



— BUREAU OF —
RECLAMATION

Glen Canyon Monthly Operations Call

Basin Hydrology and Operations

May 25, 2022

Background

This briefing is being provided consistent with the provision in Attachment B - Section 1.1 of the LTEMP ROD which states:

“Annually, Reclamation will develop a hydrograph based on the characteristics above. Reclamation will seek consensus on the annual hydrograph through monthly operational coordination calls with governmental entities, and regular meetings of the GCDAMP Technical Working Group (TWG) and AMWG.

Reclamation will conduct monthly Glen Canyon Dam operational coordination meetings or calls with the DOI bureaus (USGS, NPS, FWS, and BIA), WAPA, and representatives from the Basin States and UCRC. The purpose of these meetings or calls is for the participants to share and seek information on Glen Canyon Dam operations. One liaison from each Basin State and from the UCRC may participate in the monthly operational coordination meetings or calls.”

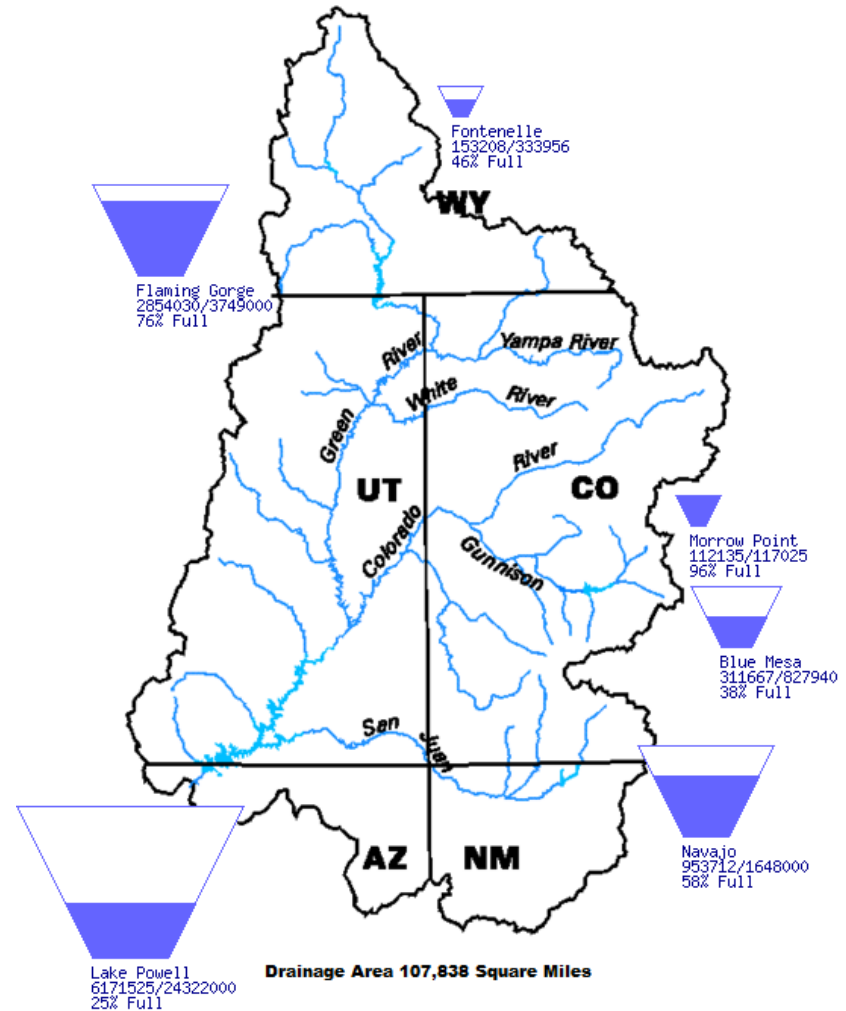


Upper Basin Storage (as of May 23, 2022)

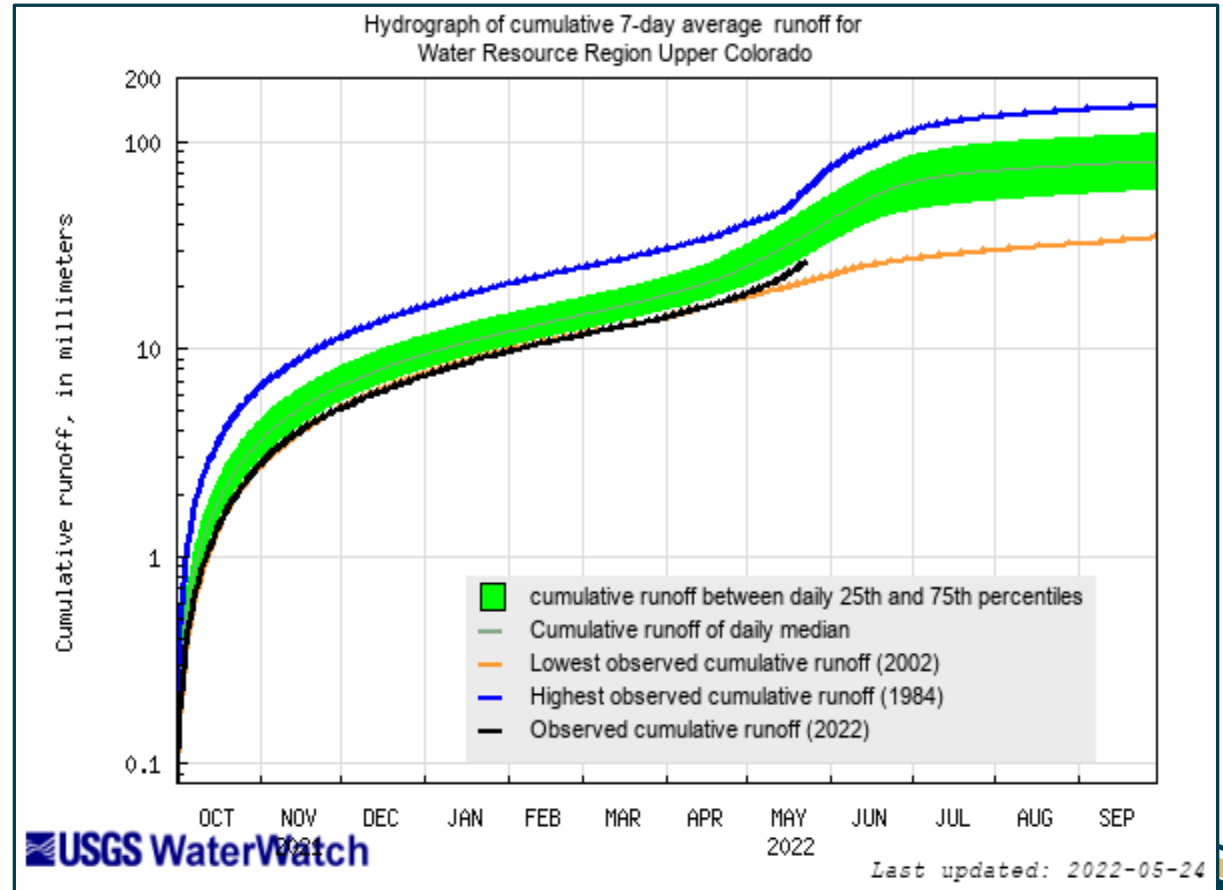
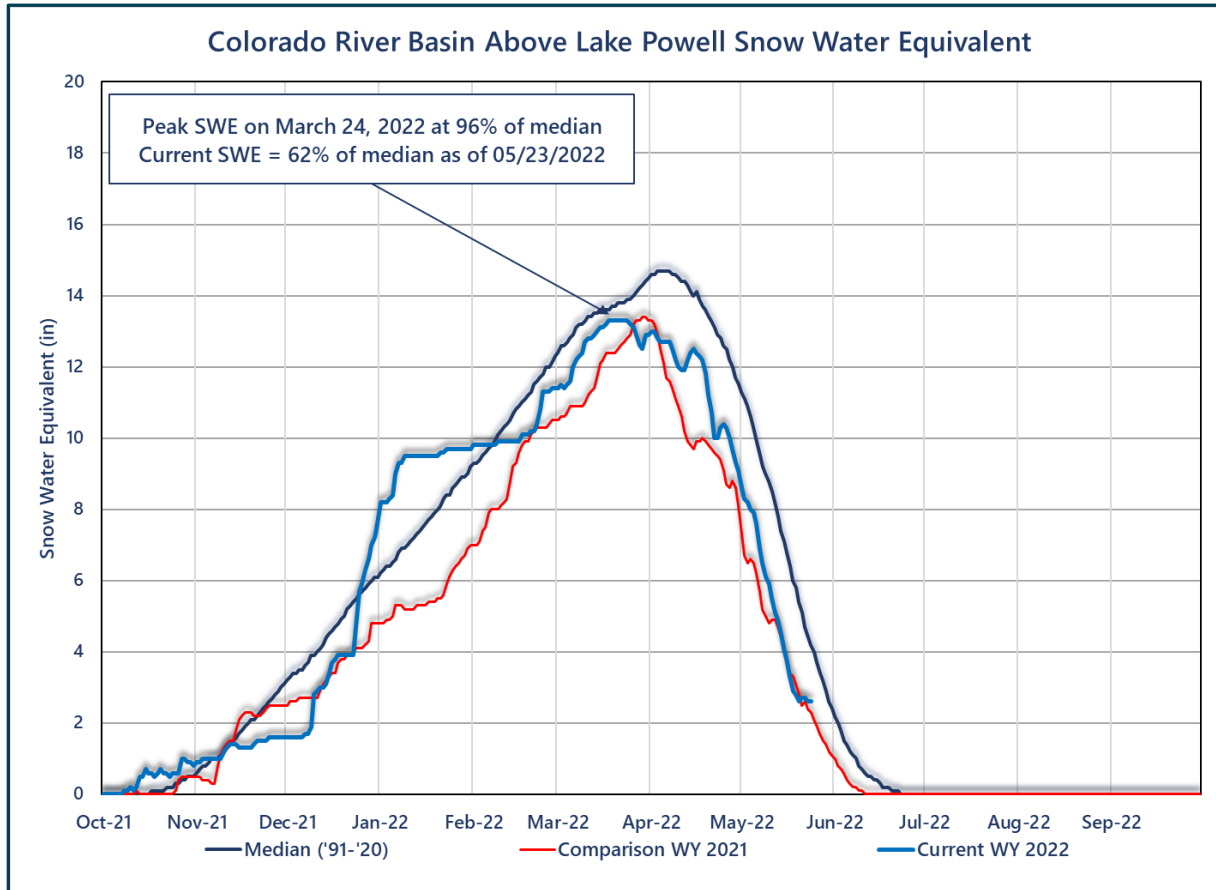
Data Current as of:
05/23/2022

