

RECLAMATION

Managing Water in the West

2014 Colorado River Annual Operating Plan

**Colorado River Management Work Group
First Consultation
May 30, 2013**



U.S. Department of the Interior
Bureau of Reclamation

2014 Colorado River AOP First Consultation Meeting

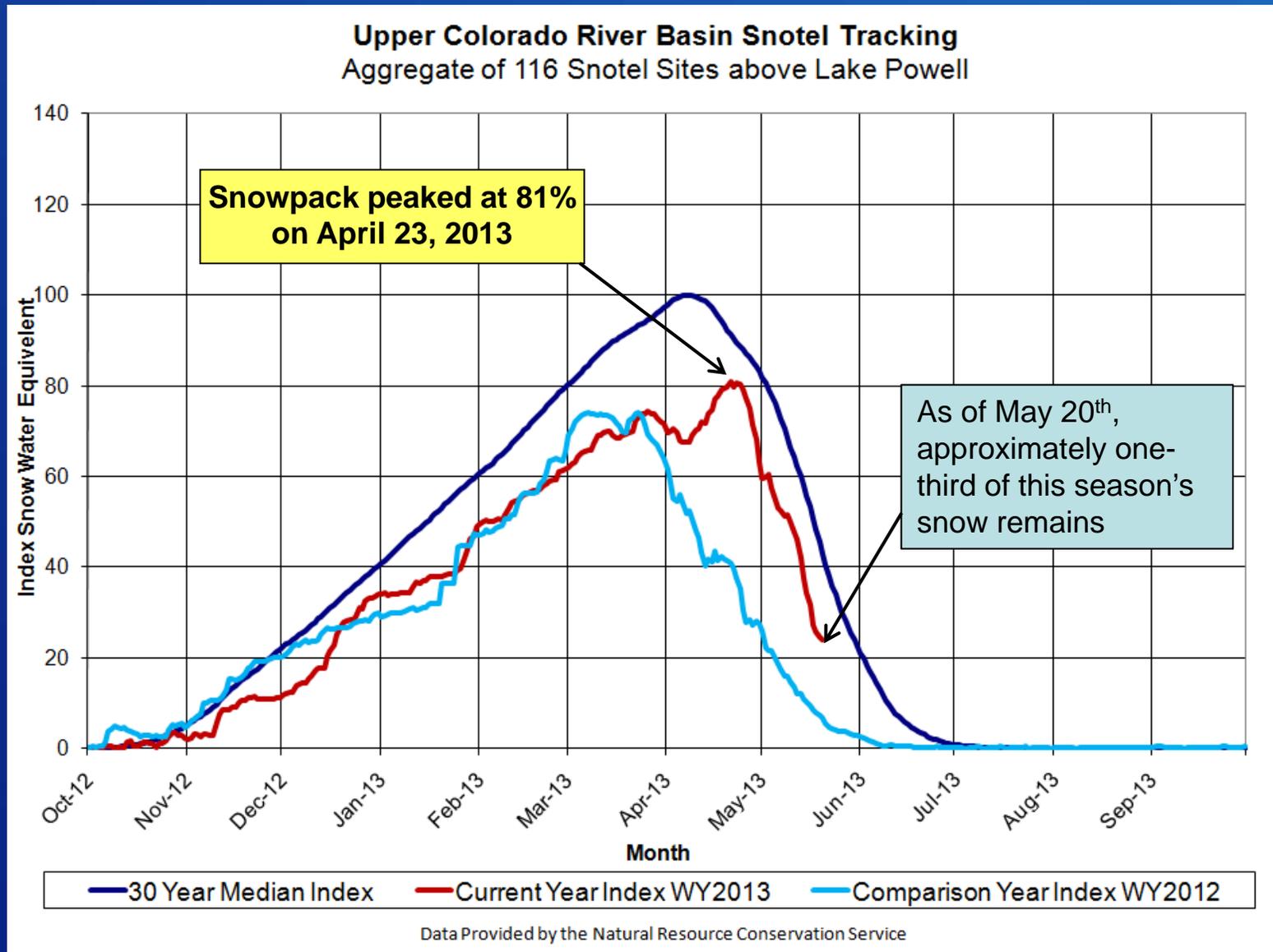
- Welcome and Introductions – *Steve Hvinden / Dave Trueman*
- Upper Basin Hydrology and Operations – *Katrina Grantz*
- Lower Basin Hydrology and Operations – *Dan Bunk / Ed Virden*
- 2014 AOP Review Process – *Steve Hvinden / Dave Trueman*
- Review of Draft 2014 AOP - CRMWG
- Conclusion, Wrap-up, Future Meeting Dates

