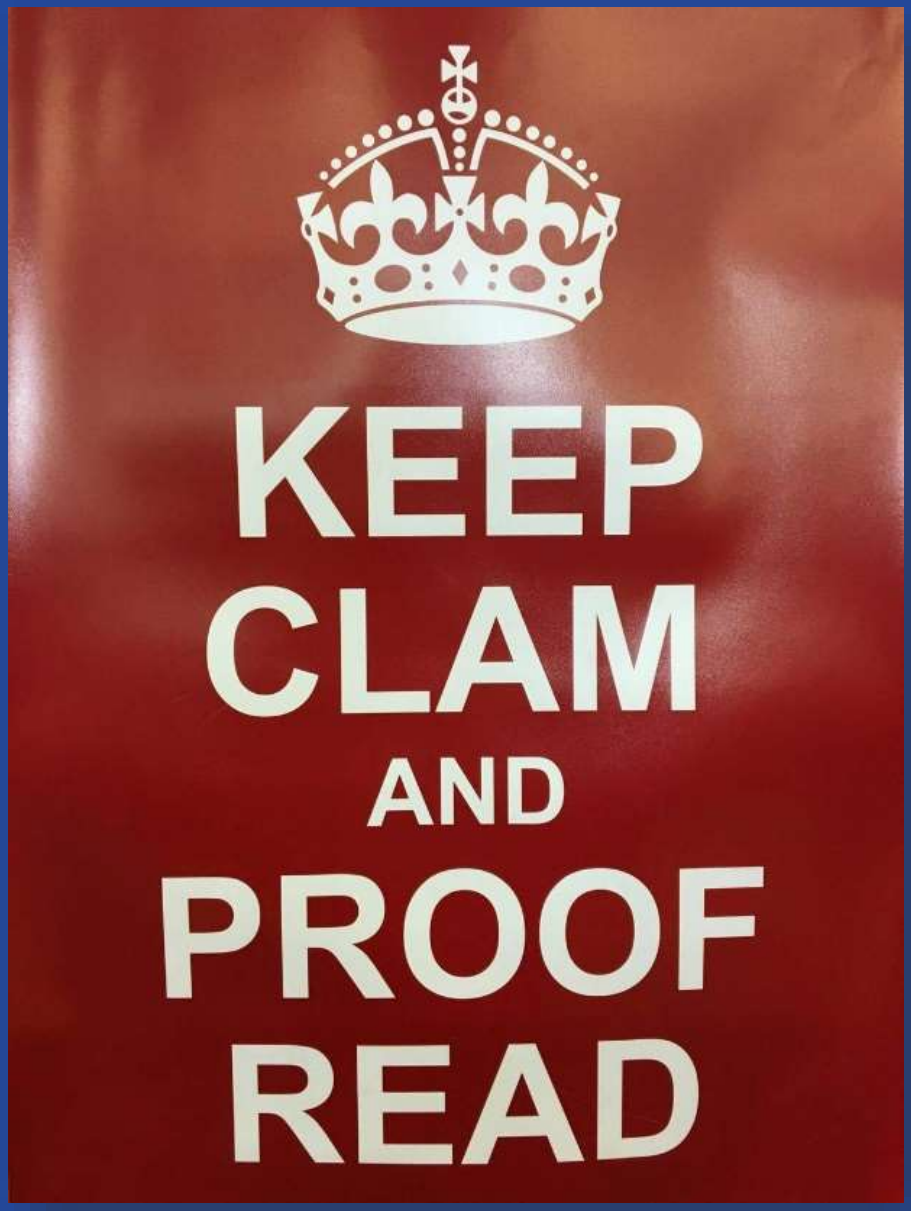
RECLAMATION
Managing Water in the West

Colorado River & Upper Basin Drought Contingency Plan Operations

Colorado Mesa University
2019 Water Course

February 25, 2019

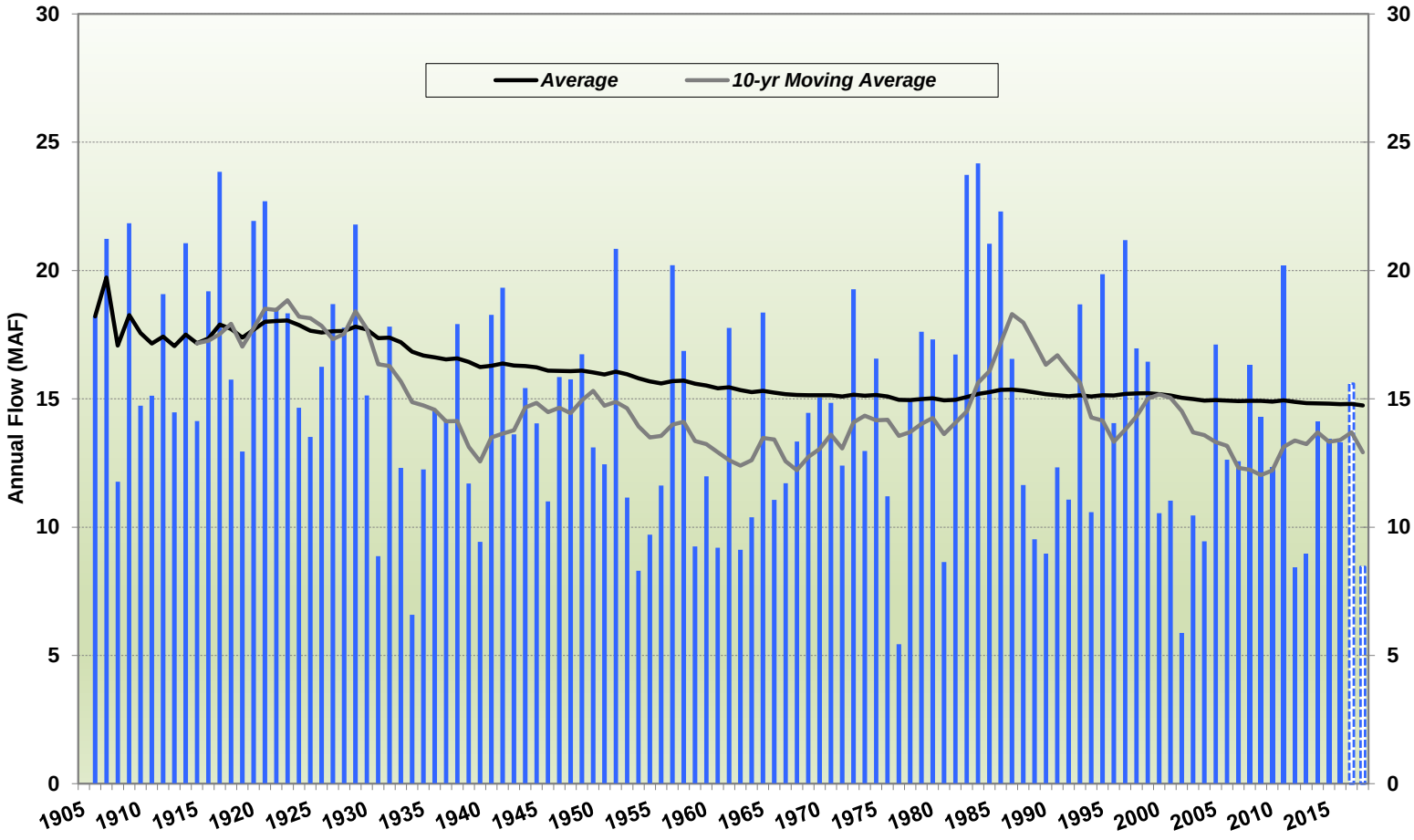

KEEP
CLAM
AND
PROOF
READ

Colorado River System Overview

- 16.5 million acre feet (maf) allocated annually
  - 7.5 maf ea. Upper & Lower Basins
  - 1.5 maf - Mexico (1/2 from Upper Basin)
- ~16 maf average annual “natural flow” (*based on historical record*)
  - 14.8 maf in Upper Basin
  - 1.3 maf in Lower Basin
- 7.5 maf + .75 maf - 20 kaf = 8.23 maf (‘Minimum Objective Release’)
- Operations governed by “Law of the River” & environmental commitments
- 2000-2018 is driest 19-year period in over 100 years of historical records

