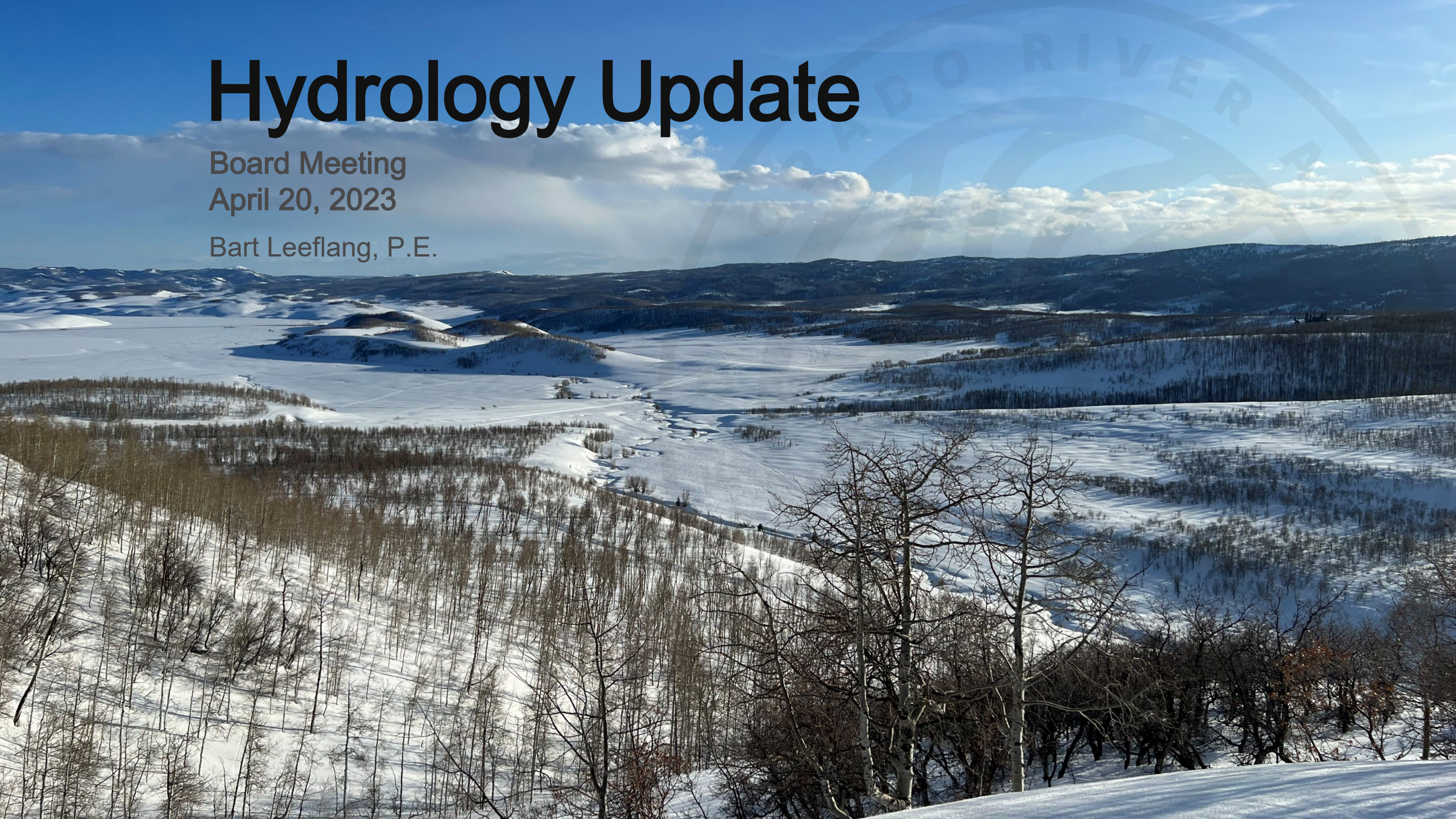


# Hydrology Update

Board Meeting  
April 20, 2023

Bart Leeftang, P.E.





# Status: April 16, 2023

Reservoir	Percent Full	Content (MAF)	Elevation (feet)
Lake Powell	23%	5.318	3,521.00
Lake Mead	29%	7.461	1,046.90
Total System Content	32%	19.131	NA
Total System Content (one year ago)	35%	20.647	NA

