

# RECLAMATION

*Managing Water in the West*

## **Basin Hydrology, Water Years 2018-2019 Operations**

**Glen Canyon Technical Work Group**  
*October 10, 2018*



U.S. Department of the Interior  
Bureau of Reclamation

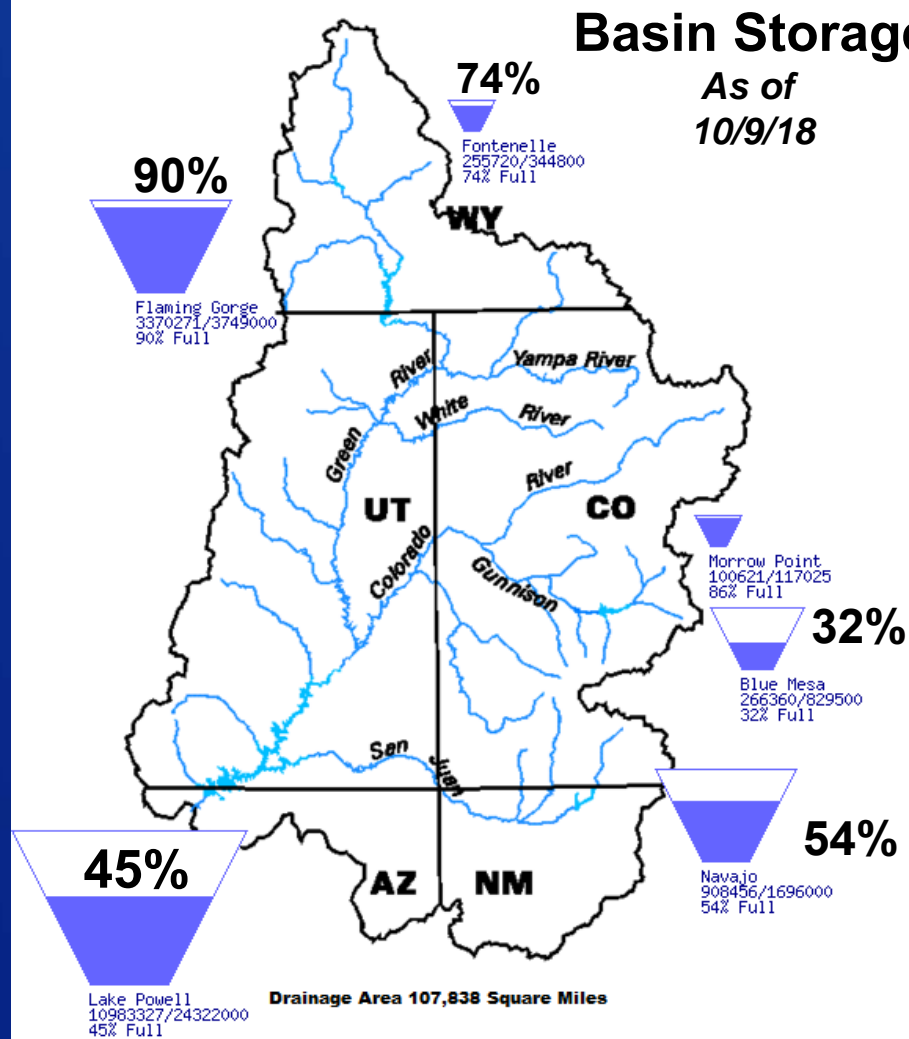
# Upper Basin Storage

Data Current as of:  
10/08/2018

## Upper Colorado River Drainage Basin

### Basin Storage

As of  
10/9/18



## Observed 2018 April-July Inflow Issued August 1, 2018

Reservoir	Observed Inflow (KAF)	Percent of Average <sup>1</sup>
Fontenelle	997	138%
Flaming Gorge	1,118	114%
Blue Mesa	238	35%
Navajo	155	21%
Powell	2,602	36%

<sup>1</sup> Percent of average based on period 1981-2010

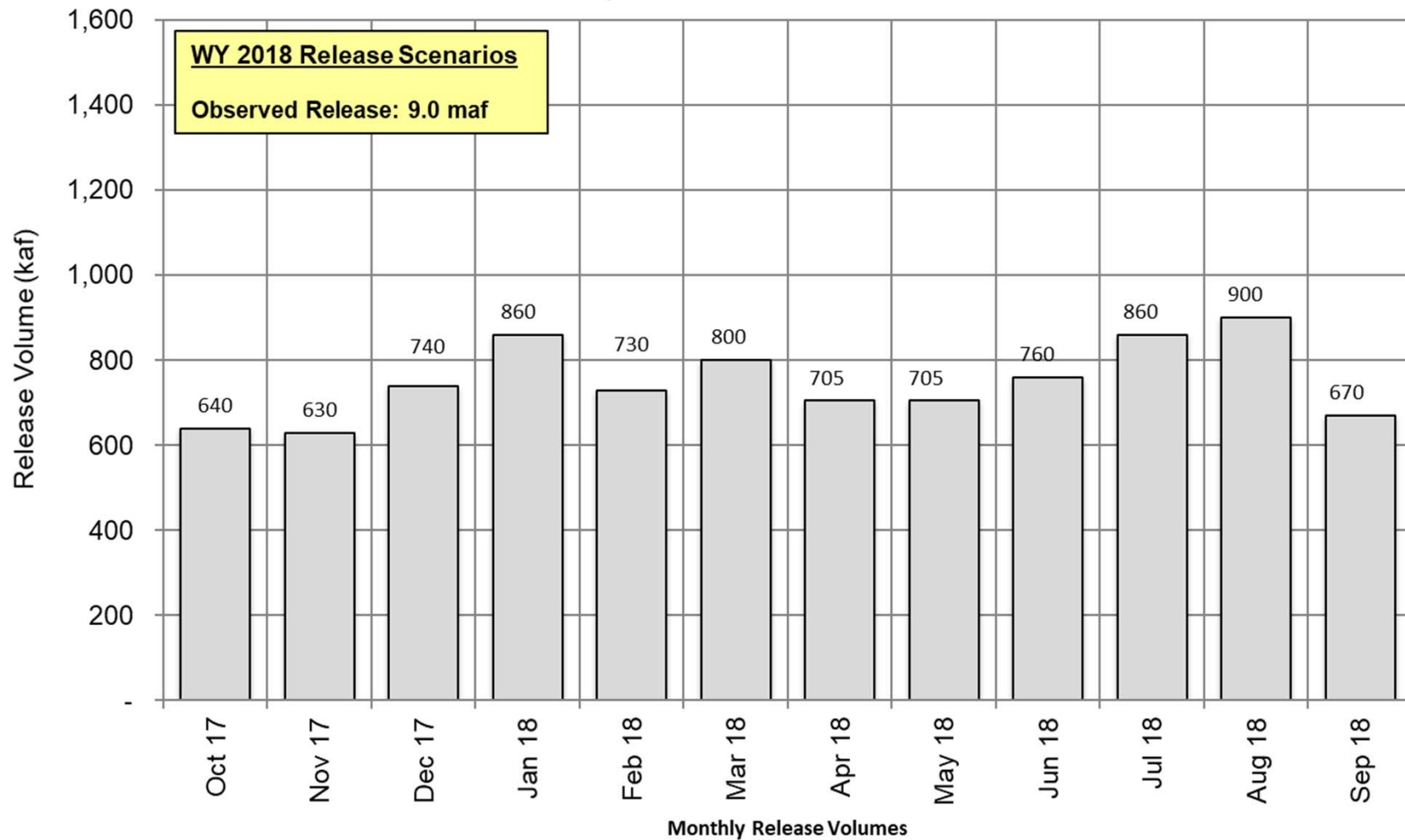
<https://www.usbr.gov/uc/water/basin/index.html>