Upper Colorado River Drainage Basin

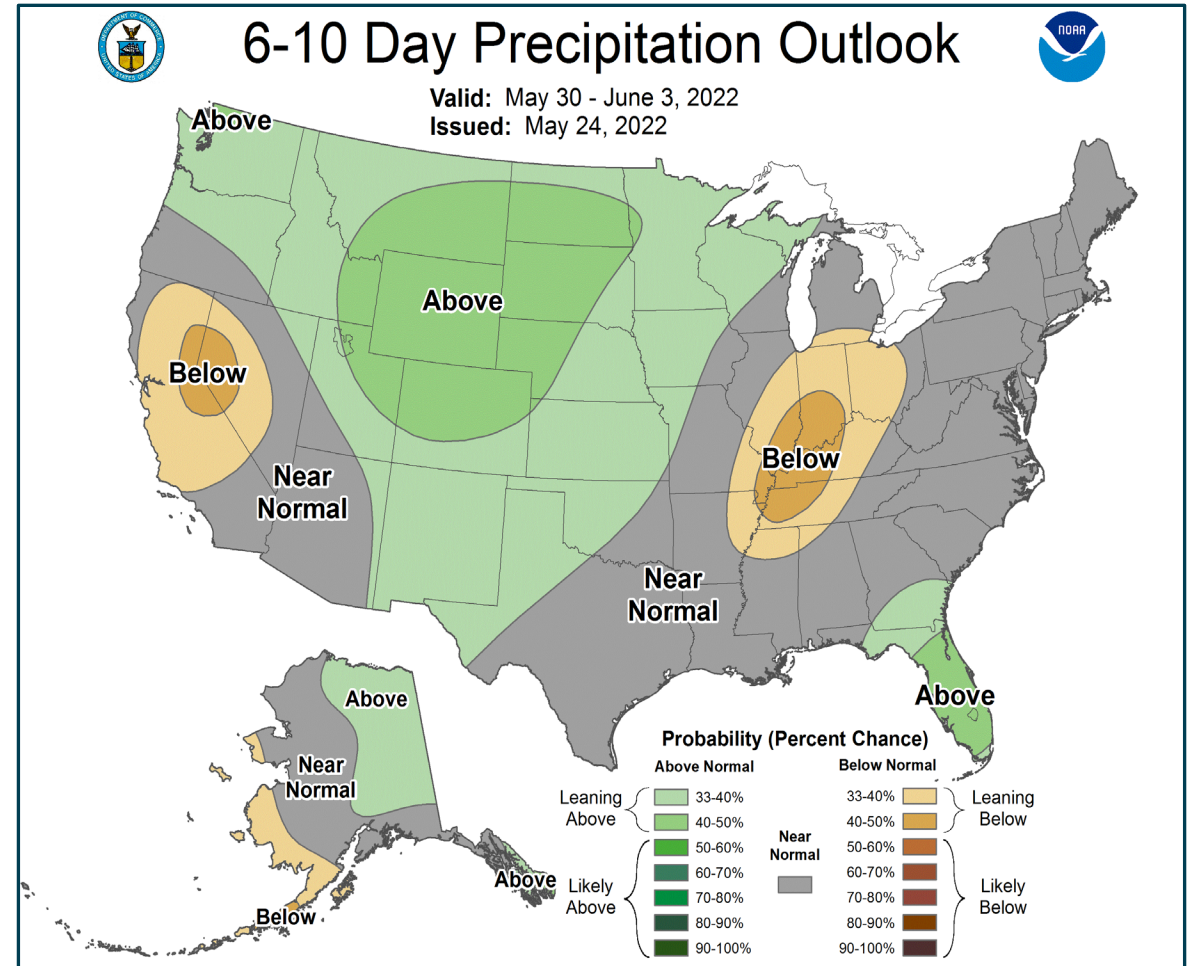
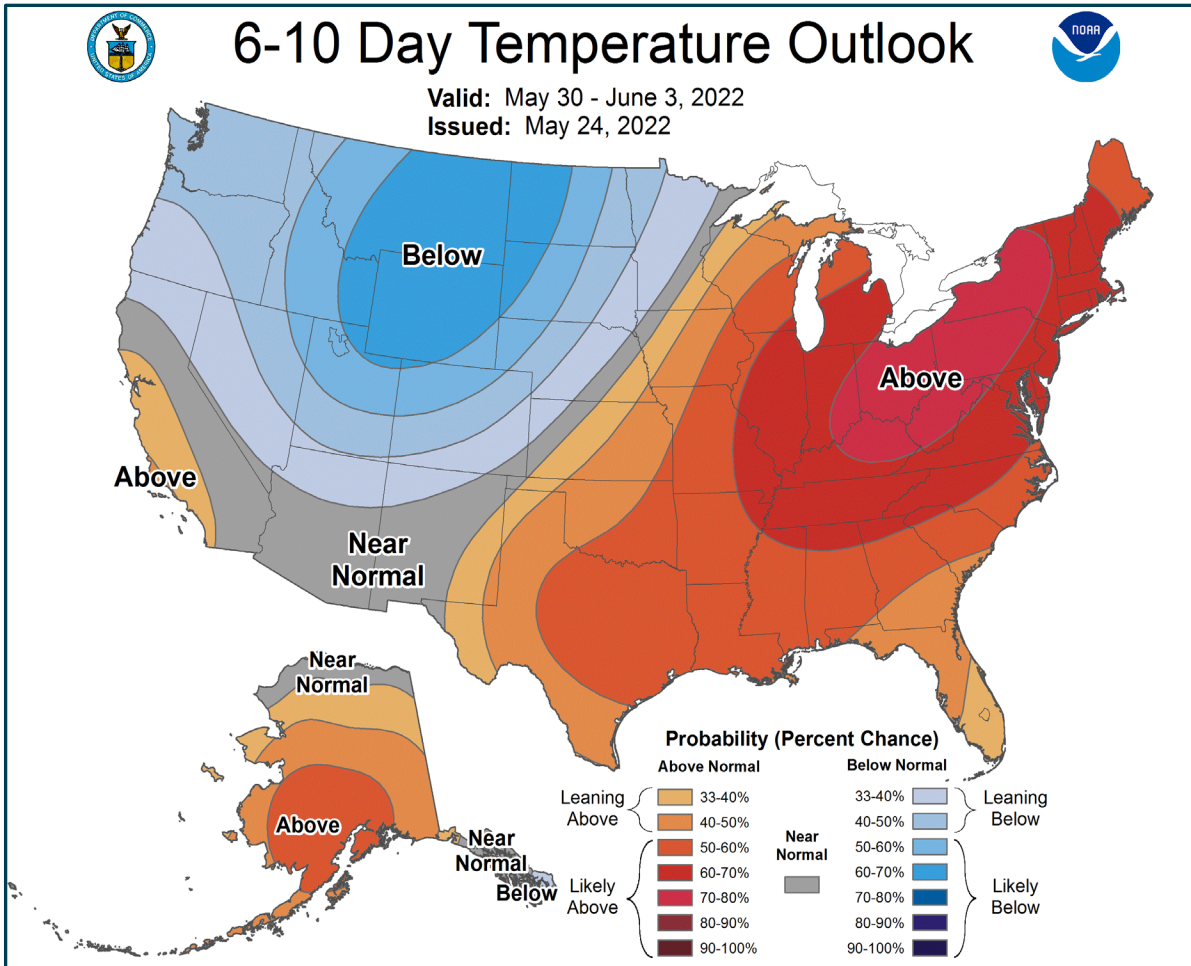
Reservoir	Percent Current Live Storage	Current Live Storage (maf)	Live Storage Capacity (maf)	Elevation (feet)
Fontenelle	46	0.15	0.33	6,478.98
Flaming Gorge	78	2.85	3.67	6,018.33
Blue Mesa	38	0.31	0.83	7,450.43
Navajo	58	0.95	1.70	6,029.40
Lake Powell	25	6.17	24.32	3,528.94
UC System Storage	34	10.57	30.94	



