

2018 ASPIRE WHITE PAPER SUBMISSION

An ASPIRE mission in Support of Sponge Grounds and Animal Tacking Research I: NW Atlantic Continental Shelf

Contact Information

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Willing to attend the Workshop? Yes (FW)

Target Name(s)

Main Feature(s)/Area(s) of Interest: Continental shelf/slope; sponge grounds; benthic habitats

Geographic Area(s) of Interest within the North Atlantic Ocean (Indicate all that apply)

Northwest Atlantic/ Scotian Shelf

Relevant Subject Area(s) (Indicate all that apply)

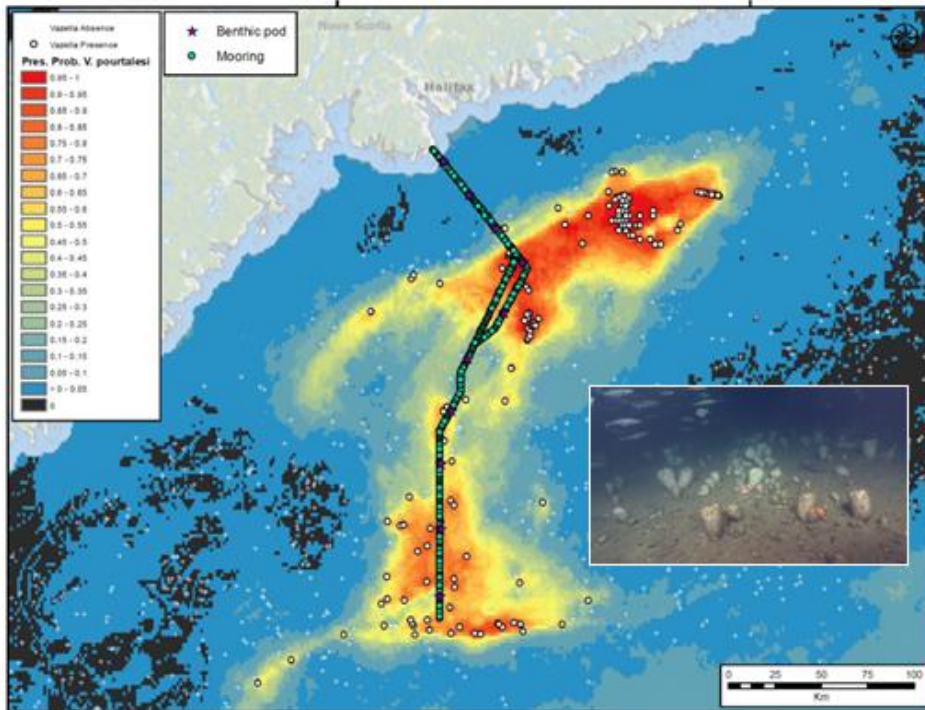
Biology, Geology, Chemistry, Physical Oceanography

Description of Topic or Region Recommended for Exploration

The continental shelf and slope of the Northwest Atlantic Ocean is an area of complex biology, topography, chemistry and ocean currents. The area is the boundary between the southern flowing cold current of the Atlantic Meridional Overturning Circulation (Labrador current) and the Northward driven Gulf stream, and exhibits pronounced season productivity cycles that drive long-distance migration to the area by highly valued marine species (e.g., Bluefin tuna, striped bass, white sharks). The resources of the shelf support the socio-economic well-being of a vast number of North American communities. The shelf off Halifax, Nova Scotia currently hosts major research efforts by two international networks. The Horizon 2020 SponGES program is providing desperately needed information about the biology of poorly known sponges in the Atlantic Ocean, the role of sponge grounds in the ecology and productivity of NW Atlantic ecosystems, and the linkages of the sponge grounds to pelagic and offshore ecosystems (benthic production exported to other food webs, rearing grounds for larvae of other species, carbon sequestration, etc.). The SponGES team from the Bedford Institution of Oceanography hosts the North American node of this project with E. Kenchington as a project so-coordinator. This is a case study area for SponGES (CS7).

Also based in Halifax is the headquarters of the global Ocean Tracking Network (OTN), an international research infrastructure and science network that uses electronic telemetry to document the movements and survival of marine animals, and to link them to environmental conditions in the face of a changing

ocean. Off Halifax, the OTN maintains a line of acoustic receivers that spans from the nearshore across the width of the continental shelf (> 100 nautical miles). This array is documenting the seasonal movements of species from overwinter habitats in southern (US) waters, into northern (Canadian) summer habitats, and providing information on the three dimensional use of the water column by these species. It also passes through important sponge grounds, and the OTN is currently a member of the SponGES consortium supporting the SponGES researchers through providing access to this valuable infrastructure. Our animal telemetry work has shown that a number of species that move into the area become resident along specific portions of the shelf for the spring-autumn period. Yet, we do not understand why these areas are so highly attractive and used by these species.



Location of OTN acoustic receivers (black and green dots) on the Scotian Shelf, in relation to the predicted distribution (red and yellow shading) of a globally unique population of glass sponge, Vazella pourtales (blue and black areas indicate low and zero probability of occurrence respectively). White circles and crosses indicate presence and absence of Vazella in research vessel surveys with the crosses indicating no Vazella. The sponge is currently protected from bottom contact fishing in parts of this range. This is a Case Study Area (CS7) for the SponGES project.

In establishing formal linkages, the research of the SponGES and OTN projects have become mutually supporting in attempting to understand the production and use of shelf areas by both sessile and mobile animals. We are integrating sampling missions and sharing equipment to ensure efficient and sustainable research, however, we lack a detailed description of the habitats within the sponge grounds and along the Halifax electronic telemetry array that could be used to inform our understanding of the ecology of species while they are using these areas, and modelling to predict the presence and or absence of animals in association with environmental conditions.

We propose an ASPIRE mission to help describe the habitats of the continental shelf from the inshore to the continental slope along the path of the Halifax line (average depth 202 m). Through a combination of high resolution mapping at night, and selective ROV dives during the day, quantitative descriptions can be provided of the benthic landscape and habitats that can be compared to the abundance of sponges and the residency patterns of electronically tagged fish to help determine the factors that make this area so important to these species.