



— BUREAU OF —
RECLAMATION

Planning and Implementation Team March 20, 2025

Agenda Items

- Review of Sediment Modeling
- Review of resource impacts
- Other Activities Updates
 - Slough
 - ROW recoating
 - SMB flows
- Open discussion
- Schedule/Next steps
 - Spring HFE
 - SMB flows



Planning and Implementation

- Planning / Implementation team coordination
- Strives for consensus recommendation to DOI
- Secretary of the Interior makes decision

1.4 COMMUNICATION AND CONSULTATION PROCESS FOR ALTERNATIVE D

To determine whether conditions are suitable for implementing or discontinuing experimental treatments or management actions, the DOI will schedule implementation/planning meetings or calls with the DOI bureaus (USGS, NPS, FWS, BIA, and Reclamation), WAPA, AZGFD, and one liaison from each Basin State and from the UCRC, as needed or requested by the participants. The implementation/planning group will strive to develop a consensus recommendation to bring forth to the DOI regarding resource issues as detailed at the beginning of this section, as well as including WAPA's assessment of the status of the Basin Fund. The Secretary of the Interior will consider the consensus recommendations of the implementation/planning group, but retains sole discretion to decide how best to accomplish operations and experiments in any given year pursuant to the ROD and other binding obligations.

P/I Team Members

Entity	Leadership Team	Technical Team
