RECLAMATION

Managing Water in the West

2016 Colorado River Annual Operating Plan

Colorado River Management Work Group
First Consultation
May 27, 2015

U.S. Department of the Interior
Bureau of Reclamation

2016 Colorado River AOP First Consultation Meeting

- Welcome and Introductions – *Steve Hvinden / Chris Cutler*
- Upper Basin Hydrology and Operations – *Lee Traynham*
- Lower Basin Hydrology and Operations – *Noe Santos*
- 2016 AOP Review Process –*Steve Hvinden / Chris Cutler*
- Review of Draft 2016 AOP - CRMWG
- Conclusion, Wrap-up, Future Meeting Dates

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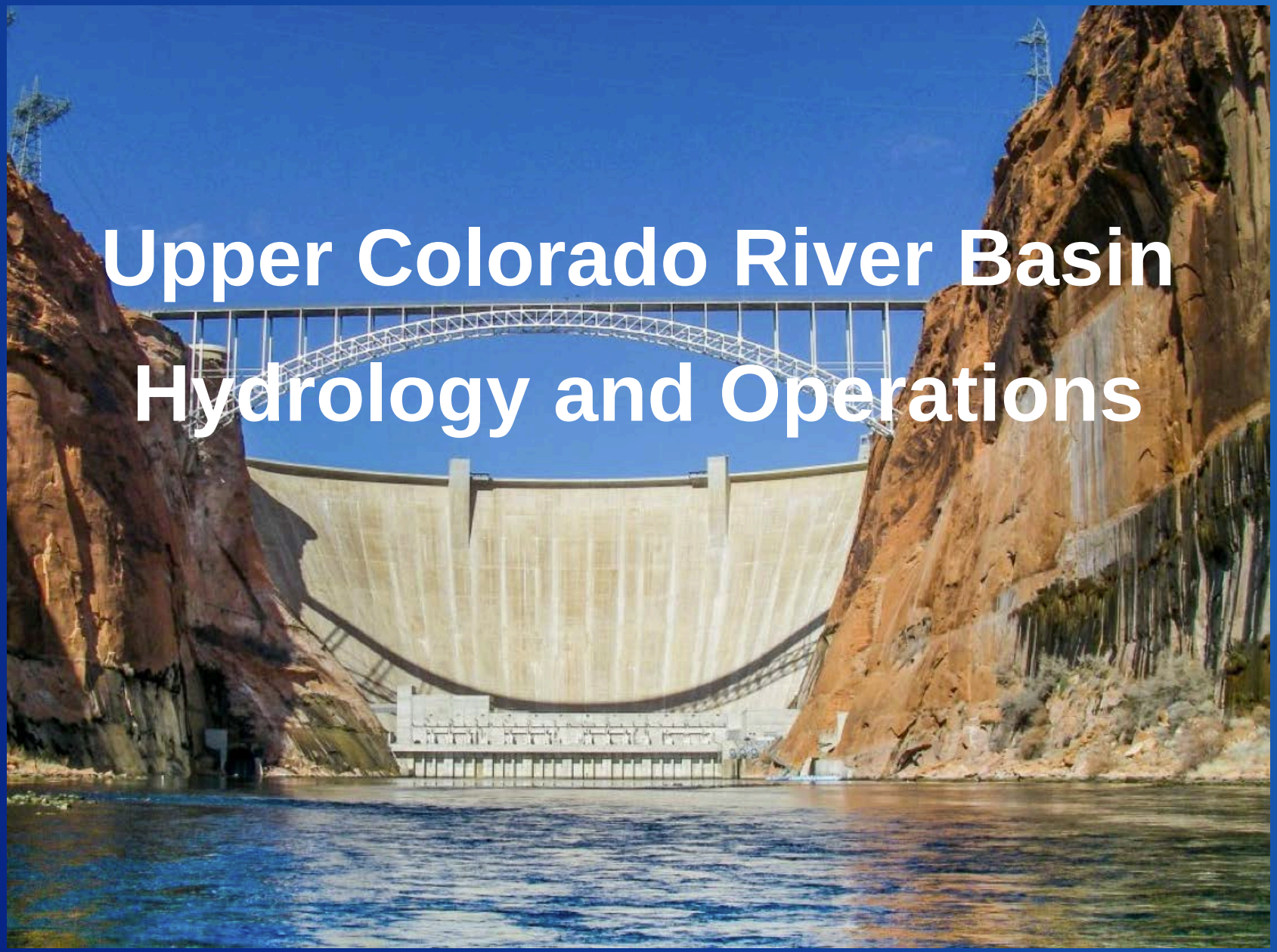

Upper Colorado River Basin Hydrology and Operations

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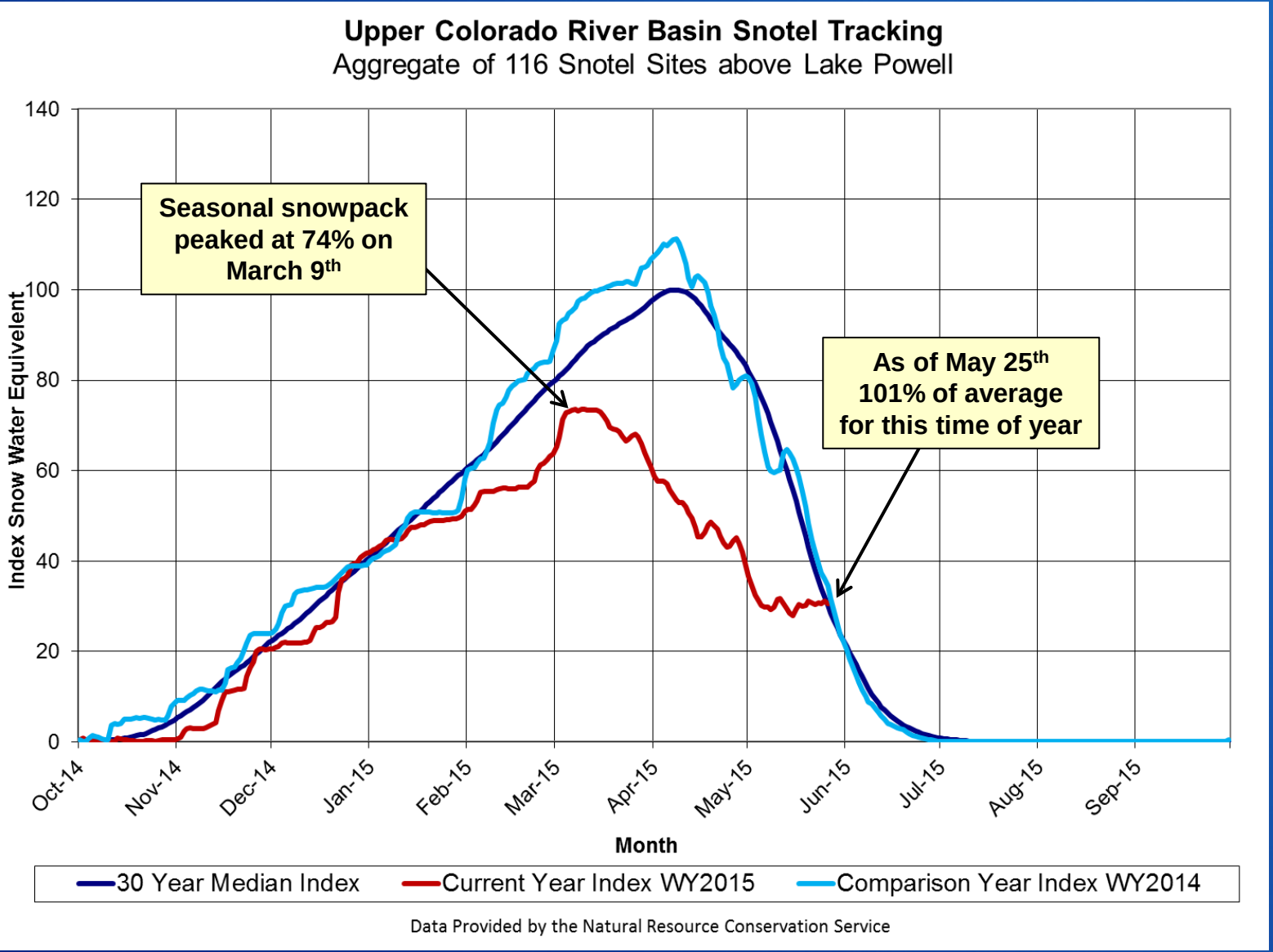
Snow Conditions



