

Assessing biodiversity and trawling impacts of an experimental fishery in Melville Bay, West Greenland

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ZSL
INSTITUTE OF
ZOOLOGY



Sustainable Fisheries
Greenland



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Fishery is the most important economy for Greenland

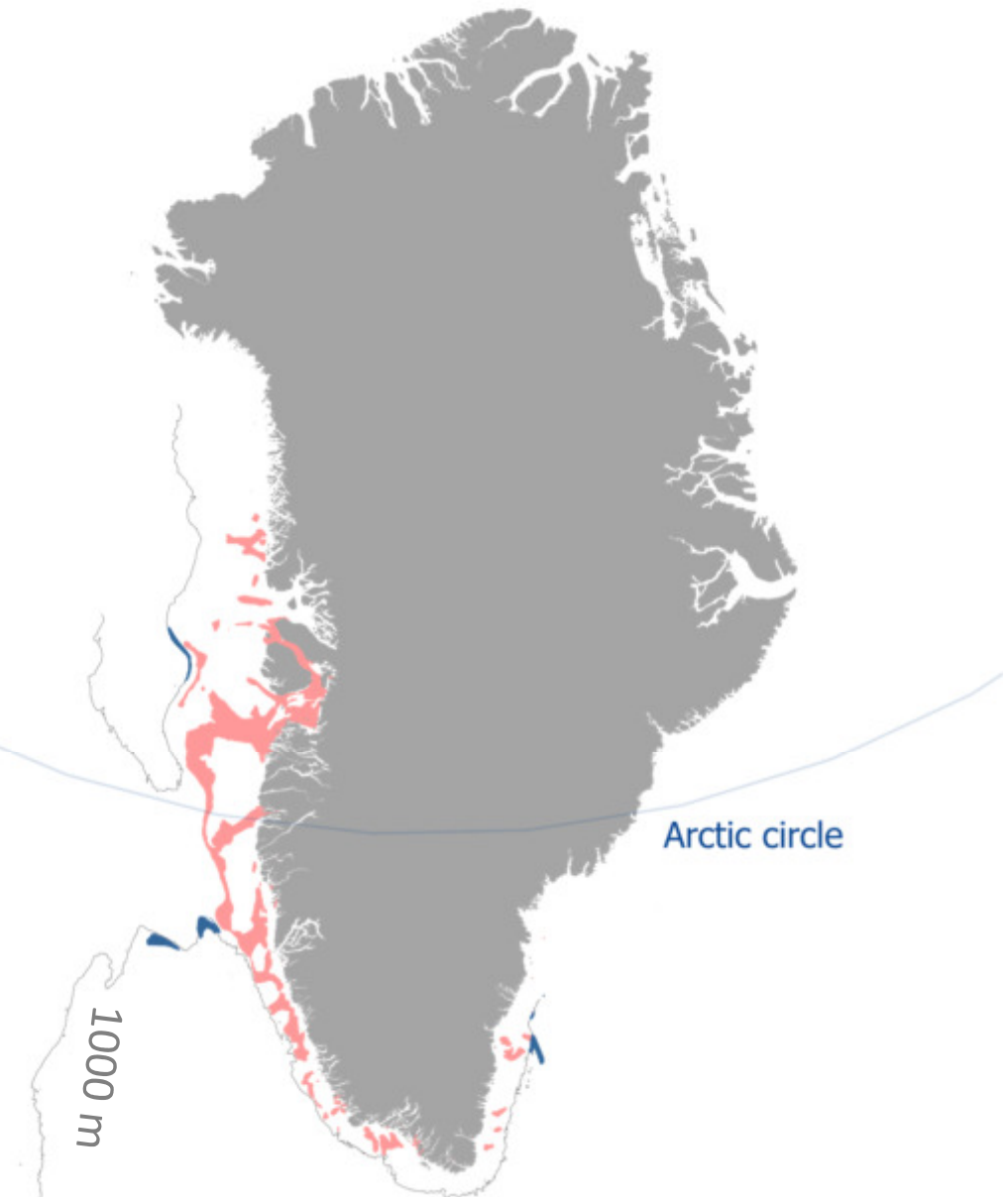


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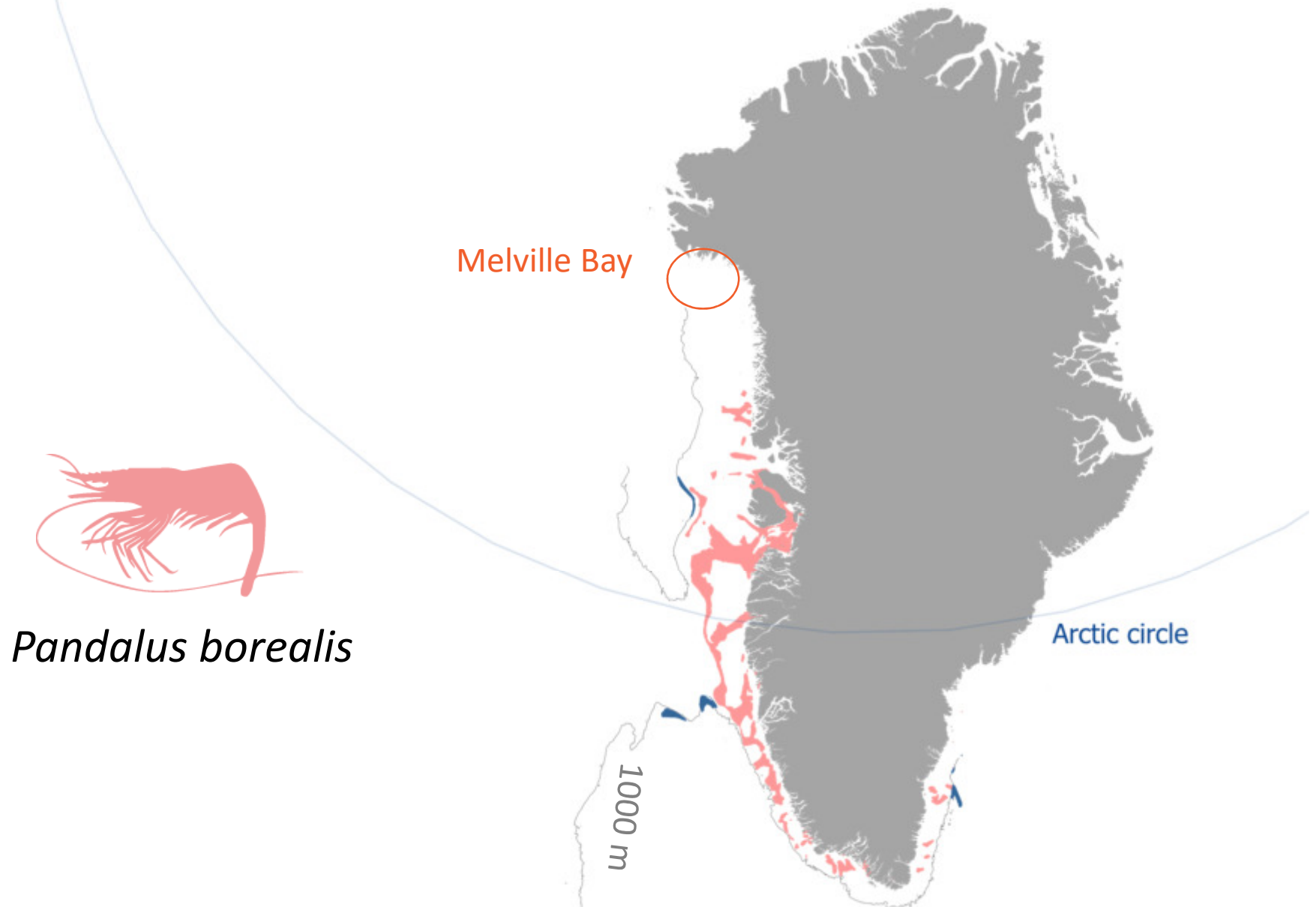
The fishery for Deep-water shrimps takes place at depths from 200 to 500m



