BUREAU OF RECLAMATION

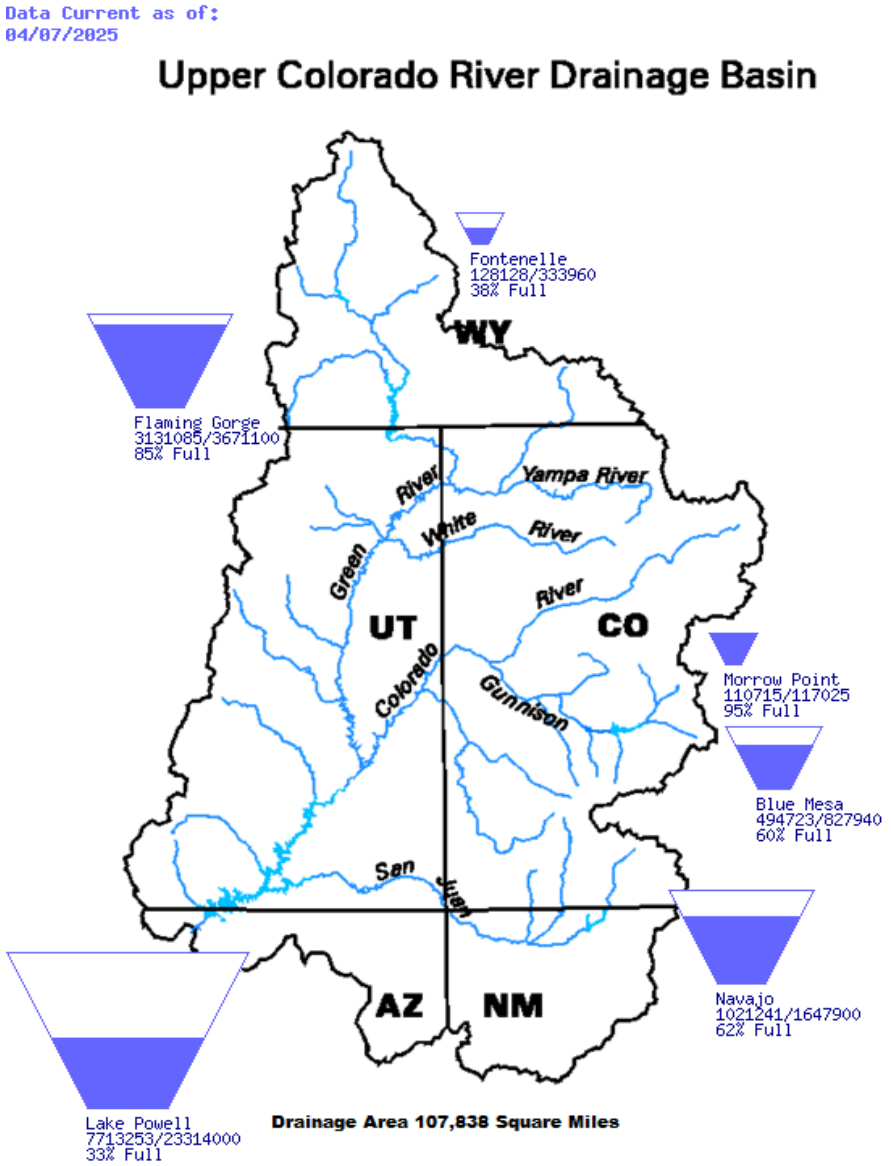
GCDAMP Technical Working Group

Basin Hydrology and Operations

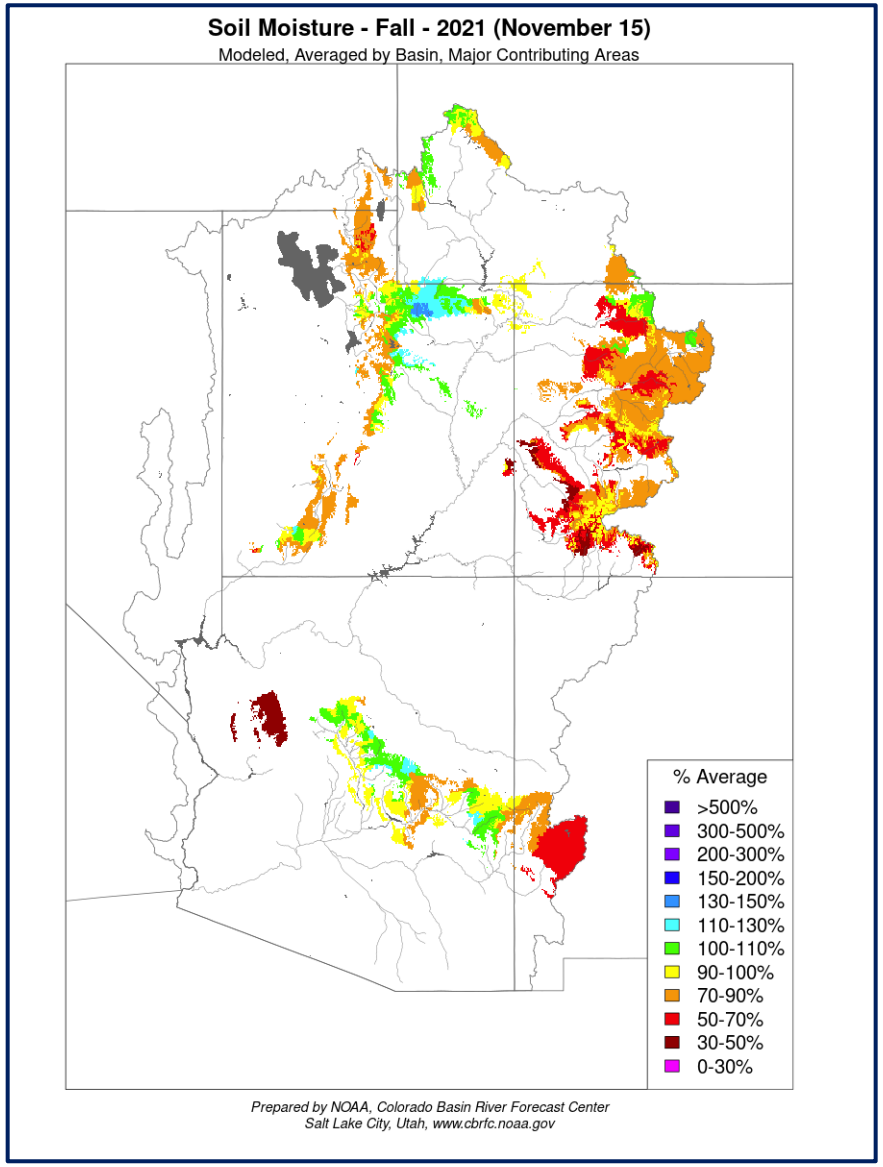
April 10, 2024

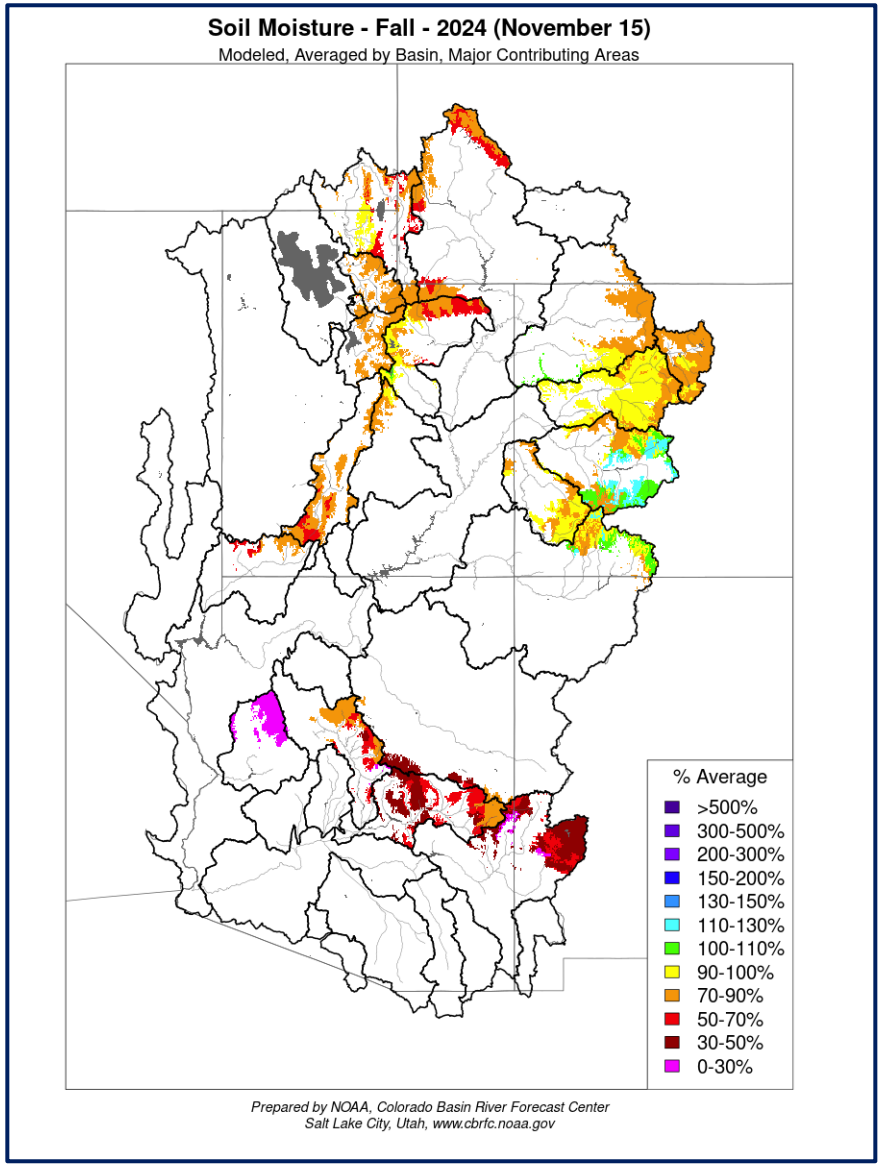
Upper Basin Storage (as of April 8, 2025)

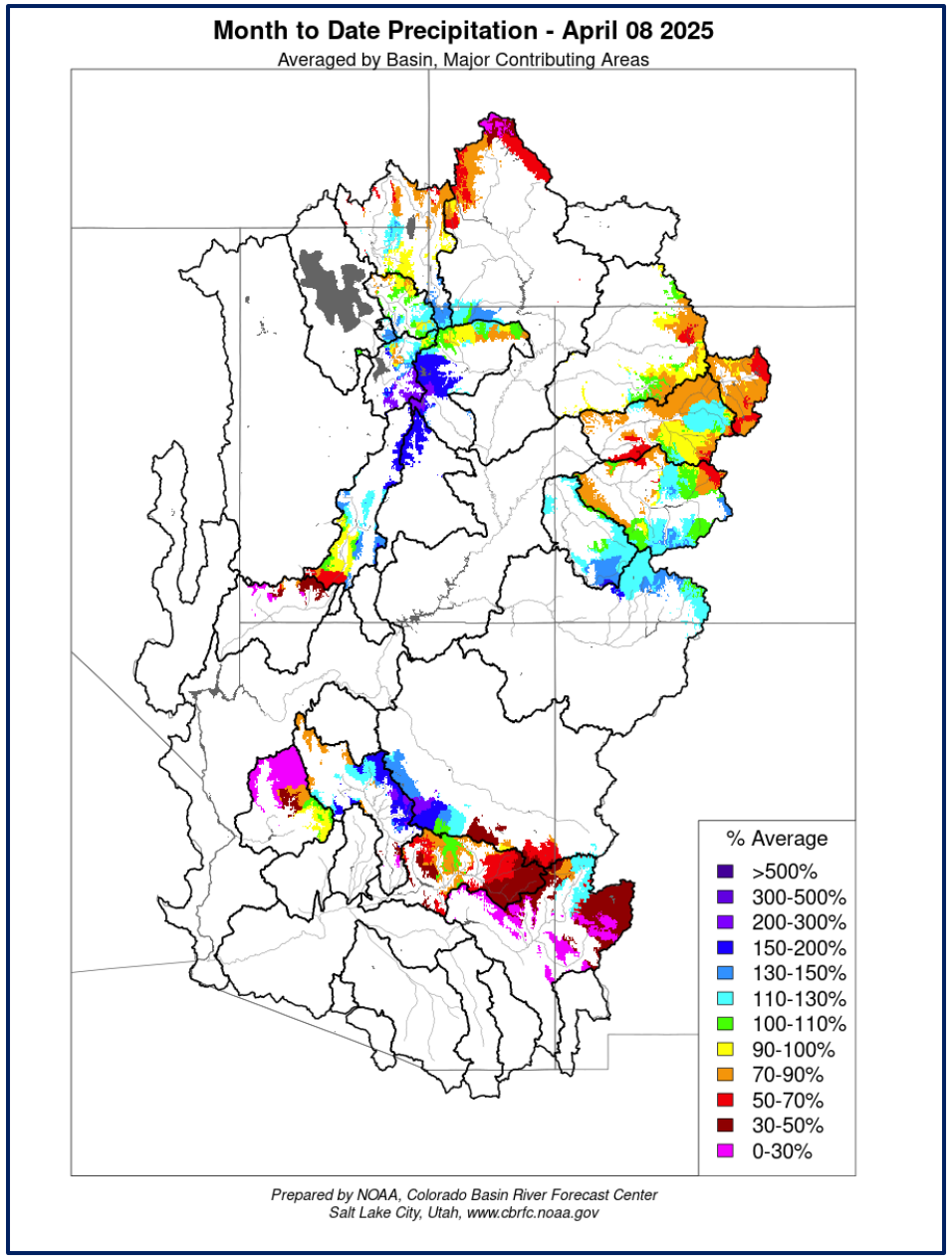
Reservoir	Percent Current Live Storage	Current Live Storage (maf)	Live Storage Capacity (maf)	Elevation (feet)
Fontenelle	38	0.13	0.33	6,473.79
Flaming Gorge	85	3.13	3.67	6,026.37
Blue Mesa	60	0.50	0.83	7,479.20
Navajo	62	1.02	1.65	6,036.18
Lake Powell	33	7.71	23.31	3,558.87
UC System Storage	42	12.61	29.79	
Total System Storage	41	23.72	58.48	

