

# History of Managing Extremes of Flood & Drought

Catastrophic flooding was the catalyst for the 1959 Agency Act and Yuba County voters' 1961 approval to construct the Yuba River Development Project for flood control and water supply.



**10,000 Flee For Lives  
In Northern California**

**Army Takes Over in Peru, Revolt Ends**  
Violence Subsides in Arequipa After Troops Move In  
ANKEETA, Peru, 18 — The

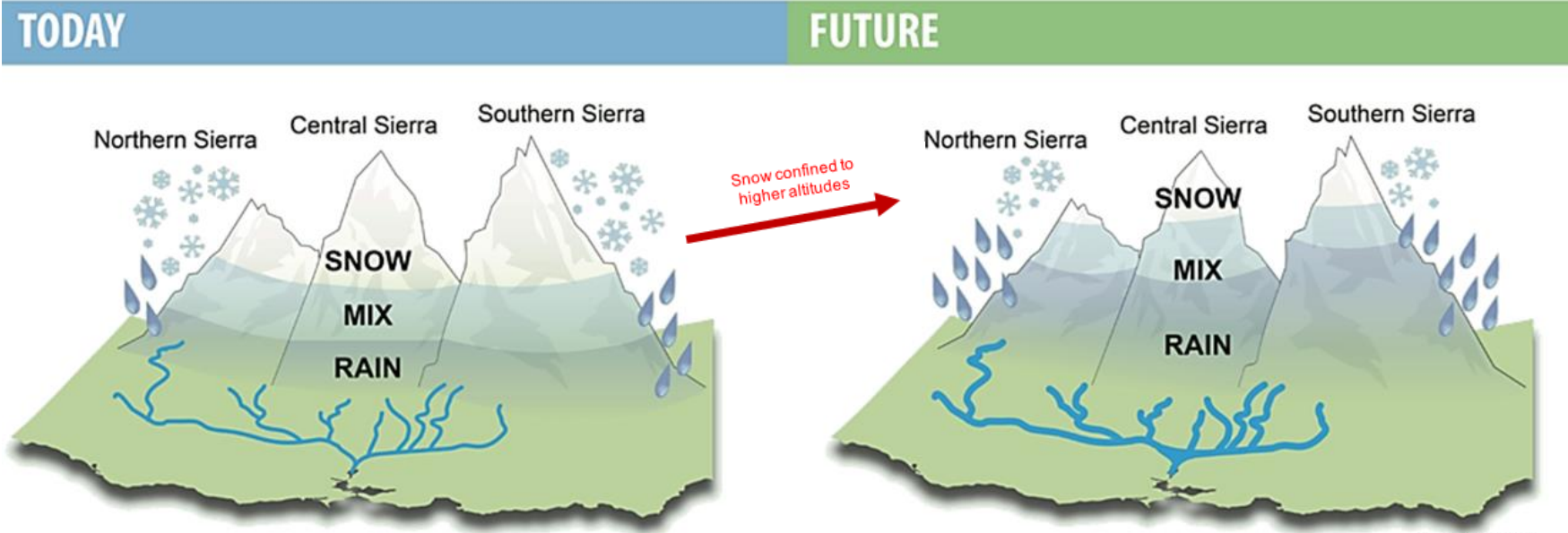
**Fate of Whole Race at Stake Warns Pope**  
Calls for Ban on Nuclear Tests in Christmas Message  
By HERBERT K. JACKSON

**Urgent Plea Sounded for Aid in Flood**  
An urgent appeal to villagers in help flood victims in the north and California area was lodged when Herb Edrins, president of the Junior Chamber of Commerce, received a 4 p.m. phone call from Sacramento flood control authorities asking for clothing, canned goods, clothes, and blankets to be sent to State Japan headquarters.

