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RECLAMATION

Glen Canyon Adaptive Management Program

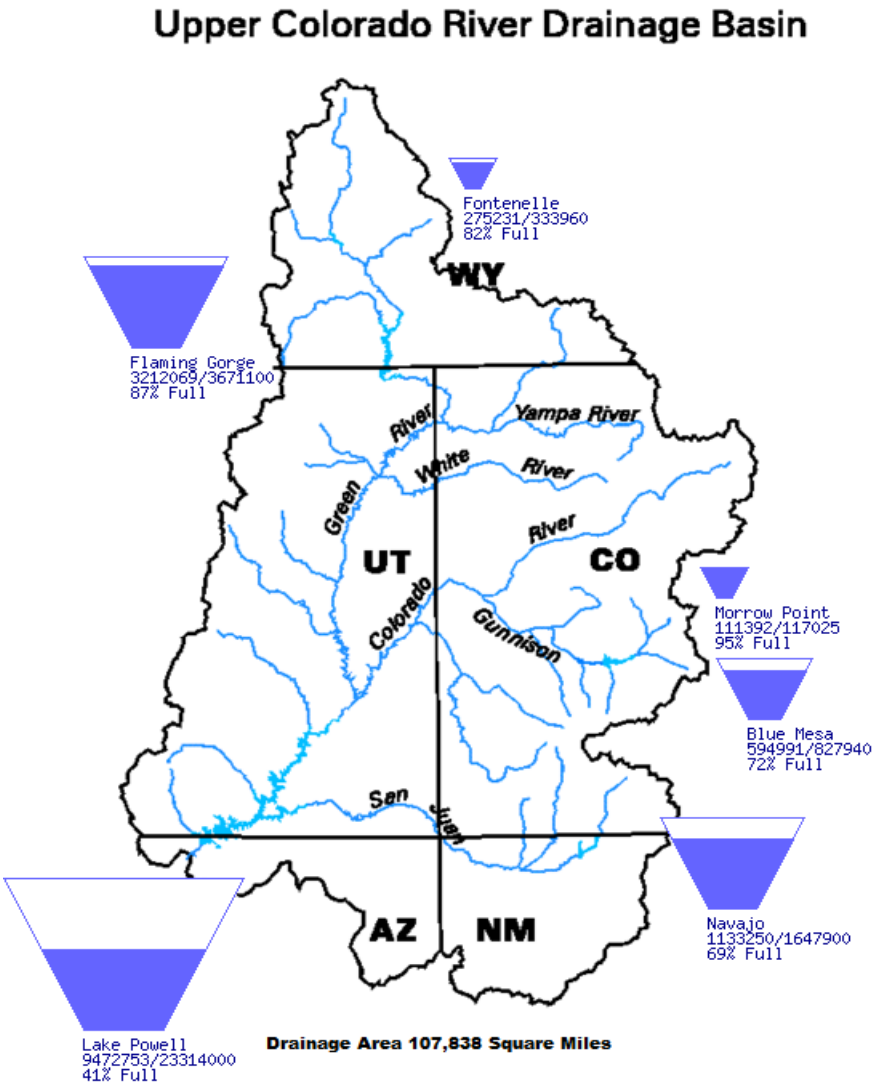
Basin Hydrology and Operations

August 21, 2024

Upper Basin Storage (as of August 19, 2024)

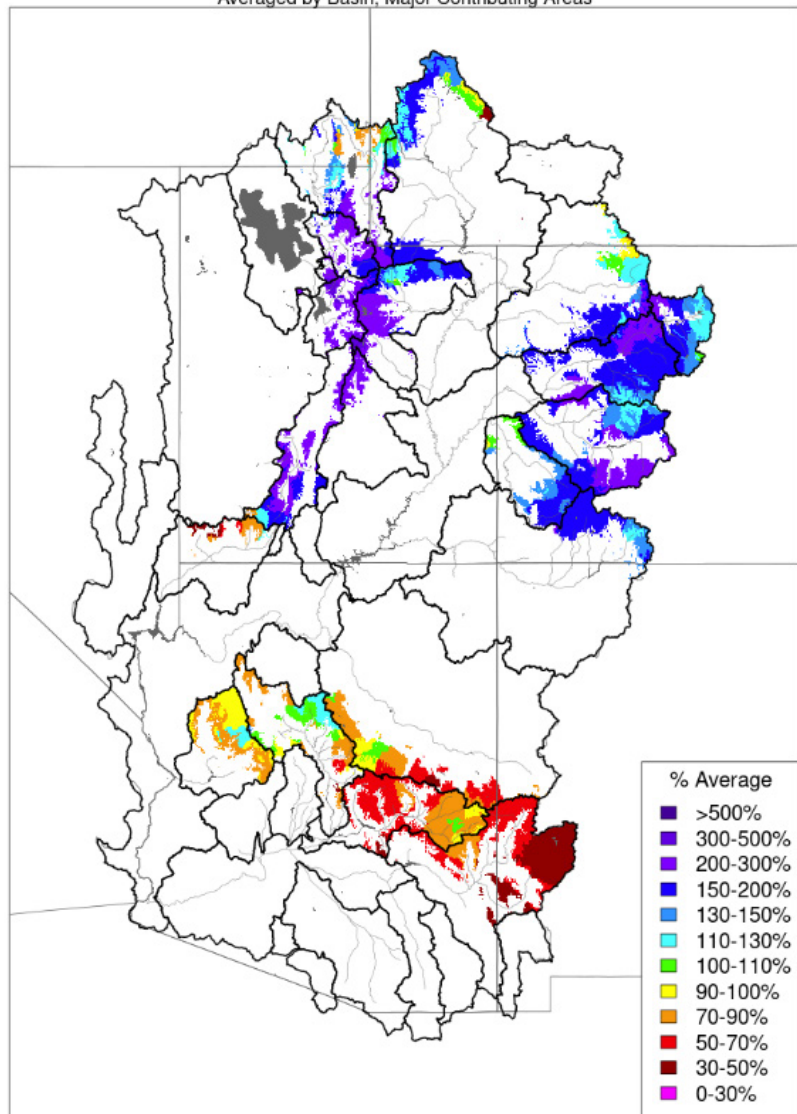
Data Current as of:
08/17/2024

Reservoir	Percent Current Live Storage	Current Live Storage (maf)	Live Storage Capacity (maf)	Elevation (feet)
Fontenelle	82	0.27	0.33	6,498.07
Flaming Gorge	88	3.22	3.67	6,028.75
Blue Mesa	72	0.59	0.83	7,492.03
Navajo	69	1.13	1.65	6,749.94
Lake Powell	41	9.45	23.31	3,581.96
UC System Storage	49	14.80	29.79	
Total System Storage	44	25.67	58.48	



Month to Date Precipitation - August 19 2024

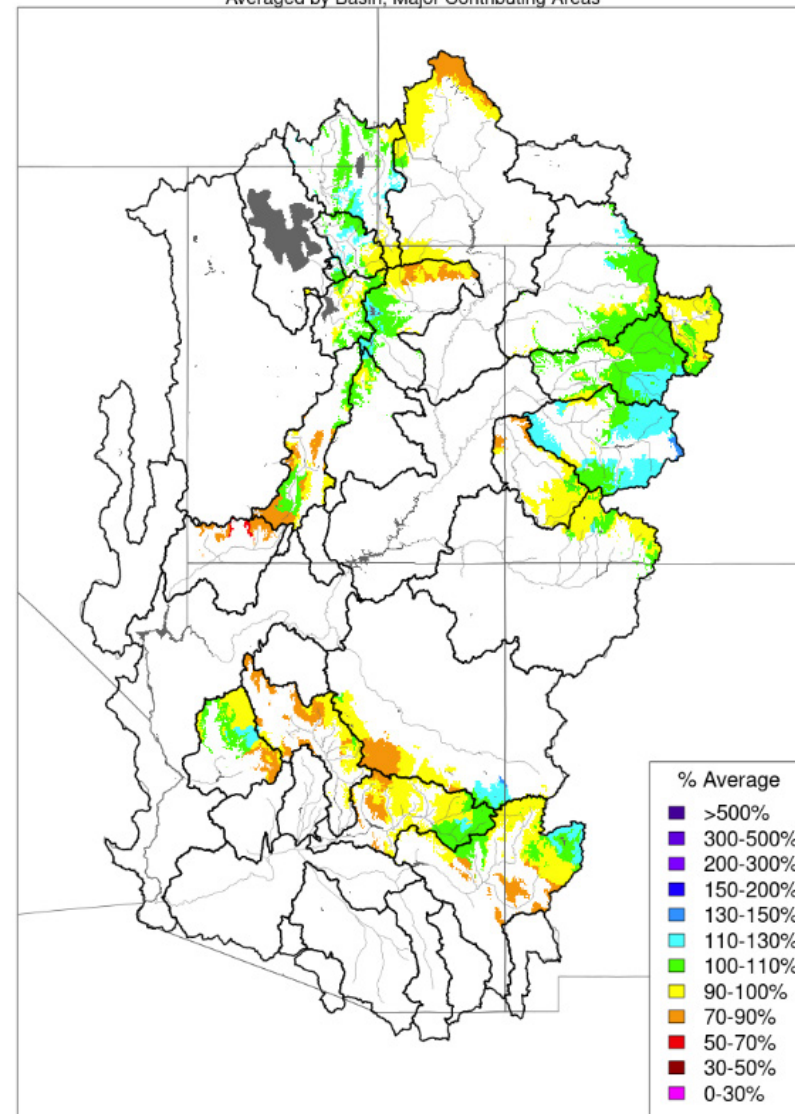
Averaged by Basin, Major Contributing Areas



