Hydrology Report - October 2021

- **Upper Basin precipitation and Temperature**

Precipitation in the Upper Basin for September was 77% of average bringing the cumulative precipitation total to 82% of average for the year. The soil moisture in the Upper Basin continues to be dry resulting in next year's forecasts for runoff to be reduced by about 3.4 million acre-feet. The majority of this year had above average temperatures which contributed to reducing the runoff from snowpack. Temperatures in September were above average in the Upper Basin.

- **Upper Basin Snowpack**

Snowpack in the Upper Basin peaked at the end of March with 83% of the seasonal average. The typical runoff period for snow melt is from April through July. The majority of this year's snowpack melted by June. The snowpack this year, was reduced by below average precipitation, above average temperatures, and dry soil conditions which negatively impacted runoff. The Colorado River Basin Forecast Center estimates runoff from snowpack this year was only 33% of average. On a more positive note, snowpack accumulation started again in October and is off to a good start with several recent storms in the Upper Basin contributing to above average snowpack for this time of year.

- **Current reservoir status**

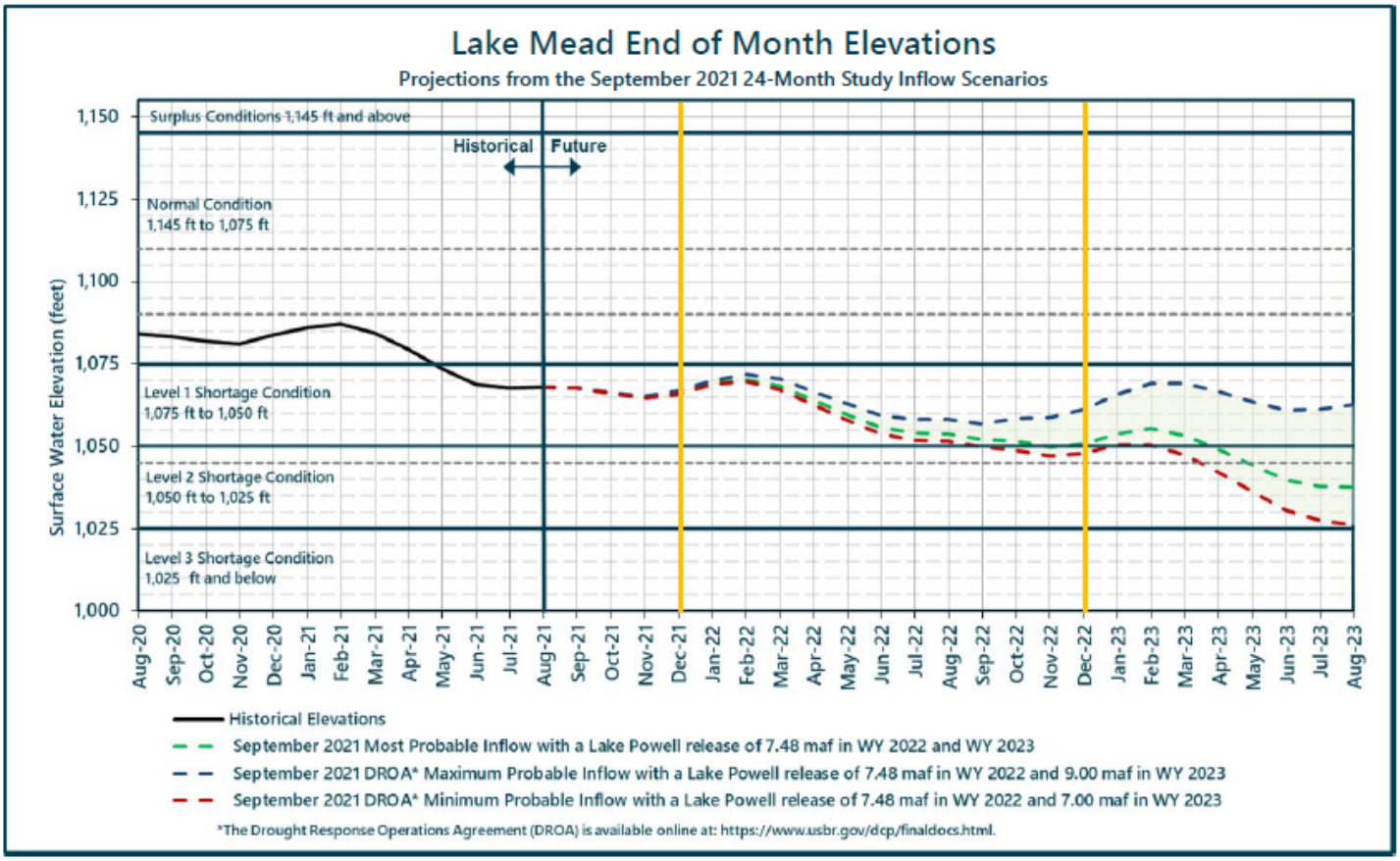
The lack of runoff this year is causing both major reservoirs to decrease in elevation. As of October 12, 2021, Lake Mead is at an elevation of 1,067.4 feet and has about 9 million acre-feet in storage (34% capacity). As of October 12, 2021, Lake Powell is at an elevation of 3,545.1 feet and has about 7.2 million acre-feet in storage (30% capacity). Since this time last year, Lake Mead has decreased about 16 feet and Lake Powell has decreased about 49 feet. Total system storage for the Upper and Lower Basin is around 22.8 million-acre-feet (38% capacity).

