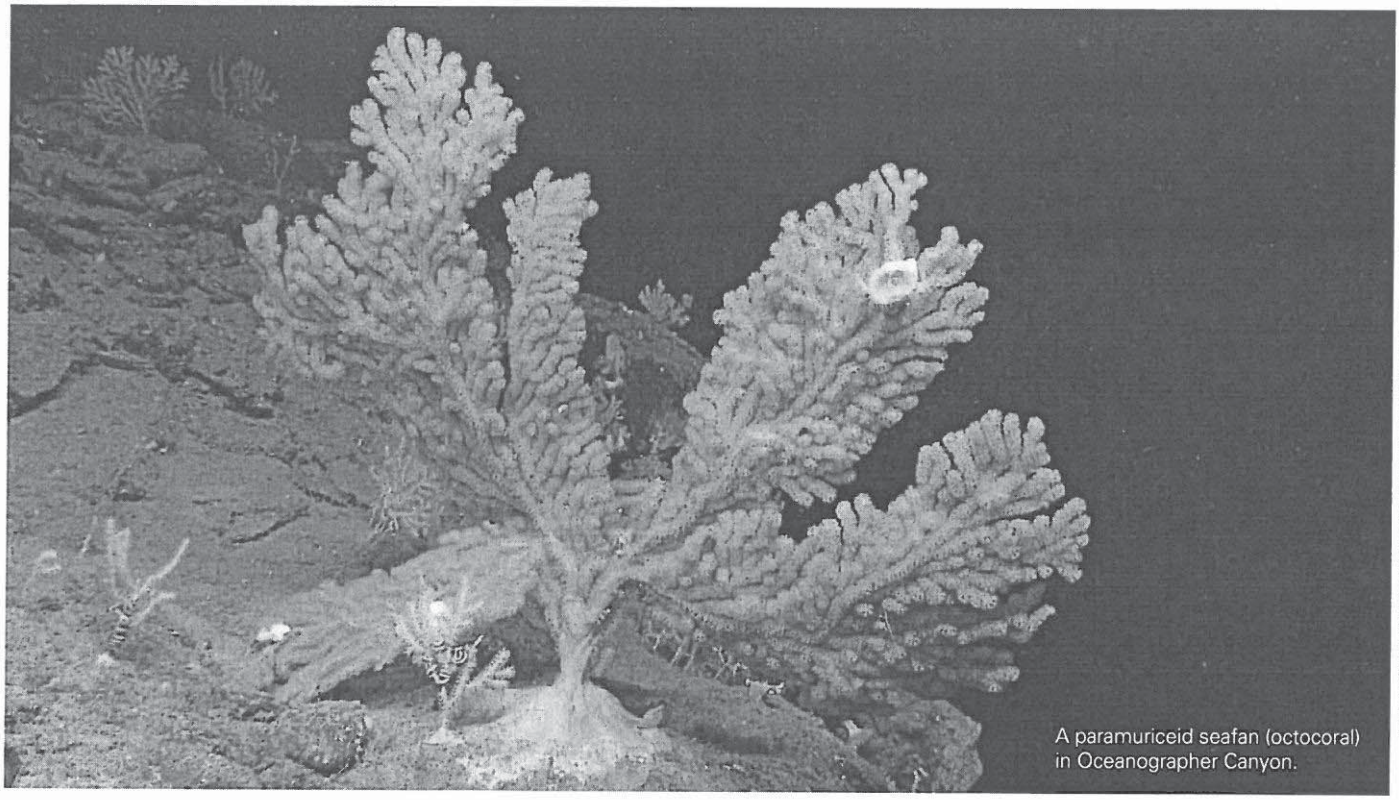
Protecting America's Deep Sea Treasures:
The New England Coral Canyons and Seamounts Area

Five undersea canyons off the southern New England coast and four nearby seamounts are home to a remarkable richness and diversity of ocean life. While their depth and isolation have kept these special ocean places largely pristine and free from human disturbance for millennia, the push to fish, drill, and mine in deeper and deeper waters will soon put these fragile habitats at risk. We must protect these deep sea treasures and avoid irreversible damage to remarkable ecosystems that we are still striving to understand.



A paramuriceid seafan (octocoral) in Oceanographer Canyon.

Image adapted from NOAA Okeanos Explorer Program, 2013 Northeast U.S. Canyons Expedition.

