BUREAU OF RECLAMATION

Trinity LTO Operations

CWEMF 2024

Kunxuan Wang

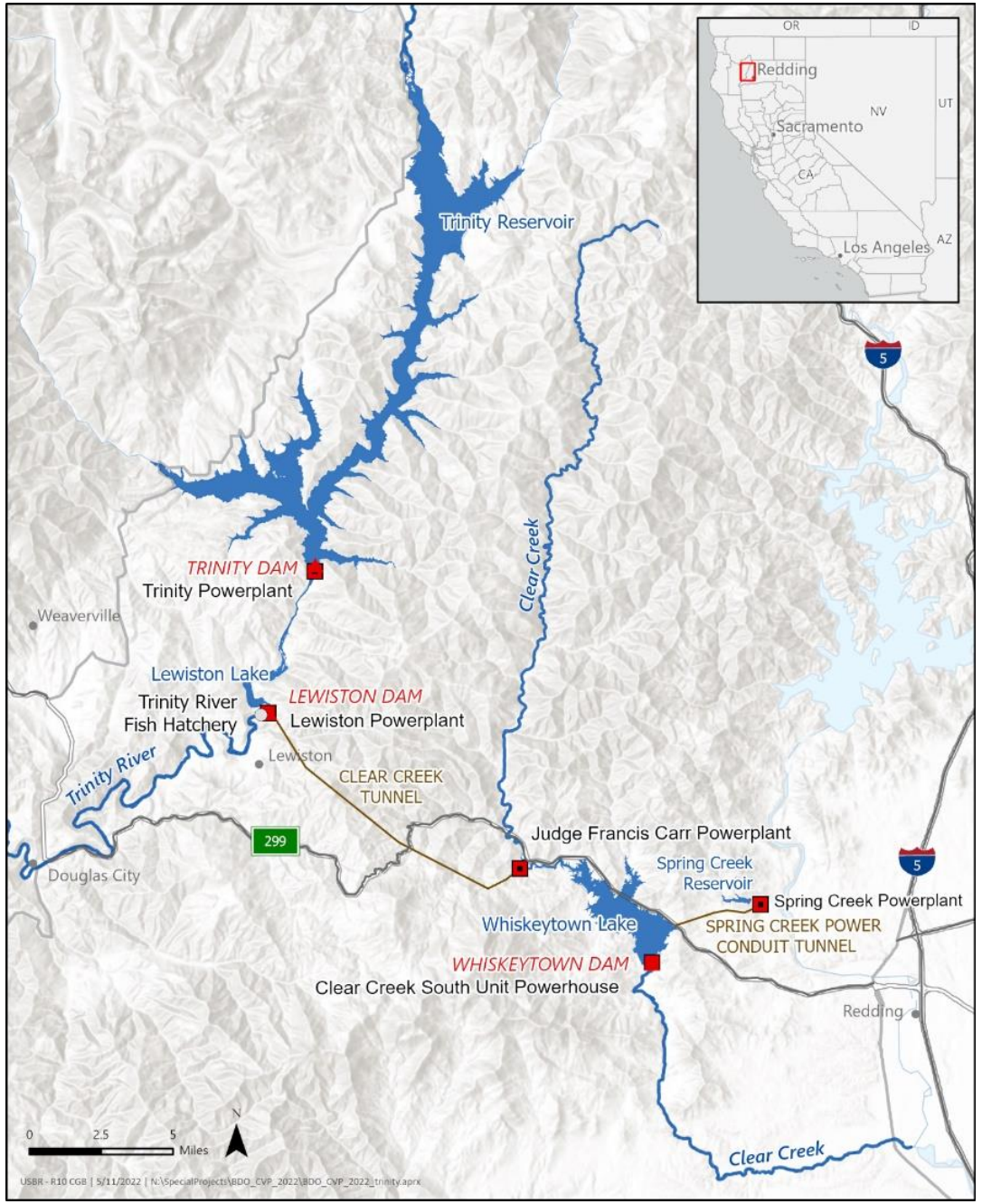
Sep 25, 2024

Outline

- Trinity Background
- Trinity LTO and key operations
- High Level Alternatives Overview
  - NAA
  - Alternatives 1-7

