

RECLAMATION

Managing Water in the West

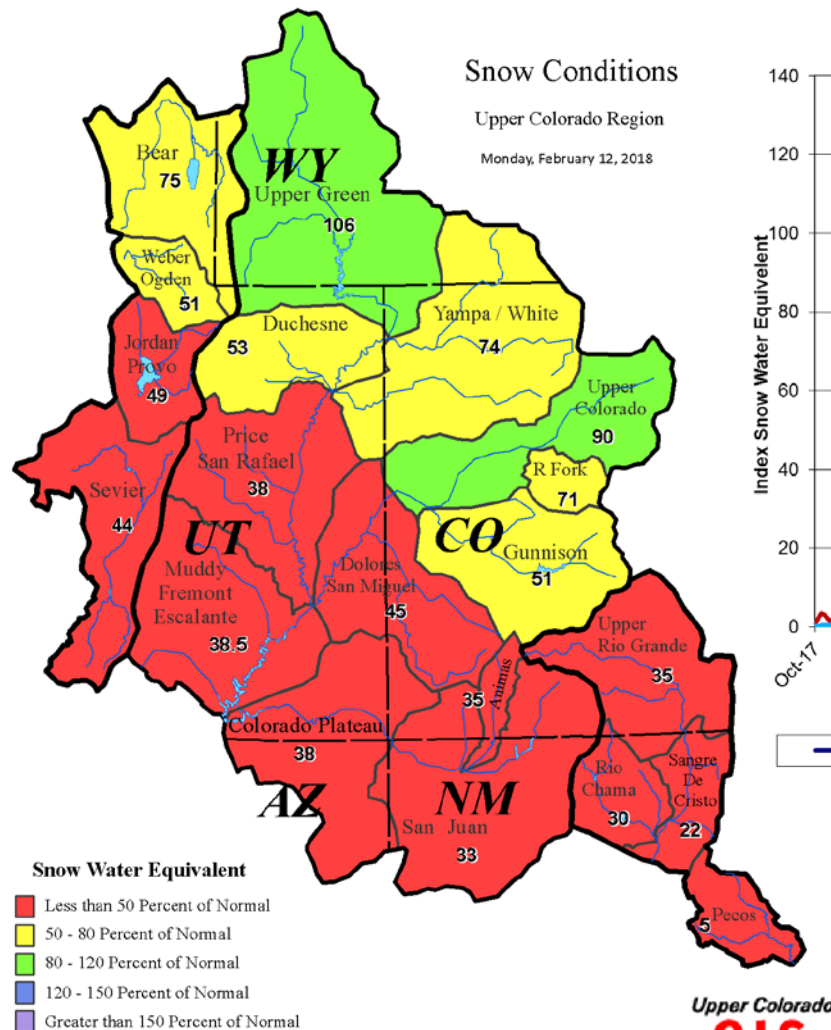
Basin Hydrology, Water Years 2018-2019 Operations

