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Managing Water in the West

Overview of Colorado River Basin Reservoir Operations

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Southern California Water Dialogue Meeting
April 26, 2017

U.S. Department of the Interior
Bureau of Reclamation

U.S. Bureau of Reclamation
Lower Colorado Region's Water Master Role

- Boulder Canyon Project Act of 1928 established the Secretary of the Interior as Water Master of the Lower Colorado River
  - Develop Annual Operating Plan for Colorado River Reservoirs
  - Administer water contracts
  - Approve U.S. water orders
  - Schedule water releases from Hoover, Davis, and Parker Dams
  - Account for all water use

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Overview of the Colorado River System

- 16.5 million acre-feet (maf) allocated annually
  - 7.5 maf each to Upper and Lower Basins
  - 1.5 maf to Mexico
- About 16 maf average annual “natural flow” (based on historical record)
  - 14.8 maf in the Upper Basin and 1.3 maf in the Lower Basin
- Inflows are highly variable from year-to-year
- 60 maf of storage (nearly 4-times the average annual inflow)
- Operations and water deliveries governed by the “Law of the River”

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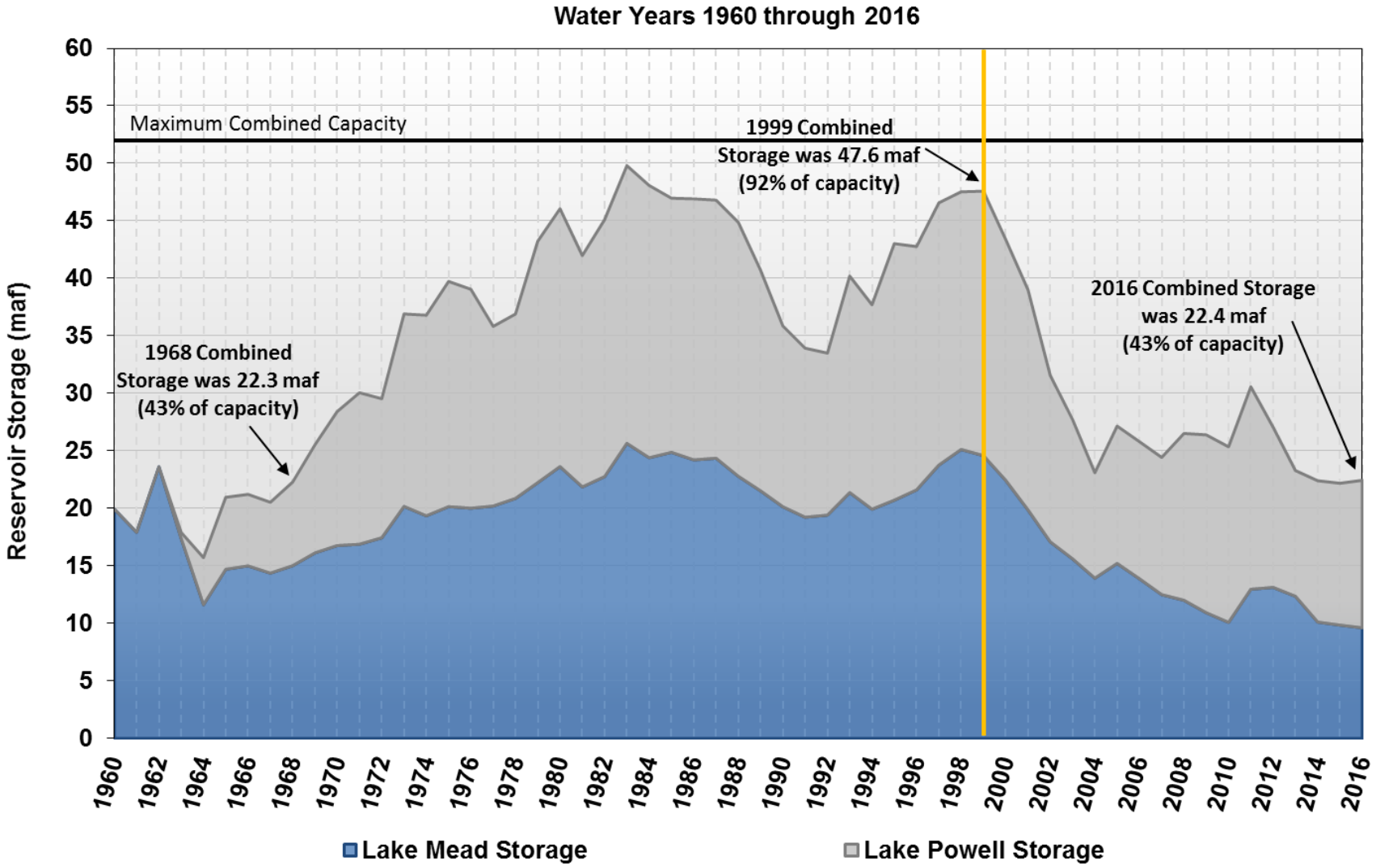
Lake Powell and Lake Mead End of Water Year Storage



