Glen Canyon Dam Adaptive Management Work Group
Agenda Item Information
April 29-30, 2009

Agenda Item

Basin Hydrology and Operations

Action Requested

√ Information item only; we will answer questions but no action is requested.

Presenters

Rick Clayton, Glen Canyon Dam Hydraulic Engineer, Water Resources Group, Upper Colorado Region, Bureau of Reclamation

Previous Action Taken

√ N/A

Relevant Science

√ N/A

Background Information

The presentation is intended to provide pertinent information to AMWG members on the hydrology of the Upper Colorado River Basin and projected reservoir operations at Lake Powell/Glen Canyon Dam. Such information is provided to assist the AMWG in developing recommendations to the Secretary on the operation of Glen Canyon Dam, particularly when such recommendations are near-term in nature.

The presentation will cover current reservoir storage conditions in the Upper Colorado River Basin and drought status. The presentation will also cover the implementation of the *Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations of Lake Powell and Lake Mead* and equalization releases from Lake Powell in water year 2009.

RECLAMATION

Managing Water in the West

Upper Basin Hydrology and Operations 2009-2010

Adaptive Management Work Group
April 29-30, 2009

U.S. Department of the Interior
Bureau of Reclamation

Lowest Consecutive Years of Natural Flow Lees Ferry, Arizona (average is 15.0 maf)

1906-2009**

Consecutive Years	Driest Period (Natural flow)
12	1953-1964 (12.18 maf)
11	1954-1964 (12.27 maf)
10	2000-2009 (11.98 maf)*
9	1999-2007 (11.75 maf)*
8	2000-2007 (11.14 maf)*

*2007 and 2008 are provisional estimates of Natural Flow

**2009 preliminary provisional estimates of Natural Flow

RECLAMATION

Lowest Consecutive Years of Natural Flow Lees Ferry, Arizona (average is 15.0 maf)

1906-2009**

Consecutive Years	Driest Period (Natural flow)
12	1953-1964 (12.18 maf)
11	1954-1964 (12.27 maf)
12	
11	
10	2000-2009 (11.98 maf)*
9	1999-2007 (11.75 maf)*
8	2000-2007 (11.14 maf)*

*2007 and 2008 are provisional estimates of Natural Flow

**2009 is preliminary provisional estimates of Natural Flow

RECLAMATION

Lowest Consecutive Years of Natural Flow Lees Ferry, Arizona (average is 15.0 maf)

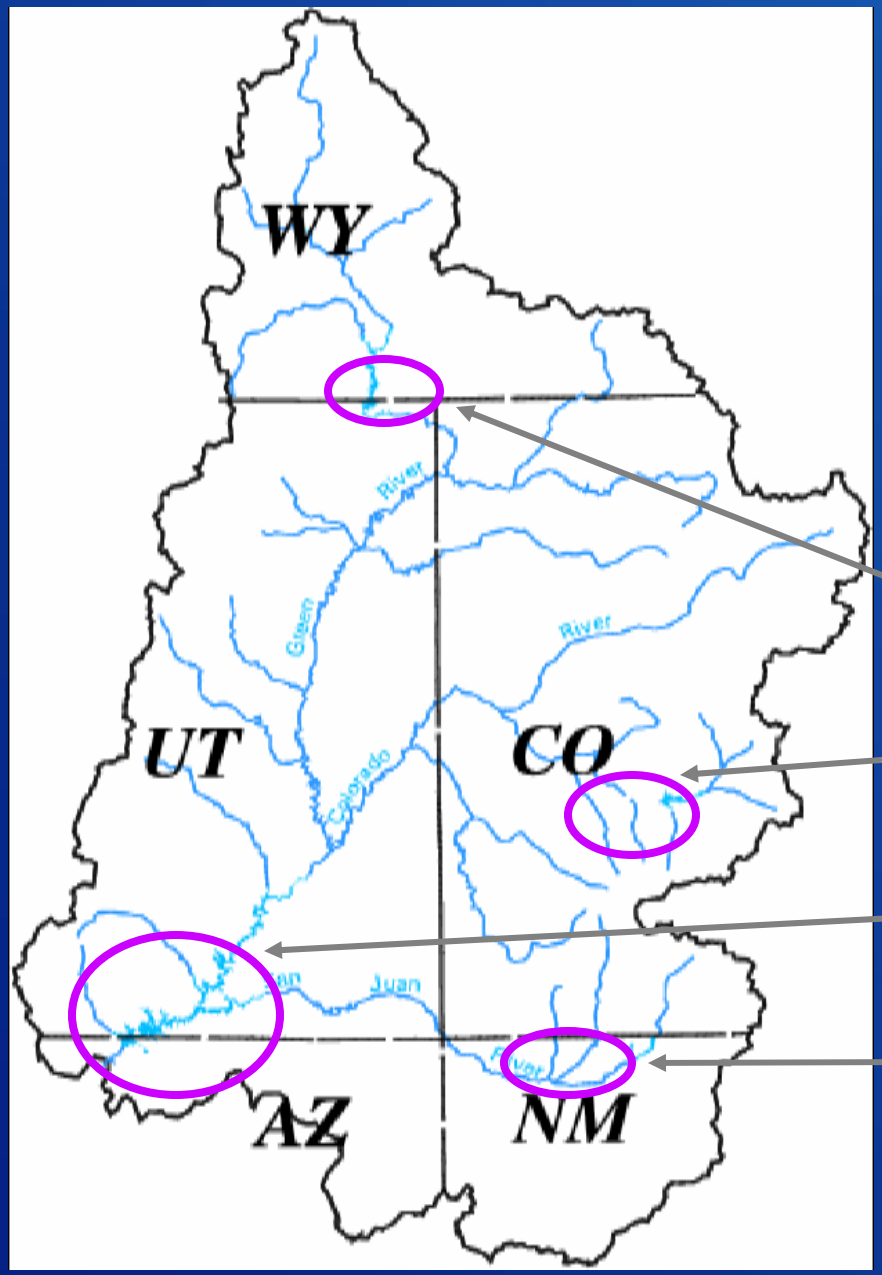
1906-2010**

Consecutive Years	Driest Period (Natural flow)
12	1953-1964 (12.18 maf)
11	1954-1964 (12.27 maf)
12	1999-2010 (12.56 maf)**
11	2000-2010 (12.22 maf)**
10	2000-2009 (11.98 maf)*
9	1999-2007 (11.75 maf)*
8	2000-2007 (11.14 maf)*