Prepared by NOAA, Colorado Basin River Forecast Center
Salt Lake City, Utah, www.cbrfc.noaa.gov

Water Year to Date Precipitation, October 01 - August 19 2024

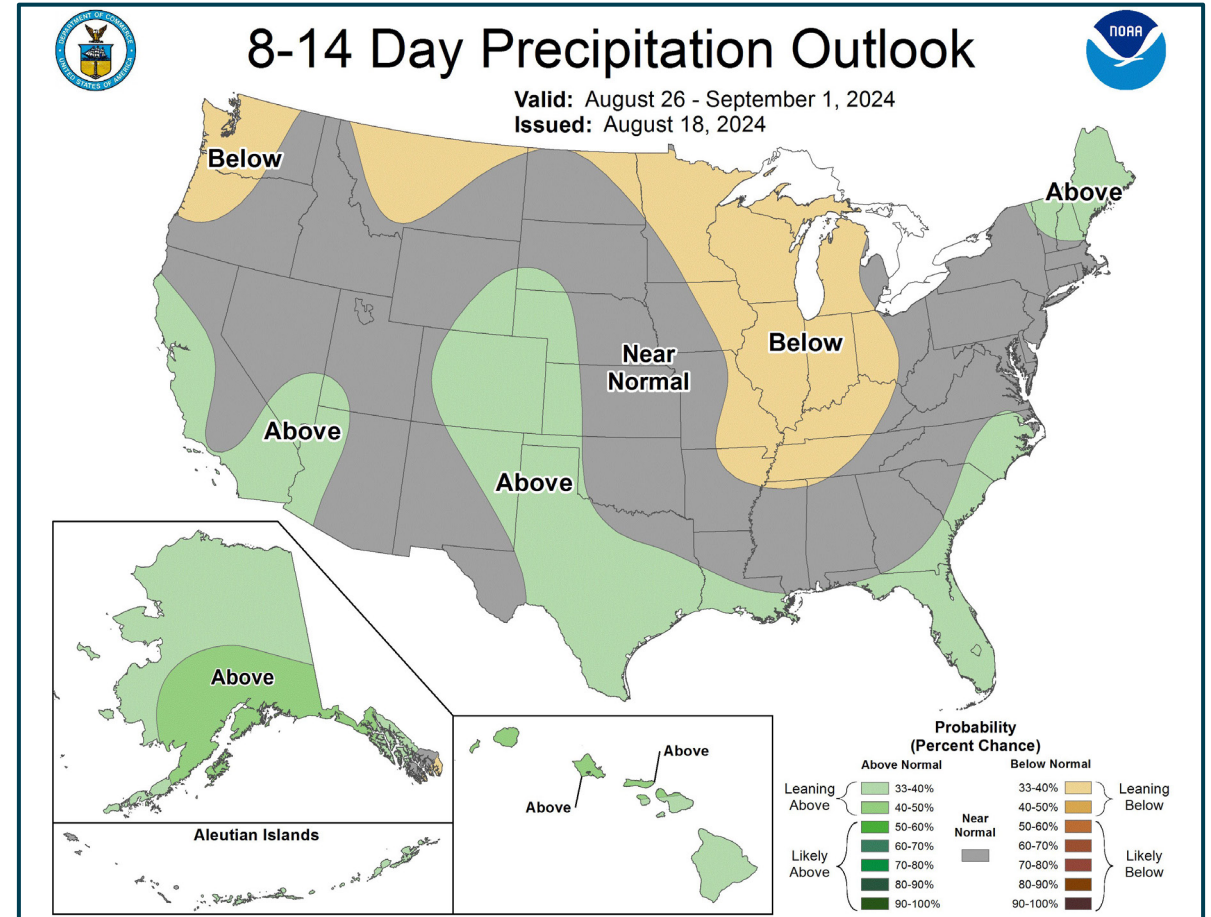
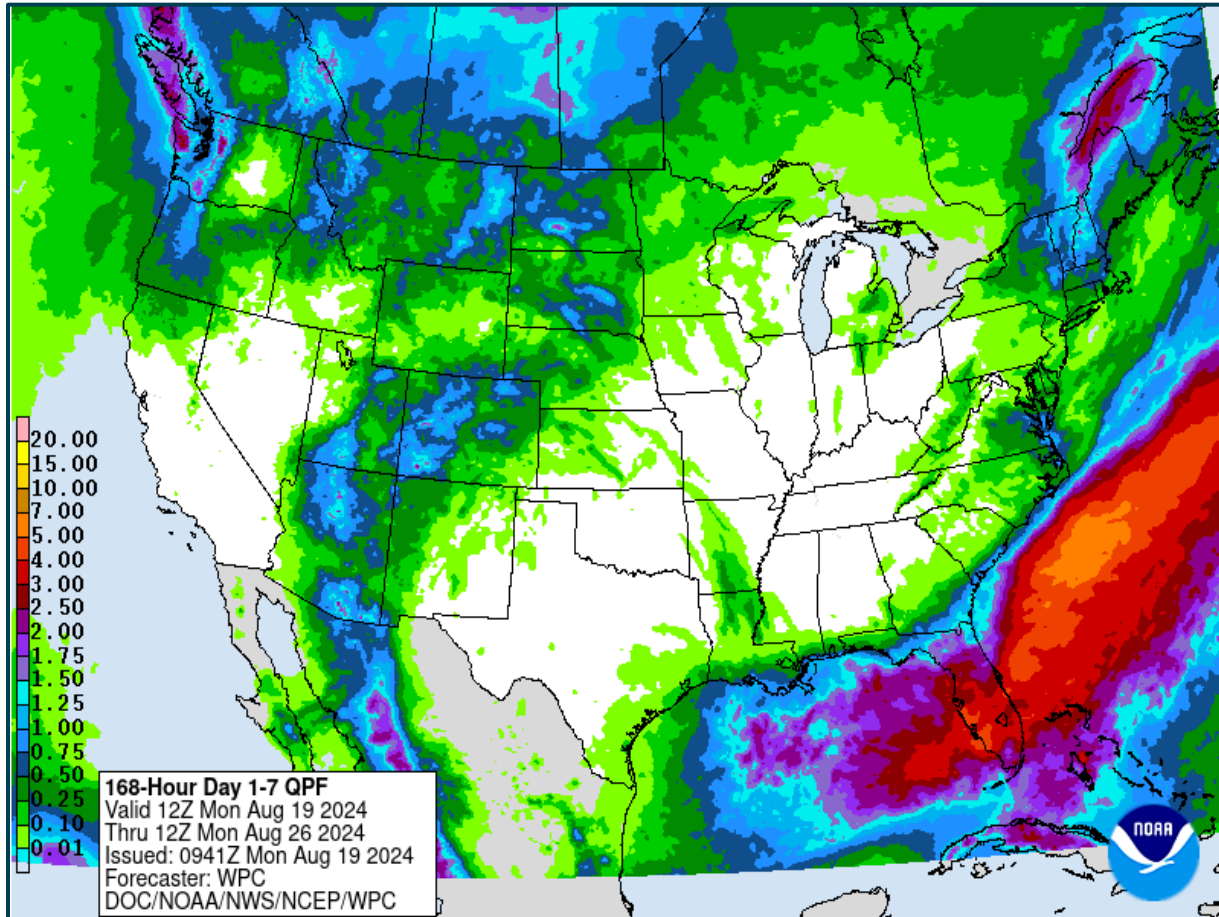
Averaged by Basin, Major Contributing Areas