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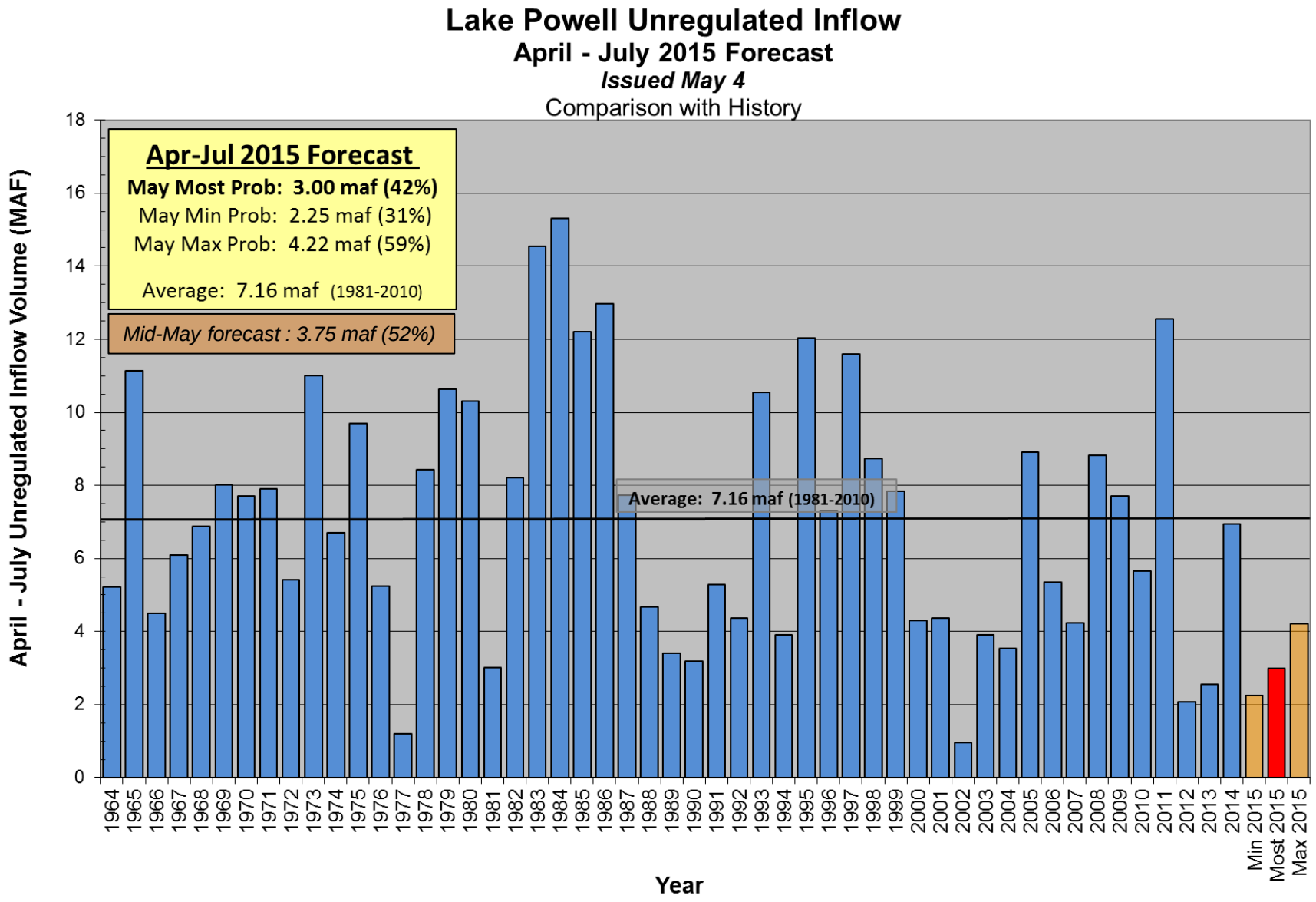

