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2023 Colorado River Annual Operating Plan

Colorado River Management Work Group

Second Consultation

August 2, 2022

2023 Colorado River AOP Second Consultation Meeting

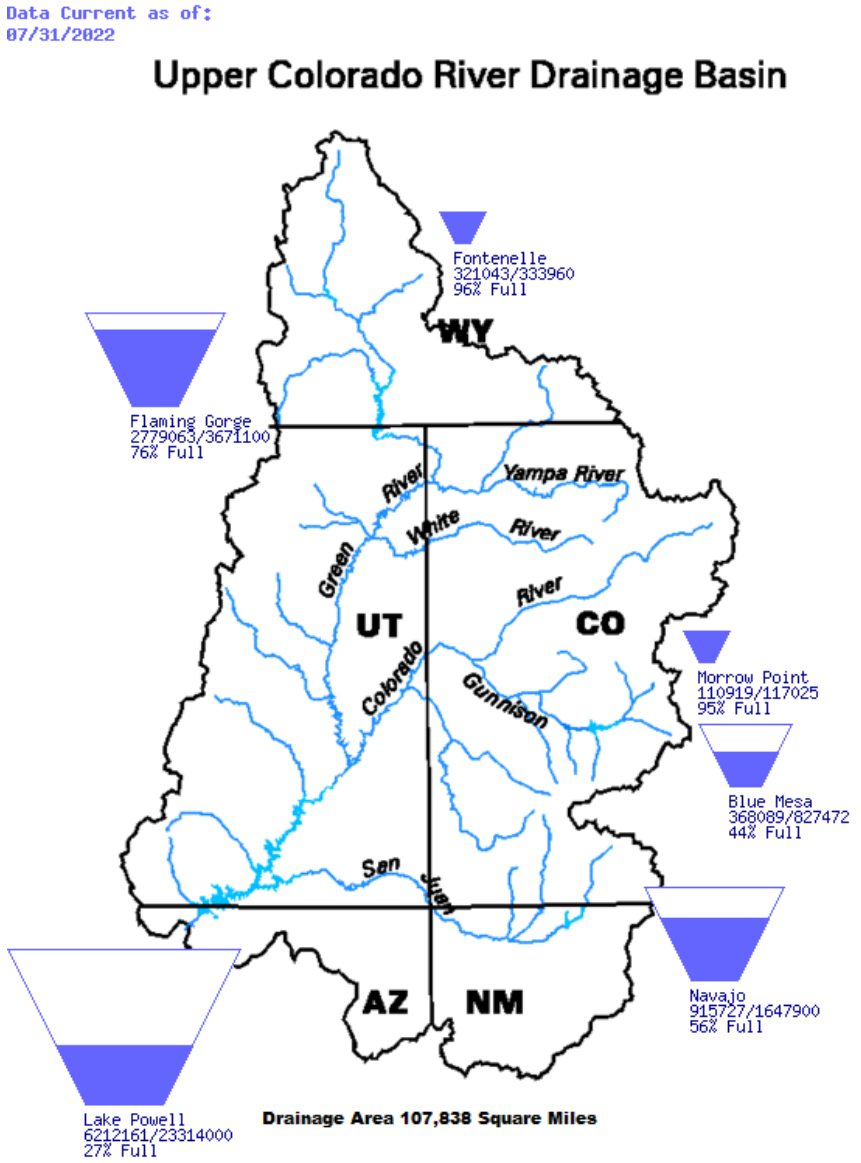
- Welcome and Introductions
  - Chris Cutler & Daniel Bunk
- Upper Basin Hydrology and Operations
  - Nathaniel Todea
- Lower Basin Hydrology and Operations
  - Alexander Pivarnik
- 2023 AOP Review Process
  - Chris Cutler & Daniel Bunk
- Review of Draft 2023 AOP
  - Chris Cutler & Noe Santos with CRMWG
- Wrap-up and Next Steps
  - Chris Cutler & Daniel Bunk
- Reminder of Future Meeting Dates

Upper Colorado Basin

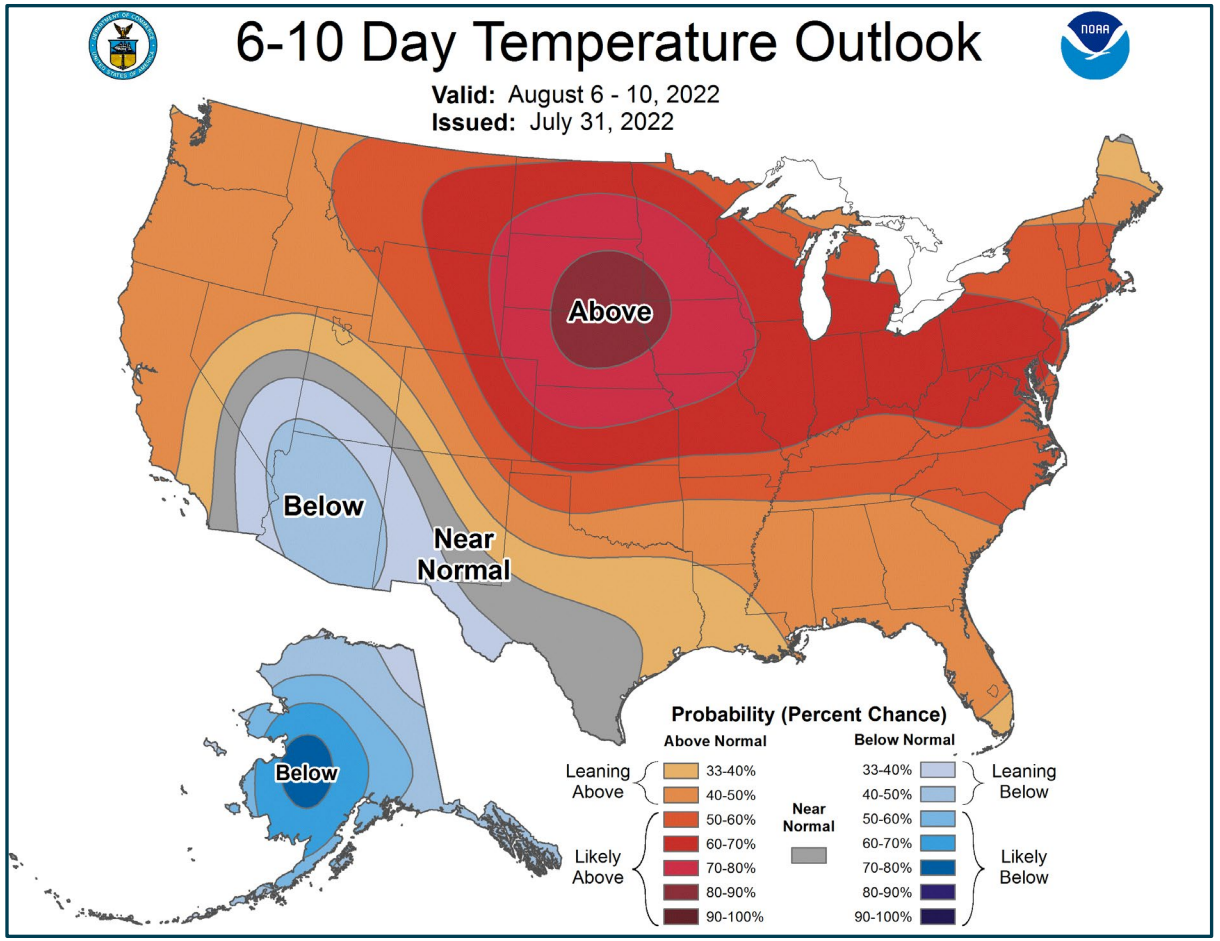
Water Year 2022 Hydrology

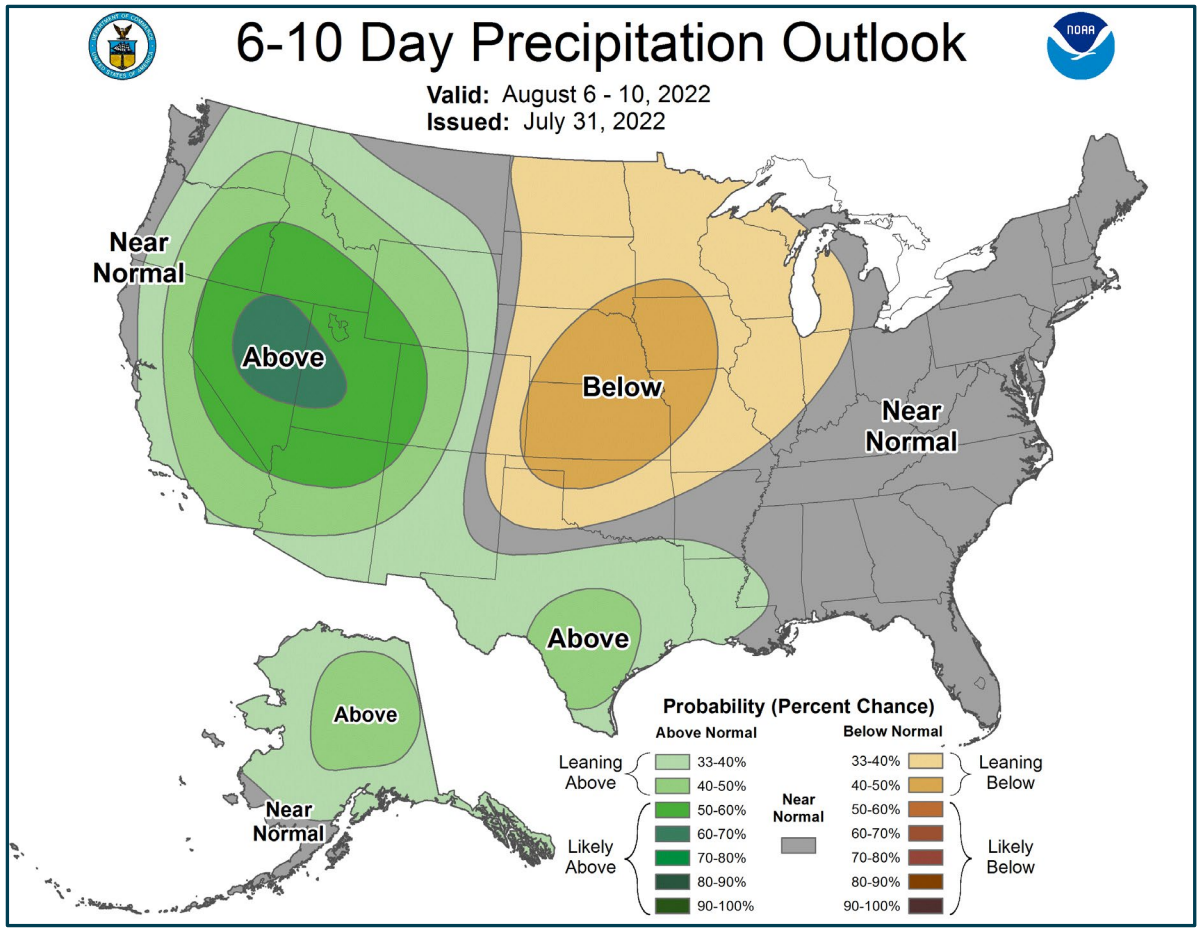
Upper Basin Storage (as of July 31, 2022)

