

Colorado River Updates

Michelle Garrison

Interstate, Federal, and Water Information Section

April 27, 2023
SWBRT Meeting



COLORADO

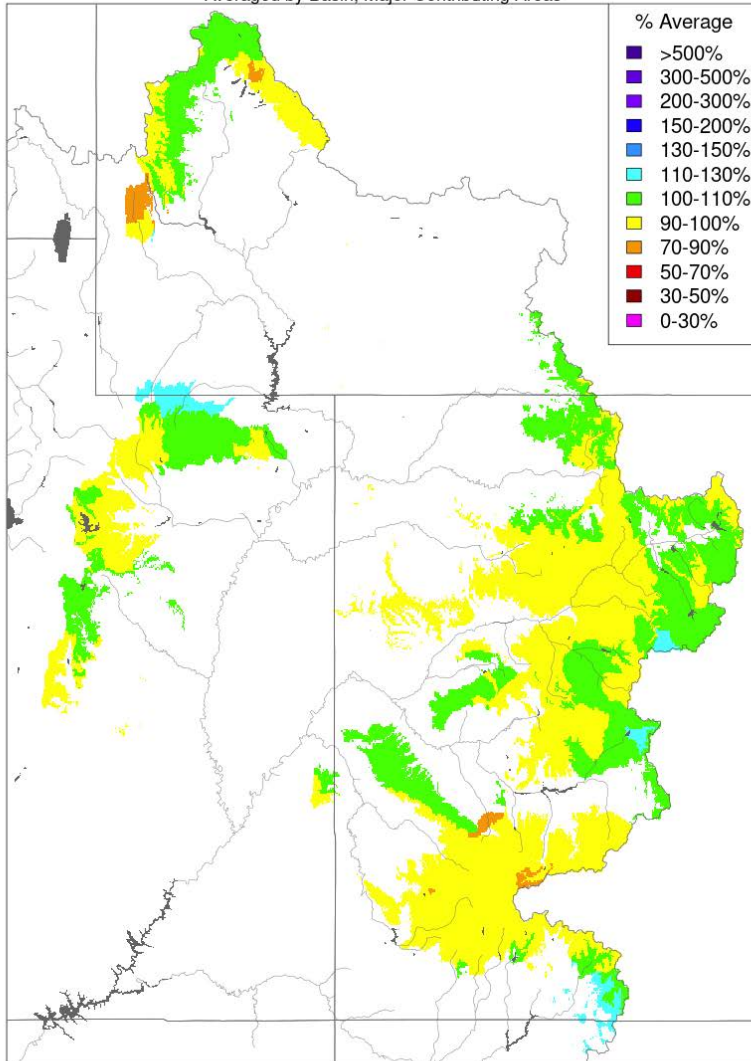
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Precipitation

Water Year Precipitation, October 2021 - September 2022

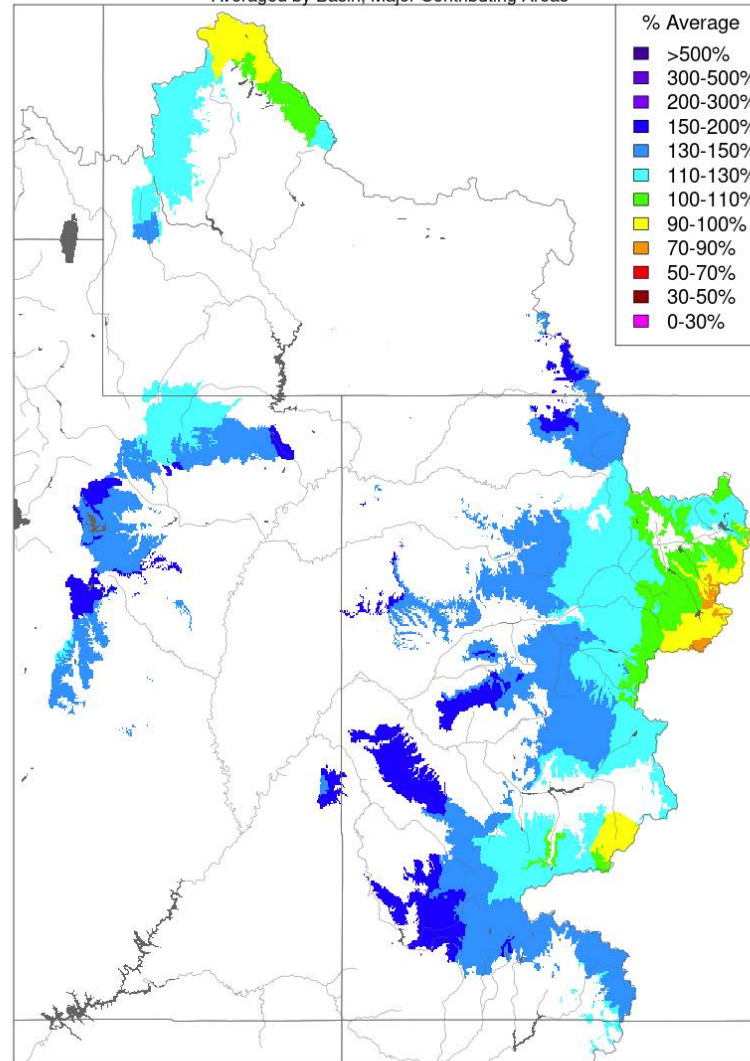
Averaged by Basin, Major Contributing Areas



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

Water Year Precipitation, October 2022 - March 2023

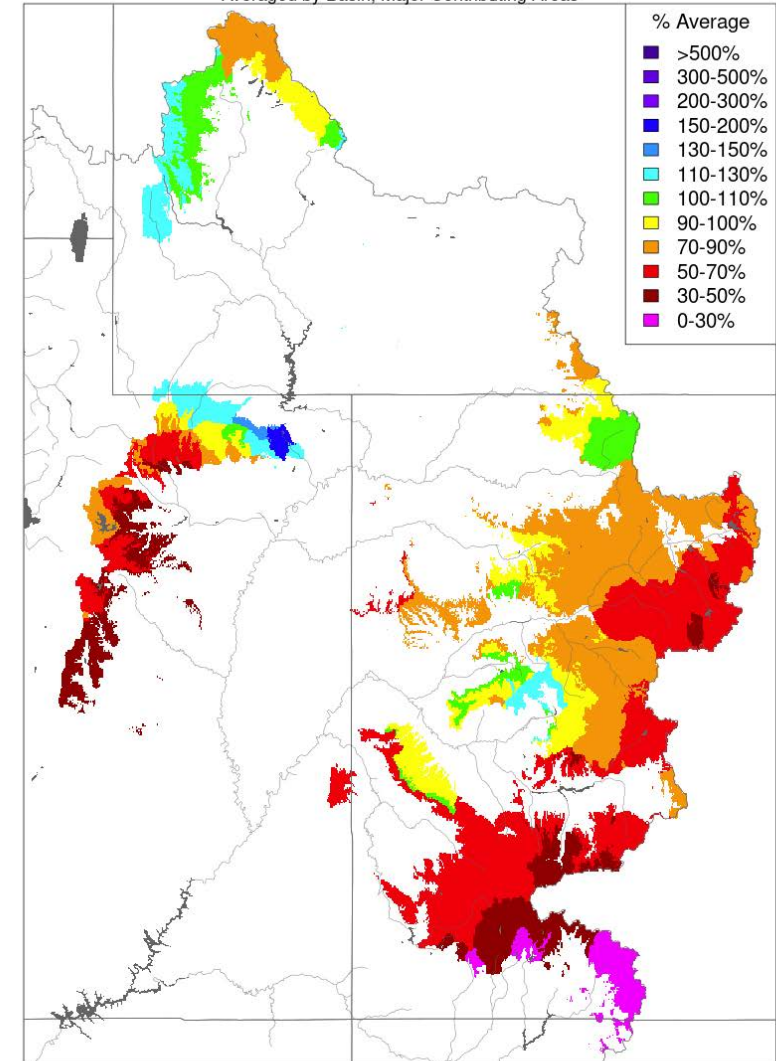
Averaged by Basin, Major Contributing Areas



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

Month to Date Precipitation - April 26 2023

Averaged by Basin, Major Contributing Areas

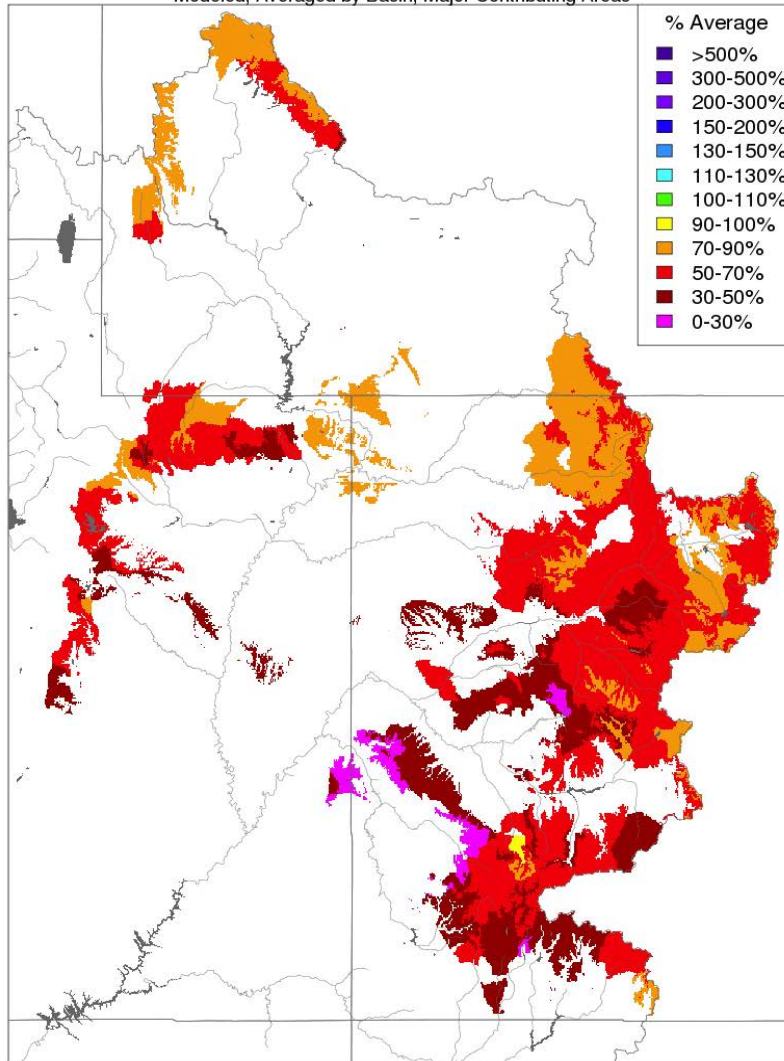


Prepared by NOAA, Colorado Basin River Forecast Center
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Soil Moisture and Snow Conditions