WATER YEAR 2023 PRECIPITATION TO DATE	127%
CURRENT BASIN SNOWPACK	155%



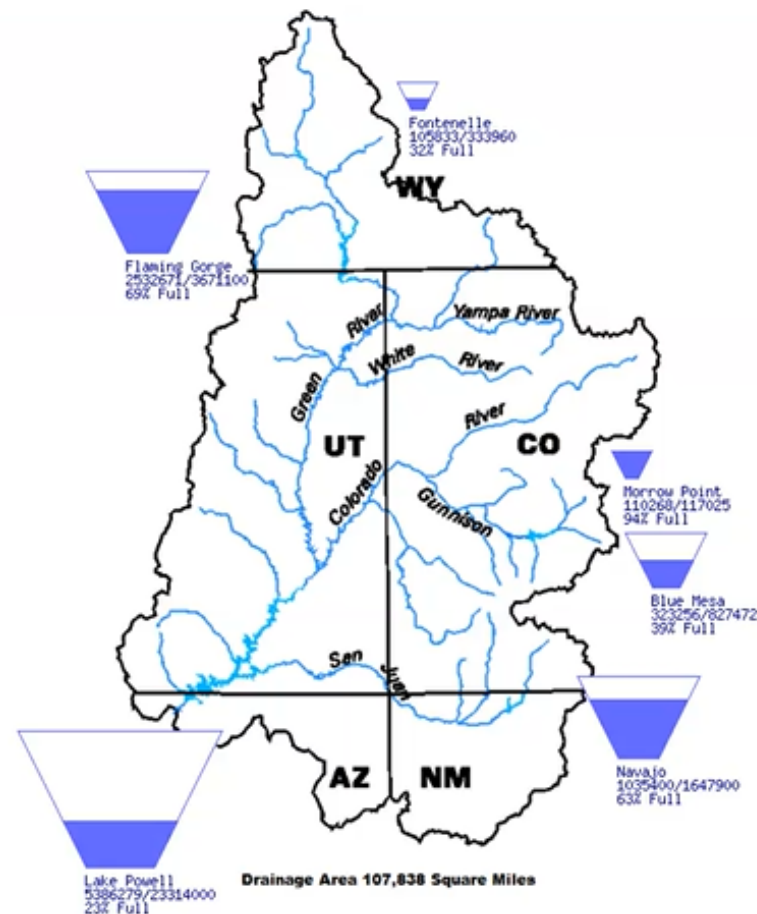


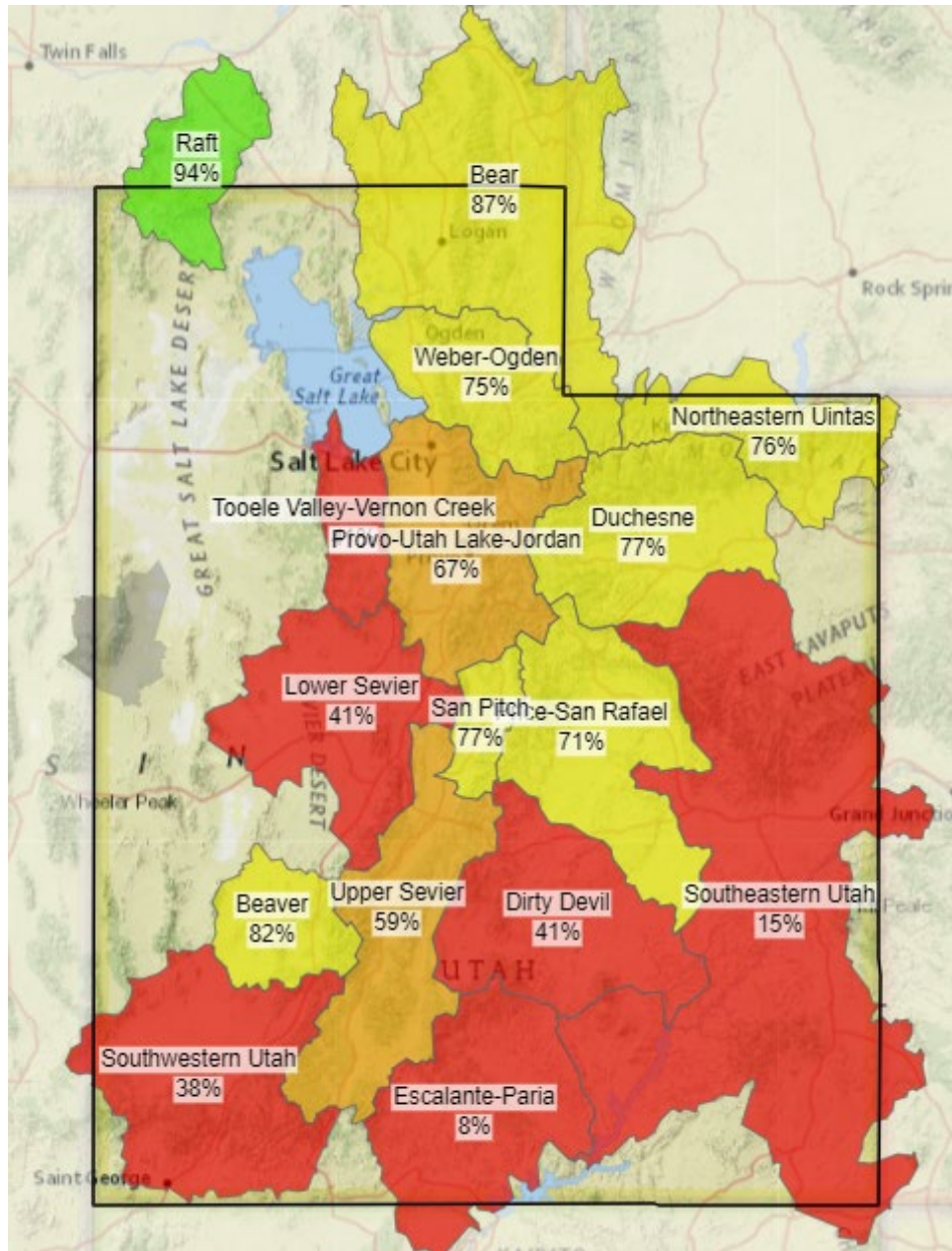
# Upper Basin Storage (as of April 18, 2023)

