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 & North Carolina

North Carolina's vast estuarine system encompasses more than two million acres. Its waterways are a prime economic resource —90 percent of the state's commercial seafood catch spends at least part of its life cycle in an estuary. The North Carolina National Estuarine Research Reserve coordinates research, education, and stewardship programs to promote better under-standing and management of North Carolina's coasts.

North Carolina's estuaries are exceptional living laboratories where CICEET-sponsored scientists 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 North Carolina

CICEET has invested more than $2.2 million in technology development and application projects related to North Carolina's estuarine system. Many of these projects address the priority needs of the state's coastal resource managers—from addressing effectiveness of habitat restoration to evaluating the overall quality of coastal waters. Here are some examples:

Habitat Mapping: To track changes in coastal habitats and then assess the implications of those changes on ecosystems, it is essential to have information about habitat type and quality. This project developed a cost-effective technology that can map bottom and water column habitat conditions over large spatial scales quickly and accurately, and then integrated this data with information from sonar, water quality sensors, and GPS.

What a VISSTA! The ability to quantify the impacts of proposed development—and then visually communicate them—is key to sustainable water resource management. However, most coastal community planners can't use existing tools, which require costly field data and complex geospatial analysis. This project is developing a comprehensive and accessible toolkit to assess potential stormwater runoff, poor drainage, and surface cover related to new development.

Tracking Contamination: Fecal contamination of coastal waters threatens human health and industries that rely on commercial shellfish harvests. Traditional approaches to water quality and monitoring use bacterial indicators to signal fecal contami-nation. However, this does not address the viruses that can survive sewage treatment and cause disease. This project developed a rapid detection system that uses viruses that infect *E. coli* bacteria to identify and source fecal pollution.

Getting the Jump on Jet Skis: Because they can be operated at high speeds in shallow water, jet skis can damage sensitive habitats, such as salt marsh creek banks and adjacent mudflats. This project used a unique, automated monitoring device to determine the impact of jet skis on shallow-water, estuarine habitats and provide the data needed to determine whether these vehicles should be restricted to protect environmentally sensitive areas.

Restoring Eelgrass: Healthy eelgrass meadows provide habitat for fish and shellfish, protect water quality, and prevent erosion. Protecting and restoring these vaulable natural resources has become a priority in many coastal communities, but the plants or seeds needed to populate new beds are in short supply. This project is adapting tissue culture technologies to produce genetically diverse plant material and ensure a reliable supply of eelgrass specific to different restoration sites.

Building a Strong Foundation: The stability of coastal salt marshes depends on the natural accumulation of sediments. Unfortunately, increased development can disrupt the natural flow of sediment into back barrier marshes. This project examined the feasibility of applying sediments, particularly from dredged material, to stabilize deteriorating marshes.

Learn more

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