*2007 and 2008 are provisional estimates of Natural Flow

**2009 and 2010 are preliminary provisional estimates of Natural Flow

RECLAMATION



Projected CRSP Storage

April 1, 2009 Conditions

Percentage of Live Capacity

September 30, 2009 Conditions

Based on April 2009

24-Month Study

Flaming Gorge — 79.6% (2.99 maf)

82.8% (3.11 maf)

Blue Mesa — 65.4% (0.54 maf)

81.9% (0.68 maf)

Lake Powell — 52.5% (12.76 maf)

64.4% (15.67 maf)

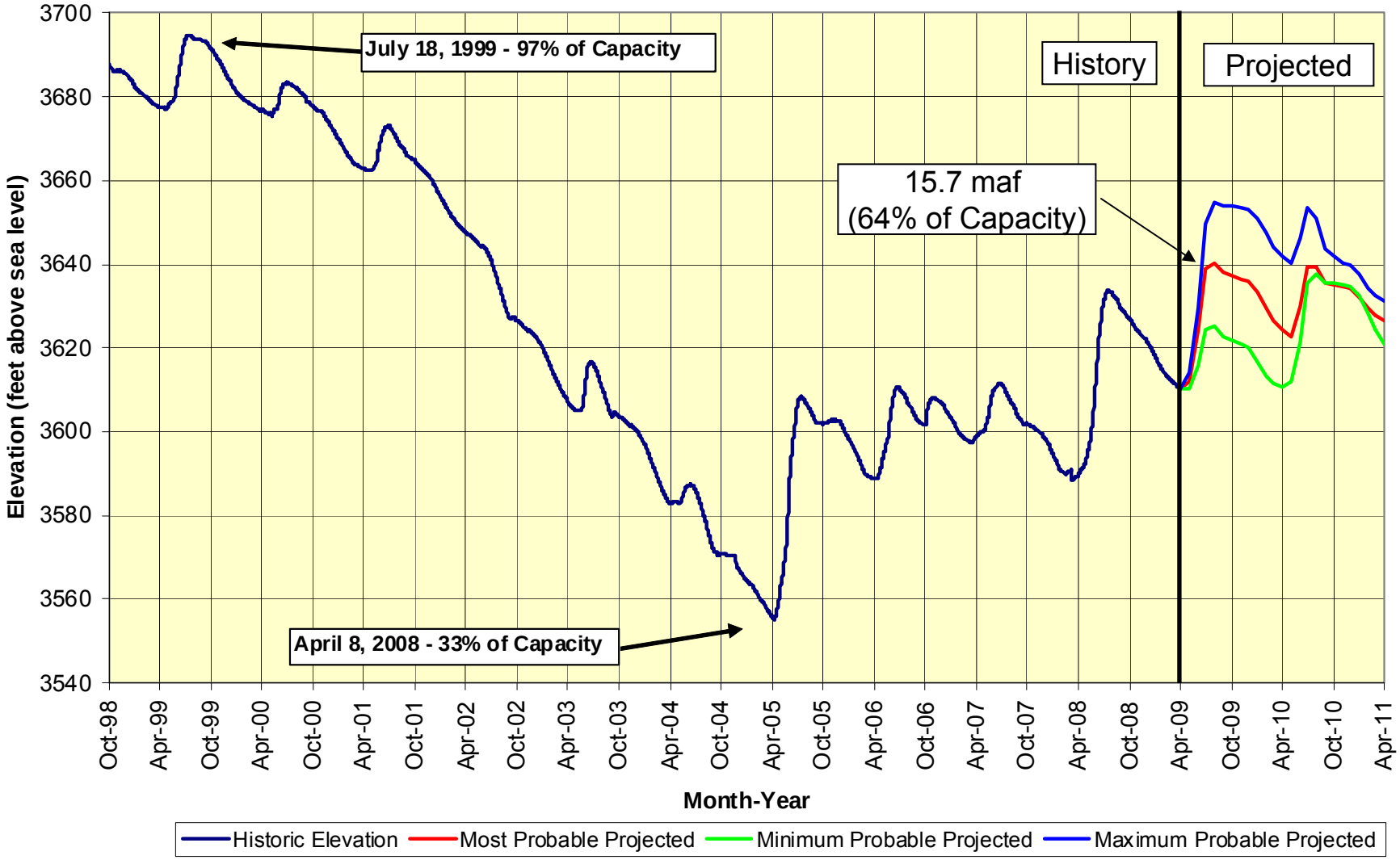
Navajo — 75.6% (1.29 maf)

84.1% (1.43 maf)

