RECLAMATION

Managing Water in the West

2016 Colorado River Annual Operating Plan

Colorado River Management Work Group
Second Consultation
July 28, 2015

U.S. Department of the Interior
Bureau of Reclamation

2016 Colorado River AOP
Second Consultation Meeting

- Welcome and Introductions – *Steve Hvinden / Chris Cutler*
- Upper Basin Hydrology and Operations – *Katrina Grantz*
- Lower Basin Hydrology and Operations – *Noe Santos*
- Progress in Implementing California's Colorado River Water Use Plan – *Tanya Trujillo*
- 2016 AOP Review Process – *Steve Hvinden / Chris Cutler*
- Review of Draft 2016 AOP – CRMWG
- Conclusion, Wrap-up, Future Meeting Dates

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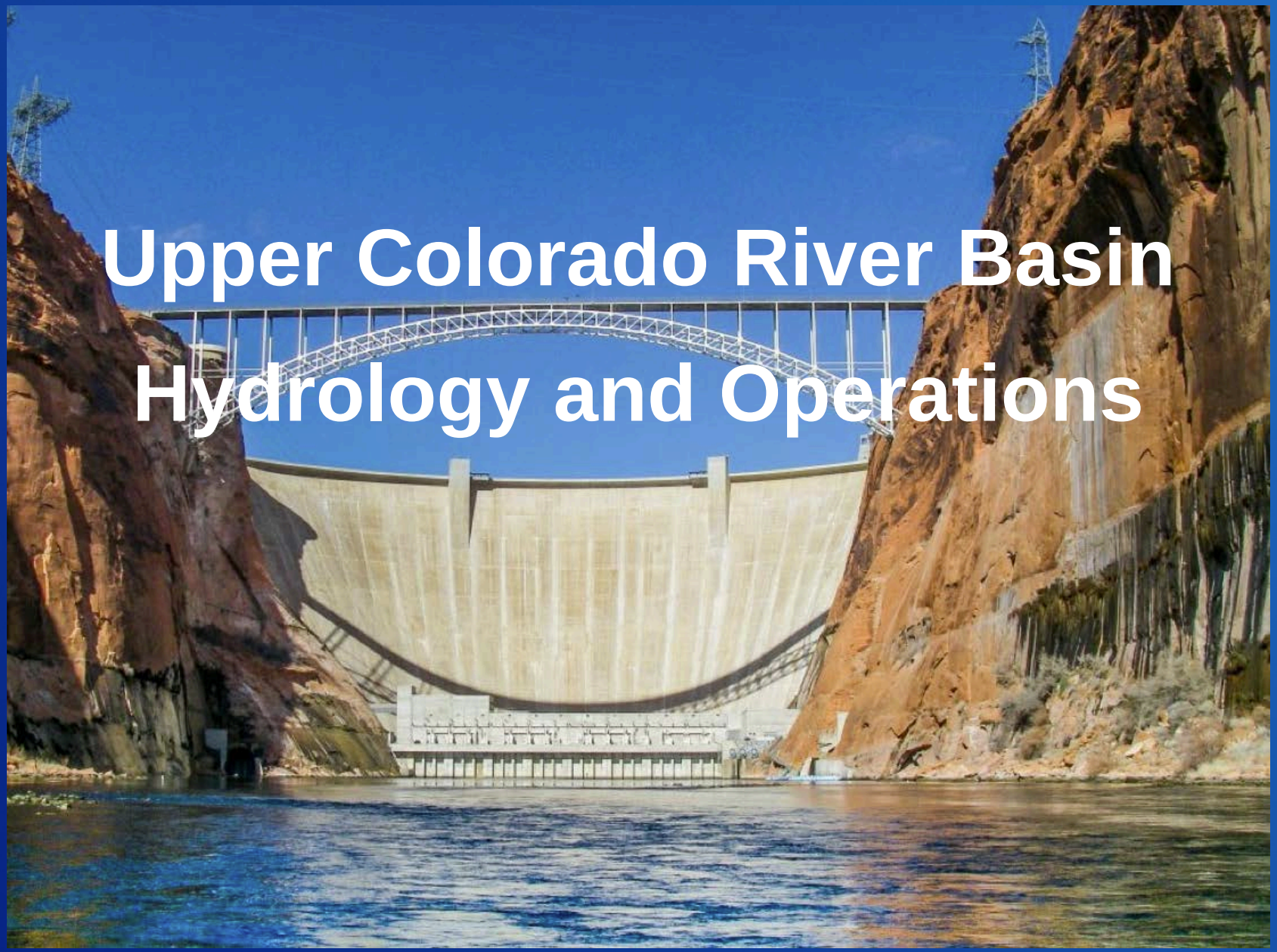

Upper Colorado River Basin Hydrology and Operations

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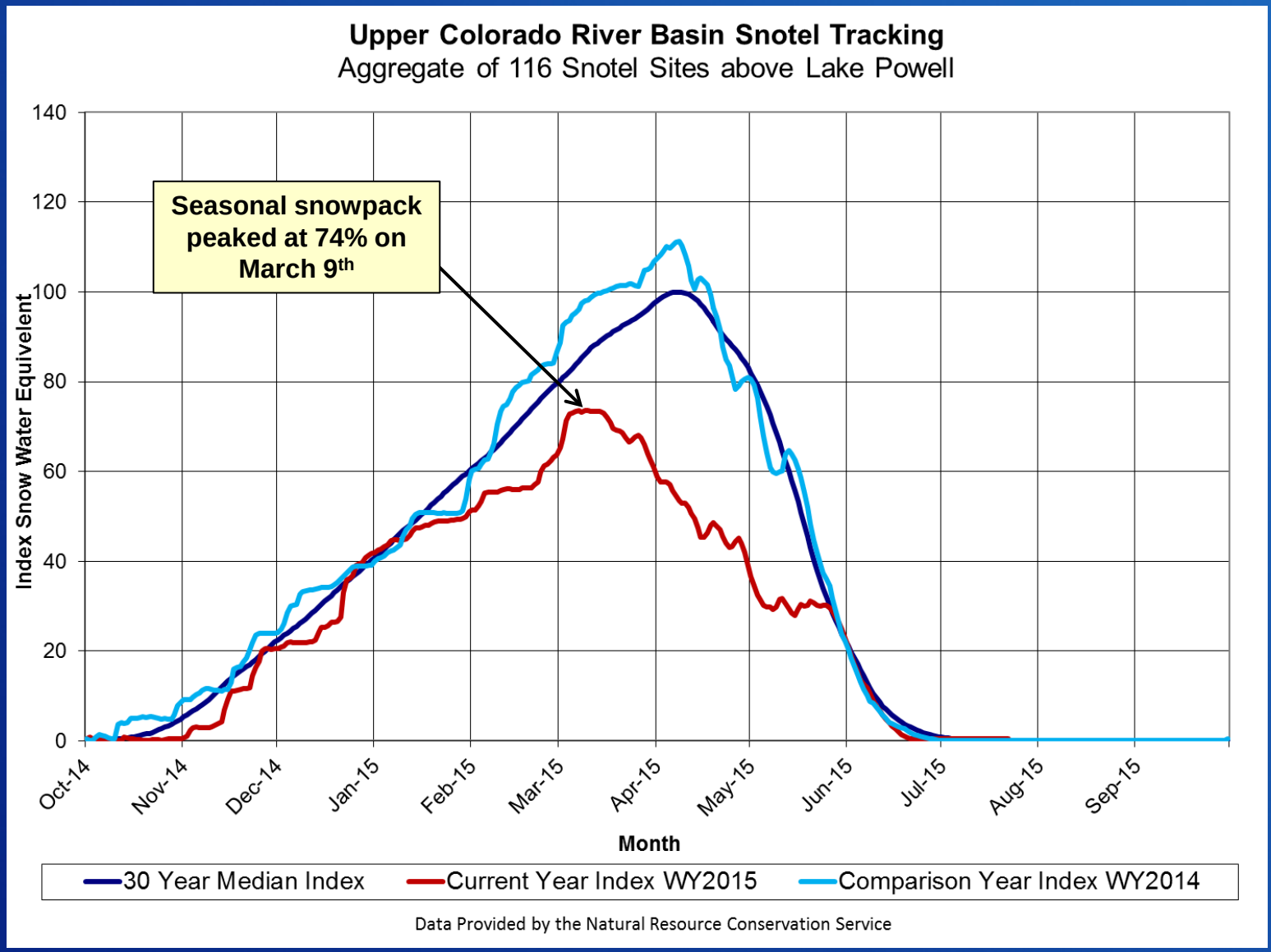
Snow Conditions



