WHAT'S HIDING ON SVALBARD'S SEAFLOOR?

DISTRIBUTION OF VULNERABLE MARINE BENTHIC COMMUNITIES AROUND SVALBARD

Sanna T. Breien, Thea S. Dannevig, Miles D. Gjerde, Emma S. Karlsen, Magnus Kjørstad & Malin Reksten

Geographic distribution of benthic communities

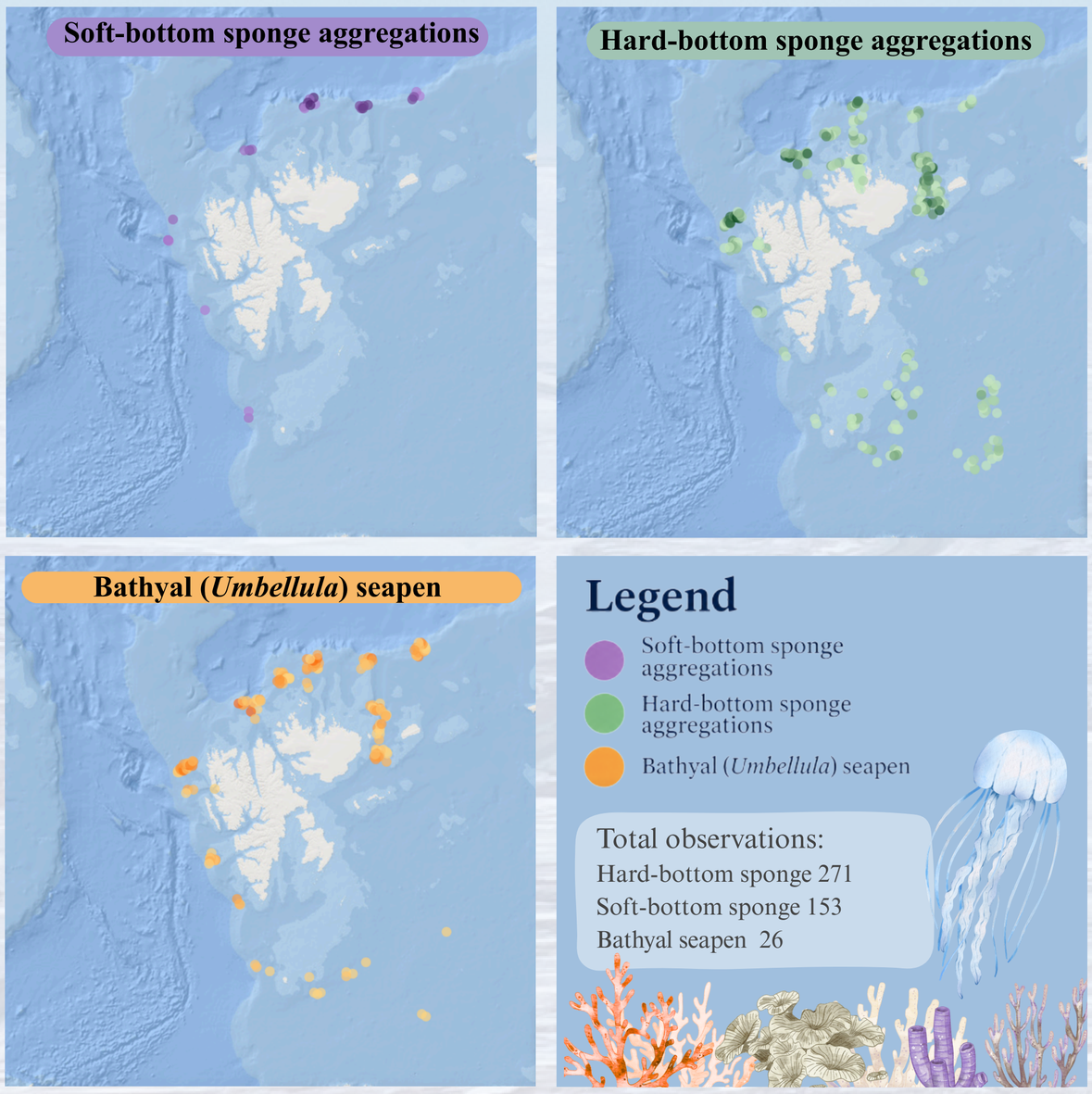


Figure 1: Geographic distribution of observed vulnerable benthic communities around Svalbard, based on data from MAREANO[1].

