Hydrology Report – August 2022

- **Upper Basin precipitation and Temperature**

July received 136% average precipitation in the Upper Basin bringing this year's cumulative precipitation to 97% of average. Temperatures in July were mostly normal.

- **Upper Basin Snowpack and runoff**

This year's snowpack peaked about two weeks earlier than expected. The snowpack peaked on March 23rd with 88% of the seasonal peak. Based on the current conditions the runoff is estimated to be 62% of average for the year.

- **Current reservoir status**

As of August 1, 2022, Lake Mead is at an elevation of 1,040.9 feet and has about 7.0 million acre-feet in storage (27% capacity). As of August 1, 2022, Lake Powell is at an elevation of 3,536.2 feet and has about 6.2 million acre-feet in storage (27% capacity). Since this time last year, Lake Mead has decreased about 27 feet and Lake Powell has decreased about 18 feet. Total system storage for the upper and lower basin is around 20.1 million acre-feet (34% capacity).

- **2022 Reservoir Operations and Drought Operations**

In calendar year 2022, there will be a Tier 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 have 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 told 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 will release the August 24 Month Study which will set the operating tiers of both reservoirs for next year.

Water Use in Southern Nevada

Southern Nevada's consumptive use January through June of 2022 was 111,306 acre-feet. In 2021, Southern Nevada consumed less Colorado River water than the 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 water levels. This stored water is accessible to the Southern Nevada in the future if necessary. The Southern Nevada Water Authority aggressively reduced consumptive uses through turf removal and conservation programs allowing 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 (July 24 month study) is forecasting Lake Mead to be at an elevation of 1,039.5 feet by the end of calendar year 2023 (Figure 1).

