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 Sysem (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 flourometers, 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

UNIVERSITY *of* NEW HAMPSHIRE

CICEET & Delaware

The Delaware National Estuarine Research Reserve and its surrounding buffer lands span nearly 5,000 acres—from the freshwater wetlands, ponds, and forest that surround Blackbird Creek to the marshes and open water of the St. Jones River and Delaware Bay. The reserve coordinates research, education, and stewardship programs to promote better understanding and management of Delaware's coasts.

Delaware Bay is also a living laboratory where CICEET investigators test solutions to the coastal resource challenges that arise in a rapidly developing landscape. These scientists develop tools and techniques to prevent or reduce development's impact on fragile coastal ecosystems—among the most precious economic and cultural resources in the First State.

Investing in Delaware

CICEET has invested more than $700,000 in environmental technology development and application projects related to the Delaware Reserve. These address the priority needs of Delaware's coastal resource management community—from how best to assess the effectiveness of habitat restoration programs to how to evaluate the overall quality of coastal waters. Here are some examples:

Restoration Microbes: Healthy salt marshes improve coastal water quality and serve as essential habitats to many marine species. Yet increased development has placed these vital resources at risk. The good news is that coastal communities have been putting an increasing emphasis on the importance of wetland restoration. How reliable and cost-effective have these efforts to return wetlands to their "natural state" actually been? Will these restored marshes function like natural marshes? This research project refined techniques that use bacterial growth efficiency as a tool to assess salt marsh restoration success.

Missing Link: Monitoring water quality is a 24/7 process, one that generates mountains of 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 an affordable, two-way system that provides real-time communication with water-quality sensor platforms in the field. The technology is used at several NERRS sites to support the System-Wide Monitoring Program (SWMP), which is part of IOOS, the Integrated Ocean Observing System. This technology is being tested for use with wetland elevation monitoring platforms.

Coastal Plain Watershed Network: In 1998, the Center for Watershed Protection developed the 8 Tools Framework (8TF) for all aspects of watershed planning in¬cluding 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.

Something in the Air: While much is known about how pollutants generated by agricultural activities travel in stormwater runoff, very little is understood about how these same pollutants can reach coastal waters through atmospheric deposition. This project expanded on an air and precipitation monitoring network to include the ability to detect pesticides. It also developed and tested a new model to help predict deposition of agricultural pollutants.

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 Delaware Reserve's ability in this regard.

Learn more

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For more information about the reserve:
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