

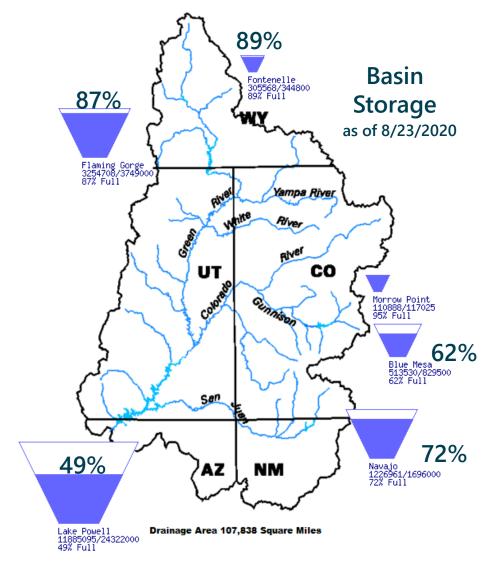
Glen Canon Monthly Operations Call

Basin Hydrology and Operations

August 25, 2020

B B

Upper Basin Storage



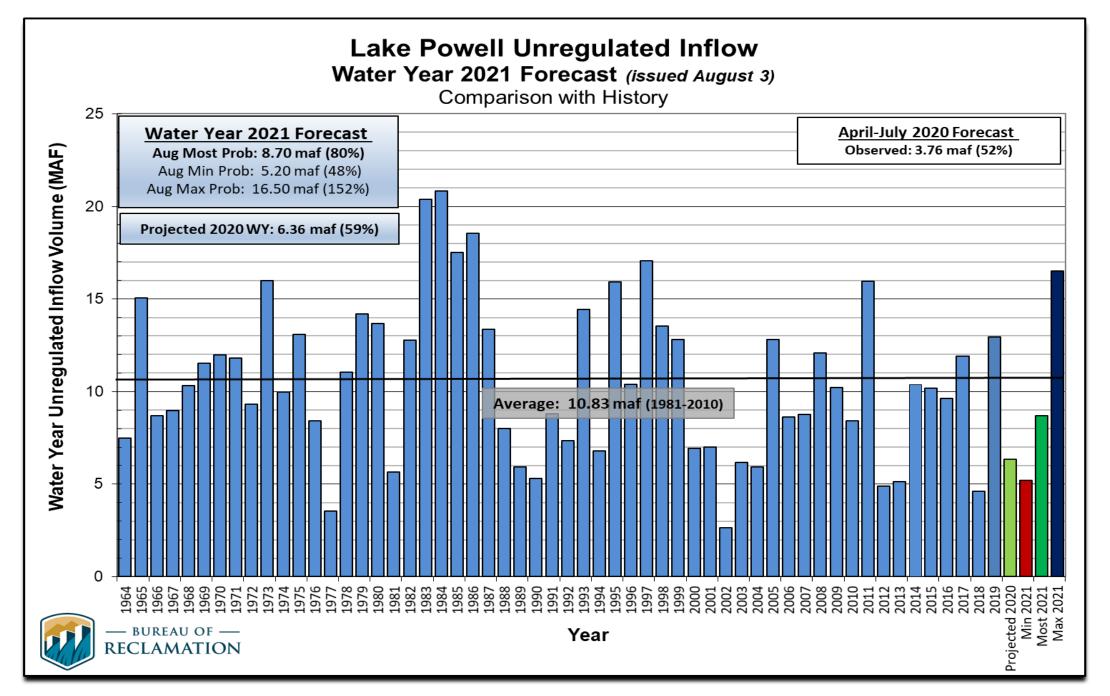
Observed 2020 April – July Unregulated Inflow

as of August 17, 2020

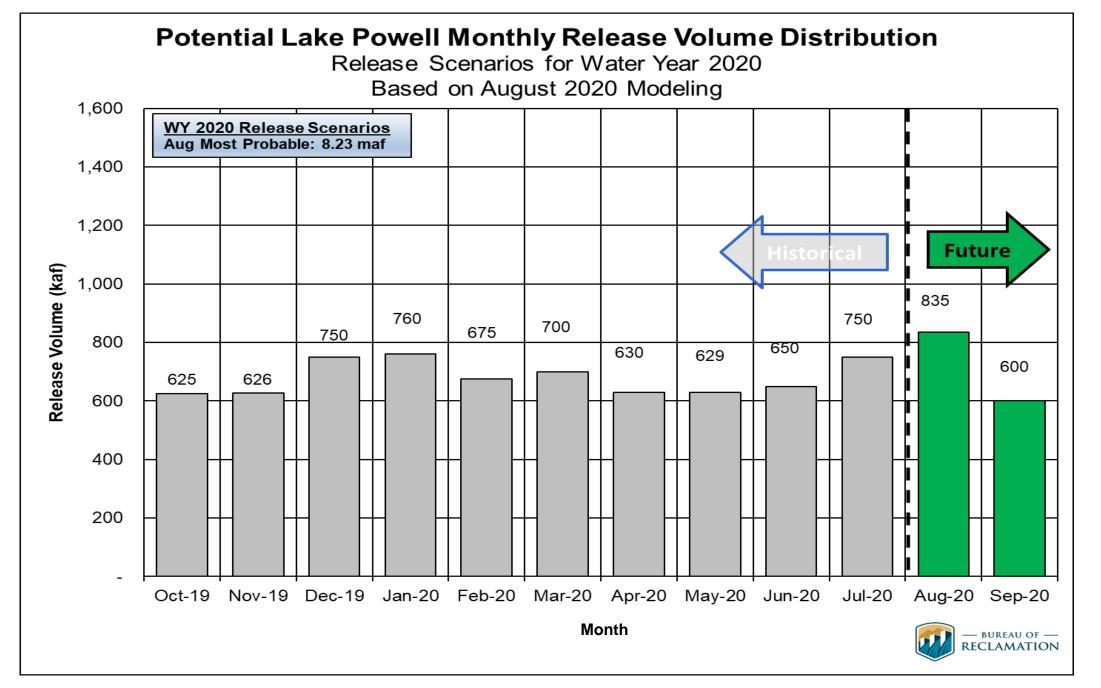
Reservoir	Preliminary Observed (kaf)	Percent of Average ¹		
Fontenelle	677	93		
Flaming Gorge	833	85		
Blue Mesa	388	57		
Navajo	347	47		
Powell	3,758	52		

¹ Percent of average based on the period of record from 1981-2010.











