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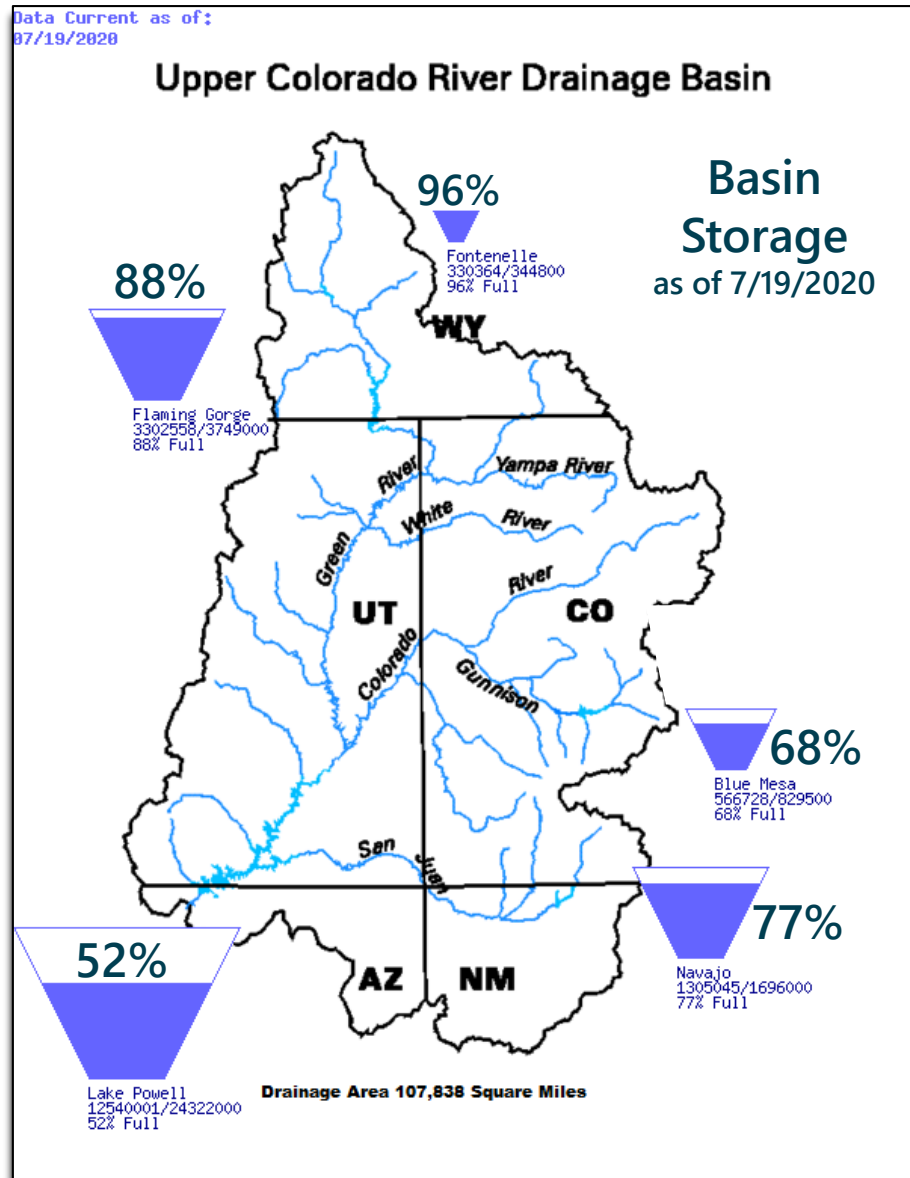
Glen Canyon Monthly Hydrology and Operations Update

July 22, 2020

Heather E. Patno

Hydraulic Engineer

Upper Basin Storage



2020 April – July Unregulated Inflow Forecast

as of July 15, 2020

Reservoir	Forecast (kaf)	Percent of Average ¹
Fontenelle	670	92
Flaming Gorge	825	84
Blue Mesa	382	57
Navajo	345	47
Powell	3,840	54

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

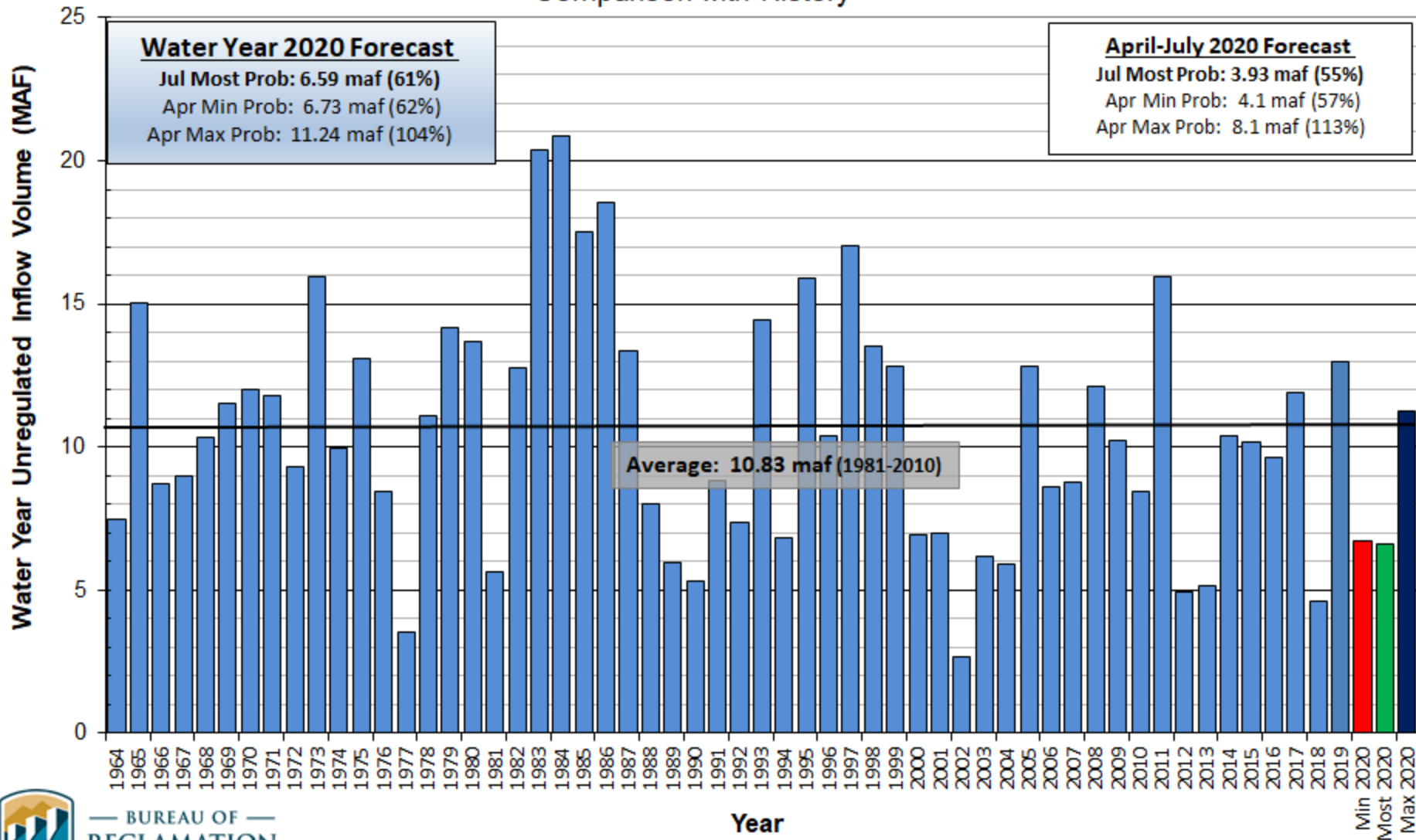
Available online at: www.usbr.gov/uc/water/basin/index.html