Adaptive Management Work Group
February 14, 2018



U.S. Department of the Interior
Bureau of Reclamation

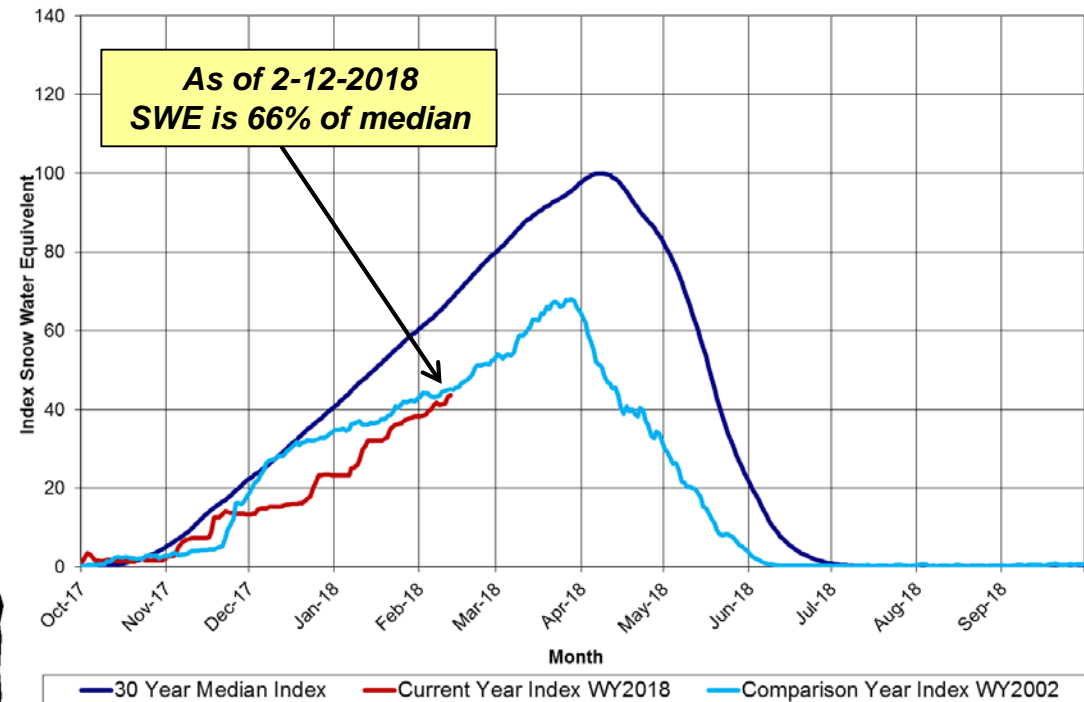
Snow Conditions



Data Provided by the Natural Resource Conservation Service

Upper Colorado
GIS
Region

Upper Colorado River Basin Snotel Tracking
Aggregate of 116 Snotel Sites above Lake Powell



Data Provided by the Natural Resource Conservation Service

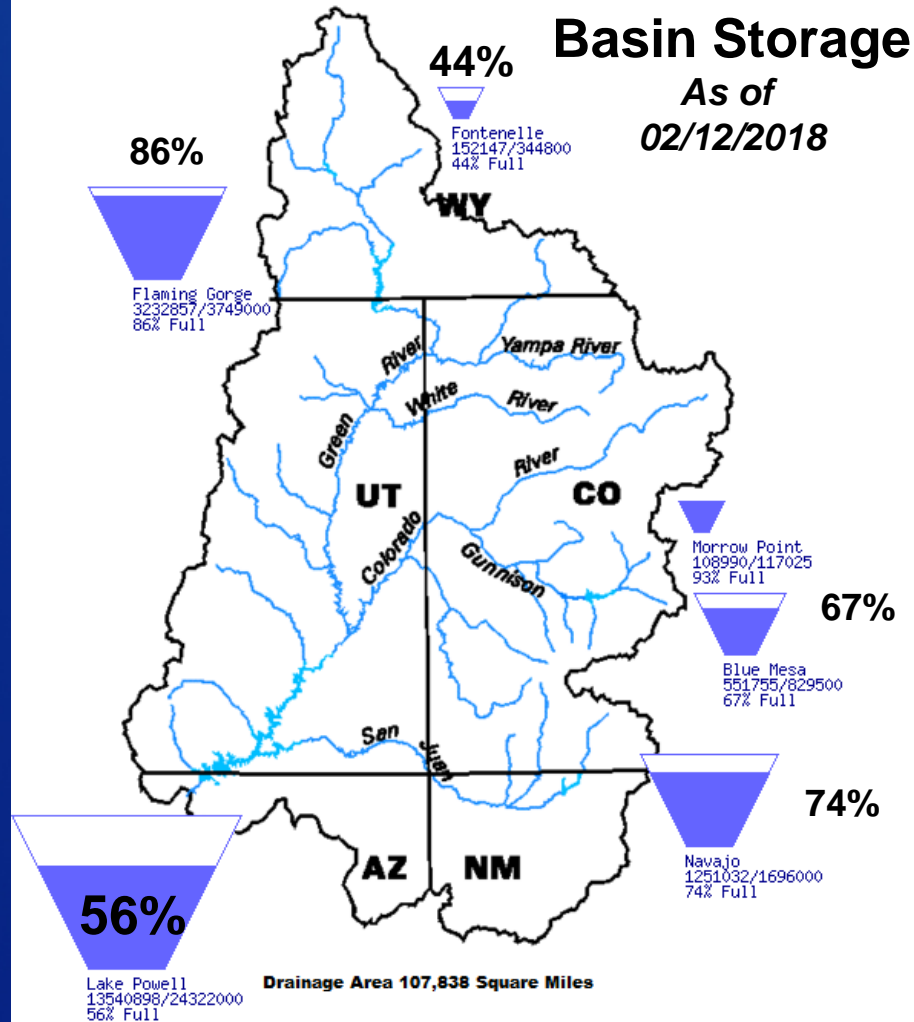
**44% of total average
seasonal accumulation
And 71% through the snow
accumulation season**