AN OCEAN TREASURE, FROM SURFACE TO SEAFLOOR

Approximately 150 miles off the coast of Cape Cod lie some of our country's greatest marine treasures. Underneath the surface of the sea, where the continental shelf drops into the pitch-black abyss of the deep Atlantic Ocean, five massive canyons plunge thousands of feet, some deeper than the Grand Canyon. Just beyond these canyons, four underwater mountains (or "seamounts")—the only ones in U.S. Atlantic waters—rise as high as 7,000 feet above the ocean floor, higher than any mountain east of the Rockies.

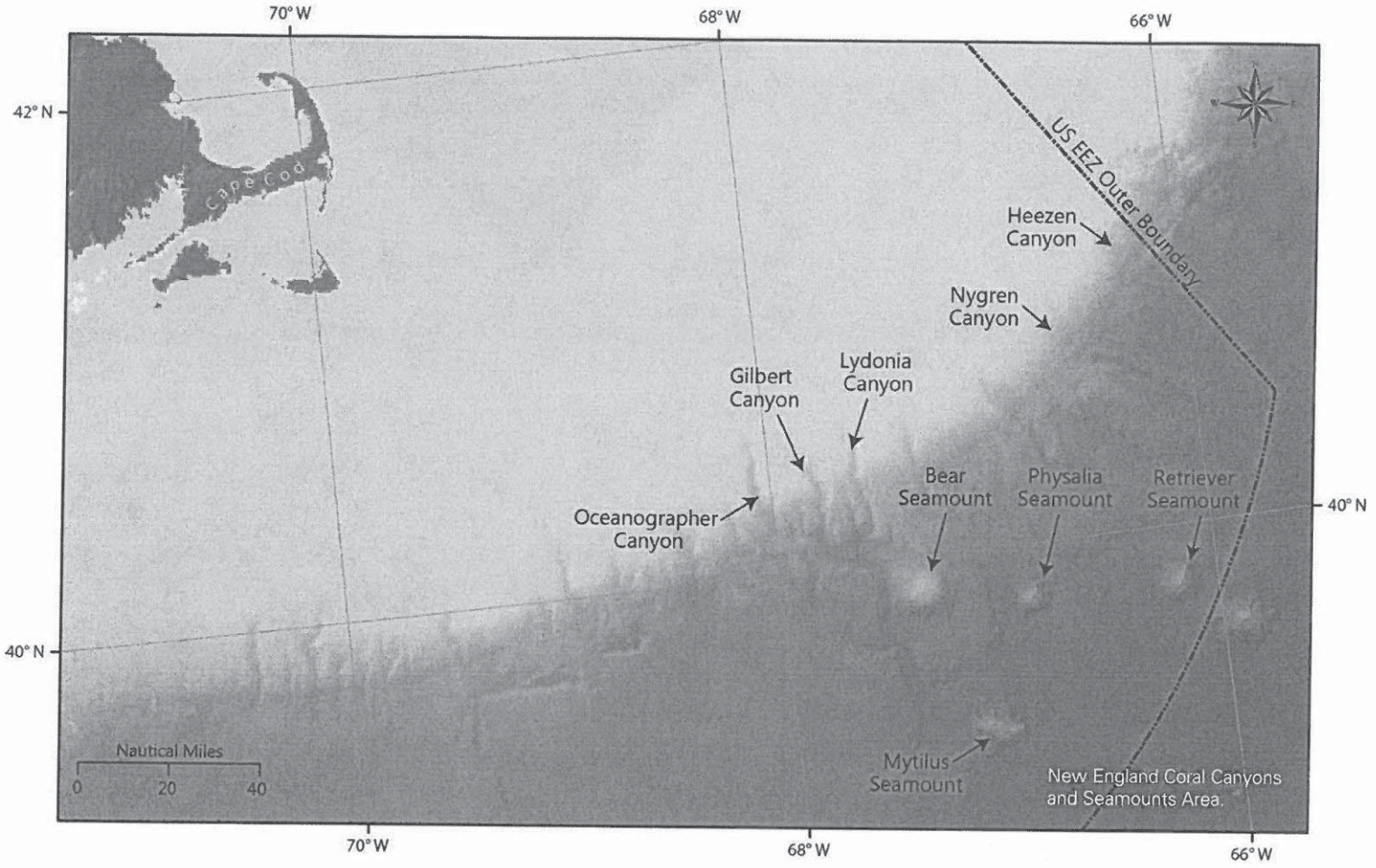
The walls of the canyons (Oceanographer, Gilbert, Lydonia, Nygren, and Heezen) and the slopes and summits of the seamounts (Bear, Physalia, Mytilus, and Retriever) are alive with vivid cold-water corals of otherworldly beauty—some the size of small trees and taking centuries to grow. These coral communities form the foundation of deep-sea