Lake Powell Unregulated Inflow

Water Year 2020 Forecast (issued July 1)

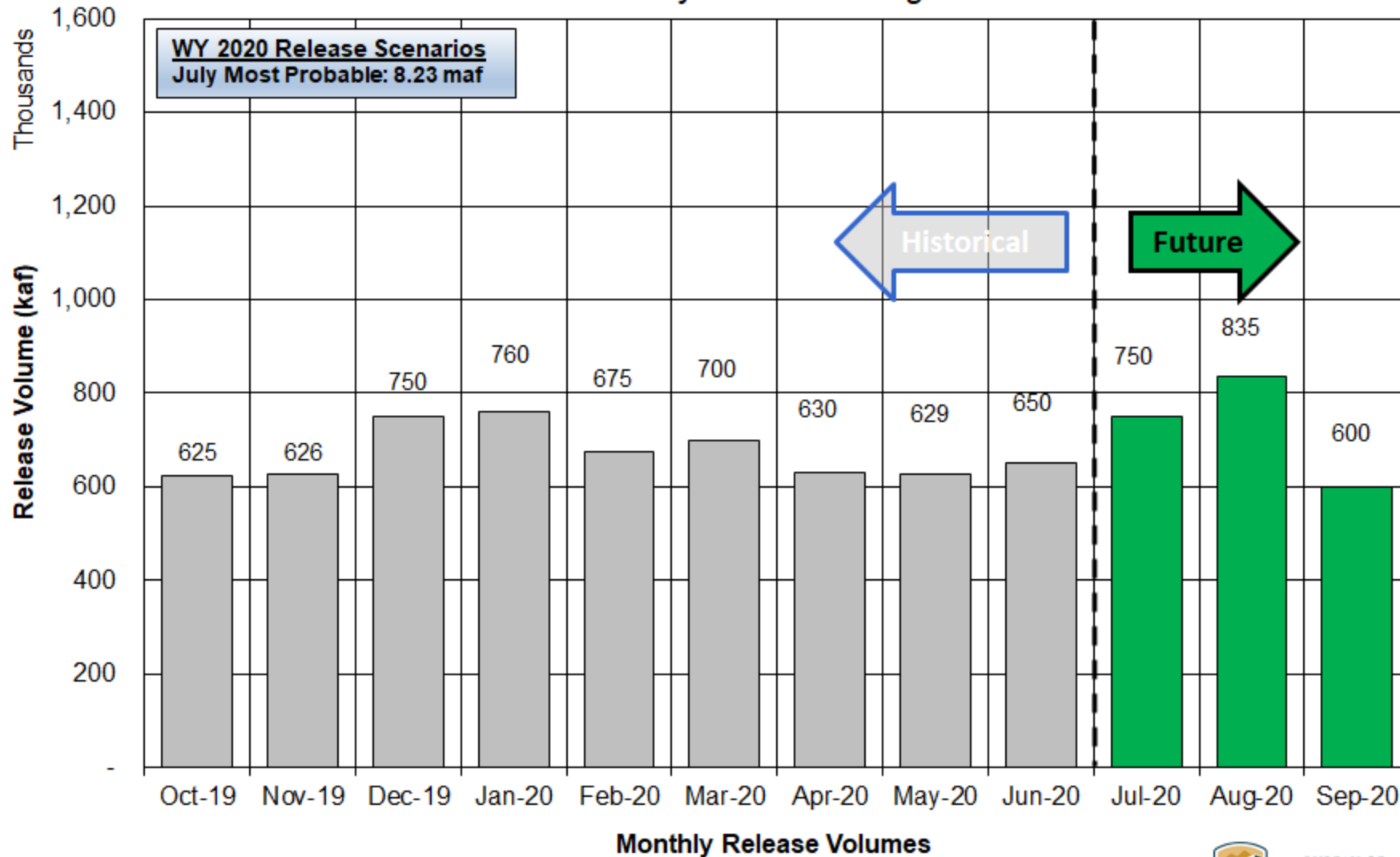
Comparison with History



Potential Lake Powell Monthly Release Volume Distribution

Release Scenarios for Water Year 2020

Based on July 2020 Modeling



Lake Powell WY 2021 Operating Tier Scenarios

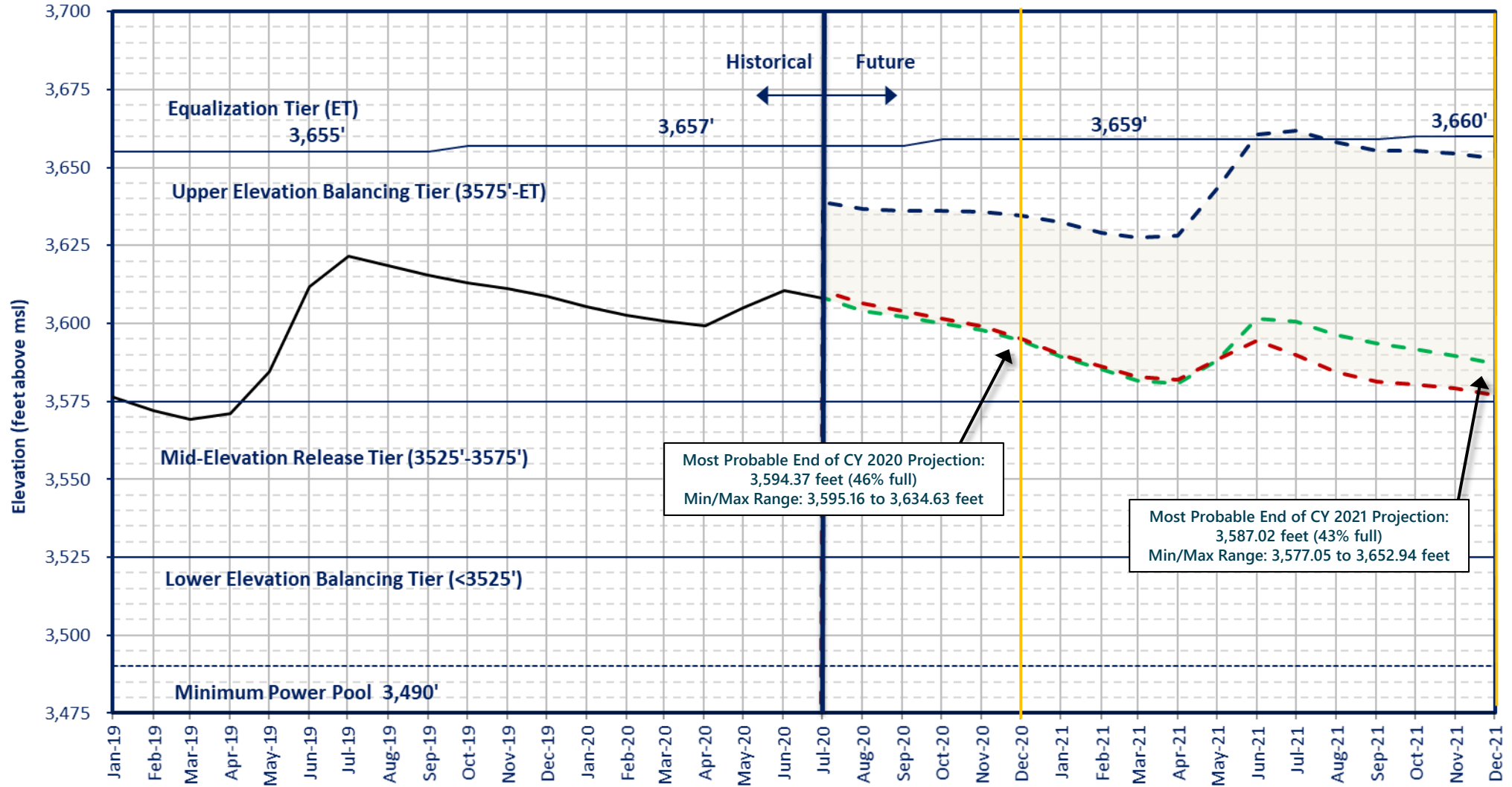
Based on April and June 2020 24-Month Study

Inflow Scenario	Operating Tier/ Release Volume
April Minimum Probable	Upper Elevation Balancing 9.00 maf
Jul Most Probable	Upper Elevation Balancing 9.00 maf
April Maximum Probable	Equalization 10.81 maf



Lake Powell End of Month Elevations

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



- July 2020 Most Probable - Lake Powell release of 8.23 maf in WY2020 and 9.0 maf in WY2021
- Apr 2020 Max Probable - Lake Powell release of 8.23 maf in WY2020 and 10.81 maf in WY2021
- Apr 2020 Min Probable - Lake Powell release of 8.23 maf in WY2020 and 9.0 in WY2021
- Historical Elevations