Natural Flow

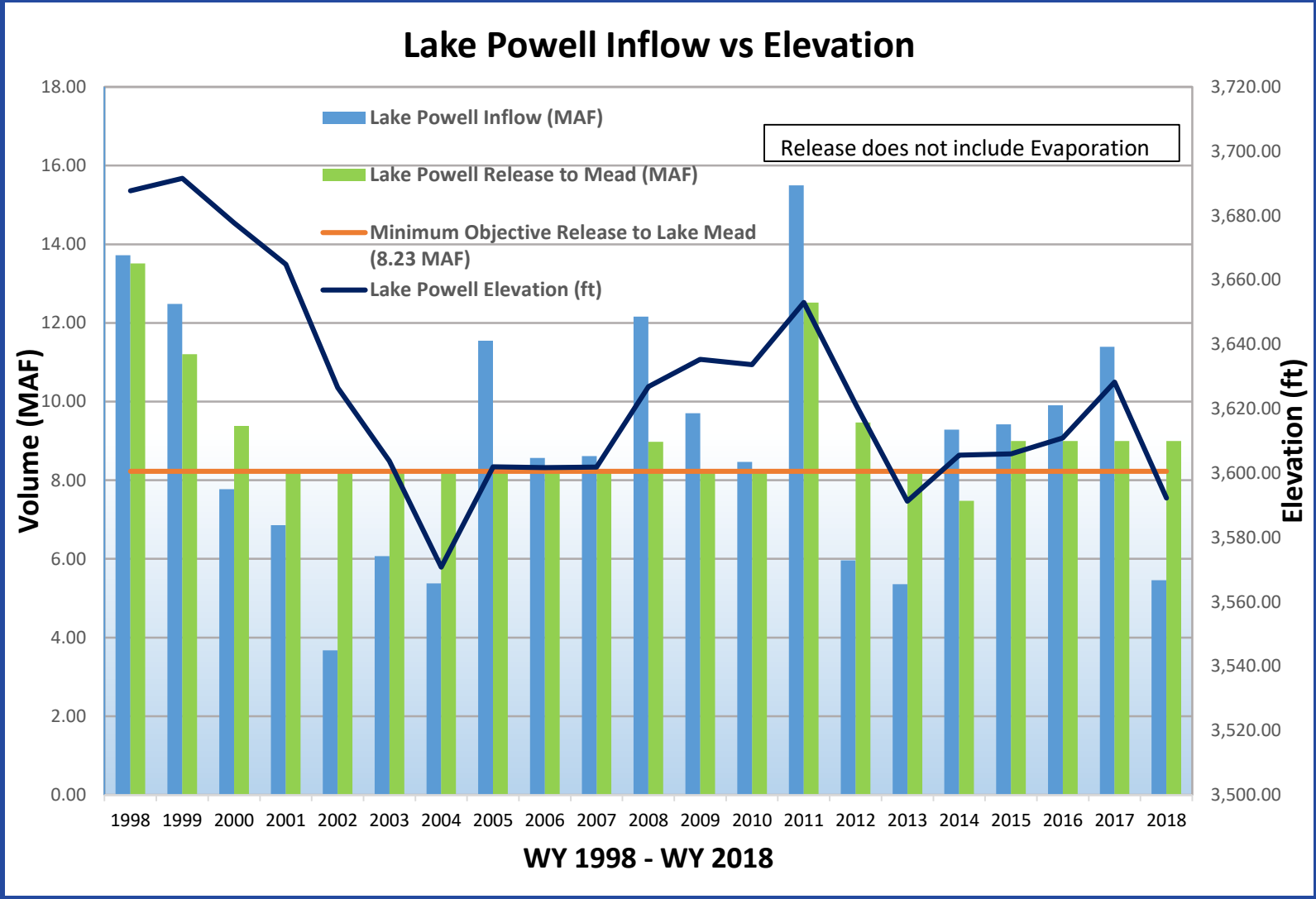
Colorado River at Lees Ferry Gaging Station, Arizona
Water Year 1906 to 2018