Data Current as of:  
04/18/2023

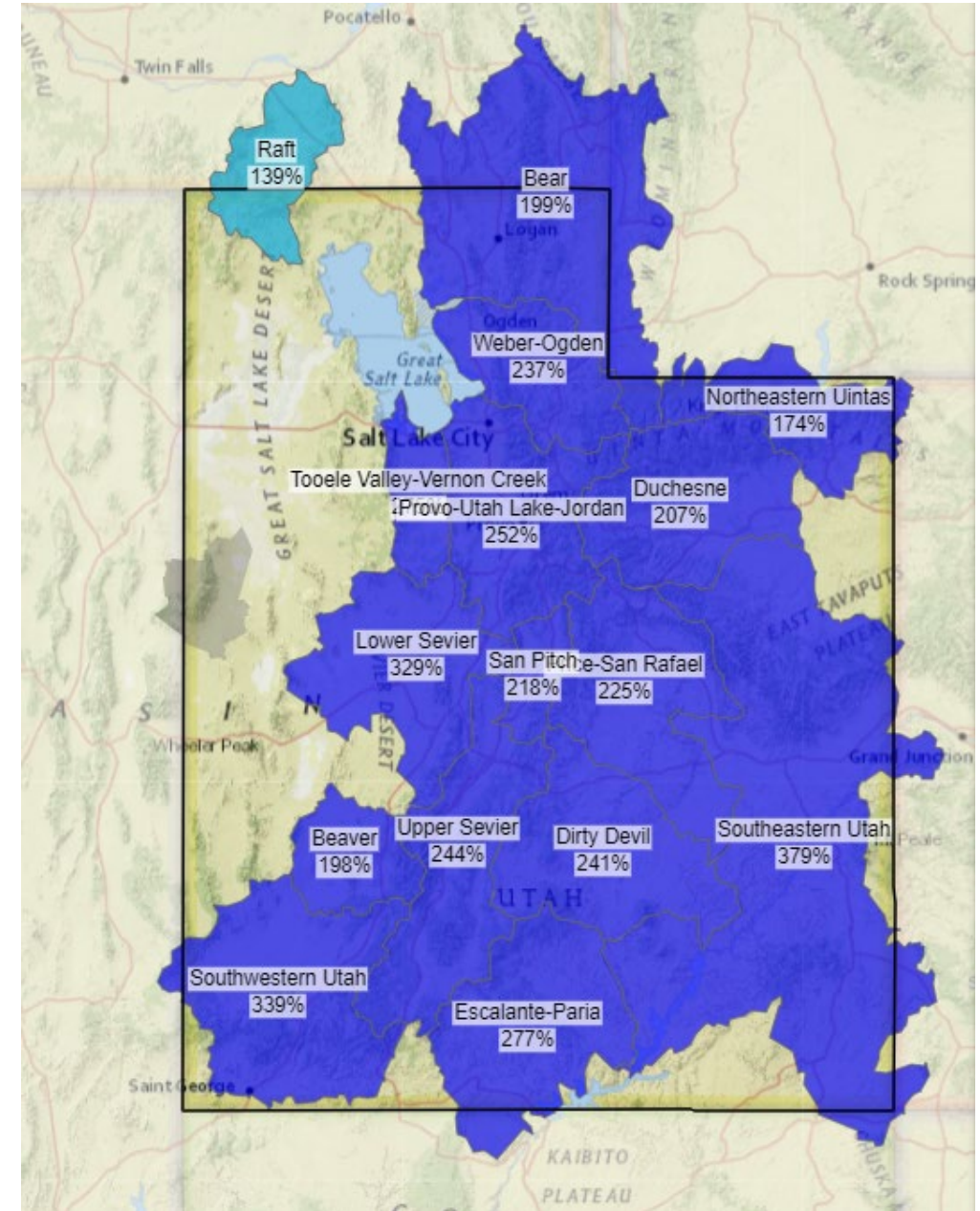
## Upper Colorado River Drainage Basin

Reservoir	Percent Current Live Storage	Current Live Storage (maf)	Live Storage Capacity (maf)	Elevation (feet)
Fontenelle	32	0.11	0.33	6,468.31
Flaming Gorge	69	2.53	3.67	6,008.35
Blue Mesa	39	0.32	0.83	7,452.51
Navajo	63	1.04	1.65	6,037.58
Lake Powell	23	5.39	23.31	3,522.22
UC System Storage	32	9.51	29.79	





April 2022 SWE



April 2023 SWE









January 7, 2023 – Currant Creek





January 28, 2023





February 4, 2023



February 11, 2023



March 4, 2023





March 18, 2023



March 25, 2023



April 8, 2023















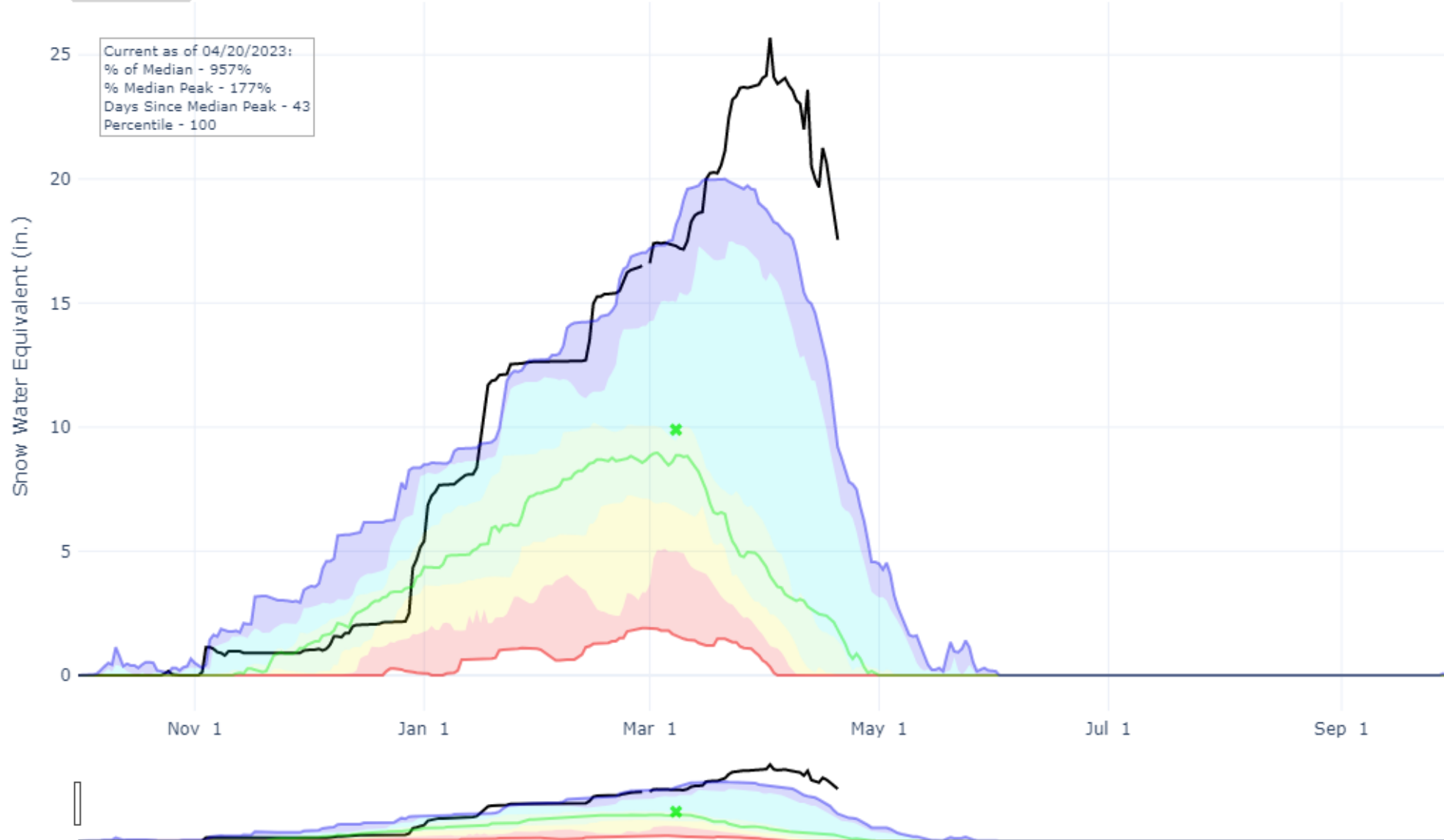
## SNOW WATER EQUIVALENT IN LOWER SAN JUAN

Reset Range

[Link to data: CSV / JSON](#)

Station List

Current as of 04/20/2023:  
% of Median - 957%  
% Median Peak - 177%  
Days Since Median Peak - 43  
Percentile - 100