Soil Moisture - Fall - 2020 (November 15)

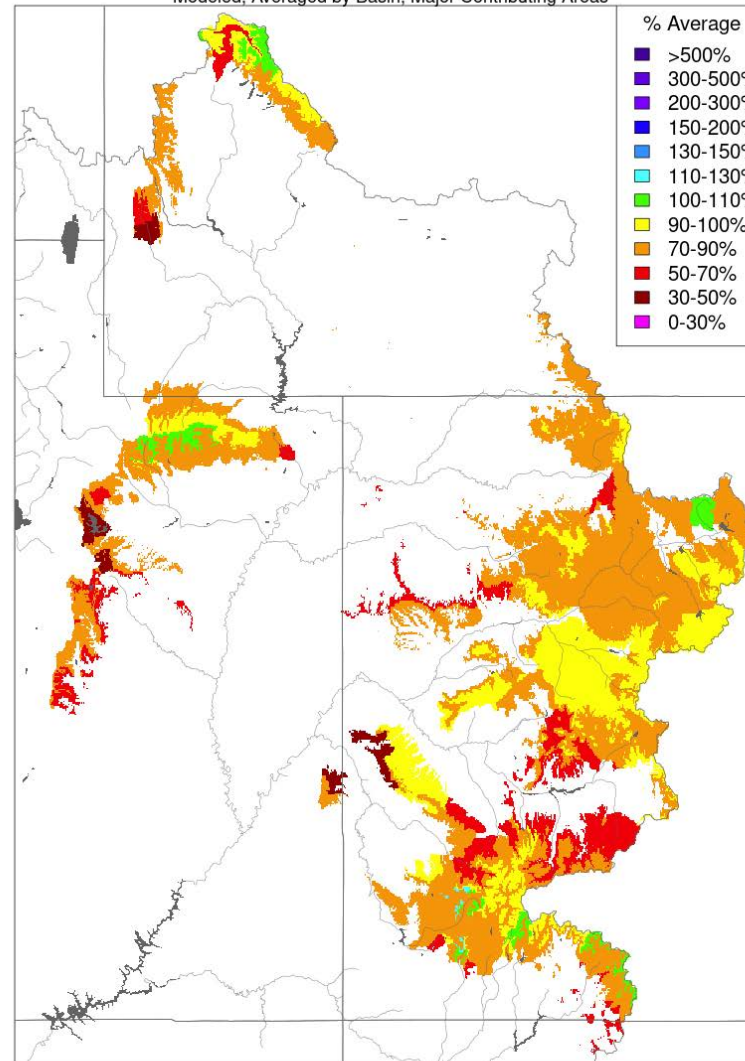
Modeled, Averaged by Basin, Major Contributing Areas



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Soil Moisture - Fall - 2022 (November 02)

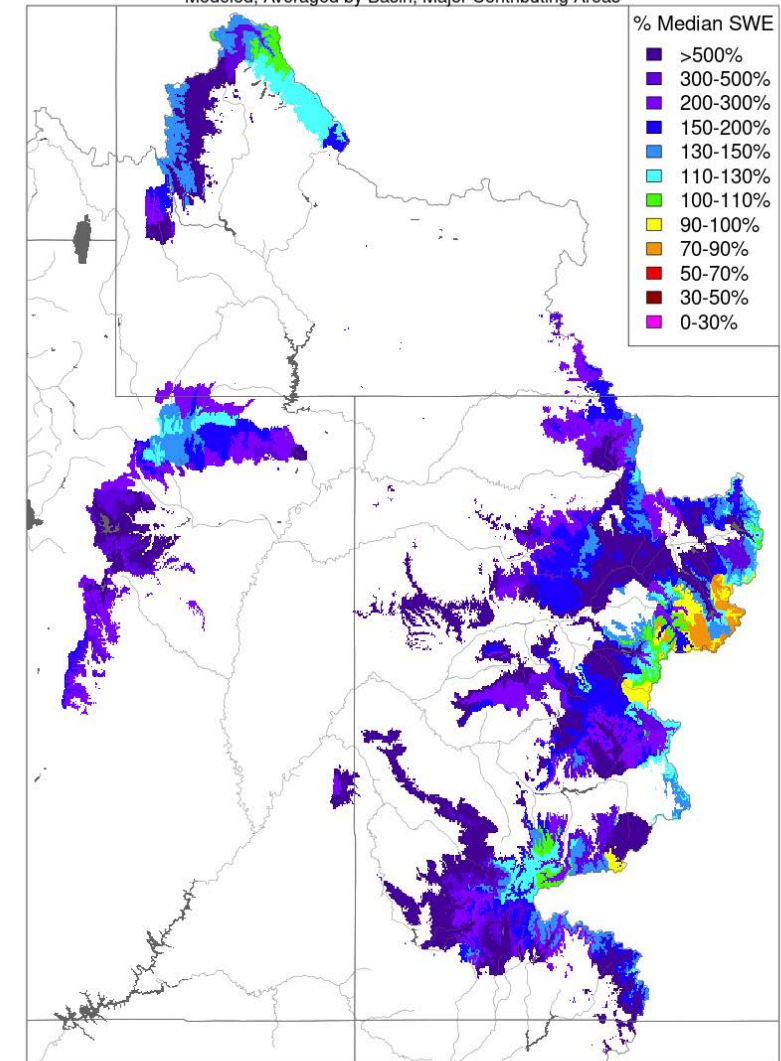
Modeled, Averaged by Basin, Major Contributing Areas



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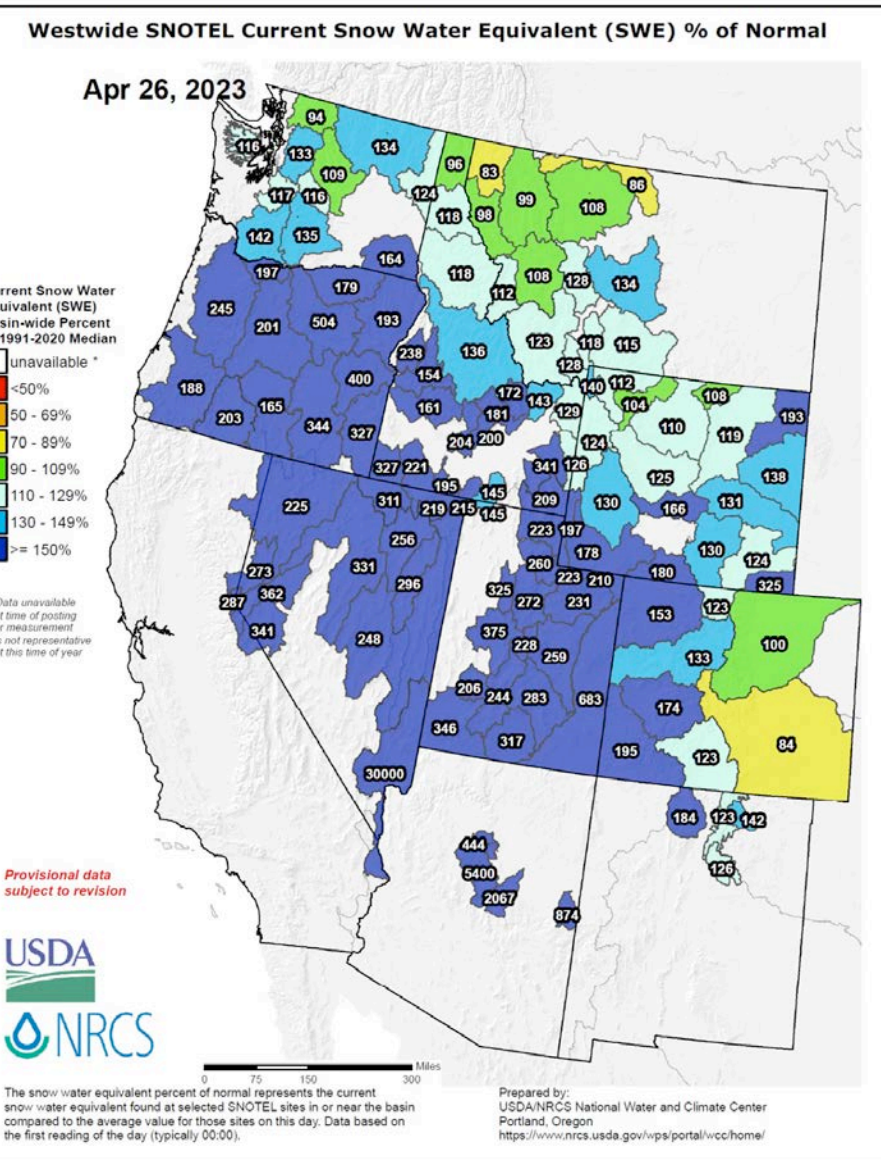
Snow Conditions - April 26 2023