Provisional data, subject to change

Estimated values for 2017-2018

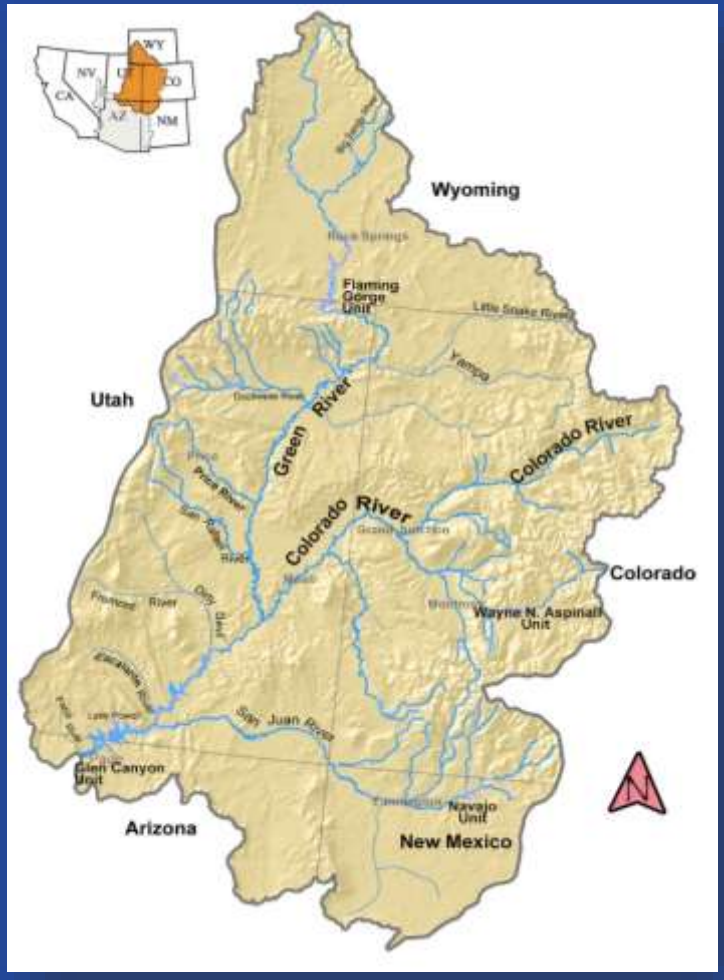
Powell Inflow, Releases and Elevation



Colorado River System Overview

- Administrative / Hydrologic differences in Upper and Lower Basins

- <u>Upper Basin</u>
  - *Supply Driven* – water users only have what variable hydrology provides; results in unreliable supply
  - Local sub-basins may be drier in any year, resulting in curtailment of junior users and shortage
  - Predominantly private water users
  - Water use governed by state water rights & administrative systems
  - Major reservoirs are at the bottom of the system, below users needs



Upper Colorado River Basin

- Upper Basin Systems
  - Numerous private systems
  - Colorado River Storage Project (CRSP) Initial Units
- General Operations of Initial Units
  - CRSP Units operated as a system for the Upper Basin States
  - Store water in upper units to make available to users & reduce evap.
  - Attempt to fill annually
  - Releases to Powell consistent with Record of Decision commitments
  - Powell releases in accordance with 2007 Interim Guidelines

UB Drought Contingency Plans (DCPs)

- Maintain Compliance w/ Colorado R. Compact / Reduce risk of Powell critical levels (3525'/3490')
- Upper Basin States' DCP Elements
  - Weather Modification
    - Currently being conducted by UB States
  - Demand Management
    - Long-term initiative being conducted by UB States based on voluntary, compensated consumptive use reduction
  - CRSP Initial Unit Drought Response Operations
    - Process devised by UB States, NPS, FWS, WAPA & Reclamation