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Upper Basin Storage

Data Current as of:
02/12/2018

Upper Colorado River Drainage Basin

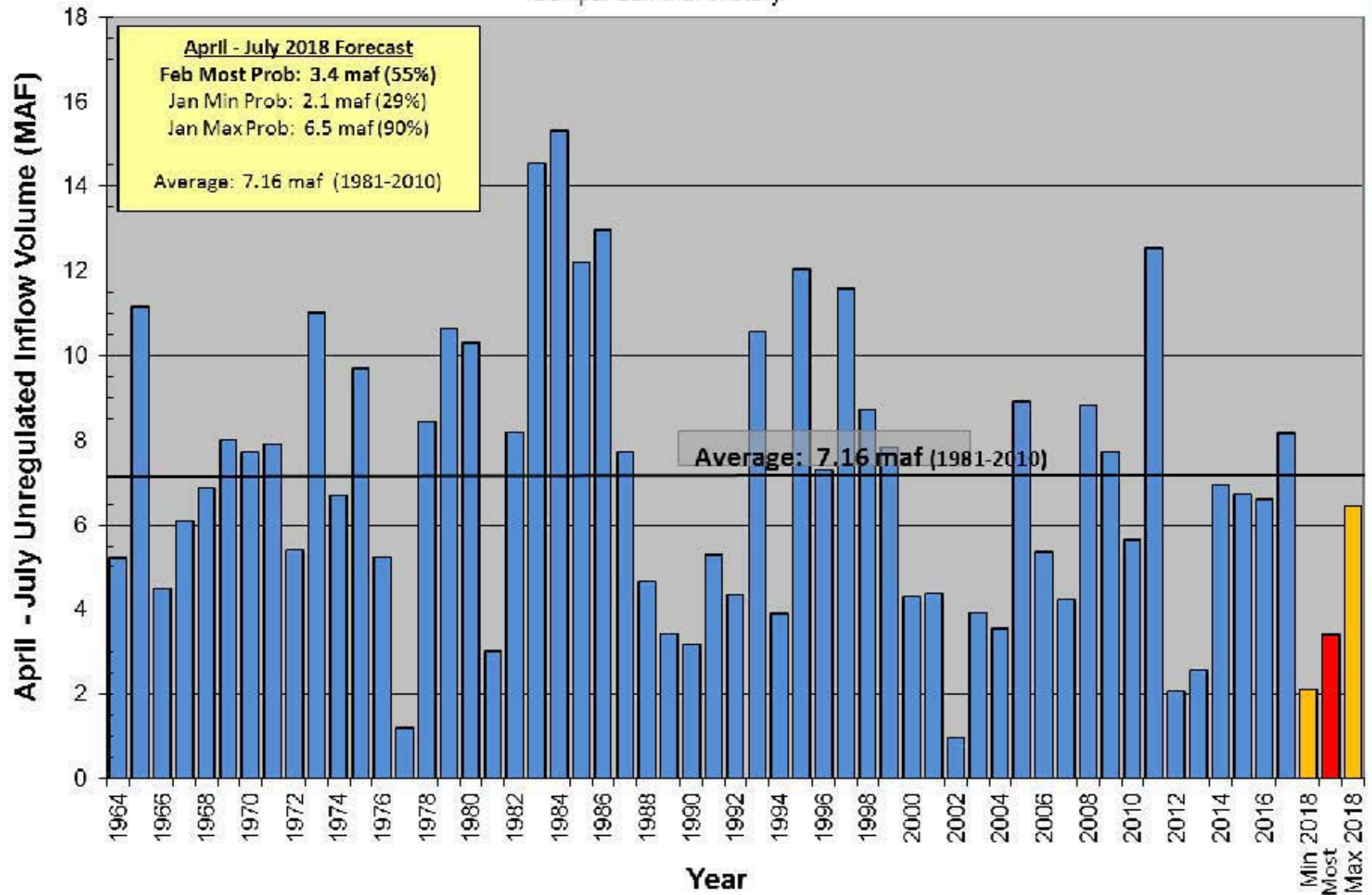


April to July 2018 Forecasted Inflow Issued February 2, 2018

Reservoir	Forecast (KAF)	Percent of Average ¹
Fontenelle	750	103%
Flaming Gorge	890	91%
Blue Mesa	400	59%
Navajo	260	35%
Powell	3,400	47%

¹ Percent of average based on 1981-2010 period.

Lake Powell Unregulated Inflow
 April - July 2018 Forecast
 Issued February 2nd
 Comparison with History



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Lake Powell 2018 Operating Tier