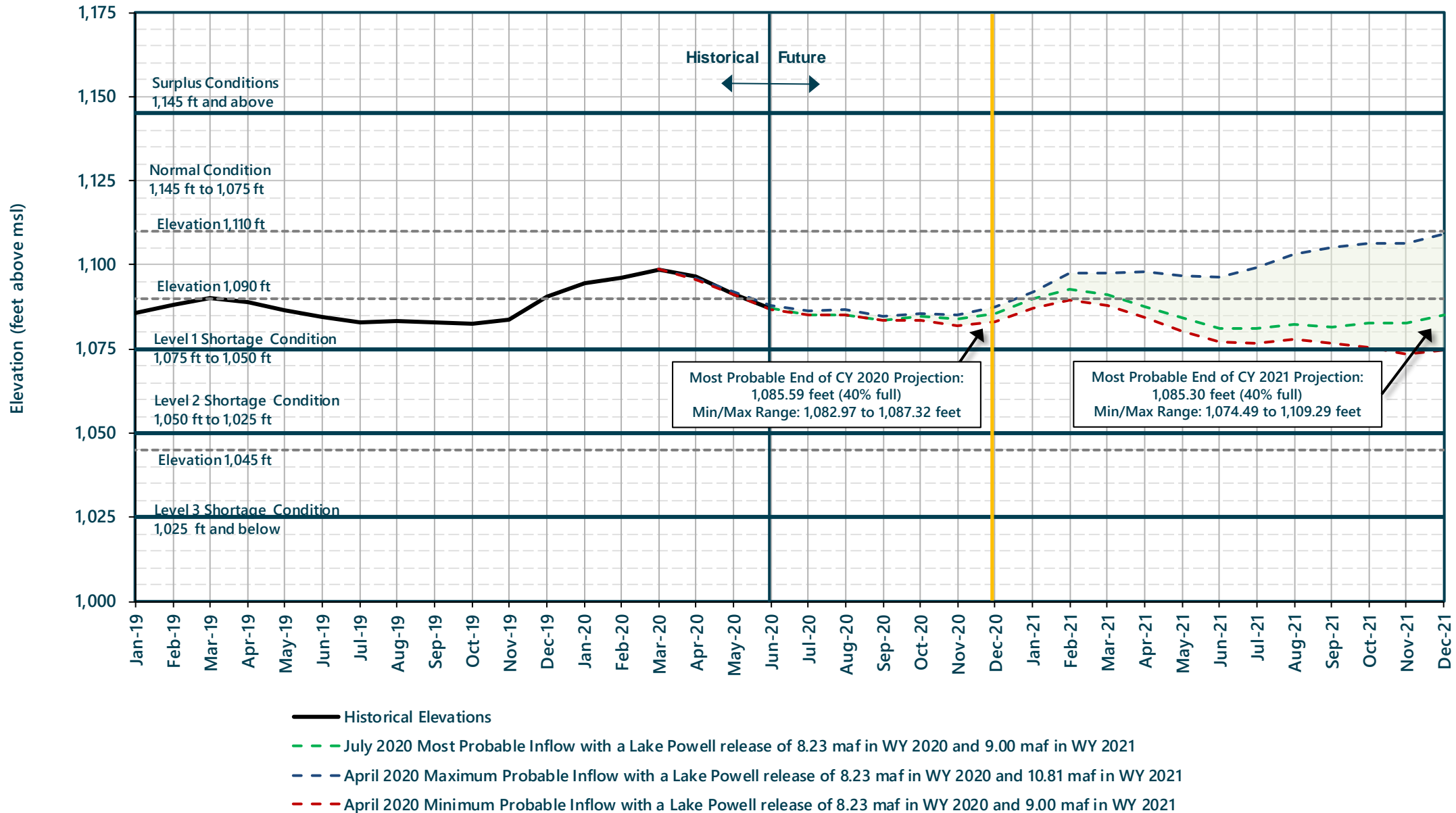


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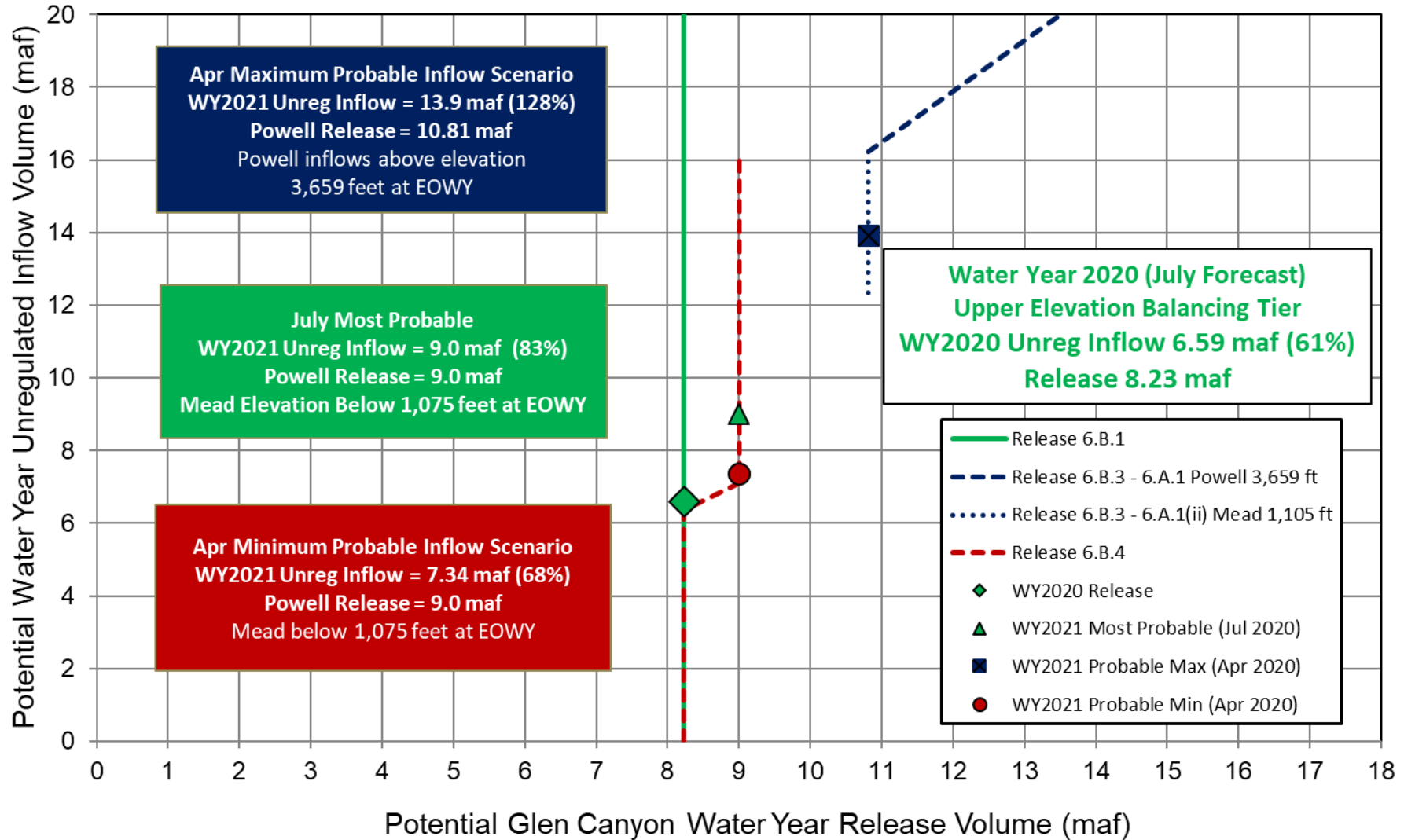
Lake Mead End of Month Elevations

Projections from the April and July 2020 24-Month Study Inflow Scenarios



Lake Powell Release Scenarios under Section 6.B

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



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	[Outage]											
2	[Outage]											
3												
4						[Outage]						
5												
6												
7												[Outage]
8												[Outage]
Units Available	5	6	6	6	6	5	6	6	6	6	6	6
Capacity (cfs)	16,800	20,500	20,400	20,400	20,300	16,500	20,200	20,400	20,600	20,400	20,300	20,300
Capacity (kaf/month)	1,060	1,160	1,420	1,250	1,180	1,100	1,210	1,300	1,390	1,670	1,380	1,210
Max (kaf) ²	625	625	750	760	675	700	630	630	650	750	835	599
Most (kaf) ¹	625	625	750	760	675	700	630	630	650	750	835	599
Min (kaf) ²	625	625	750	760	675	700	630	630	650	750	835	599

JULY MOST³
 APR MAX
 8.23
 8.23
 8.23

(updated 06-22-2020)

- 1 Projected release, based on July 2020 MOST Probable Inflow Projections and 24-Month Study model runs
