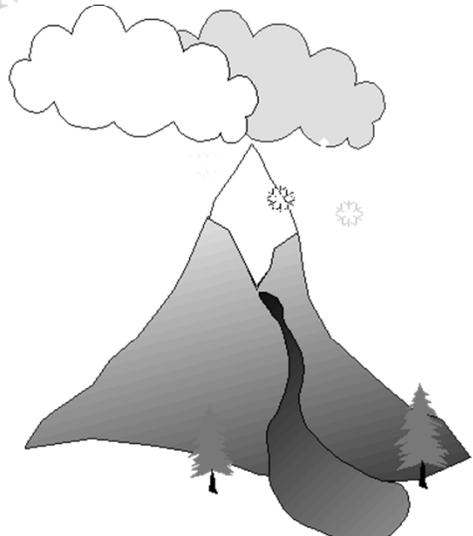
*Total Fort Peck to Garrison*



The Mountain Snowpack in the reach above Fort Peck peaked at 109% of the normal peak accumulation on May 4. The Mountain Snowpack in the reach between Fort Peck and Garrison appears peaked at 110% of the normal peak accumulation on April 17. The Missouri River basin Mountain Snowpack normally peaks near April 15.

# Types of Missouri River Basin Runoff

Mountain Snowmelt



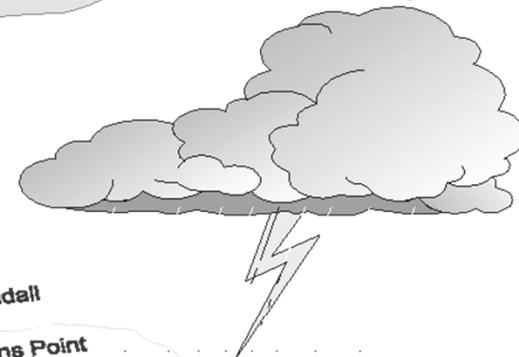
Fort Peck

Plains Snowmelt



Garrison

Rainfall



Oahe

Big Bend

Ft Randall

Gavins Point

Missouri

Mountain Snow  
109% & 110%

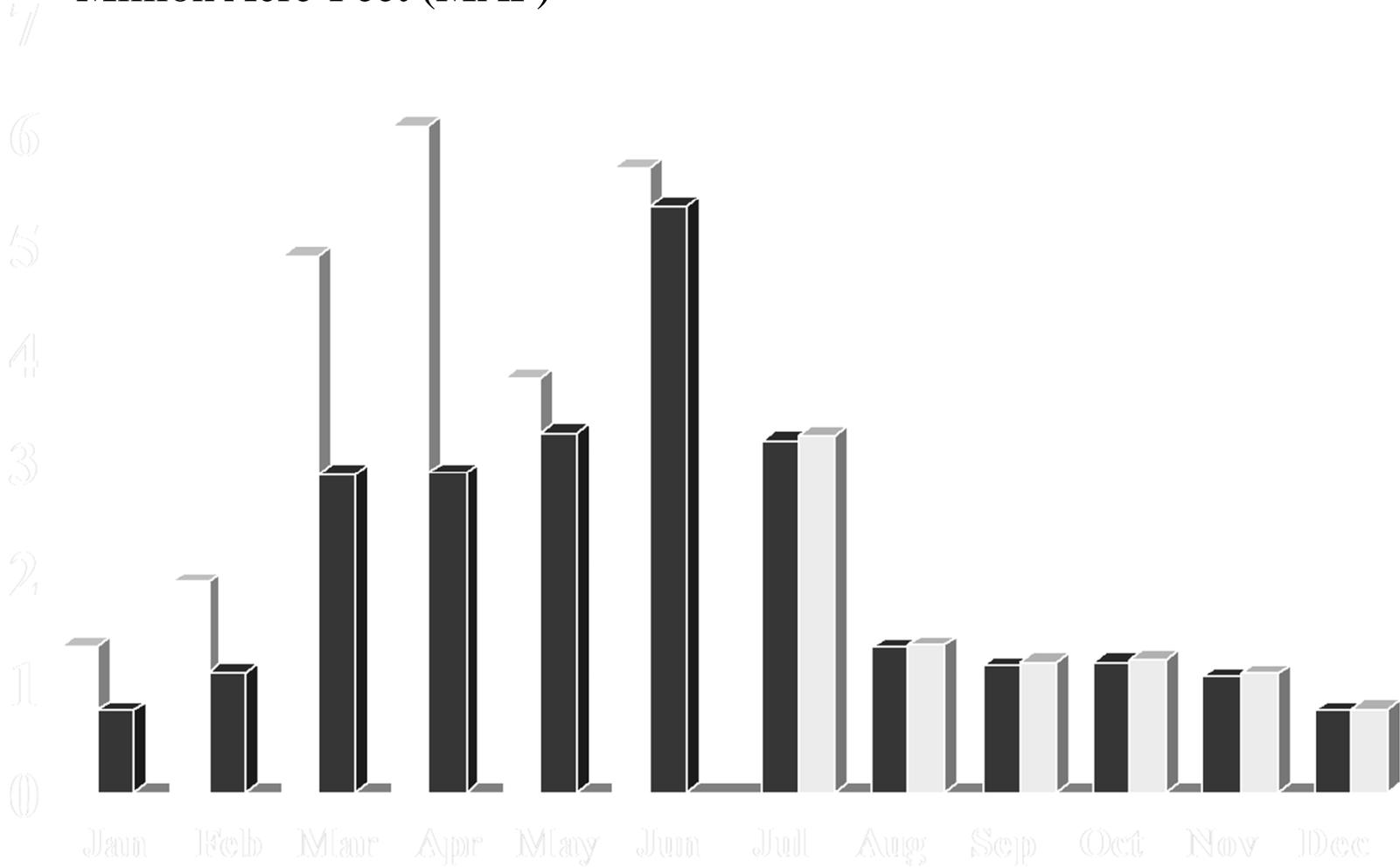
Plains Snow  
Good plains snow

2009 Rainfall  
Generally wet downstream

31.9 MAJF  
129% of Normal

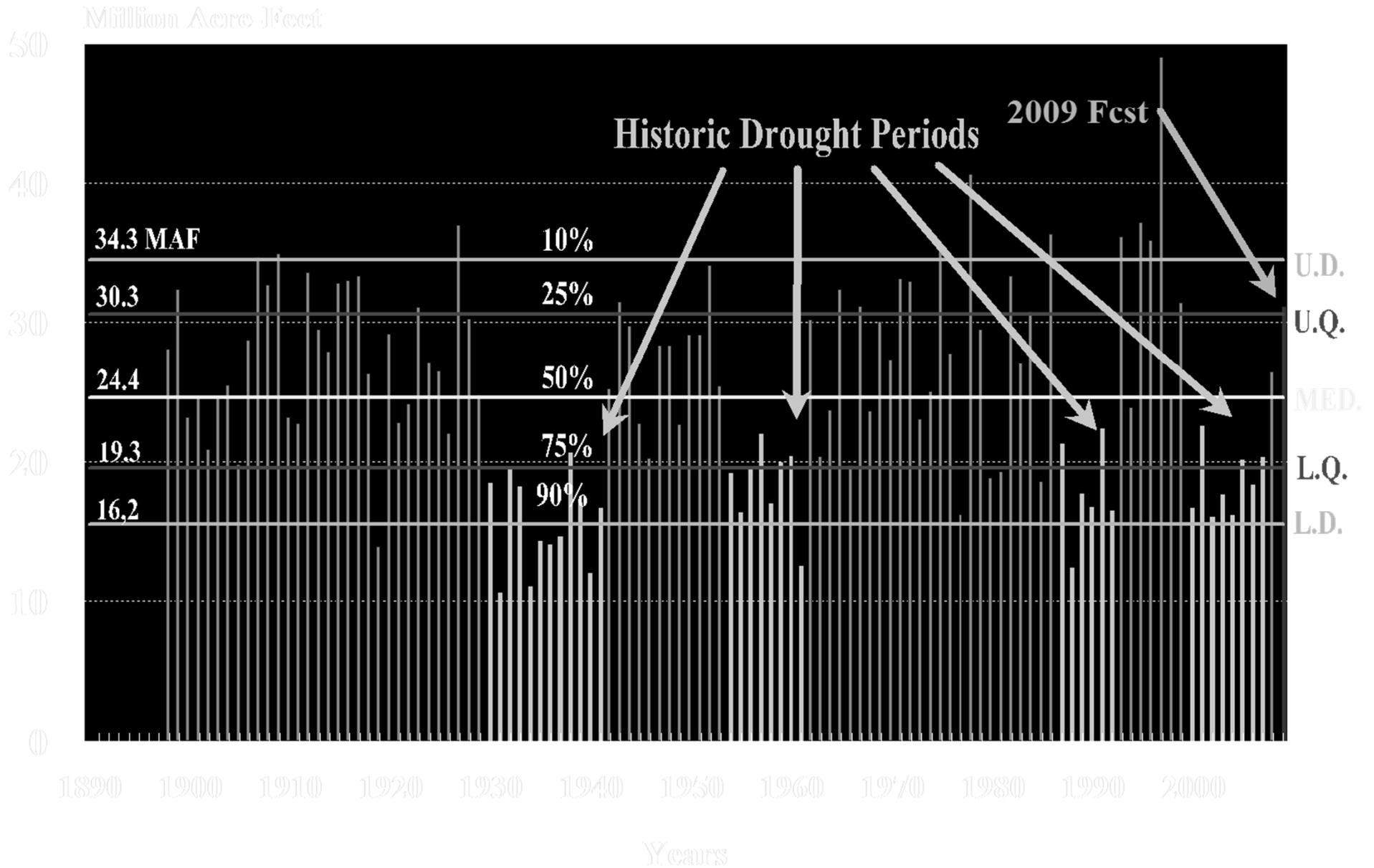
# 2009 Missouri River Runoff Above Sioux City, Iowa

Million Acre-Feet (MAF)



