

## Lead Scientist's Report

---

**Summary:** This report covers 6 items:

**Collaborative Science Activities:** (1) 2015 Long-term Operations Biological Opinions Annual Science Review Report, (2) Interim Interagency Ecological Program Lead Scientist hired, (3) Mercury in the Bay-Delta workshop series (4) Record breaking sea levels in California

**Science Communication:** (5) Two posters from the 2015 State of the Estuary Conference, (6) "By the Numbers" summary.

---

### **Collaborative Science Activities**

#### **2015 Long-term Operations Biological Opinions (LOBO) Annual Science Review Report**

The 2015 LOBO annual science review report synthesizing the findings of the independent review panel is now available online. The 2015 review, held on November 5-6, focused on the implementation of the LOBO Reasonable and Prudent Alternatives (RPAs) for operations and fisheries for water year 2015. Topics reviewed include: 1) progress on Shasta Reservoir and Sacramento River temperature monitoring, modeling, and management, 2) a report on enhanced particle-tracking modeling to simulate juvenile Chinook Salmon movement behavior and entrainment risk, and 3) a U.S. Fish and Wildlife Service (USFWS) report on past, present, and future approaches to incidental take of Delta Smelt. The goal of the review is to inform National Marine Fisheries Service (NMFS) and USFWS about the efficacy of Central Valley Project and State Water Project operations and regulatory actions during the prior year, with the goal of developing lessons learned, incorporating new science, and making appropriate, scientifically-justified adjustments to the implementation of the RPAs to support real-time decision making in future water years.

#### **Interim Interagency Ecological Program Lead Scientist Hired**

Dr. Sean Hayes, previously the deputy director of the Southwest Fishery Science Center and NMFS Salmon Ocean Ecology Team Leader, will begin work at the Council as the interim Lead Scientist of the Interagency Ecological Program (IEP) under a special interagency personnel agreement between the Council and the National Marine Fisheries Service. The IEP lead scientist will lead IEP efforts and work with the Delta Science Program to integrate IEP studies into the larger San Francisco Bay-Sacramento/San Joaquin Delta scientific program to help implement the Delta Science Plan and IEP Science Agenda. The IEP Lead Scientist is a managerial position that coordinates with nine State/federal IEP agencies as well as stakeholders to inform policy and environmental management decisions. Dr. Hayes has expertise in the behavior, ecology, evolution, physiology, and population dynamics of salmonids.

### **Mercury in the Bay-Delta Workshop Series**

In 2002, an independent science panel evaluated the state of knowledge regarding mercury in the Bay-Delta and developed a mercury strategy to guide scientific research, monitoring plans, and management actions addressing restoration and adaptive management of the Bay-Delta with respect to mercury. A new series of workshops, planned by the Delta Science Program, USGS, and Delta Conservancy, will address significant advances made since 2002, re-evaluate existing data gaps and their relative importance, and revisit the 2002 strategy document. The first workshop on mercury sources, biogeochemistry, and biotic effects will be held January 26-28 at the California Environmental Protection Agency headquarters building. Each day will have technical talks in the morning, followed by moderated discussions between scientists and other participants in the afternoon. The last workshop to be held in June will provide a final synthesis bringing the information learned in the previous workshops with discussions of future implications for mercury research and management. Proceedings of the workshop series, focusing on research to inform management, will be published in a peer-reviewed synthesis article. The workshop outcomes and synthesis will be particularly relevant as EcoRestore projects are being designed and implemented according to Delta Plan recommendations and policies. Space is limited and registration for the January meeting will begin in early January on the Council website.

### **Record Breaking Sea Levels in California**

Sea levels at San Diego, La Jolla, and Santa Barbara broke long-term records for maximum water levels on November 25 of 2015. This was caused by high tides, warm water temperatures, the current strong El Niño, and a minor storm. The combination of 1) sea-level rise (about eight inches at the San Francisco tide station to date), 2) warm seawater temperatures (the Santa Cruz wharf is about nine degrees Fahrenheit warmer than normal), 3) higher sea surface elevations due to the strong El Niño (sea surface elevations can rise by up to a foot in the eastern Pacific during very strong El Niño conditions), and 4) high spring tides at the time of full or new moon set the stage for very high tides. If coupled with low atmospheric pressure and storm surge at the time of these spring tides, the chances for a record high tide this winter in the Delta and San Francisco Bay is very real. Careful vigilance is called for if large storms are coupled with a spring tide during the winter of 2016.

### **Science Communication**

#### **Poster Summaries from the 2015 State of the Estuary Conference**

The biennial State of the Estuary Conference is a forum focusing on the management and ecological health of the San Francisco Bay-Delta Estuary. Results from the conference are 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 161 posters presented at the conference and are relevant to topics before the Council this month and to recent symposia held by Delta Science Program staff.

**Index-based Multispecies Conservation Value (IMCV) Model for Prioritizing Invasive Weed Eradication** *Alex Young, Bryan Sesser, Cassandra Liu - Sonoma Ecology Center*

Workers from the Sonoma Ecology Center in collaboration with biologists at the Department of Fish and Wildlife, the Department of Water Resources, and the Delta Conservancy developed the Index-based Multispecies Conservation Value (IMCV) indices to map habitat value throughout the legal Delta. The IMCV for each target species is derived from the habitat suitability for each species and the “endangerment index value” derived from threatened or endangered listing. Delta-specific species as well as species from state and federal listings were utilized. In total, 23 species from seven groups were selected in consultation with biologists from state agencies. A map showing the composite IMCV summed across all species groups are provided along with IMCV summed for each including reptiles, birds, fish, plants, insects, mammals, and amphibians. Managers may utilize these maps to identify ecologically important habitat areas and to inform targeted restoration, mitigation, and invasive species control efforts.

**Invasive Plant *Arundo donax*: Mapping and Prioritizing its Eradication in the Sacramento-San Joaquin Delta Region of Northern California** *Alex Young, Bryan Sesser, Cassandra Liu - Sonoma Ecology Center*

The invasive giant reed (*Arundo donax*) has become widespread in Delta riparian habitats. Prioritized efforts are needed to utilize limited funds to strategically eradicate invasive plants like the giant reed. Workers from the Sonoma Ecology Center present a prioritization method based upon giant reed occurrence and value of riparian habitat threatened. The value of riparian habitat threatened is measured by the Index-based Multispecies Conservation Value (IMCV) index. The IMCV is a multi-species index derived from the number of species, habitat suitability, and level of species endangerment. Maps of habitat suitability and ranked *Arundo donax* eradication priority locations are provided. These maps will be used by the Delta Conservancy to guide giant reed eradication efforts and potentially inform future eradication efforts for other riparian weed 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**

Attachment 1: By the Numbers Summary (*report to be provided at the Council meeting*)

**Contact**

Dr. Cliff Dahm  
Lead Scientist

Phone: (916) 445-0463