



Hydrology Update

Board Meeting
March 16, 2023

Bart Leeftang, P.E.





Status: March 13, 2023

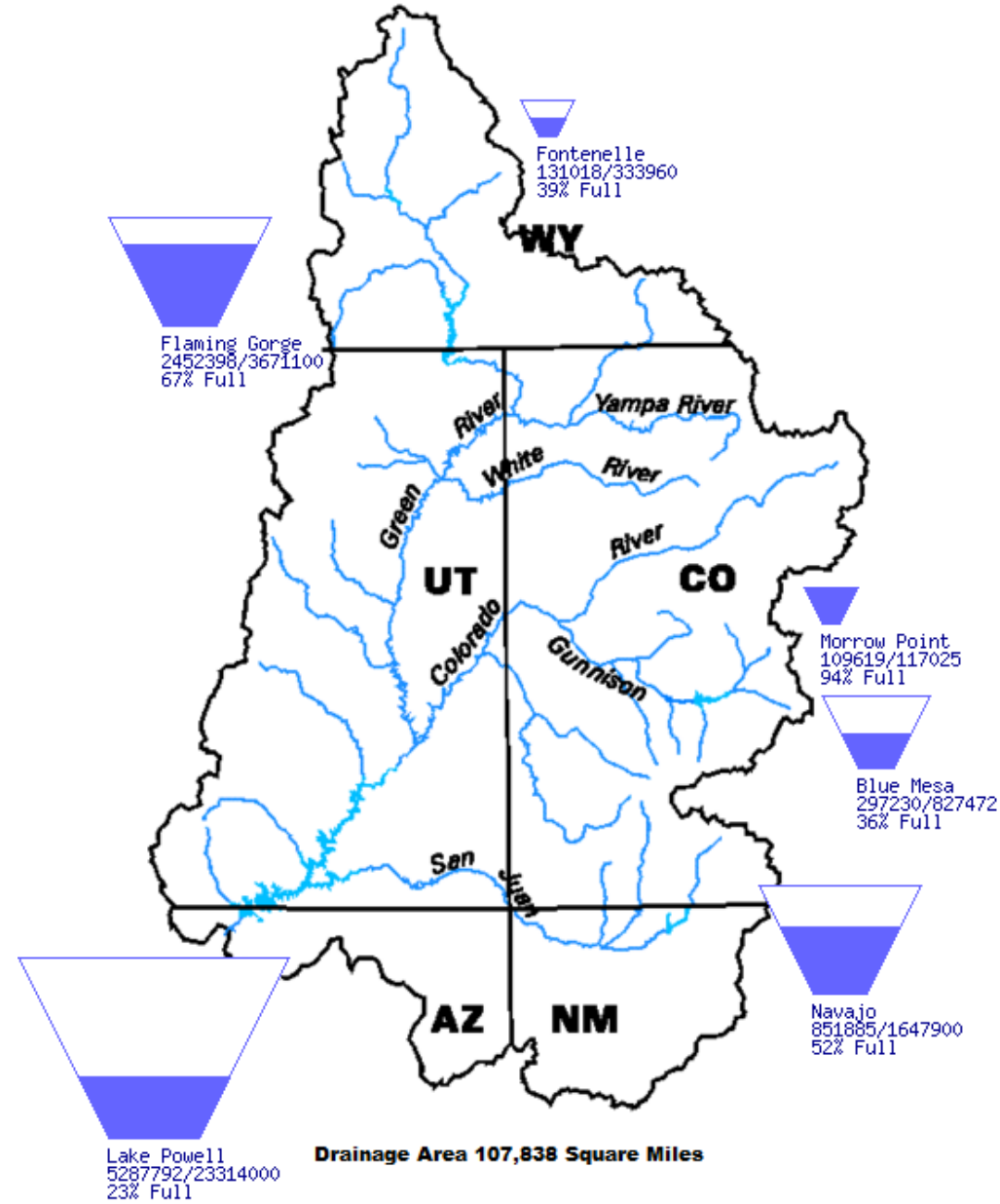
Reservoir	Percent Full	Content (MAF)	Elevation (feet)
Lake Powell	23%	5.288	3,520.47
Lake Mead	29%	7.401	1,046.06
Total System Content	32%	18.810	NA
Total System Content (one year ago)	36%	21.270	NA

WATER YEAR 2023 PRECIPITATION TO DATE	125%
CURRENT BASIN SNOWPACK	139%





Upper Colorado River Drainage Basin

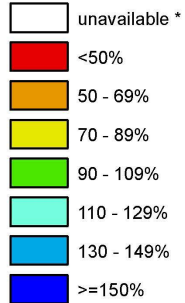




Utah SNOTEL Current Snow Water Equivalent (SWE) % of Normal

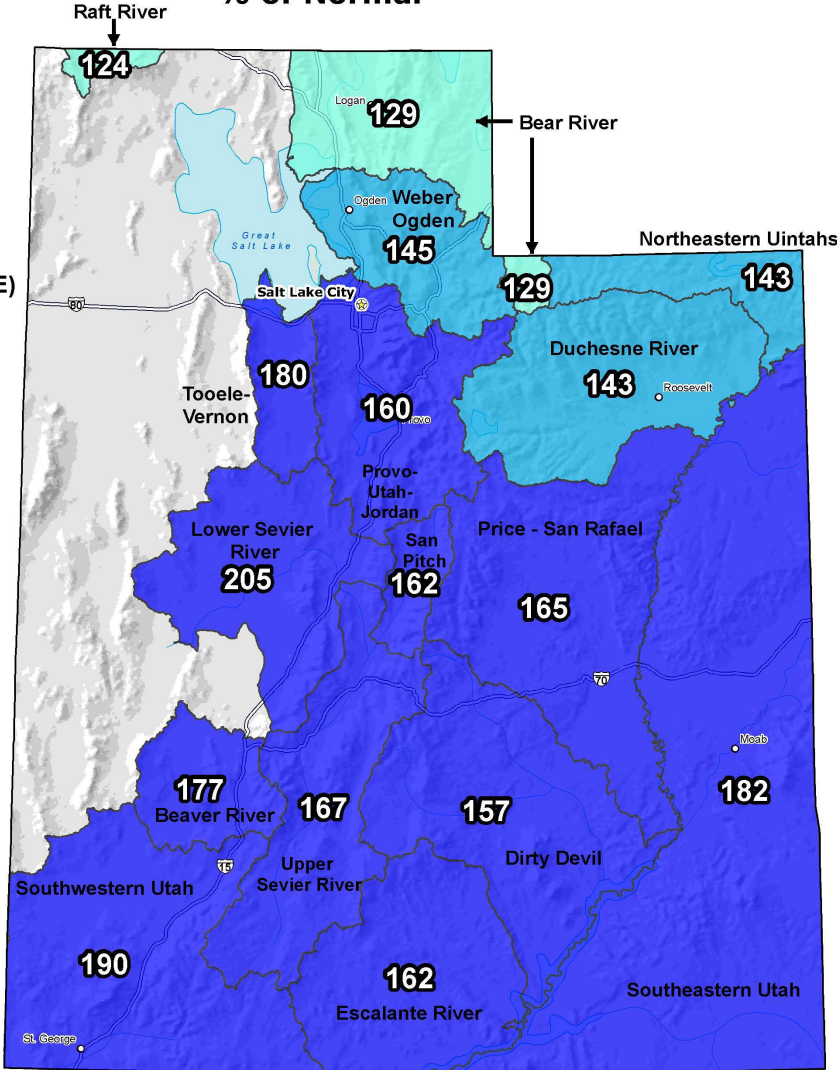
Feb 16, 2023

Snow Water
Equivalent (SWE)
Basin-wide
Percent of
1991-2020
Median



* Data unavailable at time
of posting or measurement
is not representative at this
time of year

**Provisional Data
Subject to Revision**



0 10 20 40 60 80 100 Miles

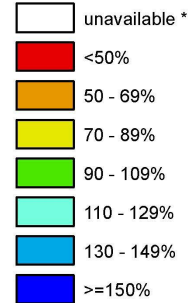
The snow water equivalent percent of normal represents the current snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

Prepared by:
USDA/NRCS National Water and Climate Center
Portland, Oregon
<https://www.nrcs.usda.gov/wps/portal/wcc/home/>

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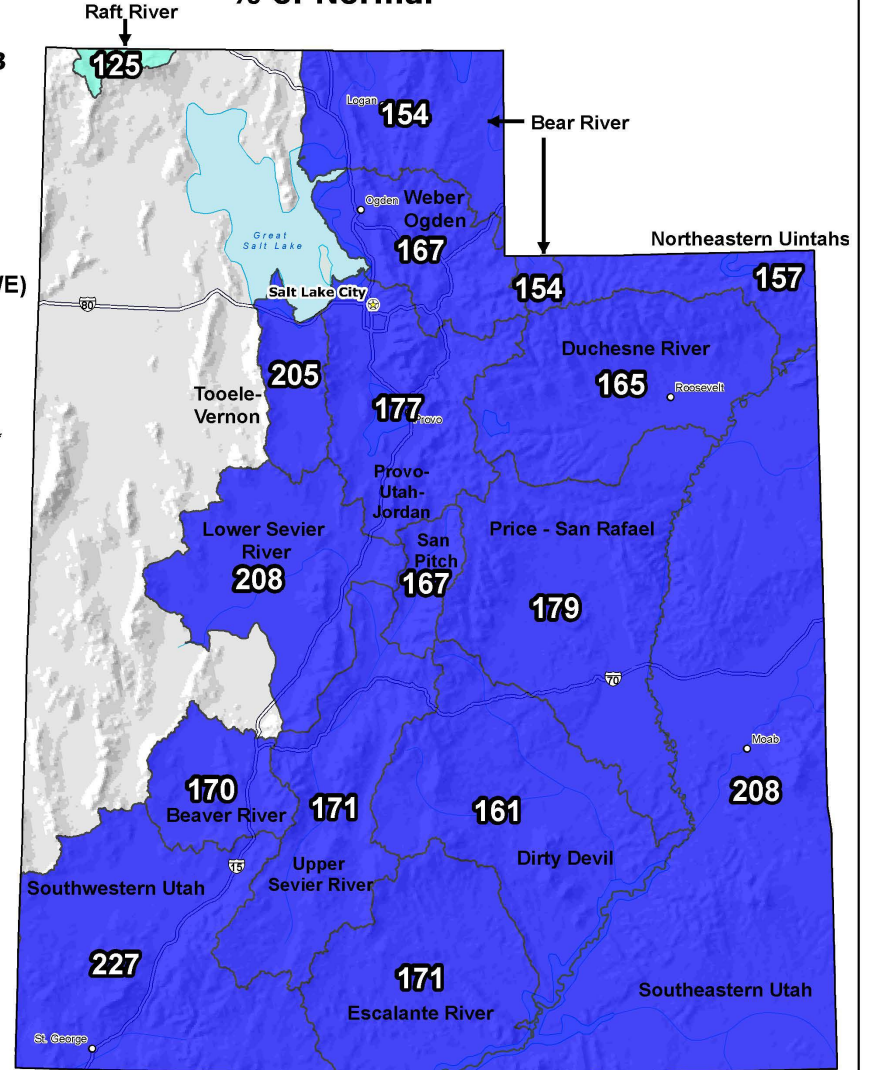
Mar 13, 2023

