A human explorer wouldn’t last long in the deep ocean. Sure, you could give a diver breathing equipment, a flashlight, and wetsuit to keep them warm. Unfortunately, the weight of all the water above would squash the diver like the Styrofoam cup.

Our Science Team is using technology to overcome these problems. One way is with a Remotely Operated Vehicle. You might know it as an “ROV.” The ROV we’re using is called the Global Explorer (Photo 1).

The Global Explorer is about the size of a minivan. It is lifted in and out of the water by a crane. A long, cable connects the ROV to the ship (Photo 2). Aboard the ship, specially trained pilots use remote controls to operate the ROV (Photo 3).

The ROV weighs approximately 7,500 pounds. In the words of our chief scientist, Dr. Sönke Johnsen, it is the equivalent of lifting a multimillion dollar “Luxury car off the deck of the ship” by a crane and trying to set it in the water on a ship rocking with the seas while avoiding injury to anyone or any of the equipment or ship.

It involves an enormous amount of teamwork and expertise that was truly phenomenal. Bringing it back aboard the ship has the same challenges, just in reverse order! (photo 4)

Video and digital cameras record images of deep sea animals. With the Global Explorer, the Science Team observe and record creatures in the deep sea such
as a rattail fish, ctenophore, siphonophore, and squid, (Photos 5, 6, 7, & 8) Laser lights on the ROV are a way to use light to measure the size of animals.

The* SPLAT screen is another tool the Science Team adds to the ROV. The SPLAT screen records bioluminescent animals in a unique way. During certain dives, the SPLAT screen is mounted in front of the ROV’s camera. Once the ROV is in the deep, the team turns off the lights. As bioluminescent creatures bump into the screen, they respond by glowing (Photos 9 & 10). The camera captures images of these animals lighting up their natural habitat. Experts like Dr. Edie Widder can tell what kind of animal hit the screen by the shape and color of the glow. The SPLAT screen gives scientists an idea of what bioluminescent animals are at certain depths, locations, or found near each other.

The Global Explorer and SPLAT screen are two tools used to learn about the deep. Knowing what kinds and how many of animals live in the deep is important to being able to protect the sea.

Jake, the SeaDog
Jake, the SeaDog
WhaleTimes and Deep-Sea Explorer
Journey into Midnight
WhaleTimes.org

Fellow Science Team members, I’m wondering about you. *The SPLAT screen was invented by Edie Widder and first used in front of submersibles to try to figure out what was hiding in the dark as the submersible slowly moved through the sea. **What tools could you invent that might help identify animals hiding in the dark?** Please share your thoughts with us!
Deep Sea Exploration Tools CONTINUED

Photo 1

Light and Life Below the Twilight Zone

The Global Explorer

NoAA-Ocean Expedition and Research

Photo courtesy: NoAA-OER/Global Explorer

https://oceanexplorer.noaa.gov/explorations/19biblion/welcome.html
Photo 2

The *Global Explorer* being lifted by crane during a research cruise in Antarctica.
Photo 3

The ROV pilot/controls center is every gamer’s dream job! The Global Explorer oceanographers Travis Kolbe (left) and Jason Tripp (right) are specially trained.
Photo 4
Meet the rat-tailed fish (Himantolophidae: This image was collected by the Global Explorer ROV.)

JOURNEY INTO MIDNIGHT
LIGHT AND LIFE BELOW THE TWILIGHT ZONE

NOAA-Ocean Expedition and Research
whaletimes.org
https://oceanexplorer.noaa.gov/explorations/28globally/wx-welcome.html
Photo 6

Global Explorer ROV photographed this ctenophore about 1,800 m (5,905 ft).

(Bathocyroes foserti)

Photo Courtesy NOAA-OER/Global Explorer

NOAA-Ocean Expedition and Research
https://oceanexplorer.noaa.gov/explorations/19biolum/welcome.html

W h a l e T i m e s
whaletimes.org
Photo 7

Meet a deep-sea siphonophore. This image was collected by the Global Explorer ROV.

NOAA-Ocean Expedition and Research
https://oceanexplorer.noaa.gov/explorations/19biolum/welcome.html

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A squid hangs out 1,100 m (3,610 ft) in the deep sea. This image was collected by the Global Explorer ROV.

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https://oceanexplorer.noaa.gov/explorations/19biolum/welcome.html

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A low light camera attached to the submerged ROV catches bioluminescent creatures that bump into the Splat screen.
Photo 10

A low light camera attached to the submerged ROV catches bioluminescent creatures that bump into the Splat screen.

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https://oceanexplorer.noaa.gov/explorations/19biolum/welcome.html

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