

# OCEAN FACTS



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## Deep Sea Treasures: Protecting Our Atlantic Submarine Canyons and Seamounts

The undersea canyons and seamounts off the U.S. Atlantic coast are home to an extraordinary universe of life, from a living seafloor of vibrant and rare coldwater corals, anemones and sponges, to an array of fish and marine mammal species, including the endangered sperm whale. Relatively undisturbed for thousands of years, these ocean oases are now in danger of irreversible damage from advanced fishing technologies and oil and gas exploration.

Off the Atlantic coast of the United States, starting just north of Cape Hatteras, North Carolina, and running up past Cape Cod, Massachusetts, a series of undersea or submarine canyons cut into the continental shelf. They plummet down thousands of feet, over clay and stone cliffs before reaching the deep ocean bottom. Off the northern end of the canyons' range, four massive underground seamounts rise thousands of feet off the ocean floor, as part of a chain of extinct drowned volcanoes that stretches down to Bermuda.

With fast flowing currents carrying in microscopic food and moving out waste, and the solid undersea walls providing a hard substrate foundation for corals and other bottom dwelling species, the Atlantic seamounts and canyons are ocean oases. They provide foraging, breeding, and nursery habitats for hundreds of fish and crustacean species, including monkfish, various species of flounder, hakes and skates, and American lobster and red crab, alongside less known species as the cod-like grenadiers and



For more information, please contact:

**Alison Chase**, *Natural Resources Defense Council*, (212) 727-4551, [achase@nrdc.org](mailto:achase@nrdc.org)

**Maureen Dolan Murphy**, *Citizens Campaign for the Environment*, (516) 390-7150, [mmurphy@citizenscampaign.org](mailto:mmurphy@citizenscampaign.org)

**Greg Cunningham**, *Conservation Law Foundation*, (207) 210-6439, [gcunningham@clf.org](mailto:gcunningham@clf.org)

**Gib Brogan**, *Oceana*, (508) 545-0942, [gbrogan@oceana.org](mailto:gbrogan@oceana.org)

**Merry Camhi**, *Wildlife Conservation Society, New York Aquarium*, (631) 581-9011, [mcamhi@wcs.org](mailto:mcamhi@wcs.org)



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the bioluminescent lanternfish. Swordfish, tuna, and sharks traverse the canyons. Tilefish and other animals construct burrows in the clay canyon walls, giving them the appearance of miniature, underwater versions of the pueblo villages of the American Southwest. Endangered sperm whales, beaked whales, dolphins, and other marine mammals come to these areas to feed.

More than 200 species of invertebrates have been identified in the Atlantic submarine canyons and seamounts, including dozens of species of stony corals, black corals, soft corals, sea pens, anemones, and sponges.<sup>1</sup> Even as such deep sea coral ecosystems dwindle around the world, here you can find colonies of *Lophelia* corals hundreds of years old, blankets of rare vivid white anemones, and forests of fan-like gorgonians the size of small trees and the color of bubblegum.<sup>2</sup>

Humans share in the bounty. Commercial fishermen troll the waters around the canyons for squid, mackerel, summer flounder, and hake, among others. The closer canyons are visited by adventurous recreational fishermen seeking marlin, tuna, and other trophy gamefish. The types of coral and sponge communities in the canyons and seamounts have yielded scientific and technological advances, including compounds for cancer treatments, models for artificial synthesis of human bone, and elements for constructing more durable optic cables.<sup>3</sup>



## DID YOU KNOW?

- The Hudson Canyon off the New Jersey and New York coasts is one of the largest underwater canyons in the world and nearly as big as the Grand Canyon.
- The sperm whale has the largest brain of any animal—averaging 17 pounds in adult males—is the deepest diver of the great whales, and can eat up to a ton of squid and fish a day.<sup>4</sup>
- Unlike their shallow water tropical cousins, deep sea corals do not need sunlight to survive.
- Investigations of the seamounts to date have turned up more than a dozen new species and many more that are rare to the region.<sup>5</sup>
- A study of New Zealand seamounts found that trawled seamounts had only 2 to 3 percent coral coverage compared to 100 percent on untrawled seamounts.<sup>6</sup>
- Field studies have shown that oil concentrations as low as 0.7 parts per billion caused developmental malformations, genetic damage, mortality, decreased size at hatching, and impaired swimming in exposed herring populations.<sup>7</sup>
- Specimens of deep-water black corals have been dated to more than 4,000 years old, making them the oldest known marine organism.<sup>8</sup>

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*According to the National Oceanic and Atmospheric Administration, “Bottom trawling is the largest potential threat to deep coral habitat for several reasons: the area of seafloor contacted per haul is relatively large, the forces on the seafloor from the trawl gear are substantial, and the spatial distribution of bottom trawling is extensive.”<sup>9</sup>*

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## OUT AT SEA, BUT NOT OUT OF HARM’S WAY

The Atlantic canyons and seamounts remain largely unscathed by humans. Because of their depth and ruggedness, they have been out of reach to destructive bottom trawling, a type of fishing using heavily weighted nets to target bottom-dwelling fish, crushing, ripping, and ultimately destroying fragile bottom habitats in the process. So far the oil and gas industry has not been allowed to commercially develop oil resources on the Eastern seaboard.

But that could quickly change. Elsewhere, so-called “canyon buster” and “rock hopper” trawl gear are opening up challenging seascapes to fishermen seeking out new populations or species to catch. These bottom trawl nets can remove in minutes what took nature centuries to build, leaving barren, scarred clay, mud, and rock where rich gardens of corals, sponges, and anemones once thrived.