Upper Colorado SWE and Observed Inflows



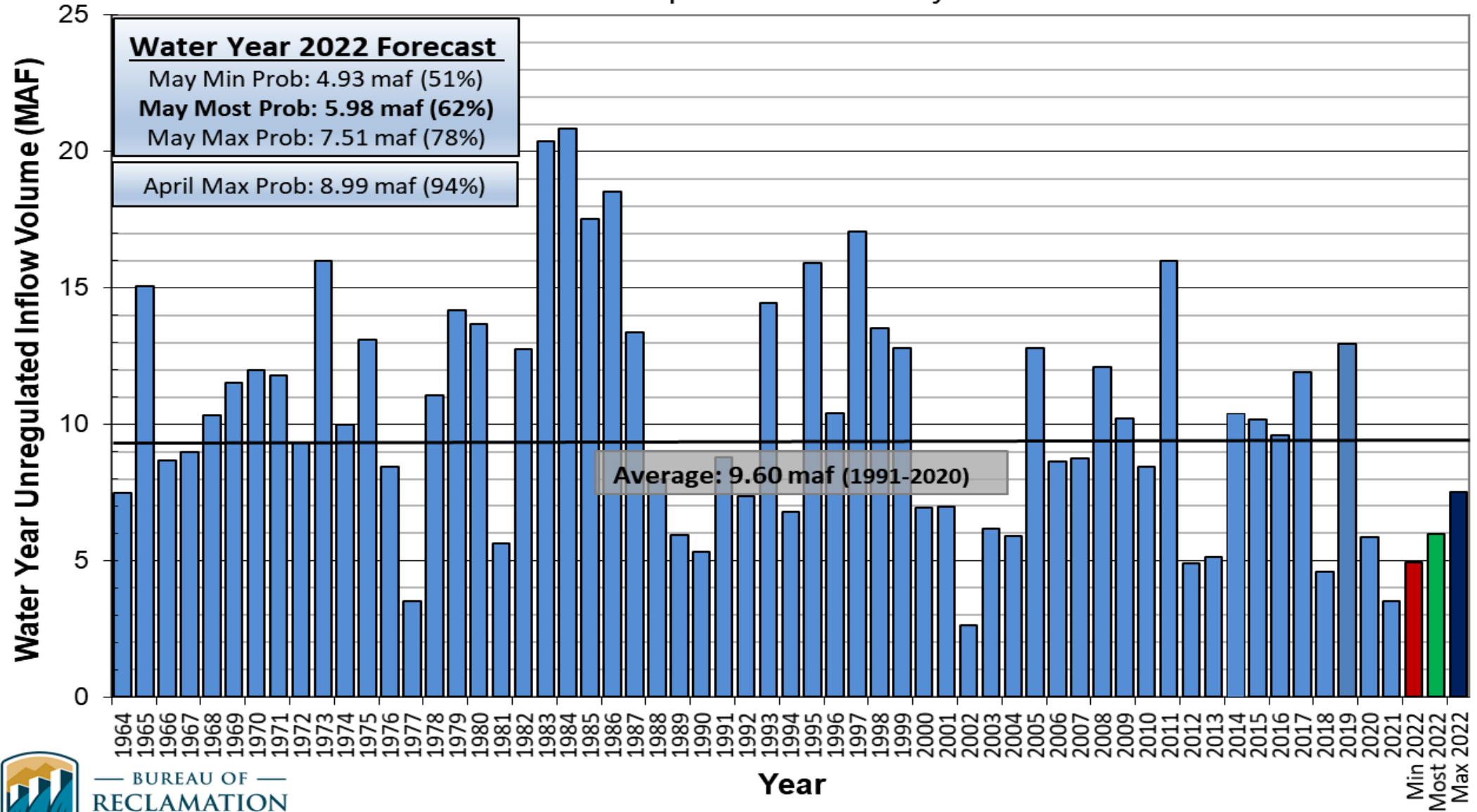
Precipitation and Temperature Outlook



Lake Powell Unregulated Inflow

Water Year 2022 Forecast *(issued May 4)*

Comparison with History



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Most Probable May Forecast Water Year 2022

April – July 2022
Forecasted Unregulated Inflow
as of May 3, 2022

Reservoir	Unregulated Inflow (kaf)	Percent of Avg
Fontenelle	475	65
Flaming Gorge	550	57
Blue Mesa	490	77
Navajo	380	60
Powell	3,800	59

May midmonth = 3,500 kaf (55% avg)

Water Year 2022
Forecasted Unregulated Inflow
as of May 4, 2022

Reservoir	Unregulated Inflow (kaf)	Percent of Avg
Fontenelle	758	71
Flaming Gorge	890	63
Blue Mesa	708	78
Navajo	544	60
Powell	5,980	62

May midmonth = 5,680 kaf (59% avg)





Upper Colorado Basin

**Projected Operations
for Water Year 2022
Based on April and
May 2022 Modeling**



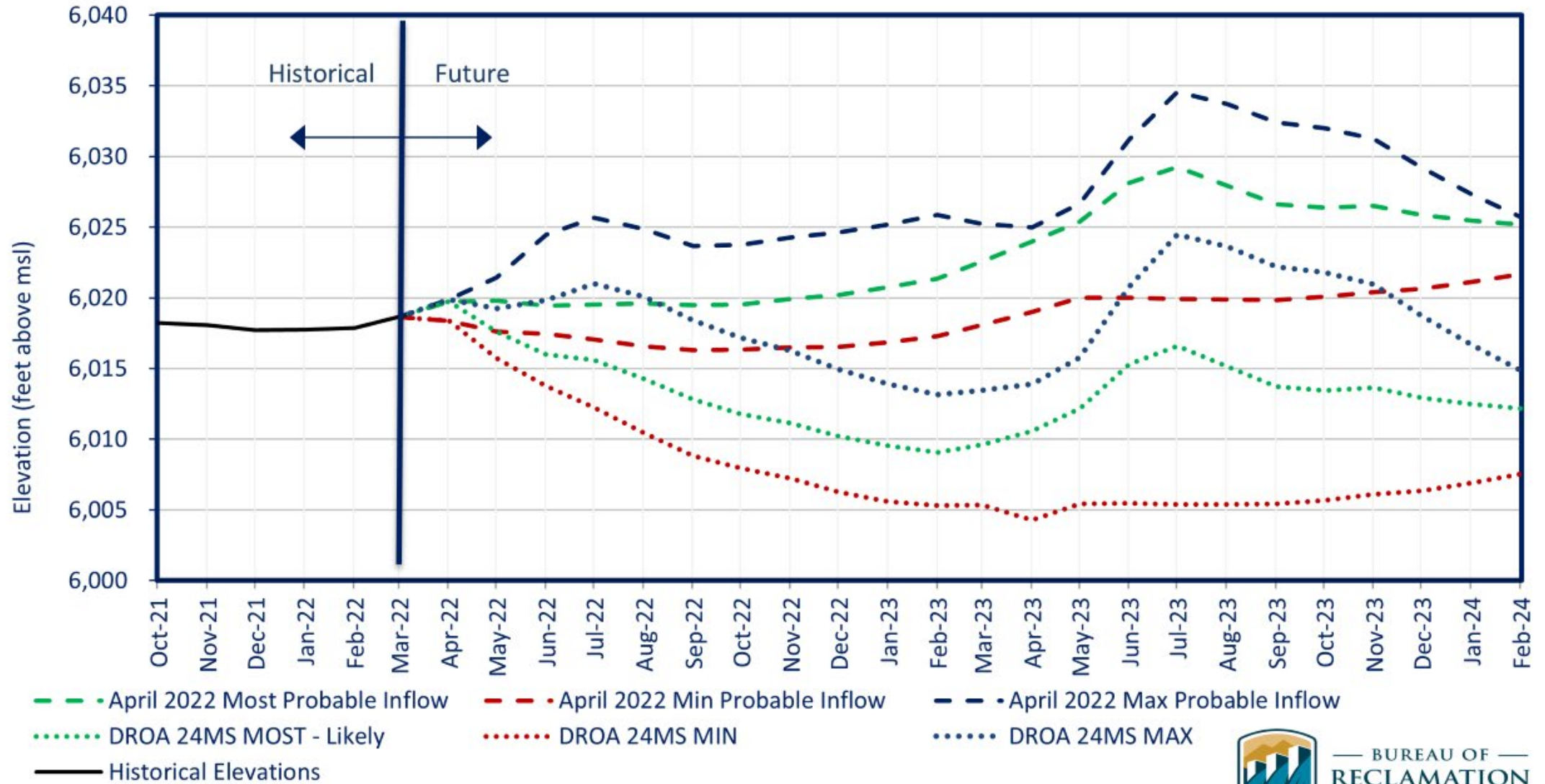
Drought Response Actions

- The Bureau of Reclamation announced on May 3, 2022, two separate urgent drought response actions that will help prop up Lake Powell by nearly 1 million acre-feet (maf) of water over the next 12 months (May 2022 through April 2023). To protect Lake Powell, more water will flow into the lake from upstream reservoirs and less water will be released downstream:
 - Under a Drought Contingency Plan adopted in 2019, approximately 500 thousand acre-feet (kaf) of water will come from Flaming Gorge Reservoir, located approximately 455 river miles upstream of Lake Powell.
For more information: <https://www.usbr.gov/uc/DocLibrary/Plans/20220503-2022DROA-GlenCanyonDamOperationsDecisionLetter-508-DOI.pdf>
 - Another 480 kaf will be left in Lake Powell by reducing Glen Canyon Dam's annual release volume from 7.48 maf to 7.0 maf, as outlined in the 2007 Interim Guidelines that control operations of Glen Canyon Dam and Hoover Dam.
For more information: <https://www.usbr.gov/uc/DocLibrary/Plans/20220429-2022DroughtResponseOperationsPlan-ApprovalMemo-508-DOI.pdf>



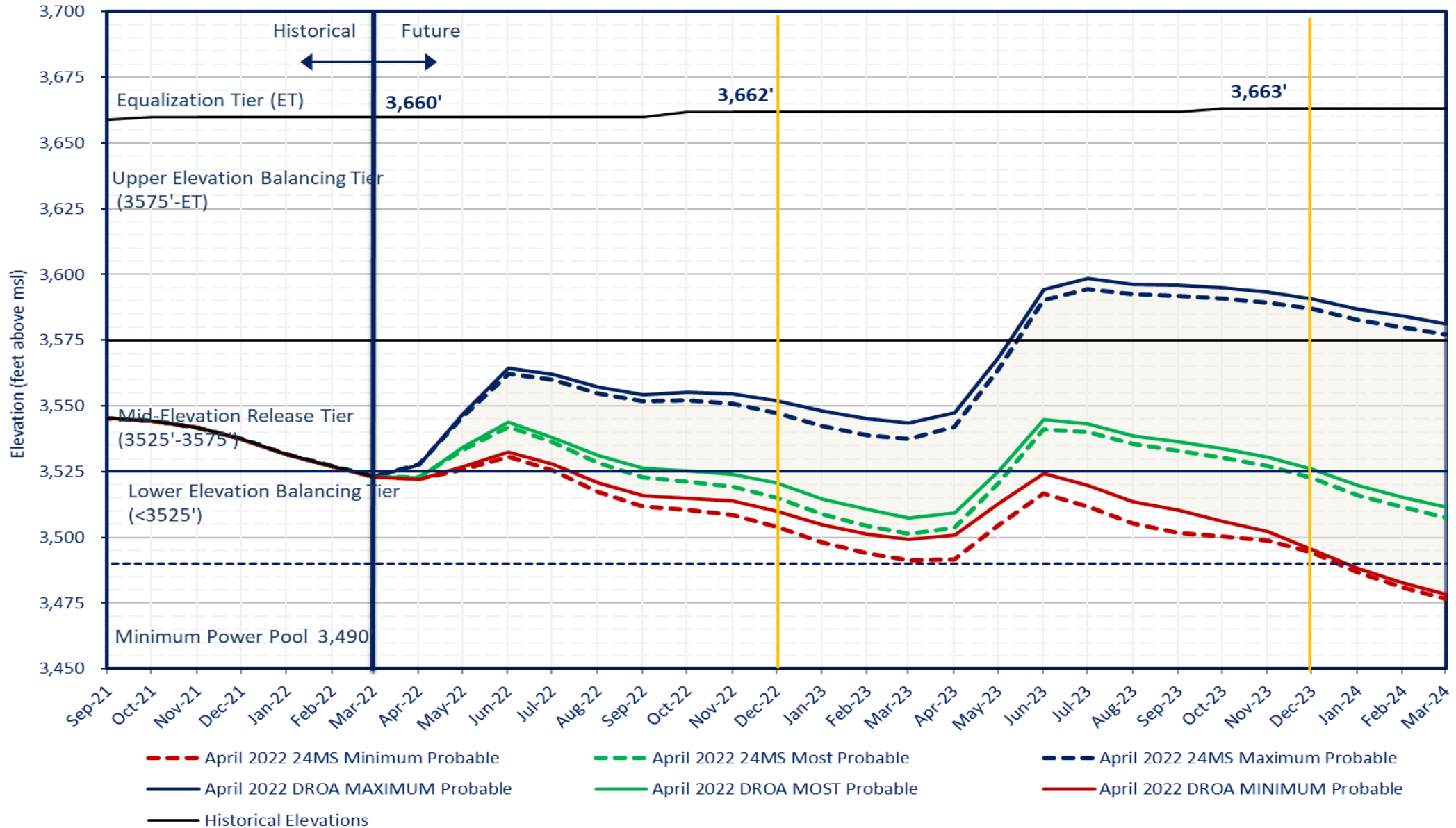
Flaming Gorge End of Month Elevations

Projections from the April 2022 24-Month Study Inflow Scenarios -- **with and without DROA**