- 2 Projected release, based on April 2020 Min and Max Probable Inflow Projections and 24-Month Study model runs
- 3 *Dependent upon availability to shift regulation and reserves



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

Unit Number	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021	Jul 2021	Aug 2021	Sep 2021
1												
2												
3												
4												
5												
6												
7												
8												
Units Available	4	6	6	6	6	6	6	6	6	6	6	6
Capacity (cfs)	12,800	20,200	20,100	20,000	19,800	19,800	19,700	19,900	20,300	20,200	20,100	20,100
Capacity (kaf/month)	1,310	1,270	1,290	1,290	1,160	1,310	1,240	1,300	1,280	1,360	1,350	1,310
Max (kaf) ²	640	640	720	860	970	920	1,030	910	960	1,110	1,170	877
Most (kaf) ¹	640	640	720	860	750	800	710	710	750	850	900	670
Min (kaf) ²	640	640	720	860	750	800	710	710	750	850	900	670
										(updated 06-22-2020)		

JULY MOST³
 APR MAX
 10.81
 9.0
 9.0

- 1 Projected release, based on July 2020 Most Probable Inflow Projections and 24-Month Study model runs
- 2 Projected release, based on April 2020 Min and Max Probable Inflow Projections and 24-Month Study model runs
- 3 Dependent upon availability to shift regulation and reserves

