Delta Independent Science Board Thematic Reviews: 2025 Delta Research Awards

Information Sheet

Delta Science Program
DELTA STEWARDSHIP COUNCIL

For 2025, the Delta Research Awards (DRA) is providing $5.9 million to fund eight projects that are responsive to one or more of the priority Science Action(s) identified in the **2022-2026 Science Action Agenda**. The new research covers a range of topics including harmful algal blooms, eco-cultural restoration, Tribal Knowledge, subsidence, hydrology, acoustic telemetry, endangered species, and more.

The purpose of this document is to demonstrate how the Delta Stewardship Council has funded research through the Delta Research Awards that addresses recommendations made by the Delta Independent Science Board (ISB).

Advancing a Collaboratory for Equitable Stewardship of the Sacramento-San Joaquin River Delta Watershed ($1,500,000)

Principal Investigator: T. Grantham (University of California, Berkeley)
M. Rohde, J. Stella, J. Gilbert, N. Thomas, J. Fantauzza, J. Stella, W. Medema

Review: Delta as an Evolving Place

ISB Recommendation	DRA Project Alignment
S2: Gain a better understanding of the Delta's cultural, recreational, natural, and agricultural values	▪ This project will allow us to gain information about values with respect to water supply management
S6: Use traditional ecological knowledge to enrich our understanding of sustainability and future possibilities	▪ Include marginalized communities in decision-making by integrating diverse knowledge, including indigenous and local knowledge into management decisions to support ecological resilience and inclusive stewardship

ISB Recommendation	DRA Project Alignment
	▪ Aims to integrate an understanding of social-ecological uses and diverse values of Delta waterways to inform equitable solutions to Delta management challenges, promote public engagement, and support equitable stewardship of the Delta's resources
In addition to considering possible approaches and undertaking research on Delta as an evolving place (e.g., particular topics suggested above), funders and researchers should give priority to projects that: S7a: improve understanding of the natural and social processes that protect and could be used to enhance the values of the Delta as an evolving place,	▪ Integrates indigenous, local, and scientific knowledge to improve understanding of the Delta's social-ecological values
S7b: are directed at reducing the greatest uncertainties in understanding, and	▪ Reduces uncertainty by addressing gaps in how diverse communities interact with and value the Delta, improving how inclusive and effective management strategies can be
S7c: are designed and undertaken to inform near-term Delta decisions and/or those that may arise as the Delta continues to evolve	▪ Uses interactive platforms and co-produced knowledge to support equitable and adaptive resource management

Eco-Cultural Renewal of Delta Tule Landscapes ($1,348,477)

Principal Investigator: A. Robinson (San Francisco Estuary Institute)
M. Tayaba, P. Cubbler, S. Pang, J. Sarmento, K. Moreno, Z. Emerson, L. Feinstein, V. Lee, L. Vaughn, A. Whipple

Review: Delta as an Evolving Place

ISB Recommendation	DRA Project Alignment
S1: Increase social science research into Delta as an evolving place to balance environmental research	▪ Data will be collected through interviews, literature reviews, and a Tribal workshop to guide future management efforts. The project is creating a narrative of how tribes interacted with the Delta with a focus on tule wetlands
S6: Use traditional ecological knowledge to enrich our understanding of sustainability and future possibilities	▪ The goal of the project is to communicate the importance of TEK to creating and maintaining a resilient Delta. Project aims to integrate TEK into Delta science, management, and policies to make these processes more inclusive
In addition to considering possible approaches and undertaking research on Delta as an evolving place (e.g., particular topics suggested above), funders and researchers should give priority to projects that: S7a: improve understanding of the natural and social processes that protect and could be used to enhance the values of the Delta as an evolving place,	▪ Improves understanding of cultural and ecological values of the Delta by integrating TEK with scientific knowledge
S7b: are directed at reducing the greatest uncertainties in understanding, and	▪ Reduces uncertainty by understanding Tribal perspectives to inform ecosystem management
S7c: are designed and undertaken to inform near-term Delta decisions	▪ Fosters collaboration between Tribes and agencies to include Tribal

ISB Recommendation	DRA Project Alignment
and/or those that may arise as the Delta continues to evolve	input into current and evolving Delta policies and practices

Understanding Social-Environmental Interactions in Suisun-Delta Tidal Marsh Restoration ($875,241)

Principal Investigator: J. Gonzalez & S. Siegel (San Francisco State University)
C. Grosso, M. Haeffner