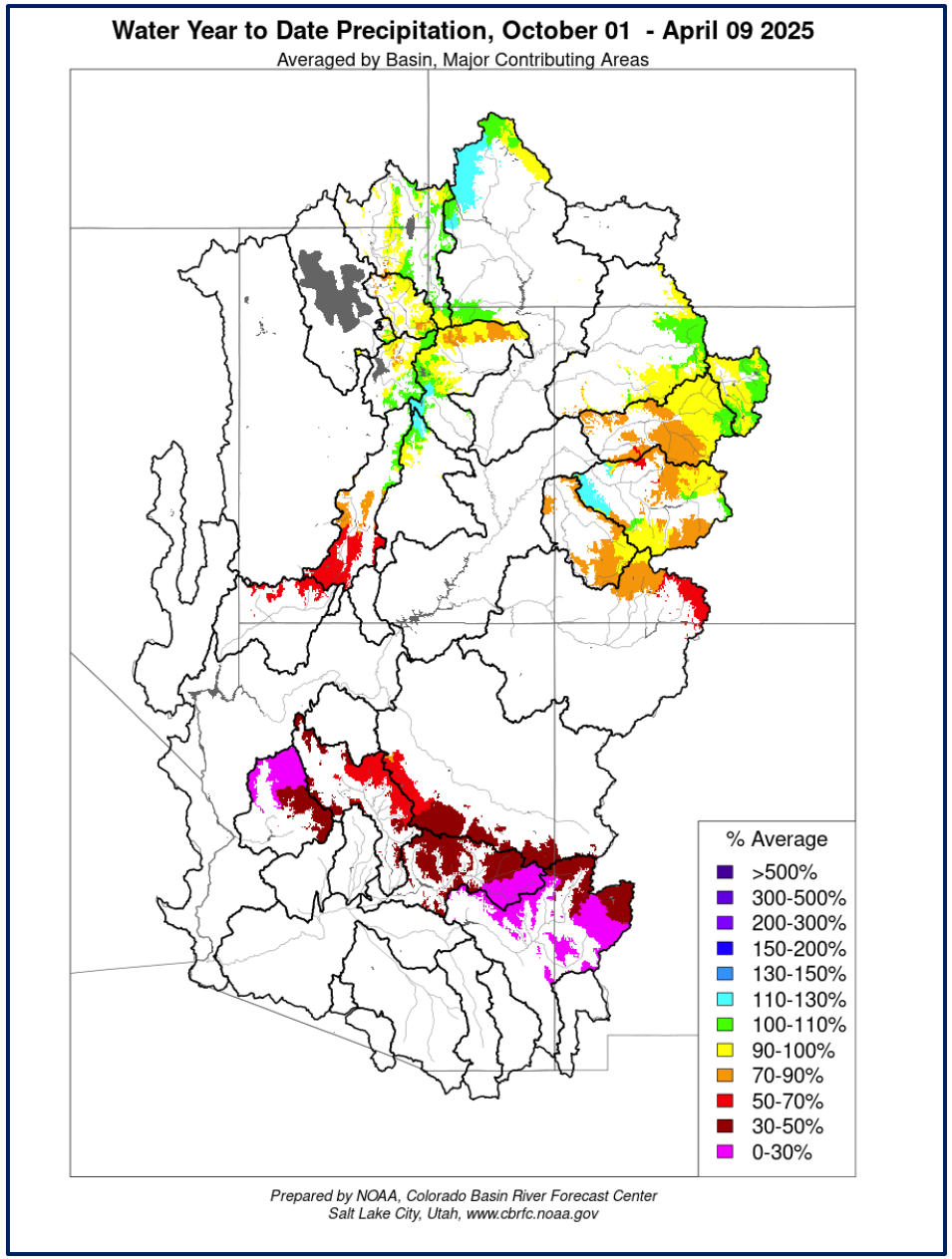


Fall Soil Moisture Comparison 2022 and 2025

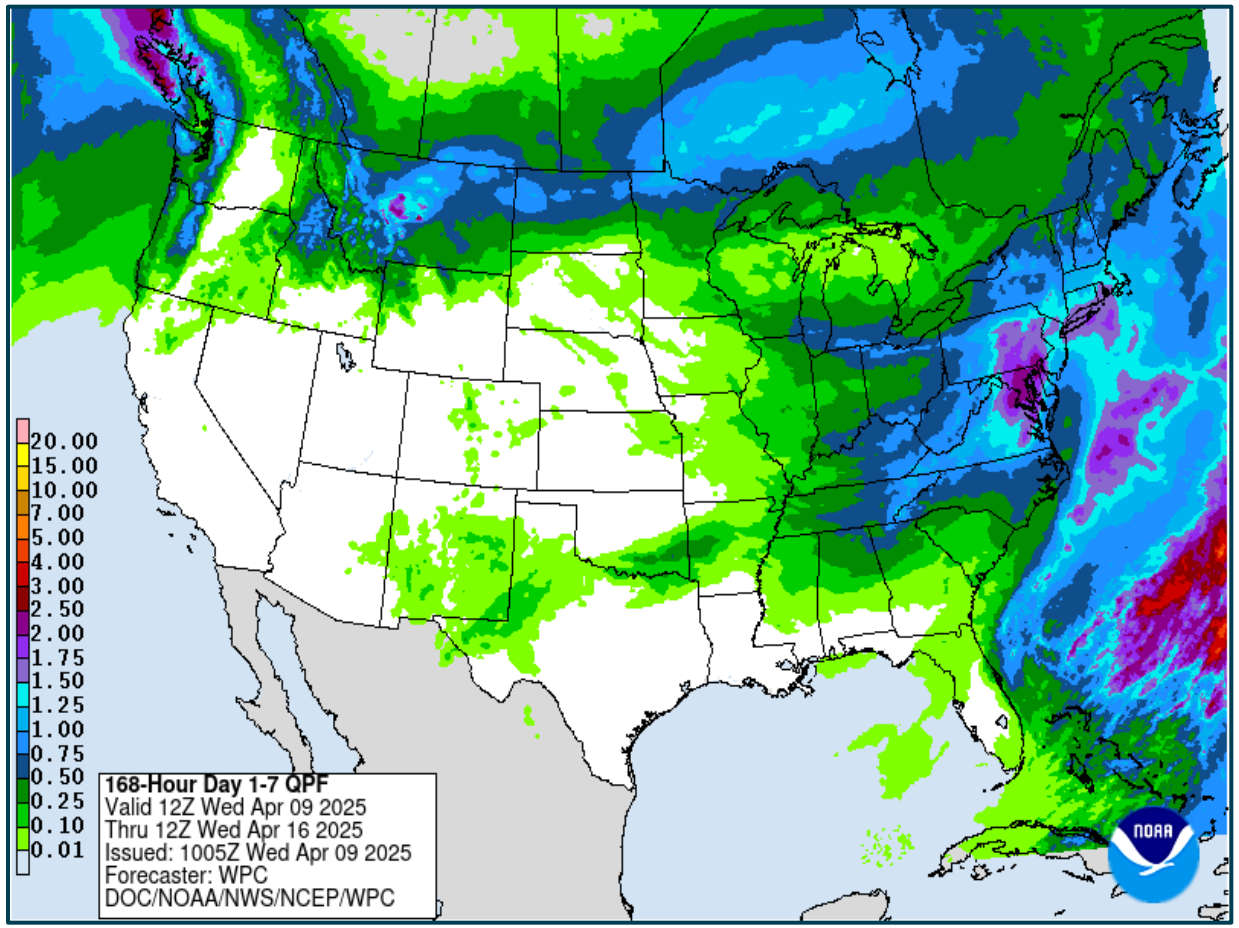


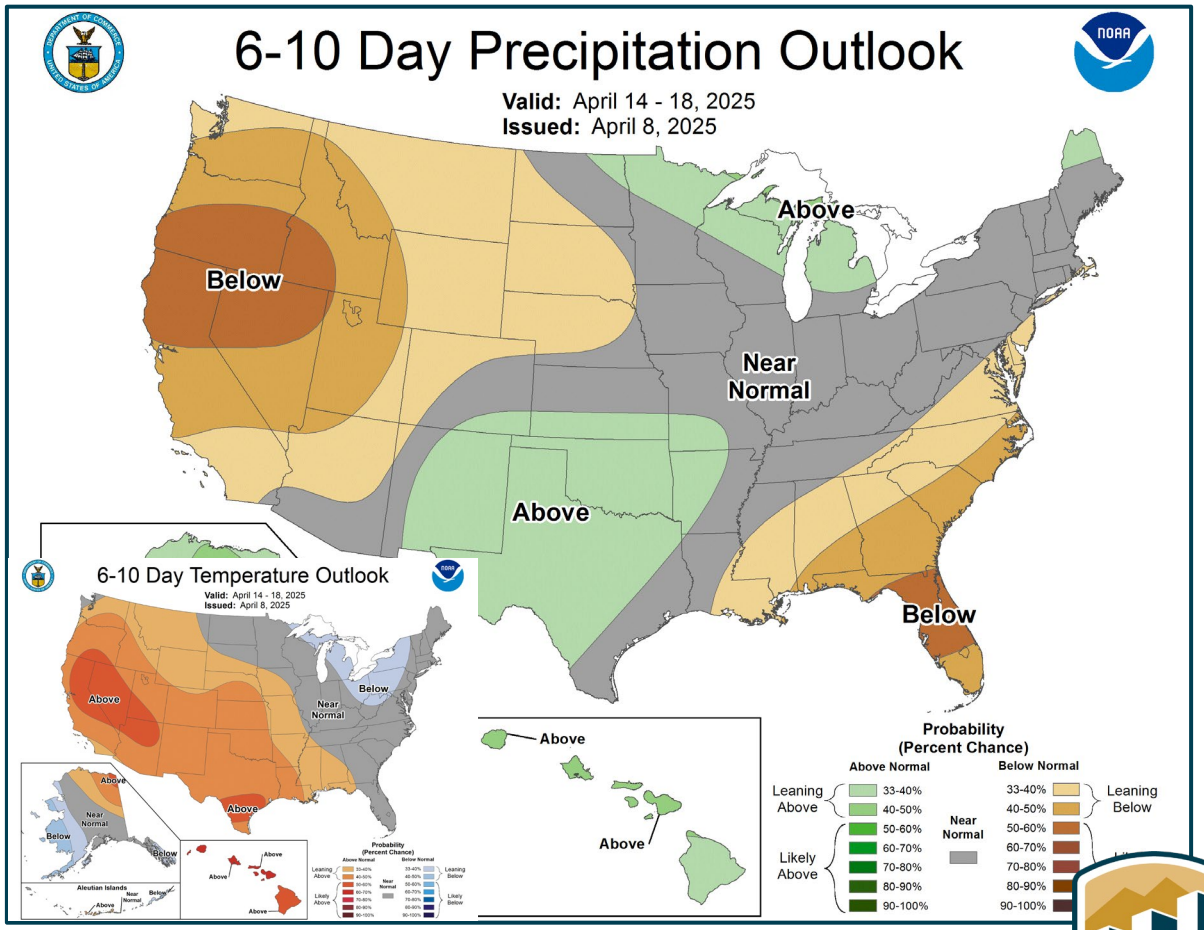



Month to Date Precipitation - April 08 2025
Averaged by Basin, Major Contributing Areas
% Average
>500%
300-500%
200-300%
150-200%
130-150%
110-130%
100-110%
90-100%
70-90%
50-70%
30-50%
0-30%
Prepared by NOAA, Colorado Basin River Forecast Center
Salt Lake City, Utah, www.cbrfc.noaa.gov