Reservoir	Percent Current Live Storage	Current Live Storage (maf)	Live Storage Capacity (maf)	Elevation (feet)
Fontenelle	96	0.32	0.33	6,504.34
Flaming Gorge	76	2.78	3.67	6,016.07
Blue Mesa	44	0.37	0.83	7,460.15
Navajo	56	0.92	1.65	6,025.41
Lake Powell	26	6.21	24.32	3,536.20
UC System Storage	34	10.60	30.80	

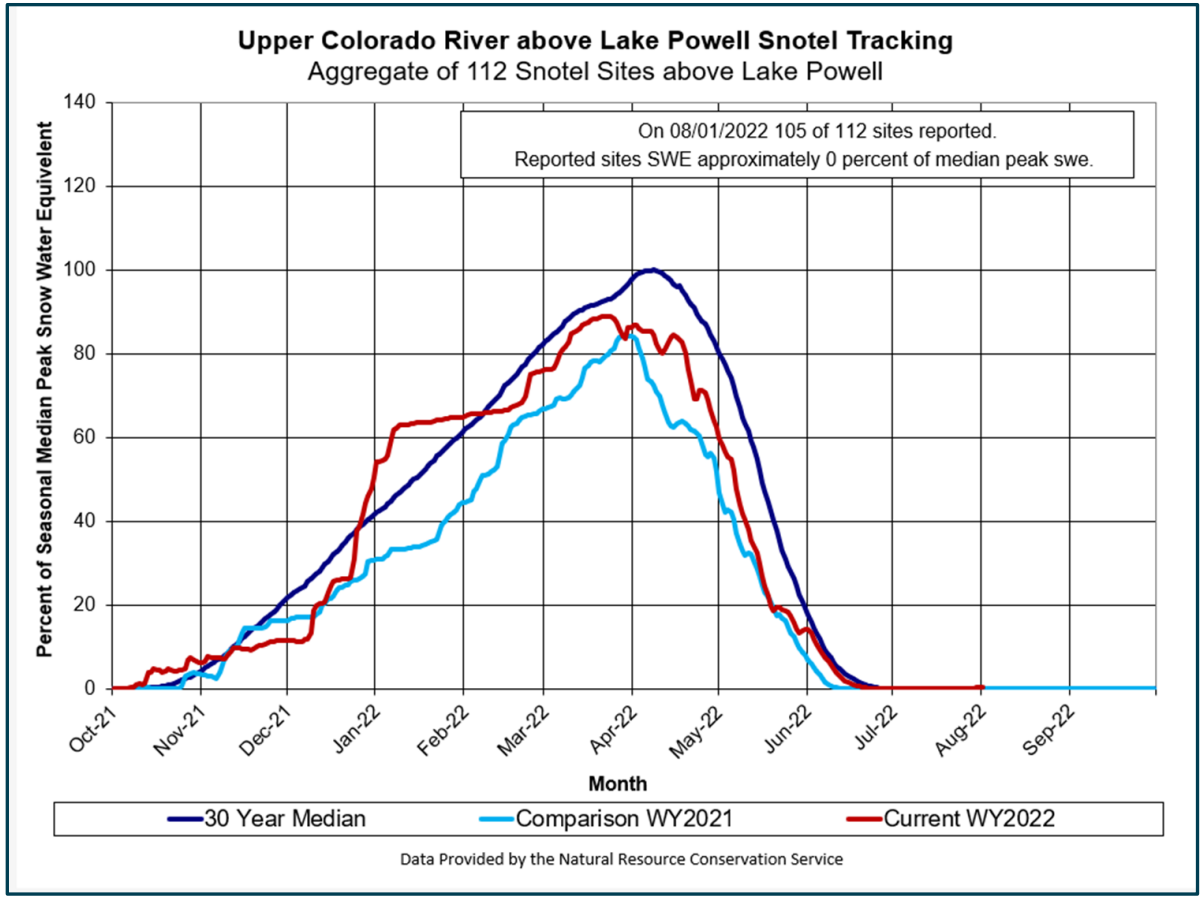


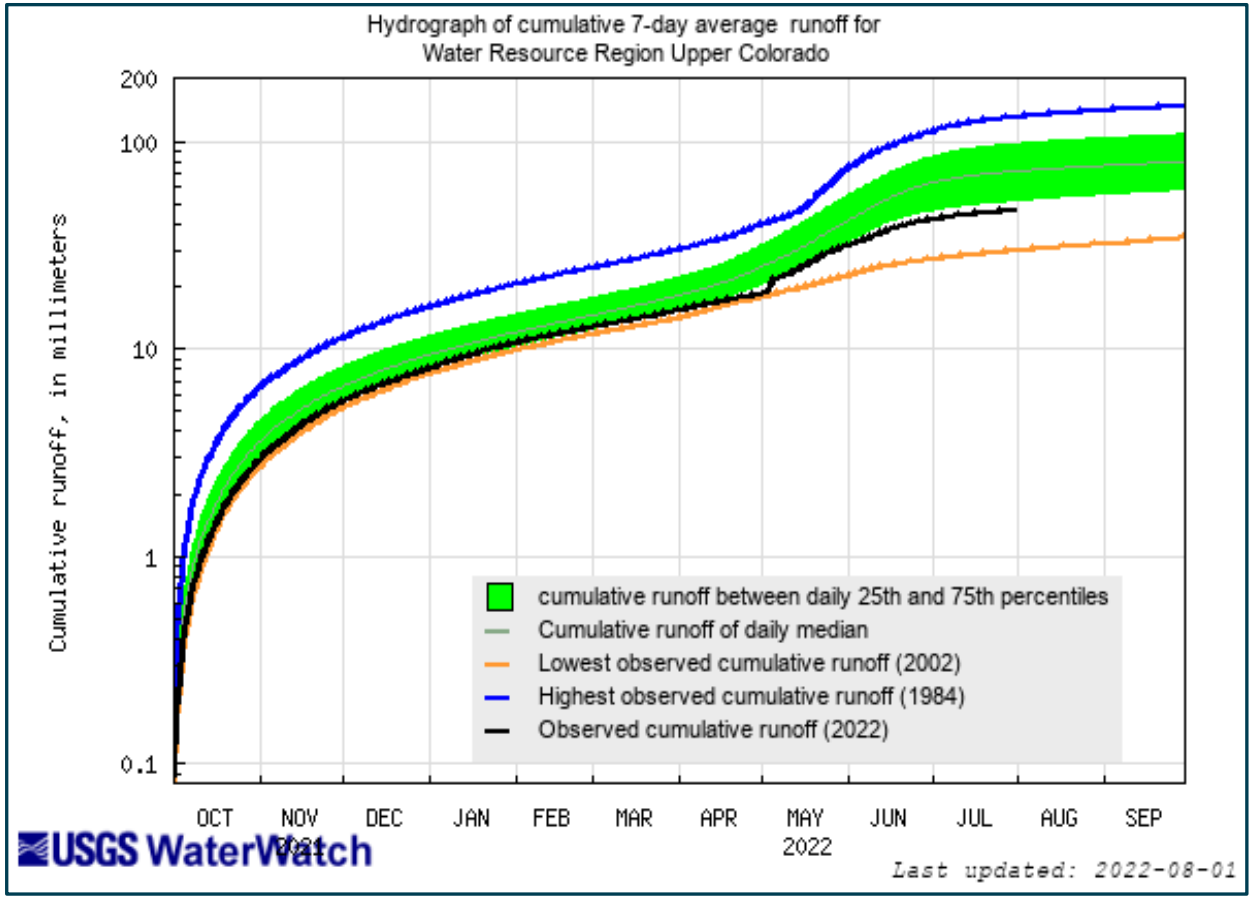
Precipitation and Temperature Outlook





Upper Colorado SWE and Observed Inflows





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

Most Probable July Forecast
Water Year 2022

April – July 2022
Forecasted Unregulated Inflow
as of July 5, 2022

Reservoir	Unregulated Inflow (kaf)	Percent of Avg[1]
Fontenelle	450	61
Flaming Gorge	540	56
Blue Mesa	425	67
Navajo	355	56
Powell	3,600	56