Modeled, Averaged by Basin, Major Contributing Areas

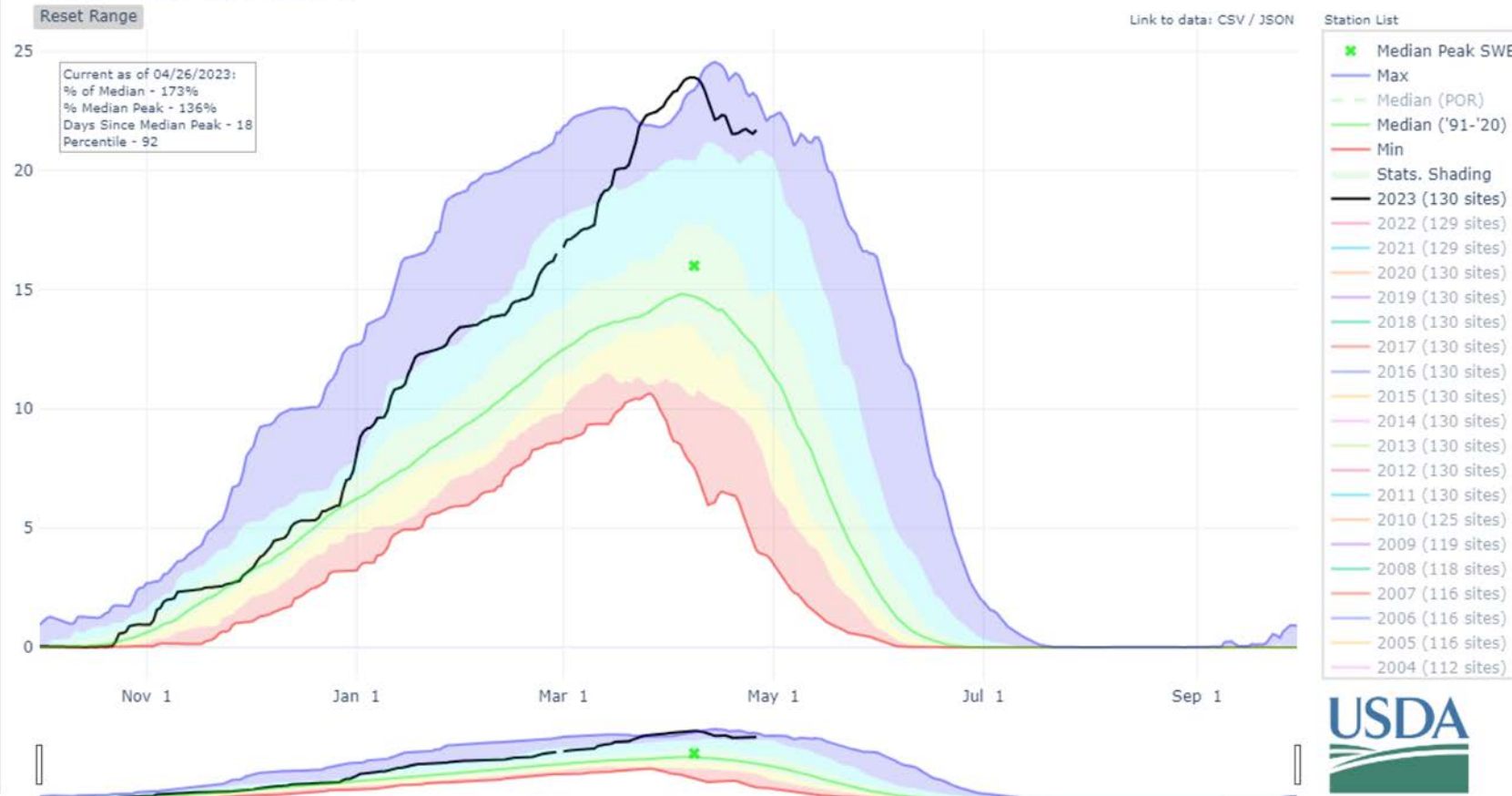


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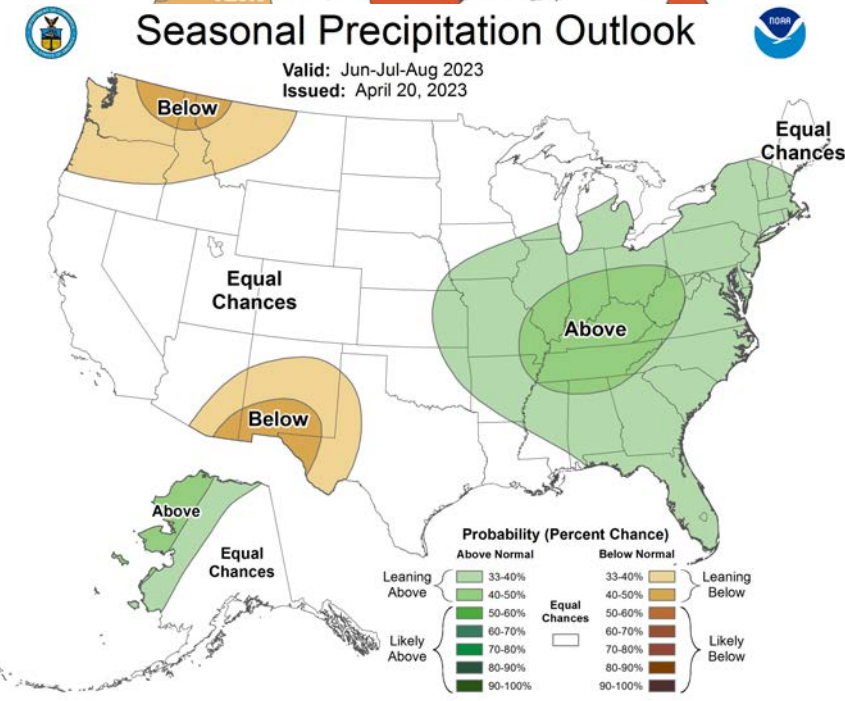
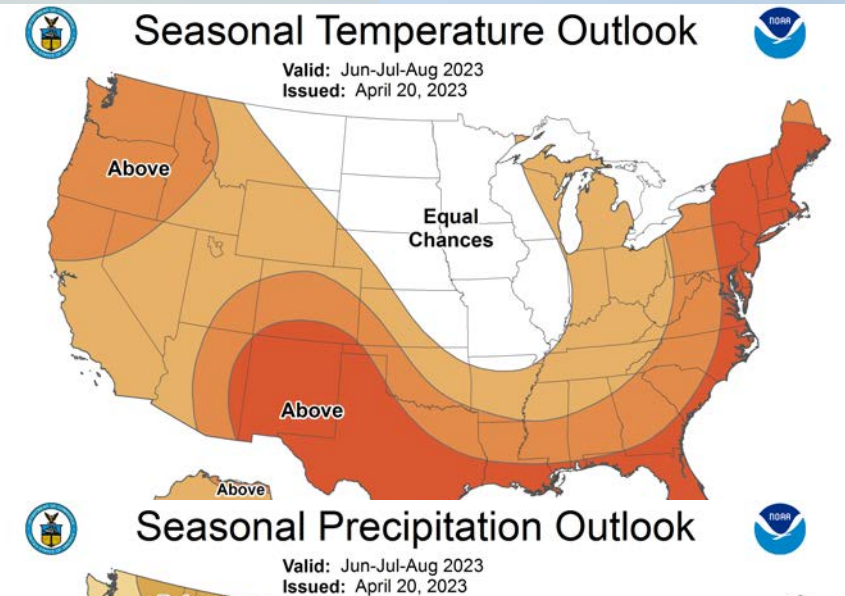
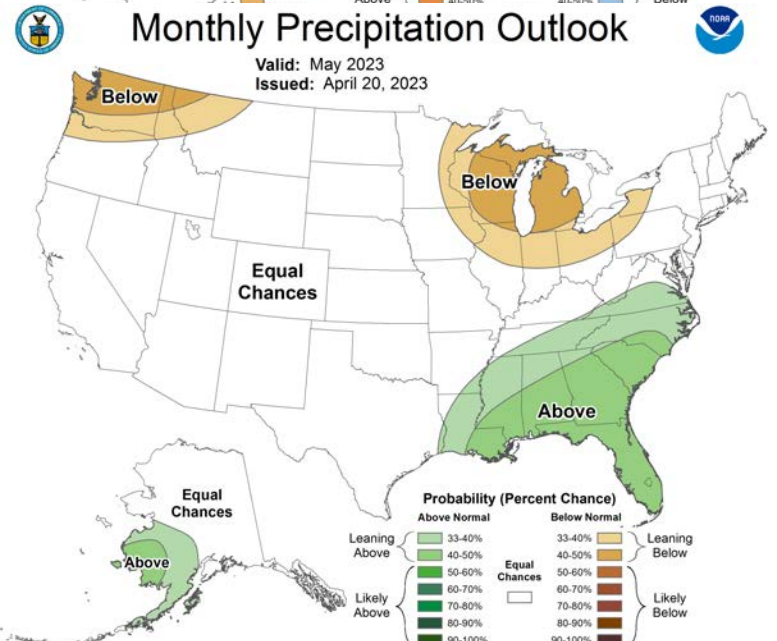