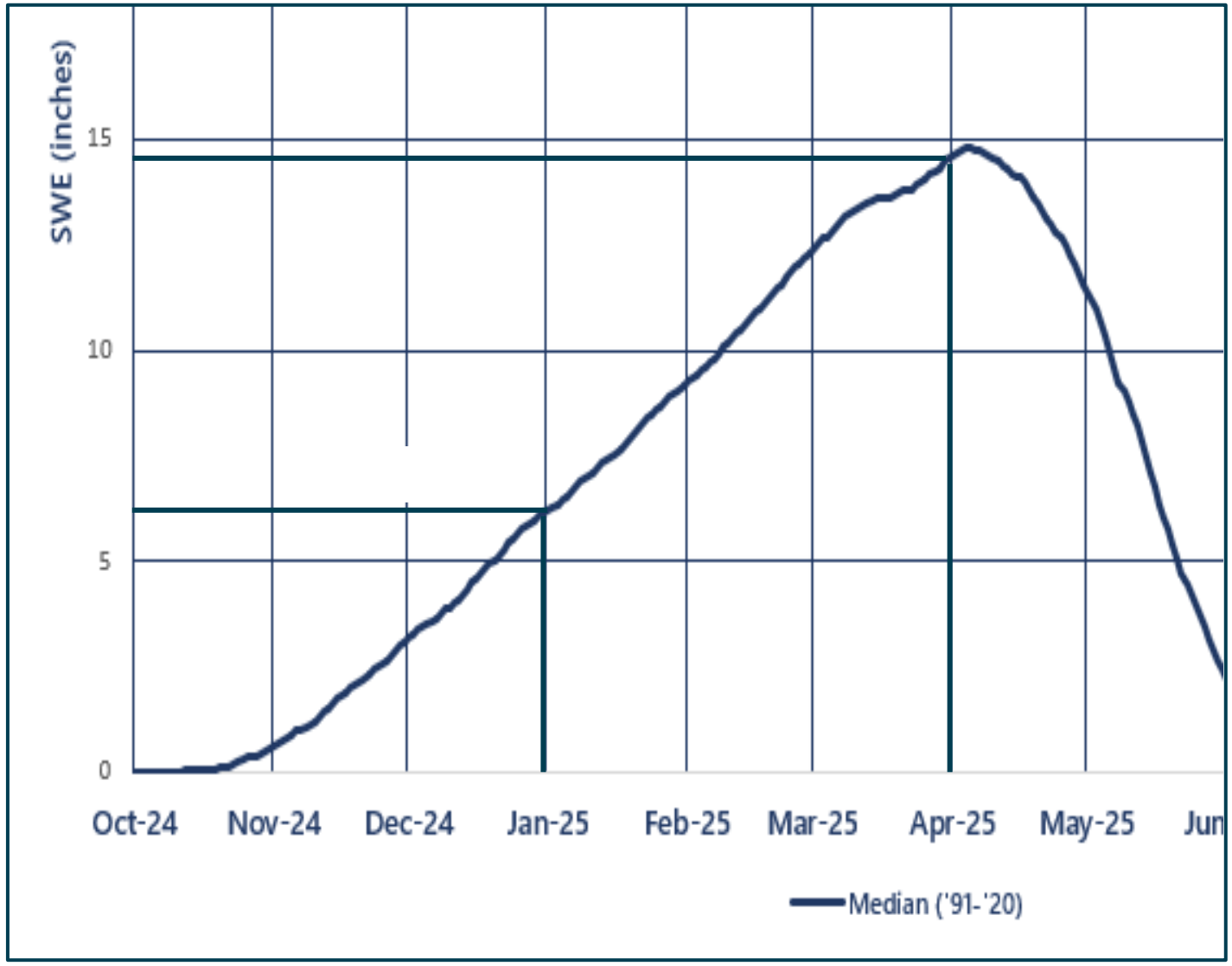

Water Year to Date Precipitation, October 01 - April 09 2025
Averaged by Basin, Major Contributing Areas
% Average
>500%
300-500%
200-300%
150-200%
130-150%
110-130%
100-110%
90-100%
70-90%
50-70%
30-50%
0-30%
Prepared by NOAA, Colorado Basin River Forecast Center
Salt Lake City, Utah, www.cbrfc.noaa.gov

Weather Prediction Center and Climate Prediction Center Precipitation Forecasts





Forecast Development



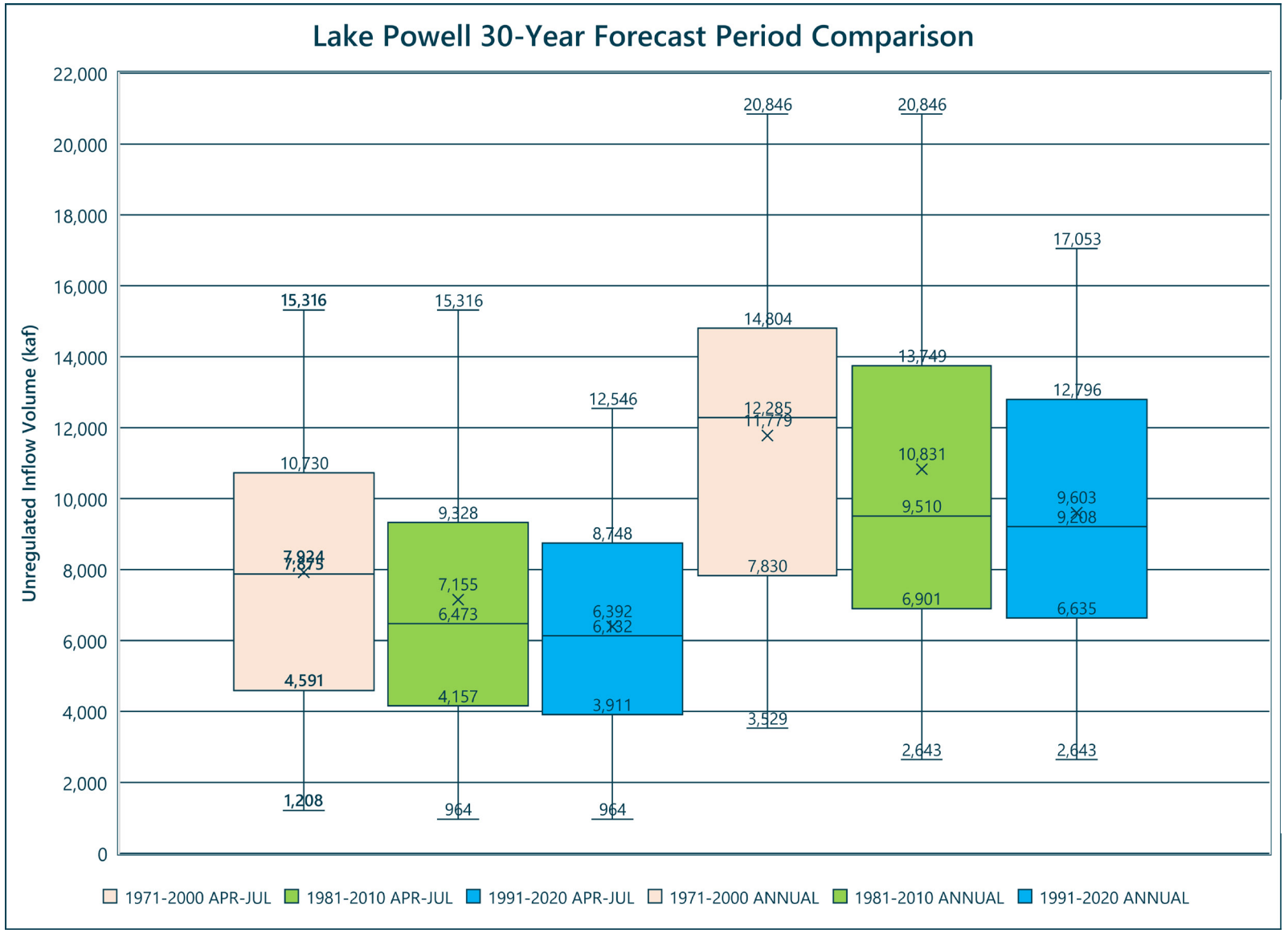
January 1st Forecast

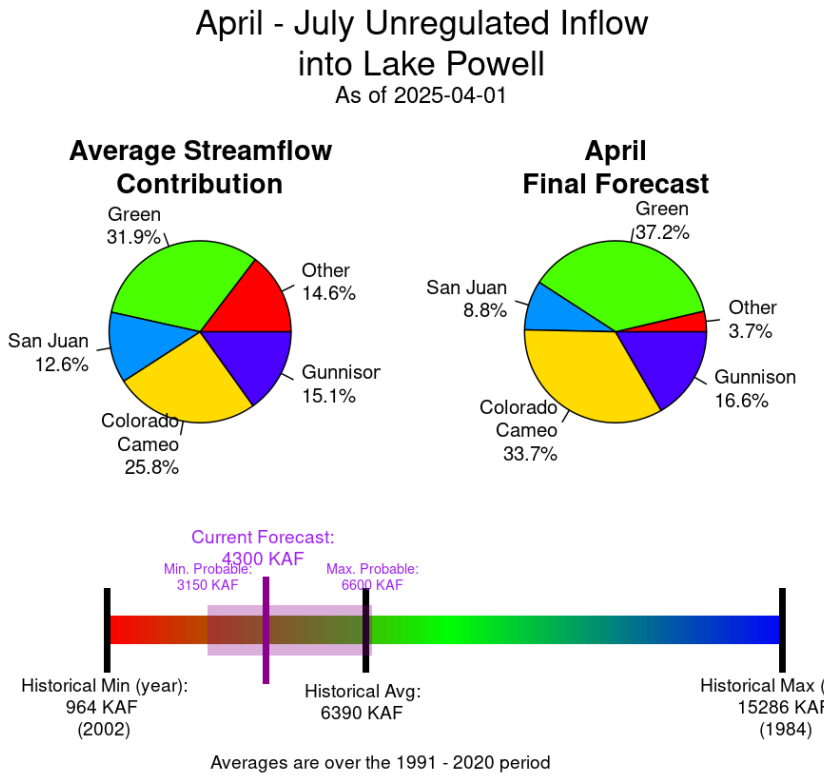
- **What we know:**
  - About 40% snowpack accumulation
  - Fall Soil Moisture conditions
- **What we don't know:**
  - Jan-May weather
  - About 60% of the snowpack accumulation

April 1st Forecast

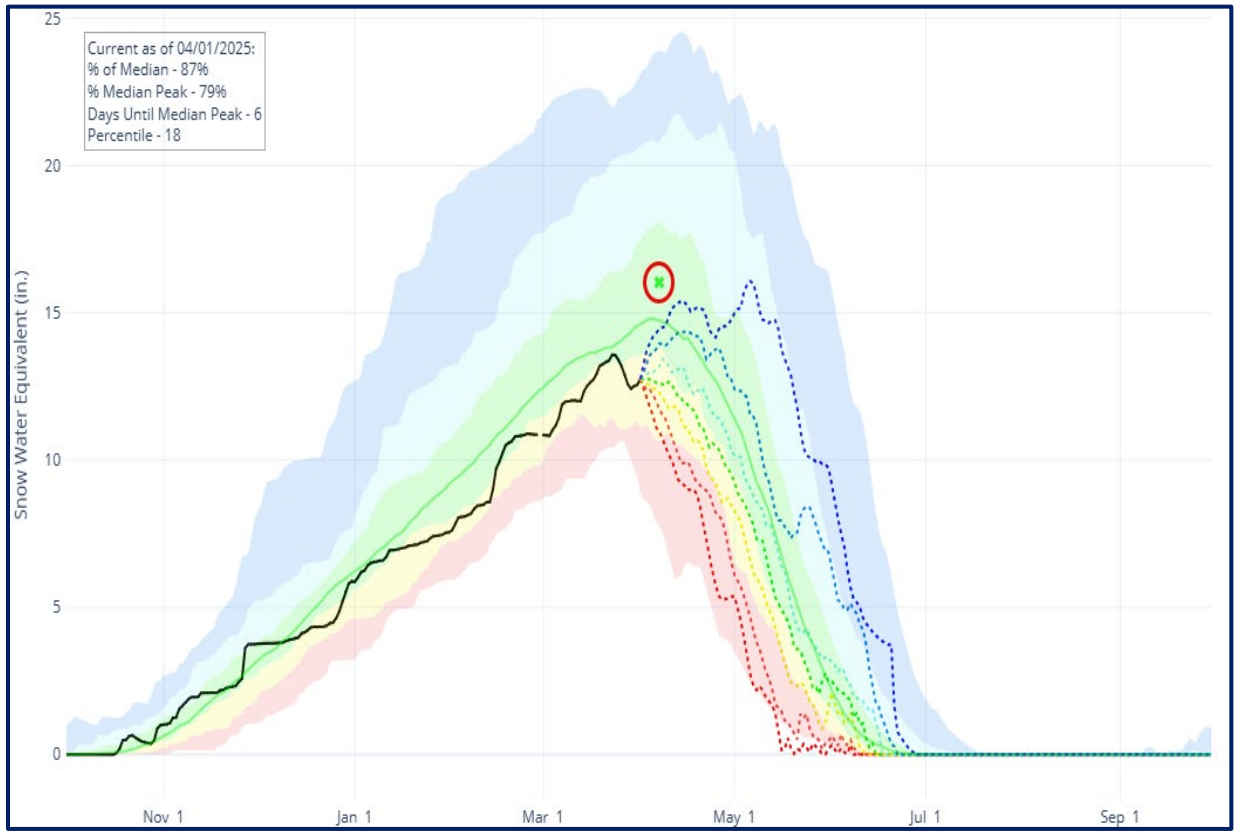
- **What we know:**
  - About 98% of the snowpack accumulation
  - Dec-March weather
- **What we don't know:**
  - April-May weather
  - Snowmelt pattern