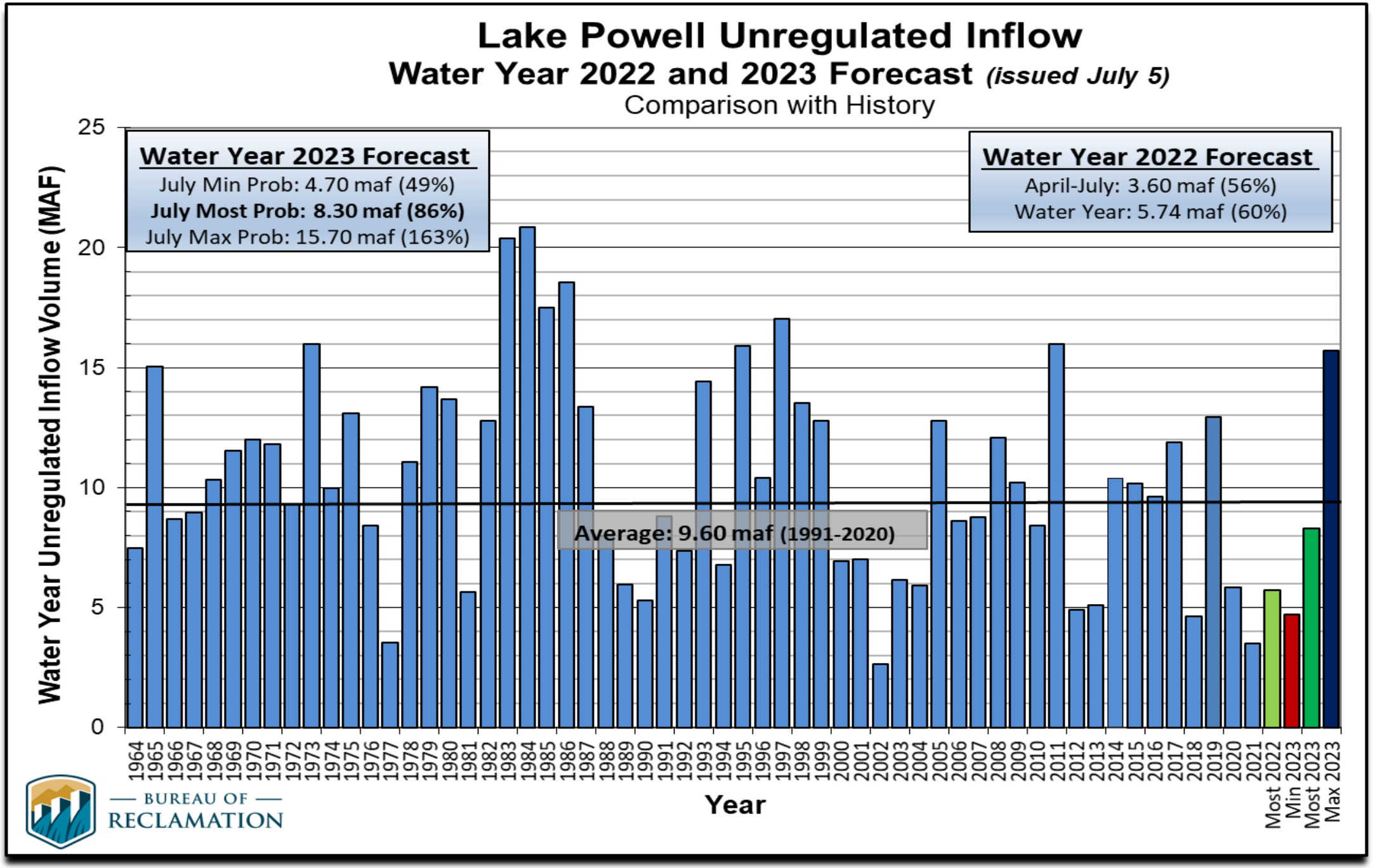
Mid-Month Forecast[2] = 3,690 kaf (58%)

Water Year 2022
Forecasted Unregulated Inflow
as of July 5, 2022

Reservoir	Unregulated Inflow (kaf)	Percent of Avg[1]
Fontenelle	730	68
Flaming Gorge	878	62
Blue Mesa	634	70
Navajo	514	56
Powell	5,736	60

Mid-Month Forecast[2]= 5,826 kaf (61%)

[1]Averages are based on the 1991 through 2020 period of record.
[2]Mid-Month Forecast dated July 18, 2022


Lake Powell Unregulated Inflow
Water Year 2022 and 2023 Forecast (issued July 5)
Comparison with History
Water Year 2023 Forecast
July Min Prob: 4.70 maf (49%)
July Most Prob: 8.30 maf (86%)
July Max Prob: 15.70 maf (163%)
Water Year 2022 Forecast
April-July: 3.60 maf (56%)
Water Year: 5.74 maf (60%)
Average: 9.60 maf (1991-2020)
Water Year Unregulated Inflow Volume (MAF)
Year
0
5
10
15
20
25
1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 Most 2022 Min 2023 Most 2023 Max 2023
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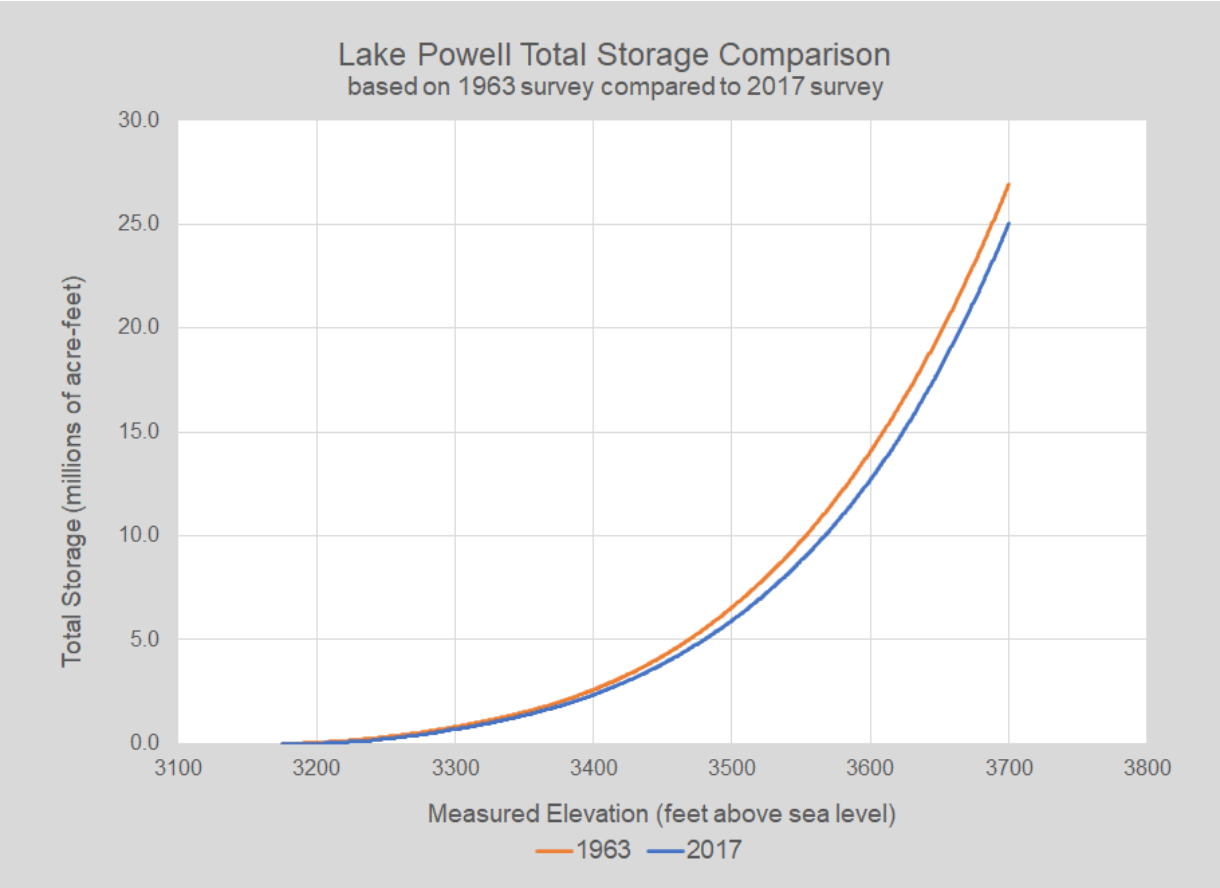
Upper Colorado Basin

Projected Operations for Water Year 2022 and 2023 Based on July 2022 Modeling

2017 Powell Elevation-Volume Relationship



- Reduced Reservoir Storage

Elevation (ft)	New 2017 Table Storage (kaf)	Old 1986 Table Storage (kaf)	Change in Volume (kaf)	% Change
3,700	23,314	24,322	-1,008	-4%
3,666	18,361	19,291	-930	-5%
3,575	8,901	9,517	-616	-6%
3,539.78	6,435	6,878	-443	-6%
3,525	5,545	5,927	-382	-6%
3,490	3,743	3,997	-254	-6%

- *Powell is a "Skinnier Bucket"*

Bathymetric Sensitivity Analysis Summary

- The bathymetry change results in less Powell storage, where change in volume varies by elevation
- Generally, forecasting higher Powell and lower Mead elevation and storage
- Bathymetry change effects differ for balancing verse tier determination.
  - Balancing and storage – reduced balancing releases from Powell due to less storage
  - Tier determination and lake elevations – move through tiers more quickly, less storage loss/gain required to change tiers
- Powell benefits from the 2022 Actions remain with the bathymetry update