**Levee Break at Yuba City Floods Town**  
Refugees from Marysville Forced to Flee Again.  
SAN FRANCISCO 18 — The



# Climate Change Will Amplify These Climate Extremes

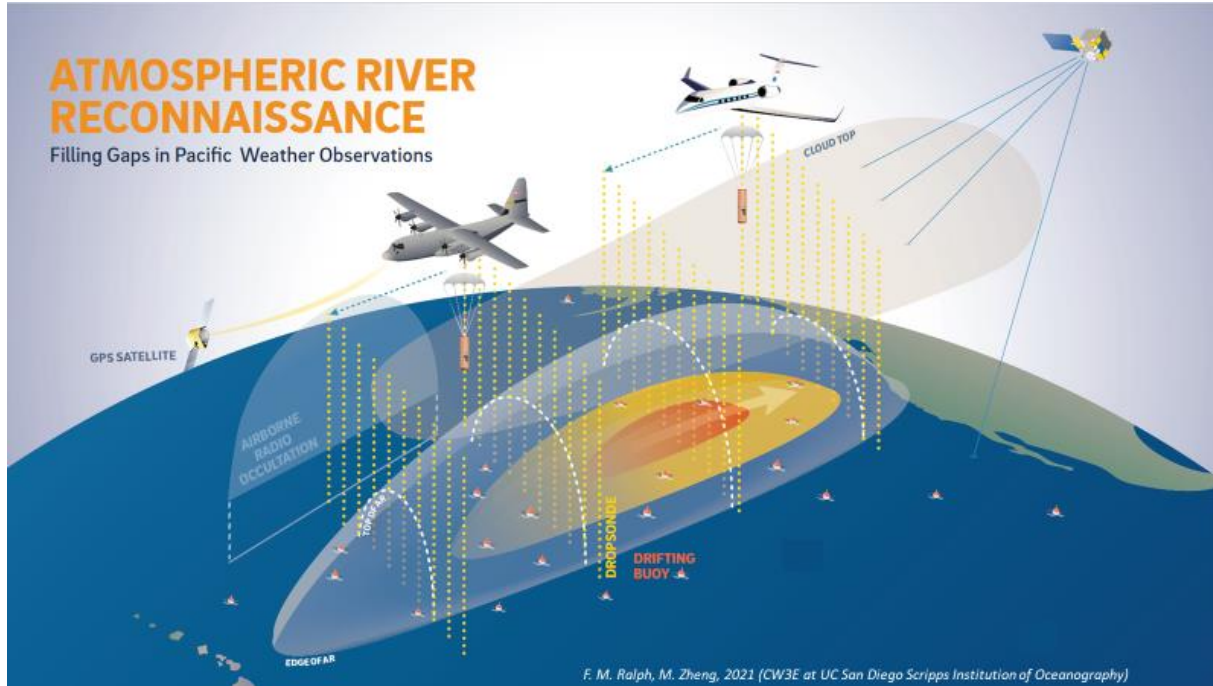


CVFPP 2017

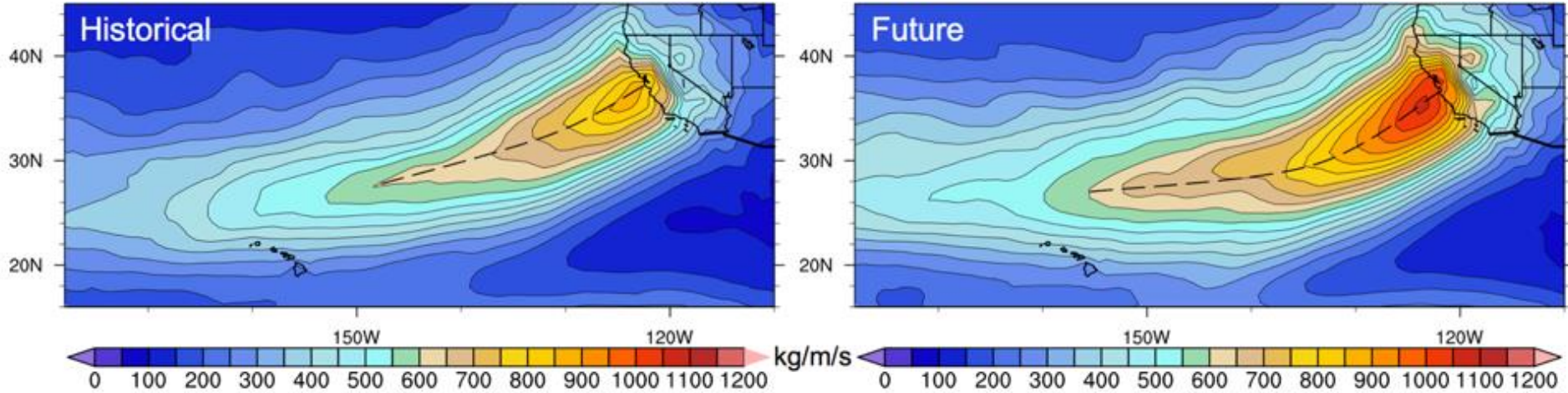
Less Snow + More Rain = **More Severe Events**