Oceanographic conditions around Svalbard

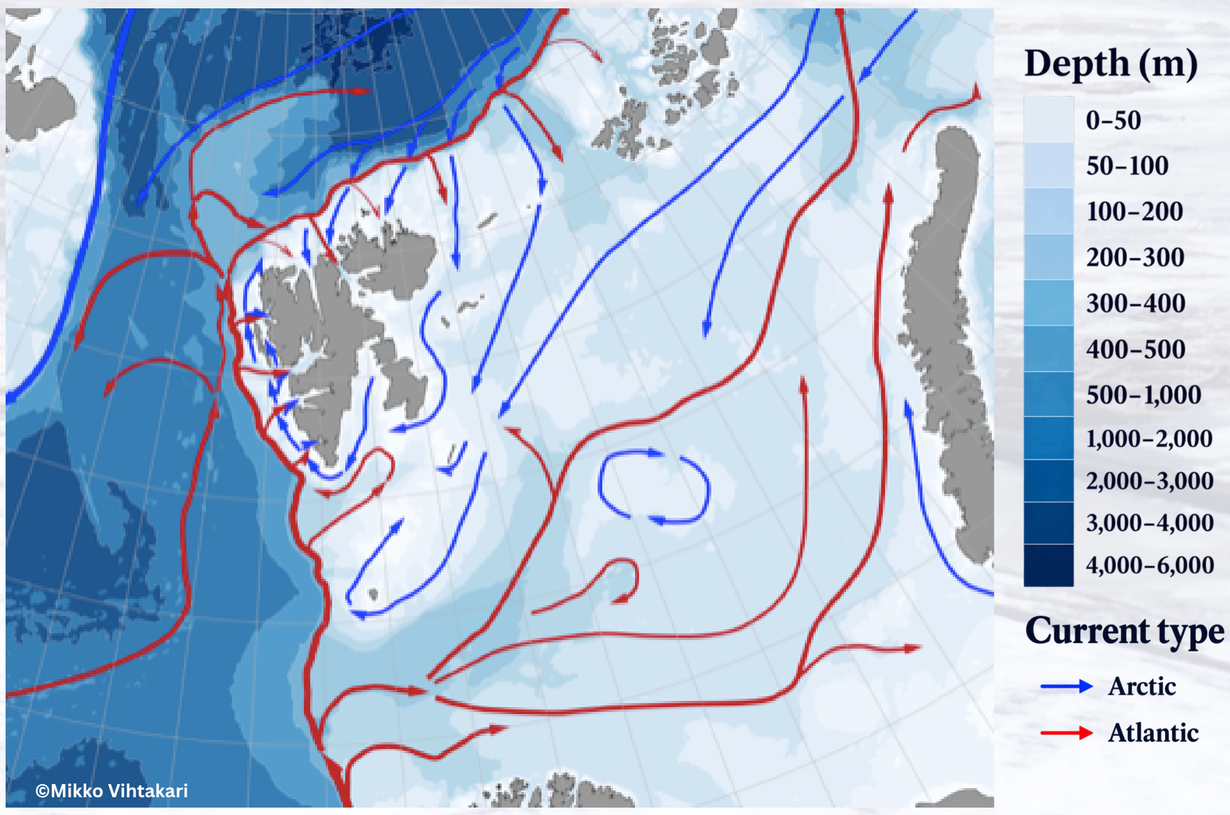


Figure 2: Ocean depth and major ocean current patterns around Svalbard. Blue shading indicates ocean depth in metres, while red and blue arrows represent Atlantic and Arctic currents, respectively. The map was created using code from PlotSvalbard[4].

Observed benthic communities



Soft-bottom sponge aggregations

Concentrations of a variety of large sponge species. These sponges are able to modify their environment by creating a thick mat of mud and spicules: small, needle-shaped skeleton structures made of silica, which characterises the community type[2].



Hard-bottom sponge aggregations

These are communities that are dominated by medium sized sponges, typically fan-shaped or branching. They form aggregations on different hard seabed substrates like coarse gravel, cobbles, boulders and bedrock[2].



Bathyal (*Umbellula*) seapen

Umbellula seapen communities are found in patches in the deep sea in relatively high densities from half way down the continental slope and deeper. This large seapen can reach a height of more than two metres[2].

Objective

The aim of this study was to map and visualise the geographical distribution of vulnerable benthic communities around Svalbard in relation to seafloor topography and ocean currents. The study also aims to highlight the ecological importance of these communities for marine biodiversity and raise awareness of potential threats to their survival.

Data and method

Data from MAREANO (2006–2024) were obtained through the Ocean Data Platform. Records from the waters surrounding Svalbard were selected for analysis. The *indicatorVME* variable was used to classify vulnerable benthic community indicators, and their geographical distribution was visualised using R in RStudio. Claude (Anthropic) assisted in developing the R script used for data processing and mapping.

Discussion and conclusion

The distribution of vulnerable benthic communities along Svalbard's topography and ocean currents appears to follow a pattern (figures 1 and 2). Ocean currents help transport food particles to filter-feeding organisms. Changes in ocean current strength could affect food availability, potentially threatening vulnerable communities. Atlantic and Arctic waters meet around Svalbard, supporting both Arctic and boreal species. Sponges, corals and other benthic organisms contribute to habitat complexity and biodiversity[5].

The observed patterns suggest that depth, substrate type and ocean currents influence benthic community distribution by affecting habitat suitability and food availability.

213.10

Litterature

1. **HUB Ocean.** *MAREANO- Vunerable Marine Species Point Observations.* Ocean Data Platform.
2. **MAREANO**. *Vulnerable biotopes maps*. mareano.no https://www.mareano.no/en/topics/habitats/vulnerable-biotope-maps
3. **Havforskningsinstituttet:** Mediearkiv, https://hi.imageshop.no/1636899/Detail/Index/8626121
4. **Vihtakari, M.** Mikko Vihtakari (2020). PlotSvalbard: PlotSvalbard - Plot research, data from Svalbard on maps. R package version 0.9.2., https://github.com/MikkoVihtakari/PlotSvalbard
5. **Havforskningsinstituttet.** (2026). *Særlig verdifulle og sårbare områder (SVO) i norske havområder.* Rapport fra havforskningen 2026-59. https://www.hi.no/hi/nettrapporter/rapport-fra-havforskningen-2026-59