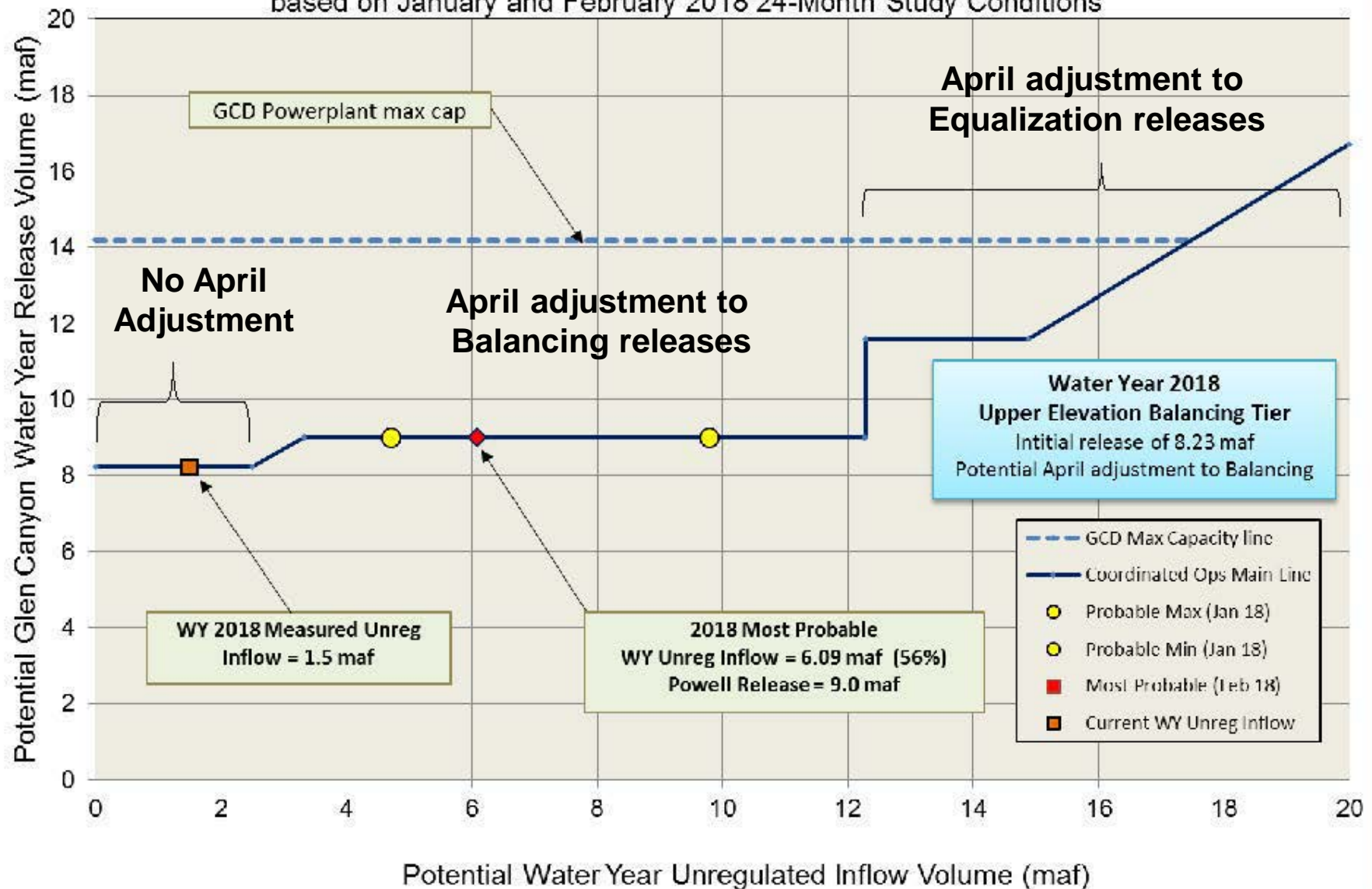
Upper Elevation Balancing

- Tier was set in August 2017
 - Start with 8.23 maf release
- Use April 24-Month Study projections of end of water year storage to potentially adjust
 1. Stay with 8.23 maf
 2. Balancing: 8.23 - 9.0 maf
 3. Equalization: > 8.23 maf

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 Tier³ 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

Potential Lake Powell Release Scenarios

Water Year 2018 Release Volume as a Function of Unregulated Inflow Volume
based on January and February 2018 24-Month Study Conditions



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Lake Powell 2018 Operating Tier Scenarios

Based on January and February 2018 modeling

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

LTEMP Monthly Release Volumes

Month	7.00	7.48	8.23	9.00	9.50	10.50	11.00	12.00	13.00	14.00
OCT	480	480	640	640	640	640	640	640	640	640
NOV	500	500	640	640	640	640	640	640	640	640
DEC	600	600	720	720	720	720	720	720	720	720
JAN	660	720	760	860	920	1040	1100	1230	1350	1470
FEB	590	640	680	750	810	920	970	1080	1190	1300
MAR	620	675	710	800	860	970	1030	1150	1260	1370
APR	550	600	640	710	760	870	920	1020	1120	1220
MAY	550	600	630	710	760	860	910	1020	1120	1220
JUN	580	630	660	750	800	910	960	1060	1170	1280
JUL	650	710	750	850	900	1020	1080	1200	1320	1440
AUG	700	760	800	900	970	1090	1160	1280	1410	1540
SEP	520	565	600	670	720	820	870	960	1060	1160

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Glen Canyon Power Plant Planned Unit Outage Schedule for Water Year 2018