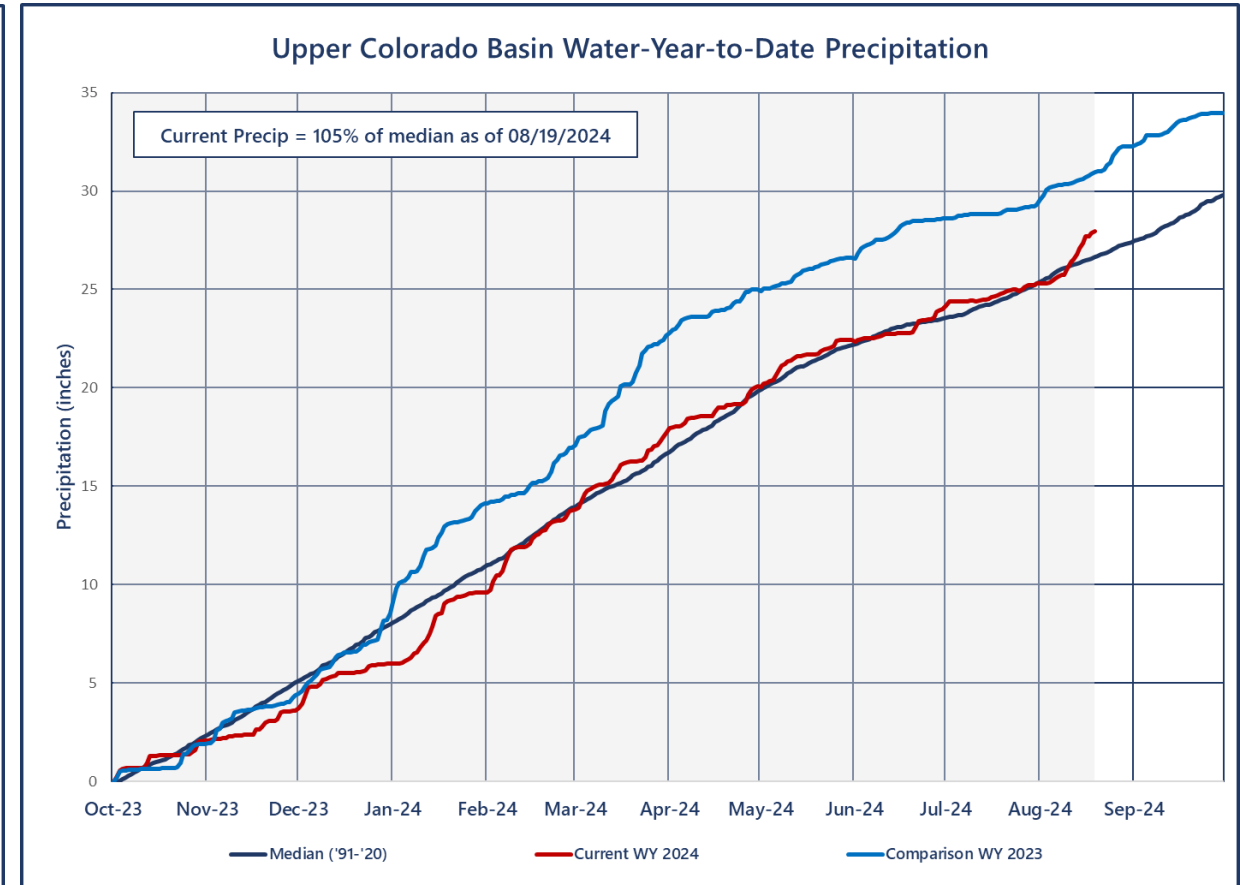
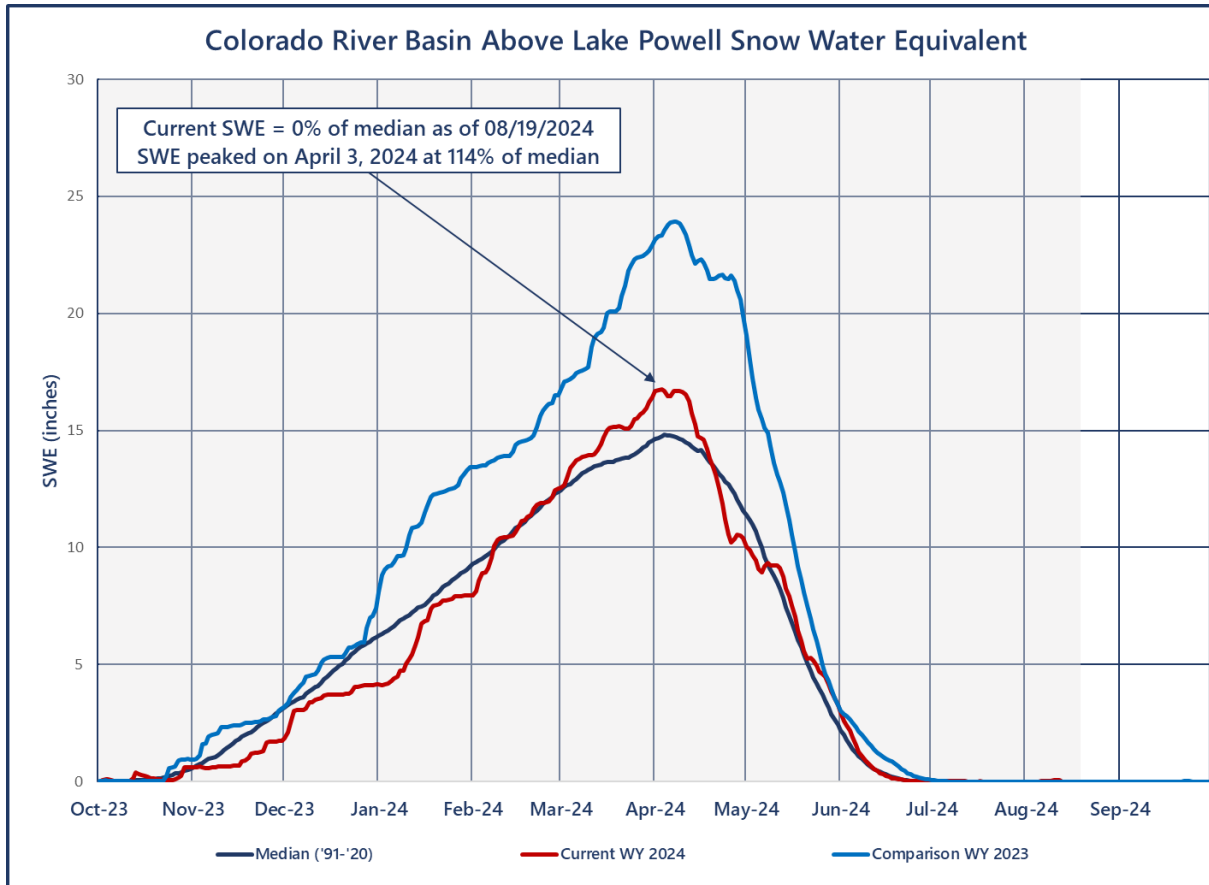
Prepared by NOAA, Colorado Basin River Forecast Center
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Weather Prediction Center and Climate Prediction Center Precipitation Forecasts



Upper Colorado SWE and Precipitation



Most Probable August Forecast Water Year 2024

April – July 2024
Preliminary Observed
Unregulated Inflow
as of August 1, 2024

Reservoir	Inflow (kaf)	Percent of Avg ¹
Fontenelle	516	70
Flaming Gorge	713	70
Blue Mesa	653	103
Navajo	448	71
Powell	5,328	83

Water Year 2024
Unregulated Inflow Forecast
as of August 1, 2024

Reservoir	Inflow (kaf)	Percent of Avg ¹
Fontenelle	836	78
Flaming Gorge	1,163	82
Blue Mesa	893	99
Navajo	566	62
Powell	7,944	83

¹Averages are based on the 1991 through 2020 period of record.

