

Lead Scientist's Report

Summary: This report covers 5 items:

Collaborative Science Activities: (1) California Salmon and Climate Variability Symposium, (2) Invasive Aquatic Vegetation Symposium, (3) Emergency Drought Barrier coordinated studies

Science Communication: (4) Two posters from the 2014 Bay-Delta Science Conference, (5) "By the Numbers" summary.

Collaborative Science Activities

California Salmon and Climate Variability Symposium at U.C. Davis

This symposium held on September 10 at U.C. Davis explored recent scientific progress toward understanding how variable and changing ocean, climate, and hydrologic conditions affect Central Valley salmon and their management. Topics included the interrelationship between climate and river flows on salmon populations, the effects of biodiversity on population stability, and how hatcheries and fisheries affect salmon populations. A summary paper synthesizing the results of the symposium will be provided in the coming months. This symposium is the first in a series of three that the Science Program and the U.C. Davis Coastal and Marine Sciences Institute's Center for Coastal Ocean Issues will be collaborating on for fiscal year 2015-16.

Science Symposium on Invasive Aquatic Vegetation

This symposium held on September 15 at U.C. Davis explored: 1) new developments in surveillance and monitoring of aquatic vegetation to facilitate management and control, 2) advances in knowledge that could lead to better management and control practices, and 3) advances in risk assessment and reduction. A summary paper synthesizing symposium results will be provided in the coming months.

Science Communication

Poster Summaries from the 2014 Bay-Delta Science Conference

The biennial Bay-Delta Science Conference is a forum for presenting technical analyses and results relevant to the Delta Science Program's mission to provide the best possible, unbiased, science-based information for water and environmental decision-making in the Bay-Delta system. The following posters from the last conference are a sampling of the 175 posters presented at the conference and were selected because they are relevant to the topics in this month's Lead Scientist's Report to the Council.

California Estuaries Portal: Bringing Science to the Public

The California Estuaries Portal, a product of a broad collaborative effort composed of multiple government agencies and non-governmental organizations, is a web-based data portal designed to improve collaboration, enhance access to environmental monitoring data, and identify ecosystem health indicators for the Delta that complement

those used in the recently released 2015 State of the Estuary report, which for the first time includes data generated by the Interagency Ecological Program that are now much more easily accessible. The effort is guided by the Delta Science Plan's call to "build on existing data management systems to enable the region's environmental and project-implementation data to be easily accessed, visualized, and processed." This and other portals developed through the Water Quality Monitoring Council's workgroups demonstrate how some data from disparate sources can now be accessed for more rapid analysis and synthesis to assist with regular updates to the State of Bay Delta Science and informing a wide variety of management challenges.

Calibration of a 3D Hydrodynamic Model to Assess Water Quality Indicators in the Bay-Delta

This poster presents a three-dimensional hydrodynamic model, intended to provide answers to the question of: "How will future changes in physical configuration and climate affect water quality, ecosystem processes, and key species in the Delta?" This U.S. Geological Survey (USGS) - led effort to understand the potential effects of changes in climate and physical configuration on water quality, ecosystem processes, and key species in the San Francisco Bay and Delta is linking a series of individual models of climate, hydrology, hydrodynamics, sediment, geomorphology, phytoplankton, bivalves, contaminants, marsh accretion, and fish. The model is a key tool for informing restoration planners and practitioners about tradeoffs among various management alternatives and in developing climate change adaptation strategies. Additional results of this model, known as "CASCaDE" (*Computational Assessments of Scenarios of Change for the Delta Ecosystem*) are available online at: <http://cascade.wr.usgs.gov>.

Emergency Drought Barrier (EDB) Studies

A coordinated, collaborative research effort was launched in early September to take advantage of, and learn from, the installation of the emergency drought barrier at False River necessitated by the continuing drought. The Delta Science Program identified through discussions with Department of Water Resources, USGS, NASA, U.C. Davis, San Francisco State University, and others how to address the following questions:

- Is the barrier functioning as was intended? Are there any unintended effects?
- How does the barrier affect hydrodynamics, water quality, and ecosystem processes?
- What can we learn from the barrier this year that would inform design or implementation of a barrier in the future?

Four "high-impact science actions" under the topic of *Drought Response*, endorsed by the Delta Plan Interagency Implementation Committee, are being funded by the Council through the Delta Science Program and include:

- Assessing the influence of the barrier on nutrient and phytoplankton processes in Franks Tract. This includes how best to refine remote sensing and ecosystem models that will help us better understand the effects of different water residence times in parts of the Delta on harmful algal blooms, the distribution and

abundance of submerged and floating aquatic weeds, and the multiple drivers of food web and habitat characteristics.

- Identifying the impacts of the reduced dispersal of zooplankton species (an important fish food) on Delta smelt, which are already hypothesized to be food-limited.
- Assessing changes in water residence time, nutrient gradients, phytoplankton productivity, and water quality that will help us understand how tidal exchange, water from agricultural drains, and water retained and eventually released from wetlands influence native species and food web dynamics. All of this information will eventually feed into coupled hydrodynamic and ecosystem recovery models.
- Identifying effects of the barrier on the distribution, biomass, and grazing rates of invasive, non-native clams. These clams contribute in major ways to reductions in phytoplankton and zooplankton biomass and to the decline of Delta smelt and other open-water native fishes that rely on zooplankton for food. This study will contribute to the Delta Plan policy to minimize habitat restoration actions that promote non-native invasive species.

By the Numbers

Delta Science Program staff will give a summary of current numbers related to Delta water and environmental management. The summary (Attachment 1) will inform the Council of recent counts, measurements, and monitoring figures driving water and environmental management issues.

List of Attachments

By the Numbers Summary *(to be provided at the Council Meeting)*

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