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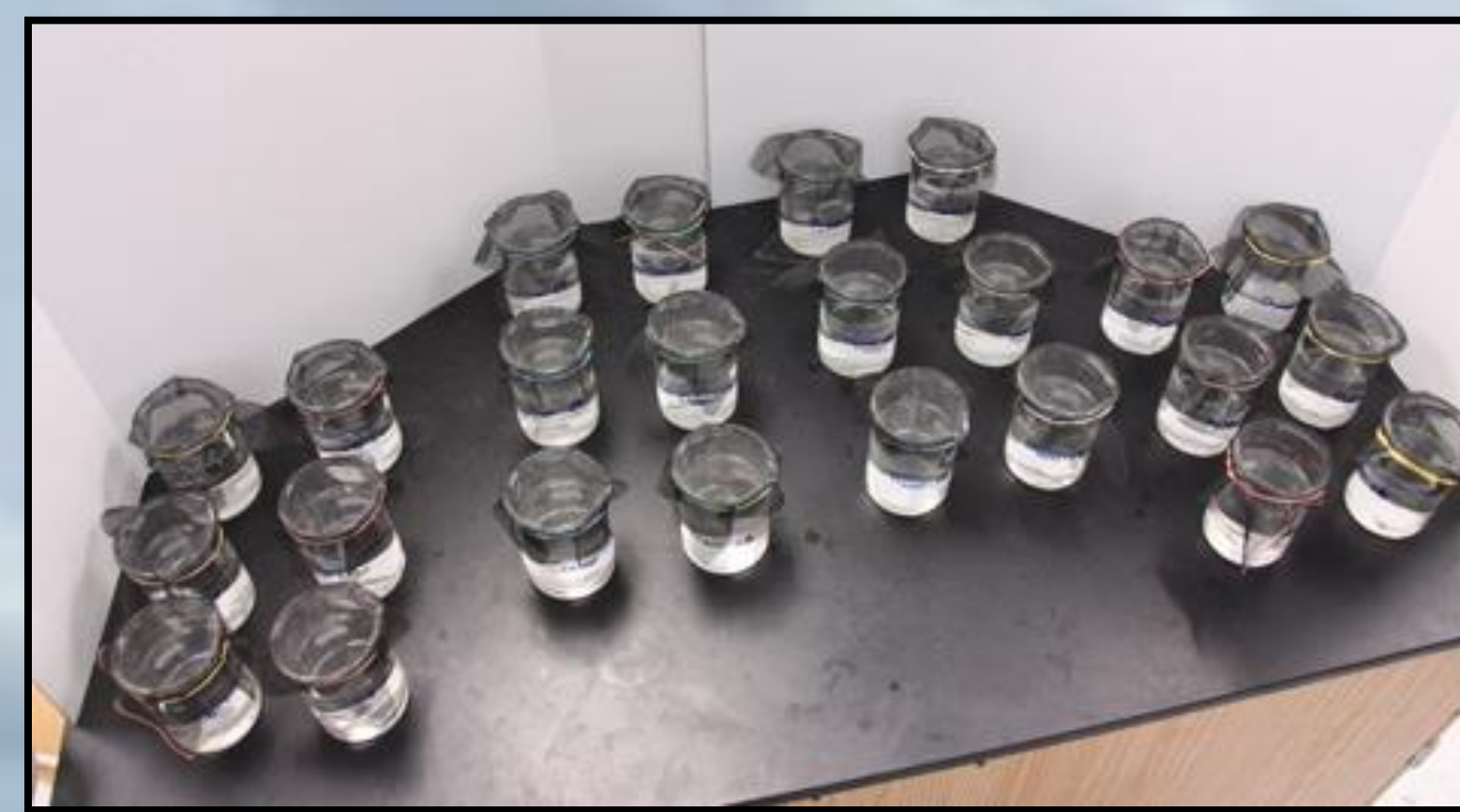
ABSTRACT

In the wake of an extensive fish kill event in May 2011 on the relatively pristine Ogeechee River in Southeast Georgia, there has been an increased awareness of the need for regular monitoring activities along the river and within its watershed. This proposed two-year project has a primary objective of establishing a research, monitoring, and exploration program for the Lower Ogeechee River Estuary. The objectives will be to monitor the chemical and biological conditions in the region initially through assessments of water and sediment, microbial community, invertebrates, and selected fish species. A component of the project will target raising awareness of the need and opportunities for local communities to be involved with monitoring of the river as well as engage and mentor undergraduate and graduate students in ecological and toxicological research. Additionally, underprivileged middle and high school youth will be given the opportunity to explore this waterway in their nearby community while learning about point and non-point source pollution.



PROJECT GOALS:

- Complete biological assays using sediment and water samples from the Ogeechee River
 - Evaluate physiological impacts of combinations of chemical compounds associated with the King America Finishing spill (formaldehyde, peroxide, ammonia) and known environmental stressors (warm temperatures, low rainfall, low dissolved oxygen, low pH, ammonia).
- Establish Savannah State University monitoring program for the lower Ogeechee River and its tributaries using framework of existing SSU monitoring of Savannah River Estuary.
 - Water chemistry
 - Plankton
 - Microbial
 - Sediment
 - Quarterly invertebrate and fish tissue analyses



Pictured above: Exposure set-up for grass shrimp *Palaemonetes* sp. for aquatic exposure to organic contaminants as part of an undergraduate research project (left). Undergraduate student collecting a water sample for field measurements (right). Photos taken 2011, 2013.