DOI-BOR	Katrina Grantz	Kathy Callister
DOI-NPS	Ed Keable/Michelle Kerns	Emily Omana Smith/Bud Fazio
DOI-FWS	Jess Newton	Dan Leavitt
DOI-USGS	Andrew Schultz	Mark Anderson
DOI-BIA	Deb Shirley?	Deb Shirley?
DOE-WAPA	Brian Sadler?	Shane Capron?
Arizona	Kristen Johnson	Emily Young
California	Jessica Neuwerth	Shana Rapoport
Colorado	Michelle Garrison	Michelle Garrison
Nevada	Colby Pellegrino	Seth Shanahan
New Mexico	Ali Effati	Christina Nofstker
Utah	Amy Haas	Betsy Morgan
Wyoming	Charlie Ferrantelli	Mel Fegler
AZGFD	Julie Carter	Dave Rogowski
UCRC	Chuck Cullom	Rachel Musil

High Flow Experiment

LTEMP SEIS ROD

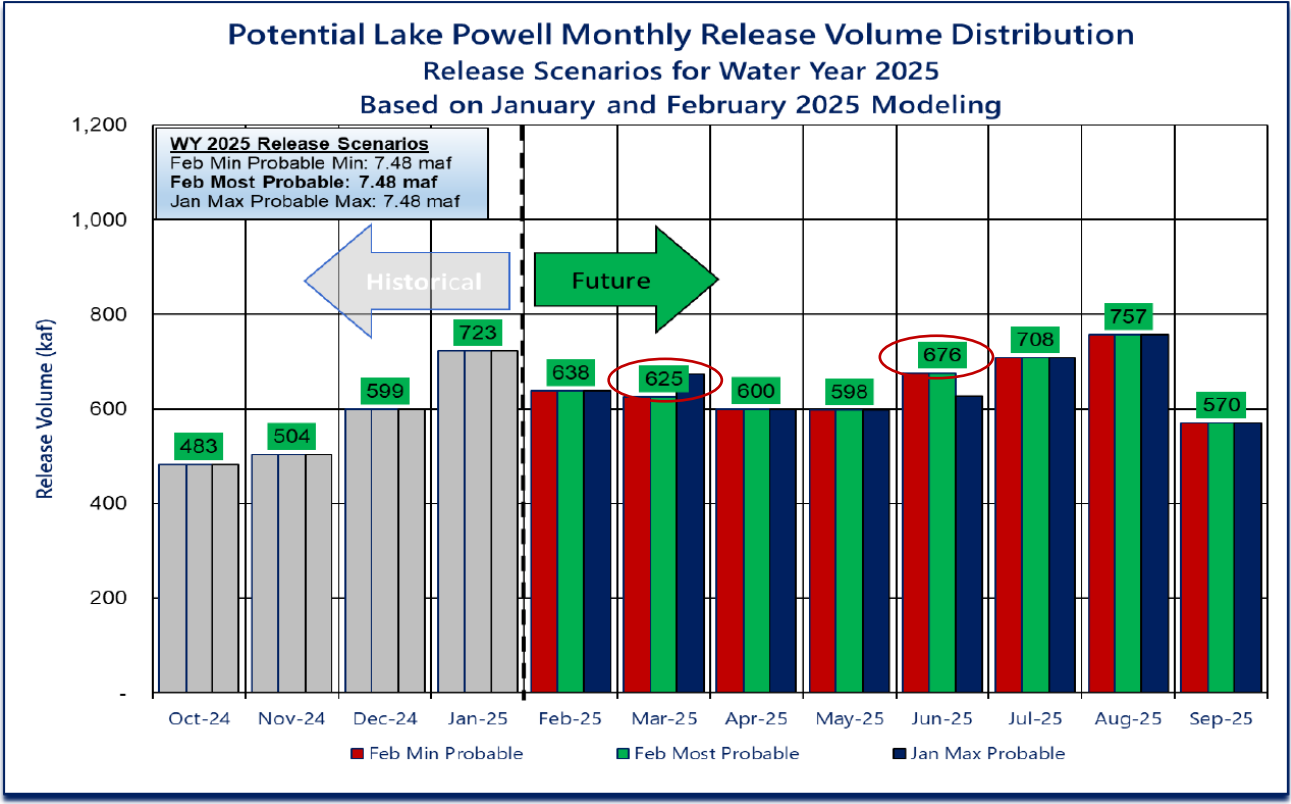
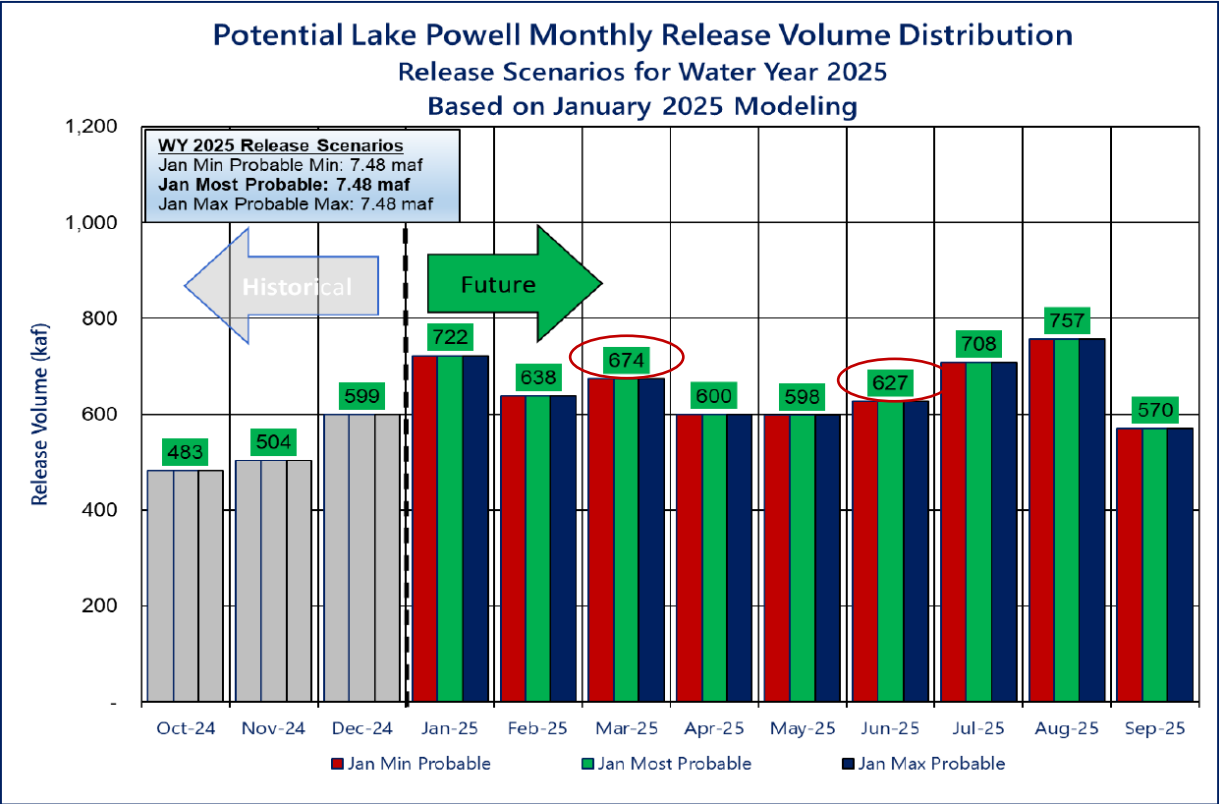
All action alternatives incorporate changes to the HFE sediment accounting period and implementation windows to use the best available science. These changes consist of adjusting the semiannual sediment accounting period to an annual period (beginning July 1) with the option for a spring or fall HFE release, or both. If a sediment trigger is met, but an HFE release is not implemented in the fall or spring, rollover of sediment into the next accounting period is possible. Implementation of a fall HFE can occur in October or November. Spring implementation could occur from March through June, depending on resource conditions and the potential for implementation of the 2024 LTEMP SEIS cold-water alternatives that include flow spikes.