Review: Habitat Restoration

ISB Recommendation	DRA Project Alignment
3: Prioritize restoration projects	▪ Project involves restoration, but it focuses on how communities perceive restoration as opposed to being a restoration project itself ▪ Results of this study will help inform restoration planning. Communities' perception of restoration is one criterion that should be considered during prioritization, but we lack data

Review: Delta as an Evolving Place

ISB Recommendation	DRA Project Alignment
S1: Increase social science research into Delta as an evolving place to balance environmental research	▪ The project aims to integrate ecological data with social metrics to understand how different communities perceive and interact with restored habitats. Researchers will identify underserved communities and conduct interviews to understand their perspectives on restoration
S2: Gain a better understanding of the Delta's cultural, recreational, natural, and agricultural values	▪ Understanding the social and cultural values associated with restoration
In addition to considering possible approaches and undertaking research on Delta as an evolving place (e.g.,	▪ Improves understanding by linking ecological data on restored tidal

ISB Recommendation	DRA Project Alignment
particular topics suggested above), funders and researchers should give priority to projects that: S7a: improve understanding of the natural and social processes that protect and could be used to enhance the values of the Delta as an evolving place,	marshes with community use, access, and perceptions
S7b: are directed at reducing the greatest uncertainties in understanding, and	▪ Reduces uncertainty by addressing knowledge gaps on how different communities interact with and are impacted by habitat restoration
S7c: are designed and undertaken to inform near-term Delta decisions and/or those that may arise as the Delta continues to evolve	▪ Informs near-term decisions by integrating ecological and social data to guide restoration planning, public engagement strategies, and policy development

Optimizing Monitoring Tools for Cyanobacterial Harmful Blooms in the Sacramento-San Joaquin River Delta ($772,992)

Principal Investigator: H. Bowers (Coastal Conservation and Research, Inc.)
G.M. Berg, E. Preece, L. Nickelhoff, S. Fern, G. Batten, T. Hinkelman, Z. Gigone

Review: Monitoring Enterprise

ISB Recommendation	DRA Project Alignment
B: Reimagine monitoring designs that are guided by priority questions and needs and systemwide conceptual or numerical models for relevant Delta processes	▪ Currently, the most extensive dataset for tracking Delta HABs is the *Microcystis* Visual Index (MVI), but it is subjective and not quantitative. The project aims to improve MVI by standardizing the visualization and ranking of colony densities as well as to be able to link *Microcystis* biomass to toxicity to be able to better monitor cyanobacterial harmful algal blooms

Review: Water Quality

ISB Recommendation	DRA Project Alignment
M4: Although several entities in the Delta fund research and monitoring activities aimed at protecting water quality in the Delta, these resources tend to support specific compliance needs. Responsibility for protecting in-Delta water quality should be broadly assigned, and more resources are needed to support coordinated and integrated water quality monitoring and science efforts	▪ HABs monitoring is only compliance related and is under-resourced. This project adds resources for coordinated HABs monitoring/science and ultimately should spread responsibility for protecting in-Delta water quality more broadly

Analyzing Flow Regime Effects on Adult Green Sturgeon Migration in Central California Rivers: Science and Policy ($511,845)

Principal Investigator: K. Börk (University of California, Davis)
J. Walter, E. Tracy, S. Colbourne, F. Bellido-Leiva, S. Yarnell

Review: Flows and Fishes

ISB Recommendation	DRA Project Alignment
1: Focus on cause and effect – the mechanisms that enable flows to affect fishes	▪ The research will model how flows and temperature affect adult green sturgeon spawning migration. The model will be used to forecast sturgeon movement under various flow scenarios with a focus on how altered flow conditions may affect timing and success of migrations

From Source to Sea: Building an Integrated Cross-Cultural Vision of Sierra Headwaters and Delta Resilience ($203,718)

Principal Investigator: J. Lauder (Sierra Streams Institute)

D. Herbst, H. Fitanides, S. Covert, A. Zettler-Mann, K. Strohm

Review: Delta as an Evolving Place

ISB Recommendation	DRA Project Alignment
S2: Gain a better understanding of the Delta's cultural, recreational, natural, and agricultural values	▪ Integrates Tribal knowledge with ecological and climate data to enhance the understanding of the Delta's cultural and natural values
S6: Use traditional ecological knowledge to enrich our understanding of sustainability and future possibilities	▪ This project will integrate data on benthic macroinvertebrates, hydrology, climate, and TEK to create tools for predicting ecosystem resilience and prioritizing conservation efforts. Integrating TEK into climate change modeling will close knowledge gaps, include Indigenous perspectives, and help implement management strategies to enhance climate resilience
In addition to considering possible approaches and undertaking research on Delta as an evolving place (e.g., particular topics suggested above), funders and researchers should give priority to projects that: S7a: improve understanding of the natural and social processes that protect and could be used to enhance the values of the Delta as an evolving place,	▪ Improves understanding of natural and social processes by combining climate data, ecological indicators, and TEK to assess and support the Delta's resilience as a connected, evolving system
S7b: are directed at reducing the greatest uncertainties in understanding, and	▪ Reduces uncertainty by addressing knowledge gaps in how climate change impacts upstream headwaters that supply the Delta