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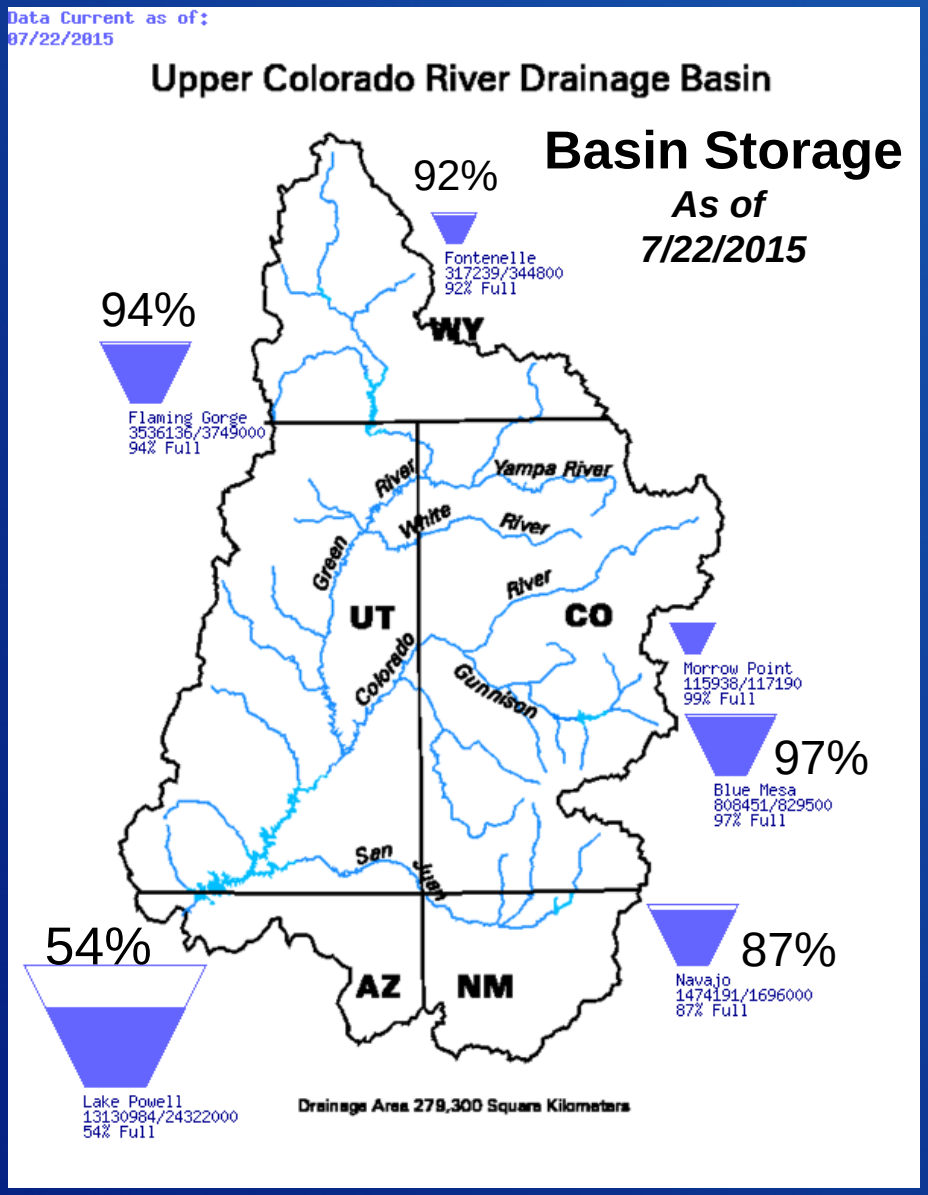
Upper Basin Storage



http://www.usbr.gov/uc/water/basin/tc_cr.html

April to July 2015 Forecasted Inflow

Issued July 1, 2015

Reservoir	A-J Forecast (KAF)	Percent of Average[1]
Fontenelle	730	101%
Flaming Gorge	990	101%
Blue Mesa	700	104%
Navajo	600	82%
Powell	6,290	88%

[1] percent of average based on period 1981-2010.