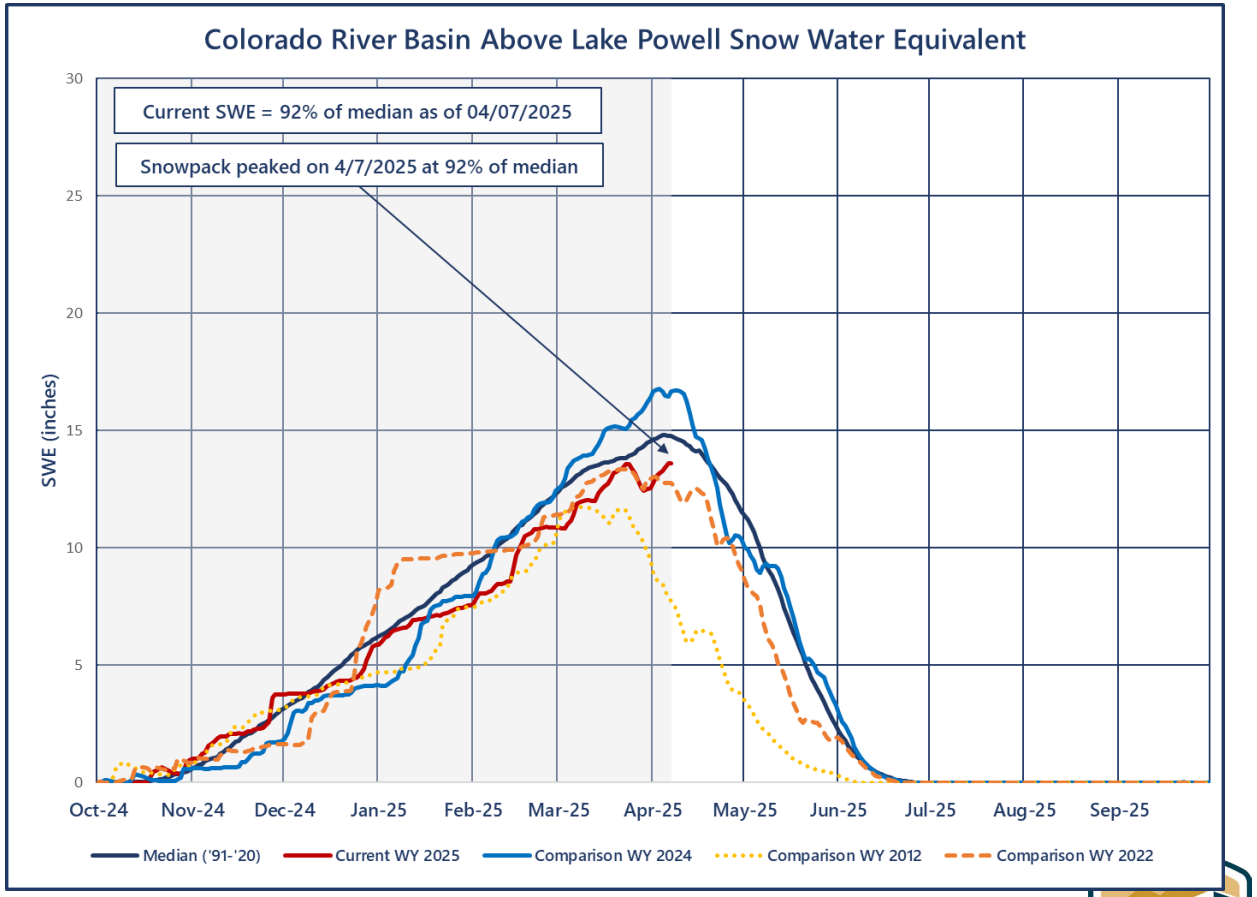
Forecast Information





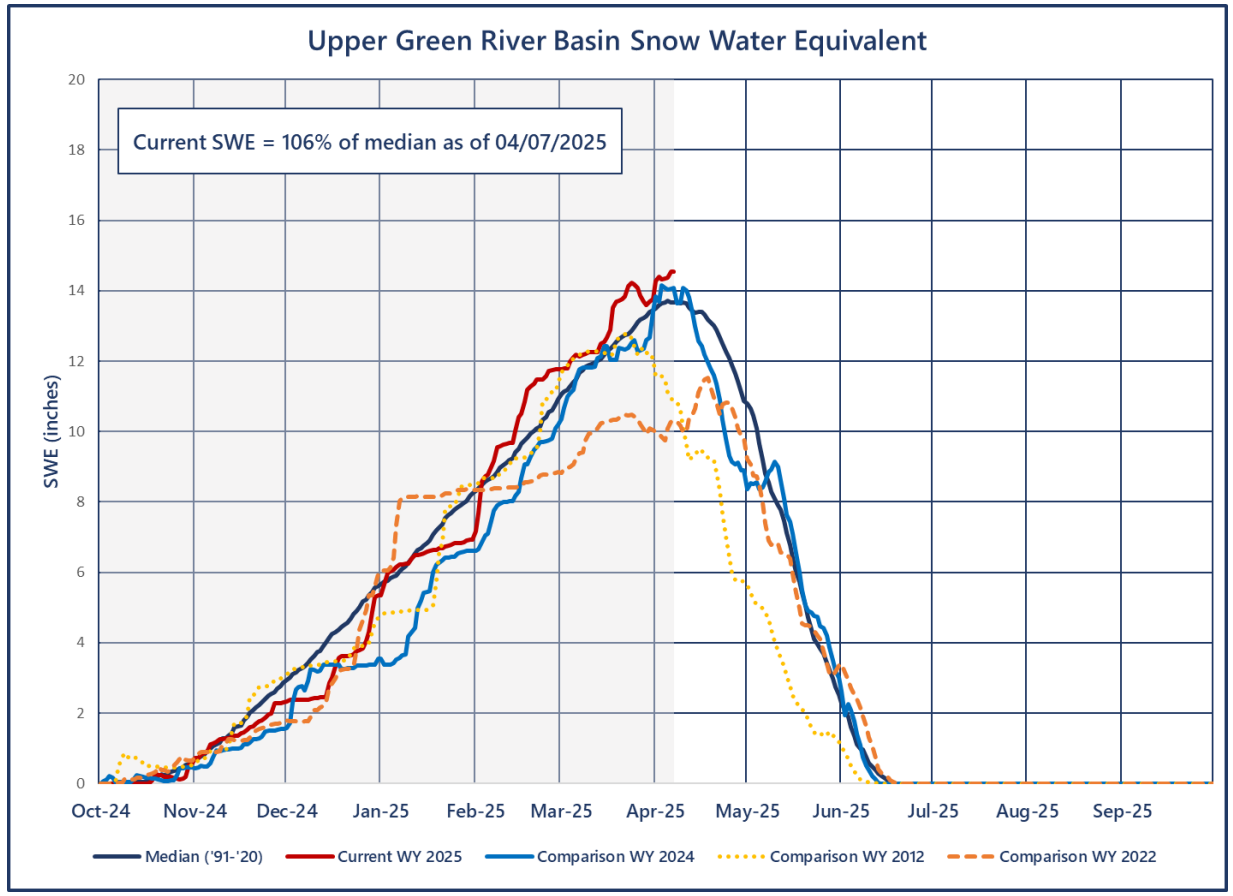
Upper Colorado Precipitation and SWE[1]

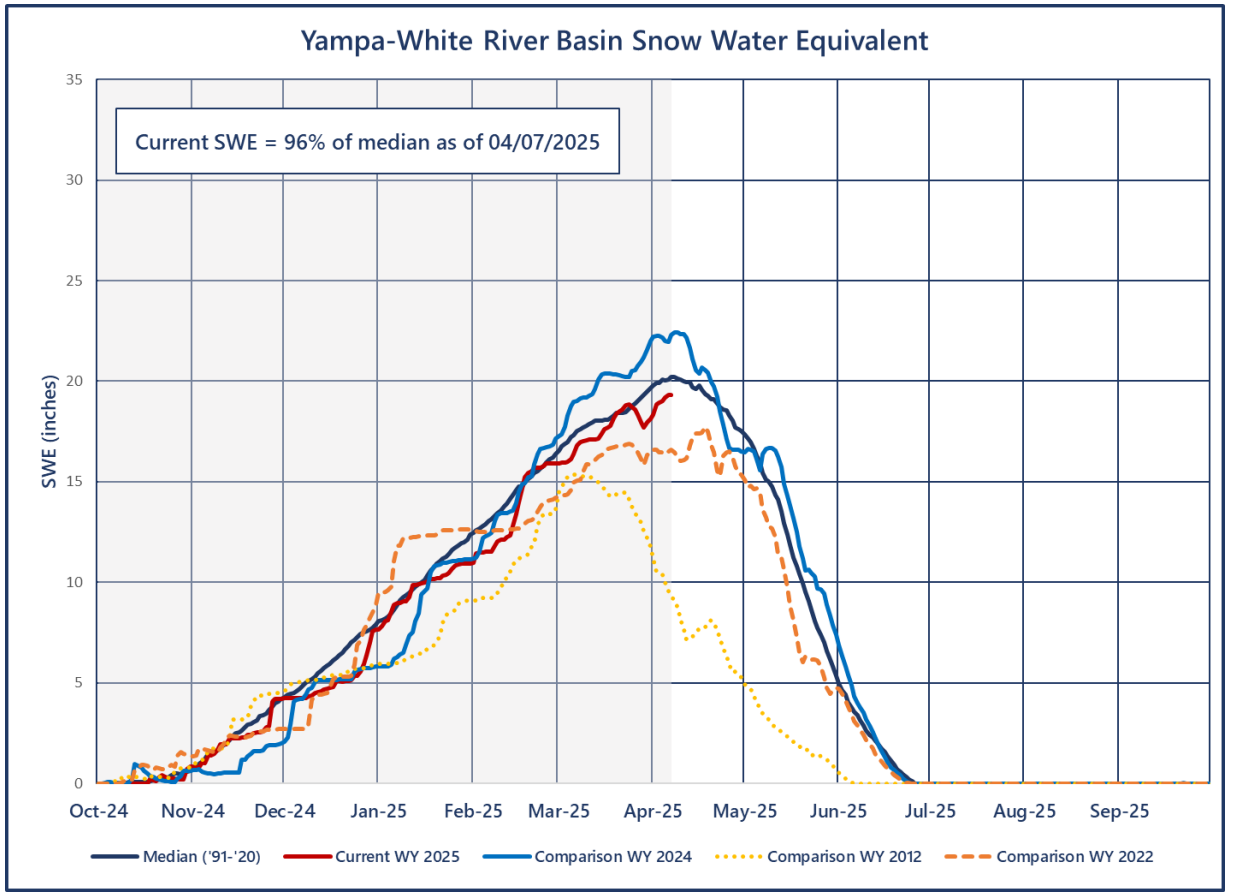




[1]Statistics are based on the 30-year period of record from 1991-2020.

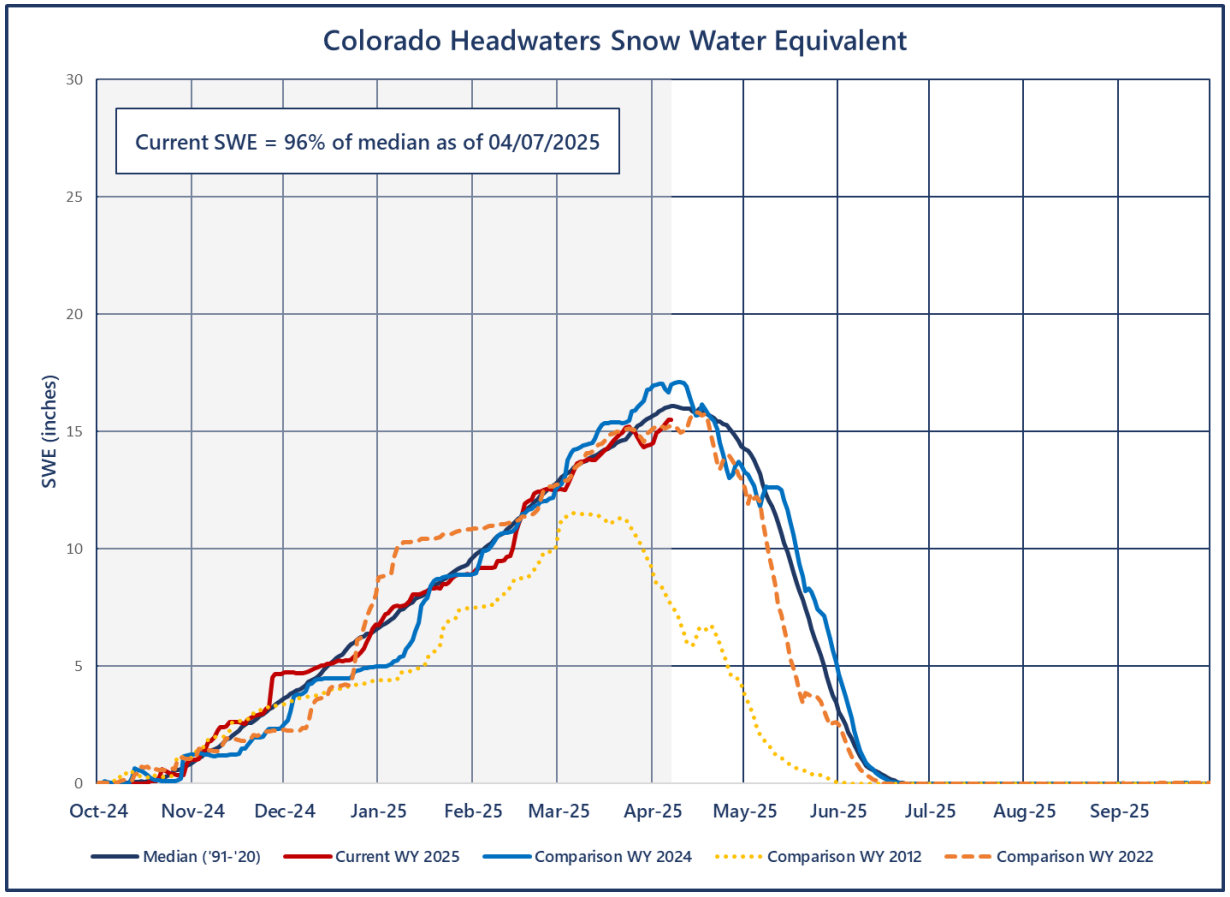
Upper Green and Yampa SWE[1]