Lake Powell End of Month Elevations

Projections from the April 2022 24-Month Study Inflow Scenarios

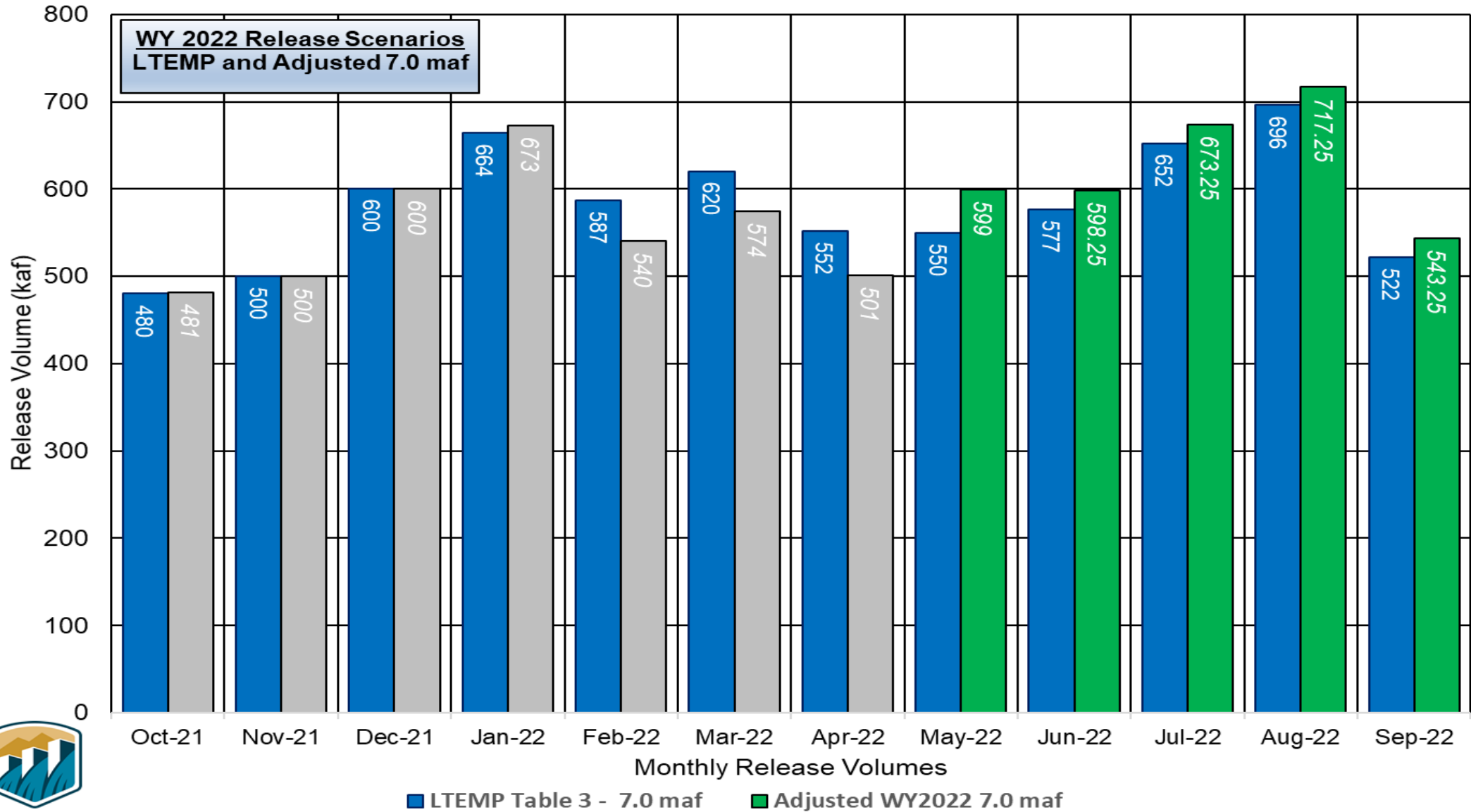


*The Drought Response Operations Agreement (DROA) can be found here: <https://www.usbr.gov/dcp/finaldocs.html>



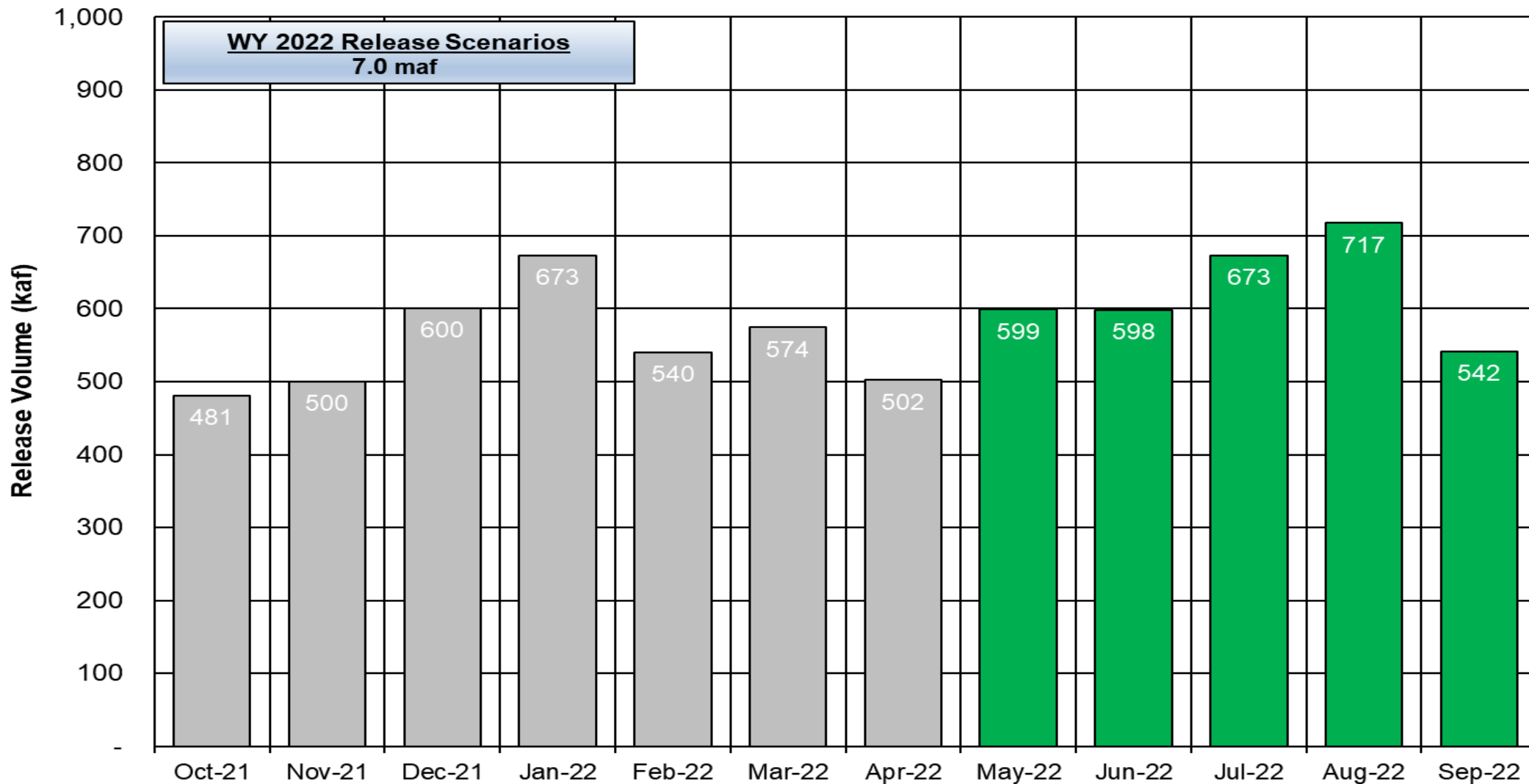
Lake Powell Monthly Release Volume Distribution