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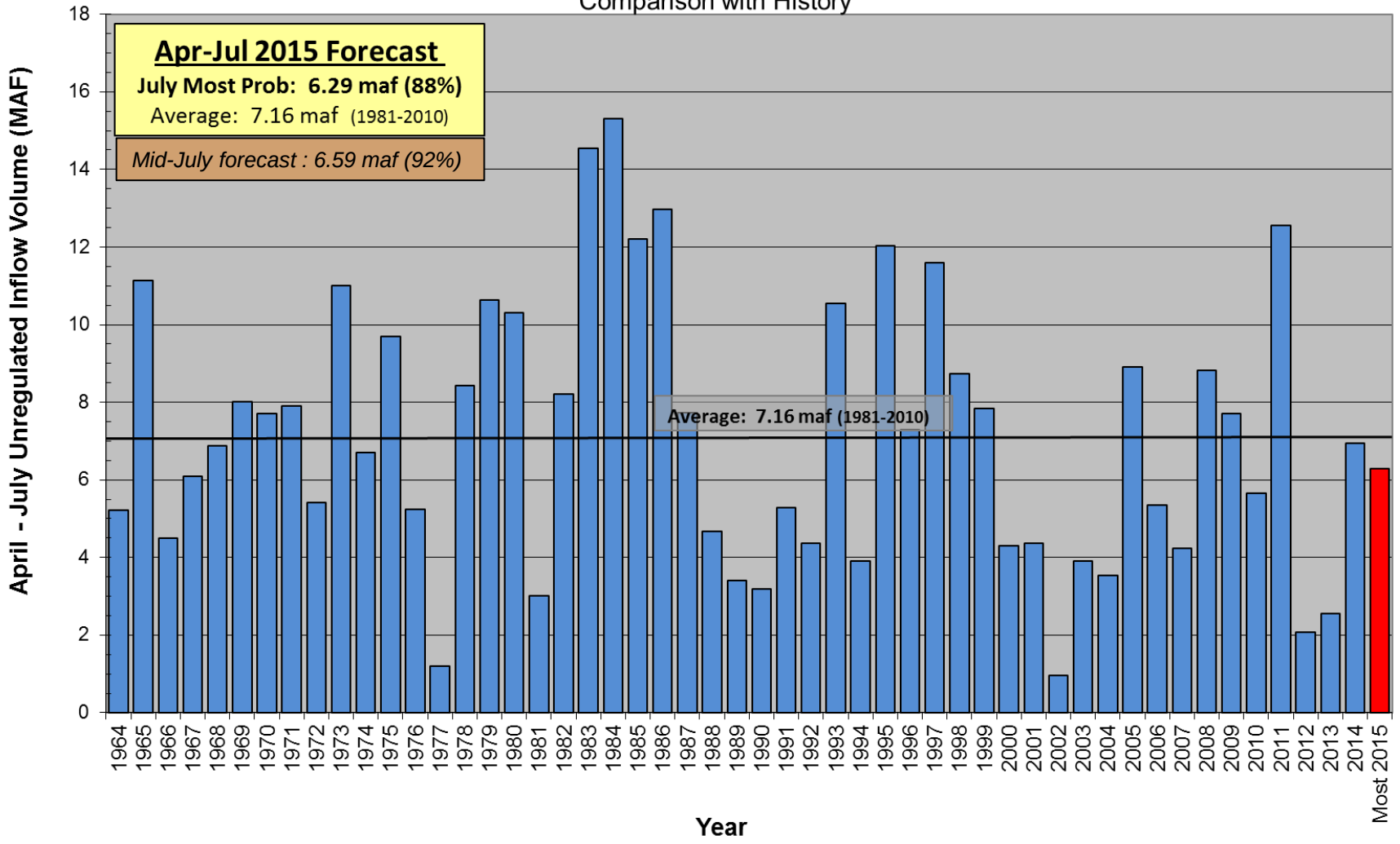
Lake Powell Unregulated Inflow
April - July 2015 Forecast
Issued July 1
Comparison with History



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Projected Operations
Water Years 2015 and 2016

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Lake Powell & Lake Mead Operational Table

Operational Tiers for Water Year/Calendar Year 2015

Lake Powell

Elevation (feet)	Operation According to the Interim Guidelines	Live Storage (maf)[1]
3,700	**Equalization Tier** Equalize, avoid spills or release 8.23 maf	24.3
3,636 - 3,666 (2008-2026)	**Upper Elevation Balancing Tier**[3] Release 8.23 maf; if Lake Mead < 1,075 feet, balance contents with a min/max release of 7.0 and 9.0 maf	15.5 - 19.3 (2008-2026)
3,575	**Mid-Elevation Release Tier** Release 7.48 maf; if Lake Mead < 1,025 feet, release 8.23 maf	9.5
3,525	**Lower Elevation Balancing Tier** Balance contents with a min/max release of 7.0 and 9.5 maf	5.9
3,490		4.0
3,370		0

Lake Mead

Elevation (feet)	Operation According to the Interim Guidelines	Live Storage (maf)[1]
1,220	**Flood Control Surplus or Quantified Surplus Condition** Deliver > 7.5 maf	25.9
1,200 (approx.)[2]	**Domestic Surplus or ICS Surplus Condition** Deliver > 7.5 maf	22.9 (approx.)[2]
1,145	**Normal or ICS Surplus Condition** Deliver ≥ 7.5 maf	15.9
1,105		11.9
1,075	**Shortage Condition** Deliver 7.167[4] maf	9.4
1,050	**Shortage Condition** Deliver 7.083[5] maf	7.5
1,025	**Shortage Condition** Deliver 7.0[6] maf Further measures may be undertaken[7]	5.8
1,000		4.3
895		0

Diagram not to scale

[1] Acronym for million acre-feet

[2] This elevation is shown as approximate as it is determined each year by considering several factors including Lake Powell and Lake Mead storage, projected Upper Basin and Lower Basin demands, and an assumed inflow.

[3] Subject to April adjustments which may result in a release according to the Equalization Tier

[4] Of which 2.48 maf is apportioned to Arizona, 4.4 maf to California, and 0.287 maf to Nevada

[5] Of which 2.40 maf is apportioned to Arizona, 4.4 maf to California, and 0.283 maf to Nevada

[6] Of which 2.32 maf is apportioned to Arizona, 4.4 maf to California, and 0.280 maf to Nevada

[7] Whenever Lake Mead is below elevation 1,025 feet, the Secretary shall consider whether hydrologic conditions together with anticipated deliveries to the Lower Division States and Mexico is likely to cause the elevation at Lake Mead to fall below 1,000 feet. Such consideration, in consultation with the Basin States, may result in the undertaking of further measures, consistent with applicable Federal law.

[1] Lake Powell and Lake Mead operational tier determinations were based on August 2014 24-Month Study projections and documented in the 2015 AOP.