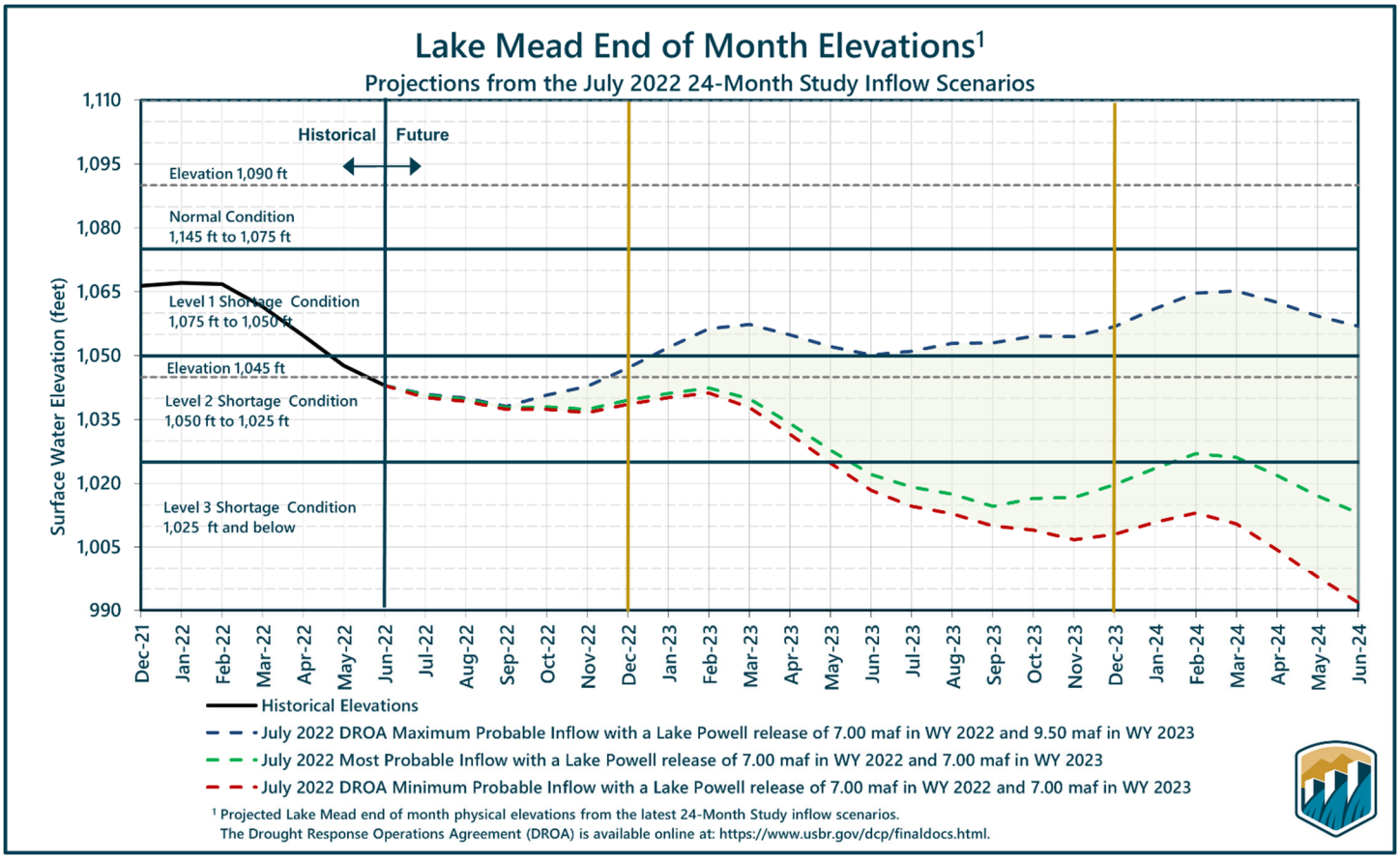


Figure 1. Reclamations July 24 Month Study.

