

# Atmospheric River Control (ARC) Spillway at New Bullards Bar Dam

Reducing Flood Risk, Enhancing Dam Safety



## Introduction

In one of its most significant flood risk reduction efforts since building New Bullards Bar Dam and Reservoir, Yuba Water Agency is designing a second spillway at the dam. The new Atmospheric River Control (ARC) Spillway will significantly reduce flood risk to communities and agriculture along the Yuba and Feather rivers, improve levee resilience, enhance climate resilience and dam safety, and bring new jobs and economic benefits to the region.

## A New Spillway at New Bullards Bar Dam

The ARC Spillway gates will be 31.5 feet lower than the existing spillway gates, allowing for the release of 35,000 cubic feet of water per second. The lower elevation will make it possible to manage an additional 117,000 acre-feet of reservoir space and release water from the reservoir *before* large, threatening storms hit, while there is still plenty of capacity downstream.

The improved control of water releases enabled by the ARC Spillway could be used to reduce water levels on levees protecting Marysville, Yuba City and other communities by as much as three feet during a storm like the 1997 New Year's flood – the largest on record. The ARC Spillway will also be able to independently handle flows like those recorded in 1997, providing a redundant dam release option and enhancing dam safety.

Yuba Water considered several alternative designs and determined an open-channel second spillway is the best public safety option with the most operational flexibility at the lowest cost, with the fewest environmental impacts.

## ARC Spillway Key Benefits

- Climate resilience tool that enhances the agency's ability to manage increasingly volatile weather events, including more frequent and stronger atmospheric rivers
- Enhances flood protection for more than 160,000 residents
- Reduces risk to property across the region valued at nearly \$30 billion
- Enables earlier reservoir releases to lower water levels on levees protecting Marysville, Yuba City and other communities during high flow events, reducing risk of levee breaks
- Increases flexibility in reservoir storage and releases

*"...the New Bullards Bar project is a rare example of a local water agency undertaking costly dam modifications in response to changing hydrology."*

Matt Weiser, Water Deeply

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## Forecast-Informed Reservoir Operations (FIRO) and Water Control Manual Updates

Current and historical trends suggest that the strength, duration and frequency of atmospheric rivers – large, wet storms – is increasing in Northern California. To maximize the benefit of the ARC Spillway, Yuba Water is working with Scripps Institution of Oceanography's Center for Western Weather and Water Extremes on atmospheric river research to improve forecasting. Implementing FIRO for both New Bullards Bar Reservoir and the California Department of Water Resources' nearby Oroville Reservoir will allow for coordinated, early releases of water on the Yuba and Feather rivers in advance of large storms, [creating more storage capacity to manage flows during the peak of a flood event](#). Using this research, Yuba Water is also working with the U.S. Army Corps of Engineers to develop new operational procedures, known as a water control manual, for managing flood flows. Together, the ARC Spillway, the new water control manual and implementation of FIRO will improve climate resilience and reduce flood risk to Yuba and Sutter counties and other downstream communities.

### Next Steps

Yuba Water committed \$11 million in 2018 to begin detailed design and planning on the project. In 2021, Utah State University developed a physical model of the planned open-channel spillway to complement computer-based models and allowed for a detailed analysis of the design performance. The design is expected to be complete in 2022.



*Conceptual rendering of the planned second spillway*

The anticipated cost of the ARC Spillway is approximately \$240 million. Yuba Water is currently exploring additional funding opportunities with state and federal partners for this critical regional climate resilience project.

This ARC Spillway will significantly reduce flood risk, enhance public safety and provide a foundation for additional social and economic opportunities throughout Yuba County and across the region.