



GUANA NUTRIENTS BUDGETS & BIVALVES

Newsletter of the NERRS Science Collaborative Project

"Assessing the Current and Potential Role of Shellfish for Improving Water Quality"

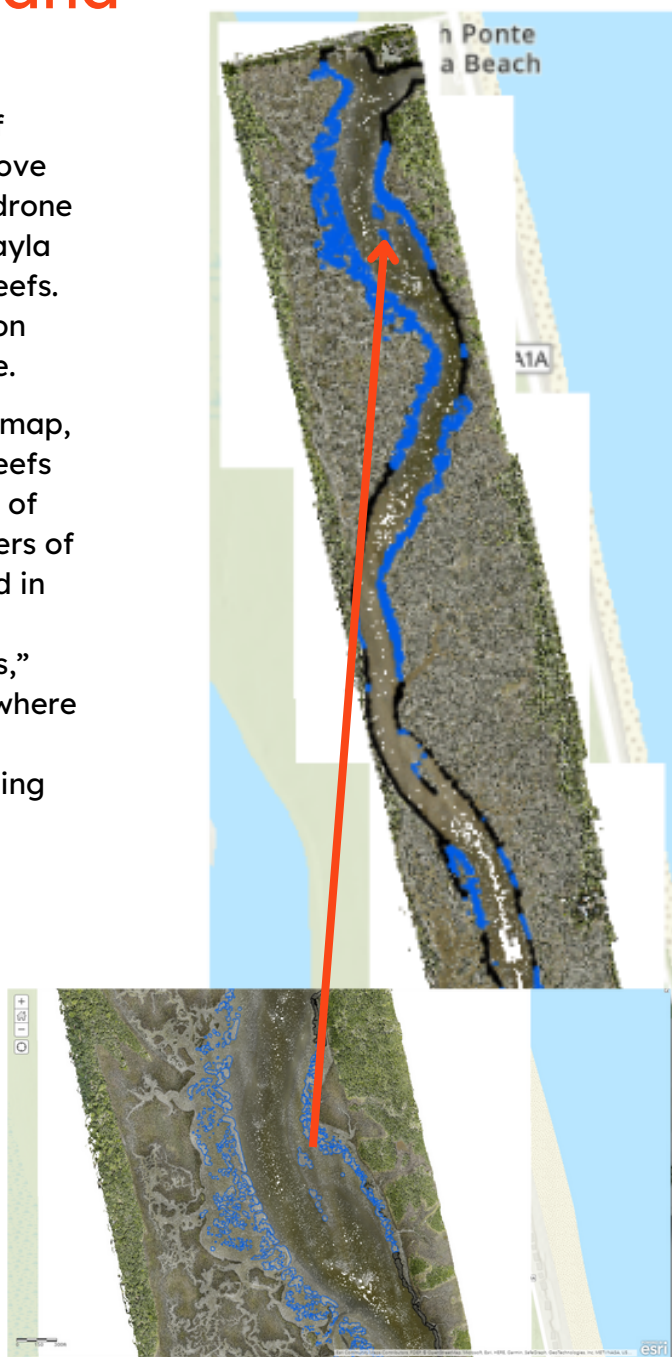
New Map of the Guana River Oyster Reefs

In fall 2022, Orlando Cordero, University of Florida (UF), piloted three drone flights above the Guana River. The imagery from those drone flights was used by Hallie Fischman and Jayla Kindelspire, UF, to manually draw oyster reefs. Those drawn oyster reefs are now a polygon shapefile accessible through ArcGIS Online.

The polygons and drone imagery create a map, pictured to the right, that outlines oyster reefs throughout the Guana River starting south of the Guana Dam. The map includes two layers of oyster reefs. "Consolidated Reefs," outlined in blue, are clearly defined reefs with a high density of oysters. "Unconsolidated oysters," outlined in black, are lower-density areas where a single reef could not be identified. Unconsolidated oysters are generally fringing areas along the marsh edge.

These maps will allow for the project team to estimate the amount of nitrogen that is removed from the system by oyster reefs and develop a "nitrogen budget". Additionally, these maps will serve as a resource in the [Florida Fish and Wildlife Conservation Commission's "Oyster Beds in Florida" data layer](#) that was developed to represent the most recent oyster distributions in Florida for current statewide display and analysis.