# Research for a New Climate Reality



# Atmospheric Rivers – Historical and Future



Climate change impacts to extreme atmospheric river events indicate a likely increase in precipitation and runoff from future events in the Yuba-Feather region.

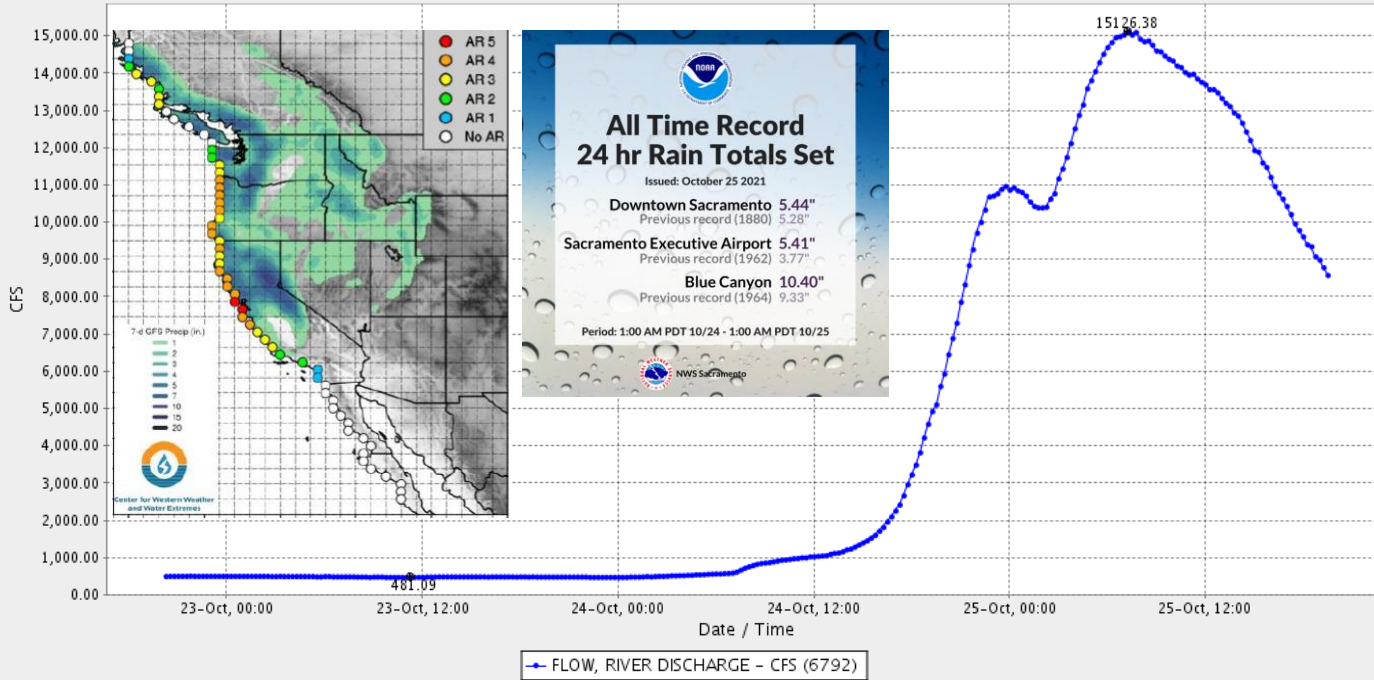


# Recent Indications: October 23-25, 2021 Atmospheric River

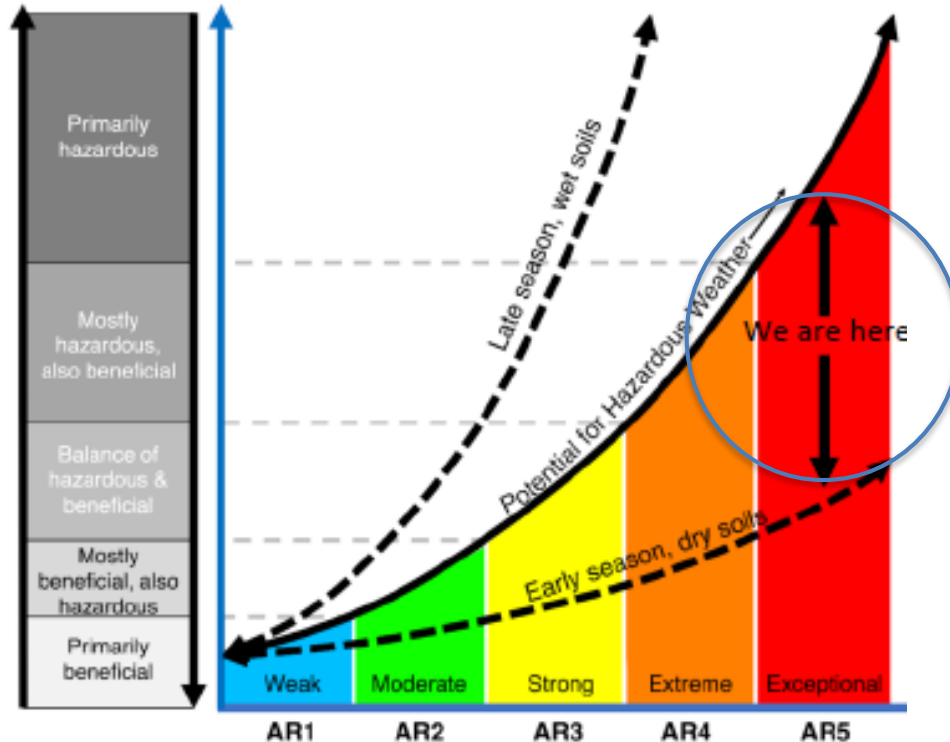