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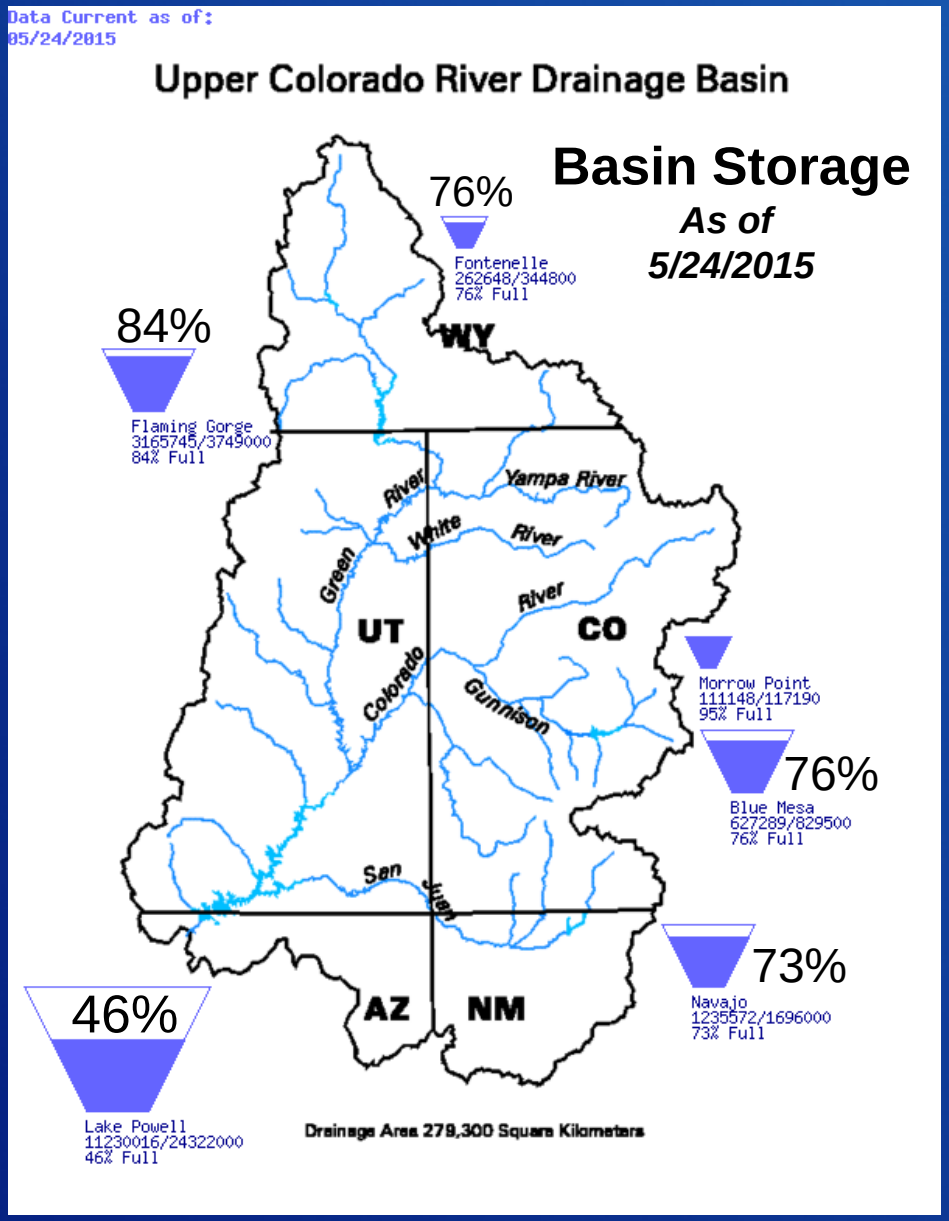

http://www.usbr.gov/uc/water/basin/tc_cr.html

April to July 2015 Forecasted Inflow

Issued May 4, 2015

Reservoir	A-J Forecast (KAF)	Percent of Average[1]
Fontenelle	495	68%
Flaming Gorge	570	58%
Blue Mesa	440	65%
Navajo	230	31%
Powell	3,000	42%

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

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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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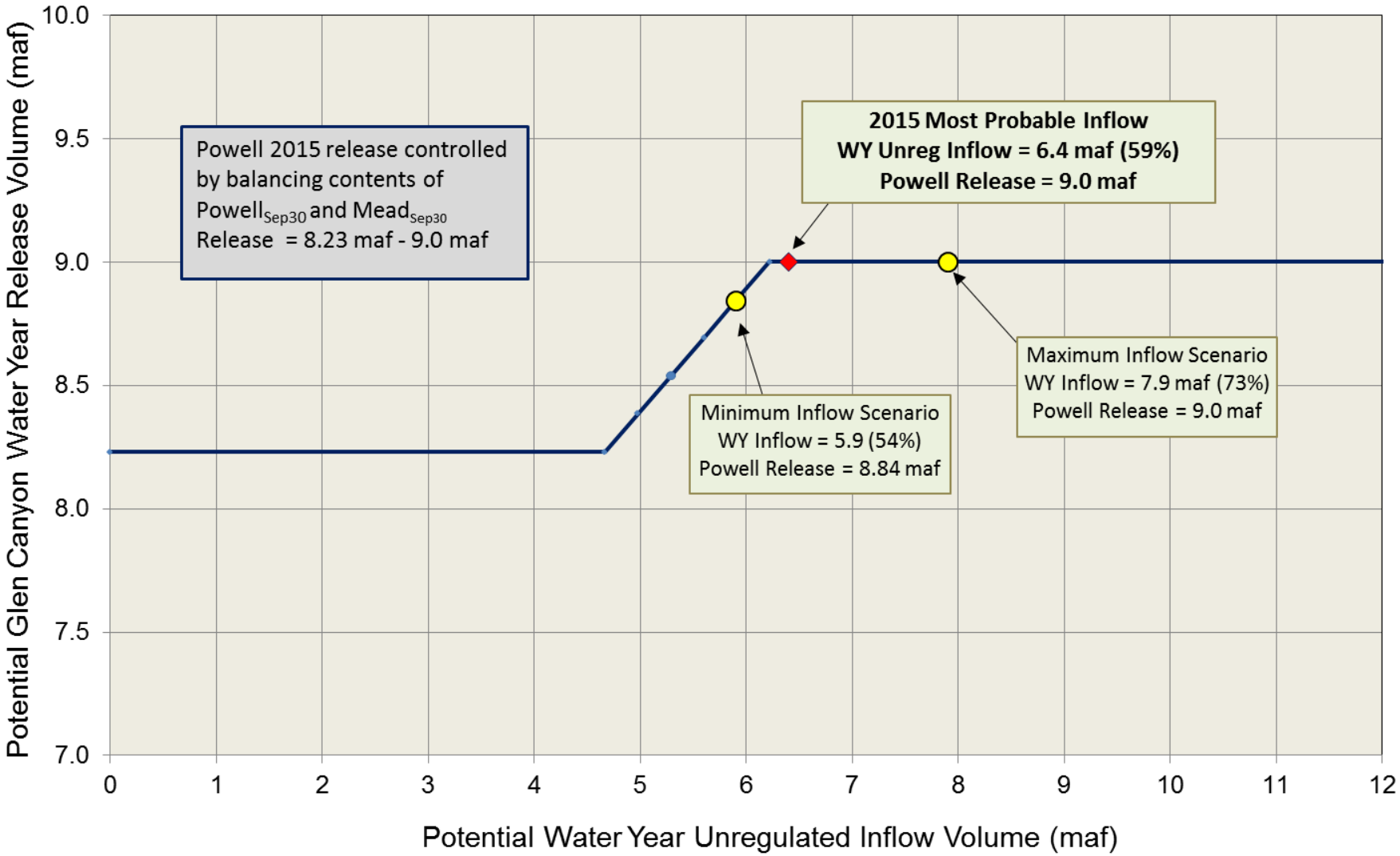
Potential Lake Powell Release Scenarios