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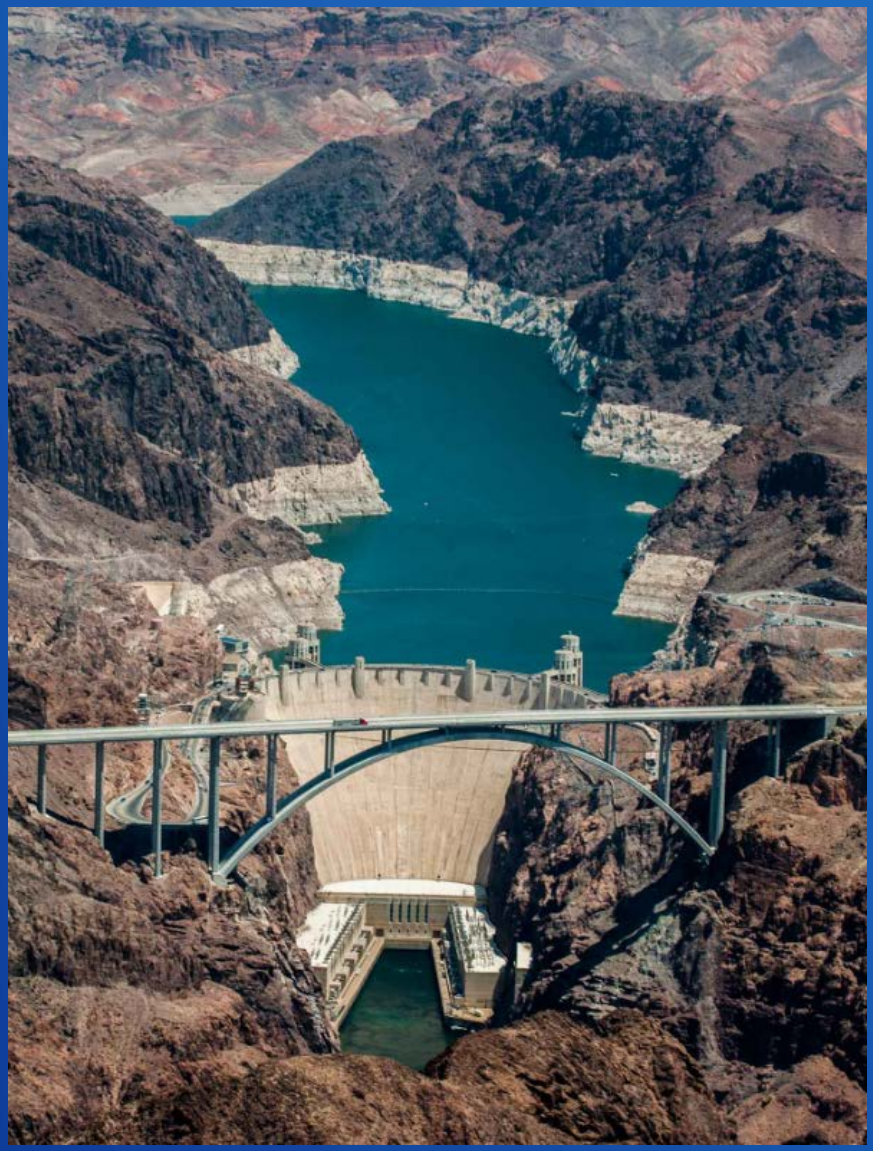
Lake Mead near Hoover Dam in 2000



Lake Mead near Hoover Dam in 2016

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Lake Mead Annual Water Budget

Given current water demands in the Lower Basin and Mexico, and with a minimum objective release from Lake Powell (8.23 maf), Lake Mead storage declines by about 1.2 maf annually (equivalent to about 12 to 14 feet in elevation)