P/I Recommendation

“The Leadership Team recommends to not conduct a Fall HFE and that the Planning & Implementation Team reconvene in Spring 2025 to review and provide a recommendation for a Spring High-Flow Experiment using the sediment accounting window from July 1, 2024- June 30, 2025.

Because the trigger for an HFE was met in the Fall of 2024, and the Technical Team’s preference is to defer a recommendation to the Spring, the Glen Canyon Dam Adaptive Management Program will plan as if a Spring HFE will occur to allow for any preparations to be made. This includes consideration of adjustments to monthly release volumes prior to the Spring HFE, allocation of monitoring resources, adjustments to maintenance schedules, and other resource considerations.”

Activities Update (Monthly Adjustments)

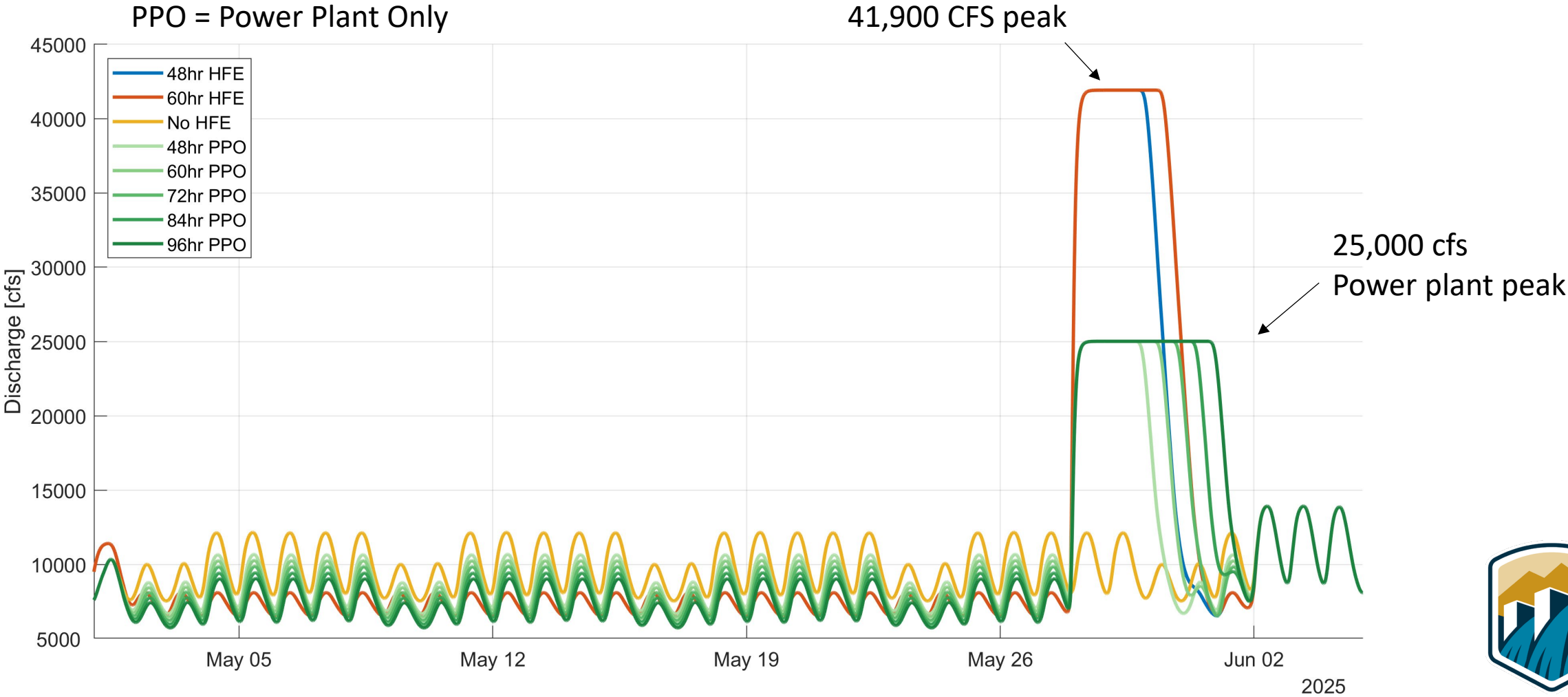


HFE Scenarios

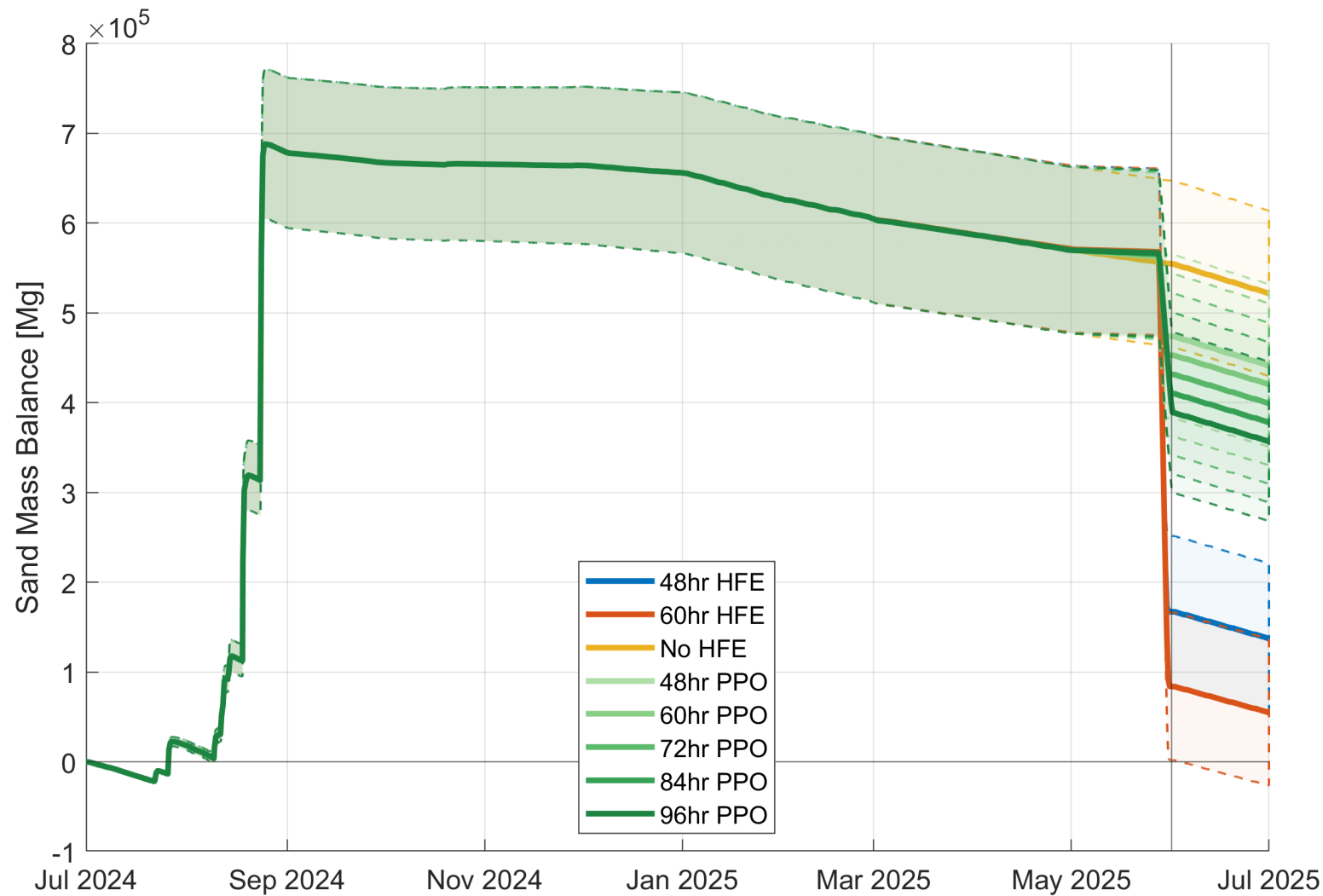
- Standard HFE
 - 48hr - 41,900 peak (15,000 cfs bypass)
 - 60hr - 41,900 peak (15,000 cfs bypass)
- No HFE
- Power Plant Only (PPO)
 - 48hr - 25,000 cfs peak
 - 60hr - 25,000 cfs peak
 - 72hr - 25,000 cfs peak
 - 84hr - 25,000 cfs peak
 - 96hr - 25,000 cfs peak