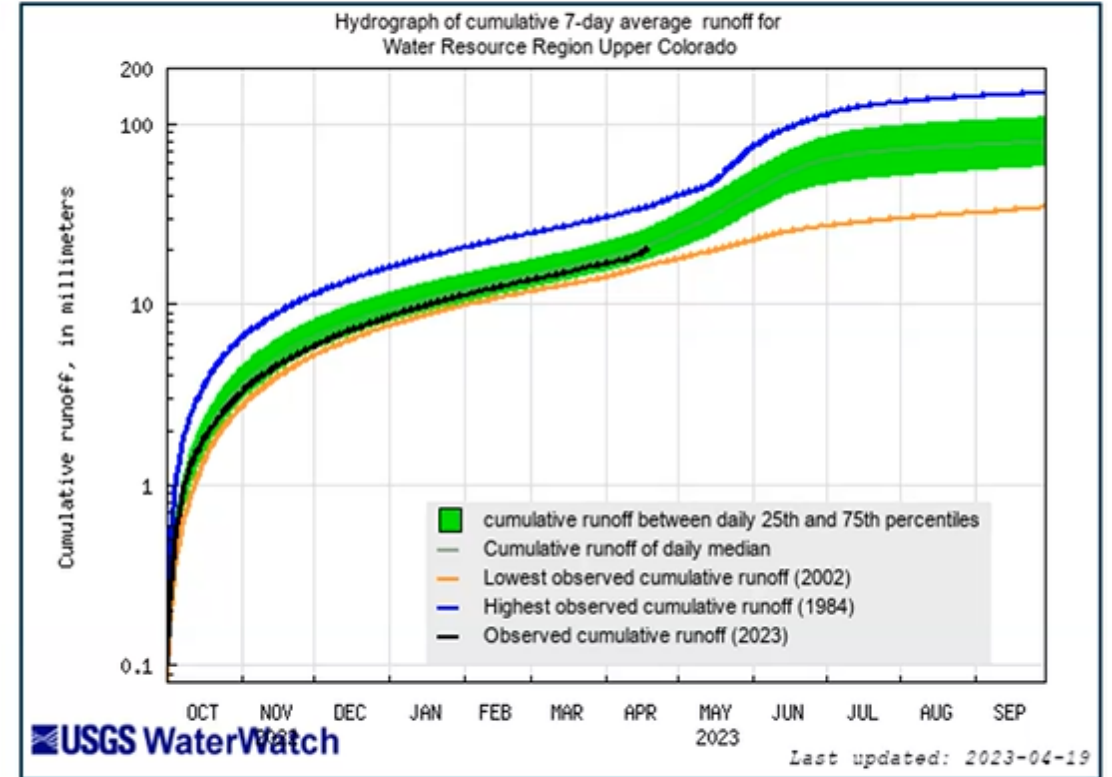
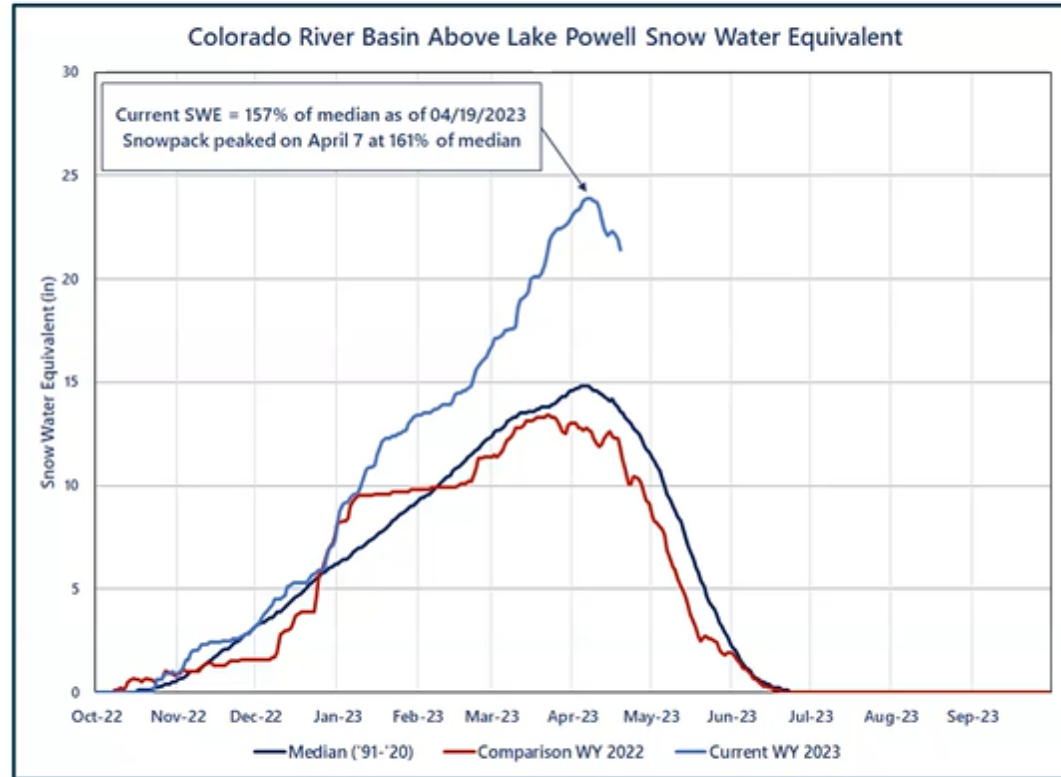


- ✱ Median Peak SWE
- Max
- Median (POR)
- Median ('91-'20)
- Min
- Stats. Shading
- 2023 (3 sites)
- 2022 (3 sites)
- 2021 (2 sites)
- 2020 (3 sites)
- 2019 (3 sites)
- 2018 (3 sites)
- 2017 (3 sites)
- 2016 (3 sites)
- 2015 (3 sites)
- 2014 (3 sites)
- 2013 (3 sites)
- 2012 (3 sites)
- 2011 (3 sites)
- 2010 (3 sites)





