Delta Science Program

DELTA STEWARDSHIP COUNCIL

2021 Delta Science Proposal Solicitation Awards

Overview

After reviewing a record number of proposals submitted in response to the 2021 Delta science proposal solicitation, the Delta Science Program (DSP) is thrilled to announce that **16 proposals have been selected for funding**. These projects will receive **over $9.6 million in combined funds** from the Delta Stewardship Council and the U.S. Bureau of Reclamation. The State Water Contractors are also providing funding support for one of the projects (Dr. Peter Hernes, UC Davis). **The projects will address critical biophysical and social science knowledge gaps in the Delta** identified in the 2017-2021 Science Action Agenda (SAA). Of the funded projects, two will carry out Integrated Socio-Ecological Systems (ISES) research, a new project category for this solicitation that involves the meaningful joining of social and natural sciences to build comprehensive knowledge on a topic.

Awarded Projects

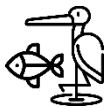
Categories

Awarded projects span a diversity of topics and advance key priorities that are essential to informing management. These projects are organized into the following four categories:

1. Harmful algal bloom drivers, trends, and impacts

2. Sea level rise and subsidence

3. Migratory fishes: science tools to inform management and recovery



4. Multi-benefit wetland habitat and Delta food webs

Connections to the Science Action Agenda

Action Area 1: Invest in assessing the human dimensions of natural resource management decisions

Action Area 2: Capitalize on existing data through increasing science synthesis

Action Area 3: Develop tools and methods to support and evaluate habitat restoration

Action Area 4: Improve understanding of interactions between stressors and managed species and their communities

Action Area 5: Modernize monitoring, data management, and modeling

The solicitation focus areas also included four **Sacramento River Science Partnership** (SRSP) science actions, which were integrated within the five SAA Action Areas noted above.

Category	Principle Investigator and Short Title[1]	Objective(s)	SAA Action Area(s)
1 	**Dr. Hans Paerl, University of North Carolina** *Addressing CyanoHABs As A Threat To Water And Air Quality*	This project will study how plankton contributing to harmful algal blooms affect both water and air quality. Results will inform human exposure guidelines and mitigation policy to diminish human and environmental health impacts of harmful algal blooms.	1, 3
1 	**Dr. Tamara Kraus, US Geological Survey** *Harmful Algal Blooms and Cyanotoxins in the Delta: Occurrence, Distribution, Trends,*	This project will provide insight on cyanobacteria occurrence, distribution, and toxins to the Central Valley Water Board and other environmental managers that can be used to trigger additional sampling, inform	4, 5, 3, 2, 1

[1] Project titles have been edited for brevity.

	and Environmental Drivers	management and mitigation efforts, and build regional capacity to predict harmful algal blooms in the Delta.	
2 	**Dr. Stefan Talke, California Polytechnic State University** *Assessing Sea Level Rise and Flooding Changes Using Historical Water-Level Records*	This project will recover, digitize, and analyze 'lost-and-forgotten' historical water level records from 1857-1982. Results will improve our understanding of tidal, flood, and sea level trends and help identify "hotspots" of habitat and flood risk sensitivity.	1, 2, 4
2 	**Dr. Dennis Baldocchi, UC Berkeley** *Quantifying Effects of Climate Change and Sea Level Rise on Carbon Accretion in Tidal and Non-Tidal Wetlands*	This project will project greenhouse gas budgets and soil carbon in restored wetlands. Results will address the resiliency of these wetlands and their capacity to sequester carbon and provide climate benefits in the future.	1, 3
3 	**Dr. Rene Henery, Trout Unlimited** *Developing an Inclusive, Landscape Scale Process for Central Valley Salmonids*	This project will develop an immediate strategy for the recovery of Central Valley salmonids through collaborative science that brings together agencies and stakeholders to develop recommended actions. Social factors will be integrated with biological factors in defining recovery, and potential actions will be evaluated using data-driven models.	1, 2, 3, 4, 5
3 	**Dr. Russell Perry, U.S. Geological Survey** *Estimating Juvenile Production and Run*	This project will integrate data sets and models to develop an annual estimate of threatened spring-run Chinook salmon exiting the Delta as juveniles. The estimate will build	2, 4, 5, (SRSP)

