



E/V Nautilus: The flagship vessel of the Ocean Exploration Trust is one of only two dedicated ships of exploration in the world. The 211-foot ship is equipped with the latest in ocean technology and can host a 31-person science team, in addition to 17 crew members.

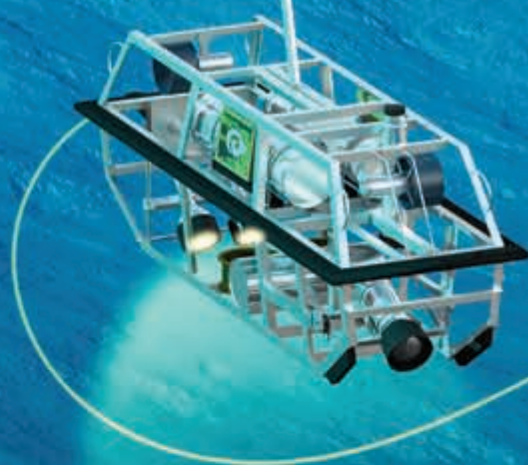
Multibeam Sonar: A hull-mounted system maps the seafloor up to 7,000 meters deep, collecting data about the ocean's physical characteristics. The information helps the crew identify areas or features of interest and to plan ROV dives.

In Depth Research

Founded in 2008 by Robert Ballard, a National Geographic explorer-in-residence who's best known for finding and mapping the site of the *Titanic* shipwreck, the Ocean Exploration Trust undertakes international scientific explorations of the seafloor. During summer 2015, the trust's flagship exploration vessel, the E/V *Nautilus* and its Corps of Exploration, explored sites along the Pacific coast of the United States. Wendy Snyder '17, a mechanical engineering major from Ossining, New York, joined the ship's crew during an expedition of an area known as the California Borderlands, just offshore from some of the most tectonically active areas of California.

DEPTH IN METERS

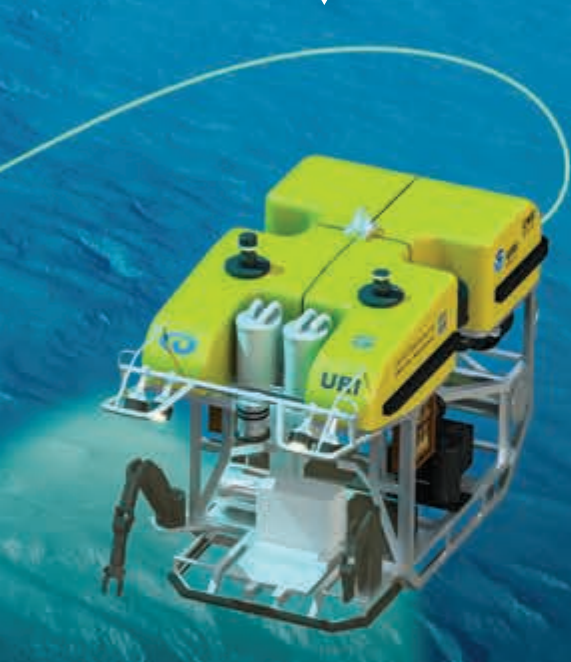
- 500 — The team explored the wreck site of the Navy's rigid airship USS *Macon* that was sunk in a 1935 storm off the coast from Monterey. The dirigible was a flying aircraft carrier and some of the craft's biplanes are still intact on the wreck, which was mapped with photomosaic and acoustic sensors on *Hercules*.
- 600 —
- 700 — The team discovered and mapped new methane seeps at Point Dume off the coast of Malibu. Running along the edge of an old river channel, possibly influenced by a fault line, the 14-kilometer area and its bacterial mats, clams, and other organisms were documented.
- 800 — The Rosebud whale fall marks a site where the remains of a whale that had washed up on the beach was sunk off San Diego with the intent of monitoring the ecosystem that developed around it. The crew documented worms, hagfish, and bacteria that have colonized the carcass.
- 900 —
- 1,000 — The first dive of the expedition was one of the deepest, reaching the Del Mar Seeps, a methane seep site off San Diego. The crew recovered samples of carbonate crust and bacteria and also recovered previously placed experiments of rock, bone, and wood that are part of a time series exploring colonization rates at the site.



ROV Argus: Most often used in conjunction with *Hercules*, *Argus* helps dampen the roll of the ship, allowing *Hercules* to remain steady through sensitive operations, as well as providing additional light to the ROV below it. By itself, *Argus* can dive deeper than *Hercules*, reaching depths of 6,000 meters.



Telepresence: As part of an effort to share the expeditions with scientists and interested viewers around the world, the ship streams video and data from the remotely operated vehicles to the *Nautilus*. From there, the high-resolution feeds are sent by satellite to the Inner Space Center at the University of Rhode Island and distributed directly to computers and to the web.



ROV Hercules: Considered the workhorse of the program, *Hercules*, which can descend to 4,000 meters, is always used in tandem with *Argus*. The ROV is designed to collect samples and recover artifacts. Video from its high-definition camera is streamed through a fiber-optic cable to the *Nautilus* and shared with the world.



IN CONTROL: Snyder took several turns helping to pilot two remotely operated vehicles that were tethered to the *Nautilus* and controlled from the main ship. The ROVs, as they're known, can be maneuvered to collect samples and artifacts.

Under the Sea

Here's a short list of things Wendy Snyder '17 saw last summer: the marine ecosystem that develops around the carcass of a whale on the ocean floor; the wreck site of the USS *Macon*, a 1933 Naval airship designed to be a flying aircraft carrier; and plumes of naturally occurring methane seeping from vents in the seafloor.

In short, she spent four weeks living the life of an oceanographic explorer aboard the E/V *Nautilus*, one of the few ships in the world designed to explore the world's oceans. One of three college interns selected to join an expedition along the coast of California, Snyder describes the experience as "very hands-on." Among her duties, she helped pilot and maintain the ship's remotely controlled exploratory vehicles. Through the cameras of those vehicles she had a close-up view of an underwater world that's invisible to most. "We came across things all the time," she says. "It was hard for people not to get excited about what we saw."