



## **INFORMATION ITEM**

### Delta Independent Science Board (ISB) Update

#### Summary

Delta Independent Science Board (ISB) member Dr. Tom Holzer will provide an update on the Delta ISB's current activities, including its subsidence review. To help inform Delta Stewardship Council (Council) efforts, the Delta ISB provides the Council with independent scientific advice on the Delta Plan and reports findings and recommendations from Delta ISB reviews of scientific activities that support adaptive management in the Delta.

#### Background

As mandated by the Sacramento-San Joaquin Delta Reform Act of 2009, California Water Code sections 85000, et seq., (Delta Reform Act), the Delta ISB is responsible for providing oversight of the scientific research, monitoring, and assessment programs that support adaptive management in the Delta (Water Code Section 85280(a)(3)) and providing independent advice on the Delta Plan (Water Code Section 85308(a)). The Delta ISB reports its findings and recommendations to the Council to inform updates to and the implementation of the Delta Plan, the Science Action Agenda, the Delta Science Plan, and other Council and Delta Science Program efforts (Water Code Section 85280(a)(4)).

The Delta ISB reviews programs that support adaptive management by "thematic" or topical areas to meet its legislative mandate. To date, the Delta ISB has completed and presented the following thematic reviews to the Council: restoration (2013), fish and flows (2015), adaptive management (2016), levee hazards (2016), Delta as an evolving place (2017), water quality (2018), the Interagency Ecological Program (2019), non-native species (2021), the monitoring enterprise (2022), and water supply reliability estimation (2022). The Delta ISB also reviews specific science documents related to adaptive management or the Delta Plan. These reviews can be either self-initiated or based on a specific request from an individual or entity. In

addition, the Delta ISB may develop “call-to-action” memos and letters to specific agencies, such as the Council, which are meant to share the Delta ISB’s emerging insights, key findings, or recommendations that require action.

As described in the Delta ISB’s operating guidelines, the comments, findings, and recommendations of the Delta ISB are expected to increase scientific credibility, improve research clarity, advance the debate about Delta issues, and seek better connectivity between science, management, and policy. The communication and relationship between the Council and Delta ISB are critical for helping to inform the Council’s work.

### Recently Completed Delta ISB Products and Ongoing Reviews

Prior to undertaking a major review, the Delta ISB will prepare a brief prospectus describing the review purpose and process based on engagement with interested parties including agencies and the public. Since the last update to the Council in April 2023, the Delta ISB completed three prospectuses for its reviews:

1. Exploring Scientific and Management Implications of Upper Trophic Level Interactions in Delta food-webs (dated June 19, 2023; Attachment 1)
2. Science Supporting Decision-Making Under Deep Uncertainty (dated July 20, 2023; Attachment 2)
3. Managing Subsidized Lands in the Sacramento-San Joaquin Delta (dated August 4, 2023; Attachment 3)

In addition, the Delta ISB recently submitted comments on the Draft Pyrethroid Control Program and Research Plan to the Central Valley Regional Water Quality Control Board (Attachment 4; completed September 18, 2023). Key highlights of these recently completed products are described in the sections below.

#### Exploring Scientific and Management Implications of Upper Trophic Level Interactions in Delta Food-webs

Food-web interactions may directly influence how environmental drivers and management actions affect the abundance of individual species, as changes in one species can affect the abundance of other species. This review will assess the importance of upper trophic level food-web interactions in the Delta and identify where improved understanding and tools (e.g., food-web models) might

substantially improve predictions of an individual species' response to environmental drivers and management actions. This review will evaluate the degree to which the inclusion of food-web interactions can benefit and facilitate multi-species management in the Delta and whether available data and science can support the development of such tools. To help inform this review, the Delta ISB will host a workshop on November 8-9, 2023, in Sacramento, California. For the full prospectus, please refer to Attachment 1.

