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Colorado River Storage Project (CRSP) 2020 Hydrology Update

August 7, 2020

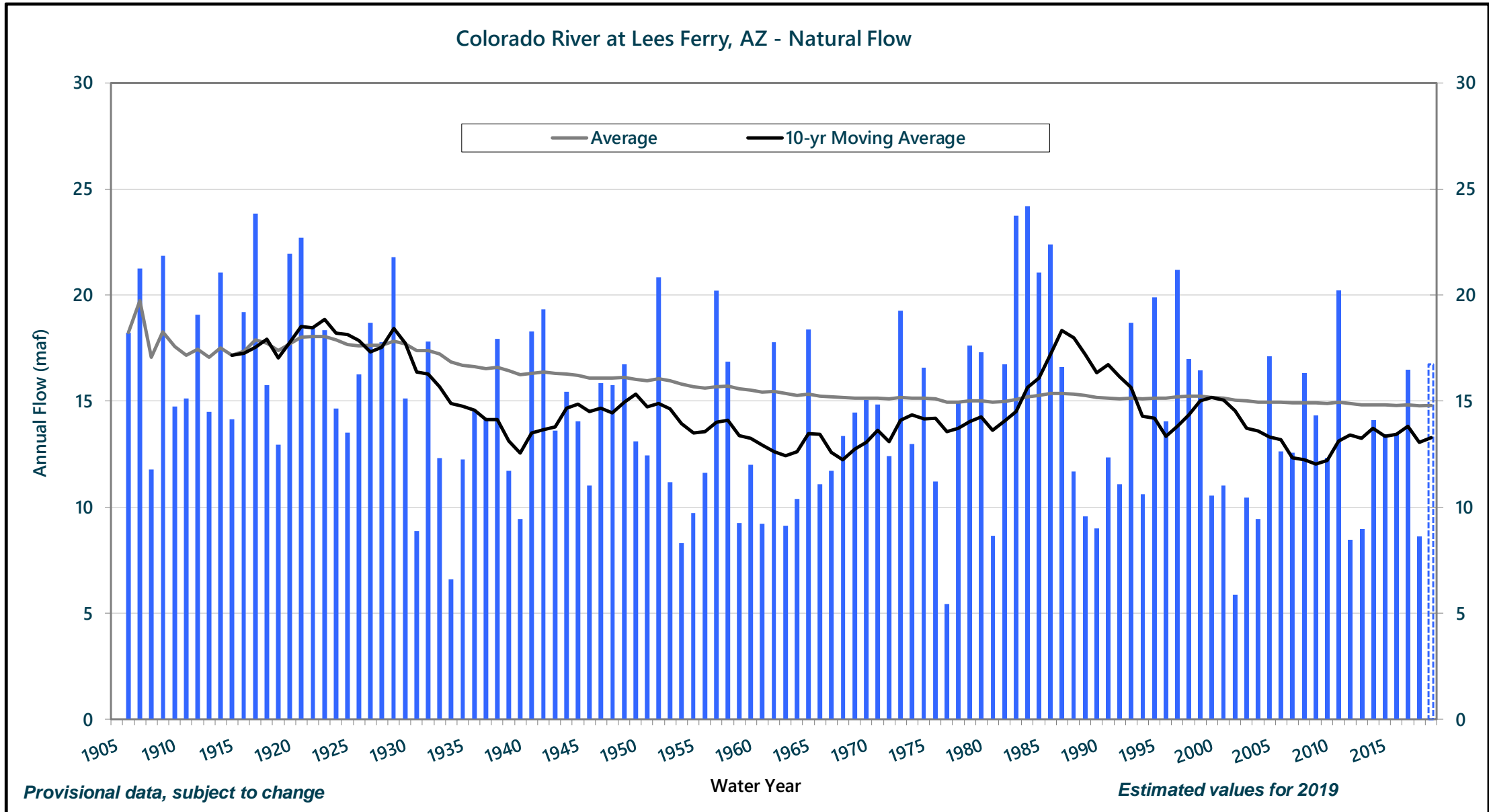
Christopher Cutler

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Natural Flow

Colorado River at Lees Ferry Gaging Station, Arizona

Water Year 1906 to 2019



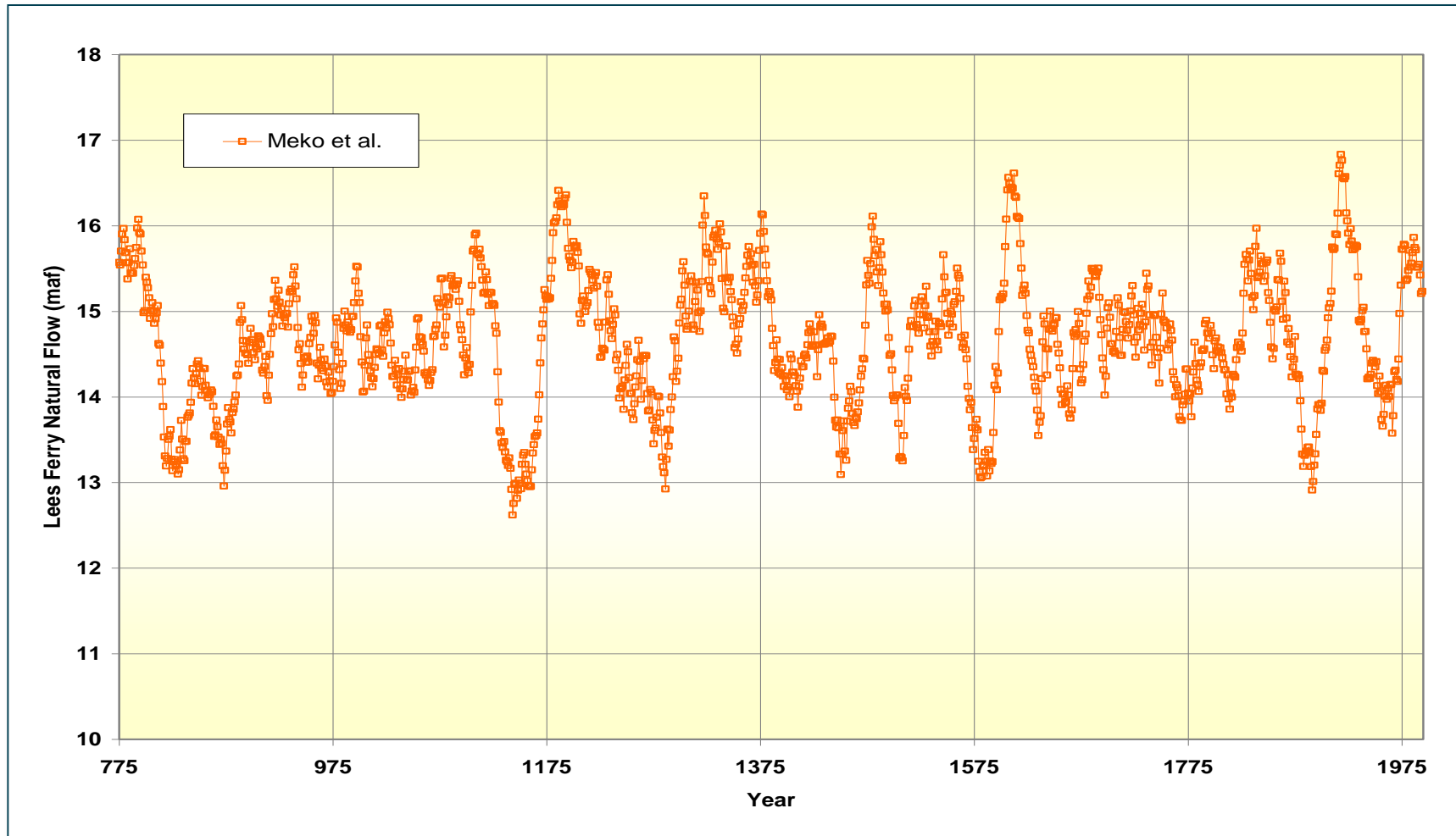
Colorado River Drought

- The Colorado River Basin is experiencing the driest 21-year period (2000–2020) in the historical record
- Only five years of above-average inflow have occurred in the last twenty years
- Tree-ring reconstructions show more severe droughts have occurred over the past 1,200 years (e.g., drought in the mid 1100s)
- The 2020 April through July runoff forecast is 52% of average¹ as of August 3, 2020
- Not unusual to have a few years of above average inflow during longer-term droughts (e.g., the 1950s)