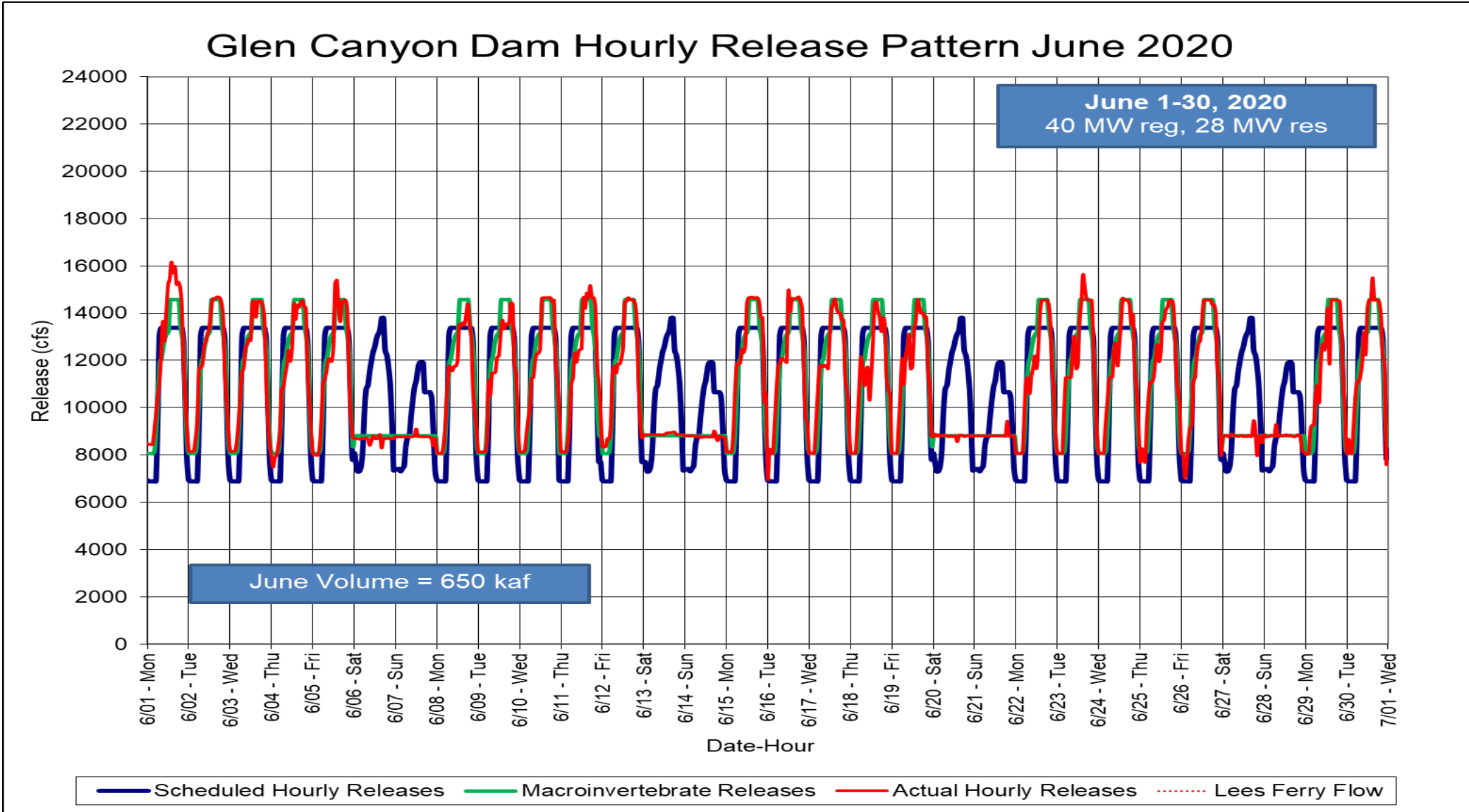


Bug Flow Hydrograph

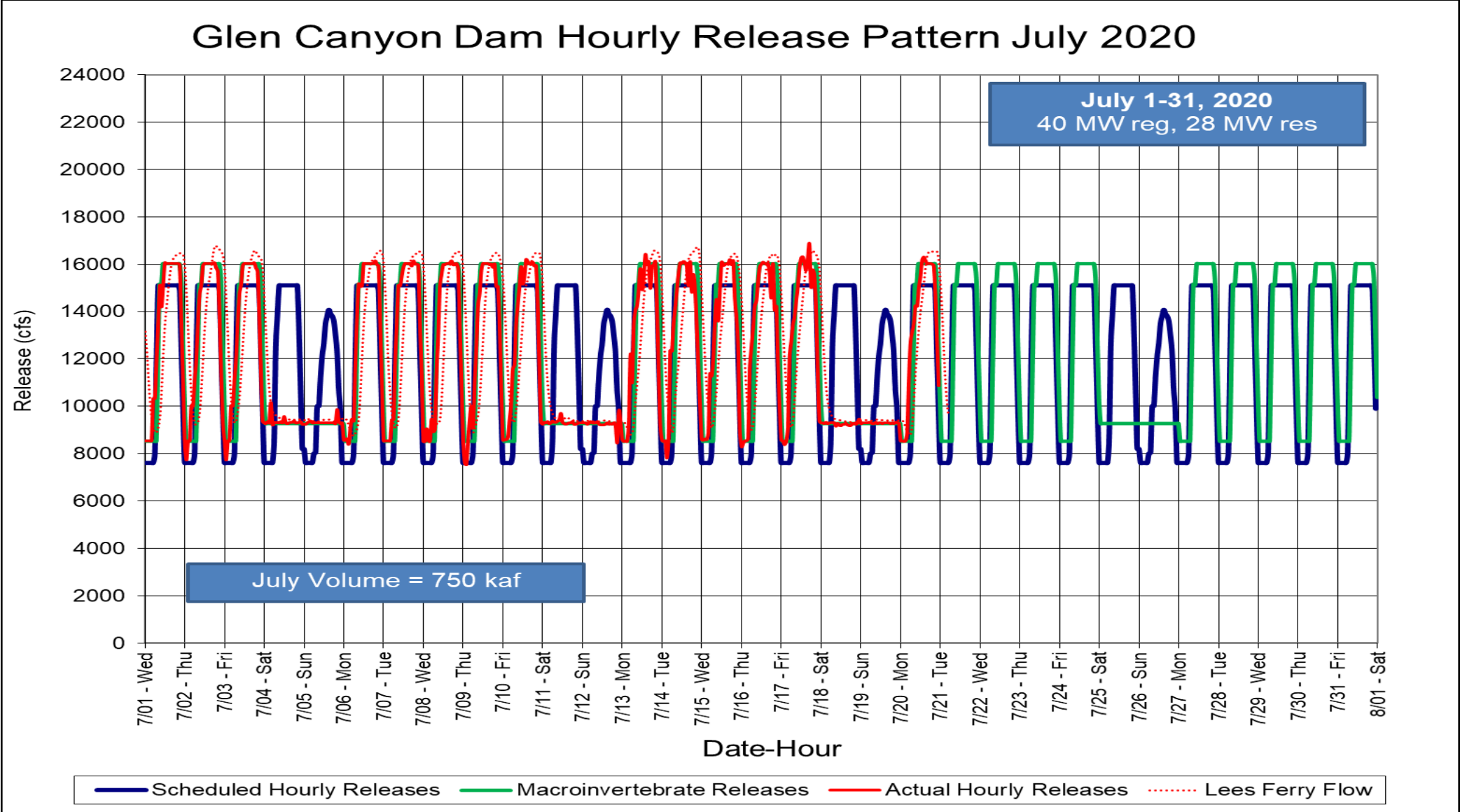
- Hydrograph characteristics:
 - Implement May 1 through August 31, 2020
 - Steady weekend lows, fluctuating weekday releases
 - Weekend lows 750 cfs higher than weekday lows
 - Weekly, monthly, and annual release volumes do not change
 - Hydropower reserves, regulation and emergency criteria remain in effect