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## Projected Lake Powell Monthly Release Volume Distribution

Release Scenarios for Water Year 2018

Updated October 2018



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# Water Year 2019 Projected Operations

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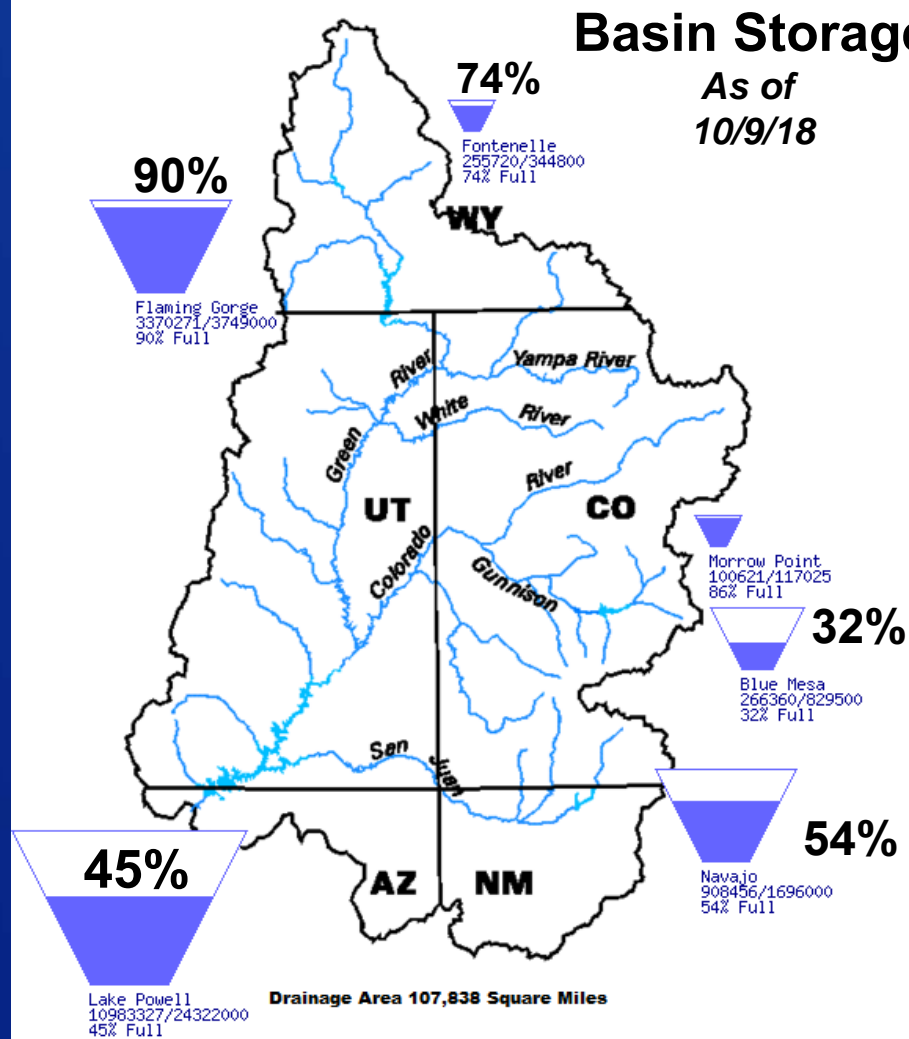
# Upper Basin Storage

Data Current as of:  
10/08/2018

## Upper Colorado River Drainage Basin

### Basin Storage

As of  
10/9/18



## CBRFC Unregulated Inflow Forecast Issued October 1, 2018

### Water Year 2019 Forecasted Inflow

Reservoir	WY Forecast (KAF)	Percent of Average <sup>1</sup>
Fontenelle	1,010	93%
Flaming Gorge	1,265	87%
Blue Mesa	725	76%
Navajo	685	64%
Powell	7,600	70%

<sup>1</sup> Percent of average based on period 1981-2010.