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



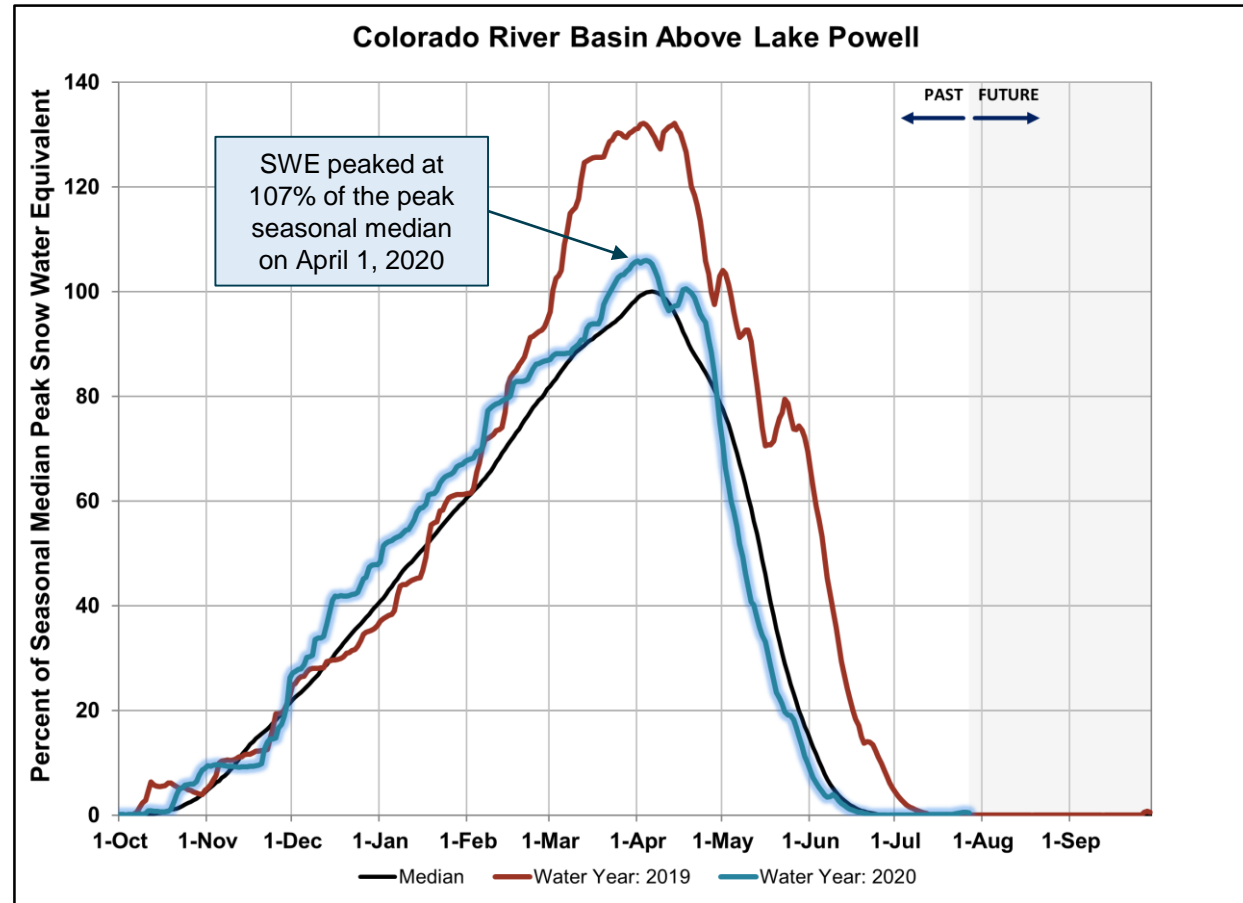
Annual Natural Flow at Lees Ferry Tree-ring Reconstruction (Meko et al., 2007) 25-Year Running Mean



Water Year Snowpack and Precipitation as of July 27, 2020¹

Colorado River Basin
above Lake Powell

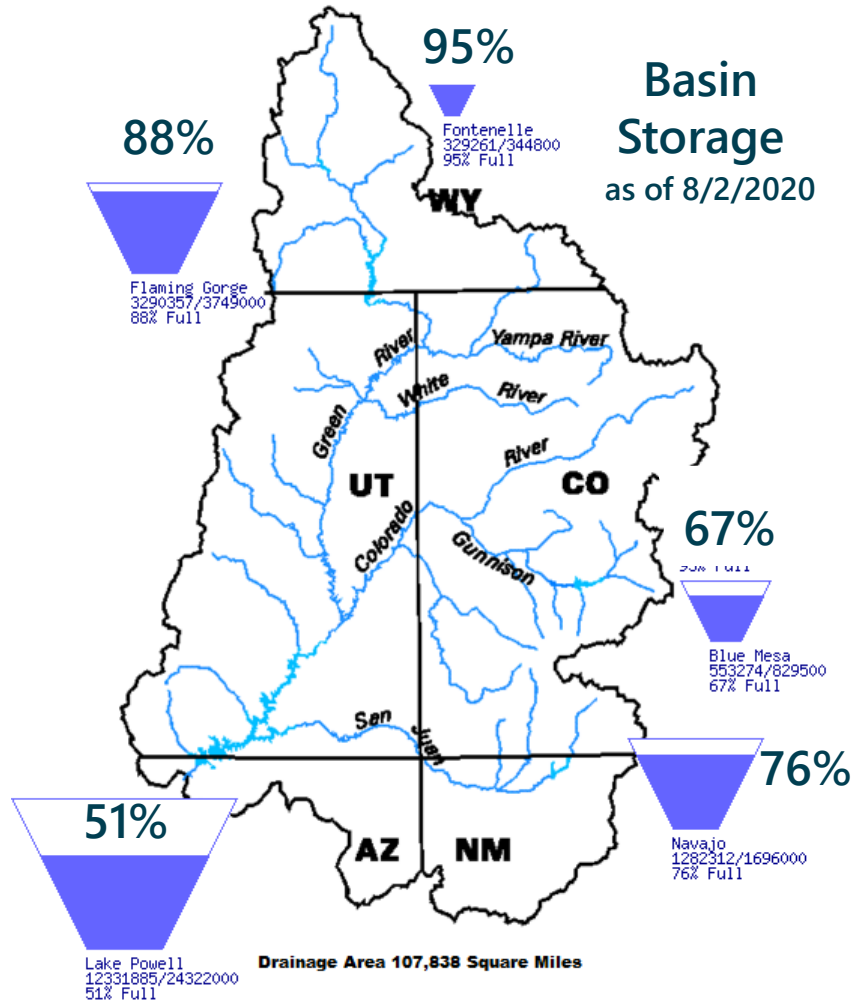
Water Year 2020
Precipitation
(year-to-date)
83% of average



