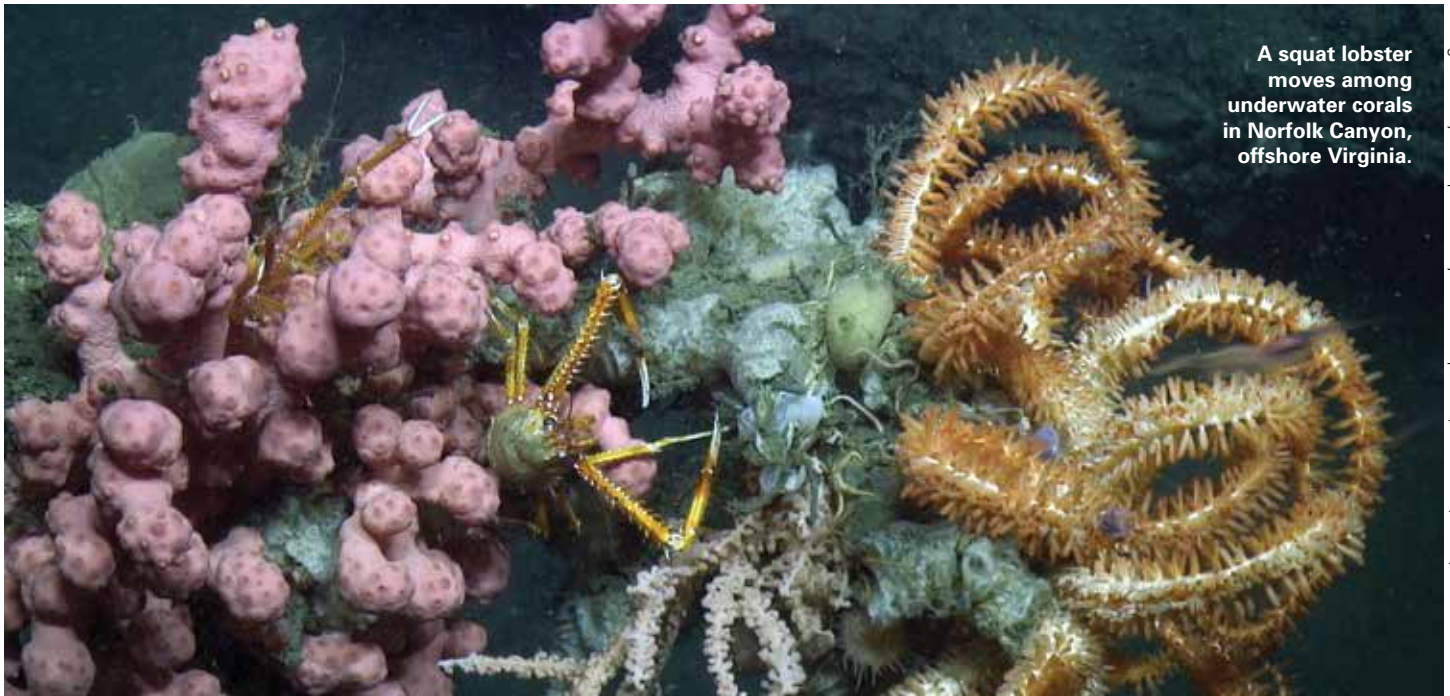


Protecting the Mid-Atlantic's Deep-Sea Ecosystems



A squat lobster moves among underwater corals in Norfolk Canyon, offshore Virginia.

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The Mid-Atlantic Fishery Management Council, which manages U.S. fisheries resources in the region, is currently developing a plan to protect deep-sea coral communities off the Mid-Atlantic coast from fishing gear damage. The Council intends to add this plan to an existing fishery management plan as the “Deep Sea Corals Amendment” and will submit it to the National Oceanic and Atmospheric Administration (NOAA) for approval.¹ The Deep Sea Corals Amendment represents a historic opportunity to protect these highly vulnerable, distinctive, and pristine ocean ecosystems and is one of the most exciting and precedent-setting marine habitat protection initiatives in the country.

WHAT ARE DEEP-SEA CORALS? WHAT ROLE DO THEY PLAY IN OCEAN ECOSYSTEMS?

Like more familiar tropical and subtropical coral species, deep-sea corals are marine invertebrate animal organisms that serve vital ecological functions. Unlike shallow water corals, deep-sea corals do not require sunlight to survive and are most commonly found in waters between 50-1,000 meters deep. In the Mid-Atlantic, deep-sea corals have been found growing as thickets, isolated colonies, or solitary individuals.

Deep-sea coral communities are sanctuaries for marine life. The deep-sea corals—and associated species like sponges and anemones—form the foundation of deep-sea ecosystems, providing food, shelter from predators, and nursery areas for young fish and crustaceans, and serving as hosts for diverse species that live exclusively on or with corals.² Protecting these habitats will help conserve dependent fishery resources in the region.