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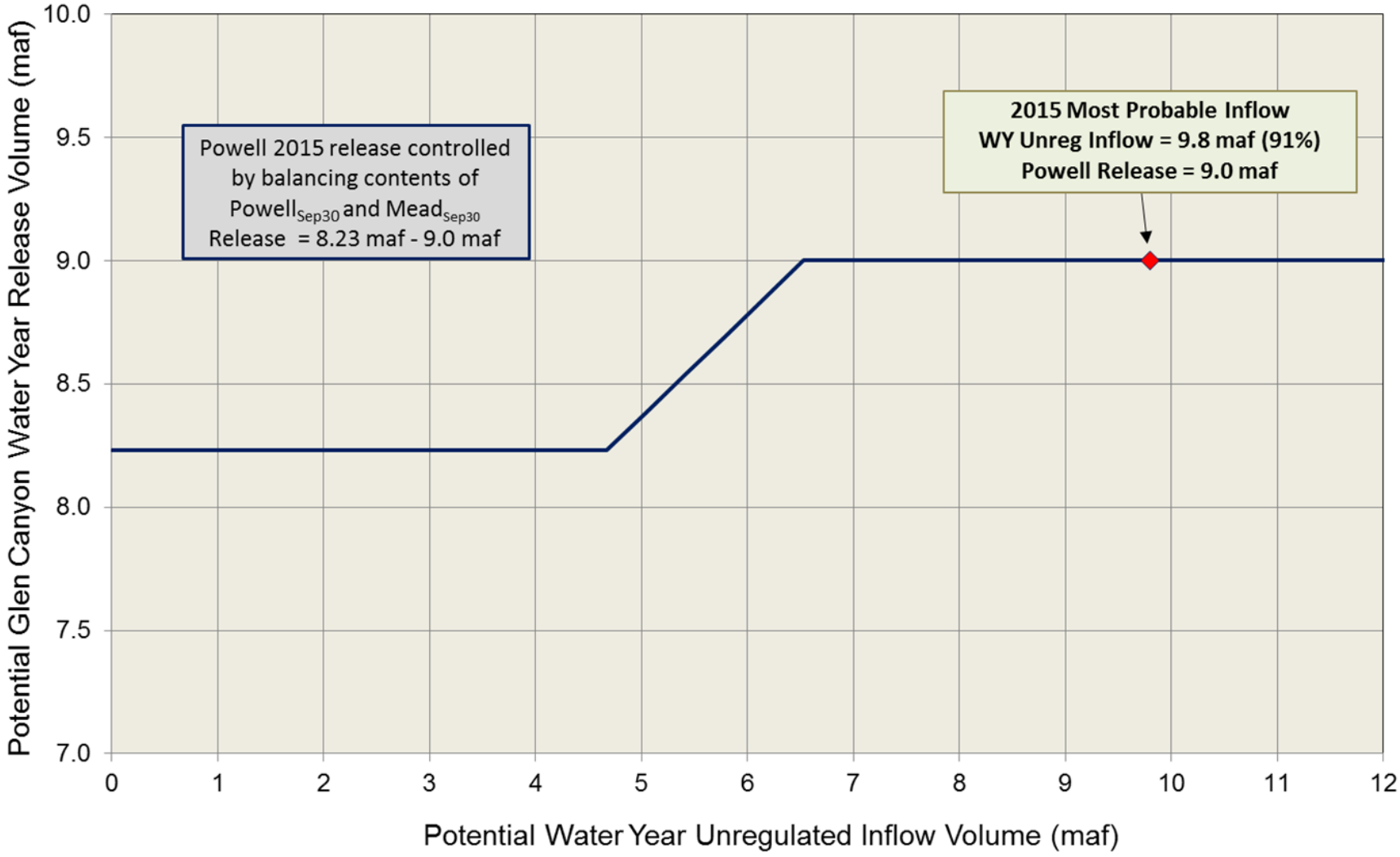
Potential Lake Powell Release Scenarios

Water Year 2015 Release Volume as a Function of Unregulated Inflow Volume
based on July 2015 forecast and 24-Month Study Conditions



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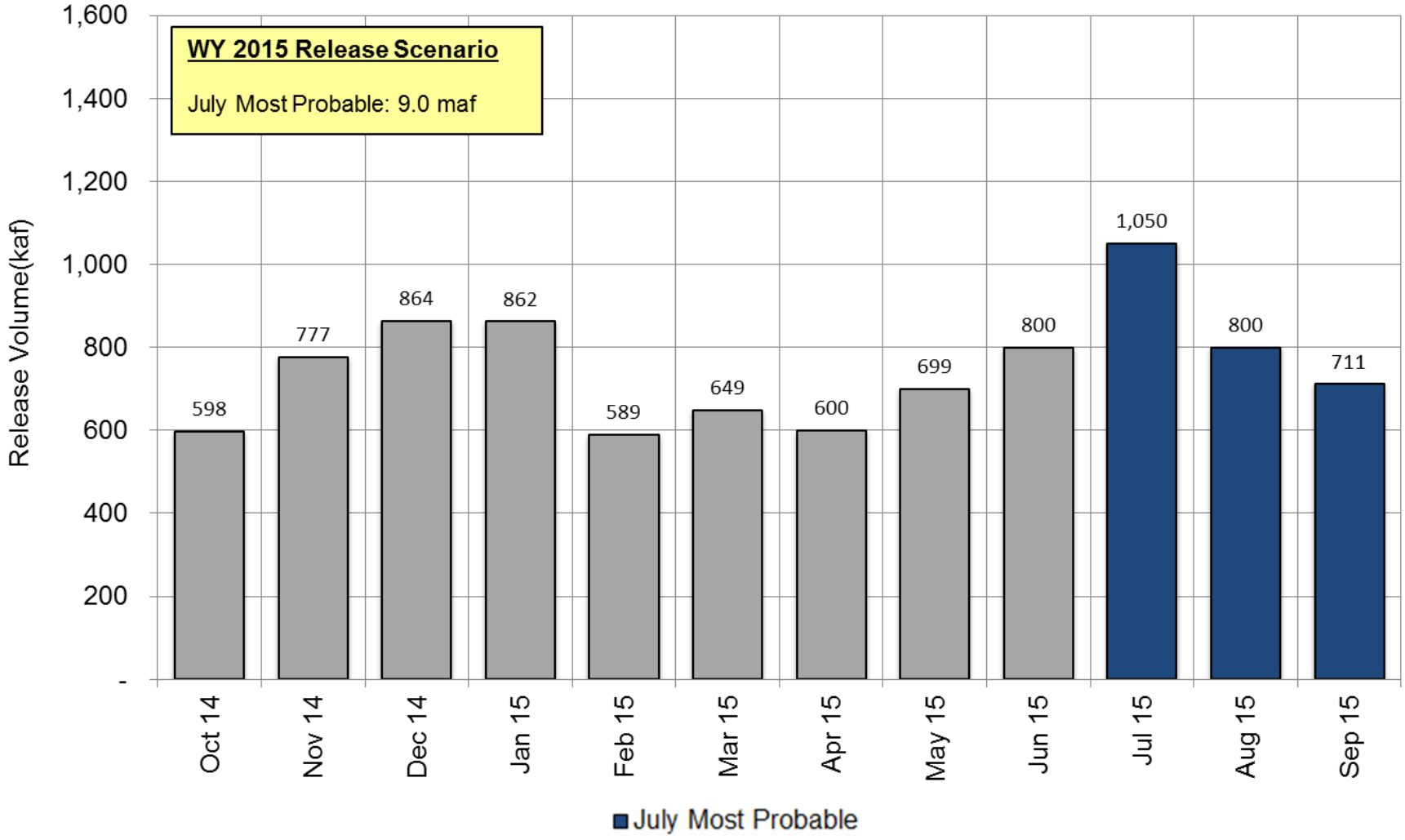
Projected Lake Powell Monthly Release Volume Distribution