Pandalus borealis



Exploratory fishing in took place Melville Bay 2014-2016



Melville Bay



There is a lack of data on the occurrence of VMEs in Greenland



Trawling is one of the major stressors on benthic biodiversity in west Greenland



58 sites in Melville bay were surveyed by camera

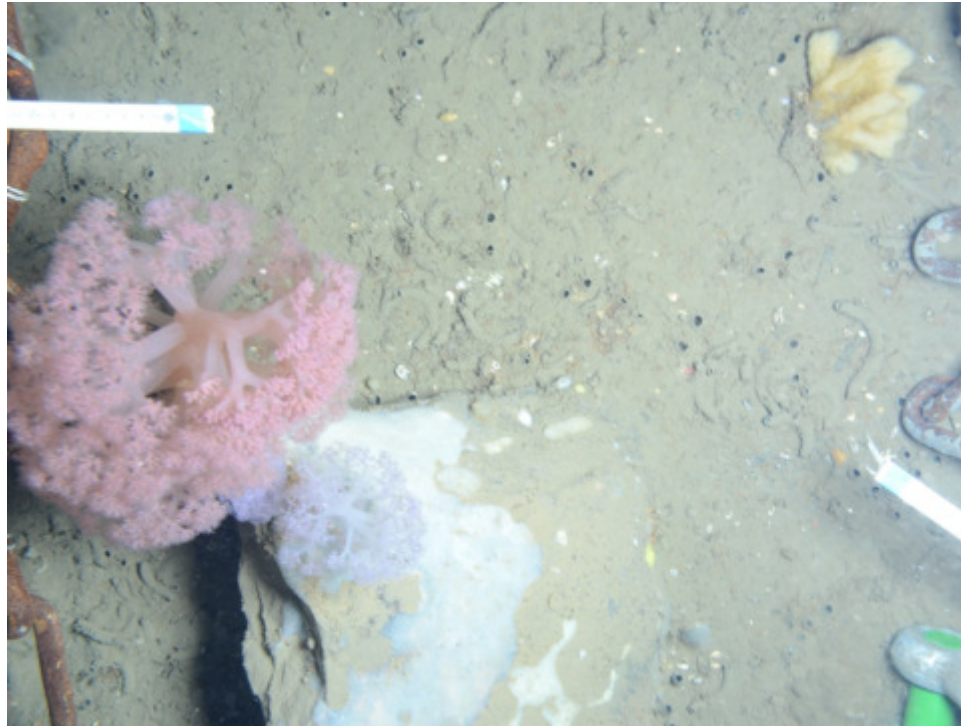
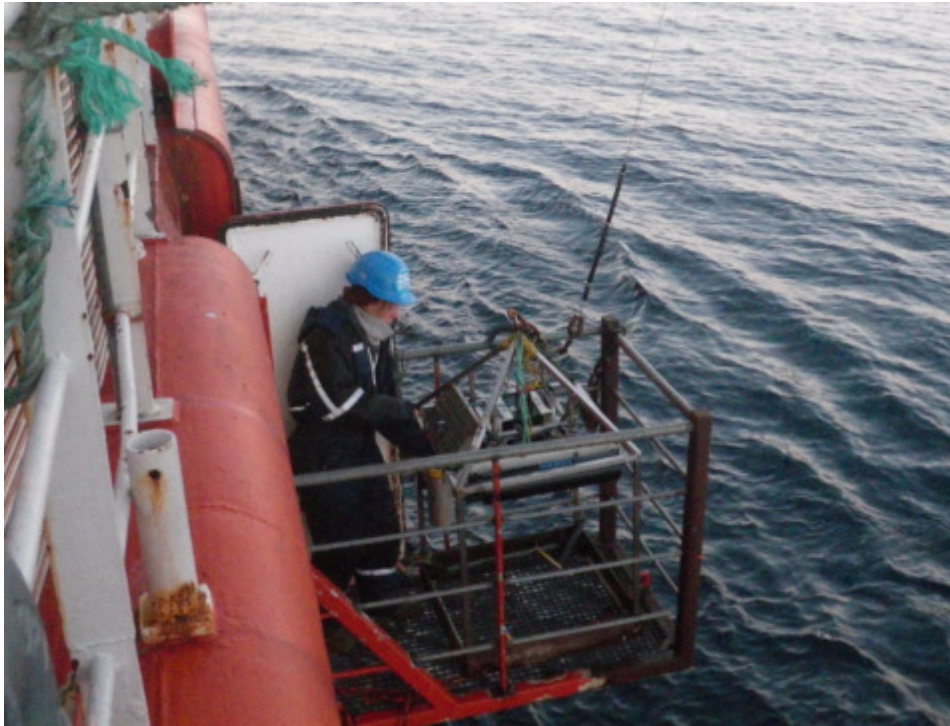
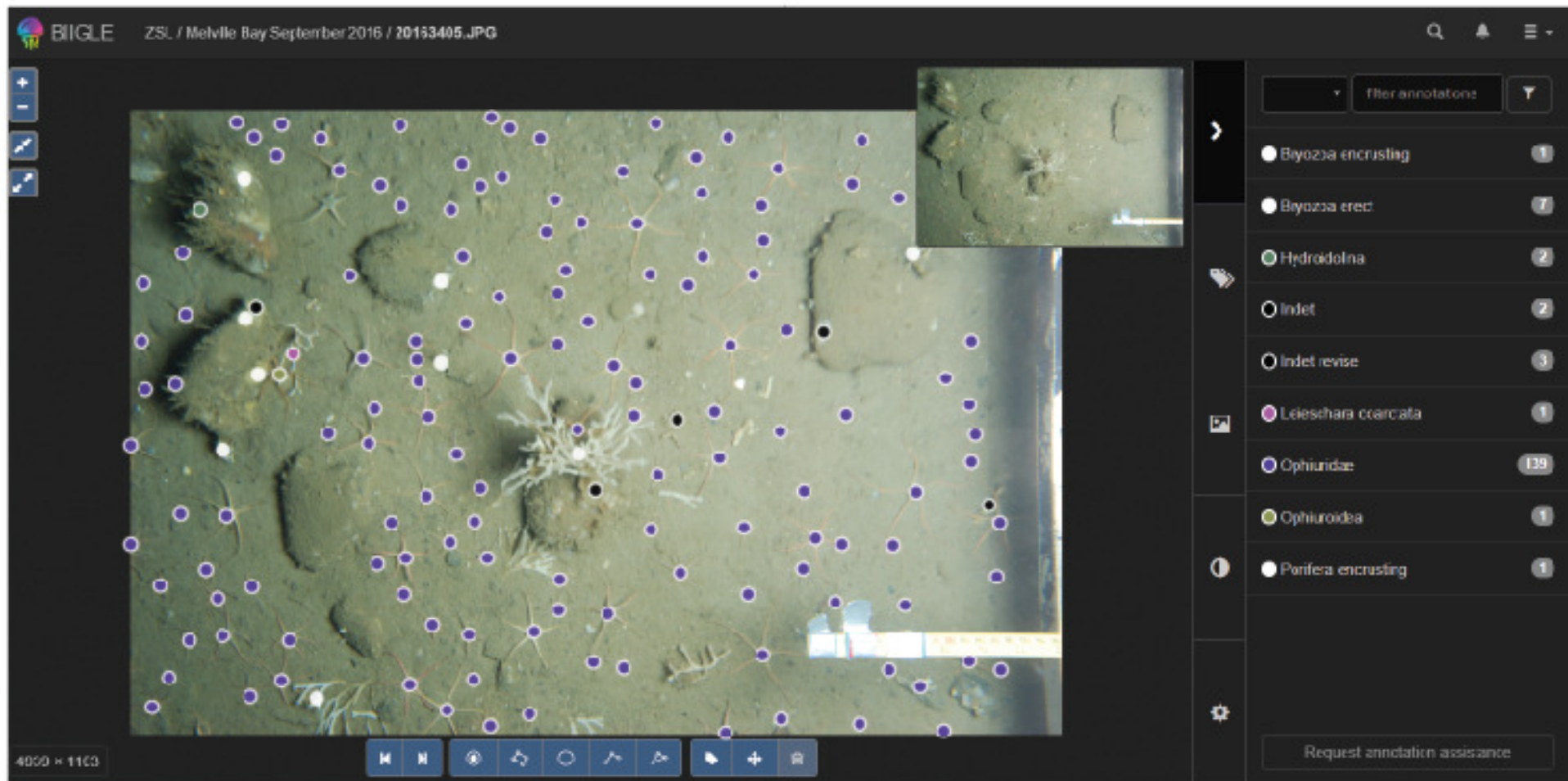