#### [Science Supporting Decision-Making Under Deep Uncertainty \(DMDU\)](#)

The Sacramento-San Joaquin Delta is undergoing continual and often rapid change. Predicting and preparing for those changes is challenging, as the past is becoming an inadequate model of future variability. Therefore, managers will require new methods of anticipating the future to effectively manage Delta systems. This review aims to build understanding of scientific tools and concepts that can inform management and policy decision-making under rapid change and increasing uncertainty of future forecasts. This Delta ISB review will draw on existing studies from the interdisciplinary sciences that support DMDU and synthesize insights from a seminar series. The review includes a dedicated effort to review the scenario-planning methods being used within the Delta or in regions relevant to the Delta. For the full prospectus, please refer to Attachment 2.

#### [Managing Subsided Lands in the Sacramento-San Joaquin Delta](#)

Drainage of land in the Delta has caused extensive oxidation of peat soils, lowering approximately 386 mi<sup>2</sup> of land from 10 ft to as much as 29 ft below sea level. A broad cross section of stakeholders, including public agencies and private sector parties, are developing and testing many different approaches to manage subsided lands. The scale of subsidence in the Delta and the severity of its consequences for Delta agriculture, greenhouse gas emissions, and water quality indicates a need to assess existing management of subsided lands and the social, cultural, and economic trade-offs among different management approaches. To help address this, the Delta Independent Science Board is working on a review to synthesize and evaluate the state of science related to adaptive management of subsided lands and provide recommendations to address knowledge gaps. To help inform this review, the Delta ISB will host a workshop from October 19-20, 2023, in Sacramento, California. For the full prospectus, please refer to Attachment 3.

### Comments on the Draft Pyrethroid Control Program and Research Plan

Pyrethroids are synthetic pesticides widely used for pest control in residential, urban, and agricultural areas throughout the Central Valley. Pyrethroid pesticides have been detected at levels of concern for aquatic species in waters and sediments of the Sacramento and San Joaquin River watersheds. Pyrethroids can be toxic to aquatic life, which can result in reduced growth, disruption of reproductive functions, and impaired swimming performance. The main sources of pyrethroids are discharges from municipal stormwater systems and agricultural lands.

As required by the federal Clean Water Act, the Central Valley Regional Water Quality Control Board established a Control Program for Pyrethroid Pesticide Discharges in 2017 as well as a Total Maximum Daily Load for pyrethroid pesticides (TMDL; the maximum amount of a pollutant that a waterbody can accept and still meet the state's Water Quality Standards for public and environmental health). In July 2023, the Central Valley Regional Water Quality Control Board (Regional Board) released the draft Pyrethroid Research Plan that describes the research and other special studies to inform the Control Program for public comment.

As described in Attachment 4, the Delta ISB commends the Regional Board for the development of the Pyrethroid Control Program and Research Plan. The Delta ISB found that the draft Pyrethroid Research Plan lays out several clear management questions and identifies some important research gaps. Nevertheless, the Delta ISB feels that there should be a stronger linkage between management needs and the proposed research, and a stronger focus on monitoring and adaptive management. It is not clear how new research or monitoring would directly inform the management questions laid out in the draft Plan. The Delta ISB also questions the usefulness of the draft Plan for resolving management questions in a timely manner, and thereby recommends some focused approaches. Additionally, evaluating the effectiveness of mitigation measures, including costs, should be considered as an overarching theme.

### List of Attachments

*Attachment 1: Exploring Scientific and Management Implications of Upper Trophic Level Interactions in Delta Food-Webs available [here](#):*

<https://deltacouncil.ca.gov/pdf/isb/meeting-materials/2023-06-19-isb-prospectus-food-webs.pdf>

*Attachment 2: Science Supporting Decision-Making Under Deep Uncertainty*  
available here: <https://deltacouncil.ca.gov/pdf/isb/meeting-materials/2023-08-04-isb-final-prospectus-dmdu.pdf>

*Attachment 3: Managing Subsided Lands in the Sacramento-San Joaquin Delta*  
available here: <https://deltacouncil.ca.gov/pdf/isb/meeting-materials/2023-08-04-isb-subsidence-prospectus.pdf>

*Attachment 4: Comments on the Draft Pyrethroid Control Program and Research Plan*  
available here: <https://deltacouncil.ca.gov/pdf/isb/products/2023-09-18-USB-Draft-Pyrethroid-Research-Plan.pdf>

## Contact

Tom Holzer, Ph.D.

Member, Delta Independent Science Board

Phone: (916) 902-6571