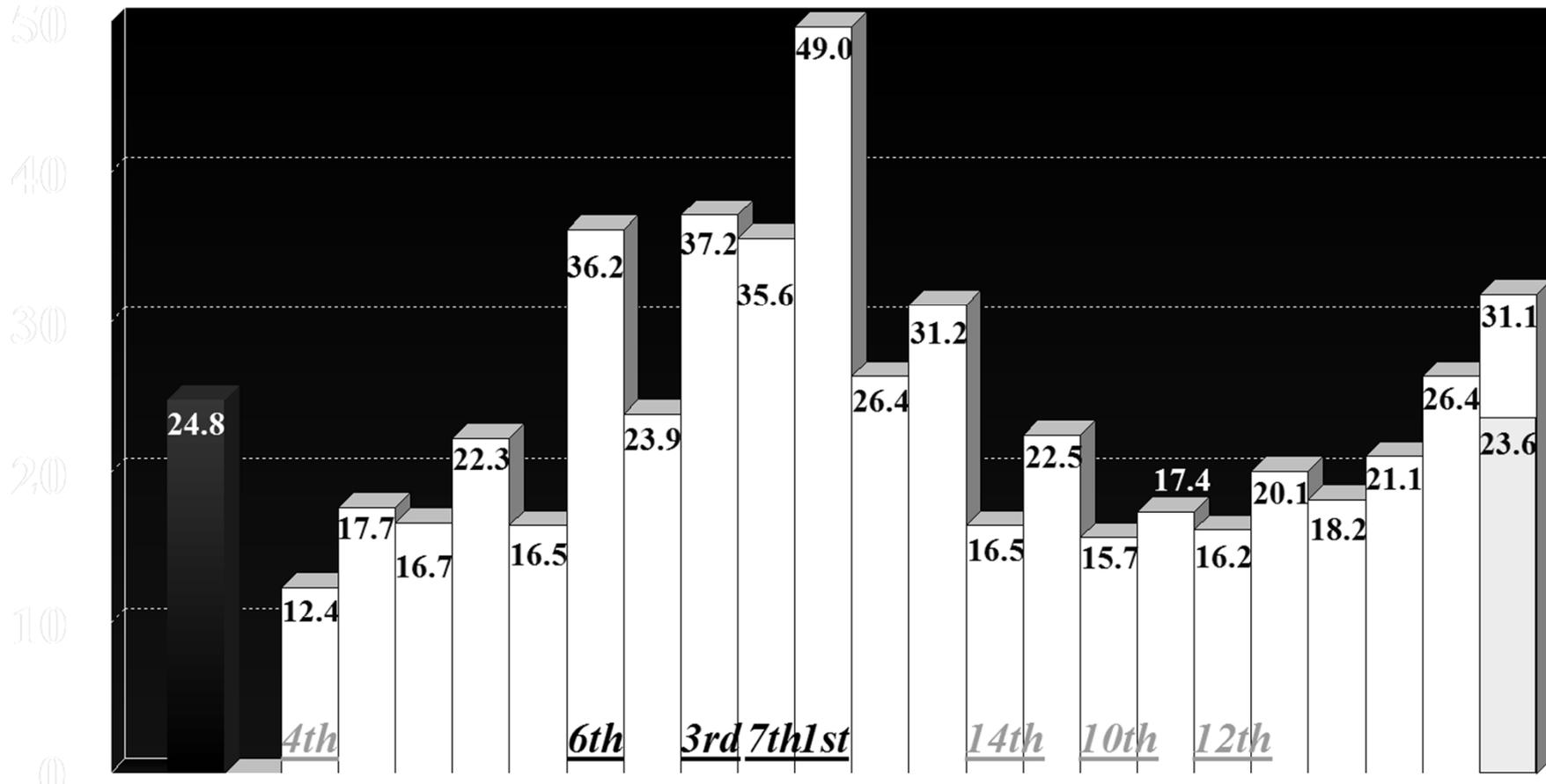
Actual ■ Normal ■ Forecasted

# Missouri River Mainstem System Annual Runoff at Sioux City, Iowa



# Missouri River Runoff Above Sioux City CY 1988-2009 vs Average

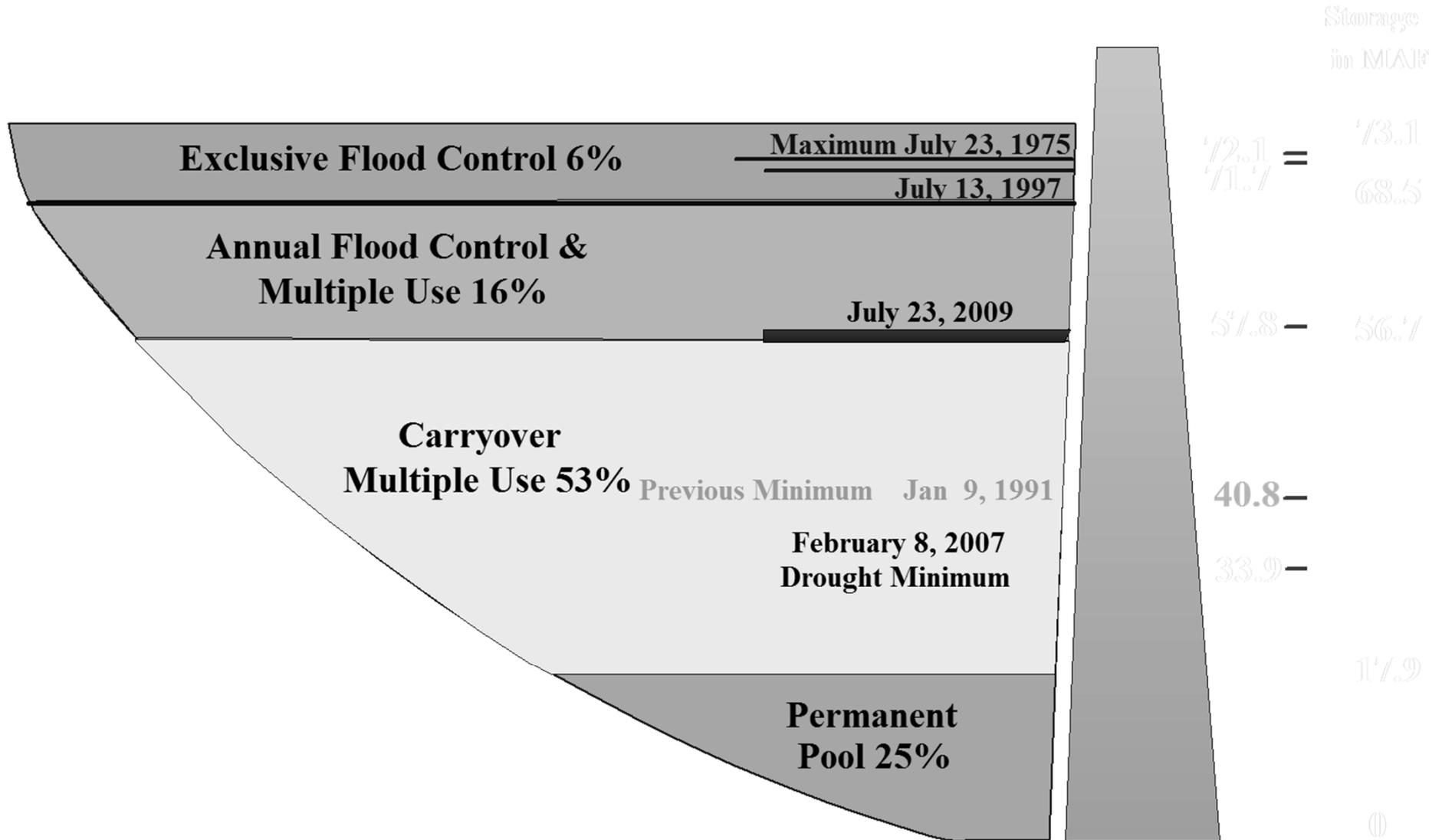
Million Acre Feet



Forecast

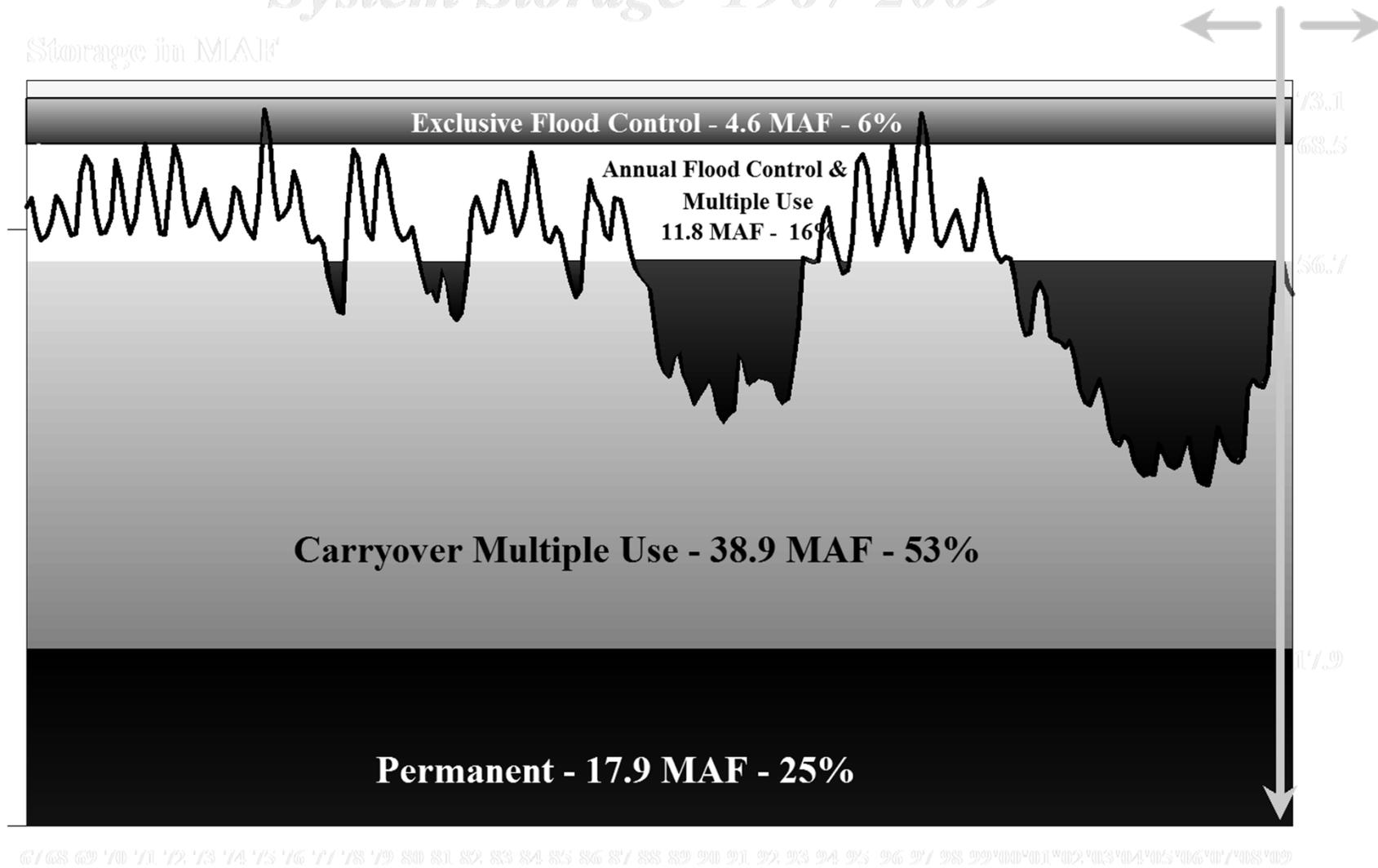
July 2009