Upper Colorado River Basin

Hydrology and Operations

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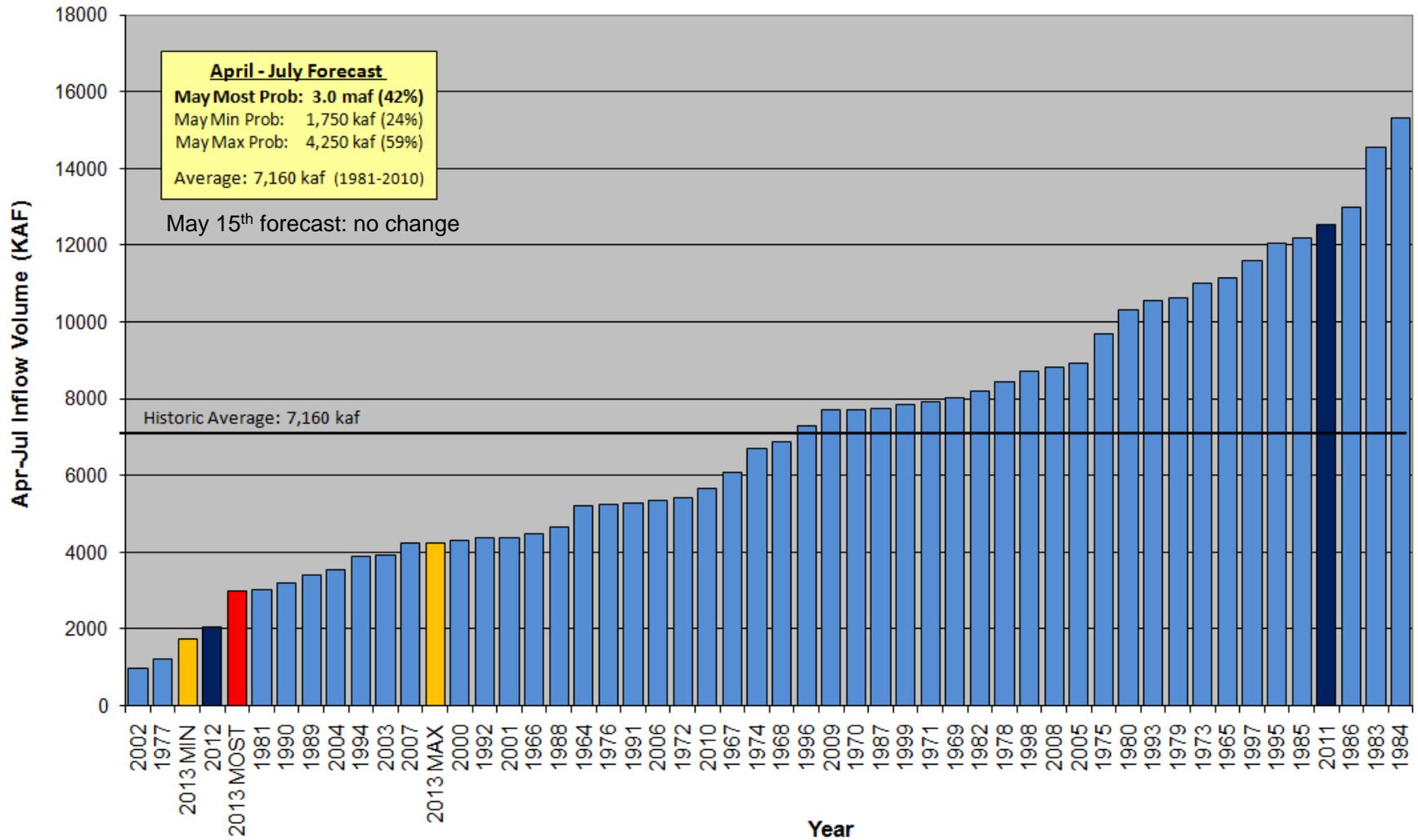
Upper Basin Hydrology Update



Powell Unregulated Inflow

Apr-Jul 2013 Forecast (issued May 2)

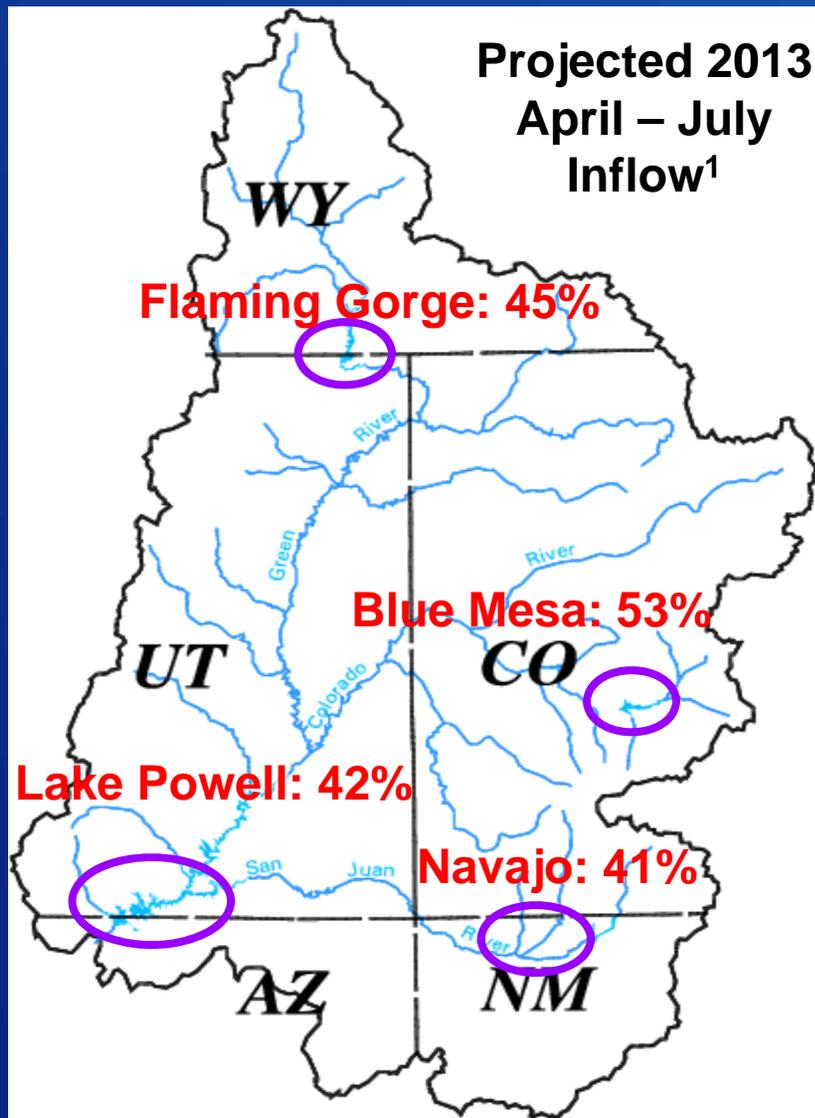
Comparison with History



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CBRFC Unregulated Inflow Forecasts

dated May 16, 2012 (May Mid-Month)