Release Scenario for Water Year 2015

Updated July 2015



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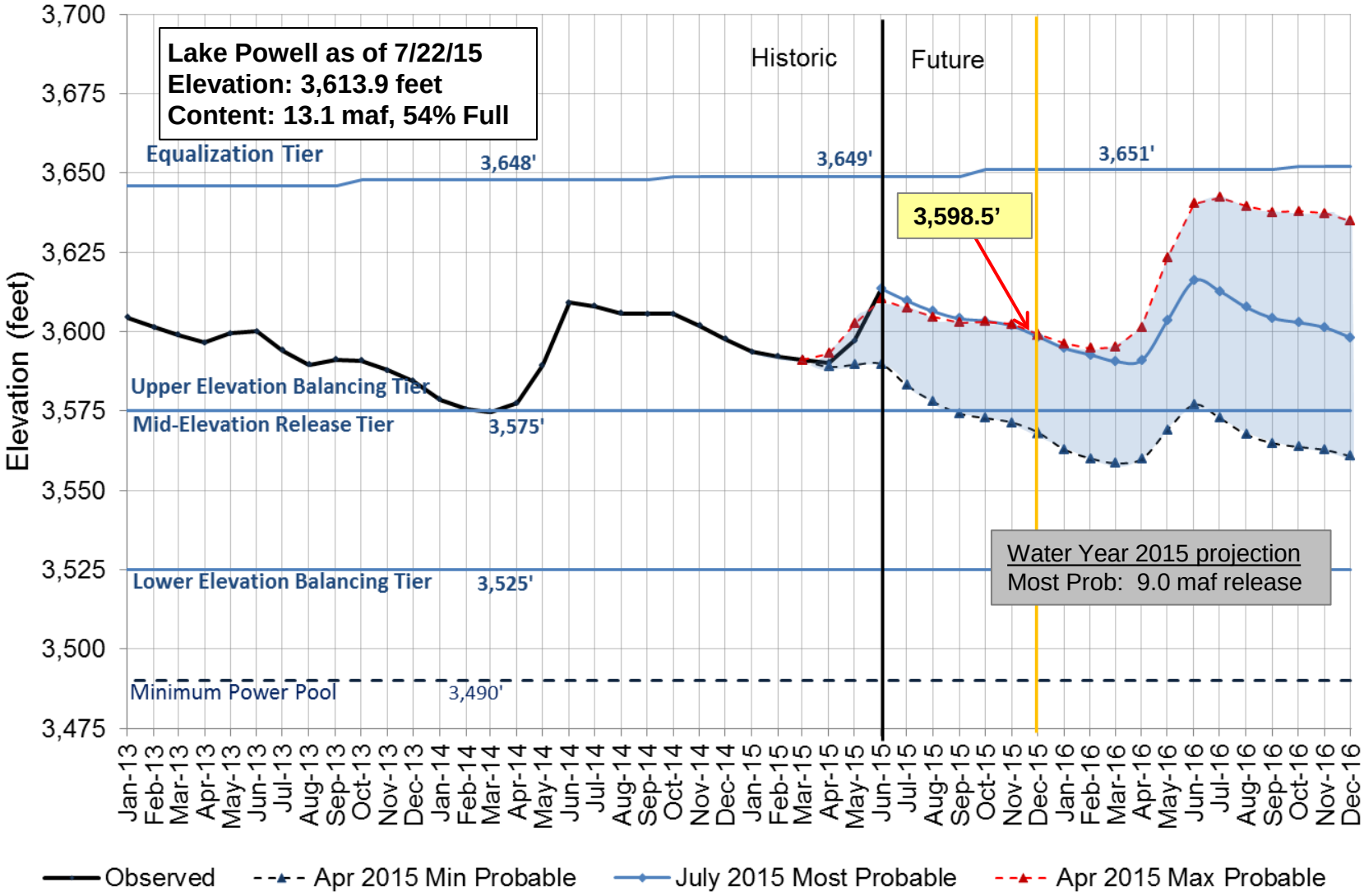
Lake Powell End of Month Elevations

Historic and projected based on July and April 2015 modeling



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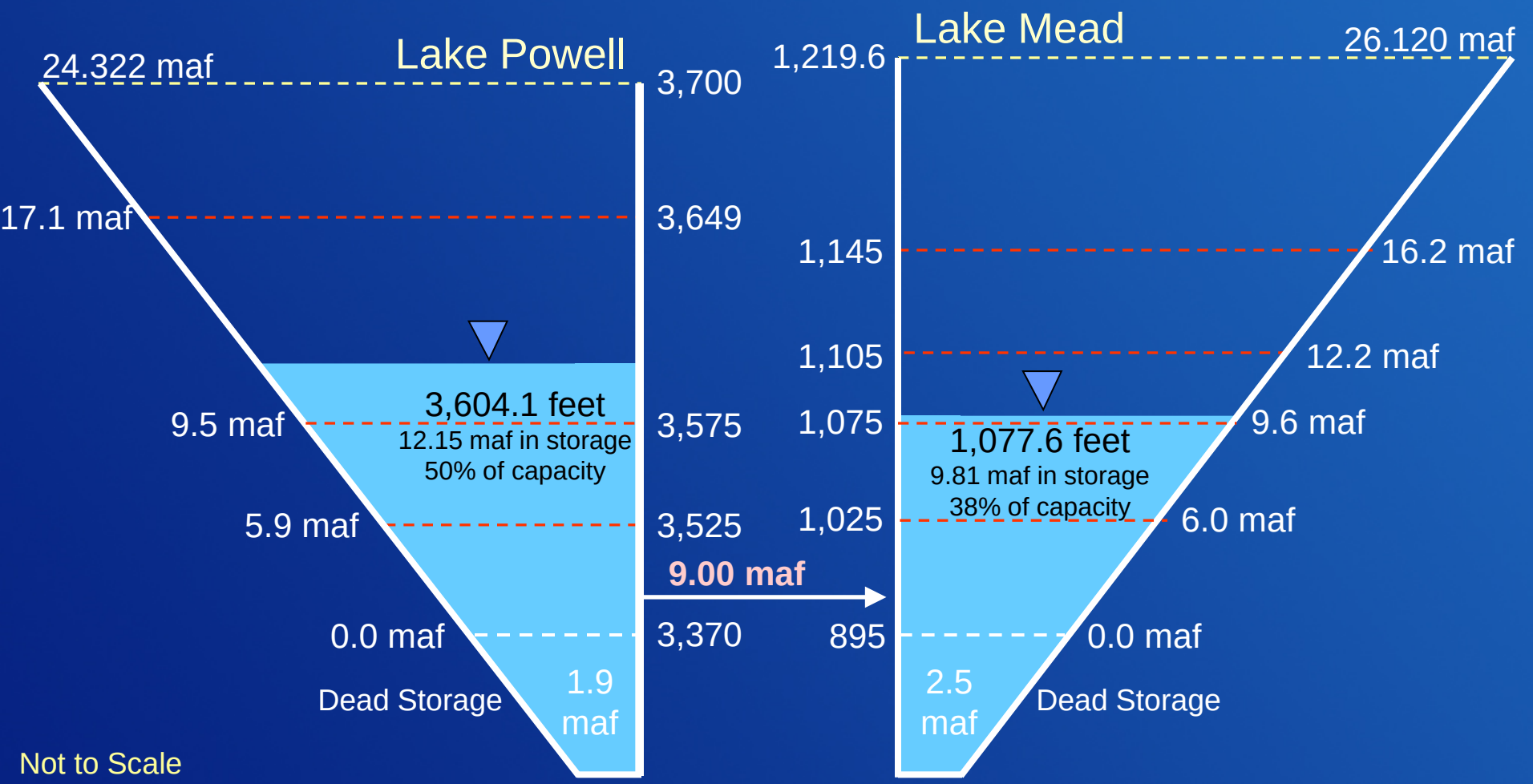
End of Water Year 2015 Projections