Month	Release Volume (af)	Maximum Daily Fluctuation (cfs)	Weekday Maximum (cfs)	Weekday Minimum (cfs)	Weekend Release (cfs)
May	630,000	2,525	11,665	9,135	9,890
June	650,000	6,500	14,565	8,065	8,815
July	750,000	7,500	16,030	8,530	9,280
August	835,000	8,000	17,880	9,880	10,630

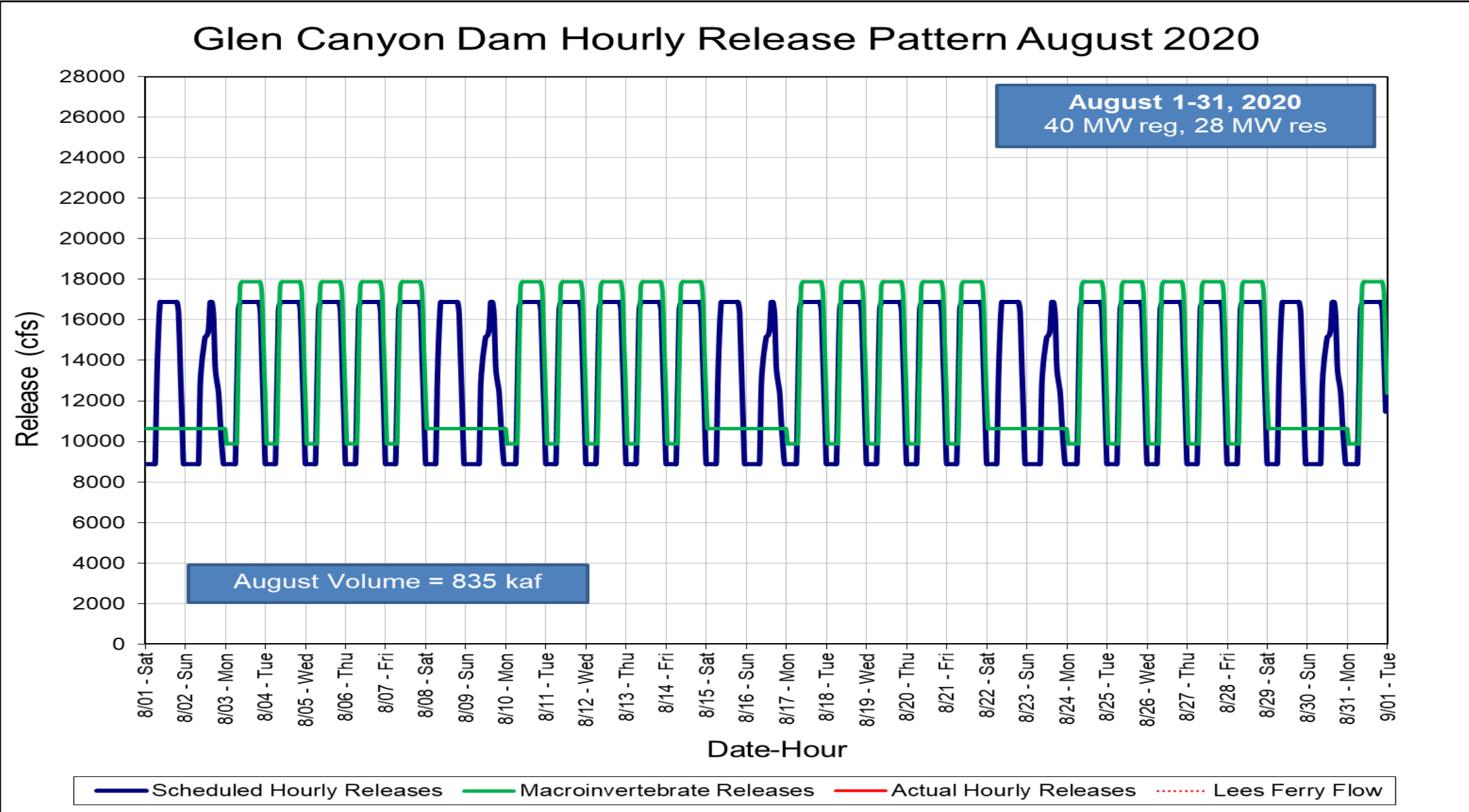
