



Using Estuary Data to Teach about Coastal Impacts of Climate Change

Project Overview

The National Estuarine Research Reserve System has a proven record of successfully transferring and translating reserve science to a broad suite of educators through teacher workshops. In recent years, teachers expressed a need for curricula, data sets, and professional development related to climate change.

This project enabled Northeast reserves to develop and offer a series of free, high-quality Teachers on the Estuary workshops for sixth through twelfth grade teachers focused on climate change impacts on coastal habitats, using Sentinel Site and System-Wide Monitoring Program data collected at the reserves.

Project Benefits

The delivery of new and existing curricula equipped over 75 teachers with the tools and confidence needed to effectively discuss climate change in the classroom.

- Teachers reported a marked increase in their knowledge and confidence to teach climate change, sea level rise, and related concepts after participating in Teachers on the Estuary workshops.
- Eighty-six percent of teachers who completed a national Teachers on the Estuary survey reported using workshop teaching resources in their classrooms over the past school year, allowing them to integrate climate change into their curriculum and teach students about basic estuarine and watershed concepts.
- An estimated 2,500 middle and high school students learned about climate change and estuary monitoring because of the Teachers on the Estuary workshops offered by the project team.

Project Location

Great Bay National Estuarine Research Reserve
 Narragansett Bay National Estuarine Research Reserve
 Waquoit Bay National Estuarine Research Reserve
 Wells National Estuarine Research Reserve

Project Duration

October 2015 to September 2017

Project Lead

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Project Partners

- Great Bay National Estuarine Research Reserve
- Narragansett Bay National Estuarine Research Reserve
- Waquoit Bay National Estuarine Research Reserve
- Wells National Estuarine Research Reserve

Project Approach

The four New England reserves worked together to share existing educational resources and develop new resources for the classroom teachers they work with.

- **New Curricula** – The reserves developed localized teaching modules about climate change impacts, which included activities on habitat mapping, salt marsh vegetation, sea level rise, and student-driven, school-based sentinel sites.
- **Teacher Workshop** – Each reserve held a three to four day intensive workshop in the summer of 2016 with between nine and 14 teachers per workshop. Teachers tested a suite of new educational resources about climate change and received guidance on how to develop stewardship projects for their students. They were also introduced to the Bringing Wetlands to Market curriculum, which focuses on blue carbon concepts and ecosystem services.
- **Application by Other Reserves** – The team used pre- and post-workshop evaluations and meetings to fine-tune and adapt the trainings and new curricula. Team members presented and made available revised training and teaching materials for Education Coordinators throughout the entire reserve system.

Products

- [Teaching modules on climate change impacts on coastal habitats](#)
- Six professional development workshops hosted by the Northeast reserves trained 78 middle and high school educators on climate change and related topics
- Educators implemented over 30 estuary stewardship projects with their students

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. The Science Collaborative is managed by the University of Michigan's Water Center through a cooperative agreement with the National Oceanic and Atmospheric Administration (NOAA). Funding for the research reserves and this program comes from NOAA. Learn more at www.nerrs.noaa.gov or www.graham.umich.edu/water/nerrs.