Inflow (Powell release + side inflows above Mead)	9.0 maf
Outflow (Lower Division State apportionments and Mexico Treaty allocation, plus balance of downstream regulation, gains, and losses)	-9.6 maf
Mead evaporation loss	-0.6 maf
Balance	-1.2 maf

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2007 Interim Guidelines for Operation of Lake Powell and Lake Mead

- Key provisions:
  - Operation for Lake Powell and Lake Mead is specified throughout the full range of operation
  - Strategy for shortages in the Lower Basin is specified, including a provision for additional shortages if warranted
  - Mechanism (Intentionally Created Surplus or ICS) is established to encourage efficient and flexible water use in the Lower Basin
- In place for an interim period (through 2026)
- Do not include provisions for Mexico

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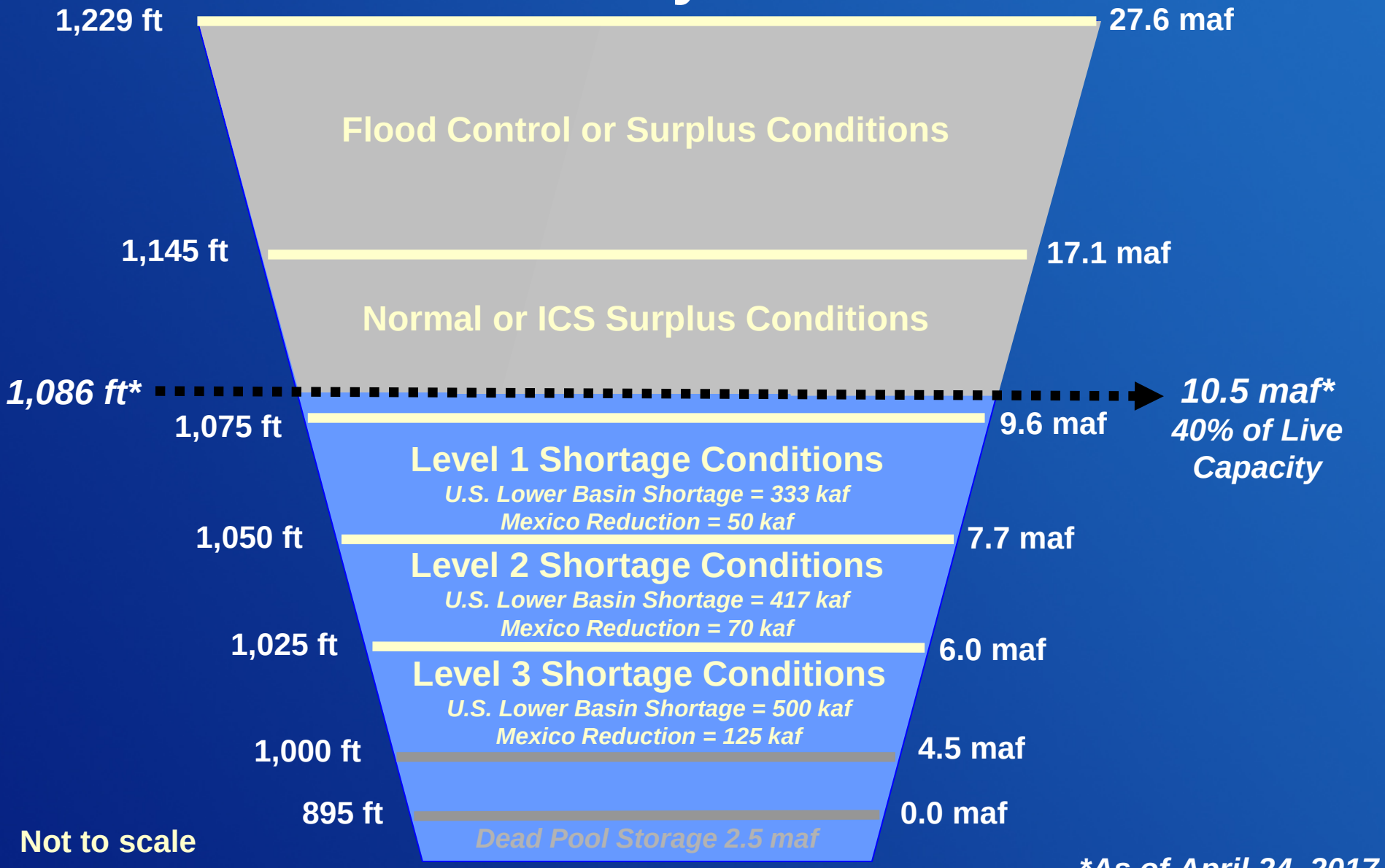
Lake Mead – Key Elevations[1,2]



*As of April 24, 2017

[1] U.S. Lower Basin shortage volumes based on the 2007 Interim Guidelines (in place from 2007 through 2026). [2] Mexico reductions based on Minute 319 (in place from 2013 through 2017).