Hourly Hydrographs



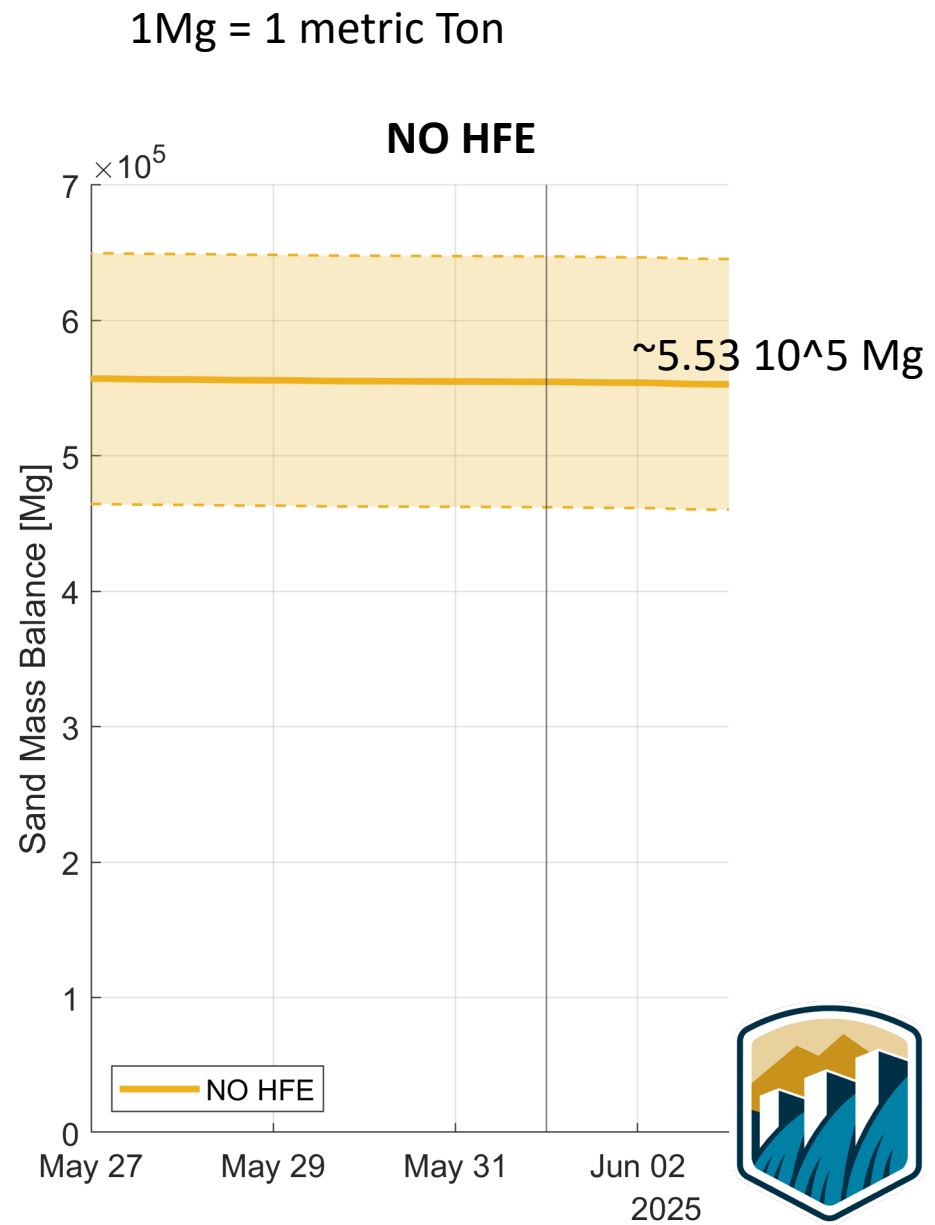
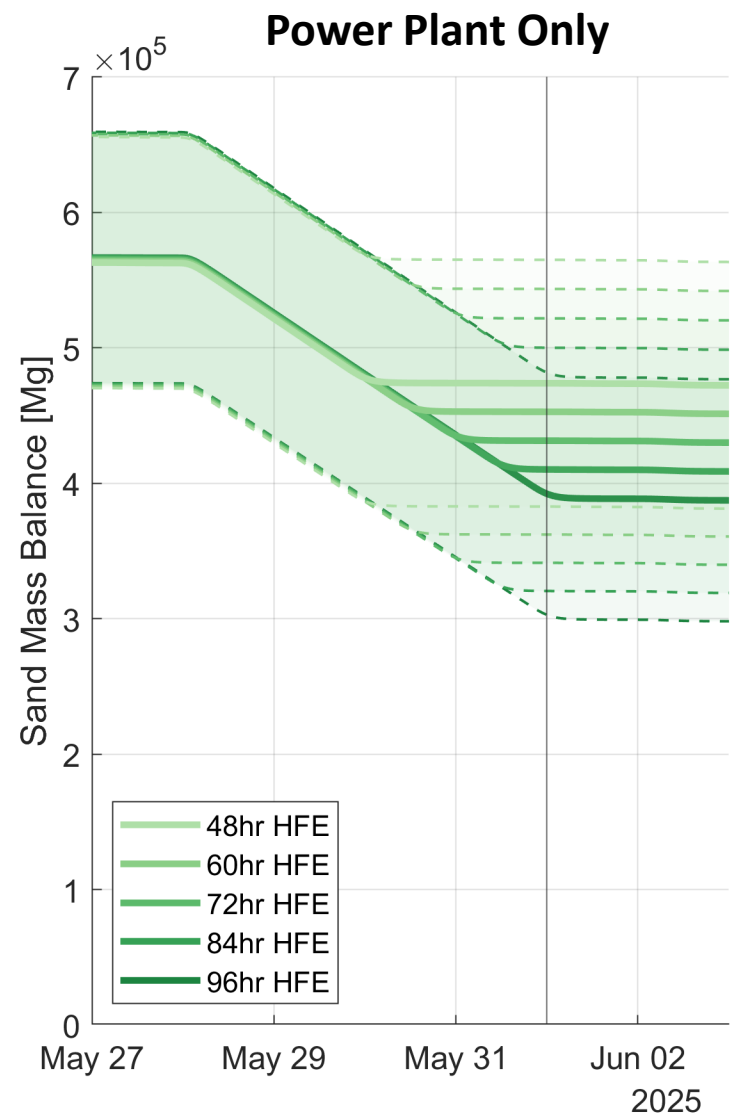
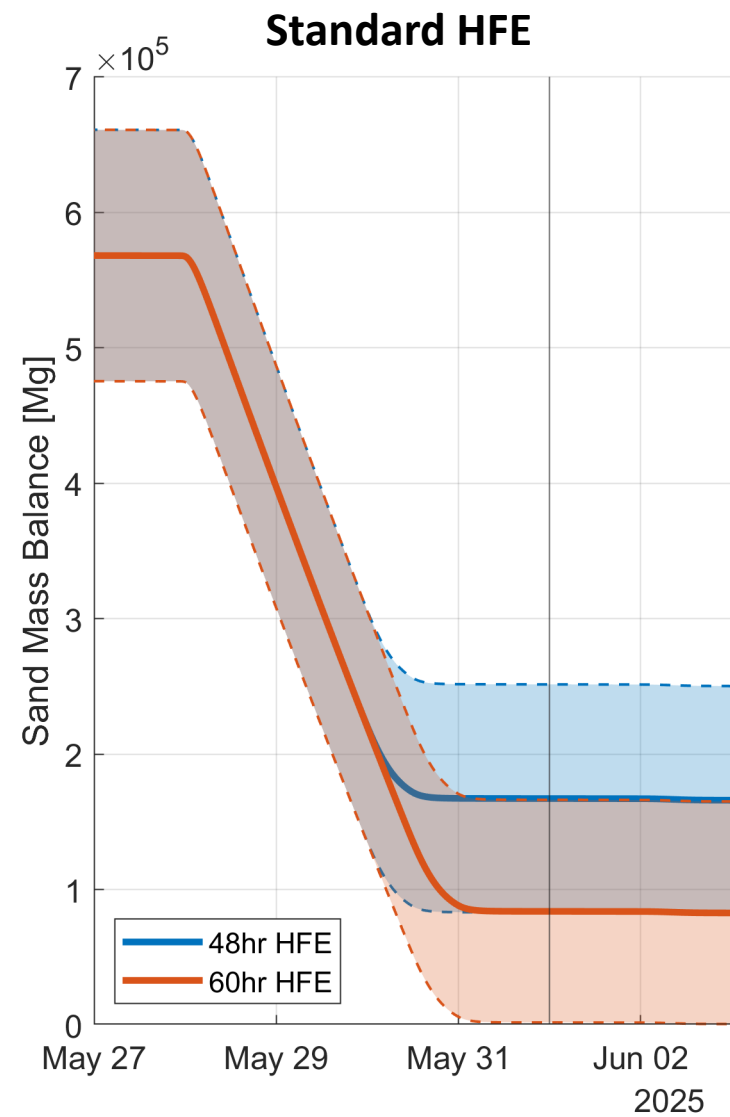
HFE Sand Mass Balance



