Remotely Operated Vehicles (ROV)

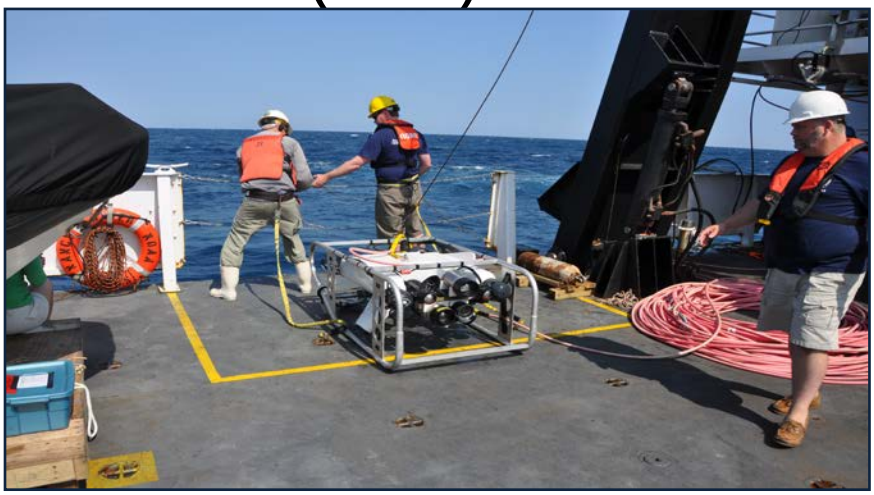
Researchers look on as the ROV sends images from the ocean floor. Courtesy NOAA.

Careers Using ROVs

- ROV Pilot
- ROV Technician
- Diver
- Dive Instructor
- Maritime Archaeologist
- Research Scientist
- Environmental Engineer
- Fishery Biologist
- Geological oceanographer
- Laboratory Technician
- Lifeguard

NOAA Corps

NOAA Commissioned Corps Officers are an integral part of NOAA. Officers can be found operating one of NOAA's 19 ships or 12 aircraft to provide support to meet NOAA's missions. Duties and areas of operations can range from launching a weather balloon at the South Pole, to conducting fishery surveys in Alaska. Find out more about the Corps, its mission, and history at http://www.noaacorps.noaa.gov/



Maritime archaeologists deploy an ROV from NOAA Ship *Nancy Foster*. Courtesy NOAA

Remotely Operated Vehicles (ROVS)

Remotely operated vehicles (ROVs) are unoccupied robots operated underwater by a person on a ship or boat. They are easy to maneuver through the water and are linked to the ship by a group of cables that carry electrical signals back and forth between the operator and the ROV. Most ROVs have a camera and lights. Additional equipment is often added to the ROV to increase its capabilities. For example, additional equipment might include sonars, magnetometers, a still camera, a manipulator or cutting arm, water samplers, and instruments that measure water clarity, light penetration, and temperature.

ROVs were first developed for industrial purposes, such as inspections of pipelines and testing the structure of offshore platforms. However, today ROVs are used for many applications, many of them scientific. They have proven extremely valuable in ocean exploration. They are also used for educational programs at aquaria and to link to scientific expeditions live via the Internet.

ROV History

In the 1950s, the Royal Navy used a remotely operated submersible to recover practice torpedoes. In the 1960s, the US Navy funded research to develop what was then named a "Cable-Controlled" separation between the center of buoyancy and the center of gravity making the ROV stable and stiff so it can work underwater. Electrical cables may be run inside oil-filled tubing, so as to protect them from corrosion in seawater. There are usually thrusters in all three axes to provide full control. Cameras, lights, and manipulators are on the front of the ROV or occasionally in the rear to help in maneuvering. Smaller ROVs can have very different designs, each geared towards its specific task.

Science ROVs

Science ROVs take many shapes and sizes and are used extensively by the science community to study the ocean. A number of deep sea animals and plants, such as the jellyfish Bumpy and the eel-like halosaurs, have been discovered or studied in their natural environment through the use of ROVs. Because good video footage is a core component of most deep-sea scientific research, science ROVs are often equipped with high-output lightning systems and broadcast quality cameras. Depending on the research being conducted, a science ROV will be equipped with various sampling devices and sensors. Many of the devices are one-of-a-kind and state-of-the-art components designed to work in the extreme environment of the deep ocean.

Submersibles

Over the last few decades, engineers have developed submersible technologies capable of meeting the many challenges that the deep sea imposes upon explorers. Using advanced submersible technologies, remarkable new deep-water ecosystems have been discovered. Many of these communities were believed not to exist in harsh environments devoid of light and under crushing pressure. One such community was found in an area surrounding a hydrothermal vent, where water temperatures reach hundreds of degrees Centigrade and the water is bathed in caustic sulfur. After preliminary studies, which discovered many new species and raised even more questions about these organisms, researchers declared these communities to be as complex as many found on land.

As much as we may learn about our planet's underwater habitats through the use of satellites, shipboard sensors and divers, these technologies scratch only the surface of our oceans. Submersibles alone enable us to explore the abyssal depths. They allow us to travel deeper and with a greater degree of freedom than ever before, so that we can observe, describe, and ultimately explain the phenomena of life in the deep ocean realm. To learn more about ocean exploration visit http://oceanexplorer.noaa.gov


Photo: NOAA

The *DeepWorker*


Photo: WHOI

The *Alvin* underwater


Photo: WHOI

WHOI's Autonomous Underwater Vehicle, the *Autonomous Benthic Explorer* being deployed