With the moratoria against oil and gas development in the Atlantic now lifted, full-scale commercial drilling in the canyons is possible. Proposals for oil and gas exploration are already under consideration, threatening the canyons’ sensitive resources. Seismic surveys are used to detect the presence of oil and gas and use high-decibel acoustic energy pulses blasted from ships. Surveys can damage or kill fish and fish larvae and have been implicated in whale beaching and stranding incidents.<sup>10</sup> The auditory assault disrupts and displaces vital behaviors, leaving marine animals unable to locate prey or mates or communicate with each other, and pushing animals out of critical migratory corridors and their nursery, foraging, and breeding habitat.<sup>11</sup>

After the Deepwater Horizon and *Exxon Valdez* disasters, we now all know the widespread ecological devastation that results from a well blow-out or a catastrophic spill. Even small oil spills can kill marine organisms and disrupt marine ecosystems. Marine mammals like dolphins and whales can also inhale oil when they surface to breathe, which causes damage to mucous membranes and airways and can be fatal.<sup>12</sup> Aside from posing a spill risk, each drilled well also generates drilling muds and cuttings, and produces water that contains toxic metals, such as lead, chromium, mercury, and carcinogens like toluene and benzene.<sup>13</sup>

## THE ATLANTIC’S SUBMARINE CANYONS AND SEAMOUNTS NEED OUR PROTECTION

We have a unique opportunity now to protect the rich and vulnerable resources of the Atlantic canyons and seamounts before irreversible harm is done. To date, only four of these canyons have been protected from bottom trawling. None of the canyons or seamounts are protected from oil and gas exploration activities. We need to fully protect these special places for the future before it is too late.

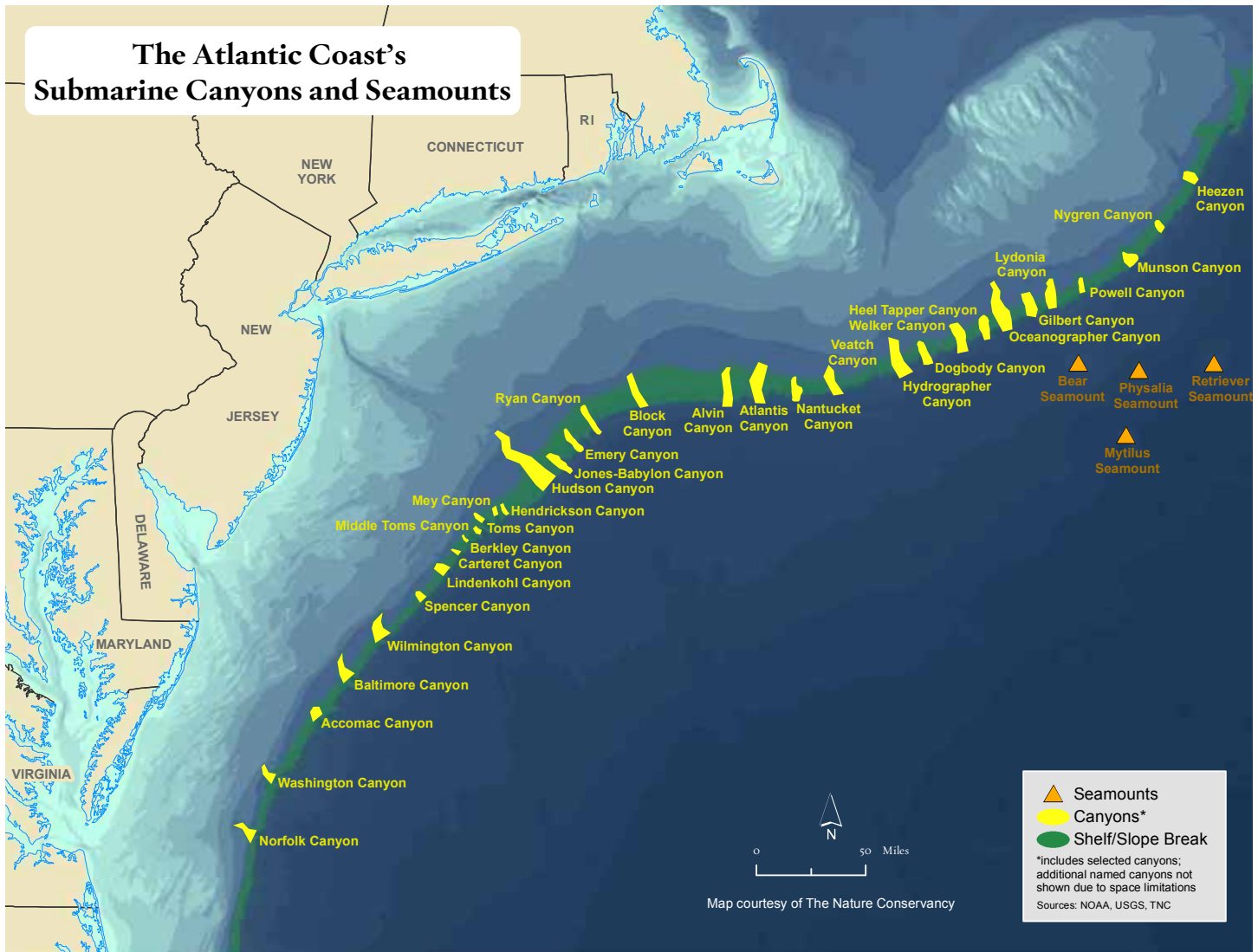


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**Learn more!** “Ocean Oases” is a short NRDC film about the urgent need to protect the precious and mysterious underwater canyons and seamounts of the Atlantic Coast. To view, visit [www.nrdc.org/oceanoases](http://www.nrdc.org/oceanoases).

# The Atlantic Coast's Submarine Canyons and Seamounts



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