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



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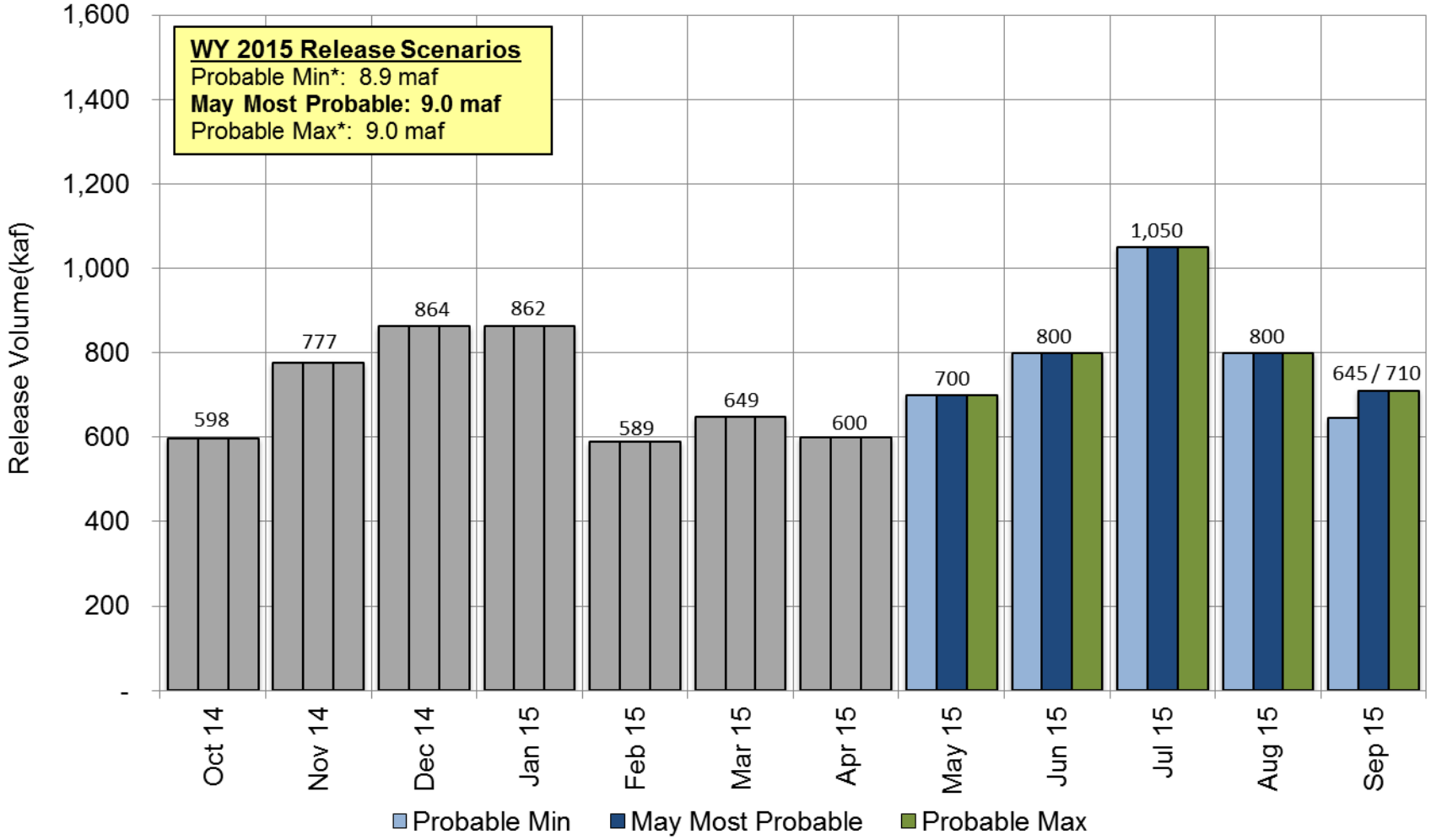
Projected Lake Powell Monthly Release Volume Distribution

Release Scenarios for Water Year 2015

Updated May 2015



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

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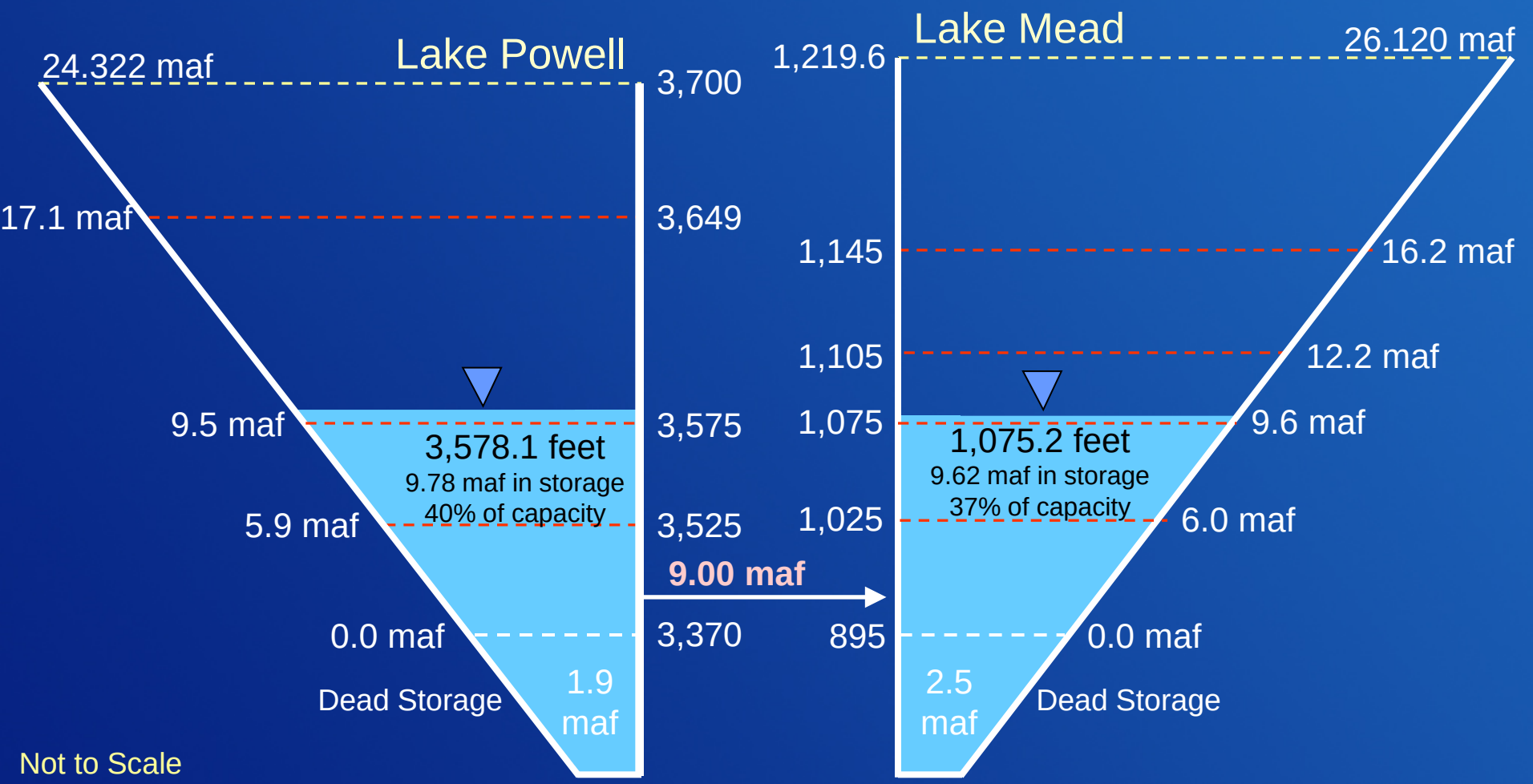
End of Water Year 2015 Projections

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

Projected Unregulated Inflow into Powell[1] = 6.40 maf (59% of average)



Not to Scale

[1] WY 2015 unregulated inflow into Lake Powell is based on the CBRFC outlook dated 5/4/15.