¹Percent of normal precipitation is based on an arithmetic mean, or average; percent of normal snowpack is based on the median value for a given date.



Upper Basin Storage



2020 April – July Unregulated Inflow Forecast as of August 3, 2020

Reservoir	Forecast (kaf)	Percent of Average ¹
Fontenelle	677	93
Flaming Gorge	833	85
Blue Mesa	388	57
Navajo	347	47
Powell	3,732	52

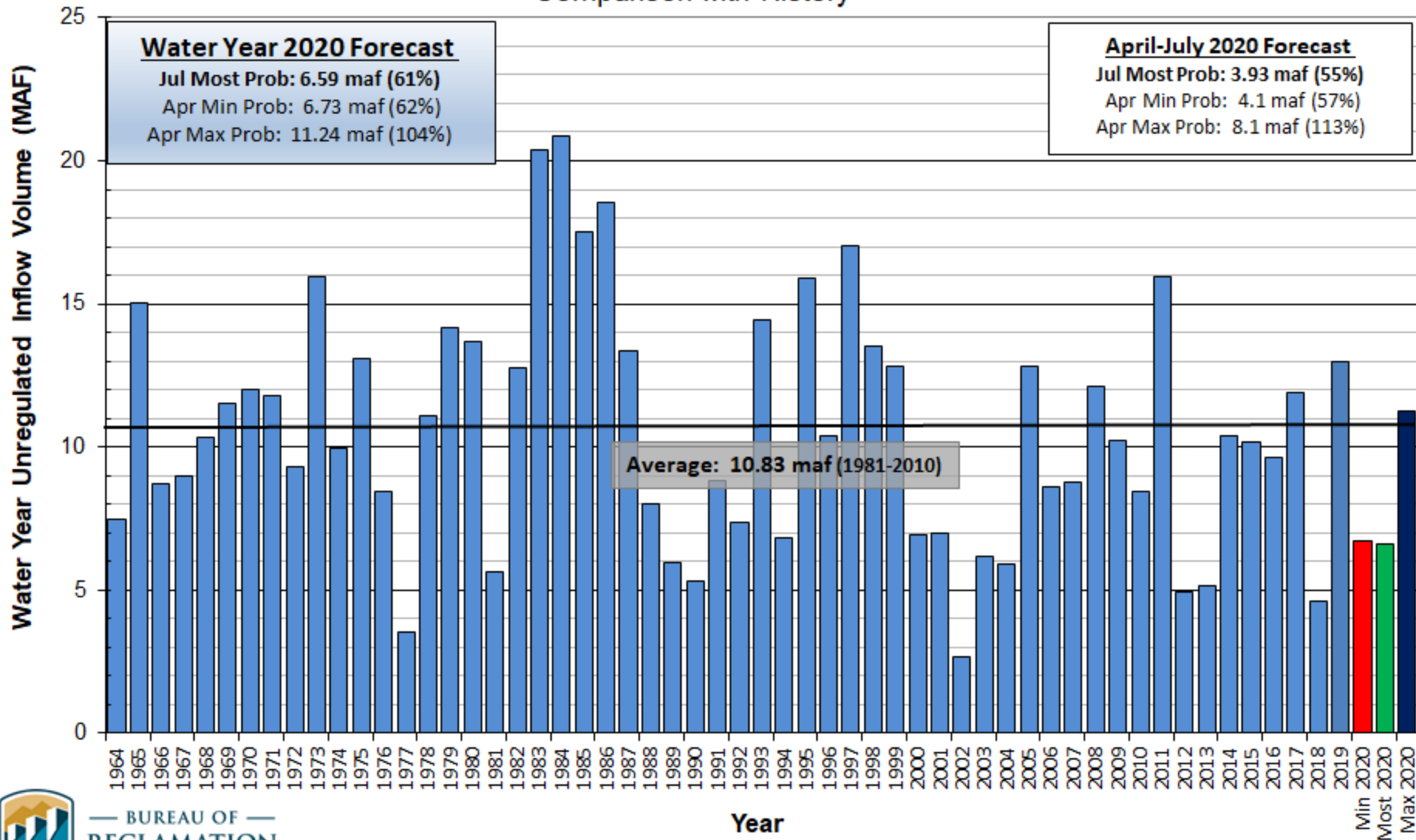
¹ Percent of average based on the period of record from 1981-2010.