- **Reclamation's August Determination**

On August 16th, Reclamation released the August 24 Month Study, which is used to determine the upcoming years operations. Reclamation announced that in calendar year 2022, there will be a first ever Tier 1 shortage declared under the 2007 Guidelines and there also 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.

- **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 (September 24 month study) is forecasting Lake Mead to be at an elevation of 1,066.1 feet at the end of the year. This is about a 1-foot decrease from the current elevation. Lake Mead elevation is forecasted to be at an elevation of 1,050.7 feet by the end of calendar year 2022.



- **Water Use in Southern Nevada**

Southern Nevada's consumptive use from January through August of 2021 was 179,988 acre-feet, which is three percent less than last year. In 2020, Southern Nevada consumed less Colorado River water than it is 300,000 acre-feet entitlement: specifically, 44,432 (15%) 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 2.1 million acre-feet in total to be stored for future use.

Colorado River Commission of Nevada

Hydrology and Water Use Update

Warren Turkett

October 12, 2021

Summary

Lake Powell

- Water Year 2021[1] had one of the lowest runoffs in recorded history.
- Unregulated inflow for water year 2021 was 33% of average.
- Upper Basin cumulative precipitation was 82% of the seasonal average.

Lake Mead

- Lake Mead is forecasted to decrease about 1 foot in elevation by the end of calendar year 2021.
- In calendar year 2022, there will be a Tier 1 shortage under the 2007 Guidelines and required DCP contributions for Nevada and Arizona.

Nevada Water Supply

- Southern Nevada has about 9 years of water supply banked. [2]
- **In 2020, Southern Nevada used 44,432 af less than our annual allocation.**

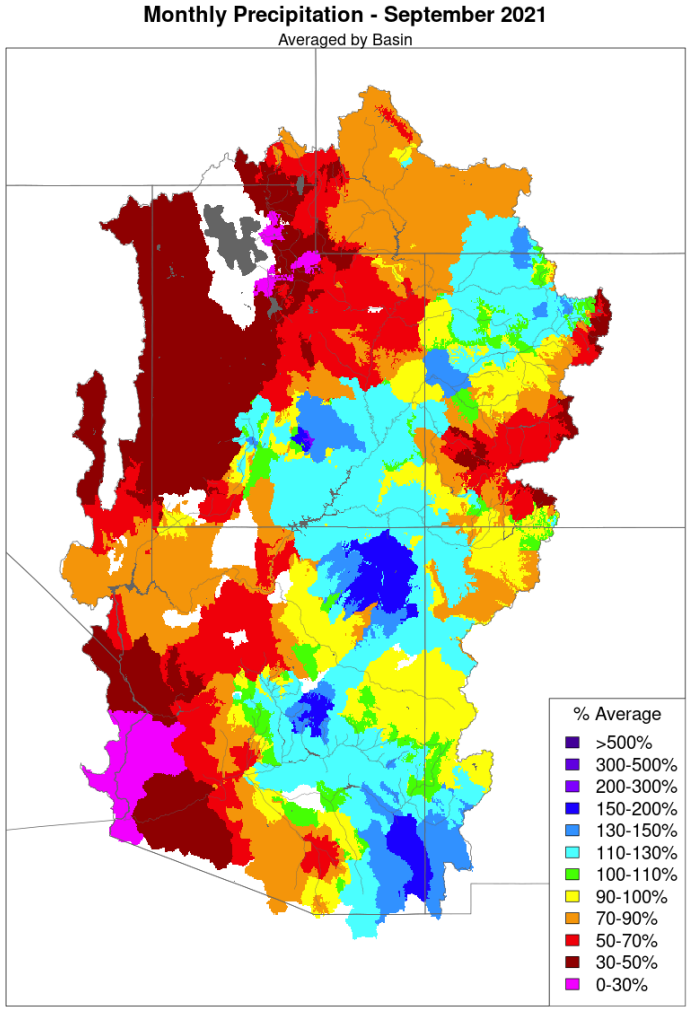
Storage	Elevation (f)	% Capacity	Change since last year
Lake Mead	1,067.4	34%	-15.7 ft
Lake Powell	3,545.1	30%	-49.2 ft

