

# TEMPORAL INVESTIGATIONS OF MARSH ECOSYSTEMS (TIME) PROJECT

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If you would like to stay in touch with this project, contact the NERRS Science Collaborative Program Coordinator: Cindy Tufts, [cindy.tufts@unh.edu](mailto:cindy.tufts@unh.edu)

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## What's happening?

The Tijuana River National Estuarine Research Reserve (TRNERR) is leading a team to synthesize ecosystem science into a decision-making framework to help guide coastal wetland recovery and management in Southern California, the TIME project. The team will use collaborative approaches to engage a range of stakeholders and refine key management questions, explore the historical ecology of the Tijuana River Valley, and identify ecosystem services provided by regional wetlands. Ultimately, their goal is to create a robust set of tools to help resource managers use information about the past, present, and future of wetland ecosystems to proactively steer restoration and management goals.

## Why this project?

Southern California is under intense pressure from development, and many of the region's coastal wetlands have been fragmented or lost altogether. In the Tijuana Estuary, for example, pressure from various land uses in San Diego and neighboring Tijuana compromise functions provided by wetlands, such as improved water quality and provision of wildlife habitat. Conserving and restoring these wetlands, and ensuring the continued provision of valuable ecosystem services, has become a priority for managers, scientists, and organizations such as the Southern California Wetlands Recovery Project and the Tijuana River Valley Recovery Team.



This project will create tools to support wetland management in the context of altered landscapes and climate-induced change. (Photo: TRNERR)

In response to the need to better understand and restore these threatened ecosystems, numerous studies relative to different points in time have been undertaken. These studies include efforts documenting the historical ecology of wetlands, which is accomplished by synthesizing diverse historical information to learn how habitats were distributed and ecological functions were maintained within native landscapes. Other studies include assessing and mapping the extent and condition of our current wetland ecosystems, as well as projecting the future ecological and social impacts of climate change.

Yet, despite this wealth of knowledge, stakeholders could benefit from two essential elements that would allow increasingly effective wetland recovery. The first is a full characterization of the ecosystem services provided by coastal wetlands in Southern California, including identification of conditions that impact a wetland's ability to provide these services over space and time. The second is a decision-making framework that addresses the use of historical ecology products, current condition assessments, and projections of climate change impacts in helping to set and achieve wetland recovery goals under changing, uncertain conditions.

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The team will explore how historic, ecological information can be used to plan for resilient wetland ecosystems in the future.

## How will this project work?

This project team consists of the California State Coastal Conservancy (SCC), San Francisco Estuary Institute (SFEI), Southern California Coastal Water Research Project (SCCWRP), Sacramento State Center for Collaborative Policy (CCP), and TRNERR. The team will use collaborative methods to engage affected and interested stakeholders to reach the following objectives:

- Conduct a stakeholder assessment to identify diverse perspectives about wetlands recovery, and identify both the information stakeholders need to effectively achieve wetland recovery goals as well as the barriers to action they encounter. This information will be used to help guide the project and its products.
- Conduct a historical ecology study of the Tijuana River Valley that will inform the team on functions that this coastal ecosystem has provided over time. Largely funded by SCC, this component of the project will explore how historic information can be used to plan for resilient wetland ecosystems in the future.
- Characterize key ecosystem functions and services provided by Southern California tidal wetlands, and describe which of these are most likely to be affected by management actions (or inaction). To reach this objective, the team will hold a stakeholder workshop series to discuss these topics and identify common ground perspectives.
- Develop GIS-based visualization tools to characterize how select ecosystem services shift over place and time, and apply that model to the Tijuana River Valley using available information. This will be based on outputs of other project elements and will draw on user needs to infer changes in services over time and under different scenarios, such as those resulting from specific management actions and climate-induced change
- Develop a user-defined conceptual framework for decision-making that: provides guidance on the key questions identified as part of this project, synthesizes the uses and limitations of available information, and helps more broadly inform work in this region by outlining a process that can be used for place-based decision-making, using this study and the Tijuana River Valley as a model.

## About the funder

The NERRS Science Collaborative puts Reserve-based science to work for coastal communities coping with the impacts of land use change, stormwater, non-point source pollution, and habitat degradation in the context of a changing climate.

The program operates by a cooperative agreement between the University of New Hampshire (UNH) and the National Oceanic and Atmospheric Administration.



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