Lake Powell Unregulated Inflow

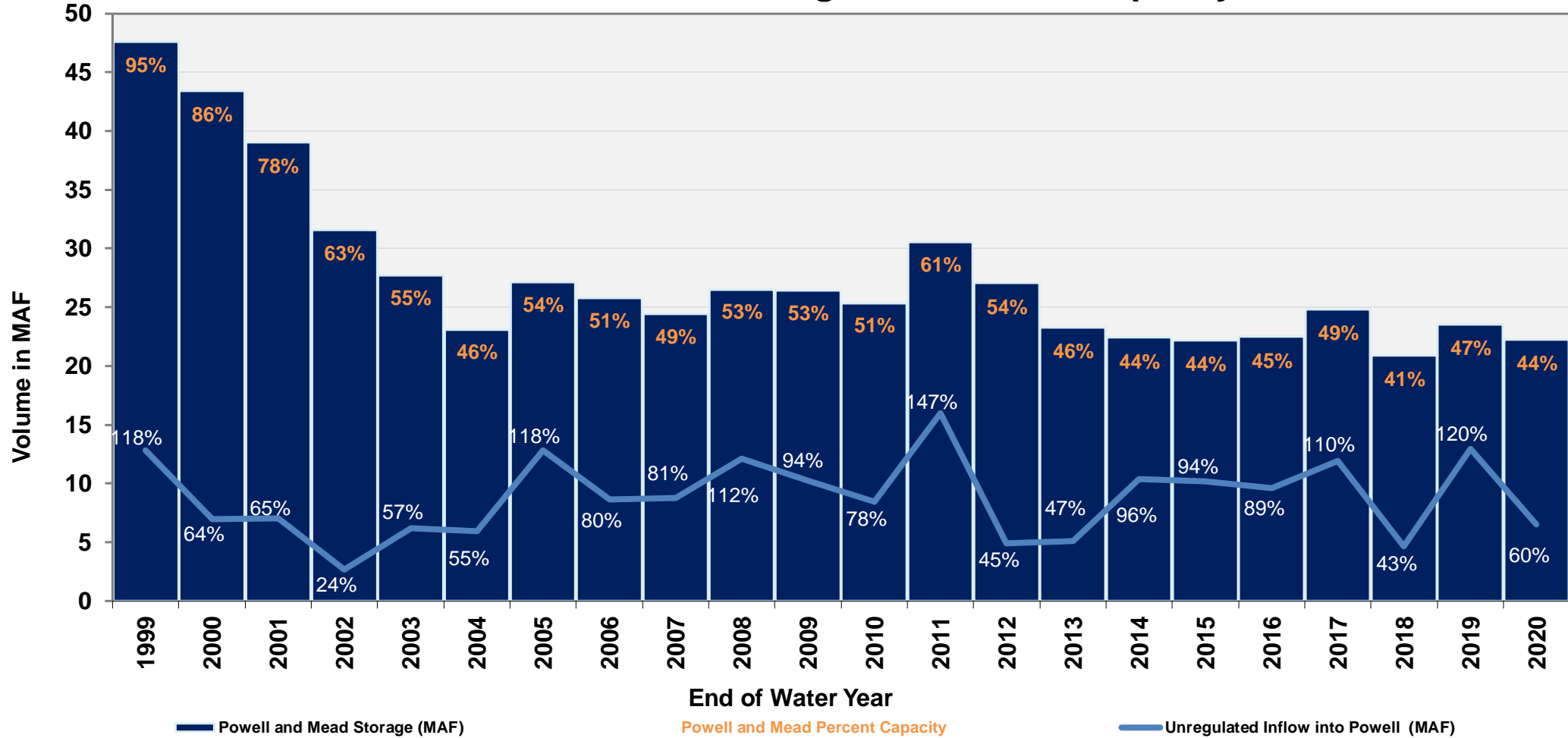
Water Year 2020 Forecast (issued July 1)

Comparison with History



State of the System (Water Years 1999-2020)^{1,2}

Unregulated Inflow into Lake Powell Powell-Mead Storage and Percent Capacity



¹Values for Water Year 2020 are projected. Unregulated inflow is based on the latest CBRFC forecast dated July 15, 2020. Storage and percent capacity are based on the July 2020 24-Month Study.