	Timing of Spring Chinook Salmon	on parallel work in the upper Sacramento and provide a critical metric for tracking the population.	
3 	**Dr. Alexander Forrest, UC Davis** *Regulation of Shasta Dam Temperature Control Device for Supporting Downstream Fish Populations*	This project will study a critical regulation device in Shasta Dam. Results will lead to more efficient use of cold-water supplies for summer and fall temperature management, which is a key challenge during drought and essential to the recovery of endangered salmon populations.	2, 4, 5, (SRSP)
3 	**Dr. Rebecca Buchanan, University of Washington** *Standard Operating Procedure for Diagnosing and Addressing Predator Detections in Salmon Telemetry Data*	This project will create a standard operating procedure for researchers to detect predation of salmon tagged with acoustic emitters. Inconsistent accounting for predated fish currently leads to variable interpretation and a fragmented understanding of fish movement.	2, 5, 1, (SRSP)
3 	**Dr. Mark Henderson, Humboldt State University** *Comparing the Impact of Predation on the Outmigration Mortality of all Central Valley Salmon to Other Habitat Related Covariates*	This project will synthesize salmon movement data to identify predation hotspots and understand how habitat water management actions affect salmon survival in the Sacramento River and Delta. This work is directly relevant to NOAA's recovery plan and the Central Valley Project Improvement Act.	2, 4
3 	**Dr. Myfanwy Johnston, Cramer Fish Sciences** *Understanding Within- and Between-Basin Migration in White*	This project will synthesize existing data to better understand White Sturgeon spawning and the use of critical habitats to inform management in the Bay-Delta. White Sturgeon, the largest	2, 1

	Sturgeon: A Synthesis of More Than 10 Years of Acoustic Tagging Data	freshwater fish in North America, is a species of concern in California, but very little is known about this species' migration patterns.	
3 	**Dr. Malte Willmes, UC Santa Cruz** *The Effects of Climate Change on the Life History of Spring-run Chinook Salmon through Time*	This project will assess the evolutionary and ecological history (spanning 600 years) of spring-run Chinook salmon to better understand life-history strategies and predict how a changing climate will influence salmon use of the Delta and Sacramento River.	4, 2
4 	**Dr. John Takekawa, Suisun Resource Conservation District** *Integrating Social and Ecological Research to Control Invasive Species*	This project will establish an integrated pest management approach for *Phragmites* (Common reed), an aggressive invasive plant in Delta wetlands. Results will highlight social and cultural barriers to collective action for invasive species control and include communication tools for developing a regional strategy for Common reed control.	1, 3, 4
4 	**Dr. Letitia Grenier, Aquatic Science Center** *Suisun Landscapes: Historical Ecology, Functional Metrics, and Community Priorities for Landscape Planning*	This project will develop maps and metrics on Suisun Marsh's historical and present habitats, infrastructure, and wildlife support, as well as information on community priorities. Results will include user-focused tools for landscape planning efforts and evidence-based, community-driven decision-making.	3, 1
4 	**Dr. Raman Nagarajan, UC Davis**	This project will utilize non-invasive environmental DNA (eDNA) to evaluate the effects of tidal wetland restoration on fish	3, 5

	Non-Invasive Environmental DNA Monitoring to Support Tidal Wetland Restoration	habitat use, and help establish eDNA as a rapid and cost-effective monitoring tool for restoration managers that is complementary to traditional survey methods. eDNA methods detect DNA molecules shed by macro-organisms without needing to sample listed species.	
4 	**Dr. Michelle Jungbluth, San Francisco State University, Estuary & Ocean Science Center** *From Microbes to Zooplankton, What Defines a Beneficial Wetland?*	This project will use eDNA methods to evaluate the extent to which tidal wetland restoration projects are providing essential food web benefits to declining estuarine fish assemblages. Results will support monitoring, habitat restoration evaluation and efforts to detect and rapidly respond to non-native and invasive species.	3, 4, 5
4 	**Dr. Peter Hernes, UC Davis** *How Delta food webs have changed: integrating detrital material into the Delta food web puzzle*	This project will characterize and ground truth the quality and food web value of algal and detrital particles in a changing Bay-Delta, including through the use of optical sensors. Results will inform habitat restoration and improve nutrient and water management activities that will enhance the food web and better support native fish.	3, 4, 5

Learn More

For more information on these projects, visit the [Delta Science Proposals Solicitations web page](deltacouncil.ca.gov/delta-science-program/delta-science-proposal-solicitations) (deltacouncil.ca.gov/delta-science-program/delta-science-proposal-solicitations).