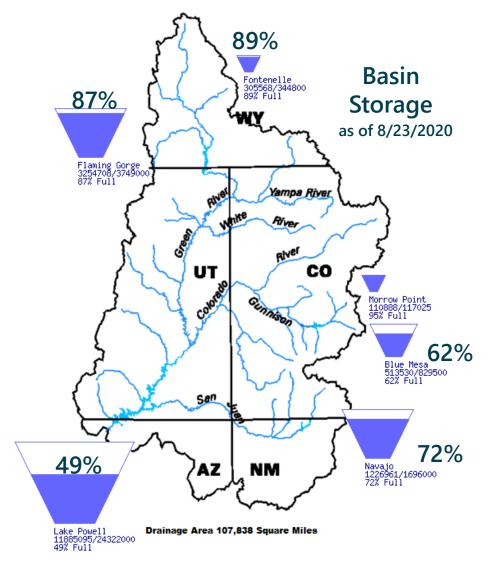


August 24-Month Study Projections Upper Colorado Basin Region Operations



B

Upper Basin Storage



Water Year 2021 Forecasted Unregulated Inflow

as of August 3, 2020

Reservoir	Preliminary Observed (kaf)	Percent of Average ¹		
Fontenelle	970	90		
Flaming Gorge	1.275	88		
Blue Mesa	820	89		
Navajo	850	81		
Powell	8,700	80		

¹ Percent of average based on the period of record from 1981-2010.



Timing of Operational Decisions

- <u>August 24-Month Study</u> projections of January 1 elevations sets the operating tiers for Lake Powell and Lake Mead
- When Lake Powell is in Upper Elevation Balancing Tier, April 24-Month Study projections of September 30 elevations may result in an adjustment to Powell's operations



Lake Powell & Lake Mead Operational Table

Operational Tiers for Water/Calendar Year 2021¹

	Lake Powell		Lake Mead				
Elevation (feet)	Operation According to the Interim Guidelines	Live Storage (maf) ¹	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	1,220	Flood Control Surplus or Quantified Surplus Condition Deliver > 7.5 maf	25.9 22.9		
3,636 - 3,666 (2008-2026)	Upper Elevation Balancing Tier ³ Release 8.23 maf;	15.5 - 19.3 (2008-2026)	(approx.) ²	Domestic Surplus or ICS Surplus Condition Deliver > 7.5 maf	(approx.) ²		
	Jan 1, 2021 if Lake Mead < 1,075 feet, balance contents with a min/max release of 7.0 and 9.0 maf		1,145 1,105	Normal or ICS Surplus Condition Deliver ≥ 7.5 maf 1,085.28 ft	15.9 11.9		
3,575	Mid-Elevation Release Tier Release 7.48 maf; if Lake Mead < 1,025 feet,	9.5	1,075	Jan 1, 2021 projection	9.4		
			1,050	Shortage Condition Deliver 7.167 ⁴ maf	7.5		
3,525	release 8.23 maf	5.9	,,,,,	Shortage Condition Deliver 7.083 ⁵ maf			
	Lower Elevation		1,025	Objective Constitution	5.8		
3,490	Balancing Tier Balance contents with a min/max release of 7.0 and 9.5 maf	4.0	1,000	Shortage Condition Deliver 7.0 ^s maf Further measures may be undertaken ⁷	4.3		
3,370		0	895		0		

Diagram not to scale

Acronym for million acre-fee

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.



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.

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

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

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

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

B. Upper Elevation Balancing Tier

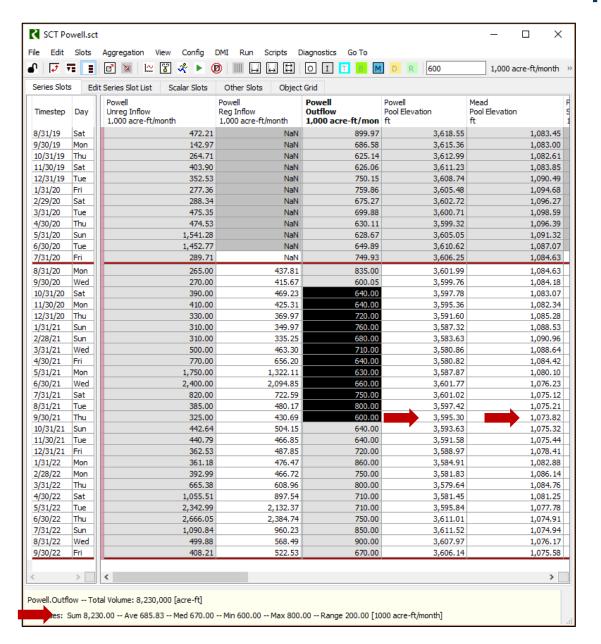
- In Water Years when the projected January 1 Lake Powell elevation is below the elevation stated in the Lake Powell Equalization Elevation Table and at or above 3,575 feet, the Secretary shall release 8.23 maf from Lake Powell if the projected January 1 Lake Mead elevation is at or above 1,075 feet.
- 2. If the projected January 1 Lake Powell elevation is below the elevation stated in the Lake Powell Equalization Elevation Table and at or above 3,575 feet and the projected January 1 Lake Mead elevation is below 1,075 feet, the Secretary shall balance the contents of Lake Mead and Lake Powell, but shall release not more than 9.0 maf and not less than 7.0 maf from Lake Powell in the Water Year.
- 3. When operating in the Upper Elevation Balancing Tier, if the April 24-Month Study projects the September 30 Lake Powell elevation to be greater than the elevation in the Lake Powell Equalization Elevation Table, the Equalization Tier will govern the operation of Lake Powell for the remainder of the Water Year (through September).
- 4. When operating under Section 6.B.1, if the April 24-Month Study projects the September 30 Lake Mead elevation to be below 1,075 feet and the September 30 Lake Powell elevation to be at or above 3,575 feet, the Secretary shall balance the contents of Lake Mead and Lake Powell, but shall release not more than 9.0 maf and not less than 8.23 maf from Lake Powell in the Water Year.
- 5. When Lake Powell is projected to be operating under Section 6.B.2. and more than 8.23 maf is projected to be released from Lake Powell during the upcoming Water Year, the Secretary shall recalculate the August 24-Month Study projection of the January 1 Lake Mead elevation to include releases above 8.23 maf that are scheduled to be released from Lake Powell during the months of October, November, and December of the upcoming Water Year, for the purposes of determining Normal or Shortage conditions pursuant to Sections 2.A. or 2.D. of these Guidelines.