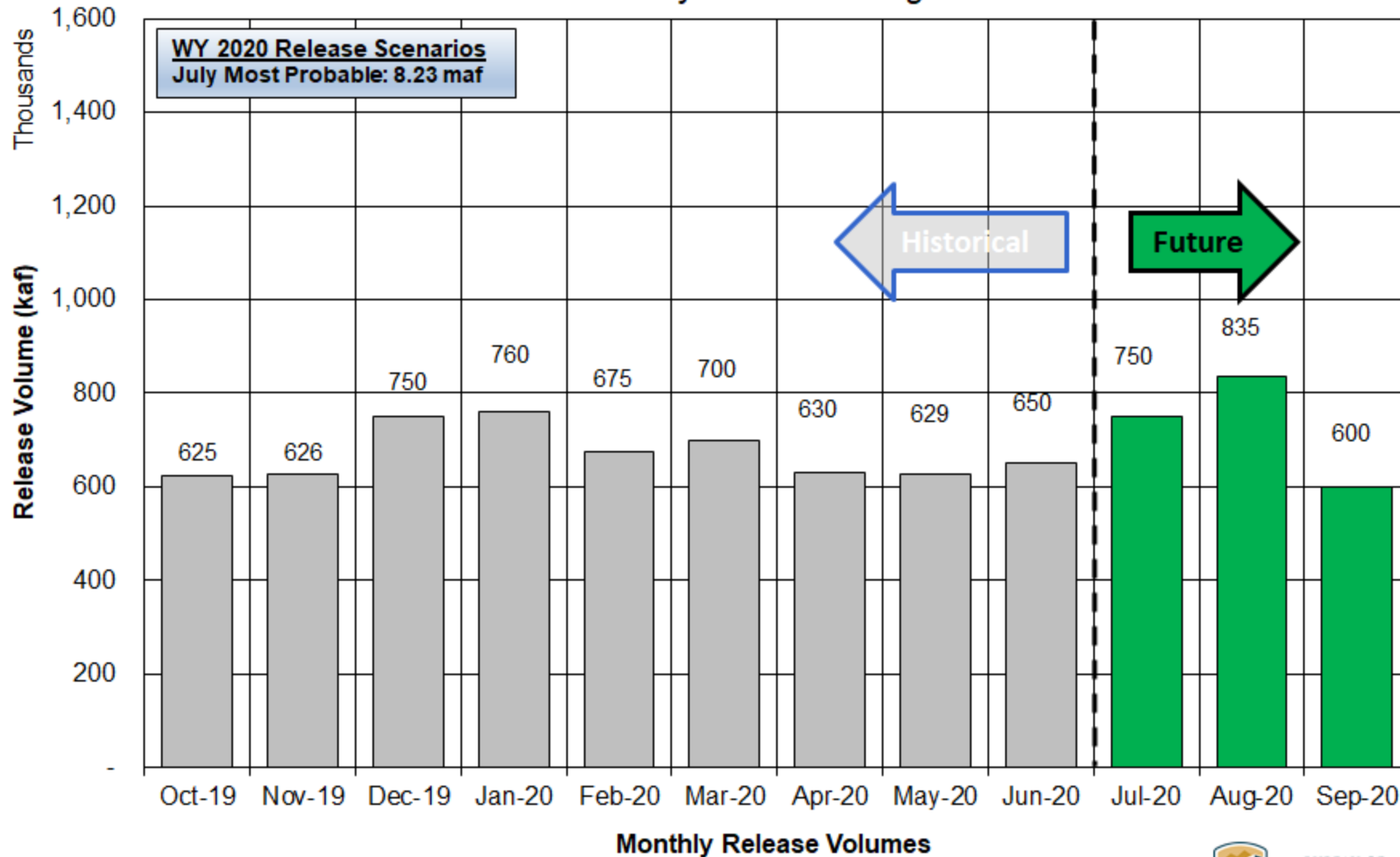
²Percentages on the light blue line represent percent of average unregulated inflow into Lake Powell for a given water year. The percent of average is based on the period of record from 1981-2010.