Most Probable August Forecast Water Year 2025

April – July 2025
Forecasted Unregulated Inflow
as of August 1, 2024

Reservoir	Inflow (kaf)	Percent of Avg ¹
Fontenelle	640	87
Flaming Gorge	815	84
Blue Mesa	617	97
Navajo	565	90
Powell	5,940	93

Water Year 2025
Unregulated Inflow Forecast
as of August 1, 2024

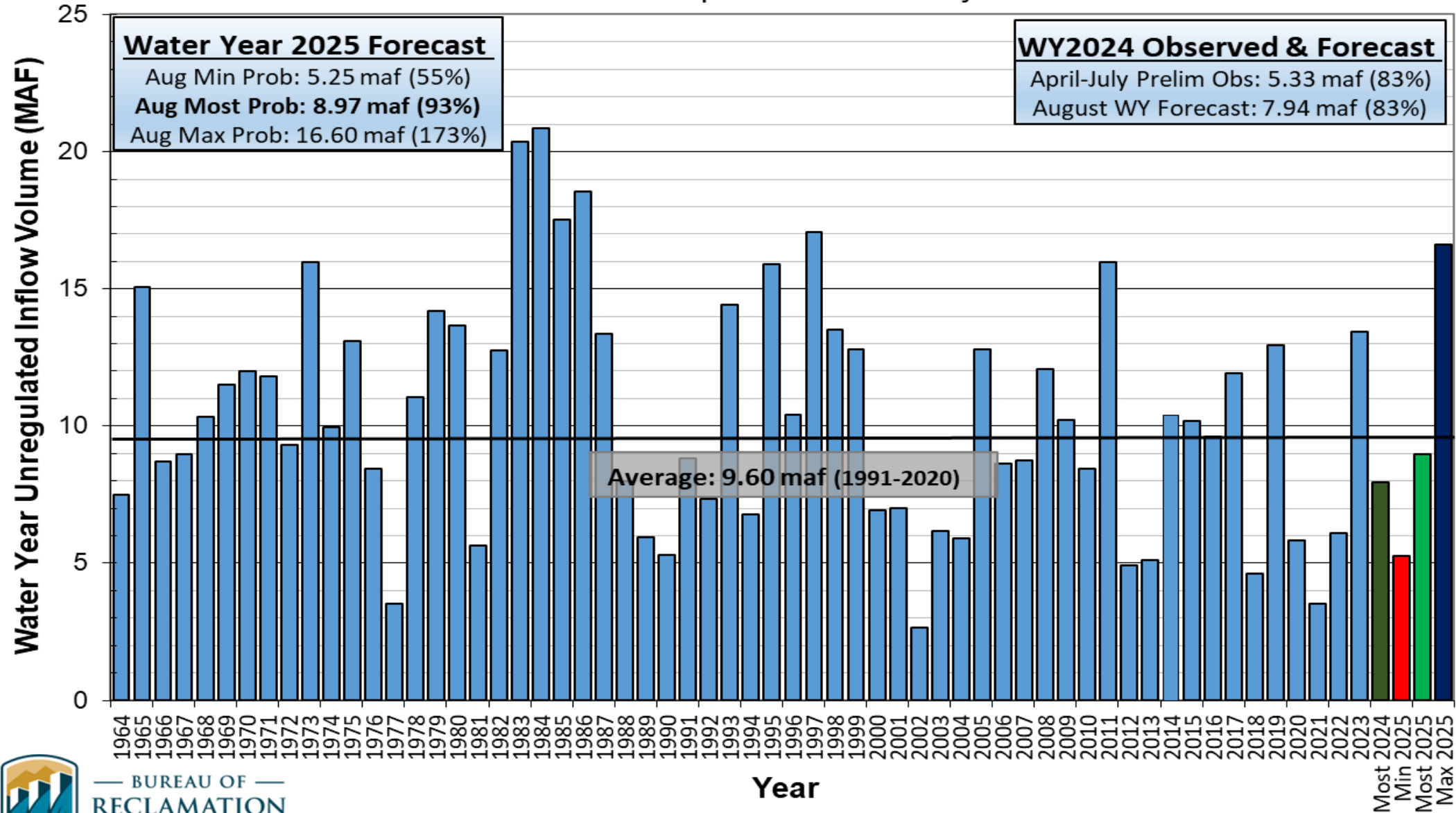
Reservoir	Inflow (kaf)	Percent of Avg ¹
Fontenelle	943	88
Flaming Gorge	1,210	86
Blue Mesa	875	97
Navajo	802	88
Powell	8,970	93

¹Averages are based on the 1991 through 2020 period of record.

Lake Powell Unregulated Inflow

Water Year 2024 and 2025 Forecast *(issued August 1)*

Comparison with History



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Upper Colorado Basin

Hydrology and Operations
Projections Based on August
2024 24-Month Study



Upper Basin Reservoir Operations

Water Years 2024 and 2025

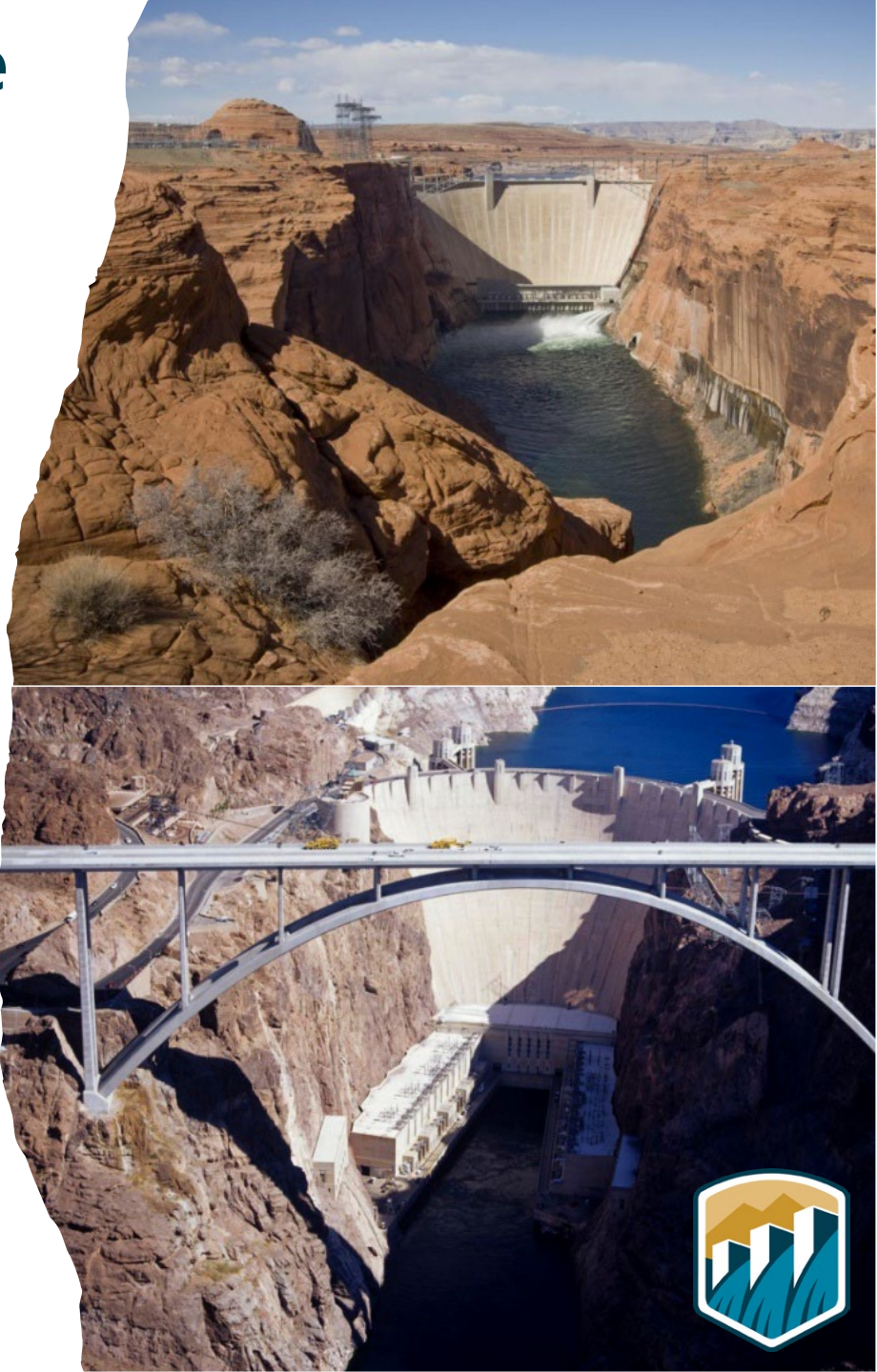
- Lake Powell will be operated consistent with the 2007 Interim Guidelines, the Upper Basin Drought Response Operations Agreement and Upper Basin Records of Decision
- Lake Powell WY 2024 will operate in the Mid-Elevation Release Tier where Lake Powell will release 7.48 maf
- Includes the Supplemental Environmental Impact Statement for Near-term Colorado River Operations Record of Decision (2024 Near-term SEIS, signed May 6, 2024)
<https://www.usbr.gov/ColoradoRiverBasin/interimguidelines/seis/index.html>
- July operations and 24-Month Study will include Glen Canyon Dam Long-Term Experimental and Management Plan Final Supplemental Environmental Impact Statement (2024 LTEMP SEIS ROD, signed July 3, 2024) <https://www.usbr.gov/uc/DocLibrary/EnvironmentalImpactStatements/GlenCanyonDamLong-TermExperimentalManagementPlan/20240703-GCDLTEMP-FinalSEIS-RecordofDecision-508-AMWD.pdf>
- Reclamation will also ensure all appropriate consultation with Basin Tribes, the Republic of Mexico, other federal agencies, water users and non-governmental organizations with respect to implementation of these monthly and annual operations.