# Upper Colorado SWE and Observed Inflows



<https://waterwatch.usgs.gov/index.php>

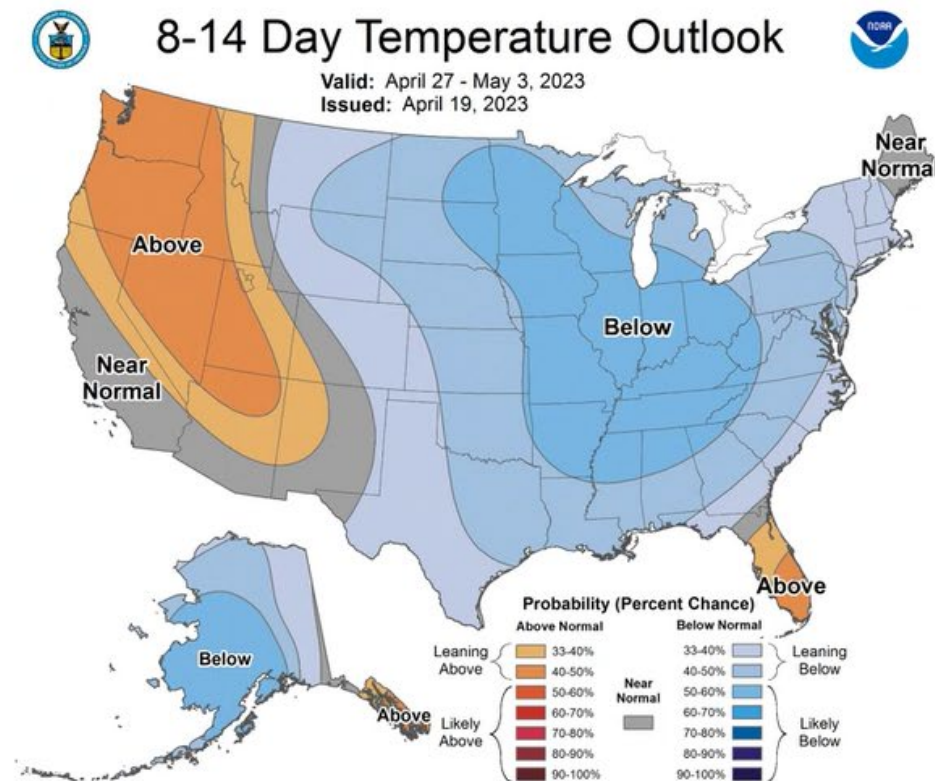
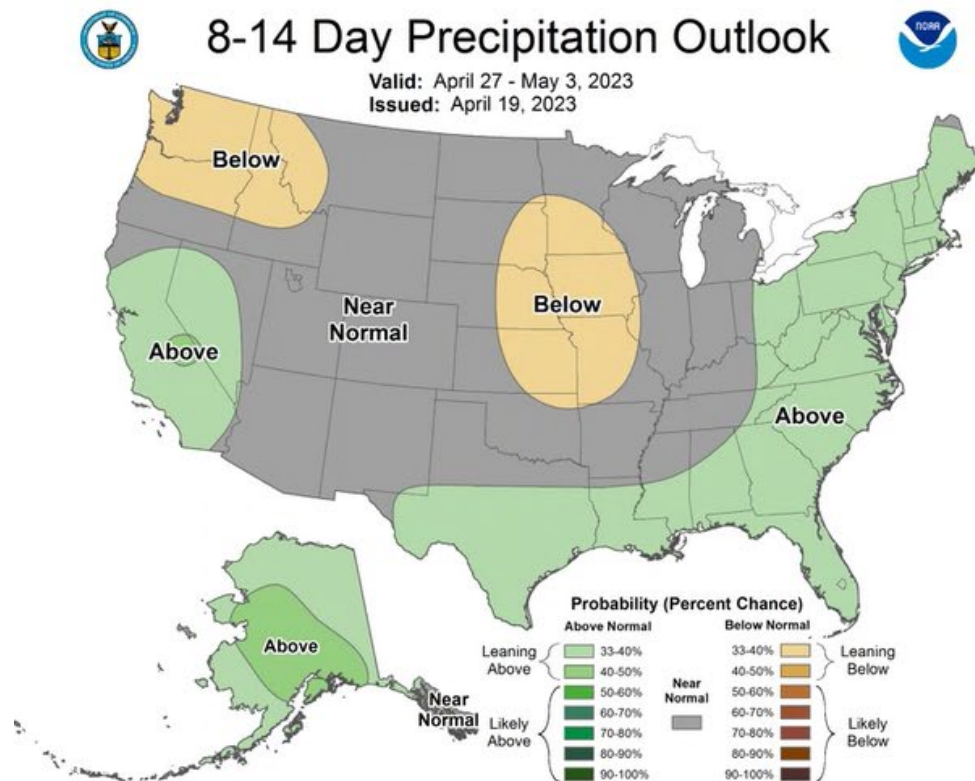


# Upcoming Weather: April 26 - May 2

27

## 8-14 Day Outlook: Precipitation Probability

## 8-14 Day Outlook: Temperature Probability



Weather models currently favor a ridge building over the Pacific Coast and a trough over the east-central US. This would bring equal chances of near average precipitation, and near to below normal temperatures to the Northern and Central Rockies.

Lots of uncertainty for this period at this time.





# Upper Basin Reservoir Operations *in Water Year 2023*

- 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's projected end of calendar year (CY) 2022 "tier determination" elevation in the August 2022 24-Month Study determined Lake Powell's operating tier in water year (WY) 2023
  - Lake Powell will operate in the Lower Elevation Balancing Tier where Lake Powell and Lake Mead will balance contents with Glen Canyon Dam release volumes no less than 7.0 maf and no more than 9.5 maf
- Consistent with the provisions of the 2007 Interim Guidelines, and to preserve the benefits to Glen Canyon Dam facilities from 2022 Operations into 2023 and 2024, Reclamation will consult with the Basin States on monthly and annual operations. 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.
  - The Glen Canyon Dam annual release was initially set to 7.00 maf
  - In April 2023, Reclamation evaluated hydrologic conditions and determined balancing releases are appropriate under the conditions established in the 2007 Interim Guidelines
  - Balancing releases will be limited (with a minimum of 7.00 maf) to protect Lake Powell from declining below elevation 3,525 feet at the end of December 2023. Lake Powell will release between 7.0 MAF and 9.5 MAF in WY 2023
  - Reclamation will remove the operational neutrality of the 0.480 maf that was retained in Lake Powell under the May 2022 action, such that balancing releases are based on physical elevations of Lake Powell and Lake Mead

8





# Most Probable April Forecast Water Year 2023

## April – July 2023 Forecasted Unregulated Inflow as of April 5, 2023

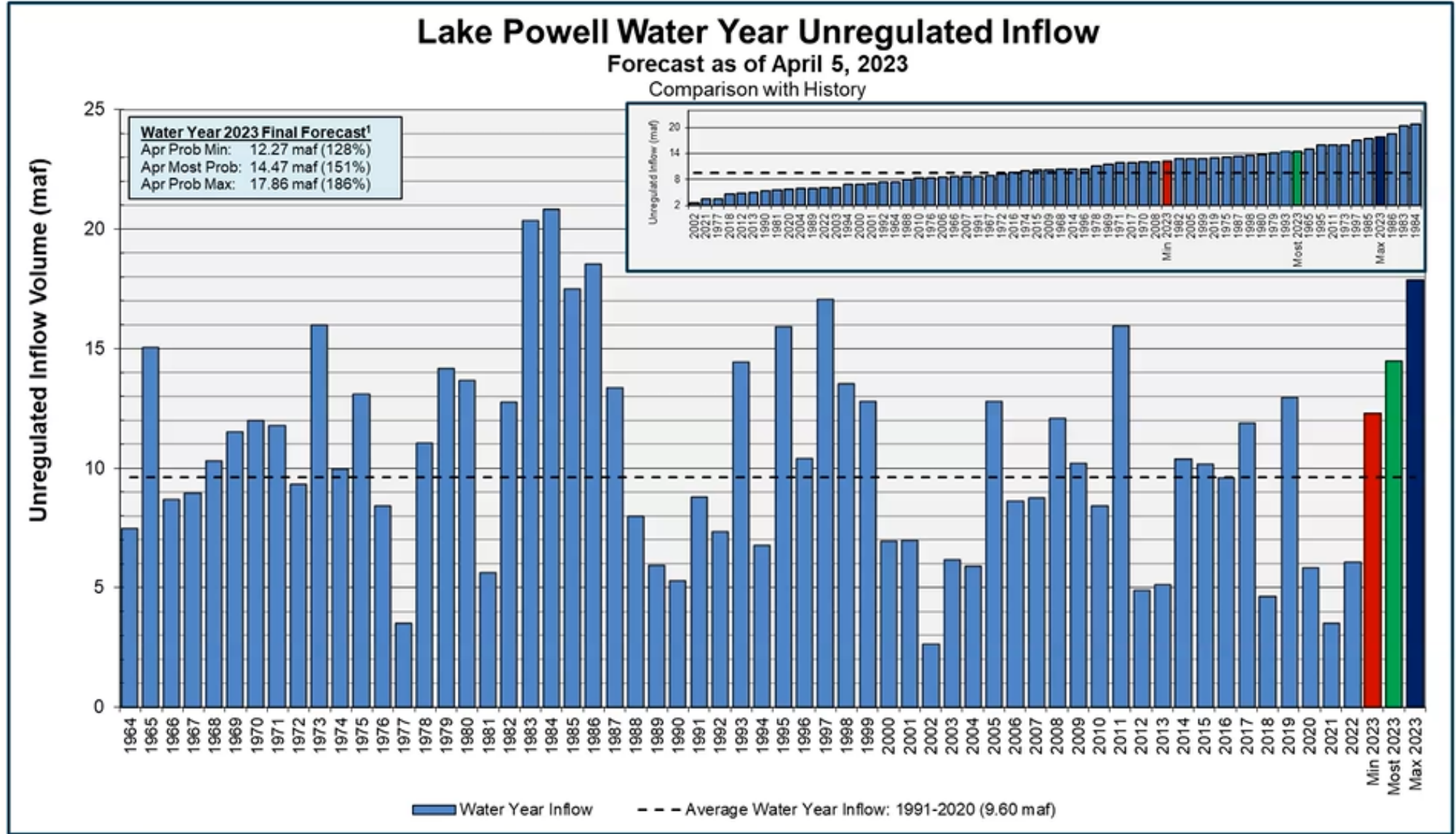
Reservoir	Inflow (kaf)	Percent of Avg <sup>1</sup>
Fontenelle	800	109
Flaming Gorge	1,200	124
Blue Mesa	850	134
Navajo	945	150
Powell	11,300	177