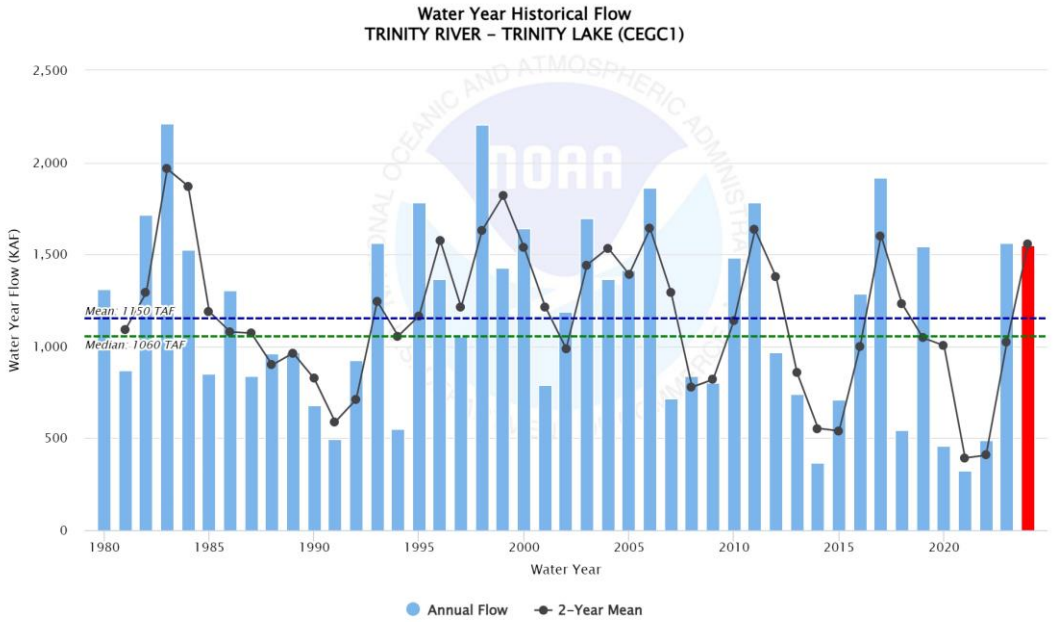
Path of Trinity Water

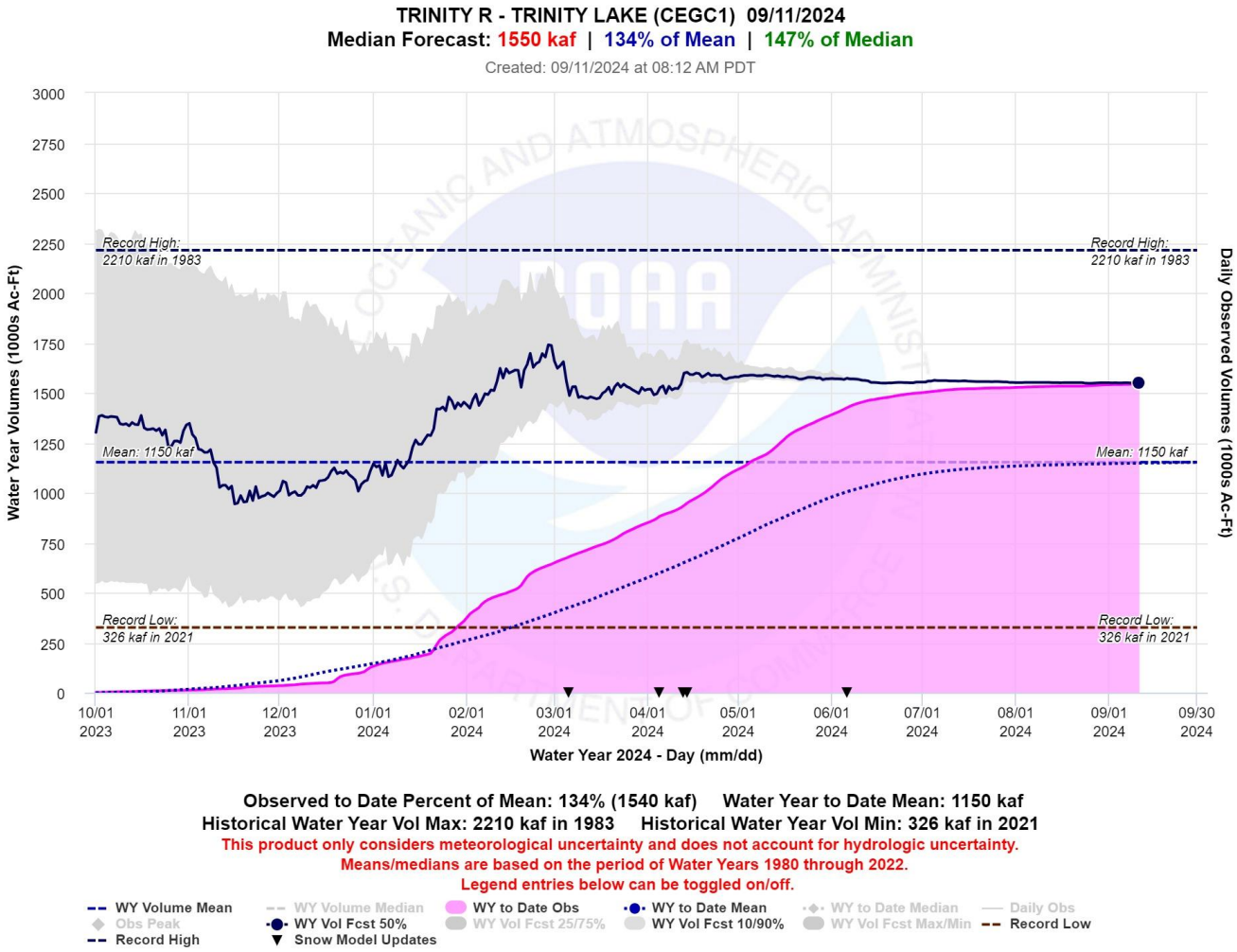
- Trinity Basin
  - Trinity Reservoir and Dam
  - Lewiston Lake and Dam
  - Trinity & Klamath Rivers
- Diversion to Sac Basin
  - Clear Creek Tunnel
  - Carr Powerplant
  - Whiskeytown Lake
  - Spring Creek Tunnel and Powerplant
  - Sacramento River