# Missouri River Main Stem System Storage Allocations



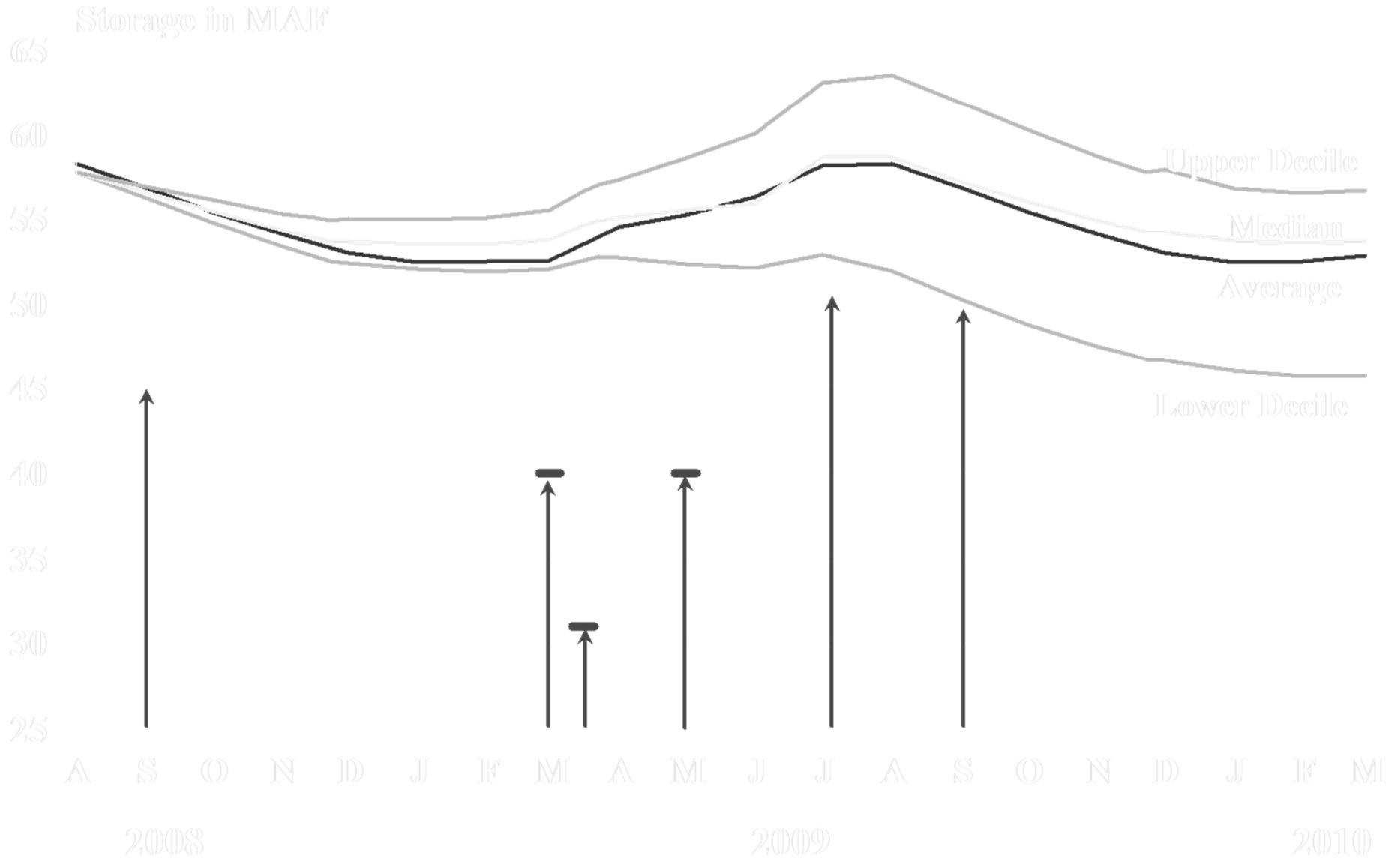
Total Storage : 73.1 MAAD

# Missouri River Main Stem System Storage 1967-2009



# *System Storage*

## *2009 - 2010 AOP Decision Points*



# *Missouri River Downstream Flow Support Support for 2010 Navigation Season*

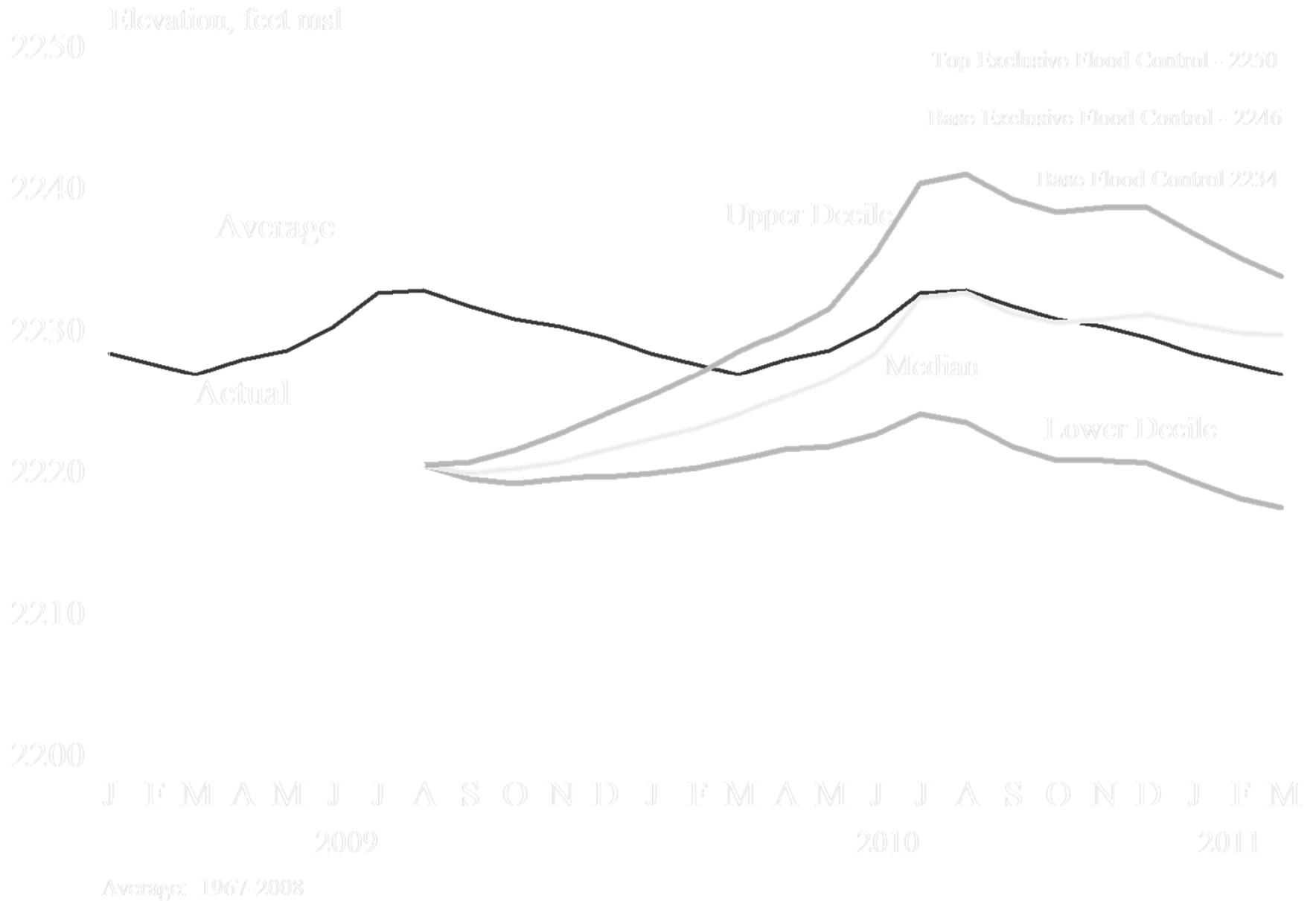
Runoff Scenario	Annual Runoff Volume (MAF)	July 1 System Storage (MAF)	Flow Level Above or Below Full Service (in cfs)		Length of Shortening (Days)
			Spring	Fall	
Upper Decile	34.3	63.1	0	0	0
Median	24.4	58.6	0	0	0
Lower Decile	16.2	52.9	-2000	-3800	0

# *Missouri River Spring Pulses*

Runoff Scenario	Annual Runoff Volume (MAF)	March 1 System Storage (MAF)	March Spring Pulse (kcfs)	May 1 System Storage (MAF)	May Spring Pulse (kcfs)
Upper Decile	34.3	55.6	+5	58.6	+0
Upper Quartile	30.3	55.6	+5	58.6	+20
Median	24.4	53.8	+5	55.6	+16
Lower Quartile	19.3	52.1	+5	52.7	+11.6
Lower Decile	16.2	52.1	+5	52.3	+11.5