## Water Year 2023 Unregulated Inflow Forecast as of April 5, 2023

Reservoir	Inflow (kaf)	Percent of Avg <sup>1</sup>
Fontenelle	1,095	102
Flaming Gorge	1,548	110
Blue Mesa	1,101	122
Navajo	1,195	131
Powell	14,472	151

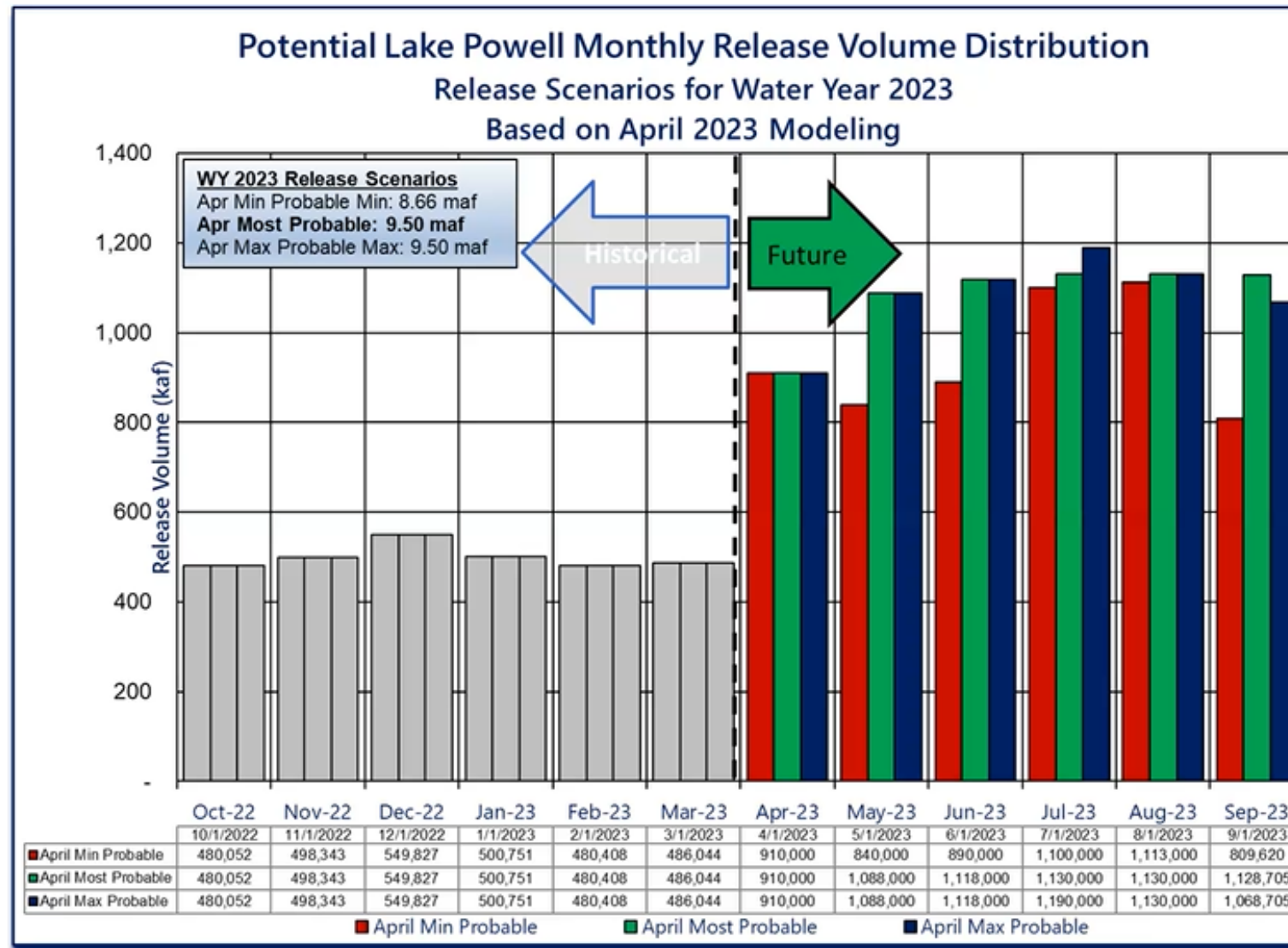
<sup>1</sup>Averages are based on the 1991 through 2020 period of record.