July 2015 24-Month Study Most Probable Inflow Scenario[1]

Projected Unregulated Inflow into Powell[1] = 9.83 maf (91% of average)



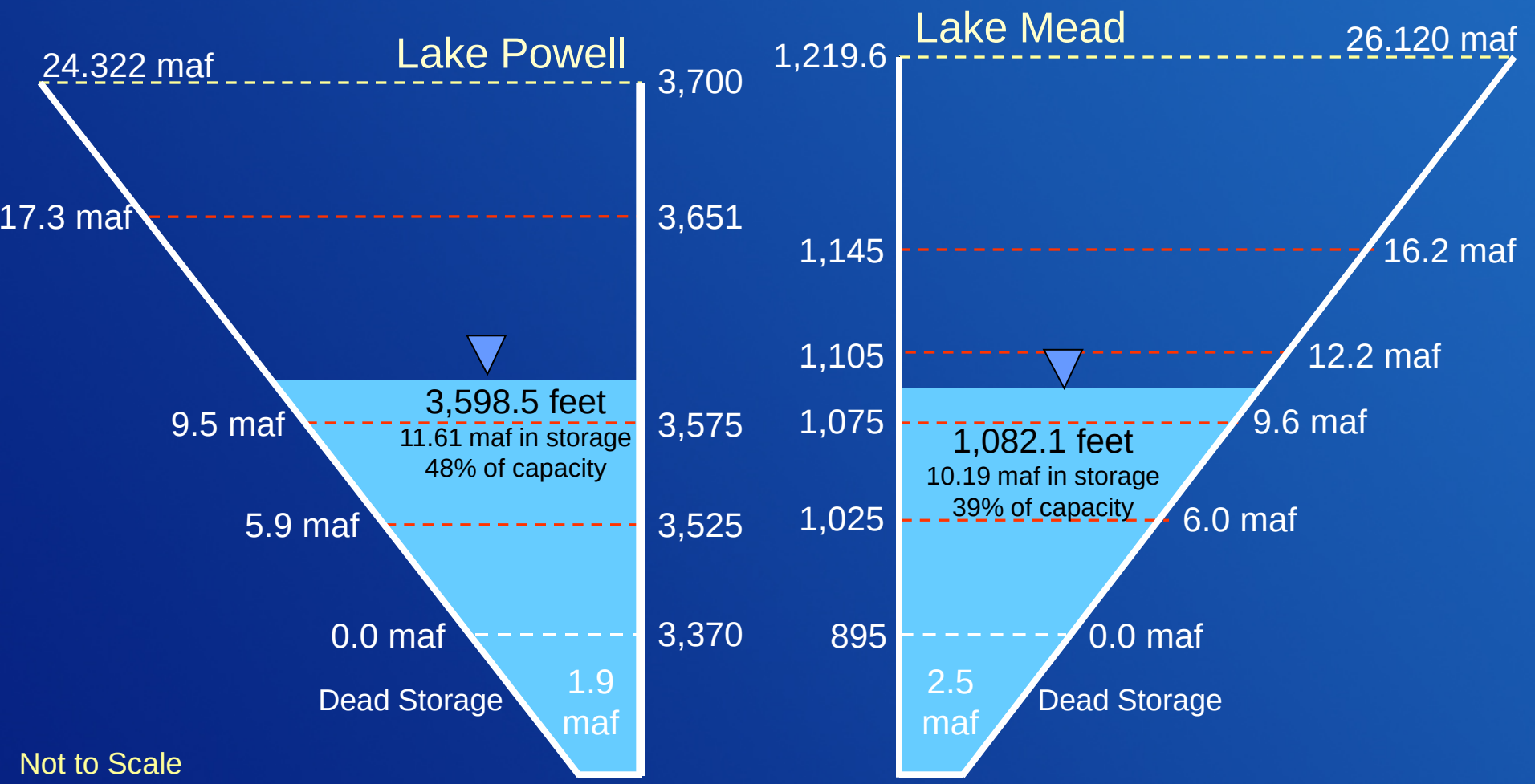
[1] WY 2015 unregulated inflow into Lake Powell is based on the CBRFC outlook dated 7/1/15.

RECLAMATION

End of Calendar Year 2015 Projections

July 2015 24-Month Study Most Probable Inflow Scenario[1]

Based on a 9.00 maf release pattern from Lake Powell in Water Year 2016



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Projected Operational Tiers for Water/Calendar Year 2016 based on the July 2015 24-Month Study