Unit Number	Oct 2017	Nov 2017	Dec 2017	Jan 2018	Feb 2018	Mar 2018	Apr 2018	May 2018	Jun 2018	Jul 2018	Aug 2018	Sep 2018
1												
2												
3												
4												
5												
6												
7												
8												
Units Available	6	6/4	4/6	6	4/6	5/6	5/6	6/7	8	8	8	5
Capacity (cfs)	21,000	13,200	13,200	20,600	13,000	13,000	16,900	20,700	28,100	28,100	28,100	12,900
Capacity (kaf/month)	1,290	970	1,170	1,260	780	1,140	1,190	1,440	1,670	1,730	1,730	1,210
Max (kaf) ¹	667	630	740	860	730	800	705	705	760	860	900	670
Most (kaf) ²	640	630	740	860	730	800	705	705	760	860	900	670
Min (kaf) ¹	630	630	740	860	750	780	683	700	760	860	900	670

1 Projected release, based on Jan 2018 Min and Max Probable Inflow Projections and 24-Month Study model runs

2 Projected release, based on Feb 2018 Most Probable Inflow Projections and 24-Month Study model runs

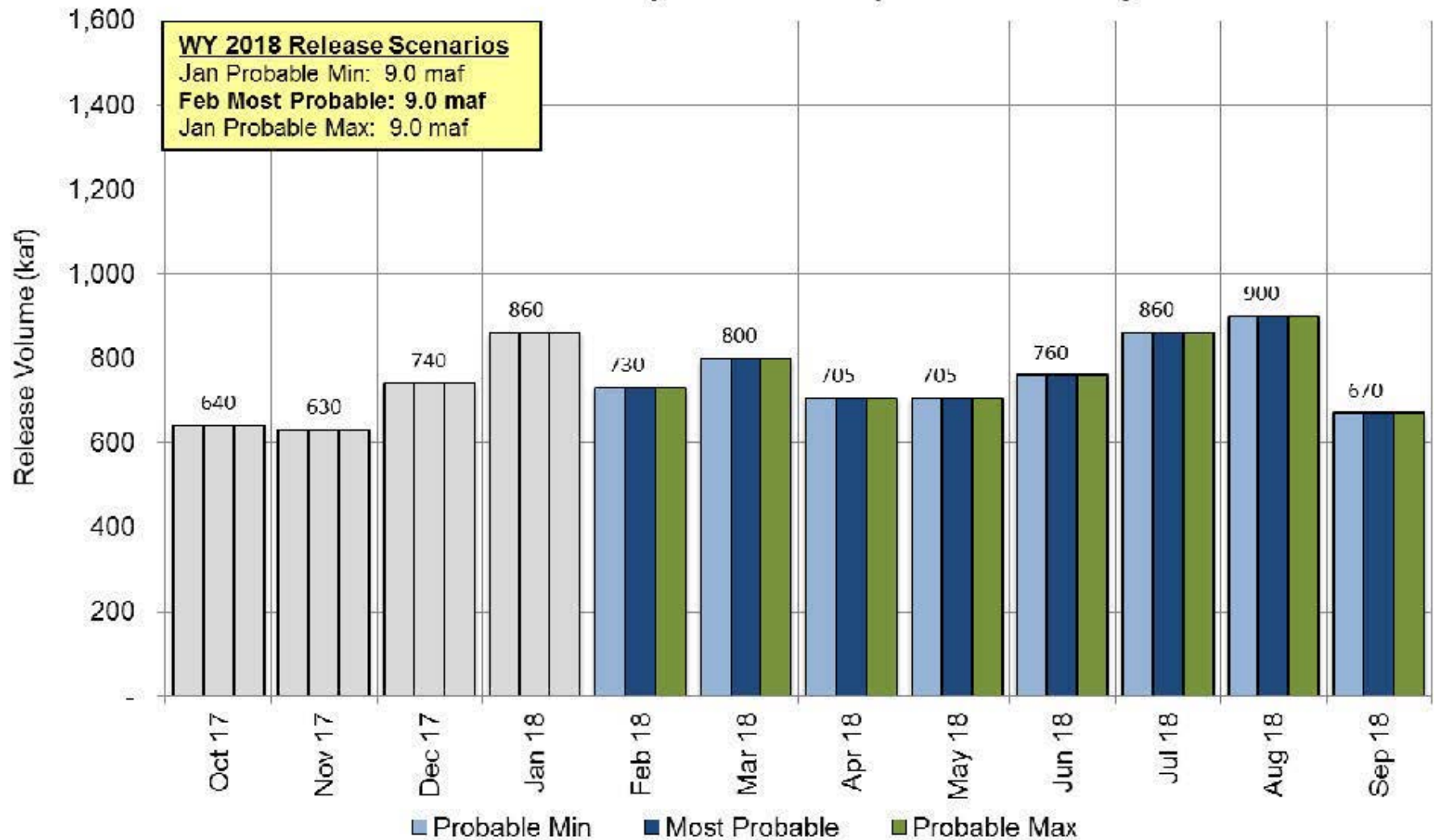
(updated 2-13-2018)

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Projected Lake Powell Monthly Release Volume Distribution