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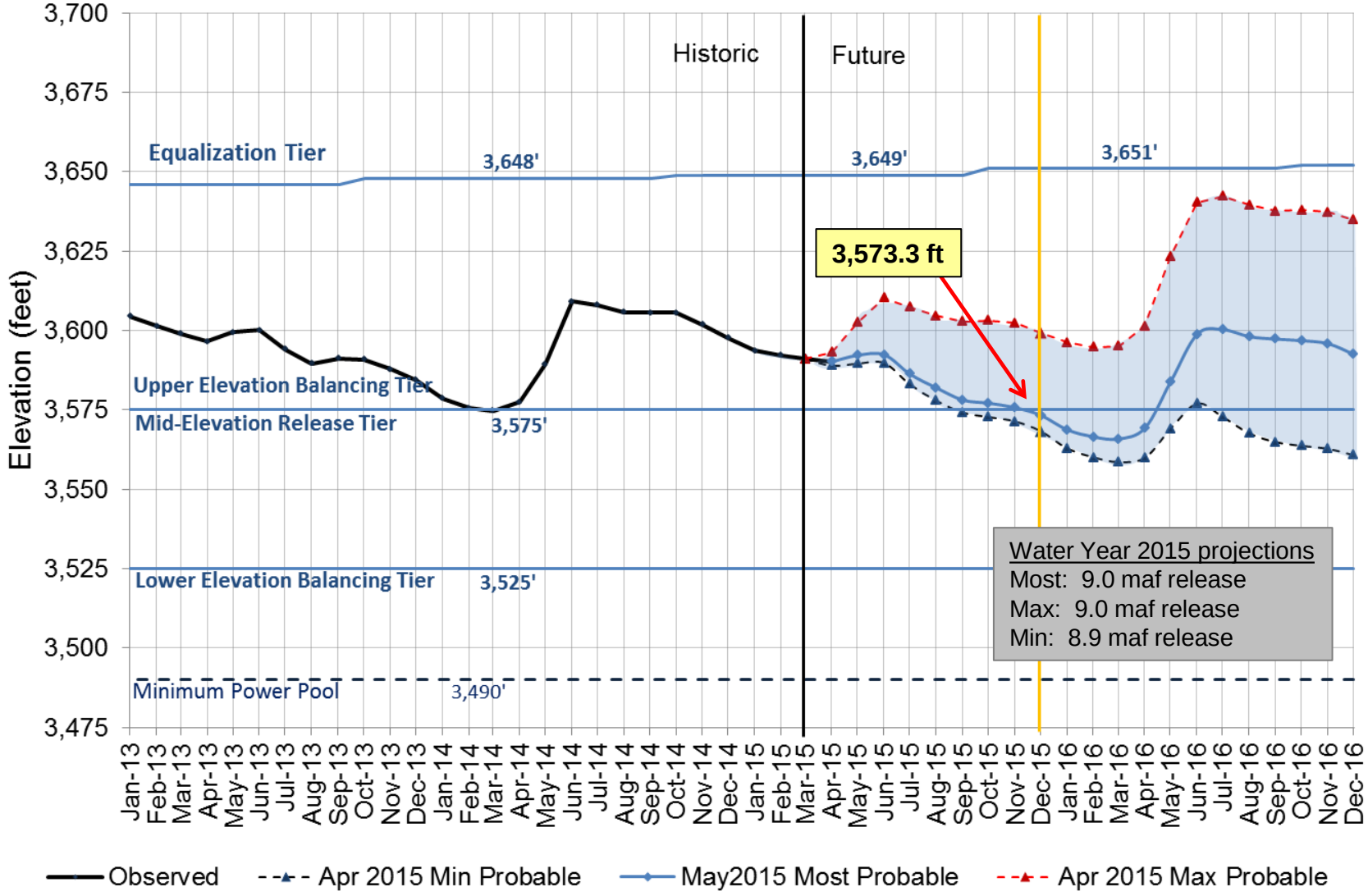
Lake Powell End of Month Elevations