RECLAMATION

Lake Powell Water Surface Elevations

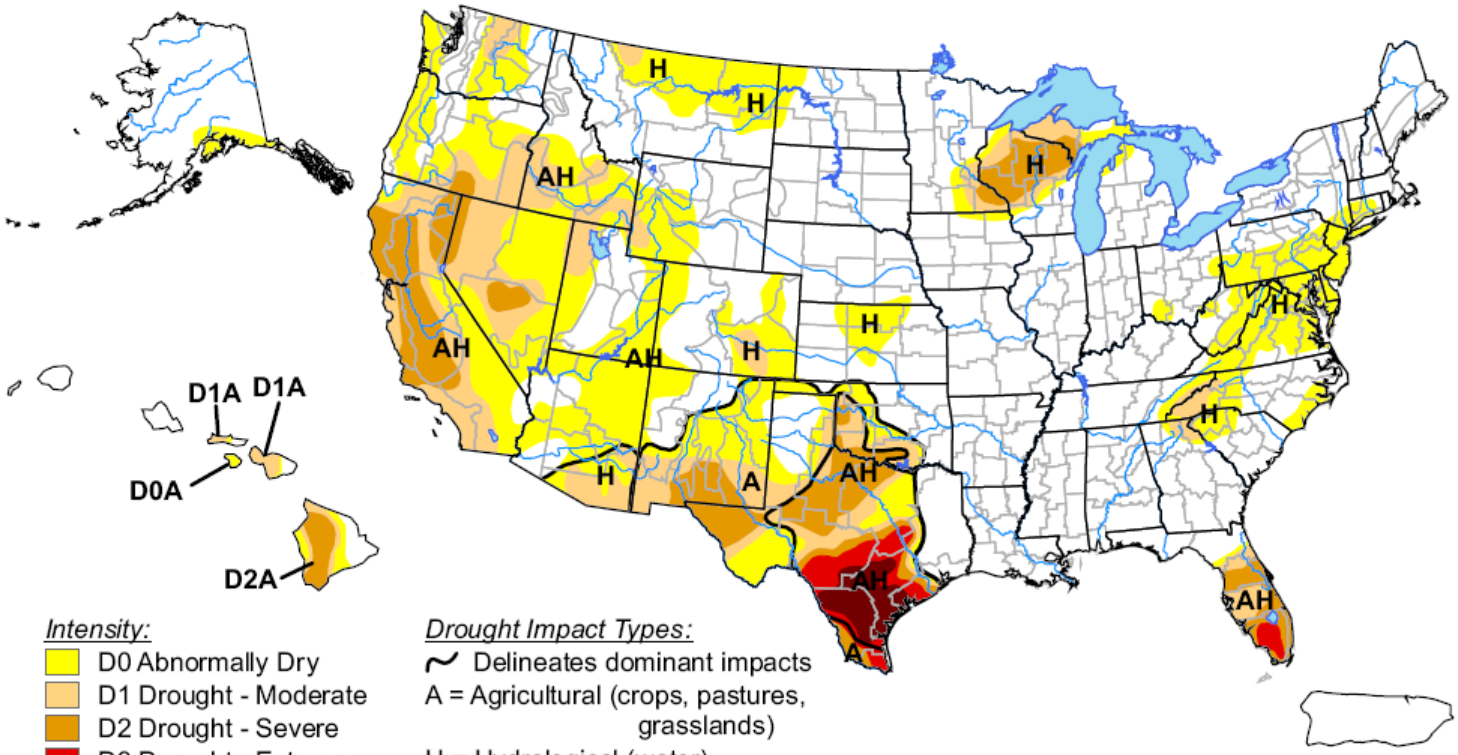
Historical October 1998 through April 1, 2009 (Projections to April 2011)



RECLAMATION

U.S. Drought Monitor

April 21, 2009
Valid 8 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
- A = Agricultural (crops, pastures, grasslands)
- H = Hydrological (water)

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

http://drought.unl.edu/dm

USDA National Drought Mitigation Center

Released Thursday, April 23, 2009

Authors: Richard Heim/Liz Love-Brotak, NOAA/NESDIS/NCDC

RECLAMATION

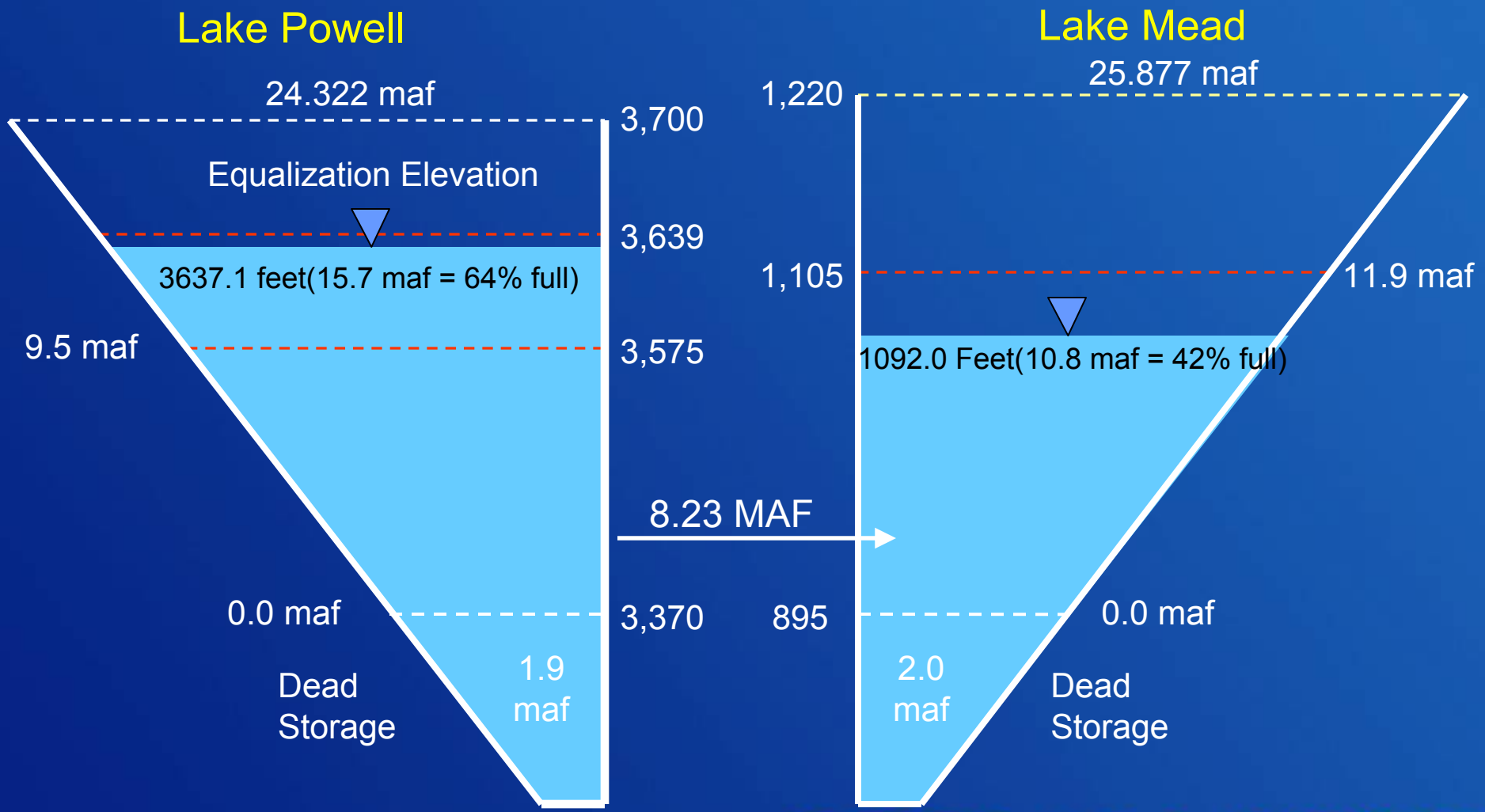
Lake Powell Operational Tiers (subject to April adjustments or mid-year review modifications)		
Lake Powell Elevation (feet)	**Lake Powell Operational Tier**	**Lake Powell Active Storage** (maf)
3,700		**24.32**
	Equalization Tier equalize, avoid spills or release 8.23 maf	
3,636 – 3,666		**15.54 – 19.29**
(see table below)	**Upper Elevation Balancing Tier** release 8.23 maf; if Lake Mead < 1,075 feet, balance contents with a min/max release of 7.0 and 9.0 maf	(2008 – 2026)
3,575		**9.52**
	Mid-Elevation Release Tier release 7.48 maf; if Lake Mead < 1,025 feet, release 8.23 maf	
3,525		**5.93**
	Lower Elevation Balancing Tier balance contents with a min/max release of 7.0 and 9.5 maf	
3,370		**0**