NRDC

clf
conservation law foundation

For more information, please contact:

Brad Sewell
bsewell@nrdc.org
(212) 727-4419
switchboard.nrdc.org/blogs/bsewell



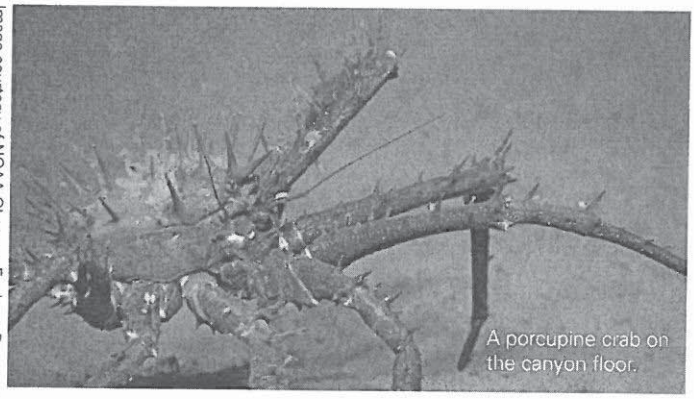


Image courtesy of NOAA Okeanos Explorer Program, 2013 Northeast U.S. Canyons Expedition.

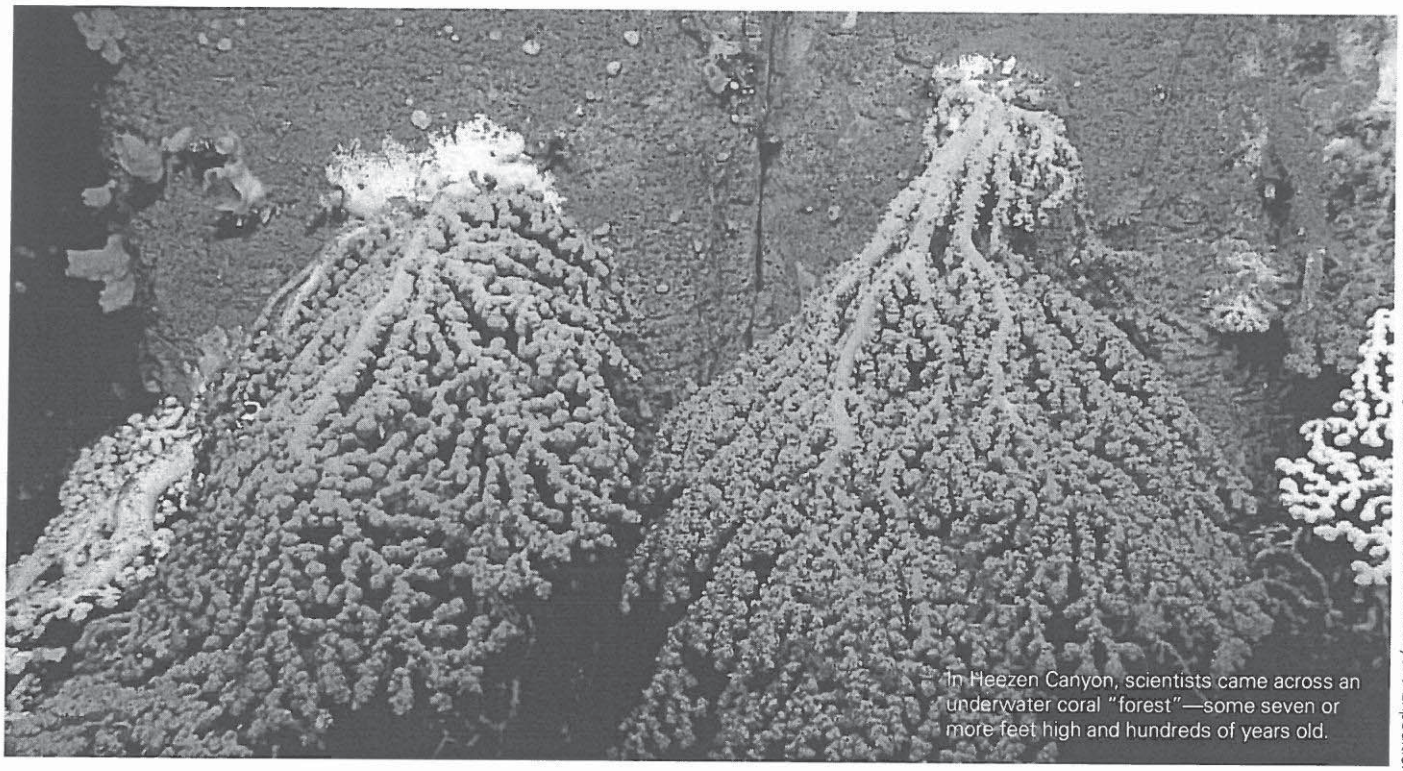
ecosystems, providing food, spawning habitat, and shelter for an array of fish and invertebrate species.

