Two Years of Cool-Mix Flows

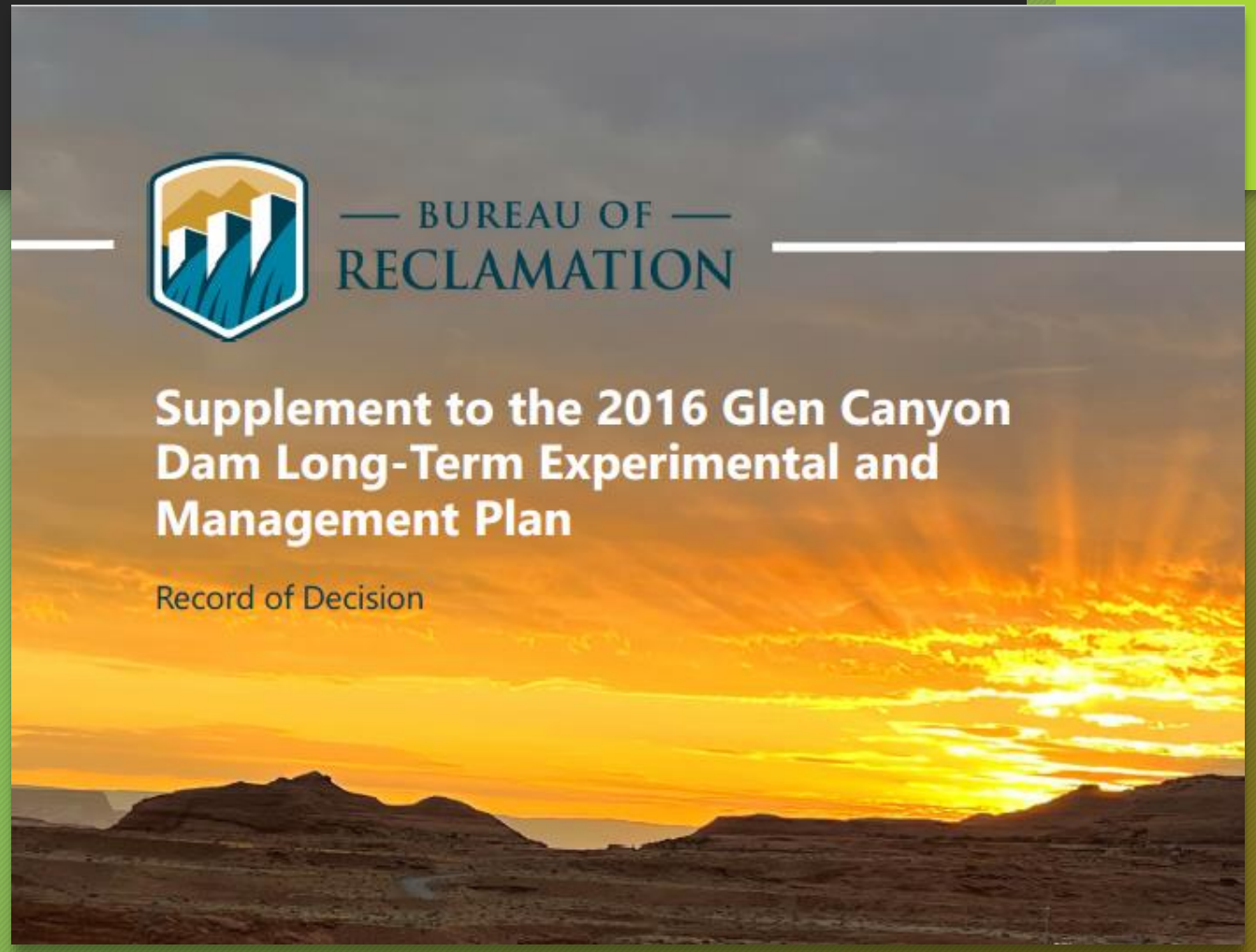
Outline

- Cool-mix process – Jeremy Hammen, Reclamation
- Temperature and other water quality Results – Bryce Mihalevich, Reclamation
- Smallmouth bass and other nonnative fish monitoring results – Drew Eppehimer, GCMRC
- Hydropower assessment – Craig Ellsworth, WAPA
- SBAHG survey results and discussion – Emily Young, SBAHG Chair

What are Cool-Mix Flows

- “The Cool Mix Alternative aims to maintain a daily average water temperature below 15.5 degrees Celsius (°C) (60 degrees Fahrenheit [°F]) at the target river mile locations below Glen Canyon Dam where smallmouth bass could spawn. It would involve strategic water releases from both the penstocks and river outlet works, with quantities determined by predicted temperatures. Flows would be triggered when temperatures rise above 15.5°C (60°F), with variations based on monthly water volumes and conditions.”