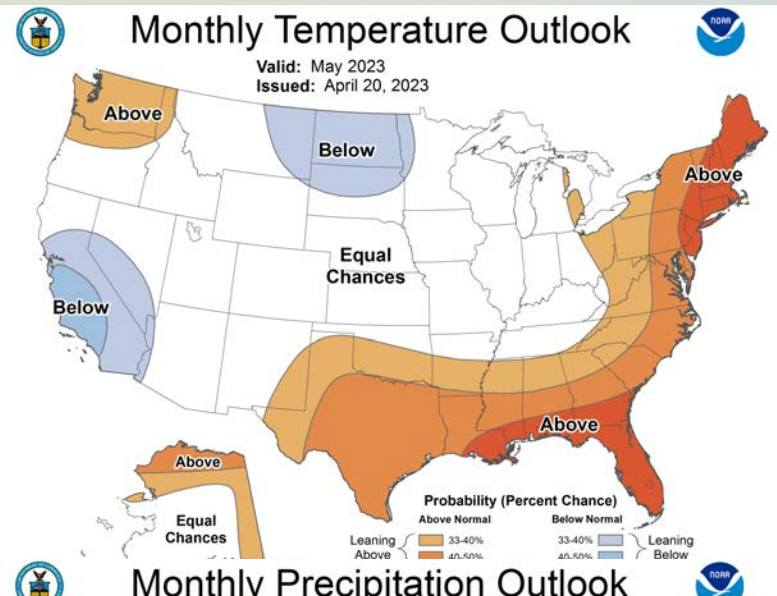
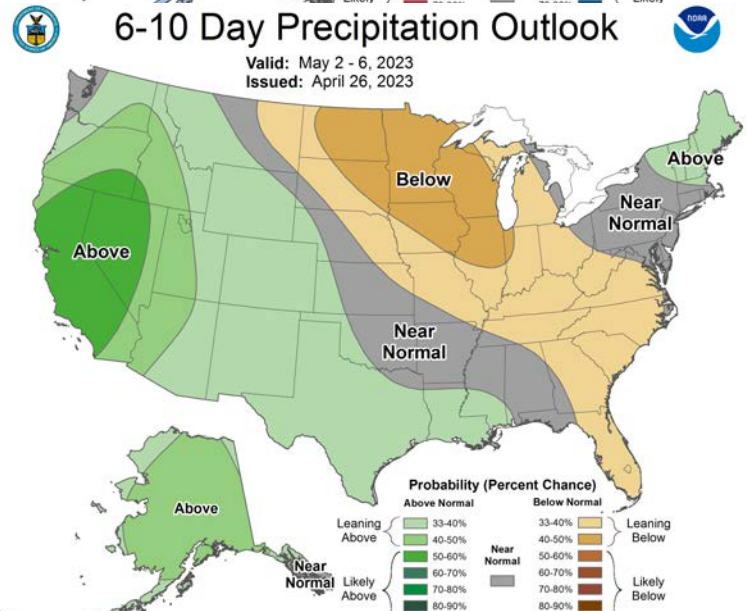
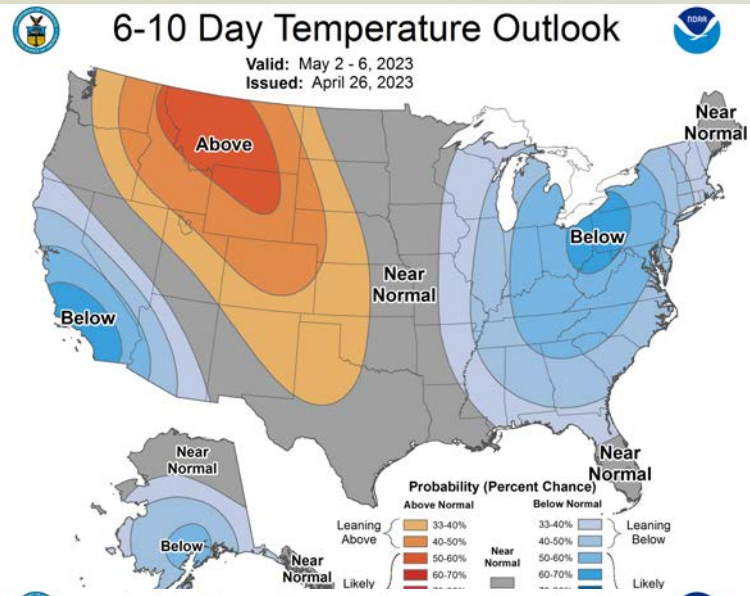
Snowpack and Runoff



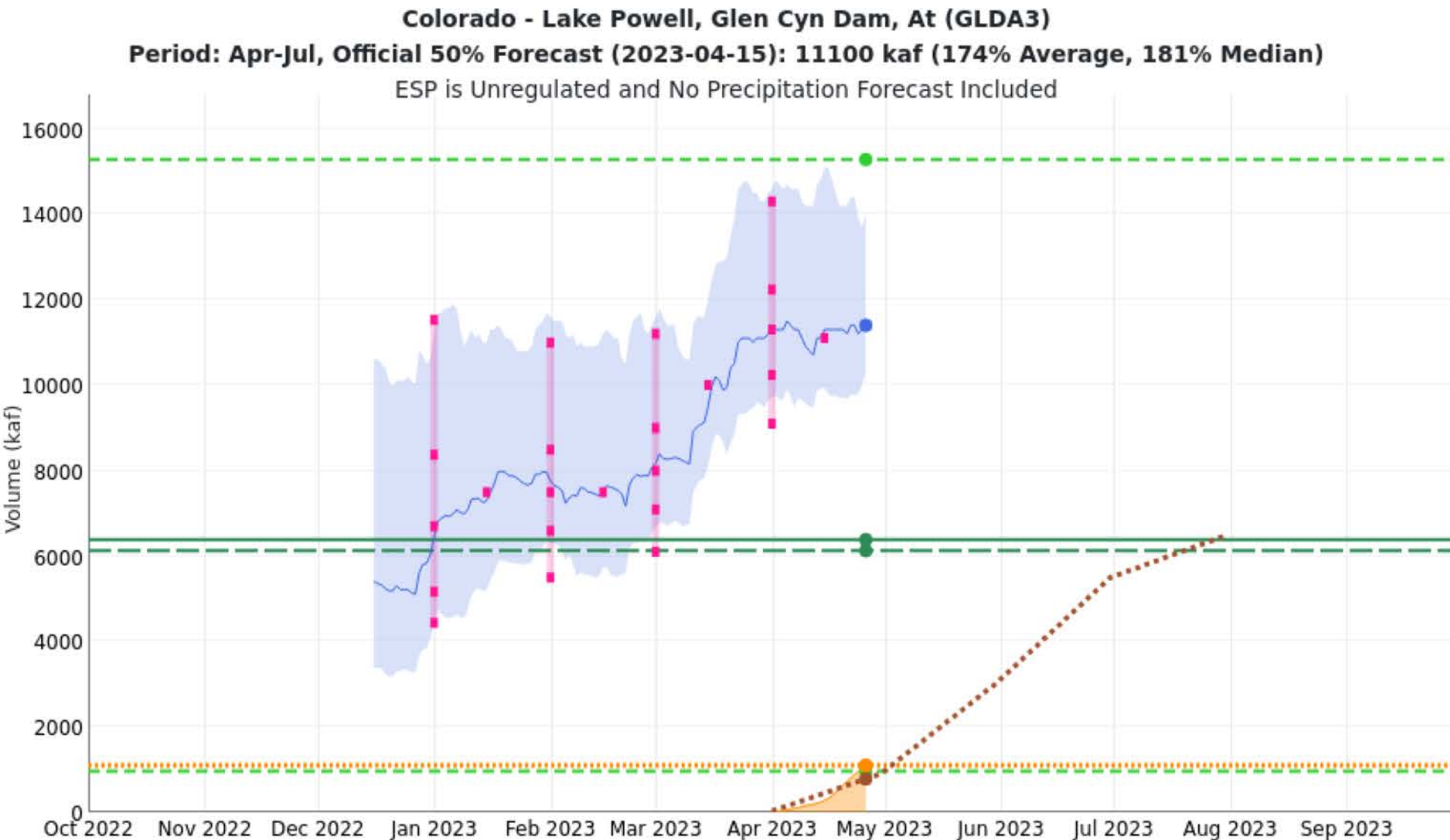
SNOW WATER EQUIVALENT IN UPPER COLORADO REGION



Climate Forecasts



Powell Runoff Forecast



2023/04/26:

Max 1984: 15285.64

Min 2002: 963.96

Average: 6390

Median: 6130

Observed Accumulation: 110

Observed Total: 1100

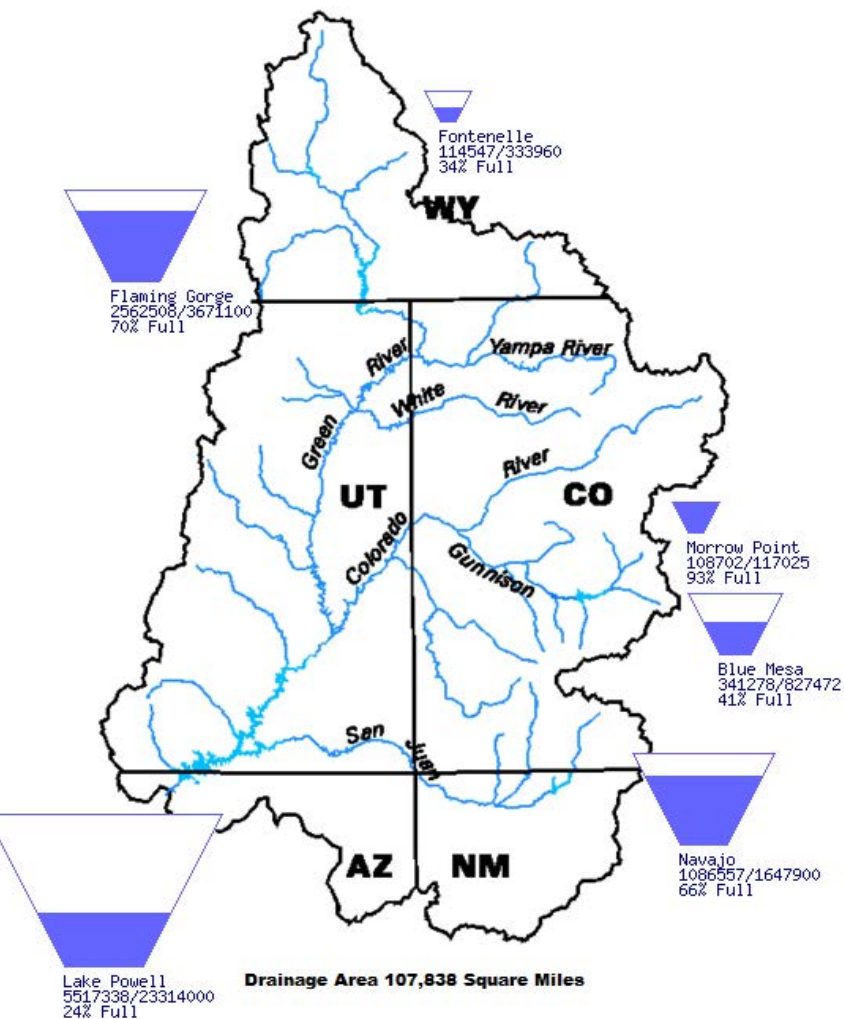
Normal Accumulation: 782

ESP: 11400

Storage Conditions

Data Current as of:
4/25/2023

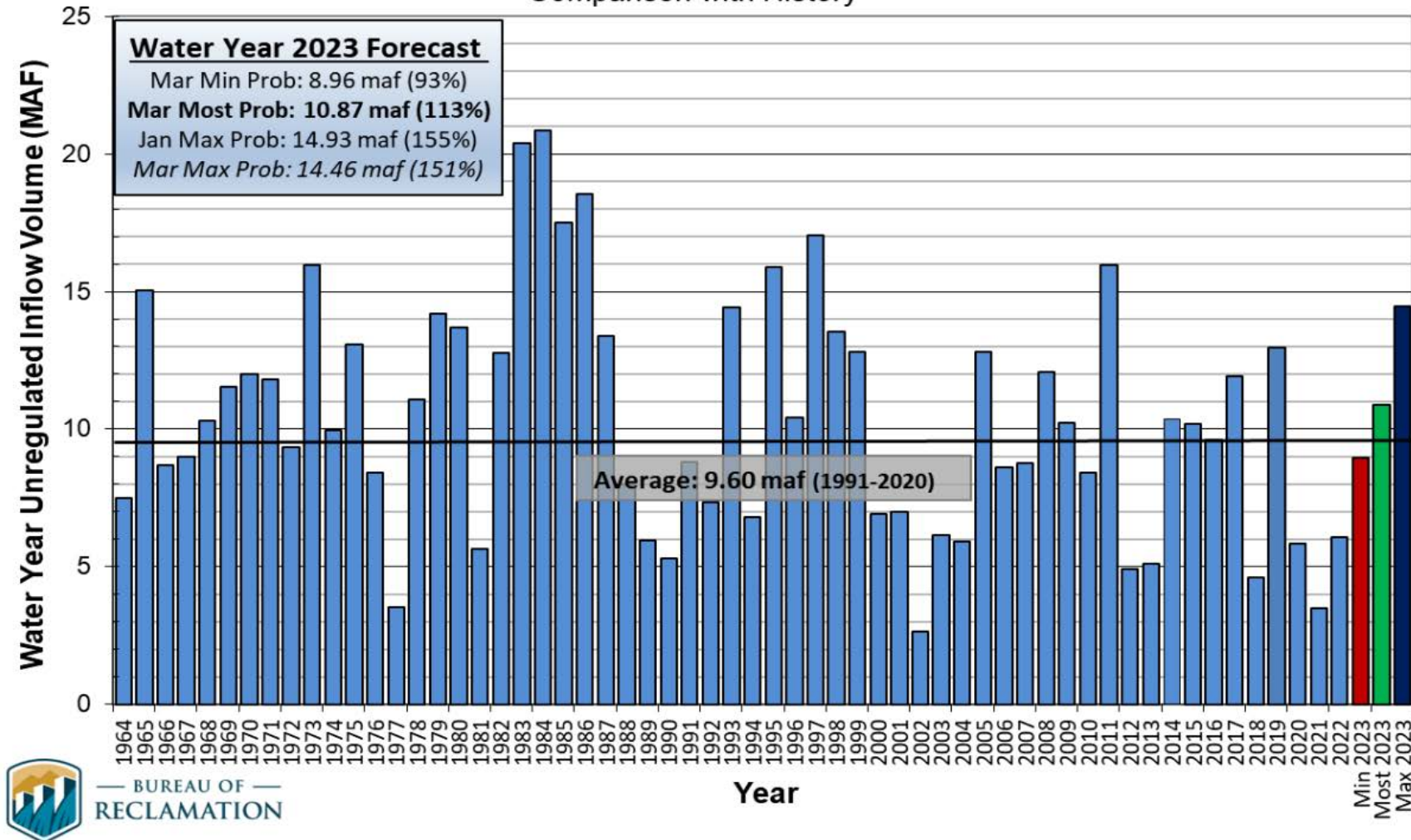
Upper Colorado River Drainage Basin



Reservoir	Apr-Jul Unregulated Inflow (kaf) Apr '23 Forecast	Percent of 1991-2010 Average	Water Year 2022 Unregulated Inflow Apr '23 Forecast	Percent of 1991-2010 Average
Fontenelle	800	109	1,095	102
Flaming Gorge	1,200	124	1,548	110
Blue Mesa	850	134	1,101	122
Navajo	945	150	1,195	131
Powell	11,300	177	14,472	151

Operational Forecasts: Lake Powell, March

Lake Powell Unregulated Inflow
Water Year 2023 Forecast (issued March 3)
Comparison with History