August Determination

April Determination



Official WY 2021 Operations Run



Water Year 2021

Based on Tier Determination Run: Start with Powell Release = 8.23 maf

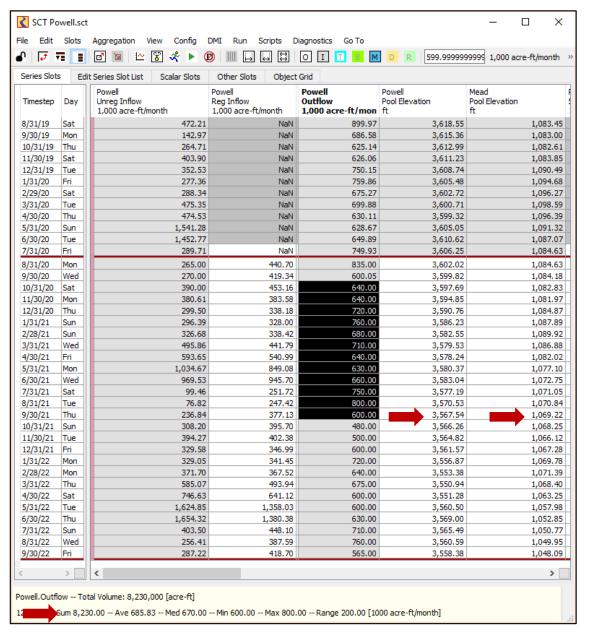
Operating under Upper Elevation Balancing Tier

August run shows an April adjustment to Balancing (6.B.4)

WY2021 Projected Release = 9.0 maf



Minimum Probable WY 2021 Operations Run



Water Year 2021

Based on Tier Determination Run: Start with Powell Release = 8.23 maf

Operating under Upper Elevation Balancing Tier

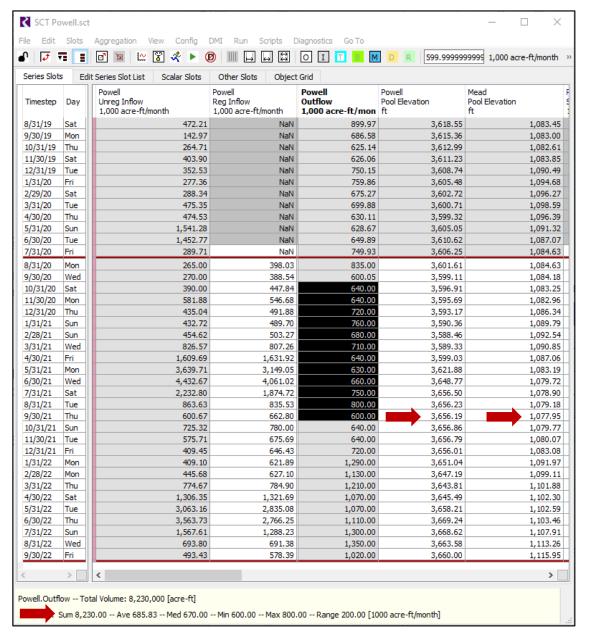
August run shows Powell elevation on September 30, 2021 below 3,575 ft and Mead below 1,075 ft.

No April adjustment to Balancing (6.B.1)

WY2021 Projected Release = 8.23 maf



Maximum Probable WY 2021 Operations Run



Water Year 2021

Based on Tier Determination Run: Start with Powell Release = 8.23 maf

Operating under Upper Elevation Balancing Tier

August run shows Powell elevation on September 30, 2021 above 3,575 ft and below Equalization elevation of 3,659 ft (2021), and Mead above 1,075 ft.

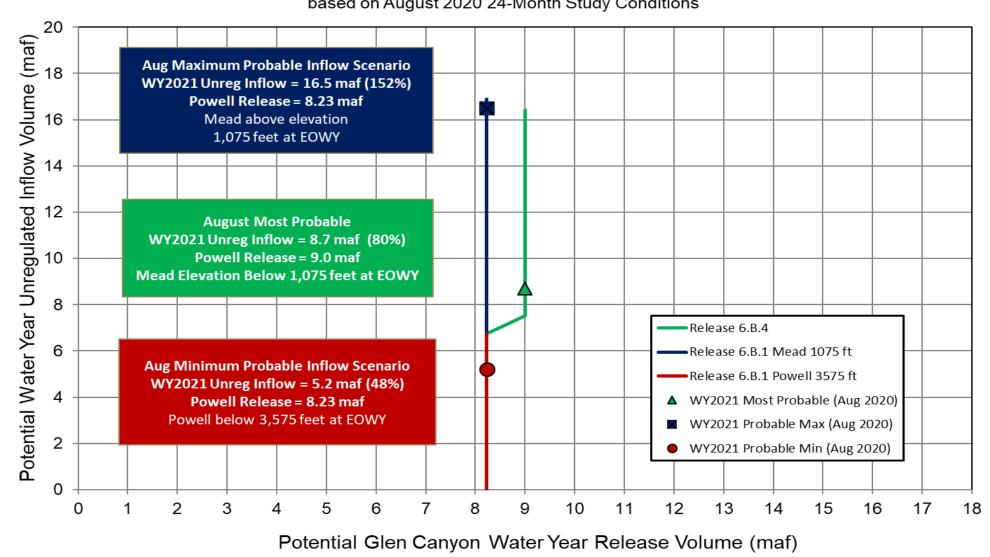
No April adjustment to Balancing (6.B.1)