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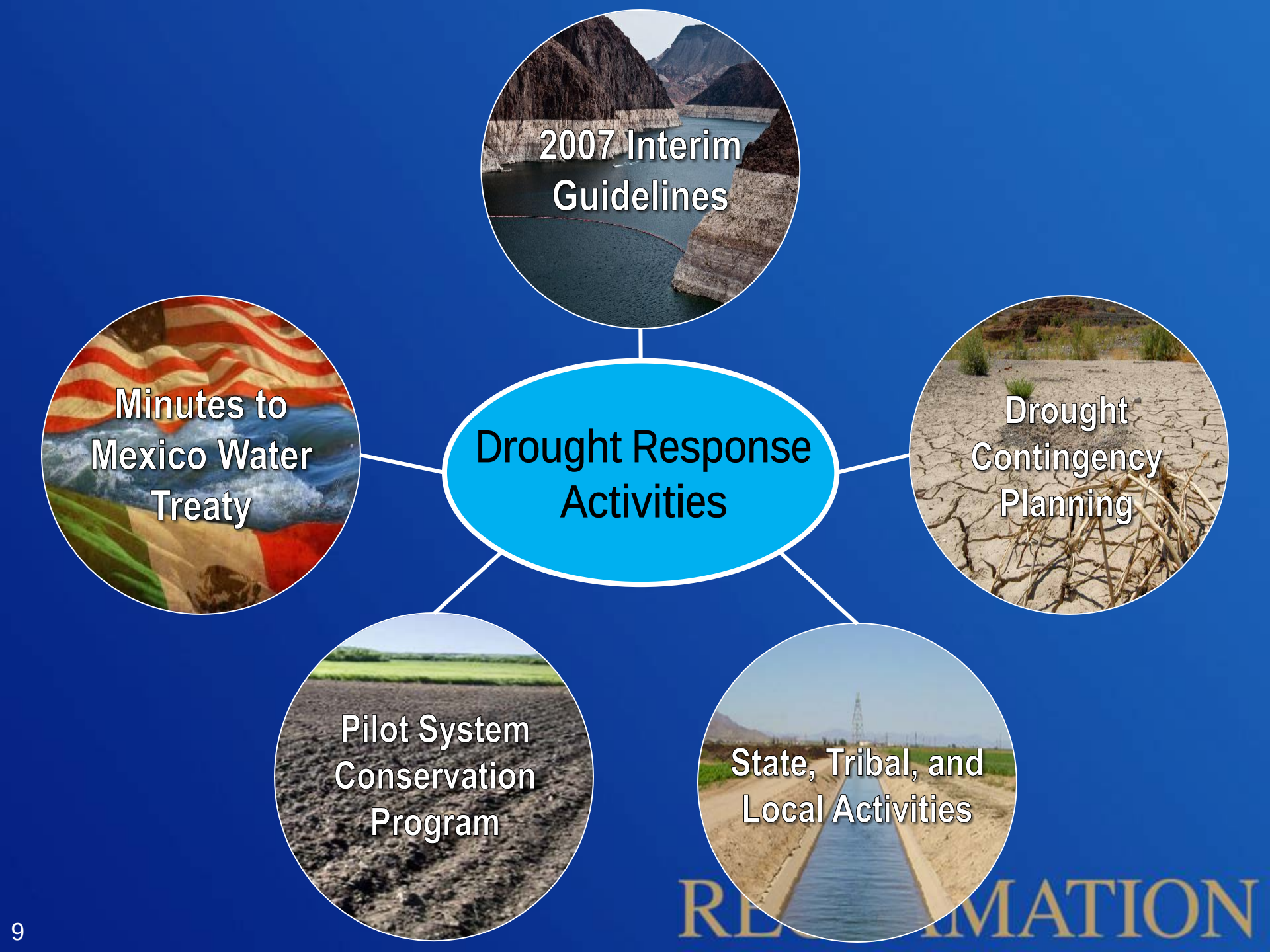
2007 Interim Guidelines
Minutes to Mexico Water Treaty
Drought Response Activities
Drought Contingency Planning
Pilot System Conservation Program
State, Tribal, and Local Activities