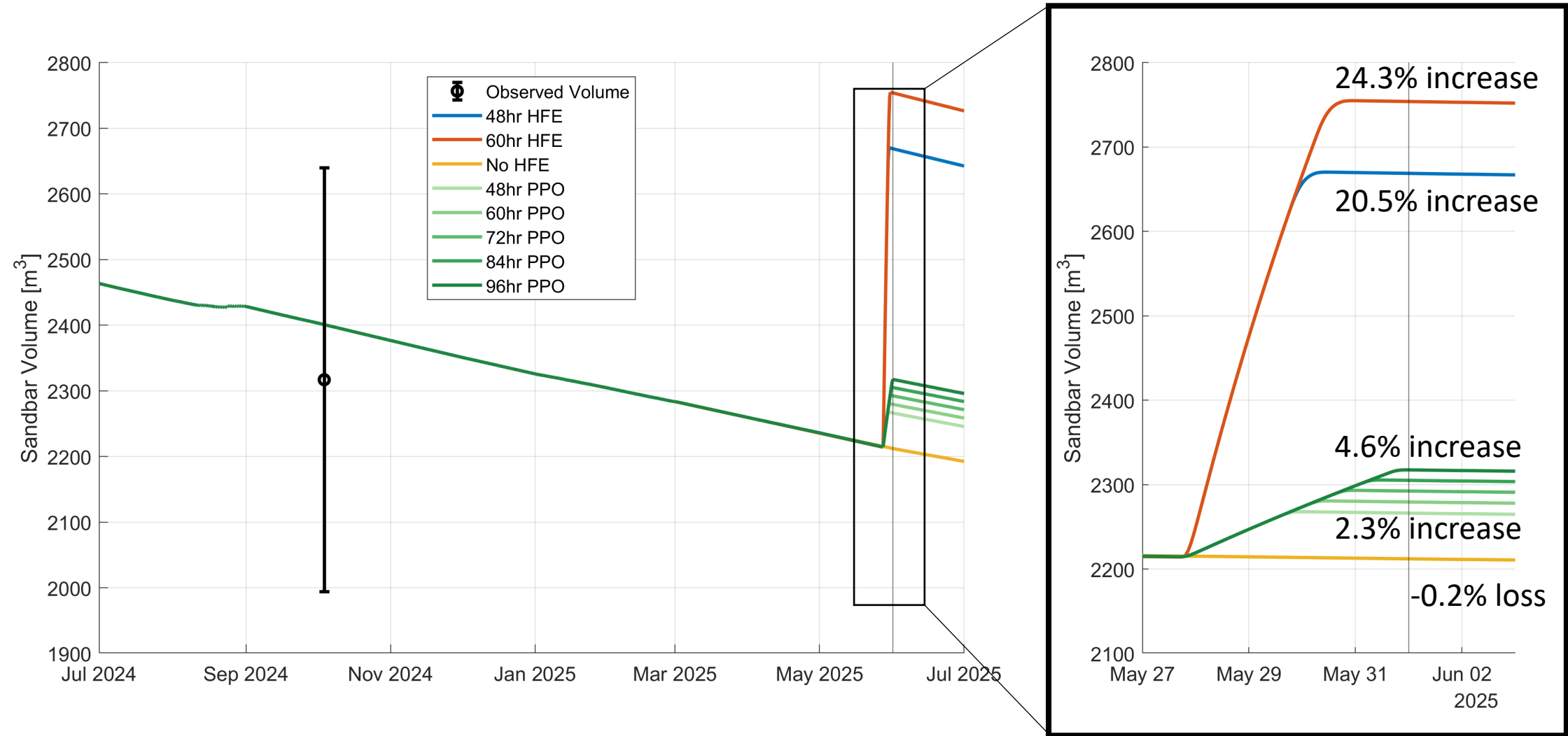
PPO = Power Plant Only



HFE Sand Mass Balance



HFE Sandbar Volume



Resource Review



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Sediment

Spring HFE - 41,900cfs (60hr)

- Based on previous sand-enriched HFEs, the proposed May 2025 HFE is predicted to result in general sandbar gains in Marble and Grand canyons above the stages associated with both 8,000 ft³/s and 25,000 ft³/s (after U.S. Geological Survey, 2025).

