



INFORMATION ITEM

Delta Independent Science Board (ISB) Update

Summary

Dr. Inge Werner, the new Delta ISB Chair, along with Delta ISB Member Dr. Bob Naiman, will provide an update on the Delta ISB's current activities, including a presentation on the recently completed food-webs 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 on the scientific programs 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 findings and recommendations of the Delta ISB 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.

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, including the Council, which are meant to share the Delta ISB’s emerging insights, key findings, or recommendations that would 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.

Since the last update to the Council in April 2024, Dr. Lisa Wainger completed her two-year term as Delta ISB Chair in September 2024, and Dr. Inge Werner started as Delta ISB Chair. In addition, Dr. Diane McKnight was elected Chair-elect, and she will begin her term as Delta ISB Chair in September 2026.

Recently Completed Products

Since the last update to the Council in April 2024, the Delta ISB completed the following reviews:

[Delta Plan Five-Year Review, 2024, with Performance Measure Report Cards](#)

In June 2024, the Delta ISB reviewed the draft of the Delta Plan Five Year Review, 2024, with Performance Measure Report Cards. In its review, the Delta ISB recognized that conducting a review of performance for such a complex system as the Delta is extremely challenging, and stated that overall, the systematic approach that the Council adopted for this review is logical and well-organized. The Board felt that the 2024 Draft Report could be clearer in explaining how performance indicators were selected and how the values were determined. While the report may provide a view into the big picture of what is happening in the Delta, it could provide more guidance on how recommendations can be implemented to better meet Delta Plan objectives. The Council considered comments from the Delta ISB and finalized the 2024 Delta Plan Five-Year Review in September 2024. The Council provided updates to the Delta ISB at its August 2024 and October 2024 meetings on how the Council addressed the Delta ISB’s comments. For the full review, please see Attachment 1.

[Final Environmental Impact Report for the Delta Conveyance Project](#)

In December 2022, the Delta ISB submitted its review to the California Department of Water Resources (DWR) on the draft Environmental Impact Report (EIR) for the Delta Conveyance Project. In December 2023, DWR released its final EIR and certified it. The Delta ISB reviewed the final EIR and submitted its comments to DWR in September 2024. The Delta ISB brought forward some concerns on the final EIR to help inform DWR on its analysis as the project goes through other regulatory processes. The Delta ISB found that although some minor changes were made in response to its comments, the responses generally did not lead to meaningful changes to the EIR for the Delta Conveyance Project. The Delta ISB stands by many of its original concerns of the draft EIR. For example, climate change is not realistically represented when projecting watershed hydrological and ecosystem responses. For the full review, please see Attachment 2.

[Seminar Synthesis Report: Understanding Decision-making under Deep Uncertainty.](#)

To build an understanding of scientific tools and concepts that can increase the capacity to anticipate and adapt to the growing uncertainty of future conditions in California's Sacramento-San Joaquin Delta, the Delta ISB began a review of decision-making under deep uncertainty (DMDU) in the spring of 2023. The review explored the techniques that could be applied to the Delta to better characterize and prepare for uncertainty and improve decision-making processes. Deep uncertainty is defined here as unpredictable events or system variability that cannot be well characterized with existing data, models, and understanding. Often, there is little or no agreement among interested parties on how systems are likely to behave or the probabilities of occurrence of such events, including the duration, sequence, and co-occurrence of events.

As part of this review effort, the Delta ISB hosted a [five-part seminar series](#) that introduced concepts from the decision sciences to the broader Delta community. The Board completed a synthesis of the seminar presentations on decision-making under deep uncertainty in October 2024 (Attachment 3). The seminar synthesis is the first report produced for its DMDU review. Subsequent reports, including overall findings and recommendations for the full review which also include an

inventory and analysis of scenario planning in the Delta, and manuscripts for peer-reviewed publications, are planned for next year.

Final Thematic Review: Advancing Scientific Understanding and Management of the Delta Through a Food Web Perspective

Food-web interactions may directly influence how environmental drivers and management actions affect the abundances of individual species, as changes in one species can affect the abundances of other species. In October 2024, the Delta ISB completed a review on food-webs (Attachment 4), which assessed the importance of upper trophic level food-web interactions in the Delta and identified 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.