Release Scenarios for Water Year 2018

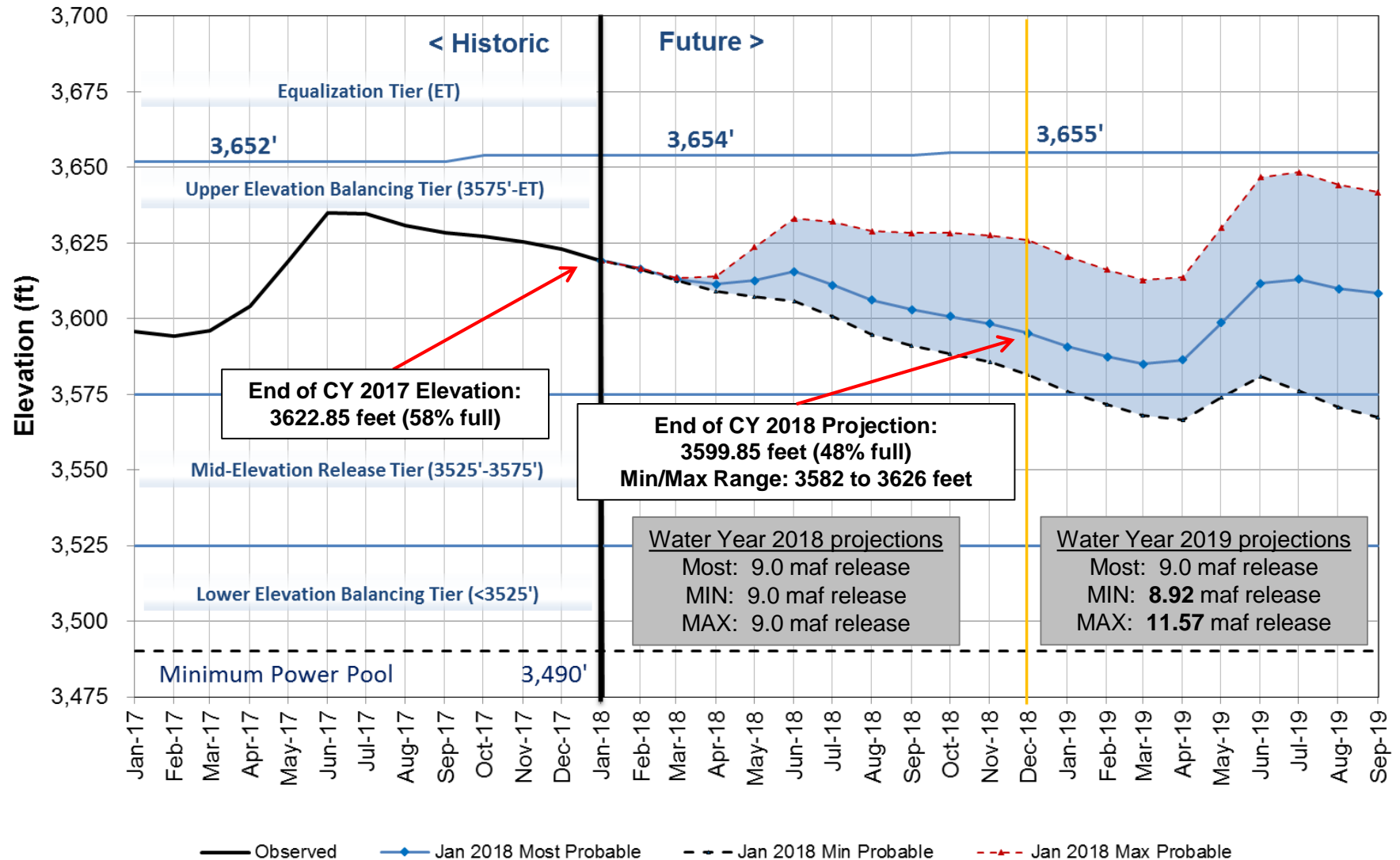
Based on January and February 2018 modeling