7.0 maf Pattern for Water Year 2022



Lake Powell Monthly Release Volume Distribution

Release Scenarios for Water Year 2022



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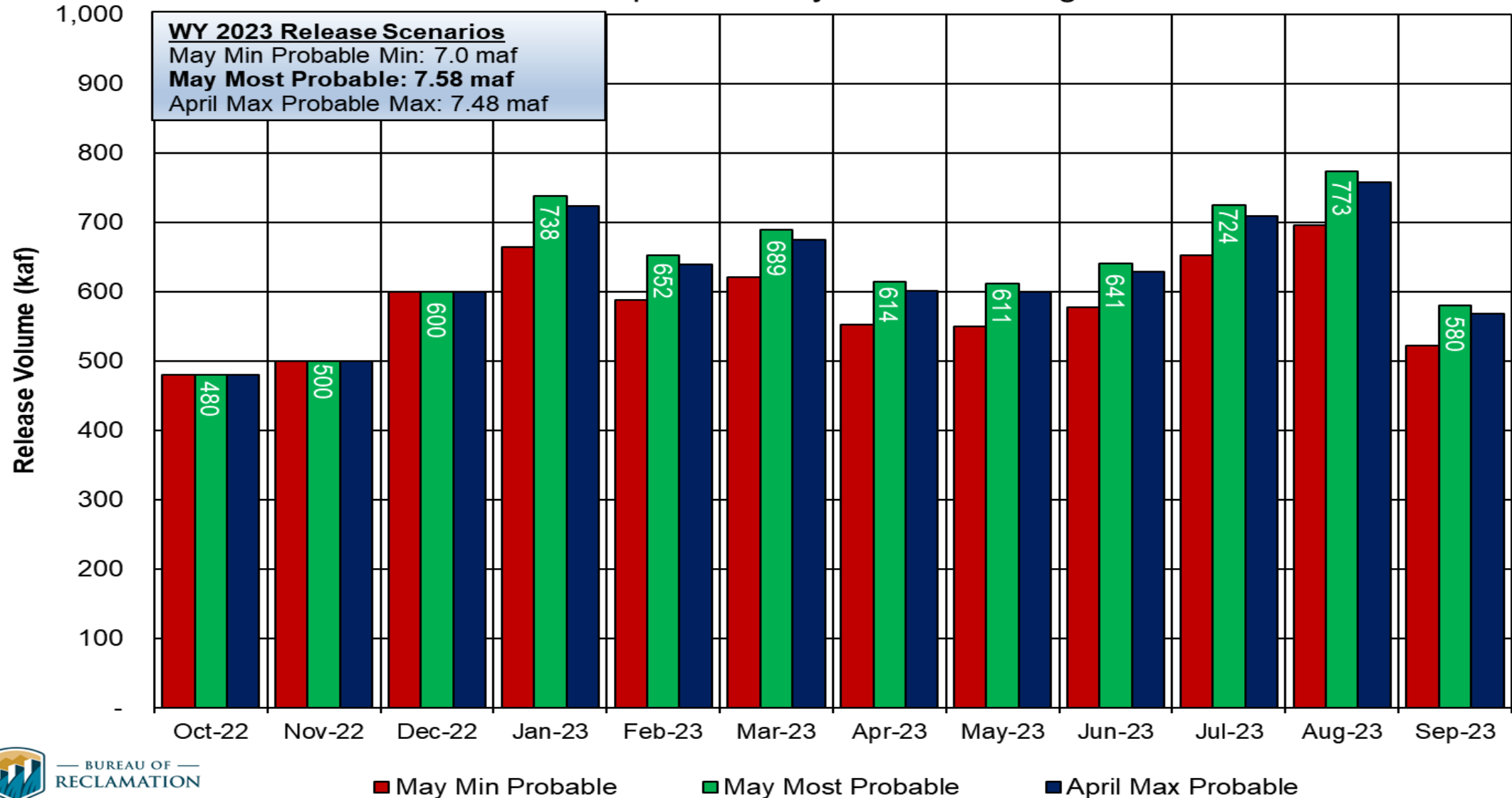
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Potential Lake Powell Monthly Release Volume Distribution

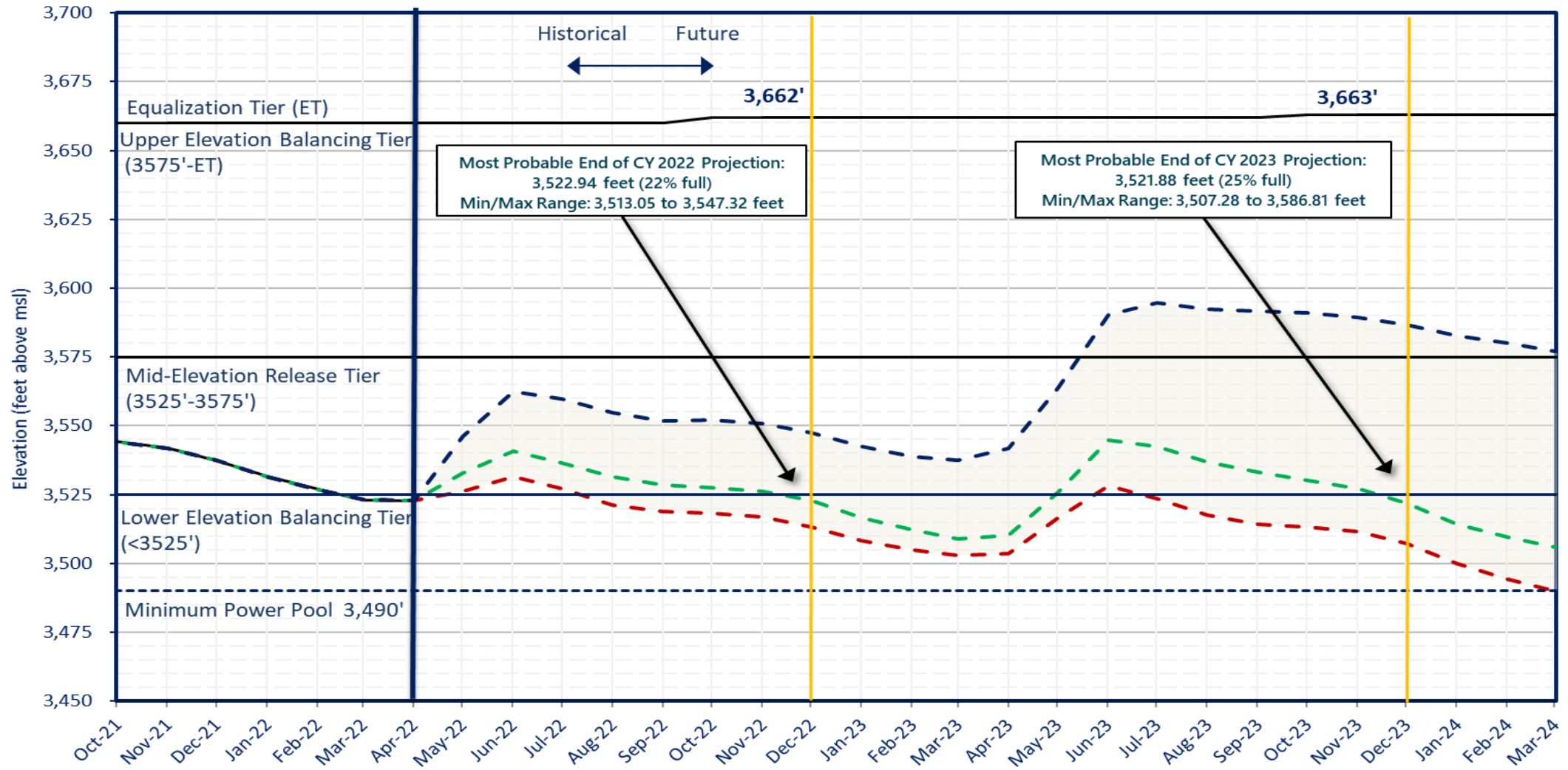
Release Scenarios for Water Year 2023

Based on April and May 2022 Modeling



Lake Powell End of Month Elevations

Projections from the April and May 2022 24-Month Study Inflow Scenarios



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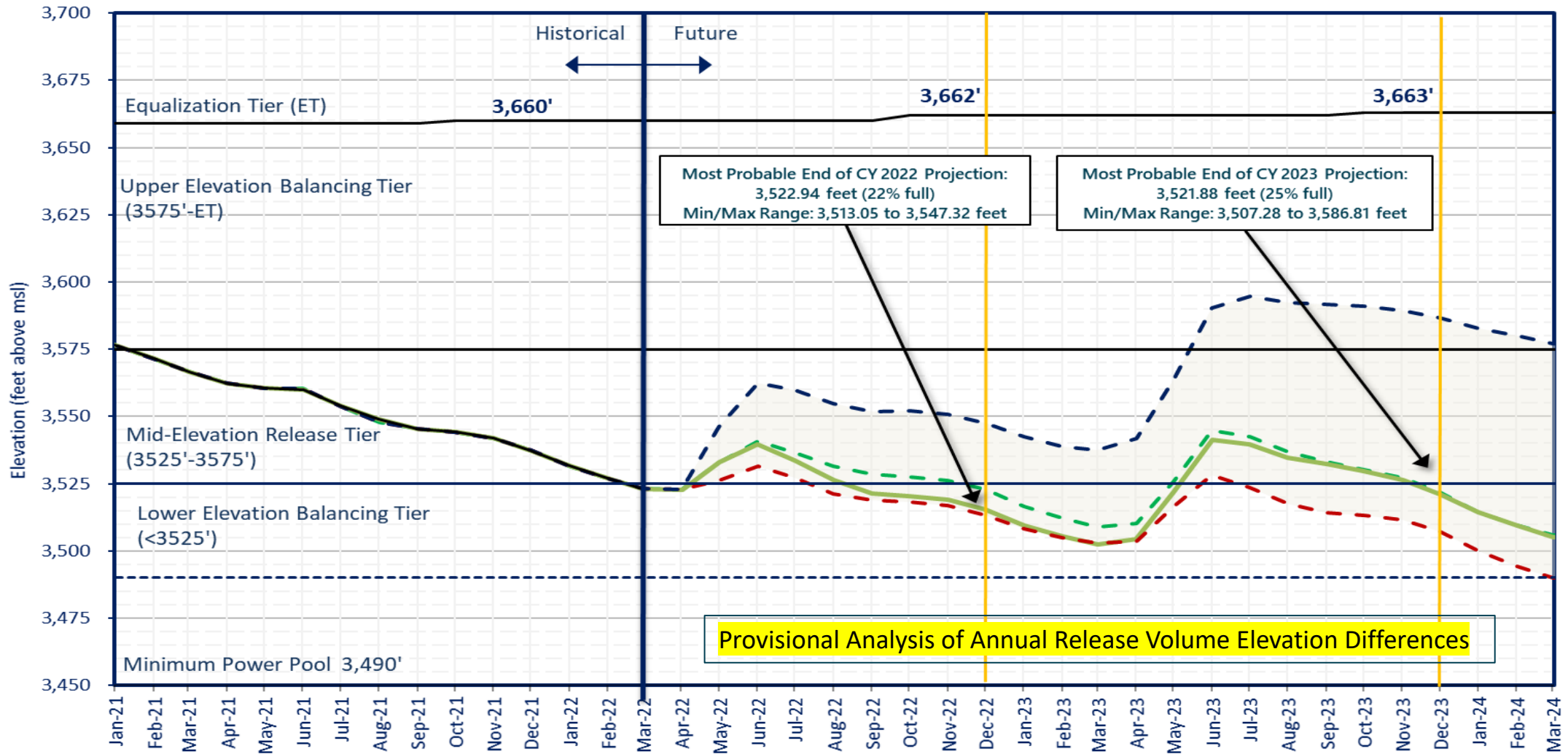
- Historical Elevations
- May 2022 Most Probable Inflow - Lake Powell release of 7.0 maf in WY2022 and 7.58 maf in WY2023
- May 2022 Minimum Probable Inflow - Lake Powell release of 7.0 maf in WY2022 and WY2023
- April 2022 Maximum Probable Inflow - Lake Powell release of 7.48 maf in WY2022 and WY2023