Spring Powerplant Only – 25,000cfs (96hrs)

- Would likely result in net erosion of the high-elevation sand (that is, the sand above the stage associated with 25,000 ft³/s) in sandbars in both Marble and Grand canyons.
- Powerplant Only flow would result in only either slight net deposition or erosion of sand above the stage associated with 8,000 ft³/s.
- There would likely be no benefit and there could be possible harm to sediment resources by conducting an HFE with a peak discharge of only 25,000 ft³/s.



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Powerplant-capacity releases generally erode high-elevation sand

	Nov. 1997 40-hour 31,000 ft ³ /s powerplant release	May 2000 80-hour 30,000 ft ³ /s powerplant release	Sep. 2000 80-hour 31,000 ft ³ /s powerplant release	Mar. 2008 60-hour 42,000 ft ³ /s sand-enriched HFE
Relative change in mean normalized sandbar volume above 25,000 ft ³ /s in Marble Canyon (<i>n</i> = 12 sites)	-21%	-6%	-1%	+26%
Relative change in mean normalized sandbar volume above 25,000 ft ³ /s in Grand Canyon (<i>n</i> = 21 sites)	-8%	-2%	Surveys not conducted throughout Grand Canyon	+68%

Analysis conducted using sites surveyed before and after all 4 experimental releases; data from USGS (2025b)

- Powerplant-capacity releases can result in slight deposition or erosion of sand above 8,000 ft³/s
- Sand-enriched HFEs generally result in much larger amounts of sand deposition above 8,000 ft³/s

	Nov. 1997 40-hour 31,000 ft ³ /s powerplant release	May 2000 80-hour 30,000 ft ³ /s powerplant release	Sep. 2000 80-hour 31,000 ft ³ /s powerplant release	Mar. 2008 60-hour 42,000 ft ³ /s sand-enriched HFE
Relative change in mean normalized sandbar volume above 8,000 ft ³ /s in Marble Canyon (<i>n</i> = 12 sites)	-10%	+1%	+16%	+33%
Relative change in mean normalized sandbar volume above 8,000 ft ³ /s in Grand Canyon (<i>n</i> = 21 sites)	-7%	+4%	Surveys not conducted throughout Grand Canyon	+42%

Archaeological and Cultural Resources

Spring HFE - 41,900cfs (60hr)

- Sandbars important to offset erosion at archaeological sites.
- In Glen Canyon, it is likely to erode terrace scarps that could impact archaeological sites within the terraces.
- A spring HFE at this magnitude and duration would likely benefit archaeological sites by resupplying source areas for wind-blown sand and protecting them from erosion.

Spring Powerplant Only – 25,000cfs (96hrs)

- Sandbars important to offset erosion at archaeological sites.
- Likely to erode and reduce the size of sandbars that serve as wind-blow sand.
- Reduce the potential to protect archaeological and cultural sites by increasing erosion potential.



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Natural Process (Flow Regime)

Spring HFE - 41,900cfs (60hr)

- A spring HFE in 2025 would not pose any direct additional risks to Natural Resources (Flow Regime).
- A spring HFE would mimic a more natural flow disturbance (pre-dam peak flow) and thus more closely align with the goals for this resource.
- A more natural flow regime could benefit ecological resources within the river system.

Spring Powerplant Only – 25,000cfs (96hrs)

- A spring Powerplant Only flow in 2025 would not pose any direct additional risks to Natural Resources (Flow Regime).
- A spring Powerplant Only flow with no bypass does not mimic a more natural flow disturbance (pre-dam peak flow), because the peak flow is not large enough to be similar to a natural flood peak.



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Natural Process (Aquatic Food Base)

Spring HFE - 41,900cfs (60hr)

- A spring HFE in 2025 would not pose any direct additional risks to Natural Processes (Aquatic Food Base) and may benefit the aquatic food base.
- Flood disturbance can help maintain native biological diversity in rivers including that of aquatic invertebrates, which represent the food base for fish and other wildlife.

Spring Powerplant Only – 25,000cfs (96hrs)

- A spring Powerplant Only flow in 2025 would not pose any direct additional risks to Natural Processes (Aquatic Food Base).
- Although a spring pulse flow with no bypass would mimic the natural timing of flow disturbance in the Colorado River, the peak flow would be small compared to natural flood peaks and is therefore less likely to enhance diversity of native aquatic invertebrates.



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Humpback Chub and Native Fish

Spring HFE - 41,900cfs (60hr)

- A spring HFE in 2025 would not pose any direct additional risks to Humpback Chub or Native Fish.
- In the PI Technical Team discussions in the fall of 2024, it was suggested that a spring HFE may have more aquatic ecosystem benefits due to historic peak timing.
- Humpback chub recruitment in Western Grand Canyon was high in 2023, but there have been other high recruitment events in years without spring HFEs (evidence is needed to further test this hypothesis).



Spring Powerplant Only – 25,000cfs (96hrs)

- A spring Powerplant Only flow would not pose any direct additional risks to Humpback Chub or Native Fish.
- In the PI Technical Team discussions in the fall of 2024, it was suggested that a spring HFE with no bypass may have more aquatic ecosystem benefits due to historic peak timing.
- Humpback chub recruitment in Western Grand Canyon was high in 2023, but there have been other high recruitment events in years without spring HFEs (evidence is needed to further test this hypothesis).

Hydropower and Energy

Spring HFE - 41,900cfs (60hr)

- A spring HFE estimated cost would be \$1,321,021.
- Basin Fund current status is below WAPA's target balance.
- The basin fund has significant risks beyond FY2025, due primarily to capital expenditures for aging infrastructure and the Smallmouth Bass experimental bypass flows from 2025 through 2027.

These expenditures could jeopardize the Basin Fund if no other funding source is identified.



Spring Powerplant Only – 25,000cfs (96hrs)

- A spring Powerplant Only flow estimated cost would be \$80,947.
- Basin Fund current status is below WAPA's target balance.
- The basin fund has significant risks beyond FY2025, due primarily to capital expenditures for aging infrastructure and the Smallmouth Bass experimental bypass flows from 2025 through 2027.
- These expenditures could jeopardize the Basin Fund if no other funding source is identified.

Recreation

Spring HFE - 41,900cfs (60hr)

- A spring HFE would not pose any direct effects to the recreational users.
- The HFE should benefit recreational users through improvements to camp areas and vegetation reduction in the near shore habitat.

