

First Unmanned, Underwater Robot Crosses the Ocean

Exploring Ocean Mysteries to Better Understand our Changing Planet

This is a robot. And not just any robot. This robot can swim. It is the first unmanned, underwater robot – also known as a ‘glider’ – to cross an ocean.

Robots are beginning to roam our world’s waters – repeatedly diving and surfacing while collecting critical information scientists need to understand what is happening in the ocean.

In 2009, researchers at Rutgers University – a Mid-Atlantic partner of the U.S. Integrated Ocean Observing System (IOOS) – became the first to navigate a glider across the vast Atlantic.

Scientists hailed the robot, known as *Scarlet Knight*, as a heroine when she landed in Spain after seven months at sea collecting data. The historic journey ushered in a new era of technology for ocean observing that will help unlock some of the mysteries surrounding our changing climate.

The warming of our planet directly impacts ocean temperature and how the ocean transports heat. Scientists can draw conclusions about our climate as they learn more about ocean conditions.



This little craft crossed the vast Atlantic, gathering data that will help a global community of scientists and political leaders understand and respond to some of the most pressing environmental and ecological challenges in human history.

Why it Matters:

Glidens monitor water currents, temperature, and conditions that reveal effects from storms, impacts on fisheries, and the quality of our water. This information creates a more complete picture of what is happening in the ocean, as well as trends scientists might be able to detect.

The robots collect information from deep water, as well as at the surface, at lower cost and less risk than ever before. As scientists deploy more gliders, they are revolutionizing how we observe our ocean. This robot propels us closer to that revolution.

The Future of Ocean Observing:

Scarlet Knight is an electric glider. That means she used battery power to do her work. But she didn’t use a lot. The robot crossed the ocean with the equivalent energy of about four Christmas tree lights.

Scarlet Knight pumped water into her nose to weigh herself down and dive into deeper water. To go back up, the glider pumped water out, causing it to weigh less and float toward the surface.

Scientists are now testing an even more efficient thermal glider in the Virgin Islands.



Instead of batteries, thermal gliders harvest their energy from the heat in the ocean.

Thermal glider testing is the next step toward an effort to send an unmanned, underwater robot around the world.

But thermal gliders do not work in all conditions, so scientists need to combine the two technologies.

Educating For Our Future:

Undergraduates at Rutgers University played a large role in this mission and will continue to do so in future efforts to send a glider around the world.

In this way, the historic journey not only advanced science and technology, but also helped educate and inspire the next generation of oceanographers and stewards of our ocean.

Historic Landing:

The robot made its historic landing in the town of Baiona, Spain—the same place where Christopher Columbus’ crew aboard the *Pinta* arrived with news of the New World more than 500 years ago.

The landing event attracted media and high-level speakers from both sides of the Atlantic, including the White House Office of Science and Technology Policy, the Department of Commerce, and Spain’s Minister of Public Works and Transport.

Baiona citizens cheered as the designers and manufacturers from Teledyne Webb Research donated a glider replica to the Mayor for the town’s new Maritime Museum. The town also installed a plaque commemorating the robot’s landing next to a brass plaque bearing the crew manifest of the *Pinta*. Both can still be seen there today.

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