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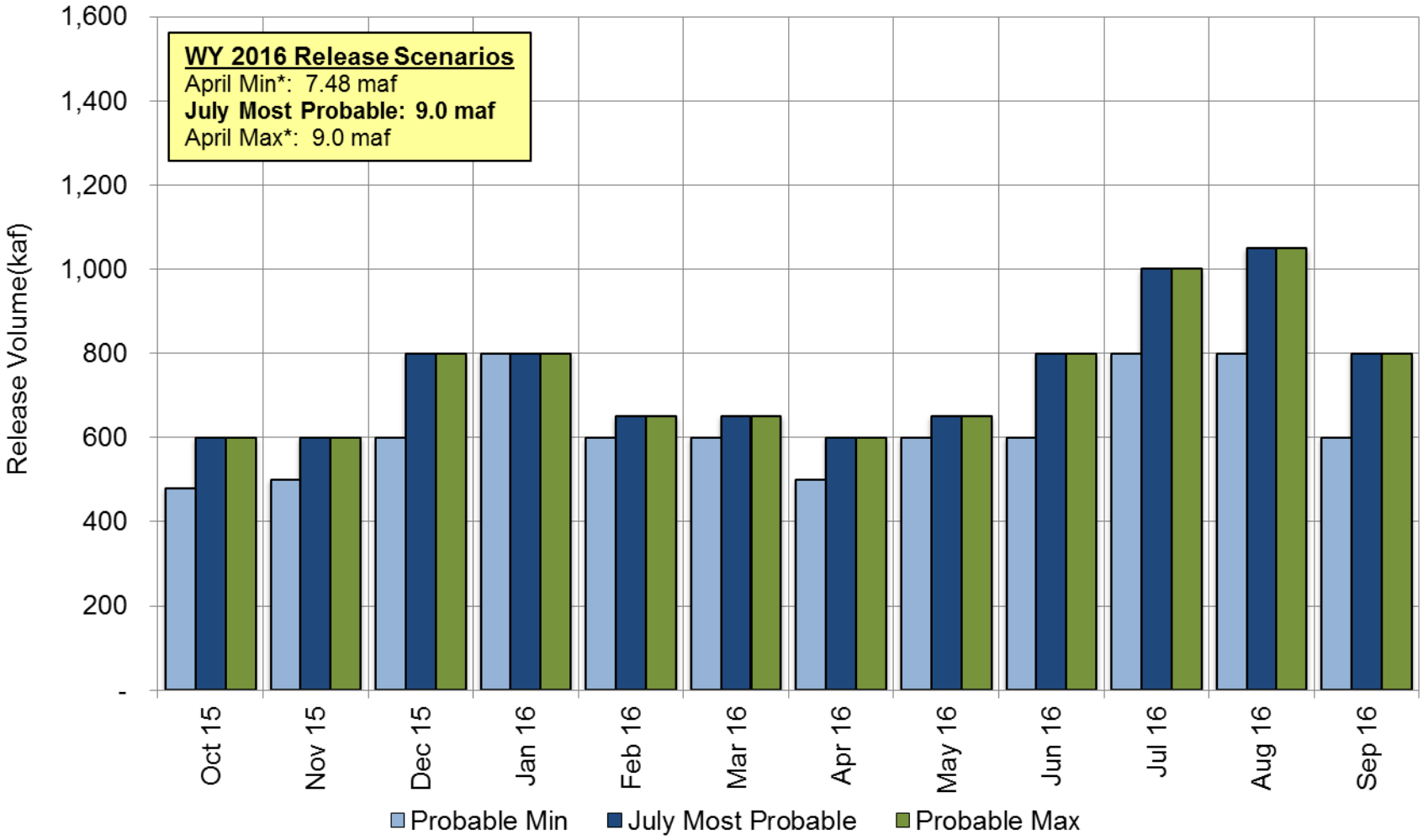

** Probable Min and Max annual release volume is based on April Min and Max inflow forecasts*

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Colorado River Basin Storage
(as of July 22, 2015)

Current Storage	Percent Full	MAF	Elevation (Feet)
Lake Powell	54%	13.13	3,613.9
Lake Mead	37%	9.72	1,076.4
Total System Storage*	53%	31.46	NA

***Total system storage was 30.59 maf or 51% this time last year**

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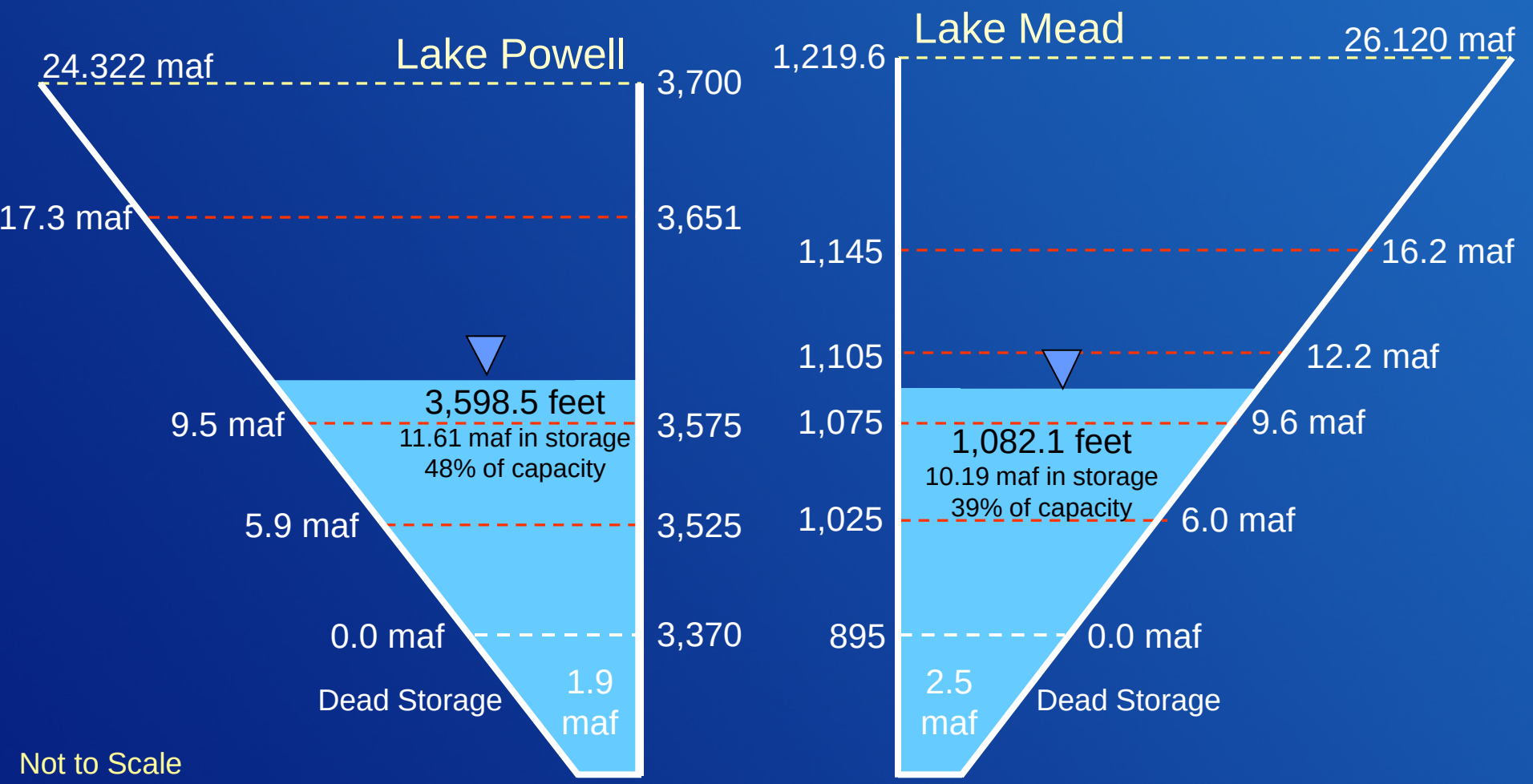

