

# Yuba-Feather River Watersheds Forecast-Informed Reservoir Operations Project Update: Work Plan

March 2021

Yuba Water Agency (Yuba Water), the California Department of Water Resources (DWR), the Center for Western Weather and Water Extremes (CW3E) at Scripps Institution of Oceanography/UC San Diego and other collaborators\* have developed a Work Plan to assess the potential of Forecast-Informed Reservoir Operations (FIRO) in the Yuba and Feather River watersheds. Leveraging improvements in weather and streamflow forecasts, FIRO applies new scientific tools and technologies to reservoir operations to reduce flood risk while ensuring sustainable water supplies.

## Yuba-Feather FIRO Work Plan

Made possible by several years of atmospheric river research by CW3E, and the successful demonstration of FIRO in the Russian River watershed, the Yuba-Feather Work Plan identifies the science, engineering and modeling needed to test and adopt FIRO at Lake Oroville and New Bullards Bar Reservoir. The Work Plan provides the path for the Preliminary Viability Assessment, which will answer questions such as:

- What are the forecast lead time requirements?
- How can snowpack best be accounted for to improve runoff forecasts?
- What FIRO alternative will result in the greatest operational benefits?
- How best can FIRO, Forecast-Coordinated Operations and Water Control Manual updates be aligned and integrated?

### Atmospheric Rivers

Atmospheric rivers are long, narrow bands of concentrated water vapor that often result in large amounts of rain and snow when they make landfall. Atmospheric rivers come in all strengths from weak (AR1) to extreme (AR5), bringing both water supply benefits and the risk of catastrophic flooding. Atmospheric rivers are responsible for more than 90 percent of the flood damages in the Yuba River watershed and understanding them is critical to improving weather forecasts for better managing water resources and predicting flood risk.



Atmospheric River Scale created by CW3E

In addition, the Work Plan identifies and assesses meteorological processes that will improve forecasts of large storms and flood events to help water managers fine-tune reservoir operations, improve public safety through reduced flood risk and potentially improve water supply and hydropower generation.

For the first time, the FIRO assessment is being coordinated with the U.S. Army Corps of Engineers’ Water Control Manual updates for Lake Oroville and New Bullards Bar. The Work Plan is the first critical step toward updated Water Control Manuals and successful application of FIRO at these two facilities. The alignment of FIRO and the Water Control Manual updates is a groundbreaking innovation and a model for future reservoir management improvements.

**\*Yuba-Feather FIRO Steering Committee:** Co-chairs Marty Ralph (CW3E), John James (Yuba Water), and John Leahigh (DWR); Molly White (DWR), Cary Talbot (USACE), Joseph Forbis (USACE), Alan Haynes (National Weather Service), Jay Jasperse (Sonoma Water), Mike Anderson (DWR) and Steven Lindley (NOAA SW Fisheries Science Center).

## Yuba-Feather FIRO and Water Control Manual Timeline

The Yuba-Feather FIRO Steering Committee finalized the Work Plan in March 2021 and will conduct the FIRO Preliminary Viability Assessment in 2021-2022.