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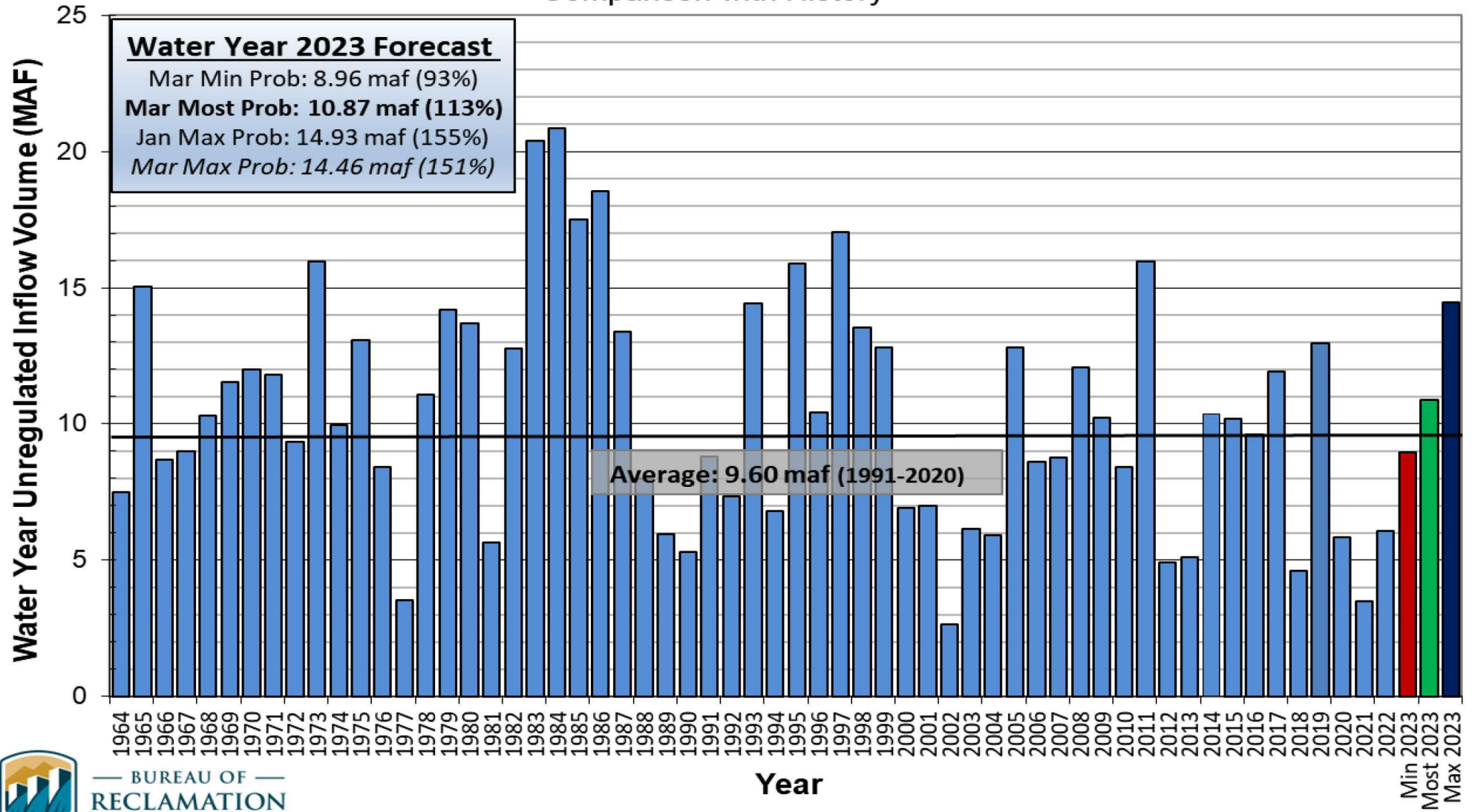
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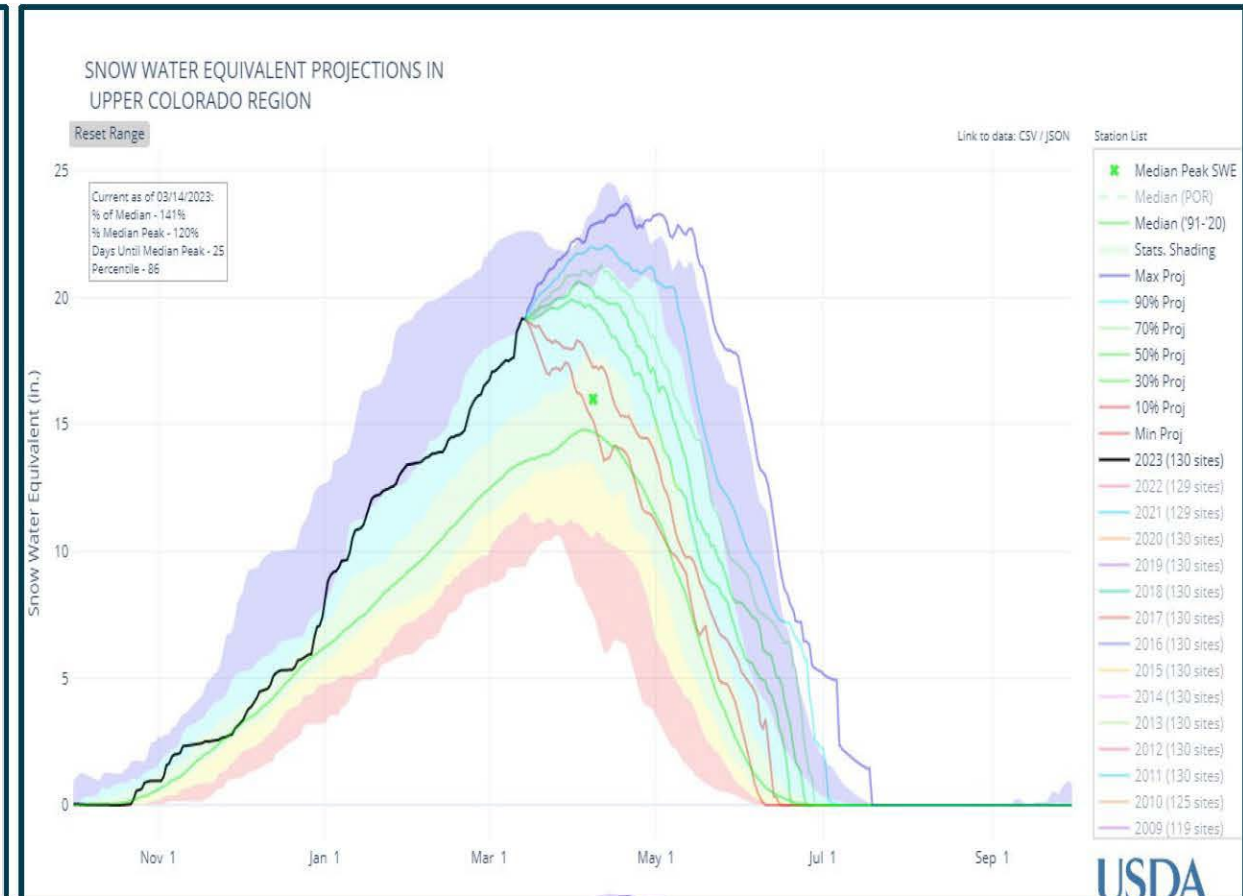
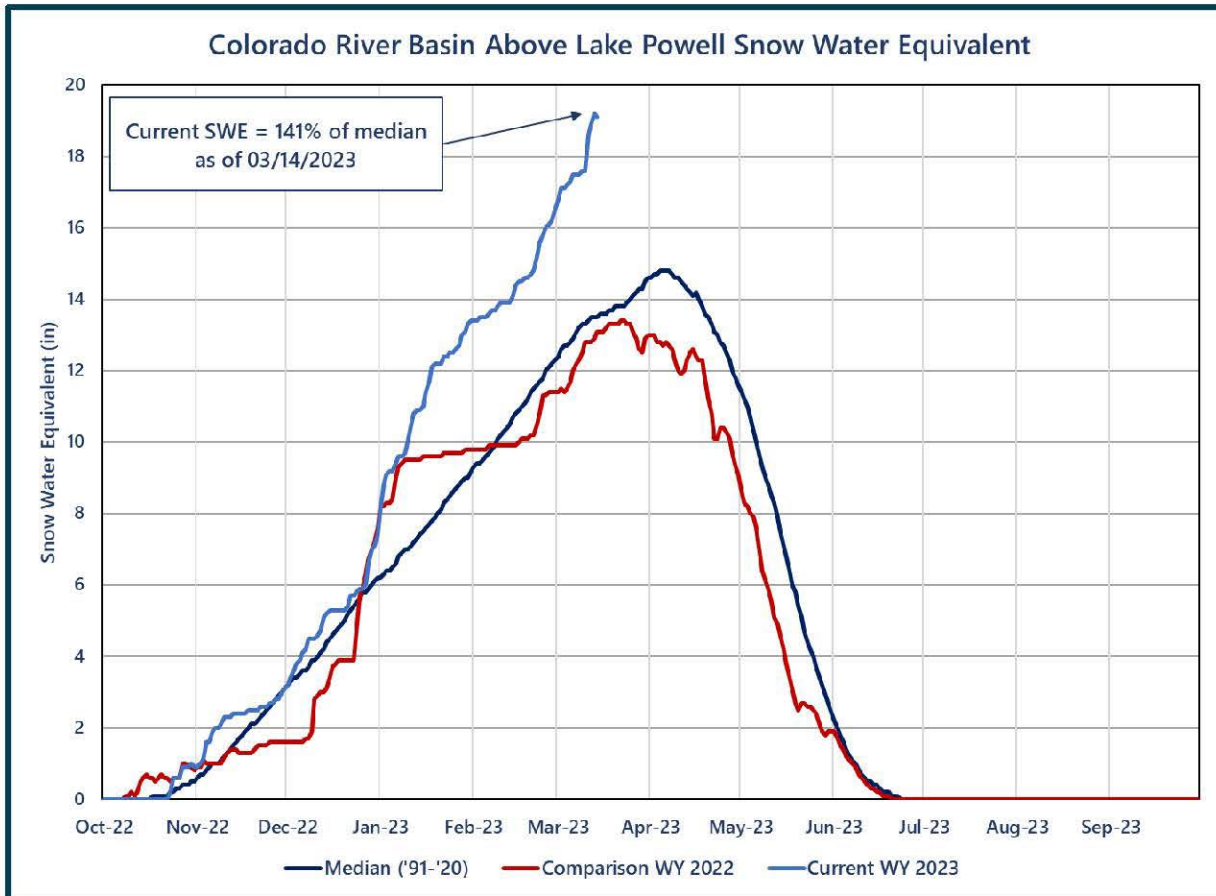
Lake Powell Unregulated Inflow

Water Year 2023 Forecast (issued March 3)

