

## Improving monitoring by understanding the patterns and drivers of biodiversity on Canada's Glass Sponge Reefs

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Glass sponge reefs, built by up to three species of dictyonine hexactinellid sponges, are hotspots of biodiversity that are unique to the waters of the Pacific continental shelf. Since 2012 we have surveyed the biological community on 21 sponge reefs from the Strait of Georgia to Chatham Sound, British Columbia. Here we present patterns of biodiversity found on glass sponge reefs and associations between common reef-dwelling organisms and sponge reef habitat categories: no visible reef, dead reef, mixed reef, live reef, and dense live reef. Further we share our findings regarding energy flow through the reef community and the implications for the maintenance of biodiversity in this system. We discuss how our findings inform monitoring in the new Hecate Strait and Queen Charlotte Sound Glass Sponge Reefs Marine Protected Areas and the many other conservation-based fishing closures centered on sponge reefs. Finally, we show how this research has led to the development of novel monitoring methods, namely the application of passive acoustic monitoring on the sponge reef ecosystem.

**Keywords:** Sponge Reefs, Monitoring, Passive Acoustics, Food webs

**Short Description:** Studying patterns and drivers of biodiversity on glass sponge reefs guided the application of novel monitoring methods