## YUBA RIVER NEAR MARYSVILLE ( MRY )

Date from 10/22/2021 20:09 through 10/25/2021 20:09 Duration : 3 days

Max of period : (10/25/2021 07:15, 15126.38) Min of period : (10/23/2021 11:15, 481.09)



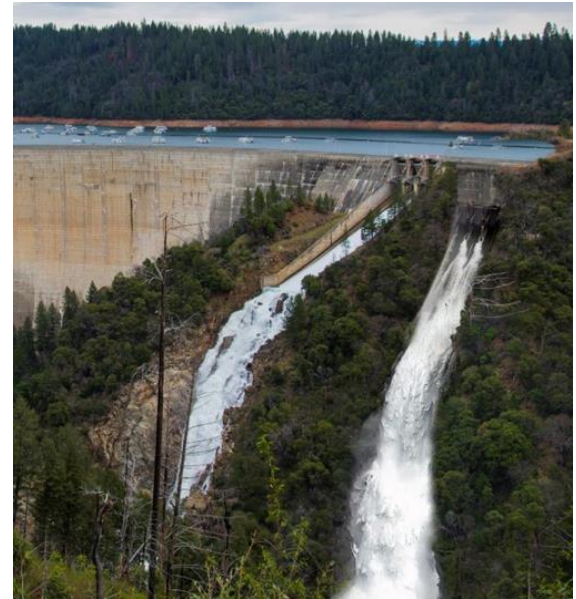
# Recent Indications: October 23-25, 2021 Atmospheric River