Period in 2013	Inflow (KAF)	Percent of Average ¹
April – July	3,000	42
Water Year Projection	4,840	45

¹ Percentages and percent of average based on period of record from 1981-2010.

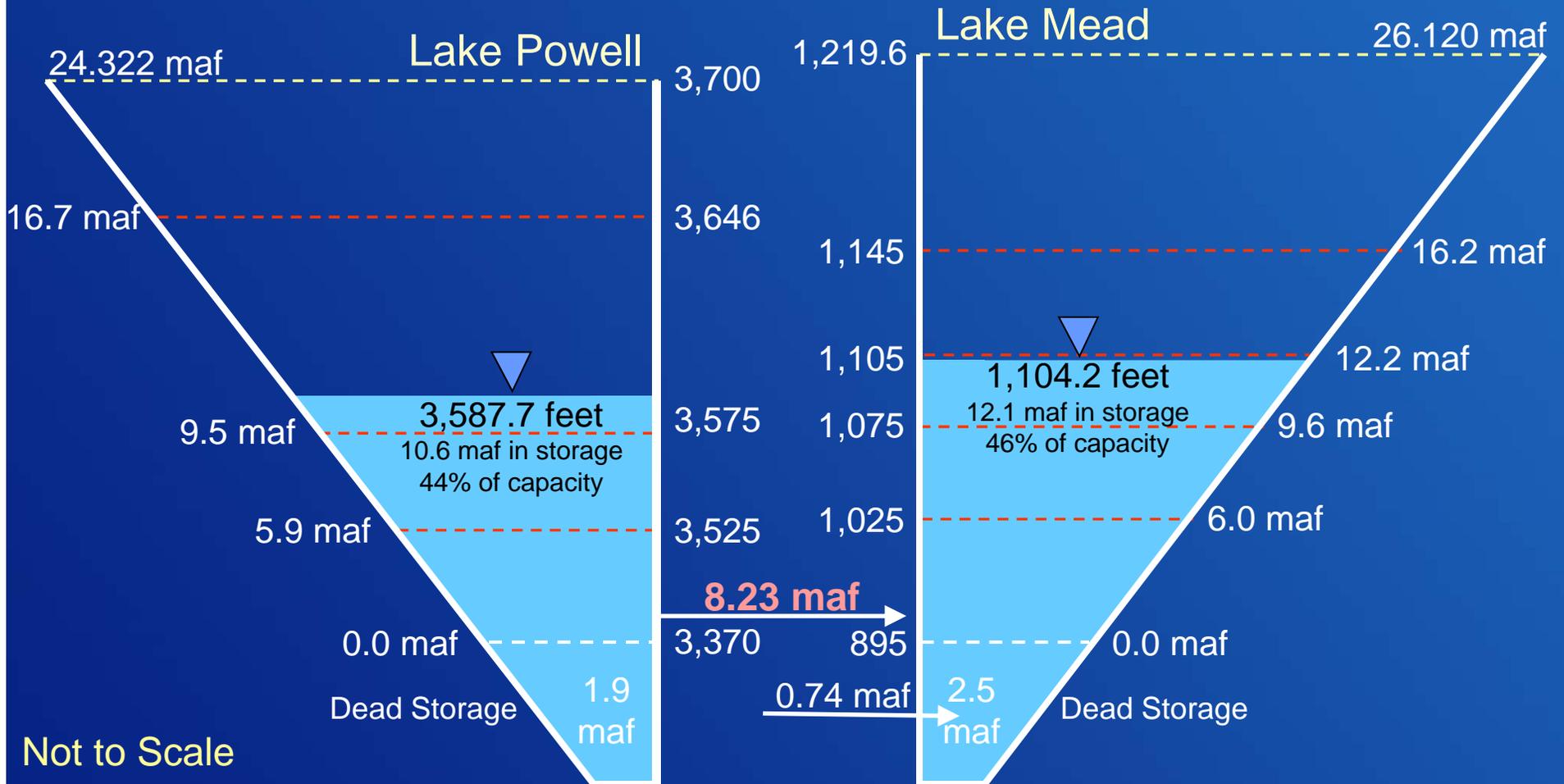
Projected Operations for the Remainder of WY 2013

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Water Year 2013 Projections

May 2013 24-Month Study Most Probable Inflow Scenario

Projected Unregulated Inflow into Powell¹ = 4.84 maf (45% of average)