WY2021 Projected Release = 8.23 maf

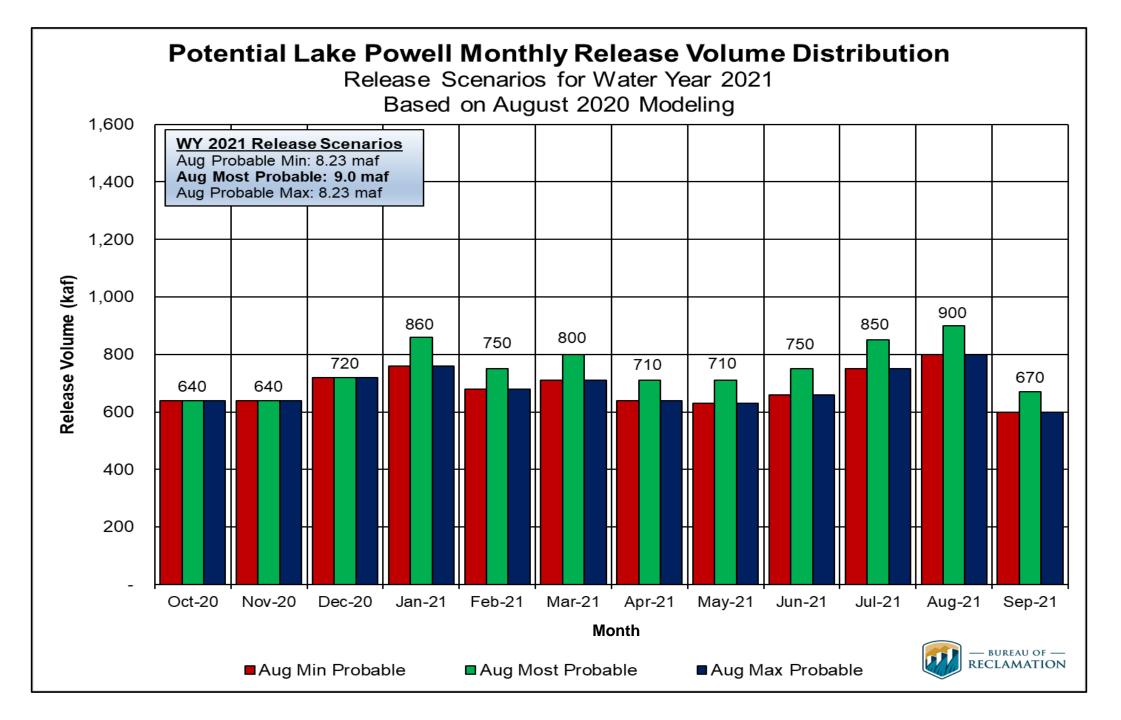


Lake Powell Release Scenarios under Section 6.B

Water Year 2021 Release Volume as a Function of Upper Elevation Balancing Tier based on August 2020 24-Month Study Conditions



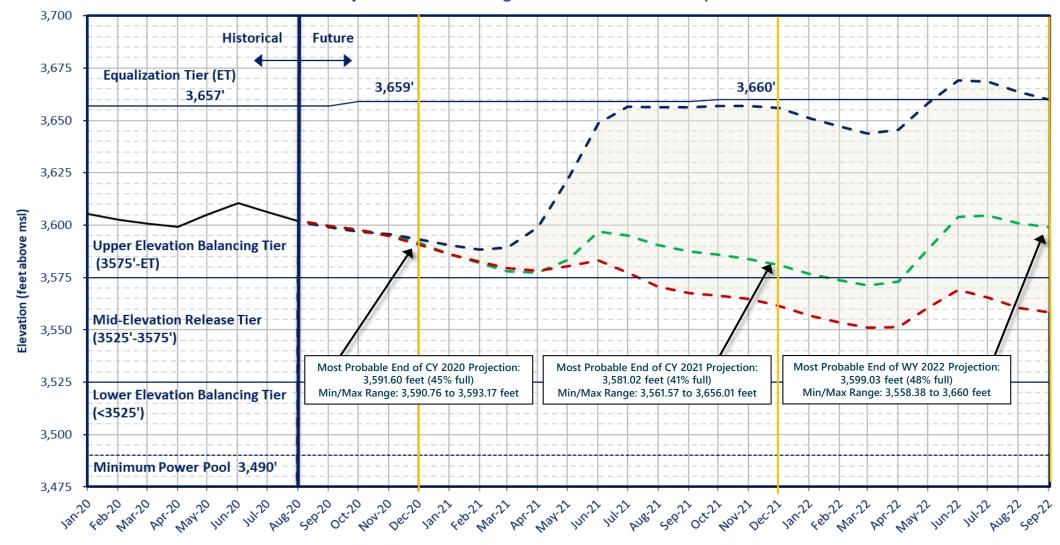






Lake Powell End of Month Elevations

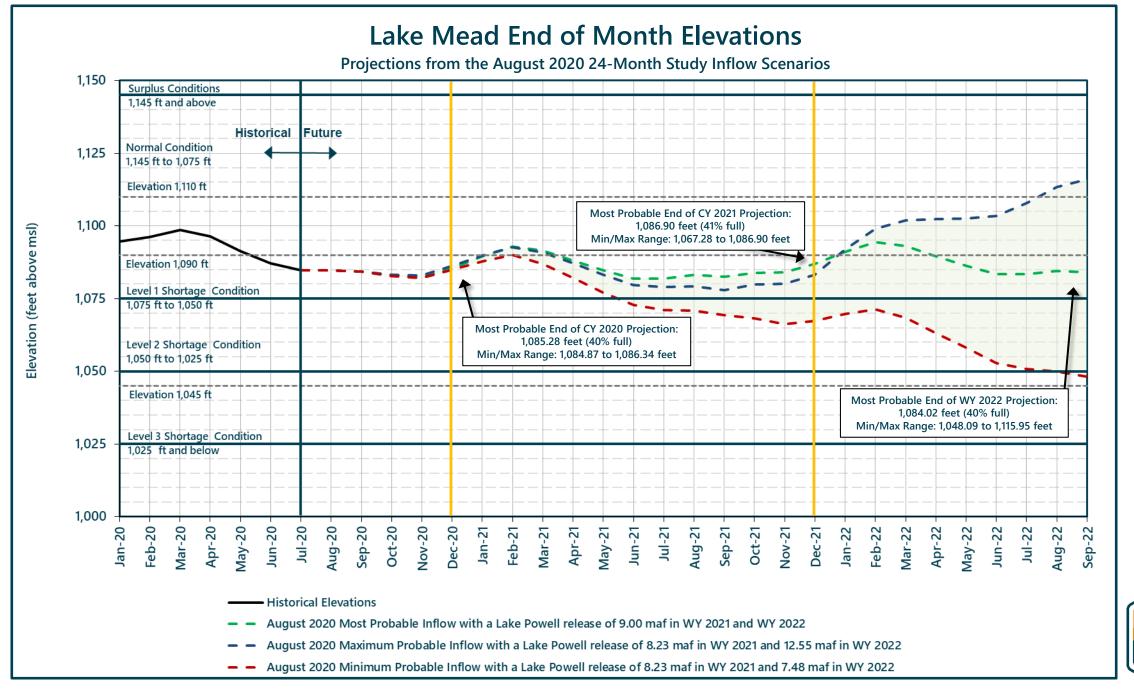
Historic and Projected based on August 2020 24-Month Study Inflow Scenarios



- Aug 2020 Most Probable Lake Powell release of 8.23 maf in WY2020, 9.0 maf in WY2021 and 9.0 maf in WY2022
- Aug 2020 Max Probable Lake Powell release of 8.23 maf in WY2020, 8.23 maf in WY2021 and 12.55 maf in WY2022
- Aug 2020 Min Probable Lake Powell release of 8.23 maf in WY2020, 8.23 maf in WY2021 and 7.48 maf in WY2022
- Historical Elevations









