



Charting “Million Mounds” Deep-Sea Corals

Expedition: [2019 Southeastern U.S. Deep-Sea Exploration - Mapping](#)



By [NOAA Ocean Exploration mission team](#)

About a hundred miles off the coast of Georgia and Florida lies a strange ecosystem at the bottom of the ocean. It’s an underwater landscape of deep-sea coral mounds that stretches as far as the eye can see.

This region, known as the **“Million Mounds coral region,”** is accessible only by submersible or remotely operated vehicle (ROV). For thousands of years, corals in this region have been growing and dying 600 to 800 meters (1,970 to 2,625 feet) below the ocean’s surface. Scientists such as NOAA Ocean Exploration’s Derek Sowers are trying to understand why and how the corals got there.

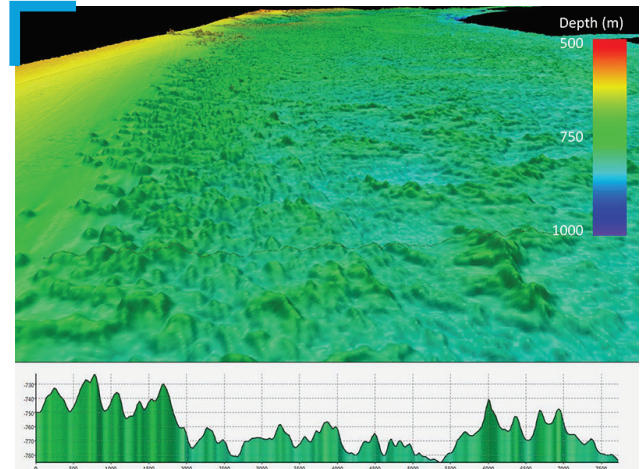
“It’s an astounding complex of mound features, thousands and thousands of them,” said Sowers. He led a [mapping expedition](#) to the area aboard NOAA Ship *Okeanos Explorer* in 2019.

Sowers says the ancient coral ecosystem acts much like an old-growth forest. It provides habitat, shelter, and food for a variety of marine life.

“You have thousands of years of growth of coral skeletons, which then die. The calcium carbonate stays behind. Living coral then grows on top of the skeletons,” Sowers explained. “The structure provides nooks and crannies for life to hide in. It’s a complex habit for many marine species.”

The Million Mounds ecosystem is primarily made up of *Lophelia pertusa*. This coral prefers water below 50 degrees Fahrenheit (10 degrees Celsius). It grows several meters in diameter and 1 to 3 meters (3 to 10 feet) high. Some living *L. pertusa* colonies off the coast of Florida are estimated to be 700 years old! It is fragile and easily broken by strong bottom currents or getting bumped by fish or other large creatures. *L. pertusa* reefs are carpeted with a dense layer of living corals growing on top of dead coral rubble. The South Atlantic region, of which the Million Mounds coral region is a part, is home to a thriving *L. pertusa* ecosystem that may be among the largest in the world.

Unlike tropical corals, deep-sea corals thrive in darkness. Deep-sea coral polyps do not contain the symbiotic algae that provide their tropical cousins with color and some nutrition. The corals that Sowers has been studying are slow-growing and white in color. They sift food from the fast-moving Gulf Stream. The current supplies food and removes sediment that could smother coral polyps. The stream flows from three to five miles per hour through the Million Mounds coral region.



Multibeam bathymetry data collected by NOAA Ship *Okeanos Explorer* showing the three-dimensional topography and profile of the Million Mounds coral region. Many of the coral mounds rise over 30 meters (100 feet) above the seafloor. *Image courtesy of NOAA Ocean Exploration.*



Lophelia pertusa is the most abundant deep-sea coral in the Million Mounds coral region. The dense *L. pertusa* mounds are made of live corals growing on top of piles of dead coral rubble below. One coral colony can provide food and/or habitat for many other species, like the squat lobster pictured here. *Image courtesy of NOAA Ocean Exploration.*



Deep-sea corals are not reliant on symbiotic algae for food. Instead the tentacles of individual coral polyps, as seen in this close up image of *Lophelia pertusa*, capture small prey from the surrounding waters. *Image courtesy of NOAA Ocean Exploration.*

EXPLORATION NOTES Deep-Sea Corals

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Scientists discovered this deep-sea coral ecosystem in the 1960s. In [2014, an *Okeanos Explorer* expedition](#) mapped a large part of the ecosystem in a place called the Blake Plateau, Sowers explained.

“It was pretty stunning,” he said. “As you move north, the seafloor changes and you get more complex and rugged terrain. Much of that is topped with coral mounds.”

In order to better understand the Million Mounds coral region, several expeditions have since returned to the area to continue mapping and exploring and sampling with underwater robots.

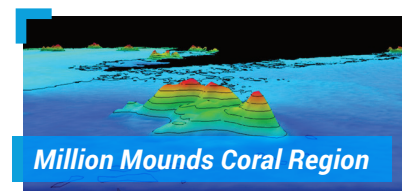
In 2018, during the [DEEP SEARCH expedition](#), scientists observed a massive *Lophelia* reef further east. It is located about 265 kilometers (165 miles) off the coast of South Carolina. Scientists confirmed the area was populated with many *L. pertusa* reefs while diving in the *Alvin* submersible. In 2019, Sowers and others returned to determine the eastern boundary of the Million Mounds coral region. They used multibeam sonar to map more than 18,000 square kilometers (6,950 square miles), which included thousands of new mound features, speculated to be deep-sea coral mounds.