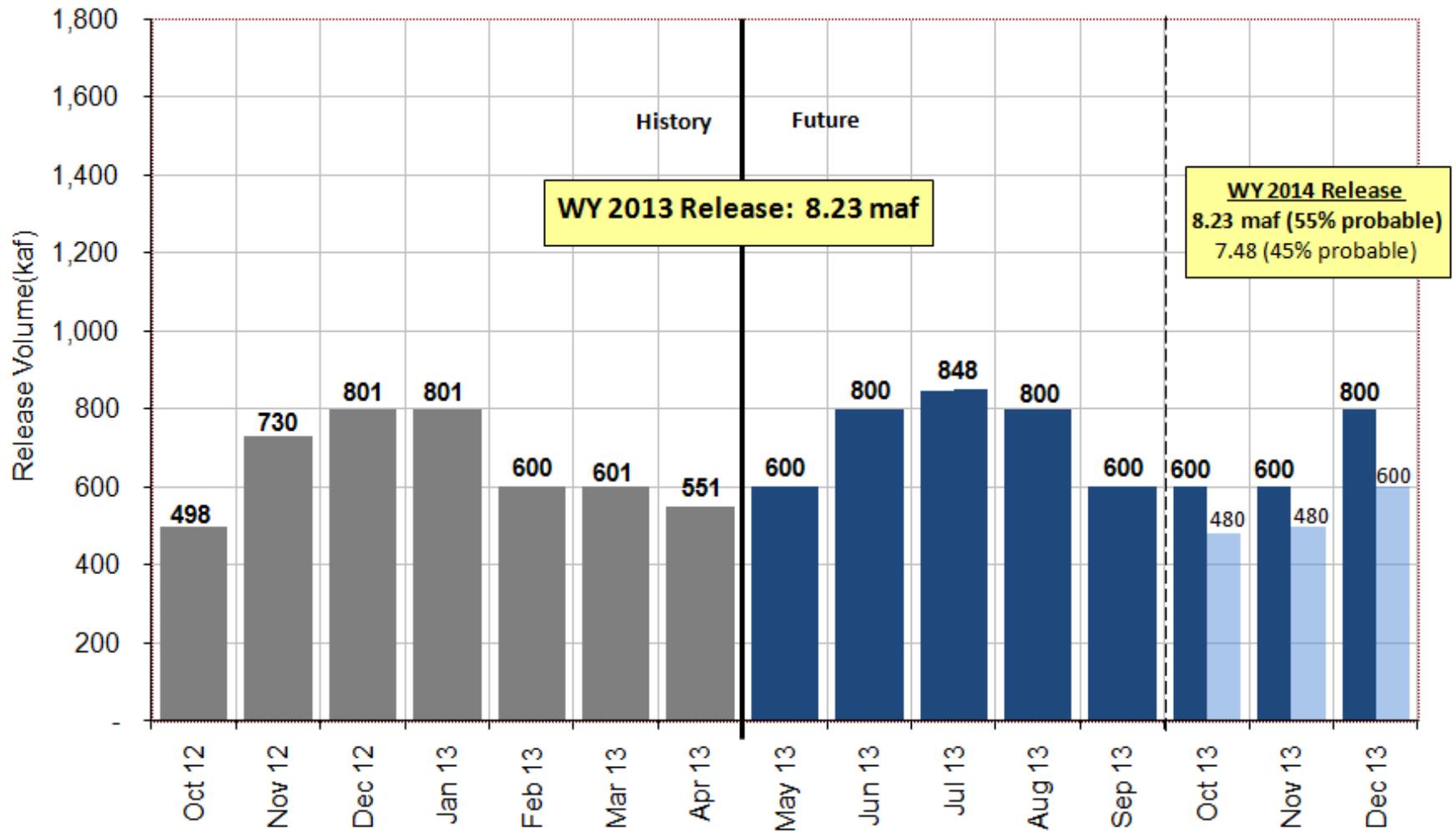
Not to Scale

¹ WY 2013 unregulated inflow volume is based on the CBRFC forecast dated 5/2/13. Percent of average inflow is based on the 30-year period of record from 1981-2010.