Installation of Wide-Head Turbines at Hoover

Existing turbine

New wide-head turbine

- Boulder Canyon Project contractors funded the installation of five wide-head turbines to replace existing turbines
- Increases operational efficiency across a wider range of reservoir levels including lower lake levels

Colorado River Basin Storage
(as of April 24, 2017)

Current Storage	Percent Full	MAF	Elevation (Feet)
Lake Powell	49%	12.0	3,602
Lake Mead	40%	10.5	1,086
Total System Storage*	51%	30.3	NA

*Total system storage was 28.6 maf or 48% this time last year

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Upper Colorado Basin
2017 Snowpack and Forecasted Inflow

Seasonal Peak Snowpack

~122% of median

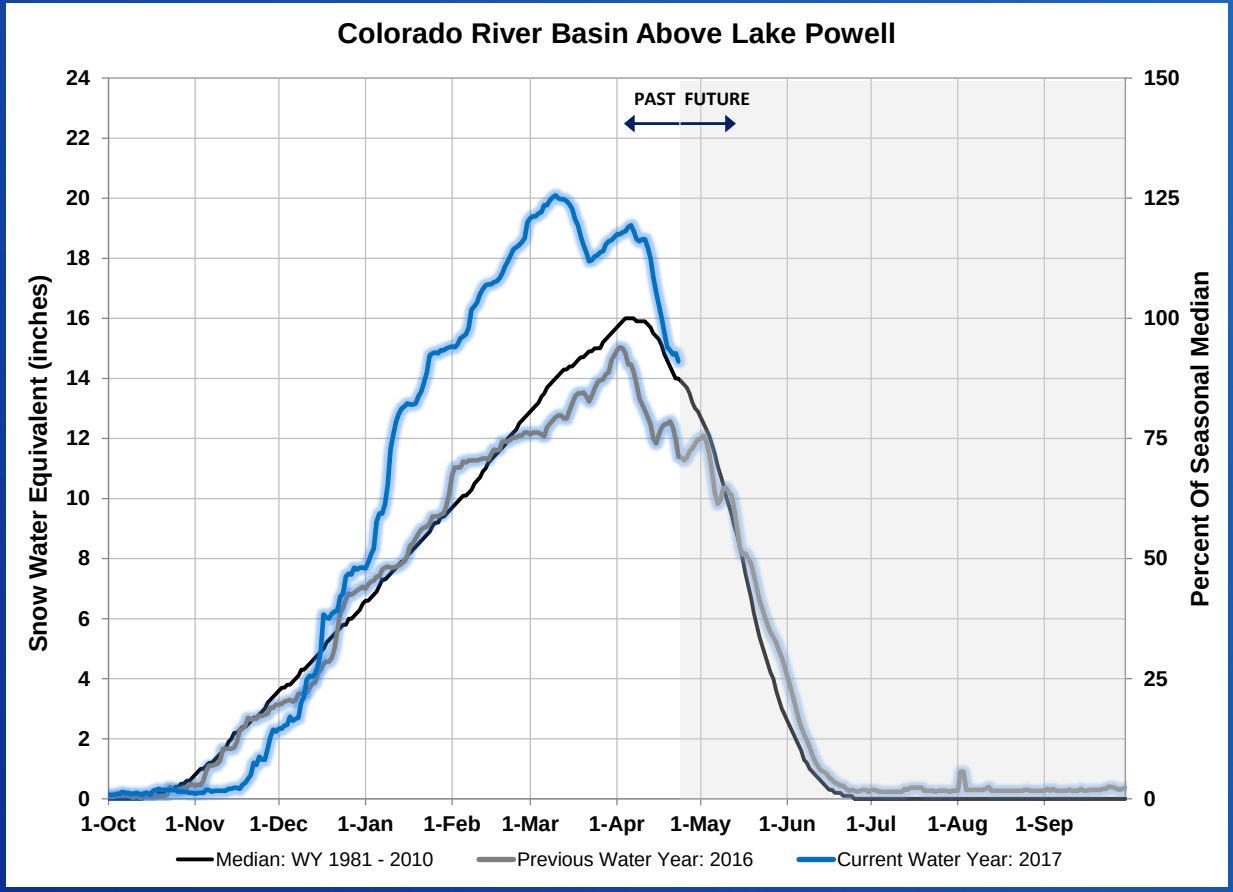
on March 10

2017 April-July Forecasted Inflow into Lake Powell

9.3 maf

130% of average

(as of April 4)