Comparison with History



Upper Colorado SWE and Observed Inflows





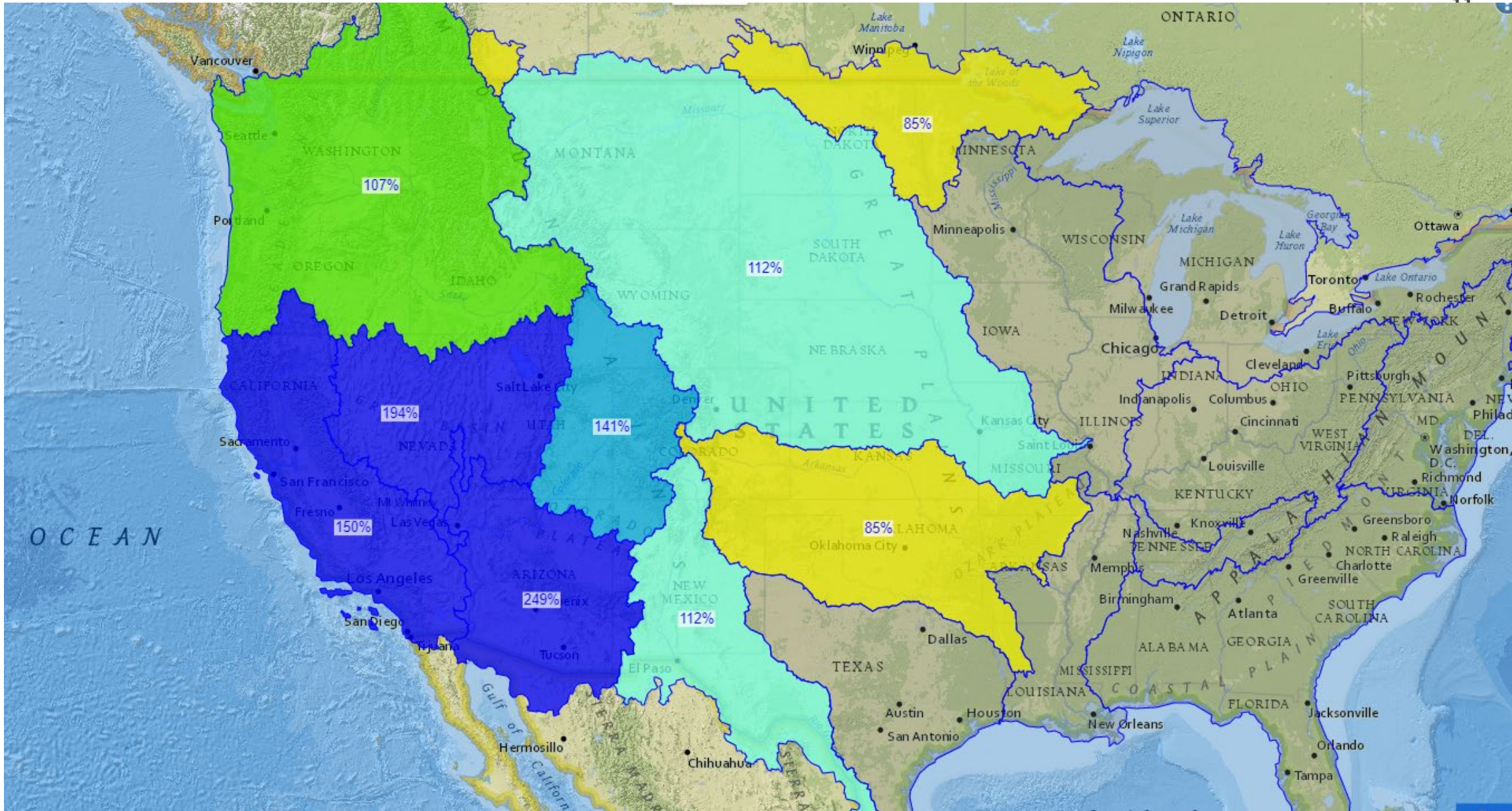




Provo Canyon Rd @ Milepost 12.21, UT



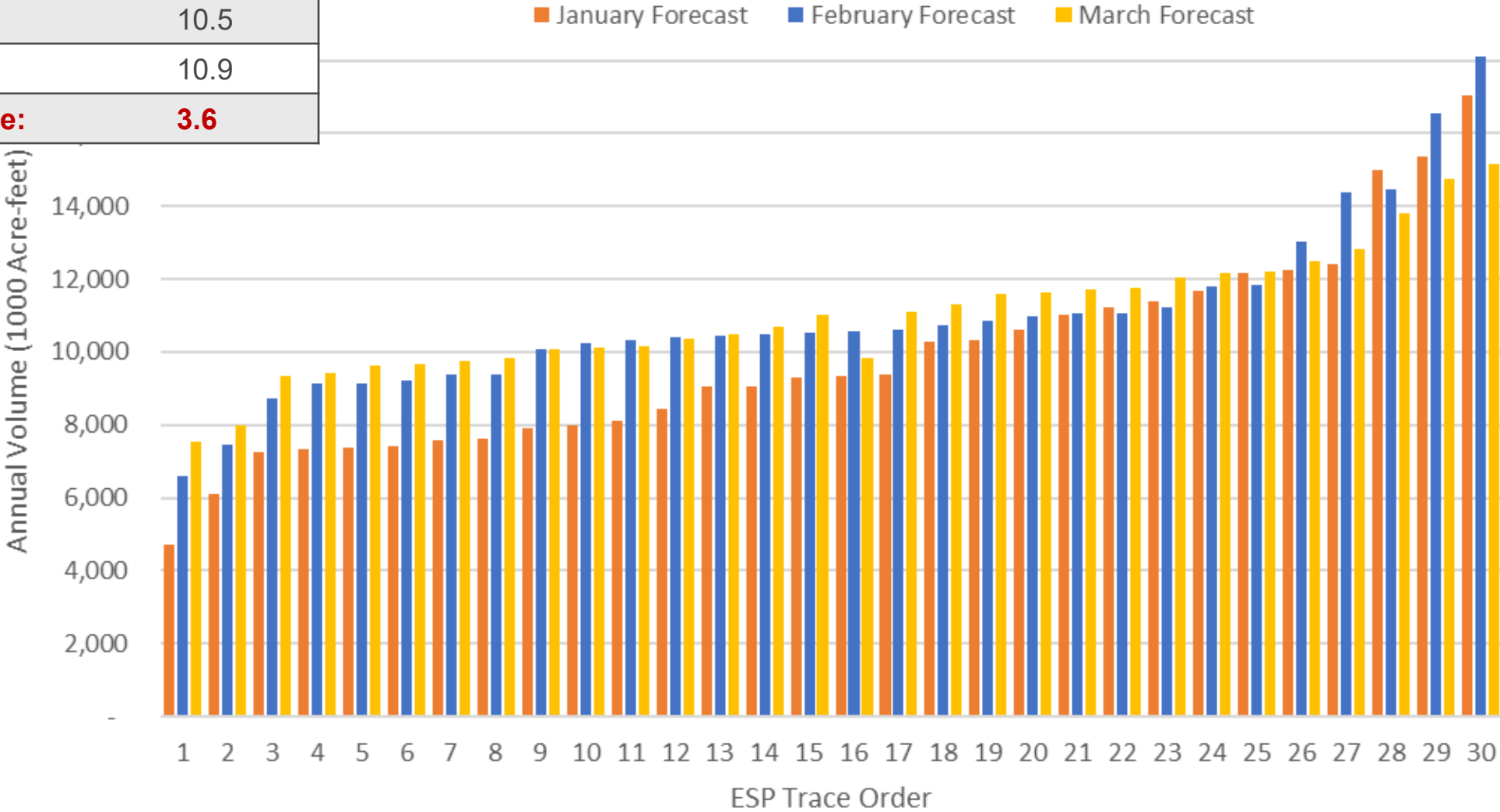






Month (Median Unregulated Lake Powell Inflow)	Volume (MAF)
December	7.3
January	9.3
February	10.5
March	10.9
Total Increase:	3.6