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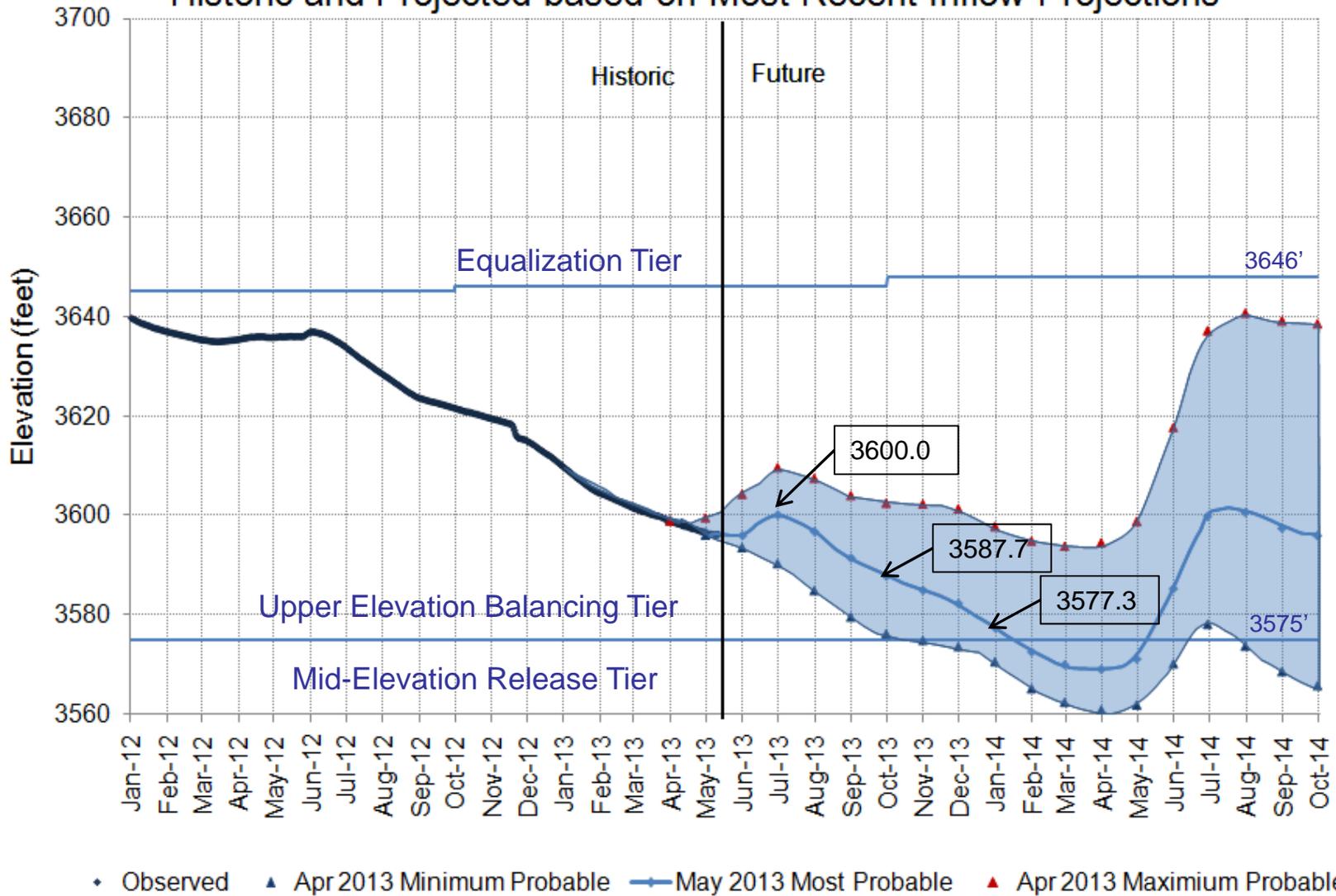
Lake Powell Monthly Release Volume Distribution

May 2013 24-Month Study



Lake Powell Elevations

Historic and Projected based on Most Recent Inflow Projections



Glen Canyon Power Plant Planned Unit Outage Schedule for Water Year 2013

Unit Number	Oct 2012	Nov 2012	Dec 2012	Jan 2013	Feb 2013	Mar 2013	Apr 2013	May 2013	Jun 2013	Jul 2013	Aug 2013	Sep 2013
1												
2												
3												
4												
5												
6												
7												
8												
Units Available	5	8 7	7	7	5	5 6	6	5	6	6	6	5
Capacity (cfs)	19,500	25,200 21,700	21,800	21,600	14,800	14,900 18,600	18,600	14,700	18,000	18,000	18,000	14,500
Capacity (kaf/month)	1310	1380	1290	1290	920	1090	1110	980	1070	1110	1120	920
Max (kaf) ¹	--	--	--	--	--	--	--	600	800	850	800	600
Most (kaf) ²	494	730	801	801	600	600	551	600	800	850	800	600
Min (kaf) ¹	--	--	--	--	--	--	--	600	800	850	800	600

(updated 5-15-2013)

1 Based on Apr 2013 Min / Max probable 24-Month Study

2 Based on May 2013 Most probable 24-Month Study

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Glen Canyon Power Plant Provisional Unit Outage Schedule for Water Year 2014

Unit Number	Oct 2013	Nov 2013	Dec 2013	Jan 2014	Feb 2014	Mar 2014	Apr 2014	May 2014	Jun 2014	Jul 2014	Aug 2014	Sep 2014
1												
2												
3												
4												
5												
6												
7												
8												
Units Available	5 6	6	6	6	4	5 6	6	5 6	6	6	6	5
Capacity (cfs)	14,500 17,900	17,900 ³	17,900	17,900	11,300	14,400 17,900	17,900	14,400 17,900	17,900	18,000	18,000	14,700
Capacity (kaf/month)	1030	1070	1100	1100	710	1000	1040	1000	1090	1110	1110	950
Max (kaf) ¹	600	600	800	800	600	600	600	600	650	850	900	630
Most (kaf) ²	600	600	800	800	600	600	600	600	650	850	900	630
Min (kaf) ¹	480	500	600	800	600	600	500	600	600	800	800	600

(updated 5-15-2013)

- 1 Based on Apr 2013 Min/Max probable 24-Month Study
- 2 Based on May 2013 Most probable 24-Month Study
- 3 Total release during a HFE = Capacity +15,000 cfs of bypass
(e.g., Nov 2013 Total Possible Release = ~32,900 cfs)

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Lower Colorado River Basin

Hydrology and Operations

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Colorado River Basin Storage (as of May 27, 2013)

Current Storage	Percent Full	MAF	Elevation (Feet)
Lake Powell	48%	11.60	3,598.5
Lake Mead	48%	12.57	1,109.2
Total System Storage*	52%	31.17	NA

*Total system storage was 36.78 maf or 62% this time last year

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Lake Powell & Lake Mead Operational Table