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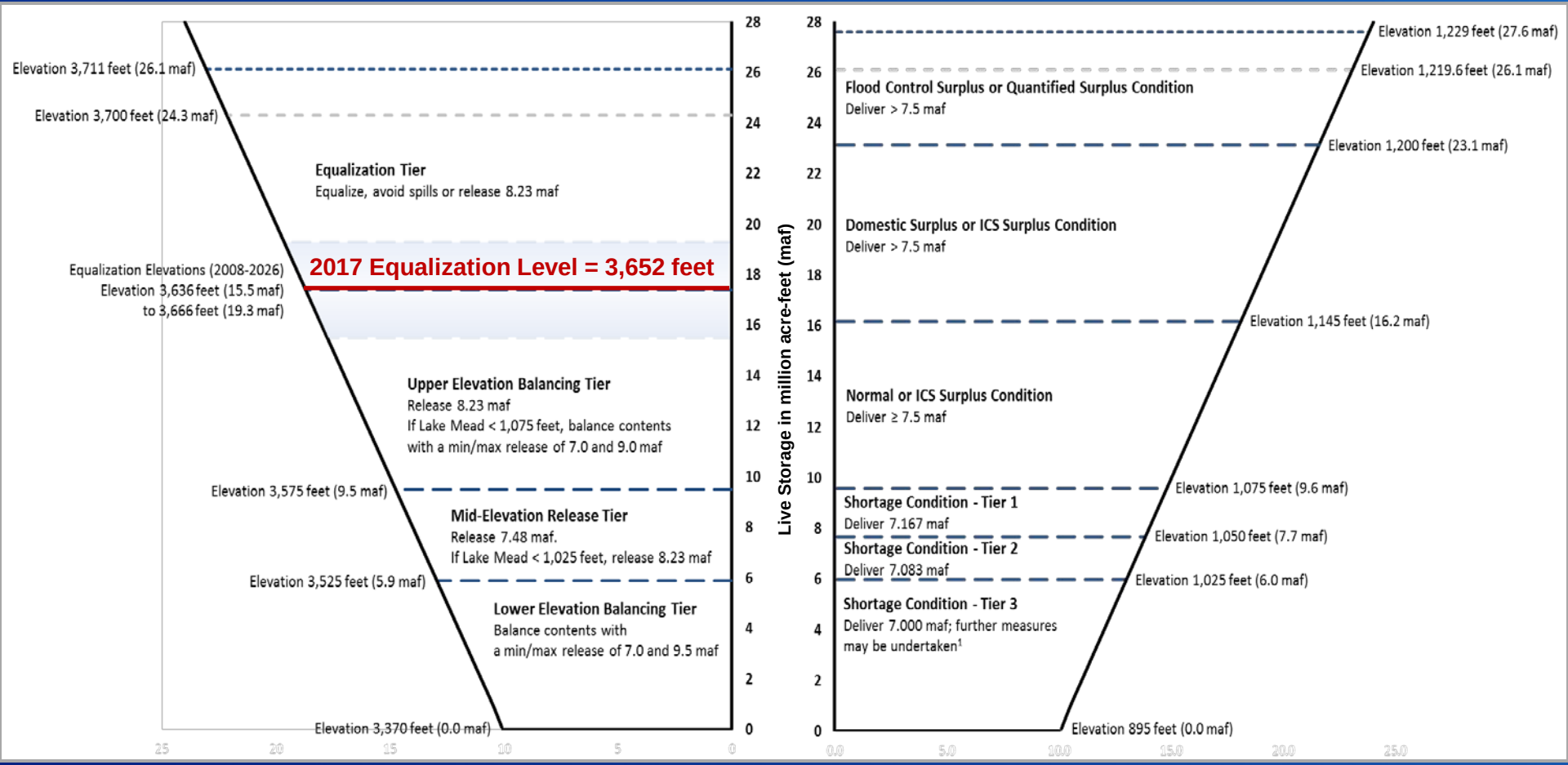
Lake Powell and Lake Mead Operational Diagrams
(According to the 2007 Interim Guidelines)

Lake Powell

Lake Mead



[1] 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.