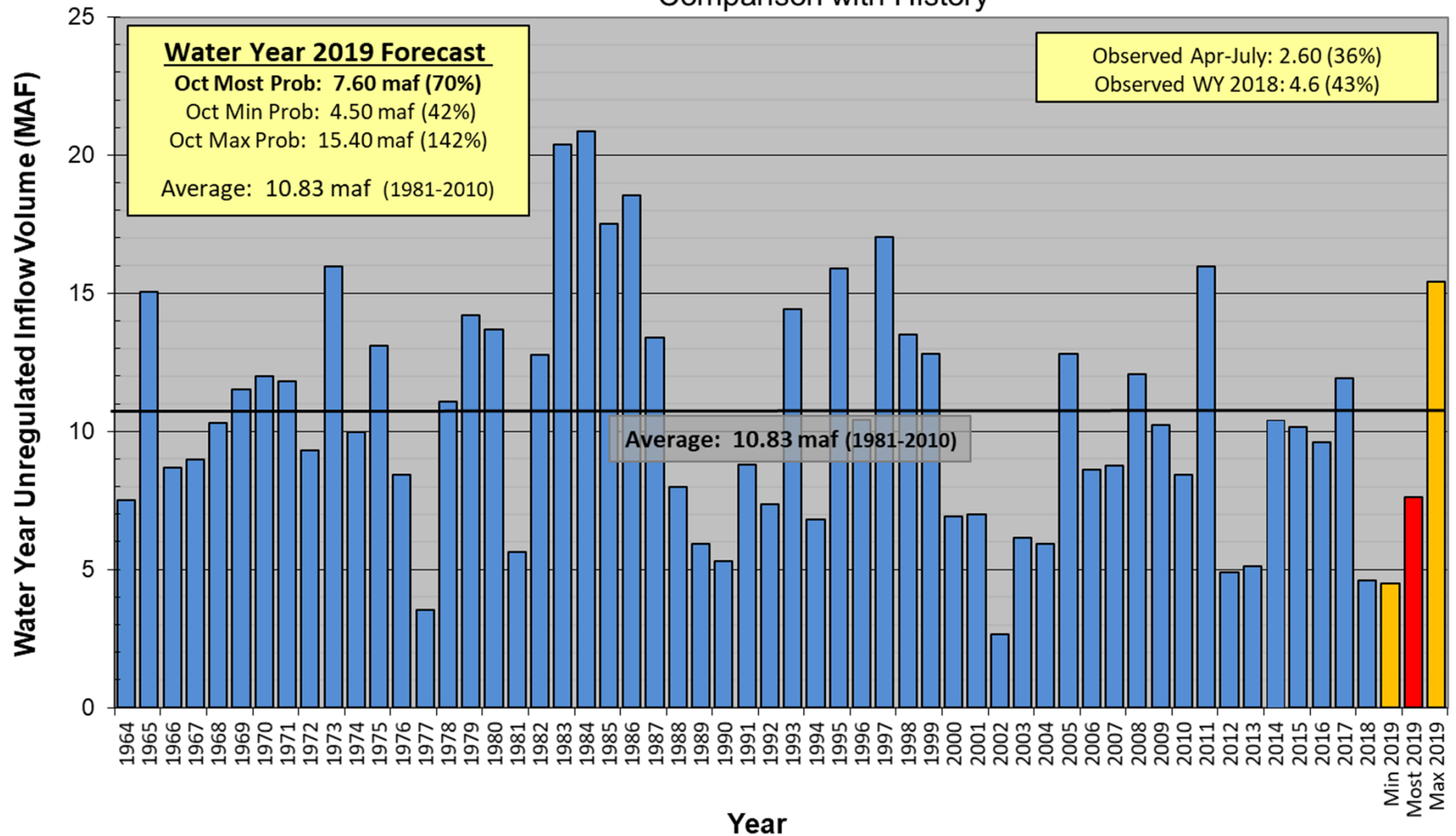
<https://www.usbr.gov/uc/water/basin/index.html>

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# Lake Powell Unregulated Inflow

## Water Year 2019 Forecast (issued October 1)

### Comparison with History



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# Lake Powell 2019 Operating Tier

## Upper Elevation Balancing

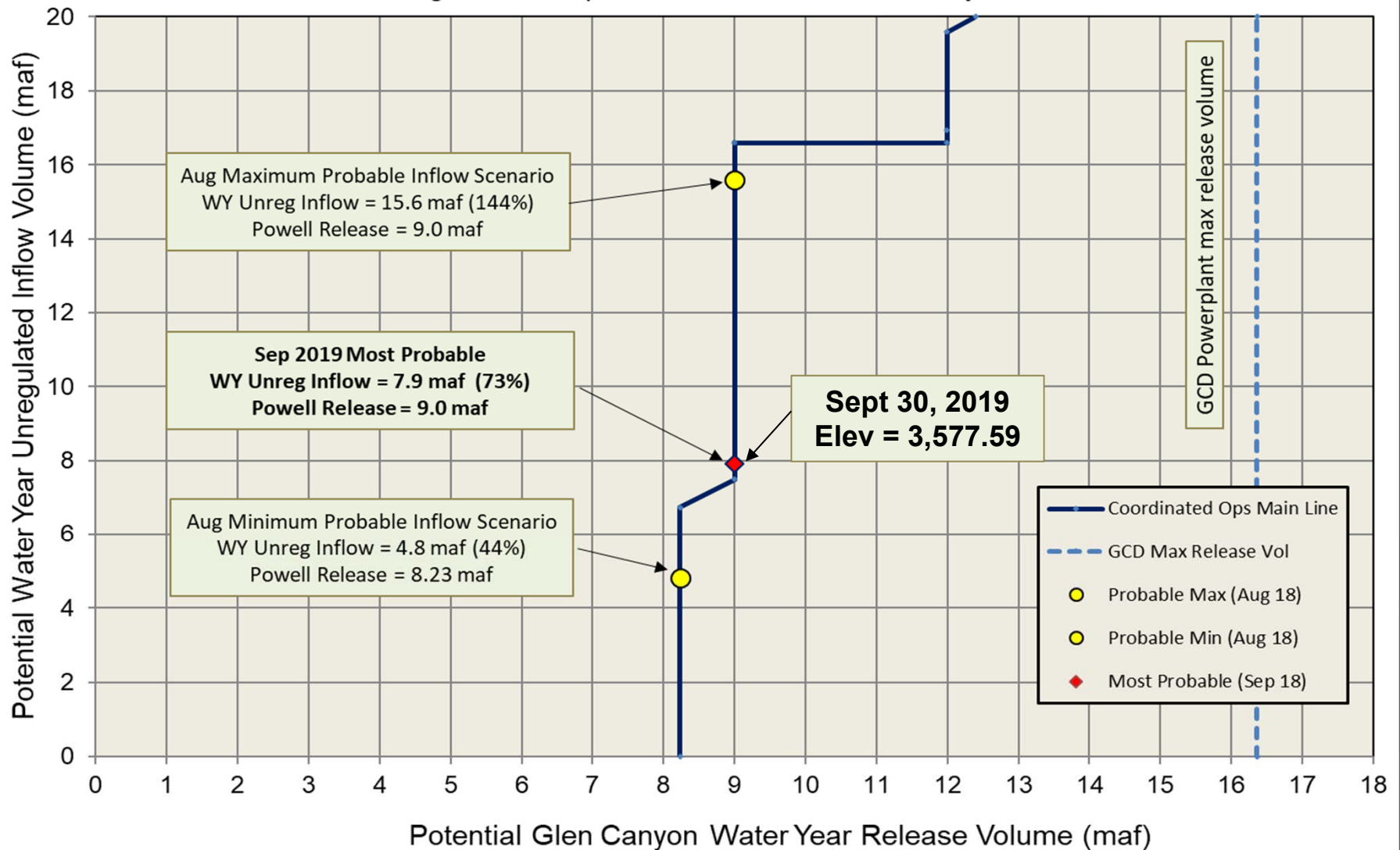
- Tier was set in August 2018
  - Start with 8.23 maf release
- Use April 24-Month Study projections of end of water year storage to potentially adjust
  1. Stay with 8.23 maf
  2. Balancing: 8.23 - 9.0 maf
  3. Equalization: > 8.23 maf

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

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## Potential Lake Powell Release Scenarios

Water Year 2019 Release Volume as a Function of Unregulated Inflow Volume  
based on August and September 2018 24-Month Study Conditions