Historic and projected based on May and April 2015 modeling



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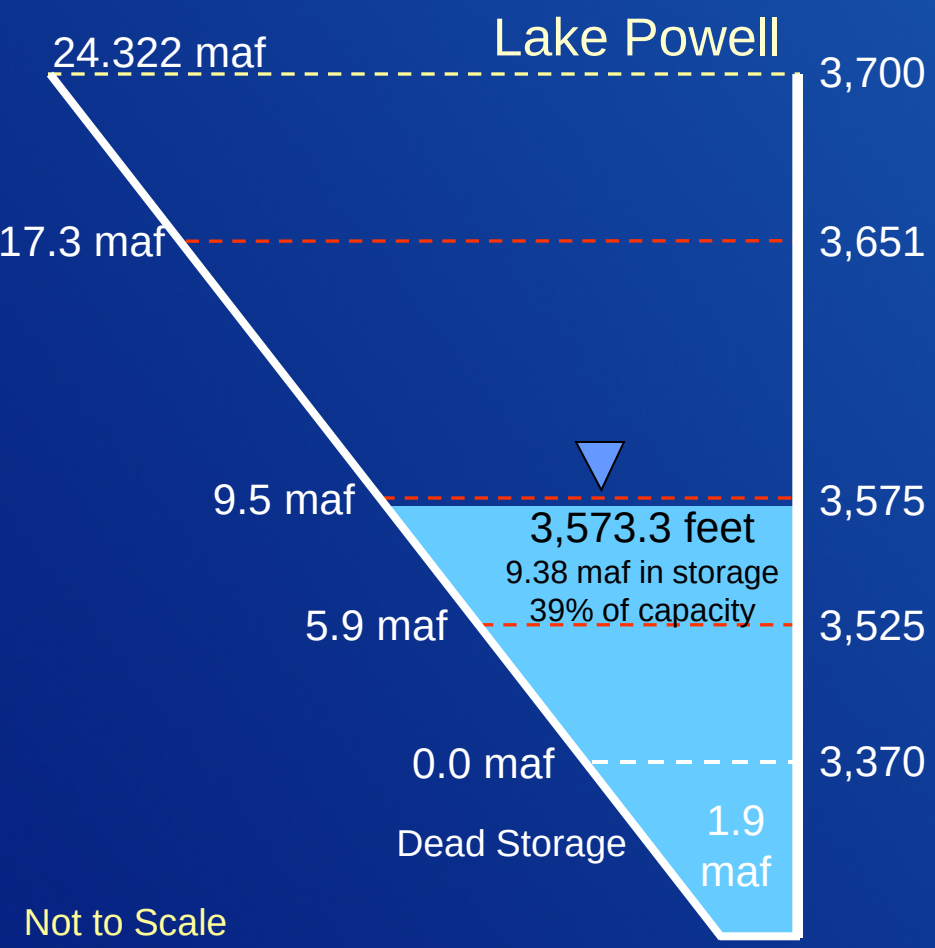
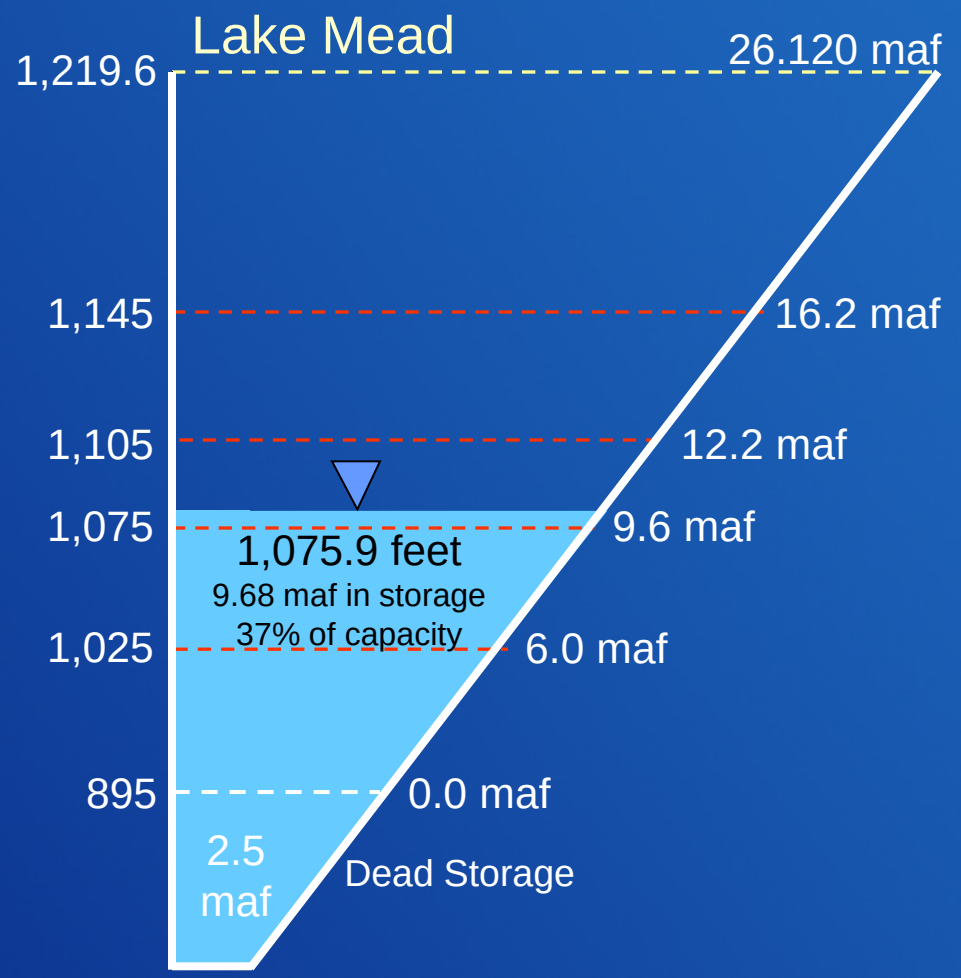
End of Calendar Year 2015 Projections

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

Based on a 7.48 maf release pattern from Lake Powell in Water Year 2016





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Lake Powell 2016 Operating Tier Scenarios

Based on April and May 2015 modeling

Inflow Scenario	Operating Tier Release Volume
Minimum Probable	Mid-Elevation Release 7.48 maf
Most Probable	Mid-Elevation Release 7.48 maf
Maximum Probable	Upper Elevation Balancing 9.0 maf

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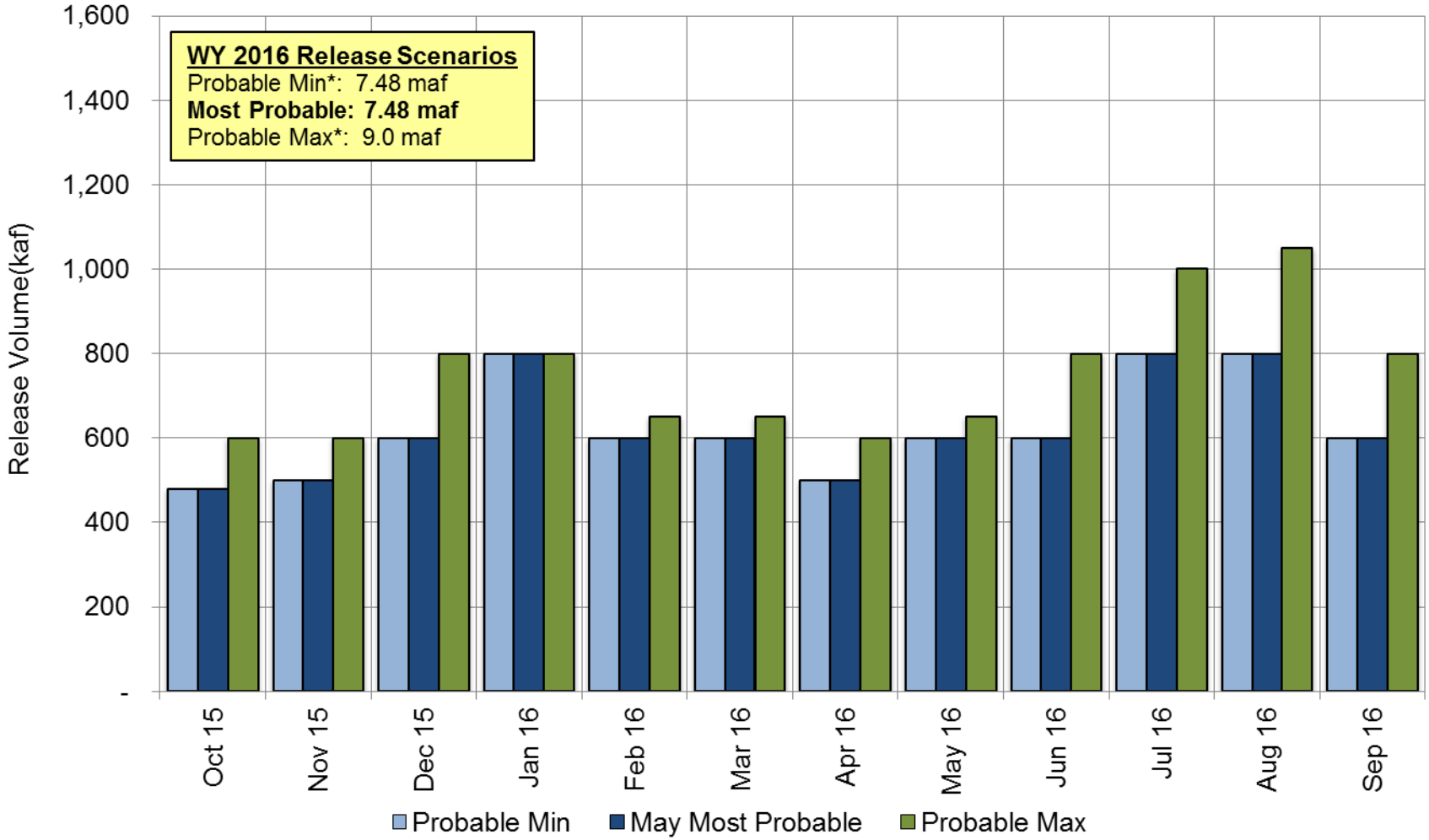
Potential Lake Powell Monthly Release Volume Distribution

