

# 2018 ASPIRE WHITE PAPER SUBMISSION

## CONTACT INFORMATION

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## WILLING TO ATTEND WORKSHOP?

(Yes/No) Yes

**TARGET NAME(S)** Canyons, Seamounts, Seeps, Deep-Sea Coral and Sponge Habitats/  
Northeast Channel, Northeast Canyons and Seamounts National Marine Monument

## GEOGRAPHIC AREA(S) OF INTEREST WITHIN THE NORTH ATLANTIC OCEAN (Indicate all that apply)

Northwest  North Central  Northeast  
 Southwest  South Central  Southeast

## RELEVANT SUBJECT AREA(S) (Indicate all that apply)

Biology  Geology  Chemistry  
 Physical Oceanography  Marine Archaeology  Other

## DESCRIPTION OF TOPIC OR REGION RECOMMENDED FOR EXPLORATION

Submarine canyons are prominent and important features along the Atlantic continental margin. They provide important connections between the shallow continental shelf and the deep sea by creating pathways for land-based sediments, organic matter, and unfortunately, marine debris. The focused water currents and steep walls of submarine canyons make them optimal habitat for deep-sea coral and sponge communities. Generally, canyons are biodiversity hotspots, harboring sensitive marine habitats (e.g., deep-sea coral and sponge communities and chemosynthetic habitats) and a variety of organisms, including commercially, recreationally, and ecologically important species.

Seamounts, like canyons are also highly productive ecosystems. High currents, reduced sedimentation, upwelling of nutrient-rich water, and habitat heterogeneity contribute to seamounts being characterized as biodiversity hotspots as well. Their steep walls provide good substrate for deep-sea corals to anchor onto, which form the basis for thriving ecosystems. Thus, it is not surprising that canyons and seamounts have become a priority for resource managers and scientists.

Prior to an extensive program of fieldwork dedicated to deep-sea coral habitats and submarine canyons off the Northeast Region (2012-2015), limited deep-sea exploration and research had been conducted recently in U.S. waters of the western Atlantic. But as the potential increased for fisheries and exploitation of other resources to move offshore, it became apparent that data gaps needed to be addressed.

Living marine resources have no geopolitical boundaries. It is this sentiment that brought together U.S. and Canadian research teams in 2011. Two successful transboundary missions (2014, 2017) have been conducted to date. Our primary objective was to explore and survey deep-sea coral habitats in submarine canyons off the coast of the Northeast U.S. and Atlantic Canada, as well as several locations in the northern Gulf of Maine.