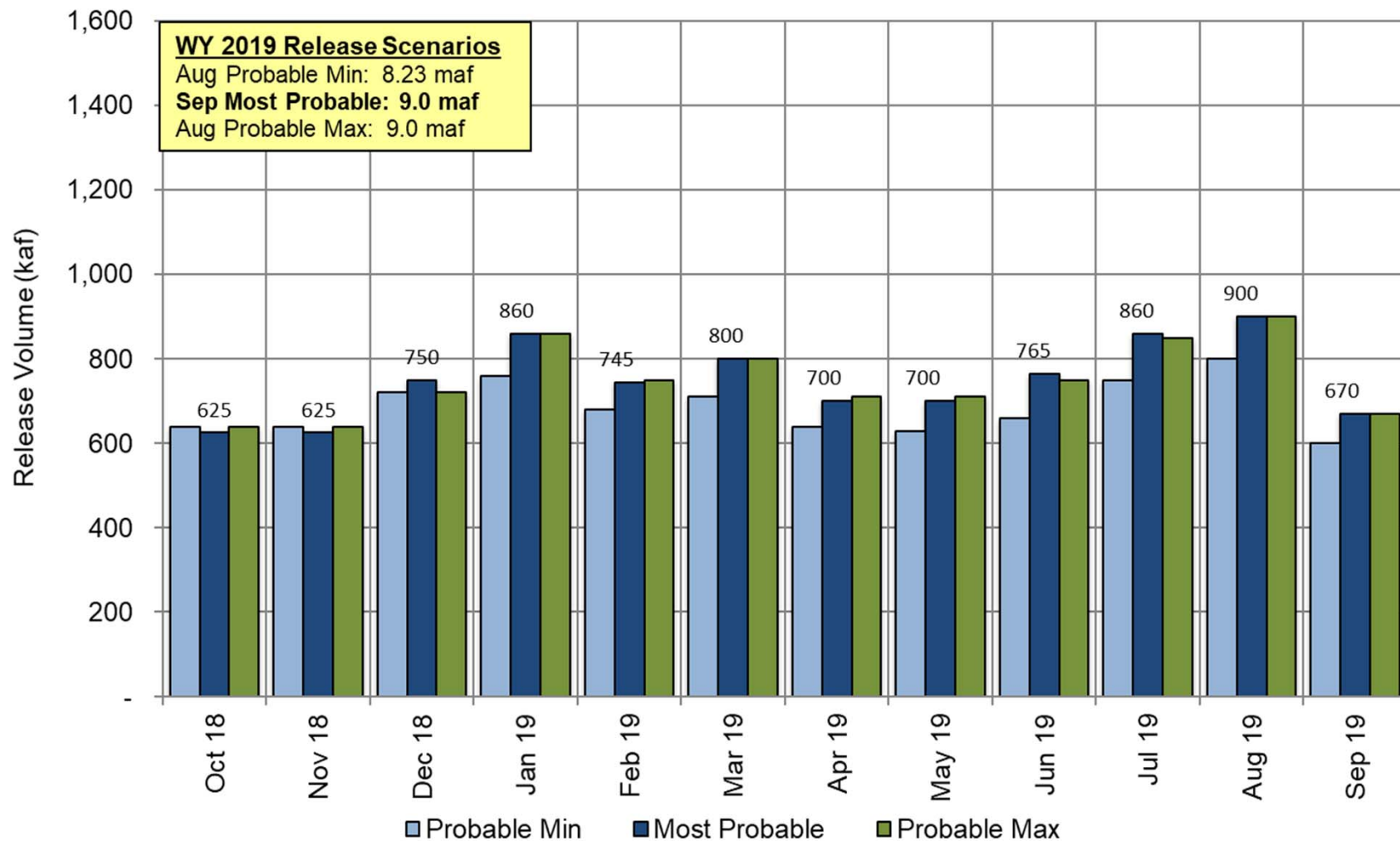
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# Projected Lake Powell Monthly Release Volume Distribution

Release Scenarios for Water Year 2019

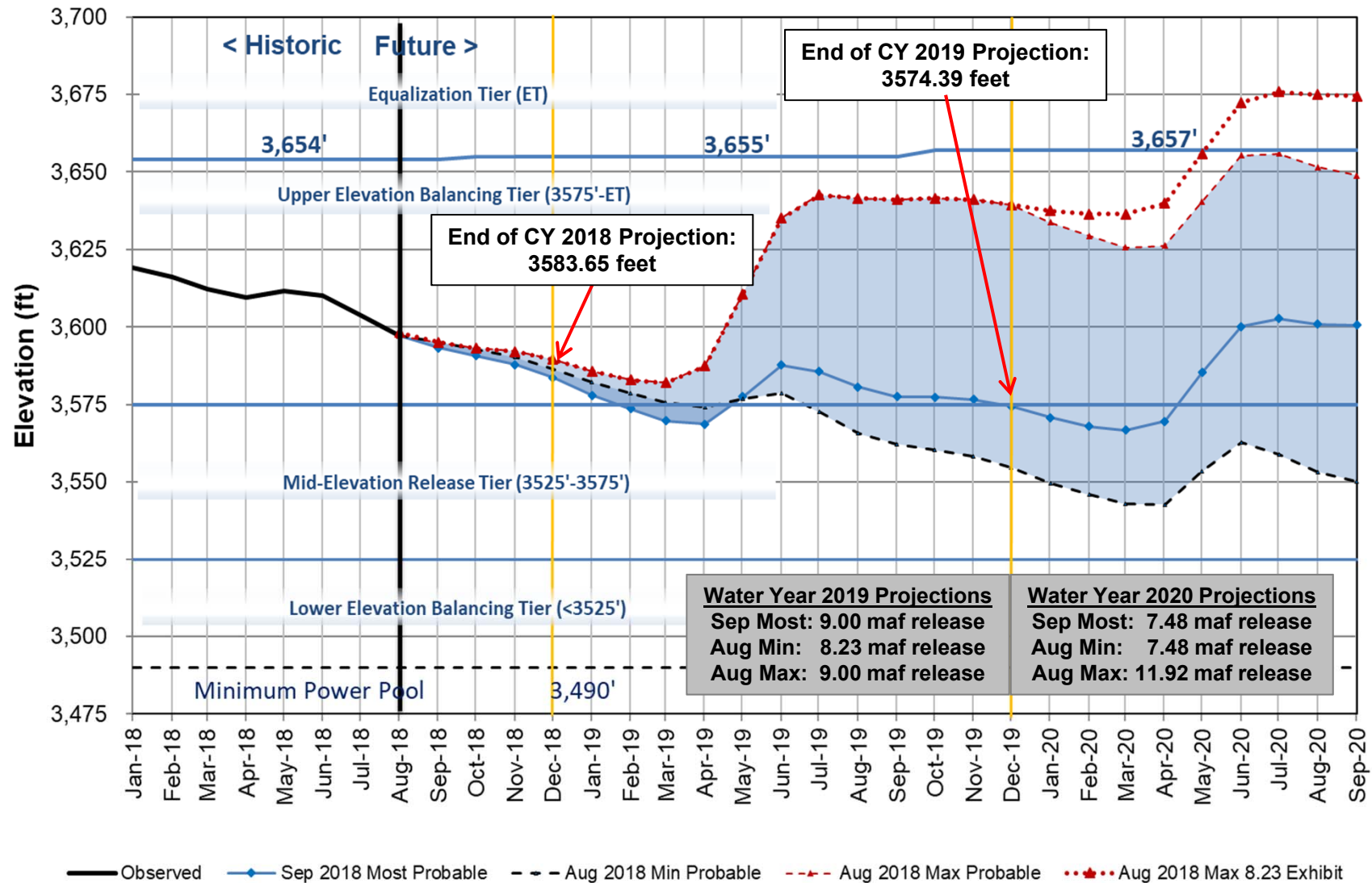
Based on September and August 2018 modeling