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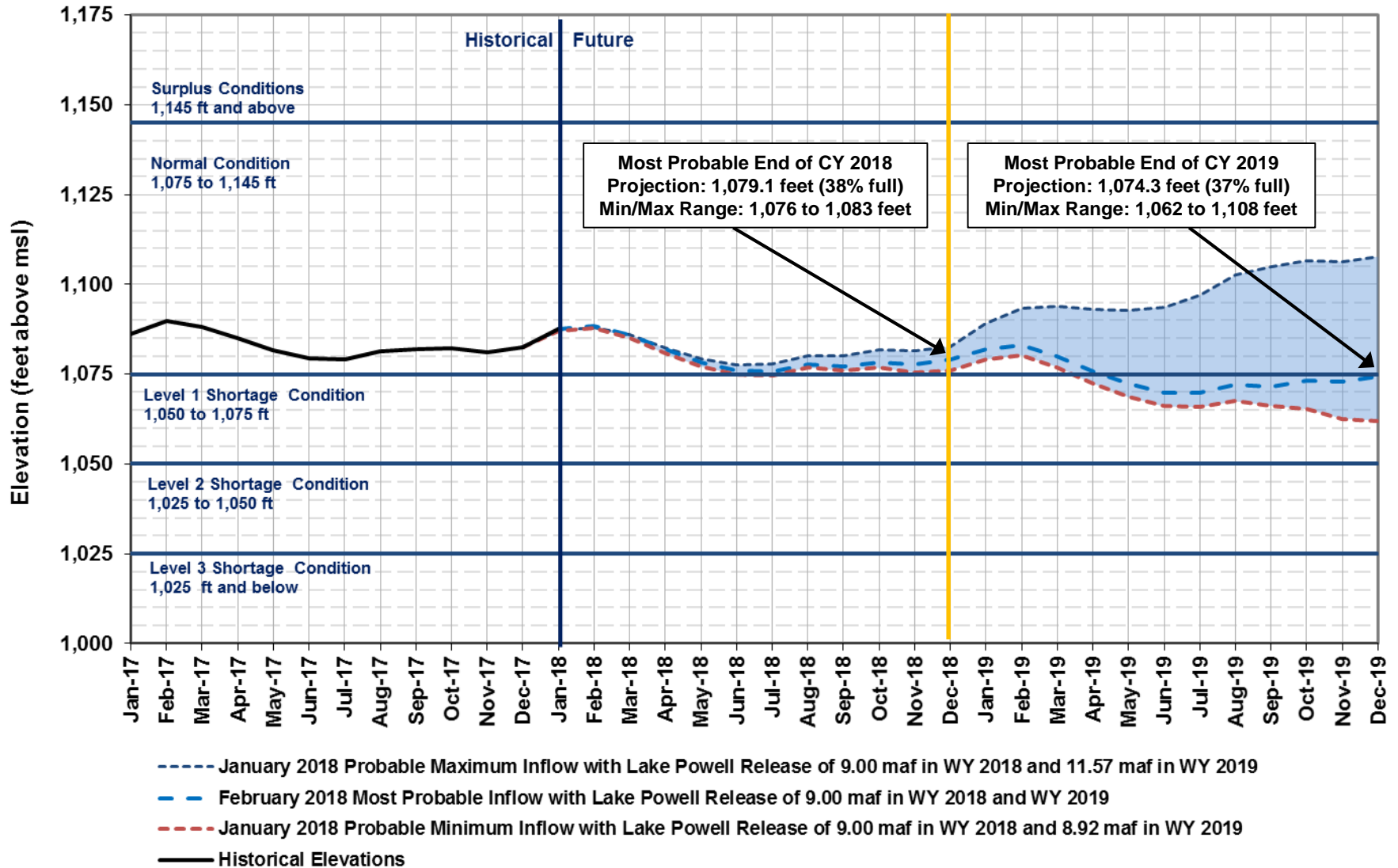
Lake Powell End of Month Elevations

Historic and Projected based on January and February 2018 Modeling



Lake Mead End of Month Elevations

Projections from January and February 2018 24-Month Study Inflow Scenarios





Water Year 2019 Projected Operations

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Lake Powell 2019 Operating Tier Scenarios

Based on January and February 2018 modeling

Inflow Scenario	Operating Tier Release Volume
Minimum Probable	Upper Elevation Balancing 8.92 maf
Most Probable	Upper Elevation Balancing 9.0 maf
Maximum Probable	Upper Elevation Balancing 11.57 maf

LTEMP Monthly Release Volumes 2019

Month	7.00	7.48	8.23	9.00	9.50	10.50	11.00	12.00	13.00	14.00
OCT	480	480	640	640	640	640	640	640	640	640
NOV	500	500	640	640	640	640	640	640	640	640
DEC	600	600	720	720	720	720	720	720	720	720
JAN	660	720	760	860	920	1040	1100	1230	1350	1470
FEB	590	640	680	750	810	920	970	1080	1190	1300
MAR	620	675	710	800	860	970	1030	1150	1260	1370
APR	550	600	640	710	760	870	920	1020	1120	1220
MAY	550	600	630	710	760	860	910	1020	1120	1220
JUN	580	630	660	750	800	910	960	1060	1170	1280
JUL	650	710	750	850	900	1020	1080	1200	1320	1440
AUG	700	760	800	900	970	1090	1160	1280	1410	1540
SEP	520	565	600	670	720	820	870	960	1060	1160

MIN & MOST

MAX

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Glen Canyon Power Plant Planned Unit Outage Schedule for Water Year 2019