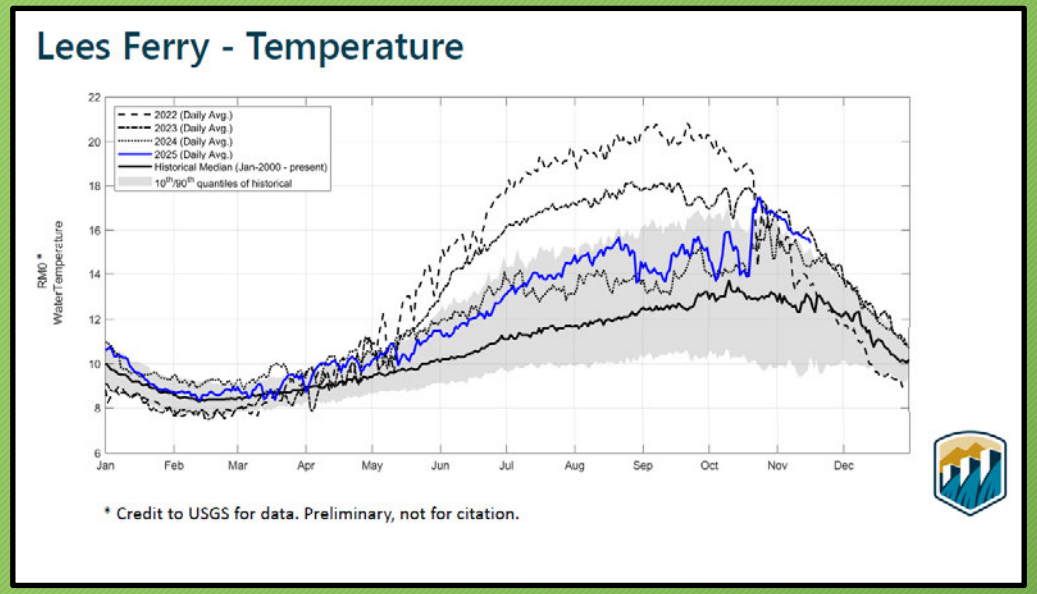
– 2024 Supplement to the 2016 Glen Canyon Dam Long-Term Experimental and Management Plan (LTEMP SEIS)



Implementation Process for 2024 and 2025

2024

- LTEMP SEIS recommended implemented immediately
  - LTEMP SEIS Outlined trigger for Cool-Mix to be implemented
  - Trigger had been met when Record of Decision was signed



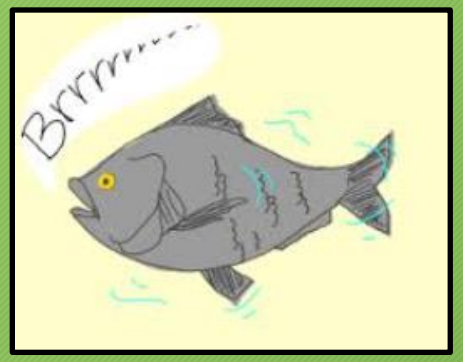
2025

- Planning and Implementation (PI) Team
  - Transparent Process Needed
  - Early Spring Kick-off Meeting
    - Forecasting models
    - Member discussion
  - PI Technical Team makes Recommendation to PI Leadership Team
    - **Smallmouth Bass Expert Panel Discussion**
    - **Member scenario ranking (N=33)**
    - **Top Rankings were used in screening tool to assess probability of Smallmouth Bass recruitment (Lambda) and cost to hydropower ($)**
      - No Cool-Mix
      - River Mile – 0,15,30,61
      - Off-Ramp – September 15, October 1, October 20, Temperature
    - Consideration of other LTEMP resources
  - PI Leadership Team makes recommendation to the Secretary of the Interior
  - Secretary of the Interior makes FINAL decision

Implementation Triggers for 2024 and 2025

2024

- River Mile = 61
- 3-day Observed Temperature = 15.5°C
  - Installed a real-time gage
- Implementation Date = July 9, 2024
- Off-Ramp = 3-day Observed Temperature = 15.5°C and anticipated to remain below



2025

- River Mile = 30
- 3-day Observed Temperature = 15.5°C
  - Originally forecasted temperatures
  - Installed a real-time gage
- Initial Implementation Date = August 3, 2025
  - GCMRC data download showed observed temperatures still under target
  - Bypass temporarily shutdown
- Second Implementation Date = August 12
- Off-Ramp = After October 20

Implementation Weekly Coordination for 2024 and 2025

Day of the Week	Activity
Monday	Reclamation Water Quality updated WAPA Modeling on current release penstock and bypass temperatures WAPA modeling develops hydrograph options using the river temperature lookup table, penstock and bypass temps, and Argonne models
Tuesday	WAPA hydrographs tested in river temp models by Reclamation Water Quality BOR Group meeting to discuss model outputs and determine hydrograph(s) that meet objectives for further discussions with WAPA Group
Wednesday	Coordination meeting between BOR Group and WAPA Group to discuss model outputs and hydrograph(s) for a final hourly release pattern determination
Thursday	Reclamation River Operations issued a directive confirming the release pattern
Friday	LTEMP Planning and Implementation Technical Team meeting to discuss experiment updates (every other Friday)
Saturday	New hydrograph implemented by Reclamation and WAPA