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# Lake Powell End of Month Elevations

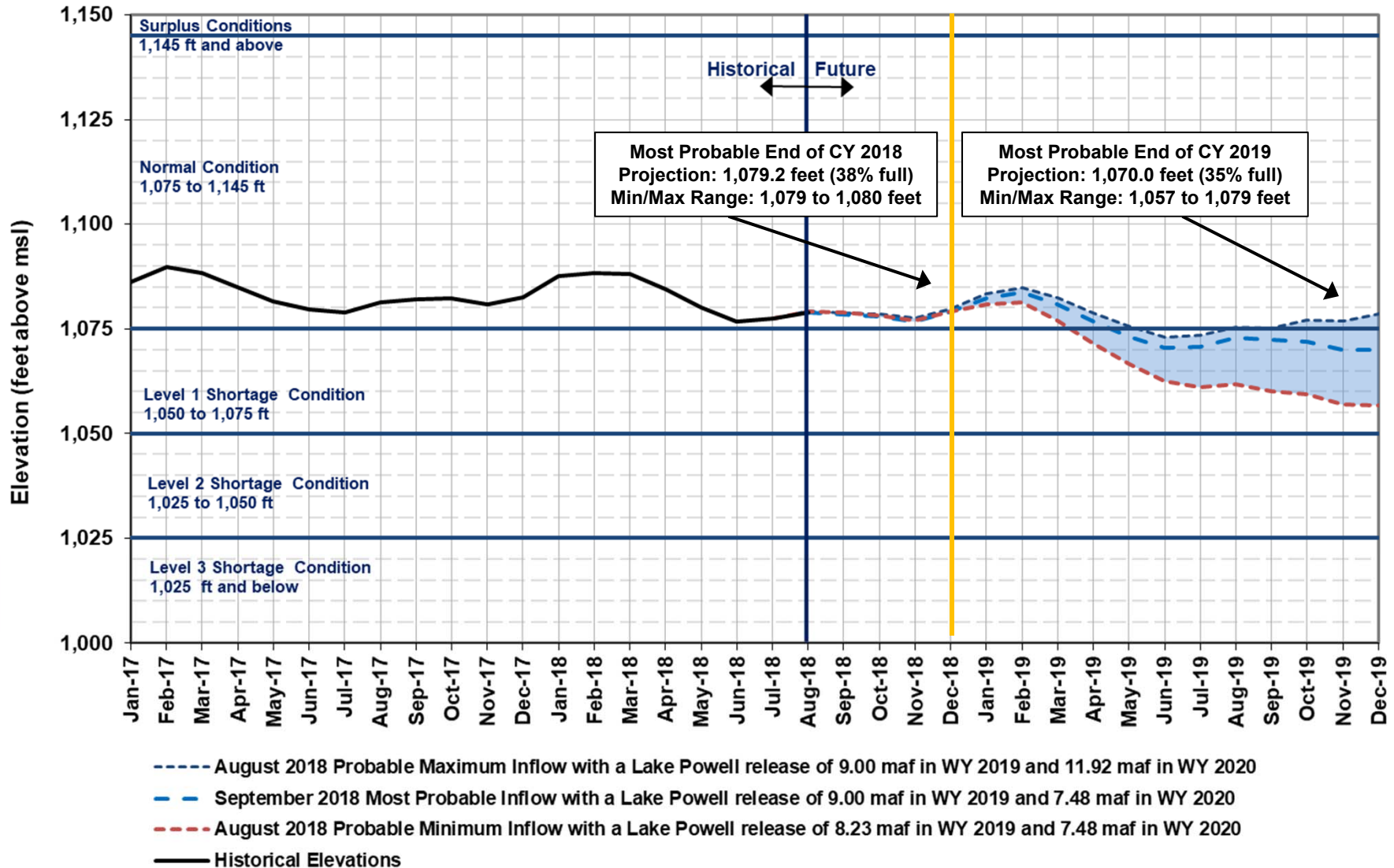
Historic and Projected based on August and September 2018 Modeling



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









# Lake Mead End of Month Elevations

Projections from the August and September 2018 24-Month Study Inflow Scenarios



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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												
2												
3		<b>Possible HFE</b>										
4												
5												
6												
7												
8												
Units Available	5	7	6	6	6	6	6	5	8	8	8	6
Capacity (cfs)	16,500	23,700	21,900	21,900	21,900	21,900	21,900	18,350	29,200	29,200	29,200	20,000
Capacity (kaf/month)	1,080	1,410	1,240	1,230	1,110	1,260	1,190	1,100	1,630	1,680	1,680	1,240
Max (kaf) <sup>1</sup>	640	640	720	860	750	800	710	710	750	850	900	670
Most (kaf) <sup>2</sup>	640	640	720	860	750	800	710	710	750	850	900	670
Min (kaf) <sup>1</sup>	640	640	720	760	680	710	640	630	660	750	800	600