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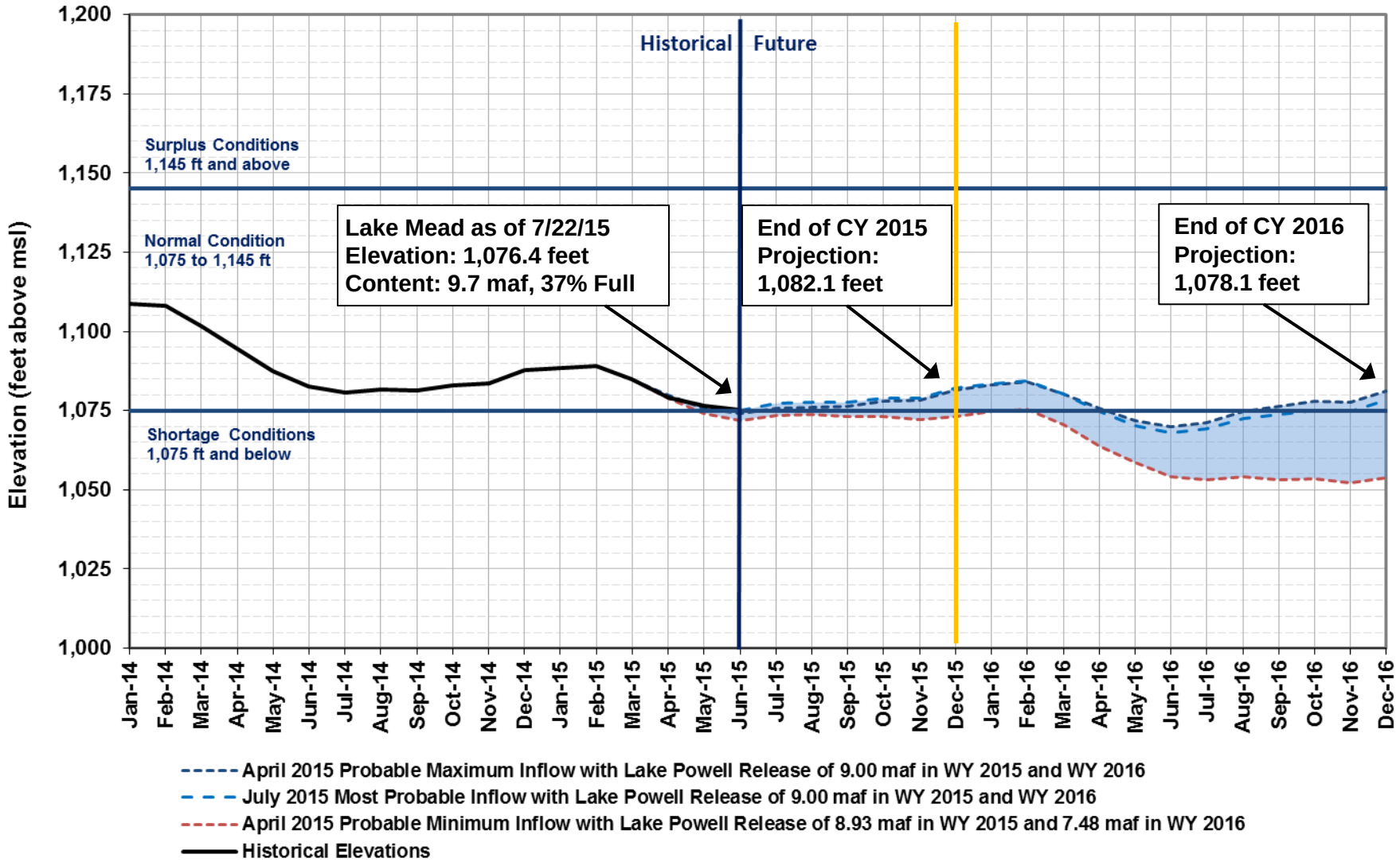
Lake Mead End of Month Elevations

Projections from April and July 2015 24-Month Study Inflow Scenarios



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Lower Basin Side Inflows – WY/CY 2015[1,2]

Intervening Flow from Glen Canyon to Hoover Dam

	Month in WY/CY 2015	5-Year Average Intervening Flow (KAF)	Observed Intervening Flow (KAF)	Observed Intervening Flow (% of Average)	Difference From 5-Year Average (KAF)
OBSERVED	October 2014	61	68	111%	7
	November 2014	50	44	88%	-6
	December 2014	96	56	58%	-40
	January 2015	72	73	101%	1
	February 2015	77	90	116%	13
	March 2015	61	57	94%	-4
	April 2015	76	26	34%	-50
	May 2015	49	26	53%	-23
	June 2015	23	15	65%	-8
PROJECTED	July 2015	67			
	August 2015	127			
	September 2015	114			
	October 2015	61			
	November 2015	50			
	December 2015	96			
	WY 2015 Totals	**874**	**763**	**87%**	**-111**
	CY 2015 Totals	**874**	**803**	**92%**	**-71**

[1] Values were computed with the LC's gain-loss model for the most recent 24-month study.

[2] Percents of average are based on the 5-year mean from 2010-2014.

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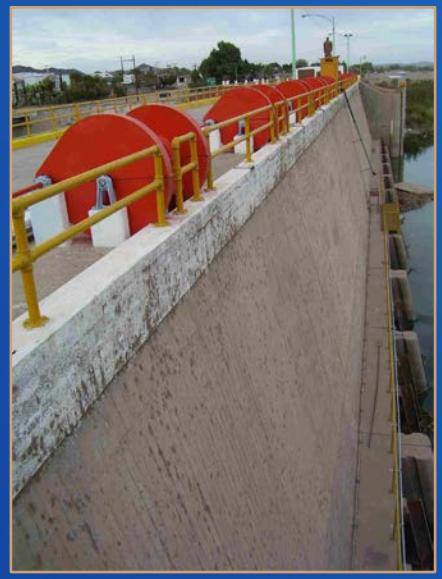
YAO Operations Update

- Brock Reservoir and Senator Wash 2015 YTD accumulated storage[1]
  - Brock 87,500 AF
  - Senator Wash 72,670 AF

- Excess Flows to Mexico

  2015 YTD total[2] 11,610 AF



[1] **Provisional year-to-date totals through July 23, 2015**

[2] **Provisional year-to-date total through July 23, 2015**

YAO Operations Update

- Pumped drainage return flows from the Wellton-Mohawk Irrigation and Drainage District
  - Flow at station 0+00 on the Main Outlet Drain from January through May 2015 was 46,062 AF at 2,680 ppm
- Provisional drainage Flows to the Colorado River
  - From the South Gila Drainage Wells January through May 2015 was 1514 AF at 1,698 ppm
  - From the Yuma Mesa Conduit January through May 2015 was 0 AF

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