Coordinated Operations of Lake Powell and Lake Mead
Upper Elevation Balancing Tier

- If Lake Powell is projected to reach the Equalization Elevation in the April 24-Month Study at the end of the water year, the Equalization Tier shall govern operations of Lake Powell for the remainder of the water year.

Published April 2009 Projection for September 30, 2009

Projected Unregulated Inflow WY 2009 =10.4 MAF
(85% Average)*



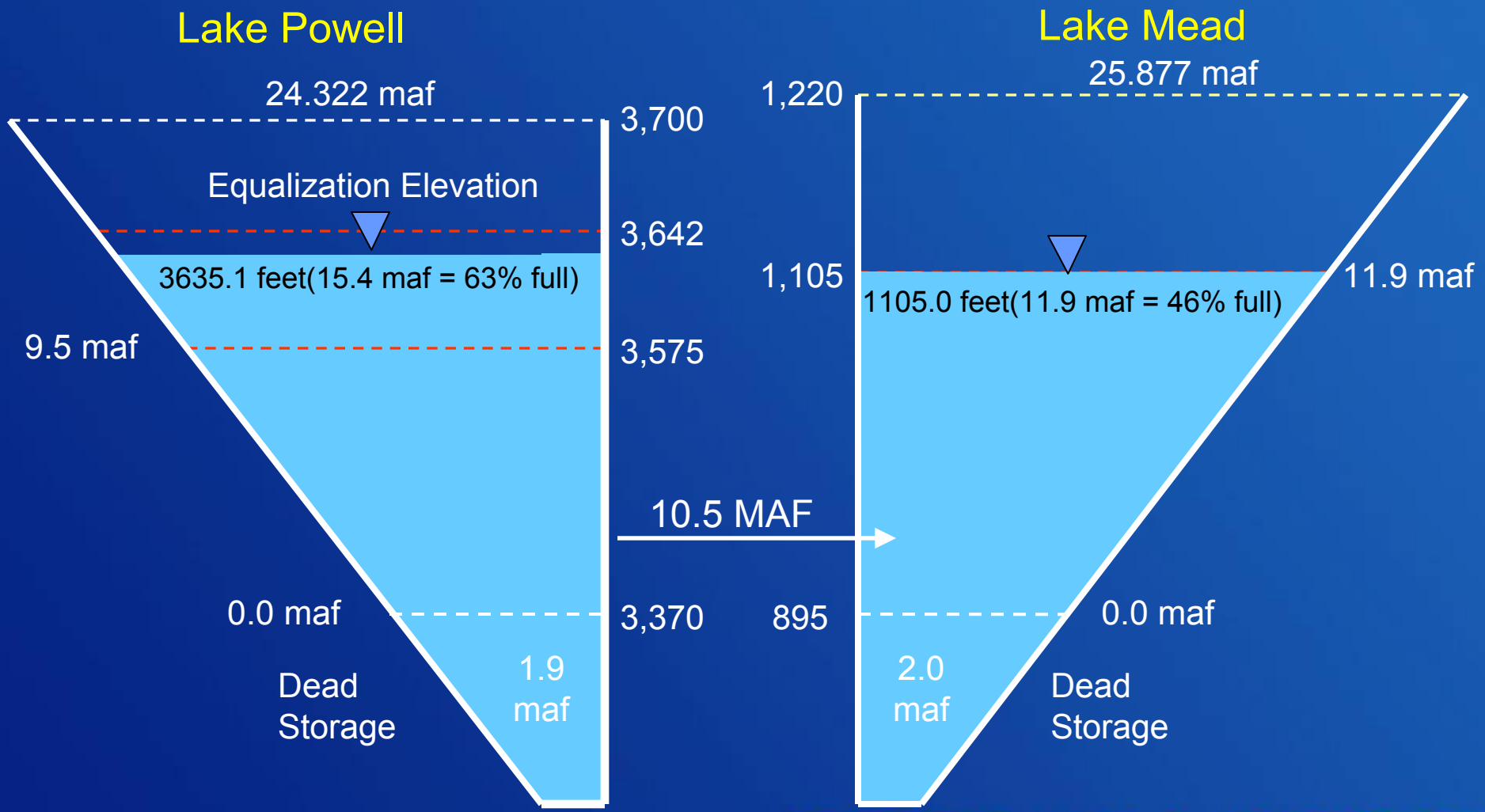
Not to Scale

*Average based on 30 year period 1971-2000

RECLAMATION

Published April 2009 Projection for September 30, 2010

Projected Unregulated Inflow WY 2010 =11.1 MAF
(92% Average)*

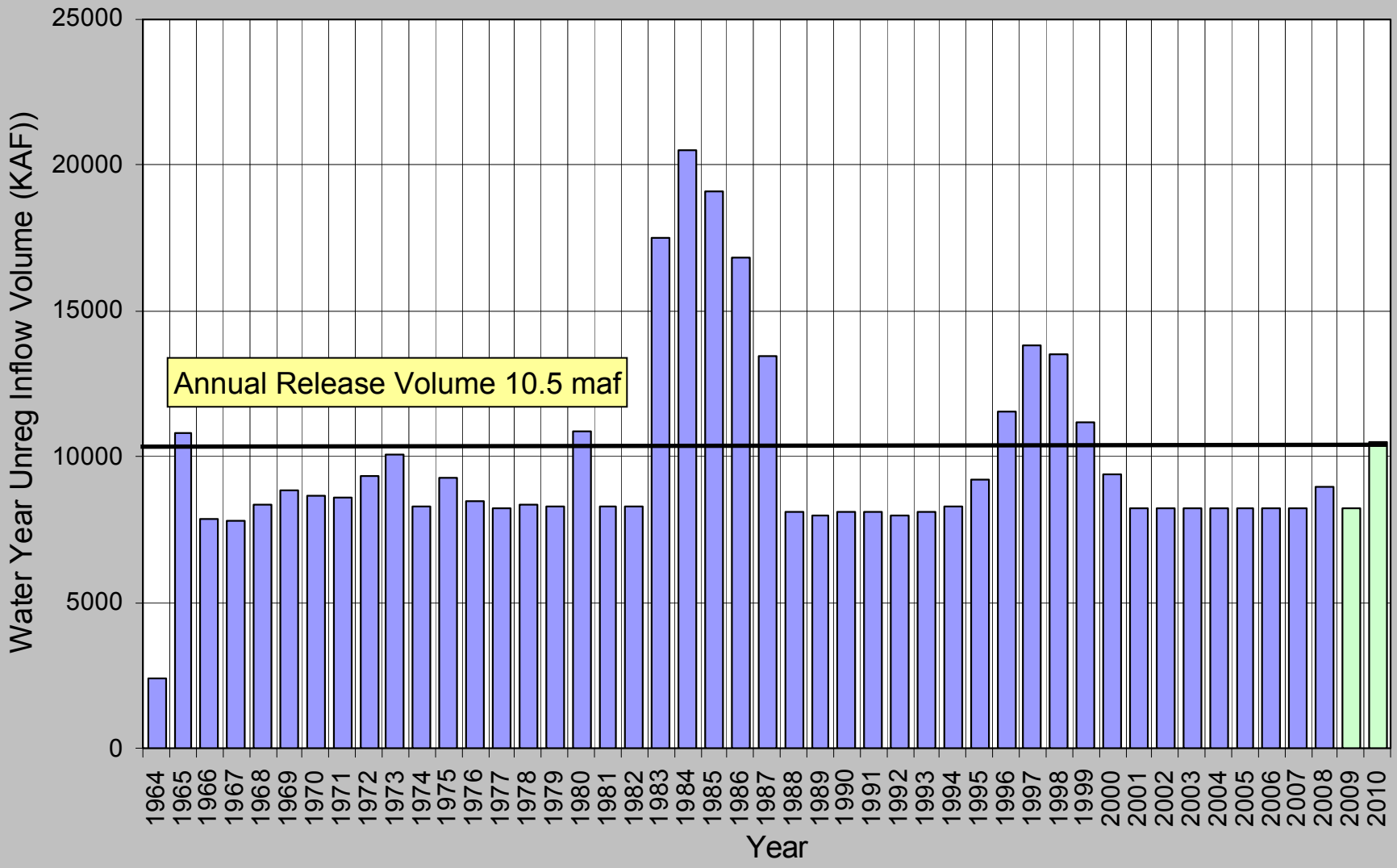


Not to Scale

*Average based on 30 year period 1971-2000

RECLAMATION

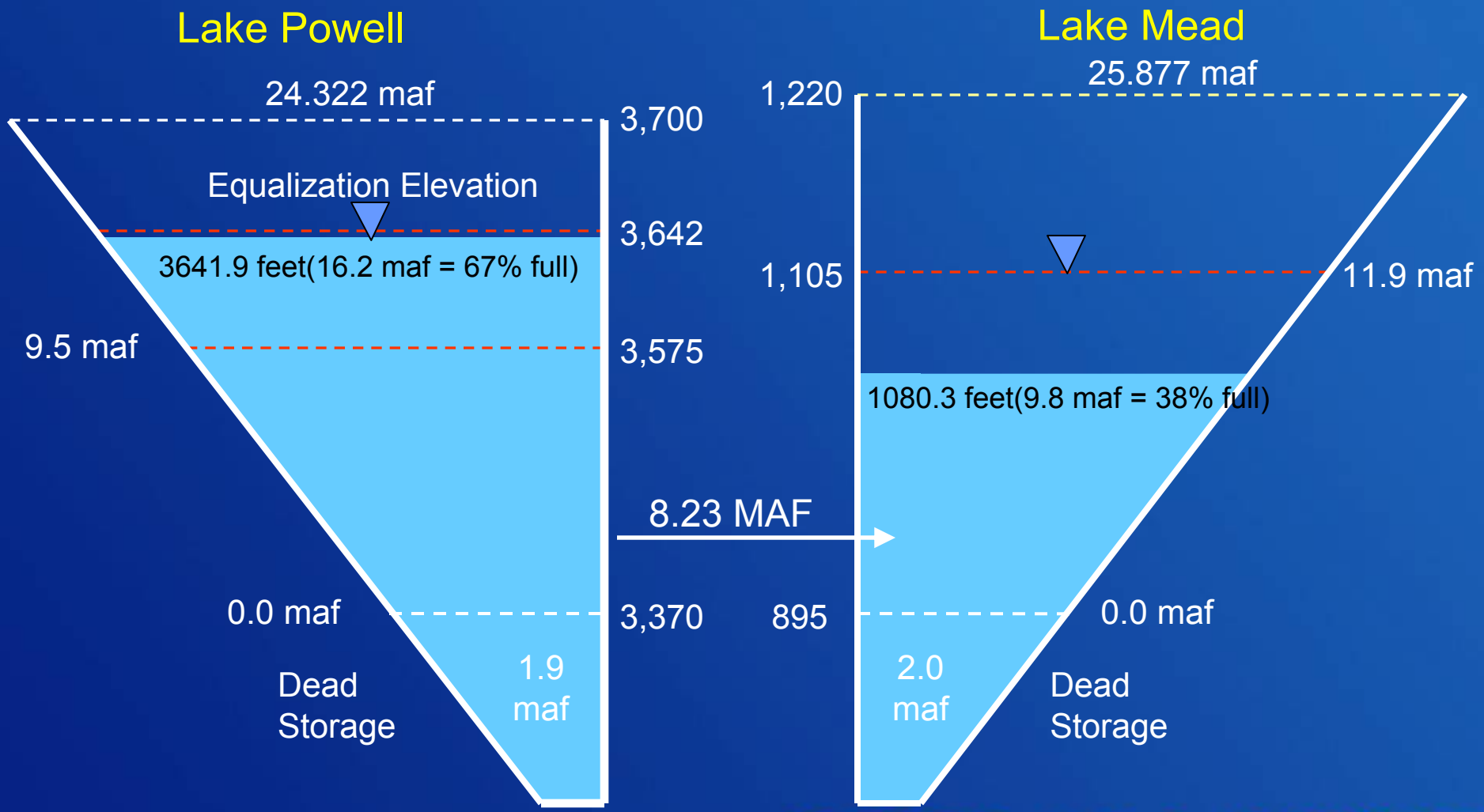
Lake Powell Water Year Release Volumes
1964 to 2008