Spring Powerplant Only – 25,000cfs (96hrs)

- A spring Powerplant Only flow would not pose any direct effects to the recreational users.



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Rainbow Trout Fishery

Spring HFE - 41,900cfs (60hr)

- A spring HFE flow could pose negative effects to the Rainbow Trout fishery.
- It would disrupt angling during high flow.
- Uncertain whether the higher velocities of a HFE flow are substantive enough to sweep fry downstream and increase their mortality.
- A May HFE flow would reduce food availability during a critical time for feeding.

Spring Powerplant Only – 25,000cfs (96hrs)

- A spring Powerplant Only flow could pose negative effects to the Rainbow Trout fishery.
- It would disrupt angling during high flow
- Uncertain whether the higher velocities of a Powerplant Only flow are substantive enough to sweep fry downstream and increase their mortality.
- A May Powerplant Only flow would reduce food availability during a critical time for feeding.



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Nonnative Fish

Spring HFE - 41,900cfs (60hr)

- A spring HFE would not pose any direct additional risks from Green Sunfish, Brown Trout, Smallmouth Bass, or other nonnative fish dispersal or recruitment.

Spring Powerplant Only – 25,000cfs (96hrs)

- A spring Powerplant Only flow would not pose any direct additional risks from Green Sunfish, Brown Trout, Smallmouth Bass, or other nonnative fish dispersal or recruitment.



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Native Riparian Vegetation

Spring HFE - 41,900cfs (60hr)

- A spring HFE would not pose any direct risks to Native Riparian Vegetation.
- Spring HFEs have greater potential to benefit regeneration of native species from seed, as they correspond more closely with the natural flow regime and germination period of some native species, such as cottonwoods and willows.
- Maintenance of sandbars and sediment resources maintains unique habitats for native riparian plant species, so also promotes unique native riparian plant communities.



Spring Powerplant Only – 25,000cfs (96hrs)

- A spring Powerplant Only flow is unlikely to pose any direct risks to Native Riparian Vegetation but will likely have fewer potential benefits than an HFE using bypass.
- Peak of the Powerplant Only flow lies within the area of the shoreline that can be affected by daily fluctuations and thus erosion possibly eroding seedlings.
- Few to no benefits are expected, but research surrounding this kind of flow would provide more information on how summer pulse flows alter riparian plant communities.

Water Delivery, Water Quality, Slough, Dam Maintenance

Spring HFE - 41,900cfs (60hr)

- Water Delivery would not be affected by a spring HFE.
 - Water Quality may experience temporary changes in the form of Temperature, DO, Phosphorus concentrations, and Electrical Conductivity.
 - Slough should not be affected by a spring HFE as long as modification has been completed before a spring HFE is conducted.
- Dam Maintenance is scheduled to be completed in early- to mid-May allowing for a spring HFE to be implemented in late-May.



Spring Powerplant Only – 25,000cfs (96hrs)

- Water Delivery would not be affected by a spring Powerplant Only flow.
- Water Quality may experience temporary changes in the form of Temperature, DO, Phosphorus concentrations, and Electrical Conductivity.
- Slough should not be affected by a spring HFE as long as modification has been completed before a spring Powerplant Only flow is conducted.
- Dam Maintenance is scheduled to be completed in early- to mid-May allowing for a spring Powerplant Only flow to be implemented in late-May.

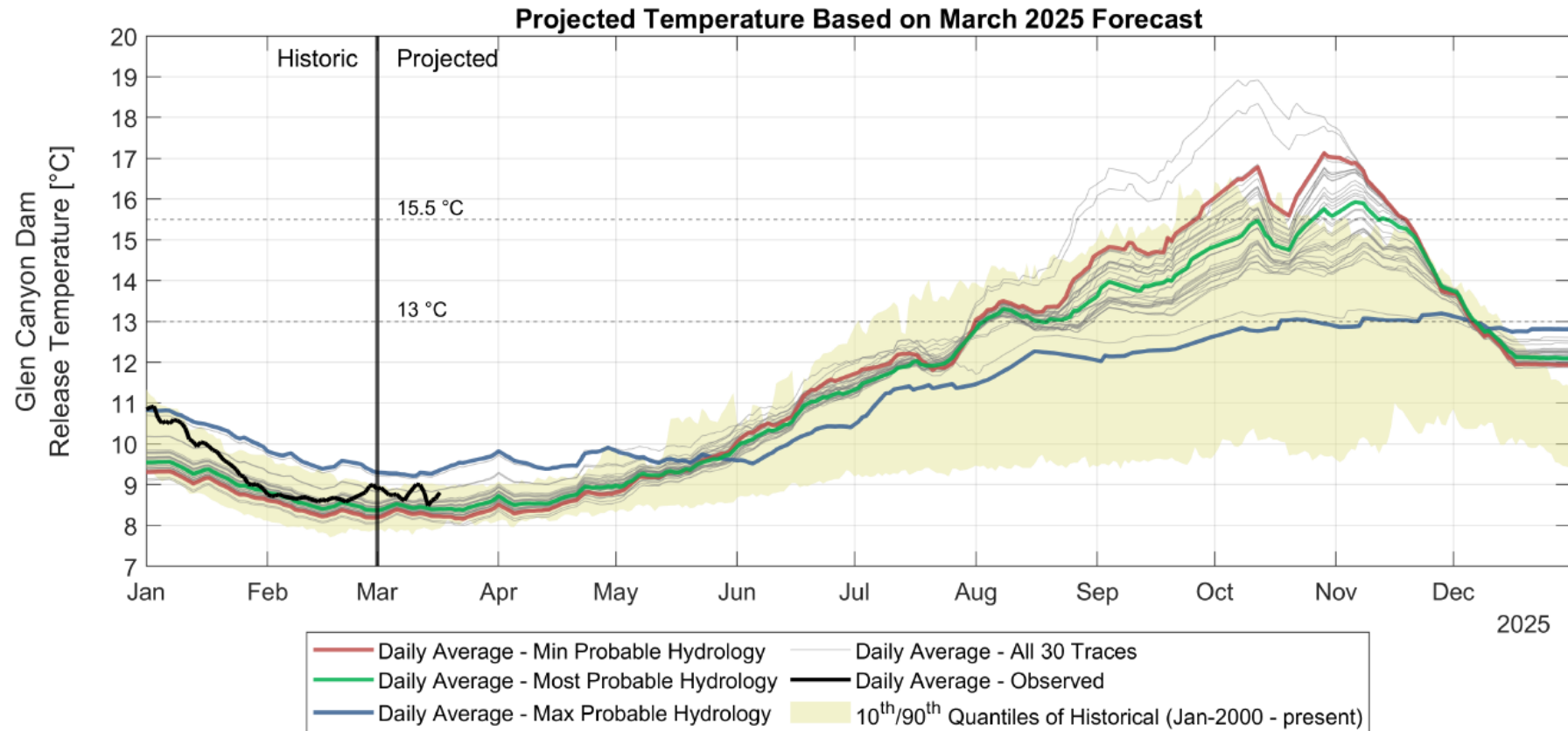
Activities Update (Slough Modification/ROW recoating)