Lake Powell & Lake Mead Operational Table

Lake Powell Operational Tier Determination Run (aka "Exhibit Run")
with an 8.23 maf Release¹

Lake Powell			Lake Mead		
Elevation (feet)	Operation According to the Interim Guidelines	Live Storage (maf)	Elevation (feet)	Operation According to the Interim Guidelines	Live Storage (maf)
3,700	Equalization Tier Equalize, avoid spills, or release 8.23 maf	23.31	1,220	Flood Control Surplus or Quantified Surplus Condition Deliver > 7.5 maf	26.18
3,636-3,666 (2008-2026)	Upper Elevation Balancing Tier Release 8.23 maf If Lake Mead < 1,075 feet, balance contents with a min/max release of 7.0 and 9.0 maf	14.65-18.36 (2008-2026)	1,200 (approx.)	Domestic Surplus or ICS Surplus Condition Deliver > 7.5 maf	23.14 (approx.)
3,575		8.90	1,145	Normal or ICS Surplus Condition Deliver ≥ 7.5 maf	16.18
3,568.99 ft Jan 1, 2025 Projection	Mid-Elevation Release Tier Release 7.48 maf; if Lake Mead < 1,025 feet; release 8.23 maf If any minimum probable Lake Powell elevation projection shows Lake Powell < 3,500 feet, begin planning to reduce releases to no less than 6.0 maf		1,075	Shortage Condition Deliver 7.167 maf	1,062.32 ft Jan 1, 2025 Projection
3,525	Lower Elevation Balancing Tier Balance contents with a min/max release of 7.0 and 9.5 maf If any minimum probable Lake Powell elevation projection shows Lake Powell < 3,500 feet, begin planning to reduce releases to no less than 6.0 maf	5.55	1,050	Shortage Condition Deliver 7.083 maf	
3,500		4.22	1,025		5.98
3,370	The Secretary reserves the right to operate Reclamation facilities to protect the Colorado River system if hydrologic conditions require such action as described in Sections 6 and 7(D) in the 2007 Interim Guidelines ROD	0	1,000	Shortage Condition Deliver 7.0 maf Further measures may be undertaken	4.48
			895		0



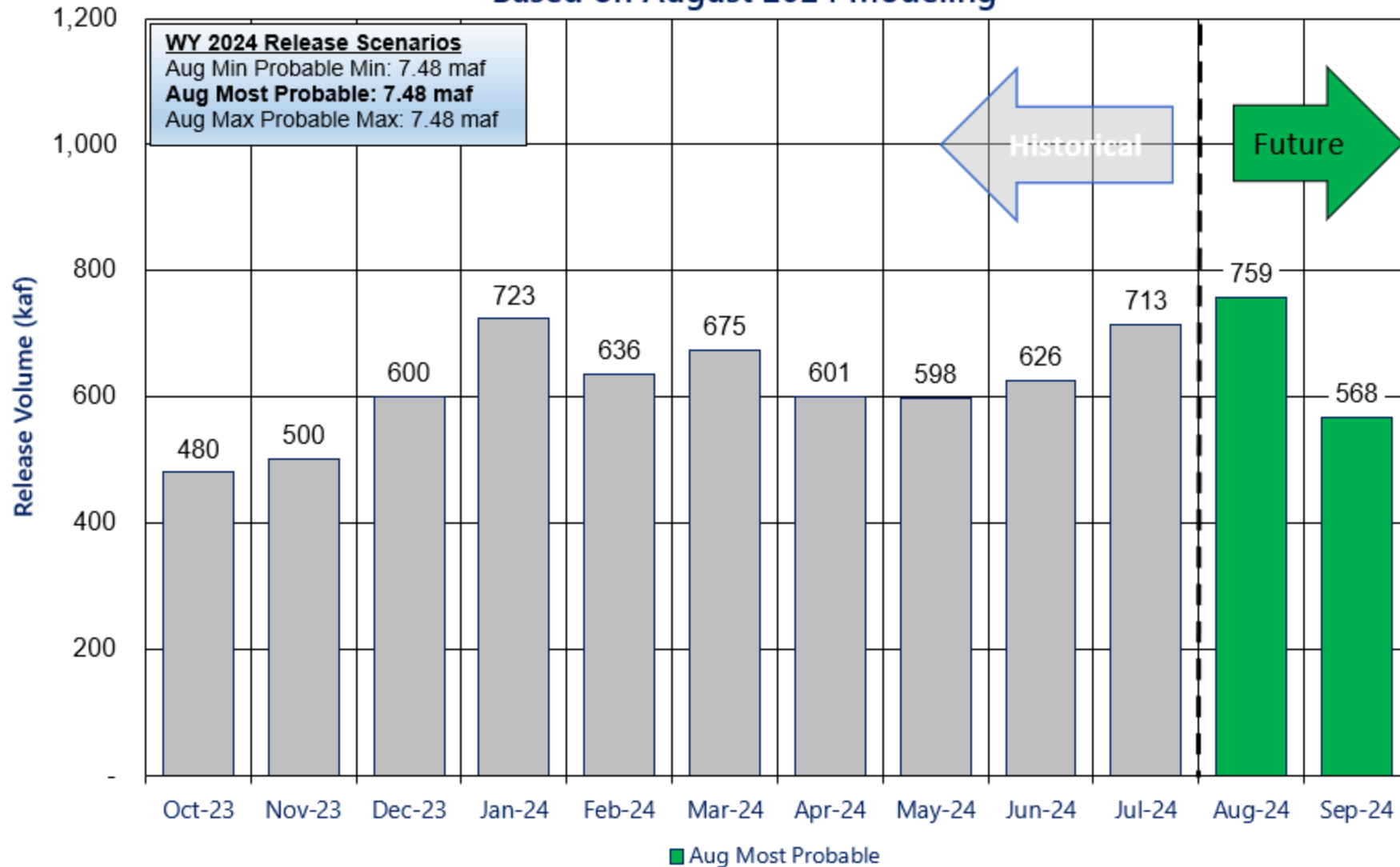
¹ Lake Powell and Lake Mead operational tier determinations will be documented in the draft 2025 AOP.



