

Underwater gliders spy on everything from whales to storms

Technology proves to be valuable tool for researchers

By **Bara Godwin**

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HONOLULU — Ocean scientists can now plunge into the middle of the sea without leaving their offices.

Six-foot, 100-pound underwater gliders are swimming the oceans of the world, sending data back to researchers on everything from whale calls to the massive waves produced by hurricanes.

Several ocean scientists reported on the use of underwater gliders at the biannual ocean sciences meeting this week sponsored by the American Geophysical Union.

"The ability to be in the ocean all the time and do it over a sustained period — people are doing it now," said Oscar Schofield, professor at the Institute of Marine and Coastal Science at Rutgers University.

The gliders suck in and shoot out water to change their buoyancy and to move up and down.

Small wings on their missile-like bodies create lift to move horizontally.

Without a noisy propeller or engine, the gliders run silently and on very little power. A small battery pack can keep them gathering information 24 hours a day on monthlong missions. They can also be programmed to surface and send data to land-based labs via satellite.

And while the cost for a large research vessel can mount up at \$15,000 per day, a single, reusable glider costs about \$25,000.

Five years ago very few scientific labs had even one of the gliders. Today as many as 15 labs across the country have up to 20 each to deploy on projects from the Mediterranean Sea to just off the New Jersey coast, Schofield said.

In October, scientists on the North Carolina coastline used a glider called Pelagia, from the Greek word for "open ocean," to gather data on physical and biological changes beneath the waves a few miles off Wrightsville Beach. Earlier last year, two ships and

25 scientists from Rutgers, Columbia University, and the University of Massachusetts at Boston used an underwater glider to follow two dye releases from the mouth of the Hudson River over two weeks. The project followed pollutants and other material discharged from the river to see how it interacts with the Atlantic.

Relatively light, easy to deploy, and inexpensive, the gliders are not subject to violent surface conditions and have the ability to maneuver among sea creatures and ply the oceans in any weather, including hurricanes.

Mark Baumgartner, a scientist with the Woods Hole Oceanographic Institution, uses the gliders to observe whales.

The standard technique for watching the mammals involves using high-powered binoculars from the deck of a ship to spot them as they surface for air. But that method requires a lot of people and money and is limited to times when conditions are clear, bright, and calm.

"Some days when it's good day-light but heavy seas, this becomes

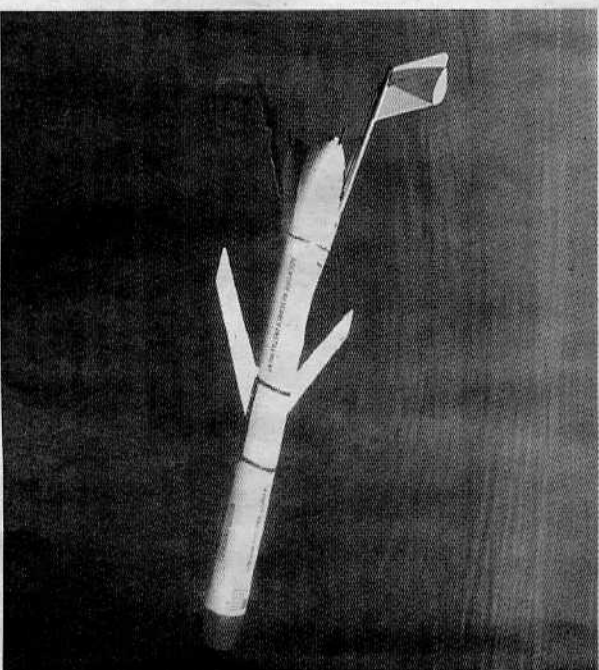
a very nauseating process to look through very large binoculars [on] a rolling ship," Baumgartner said.

In May, Baumgartner's team used a glider to capture the soulful calls of a humpback whale off the coast of Cape Cod, despite a storm that whipped up 17-foot seas and winds of more than 30 knots during the five-day project.

In the future, information from the gliders will probably be combined with data from other technologies, such as satellites and radar, to create three-dimensional views of the ocean, Schofield said.

For now, the gliders can help scientists better narrow down and target when and where they need to board a ship to get the information they want, he said.

"The big push . . . now that they're starting to demonstrate their capabilities is to start getting them out there to be a permanent presence in the ocean," he said.



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Scientists are increasingly using underwater gliders such as the one above, which can cruise for extended periods.