Operational Tiers for 2013 based on August 2012 24-Month Study Projections

Lake Powell			Lake Mead		
Elevation (feet)	Operation According to the Interim Guidelines	Live Storage (maf) ¹	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	1,220	Flood Control Surplus or Quantified Surplus Condition Deliver > 7.5 maf	25.9
3,636 - 3,666 (2008-2026)	Upper Elevation Balancing Tier³ Release 8.23 maf;	15.5 - 19.3 (2008-2026)	1,200 (approx.) ²	Domestic Surplus or ICS Surplus Condition Deliver > 7.5 maf	22.9 (approx.) ²
	3,614.89		1,145	1,119.14	15.9
	1/1/13 Projection			Normal or ICS Surplus Condition Deliver ≥ 7.5 maf	
3,575	if Lake Mead < 1,075 feet, balance contents with a min/max release of 7.0 and 9.0 maf	9.5	1,105	1/1/13 Projection	11.9
	Mid-Elevation Release Tier Release 7.48 maf; if Lake Mead < 1,025 feet, release 8.23 maf		1,075	Shortage Condition Deliver 7.167 ⁴ maf	9.4
3,525		5.9	1,050	Shortage Condition Deliver 7.083 ⁵ maf	7.5
	Lower Elevation Balancing Tier Balance contents with a min/max release of 7.0 and 9.5 maf		1,025	Shortage Condition Deliver 7.0 ⁶ maf Further measures may be undertaken ⁷	5.8
3,490		4.0	1,000		4.3
3,370		0	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

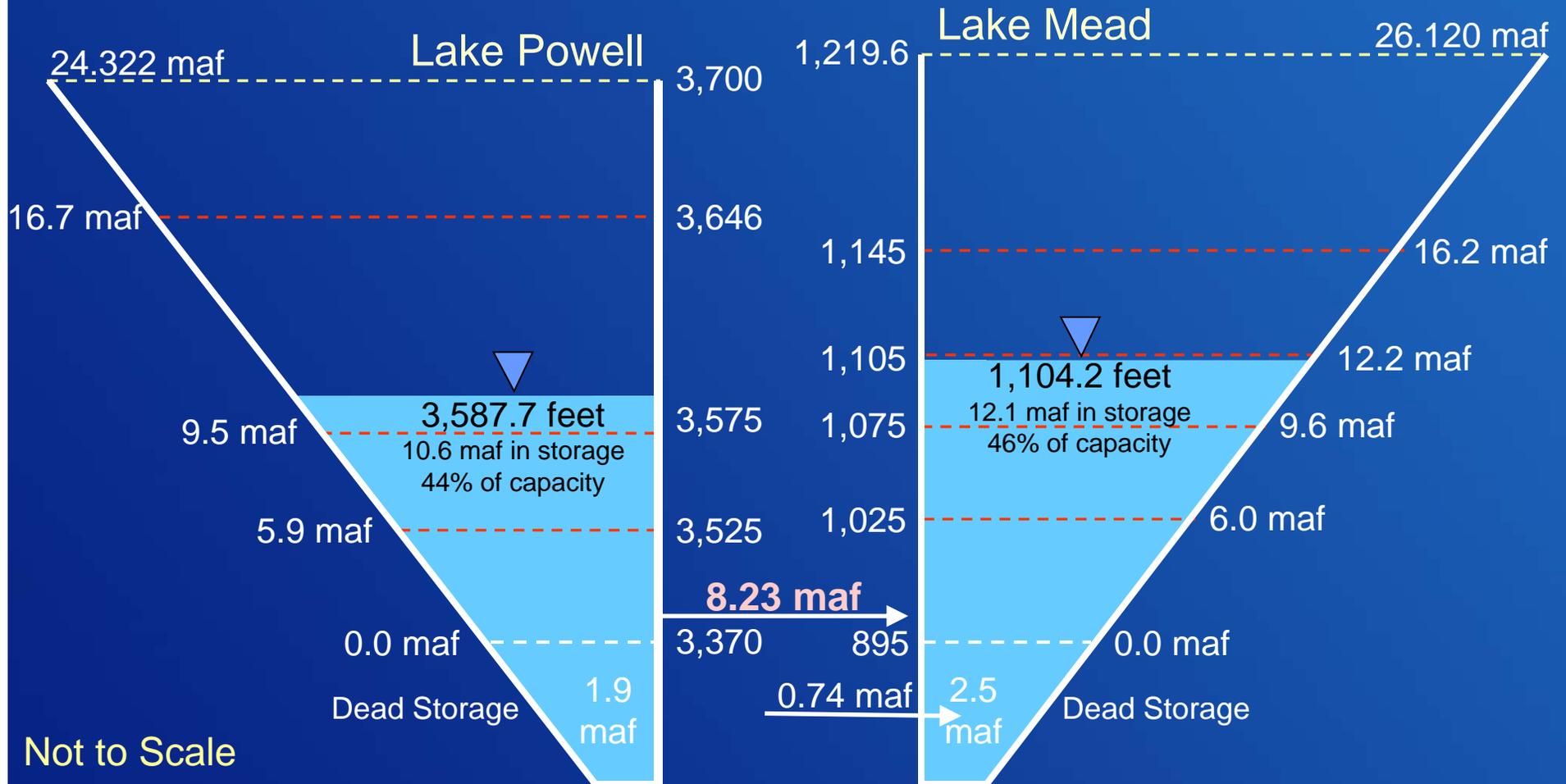
⁷ Whenever Lake Mead is below elevation 1,025 feet, the Secretary shall consider whether hydrologic conditions together with anticipated deliveries to the Lower Division States and Mexico is likely to cause the elevation at Lake Mead to fall below 1,000 feet. Such consideration, in consultation with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