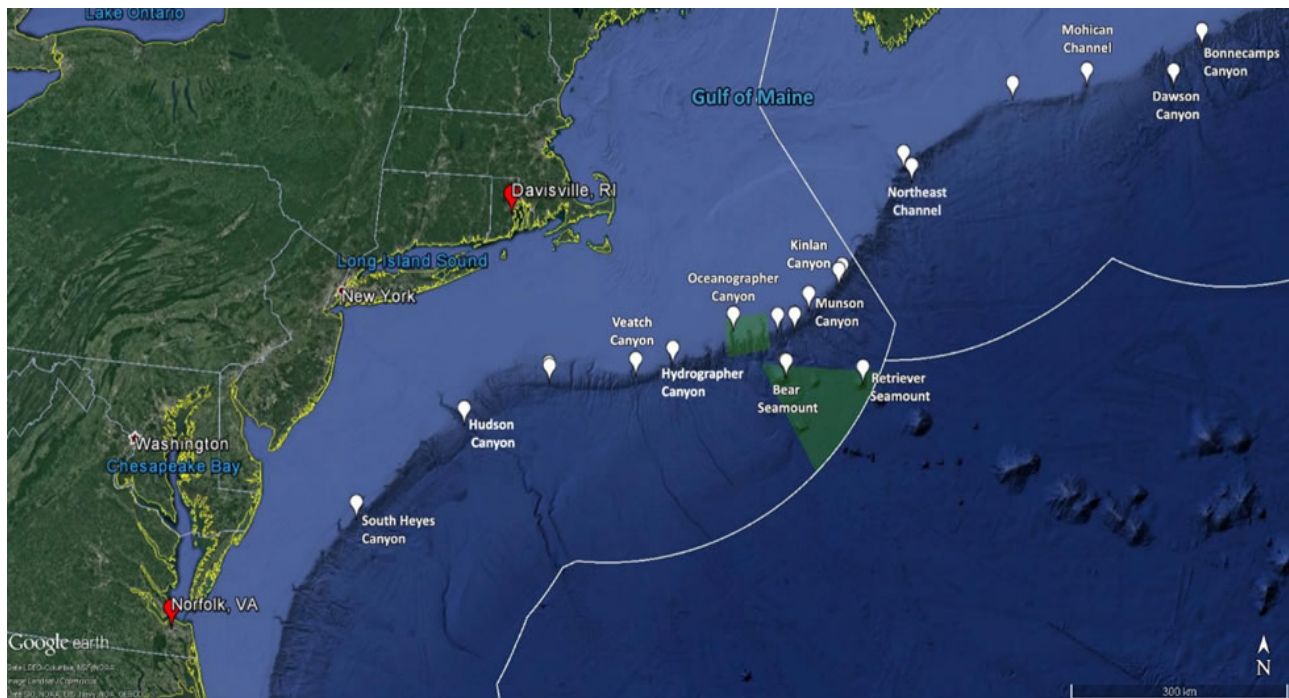
Although these missions were highly successful, data gaps were identified as well as need the to address additional questions such as connectivity between habitats and between regions throughout the North Atlantic. An international team of government and academic scientists, resource managers, and representatives from conservation organizations were solicited for recommendations on priority areas in need of further research. Submarine canyons and seamounts, with a particular emphasis on deep sea coral habitats, were identified as priority targets.

The Northeast Canyons and Seamounts Marine National Monument and the Northeast Channel Coral Conservation Area were identified as the highest priority areas within the region. Additional data are needed to (1) support the designation of these conservation areas and (2) determine if the boundaries currently set for these areas are the most appropriate.

During a series of conference calls, the team selected a number of potential dive targets that would meet the needs of the international community as a whole. Specifically, South Hayes, Hudson, Veatch, Hydrographer, Munson, Kinlan, and several minor canyons in U.S. waters; and Bonnecamps, Dawson, and Mohican canyons in Canadian waters as well as several locations in marine conservation areas on both sides of the border. See figure below.

Previous work suggests that canyons have their own biological and geological signature. But we can't effectively manage and conserve what we don't know. Filling in knowledge gaps provides us the opportunity to better understand species distributions, the processes influencing the structure of these sensitive deep-sea communities, and connectivity between canyons. Further work will help us gain a better understanding of coral diversity, abundance, and distribution; inform habitat suitability models; collect samples for taxonomy, coral aging, and reproduction; refine estimates of coral recruitment; and examine the relationship between biodiversity and ecosystem function. Work proposed here will address science themes and priority areas put forward by scientists and managers from the U.S. and Canada and international working groups supporting the Atlantic Ocean Research Alliance and the European Union's Horizon 2020 program. Given that organisms don't stop at the border and that the western Atlantic is not isolated from the eastern Atlantic, transatlantic cooperation between research initiatives in Europe, Canada, and the United States will provide a better understanding of the North Atlantic as a whole.

RELEVANT PARTNERSHIPS: SponGES, ATLAS, DFO Canada, New England and Mid-Atlantic Fishery Management Councils, Dalhousie University, Memorial University, University of Connecticut, University of Maine, NOAA (NMFS, NOS, Deep Sea Coral Research and Technology Program), USGS.



Overview map showing the proposed survey locations. New England Canyons and Seamounts National Marine Monument is highlighted in green.