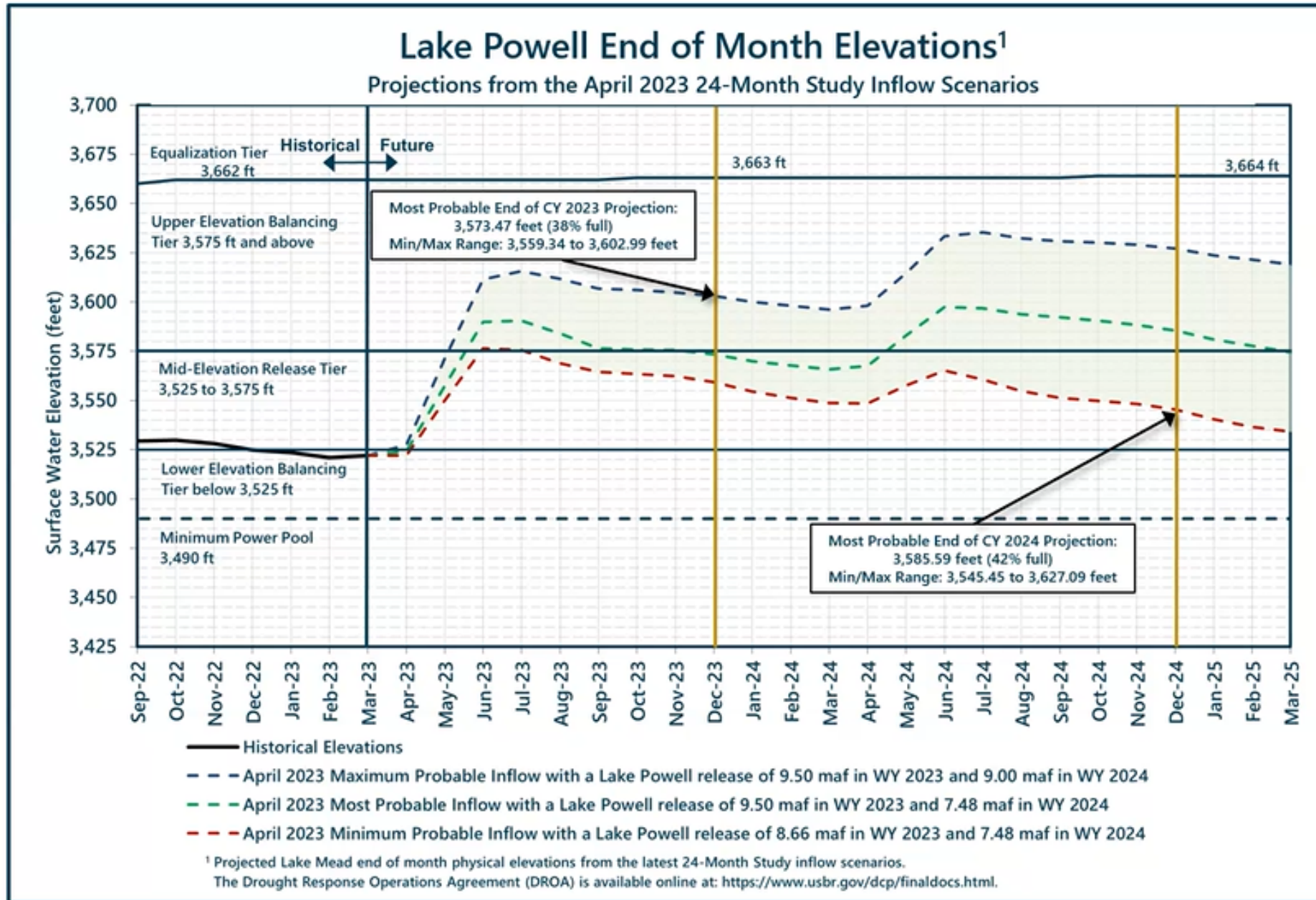
<sup>1</sup>Water Year statistics are based on the 30-year period of record from 1991-2020.





Consistent with the provisions of the 2007 Interim Guidelines, and to preserve the benefits to Glen Canyon Dam facilities from 2022 Operations into 2023 and 2024, Reclamation will consult with the Basin States on monthly and annual operations. 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.





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







## Lower Basin Side Inflows – WY/CY 2023<sup>1,2</sup>

### Intervening Flow from Glen Canyon to Hoover Dam

	Month in WY/CY 2023	5-Year Average Intervening Flow (kaf)	Observed Intervening Flow (kaf)	Observed Intervening Flow (% of Average)	Difference From 5-Year Average (kaf)
Observed	October 2022	77	94	122%	17
	November 2022	63	18	29%	-45
	December 2022	72	63	87%	-9
	January 2023	75	103	137%	28
	February 2023	71	46	65%	-25
	March 2023	97	226	234%	129
Projected	April 2023	60			
	May 2023	37			
	June 2023	22			
	July 2023	55			
	August 2023	86			
	September 2023	72			
	October 2023	77			
	November 2023	63			
	December 2023	72			
	WY 2023 Totals	786	881	112%	95
	CY 2023 Totals	786	918	117%	132

<sup>1</sup> Values were computed with the LC's gain-loss model for the most recent 24-month study.

<sup>2</sup> Percents of average are based on the 5-year mean from 2018-2022.



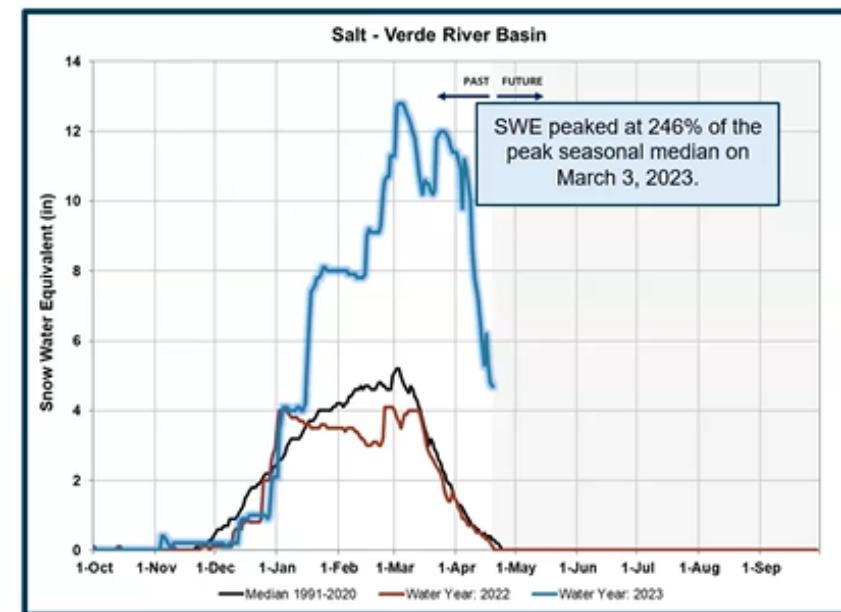
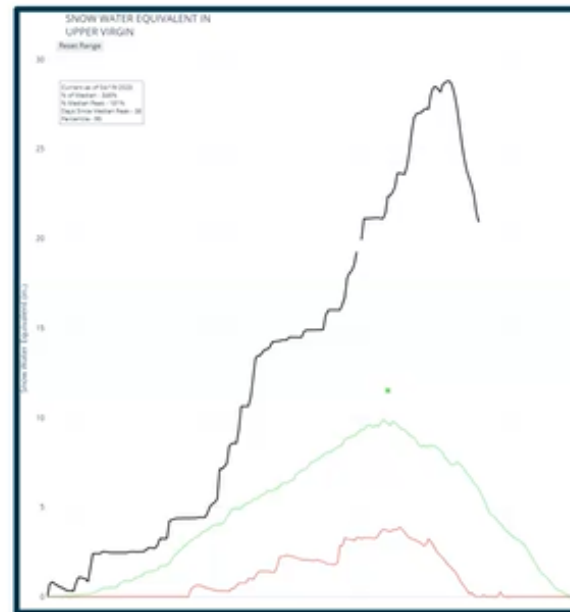


