



## CICEET

*Serving the technology needs of coastal managers*

### About CICEET

Established in 1997, the Cooperative Institute for Coastal and Estuarine Environmental Technology (CICEET) is a partnership of the National Oceanic and Atmospheric Administration (NOAA) and the University of New Hampshire (UNH). Through strategic partnerships and direct investments, CICEET develops tools for clean water and healthy coasts nationwide. CICEET's toolkit contains dozens of field ready technologies—with many more in the pipeline—that address coastal resource problems in three ways:

- **Detection: tools to detect pollution**  
CICEET has sponsored the development of a wide range of sensors, microbial rapid detection methods, Harmful Algal Bloom (HAB) detection and identification, and technologies to collect, relay, and synthesize data.
- **Recovery: tools to treat pollution and restore habitats**  
These include technologies to restore and protect shorelines, such as a multi-beam bathymetric model to map the ocean floor in high energy coastal environments, *in situ* sediment remediation technologies, and predictive models and methods for seagrass and saltmarsh restoration.
- **Prevention: tools to prevent the impacts of pollution**  
These include a unique stormwater treatment evaluation center, methods to reduce nutrient pollution, and models to predict and prevent the impacts of land use change.

### CICEET & NERRS

Collaboration with the National Estuarine Research Reserve System (NERRS) is at the heart of CICEET's mission. The reserves' geographic and ecological diversity provides a living laboratory in which CICEET investigators develop and test effective tools for coastal managers. The local and regional networks the reserves foster are important conduits through which CICEET technologies can reach the people who need them most. At the same time, CICEET supports the goals of the reserves and addresses the needs of the communities they serve.

Here's how:

- **Key Infrastructure:** CICEET invests in the equipment needs of the NERRS, including datalogger upgrades to YSI's extended deployment system, the purchase and evaluation of *in situ* YSI fluorimeters, and computers to support the GIS capability at every reserve.

- **SWMP Support:** CICEET is an engaged partner in the NERRS System-Wide Monitoring Program (SWMP), part of the national backbone of IOOS, the Integrated Ocean Observing System. Since 1998, CICEET has invested \$2,007,736 in SWMP-related infrastructure and technology demonstration and evaluation projects. CICEET also supports the training of reserve personnel in monitoring-related technologies, and contributes to the NERRS' ability to provide timely and accurate water quality data.
- **Needs Assessment:** CICEET works with the NERRS to define the priority technology needs of their local coastal resource managers. These assessments help CICEET design competitive funding programs that focus the expertise of leading researchers on the development, demonstration, and application of innovative tools for coastal management.
- **Focus on NERRS:** CICEET brings the talents of leading researchers to bear on the development of technology to address issues related to the NERRS mission. Every project funded by CICEET's Environmental Technology Development Program (ETD) must have a connection—through research, technology development, demonstration, or outreach—to a NERRS site or its watershed. NERRS personnel often serve as advisors or primary investigators for CICEET projects.
- **Serving NERRS Customers:** CICEET's partnership with the NERRS Coastal Training Program (CTP) helps bridge the distance between available tools and the coastal managers who need them, through outreach, training, and communications materials. For example, the CICEET-sponsored UNH Stormwater Center is a resource for CTP coordinators engaged in helping land use decision makers develop stormwater management programs to protect water quality.

