

2004
CALFED Bay-Delta Program
Science Conference

Representative Topics

The CALFED Bay-Delta Program is the largest and most comprehensive ecological restoration and water management program in the United States. A hallmark of the Program is the integration of sound science into long- and short-term decision making.

The following four topics are representative of the myriad of sessions that will be presented at the Science Conference and underscore the importance of science to the CALFED Program. They are difficult issues with long histories and this science conference allows discussion of the role science has in shaping management decisions both now and in the future to help resolve them. The four topics are followed by a sample of related abstracts with the presenters and session times listed for your convenience.

Mercury Contamination

The CALFED Bay-Delta Program supports efforts to reduce and/or mitigate mercury contamination in the solution area. CALFED has supported the development of a unifying mercury strategy to provide a cohesive framework for assessing and responding to mercury contamination during ecosystem restoration. The overall goal of the strategy, which was developed by independent mercury experts with input from regional scientists, managers, and stakeholders, is to avoid increasing, and to eventually decrease, the methylmercury exposure in the Bay-Delta ecosystem. The Bay-Delta Program has also provided more than \$30 million for scientific investigations examining the distribution, transport, fate, toxicological effects, and remediation of mercury in the Bay-Delta ecosystem.

The following abstracts provide more specific information about the mercury strategy and CALFED's scientific approach to this problem:

- **A Unifying Framework for Science, Management, and Ecological Restoration in a Mercury-Contaminated Ecosystem** – James G. Wiener, University of Wisconsin- La Crosse., *et al.*

Monday, October 4, 1:10 p.m., Room 202

Describes a unifying framework, or strategy, for integrated mercury investigations needed to build a scientific foundation for restoration, environmental management, assessment, and eventual reduction of mercury-related risks in the Bay-Delta ecosystem.

- **Mercury Cycling Concepts Important in the Adaptive Management of Wetland Restoration Projects** – Mark Marvin-DiPasquale, USGS

Monday, October 4, 1:50 p.m., Room 202

Summarizes ongoing projects that are examining microbial and geochemical processes contributing to methylmercury production at regional and sub-habitat spatial scales, providing information needed to develop wetland-restoration strategies for reducing the net production and bioaccumulation of methylmercury.

- **Fish Mercury in the Bay-Delta Watershed: A Dark Cloud With a Silver Lining** – Jay A. Davis, San Francisco Estuary Institute, *et al.*

Monday, October 4, 3:30 p.m., Room 202

Describes findings from analysis of mercury in sport fish sampled from the Bay-Delta watershed during recent years. Problematic concentrations of mercury in sport fish are widespread in the watershed, posing health risks for humans and wildlife that eat fish. The conventional wisdom is that wetlands are generally associated with higher levels of mercury in food webs. However, data from the Delta illustrate that this connection does not always exist.

- **Degradation of Fishery Resources by Bioaccumulative Contaminants: Prospects for Reducing Contamination and Human Exposure** – James G. Wiener, University of Wisconsin – La Crosse

Tuesday, October 5, 1:50 p.m., Room 203

Concludes that a well designed monitoring program - coupled with outreach to increase public awareness about mercury in fish, the health risks of consuming contaminated fish, and steps to reduce exposure - are the most realistic short-term approaches for reducing human exposure to methylmercury.

- **Modeling Uncertainty Using Bayesian Networks for Mercury TMDL Decision Analytical Support** – W. B. Labiosa, Stanford University Terman Engineering Center, *et al.*

Poster Session

Describes a modeling approach to handling uncertainty in decision processes pertaining to complex and highly uncertain Total Maximum Daily Loads for mercury in the San Francisco Bay. The probabilistic Bayesian Network model allows decision makers to consider uncertainties in costs of mitigation and implementation costs of meeting various environmental targets.

Levee System Integrity

Levee system integrity is one of the four overall objectives of the CALFED Program. Levee improvements are critical for flood protection, ecosystem benefits, and water supply protection. Floods, earthquakes, sea-level rise, and land subsidence are increasing the risk of catastrophic levee breaches in the Delta. A comprehensive strategy for levee system integrity is needed that balances cost and risk among beneficiaries.

The following abstracts highlight the importance of levees:

- **Lessons Learned from the Jones Tract Levee Break** – William Burkhard, Dept. of Water Resources (DWR)

Monday, October 4, 1:30 p.m., Room 314

Lessons learned at Jones Tract are being used to reformulate the flood fight planning within the Department of Water Resources.

- **Effects of the Jones Tract Levee Failure on Central Valley Project and State Water Project Operations** – John Leahigh, DWR, *et. al.*

Monday, October 4, 1:50 p.m., Room 314

The June 3, 2004, levee failure resulted in immediate and drastic changes to the Central Valley Project and State Water Project operations. Delta water quality conditions were monitored and modeled to minimize impacts and develop new operational strategies to combat ongoing changes in water quality.

- **Levees, Vegetation and Habitat in the Sacramento-San Joaquin Delta – Can They Coexist?** – Jeffrey A. Hart, Hart Restoration, Inc.

Monday, October 4, 3:10 p.m., Room 314

After going through several types of data, several conclusions and suggestions are made to support the existence of habitat on levees.