# Summary of Lower Basin Local Inflows

*As modeled in the April 24-Month Study*

	Glen to Hvr 5-yr Avg	April 24MS CBRFC Adj	Dvs to Pkr 5-yr Avg	Bill Williams Inflow Est.	April 24MS Total Abv Pkr	Gila at Dome Inflow Est.
Apr 2023	60	189	7	37	44	0
May 2023	37	142	4	39	42	31
June 2023	22	73	10	38	48	36

All values in thousand acre-feet





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

### Total Volumes (kaf)

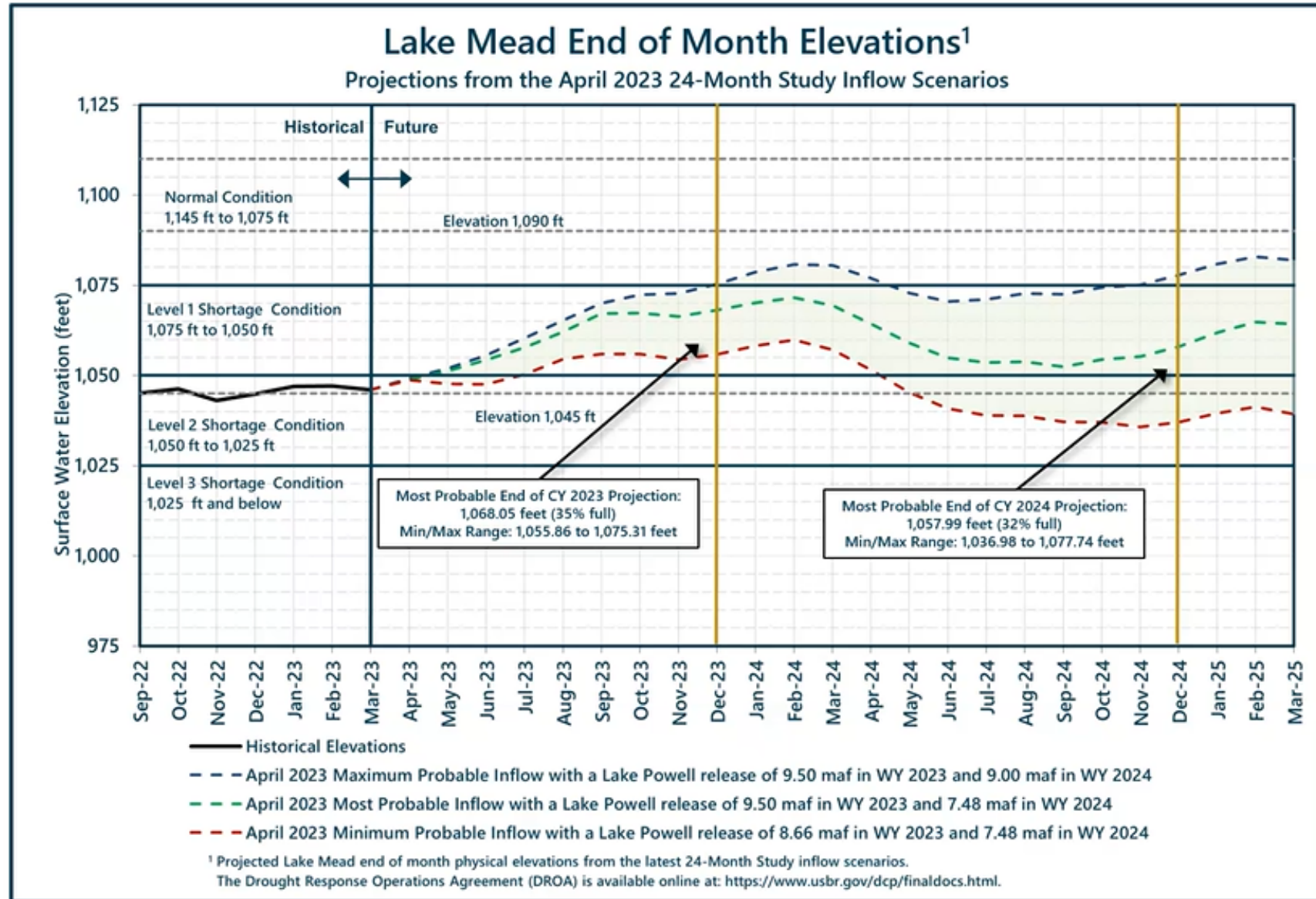
Lake Mead Elevation (feet msl)	2007 Interim Guidelines Shortages		Minute 323 Delivery Reductions	Total Combined Reductions	DCP Water Savings Contributions			Binational Water Scarcity Contingency Plan Savings	Combined Volumes by Country <i>US: (2007 Interim Guidelines Shortages + DCP Contributions)</i> <i>Mexico: (Minute 323 Delivery Reductions + Binational Water Scarcity Contingency Plan Savings)</i>					Total Combined Volumes
	AZ	NV	Mexico	<i>Lower Basin States + Mexico</i>	AZ	NV	CA	Mexico	AZ Total	NV Total	CA Total	<i>Lower Basin States Total</i>	<i>Mexico Total</i>	<i>Lower Basin States + Mexico</i>
1,090 - 1,075	0	0	0	0	192	8	0	41	192	8	0	200	41	241
1,075 - 1,050	320	13	50	383	192	8	0	30	512	21	0	533	80	613
1,050 - 1,045	400	17	70	487	192	8	0	34	592	25	0	617	104	721
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

➔  
2023 Reductions +  
Contributions

←  
2023 Reductions +  
Contributions

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.





The chart above displays projected physical elevations for Lake Mead.







# Drought Response Operations Agreement (DROA)

DROA Volumes Released<sup>1</sup>

Reservoir	2021 DROA Volume (kaf)	2022 DROA Volume (kaf)	Total DROA Volume (kaf)
Flaming Gorge	125	463	588
Blue Mesa	36	0	36
Navajo	0	0	0
Volume in Powell	161	463	624

<sup>1</sup>DROA operational year is from May through April.





# 2023 DRO Plan Development