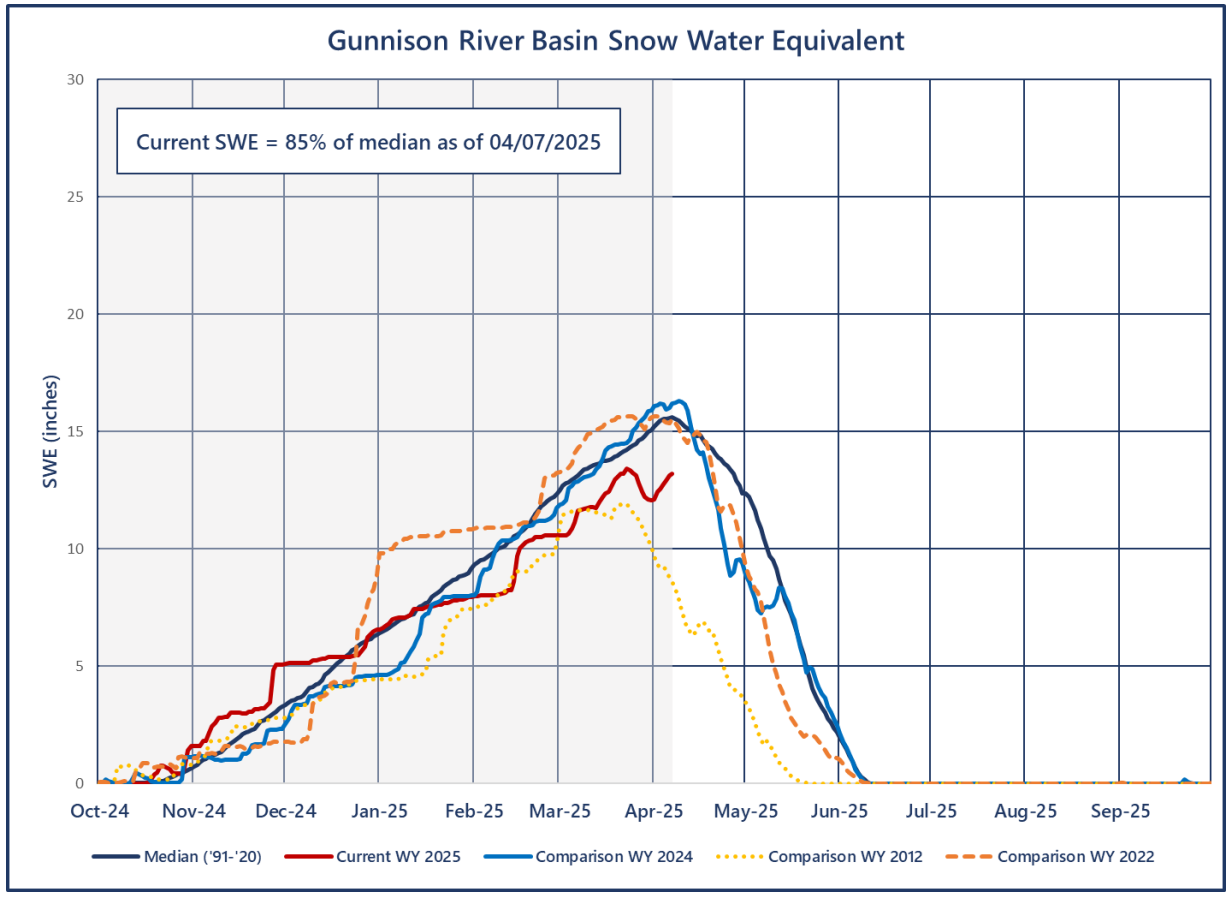




[1]Statistics are based on the 30-year period of record from 1991-2020.

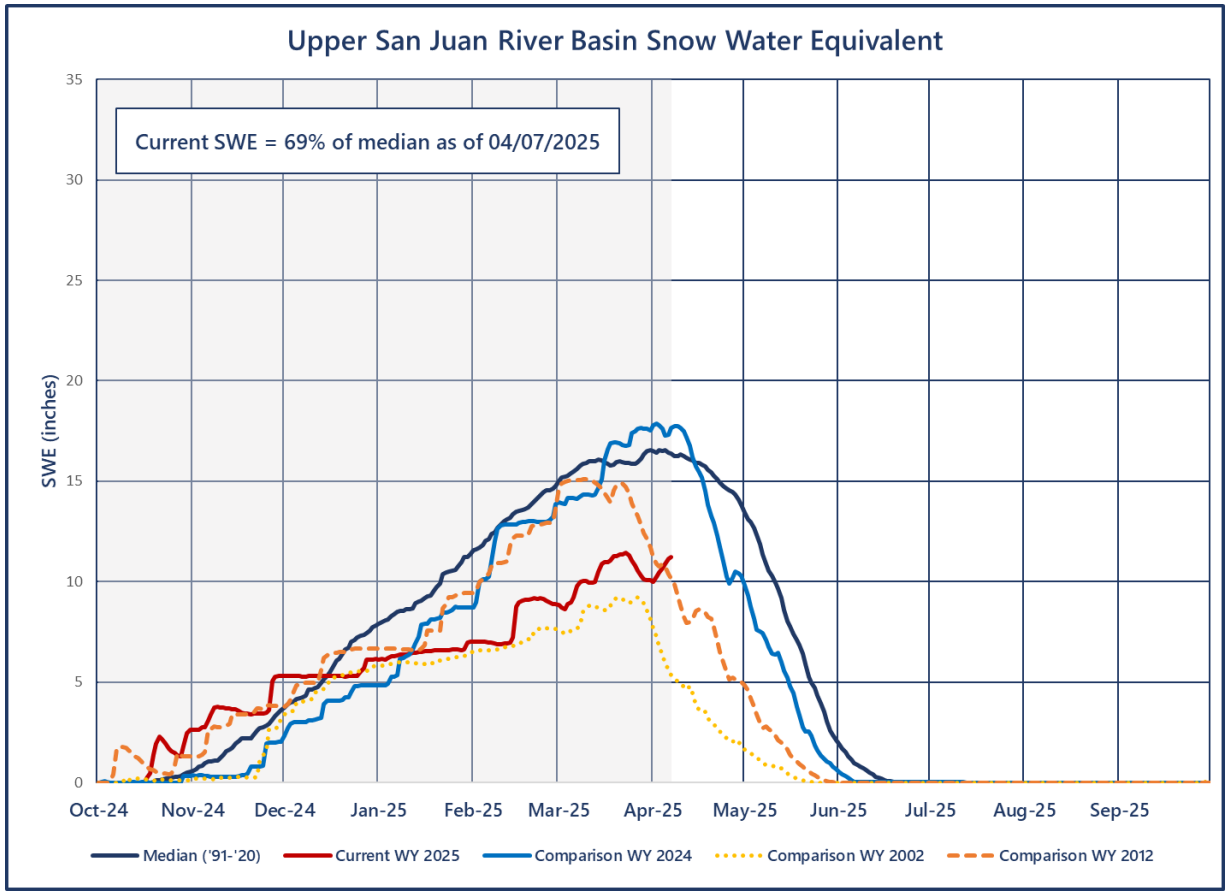
Colorado Headwaters and Gunnison SWE[1]

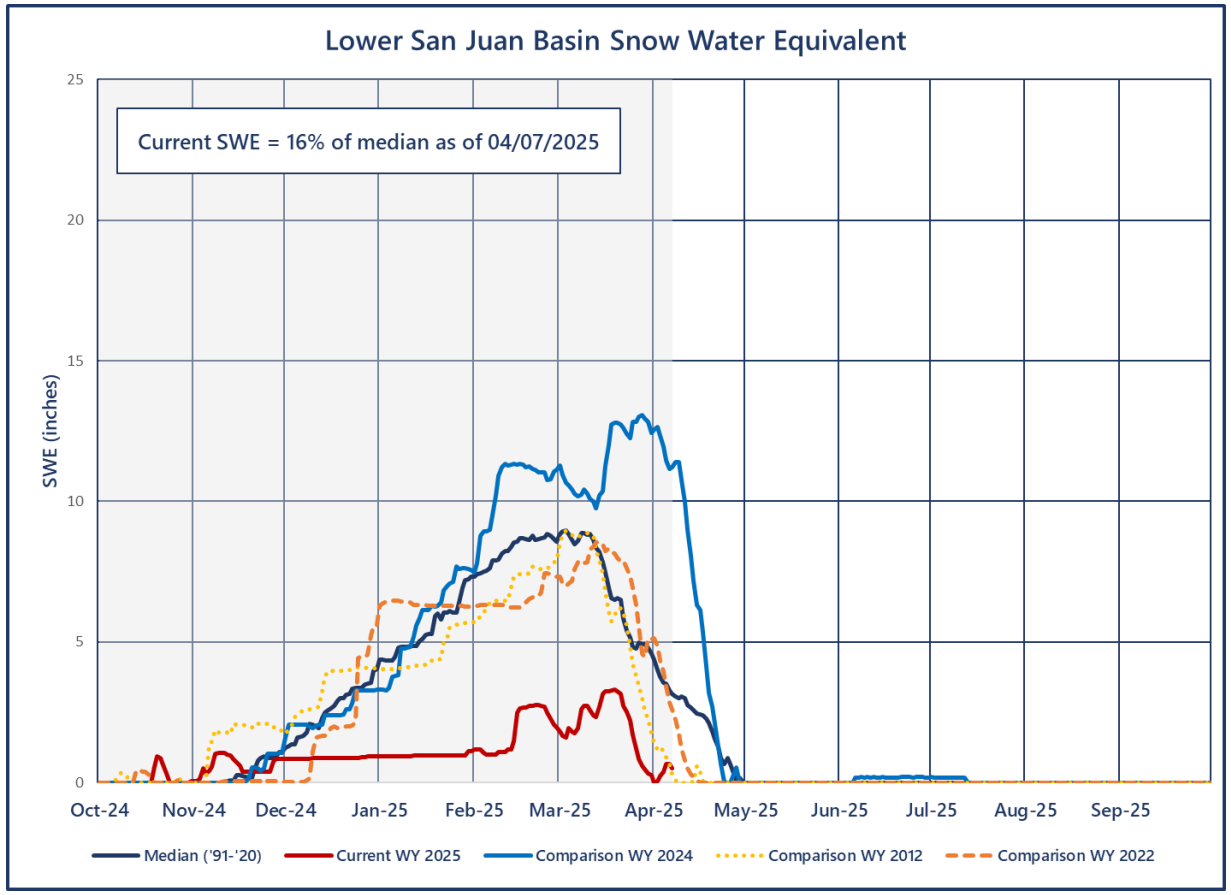




[1]Statistics are based on the 30-year period of record from 1991-2020.

San Juan SWE[1]





[1]*Statistics are based on the 30-year period of record from 1991-2020.*

Most Probable April Forecast
Water Year 2025

April – July 2025
Forecasted Unregulated Inflow

as of April 3, 2025

Reservoir	Inflow (kaf)	Change from Mar	Percent of Avg[1]
Fontenelle	655	+85	89
Flaming Gorge	770	+110	79
Blue Mesa	540	-10	85
Navajo	300	-25	48
Powell	4,300	0	67

Water Year 2025
Unregulated Inflow Forecast

as of April 3, 2025

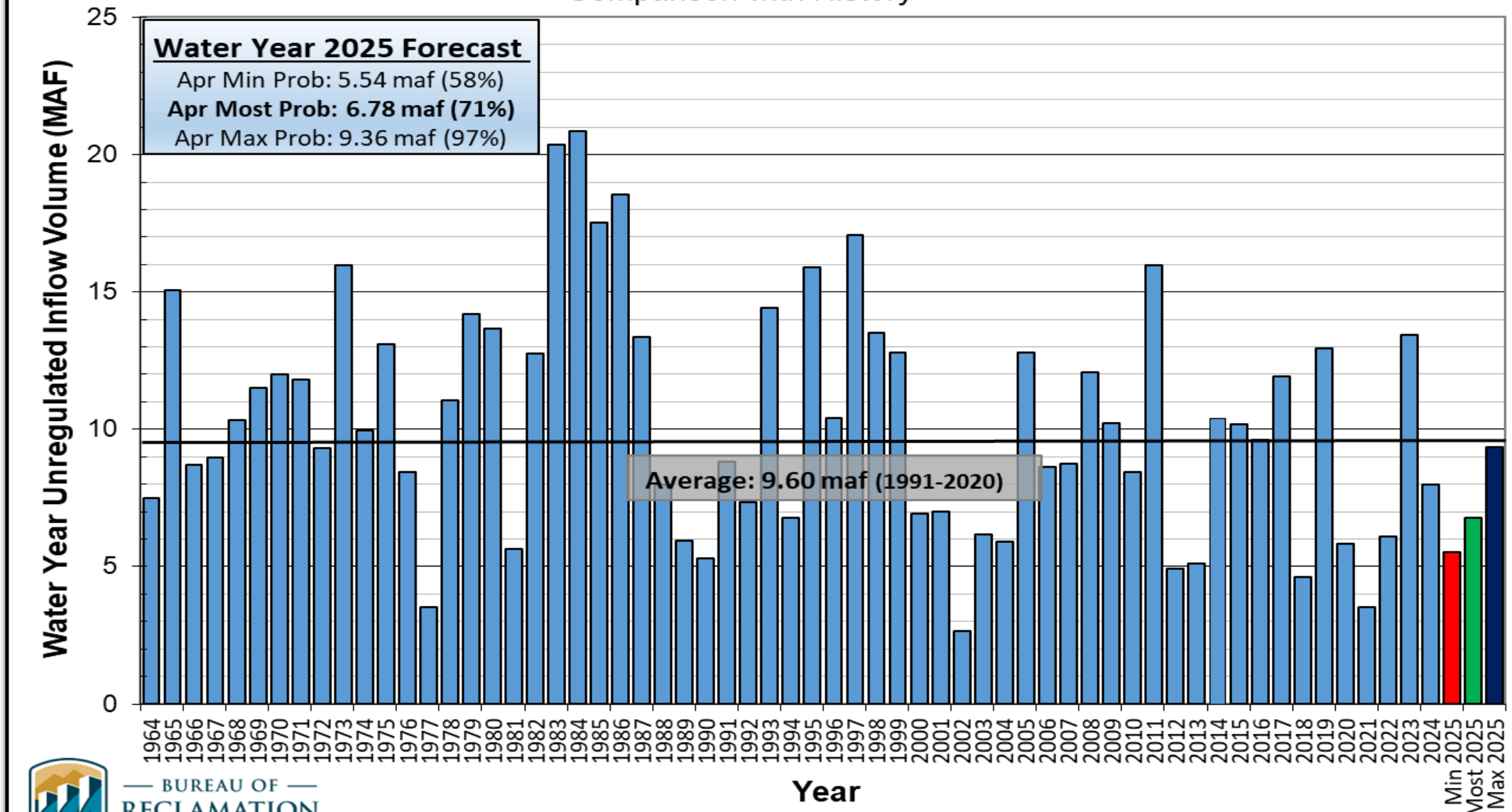
Reservoir	Inflow (kaf)	Change from Mar	Percent of Avg[1]
Fontenelle	937	+92	87
Flaming Gorge	1,133	+106	80
Blue Mesa	808	-7	89
Navajo	454	-32	60
Powell	6,776	+6	71