Drought Response Operations

- CRSP Initial Units authorized purposes include:
  - Allowing for Upper Basin water development
  - Enabling Upper Basin to meet Compact deliveries
- Glen Canyon generation highly important as it funds / supports:
  - CRSP Initial Unit Operation & Maintenance
  - Salinity Control Program
  - Western electric grid
  - Nuclear plant start-up/shut-down
  - Environmental programs


HYDROPOWER
(YEAH, THAT ISN'T HOW IT WORKS.)

Drought Response Operations

- Primary bases include:
  - Create agreed upon process to be available if needed
  - Protect Lake Powell's ability to make Compact releases – Maintain Upper Basin Compact Compliance
  - Reduce risk to hydropower generation by moving water from upper units if Lake Powell projected to hit critical elevations
  - Involve all CRSP upper reservoirs to the extent feasible
  - Do not compromise existing contractual obligations
  - Work within existing authorities, operational guidelines & environmental commitments (Records of Decision/RODs)
  - Consider local concerns

Drought Response Operations

- Team Effort led by Upper Basin States
  - Modeling by Reclamation in coordination with States
  - Coordination with other agencies
- Determined that targeting elevation 3525’
  - Allows time to deliver water to Powell
  - Reduces the likelihood of a Compact Call
  - Reduces the potential for dropping below minimum power pool
- Below minimum power pool (3490’)
  - Ability to make full compact deliveries over time is compromised
  - Power pays for CRSP O&M, Salinity Control programs, AND
  - Environmental programs that allow uses to continue in the Basin

General Operational Considerations

- Upper Colorado is supply driven
- Local sub-basin hydrology can be highly variable
- At any one time, supplies may be abundant or short in a sub-basin and reservoirs in that basin
- One cannot tell ahead of time where supply may be
- Need for a flexible ‘Plan’ that allows shifts from one source to another
- Each of the upper basin reservoirs needs to participate as it can
- Each of the Upper reservoirs have operational and environmental constraints on the rates of release
- Thus is takes time (up to > 18 months) to release the large amounts of water necessary to sustain elevations at Lake Powell
- One must start releasing and then be able to shift releases or change source over time and with changing hydrology
- **The ‘Plan’ becomes more of a ‘Process’**

