



Spreading the Seeds of Estuary Health

Overview

Involving students in restoration not only teaches core science concepts, it also empowers new generations of estuarine stewards. In the Southeast, salt marsh and tidal creek restoration is a key strategy to reducing risks to these ecosystems and enhancing their contributions to healthy water, coastal flood and erosion protection, and fisheries habitat. To engage students in these efforts, the ACE Basin, Guana Tolomato Matanzas, North Carolina, North Inlet-Winyah Bay, and Sapelo Island Reserves created a region-wide project-based learning program for salt marsh-tidal creek restoration.

Building on the success of the Seeds to Shoreline (S2S) and Spartina Transplant and Restoration (STAR) programs, these southeastern reserves worked with 18 participating schools in North Carolina, South Carolina, Georgia, and Florida to expand understanding of estuarine habitat, build scientific and technical skills, and contribute to local restoration efforts. Reserves supported teachers through each stage of the project by providing professional development opportunities, standards-based lesson plans, and an online interactive resource center. Students grew and transplanted smooth cordgrass (*Spartina alterniflora*) to eroded marsh and/or floating cordgrass islands near their schools. Ultimately, the project grew a community of practice among educators and reserves, expanded the use of salt marsh focused curriculum, increased plant growth in degraded ecosystems, and gave students the tools to be effective ecological stewards in their communities.

Project Approach

In the first year of the project, ACE Basin, Guana Tolomato Matanzas, North Carolina, North Inlet-Winyah Bay, and Sapelo Island Reserve education staff, with support from the South Carolina Sea Grant Consortium, created an online resource center, compiled relevant lessons plans, and piloted the program with teachers and students in South Carolina and Florida. In this pilot, program and education staff hosted teacher trainings and participating schools received supplies to build an onsite greenhouse with seed trays and a hydroponic growing pond. During the school year, teachers guided students through collecting and growing smooth cordgrass seeds and taught two or more lessons from the curriculum.

Project Location

Southeast

Project Duration

June 2017 to May 2020

Project Lead

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Project Type

Science Transfer – Promoting
the use of science

Products

- Online interactive resource center with topic-based classroom lesson plans, instructions for growing smooth cordgrass, and student data

Project Partners

- ACE Basin National Estuarine Research Reserve
- Guana Tolomato Matanzas National Estuarine Research Reserve
- North Carolina National Estuarine Research Reserve
- North Inlet-Winyah Bay National Estuarine Research Reserve
- Sapelo Island National Estuarine Research Reserve
- South Carolina Sea Grant Consortium

Project Webpage

nerrsciencecollaborative.org/project/Rainer17

Students collected and shared data on plant success by counting the number of stems and measuring stem height, then transplanted juvenile smooth cordgrass plugs into areas of eroded marsh or floating cordgrass islands (placed in schools' onsite water retention ponds). At the end of the year, the project team evaluated outcomes, simplified growing techniques, and identified lessons most commonly used by teachers.

In the following school year, the project expanded to all five reserves, offering an additional four teacher trainings and engaging a total of 18 schools throughout the region. Communication with reserve staff and the online resource center facilitated information sharing and helped teachers troubleshoot growing systems. The project team shared their findings with the broader reserve network at the 2018 and 2019 reserve system's annual meetings to demonstrate the potential of this model to be transferred to other regions.

Benefits

- Developed an online interactive resource center that includes topic-based classroom lesson plans, instructions for growing smooth cordgrass, and student data.
- Students from 18 schools across four states grew over 4,000 smooth cordgrass stalks that were transplanted to four restoration sites.
- Collaboration among southeastern reserves transferred knowledge of successful growing techniques for smooth cordgrass across the region.
- Established a network for teacher-to-teacher support and increased opportunities for teacher professional development related to salt marsh habitat and project-based learning.
- Increased student understanding of science through hands-on, project-based learning and lessons that incorporate data analysis.

What's Next

The five participating reserves each plan to continue growing plants with school groups using the methods that worked best in their region. Using this project as a model for K through 12 restoration education, the team is working to create similar projects to restore native plants in other ecosystems such as freshwater wetlands, dune grass, and mangrove. For example, Guana Tolomato Matanzas Reserve is building on lessons learned and piloting a growing system for the dune grass, sea oats. ACE Basin Reserve is piloting community restoration days where families can team up with classrooms to move greenhouses plants into restoration sites.

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 nerrsciencecollaborative.org or coast.noaa.gov/nerrs.