Trinity Reservoir Basin Hydrology

- Strong seasonal pattern with snowmelt contribution
- Large inflow variability
- Slow reservoir refill:
  - ~1 MAF inflow : ~2.4 MAF Storage



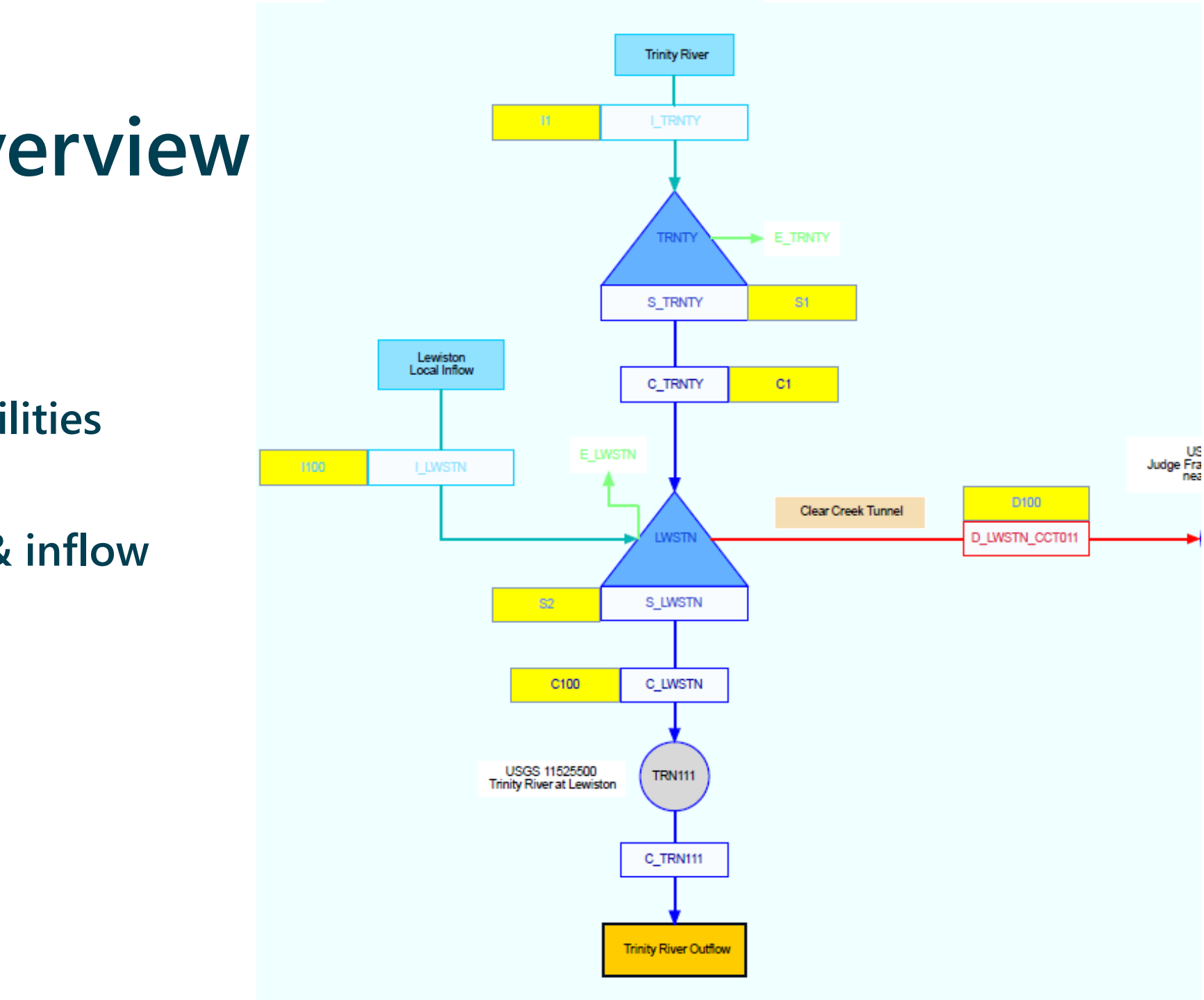


Trinity LTO

- Currently operations mainly based on 2000 River Mainstem Fishery Record of Decision (2000 Trinity ROD/2000 ROD)
- Re-consultation of the Long-Term Operation (LTO) of the Trinity River Division
  - Meet authorized purposes under climate change (2022MED)
  - Separate from 2021 Central Valley LTO
- Trinity LTO Joint Leads
  - Reclamation, the Hoopa Valley Tribe, the Yurok Tribe
  - Advised by CDFW, NMFS
- Operations planning model in Calsim 3

