

Deep-Sea Exploration Gives New Insight and Discoveries in Largest and Deepest UNESCO World Heritage Site

Scientists return on Schmidt Ocean Institute's research vessel Falkor after conducting underwater robotic dives in never before visited waters in the Phoenix Islands Protected Area (PIPA).

APIA, SAMOA – Seventeen underwater robotic dives have been made using [ROV SuBastian](#), completing the first expedition of the islands and eastern seamounts of the Phoenix Islands Protected Area (PIPA) in the nation of Kiribati. This follows an initial exploration of the western seamounts by the NOAA Ship *Okeanos Explorer*. “This journey was in the tradition of the grand research expeditions of the past,” said Chief Scientist Dr. Erik Cordes from Temple University. “We traveled nearly 3,000 miles across the Pacific Ocean and explored a part of the world that has remained entirely hidden from view until now.”

The expedition on board of R/V *Falkor* has made a major contribution to the field of marine science, defining the habitat zones of a seamount from the deep sea to the surface for the first time, and discovering at least two new species of coral and crab. Researchers collected the deep sea specimens by using a new soft robotics technology, “squishy fingers”, for adaptive sampling developed by the Wyss Institute and Harvard University and further refined by 3D printing on board while at sea.

All the robotic dives were livestreamed in high definition on Schmidt Ocean Institute's [YouTube](#) and [Facebook](#) page, attracting over 100,000 views. The diving and camera technology on ROV SuBastian allowed the scientists to make new observations of octopus behavior; and capture one of the deepest records of mantis shrimp observed. Videos will be held in perpetuity showcasing breathtaking footage of deep coral reefs, dumbo octopuses, and six-gill sharks.

“This expedition will help to inform conservation and management goals for the region,” said one of the expedition leads [Dr. Randi Rotjan](#), from Boston University. “As deep-sea mining continues to gain traction in the region, this information will help to inform responsible management of deep sea communities.”

The Phoenix Islands Protected Area (PIPA) was the first large marine protected area to include substantial deep water habitat in its boundaries. As of Jan 1, 2015, PIPA became fully closed to all extractive and commercial activities (with the exception of a small sustainable use zone around Kanton), generating an ideal space to ask questions about ecological baselines and species distribution. “Despite our intensive exploration of eight previously unmapped seamounts and island atolls, from 2,400 m, to a shallow 100 m, there was very little evidence of human presence”, said Dr. Tim Shank of the Woods Hole Oceanographic Institution and one of the Principal Investigators of the expedition. “We encountered a high biodiversity in these areas and the recent establishment of the protected area can ensure we have important model deep-sea systems for future research.”

You can learn more about the expedition [here](#). High resolution images with captions and B-roll of research vessel Falkor [can be found here](#).

Participating scientists were funded as part of NOAA's Office of Ocean Exploration and Research's 2016 Federal Funding Opportunity

PHOTO CAPTIONS:

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Image of squishy fingers: The "squishy fingers" sampling device was developed by the Wyss Institute at Harvard University. During the cruise, Daniel Vogt designed a new version based on the feedback from the ROV pilots.

Image of dumbo octopus: A large "dumbo" cirrate octopus on the steep cliffs of Tarina Seamount at approximately 1200m depth.

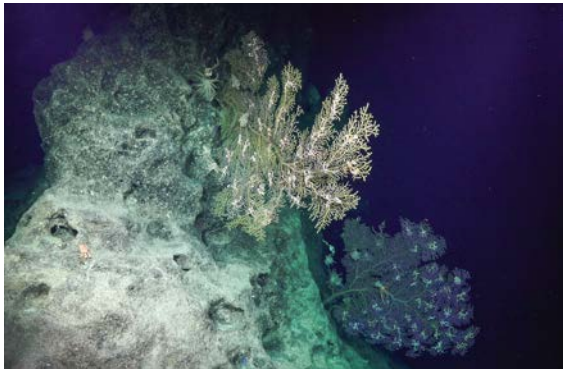
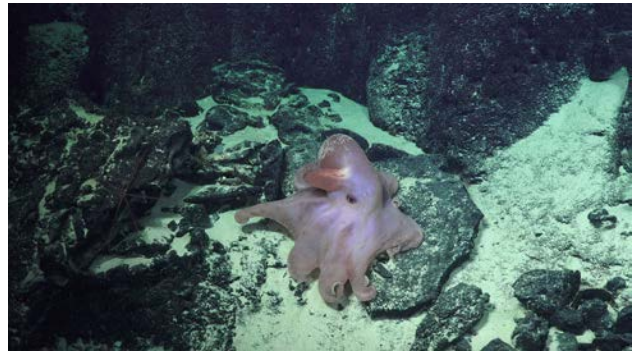


Image of coral:

Two large *Paramuricea* coral colonies with numerous brittle star associates at 400 m depth on Orona Atoll.

Image of ROV SuBastian:

ROV Lead Russell Coffield shows the science team around the "basket" of ROV SuBastian.



Image of science team: The science party in the laboratory on board the R/V *Falkor* with all of the specimens collected during one of the deep-sea ROV dives. From left to right: Alexis Weinnig, Abigail Keller, Luke McCartin, Anna Gauthier, Tim Shank, Erik Cordes, Daniel Vogt, Aranteiti Tekiau, Randi Rotjan.

Image of an oreo fish swimming:

Rock pinnacles with large *Enallopsamia* stony corals and an

Oreo fish at approximately 600m depth on the flank of Orona Atoll.