The waters above the canyons and seamounts teem with diverse marine life. More than 320 marine species have been identified in the region's canyons and another 630 on the seamounts,[1] with additional species discovered and described with each exploration. Upwellings of deep, cold water bring nutrients to plankton and schools of squid and forage fish, like mackerel. This concentration of food, in turn, attracts tunas, billfish, sharks, seabirds, and marine mammals, such as endangered sperm whales that eat up to a ton of squid and fish each day, and the North Atlantic right whale, the rarest of the North Atlantic's great baleen whales.

In recent years, research expeditions to these ocean oases have uncovered new and rare species, yielded new understandings about ecological relationships and the biological diversity in the canyons and on the seamounts, and renewed appreciation of the uniqueness of these deep-sea ecosystems. If protected, these unique examples of our natural heritage and biodiversity will remain living laboratories for years to come.

VULNERABILITY AND THREATS

From the ocean surface down to the base of the tallest seamount, these biological hotspots represent some of the most vulnerable ocean wilderness areas in the United States. These environments are threatened by a variety of human activities, including fishing, oil drilling, deep sea mining, cable-laying, and ocean acidification. Deep-sea organisms are highly vulnerable to human disturbance, with longer lifespans, later sexual maturity, and slower growth rates than their shallow-water counterparts.[2] Deep-sea corals—which are both fragile and extremely slow growing—are particularly vulnerable.[3,4] Any significant disturbance can have devastating consequences, eliminating these fragile deep-sea communities for centuries.



In Heezen Canyon, scientists came across an underwater coral "forest"—some seven or more feet high and hundreds of years old.

Image courtesy of NOAA Okeanos Explorer Program, 2013 Northeast U.S. Canyons Expedition.

Sperm whales.

©Footage Search

Although the ruggedness and depth of the canyons and seamounts have so far largely protected these deep sea coral communities from fishing, this could change as the global hunger for seafood increases and technology evolves. While there is currently no plan for drilling in federal waters off of New England, such activities may be allowed in the future. Even the seismic surveys for detecting oil and gas deposits can disrupt essential behaviors for whales, dolphins, and fish—in some cases over enormous areas of ocean.[5,6] Deep seabed mining poses yet another danger.

The fragile canyon and seamount communities are also threatened by ocean warming and ocean acidification resulting from absorption of increasing levels of carbon dioxide, which makes it more difficult for corals and other invertebrates to produce skeletons and shells. Researchers suggest that the deep-sea coral communities of the canyons and seamounts may be among the marine environments most vulnerable to ocean acidification.[7] Healthy and diverse communities over a range of latitudes and habitats will help maximize the chances that strains resistant to ocean acidification and warming are preserved.

Scientists increasingly find evidence that protected areas will be vital in order for our oceans and their living resources to withstand increasing stressors in the future, including global warming and acidification.

PERMANENT PROTECTION FOR THIS SPECIAL PLACE

New England's coral canyons and seamounts are striking examples of what a healthy ocean should look like. Their ecological integrity makes them important to the broader regional ecosystem, helps support the regional ocean economy, and makes them living laboratories for scientists hoping to learn about the health and function of our oceans.