Unit Number	Oct 2018	Nov 2018	Dec 2018	Jan 2019	Feb 2019	Mar 2019	Apr 2019	May 2019	Jun 2019	Jul 2019	Aug 2019	Sep 2019
1		Possible HFE										
2												
3												
4												
5												
6												
7												
8												
Units Available	6	8	6	6	6	4/6	6	7	8	8	8	6
Capacity (cfs)	20,600	28,100	20,500	20,500	20,500	13,100	20,500	24,600	28,100	28,100	28,100	20,500
Capacity (kaf/month)	1,350	1,670	1,290	1,260	1,140	1,220	1,280	1,590	1,670	1,730	1,730	1,260
Max (kaf) ¹	640	640	720	1,170	1,030	1,100	980	970	1,020	1,150	1,230	924
Most (kaf) ²	640	640	720	860	750	800	710	710	750	850	900	670
Min (kaf) ¹	640	640	720	860	750	800	710	710	750	850	850	639

11.57

9.0

8.92

¹ Projected release, based on Jan 2018 Min and Max Probable Inflow Projections and 24-Month Study model runs

² Projected release, based on Feb 2018 Most Probable Inflow Projections and 24-Month Study model runs

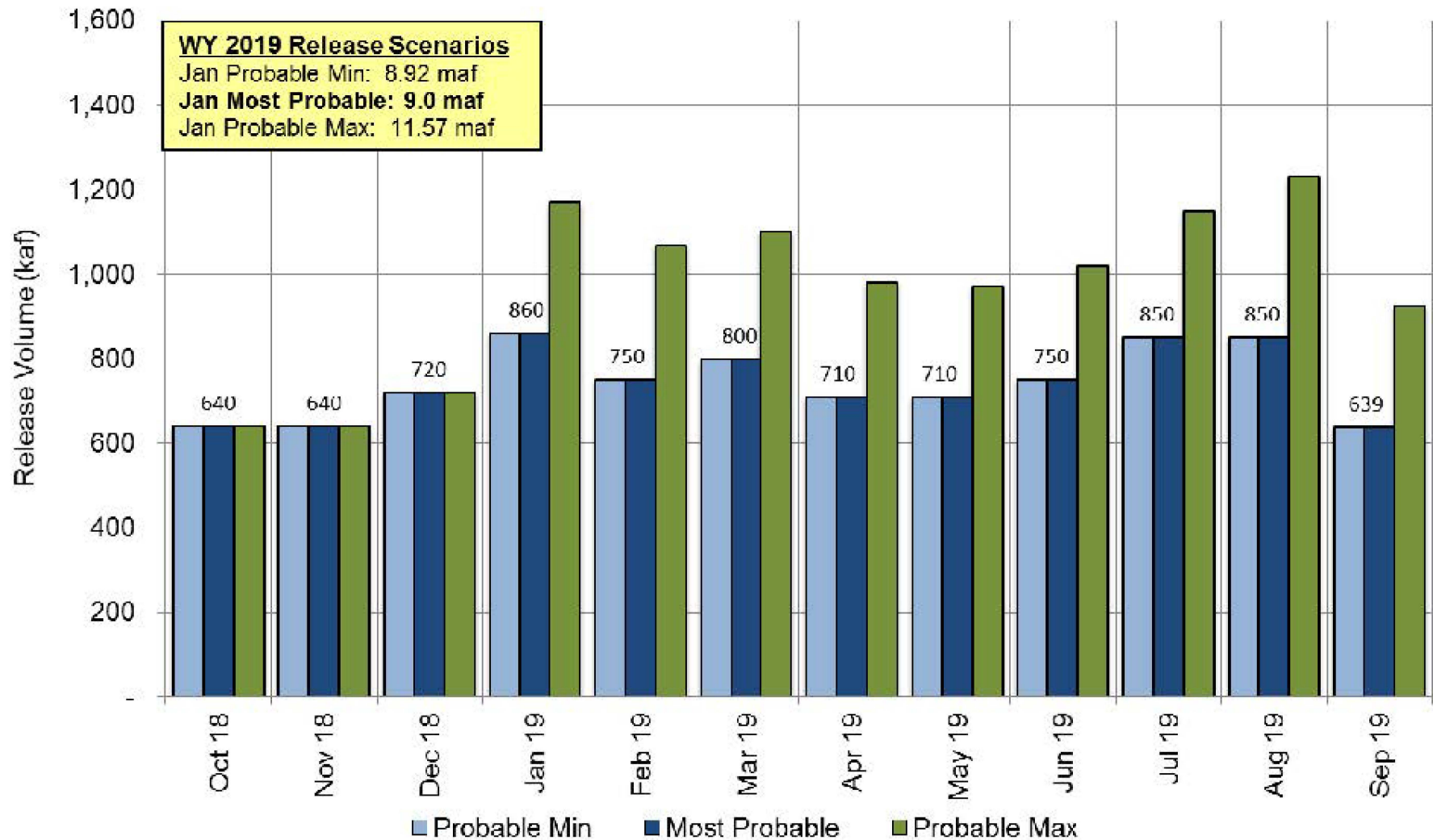
(updated 2-13-2018)

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Projected Lake Powell Monthly Release Volume Distribution

Release Scenarios for Water Year 2019

Based on January and February 2018 modeling



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Questions?

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Water Resources Group

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