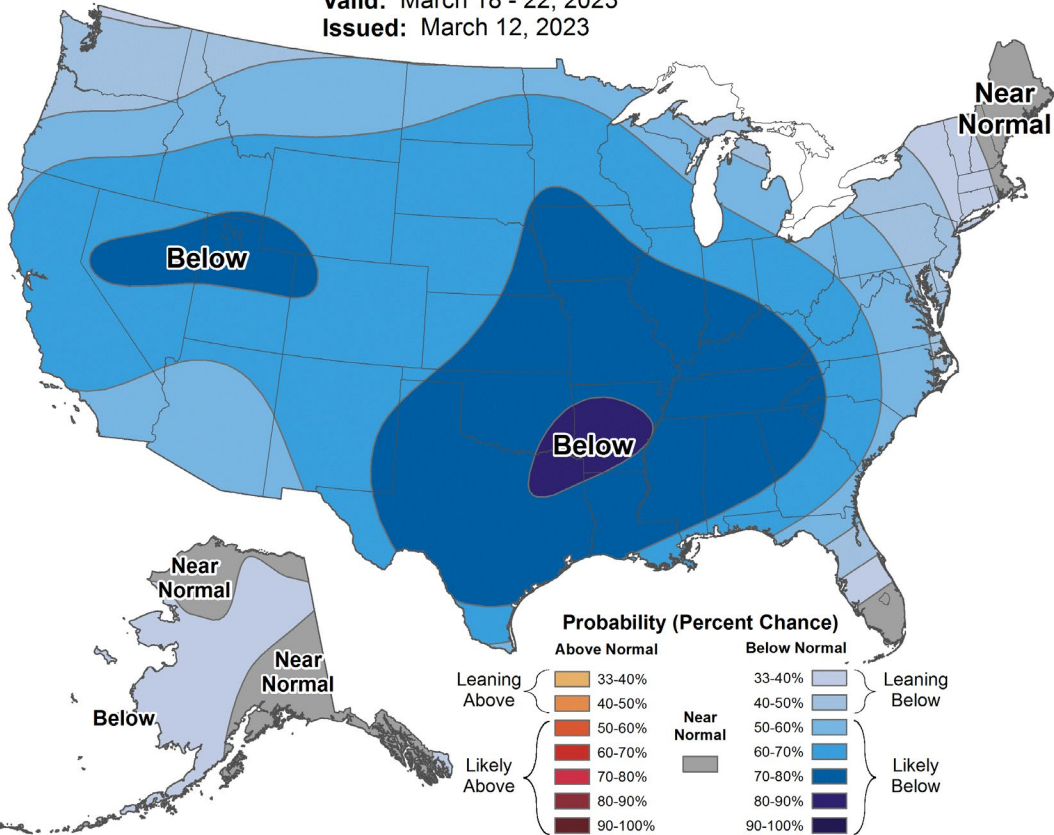
2023 Lake Powell Unregulated Inflow





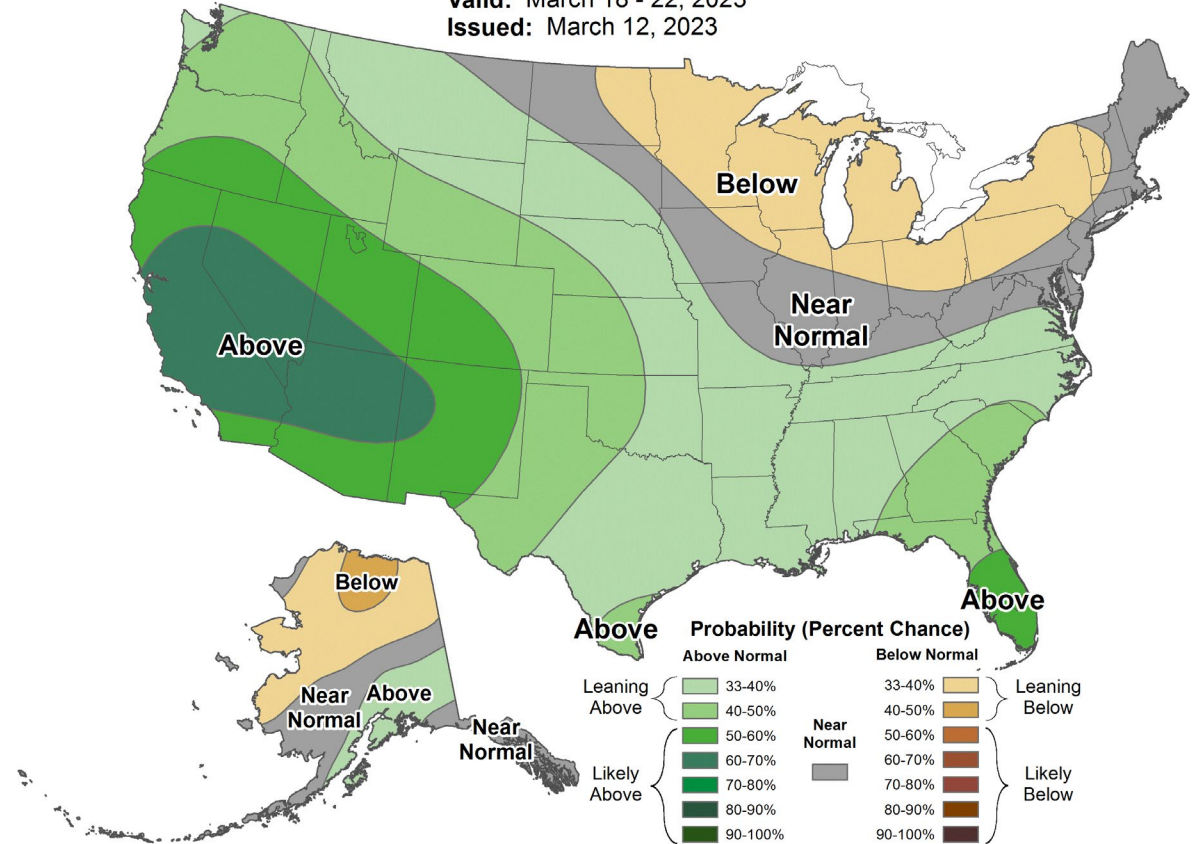
6-10 Day Temperature Outlook

Valid: March 18 - 22, 2023
Issued: March 12, 2023

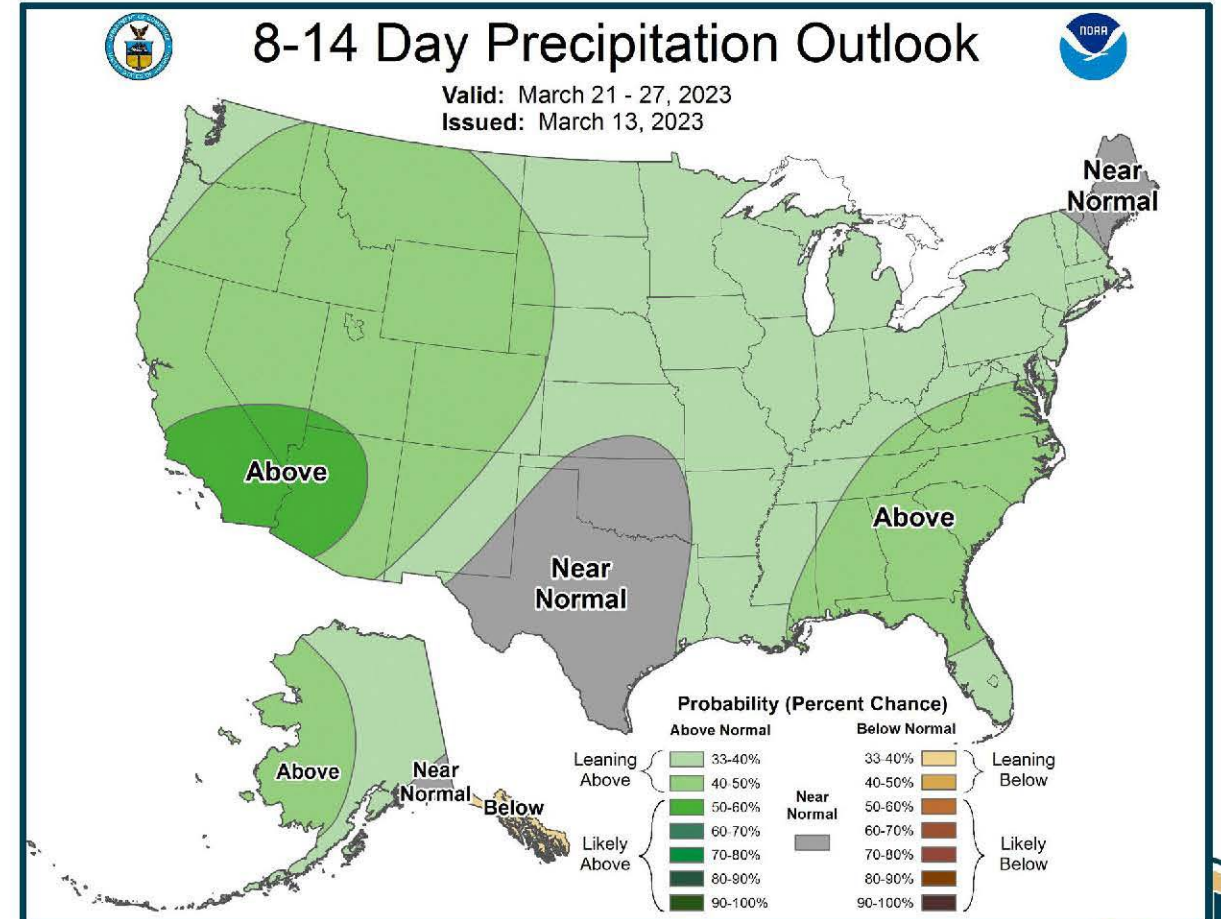
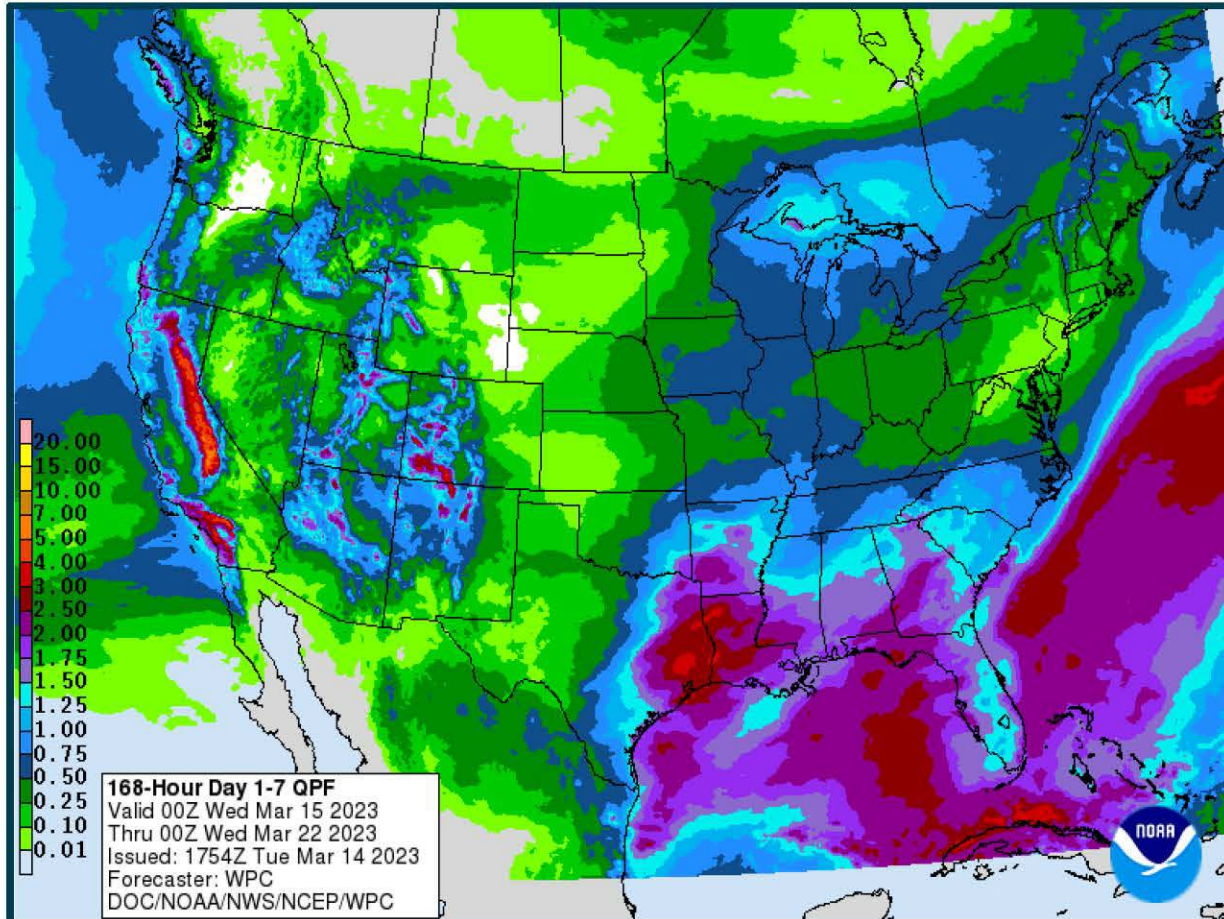


6-10 Day Precipitation Outlook

Valid: March 18 - 22, 2023
Issued: March 12, 2023



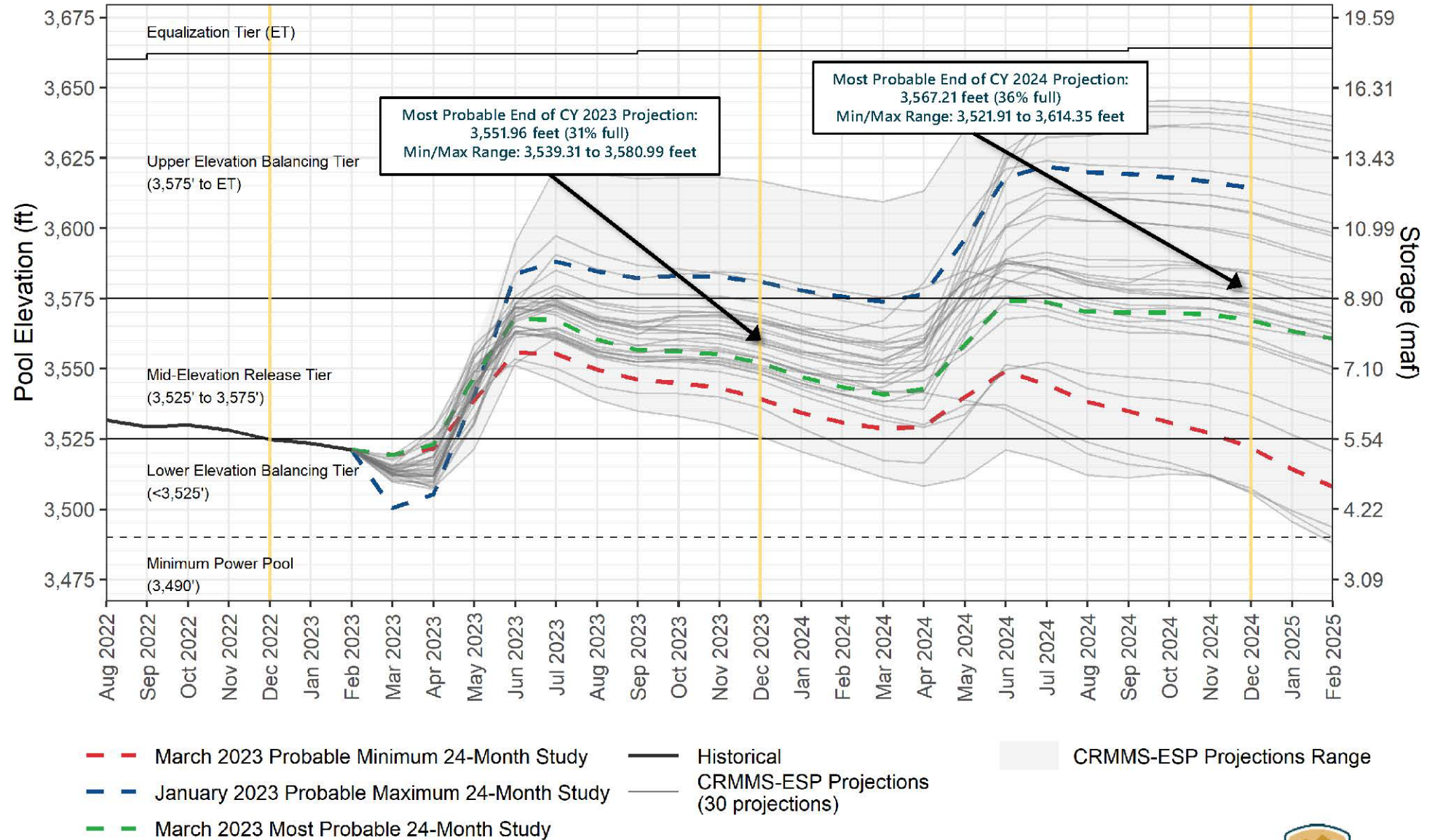
Climate Prediction Center Short-Term Precipitation Forecast