*The Drought Response Operations Agreement (DROA) can be found here: <https://www.usbr.gov/dcp/finaldocs.html>



Lake Powell End of Month Elevations

Projections from the April and May 2022 24-Month Study Inflow Scenarios



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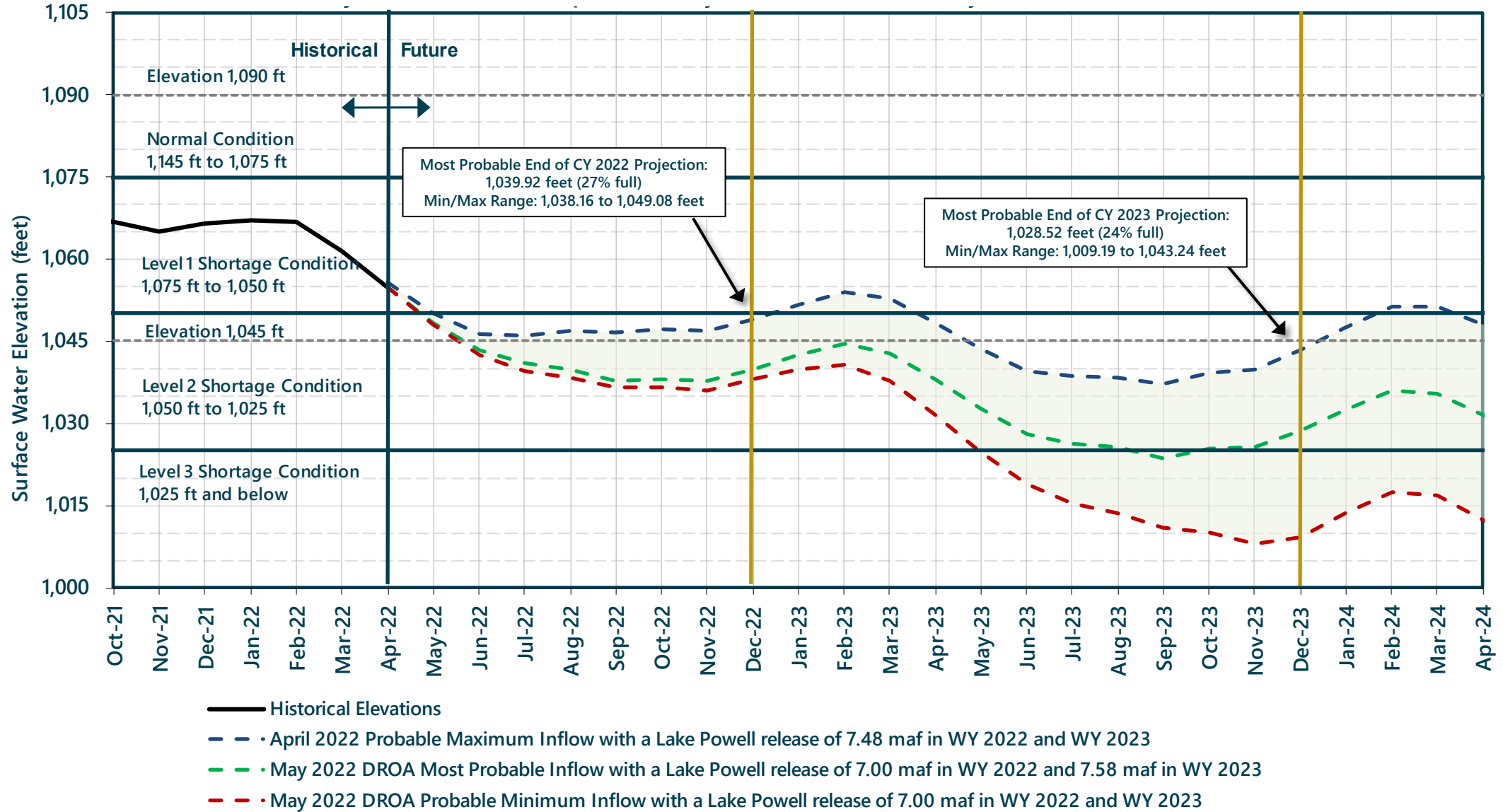
- May 2022 Most Probable Inflow - Lake Powell release of 7.0 maf in WY2022 and 7.58 maf in WY2023
- Most Probable Inflow - Powell Elevations with WY2022 7.48 maf Release with 500 kaf DROA releases
- - - May 2022 Minimum Probable Inflow - Lake Powell release of 7.0 maf in WY2022 and WY2023
- - - April 2022 Maximum Probable Inflow - Lake Powell release of 7.48 maf in WY2022 and WY2023
- Historical Elevations

*The Drought Response Operations Agreement (DROA) can be found here: <https://www.usbr.gov/dcp/finaldocs.html>



Lake Mead End of Month Elevations

Projections from the April and May 2022 24-Month Study Inflow Scenarios



The Drought Response Operations Agreement (DROA) is available online at: <https://www.usbr.gov/dcp/finaldocs.html>.





Upper Colorado Basin

Hydropower Maintenance



Glen Canyon Dam Power Plant Unit Outage Schedule for 2022

Unit Number	Oct 2021	Nov 2021	Dec 2021	Jan 2022	Feb 2022	Mar 2022	Apr 2022	May 2022	Jun 2022	Jul 2022	Aug 2022	Sep 2022	
1					█								
2													
3													
4													
5								█					
6								█					
7	█								█				
8	█												
Units Available	6	6	6	6	5	4	6	5	6	6	6	6	
Capacity (cfs)	18,700	18,600	11,700	18,700	14,800	11,300	17,900	14,900	18,570	18,440	18,270	18,170	MAY MOST ²
Capacity (kaf/month)	1,150	1,110	1,110	1,160	810	980	1,000	1,050	1,090	1,130	1,120	1,080	MAY MOST
Max (kaf) ¹	481	500	600	673	540	575	502	599	598	673	717	542	7.0 maf
Most (kaf) ¹	481	500	600	673	540	575	502	599	598	673	717	542	7.0 maf
Min (kaf) ¹	481	500	600	673	540	575	502	599	598	673	717	542	7.0 maf
										(updated 05-17-2022)			

1 Projected release, based on May 2022 minimum and most and April 2022 maximum probable inflow projections and 24-Month Study model runs.
 2 Dependent upon availability to shift contingency reserves, which will increase capacity by 30-40MW (3%) at current efficiency.



Glen Canyon Dam Power Plant Unit Outage Schedule for 2023

Unit Number	Oct 2022	Nov 2022	Dec 2022	Jan 2023	Feb 2023	Mar 2023	Apr 2023	May 2023	Jun 2023	Jul 2023	Aug 2023	Sep 2023
1												■
2												■
3							■	■	■	■	■	■
4	■						■	■	■	■	■	■
5	■	■	■	■	■	■						
6	■	■	■	■	■	■						
7						■	■					
8						■	■					
Units Available	5	6	6	6	4	6	6	6	6	6	6	4
Capacity (cfs)	14,790	18,100	17,980	17,750	13,050	17,470	17,500	18,100	18,700	18,630	18,440	11,500
Capacity (kaf/month)	950	1,080	1,110	1,060	670	1,035	1,040	1,110	1,110	1,140	1,130	750
Max (kaf) ¹	480	500	600	723	639	675	601	599	628	709	758	568
Most (kaf) ¹	480	500	600	738	652	639	614	611	641	724	773	580
Min (kaf) ¹	480	500	600	664	587	620	552	550	577	652	696	522

MAY MOST²

MAY MOST

7.48 maf

7.58 maf

7.0 maf

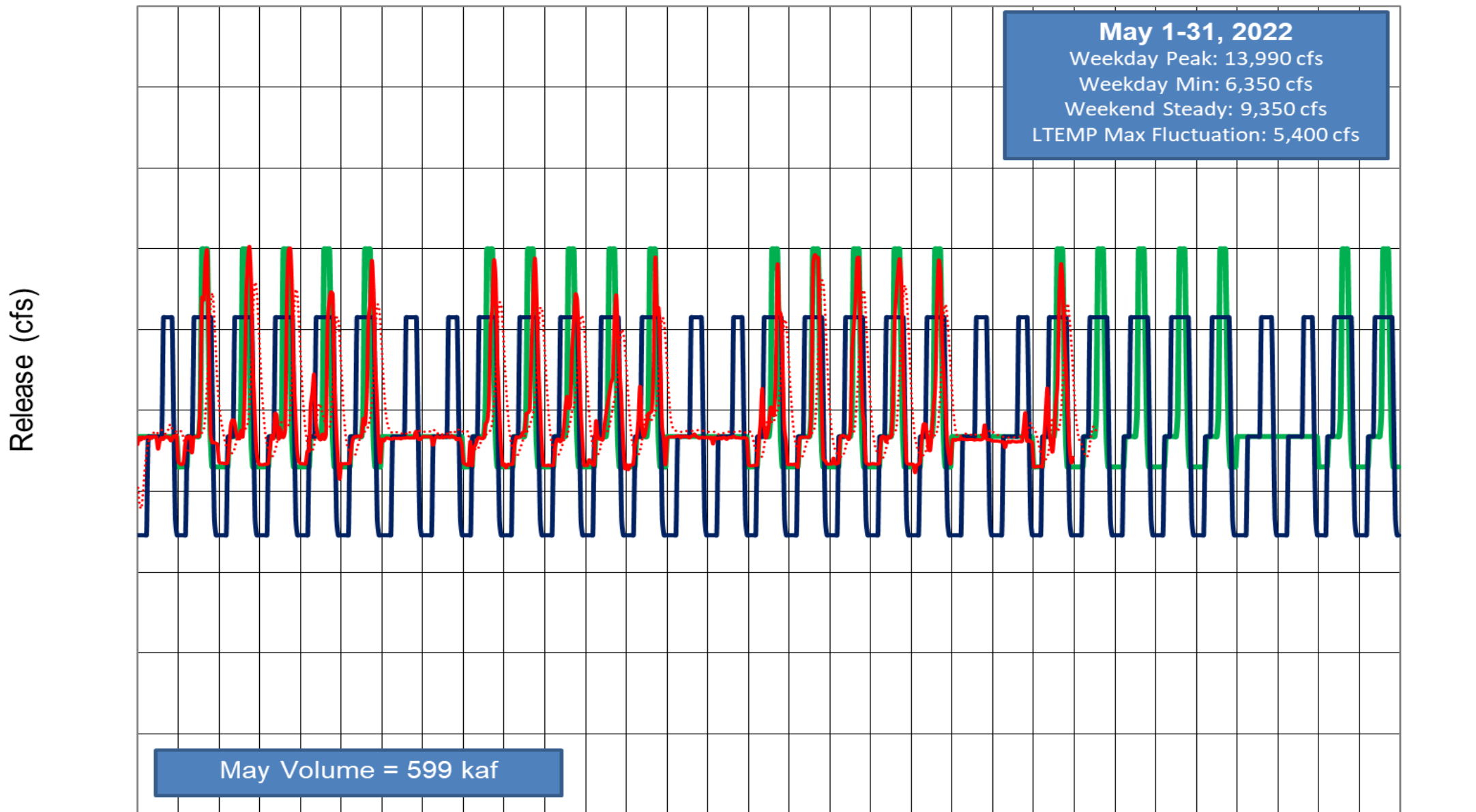
(updated 05-17-2022)

1 Projected release, based on May 2022 minimum and most and April 2022 maximum probable Inflow Projections and 24-Month Study model runs.