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

Lake Powell Unregulated Inflow

Water Year 2025 Forecast *(issued April 3)*

Comparison with History



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Upper Colorado Basin

Hydrology and Operations Projections Based on January and March 2025 24-Month Study

Most Probable March Forecast
Water Year 2025

April – July 2025
Forecasted Unregulated Inflow

as of March 5, 2025

Reservoir	Inflow (kaf)	Change from Feb	Percent of Avg[1]
Fontenelle	570	0	78
Flaming Gorge	660	-5	68
Blue Mesa	550	+30	87
Navajo	325	-25	52
Powell	4,300	0	67

Mar Midmonth = 4,500 kaf +200 (70% of avg)

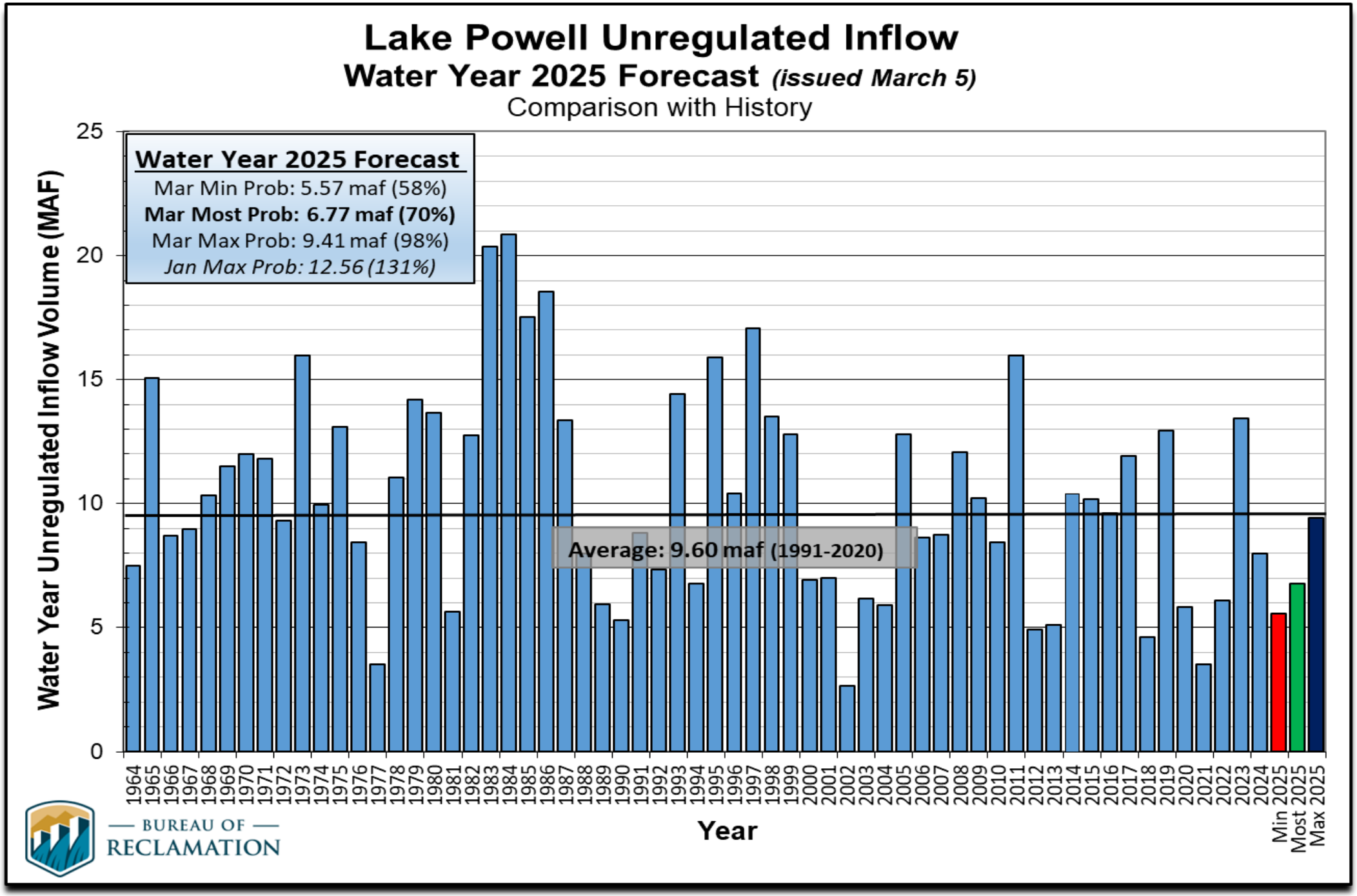
Water Year 2025
Unregulated Inflow Forecast

as of March 5, 2025

Reservoir	Inflow (kaf)	Change from Feb	Percent of Avg[1]
Fontenelle	845	-1	79
Flaming Gorge	1,027	+5	73
Blue Mesa	815	+5	90
Navajo	486	-34	53
Powell	6,770	-34	70

Mar Midmonth = 6,970 kaf +200 (73% of avg)

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


Lake Powell Unregulated Inflow
Water Year 2025 Forecast (issued March 5)
Comparison with History
Water Year 2025 Forecast
Mar Min Prob: 5.57 maf (58%)
Mar Most Prob: 6.77 maf (70%)
Mar Max Prob: 9.41 maf (98%)
Jan Max Prob: 12.56 (131%)
Average: 9.60 maf (1991-2020)
Water Year Unregulated Inflow Volume (MAF)
Year
BUREAU OF RECLAMATION

Upper Basin Reservoir Operations
Water Year 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 2025 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 Release[1]

Lake Powell

Elevation (feet)	Operation According to the Interim Guidelines	Live Storage (maf)
3,700	**Equilization Tier** Equalize, avoid spills, or release 8.23 maf	23.31
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)
3,575	**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	8.90
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
3,500	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	4.22
3,370		0

3,568.99 ft Jan 1, 2025 Projection

Lake Mead

Elevation (feet)	Operation According to the Interim Guidelines	Live Storage (maf)
1,220	**Flood Control Surplus or Quantified Surplus Condition** Deliver > 7.5 maf	26.18
1,200 (approx.)	**Domestic Surplus or ICS Surplus Condition** Deliver > 7.5 maf	23.14 (approx.)
1,145	**Normal or ICS Surplus Condition** Deliver ≥ 7.5 maf	16.18
1,075	**Shortage Condition** Deliver 7.167 maf	
1,050	**Shortage Condition** Deliver 7.083 maf	
1,025	**Shortage Condition** Deliver 7.0 maf Further measures may be undertaken	5.98
1,000		4.48
895		0

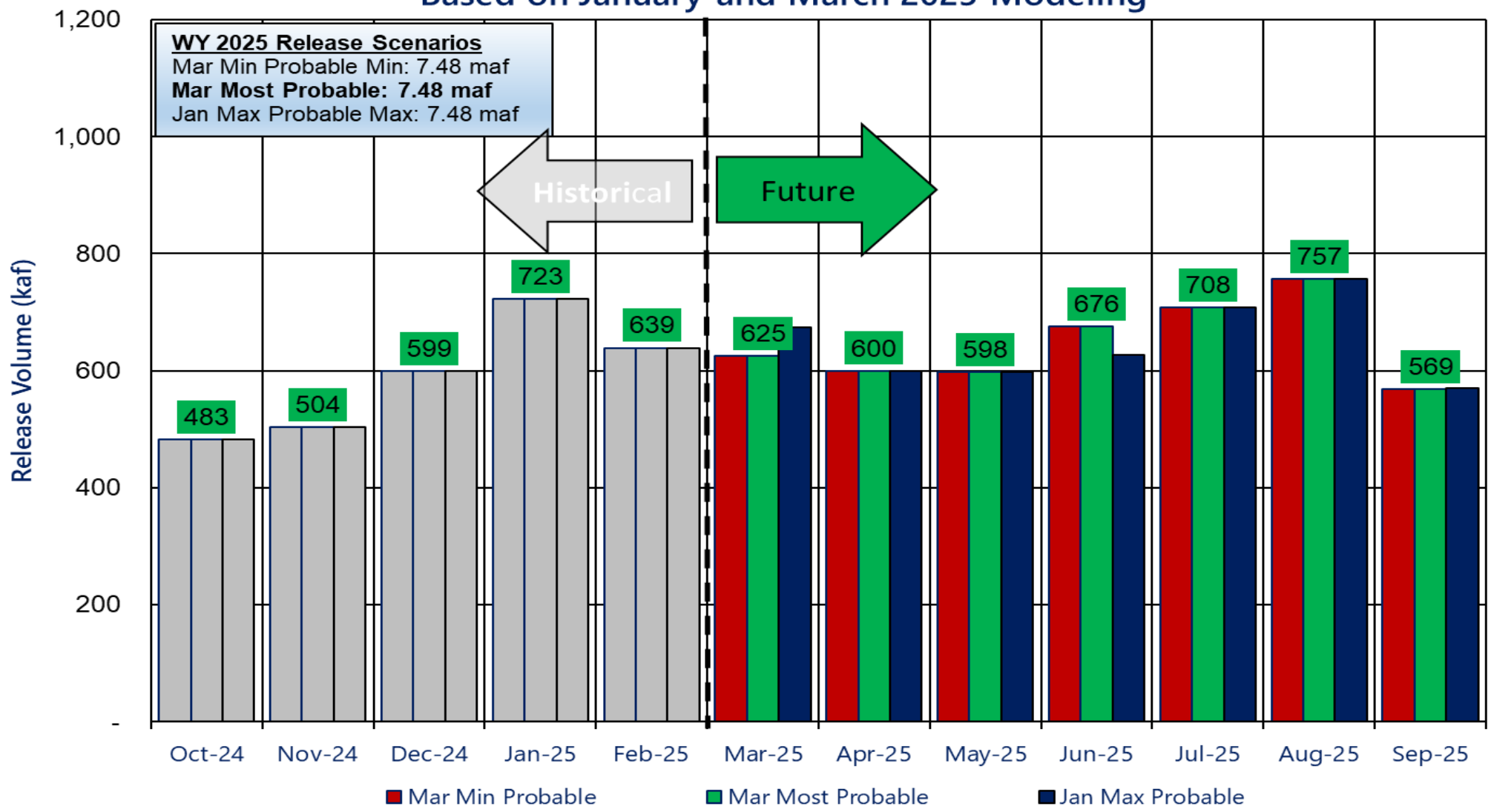
1,062.32 ft Jan 1, 2025 Projection

[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 2025

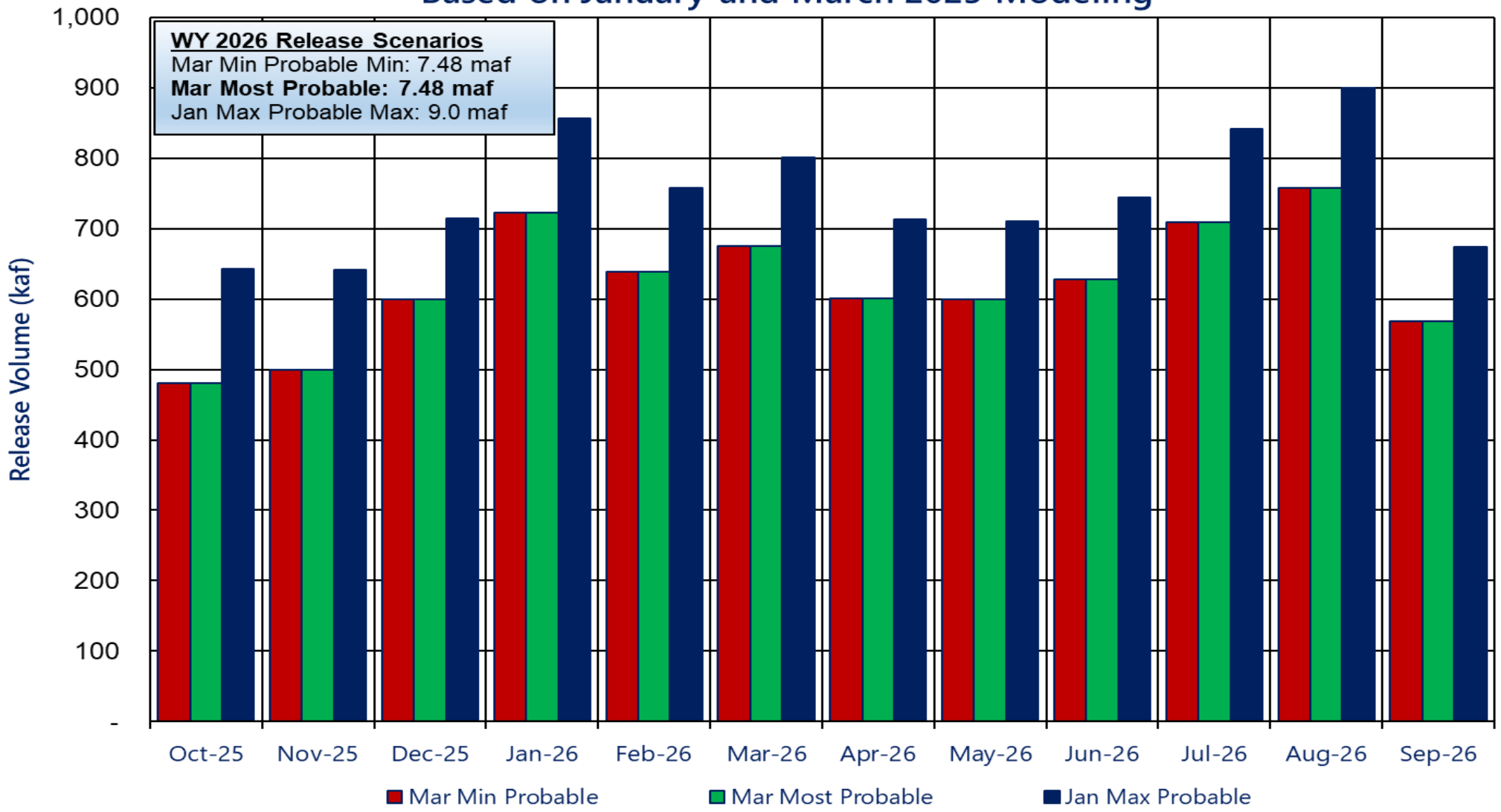
Based on January and March 2025 Modeling



