Bringing Wetlands to Market in Massachusetts

Project Location

Waquoit Bay National Estuarine Research Reserve, Massachusetts

Project Lead

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Targeted End Users and Products

- *Project final report*
- *Blue carbon fact sheets*
- *Wetland Greenhouse Gas Model*
- *Carbon offset methodology*
- *Template for understanding blue carbon and coastal management options*
- *Project videos*
- *High school curriculum*
- *Innovative salt marsh boardwalk designed to support this research*

Project Partners

- *Waquoit Bay Reserve*
- *Florida International University*
- *Marine Biological Laboratory*
- *Manomet Center for Conservation Sciences*
- *National Estuarine Research Reserve Association*
- *Restore America's Estuaries*
- *University of Rhode Island Department of Biological Sciences*
- *USGS Woods Hole Coastal and Marine Science Center*
- *USGS Earth Resources Observation and Science Center*

About the Science Collaborative
The National Estuarine Research Reserve System's Science Collaborative supports collaborative research that addresses coastal management problems important to the reserves. Learn more at *www.nerrs.noaa.gov.*

Overview

In the struggle to slow climate change, coastal wetlands are a critical asset—acre for acre, they can store up to five times as much carbon as rainforests. When wetlands are damaged or destroyed, they shift from being carbon "sinks" to being carbon sources that release greenhouse gases into the atmosphere. Unfortunately, wetlands are disappearing at an alarming pace, and decisions to develop, protect, or restore them are often made in the context of limited public resources. Trading wetlands carbon offsets on carbon markets is an exciting new approach to creating financial incentives for restoration and conservation. To help "bring wetlands to market," the Waquoit Bay Reserve led a cutting-edge, collaborative research project that examined the relationship between salt marshes, climate change, and nitrogen pollution and developed tools to leverage the "blue carbon" stored in wetlands to achieve broader management goals.

Project Benefits

- Restoring tidal flow to tidally restricted/degraded marshes can significantly reduce emissions of the powerful greenhouse gas methane, which contributes to climate change.
- The invasive plant Phragmites australis, or common reed, can store more carbon than native marsh grasses.
- Pools of standing water in wetlands tend to emit, rather than trap, greenhouses gases, suggesting that sea level rise may reduce a wetland's carbon storage capacity.
- Bringing wetlands into carbon markets is more feasible for large-scale restoration sites, but it may also be possible to group smaller projects together to reach an effective scale.
- Development of an educational unit for the reserve system's Teachers on the Estuary program for teachers and students on the science of blue carbon.
- Accelerated blue carbon research and policy making by sharing findings and tools in different parts of the country, including the Pacific Northwest, which led to a multi-sector collaborative work group focused on advancing blue carbon projects in the region.

Project Approach

Through this project, scientists, educators, policymakers, and economists collaborated to advance the science of blue carbon and provided much-needed economic tools and policy guidance to translate the science into action.

- Data Collection: The team conducted field investigations to quantify greenhouse gas emissions and carbon sequestration in coastal wetlands and predict greenhouse gas fluxes across a range of environmental settings.
- Methodology and analysis: They developed a methodology for securing credits for coastal blue carbon through verified carbon markets, a guidebook on how to use the methodology, an innovative model for predicting greenhouse gases in coastal wetlands, and a case study analysis of the costs and benefits of doing a blue carbon market project for wetlands restoration.
- Collaborative Leadership: The reserve's Coastal Training Program provided collaborative leadership and engaged a diverse group of stakeholders. These stakeholders were consulted early and often, beginning with a kick-off meeting that served as a training opportunity in the collaborative learning method used by the project.