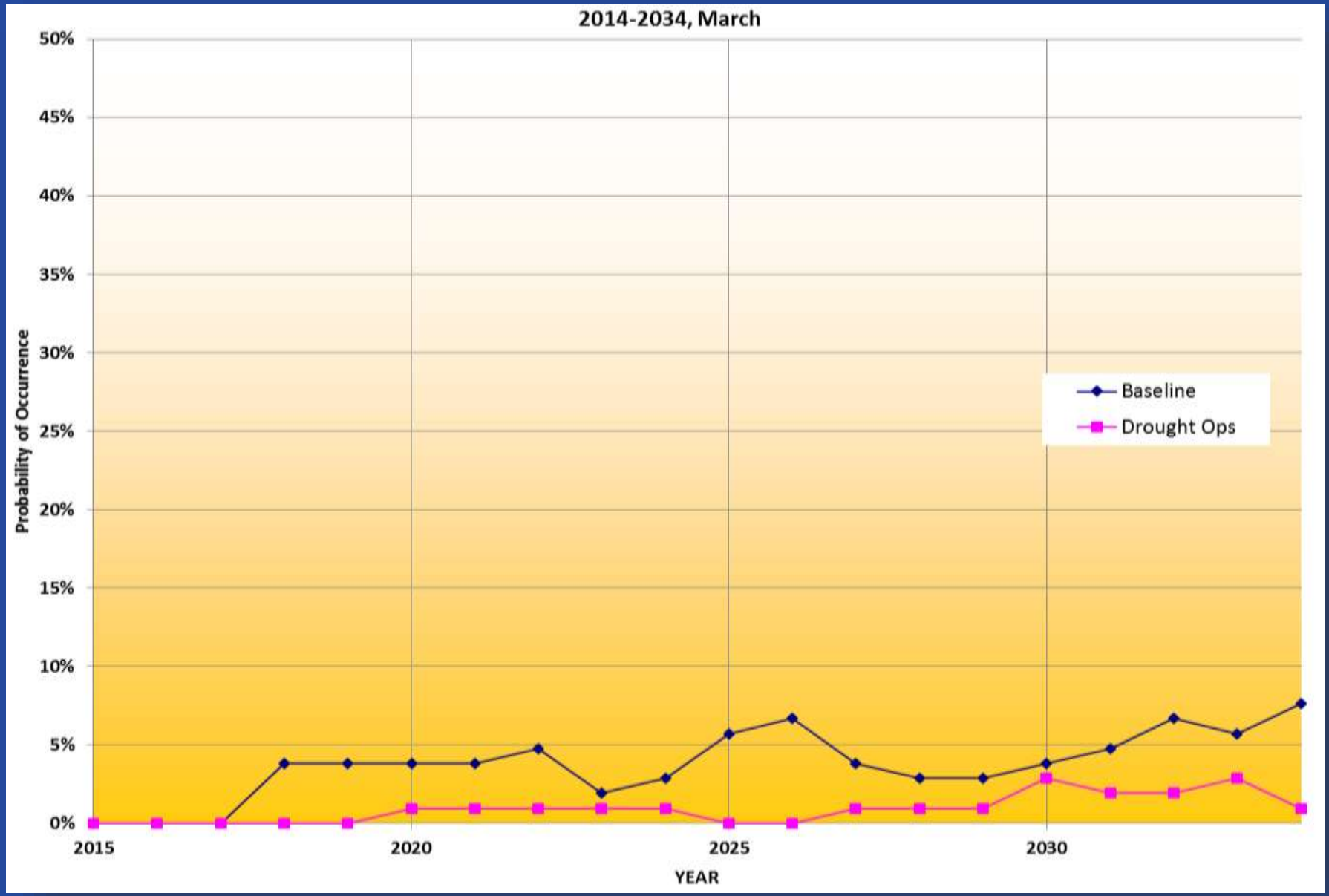
Specific Operational Considerations

- Flaming Gorge - 2006 Record of Decision (ROD) Commitments
  - 5 year types based on forecasted inflow determine:
    - Magnitude and duration of spring peak release
    - Magnitude of base flows
- Aspinall Unit - 2008 Black Canyon Decree & 2012 Aspinall ROD
  - May 1 inflow forecast determines 1 of 6 year types
  - Spring Peak flow magnitude and duration (different between decree and ROD)
  - Shoulder flows after peak (ROD)
  - Minimum base flows
- Navajo Unit
  - Forecasted inflow determines releases for San Juan River Endangered Fish Recovery program
  - Navajo Indian Irrigation Project intake level limits release