June 2020 Hourly Releases



July 2020 Hourly Releases

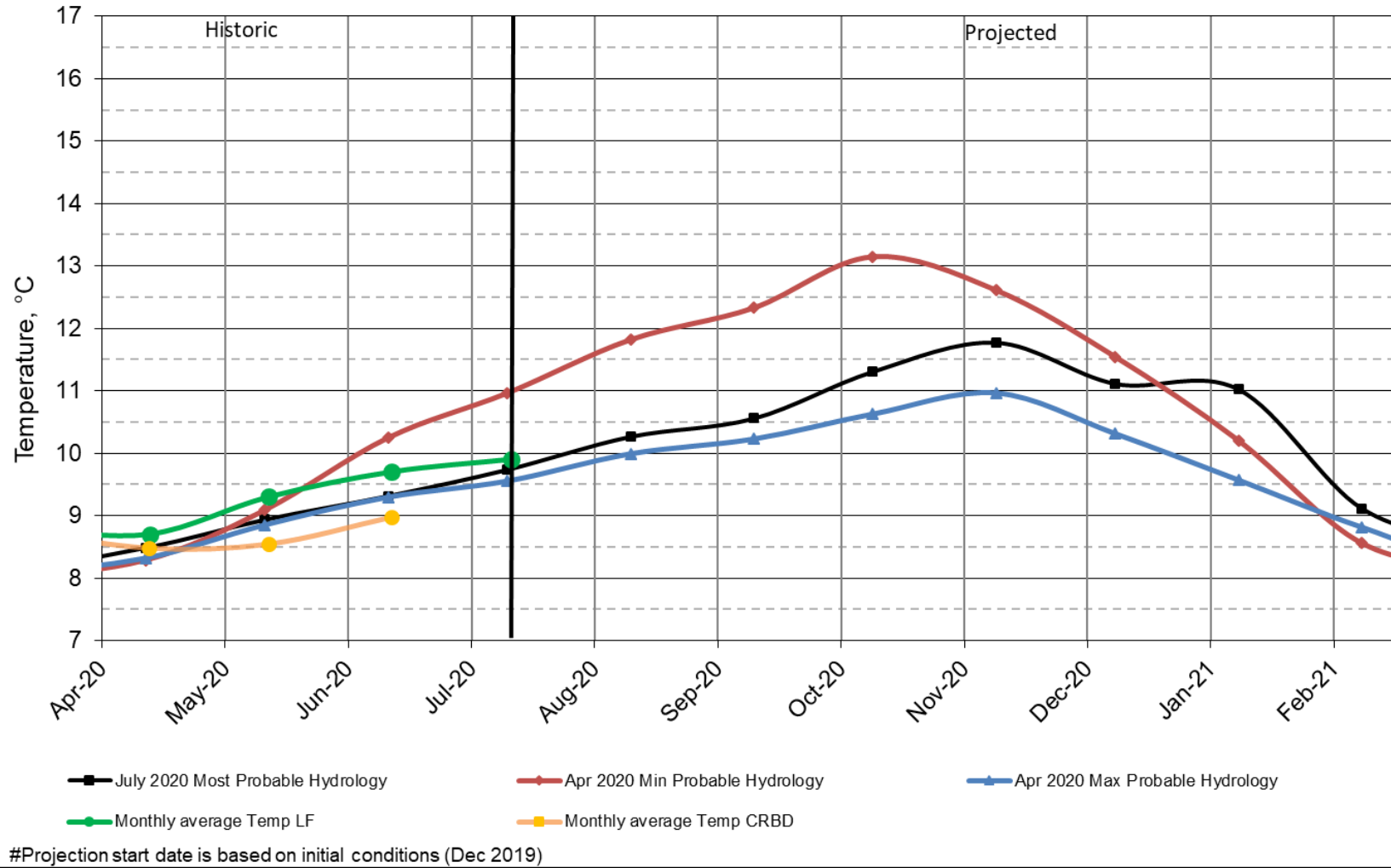


August 2020 Hourly Releases



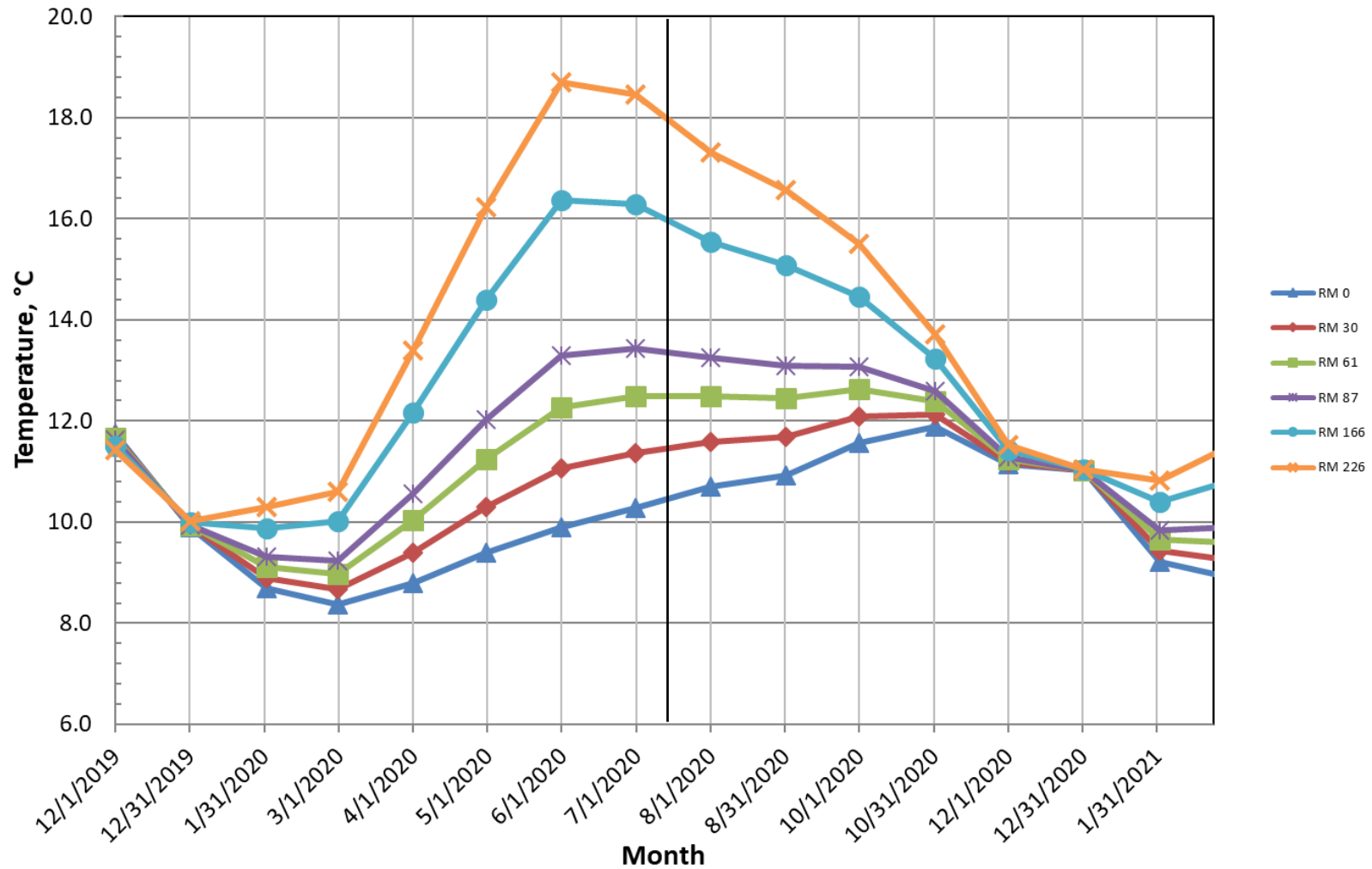
Lake Powell Release Temperature

Projected Temperature based on July 2020 Forecast

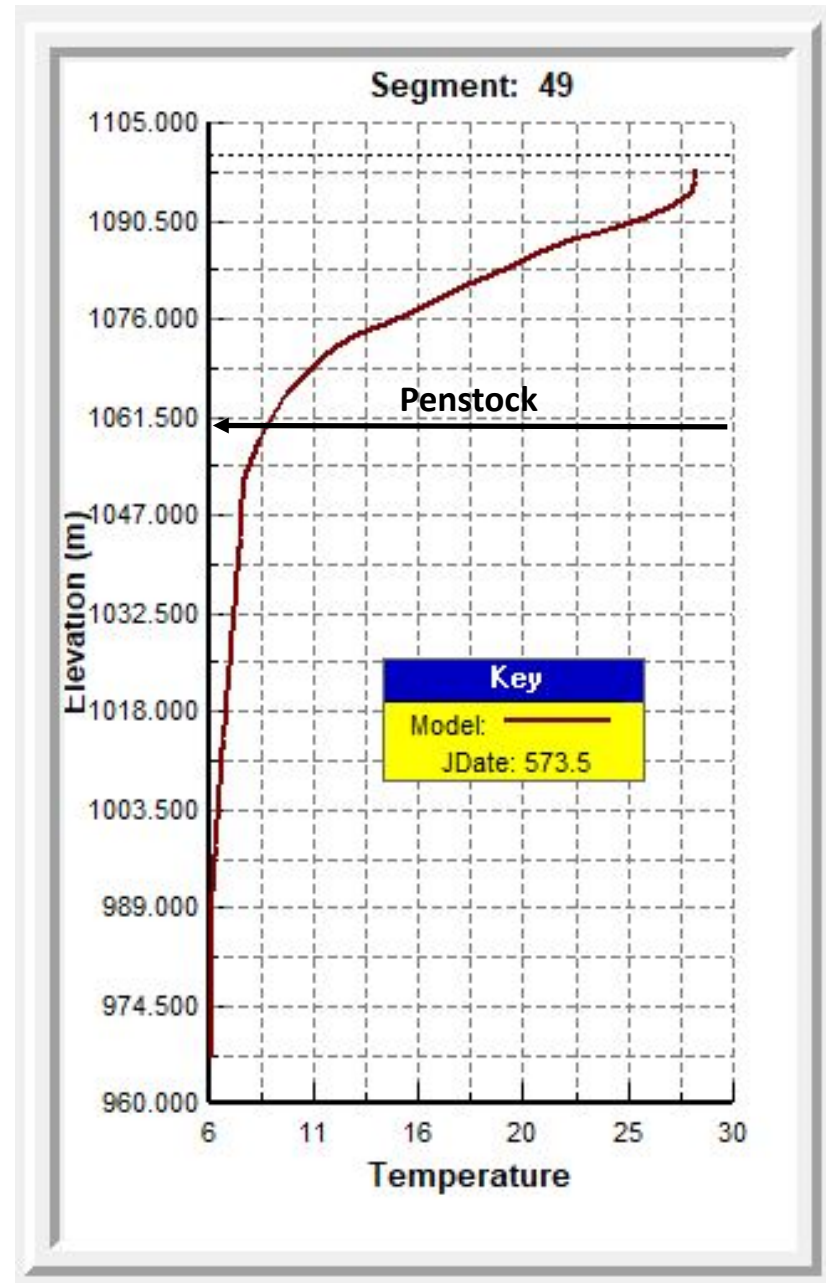