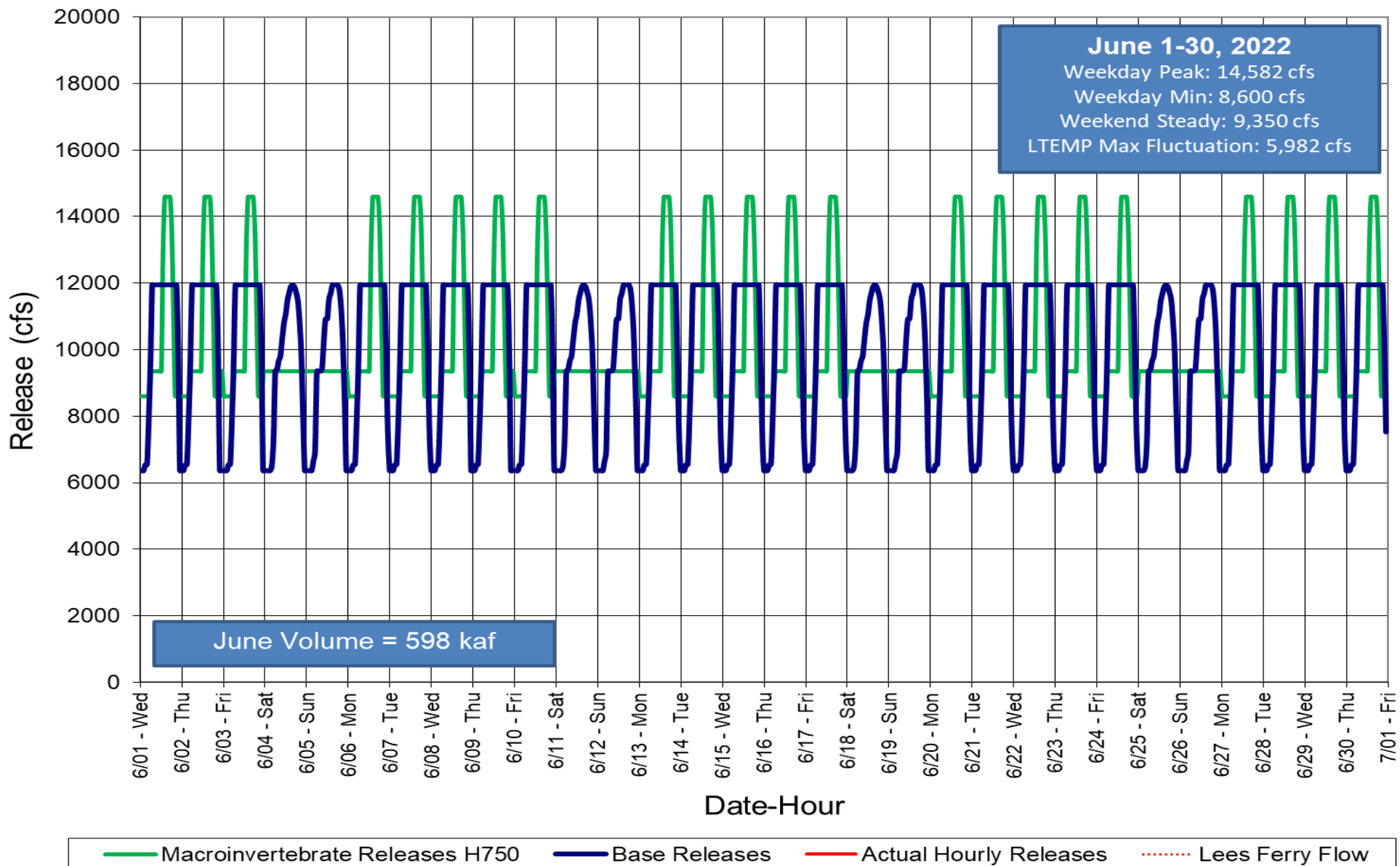
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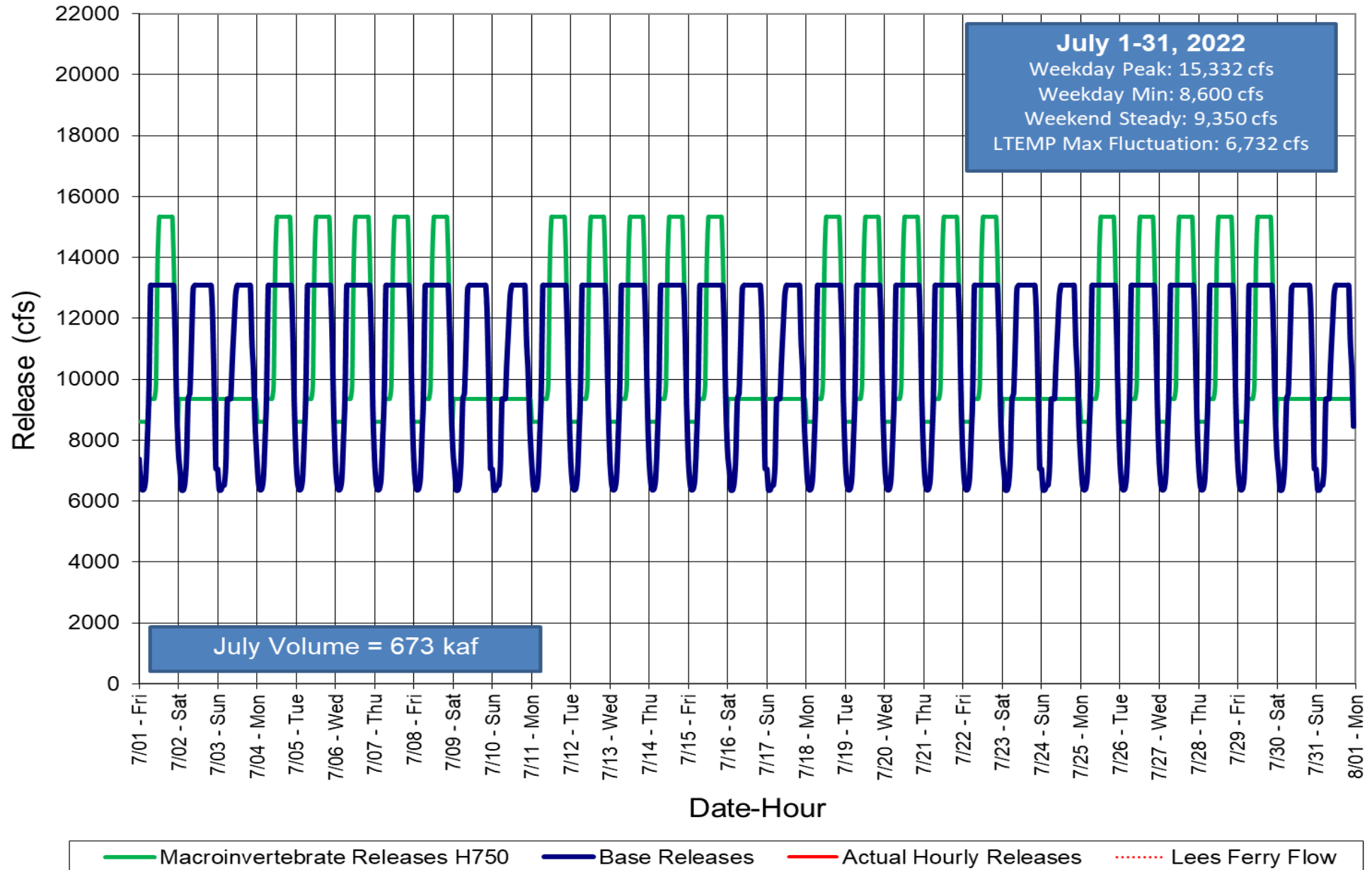
Glen Canyon Dam Hourly Release Patterns May 2022