The key finding from this review is that an improved mechanistic understanding of food webs, especially the inclusion of upper trophic levels, is essential for predicting the impacts of biophysical drivers (e.g., climate, flow, nutrients, contaminants, invasive species) and management actions (e.g., habitat restoration) on individual fish species as well as on ecosystem-level processes relevant to agencies, Indigenous Tribes, and the public. Given the potential for providing management relevant insights into aquatic ecosystem management, the Delta ISB recommends that a focused and adequately funded scientific collaboration among agencies, academia, Tribes, and the public be established to design and implement a food web science strategy. Currently, the Interagency Ecological Program (IEP) Synthesis Team is proposing a food web modeling project to assess effectiveness of tidal wetland restoration and other resource management actions, which directly addresses the Delta ISB's recommendations (Proposal available here: <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=225488&inline>).

Current Reviews

For the rest of the year and into 2025, the Delta ISB will be working on completing its thematic reviews on decision-making under deep uncertainty (described above) as well as subsidence, and will continue scoping out new reviews on contaminant monitoring, and climate science. Highlights of some of the current activities are below.

Managing Subsided Lands in the Sacramento-San Joaquin Delta

Subsidence is particularly pronounced in the Central Delta where approximately 50,000 acres of agricultural land lie several meters below sea level, protected by over 1,000 miles of levees. A broad cross-section of stakeholders, including both public agencies and private sector parties, are developing approaches to mitigate subsidence. The purpose of this review is to support ongoing and future subsidence management efforts by summarizing, examining, and assessing the existing or planned programs, barriers and opportunities, state of scientific understanding, and the scientific gaps and deficiencies of interconnected areas of subsidence. This review will be primarily based on synthesizing information from panel presentations and public discussions with invited experts at a two-day public workshop, which occurred in October 2023 (see day 1 recording here: https://cal-span.org/meeting/disb_20231019/ and day 2 recording here: https://cal-span.org/meeting/disb_20231020/). The Delta ISB is in the process of completing the review, and will release a draft for public comment later this year. For more information, please refer to the final prospectus (available here: <https://deltacouncil.ca.gov/pdf/isb/meeting-materials/2023-08-04-isb-subsidence-prospectus.pdf>).

Emerging Climate Research Symposium

As global climate change intensifies, heavily altered and engineered landscapes around the world are beginning to face increasing stressors and shocks that threaten their stability and functionality. California, a state that already experiences significant hydrometeorological variability, could be faced with increasing risks of mega-floods due to atmospheric rivers, less snow, extreme droughts, and warmer ocean temperatures. The Delta ISB seeks to stay informed on pressing and important topics affecting the Delta system. To help achieve this, the Delta ISB planning to host a symposium in early 2025 that explores the 1) current climate projections for California's Sacramento-San Joaquin Delta and related uncertainties; and 2) how organizations in the region are incorporating climate change into their decision making. The Delta ISB has released a draft prospectus for public comments, due on **November 19, 2024 at 12:00 PM** (available here: <https://deltacouncil.ca.gov/pdf/isb/meeting-materials/2024-09-30-isb-draft-climate-symposium-prospectus.pdf>)

List of Attachments

Attachment 1: Comments on the Delta Plan Five-Year Review, 2024, with Performance Measure Report Cards (available here:

<https://deltacouncil.ca.gov/pdf/isb/products/2024-06-26-isb-comments-five-year-review.pdf>)

Attachment 2: Comments on the Final Environmental Impact Report for the Delta Conveyance Project (available here:

<https://deltacouncil.ca.gov/pdf/isb/products/2024-09-20-isb-dcp-final-eir-review.pdf>)

Attachment 3: Seminar Synthesis: Understanding Decision-making under Deep Uncertainty (available here: <https://deltacouncil.ca.gov/pdf/isb/products/2024-10-02-isb-dmdu-seminar-synthesis.pdf>)

Attachment 4: Thematic Review: Advancing Scientific Understanding and Management of the Delta Through a Food Web Perspective (available here: <https://deltacouncil.ca.gov/pdf/isb/products/2024-10-02-isb-food-webs-review.pdf>)

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