[CLICK HERE TO EXPLORE THE NEW MAPS.](#)



Screengrabs of the ArcGIS Online map.

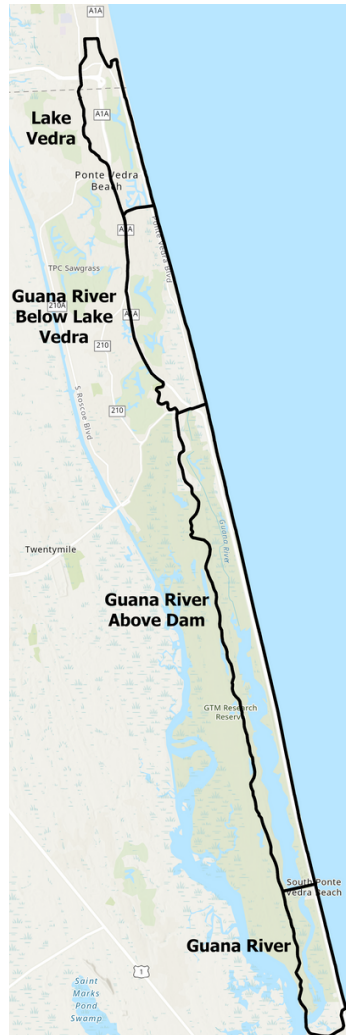
Guana Water Quality

Options for taking action

A final output of the Guana Nutrients: Budgets and Bivalves project is a list of water quality restoration recommendations for the impaired waters of the Guana Estuary (see map right). [Read a NEW handout about the restoration plan opportunities and next steps.](#)

To ensure that the recommendations are relevant and actionable, the project team has work with members of the GTM Technical Advisory Group to identify Best Management Practices (BMPs) to incorporate into scenario testing that will reduce pollutant inputs into the Guana Estuary. BMPs are structural, vegetative, or managerial practices used to treat, prevent, or reduce water pollution.

[Read the suggested BMPs](#) including the strengths, weaknesses, opportunities, and concerns of each that were discussed at the May TAG meeting (pgs. 4-5, 14-16 of the meeting notes).



Top- map of the Guana Estuary. Bottom-graphic from new [handout about water quality restoration options.](#)

Related Work

Upcoming Workshop

Interested in learning about payments for ecosystem services from shellfish? Members of the project team are hosting a virtual workshop that will include regulatory and incentive-based policies used in bivalve-based restoration aquaculture. This workshop will summarize the findings of a [2-year grant funded by The Nature Conservancy SOAR program.](#)

What: "A Holistic Assessment of Using Shellfish Aquaculture for Water Quality Improvement Initiatives in Florida"
When: Oct. 24, 2023, 2:00 – 3:30 PM ET
Where: Online - register [here!](#)

Pollution Modeling and Monitoring

Using a [YSI HYCAT, an autonomous surface vehicle](#), Dr. Alberto Canestrelli (UF), is collecting data on water quality, water velocity, and bathymetry of Guana Lake. This data will be used to develop a water quality remediation plan and BMPs for Guana dam operations. [Click here to learn more.](#)



Historical Oyster Sizes

Jaleigh Pier, Cornell University, is collecting deep oyster reef cores to determine the age of Guana River oyster reefs. This will help understand if oyster sizes and densities (and the capacity for nitrogen removal) have changed over time. [Click here to learn more.](#)



Jaleigh and crew using a vibracore to collect the core sample.

Meet the Collaborative Team



Christine Angelini, Ph.D.

Christine Angelini is an Assistant Professor in Environmental Engineering Sciences. She received her Ph.D. in Biology from the University of Florida in 2014 and her B.Sc. in Marine Biology from Brown University in 2009. She is an ecologist with expertise in wetland, reef and dune systems. Her research focuses on advancing mechanistic understanding of how species interactions moderate ecosystem resilience to climate change and influence contaminant integration into food webs.

For this project, her students work closely with other members to perform aerial surveys, shellfish surveys, and reef laser scanning of the Guana estuary.

About the Project: <http://www.nerrsciencecollaborative.org/project/Smyth20>