Lake Powell End-of-Month Elevations¹

CRMMS Projections from January and March 2023

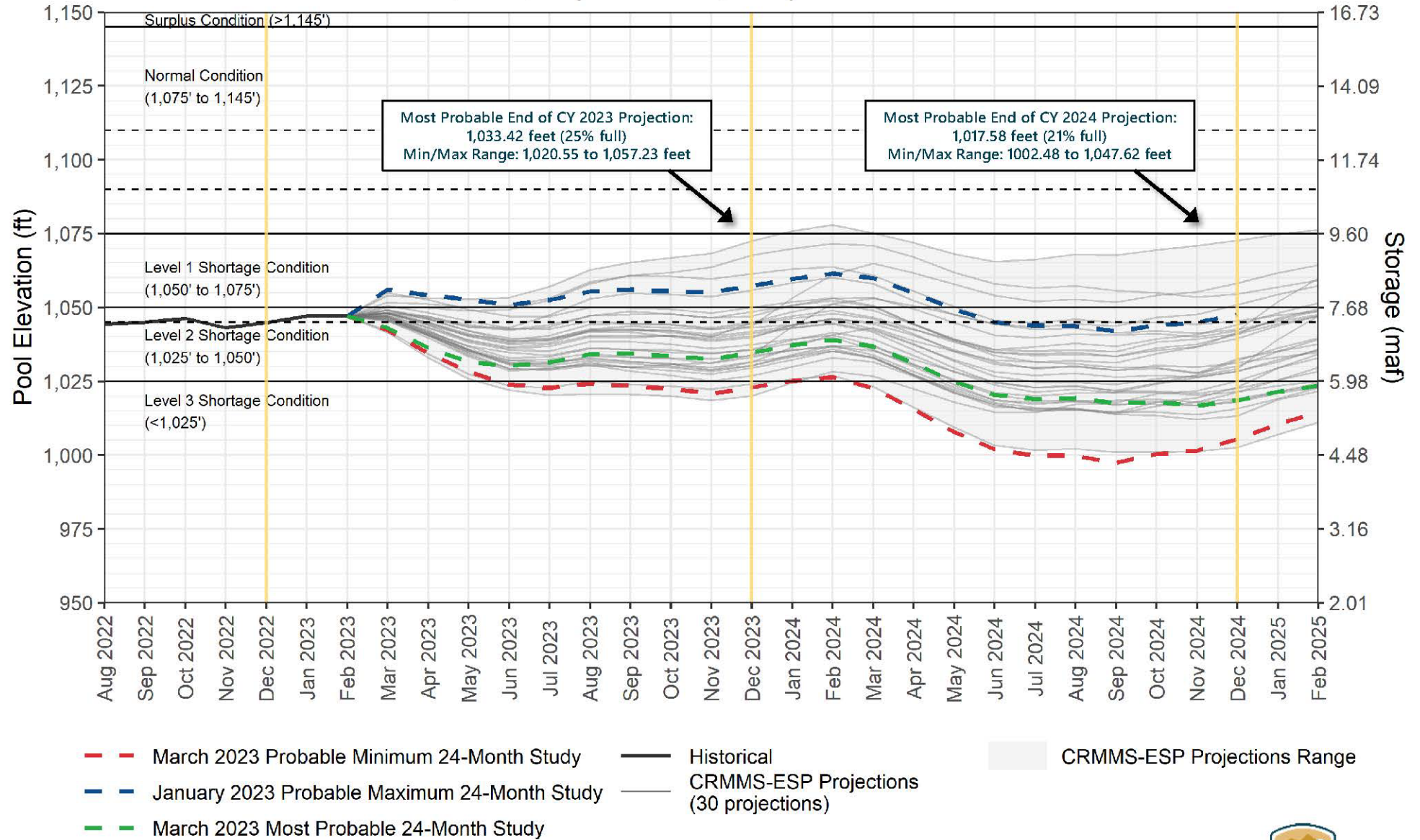


¹ Projected Lake Powell end-of-month physical elevations from the latest CRMMS-ESP and 24-Month Study inflow scenarios.



Lake Mead End-of-Month Elevations¹

CRMMS Projections from January and March 2023



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2023 Lake Powell Operations and Drought Response Operations Agreement (DROA) Intersect



DRO Releases to date

- Total FG '21 and '22 DRO Releases as of March 15, 2023: ~588,267 acft
- 2022 DRO Releases ceased on 3/7/2023

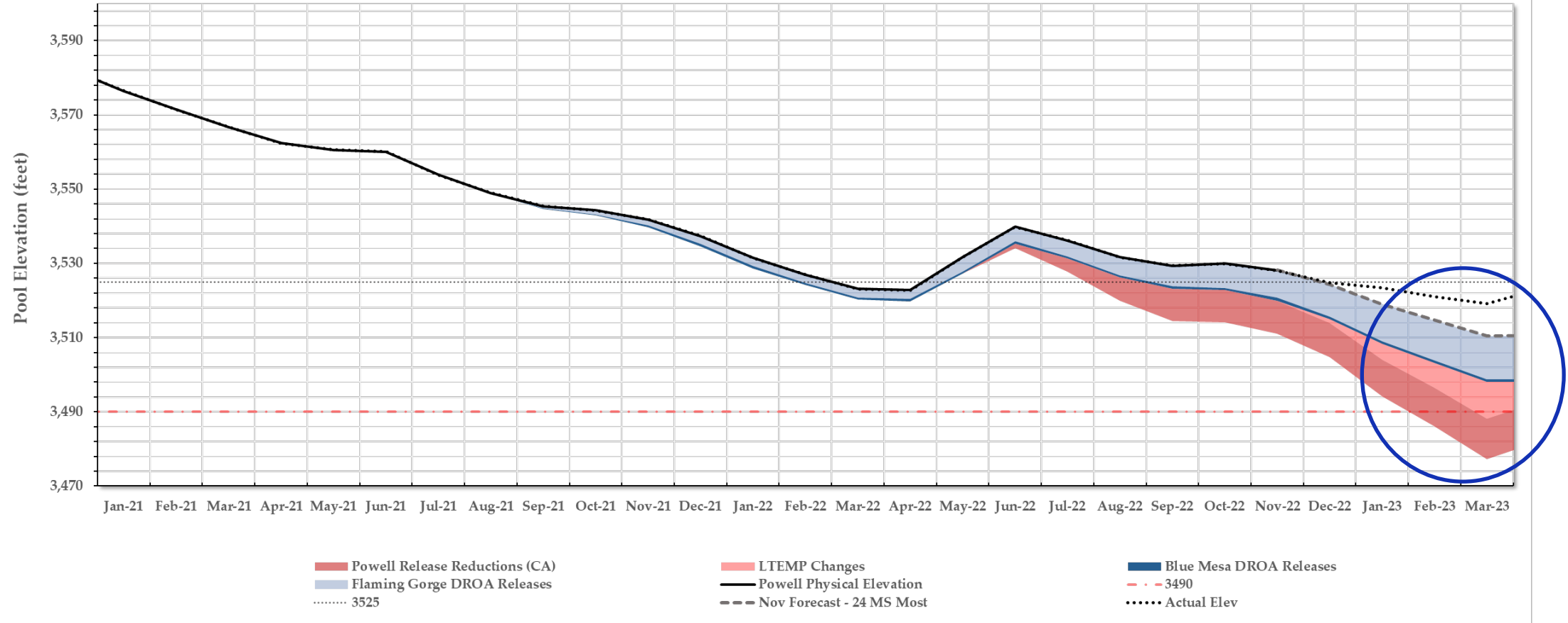
Drought Response Releases				
Initial Unit	Year			Total
	2021	2022	2023	
Flaming Gorge	125,000	463,267	TBD	588,267
Blue Mesa	36,000	-	TBD	36,000
Navajo	-	-	TBD	-
Total	161,000	463,267	TBD	624,267

Month	DRO Plan Releases (1,000 acft)	DRO Actual Releases (1,000 acft)	
May-22	81	97.3	
Jun-22	43	19.0	
Jul-22	18	15.0	
Aug-22	49	25.4	
Sep-22	48	36.3	
Oct-22	37	55.0	
Nov-22	36	51.2	
Dec-22	43	54.8	
Jan-23	43	55.7	
Feb-23	39	50.5	
Mar-23	43	3.1	(as of 3/6/23)
Apr-23	21	-	
Total	500	463.3	