Image analysis yields data on abundances of epifaunal organisms

BIIGLE ZSL / Melville Bay September 2016 / 20163405.JPG



The screenshot displays the BIIGLE software interface. The main window shows a photograph of a seabed with numerous purple bounding boxes around various epifaunal organisms. A right-hand panel lists the following categories and counts:

Category	Count
Bryozoa encrusting	1
Bryozoa erect	7
Hydroidina	2
Indet	2
Indet revise	3
Lelethara coarctata	1
Ophiuridae	139
Ophiuroidea	1
Porifera encrusting	1

4000 x 1100

Comparison of imagery to benthic beam trawl samples and bycatch obtains biomass and captures rare species

INAMon (Initiating North Atlantic Benthos Monitoring Program)



Beamtrawls

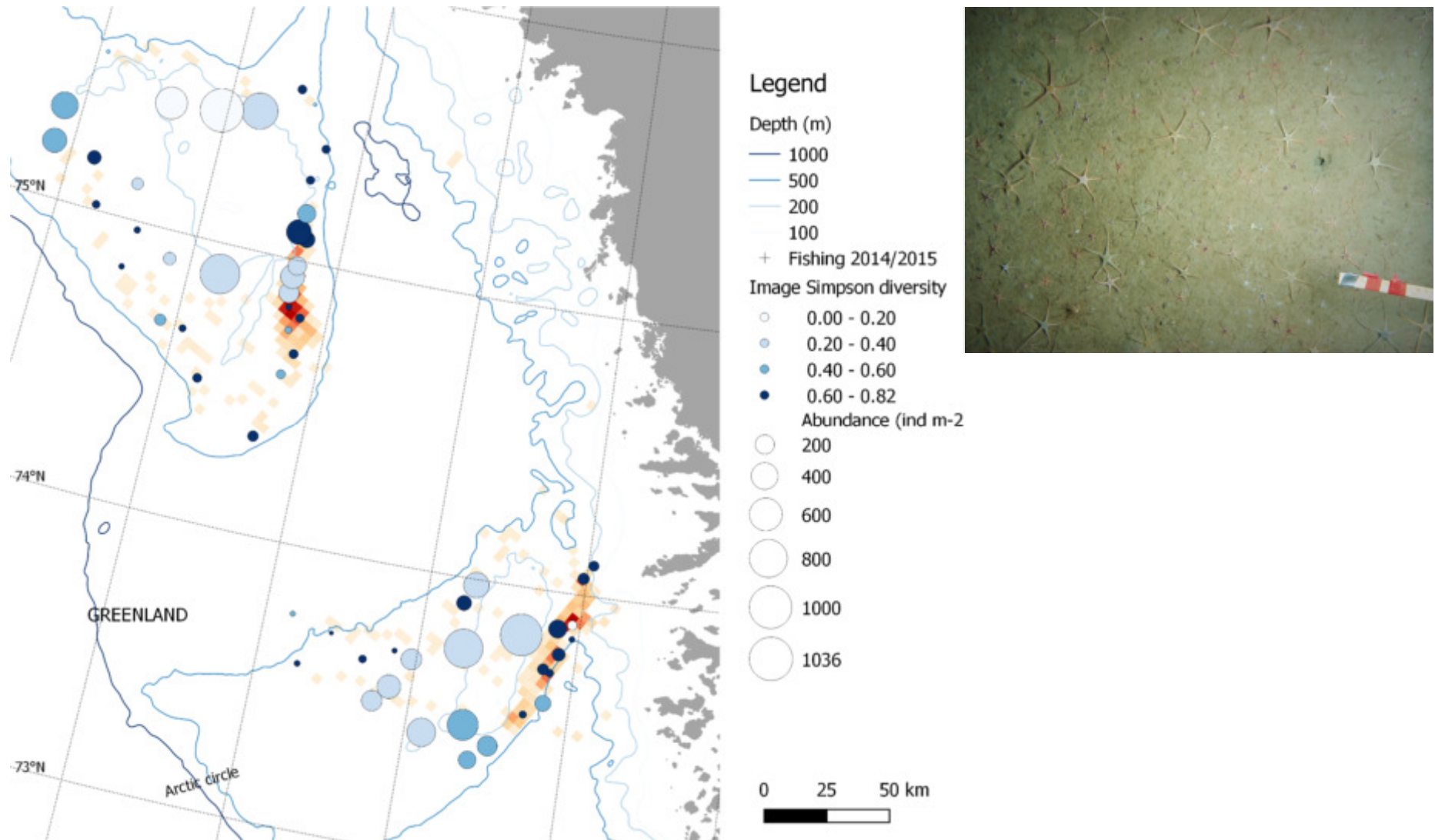


Bycatch from shrimp trawls

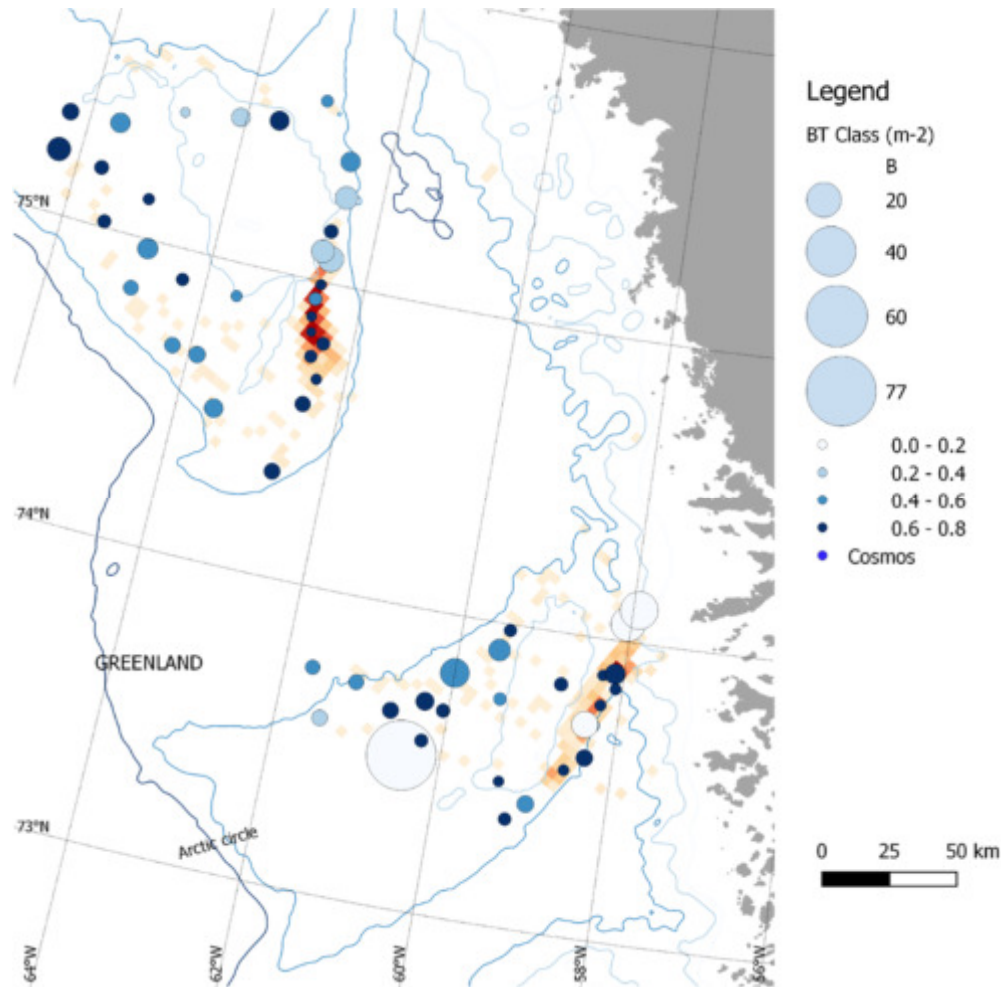
Preliminary results show higher abundances and diversity than further south along the coast



