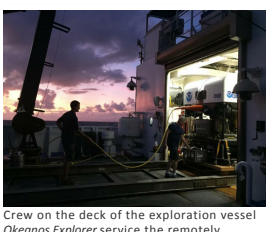
Ocean Exploration and Research

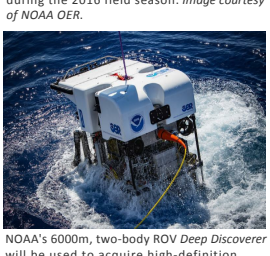
Ocean Exploration Education Highlights
February 2017

Welcome to the NOAA Ocean Explorer Education Highlights newsletter. This monthly newsletter provides you with quick access to ocean exploration-focused, standards-based tips and tools to bring the excitement and science of ocean exploration into your classroom!

What's the latest from NOAA Ocean Exploration for Your Classroom?



Crew on the deck of the exploration vessel *Okeanos Explorer* service the remotely operated vehicle (ROV) *Deep Discoverer* (D2) after a long day of deep sea exploration during the 2016 field season. *Image courtesy of NOAA OER.*



NOAA's 6000m, two-body ROV *Deep Discoverer* will be used to acquire high-definition viseual data of unknown and poorly known areas and collect limited samples during the 2017 expeditions. *Image courtesy of NOAA OER.*

The 2017 Field Season has Started! Join Us as We Explore Unknown Areas of the Central Pacific!

Ahoy Educators, and welcome to the 2017 field season of the *Okeanos Explorer*.

NOAA's exploration vessel, the *Okeanos Explorer,* started the 2017 field season on January 20th in Honolulu, HI. The ship will collect bathymetric data using multibeam sonar to map the ocean floor until the middle of February.

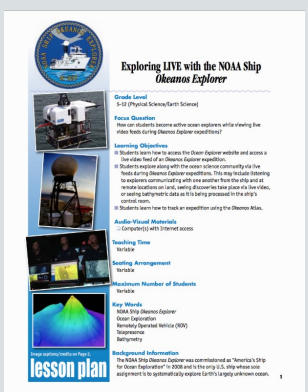
On February 16th, starting in Pago Pago, American Samoa, the crew will employ remotely operated vehicles (ROVs) to explore the never-seen-before sea floor and water column and all the known and unknown creatures living at depth in that area of the Central Pacific. ROV dive sites will include deep-sea coral and sponge habitats, bottom fish habitats, hydrothermal vents, and seamounts. The cruise will end on march 2nd in Apia, Samoa. Stay tuned for a webinar announcement introducing the science behind the expedition and associated Education Expedition Module, lesson plans and classroom resources. An overview of the entire 2017 field season can be found here.

Please join us via telepresence with your students as we discover the mysteries of the Central Pacific. Additionally, our website provides access to ocean exploration-focused, standards-based tips and tools to bring the excitement and science of ocean exploration into your classroom. This field season promises to be extremely exciting, and we would love to have you and your students along for the ride. Onward and downward!

Standards-Based Lesson

Exploring LIVE! with the NOAA Ship *Okeanos Explorer* (Grades 5-12)

NGSS:
Performance Expectation MSPS-4-3, HSPS-4-2
Disciplinary Core Idea PS4.C, PS4.A

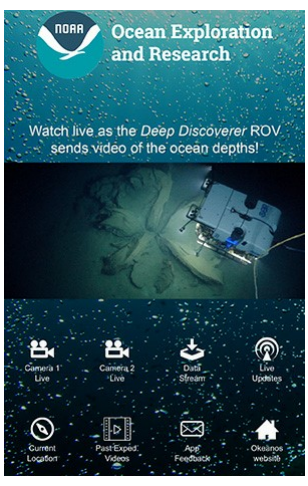


In this lesson, students learn how to access the Ocean Explorer website and participate in *Okeanos Explorer* expeditions through the live video feed. This includes listening to explorers communicating with one another from the ship and at remote locations on land, seeing discoveries take place in real time and seeing bathymetric data as it is being processed in the ship's control room. This lesson provides suggestions on how educators can make the best instructional use of live feeds during *Okeanos Explorer* expeditions.

Note: All lessons are written to support the NGSS and the Ocean Literacy Essential Principles and Fundamental Concepts.

Tune in to *Okeanos Explorer* Live Video from Your Mobile Device

Want to watch the *Okeanos Explorer* live video feeds, but don't want to be stuck in front of your computer monitor? Now, there's an app for that! Check out our mobile app (for iOS and Android devices) that will allow you to bring the excitement of ocean discovery directly to your smart phone or tablet.