Operations Overview

- Lewiston Release
  - Fisheries benefits
  - Tribal trust responsibilities
- Storage
  - Trinity water supply & inflow management
  - Recreation
- Diversion
  - CVP water supply
  - Power generation x4
  - Temperature



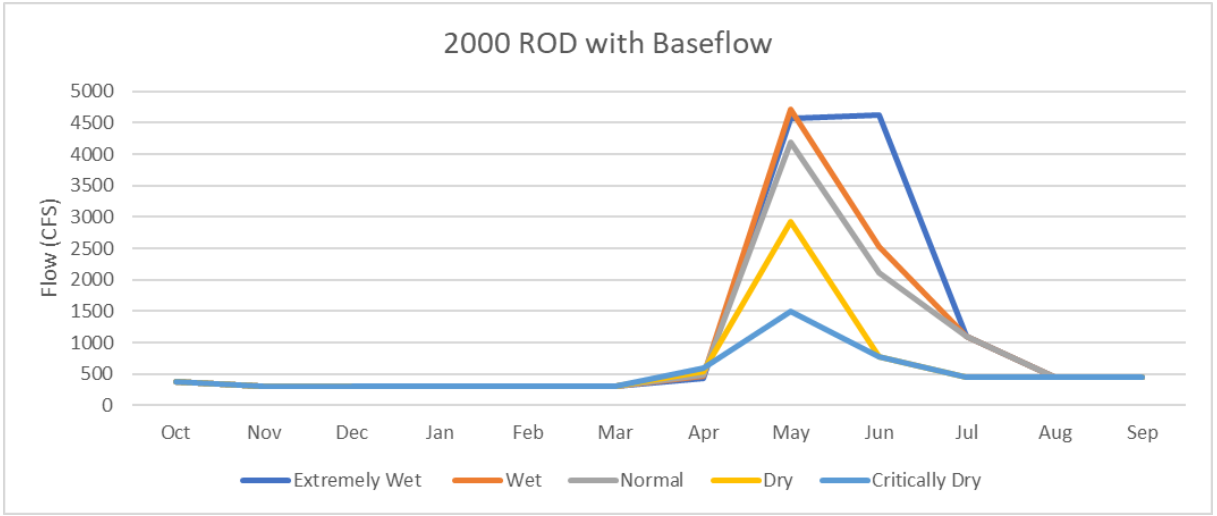
Preliminary Alternatives Overview

- No Action Alternative – 2000 ROD / 2017 ROD / 2020 ROD
- Alternative 1 – Water Quality Control Plans
- Alternative 2 – Multi-Agency Deliberation
- Alternative 3 – Modified Natural Hydrograph
- Alternative 4 – Risk-Informed Operations
- Alternative 5 – Low Emissions with Flexible Management
- Alternative 6 – Trinity County Local
- Alternative 7 – Maximum Flow