ISB Recommendation	DRA Project Alignment
	with the inclusion of Indigenous knowledge in predictive modeling
S7c: are designed and undertaken to inform near-term Delta decisions and/or those that may arise as the Delta continues to evolve	▪ Informs decisions by developing tools that guide conservation efforts and climate adaptation strategies

Leveraging Citizen Science to Study Sturgeon Mortality in the San Francisco Estuary ($200,000)

Principal Investigator: B. Burford (University of California, Santa Cruz)
N. Demetras

Review: Delta as an Evolving Place

ISB Recommendation	DRA Project Alignment
S5: Use citizen science to identify, monitor, and evaluate unique Delta qualities and explore alternative futures	▪ This project will use citizen science to gather data on non-fisheries sturgeon mortality that will support CDFW's review and guide management strategies to help recover adult green and white sturgeon populations. Researchers will create a user-friendly public reporting system and use social media to engage communities to help in reporting

Improving Subsidence and Carbon Emissions Modeling ($197,507)

Principal Investigator: S. Deverel (HydroFocus)
M. Olds, S. Haas

Draft Review: Subsidence

ISB Recommendation	Project Alignment
R1a: The Delta ISB recommends establishment of a strategic long-term program to monitor, document, and understand areas of the Delta that are still subsiding and the potential benefits and tradeoffs of subsidence reversal	▪ The SUBCALC model supports long-term understanding of subsidence patterns and impacts by simulating current and future subsidence across the Delta, using historical and

ISB Recommendation	Project Alignment
	new monitoring data to inform scenario analysis and planning.
R1b: There is also a need to further evaluate the potential for rice cultivation and other paludiculture crops to reverse and not just arrest subsidence	▪ SUBCALC can simulate subsidence and GHG emissions under various land uses, including rice and wetlands, to evaluate their potential to reverse subsidence, not just stop it
R1c: In addition to establishing long-term monitoring, developing and maintaining technical and scientific expertise will be essential	▪ This project supports technical expertise by improving an existing model that provides accurate estimates of subsidence and CO_2 emissions in Delta organic soils
R2a: A portfolio of analysis and modeling is needed to address key questions related to achieving the benefits of sequestering carbon and minimizing GHG emissions	▪ This project improves the SUBCALC model, which simulates CO2 emission reductions and informs carbon market participation through scenario modeling
R2c: Important topics to target: 1. Understanding processes controlling methane emissions 2. Developing approaches to increase and stabilize organic carbon in wetland soils 3. Developing predictive models to evaluate land-use scenarios	▪ Methane is not directly modeled but could be evaluated through integrated datasets. ▪ SUBCALC is a predictive model that estimates CO2 fluxes under varied scenarios ▪ It helps evaluate where land uses like wetlands or rice may stabilize organic carbon and reduce GHG emissions
R2d: In addition to targeted research, insights can result from maintaining year-round GHG monitoring programs and continuing improvements in coordination of monitoring efforts	▪ This project aims to improve the accuracy of the SUBCALC model
R4b: Understanding of the impact of different management practices, e.g., crop rotation, soil wetting and drying etc., on GHG emissions and sequestration across the Delta landscape needs refinement	▪ SUBCALC simulates emissions and subsidence under different land use and water management practices, helping assess how these influence carbon loss and land stability.

ISB Recommendation	Project Alignment
R4d: Advancing scientific understanding of the underlying biogeochemical processes that influence net GHG emission associated with alternative landscape scenarios is a high priority. Such information can inform the extent to which carbon markets and credit verification requirements can effectively motivate changes in landscape practices that will mitigate subsidence, while also reducing GHG emissions	▪ The SUBCALC model can provide baseline emissions and subsidence rates to understand the benefits for sequestering carbon and reducing/reversing subsidence in different land use scenarios ▪ Improve the accuracy of the SUBCALC model to provide improved and more reliable estimates for carbon-market estimates