Glen Canyon Power Plant Planned Unit Outage Schedule for Water Year 2020

Unit Number	Oct 2019	Nov 2019	Dec 2019	Jan 2020	Feb 2020	Mar 2020	Apr 2020	May 2020	Jun 2020	Jul 2020	Aug 2020	Sep 2020	
1													
2													
3													
4													
5													
6													
7													
8													
Units Available	5	6	6	6	6	5	6	6	6	6	6	6/5	
Capacity (cfs)	16,800	20,500	20,400	20,400	20,300	16,500	20,200	20,400	20,600	20,400	20,200	20,200 /16,500	AUG MOST ³
Capacity (kaf/month)	1,060	1,160	1,420	1,250	1,180	1,100	1,210	1,300	1,390	1,670	1,240	980	AUG MAX
Max (kaf) ²	625	625	750	760	675	700	630	630	650	750	835	600	8.23
Most (kaf) 1	625	625	750	760	675	700	630	630	650	750	835	600	8.23
Min (kaf) ²	625	625	750	760	675	700	630	630	650	750	835	600	8.23
											(updated 0	8-18-2020)	

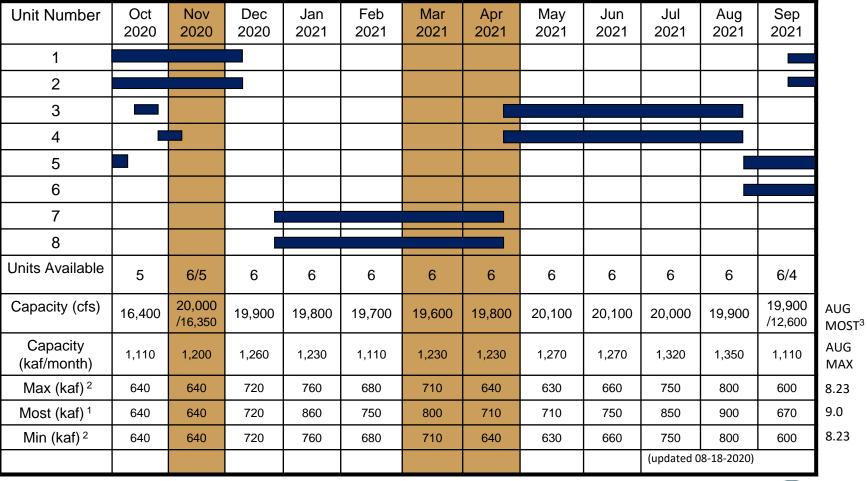
1 Projected release, based on August 2020 MOST Probable Inflow Projections and 24-Month Study model runs



² Projected release, based on August 2020 Min and Max Probable Inflow Projections and 24-Month Study model runs

^{3 *}Dependent upon availability to shift reserves

Glen Canyon Power Plant Planned Unit Outage Schedule for Water Year 2021

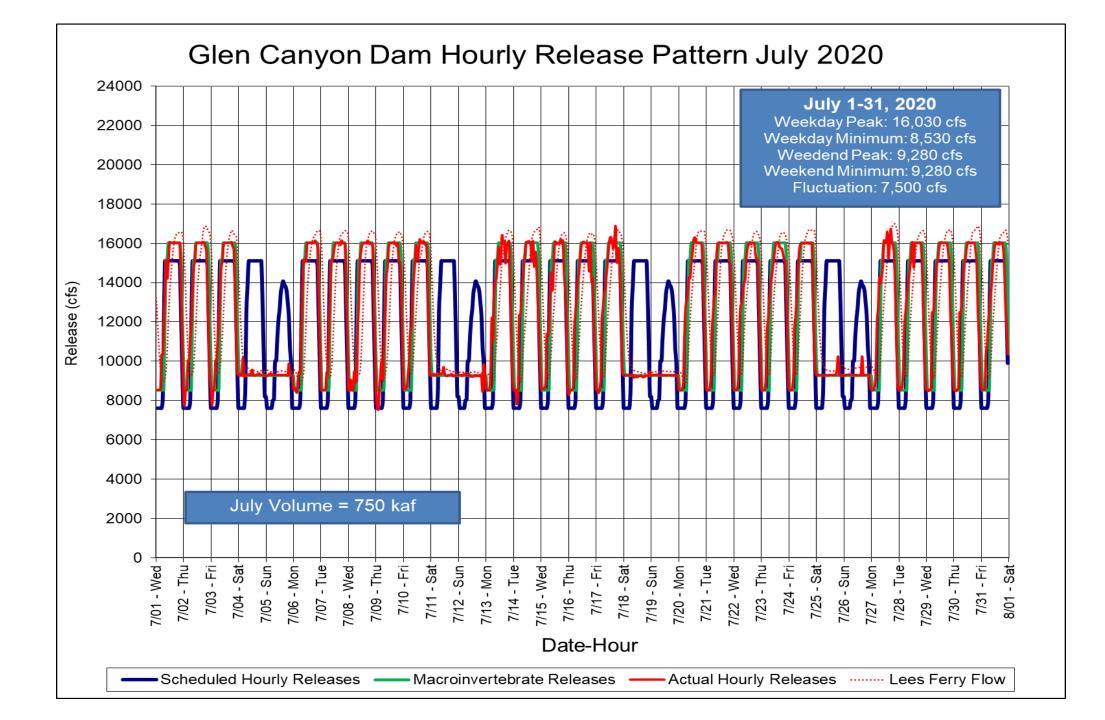


¹ Projected release, based on August 2020 Most Probable Inflow Projections and 24-Month Study model runs