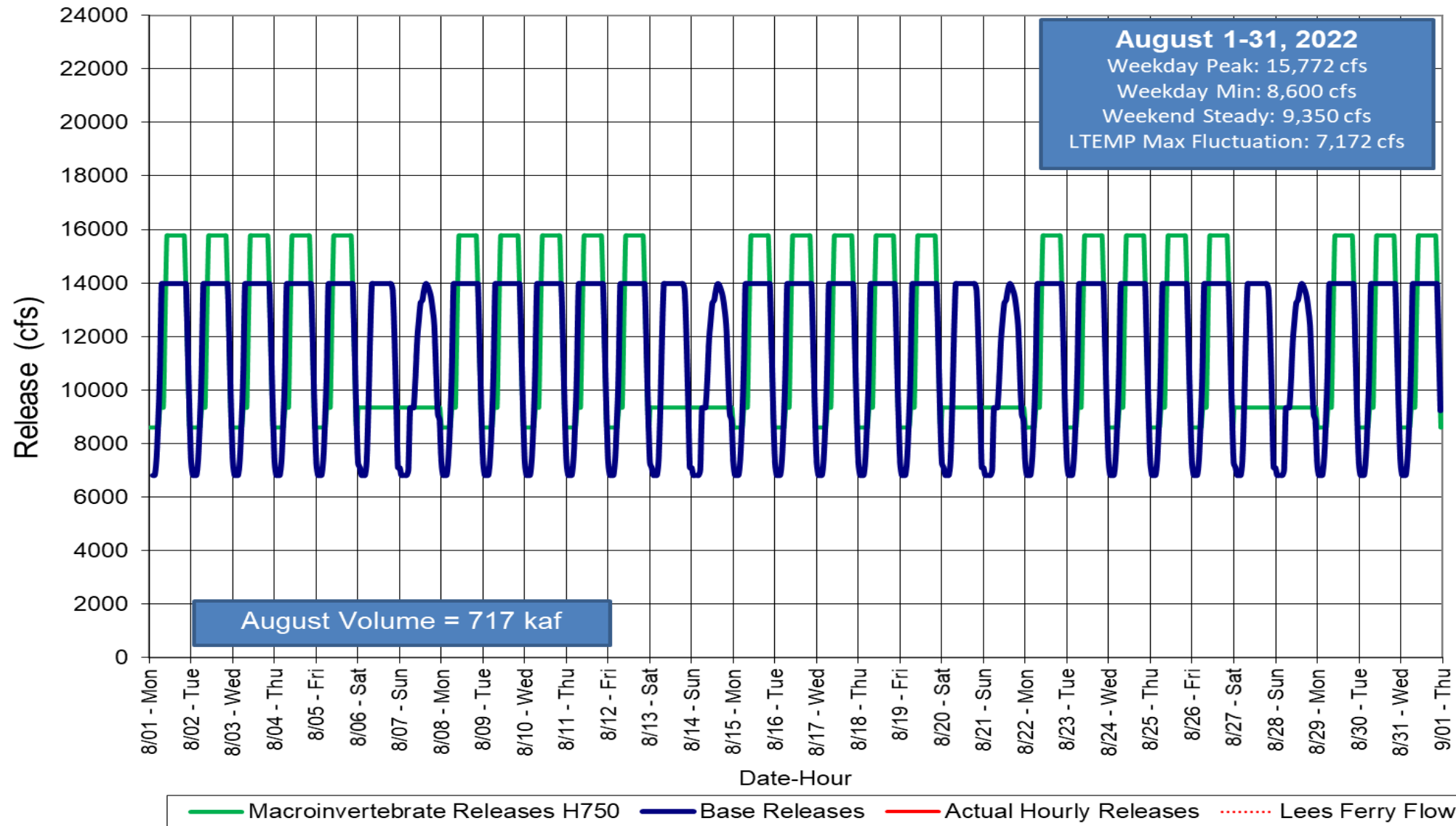
Glen Canyon Dam Hourly Release Pattern June 2022



Glen Canyon Dam Hourly Release Pattern July 2022



Glen Canyon Dam Hourly Release Pattern August 2022

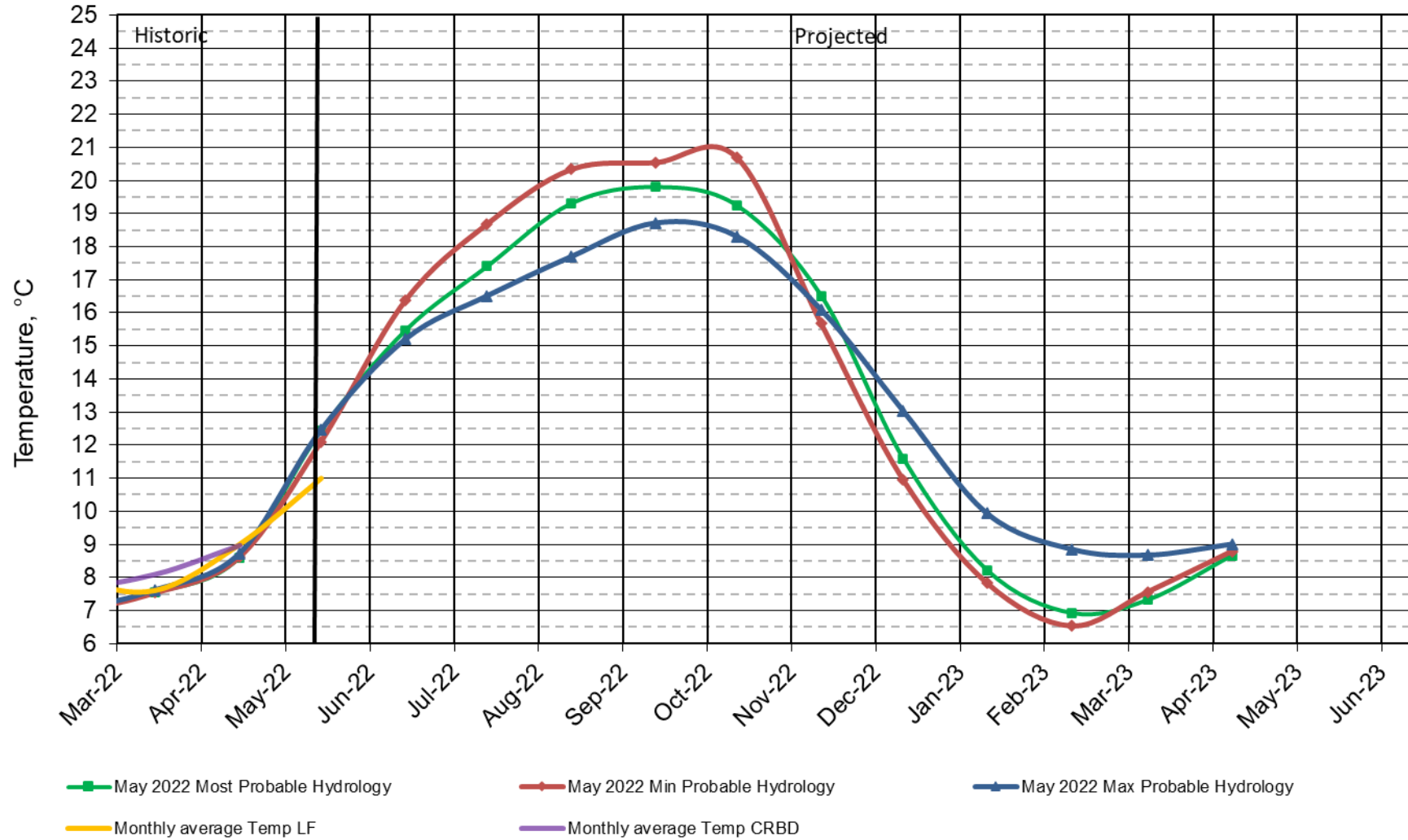


Water Quality



Lake Powell Release Temperature

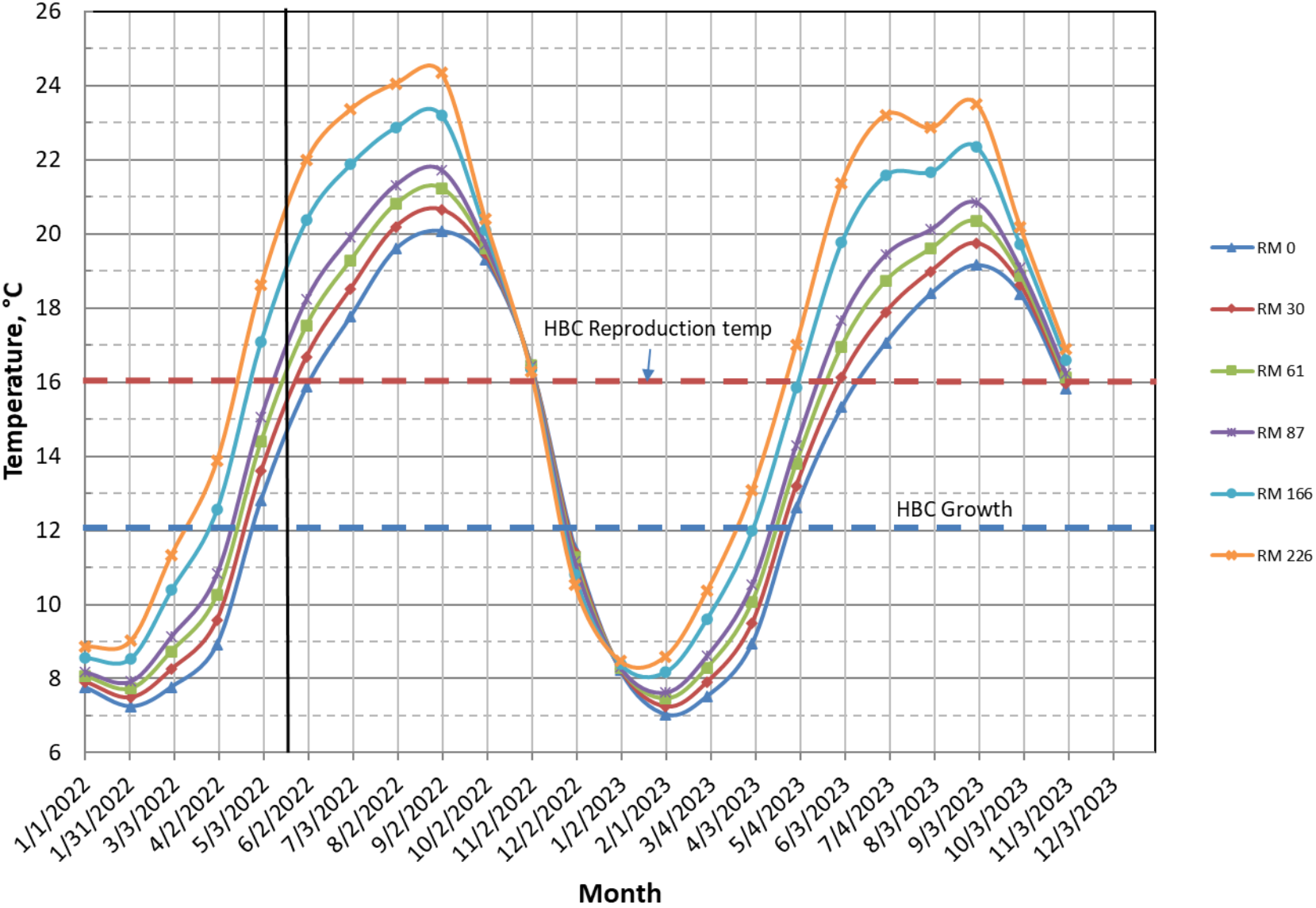
Projected Temperature based on May 2022 Forecast



#Projection start date is based on initial conditions (March 2021)

Colorado River, Grand Canyon Water Temperatures

Projections based on May2022, Most Probable Hydrology



Questions?



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