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Vivid corals and other creatures are found deep off the Mid-Atlantic coast

A mile deep in Norfolk Canyon, a crab picks its way along a vast bed of mussels living on methane seeping from the ocean floor. (FROM ART HOWARD/ NOAA-OER/BOEM/USGS)

By Stephen Paul Nash June 10, 2013

Marine scientists have found gardens of vivid coral and creatures normally seen in the Gulf of Mexico in deep canyons only about 50 miles off the Mid-Atlantic coast.

The little-known cold-water corals occur on the outer continental shelf and along the walls of the Washington, Norfolk and Baltimore canyons, up to 5,000 feet deep. The federally funded project that found the creatures is mapping the biological communities, the rocks and the archaeology of this region that, despite its proximity to the East Coast, has been mostly terra incognita — or maybe *mare incognita*.

“I am really surprised at the abundance of bubblegum coral down there — it actually does look like bubblegum! — and there are massive trees of it. One was about 15 feet tall,” said Sandra Brooke, a deep-water coral specialist at Florida State University. The species looks like an elegant, electric-pink candelabrum on video taken from an unmanned submarine.

A dozen species of coral have been logged during the research project, which began in 2011. In May, the scientists reconnoitered a newly discovered methane cold seep that may be the largest on the planet.

The methane is probably coming from slowly decaying organic material from a long-ago epoch. Unlike the very hot water that comes up through deep-sea hydrothermal vents, the methane seeps are more or less at ocean water temperature. Such seeps may turn out to be far more common than once thought,

according to fisheries biologist Steve Ross of the University of North Carolina at Wilmington.

Ross and Brooke are the co-directors of the project, whose research is being done on vessels provided by the National Oceanic and Atmospheric Administration, with funding from the Interior Department's Bureau of Ocean Energy Management and the U.S. Geological Survey. The total cost is about $9 million.

One of BOEM's keen interests is to anticipate the potential effects of future oil and gas leases or wind-energy sites on natural areas or archaeological sites, said Marjorie Weisskohl, a BOEM spokeswoman.

Some of the scientists hope the research will encourage the establishment of marine sanctuaries in what they regard as an offshore treasure already battered by trawl fishing and under threat from climate disruption, acidification, pollution and overfishing.

"We've had very little information about the communities in the canyons," Brooke said. "The rockier habitats in these obscure places are just a big unknown. We've never been able to look there before with the kinds of tools that we need."

The vast canyons occur on the outer continental shelf,

which was the Atlantic shoreline 19,000 years ago when sea level was about 360 feet lower than it is today. At that time, the canyons were like fjords — extensions of rivers that have now been submerged for millennia.

Last year's research trip discovered that a species of mussel normally found in the Gulf of Mexico was living near a methane seep in Baltimore Canyon. This is an example of the odd biology that scientists say has evolved around columns of methane bubbles that are ordinarily considered toxic. Last month, a far larger mussel bed was discovered 4,800 feet down by the sub Jason, remotely guided by scientists in a research vessel on the surface above Norfolk Canyon.

The blanket of mussels "was one of the high points of this cruise, once we started to see the size of it," Ross said. "It's certainly the biggest we know of in the Atlantic, and possibly the biggest in the world, over a square kilometer.

"One of the most interesting things about these seep communities is they are chemosynthetic rather than photosynthetic: It's the only life-sustaining activity we know of that is not based on energy from the sun. It shows that sunlight is not necessarily critical to some life forms, and that has huge implications for looking for life on other planets."

If global warming or some other planetary hazard interferes with photosynthesis, he said, “these systems will probably just keep right on going.”

The canyons create a funnel for strong currents that sluice in krill, crustaceans, plankton and other nutrients, providing a rich feeding area at all depths. They are “heavily packed with squid,” Ross said, along with blackbelly rosefish, a big relative of the cod called cusk, pilot whales, sperm whales, caves full of American lobster and golden tilefish, and coral.

The imprint of human activity is also much in evidence. “We saw so much damage and trash, plastic bags wrapped around corals, garbage, discarded nets, traps and lines. I’ve never seen that much junk on good habitat in 30-plus years of doing this kind of work,” Ross said.

Some of the research tracks ocean acidification, a consequence of the thickening of carbon dioxide in the global atmosphere. The oceans are already 30 percent more acidic than they were 250 years ago, and they may be changing at a faster rate than at any time in the past 300 million years, according to an overview of research on the issue published last year in the journal Science.

A 2010 report by the National Academy of Sciences points out the possible risks: “If the ocean continues to acidify, the water could become corrosive to

calcium carbonate structures, dissolving coral reefs and the shells of marine organisms."

Corals are stationary and resemble plants, but they are animals, with skeletons and metabolisms. They cannot create a skeleton if too much acid has changed the water chemistry, Ross said. Shellfish and other types of sea life are also vulnerable, as are plankton, the base of the ocean food chain.

Although continuing acidification is a given, he said, it is not yet clear how quickly it will occur or what all of its consequences will be, especially at the depths where the cold-water corals live.

Nash is a science journalist based in Richmond and the author of "Millipedes and Moon Tigers: Science and Policy in an Age of Extinction."

http://www.washingtonpost.com/national/health-science/vivid-corals-and-other-creatures-are-found-deep-off-the-mid-atlantic-coast/2013/06/07/19fad9e6-c928-11e2-9245-773c0123c027_story.html