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

About CICEET:
Dolores Leonard
CICEET Communications Manager
T: 603.862.3685
E: dolores.leonard@unh.edu

About the NERRS:
George Cathcart
ERD NOAA Communications Specialist
T: 301.713.3155 x141
E: george.cathcart@noaa.gov

CICEET & Oregon

Spanning more than 4,500 acres on Oregon's south coast, the South Slough National Estuarine Research Reserve encompasses upland forests, freshwater wetlands and ponds, salt marshes, mud flats, eelgrass meadows, and open water habitats. The reserve coordinates research, education, and stewardship programs to promote better understanding and management of Oregon's coasts.

South Slough provides an environment where CICEET investigators can test solutions to the challenges that coastal resource managers face in a dynamic 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 Oregon

CICEET has invested more than $1.7 million in technology development and demonstration projects related to the priority needs of Oregon's coastal resource managers, some of which took place at reserves in several states. Many of these projects have been concerned with tracking changes in coastal habitats and evaluating the overall quality of coastal waters. Here are some examples:

Building SWAMPs in Coastal Oregon: To cope with stormwater problems in a developing landscape, Oregon's metro areas are implementing low impact development practices that balance development with resource protection. To bring the lessons learned of metro areas to smaller communities, this project is adapting existing models and coupling them with other analytical tools to create SWAMP, an open source stormwater assessment and management decision support system.

Running Down Runoff: The single biggest threat to coastal water quality nationwide is stormwater runoff, which carries pollutants like nitrogen and phosphorous directly into coastal waters. This project is developing the NanoLAB, a small, nutrient monitoring system that uses wet chemistry assays to test water quality at regular intervals. The goal is to develop a field-ready instrument to deploy in the field for up to a month.

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.

Shining Light: Nutrient pollution from wastewater and runoff threatens human health and estuarine ecosystems. Accurate monitoring of phytoplankton can provide an early warning of increasing nutrient levels. This project is developing an advanced laser fluorescence technique that can detect changes in the condition and composition of phytoplankton communities, pinpointing estuarine changes as they occur.

An Eye on the Past: Can a habitat really be restored without data about what it was like in the first place? Traditionally, collecting data about the condition of a pre-development ecosystem requires continuous monitoring of habitats, which can be a time consuming and expensive task. This project is a pilot for establishing and monitoring reference sites for restoration practitioners along the Pacific Northwest coast. It combines wireless networks and iButton temperature logger arrays to collect baseline data about tidal wetlands—including tidal inundation, groundwater flow, and salinity fluctuation—and makes it easily accessible to restoration experts.

Pollution Tracker: Understanding the source and path of sediment pollution is a key component of maintaining a healthy habitat for fish and shellfish. This CICEET project developed an innovative technique that used naturally-occurring radioactive particles to track how pollutants travel through estuaries like South Slough.

Learn more

For more information on these tools, contact Dolores Leonard at CICEET:
T: 603.862.3685; E: dolores.leonard@unh.edu

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