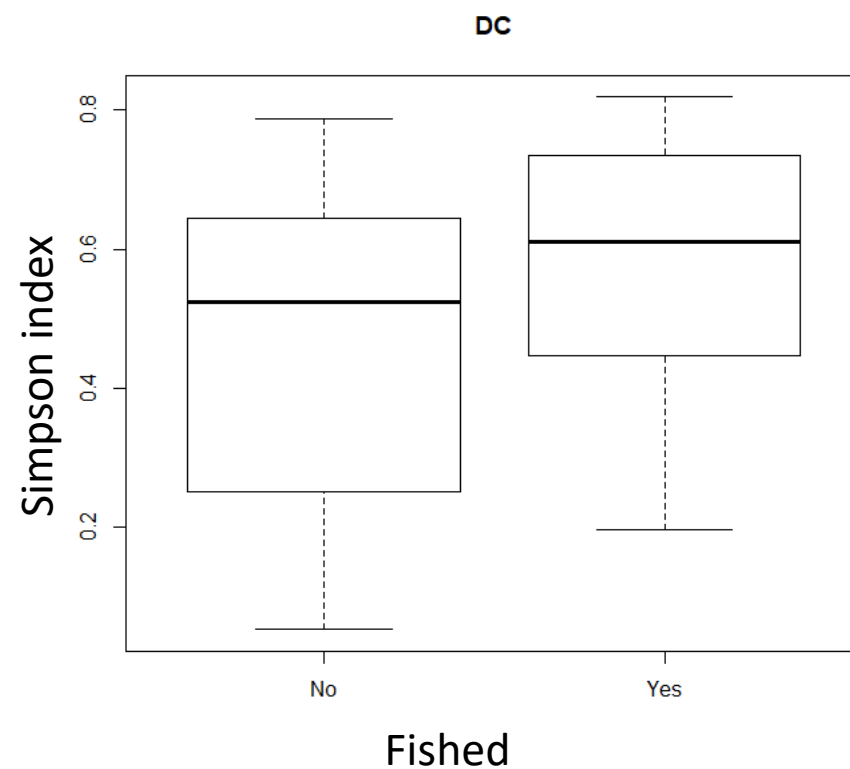
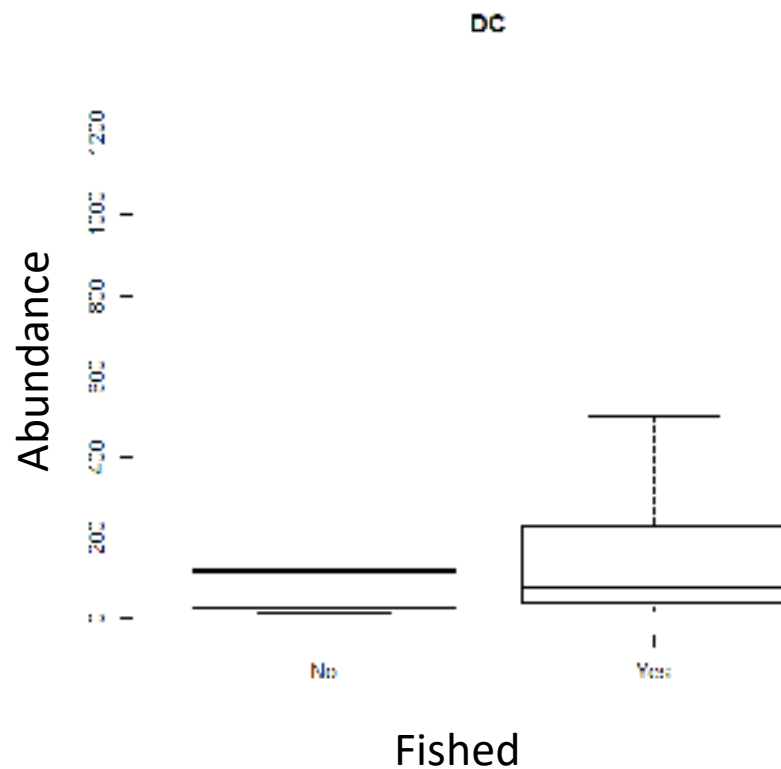
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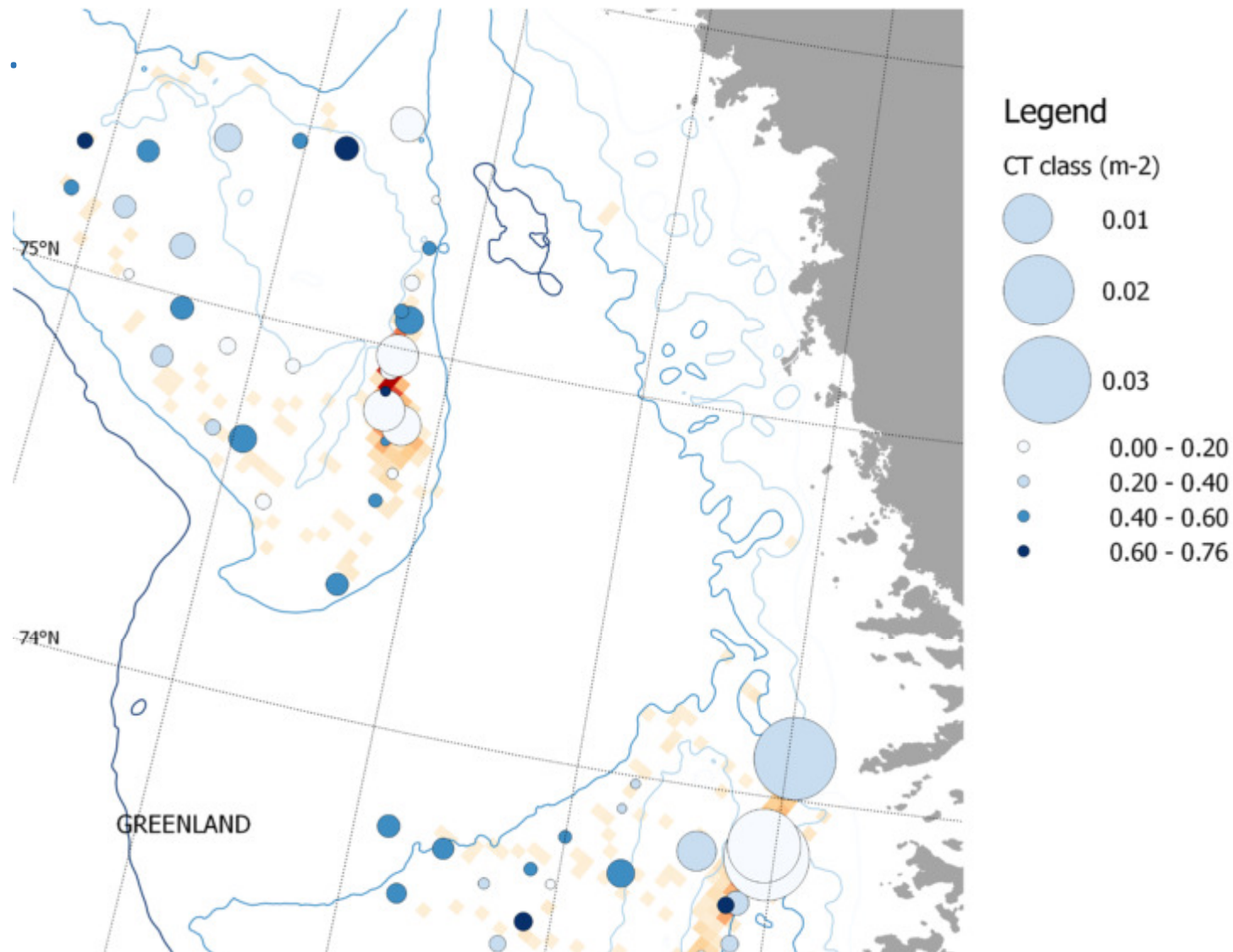