The app allows you to stream video LIVE from our remotely operated vehicle on the seafloor (at depths of up to 6,000 meters or 3.7 miles) to your mobile device. Join scientists from around the world as they explore the deepest, darkest reaches of our planet's last unknown frontier, and hear them discuss their findings and watch as true discoveries unfold.

The app also provides information on the location of NOAA Ship *Okeanos Explorer* and updates about our dives.
Access the app here:

- iOS device/Apple store
- Android Google store

NOAA Open House February 11, 2017 in Silver Spring, MD

Come Visit NOAA for an Exiting Day of Discovery and Exploration!

Explore your world and learn how NOAA takes the pulse of the planet every day and protects and manages ocean and coastal resources.

Join us on NOAA's Silver Spring, Maryland campus for a series of free activities, including engaging guest presentations, interactive exhibits, and hands-on activities for ages 5 and up. Meet and talk with scientists, weather forecasters, hurricane hunter pilots, and others.

Want to explore a mysterious shipwreck or see an example of an animal different from all other life we thought existed on Earth? Visit NOAA's Ocean Exploration Command Center at the Open House where you'll learn how scientists ashore are connected live to ocean exploration missions in distant and remote parts of the world. You'll also learn how to see live video from the seafloor on your own computer as ocean exploration missions unfold. It's all in the Exploration Command Center!

More information about this event can be found here.

Image of the Month

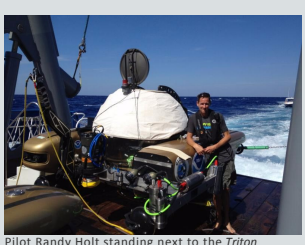
This large (20-cm wide) xenophyophore was seen on the Mid-Atlantic Ridge in July 2005. As benthic particulate feeders, xenophyophores normally sift through the sediments on the ocean floor and excrete a slimy substance to form an exoskeleton known as a test. *Image courtesy of NOAA OER.*

Xenophyophore

Xenophyophores are giant multinucleate single-celled organisms found on the ocean floor throughout the world's ocean. They are considered among the world's largest living single-celled organisms.

Xenophyophores live in the deep ocean and they have been found at depths of more than 10 km (6.6 miles). There are 60 known species in 14 genera. Xenophyophores are a kind of foraminifera that extract minerals from their surroundings and use them to form an exoskeleton.

Click here to watch video footage of a stunning scene of xenophyophores from our Exploring Atlantic Canyons and Seamounts expedition in 2014.



Pilot Randy Holt standing next to the *Triton* submersible during the Battle of the Atlantic expedition in the the summer of 2016. *Image courtesy of NOAA OER.*

Educators build a methane model during the *Exploring the Deep Ocean with NOAA* Professional Development workshop in the Fall of 2016. *Image courtesy of NOAA OER.*

Meet Submersible Pilot Randy Holt

Randy Holt is a manned submersible pilot. His work takes him all over the world to places where deep sea research requires his skills. Randy operates two person submersibles and takes scientists, sponsors, filmmakers etc. to the depths of the ocean for a first hand glance of inner space. He also ensures the safety and reliability of the submersibles, performs all submersible maintenance, and helps integrate the science equipment used for each mission.

Through his work Randy encounters a number of underwater historical wrecks: "[Shipwrecks] are one of the most intriguing sights to see for me personally, as all of these shipwrecks have their own story and most have not been seen by humans since the day they sank." When asked about one of his favorite moments at work he doesn't have to think long:"In 2014, off the coast of Sicily, we documented Roman shipwrecks over 2,000 years old and worked with archaeologists to recover several artifacts for preservation. This was one of the highlights of my career as a sub pilot."

Read more about Randy Holt's work as a submersible pilot and see images of some of the archaeological sites he has encountered.

Upcoming Education Professional Development

If you want to learn about why and how we explore the deep sea and get more exploration-focused, standards-based tips and tools to bring the excitement and science of ocean exploration into your classroom, please attend one of our free educator professional development workshops.

Our Spring 2017 professional development schedule for *Exploring the Deep Ocean with NOAA* is posted on our website. Sign up for a full-day onsite professional development at an aquarium or science center near you!

Note: *This workshop is a combination of the previously offered Why Do We Explore? and How Do We Explore? workshops.*

We hope that these Exploration Education Highlights will help you focus more of your classroom teaching and learning on the amazing discoveries taking place right here, right now, on our own Planet Ocean! Onward and downward!

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