**9.0**

**9.0**

**8.23**

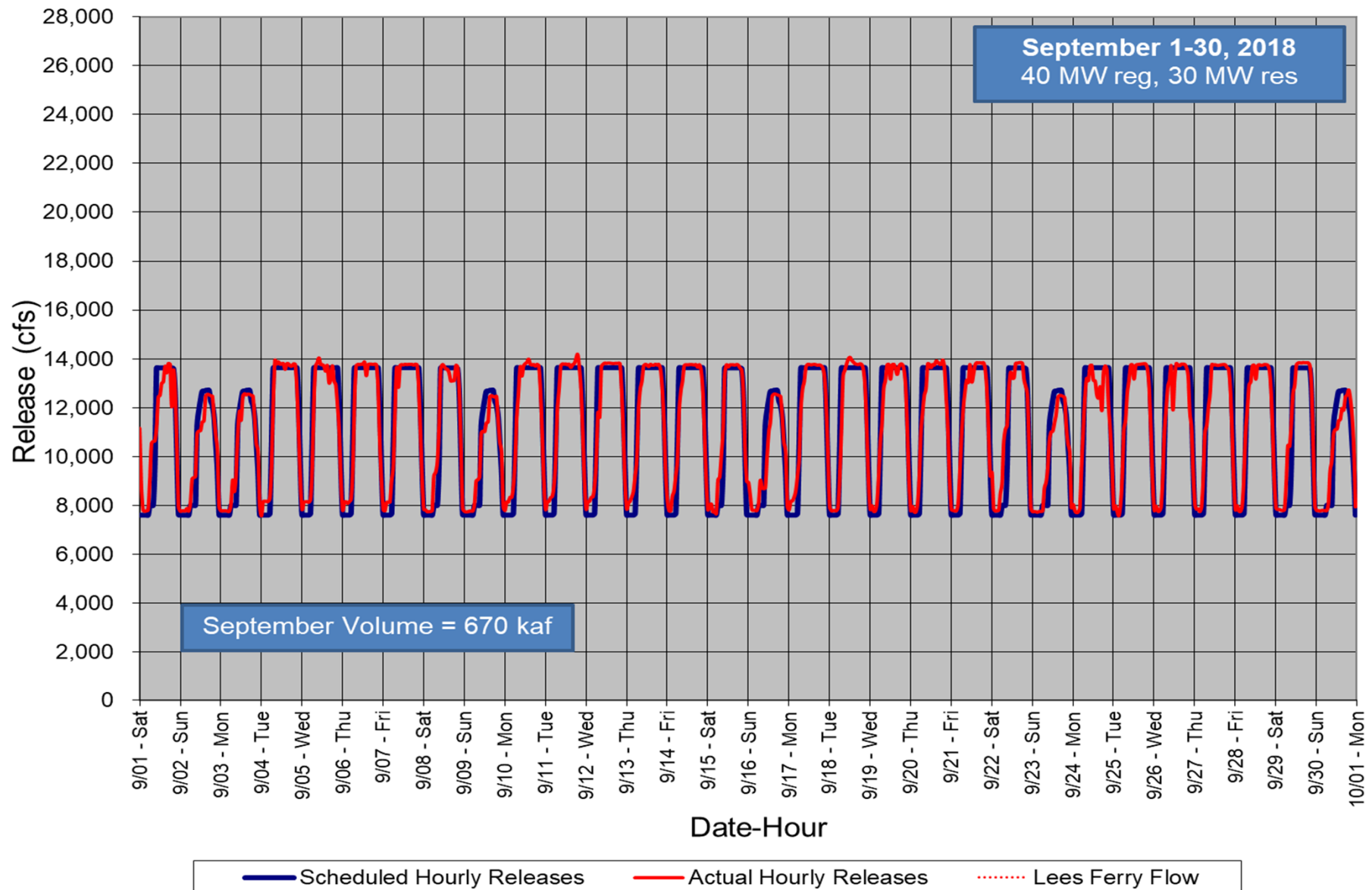
(updated 9-13-2018)

<sup>1</sup> Projected release, based on Aug 2018 Min and Max Probable Inflow Projections and 24-Month Study model runs

<sup>2</sup> Projected release, based on Aug 2018 Most Probable Inflow Projections and 24-Month Study model runs

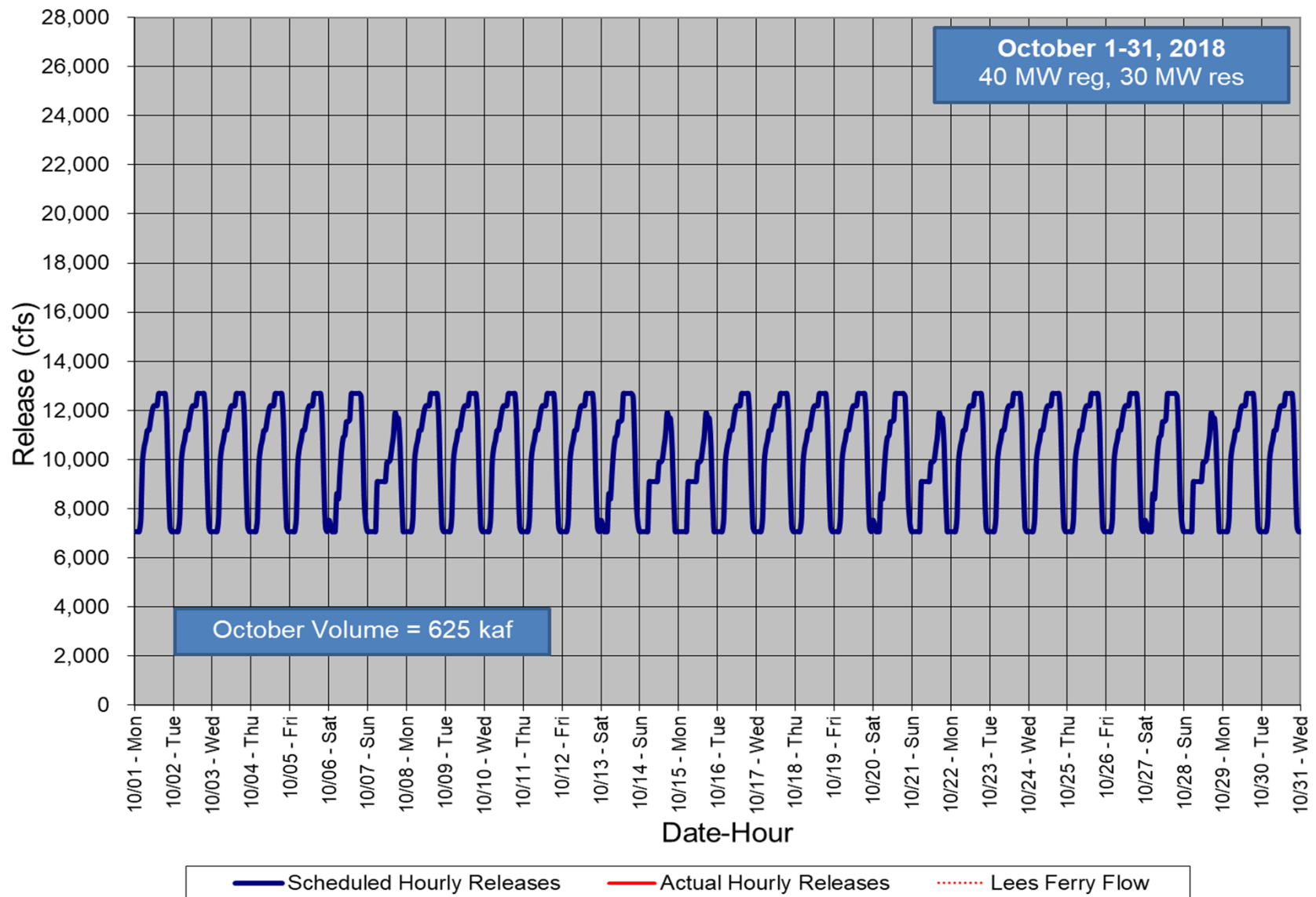
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## Potential Glen Canyon Dam Hourly Flow Pattern September 2018