Potential Lake Powell Monthly Release Volume Distribution

Release Scenarios for Water Year 2020

Based on July 2020 Modeling



Lake Powell & Lake Mead Operational Diagrams and Current Conditions

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
3,636 - 3,666 (2008-2026)	Upper Elevation Balancing Tier³ Release 8.23 maf; if Lake Mead < 1,075 feet, balance contents with	15.5 - 19.3 (2008-2026)	1,200 (approx.) ²	Domestic Surplus or ICS Surplus Condition Deliver > 7.5 maf	22.9 (approx.) ²
3,606.00 8/2/20			1,145		
	a min/max release of 7.0 and 9.0 maf	12.33 8/2/20	1,084.57 8/2/20	Normal or ICS Surplus Condition Deliver ≥ 7.5 maf	10.39 8/2/20
3,575	Mid-Elevation Release Tier Release 7.48 maf; if Lake Mead < 1,025 feet, release 8.23 maf	9.5	1,075	Shortage Condition Deliver 7.167 ⁴ maf	9.4
3,525			1,050		
	Lower Elevation Balancing Tier Balance contents with a min/max release of 7.0 and 9.5 maf	5.9	1,025	Shortage Condition Deliver 7.083 ⁵ maf	5.8
3,490			1,000		
3,370		0	895	Shortage Condition Deliver 7.0 ⁶ maf Further measures may be undertaken ⁷	0

Diagram not to scale

¹ Acronym for million acre-feet

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.

³ Subject to April adjustments which may result in a release according to the Equalization Tier

⁴ Of which 2.48 maf is apportioned to Arizona, 4.4 maf to California, and 0.287 maf to Nevada

⁵ Of which 2.40 maf is apportioned to Arizona, 4.4 maf to California, and 0.283 maf to Nevada

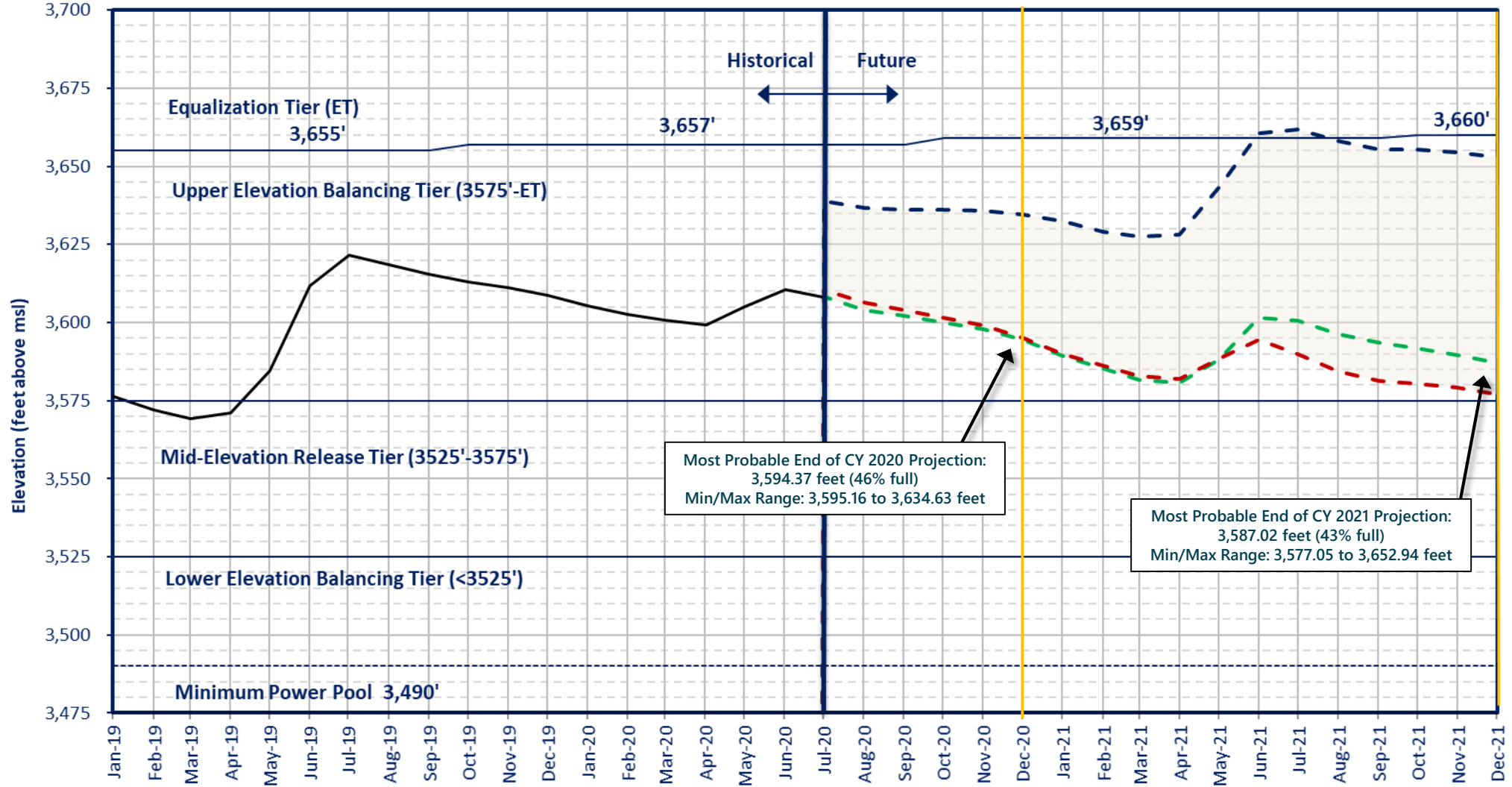
⁶ Of which 2.32 maf is apportioned to Arizona, 4.4 maf to California, and 0.280 maf to Nevada

⁷ 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.