Colorado River, Grand Canyon Water Temperatures

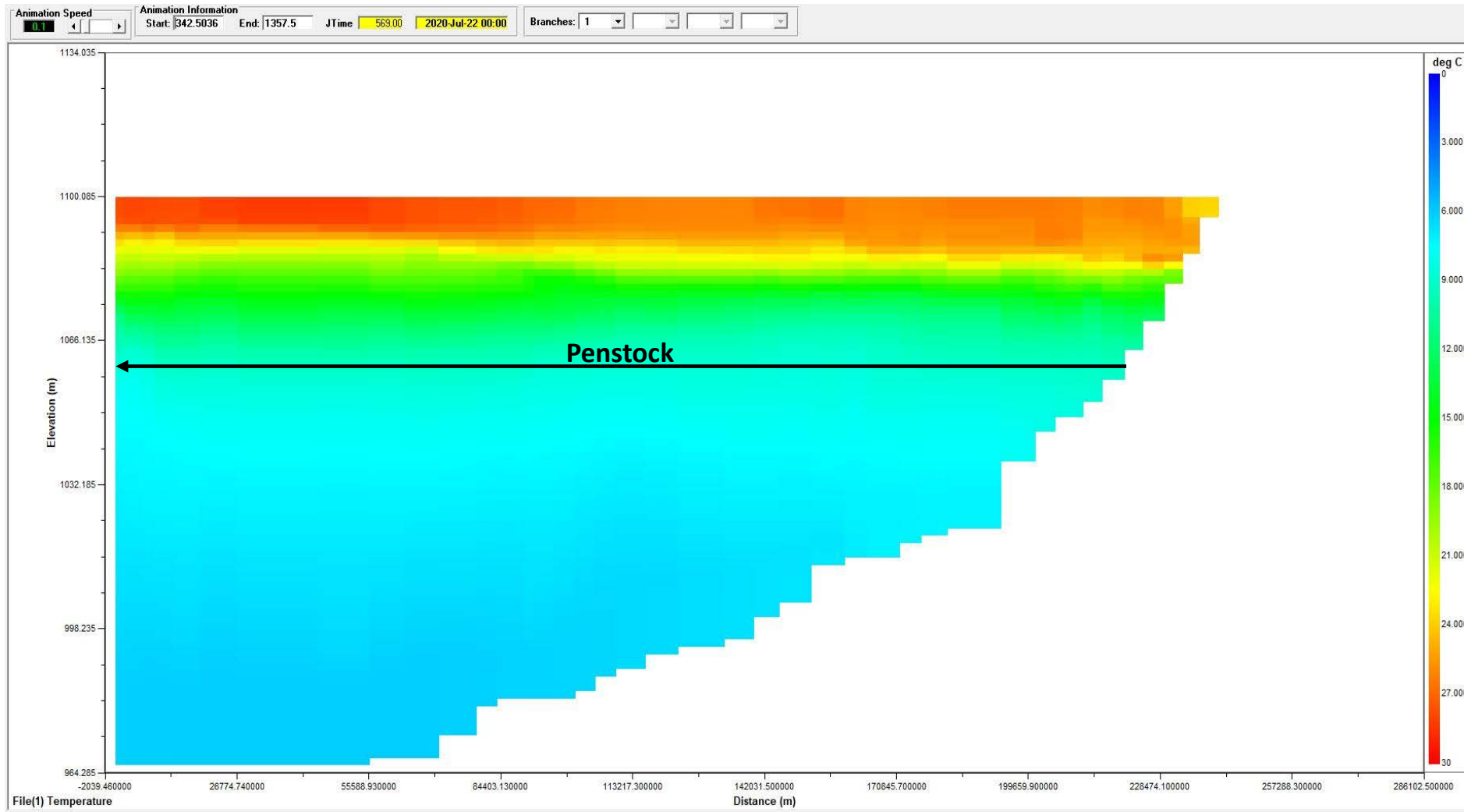
Projections based on July 2020, Most Probable Hydrology



Temperature Profile of Lake Powell near GC Dam



Cross Sectional Temperature Profile of Lake Powell



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