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Water Year 2013 Projections

May 2013 24-Month Study Most Probable Inflow Scenario

Projected Unregulated Inflow into Powell¹ = 4.84 maf (45% of average)



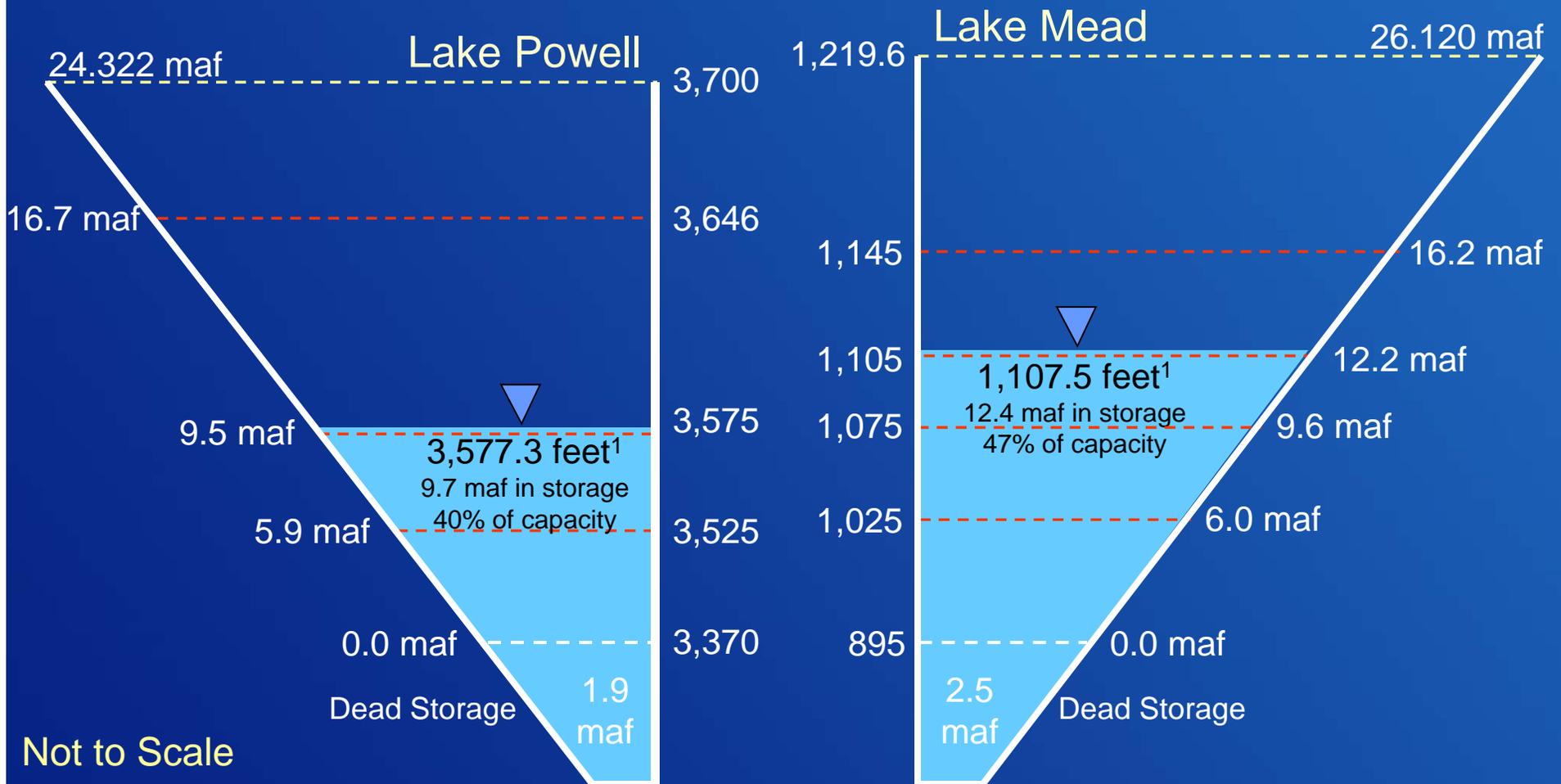
Not to Scale

¹ WY 2013 unregulated inflow volume is based on the CBRFC forecast dated 5/2/13. Percent of average inflow is based on the 30-year period of record from 1981-2010.

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End of Calendar Year 2013 Projections