- Slough
 - Modification work has been initiated.
 - Anticipated completion early May.
- River Outlet Work Recoating
 - ROW 1 & 2 completed
 - ROW 3 is underway
 - ROW 3 anticipated to be complete by early May



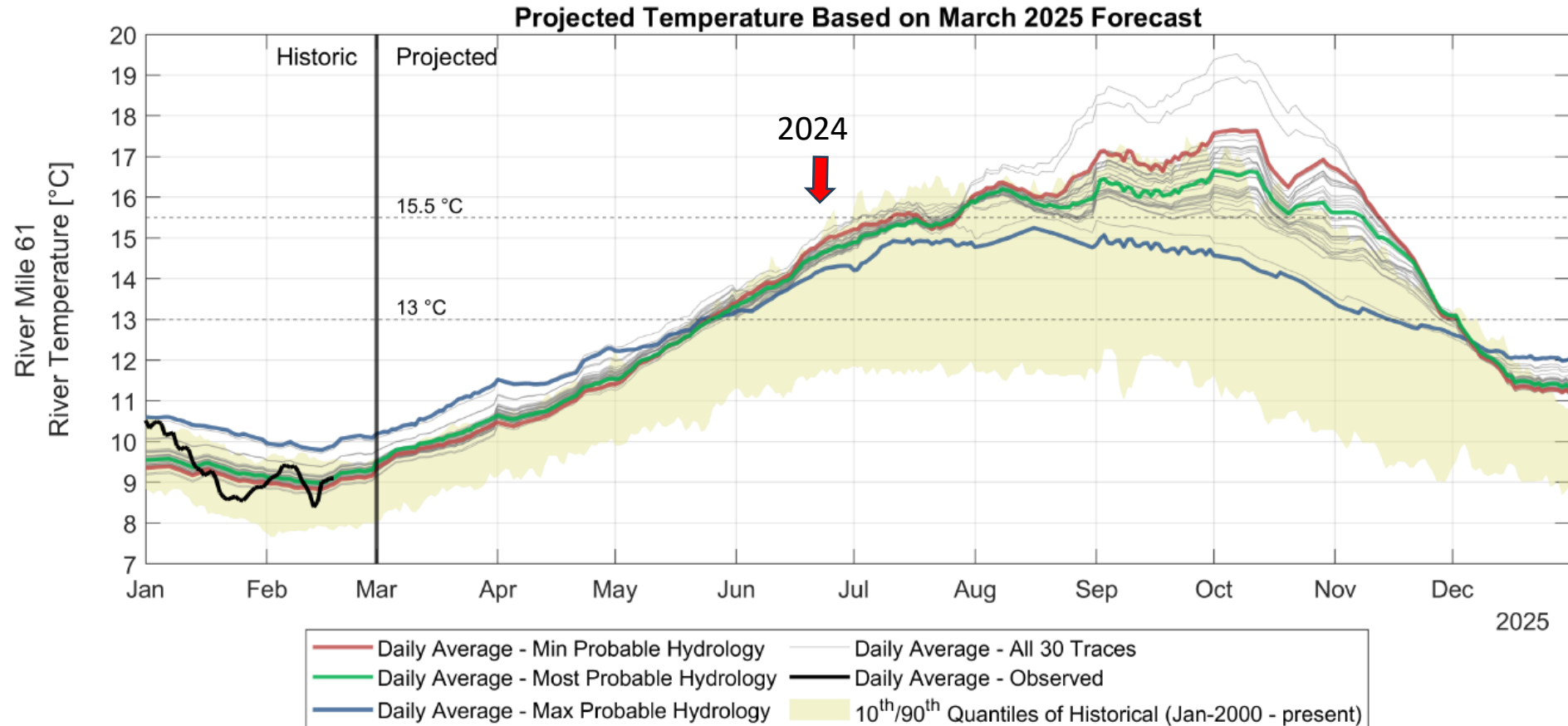
Activities Update (Smallmouth Bass Flows)

Glen Canyon Dam Release Temperature (*Eppehimer et al, 2024 model)



Activities Update (Smallmouth Bass Flows)

River Mile 61 Temperature (*Dibble et al, 2020 model)



A wide-angle photograph of a massive concrete dam, likely the Glen Canyon Dam, situated in a deep, rugged canyon. The dam's face is a smooth, light-colored concrete, contrasting with the dark, layered red rock of the canyon walls. Water is seen cascading over the base of the dam, creating a white, frothy spray. At the top of the dam, a series of steel support structures and walkways are visible. In the background, the canyon opens up into a vast, arid landscape under a clear sky. The text "Open Discussion" is centered over the dam's face in a large, black, sans-serif font.

Open Discussion

HFE Tentative Timeline

- March
 - 3/20: P/I team final meeting before tech recommendation
 - 3/20-3/27: Draft technical memo review
- April
 - 4/3: P/I Technical Recommendation
 - 4/10: TWG meeting
 - 4/11: P/I Leadership Recommendation
 - 4/18: DOI Decision
- May
 - Possible Implementation



Smallmouth Bass Flow Tentative Timeline

- February
 - Expert Panel Solicitation (Biological)
- March
 - 3/14: Summary of Panel Results
- April
 - 4/4: Draft summary report for 2024 cool mix
 - 4/25: Technical memo
- May
 - 5/15: P/I Recommendation
- June
 - Early June: DOI Decision
 - Possibly begin implementation (based on decision and conditions)



QUESTIONS



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