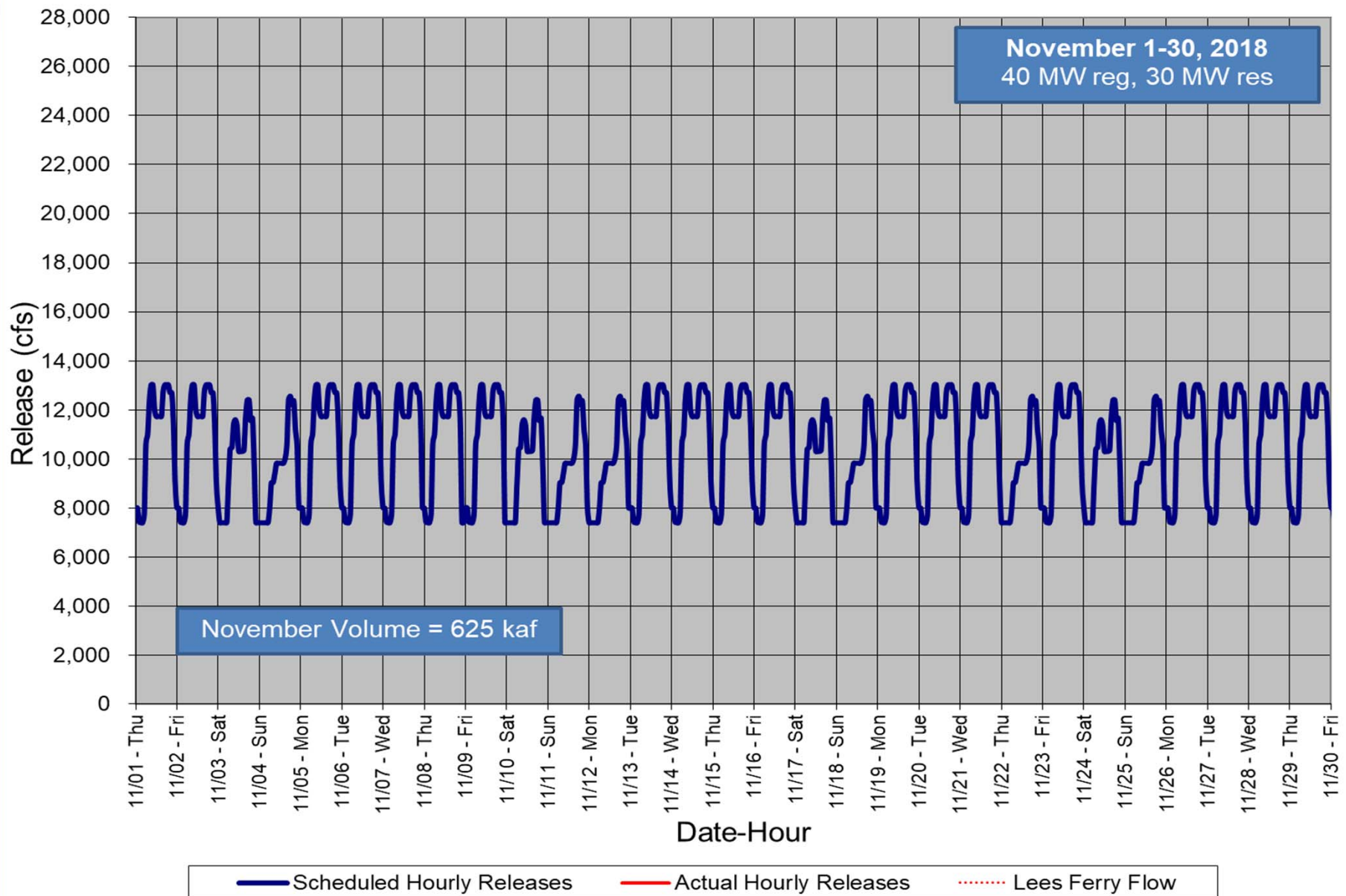
## Glen Canyon Dam Hourly Release Pattern October 2018