RECLAMATION

What If Scenario

Projected Unregulated Inflow WY 2010 =9.7 MAF
(~80% Average)*

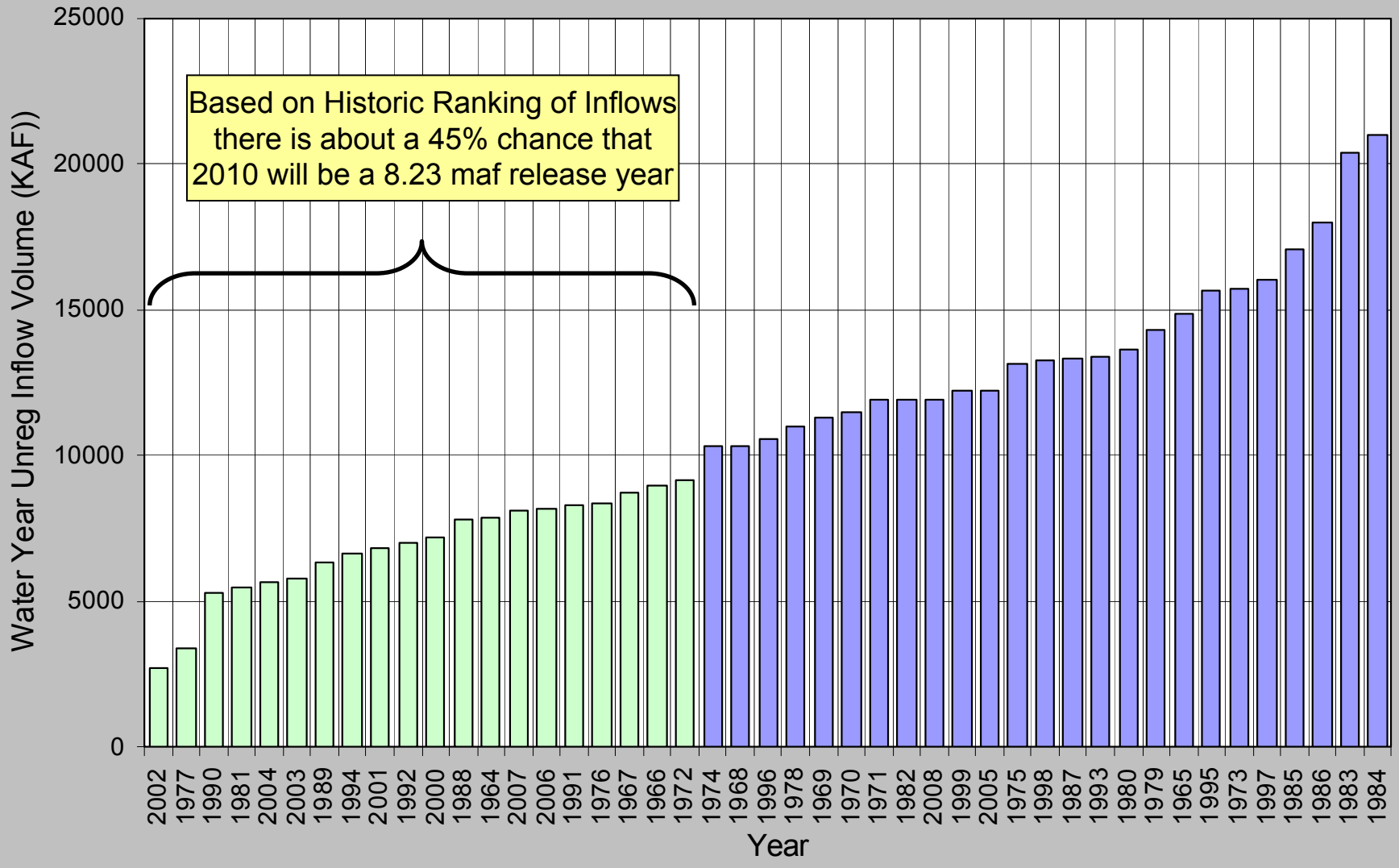


Not to Scale

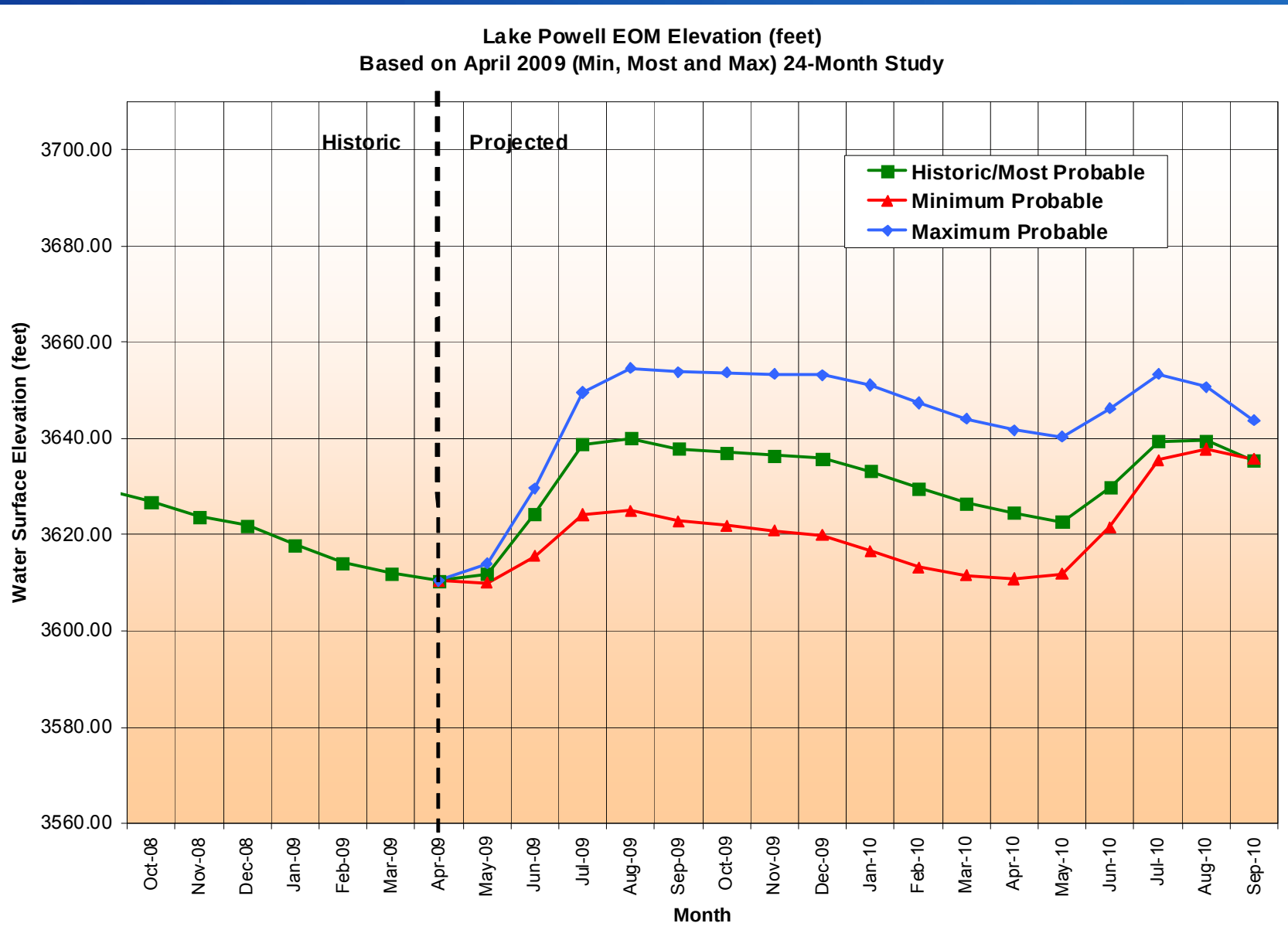
