

## Hydrology Report – September 2022

- **Upper Basin precipitation and Temperature**

August received 132% average precipitation in the upper basin bringing this year's cumulative precipitation to 100% of average. The last three months of above average precipitation will hopefully improve soil moisture. Temperatures in August were below average in the lower basin and 3-5 degrees above normal in the northern portion of the upper basin.

- **Upper Basin Snowpack and runoff**

This year's snowpack peaked about two weeks earlier than expected. The snowpack peaked on March 23<sup>rd</sup> with 88% of the seasonal peak. Based on the current conditions the runoff is estimated to be 63% of average for the year.

- **Current reservoir status**

As of September 6, 2022, Lake Mead is at a current elevation of 1,044.2 feet and has about 7.3 million acre-feet in storage (28% capacity). As of September 6, 2022, Lake Powell is at a current elevation of 3,531.1 feet and has about 5.9 million acre-feet in storage (25% capacity). Since this time last year, Lake Mead has decreased about 24 feet and Lake Powell has decreased about 18 feet. Total system storage for the upper and lower basin is around 19.7 million acre-feet (34% capacity).

- **2022 Reservoir Operations and Drought Operations**

In calendar year 2022, there will be a Level 1 shortage under the 2007 Guidelines and there will be a required Drought Contingency Plan contribution for Nevada and Arizona. Accordingly, in 2022, Nevada will be required to reduce consumptive use by 13,000 acre-feet under the 2007 Interim Guidelines and make a Drought Contingency Plan contribution of 8,000 acre-feet. Arizona and Mexico are also required to take shortage and make a water savings contribution in 2022. Those amounts are significantly larger than Nevada's obligations. The total combined volumes for Arizona, Nevada, and Mexico are 613,000 acre-feet in calendar year 2022, which will save the equivalent of about 8 feet in elevation in Lake Mead.

In response to declining runoff and lowering lake levels the 500+ plan was initiated with the purpose of storing an additional 500,000 acre-feet in Lake Mead during each of the next two years to prevent reaching critical elevations. Efforts are still ongoing to reach the 500+ plan.

On May 3, Reclamation announced two drought response actions to protect Lake Powell due to the potential risk of falling below power pool. Flaming Gorge Reservoir was scheduled to release an additional 500 thousand acre-feet to Lake Powell and 480 thousand acre-feet will be left in Lake Powell by reducing the releases to Lake Mead. The combined actions are expected to increase Lake Powell's elevation by approximately 16 feet.

On June 14, the commissioner for Reclamation at the Senate hearing on western drought announced to the basin states that 2 to 4 million acre-feet of water reductions are needed next year as part of an emergency plan.

The seven basin states and the Bureau of Reclamation are currently in discussions to address what further actions can be implemented to protect critical levels at both Lake Powell and Lake Mead.

On August 16, Reclamation released the results of the August 24 Month Study, which is used to determine the operations of the upcoming water year for both reservoirs. The August 24 Month Study projected the January 1, 2023, elevation for Lake Powell to be below 3,525 feet elevation indicating next year will be operated in the Lower Elevation Balancing Tier with an initial release of 7.0 million acre-feet. Lake Mead was projected to be below 1,050 feet and above 1,045 feet, indicating a Level 2a Shortage Condition for the lower basin. Thus, in 2023, Nevada will have a 17,000 acre-feet reduction from the 2007 Interim Guidelines and an 8,000 acre-feet Drought Contingency Plan contribution in calendar year 2023. The reductions and contributions for calendar year 2023 are highlighted in Figure 1.

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

Figure 1. The reductions and contributions for calendar year 2023 based on the August 2022 24 Month Study.

### Water Use in Southern Nevada

Southern Nevada’s consumptive use in January through July of 2022 was 142,395 acre-feet. In 2021, southern Nevada consumed less Colorado River water than its 300,000 acre-feet entitlement: specifically, 49,832 (17%) acre feet less. The Southern Nevada Water Authority stored the unused water in Lake Mead to help maintain critical lake levels. This stored water is accessible to southern Nevada in the future if necessary. The Southern Nevada Water Authority has been aggressively reducing consumptive uses through turf removal and conservation programs allowing thus far over 2.3 million acre-feet in total to be stored for future use.

- **Reclamation’s Lake Mead Projection**

Reclamation uses computer models to forecast reservoir elevations based on planned water use and anticipated runoff. The most current model (August 24 month study) is forecasting Lake Mead to be at a projected elevation of 1,040.8 feet by the end of calendar year 2023 (Figure 2).