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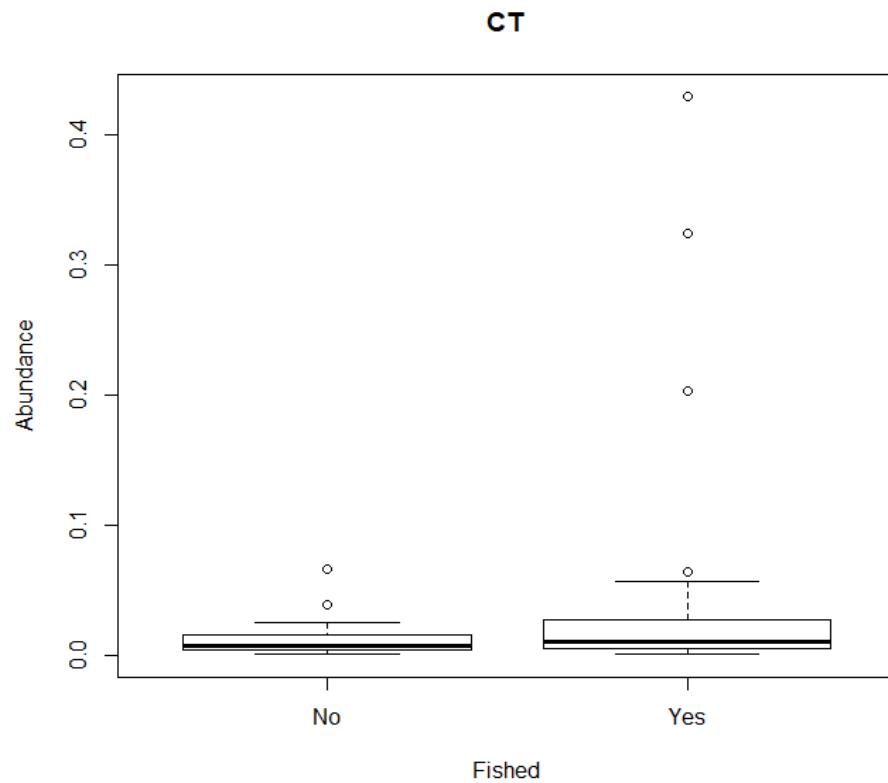
There is no obvious relationship of abundance or biomass and diversity to trawling effort (assessed from drop camera images or BT)