Potential Lake Powell Monthly Release Volume Distribution

Release Scenarios for Water Year 2024

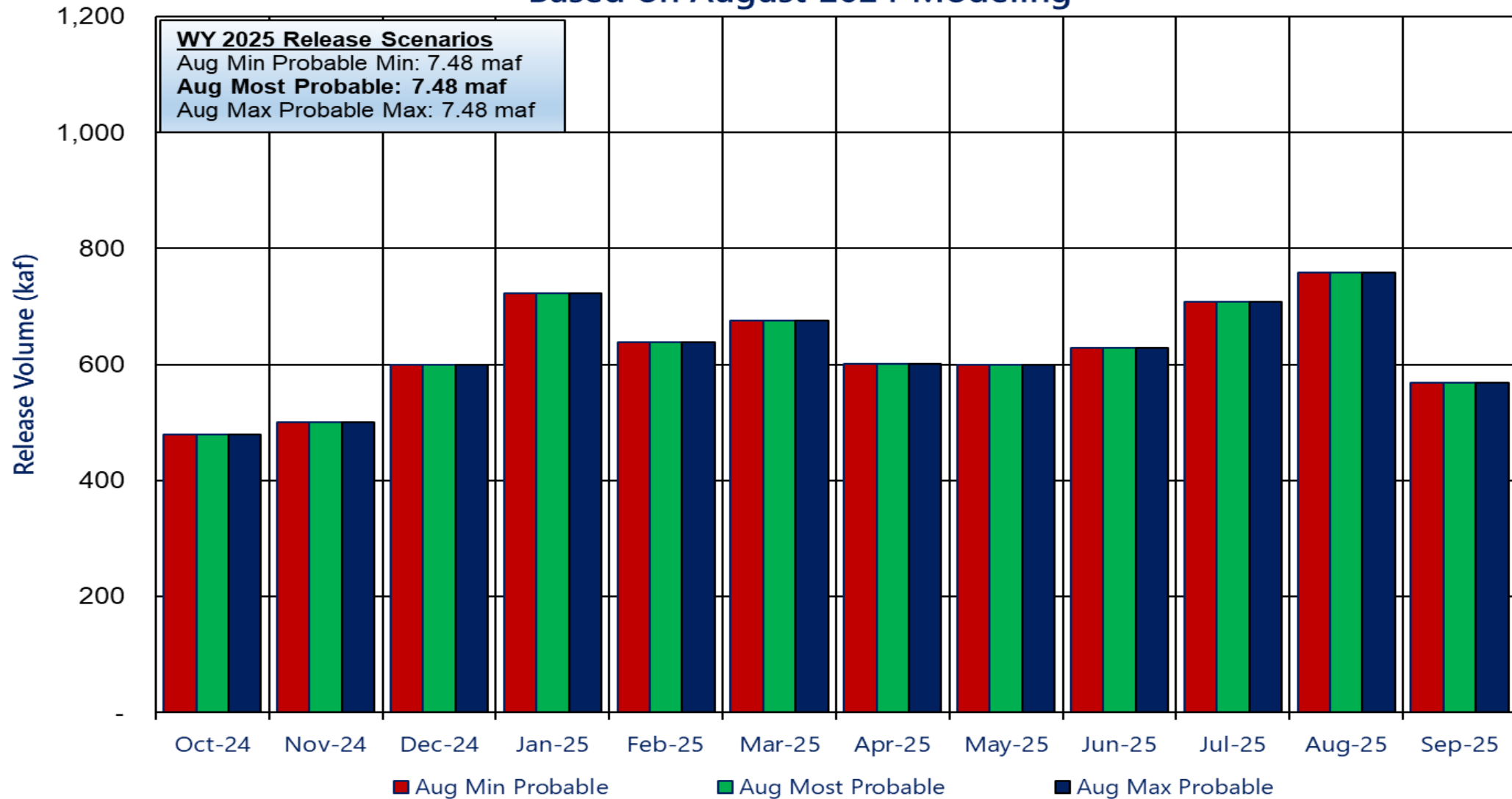
Based on August 2024 Modeling



Potential Lake Powell Monthly Release Volume Distribution

Release Scenarios for Water Year 2025

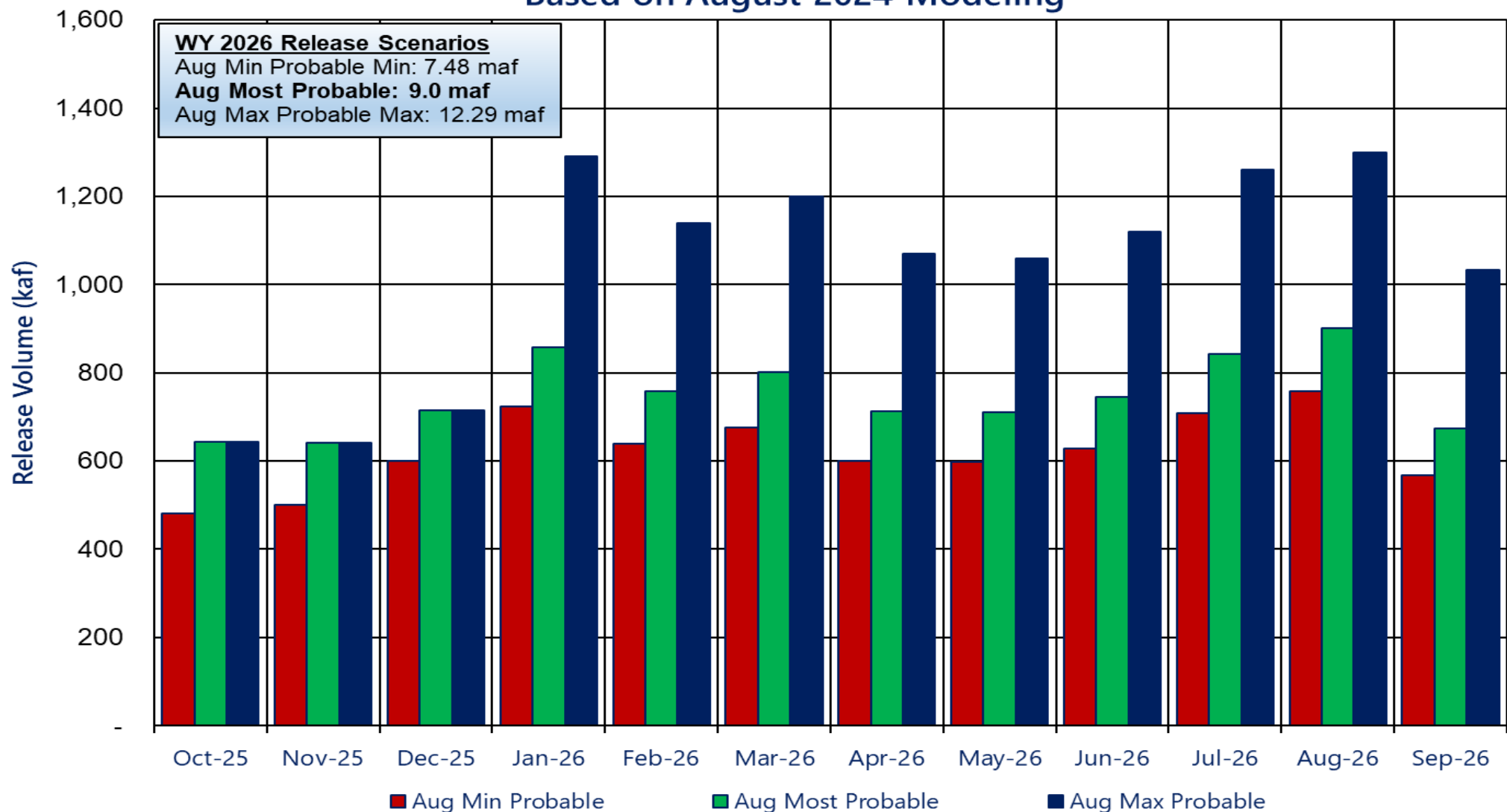
Based on August 2024 Modeling



Potential Lake Powell Monthly Release Volume Distribution

Release Scenarios for Water Year 2026

Based on August 2024 Modeling



Reclamation Operational Modeling

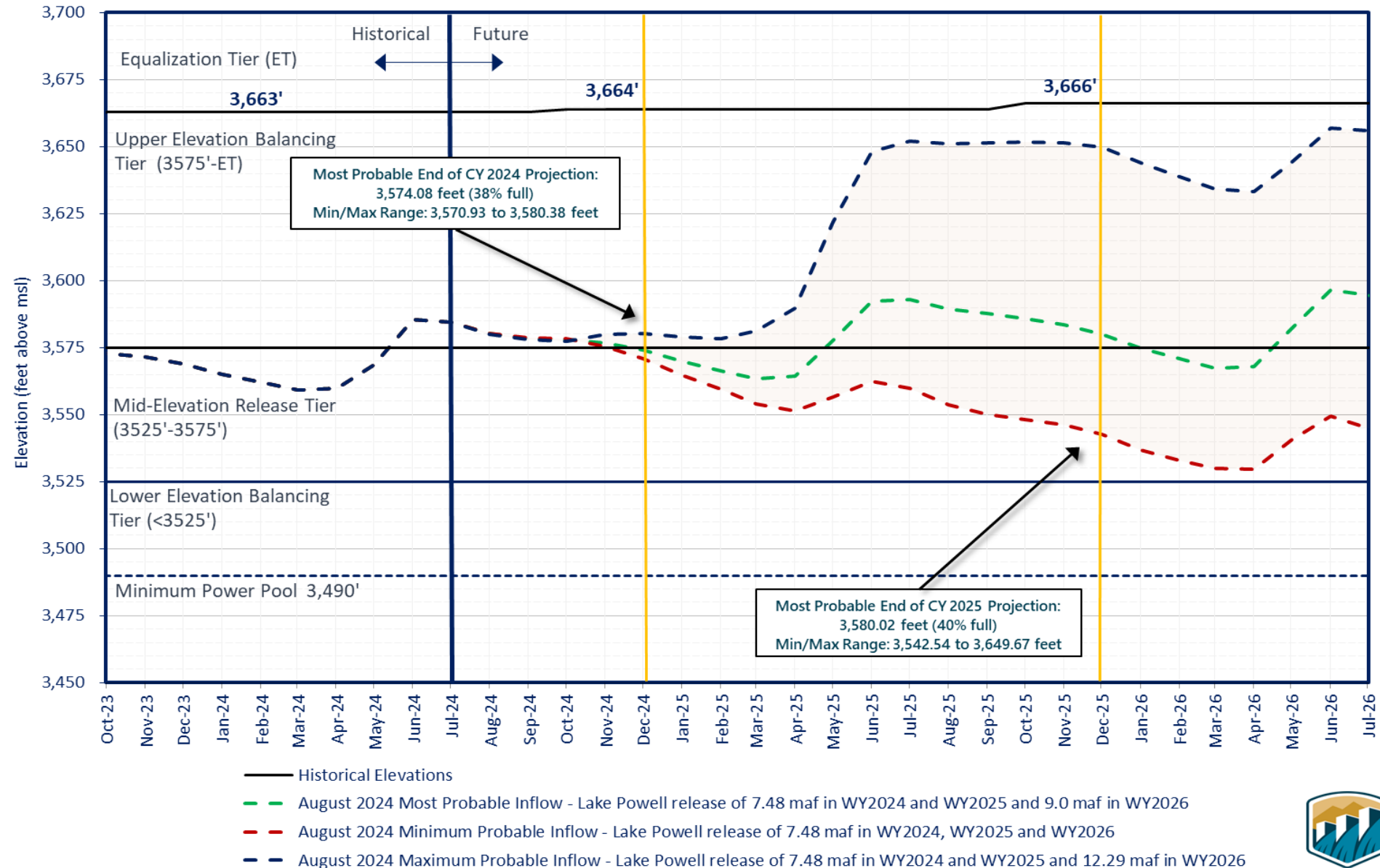
Model Comparison

	Colorado River Mid-term Modeling System (CRMMS)		CRSS
	24-Month Study Mode (Manual Mode)	Ensemble Mode (Rule-based Mode)	
Primary Use	AOP tier determinations and projections of current conditions	Risk-based operational planning and analysis	Long-term planning, comparison of alternatives
Simulated Reservoir Operations	Operations input manually	Rule-driven operations	
Probabilistic or Deterministic	Deterministic – single hydrologic trace	Deterministic OR Probabilistic 30 (or more) hydrologic traces	Probabilistic – 100+ traces
Time Horizon (years)			
Upper Basin Inflow	Unregulated forecast, 1 trace	Unregulated ESP forecast, 30 traces	Natural flow; historical, paleo, or climate change hydrology
Upper Basin Demands	Implicit, in unregulated inflow forecast		Explicit, 2016 UCRC assumptions
Lower Basin Demands	Official approved or operational		Developed with LB users