# Fort Peck

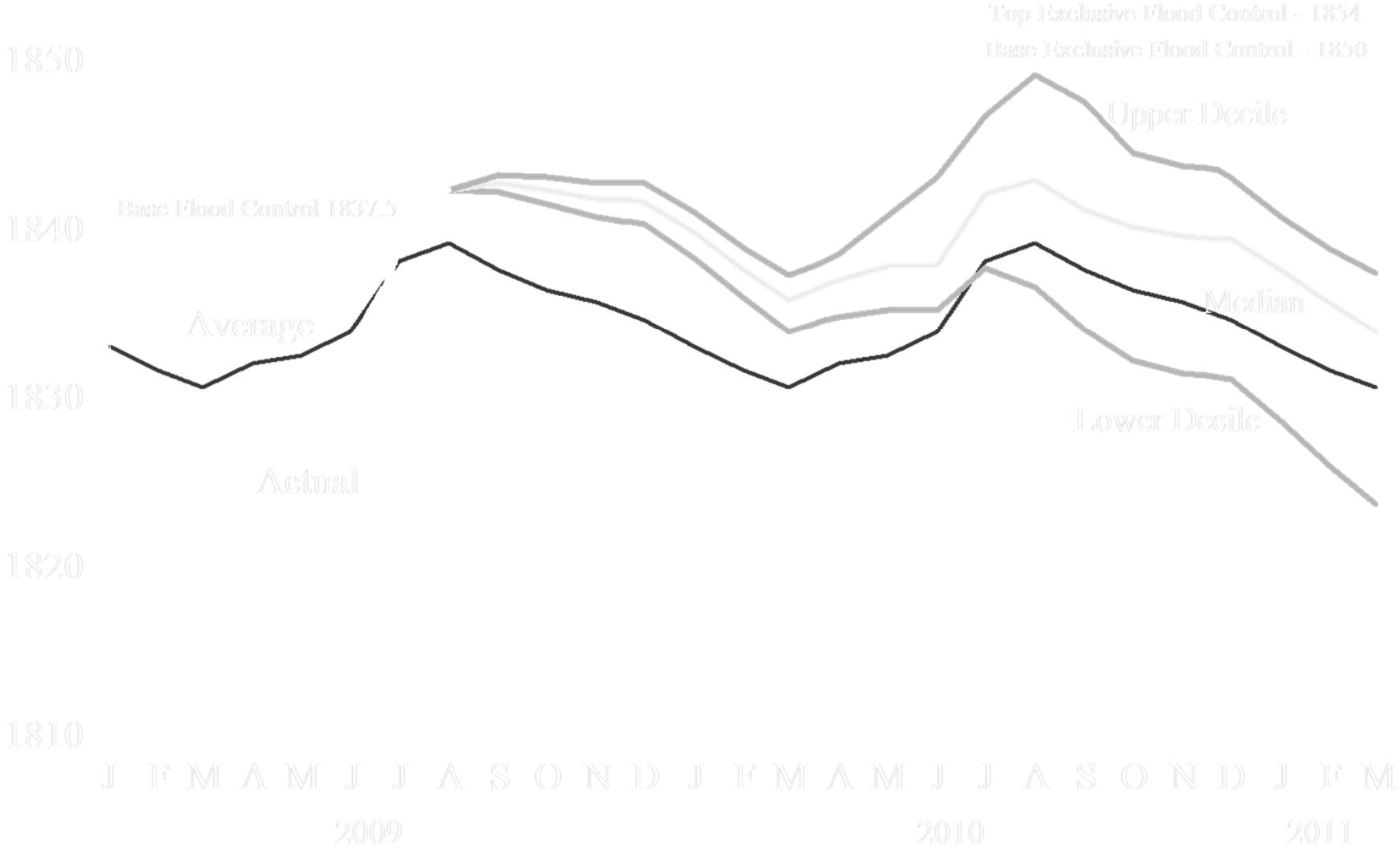
## 2009-2010 Preliminary Draft AOP Simulations