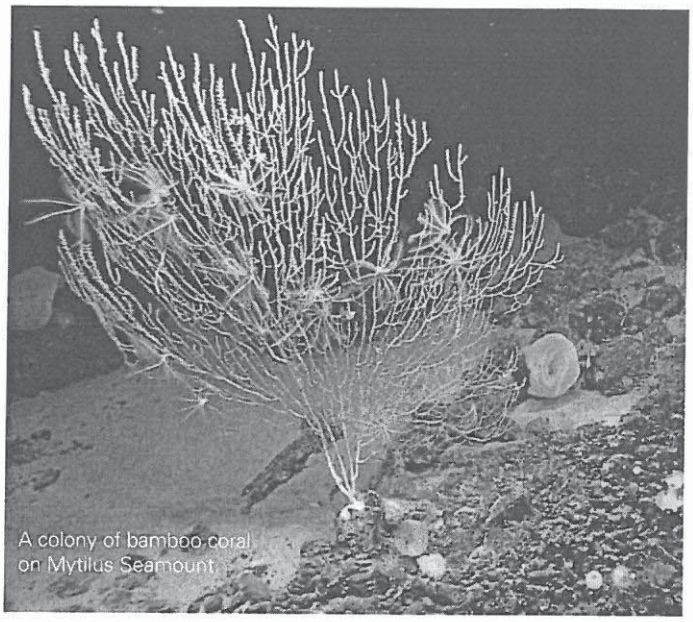
America has a long tradition of protecting our remarkable natural heritage and biological bounty. New England's coral canyons and seamounts are nationally significant deep-sea treasures that deserve long-term protection. We need to act now before irreversible damage is done. Please send a message to your elected representatives that you support permanent protection of the New England coral canyons and seamounts.

About NRDC

The Natural Resources Defense Council (NRDC) is an international nonprofit environmental organization with more than 1.4 million members and online activists. Since 1970, our lawyers, scientists, and other environmental specialists have worked to protect the world's natural resources, public health, and the environment. NRDC has offices in New York City, Washington, D.C., Los Angeles, San Francisco, Chicago, Bozeman, MT, and Beijing. Visit us at www.nrdc.org and follow us on Twitter @NRDC.

About CLF

Conservation Law Foundation's Ocean Conservation program is a leader in ocean conservation, working to create sustainable fisheries, protect special places, manage ocean sprawl, and fight ocean pollution. Using innovative approaches backed by sound science and legal advocacy, CLF aims to protect ocean ecosystems and help our coastal communities thrive. Founded in 1966, CLF is a non-profit, member-supported organization with offices in Maine, Massachusetts, New Hampshire, Rhode Island and Vermont.



A colony of bamboo coral on Mytilus Seamount

Image courtesy of NOAA Okeanos Explorer Program

To view a video compilation from recent NOAA expeditions, please visit http://youtu.be/Hgh0kYH6RSo.

Endnotes

1 Kelly, N.E., et al. "Biodiversity of the Deep-Sea Continental Margin Bordering the Gulf of Maine (NW Atlantic): Relationships among Sub-Regions and to Shelf Systems." *Public Library of Science ONE 5*, no. 11 (November 19, 2010), http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0013832.

2 Morato, T., Cheung, W.W.L., and Pitcher, T.J. "Vulnerability of seamount fish to fishing: fuzzy analysis of life-history attributes." *Journal of Fish Biology* 68, no. 1 (2006): 209–221.

3 Risk, M.J., et al. "Lifespans and growth patterns of two deep-sea corals: *Primnoa resedaeformis* and *Desmophyllum cristagalli.*" Hydrobiologia 471, no. 1-3 (2002): 125–131.

4 Roark, E.B., et al. "Extreme Longevity in proteinaceous deep-sea corals," *Proceedings of the National Academy of Sciences of the United States* 106, no. 13 (March 23, 2009): 5204–5208.

5 Weilgart, L. (ed.) "Report of the workshop on alternative technologies to seismic airgun surveys for oil and gas exploration and their potential for reducing impacts on marine mammals" (presentation, Okeanos – Foundation for the Sea, Monterey, CA, August 31–September 1, 2009, published March 2010), 35, www.okeanos-foundation.org/assets/Uploads/Airgun.pdf.

6 McCauley, R.D., et al. "Marine seismic surveys: analysis and propagation of air-gun signals, and effects of air-gun exposure on humpback whales, sea turtles, fishes, and squid" (Western Australia: Curtin U. of Technology, August 2000), 203.

7 Frey, O.T., and DeVogelaere, A.P. "A Review of Resource Management Strategies for Protection of Seamounts" (Silver Spring, MD: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of National Marine Sanctuaries, 2014), 52, http://sanctuaries.noaa.gov/science/conservation/pdfs/seamount14.pdf.