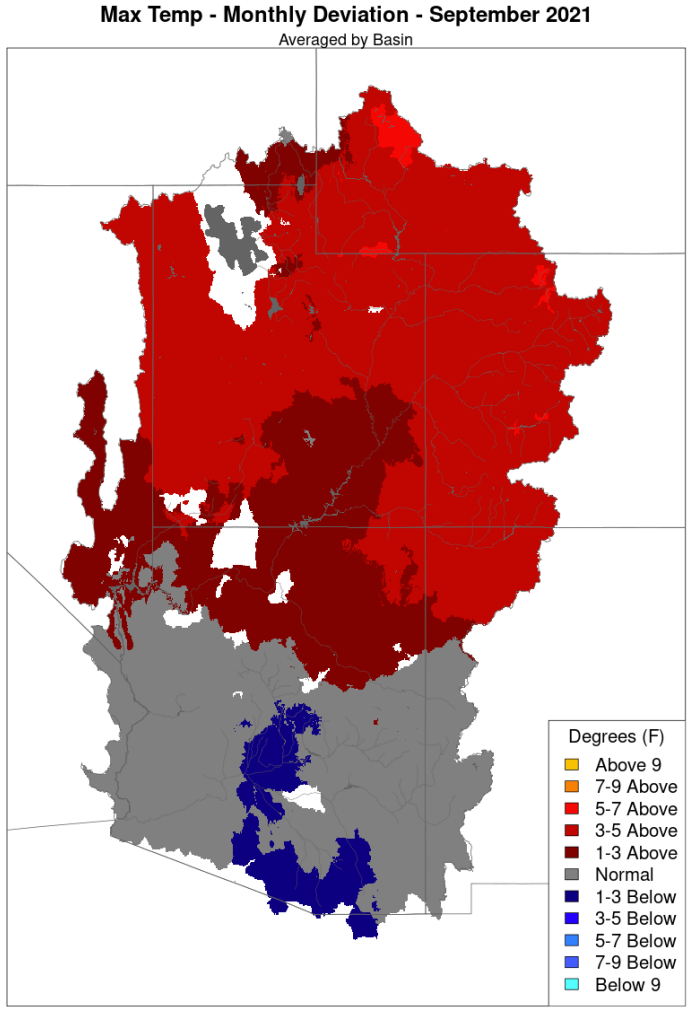
Data retrieved October 12, 2021.

[1] Water year is defined as October through September.

[2] Based on 2020 consumptive use and storage volumes through 2020.

Precipitation and Temperature





Above Lake Powell August precipitation: 77%

Above Lake Powell water year 2021 cumulative precipitation: 82%

Unregulated Inflow, Current and Projected Reservoir Status

Projected unregulated inflow to Lake Powell	Acre-Feet	% Average
Water Year 2022	7,400,000	68%
April thru July 2022	5,170,000	72%

Reservoir	Current Elevation	Current Storage Acre-Feet	Current % Capacity	Projected Elevation on 1/1/2022[1]
Lake Mead	1,067.4	8,995,000	34%	1,066.1
Lake Powell	3,545.1	7,242,000	30%	3,536.6

Data retrieved October 12, 2021

[1] Based on Reclamation's September 2020 24 Month Study Most Probable Inflow.

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

Total Volumes (kaf)

2022 Reductions + Contributions

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 - 1050	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***

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.

Water Use In Southern Nevada

Southern Nevada Water Use	2020 Actual Use in Acre-Feet
Nevada Annual Allocation	300,000
Diversion	478,969
Return Flows	223,401
Consumptive Use	255,568
Unused Allocation Available for Banking	44,432 (15%)

Southern Nevada Water Use	Diversions	Return Flows	Consumptive Use
January – August 2021	336,296	156,308	179,988

Banked Water (through end of 2020)	Acre-Feet
Ground Water Recharge in So. Nevada	357,643
Banked in Lake Mead	865,741
Banked in California and Arizona	944,071
Total	2,167,455