New current meter provides answers for lobster industry, oyster farmers, scientists

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When a federal fisheries scientist sought to learn how ocean currents affect the catch rate of lobsters, he turned to a University of Rhode Island oceanographer who had developed an innovative and inexpensive meter for measuring currents near the bottom of bays, rivers and other shallow waters.

So did aquaculture farmers in Rhode Island looking to identify the best site for farming oysters, Cape Cod officials interested in understanding tidal fluctuations in Waquoit Bay, and students at Cohasset (Mass.) High School studying circulation patterns in Cohasset Bay.

They all called on Vitalii Sheremet, associate marine research scientist at URI's Graduate School of Oceanography, whose expertise about currents, tides and waves, along with his SeaHorse tilt current meter, provided the answers.

Currents cause the meter - a buoyant plastic pipe containing an accelerometer and an electronics package that is anchored vertically to the sea floor - to tilt at an angle, with stronger currents creating a greater tilt.

"It's lightweight, it's inexpensive, it's easy to deploy, and you can deploy large numbers of them to gain different perspectives on whatever problem you're looking at," said Sheremet.

Most current meters used by scientists cost about $15,000 each, while

Sheremet's meter is only about $500, and he makes each one by hand. It takes him about a week to build and calibrate 10 of them. He hopes to have them commercially available sometime next year as soon as the final design is chosen.

Sheremet takes custom orders for his meter from fellow researchers around the world, and he has provided several dozen to URI faculty and students. They have been used in the Red Sea, the Black Sea, off the coast of Taiwan, and in the waters around New England and Hawaii.

This month, 50 meters are being deployed in the Gulf of Maine to monitor the currents around lobster traps. In a joint project with Jim Manning, a researcher with the National Oceanic and Atmospheric Administration, Sheremet is studying how the orientation of lobster traps relative to the direction of the current and tides affects how many lobsters are caught. The project may boost the lobster fishing industry by indicating which direction the trap mouth should face to have the greatest likelihood of catching the valuable crustaceans.

At Waquoit Bay National Estuarine Research Reserve on Cape Cod, 35 current meters have been deployed since last fall to understand tidal flows and water circulation in the bay.

"Pollution from local rivers runs into the bay," Sheremet said. "It's important to know how the currents flush water from the bay and how larvae are transported."

Sponsored by the Office of Naval Research, the project is helping to evaluate the performance of the SeaHorse tilt current meters.

Sheremet also supervised the work of a team of Cohasset High School students this summer so they could track the flow of wastewater and storm water through Cohasset Harbor and assess how they affect the

ecosystem.

"They used my meter and some homemade drifters to measure bottom currents and surface circulation and tidal oscillation in the harbor," he said. "The students learned a great deal about oceanographic measuring techniques and about ocean circulation patterns."

In October the URI scientist will present his technology at a meeting of aquaculture industry representatives. Sheremet said that it is especially important for oyster farmers to select sites that have strong currents, and his meter is the perfect device for identifying the sites with the best flow rate.

Provided by University of Rhode Island