

Monitoring biodiversity in offshore marine protected areas: A habitat mapping approach

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A core objective of marine protected areas (MPA) is to conserve regions of high biodiversity. Establishing biodiversity baselines – e.g. local species richness and community structure – is necessary to monitor change within MPAs, but such knowledge is often lacking in offshore marine ecosystems. Here, we focus on the benthos and demonstrate how explicitly incorporating the distribution of seabed habitats through a habitat mapping approach can assist in establishing biodiversity baselines and monitoring strategies in large offshore MPAs. Two areas in temperate Atlantic Canadian waters with contrasting levels of benthic habitat diversity were considered: the St. Anns Bank MPA (high habitat diversity) and the Laurentian Channel Area of Interest (low habitat diversity). The distribution of seabed habitats was determined in both areas using high-resolution acoustic data (bathymetry, backscatter), validated with in-situ imagery of the seabed, and coupled with patterns of epibenthic and infaunal communities. Initial results suggest that 1) sampling methodology and efforts to establish biodiversity baselines are habitat-specific, since accurate species detection is challenging in complex habitats, and 2) the relationship between community structure and the spatial distribution of seabed habitats could help identify target monitoring locations. This work further develops the role of benthic habitat mapping in marine spatial planning.