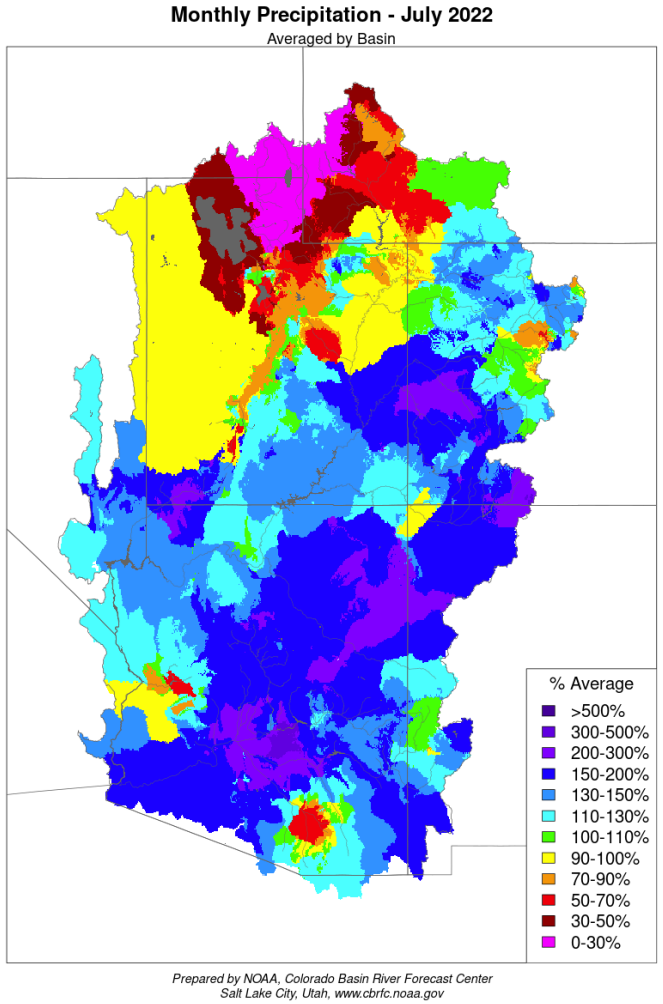
Colorado River Commission of Nevada

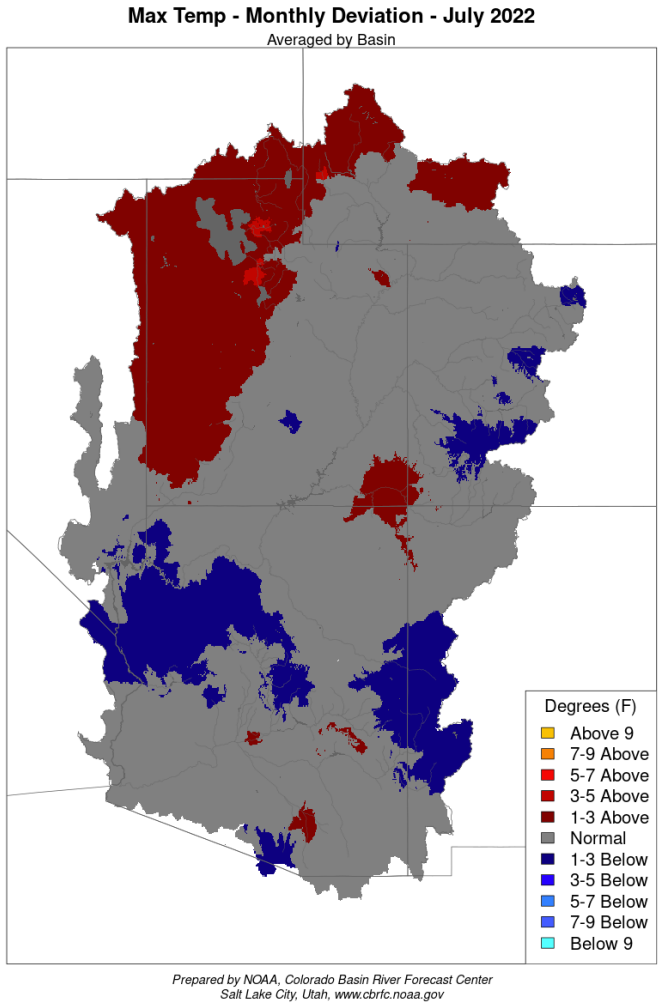
Hydrology and Water Use Update

Warren Turkett

August 9, 2022

Precipitation and Temperature





Lake Powell %Average Precipitation Water Year 2022

Area	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Water Year
UC-Powell	127	45	206	51	62	84	68	76	146	136	97

Unregulated Inflow, Current and Projected Reservoir Status

Projected unregulated inflow to Lake Powell	Acre-Feet	% Average
Water Year 2022	5,961,000	62%
April thru July 2022	3,751,000	59%

Reservoir	Current Elevation	Current Storage Acre-Feet	Current % Capacity	Projected Actual Elevation on 1/1/2023[1]
Lake Mead	1,040.9	7,041,000	27%	1,039.5
Lake Powell	3,536.2	6,212,000	27%	3,520.3

Data retrieved August 1, 2022

[1] Based on Reclamation's July 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 - June Southern Nevada Water Use	Acre-Feet
Nevada Annual Allocation	300,000
2022 Drought Contingency Plan contribution	-8,000
Interim Guidelines Shortages	-13,000
Diversions	227,959
Return Flow Credits	116,652
Consumptive Use	111,306