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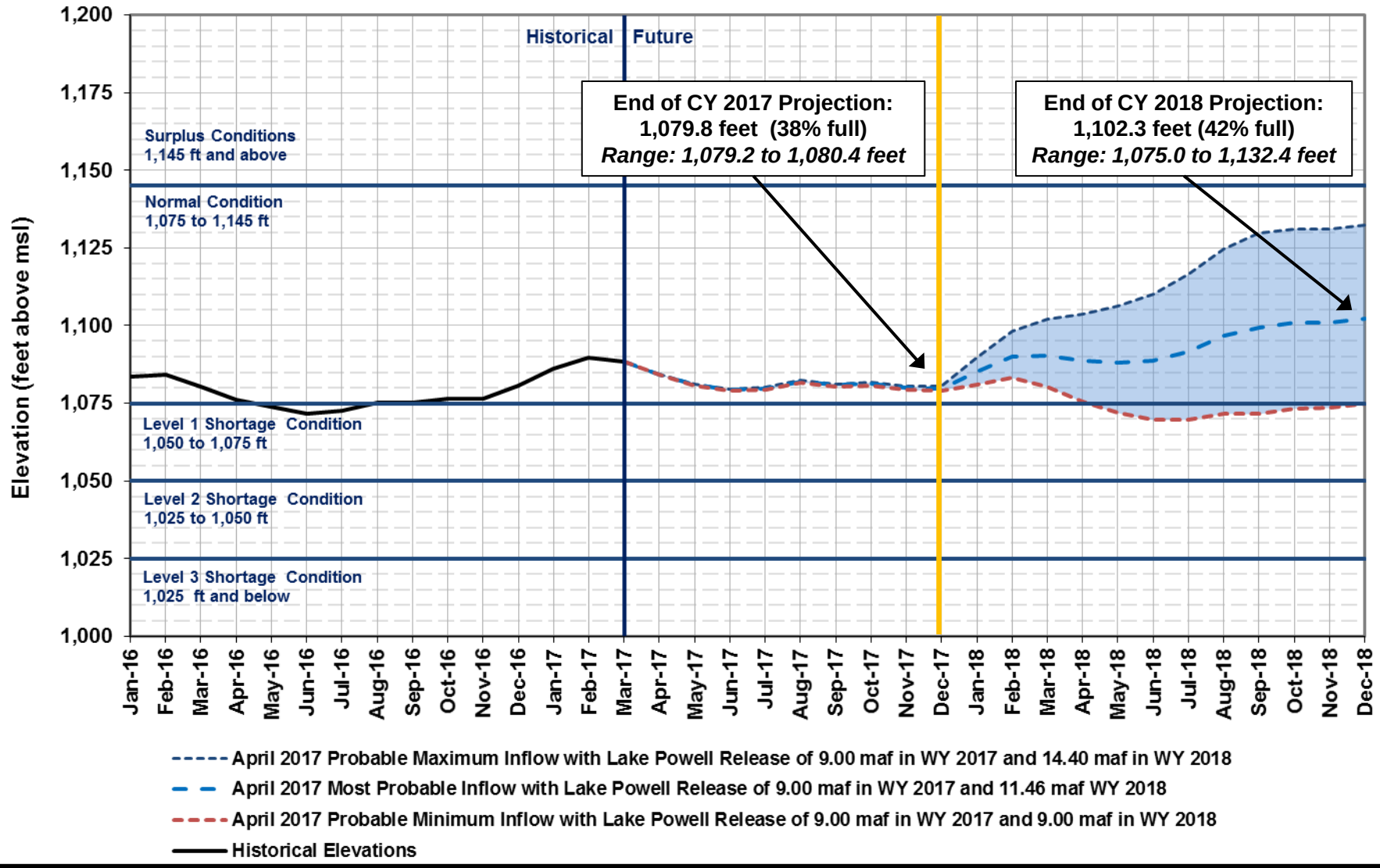
Lake Mead End of Month Elevations

Projections from the April 2017 24-Month Study Inflow Scenarios



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Overview of Colorado River Basin Reservoir Operations
For more information:
http://www.usbr.gov/lc/riverops.html