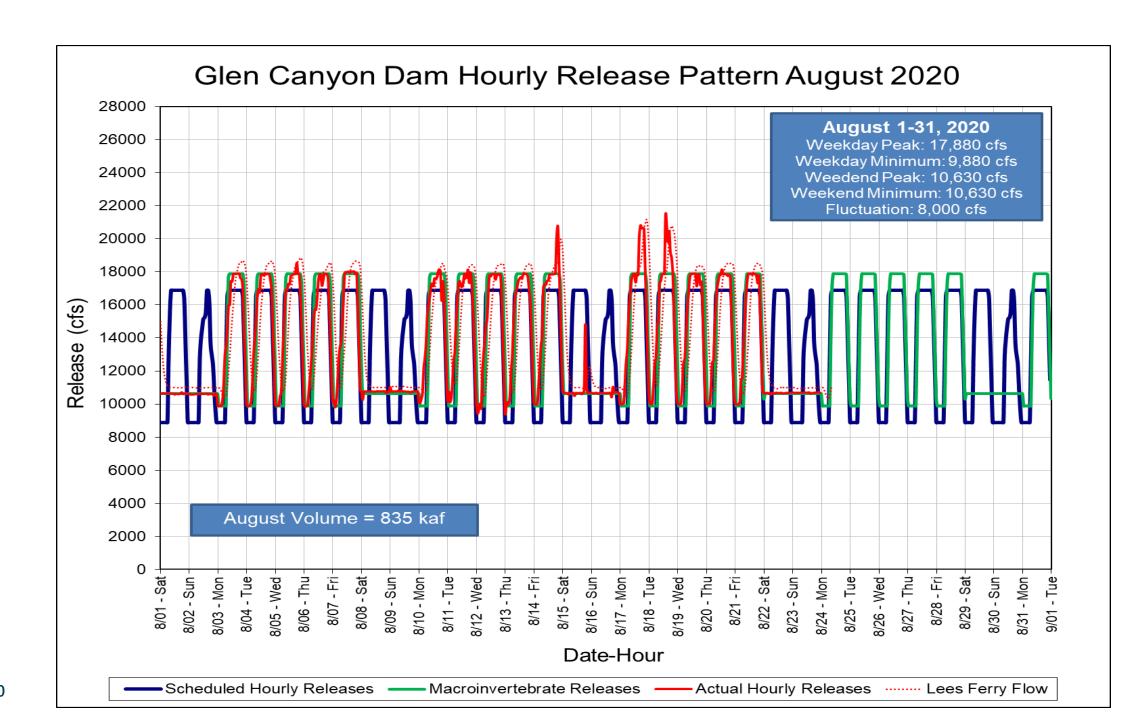


² Projected release, based on August 2020 Min and Max Probable Inflow Projections and 24-Month Study model runs

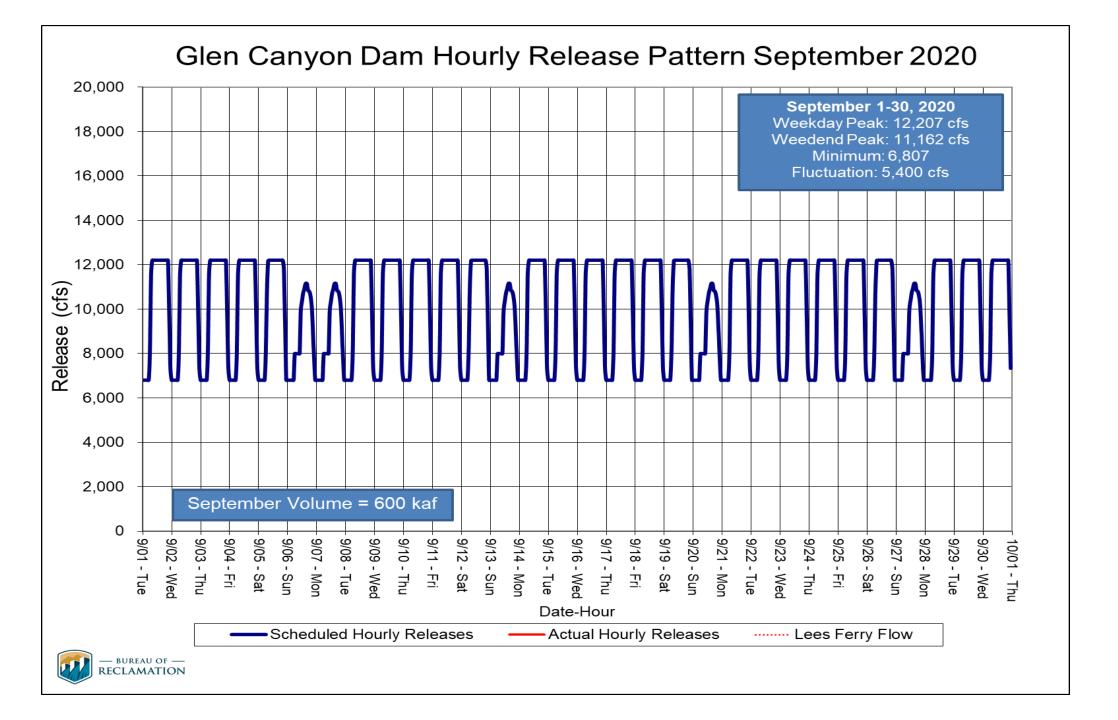
³ Dependent upon availability to shift reserves