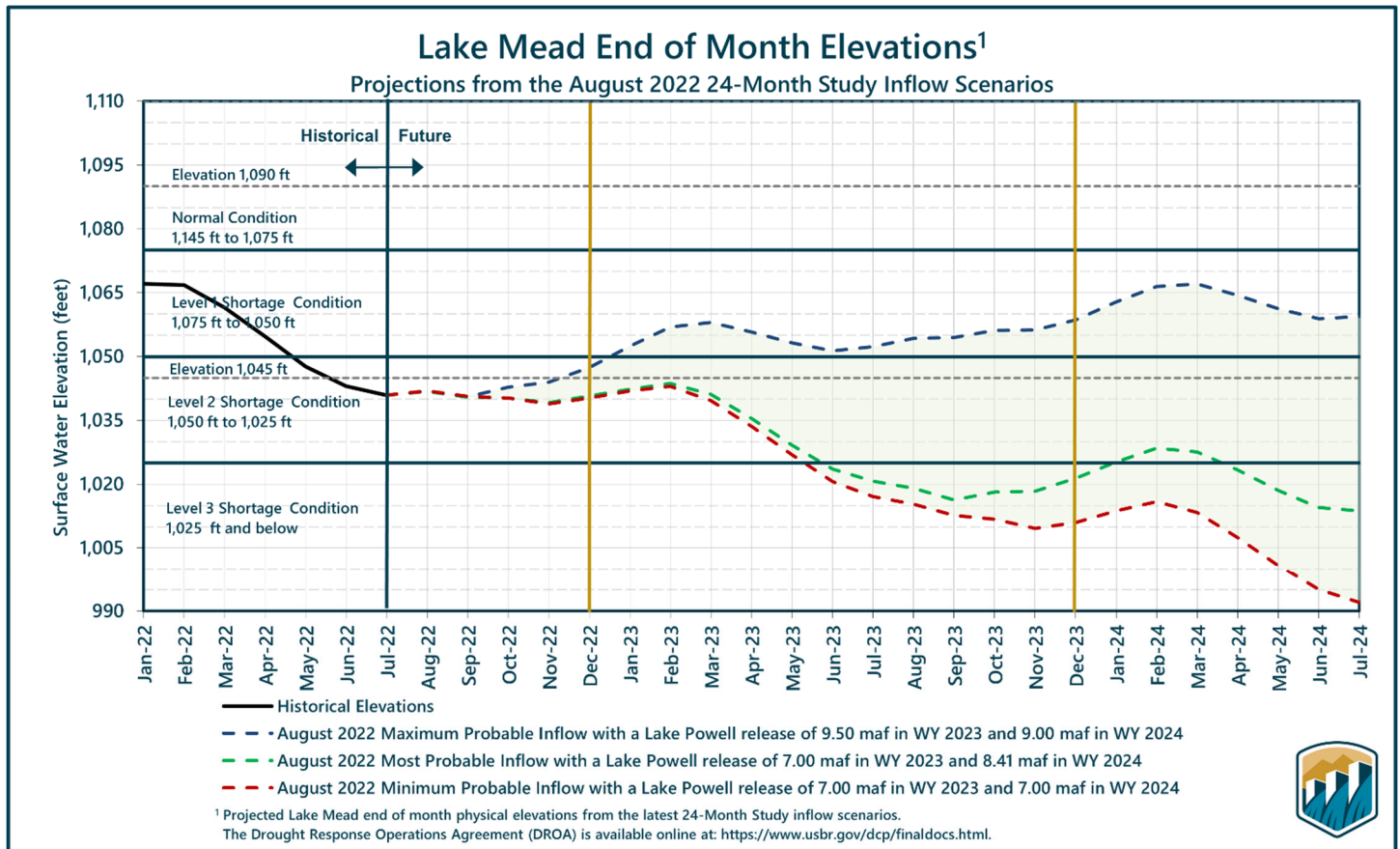


Figure 2. Reclamations August 2022 24 Month Study.