No Action Alternative

- Lewiston Release
  - 2000 Trinity ROD
- Storage Target
  - Target 600 TAF
- Diversion
  - Off Season Oct-Feb
    - Oct: move warm water out of Lewiston
    - Nov-Feb: Divert when SOD release is likely
  - In Season Mar-Sep
    - Lower in spring/summer and higher in fall/winter for temperature benefits

WYT (in Apr)	Unimpared Annual Inflow (TAF)	2000 ROD Volume (TAF)
Extremely Wet	> 2000	817
Wet	> 1350	702
Normal	> 1025	648
Dry	> 650	453
Critically Dry	<= 650	369



No Action Alternative

- Lewiston Release
  - 2000 Trinity ROD
- Storage Target
  - Target 600 TAF
- Diversion
  - Off Season Oct-Feb
    - Oct: move warm water out of Lewiston
    - Nov-Feb: Divert when SOD release is likely
  - In Season Mar-Sep
    - Lower in spring/summer and higher in fall/winter for temperature benefits

Alternative 6 - Trinity County Local Alternative

Prolonged drought protection

- Storage Target
  - Storage targets for consecutive drought (Dry and Critical) years

Consecutive Drought Storage Targets	
1st year or non-drought	1.5 MAF
2nd year	1.3 MAF
3rd year	1.1 MAF
4th year	1.0 MAF
5th year	900 TAF
6th year	825 TAF
7th year	750 TAF

Alternative 1 - Water Quality Control Plan

1992 CVPIA, pre-2000 ROD

- Lewiston Releases
  - Restoration flow: 340 TAF release based on CVPIA
- Storage Target
  - None. Deadpool at 240 TAF
- Diversion
  - Divert as needed

Alternative 7 – Maximum Flow

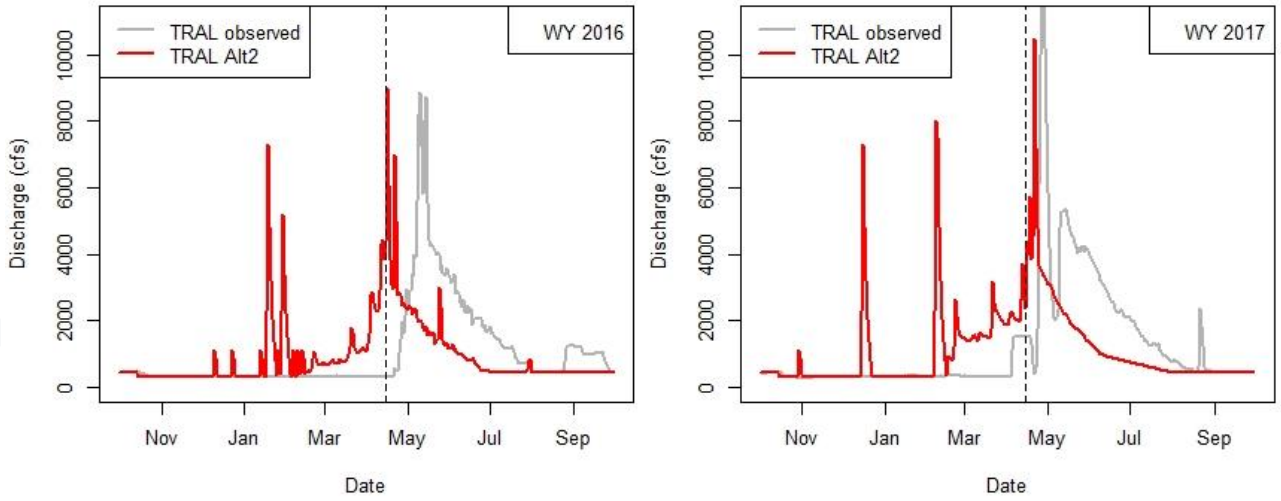
Maximize flow down Trinity River

- Lewiston Releases
  - 70% of inflow to Trinity
- Storage Target:
  - 750 TAF
- Diversions:
  - None
  - Except to meet temperature target and releases to avoid Safety of Dams concerns

Alternative 2 - Multi-Agency Deliberation

Shift flows earlier in the season for fisheries benefits

- Lewiston Releases
  - 2000 ROD volume
  - Higher flows in winter and early spring
- Storage Target
  - End of December planning minimum over consecutive drought (Dry or Critical) years
- Diversion
  - From Oct to Jun/Jul 1st, prioritize Trinity River flow and temperature
  - From Jun/Jul 1st to Sep 30th, divert to meet other CVP needs