Lake Powell Average Annual Inflow

1981 – 2010 10.83 MAF

1991 – 2020 9.60 MAF

Lake Powell Releases

WY 2019: 9.0 MAF

WY 2020: 8.23 MAF

WY 2021: 8.23 MAF

WY 2022: 7.48 MAF

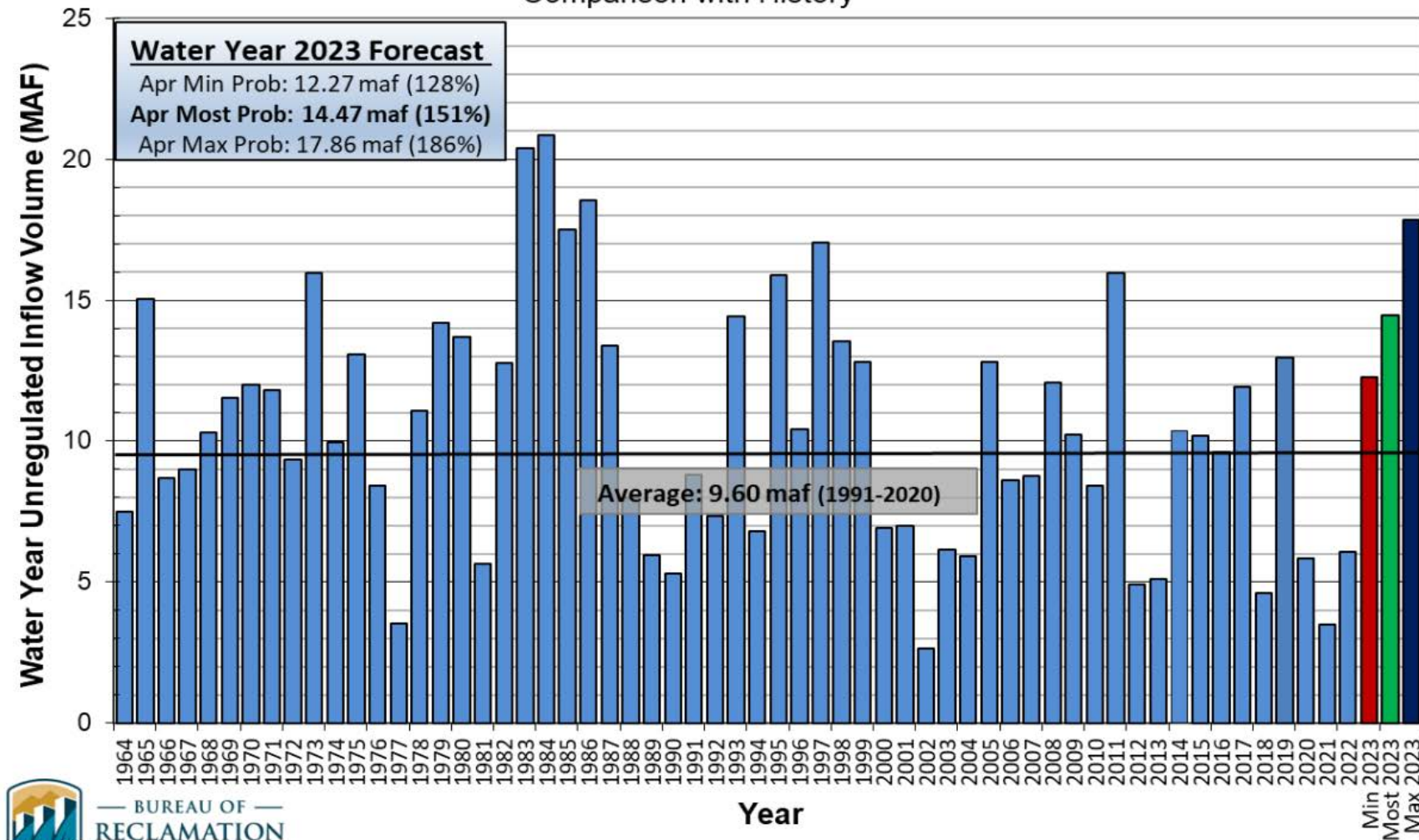
WY 2023: 7.0 MAF + April
adjustment



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Operational Forecasts: Lake Powell, April

Lake Powell Unregulated Inflow
Water Year 2023 Forecast (issued April 5)
Comparison with History



Lake Powell Average Annual Inflow

1981 – 2010 10.83 MAF

1991 – 2020 9.60 MAF

Lake Powell Releases

WY 2019: 9.0 MAF

WY 2020: 8.23 MAF

WY 2021: 8.23 MAF

WY 2022: 7.48 MAF

WY 2023: 7.0 MAF + ~2.5 MAF

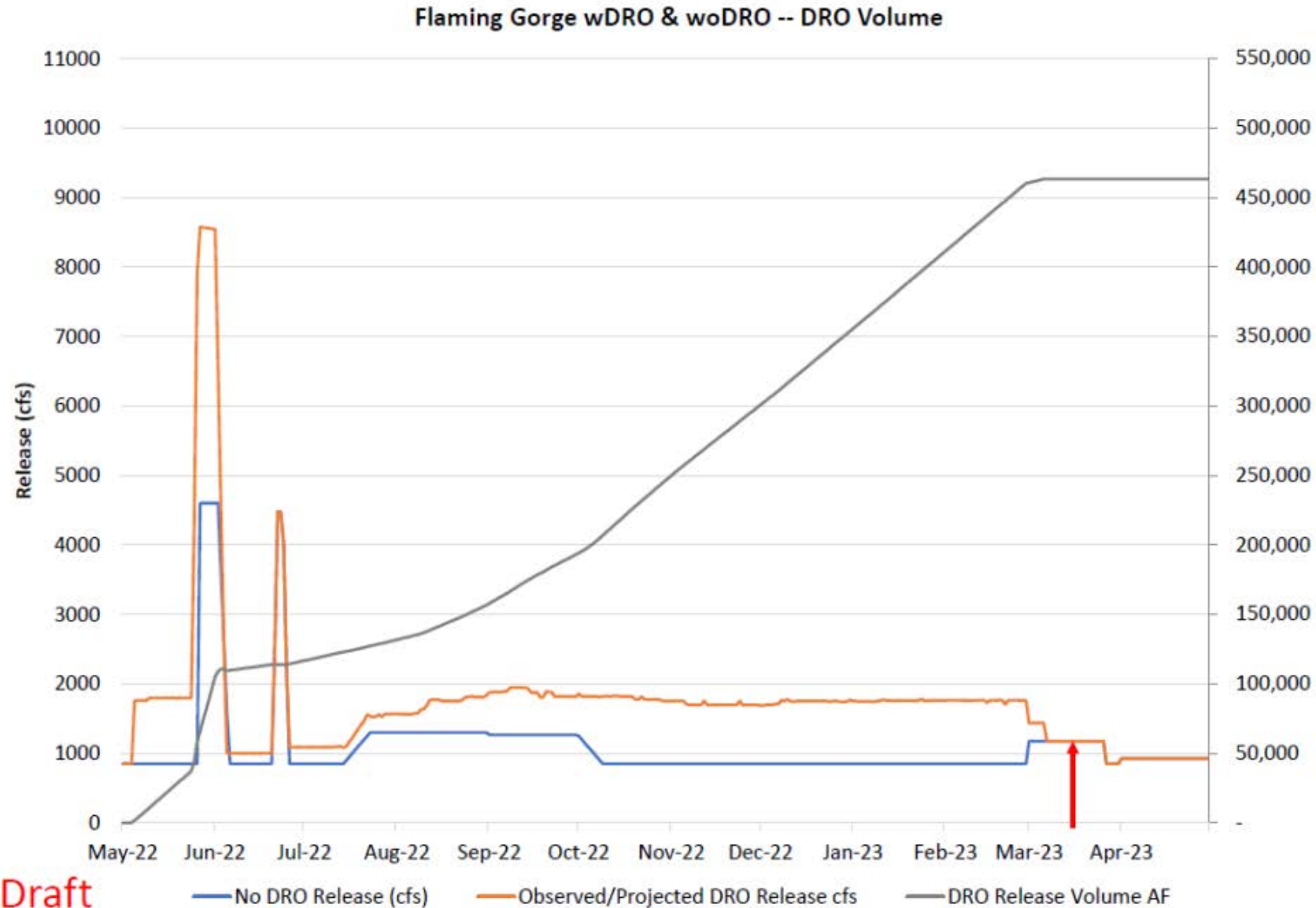
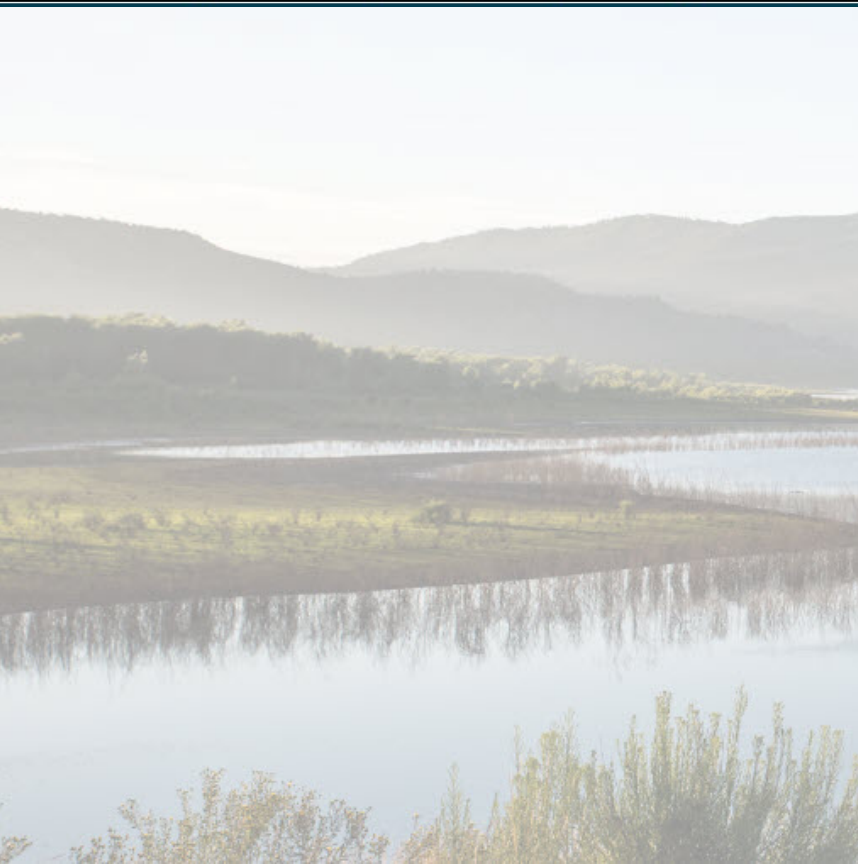
April adjustment










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Drought Response Operations

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



Operational Forecasts: April 24-Month Study

- Lake Powell Inflow Forecast: 8 MAF  11.3 MAF (Apr 15 11.1 MAF)
- Treatment of 480 KAF withheld in WY2022: Operational Neutrality removed (Powell/Mead differential  960 KAF, balancing release  480 KAF, subject to 9.5 MAF cap)
- DROA “Preserve the Benefit” Reclamation proposed rule to protect 3525’  irrelevant
- LB Intervening Flow assumptions: replace 5-year average with 2023 forecast; include Alamo & Painted Rock Dam releases
- LB Use/Conservation assumptions: 500+ Plan:  143.5 KAF 2022,  448 KAF 2023
- LB Use/Conservation assumptions: Current 999 KAF total, will be updated monthly
- April Adjustment to Powell WY 2023 releases:
Min 7 MAF  to max 9.5 MAF.

Balancing release calculations will be updated monthly through September.