*Average based on 30 year period 1971-2000

RECLAMATION

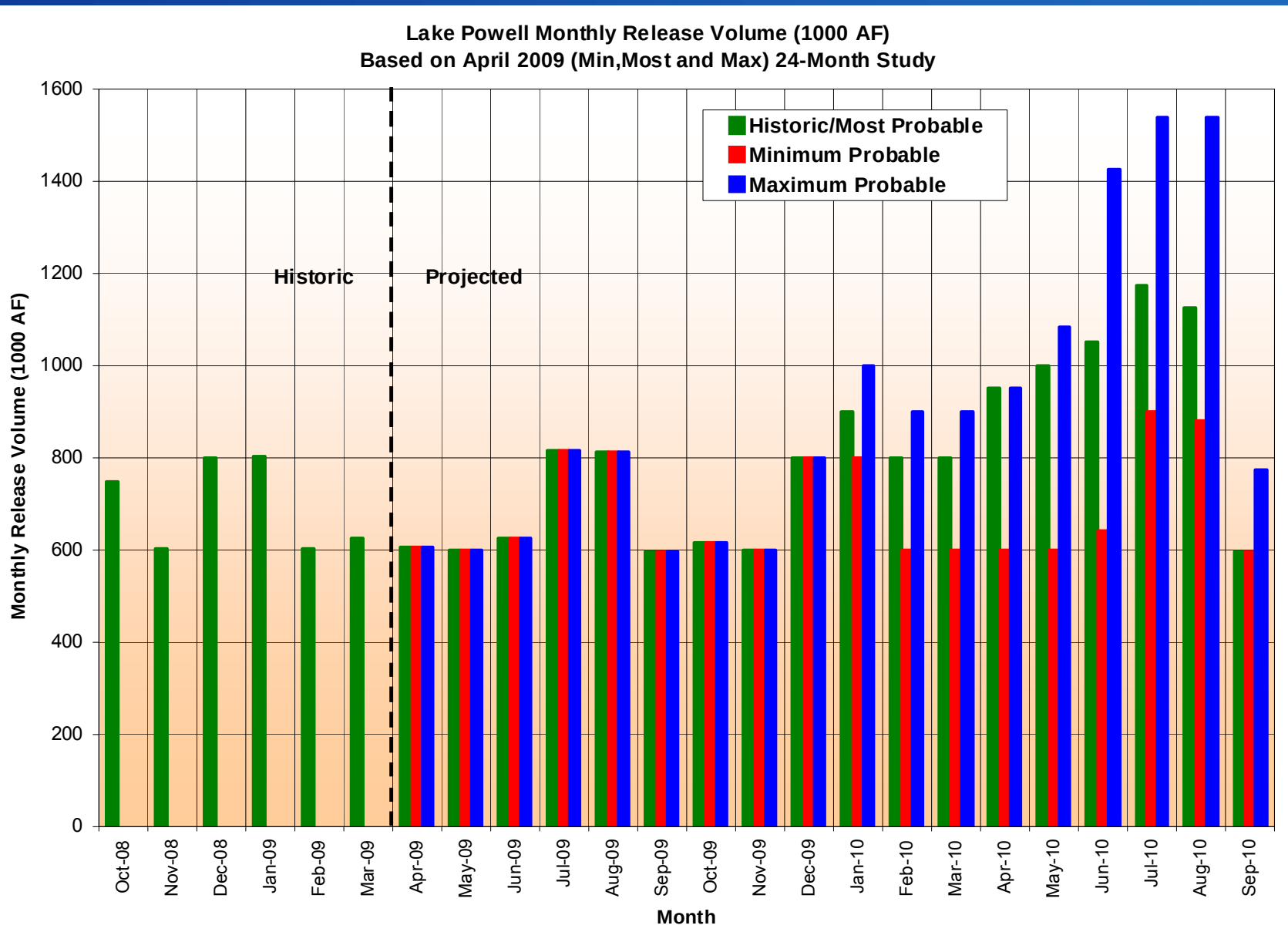
Lake Powell Water YearUnregulated Inflow Volume Ranking
1964 to 2008