Potential Lake Powell Monthly Release Volume Distribution

Release Scenarios for Water Year 2026

Based on January and March 2025 Modeling

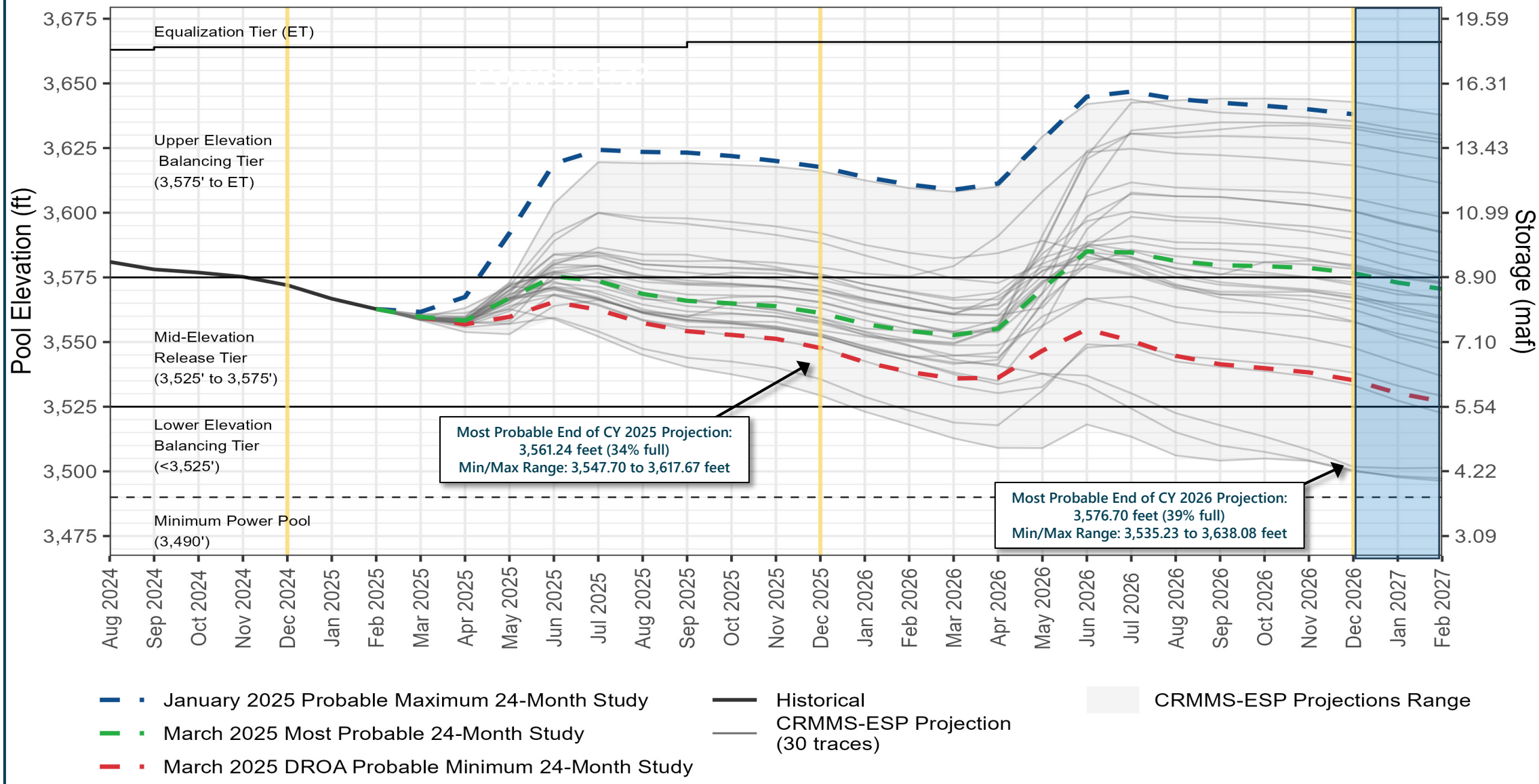


Reclamation Operational Modeling
Model Comparison

	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)	1 - 2	1 - 5	1 - 50
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[1]

CRMMS Projections from January and March 2025



[1]For modeling purposes, simulated years beyond 2026 assume a continuation of the 2007 Interim Guidelines including the 2024 Supplement to the 2007 Interim Guidelines (no additional SEIS conservation is assumed to occur after 2026), the 2019 Colorado River Basin Drought Contingency Plans, and Minute 323 including the Binational Water Scarcity Contingency Plan. With the exception of certain provisions related to ICS recovery and Upper Basin Demand management, operations under these agreements are in effect through 2026. Reclamation initiated the process to develop operations for post-2026 in June 2023, and the modeling assumptions describe here are subject to change.

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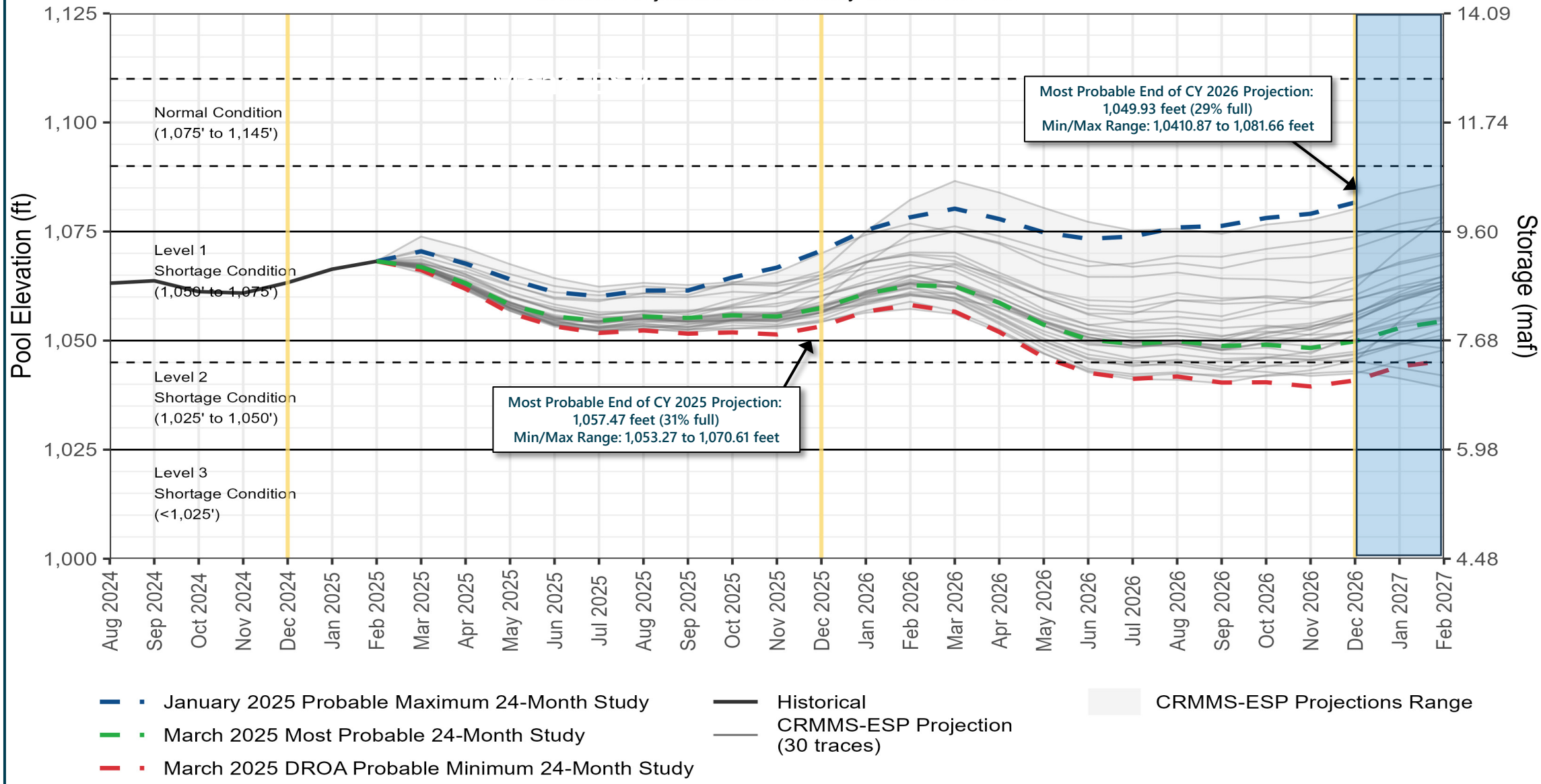
Lake Mead End-of-Month Elevations[1]

CRMMS Projections from January and March 2025



[1]*For modeling purposes, simulated years beyond 2026 assume a continuation of the 2007 Interim Guidelines including the 2024 Supplement to the 2007 Interim Guidelines (no additional SEIS conservation is assumed to occur after 2026), the 2019 Colorado River Basin Drought Contingency Plans, and Minute 323 including the Binational Water Scarcity Contingency Plan. With the exception of certain provisions related to ICS recovery and Upper Basin Demand management, operations under these agreements are in effect through 2026. Reclamation initiated the process to develop operations for post-2026 in June 2023, and the modeling assumptions describe here are subject to change.*

BUREAU OF RECLAMATION

Upper Colorado Basin

Hydropower Maintenance

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	6	6	7	5	5	6	7	7	8	8	8	6	
Penstock Capacity (cfs)	19,650	19,700	23,350	16,100	16,100	19,700	23,300	23,300	26,900	26,900	26,900	19,700	MAR MOST[2]
Penstock Capacity (kaf/month)	1,200	1,500	1,550	1,360	910	1,240	1,380	1,590	1,600	1,650	1,650	1,180	Mar MOST
Jan 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 03-17-2025)			

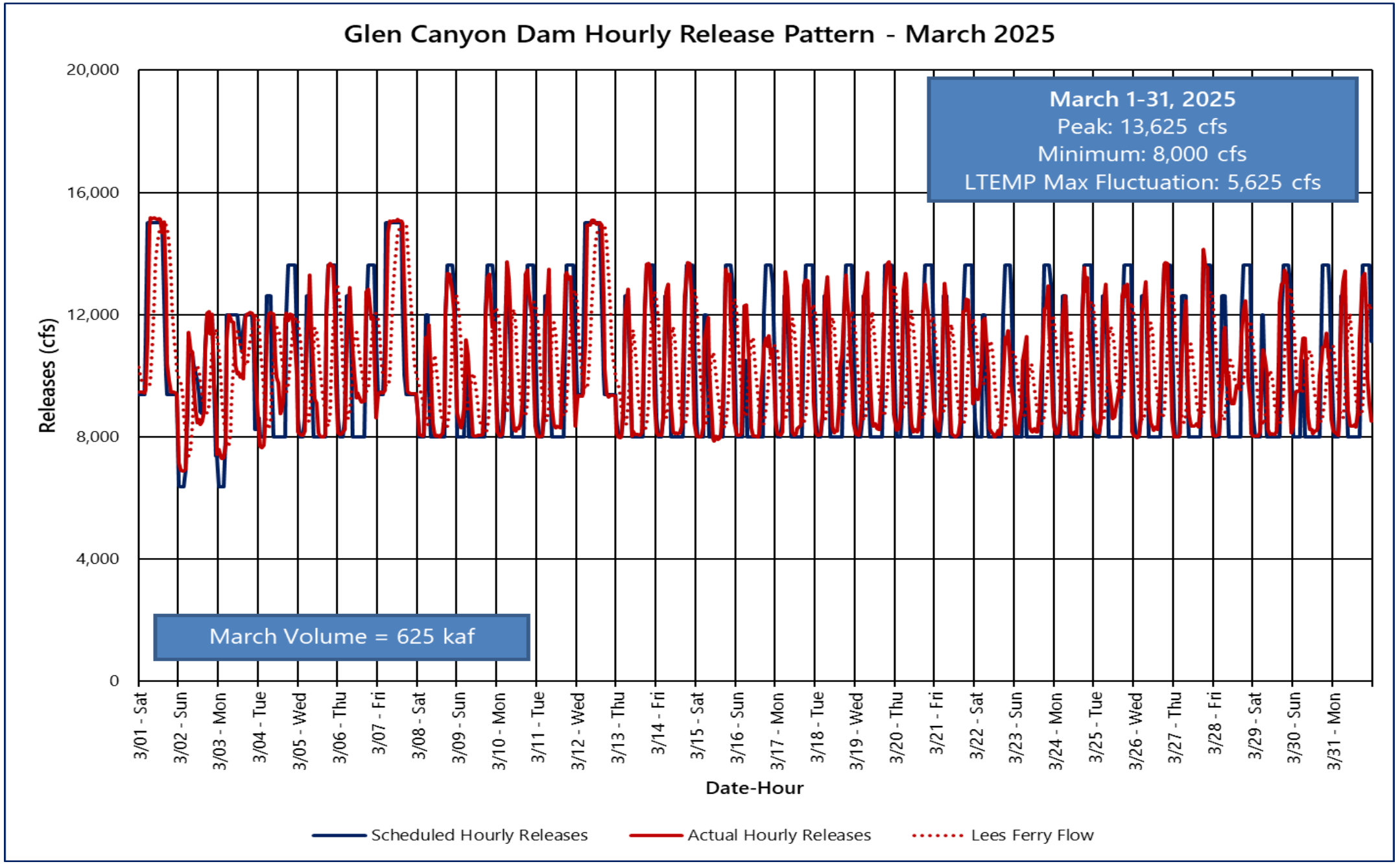
1 Projected release based on March 2025 24MS for the probable most and minimum and the January 2025 maximum 24-Month Study model runs.
2 Dependent upon availability to shift contingency regulation, which will increase capacity by 30-40MW (3%) at current efficiency.

