Treasures found in Hawaii's deep coral reefs

By Jessica Aldred, The Guardian, adapted by Newsela staff on 10.11.16
Word Count **640**

Coral reefs in Hawaii's oceanic twilight zone, the deep area of ocean where light still penetrates and photosynthesis occurs, are abundant and home to a wide variety of regionally unique fish species. NOAA and Bishop Museum via AP

Scientists have discovered a rich undersea world in the waters of Hawaii. Deep sea coral reefs there are home to vast algae meadows. Algae are simple, leafless plants.

Coral reefs are rock-like ridges. They are formed out of the hard outer shells of tiny animals known as coral.

Corals have hard outer shells, which remain after they die. The shells pile up and stick together. In time, the result is a huge coral reef.

Algae grow on these coral reefs. In turn, large numbers of fish live on the algae, or on other fish attracted to the reefs.

Scientists say the newly discovered algae meadows support more fish than any other place in Earth's seas. They are also home to many kinds of fish not found elsewhere.

Fishing For Information

Shallow coral reefs have been carefully studied for years. However, until now scientists did not know much about deep reefs. Deep reefs are those found from 100 to 500 feet down.

The new study took 20 years to complete. It focused in particular on areas off the islands of Maui and Kauai.

In both places, scientists found vast stretches where the ocean floor was completely covered with coral reefs. These regions were found 300 feet beneath the surface and even deeper.

“It’s amazing to find such rich coral communities down so deep," said scientist Anthony Montgomery.

Light Gives Life

Both corals and algae need sunlight to live. The scientists say the area's unusually clear water allows sunlight to reach the deep reefs.

The scientists found more than 70 kinds of algae spread across huge deep sea meadows. The plants support many kinds of fish.

The scientists also found many fish that are endemic to their area. Endemic fish are fish that are found only in one place and nowhere else on the planet.

Many Native To Hawaii

The deeper the scientists looked, the more endemic fish they found. In shallow reef areas, only around 1 in 6 of the different kinds of fish is endemic to the Hawaiian Islands. Below 230 feet, more than half of the kind of fish the scientists saw were endemic.

The difference was particularly striking in deep reef areas off the Northwestern Hawaiian Islands. There, every type of fish the scientists saw is found only in Hawaii.

The amount of fish endemism is "astonishing,” said scientist Randall Kosaki. Hawaii's deep reefs have more endemic fish than anywhere else on Earth.

Man And Machine

The study faced one big problem. Hawaii’s deep reefs are too far down for ordinary divers to reach.

The scientists solved that problem by combining different approaches. They used sonar, or sound waves, to map the seabed. They towed cameras underneath boats and sent remote-control cameras down to the bottom.

They also sent down divers who used special rebreather systems that let them stay under longer. The divers explored alongside submersible vessels. These are something like submarines.

“Free-swimming divers and submersibles don’t often work side-by-side,” said Richard Pyle, leader of the study. “Submersibles can go much deeper and stay much longer," he said. However, divers are much better at doing experiments and collecting samples. "Combining both together on the same dives allowed us to achieve tasks that could not have been performed by either technology alone.”

Sadly, Shallow Reefs Are In Deep Trouble

The deep reefs could help us protect our oceans, the scientists say.

Shallow reefs are being rapidly destroyed by water pollution and various human activities. The fish that depend on them are dying out too. Perhaps deep coral reefs could serve as a refuge for these fish. The reefs could give them another way to find food and shelter.

Hawaii's deep reefs provide us with a chance to help protect ocean life, said scientist Kimberly Puglise. We must make sure we do not destroy them as well, she said.