
AWRA 2011 ANNUAL WATER RESOURCES CONFERENCE
Albuquerque, New Mexico

November 7-10, 2011

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EVALUATING THE EFFECTS OF FLOODPLAIN RECONNECTION ON FLOOD RISK AND ENVIRONMENTAL HEALTH IN THE SACRAMENTO-SAN JOAQUIN DELTA

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ABSTRACT: The California Delta, at the confluence of the Sacramento and San Joaquin Rivers, is an inland river delta and the largest estuary on the West coast of the United States. As the delta developed through the 19th and 20th centuries, floodplains were separated from the main river channel by an uncoordinated levee system. Heavy agricultural and urban/suburban development followed behind these levees resulting in exceptional vulnerability and risk to life and property. In addition, loss of connectivity between the main stem of the San Joaquin and Sacramento Rivers and their floodplains had severe environmental consequences by greatly reducing the amount of inundated habitat which is critical to many native fish species. Recognizing the success of the Yolo Bypass, a 94 square-mile floodway that is managed for agriculture, wildlife habitat, and conveyance of high flows, there is a movement in the California Delta to add more floodplain restoration projects to the area's flood management portfolio. By integrating a hydraulic model of the CaliforniaDelta system with a statistical ecosystem functions model, we examined hypothetical floodplain reconnections and flood bypasses to estimate how they might reduce flood risk in urban areas during extreme events and increase the ecosystem benefits that occur during more frequent inundations. Ultimately, this project develops a method by which one can quantify the impact of floodplain reconnection projects on improving the health of riparian ecosystems and minimizing flood risk to people and property and presents preliminary findings on the dual-benefits these types of systems can provide.

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