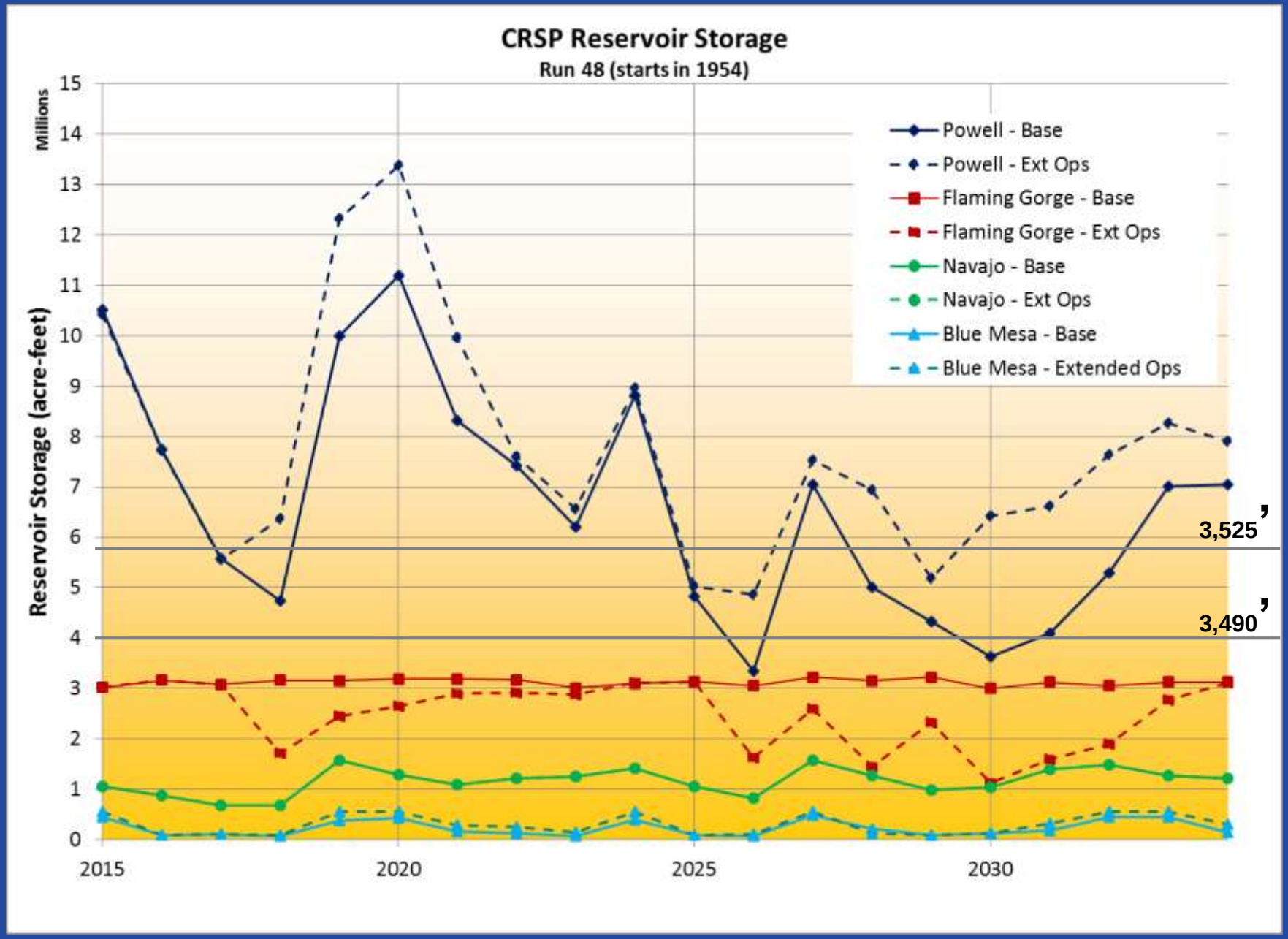
Drought Response Operations Process

- Reclamation projects monthly reservoir contents for next 24 mos.
- If minimum probable projection is for Powell to be < 3,525’ during the next 24 months – initiate consultation with States / agencies / public
- Consult at least monthly to assess water demands / availability, resource status, & develop Drought Response Recommendation
- Submit Recommendation for approval to the Interior Secretary
- If most probable Powell projection is < 3,525’ in the next ~18 mos:
  - Shift month to month Powell releases,
  - if insufficient, initiate releases from upper reservoirs
- Only release amount necessary to raise Powell to above 3,525’
- Continually monitor and change releases based on hydrology
- After Drought Ops – attempt to refill reservoirs within minimum environmental release requirements
- Draft DCP docs available at https://www.usbr.gov/dcp/docs/DCP_Agreements_Final_Review_Draft.pdf

Traces with Powell Below 3,490’



CRSP Reservoir Storage




INTERAGENCY TEAMWORK

Questions?

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Glen Canyon Dam