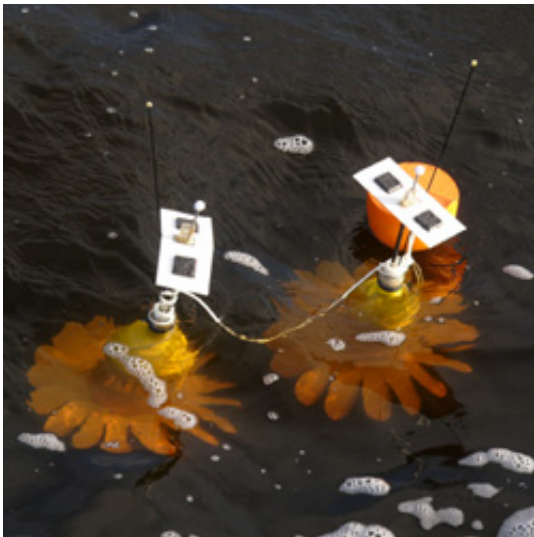


# Real-time electronic monitoring for coastal waters

November 1 2010, By Matt Shipman

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Researchers will develop sensors (similar to those seen here) to measure light, temperature, salinity, depth, and other variables in coastal waters.

(PhysOrg.com) -- Researchers from North Carolina State University are developing a cost-effective electronic monitoring system that will enable researchers to advance our understanding of critical coastal ecosystems by allowing users to track water-quality data from these waters in real time, thanks to support from a National Science Foundation (NSF) grant.

“Our goal is to make it cheap and easy to monitor environmental conditions in the Chesapeake Bay, the sounds of North Carolina and other coastal waterways,” says Dr. Alex Dean, associate professor of

electronic and computer engineering (ECE) at NC State and primary investigator on the project. “Existing technology is costly to implement on a large scale, and is not easy to use. As a result, environmental officials currently do not have much access to real-time environmental data.”

The researchers, who are working on the project with the Chesapeake Bay Environmental Center (CBEC), are developing inexpensive, wireless sensors that can be anchored to the sea bed, moored to buoys or towed behind vessels to collect data. Dean explains that those sensors will send the data they collect to a centralized server that will “make it available, essentially immediately, online.” The sensors will collect a variety of data, including water temperature, salt levels in the water and water clarity.

The data collection system should help track environmental health, and help scientists answer a number of ecological research questions. For example, the team is planning to incorporate sensors into its network that can be used to measure oyster activity. Researchers can then compare the oyster activity to data on environmental quality to see what conditions are most conducive to oyster growth.

“We are very pleased to be teaming with NC State researchers on this important venture,” says Vicki Paulas, CBEC’s restoration manager. “This project offers CBEC a significant opportunity to test cost-effective techniques for monitoring environmental conditions in the Chesapeake Bay. Most importantly, it directly correlates with CBEC’s mission of stewardship and sustainability through environmental education and habitat restoration.”

The researchers will adapt inexpensive, off-the-shelf sensors to withstand the aquatic environment. They are also developing and implementing new tools that ensure real-time processing of data and that

make the sensors and data-processing equipment more energy efficient. “Energy efficiency is essential to making this system cost-effective,” Dean says.

The research team will also be making all of its hardware and software designs open source, so that the system can be duplicated anywhere – from high school science programs to state environmental agencies.

The researchers will begin testing the sensory equipment in North Carolina waters as early as winter 2010. They hope to have a working model system in place in the Chesapeake in spring 2011, with plans to ultimately add a network in North Carolina. The other researchers on the grant include Dr. Mihail Sichitiu, associate professor of ECE at NC State, and Dr. Tom Wolcott, professor emeritus of marine, earth and atmospheric sciences at NC State.

Provided by North Carolina State University

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