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

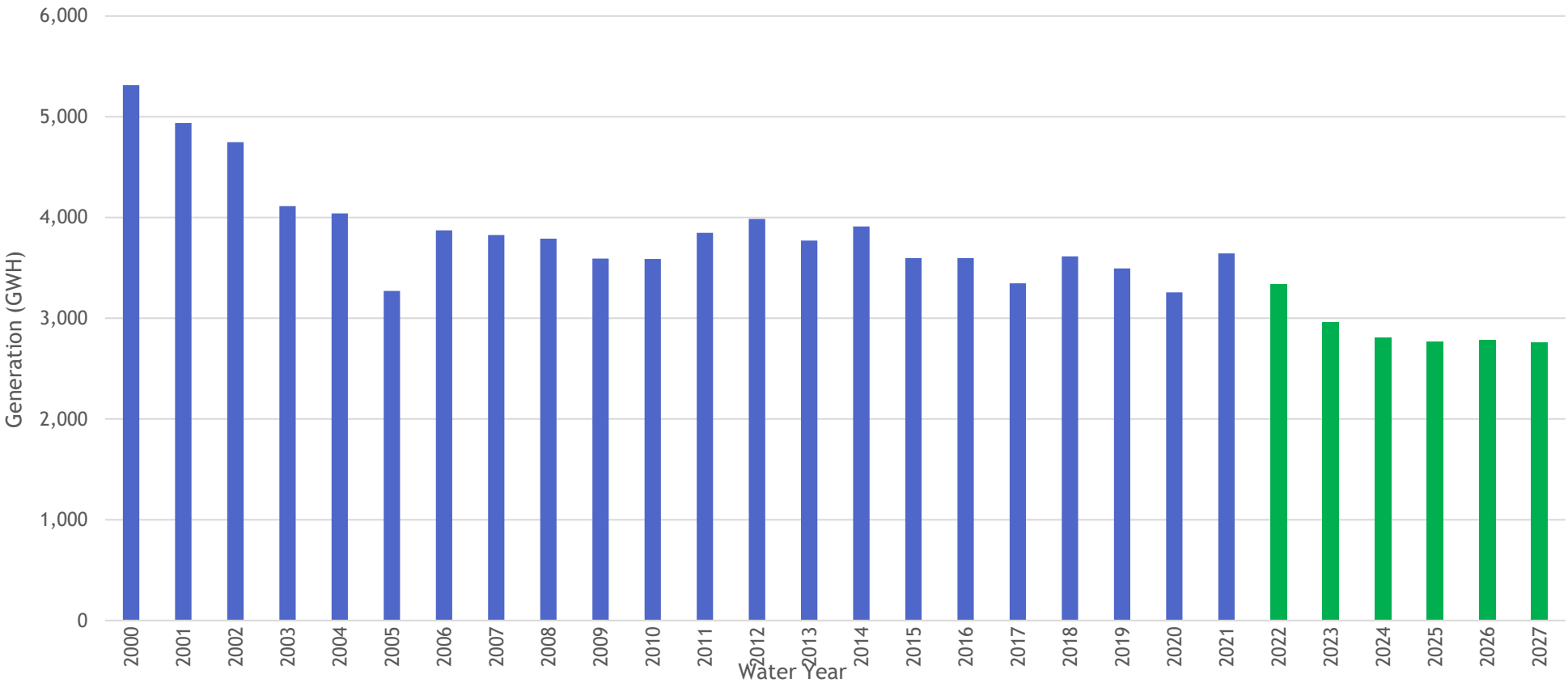
Total Volumes (kaf)

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***

Projected 2023 Reductions + Contributions

On August 16, Reclamation will release the August 24 Month Study to determine the upcoming years operations.

Historical and Forecast of Hydropower Generation at Hoover



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

Summary

Lake Powell

- Water Year 2022[1] has received 97% 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 62% of average.

Lake Mead

- On August 16, Reclamation will announce the operations for the upcoming year.
- There are significant ongoing negotiations occurring to meet the Commissioner's requested emergency plan to reduce water use.

Nevada Water Supply

- Southern Nevada has about 9 years of water supply banked. [2]
- **In 2021, Southern Nevada used 57,832 af less than our annual allocation.**

Storage	Elevation (f)	% Capacity	Change since last year
Lake Mead	1,040.9	27%	-26.9 ft
Lake Powell	3,536.2	27%	-17.6 ft

Data retrieved August 1, 2022.
[1] Water year is defined as October through September.
[2] Based on 2021 consumptive use and storage volumes through 2021.