RECLAMATION

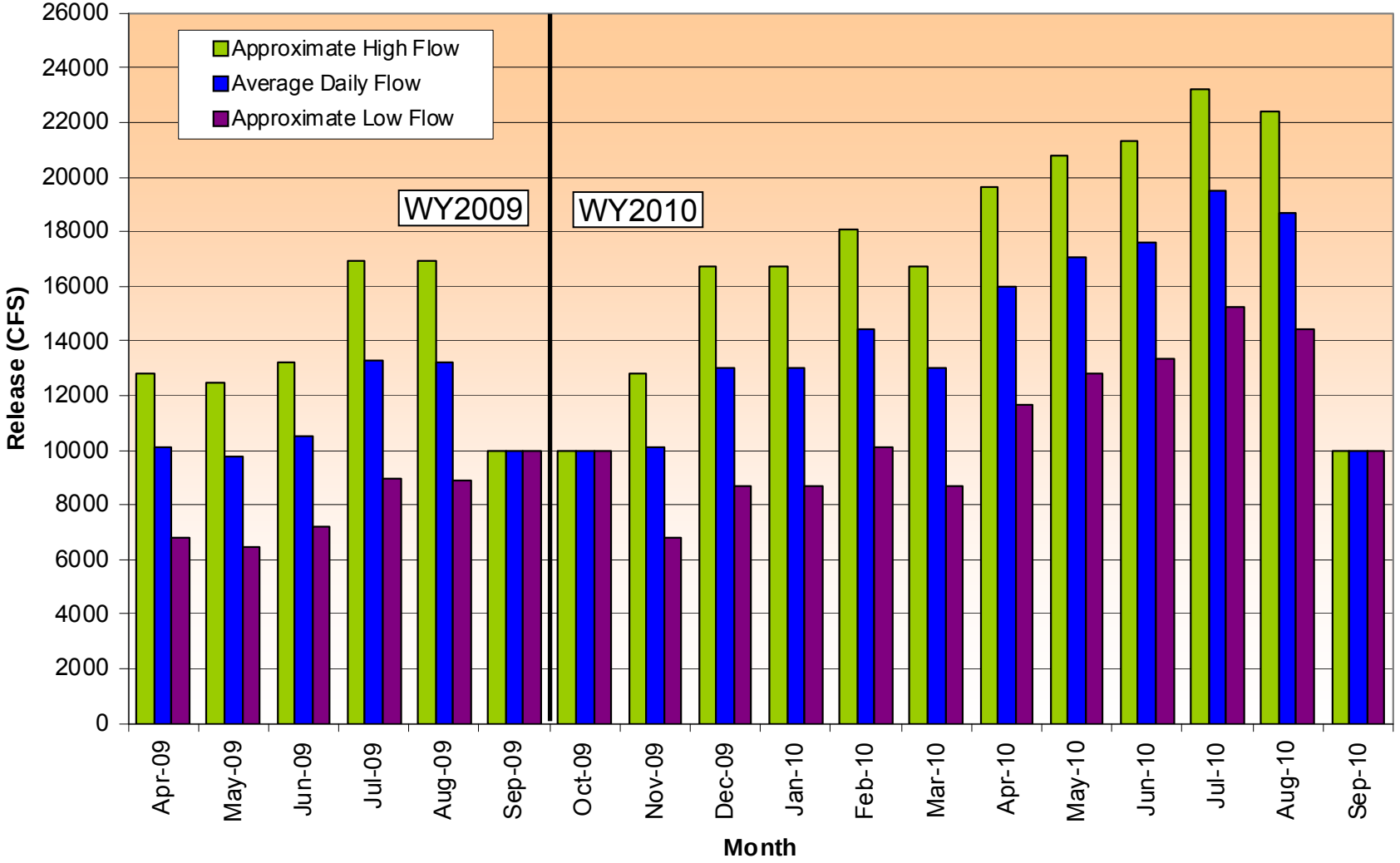


RECLAMATION



RECLAMATION

WY 2009/2010 Lake Powell Releases (CFS) under Most Probable Conditions



RECLAMATION

Rick Clayton
rclayton@usbr.gov
(801)524-3710

Questions?

RECLAMATION