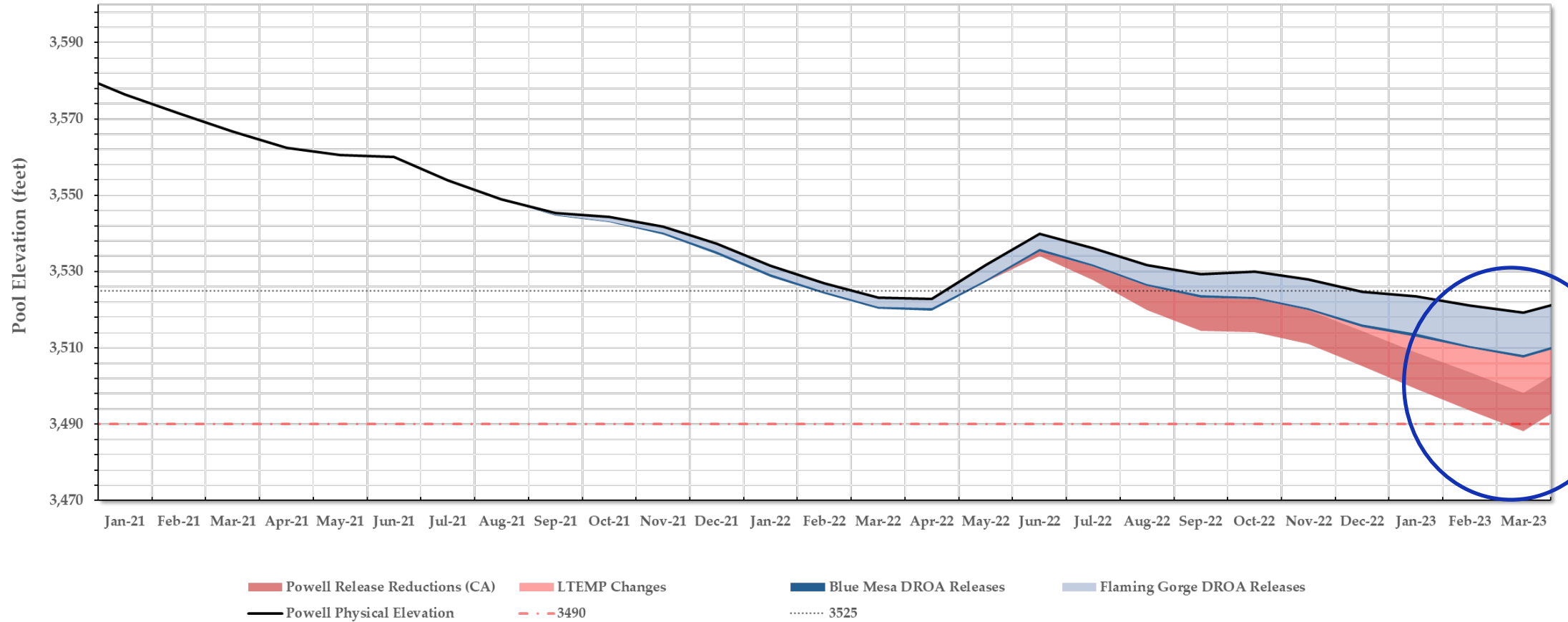


November - Lake Powell Elevations with Protection Actions





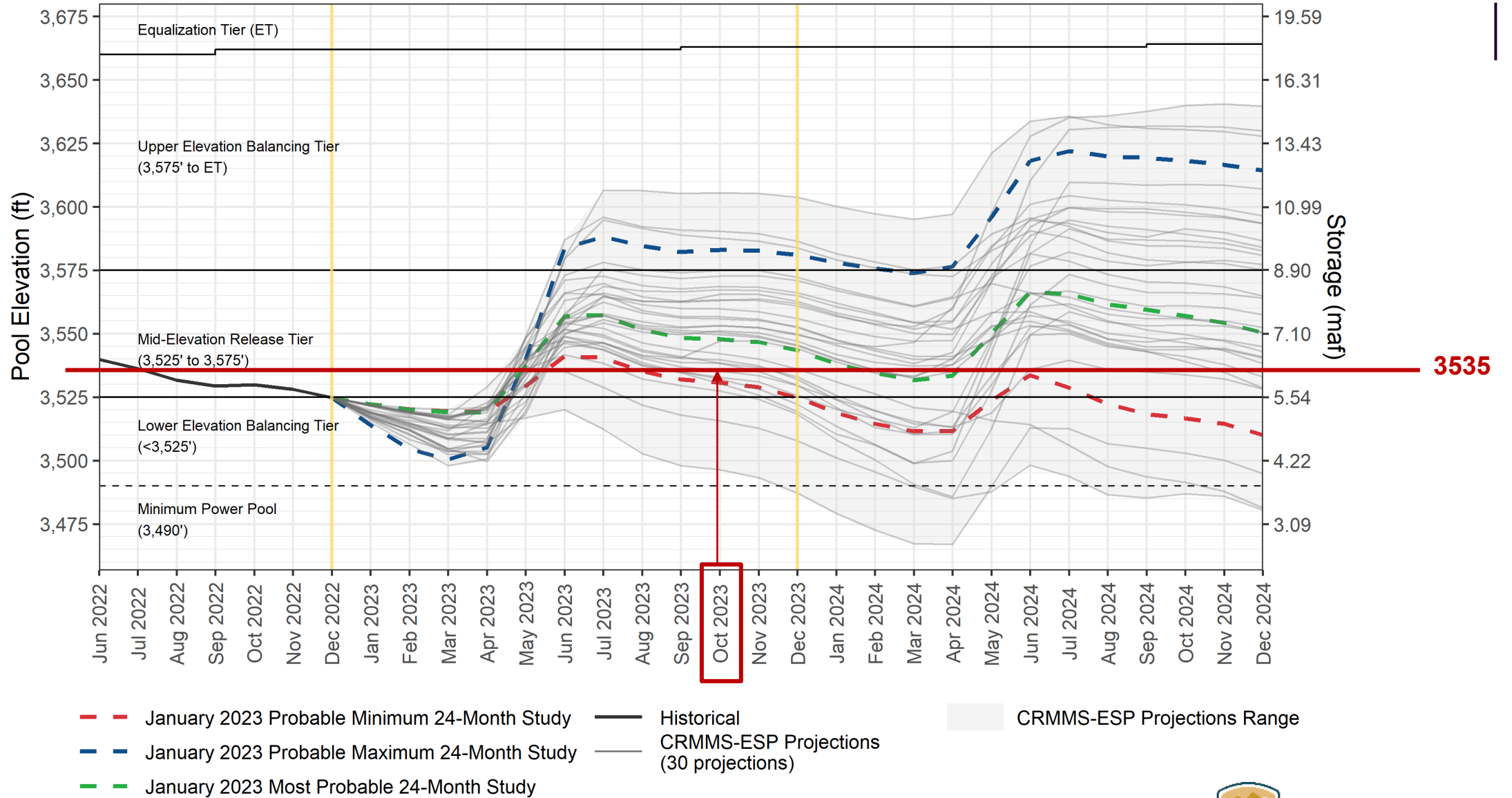
Lake Powell Elevations with Protection Actions





Lake Powell End-of-Month Elevations¹

CRMMS Projections from January 2023

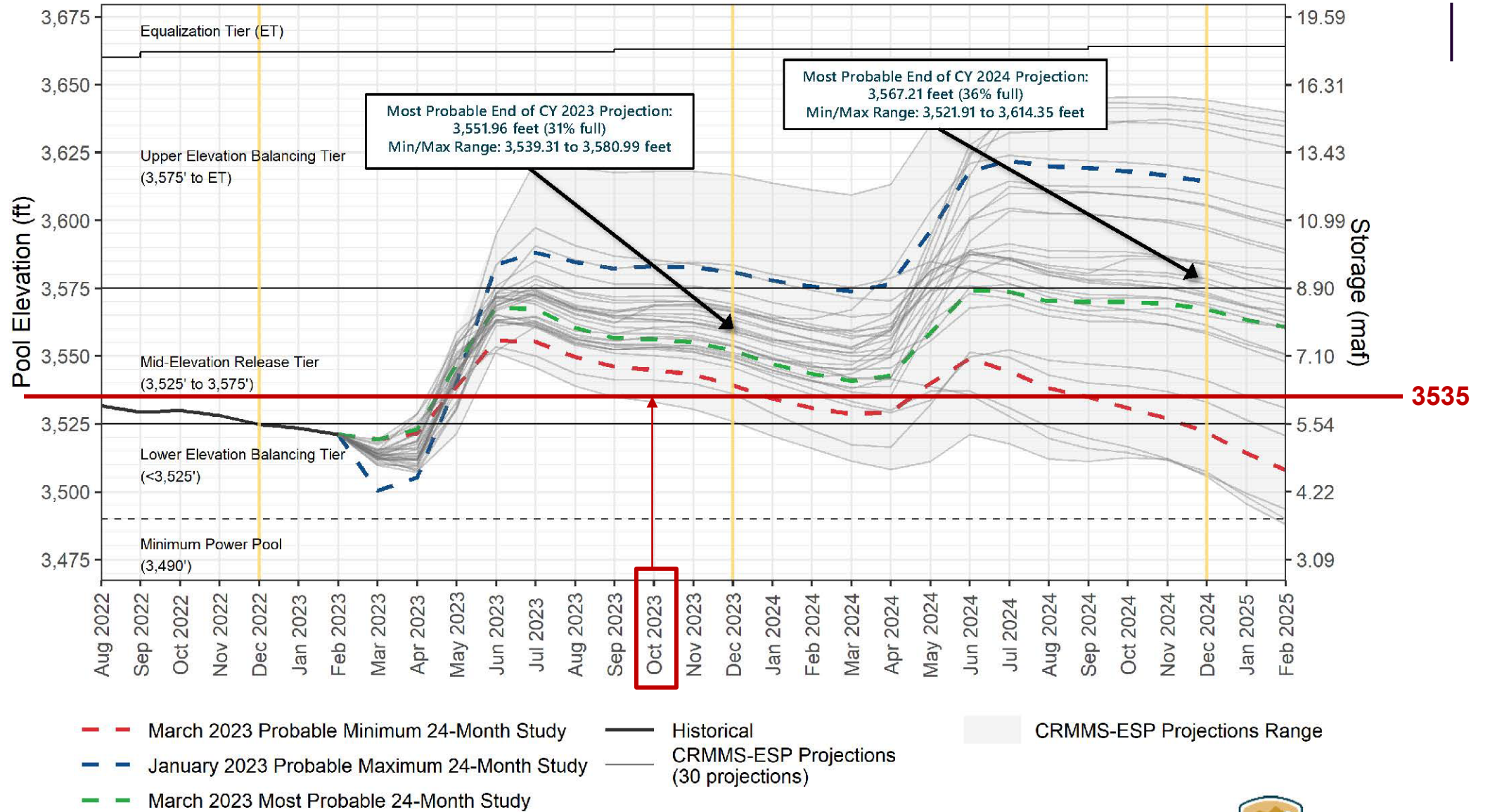


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Lake Powell End-of-Month Elevations¹

