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Lead Scientist's Report

Summary: This report covers 7 items:

Science Reviews: (1) Ballast Water Feasibility Study Review

Collaborative Science Activities: (2) Delta Challenges Report, (3) Data Summit White Paper

Science Communication: (4) Potential impacts of the California forest fires on surface water quality when winter precipitation arrives; implications from Dahm et al (2015), (5) Essays on groundwater in San Francisco Estuary and Watershed Science September issue (6) Two posters from the 2015 State of the Estuary Conference, (7) "By the Numbers" summary.

Science Reviews

Ballast Water Feasibility Study Review

The Council's Delta Science Program hosted the first of three scheduled independent reviews of a study of the feasibility of shore-based ballast water treatment being conducted for the State Lands Commission on Oct. 6, 2015. This study will provide important information guiding the State's efforts to prevent introductions of new invasive species. A panel of nationally recognized experts on various aspects of the ballast water issue heard presentations by the study team and provided their initial comments. The first report from the independent review panel is due Nov. 5, 2015. The entire feasibility study and independent panel reviews will be completed in early 2017. More information is available on the web here: http://deltacouncil.ca.gov/feasibility-study-shore-based-ballast-water-reception-and-treatment-facilities-california-0

Collaborative Science Activities

Delta Challenges Report: *Challenges Facing The Sacramento-San Joaquin Delta: Complex, Chaotic, or Simply Cantankerous?*

On March 16, 2015 the Delta Science Program convened the Delta Challenges Workshop. This independent science panel workshop focused on summarizing the state of knowledge concerning risks and challenges facing the Bay-Delta system. The workshop consisted of panel presentations concerning three central topics and their associated challenges:

- The Delta's agricultural, land use, cultural and recreational characteristics
- Water supply reliability
- Preserving and restoring the Delta's ecosystem

A report, written by the workshop's author panel, comprised of three previous CALFED/Delta Science Program lead scientists (Sam Luoma, Johnnie Moore, Mike Healey) and the current Delta Science Program lead scientist, Cliff Dahm, is published

in the *San Francisco Estuary and Watershed Science* journal and is available online at:
http://escholarship.org/uc/jmie_sfews (article format)
http://resources.ca.gov/docs/DeltaChallenges-v13.pdf (brochure format)

Enhancing the Vision for Managing California's Environmental Information
Printed copies are now available for the Data Summit (June 2014) vision document. The document provides concepts for sustainable support and advancement of California's data systems, ensuring alignment with national technology trends, and laying the foundation for more consistent and robust access to data and metadata across organizational boundaries. Electronic copies are available through the Council's website at http://deltacouncil.ca.gov/enhancing-the-vision-for-managing-californias-environmental-information

Science Communication

Potential Impacts of the California Forest Fires on Surface Water Quality
Recent work analyzing water quality along the Rio Grande following the catastrophic Los Conchas fire in central New Mexico has implications for Californian surface water quality when winter precipitation arrives this year. Turbidity peaks, anoxia (zero dissolved oxygen), pH sags, and changes in conductivity, tied directly to runoff from burn scars, were observed along a 31 mile stretch of the Rio Grande (Dahm et al., 2015). With extensive wildfires throughout California this year Bay-Delta watersheds may face similar catastrophic changes in water quality with the arrival of winter precipitation this year.

Essays on Groundwater in *San Francisco Estuary and Watershed Science* (SFEWS) September Issue
Three essays on the status of California groundwater with discussion of the methods used to understand the resource in the larger context of California water supply are provided in the most recent SFEWS issue. Dr. John Bredehoeft, a senior leader in the United States Geological Survey (USGS) for 32 years and principal at The Hydrodynamics Group headquartered in Sausalito, California, provides an overview of principles underlying groundwater issues. Dr. Claudia Faunt, Program Chief for Groundwater Framework and Applied Modeling for the California Water Science Center of the USGS, and Dr. Michelle Sneed, a USGS expert on groundwater subsidence in the Central Valley, provide an essay on the status and history of Central Valley groundwater resources and issues. Dr. Alexandra S. Richey, an expert on measuring groundwater resources using satellite monitoring, provides an overview of new technologies to assess large-scale groundwater resources worldwide.

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 recent conference are a sampling of the 161 posters presented at the conference on September 17-18, and the

posters were selected because they are relevant to topics in this month's Council meeting and recent symposia convened by Delta Science Program staff.

Delta Smelt: Biology of a Once Abundant Species in the San Francisco Estuary
Aquatic biologist experts from UC Davis (Peter Moyle, John Durand, and James Hobbs) and the USGS (Larry Brown) provide highlights of the upcoming 2016 Bay-Delta Science Report chapter on Delta smelt biology, history, causes of decline, and lessons learned. Causes of Delta smelt decline include: entrainment, altered hydrology, food resources and feeding strategies, predation, contaminants, habitat change, drought, and climate change. Ecosystem-based recovery actions based upon the Council's coequal goals must be taken quickly to recover the species.

Increasing Dominance of Floating Aquatic Vegetation (FAV) in the Sacramento-San Joaquin Delta Over the Past Decade
Invasive submerged aquatic vegetation (SAV) and FAV increasingly impact the Delta ecosystem and waterways by providing habitat for invasive fishes and reducing flow and turbidity. Researchers utilize satellite imagery to map changes in Delta SAV and FAV annually from 2004 to 2008 and again in 2014. Mapping shows that: 1) total invaded area (SAV+FAV) increased from 5,000 acres to nearly 11,000 acres from 2008 to 2014, 2) a nearly 4-fold increase in FAV, and 3) shifts in FAV species, notably a shift to water primrose, a FAV species that cannot be sprayed due to a lack of permitting. Potential causes for changes in SAV and FAV cover include: prolonged drought, permitting issues, positive environmental feedbacks, and low water velocities.

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 *(To be provided at the Council Meeting)*

Contact

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