UNDERGRADUATE RESEARCH DEVELOPMENT & OUTREACH:

- Integration of undergraduate and pre-undergraduate students in laboratory- and field-based research is a key element of this proposed project.
 - Academic year and summer interns
 - Community center after-school programs
- Exploration opportunities: opportunity for undergraduate mentees to lead STEM activities
 - Community center after-school programs
 - Exploratory field trips



BACKGROUND:

In May 2011 and May 2012: 10,000+ fish deaths attributed to stress-related *Columnaris* bacteria outbreak.

- Elevated, sub-lethal concentrations of ammonia, peroxide, formaldehyde
- Metals detected in fish tissues below known fatal levels
- Warming temperatures related to springtime norms
- Low river flow associated with lower-than-average precipitation

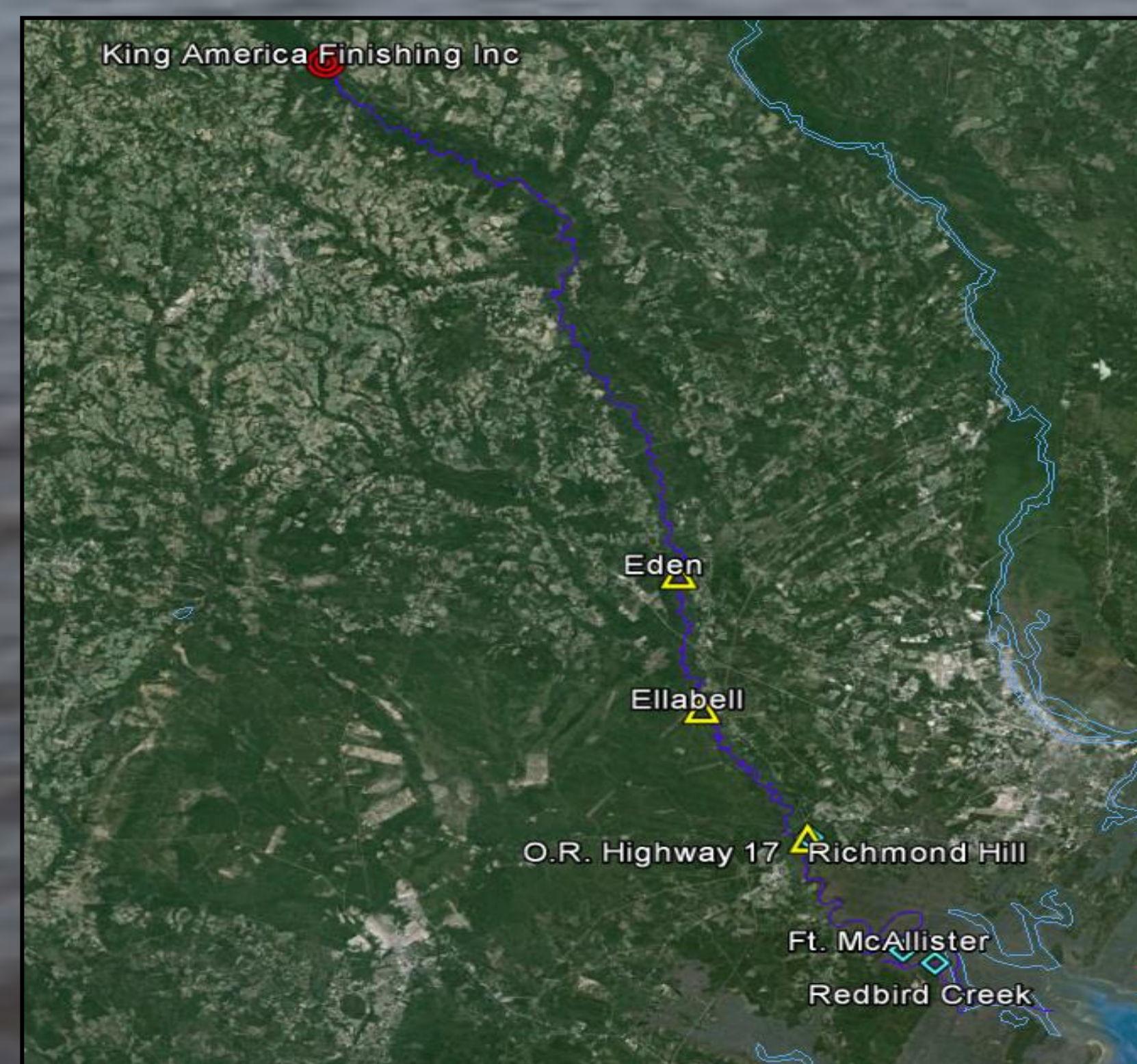


Figure 1: Lower Ogeechee River and its tributary the Canoochee River have been highlighted. Preliminary sample stations located on O.R. at Hwy 17, Ft. McAllister, and Redbird Creek) and are delineated with diamonds on the map. The USGS stations are located at: Richmond Hill (02203536); Ellabell (02202680); Eden (02202500) and are delineated with triangles (USGS, 2013).