Lake Powell & Lake Mead Operational Table

Operating Determinations for Water Year/Calendar Year 2022

Lake Powell

Elevation (feet)	Operation According to the Interim Guidelines	Live Storage (maf)[1]
3,700	**Equalization Tier** Equalize, avoid spills or release 8.23 maf	24.3
3,636 - 3,666 (2008-2026)		15.5 - 19.3 (2008-2026)
	Upper Elevation Balancing Tier[3] Release 8.23 maf; if Lake Mead < 1,075 feet, balance contents with a min/max release of 7.0 and 9.0 maf	
3,575		9.5
	Mid-Elevation Release Tier Release 7.48 maf; if Lake Mead < 1,025 feet, release 8.23 maf	
	3,535.40 ft Jan 1, 2022 Projection	
3,525		5.9
	Lower Elevation Balancing Tier Balance contents with a min/max release of 7.0 and 9.5 maf	
3,490		4.0
3,370		0

Lake Mead

Elevation (feet)	Operation According to the Interim Guidelines	Live Storage (maf)[1]
1,220	**Flood Control Surplus or Quantified Surplus Condition** Deliver > 7.5 maf	25.9
1,200 (approx.)[2]		22.9 (approx.)[2]
	Domestic Surplus or ICS Surplus Condition Deliver > 7.5 maf	
1,145		15.9
1,105	**Normal or ICS Surplus Condition** Deliver ≥ 7.5 maf	11.9
1,075	***1,065.85 ft Jan 1, 2022 Projection***	9.4
	Shortage Condition Deliver 7.167[4] maf	
1,050		7.5
	Shortage Condition Deliver 7.083[5] maf	
1,025		5.8
1,000	**Shortage Condition** Deliver 7.0[6] maf Further measures may be undertaken[7]	4.3
895		0

Diagram not to scale

[1] Acronym for million acre-feet

[2] This elevation is shown as approximate as it is determined each year by considering several factors including Lake Powell and Lake Mead storage, projected Upper Basin and Lower Basin demands, and an assumed inflow.

[3] Subject to April adjustments which may result in a release according to the Equalization Tier

[4] Of which 2.48 maf is apportioned to Arizona, 4.4 maf to California, and 0.287 maf to Nevada

[5] Of which 2.40 maf is apportioned to Arizona, 4.4 maf to California, and 0.283 maf to Nevada

[6] Of which 2.32 maf is apportioned to Arizona, 4.4 maf to California, and 0.280 maf to Nevada

[7] Whenever Lake Mead is below elevation 1,025 feet, the Secretary shall consider whether hydrologic conditions together with anticipated deliveries to the Lower Division States and Mexico is likely to cause the elevation at Lake Mead to fall below 1,000 feet. Such consideration, in consultation with the Basin States, may result in the undertaking of further measures, consistent with applicable Federal law.

[1] **Lake Powell and Lake Mead operating determinations are based on August 2021 24-Month Study projections consistent with the 2007 Interim Guidelines and 2019 Drought Contingency Plans. These determinations will be documented in the 2022 Annual Operating Plan for Colorado River Reservoirs.**

Upper Basin Drought Response Actions

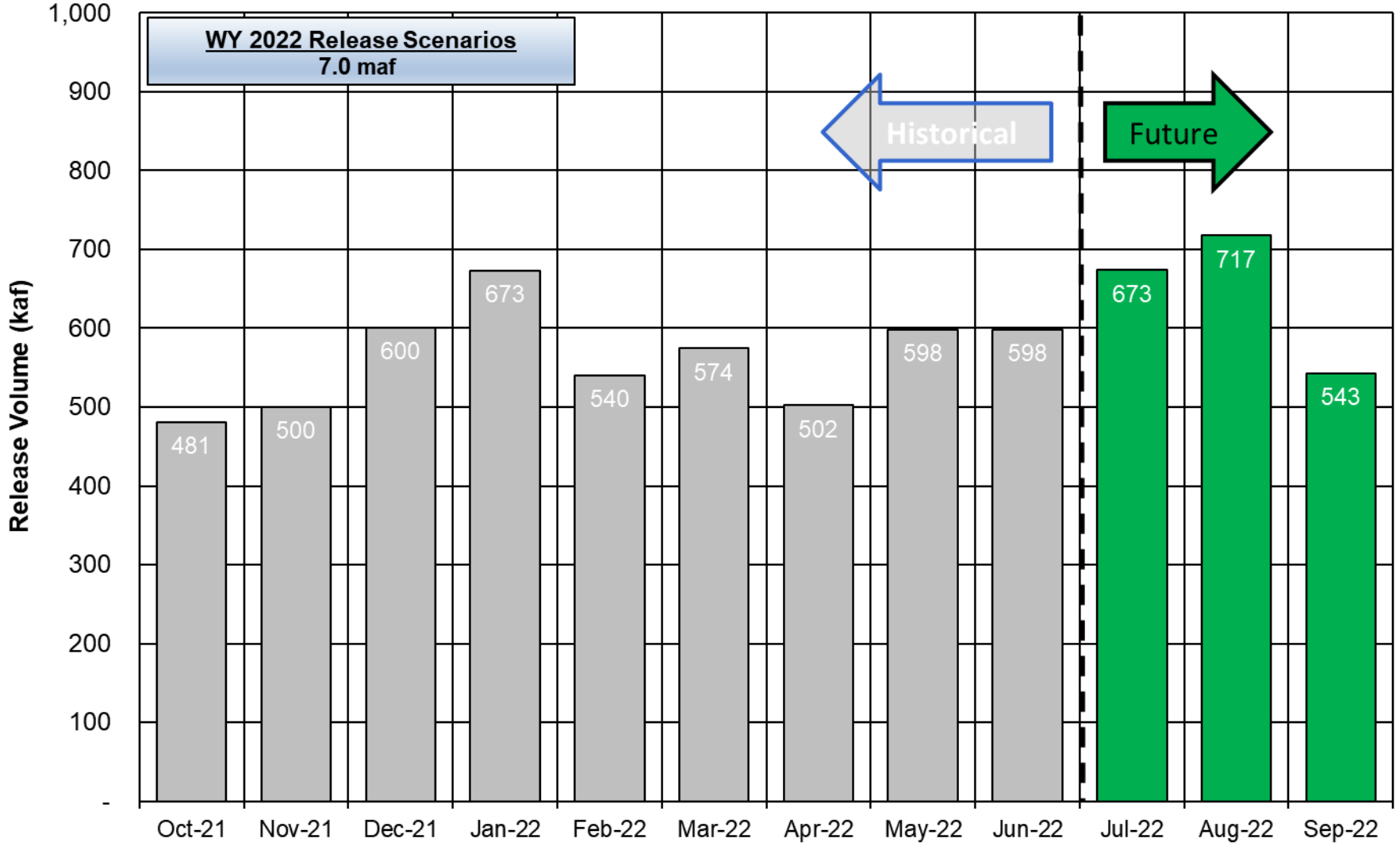
- The Bureau of Reclamation announced on May 3, 2022, two separate urgent drought response actions that will help prop up Lake Powell by nearly 1 million acre-feet (maf) of water over the next 12 months (May 2022 through April 2023). To protect Lake Powell, more water will flow into the lake from upstream reservoirs and less water will be released downstream:

  - Under a Drought Contingency Plan adopted in 2022, approximately 500 thousand acre-feet (kaf) of water will come from Flaming Gorge Reservoir, located approximately 455 river miles upstream of Lake Powell (2022 Plan).
    - For more information: https://www.usbr.gov/uc/DocLibrary/Plans/20220429-2022DroughtResponseOperationsPlan-ApprovalMemo-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 7.00 maf (GC Operational Adjustment), in accordance with Sections 6 and 7.D of the 2007 Interim Guidelines.
    - For more information: https://www.usbr.gov/uc/DocLibrary/Plans/20220503-2022DROA-GlenCanyonDamOperationsDecisionLetter-508-DOI.pdf