#### Learn more

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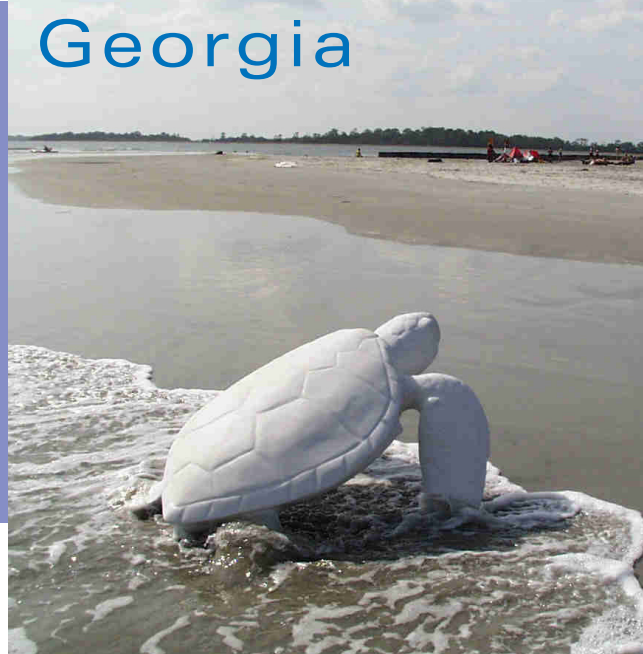
Tools for Clean Water & Healthy Coasts



## CICEET & Georgia

Sapelo Island is the fourth largest Georgia barrier island and one of the most pristine. Spanning more than 6,000 acres, the Sapelo Island National Estuarine Research Reserve is made up of salt marshes, maritime forests, and beach dune areas. The reserve coordinates research, education, and stewardship programs to promote better understanding and management of Georgia's coasts.

It also is a living laboratory where CICEET investigators test solutions to the priority challenges of local coastal resource managers. These scientists and technology innovators develop tools to prevent or reduce development's impact on fragile coastal ecosystems—among the most precious economic and cultural resources in the state.



### Investing in Georgia

CICEET has invested more than \$750,000 in environmental technology development and demonstration projects to address the priority needs of Georgia's coastal resource managers—from assessing the effectiveness of habitat restoration programs to evaluating the overall quality of coastal waters. Here are some examples:

**Missing Link:** Monitoring water quality is a 24/7 process, one that generates mountains of the data needed to make decisions that protect ecosystems and human health. Moving that data from a sensor to a laboratory desktop, however, can be expensive and technically challenging. This project developed a commercially available, two-way, data communications system that provides real-time communication with water-quality sensor platforms in the field.

**Microbe Measure:** Healthy salt marshes improve water quality and serve as essential habitats for many marine species, yet increased development has placed these vital resources at risk. While coastal communities have been putting an increasing emphasis on wetland restoration, they need ways to determine how effective their efforts are in returning wetlands to their natural state. This project refined techniques that use bacterial growth efficiency as a tool to assess salt marsh restoration success.

**Real-Time Data Sharing:** Research reserves use a variety of tools and techniques to collect data about current water quality conditions, but sharing this information between reserve sites in real-time can be expensive and time consuming. This project examined the current technologies used to transmit live data between sites and developed a prototype system to improve the timeliness and efficiency of data delivery.

**How's the Water?** Is it safe to swim at the local beach? Those responsible for answering this question are challenged by water testing technologies that can take days to process. Identifying the source of fecal contamination can be particularly challenging. This project tested a targeted water sampling approach for isolating persistent sources of fecal contamination and leveraged genetic testing to identify human fecal bacteria quickly, accurately, and cost-effectively.

**Coastal Plain Watershed Network:** In 1998, the Center for Watershed Protection developed the 8 Tools Framework (8TF) for all aspects of watershed planning including zoning, plan review, construction, and occupancy. This project is adapting the 8TF to the specific parameters, issues and challenges related to effective land use planning in the coastal plain.

**Taking the Pulse:** Taking the pulse of ecosystems and water quality requires sophisticated technology and a staff that knows how to use it. CICEET's overall investment in NERRS monitoring programs has enhanced the individual capacity of the Georgia reserve's ability in this regard.

### Learn more

For more information on these tools, contact Dolores Leonard at CICEET:  
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For more information on this reserve, visit:  
[nerrs.noaa.gov/SapeloIsland](http://nerrs.noaa.gov/SapeloIsland)

<http://ciceet.unh.edu>

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