May 2013 24-Month Study Most Probable Inflow Scenario

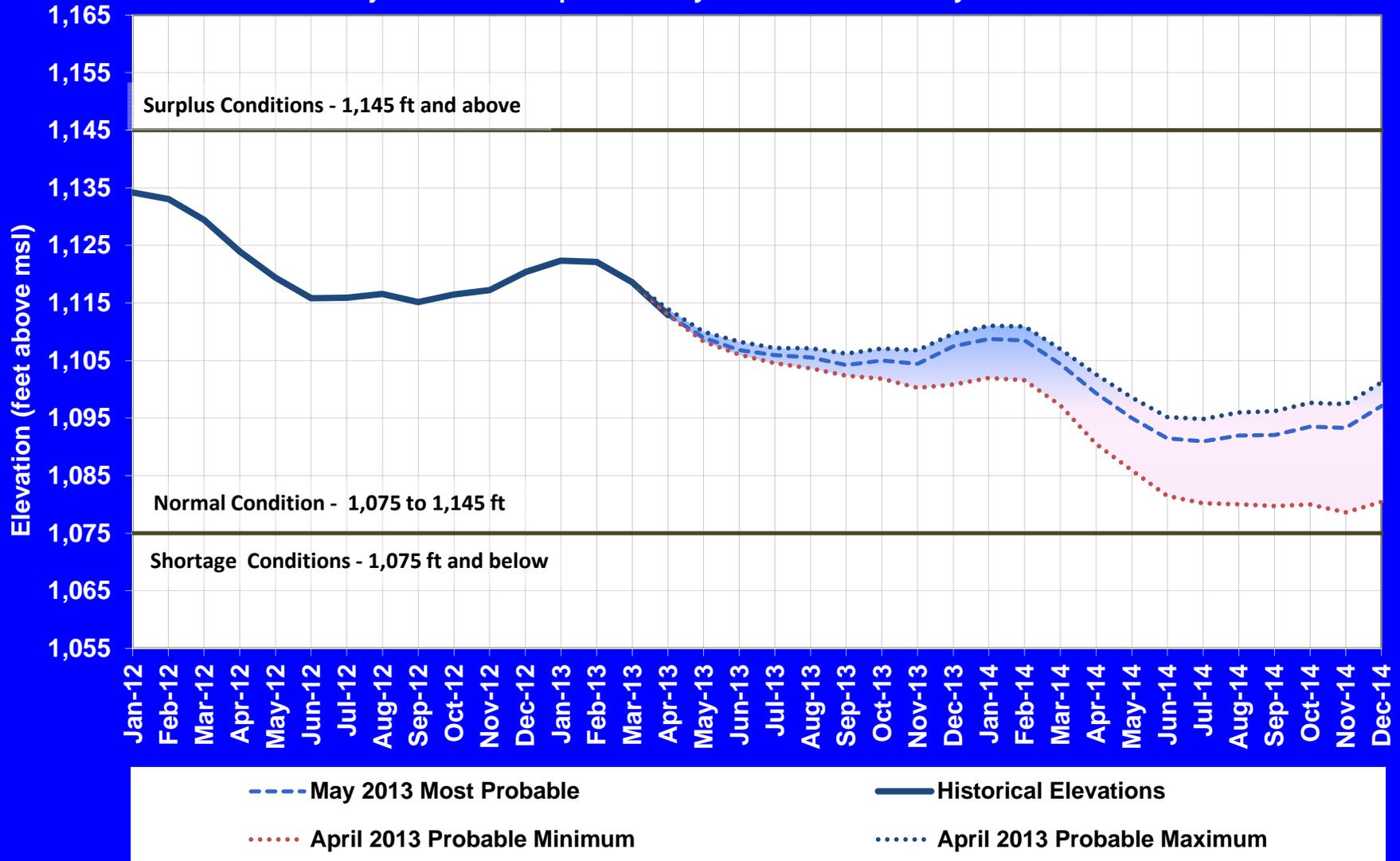


Not to Scale

¹ Based on an 8.23 maf release pattern from Lake Powell in Water Year 2014.

Lake Mead End of Month Elevations

Projections from April and May 2013 24-Month Study Inflow Scenarios



Lower Basin Side Inflows – WY/CY 2013^{1,2}

Intervening Flow from Glen Canyon to Hoover Dam

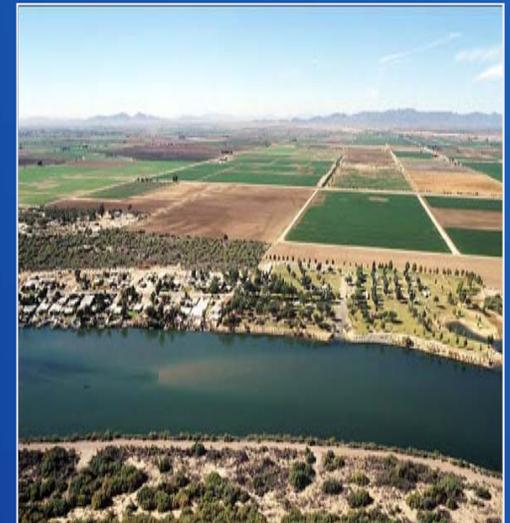
Month in WY/CY2013		5-Year Average Intervening Flow (KAF)	Observed Intervening Flow (KAF)	Observed Intervening Flow (% of Average)	Difference From 5-Year Average (KAF)
H I S T O R Y	October 2012	54	54	98%	-1
	November 2012	44	60	136%	+16
	December 2012	99	50	50%	-49
	January 2013	81	56	69%	-25
	February 2013	94	68	73%	-26
	March 2013	77	69	89%	-8
	April 2013	80	38	48%	-42
F U T U R E	May 2013	64			
	June 2013	33			
	July 2013	55			
	August 2013	109			
	September 2013	81			
	October 2013	54			
	November 2013	44			
December 2013	99				
WY 2013 Totals		870	735	84%	-135
CY 2013 Totals		870	769	88%	-101

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 2008-2012.

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 March 2013 was 28,602 AF at 2,650 ppm
- Provisional drainage Flows to the Colorado River
 - From the South Gila Drainage Wells January through April 30, 2013 was 14,207 AF at 1,740 ppm
 - From the Yuma Mesa Conduit January through April 30, 2013 was 5,492 AF at 1,890 ppm



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An aerial photograph of a large concrete dam with a reservoir behind it, set in a rugged, mountainous landscape. The water in the reservoir is a deep blue-green color. The dam has several spillways and a road on top. The surrounding terrain is rocky and sparsely vegetated.

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