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Additional Water Modeled Under 500 Plus Plan

(as modeled in the August 2022 Most Probable 24-Month Study)

Conservation Activity (volumes in AF)	2021	2022 (Projected)	2023 (Projected)
CAP ICS delivery offset	6,147	19,604	-18,400
GRIC System Conservation	40,000	50,937	0
GRIC ICS creation	0	78,565	0
CRIT System Conservation <i>(in lieu of ICS)</i>	4,685	4,685	0
CAWCD System Conservation	0	35,506	0
YMIDD System Conservation	0	8,544	13,670
MVIDD System Conservation	0	9,592	9,592
MWD ICS delivery offset and/or creation	58,134	-4,578	-161,978
PVID System Conservation	12,305	50,800	58,000
SNWA ICS creation	12,832	15,000	15,000
Annual Total <i>(Non-Shortage/DCP)</i>	134,103	268,655	-84,116
Cumulative Total	134,103	402,758	318,642

- 2022 and 2023 volumes reflect executed agreements and/or current operational projections and are subject to change.
- Additional conservation activities are being considered. After new agreements are finalized and executed, these additional activities will be included in Reclamation's operational modeling.



Additional Water Modeled Under 500 Plus Plan

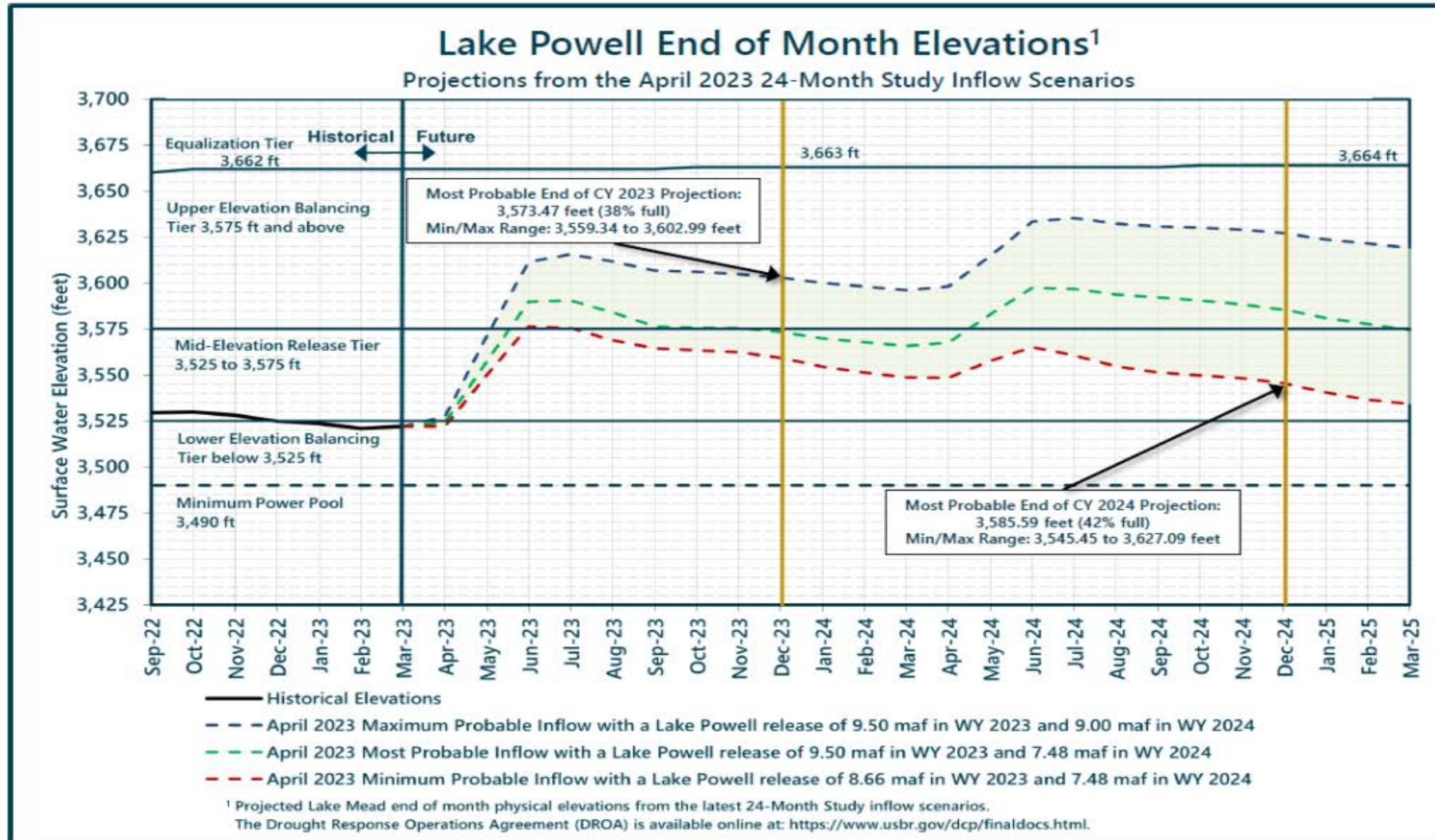
(as anticipated to be modeled in the April 2023 Most Probable 24-Month Study)

Conservation Activity <i>(volumes in AF)</i>	2021	2022 <i>(Provisional)</i>	2023 <i>(Projected)</i>
CAP ICS delivery offset	6,147	15,876	-10,900
GRIC System Conservation	40,000	58,837	125,000
GRIC ICS creation	0	78,565	0
CRIT System Conservation	4,685	4,685	0
CAWCD System Conservation	0	87,794	0
YMIDD System Conservation	0	8,523	13,670
MVIDD System Conservation	0	9,531	12,819
FMYN System Conservation	0	0	13,933
MWD ICS delivery offset and/or creation	58,134	58,211	107,347
PVID System Conservation	12,305	52,789	58,400
CVWD System Conservation	0	9,083	0
SNWA ICS creation	12,832	28,330	44,000
Annual Total <i>(Non-Shortage/DCP)</i>	134,103	412,224	364,269
Cumulative Total	134,103	546,327	910,596

- 2023 volumes reflect executed agreements under the 500+ Plan and LC Conservation Program and current operational projections and are subject to change.
- Additional conservation activities are being considered. After new agreements are finalized and executed, these additional activities will be included in Reclamation's operational planning and modeling.



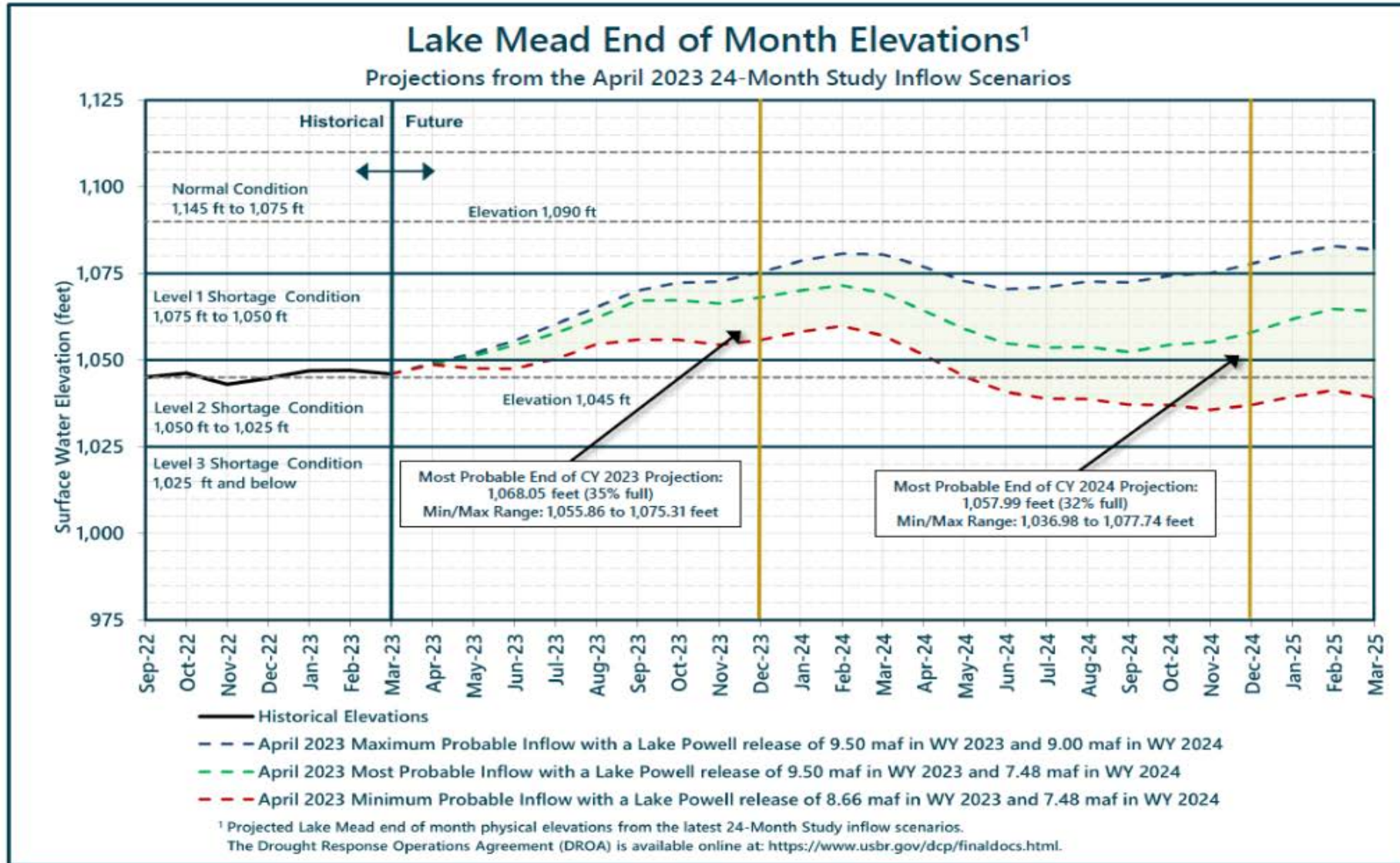
Operational Forecasts: Lake Powell



The chart above displays projected “physical” elevations for Lake Powell.