In 2021, the NOAA Ocean Exploration team returned to the Million Mounds coral region during the [Windows to the Deep 2021](#) expedition to continue studying the area. Several dives were conducted with remotely operated vehicle (ROV) *Deep Discoverer* to take high-resolution images and video, as well as to collect biological and geological samples.

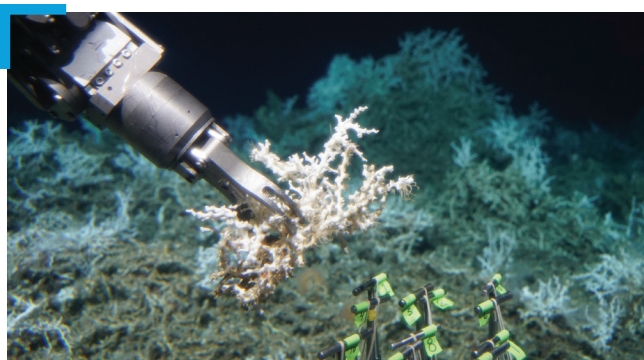
All of these data are used to help scientists better understand the ecology and geology of this unique area. Additionally, these data are used to inform conservation and management practices in the region.

Sowers has been lucky enough to return to this coral realm on several expeditions. Each time he learns new things about a mostly unexplored world.

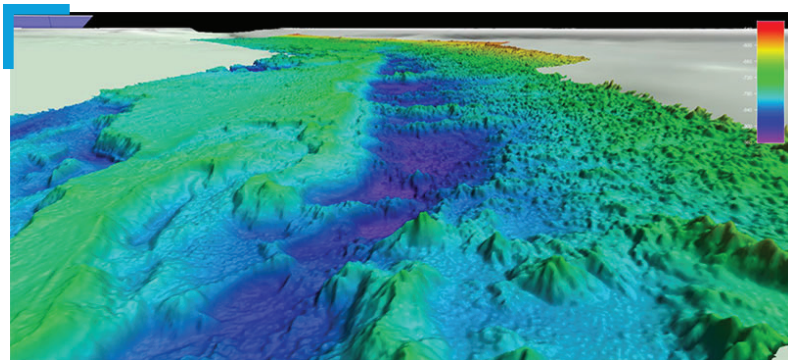
“For those of us that get to explore it, you appreciate what an amazing place it is,” Sowers said. “You are always wondering what’s down there and what the habitat looks like up close. To come back and explore with ROVs and see these areas in high-definition video is stunning. Then we get to stream this video off the ship in real time to anyone with the internet. They can explore with us! It’s a lot of fun.”



Learn more about the Million Mounds Coral Region and check out high-definition video captured by ROVs exploring the reef mounds. Video courtesy of NOAA Ocean Exploration.



During the 2018 DEEP SEARCH expedition, human-occupied vehicle (HOV) *Alvin*, collected samples of *Lophelia pertusa*. Image courtesy of DEEP SEARCH 2018 - BOEM, USGS, NOAA, HOV *Alvin*. Copyright Woods Hole Oceanographic Institution.



High-resolution multibeam bathymetry of the Stetson Mesa north region collected by multibeam sonar technologies on board NOAA Ship *Okeanos Explorer*. The complex seafloor topography and thousands of mound features create important habitat that supports a diversity of marine life. Image courtesy of NOAA Ocean Exploration.

Original essay: <https://oceanexplorer.noaa.gov/ex10years/stories/million-mounds.html>
Expedition: <https://oceanexplorer.noaa.gov/okeanos/explorations/ex1906/welcome.html>
Explorers (bios): <https://oceanexplorer.noaa.gov/okeanos/explorations/ex1907/background/explorers/explorers.html>
Multibeam bathymetry Million Mounds (image): <https://oceanexplorer.noaa.gov/ex10years/stories/media/million-mounds-800.jpg>
Lophelia pertusa (image): <https://oceanexplorer.noaa.gov/explorations/19deepsearch/background/corals/media/img2-hires.jpg>
Coral polyps (image): <https://oceanexplorer.noaa.gov/explorations/10lophelia/background/media/biology1-380.jpg>
2014 *Okeanos Explorer* (webpage): <https://oceanexplorer.noaa.gov/okeanos/explorations/ex1403/welcome.html>
2018 DEEP SEARCH Expedition (webpage): <https://oceanexplorer.noaa.gov/explorations/18deepsearch/welcome.html>
2021 Windows to the Deep Expedition (webpage): <https://oceanexplorer.noaa.gov/okeanos/explorations/ex2107/welcome.html>
Million Mounds Coral Region (video): <https://oceanexplorer.noaa.gov/okeanos/explorations/ex2107/gallery/media/million-mounds-1280x720.mp4>
HOV *Alvin* (image): <https://oceanexplorer.noaa.gov/explorations/19deepsearch/background/plan/media/img3-hires.jpg>
Multibeam bathymetry north (image): <https://oceanexplorer.noaa.gov/ex10years/stories/media/stetson-north-800.jpg>