Ralph et al. (2019) AR Scale Ranking and Classification

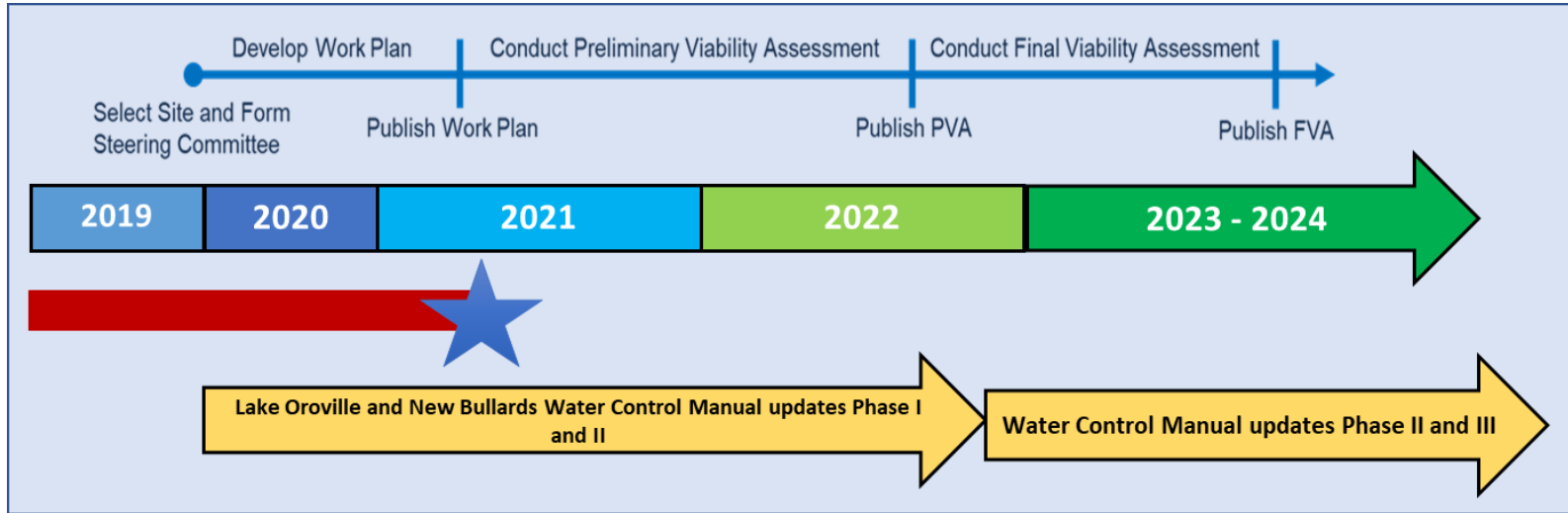
# Climate Resilience – What it Means for Infrastructure

- Atmospheric River Control (ARC) Spillway at New Bullards Bar to create additional storage to capture peak flows and reduce peak releases during storm events.
  - 90% design expected in early 2022.
- Enables management of an additional 117,000 acre-feet of reservoir space.
- Improves the management, integrity and performance of the downstream flood protection system, including state/federal levees.



# Climate Resilience – What it Means for Operations

## Yuba-Feather Forecast Informed Reservoir Operations and Water Control Manual Update Timeline



Center for Western Weather  
and Water Extremes  
SCRIPPS INSTITUTION OF OCEANOGRAPHY  
AT UC SAN DIEGO

