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Sophisticated monitors help science track environment

One of many new environmental observers, a buoy near Point Fermin will transmit to a marine research institute on Terminal Island.

By Lee Peterson
Daily Breeze

Sea gulls glide astern of the Sea Watch, bleating for a meal that won't be coming.

There will be no lunch because the vessel isn't a fishing boat. The only thing the crew is hooking today is a battered white float, so it can be swapped out for the buoy resting on the rear deck, a 12-foot-tall, yellow-and-blue model that gleams with solar panels and an antenna.

Sea Watch Capt. Ken Kivett, who has left the helm to direct the buoy exchange, secures the anchor chain to the boat with the help of the crew and lifts the rusting white globe on board.

Marine support technician Adam Willingham fixes the anchor chain to the new buoy. Kivett mans the winch, and he and the scientist-deckhands gingerly coax the hefty new buoy into the water.

It's here, a bit more than 2½ miles due south of San Pedro's Point Fermin, where the Southern California Marine Institute's newest scientific buoy will join a growing network of ocean observers along California and other coastal states.

The network will keep tabs on hot-button environmental concerns like toxic red tides, kelp growth, depletion of fish stocks and climate change -- as in global warming.

The Terminal Island-based Southern California Marine Institute, a research and education facility, this fall is adding two near-surface monitors to the California State University-run ocean observatory network: the one in coastal waters off San Pedro, and another at Long Beach Harbor at the mouth of the Los Angeles River.

Next year, the hope is to add a unit to the mouth of the San Gabriel river, at Seal Beach. The units start gathering data as soon as they are put in the water and eventually they will be transmitting it so that it can be put online in real time.

Southern California Marine Institute Director Rick Pieper said in light of efforts to clean up the region's storm water runoff, it will be interesting to compare the data from the river's mouth to the relatively clean spot near the Palos Verdes Peninsula.

"We will be looking at it, and hopefully a lot of other people will be looking at it, too," Pieper said of the data.

Because of prevailing currents and the depth of sewage-treatment outfalls at the ocean bottom in the area, the buoy off the Peninsula is not expected to come in contact with the effluent.

While the ocean buoy is large, the actual monitor is a small cylindrical device, called a "sonde" or a "CTD" by oceanographers, for its traditional measurements: conductivity, temperature and depth. But CTDs these days also measure salinity, oxygen content, chlorophyll, and clarity -- a variety of useful data that gives oceanographers and others a glimpse of ocean conditions.

What's new is the push to collect ongoing, constant data, rather than just intermittent spot tests.

"The scientists have wanted this kind of thing for a long time," said Lisa Gilbane, project coordinator for SCMI.

For a long time, said Pieper, it's been impossible to get grants for long-term monitoring projects like this, because it was considered mundane and lacking an overriding hypothesis to prove or disprove.

But the National Oceanic and Atmospheric Administration opened up the purse strings after two organizations, the Pew Oceans Commission and the U.S. Ocean Commission in recent years declared that there was a need for more long-term ocean monitoring.

Heeding that call was the Center for Integrative Coastal Observations, Research and Education, which draws upon resources of the California State University system to coordinate a monitoring and seafloor-mapping program for the entire coast. Southern California Marine Institute participates in CICORE through its affiliation with California State University, Long Beach.

The program's goal is to establish a network of coastal monitors spanning the length of the state to monitor the health of the ocean, said CICORE principal investigator Kenneth Coale.

"We are focusing on the near-shore environment, which bears the most impact and is also the most visited by humans. It's an important region that is not necessarily overlooked, but is not heavily monitored," Coale said.

The network's data will answer questions about what factors contribute to harmful algae blooms, beach closures and the depletion of fishery stocks.

The center's data products not only appeal to scientists, Coale said, they are or will be useful for mariners, windsurfers, anglers, lawyers assessing marine hazards and even search-and-rescue personnel. It's also an attempt to get a look at the big picture.

"We hope to develop a predictive model of coastal environmental change," Coale said.

CICORE's network started up four years ago.

"Hopefully this will become part of a long-term database that will extend for decades into the future. It's hard to say anything about climate change in the coastal ocean with a measurement here and a measurement there. What's really needed is long-term monitoring to decipher the signals," Coale said.

Eventually, real-time sensors like the ones installed off the coast locally will be able to detect levels of nitrogen and various compounds in the water.

"We're going to have a data glut as opposed to not having any," Pieper said.

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