

Shellfish may improve water quality in north Florida estuary; UF scientists, colleagues awarded \$595,000 grant

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GAINESVILLE — (Feb. 18, 2021) — Shellfish are vital to keeping estuaries healthy. They efficiently feed on and filter nutrients and chemical contaminants, which helps keep the water clear for underwater grasses and other aquatic life.

Recognizing the cleaning ability of shellfish, a team of scientists from the University of Florida and elsewhere hopes to restore a polluted estuary in north Florida.

Ashley Smyth, a scientist at the University of Florida Institute of Food and Agricultural Sciences Tropical Research and Education Center, and colleagues have been awarded a \$595,000 grant to study the role shellfish can take to mitigate water quality issues in the Guana Lake and Guana River in St. Johns County. Smyth will serve as lead principal investigator in a multi-step, multi-year research project.

“Normally, this would be a pristine area of nature, but nitrogen and other nutrients have found their way into the system, leading to algal blooms and low oxygen in the water, with consequences for oysters and mussels,” said Smyth, an assistant professor of biogeochemistry in the UF/IFAS department of soil and water sciences.

This protected estuary is home to rich marshes, mounds of mussels and live oyster reefs. The estuary’s dam separates the river from Guana Lake. Over the

last few years, a community-supported, multi-agency monitoring effort revealed that the estuary is showing signs of pollution.

“The heart of all of this is that there is a water quality problem causing deterioration in the ecosystem that people enjoy, where wildlife thrives, and that benefits the environment and economy. This research will help the community develop restoration and management plans,” said Smyth.

The three-year grant, which begins in April, will accomplish various tasks:

- Assess and collect data about the water quality and health of shellfish in the Guana River Estuary.
- Identify how changes in land use have produced nitrogen spikes into the waterway.
- Assess how shellfish can improve water quality and benefit the local economy.
- Engage stakeholders and community groups throughout the project to encourage practices that will reduce nutrient input into the estuary.
- Engage stakeholders and outlying communities in proactive estuary reform.

Researchers aim to develop a restoration and management plan that stakeholders can buy into and improves the estuary. Doing so may prevent legislative mandated action required by the U.S. Environmental Protection Agency that oversees the maximum amount of nutrients that can be in the system. Currently, the water quality issues are related to excess nutrients.

Funding for the project, which is provided by the National Estuarine Research Reserve System (NERRS) Science Collaborative, is designated for research to inform management of the Guana

Tolomato Matanzas National Estuarine Research Reserve. The reserve is one of 29 coastal sites that are part of the National Estuarine Research Reserve system throughout the United States.

The Guana River estuary consists of Guana Lake, which skirts the seaside community of Ponte Vedra Beach in St. Johns County, and the Guana River, which is separated from the lake by a dam.


Collaborating with Smyth’s team from UF are Nikki Dix, research director at the Guana Tolomato Matanzas National Estuarine Research Reserve and Kaitlyn Dietz, coastal training coordinator.

“The project outcomes will contribute significantly to future resource management decisions by quantifying the interaction between stressors, the ecological services that oysters provide, and the costs and benefits of enhancing oyster harvesting and aquaculture in the Guana River,” according to a statement in the reserve’s letter of support.

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