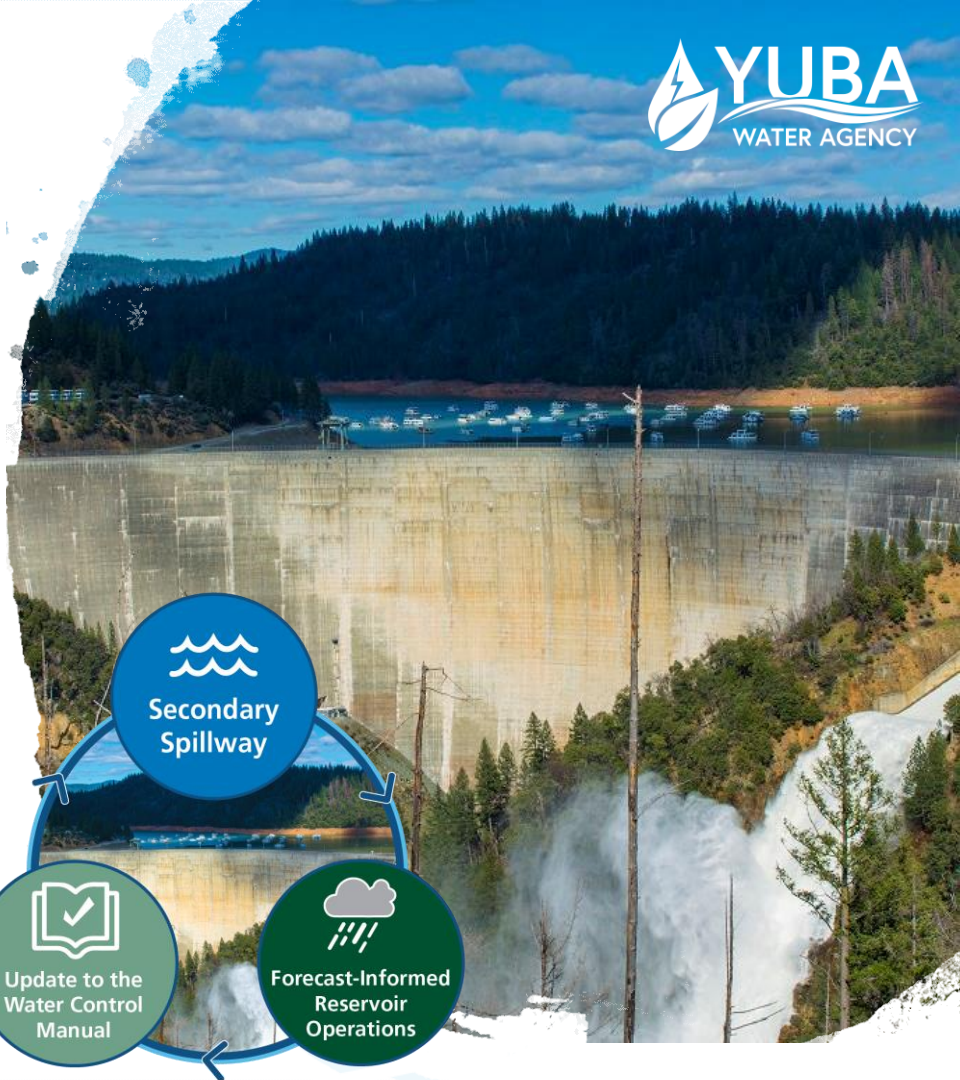
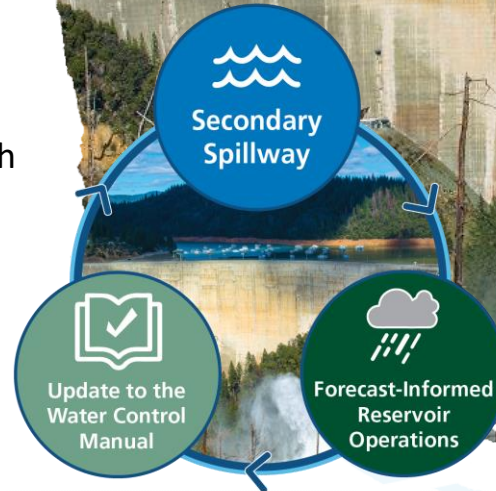




# Yuba-Feather Forecast-Informed Reservoir Operations (FIRO)



- Improves forecasts used in flood and water supply operations decision making processes
- Directly informs **updates to reservoir operational rules under the USACE Water Control Manuals** to use forecasts, improve operational flexibility and implement adaptive water management strategies
- Benefits include **reduced flood risk**, potential **water availability improvements**, and **climate resilience**
- Enhances benefits of infrastructure improvements such as **New Bullards Bar ARC Spillway**
- Promotes **continued collaboration and trust** between federal, state and local reservoir operators



# Yuba Water's Watershed Resilience Program

- Established to reduce risk of catastrophic wildfire, protect local communities and safeguard water supply
- Advances and funds collaborative projects within Yuba County and Yuba River watershed that support these goals
- Develop a body of knowledge around water supply benefits of forest restoration