# Colorado River Commission of Nevada

## Hydrology and Water Use Update

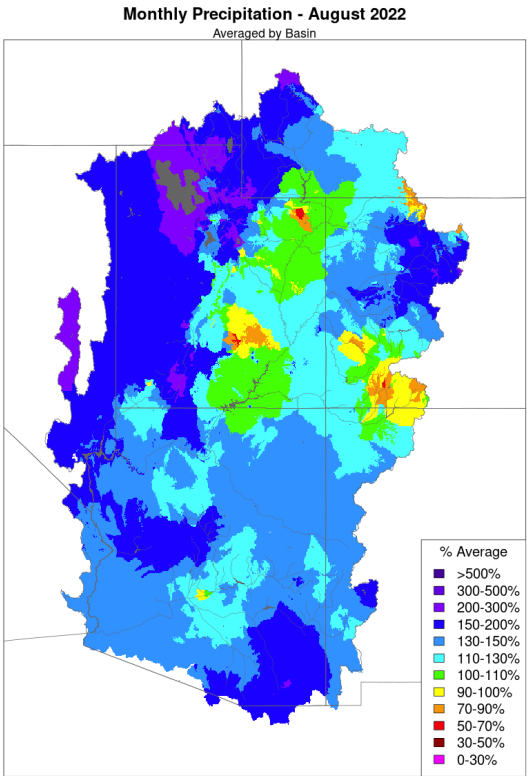
Warren Turkett

September 13, 2022

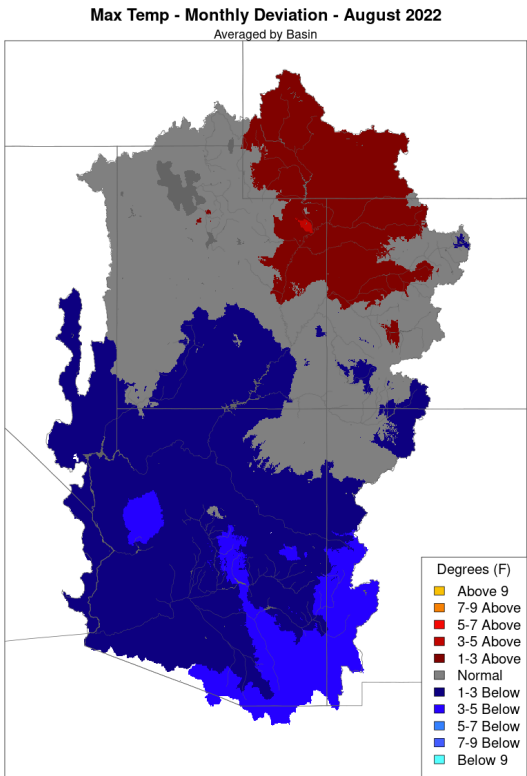




# Precipitation and Temperature



Prepared by NOAA, Colorado Basin River Forecast Center  
Salt Lake City, Utah, [www.cbrfc.noaa.gov](http://www.cbrfc.noaa.gov)



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Lake Powell %Average Precipitation Water Year 2022

Area	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Water Year
UC-Powell	127	45	206	51	62	84	68	76	146	135	132	100



## Unregulated Inflow, Current and Projected Reservoir Status

Projected unregulated inflow to Lake Powell      Acre-Feet      % Average

Water Year 2022	6,079,000	63%
April thru July 2022	3,751,000	59%

Reservoir	Current Elevation	Current Storage Acre-Feet	Current % Capacity	Projected Actual Elevation on 1/1/2023 <sup>1</sup>
Lake Mead	1,044.2	7,272,000	28%	1,040.8
Lake Powell	3,531.1	5,900,000	25%	3,521.8

Data retrieved September 6, 2022

<sup>1</sup> Based on Reclamation's August 2022 24 Month Study Most Probable Inflow.



# Water Use In Southern Nevada

## 2021 Southern Nevada Water Use

Acre-Feet

Nevada Annual Allocation	300,000
2021 Drought Contingency Plan contribution	-8,000
Diversions	481,079
Return Flow Credits	238,911
Consumptive Use	242,168
Unused Allocation Available for Banking	49,832 (17%)

## 2022 January - July Southern Nevada Water Use

Acre-Feet

Nevada Annual Allocation	300,000
2022 Drought Contingency Plan contribution	-8,000
Interim Guidelines Shortages	-13,000
Diversions	279,936
Return Flow Credits	137,542
Consumptive Use	142,395
Banked Water (through end of 2021)	2,250,684



## 2007 Interim Guidelines, Minute 323, Lower Basin Drought Contingency Plan, and Binational Water Scarcity Contingency Plan Total Volumes (kaf)

