Developing New Ways to Analyze Reserve Monitoring Data

Project Location

Jacques Cousteau National Estuarine Research Reserve

Project Duration

September 2015 to August 2017

Project Lead

Thomas M. Grothues
Research Associate Professor
Rutgers University
Grothues@marine.rutgers.edu
(609) 296-5260 x262

Project Lead

Science Transfer - promoting the use of science

Products

- MATLAB and R code that performs the same core analyses for all reserves while allowing for application of settings that reflect site-specific conditions

Project Partners

- Delaware National Estuarine Research Reserve
- Eagle Rock Analytics
- Jacques Cousteau National Estuarine Research Reserve

Project Overview

The National Estuarine Research Reserve System forms a network of coastal sites protected for long-term stewardship, research, and education. To support this mission, the reserve system established the System-Wide Monitoring Program (SWMP) in 1995 to conduct long-term monitoring of water quality, weather, coastal habitat, and biological communities using consistent methods. The monitoring program is critical for reserve coastal management and research. However, realizing the full value of the program is limited by the lack of time, technical expertise, and computational resources reserves have for analyzing large, complex data sets.

This project addressed these constraints by producing tools, graphical support, and training for research staff from the Mid-Atlantic reserves (Jacques Cousteau, Delaware, Chesapeake Bay - Maryland, and Chesapeake Bay - Virginia) to better utilize reserve monitoring data. The project team specifically focused on producing tools to understand water quality trends—a reserve management priority. Through workshops and statistical application development, this project increased capacity to distill monitoring data into a format that resource managers can more readily use. The project team shared their approach and project outputs with participating reserves to increase capacity for the reserve monitoring program.

Project Benefits

The project addressed a need expressed by the Mid-Atlantic reserves to increase the capacity of reserve staff to analyze System-Wide Monitoring Program data.

- The project provided Mid-Atlantic Reserve staff with tailored data summaries and graphs using program data, building their capacity to develop data products for use by the reserves and their partners.
- Reserve staff who attended the project workshop reported increased confidence, skills, and access to new graphical and analytical tools that improved their understanding of water quality trends.

- The project team demonstrated and modelled the process for potential transfer to the entire reserve system, increasing the capacity of participating reserves to distill and analyze monitoring program data.
- The analytical tools produced contributed to the development of an annual automated reporting system.

Project Approach

A team from the Jacques Cousteau and Delaware Reserves improved the ability of research staff members from the Mid-Atlantic reserves and beyond to utilize reserve monitoring data using the following approach:

- **Data Product Development** – Expanding on previous analytical coding efforts, the project team developed a template that performs the same core analytical processes for all sites while making allowances for local conditions. The team tailored product specifications in response to reserve priorities. External project partner, Eagle Rock Analytics, validated the analytical products.
- **Workshop** – The team hosted a two-day workshop to share the newly developed data analysis tools with research staff members from Mid-Atlantic reserves. Before the workshop, participants received background reading and preparatory exercises. The workshop allowed participants to run analyses and produce individualized graphs and data summaries.

What's Next

- The analytical products produced through this project are available for the National Estuarine Research Reserve System and others to access through the system's Centralized Data Management Office.

OFFICE FOR COASTAL MANAGEMENT
National Estuarine Research Reserve System