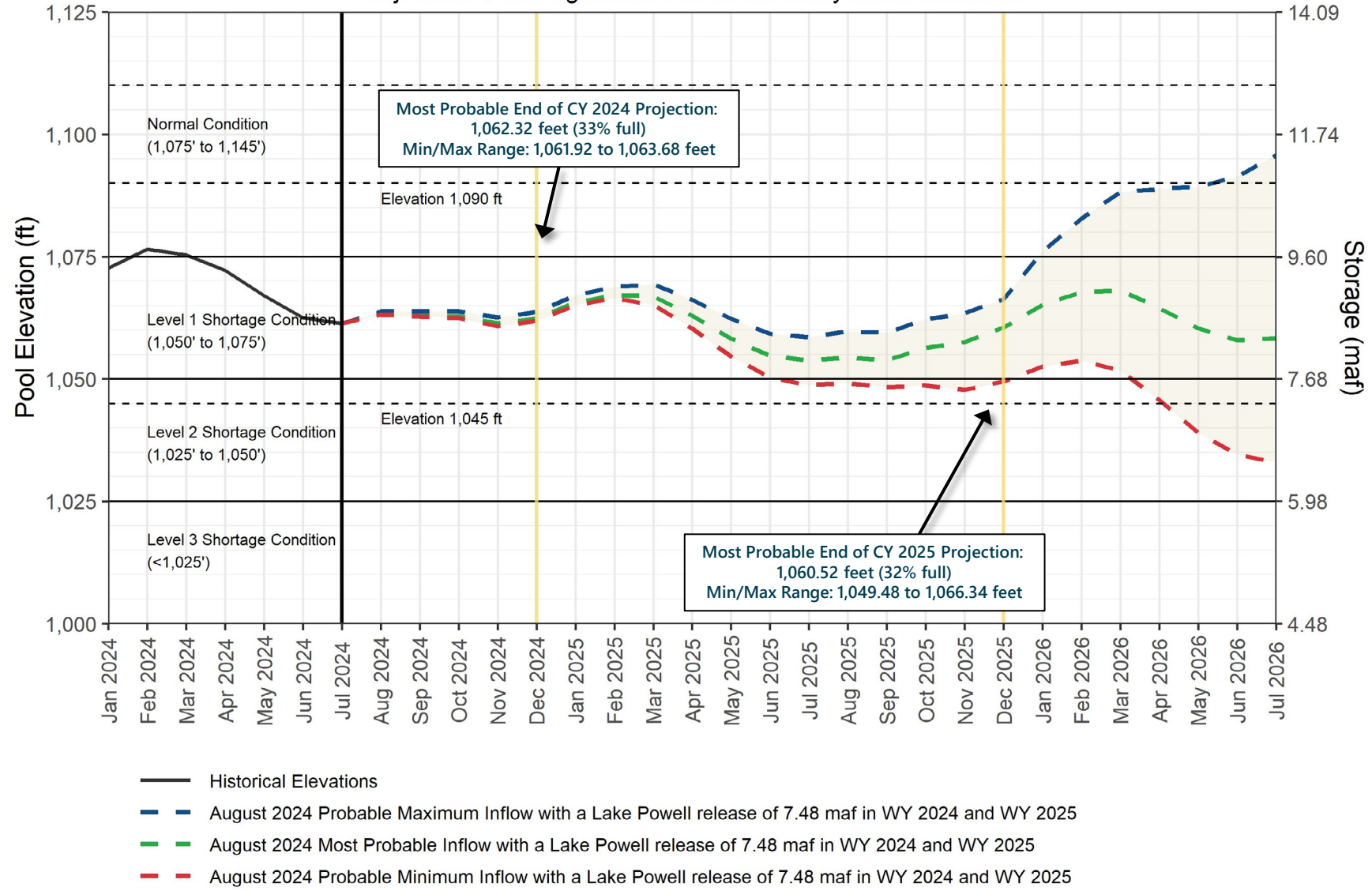


Lake Powell End of Month Elevations

Projections from the August 2024 24-Month Study Inflow Scenarios



Lake Mead End-of-Month Elevations Projections from August 2024 24-Month Study Inflow Scenarios





Upper Colorado Basin

Hydropower Maintenance



Glen Canyon Dam Power Plant Unit Outage Schedule for 2024

Unit Number	Oct 2023	Nov 2023	Dec 2023	Jan 2024	Feb 2024	Mar 2024	Apr 2024	May 2024	Jun 2024	Jul 2024	Aug 2024	Sep 2024
1												
2												
3												
4												
5												
6												
7												
8												
ROW 1												
ROW 2												
ROW 3												
ROW 4												
Units Available	4	4	6	6	6	6	6	5	8	8	7	6
Penstock Capacity (cfs)	12,400	19,450	19,400	19,300	19,200	19,100	19,100	16,000	27,000	27,000	23,400 ³	19,700
Penstock Capacity (kaf/month)	770	1,030	1,190	1,190	1,100	1,220	1,280	1,030	1,600	1,660	1,570	1,200
Max (kaf) ¹	480	500	600	723	639	675	601	599	628	709	758	567
Most (kaf) ¹	480	500	600	723	639	675	601	599	628	709	758	567
Min (kaf) ¹	480	500	600	723	639	675	601	599	628	709	758	567
											(updated 08-19-2024)	
















1 Projected release, based on August 2024 24MS for the minimum, most probable and the maximum probable 24-Month Study model runs.

2 Dependent upon availability to shift contingency regulation, which will increase capacity by 30-40MW (3%) at current efficiency.

