

IMPACT

CA&ES DEAN'S OFFICE • UNIVERSITY OF CALIFORNIA • ONE SHIELDS AVENUE, DAVIS, CA 95616

IMPACT is a series of publications highlighting how UC Davis' College of Agricultural and Environmental Sciences makes a difference in the lives of Californians. Through research, teaching, and outreach programs, UC Davis research touches almost all aspects of Californian life. Today, millions of people eat safer foods, breathe cleaner air, and drink healthier water with the help of our researchers. We're making discovery work – for California and the world.

EXPLORING SOLUTIONS FOR THE DELTA

THE ISSUE

The Sacramento-San Joaquin Delta, the hub of California's water delivery system, is in crisis.

Formed by the confluence of the Sacramento and San Joaquin rivers, the Delta was once a marshy lowland that funneled rainfall and snowmelt from the Sierra Nevada to the Pacific Ocean. Today the Delta waterways south of Sacramento contain more than 50 islands created from drained land that are protected by miles of earthen embankments, or levees. Cultivation and erosion of the Delta's peat soils have caused many islands to subside well below sea level. UC Davis experts predict that large portions of the Delta face a two-thirds chance of catastrophic levee failure by mid-century due to earthquakes or flooding from rising sea levels.

Enormous pumps at the southern end of the Delta deliver drinking water to some 25 million Californians and irrigation water to farmers in the Central Valley. Water managers have maintained the Delta as more of a freshwater lake than its natural condition as a brackish estuary with fluctuating salinity, improving water quality for Delta farmers and for water exports, but damaging habitats for native fish and wildlife. Over decades, increased water exports have contributed to a precipitous decline in native fish populations. Since 2007, the courts have restricted Delta water exports in order to benefit threatened and endangered species.



CALIFORNIA DEPARTMENT OF WATER RESOURCES

WHAT WE'RE DOING

Faculty in the UC Davis College of Agricultural and Environmental Sciences (CA&ES) are conducting research that will help policymakers determine a new management strategy for the Delta.

“Sea level rise, earthquake risks, soil erosion—over the next 50 years, these forces will change the nature of the Delta, regardless of what we do,” said Professor Richard Howitt, an agricultural and resource economist whose research includes modeling to assess the economic impact of water-use decisions. “The question is, do we aim for a soft landing, or a crash landing? It's very clear that soft landings are cheaper.”

See additional IMPACT sheets at <http://impact.ucdavis.edu>

Howitt is part of a multidisciplinary team of scientists who collaborate through the UC Davis Center for Watershed Sciences. The team includes biologists, engineers, a geologist, as well as an economist from the nonprofit Public Policy Institute of California (PPIC). The group has published two reports on the Delta.

Envisioning Futures for the Sacramento-San Joaquin

Delta documents the decline of the Delta and offers a scientific analysis of why maintaining the status quo is unsustainable for urban, agricultural, and environmental stakeholders. The authors analyze the costs and benefits of alternative management strategies.

Comparing Futures for the Sacramento-San Joaquin

Delta provides analyses of policy alternatives for the Delta. The authors conclude that building a peripheral canal to carry water around the Delta would be the best approach to balance two critical policy goals: ensuring a stable water supply for California and reviving a threatened ecosystem.

Spotlight: California Thirsty for Water, a video produced by UC Davis News Service, includes interviews with resource economist Howitt and other faculty from the Center for Watershed Sciences who collaborate on Delta research. Civil and environmental engineering professor Jay Lund explains why a peripheral canal would be the least expensive and most environmentally beneficial way to repair the unreliable Delta.

Also featured in the video is CA&ES professor Peter Moyle, a leading expert on California's freshwater fishes. He warns that the state's native salmonids are in unprecedented decline. His research indicates

that without remediation, 65 percent of native salmon and trout could become extinct within the century. "The fish don't lie," said biologist Moyle. "The story they tell is that California's environment is unraveling. Their demise is symptomatic of a much larger water crisis that, unless addressed, will severely impact every Californian."

Sierra to the Sea, an interactive online site created by the Department of Land, Air and Water Resources, offers additional perspectives from UC Davis experts. CA&ES faculty address topics that affect the Delta, including climate change, groundwater, runoff contamination, fish habitat, and invasive species. Also featured is Jeffrey Mount, founding director of the Center for Watershed Sciences and a professor in the Department of Geology, who explains how natural forces are destabilizing the Delta.

A SHARED VISION

The Sacramento-San Joaquin Delta needs an environmentally sustainable management strategy. At stake is the future of much of California's water supply, as well as the future of one of our state's most critical ecosystems.

UC Davis scientists are examining the alternatives for Delta water management. CA&ES faculty are part of a multidisciplinary research effort to help Californians evaluate the tough public policy choices that lie ahead.

That's impact—cutting-edge science and policy development to chart a new future for the ailing Delta.

Links to the boldfaced resources are embedded in the PDF version of this publication at <http://impact.ucdavis.edu>.

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