

## **Using reservoir operations to address ecosystem impacts at Shasta Lake**

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### **ABSTRACT**

River regulation can have large impacts on freshwater ecosystems, changing natural lotic river systems into fragmented networks of regulated flows and artificial 'lentic' reservoirs. In some cases, dam operations can be adjusted to lessen riverine impacts to aquatic ecosystems, or to impact upstream water quality dynamics. This presentation will describe past work that looked at impacts of reservoir operations on the upstream aquatic community, as well as current work addressing the potential implications of extreme climate on reservoir operations for management of downstream temperatures. Both projects involved two-dimensional hydrodynamic modeling of reservoir operations at Shasta Lake using CE-QUAL-W2 and coupling the model to ecological models or stochastic generation approaches to address the research questions. The current project also involves workshops with reservoir managers to obtain operating guidelines and decision-making criteria, and to analyze scenarios that will help managers to make decisions about operations at Shasta.