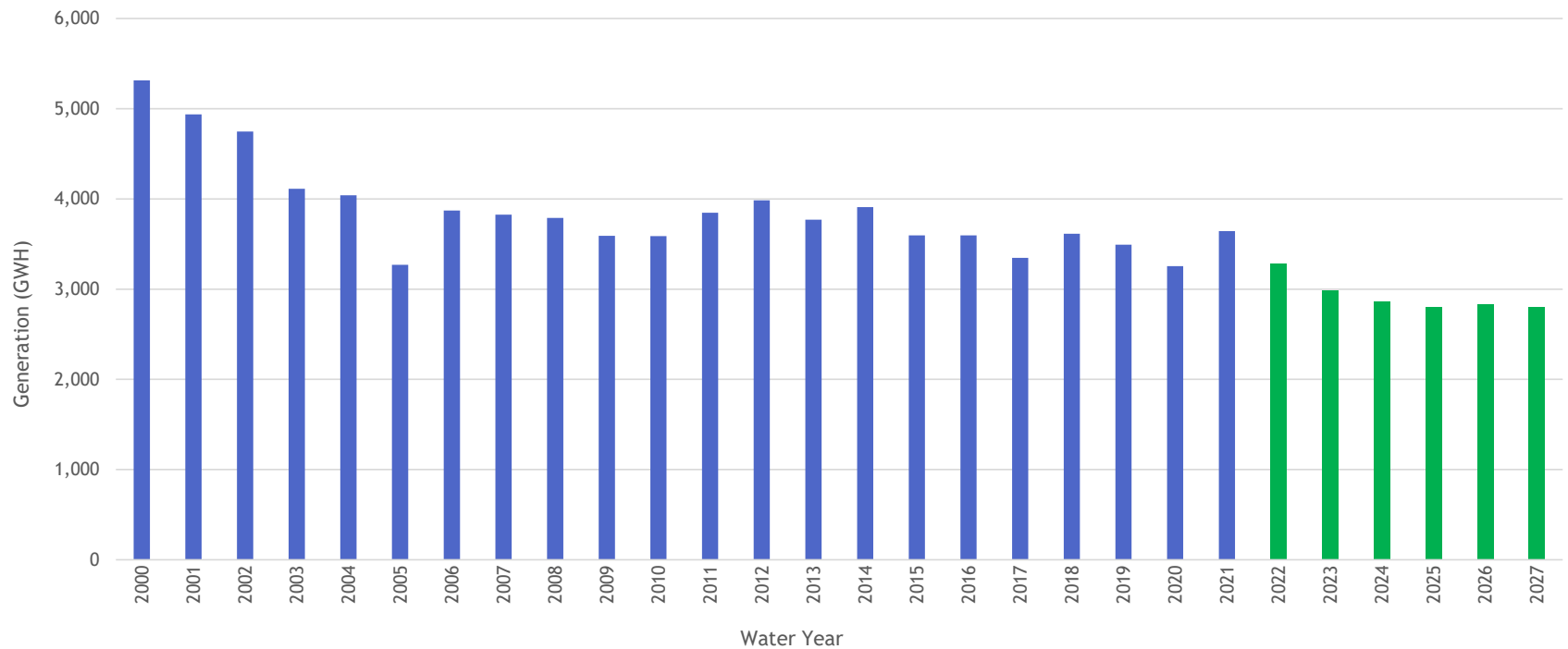
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On August 16, Reclamation released the August 24 Month Study which determined the upcoming years operations. Lake Mead in calendar year 2023 will be operated in a Level 2a Shortage Condition.





## Historical and Forecast of Hydropower Generation at Hoover



Historical generation at Hoover Dam in blue and forecasted generation from Reclamation's August 2022 CRMMS model in green.



# Summary

## Lake Powell

- Water Year 2022<sup>1</sup> has received 100% of average precipitation in the Upper Basin.
- Upper Basin snowpack peaked at 88% of the seasonal median.
- Unregulated inflow for water year 2022 is forecasted to be 63% of average.

## Lake Mead

- On August 16, Reclamation announced the 2023 operating conditions for Lake Powell and Lake Mead. In 2023, Lake Powell will start with an initial release of 7 million acre-feet and Lake Mead will operate in a Level 2a Shortage Condition (slide 5).

## Nevada Water Supply

- Southern Nevada has about 9 years of water supply banked.<sup>2</sup>
- **In 2021, southern Nevada used 57,832 af less than its annual allocation.**

Storage	Current Elevation (f)	% Capacity	Change since last year
Lake Mead	1,044.2	28%	-23.7 ft
Lake Powell	3,531.1	25%	-17.9 ft

Data retrieved September 6, 2022.

<sup>1</sup> Water year is defined as October through September.

<sup>2</sup> Based on 2021 consumptive use and storage volumes through 2021.