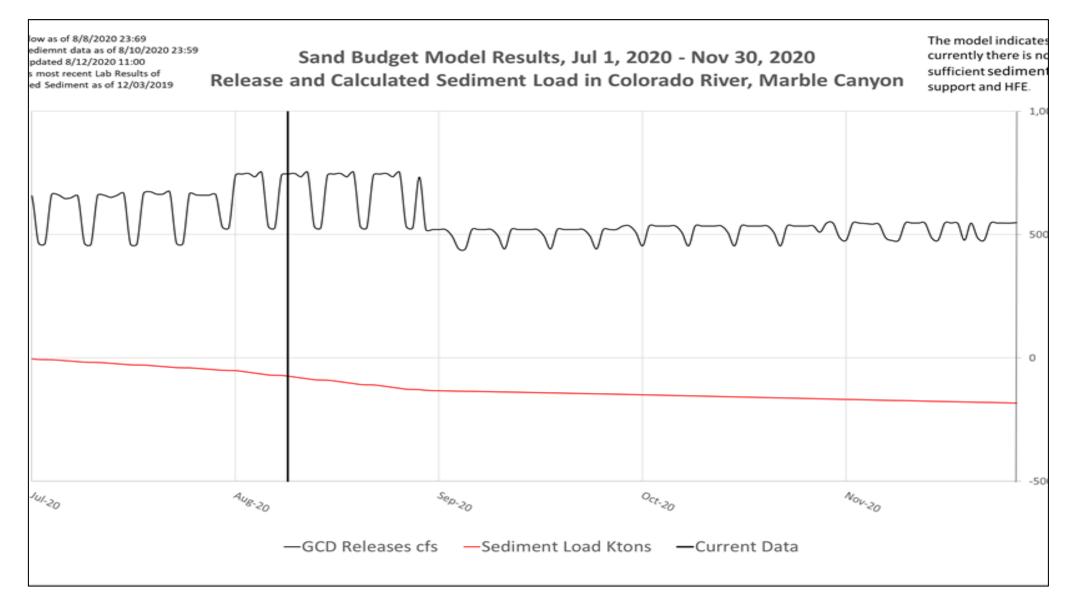




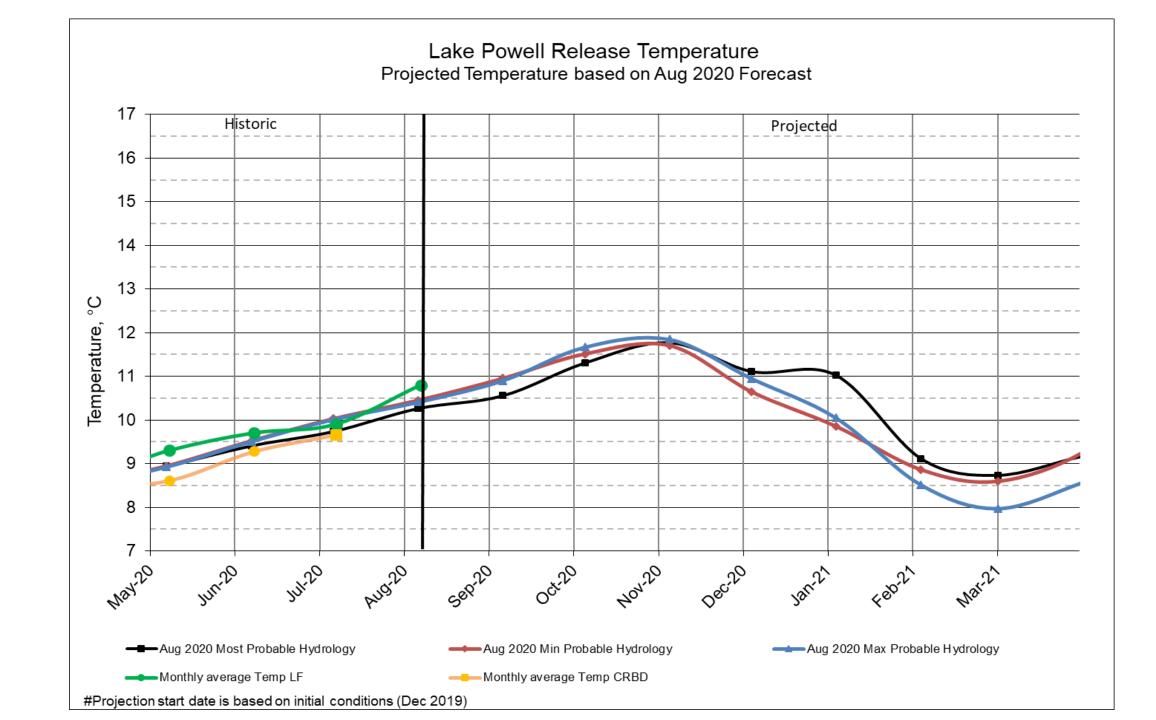


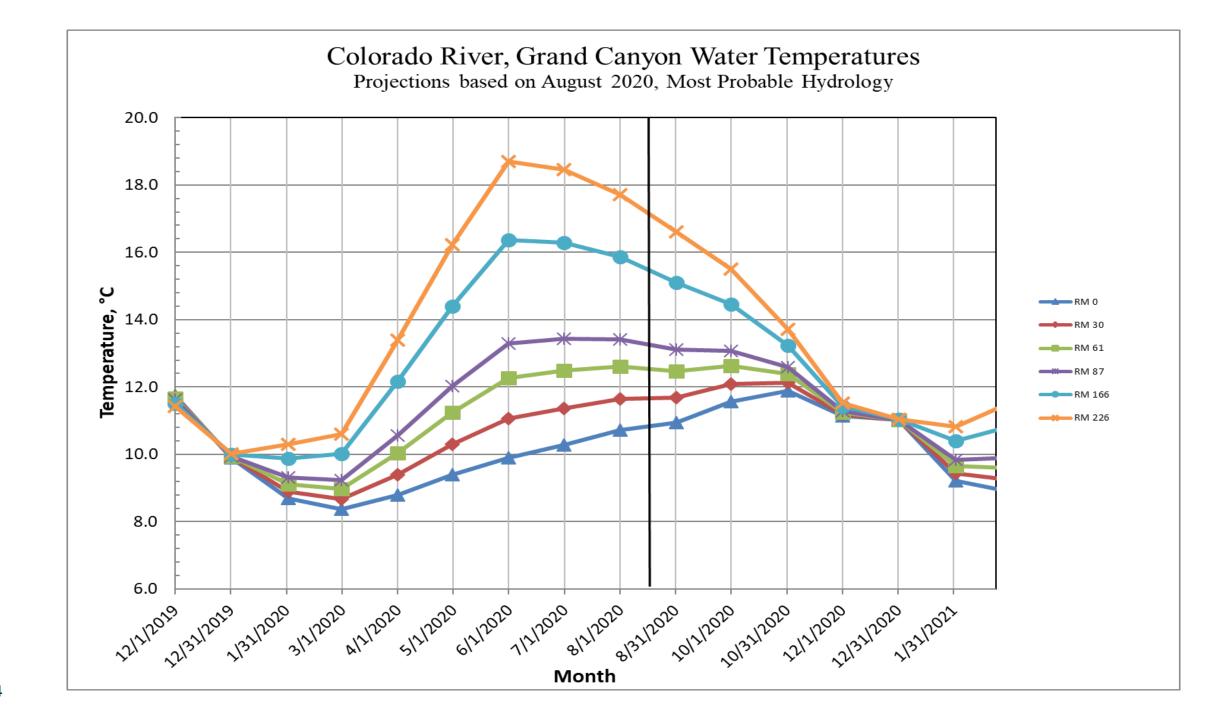


HFE Sand Budget Model Results

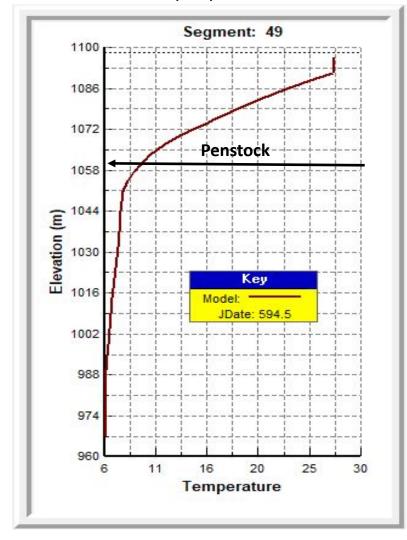




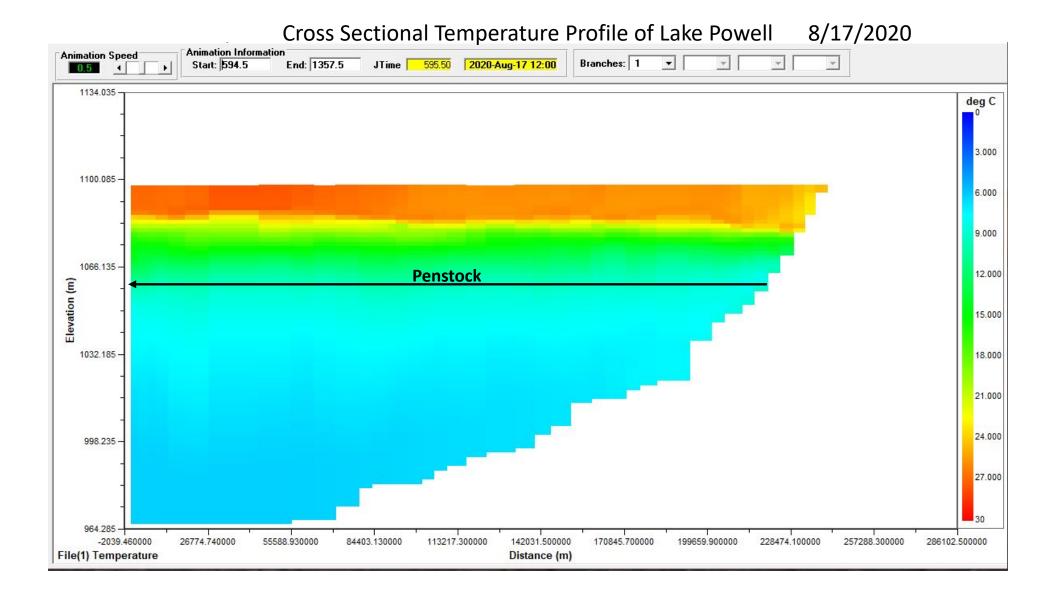