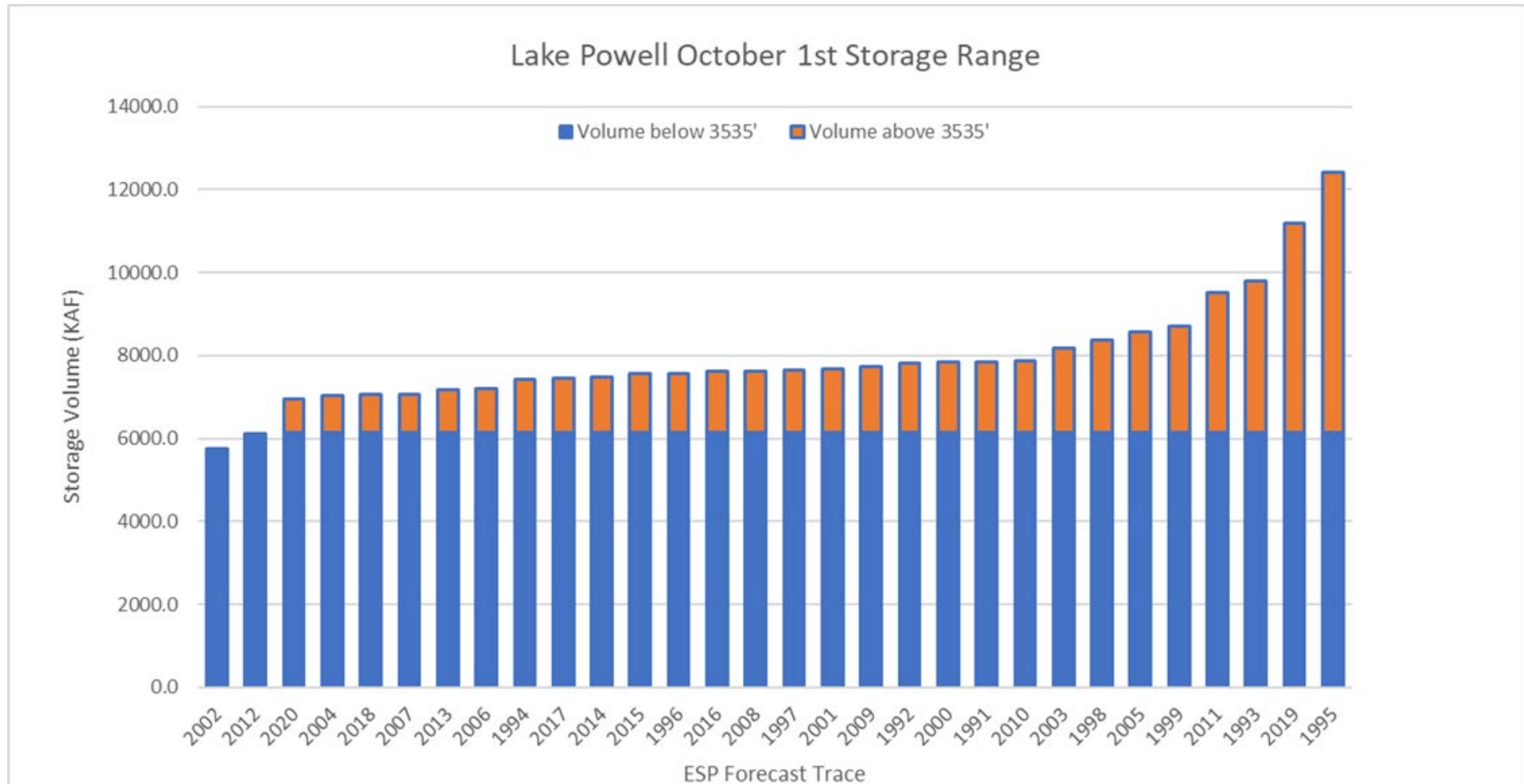
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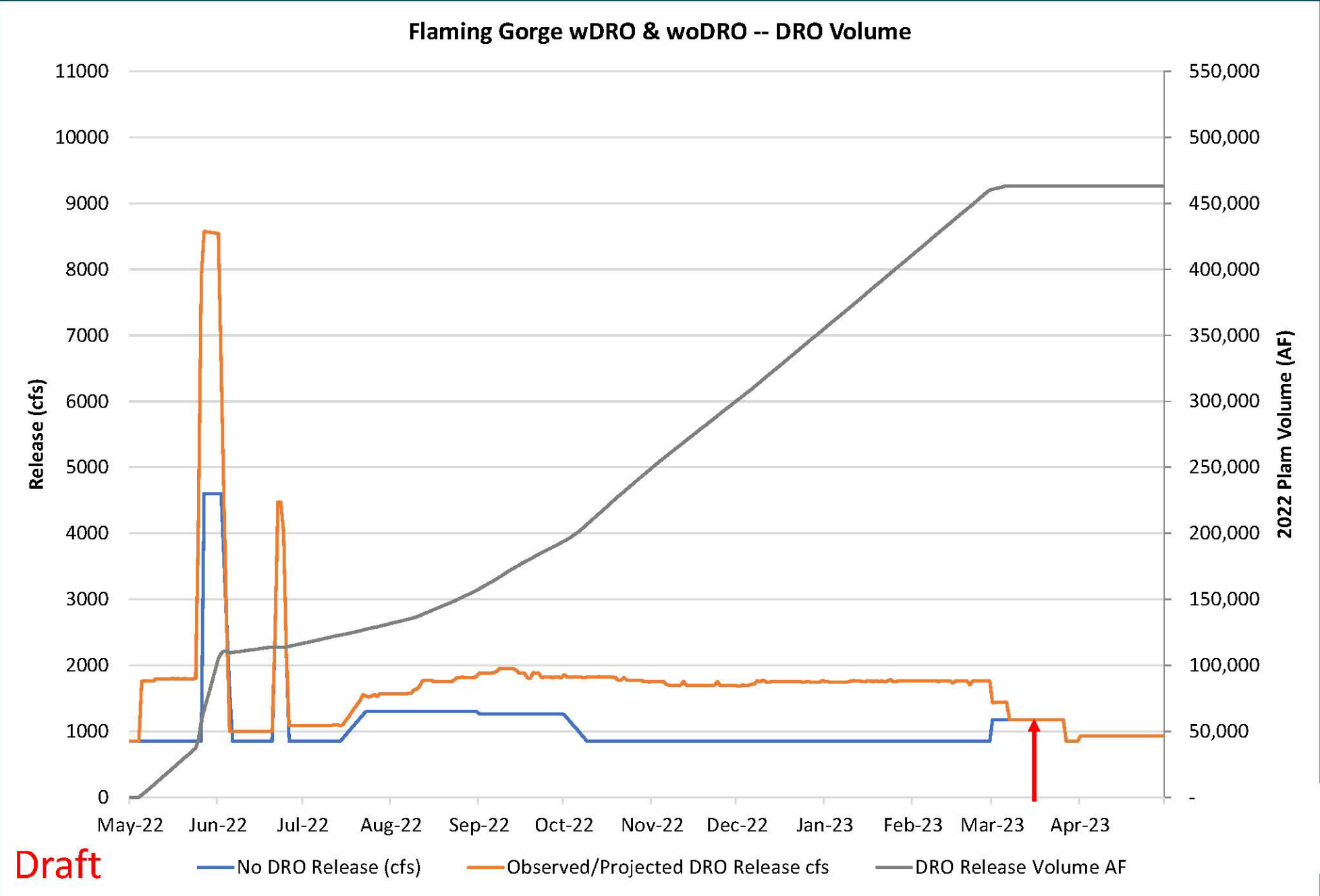


CBRFC Traces Resulting in Lake Powell Balancing



- February CBRFC forecast show 28 of 30 traces balancing
- Current Reclamation DROA accounting results mining of Lake Powell
- **50% (330 KAF) of DROA water in Lake Powell being released from Glen Canyon Dam to Lake Mead**
- Lake Powell mining mitigation through DROA recovery

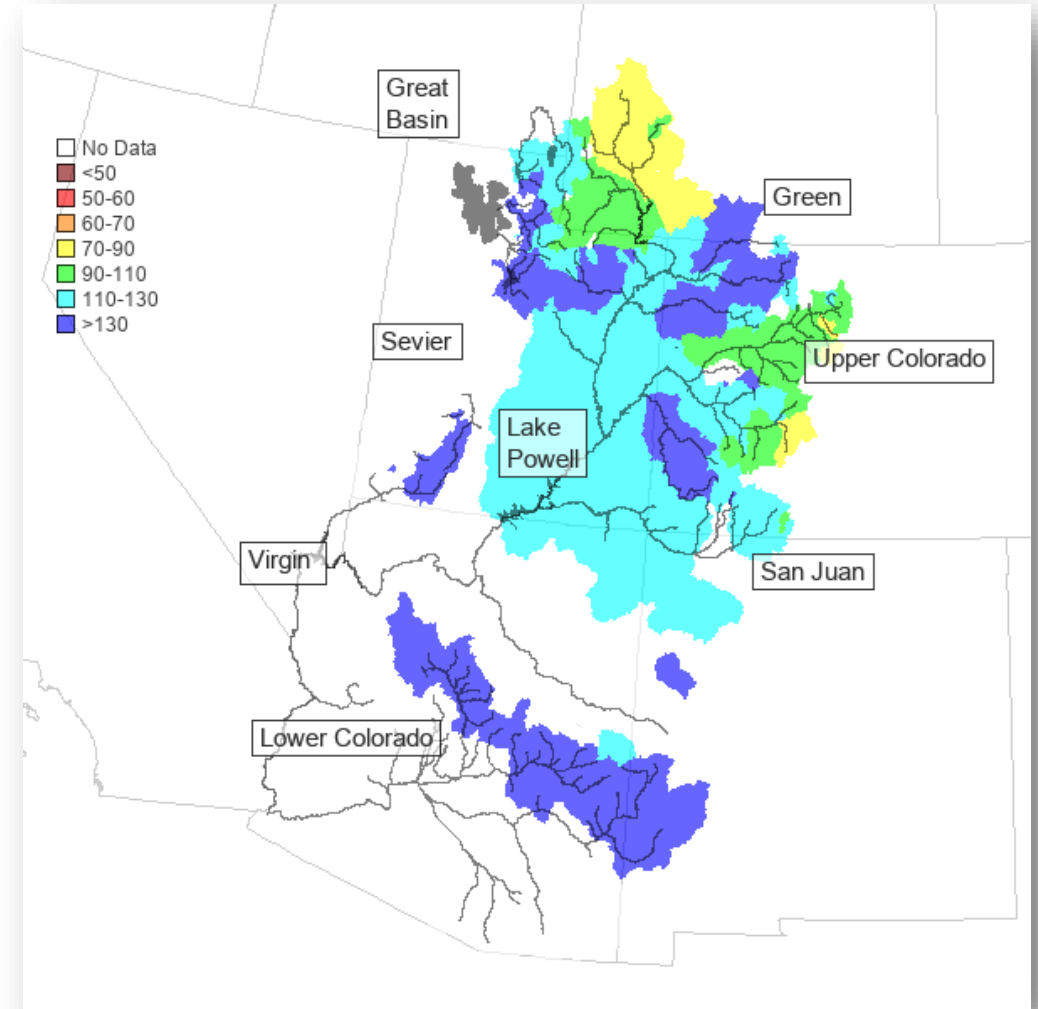
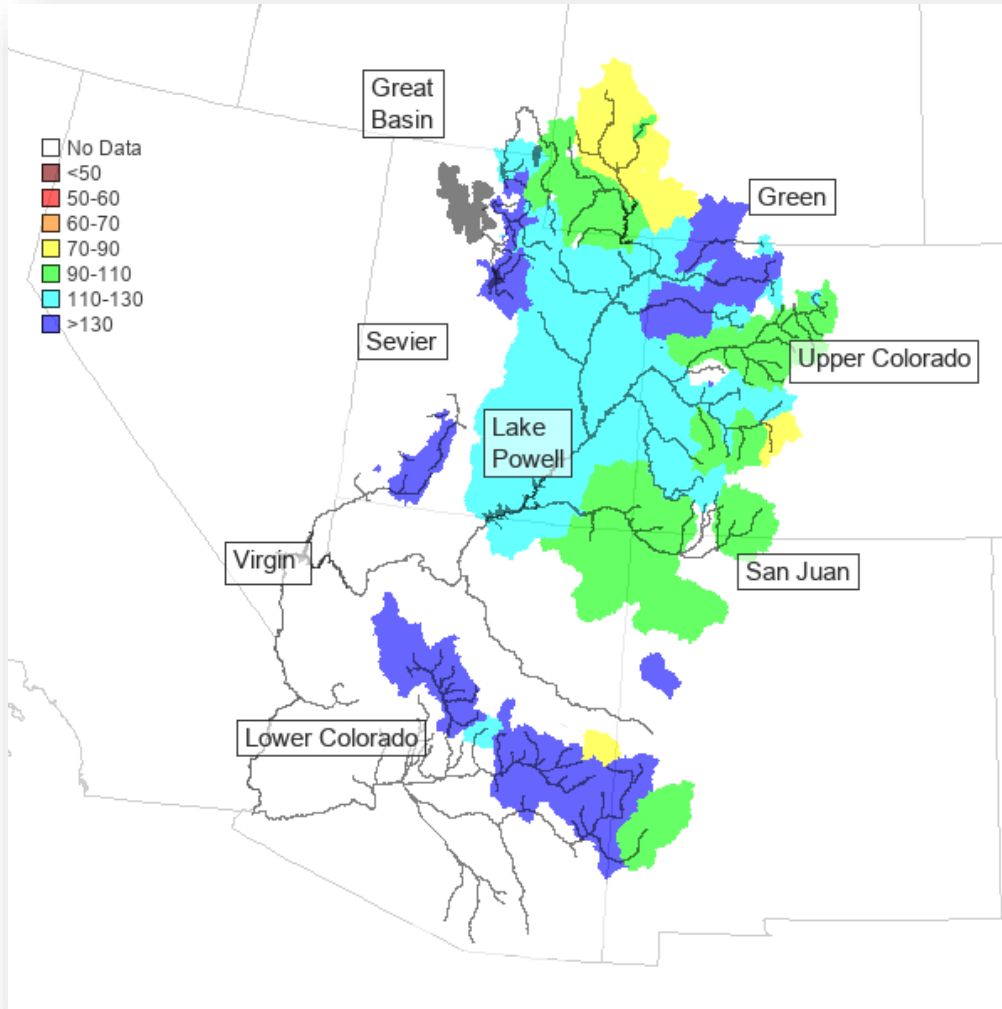
DRO
Releases
to date





