

Researchers in Northwestern Hawaiian Islands finds highest rates of unique marine species

October 1 2015

Today, scientists returned from a 28-day research expedition aboard NOAA Ship Hi'ialakai exploring the deep coral reefs within Papahānaumokuākea Marine National Monument in the Northwestern Hawaiian Islands. During the trip, scientists recorded numerous species of marine life never before seen, including a possible new species of seahorse, and a sea star not previously found in Hawaii.

Using advanced diving technology to survey reefs at depths up to 300 feet, much deeper than conventional scuba gear allows, scientists were able to observe rarely seen ecosystems. Fish surveys at these depths around the northernmost atolls revealed an extremely high abundance of species found only in the Hawaiian Islands.

"On some of the deep reefs we surveyed, 100 percent of the fishes we recorded were endemic, meaning that they are all unique to the Hawaiian archipelago," said Randall Kosaki Ph.D., NOAA's deputy superintendent of Papahānaumokuākea Marine National Monument and chief scientist of the expedition. "This is the highest level of endemism recorded from any marine ecosystem on Earth."

The team was the first to dive on several open-ocean seamounts in the monument, which were first mapped using high resolution multibeam sonar in 2014 and 2015. These undersea mountains rise from the floor of the ocean in 14,000 feet of water and summit within 200 to 300 feet of

the surface.

Scientists collected specimens and photographs of new records of marine life from the seamounts, including potential new species of fish, algae and invertebrates. The specimens will be sent to experts at various museums around the world to confirm the identity of the organisms.

"Discoveries of rare and unique species of [marine life](#) remind us why Papahānaumokuākea is so special and why we need to continue exploring, managing and protecting it," said Athline Clark, NOAA superintendent of Papahānaumokuākea Marine National Monument, "We are delighted to have so many partners who help us to achieve these significant research findings."

In addition to studying the monument's environment, the deep divers were in turn the subjects of a medical study to understand the effects of extreme dive exposures on human physiology. Neal Pollock, Ph.D., research director of Divers Alert Network (DAN), led a team that conducted ultrasound imaging of the divers' hearts after ascent from deep dives.

Formation of gas bubbles in the bloodstream on ascent from deep dives is known to cause decompression sickness, or "the bends," a potentially life-threatening condition. "We hope this information will better inform the algorithms used by dive computers to guide divers through gradual decompression from deep dives," said Pollock. "We hope to make scuba diving safer for scientific divers as they expand our understanding of the oceans."

The scientific team included researchers from NOAA's Office of National Marine Sanctuaries, NOAA's Pacific Islands Fisheries Science Center, the Hawai'i Institute of Marine Biology, the Bernice P. Bishop Museum, and Divers Alert Network.

The NOAA Diving Center, part of the NOAA Office of Marine and Aviation Operations (OMAO), supported this mission by providing staff to serve as a divemaster, diving medical technician and hyperbaric chamber operator for the 348 dives that were conducted during the mission. Homeported in Honolulu, NOAA Ship Hi'ialakai is part of the NOAA fleet of ships and aircraft operated, managed and maintained by OMAO, which includes both civilians and the commissioned officers of the NOAA Corps, one of the seven uniformed services of the United States.

Provided by NOAA Headquarters

Citation: Researchers in Northwestern Hawaiian Islands finds highest rates of unique marine species (2015, October 1) retrieved 15 May 2024 from

<https://phys.org/news/2015-10-northwestern-hawaiian-islands-highest-unique.html>

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