Emerging Climate Research Symposium: Considerations for the Delta Region

Delta Independent Science Board

Draft Prospectus

September 30, 2024

Motivation:

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. Coastal areas are predicted to be particularly affected by climate change impacts of sea level rise and storm surge, intense rainfall, high tide flooding, and severe storms (EPA, 2024). California, a state that already experiences significant hydrometeorological variability, could be faced with increasing risks of mega-floods due to atmospheric rivers leading to increased precipitation and decreased snow fraction (Huang & Swain, 2022), along with extreme droughts and warmer ocean temperatures (Shi et al., 2021).

As part of its legislative mandate to provide scientific oversight of adaptive management, the Delta Independent Science Board (Delta ISB) seeks to stay informed on pressing and important topics affecting the Delta system. There is a timely need for Delta ISB members, the scientific community, and public at large to better understand rapidly evolving climate projections relevant to the Sacramento-San Joaquin Delta region in order to consider the range of possible climate futures in decision making. To help achieve this, the Delta ISB will host a symposium on the state of current climate science research specific to the Delta region relevant to planning for the near and distant future. This symposium builds off the Delta ISB's decision-making under deep uncertainty (DMDU) review, which is exploring the scientific tools and concepts that can increase the capacity to anticipate and adapt to growing uncertainty of future conditions in the Delta.

Goals:

The Delta ISB's goal is to organize and host a symposium on the current state of climate science in order to understand 1) the current climate projections and

related uncertainty; and 2) how organizations in the Delta are considering climate change. This symposium will also explore the science to management connection that can help shed light on the process of incorporating emerging research into management decisions. The event will consist of presentations and panel discussions by experts on relevant topics to help understand current climate projections and the important drivers for future climate planning in the Delta region. The topics to be covered include in this symposium will include the following, depending on speaker availability and public feedback:

1. What are the important climate drivers for planning under future conditions? Are we observing changes in these drivers already?
2. What are current projections for various climate scenarios (e.g., sea level rise) including the range of uncertainty?
3. What changes in the drivers (atmospheric rivers, global and regional warming) contribute to future climate change?
4. How will droughts change in the future (duration and magnitude)?
5. What factors would contribute to compounding impacts (spatial and temporal)?
6. What are the best downscaled climate products?
7. How are organizations in the Delta region integrating climate projections intp planning?

Audience:

The symposium is intended to help inform the Delta ISB on the latest climate science related to climate projections to help inform its work. The symposium will be open to the public and any interested parties can attend.

Input:

The symposium will be organized by the Delta ISB with support from the Delta ISB support staff. The Delta ISB will discuss symposium planning at its monthly public meetings and will take public comments on format and potential speakers into consideration. In addition, this draft prospectus will be circulated for public comment via the Delta Stewardship Council listserv and other mailing lists.

Expected Products and Outcomes:

The goal of the symposium is to increase the understanding among Delta ISB members, researchers, practitioners, and affected parties about the latest climate science. The Delta ISB's current plan is to prepare a summary/memorandum of the event that highlights the key takeaways. The Delta ISB will check with Maven's Notebook to see if it can prepare a proceedings report. Based on the event, the Delta ISB may consider drafting a perspective piece for publication in a peer reviewed journal.

Timeframe:

The symposium is targeted to take place in March 2025 and have a hybrid format.

Target Date	Benchmark
October 2024	Release draft prospectus for public comments, and request for ideas for speakers
November/December 2024	Finalize prospectus
December 2024	Contact speakers for event
January 2025	Open registration for event and finalize agenda
March 2025	Host hybrid event
May 2025	Prepare and release summary/memorandum
Summer 2025 to Early 2026	Work on manuscript for peer review publication

Related Reviews and Events:

As previously mentioned, this symposium will build off the Delta ISB's decision-making under deep uncertainty review, which the Delta ISB will concurrently complete as it plans for this symposium. Extensive work has been conducted on the

topic of climate change, such as reports produced by the International Panel on Climate Change (IPCC) and the California Climate Change Assessments (currently working to produce the fifth assessment). We will coordinate with the following activities occurring in the region:

- the latest edition of the State of Bay Delta Science, a science communication effort, facilitated by the Delta Science Program, that synthesizes relevant information for management in the region. The next edition of the State of Bay Delta Science will focus on extreme events.
- the Interagency Ecological Program Climate Change Project Work Team, which synthesizes relevant science and develops conceptual models for understanding the effects of climate change on the aquatic resources of the upper San Francisco Estuary.
- The Delta Stewardship Council's climate initiative known as Delta Adapts, which consists of two parts: (1) a Climate Change Vulnerability Assessment for the Delta and Suisun Marsh, and (2) an Adaptation Plan (formerly referred to as the Adaptation Strategy) detailing strategies and actions to adapt and respond to the identified vulnerabilities. The Delta ISB plans to review the draft Adaptation Plan when it is released.
- The State of California Sea Level Rise Guidance: 2024 Science and Policy Update, developed and adopted by the Ocean Protection Council (OPC). It provides updated scenarios and policy recommendations tailored to California's coastline.

In addition, this symposium will be informed by previous work that has occurred in the Delta region. This includes, but is not limited to the:

- 2022 Adapting Restoration for a Changing Climate Symposium: This symposium, organized by the Delta Science Program, explored how restoration projects are incorporating climate change considerations into their planning and implementation in the San Francisco Estuary.
- 2016 State of Bay Delta Science: Climate Change and the Delta. This synthesis summarizes the current state of climate-change science as it applies to the restoration and sustainability of the Delta environment, facilities, and ecosystems.

References:

EPA. Climate Change Impacts on Coasts. Environmental Protection Agency. Accessed on August 16, 2024 at https://www.epa.gov/climateimpacts/climate-change-impacts-coasts

Huang, X. & Swain, D. 2022. Climate change is increasing the risk of a California megaflood. Science Advances. Vol 8, 32. DOI: 10.1126/sciadv.abq0995

Shi, H., Garcia-Reyes, M., Jacox, M., Rykaczewski, R., Black, B., Bograd, S., Sydeman, W. (2021). Co-occurrence of California Drought and Northeast Pacific Marine Heatwaves Under Climate Change. Geophysical Research Letters. Vol 48-17. https://doi.org/10.1029/2021GL092765