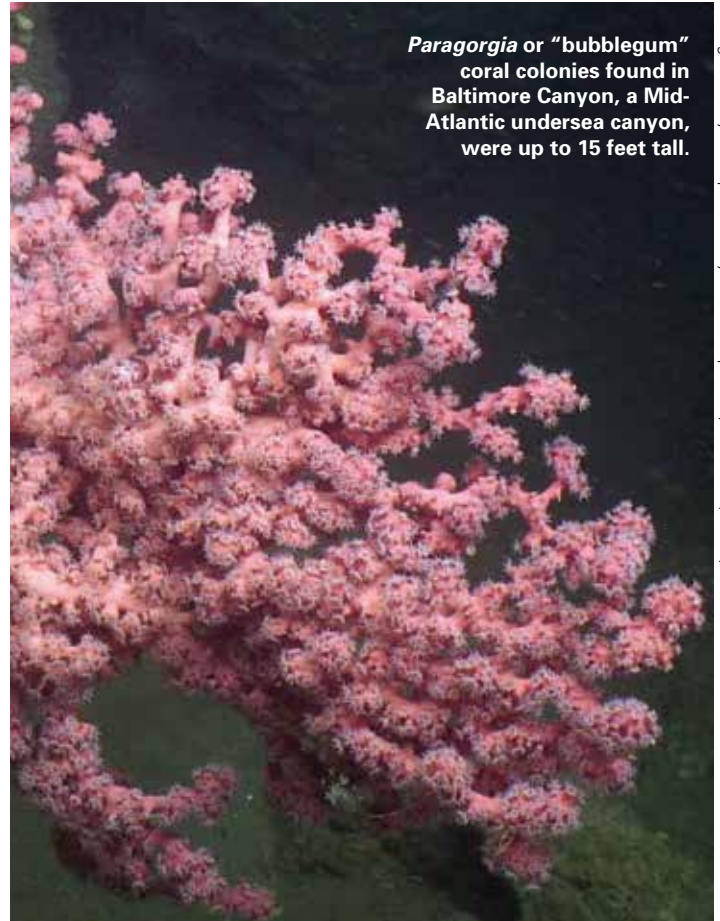
WHAT ARE WE STILL DISCOVERING ABOUT DEEP-SEA CORALS?

Over the last several years, NOAA, other federal agencies, and academic institutions have been intensively investigating the region's deep-sea coral communities, producing a steady stream of new information and scientific insights. For example, of 45 octocoral species collected on the New England seamounts, only 11 had been previously identified.³ To date, one new genus of corals and nine new species have been discovered.⁴ In Block Canyon, roughly 100 miles south of Long Island, two potential new species were documented in 2013: one black coral and one bubblegum coral.⁵ In 2012, colonies of the reef-forming coral *Lophelia pertusa* were discovered for the first time in the Mid-Atlantic.

Deep-sea corals and sponges have produced scientific and technological innovations, including compounds for cancer treatments, models for artificial synthesis of human bone, and elements to design more durable optic cables.⁶ Because deep-sea corals live so long, scientists can learn about historic changes in global climate and ocean current systems through trace elements and isotopes incorporated into coral skeletons over time.⁷ The Deep Sea Corals Amendment could conserve deep-sea coral communities in the region for further research and social benefits. The Amendment could also help turn the region's significant public investment in deep-sea research and exploration into a landmark ocean protection achievement, creating a legacy of conservation for future generations.

WHERE ARE DEEP-SEA CORALS FOUND IN THE MID-ATLANTIC REGION?

Deep-sea coral communities have been found along the Mid-Atlantic's continental slope, typically in waters deeper than 100 meters. Coral communities have been found in particular abundance in the region's more than two dozen submarine canyons, which can plunge as deep as the Grand Canyon. Strong currents and other erosional forces in the canyons expose ample hard substrate to which corals attach themselves. In Baltimore Canyon offshore Maryland, scientists found a colony of *Paragorgia* or "bubblegum" coral—so named for their bulbous pink branch ends—nearly 15 feet tall.⁸ In Norfolk Canyon offshore Virginia, scientists observed coral colonies in 100 percent of their dives. The region's canyons are generally known as biodiversity "hotspots," containing significant and diverse concentrations of marine life, including squid and other forage fish; "ecosystem engineers" like tilefish, lobsters, and other crustaceans that create complex burrows in canyon walls; large pelagic fish, including tuna and billfish; and marine mammals, including endangered fin and sperm whales.



Paragorgia or "bubblegum" coral colonies found in Baltimore Canyon, a Mid-Atlantic undersea canyon, were up to 15 feet tall.

© Image courtesy of Deepwater Canyons 2013 Expedition, NOAA-OER/BOEM/USGS.

WHAT THREAT DOES FISHING POSE TO DEEP-SEA CORAL COMMUNITIES IN THE MID-ATLANTIC?