Potential Lake Powell Monthly Release Volume Distribution

Release Scenarios for Water Year 2022



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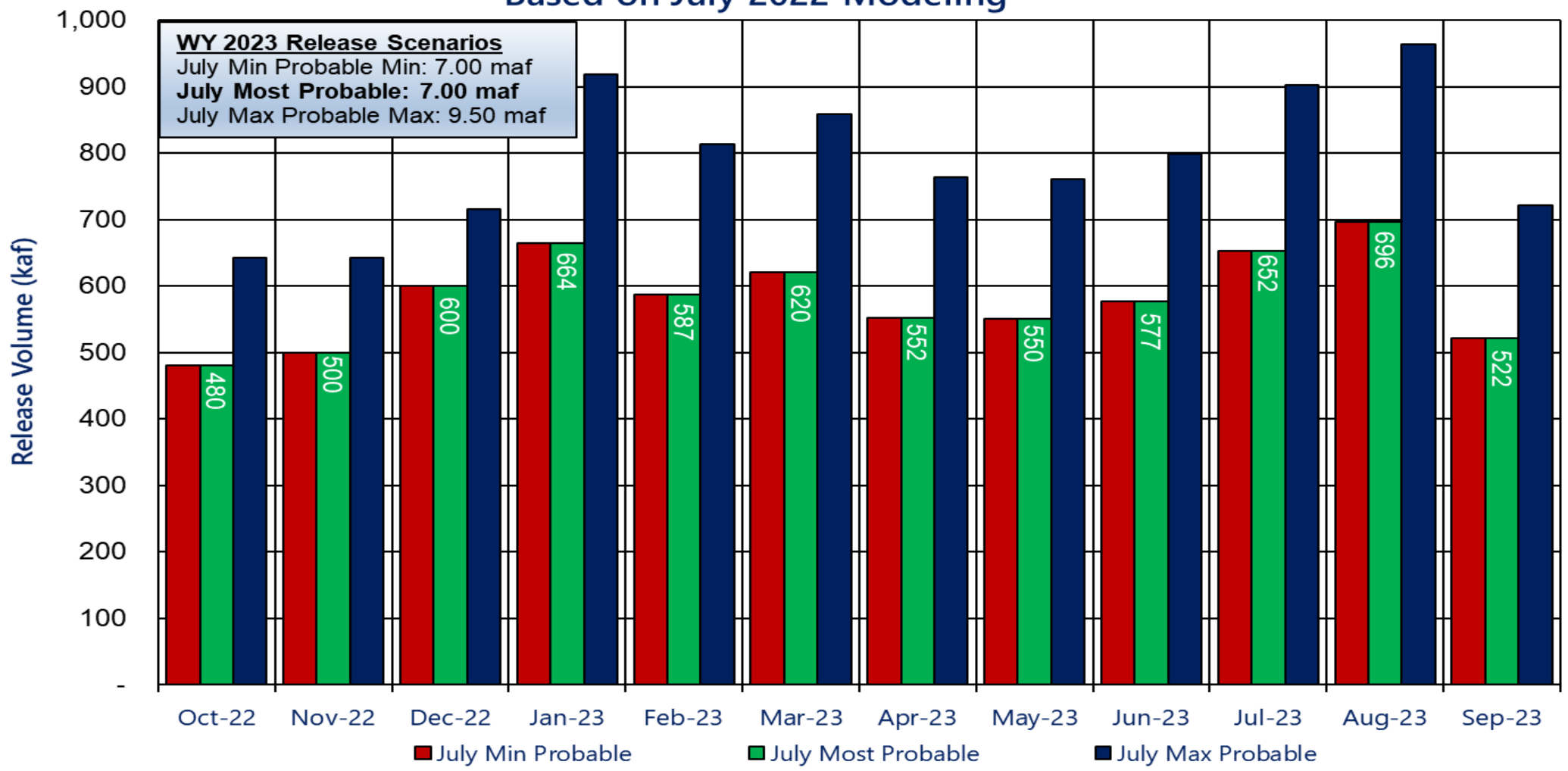
The Drought Response Operations Agreement (DROA) can be found here: https://www.usbr.gov/dcp/finaldocs.html

Potential Lake Powell Monthly Release Volume Distribution

Release Scenarios for Water Year 2023

Based on July 2022 Modeling



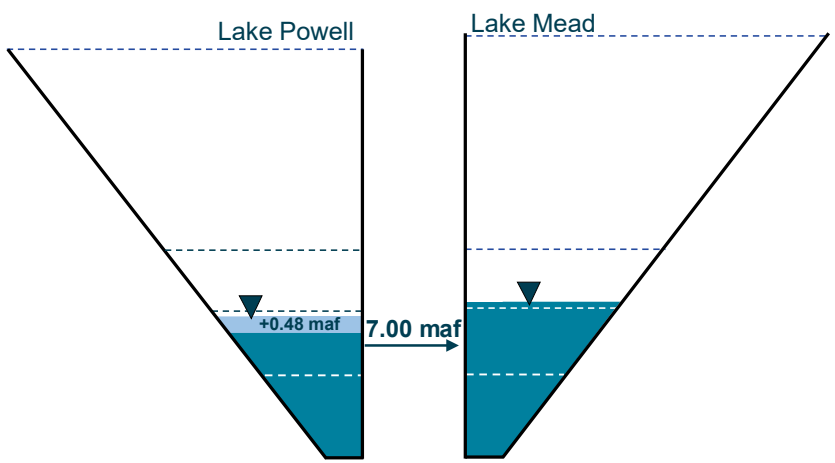
The operating determination for upcoming years will be based on a projected "tier" elevation in the August 2022 24-Month Study. Based on July 2022 24-Month Study modeling, Lake Powell's operating condition for water year 2023 is projected to be within the Lower Elevation Balancing Tier. The Department of Interior and Reclamation will work with the Basin States to determine the manner in which to operate Glen Canyon Dam to ensure the benefits of the drought actions are preserved.

Timing of Operational Decisions

- August 24-Month Study projections of January 1 elevations sets the operating tiers for Lake Powell and Lake Mead

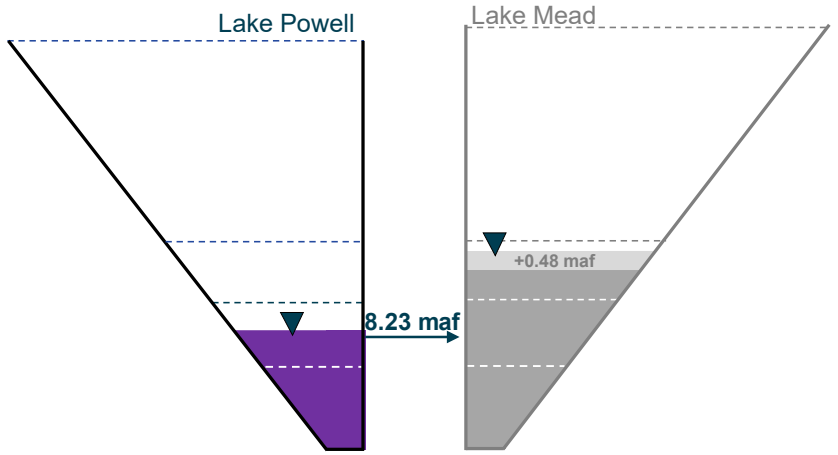
End of Calendar Year 2022 Lake Powell and Lake Mead Elevations Based on July 2022 24-Month Study[1,2,3]

Physical Elevations: Real-time or projected elevations based on a 7.00 maf release from Lake Powell in WY 2022 and 7.00 maf in WY 2023.



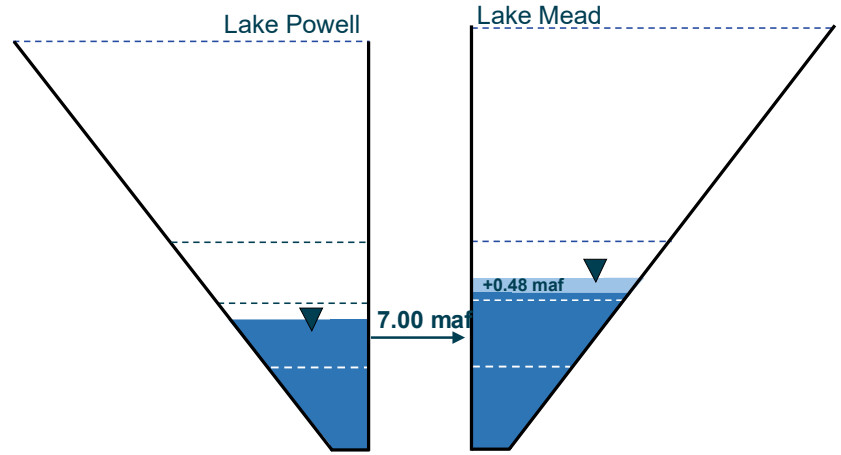
Reservoir	End of Calendar Year 2022 **Physical Elevation**
Lake Powell	3,520.25
Lake Mead	1,039.54

Powell Tier Determination: Projected elevation "as if" the additional 0.48 maf were released from Powell in WY 2022 and with an 8.23 maf WY 2023 Powell release.



Reservoir	End of Calendar Year 2022 **Powell Tier Determination Elevation**
Lake Powell	3,503.88
Lake Mead	NA

Effective Elevation & Mead Operating Condition Determination: Projected elevation "as if" the additional 0.48 maf were released from Powell in WY 2022, with an adjusted WY 2023 Powell release of 7.00 maf.



Reservoir	End of Calendar Year 2022 **Effective Elevation**
Lake Powell	3,511.41
Lake Mead	1,046.41

[1] For more information: https://www.usbr.gov/uc/DocLibrary/Plans/20220503-2022DROA-GlenCanyonDamOperationsDecisionLetter-508-DOI.pdf.
[2] Both the Powell Tier Determination and Effective Elevations are "as if" the additional 0.48 maf were released from Powell in WY 2022. Powell's Tier Determination elevation is used to set the WY 2023 operating tier. For Mead, the Effective Elevation is used to set the CY 2023 operating condition. The Department of Interior and Reclamation will work to determine the manner in which to operate Glen Canyon Dam to ensure the benefits of these actions are preserved.
[3] Images are **not** to scale.

Lake Powell & Lake Mead Operational Table

Projected Tiers for Water/Calendar Year 2023 based on the July 2022 24-Month Study

3,503.88 ft
Jan 1, 2023 Projection

Lake Powell		
Elevation (feet)	**Operation According to the Interim Guidelines**	**Live Storage (maf)[1]**
3,700	**Equalization Tier** Equalize, avoid spills or release 8.23 maf	24.3
3,636 - 3,666 (2008-2026)	**Upper Elevation Balancing Tier[3]** Release 8.23 maf; if Lake Mead < 1,075 feet, balance contents with a min/max release of 7.0 and 9.0 maf	15.5 - 19.3 (2008-2026)
3,575	**Mid-Elevation Release Tier** Release 7.48 maf; if Lake Mead < 1,025 feet, release 8.23 maf	9.5
3,525	**Lower Elevation Balancing Tier** Balance contents with a min/max release of 7.0 and 9.5 maf	5.9
3,490		4.0
3,370		0

Lake Mead		
Elevation (feet)	**Operation According to the Interim Guidelines**	**Live Storage (maf)[1]**
1,220	**Flood Control Surplus or Quantified Surplus Condition** Deliver > 7.5 maf	25.9
1,200 (approx.)[2]	**Domestic Surplus or ICS Surplus Condition** Deliver > 7.5 maf	22.9 (approx.)[2]
1,145		15.9
1,105	**Normal or ICS Surplus Condition** Deliver ≥ 7.5 maf	11.9
1,075	**Shortage Condition** Deliver 7.167[4] maf	9.4
1,050		7.5
1,025	**Shortage Condition** Deliver 7.083[5] maf	5.8
1,000	**Shortage Condition** Deliver 7.0[6] maf Further measures may be undertaken[7]	4.3
895		0

1,046.41 ft
Jan 1, 2023 Projection

Diagram not to scale

[1] Acronym for million acre-feet

[2] This elevation is shown as approximate as it is determined each year by considering several factors including Lake Powell and Lake Mead storage, projected Upper Basin and Lower Basin demands, and an assumed inflow.

