

## VIMS Launches Real-Time Data Buoy

An interdisciplinary team of VIMS researchers and technicians launched a new data buoy into the York River on April 9th. The buoy is now streaming real-time images back to the VIMS web site and sending data updates every 15 minutes.

Funds to deploy the buoy came from Congress through a one-year collaboration between VIMS and the U.S. Coast Guard. One aim of the project is to learn how to better use buoy data, along with computer models, to support search and rescue operations.

On a broader scale, VIMS researchers see the deployment as an initial step toward expanding the Chesapeake Bay Observing System (CBOS) into the lower Bay. CBOS is one part of an array of ocean observing systems springing up along the U.S. coastline. Other local and regional systems include GoMOOS in the Gulf of Maine, SEA-COOS along the Southeast Atlantic coast, TABS in the Gulf of Mexico, and SCCOOS on the West Coast.

“These regional systems are the building blocks of a larger movement to create a national and international ocean observing system,” says VIMS physical oceanographer Dr. John Brubaker, who helps lead the Coast Guard project.

A call to develop a national ocean observing system is one of the main recommendations of the U.S. Ocean Commission’s recent report (see story on p. 1).

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“We agree with the commission that this is a reasonable investment in view of the value generated by ocean and coastal industries,” notes Wright.

The U.S. Commission on Ocean Policy released its report in late April. Issuance of a final report will follow a 90-day review by the 50 governors and other stakeholders. The President is mandated to use the final report as a guide for submitting a new national ocean policy to Congress.

Congress mandated the 16-member commission in the Oceans Act of 2000, with a charge to make recommendations for a “coordinated and comprehensive” national ocean policy. The mandate reflected widespread recognition that ocean issues have changed dramatically in the 35 years since Congress last authorized an ocean report—including the addition of

Brubaker, along with colleagues Carl Friedrichs and Don Wright, has spent the last several years working with technicians Todd Nelson and Ned Burger and graduate students Lorraine Brasseur and Art Trembanis to develop communications and data management subsystems and to implement the sensors that now adorn the 10-foot-tall, solar-powered buoy. Initial funds to purchase and outfit the buoy came from the General Assembly.

The buoy’s data sensors measure wind, air and water temperature, salinity, pH, chlorophyll levels, and dissolved oxygen. The team is currently working to add an Acoustic Doppler Current Profiler to the mix. The ADCP uses sound waves to measure the speed and direction of currents throughout the water column and also determines wave conditions at the water surface. A two-way radio connection allows VIMS researchers to control the sampling remotely.

Brubaker notes that information on currents and waves is of special interest to the Coast Guard.

“Tidal estuaries like Chesapeake Bay pose unique challenges for search and rescue operations,” says Brubaker. “If someone goes over, the Coast Guard needs to know their likely path so they can organize a search. In tidal waters the current could carry a person or disabled boat one way for a few hours, then reverse, and they need to keep track of that. They already have some tools, but they are always

37.5 million people to the nation’s coastal watershed counties.

“The recommendations in the

report were well received by the marine science community,” says Wright. “The breadth and depth of the analysis shows that the commissioners obviously did their homework.” The commission’s report is based on 15 public meetings and 17 site visits

between 2001 and 2003, combined with input from hundreds of experts.

One such expert was VIMS Associate Professor Dr. Linda Schaffner, who as President-Elect of

looking for better information on tides and currents.”

A key to providing accurate predictions of current speed and direction is to pair the buoy with a high-resolution computer model that can extrapolate from the buoy’s single-point data to a prediction of currents throughout the lower Bay.

“Integration with models is crucial,” says Brubaker. “The buoy data helps keep the model on track. With the model we have a fine grid, a mesh of points that covers the York River and Chesapeake Bay. In principle with that we can give information almost anywhere in the River and the Bay.”

VIMS modelers Drs. Jian Shen, Harry Wang, and Courtney Harris provide the modeling expertise for the Coast Guard project. They have already refined the model to predict tidal height, and are now testing and calibrating it to accurately predict currents.

The buoy’s imaging capabilities are also of great interest to the Coast Guard. The buoy features a camera that captures pictures rapidly enough to create near video-quality moving images. These are instantly available to VIMS researchers via a 2.4 gigahertz wireless connection.

“The first thing the Coast Guard asked us for was the camera images,” says Brubaker. “It just may be that during the time leading up to a boating accident our camera might capture an image of the boat passing by.”

the Estuarine Research Federation (ERF) helped draft that organization’s statement to the Commission.

### ***Some of the actions recommended by the U.S. Commission on Ocean Policy:***

- Double the nation’s investment in ocean research
- Implement the national Integrated Ocean Observing System
- Increase attention to ocean education
- Strengthen the link between coastal and watershed management
- Create measurable water-pollution reduction goals
- Reform fisheries management
- Establish an Ocean Policy Trust Fund to pay for implementing the recommendations

unify our currently fragmented approach to coastal and marine management, and to increase the availability and use of scientific knowledge in the management process.”

“Our statement agreed with the Commission’s conclusion that our marine resources are in serious trouble and that we urgently need to develop a comprehensive National Ocean Policy,” says Schaffner. “It also stressed that we need to



Solar panels power the sensors aboard VIMS’ new research buoy.

The camera can also be useful for homeland security. “The images have a value totally separate from search and rescue, just keeping track of vessel traffic in general,” says Brubaker.

Now that the Coast Guard project is nearing its end, VIMS researchers are turning their attention toward securing the funds to continue its operation. “We now have the core infrastructure for the observing system in place and we’re still learning about what the potential and possibilities are,” notes Brubaker.

To view real-time data from the VIMS buoy, visit [www.vims.edu/realtime/](http://www.vims.edu/realtime/)

The ERF letter also called for a greater emphasis on linking marine management to land-use issues and stressed the value of setting achievable goals to reduce fisheries harvests and pollutant inputs.

“We also emphasized the critical need to train new scientists and encourage interactions between scientists, engineers, economists, and social scientists so that the next generation can effectively address complex issues and assist with policy development,” says Schaffner.

Congress last authorized a report on national ocean policy in the late 1960s. Since then, pressures on the ocean and coastal watershed have multiplied significantly, while the focus of marine resource management has shifted from maximizing yields to maintaining sustainability.

For more information, the full text of the 531-page report is available online at [oceancommission.gov/](http://oceancommission.gov/)