Release Scenarios for Water Year 2016

Updated May 2015



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Lower Colorado River Basin

Hydrology and Operations

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Colorado River Basin Storage
(as of May 26, 2015)

Current Storage	Percent Full	MAF	Elevation (Feet)
Lake Powell	46%	11.31	3,595.3
Lake Mead	37%	9.75	1,076.8
Total System Storage*	48%	28.83	NA

***Total system storage was 28.64 maf or 48% this time last year**

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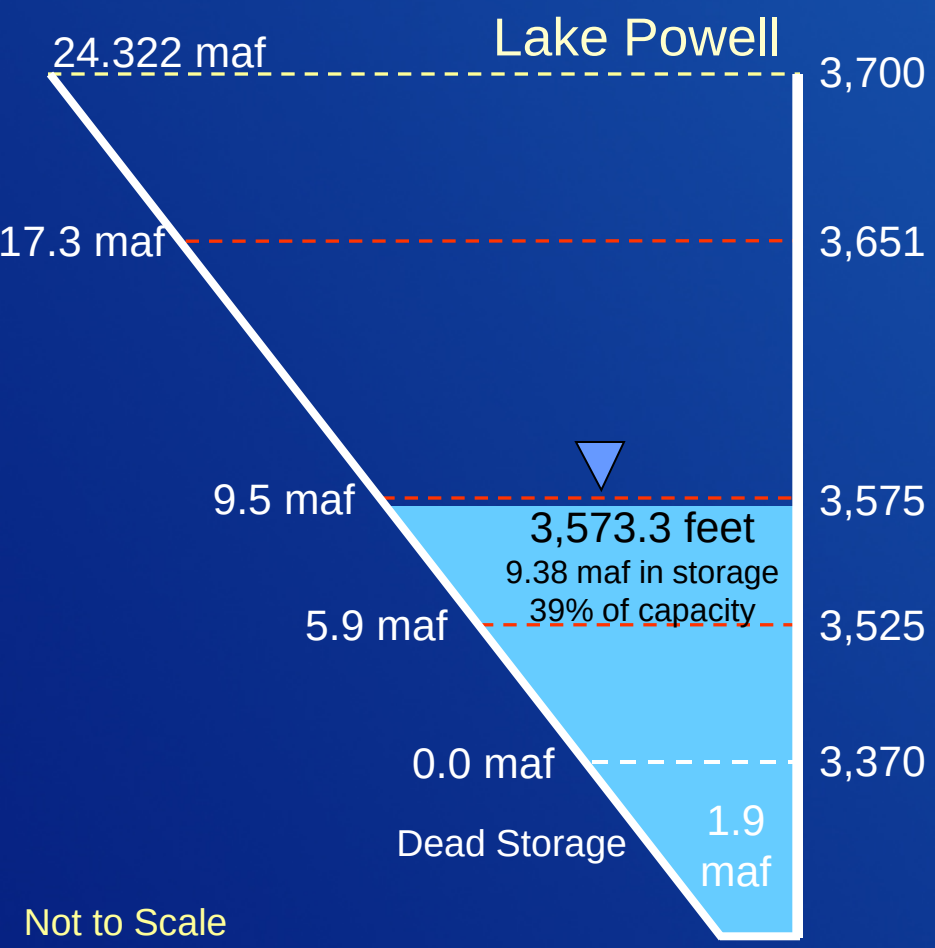

