Incorporating spatial analyses into conservation and monitoring of deep-sea megafauna in Marine Protected Areas (MPAs)

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1   **Abstract**

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4   Deep-sea ecosystems are being impacted by anthropogenic stressors, such as trawling

5   and oil-gas exploration. Protection of these ecosystems is delayed by limited

6   understanding of spatial distribution, suitable habitat, species associations, and

7   recruitment. Imagery was analyzed from the Laurentian Channel AOI and 3 canyons

8   (Corsair, Georges, Fiddlers Cove) on the western Scotian Slope in the Northwest

9   Atlantic Ocean. We used two sampling designs, exploratory linear transects and a

10   systematic-cluster transect array and will compare the information that can be extracted

11   from each method. Megaepifaunal biodiversity, abundance, and species-species

12   associations were identified at each site. For example, at Fiddlers Cove, different types

13   of Gorgonian corals (e.g. *Acanella, Desmophyllum*, and stoloniferous coral), soft corals,

14   and sponges occurred mainly on outcrops; sea pens and anemones, along with large

15   colonies of *Paragorgia arborea* were present in Corsair Canyon; and several Gorgonian

16   corals, anemones, lobsters, and Holothuroidea were present in Georges Canyon. We

17   will use spatial analyses to measure spatial structure at local and regional scales,

18   identify species-environment associations, and predict suitable habitat for deep-sea

19   megaepifauna. Overall, the study will provide a broader understanding of deep-sea

20   megaepifaunal ecosystems, and develop recommendations for a deep-sea MPA

21   monitoring framework to achieve effective conservation that promotes biodiversity.