3 NERC testing with occasional removal of penstock generating capacity.



Glen Canyon Dam Power Plant Unit Outage Schedule for 2025

Unit Number	Oct 2024	Nov 2024	Dec 2024	Jan 2025	Feb 2025	Mar 2025	Apr 2025	May 2025	Jun 2025	Jul 2025	Aug 2025	Sep 2025	
1													
2													
3													
4													
5													
6													
7													
8													
ROW 1													
ROW 2													
ROW 3													
ROW 4													
Units Available	5	6	8	6	6	6	7	7	8	8	8	6	
Penstock Capacity (cfs)	16,100/ 4,000 ³	19,700	26,900	19,700	19,700	19,700	23,300	23,300	26,900	26,900	26,900	19,700	AUG MOST ²
Penstock Capacity (kaf/month)	1,200	1,500	1,650	1,580	1,110	1,240	1,380	1,590	1,600	1,650	1,650	1,180	AUG MOST
Max (kaf) ¹	480	500	600	723	639	675	601	599	628	709	758	568	7.48 maf
Most (kaf) ¹	480	500	600	723	639	675	601	599	628	709	758	568	7.48 maf
Min (kaf) ¹	480	500	600	723	639	675	601	599	628	709	758	568	7.48 maf
										(updated 08-19-2024)			

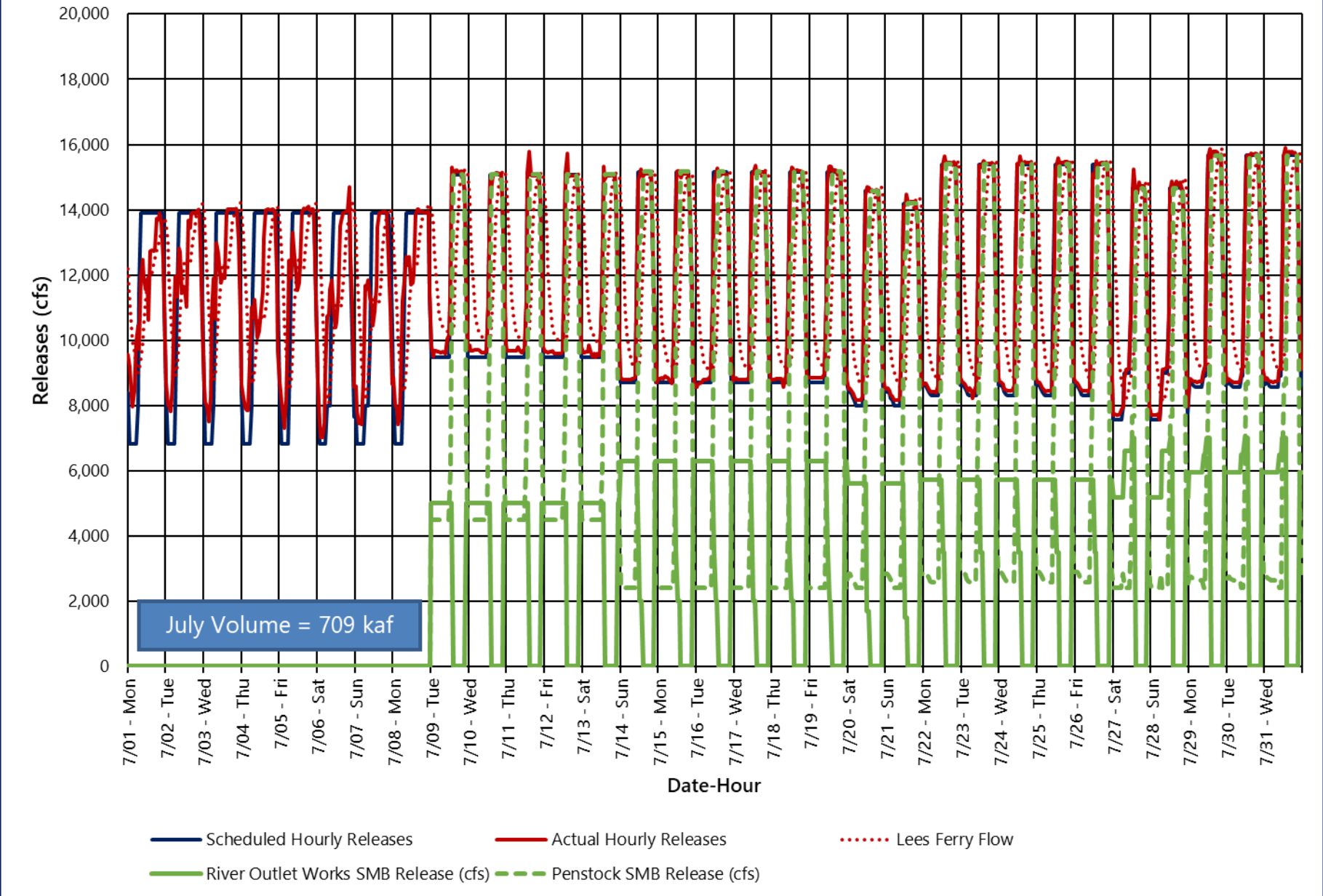
1 Projected release, based on August 2024 24MS for the minimum, most probable and the maximum probable 24-Month Study model runs.

2. Dependent upon availability to shift contingency regulation, which will increase capacity by 30-40MW (3%) at current efficiency.

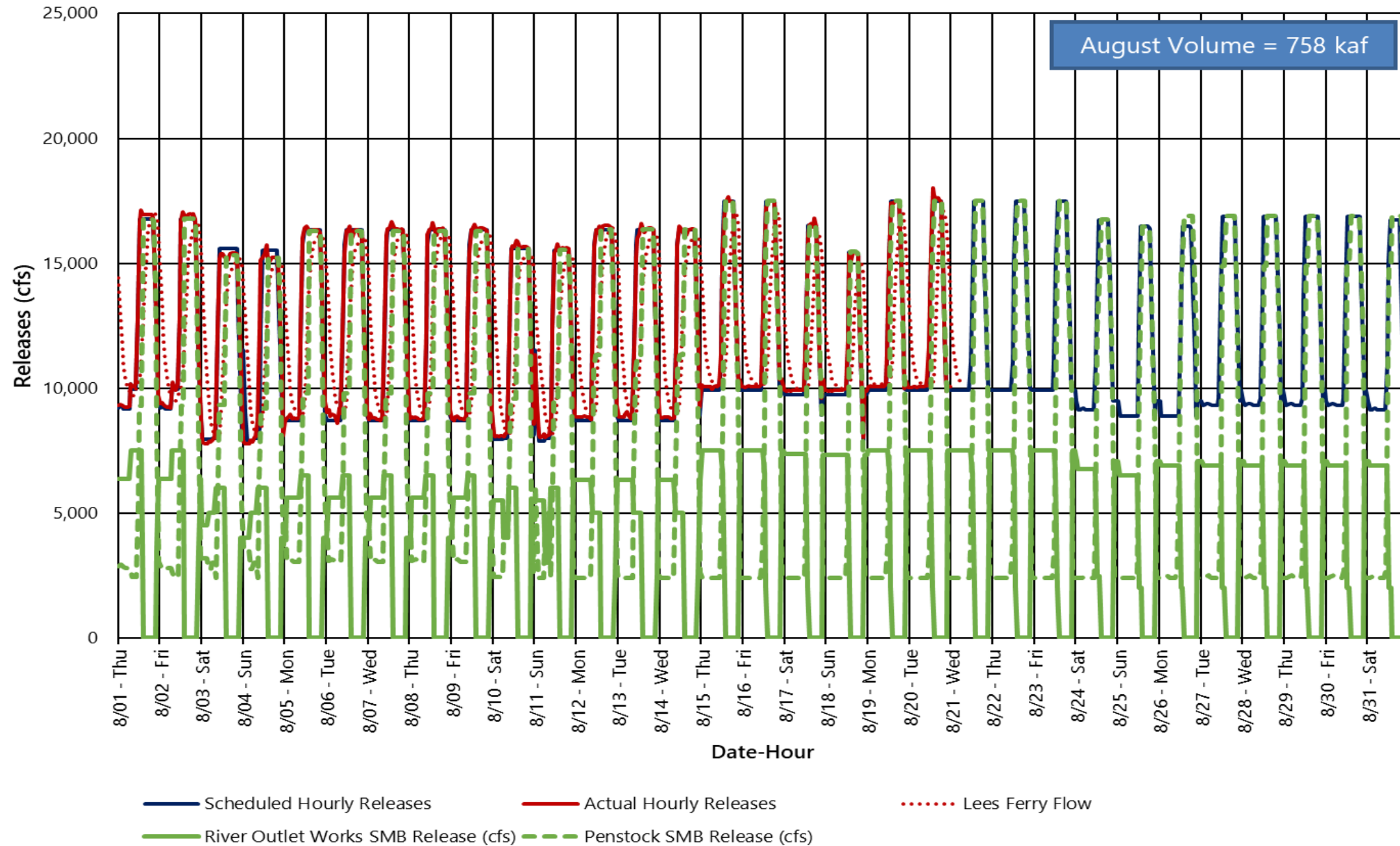
3 Tailwater/Forebay inspection from October 21-24 will require one day at 4,000 cfs, and possibly two if necessary.



Glen Canyon Dam Hourly Release Pattern - July 2024



Glen Canyon Dam Hourly Release Pattern - August 2024



Questions?



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