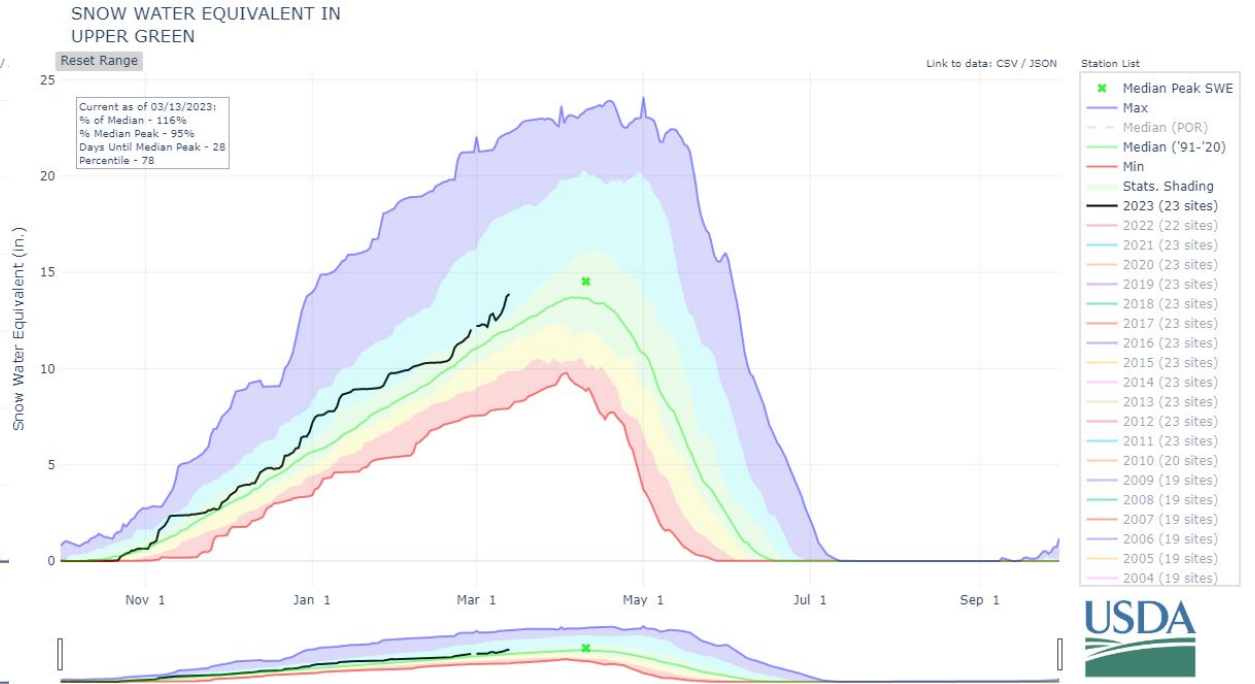
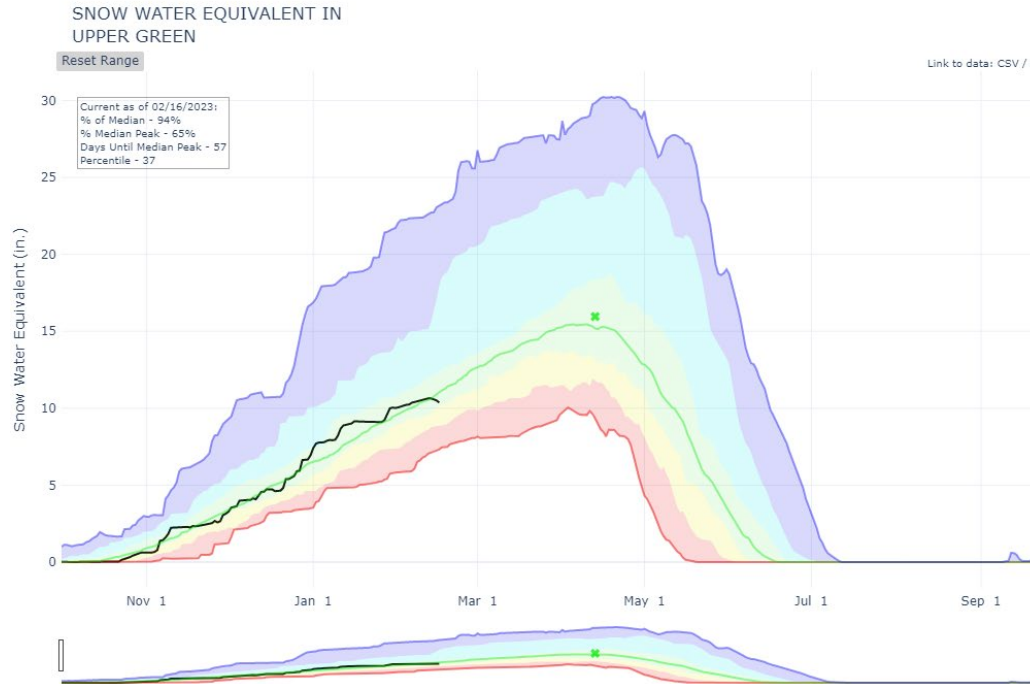
Green River Drainage Drier than the Rest of the UB

25



- Worst Case – Good Hydrology Elsewhere = Large Balancing
- Poor Green River Hydrology = Reduced Possibility of DROA Recovery

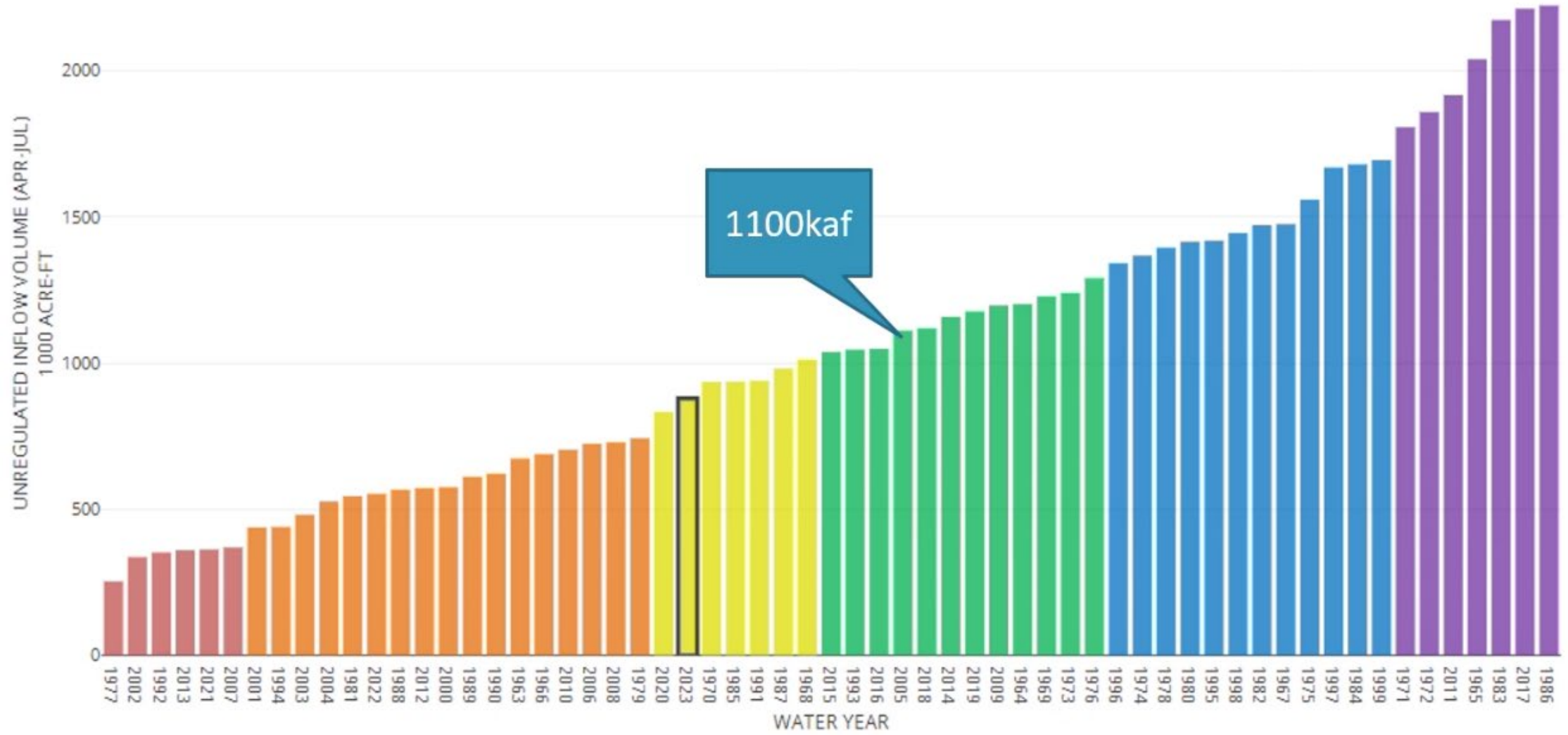






FLAMING GORGE RESERVOIR
HISTORIC UNREGULATED INFLOW VOLUME RANKING
(APR-JUL)

2023 UNREGULATED INFLOW VOLUME
880.0 KAF (APR-JUL)
91% Average (1991-2020)
61% Pearson III Exceedance (1963-2022)





February CRMMS Hydrology Ensemble May – September, 2023 DROA Recovery Potential

- There is a range of possible recovery volumes for each recovery option due to hydrologic uncertainty
- Full recovery is attained only with most aggressive strategies in wettest conditions
- At the median hydrology, the recovery volume goes from 236 KAF up to 423 KAF as the recovery strategy gets more aggressive

Recovery Volumes Range (AF)				
Exceedance	Same HC	Down 1 HC	Lowest HC	Lowest HC Min Baseflow
Max	493,111	517,010	583,986	585,215
10%	394,535	469,715	495,564	585,215
20%	343,343	410,533	479,784	556,482
30%	307,016	348,404	430,370	535,860
40%	272,663	306,862	348,962	458,088
Median / 50%	235,606	268,234	319,016	423,496
60%	223,474	226,779	298,222	395,166
70%	194,113	211,993	281,283	369,966
80%	158,286	189,055	237,521	338,687
90%	90,856	154,630	213,100	312,231
Min	-	-	-	-

