RESEARCHERS SAMPLE RICH DEEP-SEA AREA OFF HAWAII

Scientists puzzled by abundance of marine life in area

BY CALEB JONES

HONOLULU

Federal researchers have just returned from an expedition to study the biodiversity and mechanisms of an unusually rich deep-sea ecosystem off the coast of Hawaii's Big Island.

Scientists with the National Oceanic and Atmospheric Administration told The Associated Press in a telephone interview Thursday that the abundance of sea life sampled in a particular stretch of water off the Big Island points to a thriving deep-sea habitat, but they aren't exactly sure why.

The area, about a mile off the south shore of Hawaii Island, was full of fish including sawtooth eels, dragonfish and many other mysterious deep-sea creatures.

Much of the ocean surrounding Hawaii is among the least productive water in the Pacific, said the expedition's lead researcher, Jamison Gove, a NOAA oceanographer.

"Yet we know that Hawaii is this biological hot spot," he said. "So there's kind of this paradox: How can you have so much productivity around Hawaii yet the surrounding ocean waters are literally a barren ocean landscape?"

Part of the mission's purpose was to pinpoint why the islands, and this location in particular, are so rich in marine diversity, Gove said.

They took samples of the area from depths of about 1,500 to 2,000 feet using large trawling nets.

They are now assessing those samples in hopes of better understanding potential management and policy needs around the region.

They also hope the research will advance understanding of the overall ocean ecosystem, especially the largely unknown and unexplored deep sea areas.

Jack Kittinger, the senior director of the Hawaii program at Conservation International, told the AP that the Kona coast is "such a gift," full of spectacular life.

Some areas of the world's oceans simply have more life than others, he said, and a combination of factors, such as currents, water temperature and undersea topography, likely all play a role.

"We really have to do a good job of managing these special, amazing places, and Kona is absolutely one of them," Kittenger said. "If there's one (hot spot) in Kona, there's probably dozens and dozens of them in other places, including in Hawaii. We just haven't stuck anything down there to find them yet."

It will take the researchers up to a year or more to draw their conclusions. But they believe part of the reason for such a rich habitat in this location is the way the seafloor dramatically rises as it reaches the island, bringing nutrients up and creating food for a wide range of sea life.

"What we know about the ocean is less than the surface of the moon," Kittinger added.

The team also studied surface slicks, which are the narrow, glassy channels of water that are visible in the coastal ocean waters. The researchers found that these ribbons of water create "an oasis in the desert" as they pull together juvenile reef fish, baby sea turtles, plankton and even coral larvae.

But the slicks, which are created by wind, tide and undersea structure, also gather other material, such as plastic and land debris, that could be hurting the life that exists there.

The federal research team was joined by scientists from Bangor University in North Wales, United Kingdom, and the University of Hawaii.

Another recent expedition by Conservation International and the University of Hawaii was conducted farther off the coast of the Big Island at a group of seamounts, active and dormant underwater volcanoes similar to the Hawaiian Islands that never reach the surface.

The seamounts, like the area studied off the coast of the Big Island, were also rich in marine diversity, likely for many of the same reasons, the researchers said.

"There will always be the unexpected when you go into the deep ocean," said Conservation International's Greg Stone, the seamount expedition's lead scientist.

Jones writes for The AP.

NOAA AP

A glass squid was found off the coast of Hawaii's Big Island.

WARM PACIFIC OCEAN 'BLOB' FACILITATED TOXIC ALGAE BLOOM

BY PHUONG LE

SEATTLE

A new study has found that unusually warm Pacific Ocean temperatures helped cause a massive bloom of toxic algae last year that closed lucrative fisheries from California to British Columbia and disrupted marine life from seabirds to sea lions.

Scientists linked the large patch of warm ocean water, nicknamed the "blob," to the vast ribbon of toxic algae that flourished in 2015 and produced record-breaking levels of a neurotoxin that is harmful to people, fish and marine life.

The outbreak of the domoic acid toxin, the largest ever recorded on the West Coast, closed razor clam seasons in Washington and Oregon and delayed lucrative Dungeness crab fisheries along the coast. High levels also were detected in many stranded marine mammals.

"We're not surprised now having looked at the data, but our study is the first to demonstrate that linkage," said Ryan McCabe, lead author and a research scientist at the University of Washington's Joint Institute for the Study of the Atmosphere and Ocean. "It's the first question that everyone was asking."

McCabe and his co-authors explain how the toxic algae bloom thrived in their study published in the journal Geophysical Research Letters.

Seasonal algae blooms are common each year along the West Coast, but most are not toxic. The scientists found that the algae bloom was dominated by a single species called Pseudo-nitzschia australis that is highly toxic.

The algae survived and took advantage of warm, nutrient-poor conditions set up by the patch of water that was warmer at the surface than normal.

Coastal upwelling last spring — a seasonal event that brings nutrient-rich, cooler waters up from the deep ocean — provided nutrients for the algae to bloom into a large population fairly quickly at sea. Finally, a series of late spring storms delivered the bloom to the coast.

"While temperature isn't everything, it's serving as a decent proxy," said McCabe. "We think there's a linkage between toxic events along our coast and climate variability indices."

The blob was a one-time event that was not because of global warming, "but we are looking at this event as a potential window into the future as what conditions could look like," McCabe said.

Kathi Lefebvre, a co-author and marine biologist at NOAA's Northwest Fisheries Science Center, said the bloom resulted in the highest levels of domoic acid contamination in the food web ever recorded for many species.

Domoic acid accumulates in anchovies, sardines and other small fish as well as shellfish that eat the algae.

Marine mammals and fish-eating birds in turn can get sick from eating the contaminated fish. In people, it can trigger amnesic shellfish poisoning, which can cause permanent loss of short-term memory in severe cases.

Sea lions in California commonly experienced seizures, a common sign of domoic acid poisoning, during harmful algae blooms along that state's coast. But 2015 was the first year that such harmful effects were documented as far north as Washington state, scientists said.

Le writes for The Associated Press.

AP

NOAA researchers pour a sample of seawater containing a brownish toxic algae into a jar aboard a research vessel off the Washington Coast.