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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CICEET & Mississippi

Located in southeastern Mississippi, the Grand Bay National Estuarine Research Reserve spans more than 18,000 acres of coastal bay, saltwater marshes, maritime pine forest, and pine savanna. The reserve coordinates research, education, and stewardship programs to promote better understanding and management of Mississippi's estuaries.

Grand Bay is also a living laboratory where CICEET-sponsored investigators can test solutions to the challenges that coastal resource managers face in a rapidly developing landscape. These research scientists and technology innovators develop tools to prevent or reduce the impacts of development on fragile coastal ecosystems that are important economic and cultural resources for the state.

Investing in Mississippi

CICEET has invested more than $500,000 in environmental technology development and application projects in Mississippi. These projects address the priority needs of Misssissippi's coastal resource managers—from monitoring water quality at swimming beaches to the treatment of domestic wastewater.

Detecting Red Tide: Harmful algal blooms (HABs) such as red tide threaten human health and are responsible for millions of dollars in losses in the shellfish, finfish, recreation, and tourist industries. Traditional approaches to detecting and tracking red tides are time consuming and expensive. They also don't deliver the rapid detection and real-time data that coastal managers need if they are going to make decisions that balance the protection of human and economic health. This project's researchers are developing a field stage prototype system that uses lasers to detect and identify different species of potentially harmful algae.

Tracking the Source: To protect public health, coastal managers must be able to monitor water quality at swimming beaches. With support from CICEET, researchers from the University of Southern Mississippi are participating in a large-scale study that evaluates the effectiveness of current methods to identify the sources of contamination. At the same time, the study is examining how well the data generated by these methods correlates with public health effects in swimmers in the region. The Mississippi researchers are building on successful lab tests to demonstrate the effectiveness of specific molecular markers to identify the source of sewage pollution—whether it comes from human wastewater, livestock operations, pets, or wildlife.

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.

Treating Wastewater: Nutrient pollution comes from a variety of sources, including private septic systems. With a grant from CICEET, researchers advanced the development of the marshland upwelling system (MUS). This system takes advantage of the filtering properties of natural soils and sediments to treat wastewater.

Taking the Pulse: Taking the pulse of coastal ecosystems requires sophisticated technology that must be operated by highly trained professionals. CICEET supports the Grand Bay NERR's capacity to monitor estuarine ecosystems through investments in monitoring technology and the training of reserve staff.

Learn more

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For more information on this reserve, visit:
www.grandbaynerr.org