[3] Subject to April adjustments which may result in a release according to the Equalization Tier

[4] Of which 2.48 maf is apportioned to Arizona, 4.4 maf to California, and 0.287 maf to Nevada

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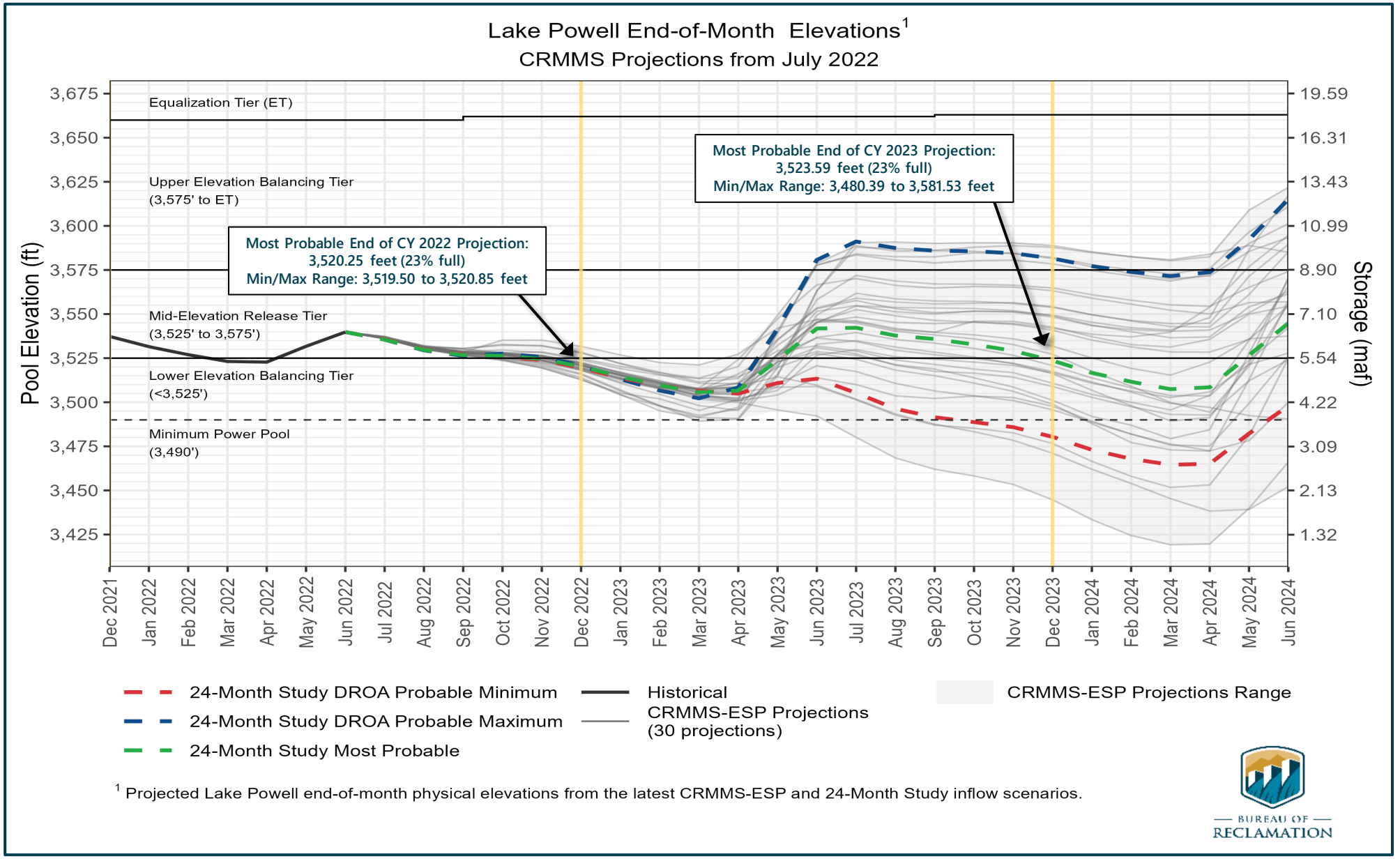
[6] Of which 2.32 maf is apportioned to Arizona, 4.4 maf to California, and 0.280 maf to Nevada

[7] Whenever Lake Mead is below elevation 1,025 feet, the Secretary shall consider whether hydrologic conditions together with anticipated deliveries to the Lower Division States and Mexico is likely to cause the elevation at Lake Mead to fall below 1,000 feet. Such consideration, in consultation with the Basin States, may result in the undertaking of further measures, consistent with applicable Federal law.

[1] Lake Powell and Lake Mead operational tier determinations will be based on the August 2022 24-Month Study projections and will be documented in the 2023 AOP.



The chart above displays projected "physical" elevations for Lake Powell. The operating determination for upcoming years, however, will be based on a projected "tier" elevation in the August 2022 24-Month Study. Based on July 2022 24-Month Study modeling, Lake Powell's operating condition for water year 2023 is projected to be within the Lower Elevation Balancing Tier. The Department of Interior and Reclamation will work to determine the manner in which to operate Glen Canyon Dam to ensure the benefits of the drought actions are preserved.

Lake Powell WY 2023 Operating Tier Scenarios

Based on July 2022 24-Month Study Inflow Scenarios

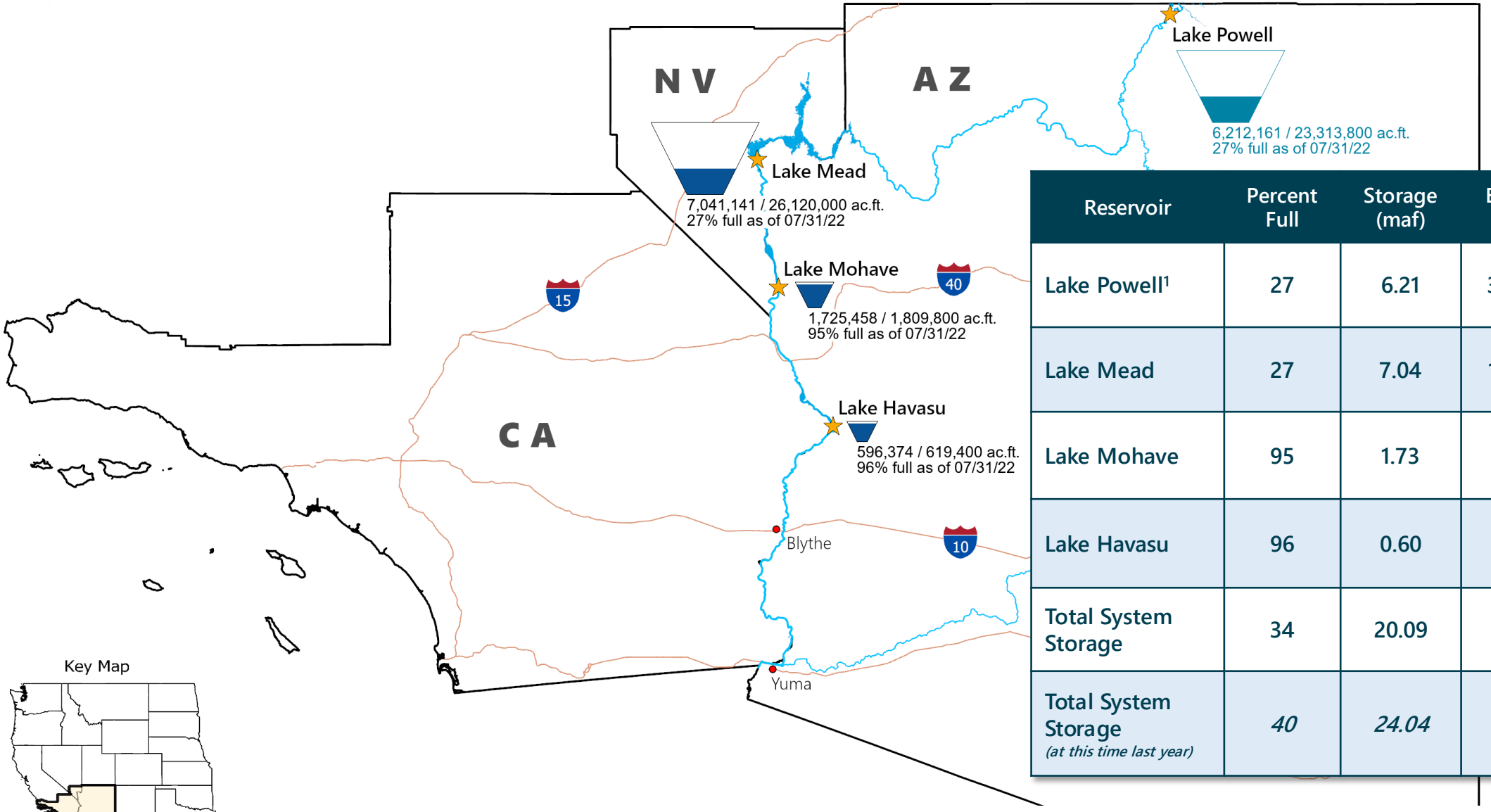
Inflow Scenario	Operating Tier/ Release Volume
July DROA* Minimum Probable	Lower Elevation Balancing 7.00 maf
July Most Probable	Lower Elevation Balancing 7.00 maf
July DROA* Maximum Probable	Lower Elevation Balancing 9.50 maf