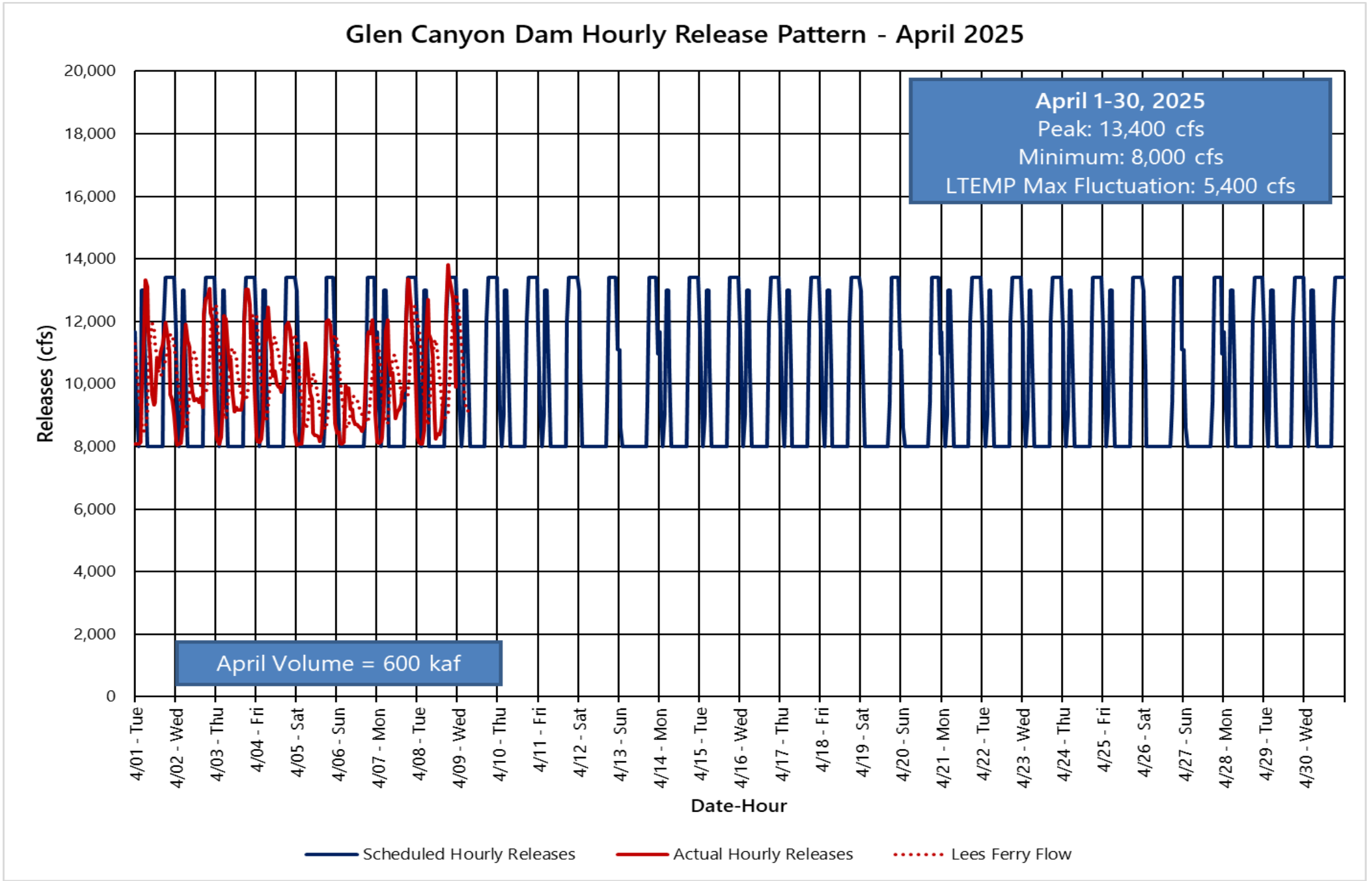
Glen Canyon Dam Power Plant Unit Outage Schedule for 2026

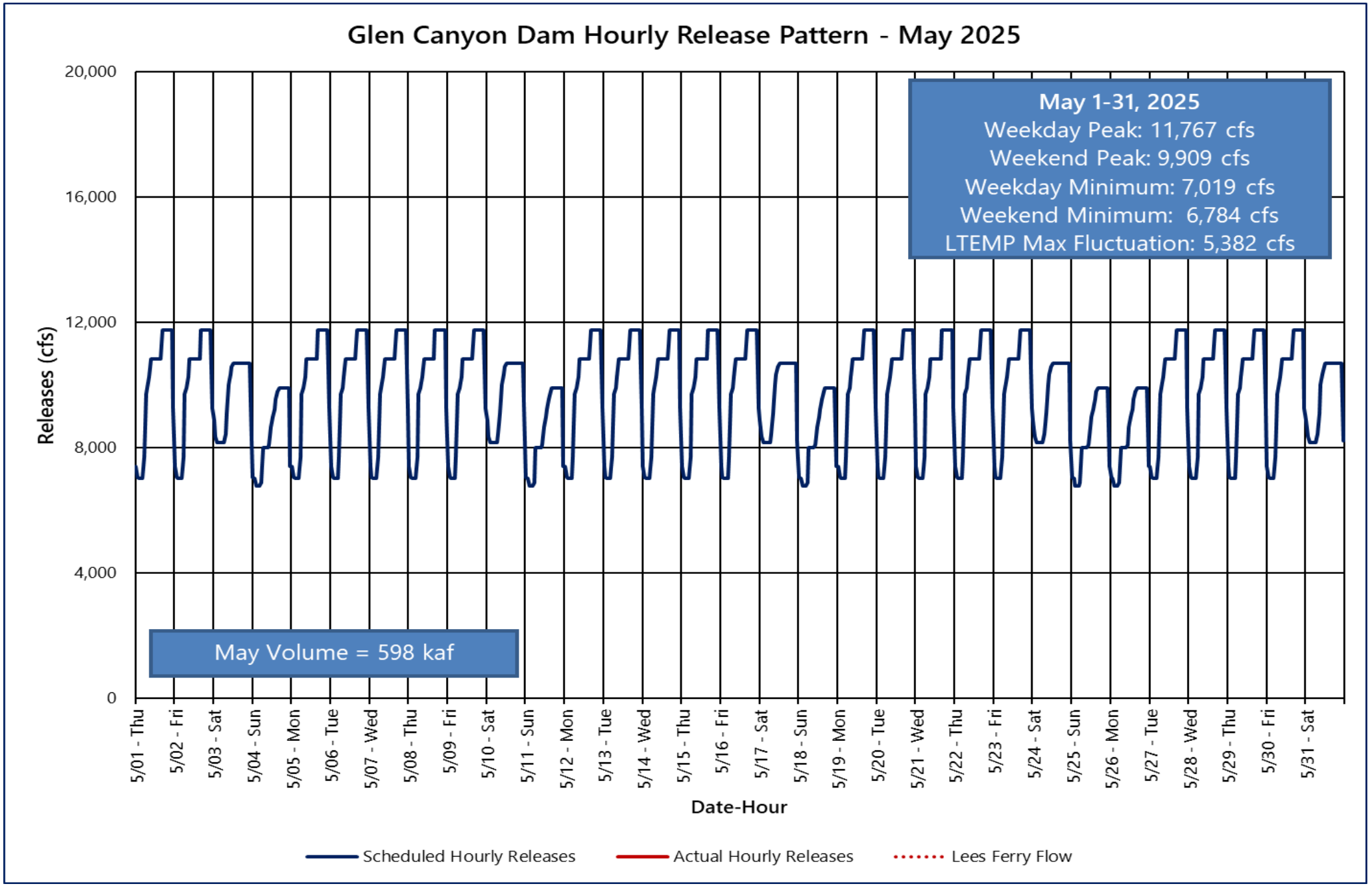
Unit Number	Oct 2025	Nov 2025	Dec 2025	Jan 2026	Feb 2026	Mar 2026	Apr 2026	May 2026	Jun 2026	Jul 2026	Aug 2026	Sep 2026	
1													
2													
3													
4													
5													
6													
7													
8													
Units Available	6	8	8	8	6	6	7	7	8	8	8	6	
Penstock Capacity (cfs)	19,700	26,900	26,900	26,900	19,700	19,700	23,300	23,300	26,900	26,900	26,900	19,700	MAR MOST[2]
Penstock Capacity (kaf/month)	1,250	1,510	1,650	1,570	1,120	1,220	1,440	1,550	1,600	1,650	1,640	1,170	MAR MOST
Jan Max (kaf) [1]	643	642	715	857	758	801	713	710	745	842	900	674	9.0 maf
Most (kaf) [1]	480	500	600	723	639	675	601	599	628	709	758	567	7.48 maf
Min (kaf) [1]	480	500	600	723	639	675	601	599	628	709	758	567	7.48 maf
										(updated 03-17-2025)			

1 Projected release based on March 2025 24MS for the probable most and minimum and the January 2025 maximum 24-Month Study model runs.

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


Glen Canyon Dam Hourly Release Pattern - March 2025
March 1-31, 2025
Peak: 13,625 cfs
Minimum: 8,000 cfs
LTEMP Max Fluctuation: 5,625 cfs
March Volume = 625 kaf
Releases (cfs)
20,000
16,000
12,000
8,000
4,000
0
3/01 - Sat
3/02 - Sun
3/03 - Mon
3/04 - Tue
3/05 - Wed
3/06 - Thu
3/07 - Fri
3/08 - Sat
3/09 - Sun
3/10 - Mon
3/11 - Tue
3/12 - Wed
3/13 - Thu
3/14 - Fri
3/15 - Sat
3/16 - Sun
3/17 - Mon
3/18 - Tue
3/19 - Wed
3/20 - Thu
3/21 - Fri
3/22 - Sat
3/23 - Sun
3/24 - Mon
3/25 - Tue
3/26 - Wed
3/27 - Thu
3/28 - Fri
3/29 - Sat
3/30 - Sun
3/31 - Mon
Date-Hour
Scheduled Hourly Releases
Actual Hourly Releases
Lees Ferry Flow


Glen Canyon Dam Hourly Release Pattern - April 2025
April 1-30, 2025
Peak: 13,400 cfs
Minimum: 8,000 cfs
LTEMP Max Fluctuation: 5,400 cfs
April Volume = 600 kaf
Releases (cfs)
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
4/01 - Tue
4/02 - Wed
4/03 - Thu
4/04 - Fri
4/05 - Sat
4/06 - Sun
4/07 - Mon
4/08 - Tue
4/09 - Wed
4/10 - Thu
4/11 - Fri
4/12 - Sat
4/13 - Sun
4/14 - Mon
4/15 - Tue
4/16 - Wed
4/17 - Thu
4/18 - Fri
4/19 - Sat
4/20 - Sun
4/21 - Mon
4/22 - Tue
4/23 - Wed
4/24 - Thu
4/25 - Fri
4/26 - Sat
4/27 - Sun
4/28 - Mon
4/29 - Tue
4/30 - Wed
Date-Hour
Scheduled Hourly Releases
Actual Hourly Releases
Lees Ferry Flow


Glen Canyon Dam Hourly Release Pattern - May 2025
May 1-31, 2025
Weekday Peak: 11,767 cfs
Weekend Peak: 9,909 cfs
Weekday Minimum: 7,019 cfs
Weekend Minimum: 6,784 cfs
LTEMP Max Fluctuation: 5,382 cfs
May Volume = 598 kaf
Releases (cfs)
20,000
16,000
12,000
8,000
4,000
0
5/01 - Thu
5/02 - Fri
5/03 - Sat
5/04 - Sun
5/05 - Mon
5/06 - Tue
5/07 - Wed
5/08 - Thu
5/09 - Fri
5/10 - Sat
5/11 - Sun
5/12 - Mon
5/13 - Tue
5/14 - Wed
5/15 - Thu
5/16 - Fri
5/17 - Sat
5/18 - Sun
5/19 - Mon
5/20 - Tue
5/21 - Wed
5/22 - Thu
5/23 - Fri
5/24 - Sat
5/25 - Sun
5/26 - Mon
5/27 - Tue
5/28 - Wed
5/29 - Thu
5/30 - Fri
5/31 - Sat
Date-Hour
Scheduled Hourly Releases
Actual Hourly Releases
Lees Ferry Flow


Questions?
BUREAU OF
RECLAMATION