Lead Scientist's Report

Summary: Delta Lead Scientist Dr. John Callaway will discuss an article from the *Journal of Geophysical Research: Earth Surface* on the modeling of future impacts on intertidal areas in San Pablo Bay, summarize two recent conferences where Council staff presented, review the California Sea Grant State Fellows Matching Workshop, highlight upcoming events and announcements and provide the By the Numbers Report.

Intertidal Area Disappears Under Sea-Level Rise: 250 Years of Morphodynamic Modeling in San Pablo Bay, California. Elmilady, H., M. van der Wegen, D. Roelvink, and B.E. Jaffe. *Journal of Geophysical Research: Earth Surface*. January 2019.

Sea-level rise is anticipated to have large impacts on coastal and estuarine areas over the next 100 years. Improving forecasting of these potential impacts with the use of models is important for the planning of mitigation and adaptation strategies. This modeling effort highlights the value of integrating models of water flow with sediment and habitat dynamics, and underlines the importance of historical data to inform forecasts of future conditions. The Delta Science Program is coordinating the development of a strategy for improved use of integrated models in the Delta. This research was funded jointly by the Delta Science Program and the U.S. Geological Survey, and it is part of a larger effort to evaluate climate change impacts across the estuary (i.e.,CASCaDE project).

Scientists in this study set out to create a model of sea-level rise impacts on intertidal habitats (mudflats and other areas that are underwater at high tide, but dry at low tide) in San Pablo Bay. The researchers evaluated model performance by comparing model predictions to historical bathymetric (seafloor elevation) surveys that have occurred every 30-40 years since 1856. The model successfully reproduced historical observations over a 150-year period, confirming the validity of the model in forecasting the impacts of future sea-level rise. Over the next century, the model predicts that intertidal elevations will continue to rise via sediment deposition, but the forecasted sea-level rise will be greater, drowning intertidal mudflats within San Pablo Bay.

While the predicted loss of mudflats within San Pablo Bay is a local effect, similar dynamics are likely to occur for intertidal areas and mudflats throughout the estuary, including in the Delta, with ensuing impacts on wildlife and people. Recommendations within the Delta Plan, such as ER-R5 and DP-R6, call for policies that incorporate future sea-level rise. This study adds insight to improve the incorporation of sea-level rise and climate change in restoration and management plans.

State of the Estuary Conference

The 14th Biennial State of the Estuary Conference took place on October 21-22, 2019. Staff from the Science Program and Planning Division attended, and multiple staff gave oral presentations, participated in panels, and presented posters. The conference included two days of organized sessions, many of which focused on coastal resilience strategies and incorporated the human element to how we plan for a healthy estuary. Another key theme was that of "One Estuary, One Science" emphasizing how the Delta and the Bay are inextricably linked to form the estuary, and that science in the Bay impacts science in the Delta, and vice versa. In addition, the State of the Estuary Report 2019 was released at the conference and is available at: https://www.sfestuary.org/our-estuary/soter/.

American Fisheries Society and the Wildlife Society Joint Conference

A joint conference between the American Fisheries Society and The Wildlife Society was held in Reno, Nevada from September 29 through October 3, 2019. Approximately 5,000 people were in attendance, including professionals from federal and state agencies, academia, NGOs, and private industry. With 49 concurrent sessions, Council staff heard from experts on a variety of topics, including several talks sharing results of research funded by the Science Program. Staff who had posters or gave presentations at the conference included: Eva Bush, Louise Conrad, Steve Culberson, Pascale Goertler, Tracy Grimes, Annika Keeley, and Chris Kwan. This was the first-ever joint national conference for both of these societies, and it provided unparalleled opportunities to learn and network with fisheries and wildlife professionals from across the globe.

California Sea Grant State Fellows Matching Workshop

On October 29 to 30, 2019, Council staff and members of the current class of Sea Grant State Fellows took part in a matching workshop for the 2020 California Sea Grant State Fellowship. This fellowship is an opportunity for students who have recently graduated with their masters or doctorate to work at the intersection of science and policy. The program provides fellows for each of the three units of the Delta Science Program and one fellow for the Planning Division. Fellows contribute to various Council efforts, as well as work on individual projects during their yearlong tenure in the program. This year's fellows are Cori Flannery, Tracy Grimes, Kate Melanson, and Madison Thomas. They have worked on multiple Council projects including zooplankton synthesis, fish population models, the Delta Plan Ecosystem Amendment, and science communication efforts, including reports and presentations at Council meetings.

On your radar

Environmental DNA (eDNA) Symposium:

This symposium will be held on January 29, 2020, at U.C. Davis and is sponsored jointly by the Delta Science Program and the Coastal and Marine Sciences Institute at

U.C. Davis. The symposium will explore the use of this new tool that is primarily used to monitor fish and other aquatic species. Registration is available now at: https://marinescience.ucdavis.edu/events/upcoming-events/edna.

By the Numbers

Delta Science Program staff will provide 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 (provided at the Council Meeting).

Attachment 2: Visual abstract for Intertidal Area Disappears Under Sea-Level Rise Article.

Contact

Dr. John Callaway
Delta Lead Scientist
Phone: (916) 445-0463