- **Levee Integrity and Subsidence: Tied at the Hip for the Future of the Delta** – Christopher S. Enright, DWR

Monday, October 4, 4:10 p.m., Room 314

The renewed attention to levee integrity and their linkage to water quality protection adds balance to Delta resource planning, but another related issue is land subsidence. Research efforts to stop and reverse subsidence need to be made a high priority.

- **Sacramento River Bank Protection Project Riverbank Mapping and Initial Geographic Information System Results** – M.L. Deitl, *et al.*

Poster Session

More than 475 miles of banks of the Sacramento River between Collinsville and Colusa, and along Steamboat, Sutter, Georgiana, and Miner sloughs were mapped using Global Positioning Systems technology that will help determine target or threshold levels for restoration or allowable system manipulation for various attributes.

Water Quality

Water quality remains a high priority for the CALFED Program. Investments are being made to improve water quality for the more than 22 million Californians whose drinking water supplies come from the Bay-Delta watershed and in the ecosystems where a balanced environment benefits fish, animals and humans. The Drinking Water Quality Sessions focus on the concept of an “equivalent level of public health protection” or “ELPH” – the optimization of water quality protections and improvements from the water’s origins in the upper watersheds, through its conveyance to and from the Delta, to its arrival at the household tap, while balancing competing water supply and quality needs.

The following abstracts demonstrate progress in drinking water quality:

- **ELPH, Multiple Barriers, and Drinking Water Quality** – William H. Glaze, Oregon Health and Science University

Tuesday, October 5, 8:30 a.m., Room 202

An overview of some of the unique challenges of the Delta as a source of drinking water, how some of the work being done addresses the challenges, and a national perspective on water quality improvement efforts in California.

- **Integrating Science and Management in the CBDA Drinking Water Quality Program** – Sam Harader, California Bay-Delta Authority

Tuesday, October 5, 9:30 a.m., Room 202

With the overall CALFED Program investment in science projects related to drinking water quality at more than \$80 million, significant progress has been made in understanding the potential for treatment to address the unique challenges of Delta water.

- **A Synthesis of Processes Affecting DOM in the Sacramento-San Joaquin Delta: What do we Know?** – Brian Bergamaschi, USGS

Tuesday, October 5, 9:50 a.m., Room 202

A Synthesis of information from a variety of researchers challenges our understanding of dissolved organic material sources and trends in the Delta.

- **Minimizing Bromate Formation in Ozonated State Project Water Using Carbon Dioxide** – Issam Najm, Water Quality & Treatment Solutions, *et al.*

Tuesday, October 5, 3:10 p.m., Room 202

A CALFED-funded project has been completed and all data analyzed showing that carbon dioxide could be a highly effective strategy for bromate control.

- **Treating California State Project Water to Meet Future Regulations – Engineering and Economic Implications** – I.N. Najm, *et al.*

Tuesday, October 5, 3:50 p.m., Room 202

A comprehensive engineering and economic assessment of what it will take to treat State Project water to meet increasingly stringent disinfection and disinfection by-product standards with a specific focus on natural organic matter.

Ecosystem Restoration/Fish

CALFED agencies are working to improve the ecological health of the Bay-Delta watershed through restoring and protecting habitats, ecosystem functions, and native species. More than 400 ecosystem projects have been funded to help meet program goals.

The following abstracts demonstrate progress in both ecosystem improvements and the growing body of scientific knowledge:

- **Escapement, Ocean Harvest and Straying of Hatchery and Natural Chinook Salmon in the Mokelumne River, California** – Joseph J. Miyamoto, East Bay Municipal Utility District, *et al.*

Tuesday, October 5, 4:10 .p.m., Room 313

The need to minimize the interaction of hatchery fish with naturally spawning populations and other results from studies are discussed as ways to help restore natural stocks of Chinook salmon.

- **Controls on Migration Rates in the Sacramento River and Implications for Improving Prediction of Meander Migration** – Candice R. Constantine, UC Santa Barbara, *et al.*

Wednesday, October 6, 9:10 a.m., Room 315

Study results will help guide attempts to predict the response of the Sacramento River to proposed restoration scenarios such as levee setbacks.

- **Biology of Central Valley Salmonids – Session Summary** – Randall L. Brown, DWR (Retired)

Wednesday, October 6, 9:50 a.m., Room 313

A framework for developing a comprehensive monitoring, research, and analytical program to assess the success of protection and recovery efforts for salmon is presented.

- **Introduction to the Native and Resident Fishes Session with Implications for Conservation and Restoration in the San Francisco Estuary** – Frederick Feyrer and Matthew Nobriga, DWR

Wednesday, October 6 –Session I: 10:30 a.m.-11:50 a.m.; Session II: 1:10 p.m.-2:30 p.m.; Session III: 3:10 p.m.-4:30 p.m. Room 313

Facilitates the exchange of breaking research on the biology and ecology of native and resident fishes, and how this new information can be applied to shallow water habitat restoration and species conservation in the estuary. (Session I focuses on community ecology of the upper estuary; Session II focuses on the biology and management of splittail; Session III focuses on the biology and management of delta smelt.)

- **Nearshore Fishes of the Sacramento-San Joaquin Delta, California** – Larry R. Brown, USGS

Wednesday, October 6, 11:10 a.m., Room 313

Study results suggests that restoration efforts should focus in the North Delta where native fishes are still relatively common.