Operational Forecasts: Lake Mead



The chart above displays projected physical elevations for Lake Mead



2007 Interim Guidelines, Minute 323, Lower Basin Drought Contingency Plan, and Binational Water Scarcity Contingency Plan

Total Volumes (kaf)

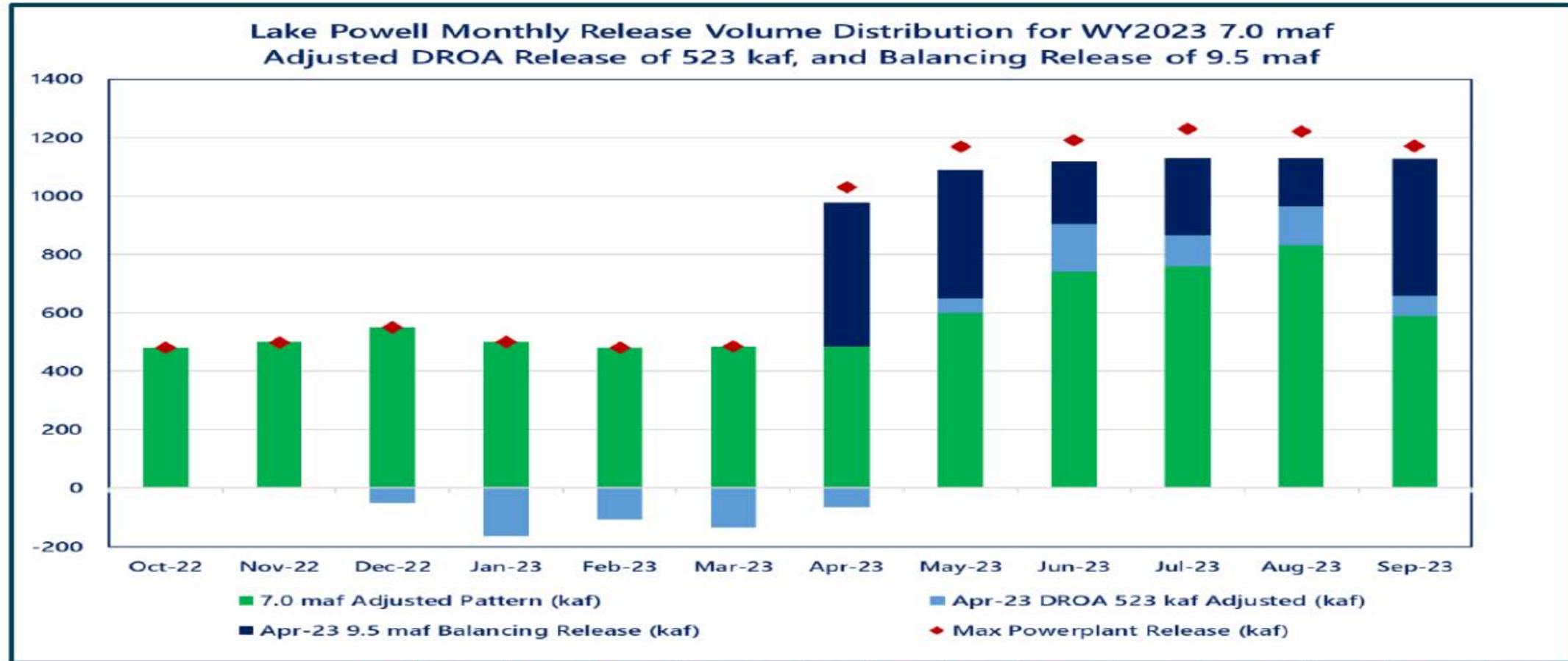
Lake Mead Elevation (feet msl)	2007 Interim Guidelines Shortages		Minute 323 Delivery Reductions	Total Combined Reductions	DCP Water Savings Contributions			Binational Water Scarcity Contingency Plan Savings	Combined Volumes by Country US: (2007 Interim Guidelines Shortages + DCP Contributions) Mexico: (Minute 323 Delivery Reductions + Binational Water Scarcity Contingency Plan Savings)					Total Combined Volumes		
	AZ	NV	Mexico	Lower Basin States + Mexico	AZ	NV	CA	Mexico	AZ Total	NV Total	CA Total	Lower Basin States Total	Mexico Total	Lower Basin States + Mexico		
2022 Operations →	1,090 - 1,075	0	0	0	192	8	0	41	192	8	0	200	41	241	← 2022 Operations	
	1,075 - 1050	320	13	50	383	192	8	0	30	512	21	0	533	80	613	←
2023 Operations →	1,050 - 1,045	400	17	70	487	192	8	0	34	592	25	0	617	104	721	← 2023 Operations
	1,045 - 1,040	400	17	70	487	240	10	200	76	640	27	200	867	146	1,013	
	1,040 - 1,035	400	17	70	487	240	10	250	84	640	27	250	917	154	1,071	
	1,035 - 1,030	400	17	70	487	240	10	300	92	640	27	300	967	162	1,129	
	1,030 - 1,025	400	17	70	487	240	10	350	101	640	27	350	1,017	171	1,188	
	<1,025	480	20	125	625	240	10	350	150	720	30	350	1,100	275	1,375	

The Secretary of the Interior will take affirmative actions to implement programs designed to create or conserve 100,000 acre-ft per annum or more of Colorado River System water to contribute to conservation of water supplies in Lake Mead and other Colorado River reservoirs in the lower basin. All actions taken by the United States shall be subject to applicable law, including availability of appropriations.



Operational Forecasts: Lake Powell

WY2023 Potential GCD Release of 9.5 maf

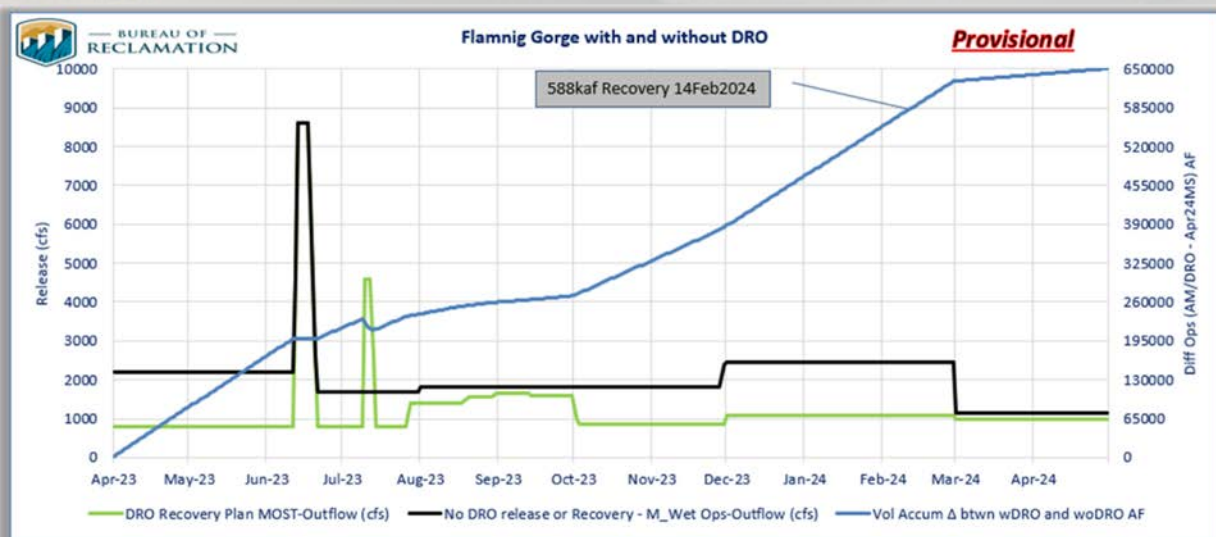


	WY2023	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Total
Max Powerplant Release (kaf)		480	498	550	501	480	485	1,030	1,170	1,190	1,230	1,220	1,170	
7.0 maf LTEMP Pattern (kaf)		480	500	600	664	587	620	552	550	577	652	696	522	7,000
April 24MS Min Prob 8.66 maf Pattern (kaf)		480	498	550	501	480	486	910	840	890	1,100	1,113	810	8,658
9.0 maf Release (kaf)		480	498	550	501	480	486	910	1,036	1,029	1,130	1,130	770	9,000
April-23 9.5 maf Release (kaf)		480	498	550	501	480	486	910	1,088	1,118	1,130	1,130	1,129	9,500



Drought Response Operations Updates

- Drought Response Operations Releases ceased March 7, 2023 due to improving hydrologic conditions.
- Focus moves to recovery of storage
- DROA plan for May 2023 – Apr 2024 will be released mid-May



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Draft SEIS Update

- DSEIS released, comments due May 30
- No Action and 2 Action Alternatives
 - Main difference is how LB reductions are distributed
 - DROA modeled in Alternative 2 but would apply for both alternatives, as controlled by the DROA agreement itself
 - Changes to tiers, including reduced releases at lower elevations
 - Lake Powell: protection of elevation 3500'
 - Lake Mead: slowing of storage decline, but no hard elevation protection



THANK YOU

Michelle Garrison

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