Consecutive Drought Storage Targets	
1st year or non-drought	1.2 MAF
2nd year	900 TAF
3rd year	750 TAF
All times	>750 TAF

Alternative 2 - Multi-Agency Deliberation

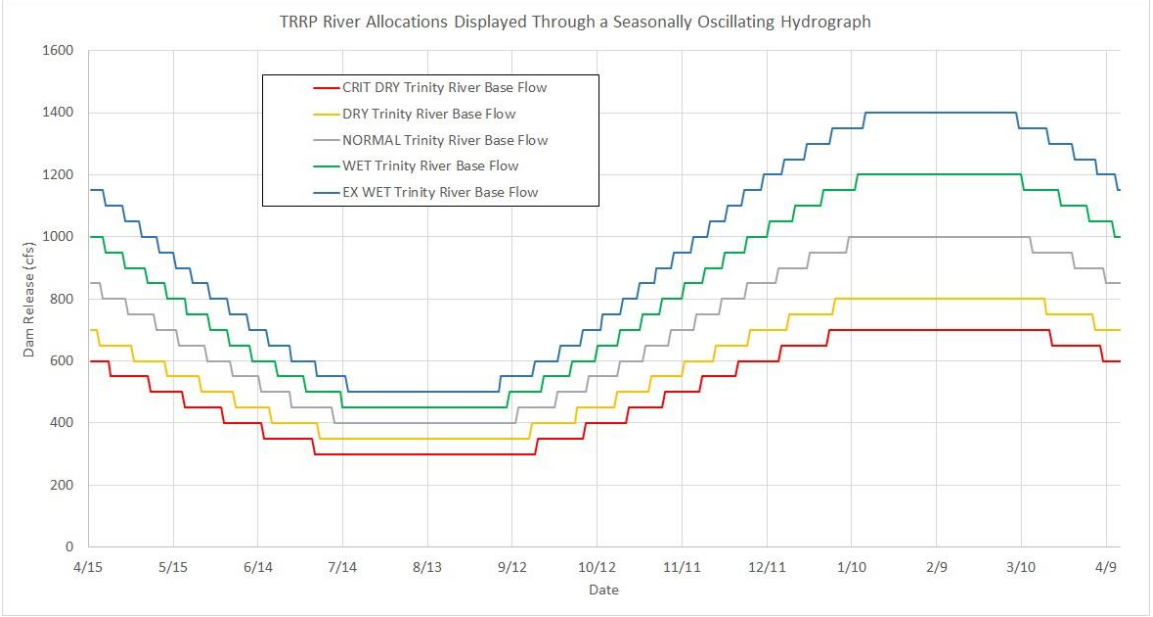
Shift flows earlier in the season for fisheries benefits

- Lewiston Releases
  - Higher flows in winter and early spring
- Storage Target
  - End of December planning minimum over consecutive drought (Dry or Critical) years
- Diversion
  - From Oct to Jun/Jul 1st, prioritize Trinity River flow and temperature
  - From Jun/Jul 1st to Sep 30th, divert to meet other CVP needs

Alternative 3 – Modified Natural Hydrograph

Shift of 2000 ROD volume release

- Lewiston Releases
  - 2000 ROD volume
  - Seasonally Oscillating Hydrograph
  - Supplemental pulse flows



Alternative 4 – Risk Informed Operations

Max water availability and flexibility for Diversion

- Lewiston Releases
  - Same as Alternative 2
  - Reduced 2000 ROD volume by 15% if storage fell below 750 TAF following a multi-year drought
- Storage Target:
  - 750 TAF
- Diversion:
  - Same as NAA

Alternative 5 – Low Emissions with Flexible Management

50/50 sharing of water between Trinity and Sac

- Lewiston Releases
  - 50/50 split of water supply
- Storage Targets
  - Same as Alt6
- Diversions:
  - Same as Alt2 with minimum diversion

Consecutive Drought Storage Targets	
1st year or non-drought	1.5 MAF
2nd year	1.3 MAF
3rd year	1.1 MAF
4th year	1.0 MAF
5th year	900 TAF
6th year	825 TAF
7th year	750 TAF

Questions?

Kunxuan Wang, kwang@usbr.gov
Bay Delta Office, Modeling Division
US Bureau of Reclamation

Derya Sumer, dsumer@usbr.gov
Bay Delta Office, Modeling Division Chief
US Bureau of Reclamation

BUREAU OF RECLAMATION