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

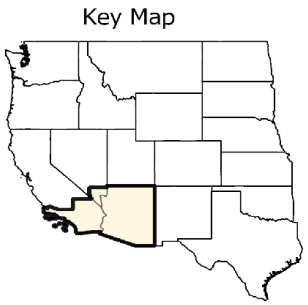
Lower Colorado Basin

Calendar Year 2022 Operations Update

Lower Colorado Basin System Conditions (as of July 31, 2022)



Reservoir	Percent Full	Storage (maf)	Elevation (feet)
Lake Powell[1]	27	6.21	3,536.20
Lake Mead	27	7.04	1,040.92
Lake Mohave	95	1.73	643.97
Lake Havasu	96	0.60	448.84
Total System Storage	34	20.09	-
Total System Storage *(at this time last year)*	*40*	*24.04*	-



[1] *Reclamation implemented the updated Lake Powell live storage capacity of 23.314 maf as of July 1, 2022. This reflects a 4% decrease since the last reservoir survey in 1986.*

Lower Basin Side Inflows – WY/CY 2022[1,2,3]

Intervening Flow from Glen Canyon to Hoover Dam

Month in WY/CY 2022		5-Year Average Intervening Flow (kaf)	Observed Intervening Flow (kaf)	Observed Intervening Flow (% of Average)	Difference From 5-Year Average (kaf)
Observed	October 2021	69	80	116%	11
	November 2021	68	42	62%	-26
	December 2021	69	64	94%	-4
	January 2022	87	60	69%	-27
	February 2022	88	58	65%	-31
	March 2022	107	41	39%	-65
	April 2022	72	30	43%	-41
	May 2022	43	8	18%	-35
	June 2022	22	16	72%	-6
	July 2022	56	71	127%	15
Projected	August 2022	66			
	September 2022	62			
	October 2022	69			
	November 2022	68			
	December 2022	69			
	WY 2022 Totals	810	599	74%	-211
	CY 2022 Totals	810	619	76%	-191

[1] Values were computed with the LC's gain-loss model for the most recent 24-month study.

[2] Percents of average are based on the 5-year mean from 2017-2021.

[3] Lake Mead's evaporation in the intervening flow mass balance incorporates evaporation coefficients developed by the USGS between 2010-2019. The study report can be found online at: https://pubs.usgs.gov/of/2021/1022/ofr20211022.pdf

Lake Powell & Lake Mead Operational Table

Operating Determinations for Water Year/Calendar Year 2022

Lake Powell

Elevation (feet)	Operation According to the Interim Guidelines	Live Storage (maf)[1]
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3,575		9.5
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	3,535.40 ft Jan 1, 2022 Projection	
3,525		5.9
	Lower Elevation Balancing Tier Balance contents with a min/max release of 7.0 and 9.5 maf	
3,490		4.0
3,370		0

Lake Mead

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1,200 (approx.)[2]		22.9 (approx.)[2]
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1,075	***1,065.85 ft Jan 1, 2022 Projection***	9.4
	Shortage Condition Deliver 7.167[4] maf	
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1,000	**Shortage Condition** Deliver 7.0[6] maf Further measures may be undertaken[7]	4.3
895		0

Diagram not to scale

[1] Acronym for million acre-feet

[2] This elevation is shown as approximate as it is determined each year by considering several factors including Lake Powell and Lake Mead storage, projected Upper Basin and Lower Basin demands, and an assumed inflow.

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[1] **Lake Powell and Lake Mead operating determinations are based on August 2021 24-Month Study projections consistent with the 2007 Interim Guidelines and 2019 Drought Contingency Plans. These determinations will be documented in the 2022 Annual Operating Plan for Colorado River Reservoirs.**

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***
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***

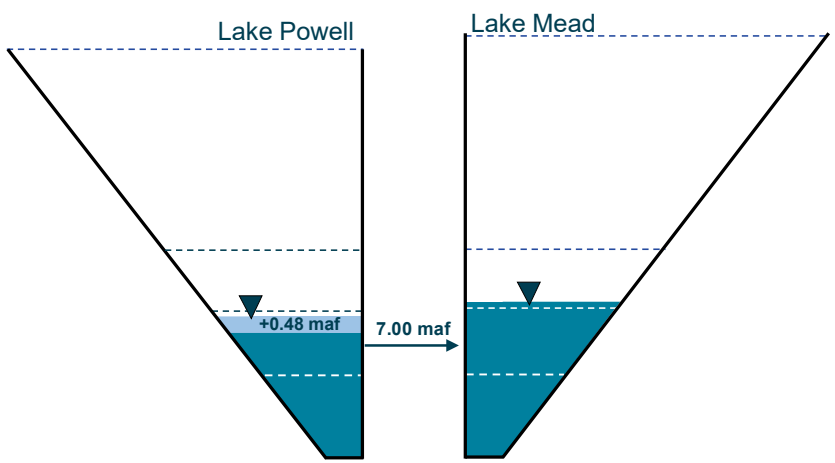
2022 Reductions + Contributions

2022 Reductions + Contributions

The Secretary of the Interior will take affirmative actions to implement programs designed to create or conserve 100,000 acre-ft per year 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.

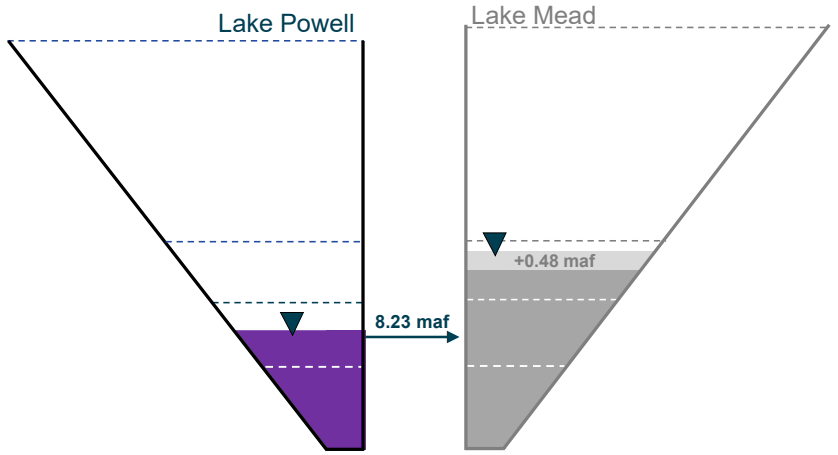
End of Calendar Year 2022 Lake Powell and Lake Mead Elevations Based on July 2022 24-Month Study[1,2,3]

Physical Elevations: Real-time or projected elevations based on a 7.00 maf release from Lake Powell in WY 2022 and 7.00 maf in WY 2023.



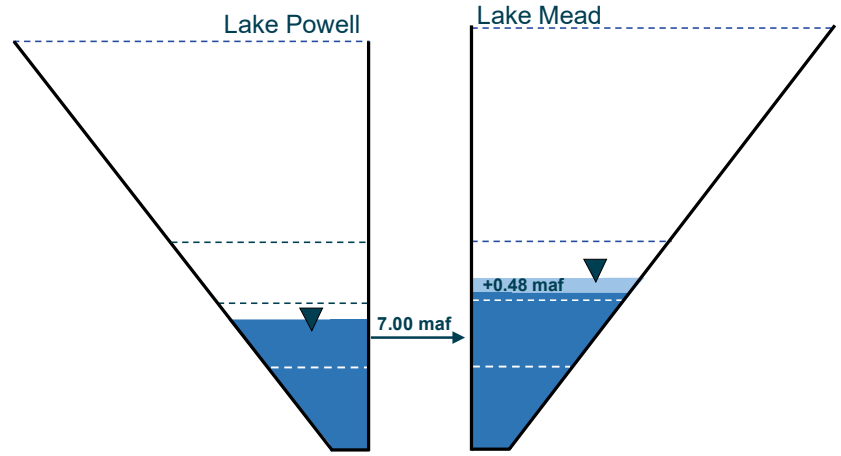
Reservoir	End of Calendar Year 2022 **Physical Elevation**
Lake Powell	3,520.25
Lake Mead	1,039.54

Powell Tier Determination: Projected elevation "as if" the additional 0.48 maf were released from Powell in WY 2022 and with an 8.23 maf WY 2023 Powell release.



Reservoir	End of Calendar Year 2022 **Powell Tier Determination Elevation**
Lake Powell	3,503.88
Lake Mead	NA

Effective Elevation & Mead Operating Condition Determination: Projected elevation "as if" the additional 0.48 maf were released from Powell in WY 2022, with a WY 2023 Powell release of 7.00 maf.



Reservoir	End of Calendar Year 2022 **Effective Elevation**
Lake Powell	3,511.41
Lake Mead	1,046.41

[1] For more information: https://www.usbr.gov/uc/DocLibrary/Plans/20220503-2022DROA-GlenCanyonDamOperationsDecisionLetter-508-DOI.pdf.