Deep-sea corals are exceptionally long-lived and slow-growing. Marine researchers recently determined that one coral colony found off the coast of Hawaii was about 4,270 years old, possibly the oldest living species.⁹ Some deep-sea coral species are estimated to grow at only 0.5–2.5 millimeters a year.¹⁰ These characteristics make deep-sea corals highly vulnerable to harm from certain fishing gear, such as bottom trawls. According to NOAA's *Strategic Plan for Deep-Sea Coral and Sponge Ecosystems*, bottom trawling is the "major threat" in most U.S. regions to deep-sea coral communities.¹¹ One pass of a trawl net that scrapes along a canyon wall or ocean floor can destroy corals that have been growing for thousands of years, eliminating fragile and important deep sea communities for any ecologically relevant period of time.

Fortunately, the depth and ruggedness of the canyons and other deep-sea coral habitat in the region has kept them largely off-limits to most fishing, including bottom

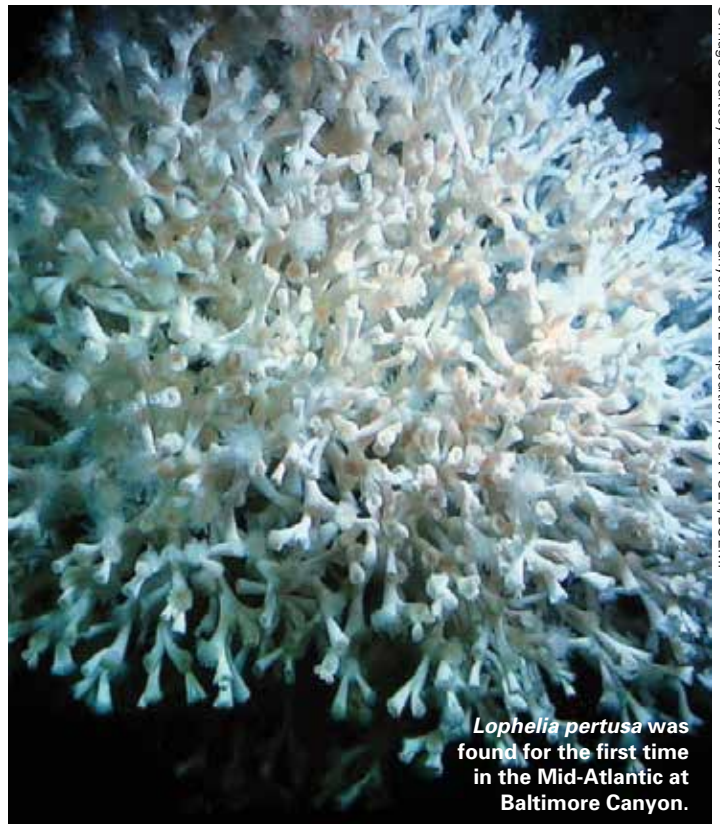
trawling. But as traditional fish species become overfished, markets change, and technology advances, fishing will likely continue to move into deeper waters and more difficult terrain. In recent years, scientists have found fishing gear in many submarine canyons and some damage to coral habitat that appears to be the result of fishing.¹² In the early 1990s, the deep-sea trawl fishery for orange roughy—a formerly unpopular fish that thrived on the seamounts of New Zealand and Australia—developed. In just over a decade, orange roughy populations collapsed, with some schools reduced to less than 10 percent of their original size. Their fragile deep-sea habitat had been devastated.¹³ This kind of rapid development of new fisheries can happen anywhere. For example, monkfish were previously just caught incidentally in this region in the scallop and groundfish fisheries. In the 1980s and 1990s, however, monkfish exploded as a fishery when demand for their tails and livers shot up in Europe and Asia.¹⁴

HOW WILL THE DEEP SEA CORALS AMENDMENT HELP TO PROTECT THE MID-ATLANTIC'S DEEP-SEA CORAL COMMUNITIES?

The Deep Sea Corals Amendment could implement important protections for coral communities in the Mid-Atlantic's canyons and seamounts. The Mid-Atlantic Fishery Management Council is considering designating “discrete” and “broad” deep-sea coral protection zones. The discrete zones would encompass the canyons and adjacent areas that are known or considered highly likely by scientists to contain deep-sea coral communities. The broad zone(s) would encompass other deep sea areas in which coral communities are likely or possibly present and where significant fishing activity is not yet occurring. Restrictions on harmful gear would be put in place in each type of zone. The Deep Sea Corals Amendment comes at the perfect time: bottom trawling and other harmful fishing practices do not yet generally occur in the areas considered for protection, so we can proactively enact protective measures.

HOW CAN I HELP PROTECT DEEP-SEA CORALS?

Mid-Atlantic citizens have the opportunity to help protect these ocean oases. The Council is asking the public to weigh in on the best ways to preserve deep-sea corals. Public hearings will be held in late fall 2014 to discuss the Council's proposed protections. The Council will also solicit written comments. Visit www.mafmc.org to find the public hearing nearest you and the address for written comments. Make your voice heard in protecting these habitat gems.



© Image courtesy of Deepwater Canyons 2012 Expedition, NOAA-OER/BOEM.



© Images courtesy of Deepwater Canyons 2013 Expedition, NOAA-OER/BOEM/USGS.



Endnotes

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