



Undergraduates Develop Job Skills by Creating Interactive Software for Reserve Visitors

Overview

This project supported the development of new, innovative visitor displays at three National Estuarine Research Reserves. Guana Tolomato Matanzas, Mission-Aransas, and Delaware Reserves partnered with University of Delaware students to produce educational, gesture-controlled computer games that could be installed on interactive screens in each reserve's exhibit hall. The games are a valuable addition to the visitors centers' largely hands-off exhibits. The games offer visitors interactive learning opportunities and encourage stewardship by exploring actions individuals, families, and communities can take to promote ecosystem resilience.

Project Approach

Guided by the three reserve education coordinators, participating University of Delaware undergraduate students created new reserve-specific computer games that focused on topics and current research important to each site. Data stories about estuarine dynamics developed by reserve staff and user surveys informed game design and refinement. During the summers, software design and graphic design students worked to produce pilot and final products.

This project produced three educational mini games, including a suite of custom artwork, software code to run the games, and user manuals for educators installing the games. Each game allows participants to explore the dynamic nature of estuarine systems, drawing from recent research at the reserves and illustrating common issues faced by estuaries across the country. The three new games are the following:

- Blue Crab Run – Demonstrates how crabs use the salinity gradient to navigate up the estuary, while avoiding predators and navigating the impacts of drought on the salinity gradient to reach their destination.
- Shoreline Restoration Race – Educates users about shoreline erosion due to boat wakes and the different items that are used to reduce erosion in the estuary.
- Estuary Stories – Gives players the chance to reflect on what they learned during the other two games and apply the new knowledge to create a stewardship story.

The project team evaluated users' experiences and shared lessons learned with the broader reserve network through an [online webinar](#).

Project Location

Delaware, Florida, and Texas

Project Duration

September 2016 to January 2019

Project Lead

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Project Type

Science Transfer – Promoting
the use of science

Products

- Three new [interactive games](#) for use in reserve visitors centers
- [User manuals](#) to help reserves use games and interactive displays
- [Customized images](#) used in game development
- [Videos](#) promoting the use of the games

Project Partners

- Friends of the GTM Research Reserve
- Guana Tolomato Matanzas National Estuarine Research Reserve
- Delaware National Estuarine Research Reserve
- Mission-Aransas National Estuarine Research Reserve
- University of Delaware

Project Webpage

nerssciencecollaborative.org/project/Rainer16

Benefits

This project significantly updated the interpretive exhibits at three reserves: Guana Tolomato Matanzas, Mission-Aransas, and Delaware. Visitors' interactive experiences improved their understanding of and engagement with locally relevant science and estuarine conservation. The new games also increased the accessibility of the reserves' educational offerings for audiences with different learning styles. The games developed through this project are being shared and used across the National Estuarine Research Reserve System.

This project established an ongoing partnership between the Delaware Reserve and the University of Delaware's software engineering undergraduate program. The partnership provided students with real-world experiences in game design to prepare them for a competitive workforce. And the reserves benefited because they were able to produce customized art and games with a small financial investment.



Student using a new touch screen display in the visitor center at Guana Tolomato Matanzas Reserve in Florida.

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.