[2] Both the Powell Tier Determination and Effective Elevations are "as if" the additional 0.48 maf were released from Powell in WY 2022. Powell's Tier Determination elevation is used to set the WY 2023 operating tier. For Mead, the Effective Elevation is used to set the CY 2023 operating condition. The Department of Interior and Reclamation will work with the Basin States to determine the manner in which to operate Glen Canyon Dam to ensure the benefits of these actions are preserved.

[3] Images are **not** to scale.

Lake Powell & Lake Mead Operational Table

Projected Tiers for Water/Calendar Year 2023 based on the July 2022 24-Month Study

3,503.88 ft
Jan 1, 2023 Projection

Lake Powell		
Elevation (feet)	**Operation According to the Interim Guidelines**	**Live Storage (maf)[1]**
3,700	**Equalization Tier** Equalize, avoid spills or release 8.23 maf	24.3
3,636 - 3,666 (2008-2026)	**Upper Elevation Balancing Tier[3]** Release 8.23 maf; if Lake Mead < 1,075 feet, balance contents with a min/max release of 7.0 and 9.0 maf	15.5 - 19.3 (2008-2026)
3,575	**Mid-Elevation Release Tier** Release 7.48 maf; if Lake Mead < 1,025 feet, release 8.23 maf	9.5
3,525	**Lower Elevation Balancing Tier** Balance contents with a min/max release of 7.0 and 9.5 maf	5.9
3,490		4.0
3,370		0

Lake Mead		
Elevation (feet)	**Operation According to the Interim Guidelines**	**Live Storage (maf)[1]**
1,220	**Flood Control Surplus or Quantified Surplus Condition** Deliver > 7.5 maf	25.9
1,200 (approx.)[2]	**Domestic Surplus or ICS Surplus Condition** Deliver > 7.5 maf	22.9 (approx.)[2]
1,145		15.9
1,105	**Normal or ICS Surplus Condition** Deliver ≥ 7.5 maf	11.9
1,075	**Shortage Condition** Deliver 7.167[4] maf	9.4
1,050		7.5
1,025	**Shortage Condition** Deliver 7.083[5] maf	5.8
1,000	**Shortage Condition** Deliver 7.0[6] maf Further measures may be undertaken[7]	4.3
895		0

1,046.41 ft
Jan 1, 2023 Projection

Diagram not to scale

[1] Acronym for million acre-feet

[2] This elevation is shown as approximate as it is determined each year by considering several factors including Lake Powell and Lake Mead storage, projected Upper Basin and Lower Basin demands, and an assumed inflow.

[3] Subject to April adjustments which may result in a release according to the Equalization Tier

[4] Of which 2.48 maf is apportioned to Arizona, 4.4 maf to California, and 0.287 maf to Nevada

[5] Of which 2.40 maf is apportioned to Arizona, 4.4 maf to California, and 0.283 maf to Nevada

[6] Of which 2.32 maf is apportioned to Arizona, 4.4 maf to California, and 0.280 maf to Nevada

[7] Whenever Lake Mead is below elevation 1,025 feet, the Secretary shall consider whether hydrologic conditions together with anticipated deliveries to the Lower Division States and Mexico is likely to cause the elevation at Lake Mead to fall below 1,000 feet. Such consideration, in consultation with the Basin States, may result in the undertaking of further measures, consistent with applicable Federal law.

[1] Lake Powell and Lake Mead operational tier determinations will be based on the August 2022 24-Month Study projections and will be documented in the 2023 AOP.

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***
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***
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Projected 2023 Reductions + Contributions

Projected 2023 Reductions + Contributions

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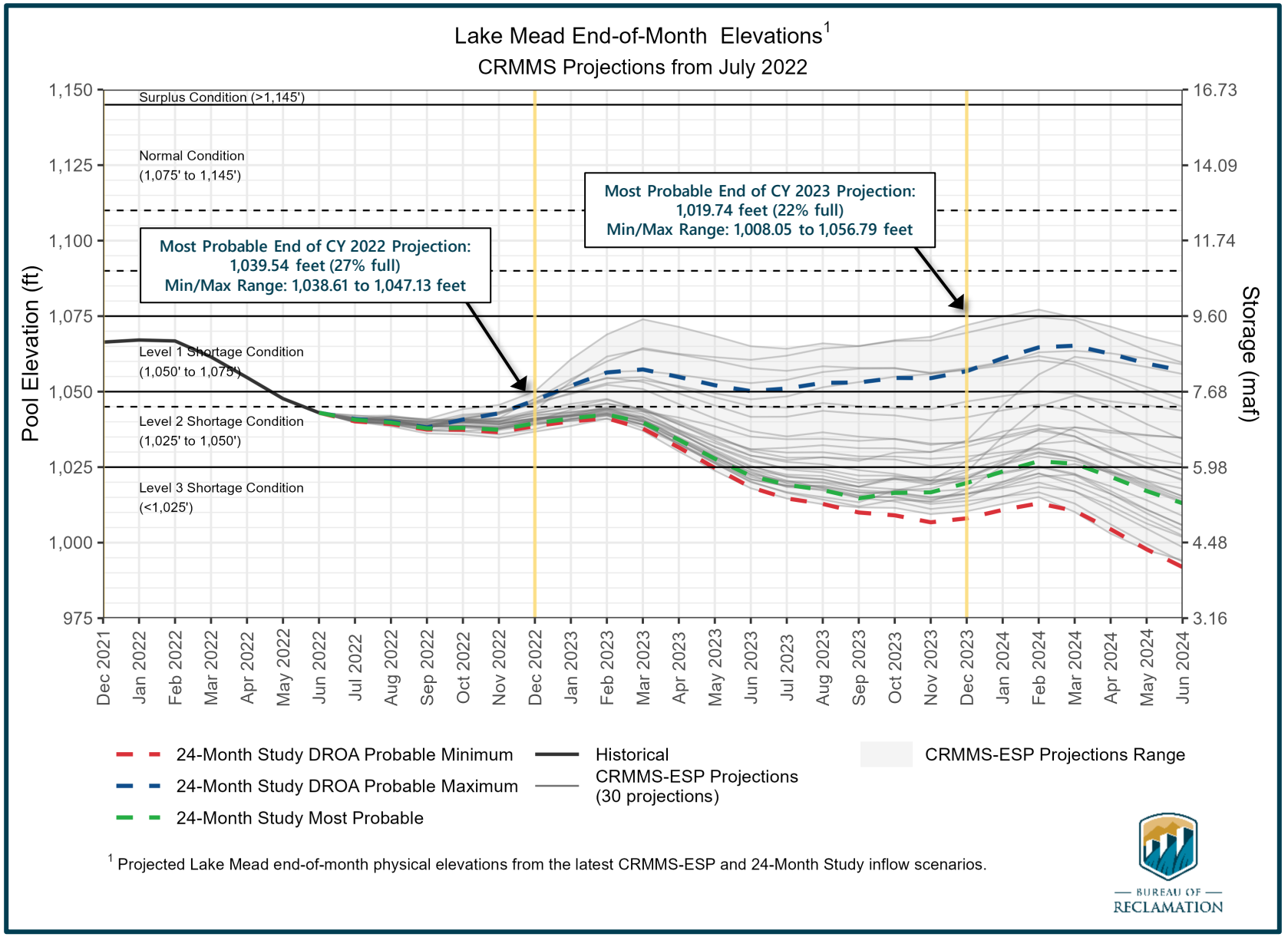


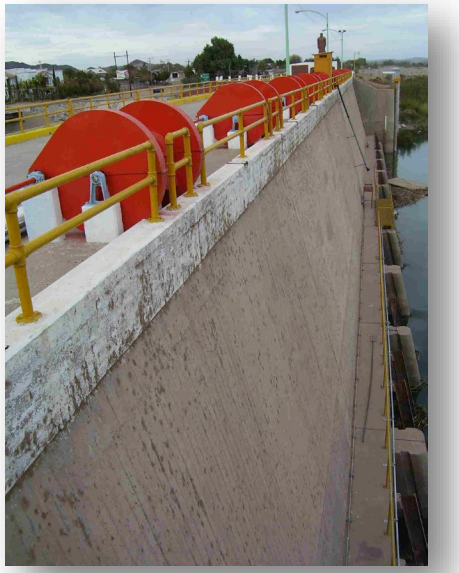
The chart above displays projected "physical" elevations for Lake Mead. The operating determination for upcoming years, however, will be based on a projected "tier" elevation in the August 2022 24-Month Study. Based on July 2022 24-Month Study modeling, the Lower Basin is projected to operate in a level 2 shortage condition with required DCP and BWSCP contributions in calendar year 2023. The Department of Interior and Reclamation will work to determine the manner in which to operate Glen Canyon Dam to ensure the benefits of the drought actions are preserved.

Additional Operational Data
Provisional 2022 Year-to-Date Totals

- Mexico Excess Flows
  - ➢1,887 af (through 7/31)

- Brock Reservoir Total Storage
  - ➢64,644 af (through 7/28)

- Senator Wash Total Storage
  - ➢48,916 af (through 7/28)



YAO Operations Update

- Pumped drainage return flows from the Wellton-Mohawk Irrigation and Drainage District
  - Flow at station 0+00 on the Main Outlet Drain from January through June 2022 was 48, 520 ac-ft at 2,636 ppm
- Provisional drainage flows to the Colorado River
  - From the South Gila Drainage Wells January through Jun 2022 was 1,355 ac-ft at 1,663 ppm
  - From the Yuma Mesa Conduit January through June 2022 was 17,840 ac-ft at 1,238 ppm

2023 Colorado River Annual Operating Plan

Colorado River Management Work Group

Second Consultation

August 2, 2022

BUREAU OF RECLAMATION