# Garrison

## 2009-2010 Preliminary Draft AOP Simulations

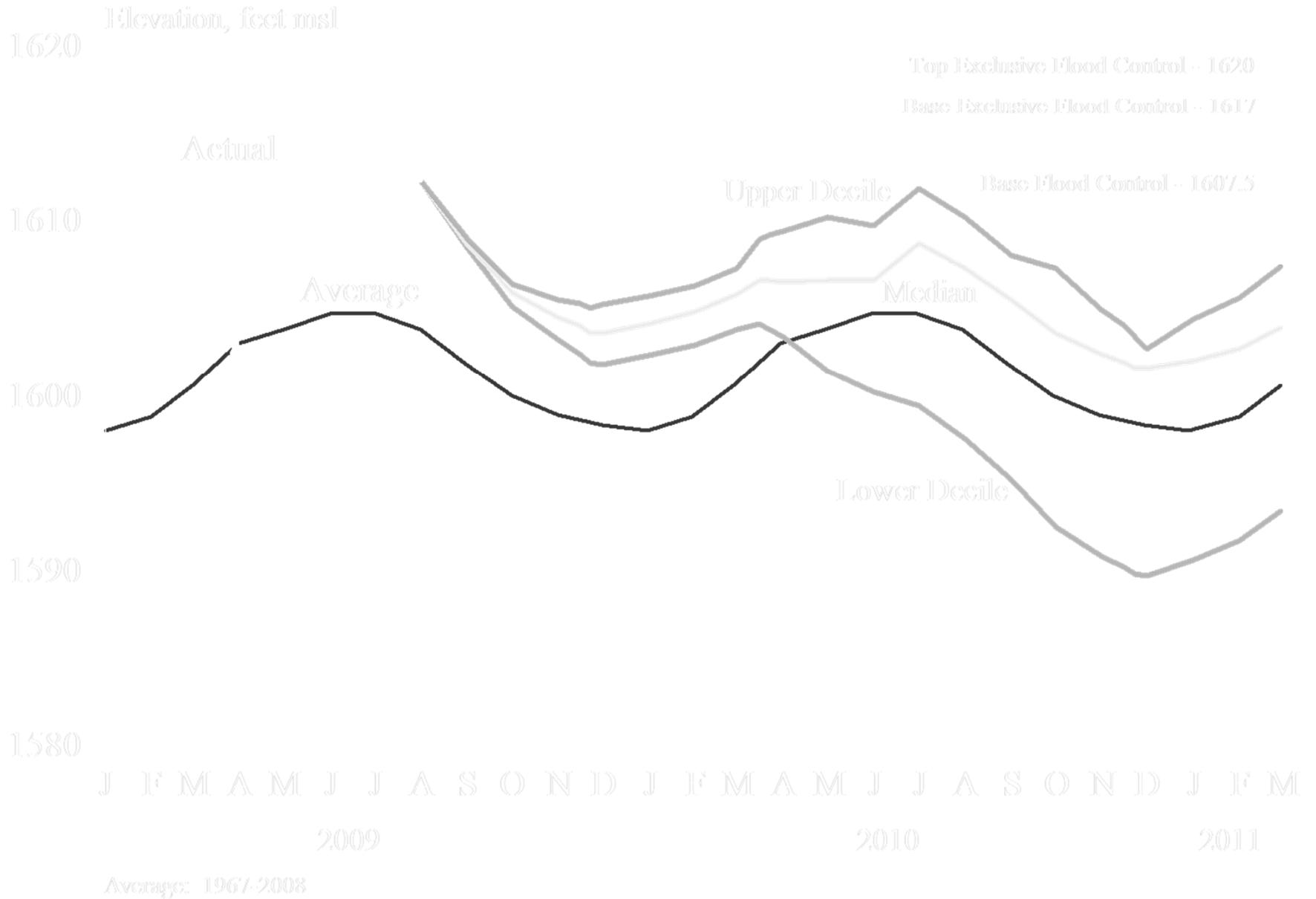
Elevation, feet msl



Average: 1967-2008

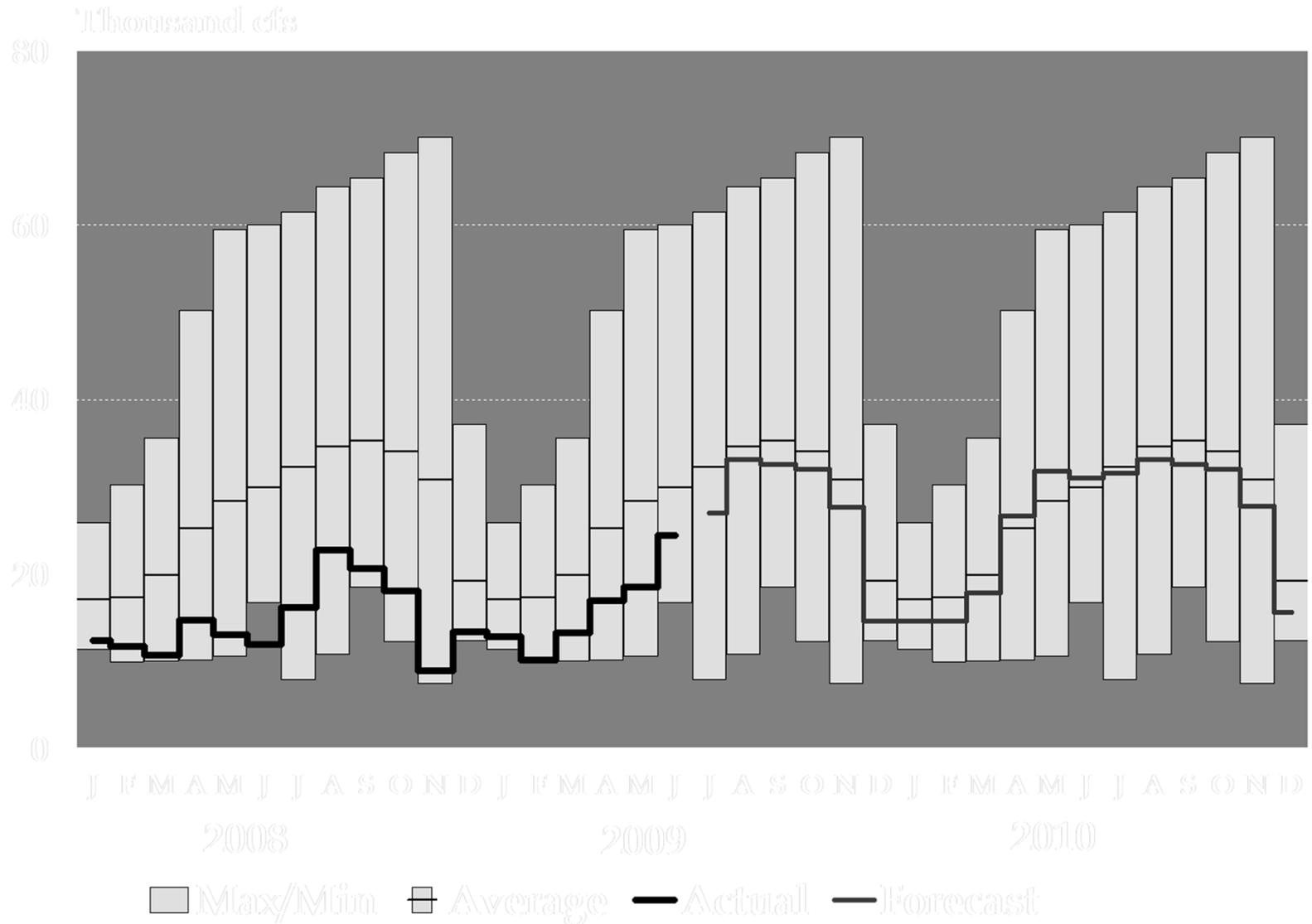
# Oahe

## 2009-2010 Preliminary Draft AOP Simulations



# *Gavins Point Monthly Releases*

## *2008 through 2009 & 2009 -2010 AOP Releases*



Max, Min, and Avg 1967-2008