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 Powell WY 2021 Operating Tier Scenarios

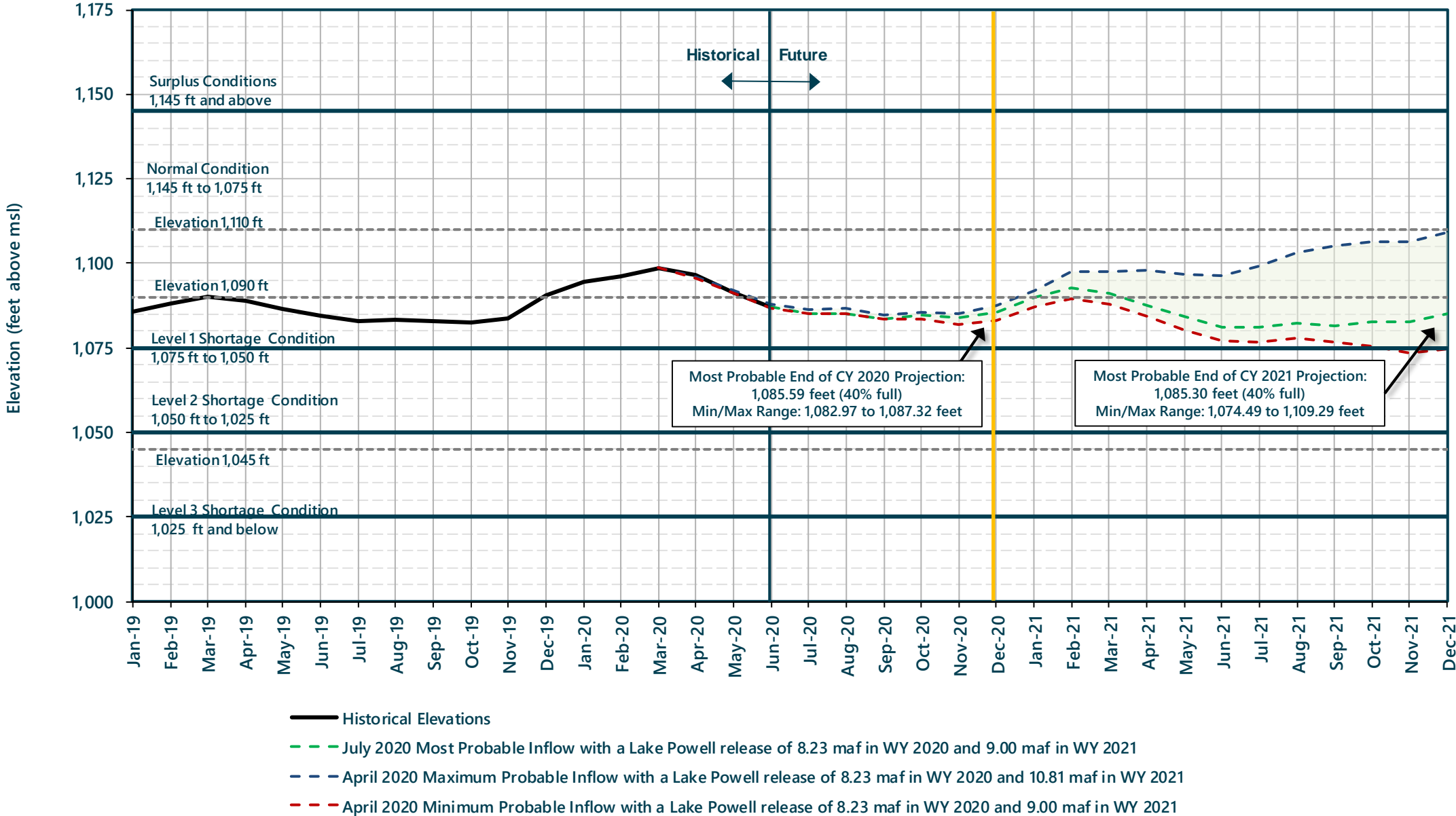
Based on April and June 2020 24-Month Study

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 Mead End of Month Elevations

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



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