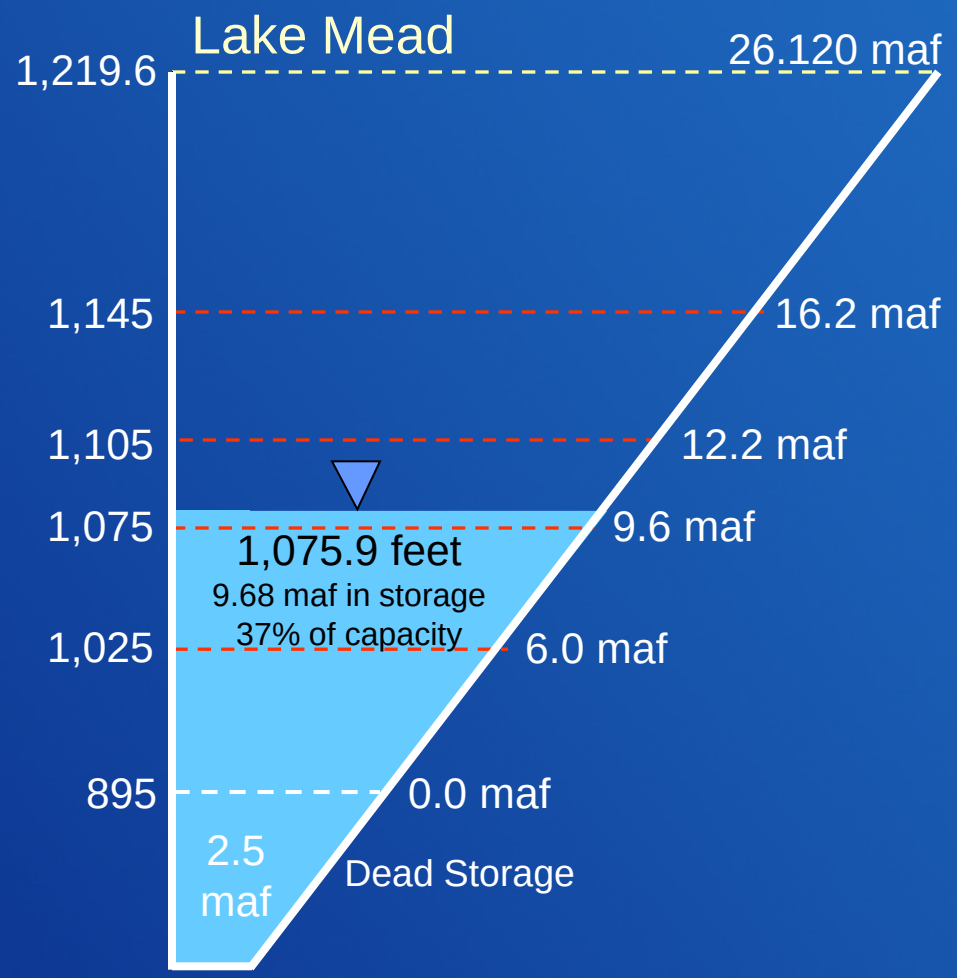

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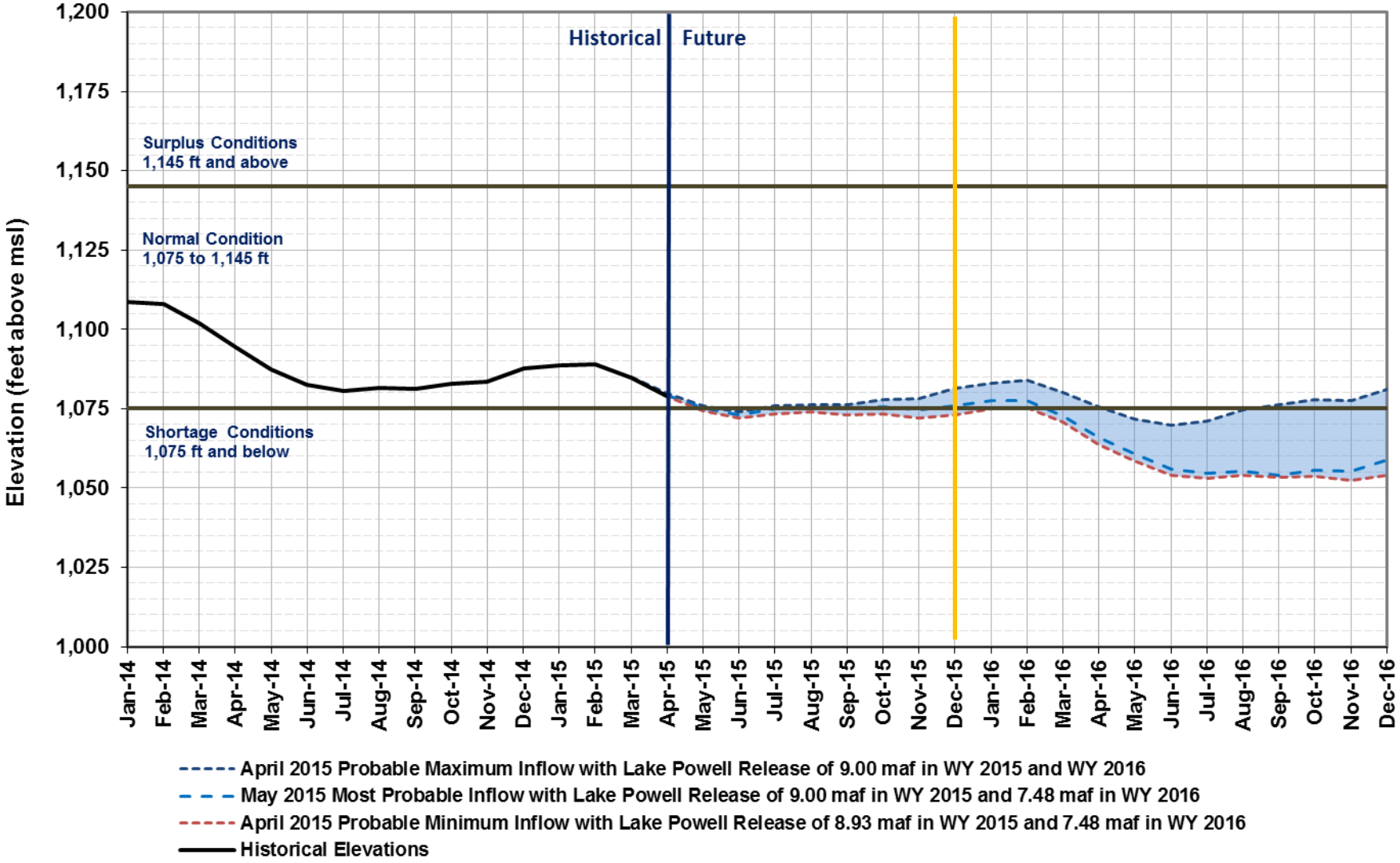
Lake Mead End of Month Elevations

Projections from April and May 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
PROJECTED	May 2015	49			
	June 2015	23			
	July 2015	67			
	August 2015	127			
	September 2015	114			
	October 2015	61			
	November 2015	50			
	December 2015	96			
	WY 2015 Totals	**874**	**794**	**91%**	**-79**
	CY 2015 Totals	**874**	**834**	**95%**	**-40**

[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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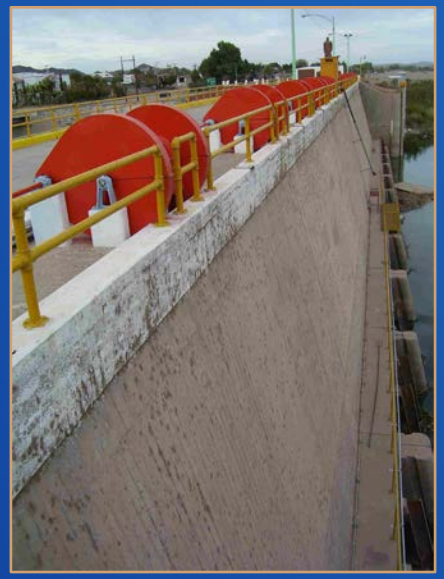
YAO Operations Update

- Brock Reservoir and Senator Wash 2015 YTD accumulated storage[1]
  - Brock 68,100 AF
  - Senator Wash 46,660 AF



- Excess Flows to Mexico

  2015 YTD total[2] 11,729 AF

[1] Provisional year-to-date totals through May 25, 2015
[2] Provisional year-to-date total through May 26, 2015

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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 April 2015 was 36,762 AF at 2,641 ppm
- Provisional drainage Flows to the Colorado River
  - From the South Gila Drainage Wells January through April 30, 2015 was 1,514 AF at 1,698 ppm
  - From the Yuma Mesa Conduit January through April 30, 2015 was 0 AF

2015 Colorado River Annual Operating Plan

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May 27, 2015

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