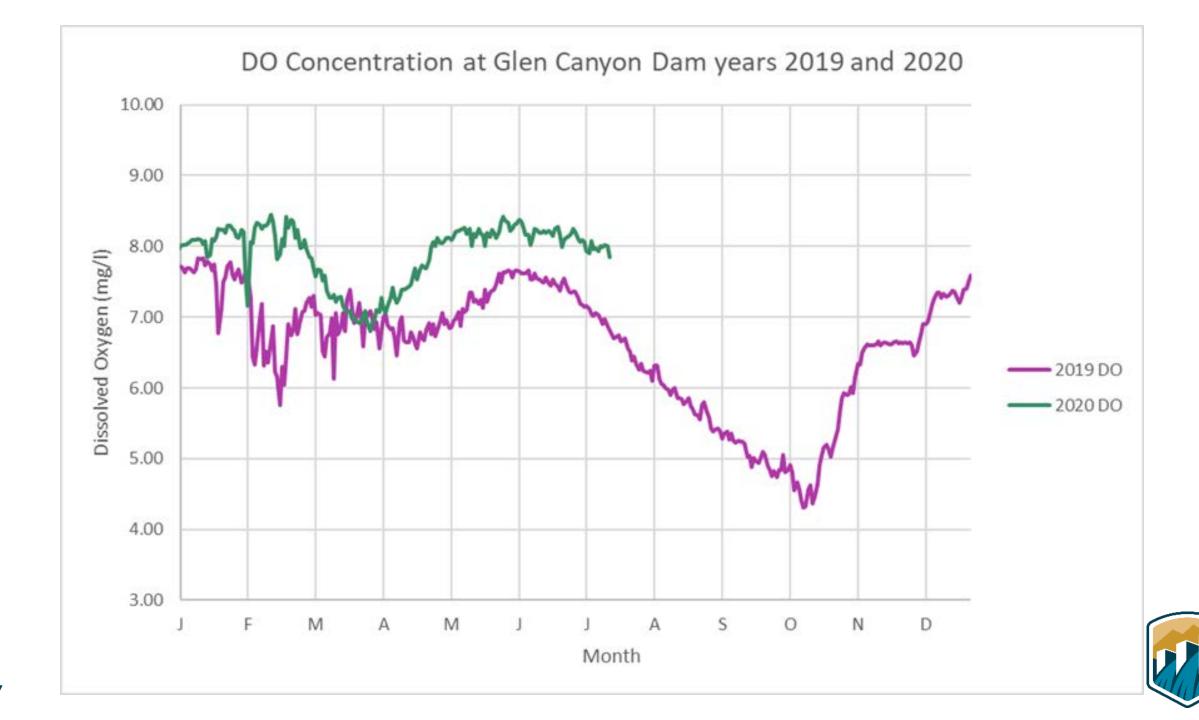
Temperature Profile of Lake Powell near GC Dam 8/17/2020



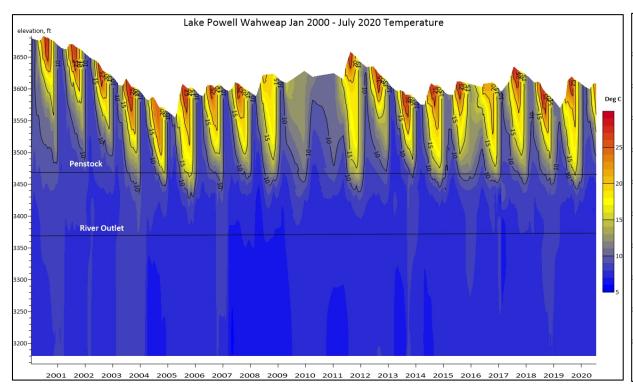


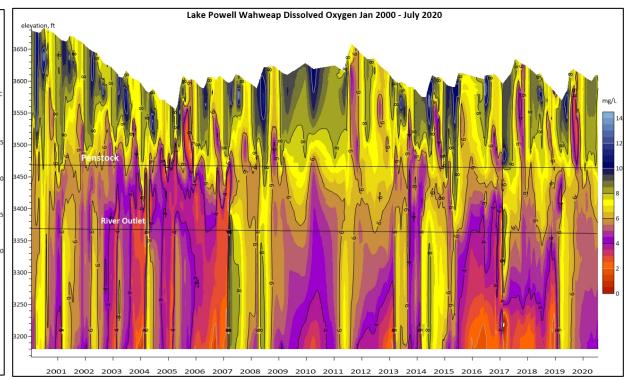






Temp and Dissolved Oxygen at Wahweap







Temp and Dissolved Oxygen at Wahweap

