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 & Alabama

Forty miles southeast of Mobile is Weeks Bay National Estuarine Research Reserve, a 6,016-acre protected area. The reserve coordinates research, education, and stewardship programs to better understand and manage Alabama's estuaries.

Weeks Bay is also a living laboratory for CICEET investigators who test solutions to the challenges that coastal resource managers face in a 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 Alabama

CICEET has invested more than $1 million in technology development and application projects related to the needs of Alabama's coastal managers since 1998. These projects largely have focused on understanding and managing nonpoint source pollution, which negatively impacts the state's valuable commercial and recreational fishing industries. Some examples:

• **Pollution Tracker:** Understanding the source and path of sediment pollution is a key component to maintaining a healthy habitat for shellfish and fish. This project developed a new technique to track how pollutants travel through estuaries like Weeks Bay.

• **A Model Approach:** Excess nutrients like nitrogen and phosphorus from fertilizer, sewage and atmospheric deposition can cause oxygen depletion in coastal waters and impair vital fish and shellfish habitats. Managing nutrient input requires knowledge of sources and pathways. This project developed a model to identify sources and predict the ecological consequences of nutrient pollution.

• **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 investments in NERRS monitoring programs has enhanced the individual capacity of the Alabama reserve's ability in this regard.

• **Weathering the Storm:** Polluted stormwater runoff is the single biggest threat to water quality nationwide, and the motivation behind the U.S. Environmental Protection Agency's Clean Water Act Phase II rules. This project tested new techniques that evaluate how pollution travels in stormwater, critically needed information—in Alabama and around the country—for the design of stormwater treatments that improve water quality and protect human health.

• **Red Tide Detection:** 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. This project is developing a technology that uses lasers to detect and identify different species of potentially harmful algae.

• **Something in the Air:** Atmospheric deposition of nitrogen may represent a significant part of the total input to estuarine and coastal areas, and it's not easy to measure. This project developed an innovative automatic atmospheric sampler, capable of collecting and preserving 14 samples over a predetermined time period.

• **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.

Learn more

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For more information on this reserve, visit:
nerrs.noaa.gov/WeeksBay

Tools for Clean Water & Healthy Coasts

UNIVERSITY of NEW HAMPSHIRE