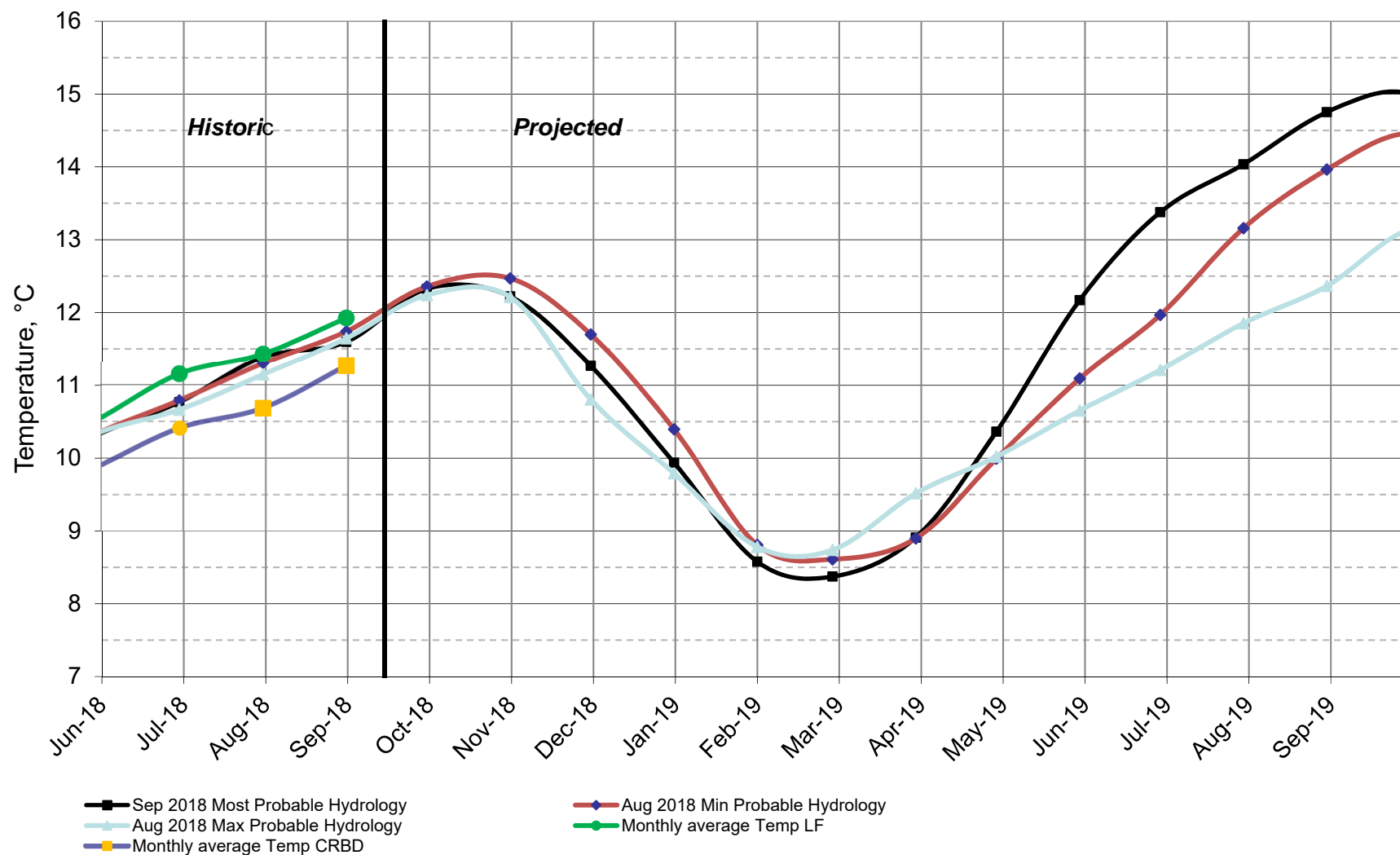
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## Glen Canyon Dam Hourly Release Pattern November 2018



# Lake Powell Release Temperature Projected Temperature based on Sep 2018 Forecast

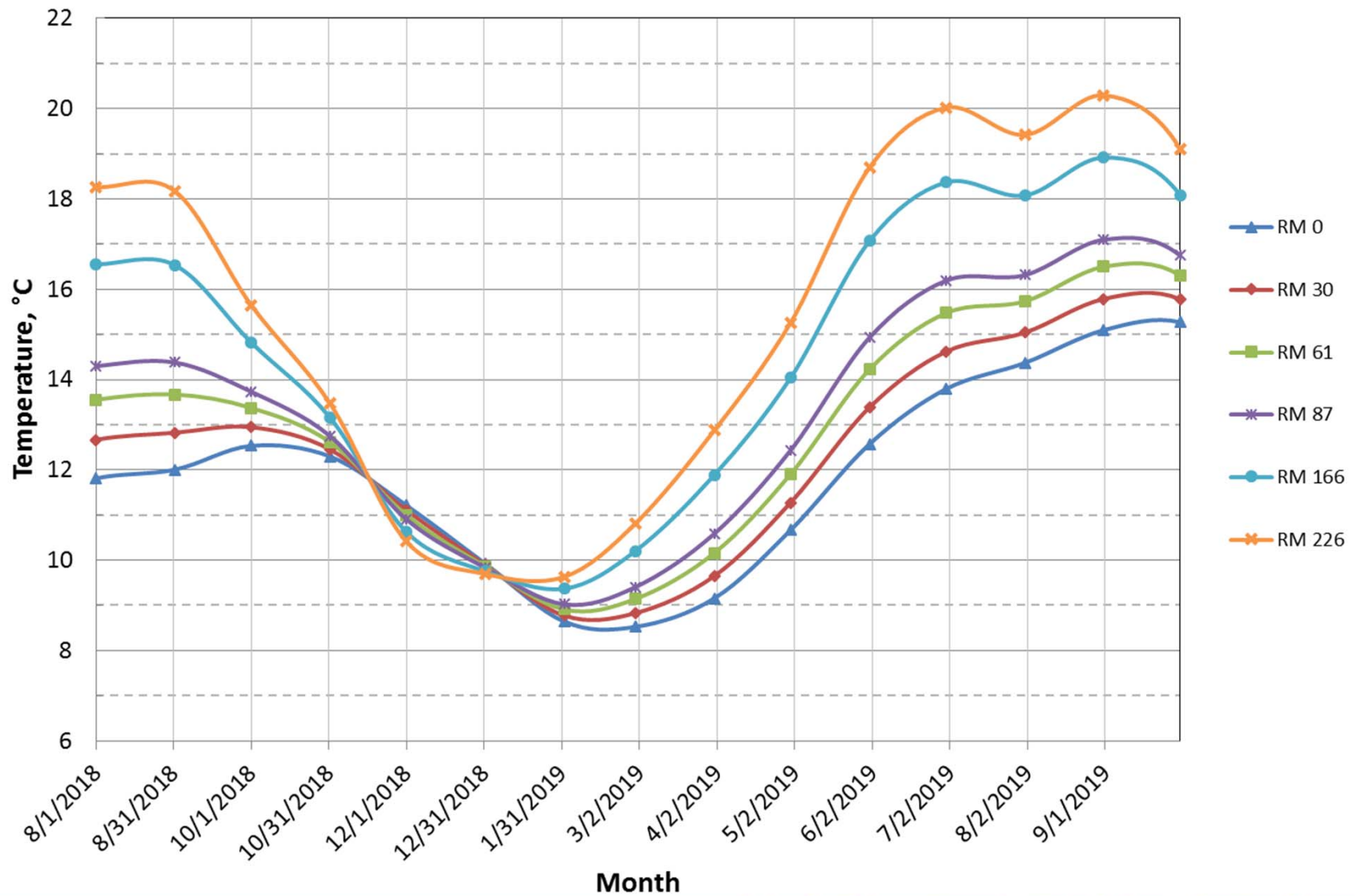


#Projection start date is based on initial conditions (Jan 2018)

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# Colorado River, Grand Canyon Water Temperatures

Projections based on September 2018, Most Probable Hydrology



# Questions?

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Resource Management Division  
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## 2018 Hydrograph (9.0 MAF)

Month	LTEMP Release, (kaf)	BOR/WAPA Planned Release, (kaf)
OCT	640	640
NOV	640	630
DEC	720	740
JAN	860	860
FEB	750	730
MAR	800	800
APR	710	705
MAY	710	705
JUN	750	760
JUL	850	860
AUG	900	900
SEP	670	670
TOTALS		

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# 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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