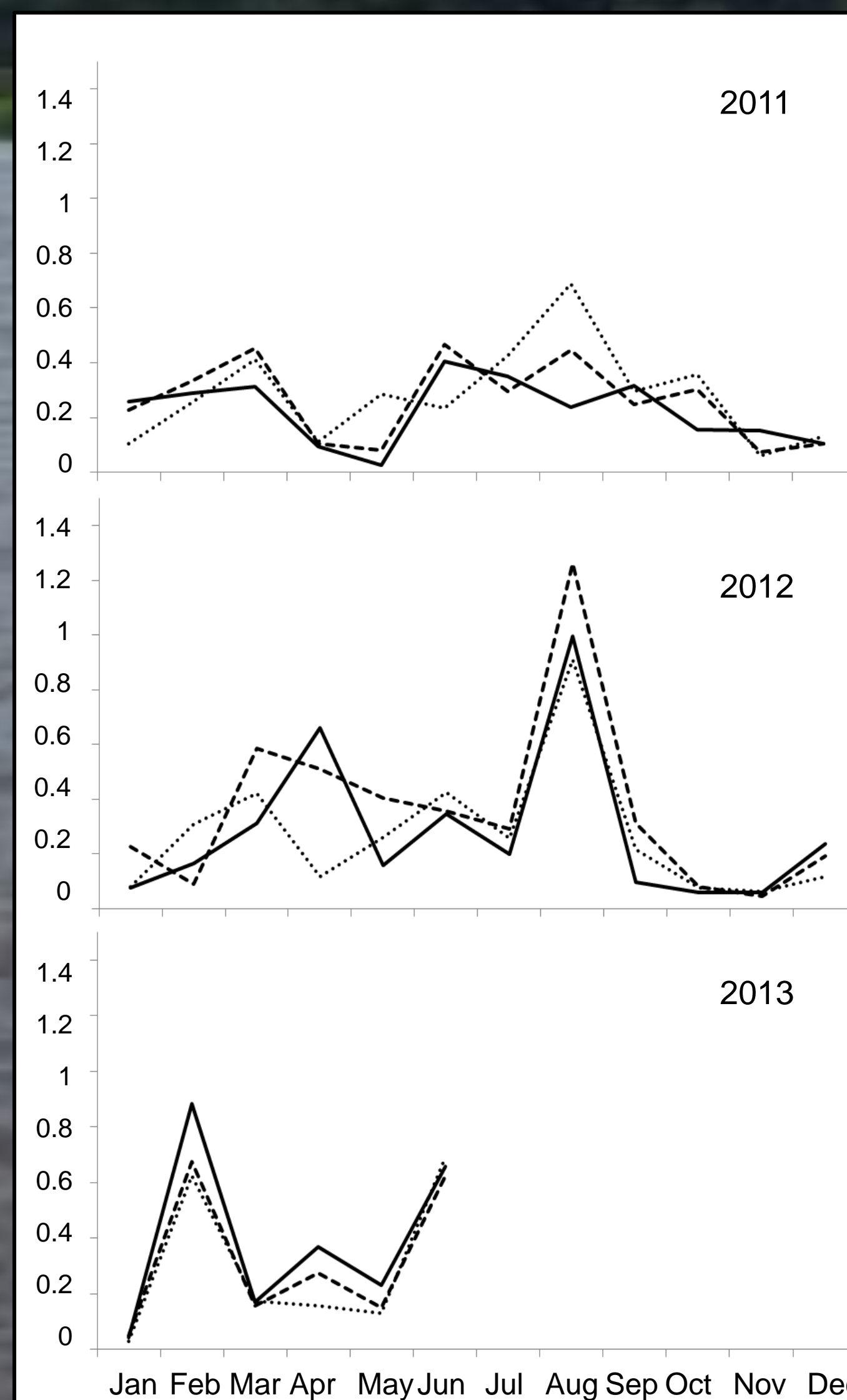


Figure 2: Average monthly rainfall data in centimeters (USGS, 2013) from three USGS stations on the lower Ogeechee R.: Richmond Hill (02203536); Ellabell (02202680); Eden (02202500). Values were averaged by month.

DATA MANAGEMENT:

- Various portions of the data collected as part of this proposed research will be made available through on-site SSU and other databases
- On-site in conjunction with previous data collected on Savannah R. through NSF-EDGE project.
 - Georgia Department of Natural Resources Adopt-A-Wetland site
 - Currently seeking other potential storage venues.



Pictured above: Undergraduate students engaged in small vessel and shipboard research and exploratory events in the Inter-coastal Waterway. Students sort catch from otter and beam trawls onboard the R/V Savannah and R/V Margaret C. Robinson as part of class and internship experiences. Photos taken 2011, 2012.

ACKNOWLEDGMENTS

- Ogeechee Riverkeeper
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