



GUANA NUTRIENTS BUDGETS & BIVALVES

Biannual Newsletter of the NERRS Science Collaborative Project
"Assessing the Current and Potential Role of Shellfish for Improving Water Quality"

From the Field

Cubes + Containers = Cubitainers

Justina Dacey, University of Florida

On June 27, 2022, Justina dodged thunderstorms to begin a nutrient limitation bioassay experiment by collecting water samples at four sites in the Guana Lake and Guana River. The experiment is to investigate how the phytoplankton community responds to varying levels of nutrients. The monthly Guana Nuts water sampling data was used to identify concentrations of nitrogen and phosphate that would exceed Florida State threshold criteria for nutrient loading targets. These targets are designed to prevent eutrophication and improve overall water quality.

Ninety-six total samples were collected from the Mickler's Weir, middle of Guana Lake, north of the Guana Dam, and south of the Guana dam. Five different treatments of inorganic nitrogen, phosphorus, dissolved organic nitrogen, and a combination were applied to each of the sites, leaving one control from each site. The cubitainers were then attached to a PVC pole system to lower them into the water at the Guana dock to allow for the samples to incubate under in situ temperature and light conditions for 2.5 days.

The water samples were then taken to UF's Urban Ecosystem Ecology lab to be filtered and analyzed for chlorophyll-a and nutrient concentrations. This data will provide a better understanding of phytoplankton response to enhanced nutrient additions from stormwater runoff and other forms of nutrient pollution. Detecting specific practices, locations, and times where management actions can be implemented to maximize water quality improvement and minimize nitrogen loading into the Guana River will be helpful in year three of the project when the project team makes recommendations.

BONUS- While sampling, Justina came across an injured royal tern. With assistance from reserve staff, the tern was captured and taken to a local veterinary office for assistance.



Top (L-R): Justina holding cubitainer.
Justina adding treatments to cubitainers.
Center (L-R): Collected cubitainers.
Deployed cubitainers.
Bottom: Cubitainers attached to PVC pole deployment system



From the Field

860 mussels, 600 oysters, and 60 tubes of superglue?

Hallie Fischman & Kristie Perez,
University of Florida

Between two sampling events in April and June 2022, 860 mussels and 600 oysters were collected from the Guana River, measured, tagged, and deployed back into the Guana River for to evaluate the effect of the nutrients and inundation time on shellfish growth. In the photo below, the bivalves collected were deployed at six different elevations at a site in the Guana River (3 elevations for mussels and 3 elevations for oysters). They will be re-collected after six months. The project team will visit the tagged shellfish monthly to check for any tag loss.

From left to right:
University of Florida students, Hallie Fischman, Emma Gaines, Asher Mann-Romey, Kristie Perez, and Jonathan Crabill tagging mussels and oysters from the Guana River.



Notes from the Team

Next Meeting Details

Please save-the-date for our virtual stakeholder meeting. Additional details will be sent through email.

DATE: November 16, 2022

TIME: 1:00 a.m.- 4:00 p.m.

LOCATION: Virtually on Zoom, [RSVP](#)

For more information, contact
Kaitlyn.Dietz@FloridaDEP.gov.

Did you miss the May 2022 meeting?
View the meeting summary [HERE](#).

Stay Engaged!

See below for a schedule of when and how the project team will share updates through 2024:

- February: Newsletter
- May: In-person meeting
- August: Newsletter
- November: Virtual meeting

Meet the Collaborative Team



Shirley Baker, Ph.D.

Shirley Baker is a professor in the School of Forest, Fisheries and Geomatics Sciences at the University of Florida. Her research focuses on shellfish aquaculture, invasive species, and ecosystem services. Specifically, she studies bivalve feeding and metabolism in response to stressors. While there are literally “boring” bivalves, bivalves are never boring! Shirley trained as a Marine Scientist at the University of Oregon (M.S.) and the Virginia Institute of Marine Science (Ph.D.). She studied freshwater mussels at Macalester College (St. Paul, MN) and SUNY Stony Brook, before joining the faculty of the University of Florida in 1999. Shirley is Co-PI on the Guana Nuts project and will focus on quantifying bivalve health and feeding rates in the Guana system.



Peter Ifju, Ph.D.

Peter Ifju is the MAE Excellence Term Professor and Associate Chair for Faculty Affairs in the Mechanical and Aerospace Engineering Department at the University of Florida. His research includes the development of drones specific to natural resource applications. Recently, Dr. Ifju developed drones to perform water sampling for red tide and harmful algal blooms, and bathymetric surveys. He is also known for research on micro air vehicles, electric vertical take-off and landing civil transports, experimental stress analysis in solid mechanics, optical methods for measuring deformation in solids and composite material characterization. He received a Ph.D. in Materials Engineering Science (1992), a M.S. in Engineering Science and Mechanics (1989), and a B.S. in Civil Engineering (1986) all from Virginia Tech. He also performed a Post-Doc at NASA Langley Research Center (1992-1993) in the Mechanics of Materials Branch. For this project, his students work closely with other members to perform aerial surveys of the Guana estuary.

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