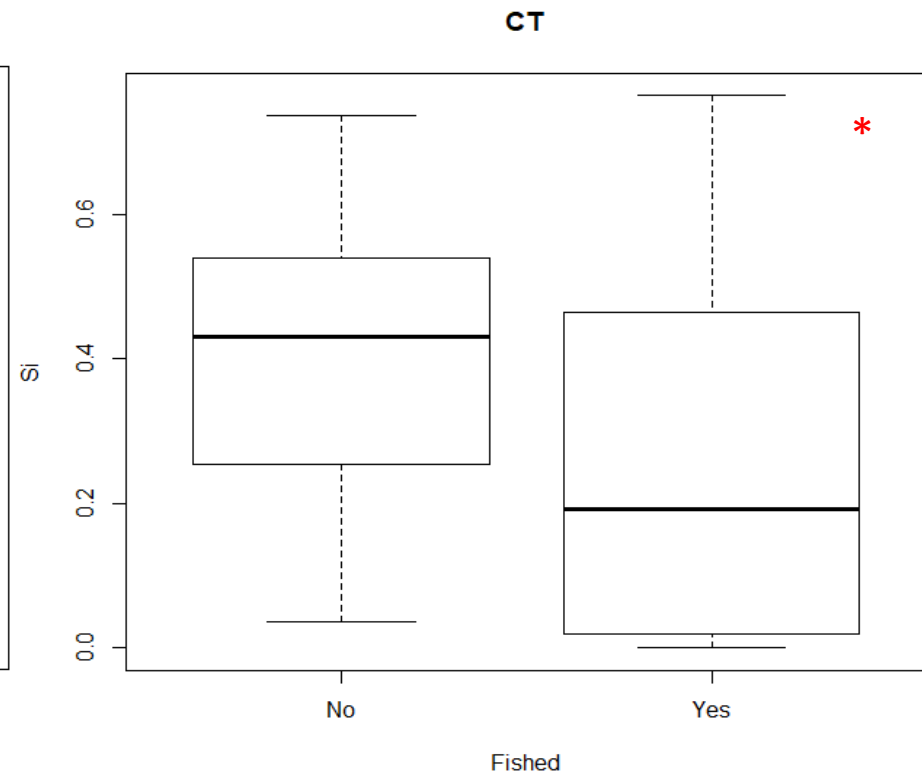
Benthic bycatch biomasses in trawls were low compared to BT samples



Bycatch diversity is lower at trawled sites



No trends in Abundance and
Biomass

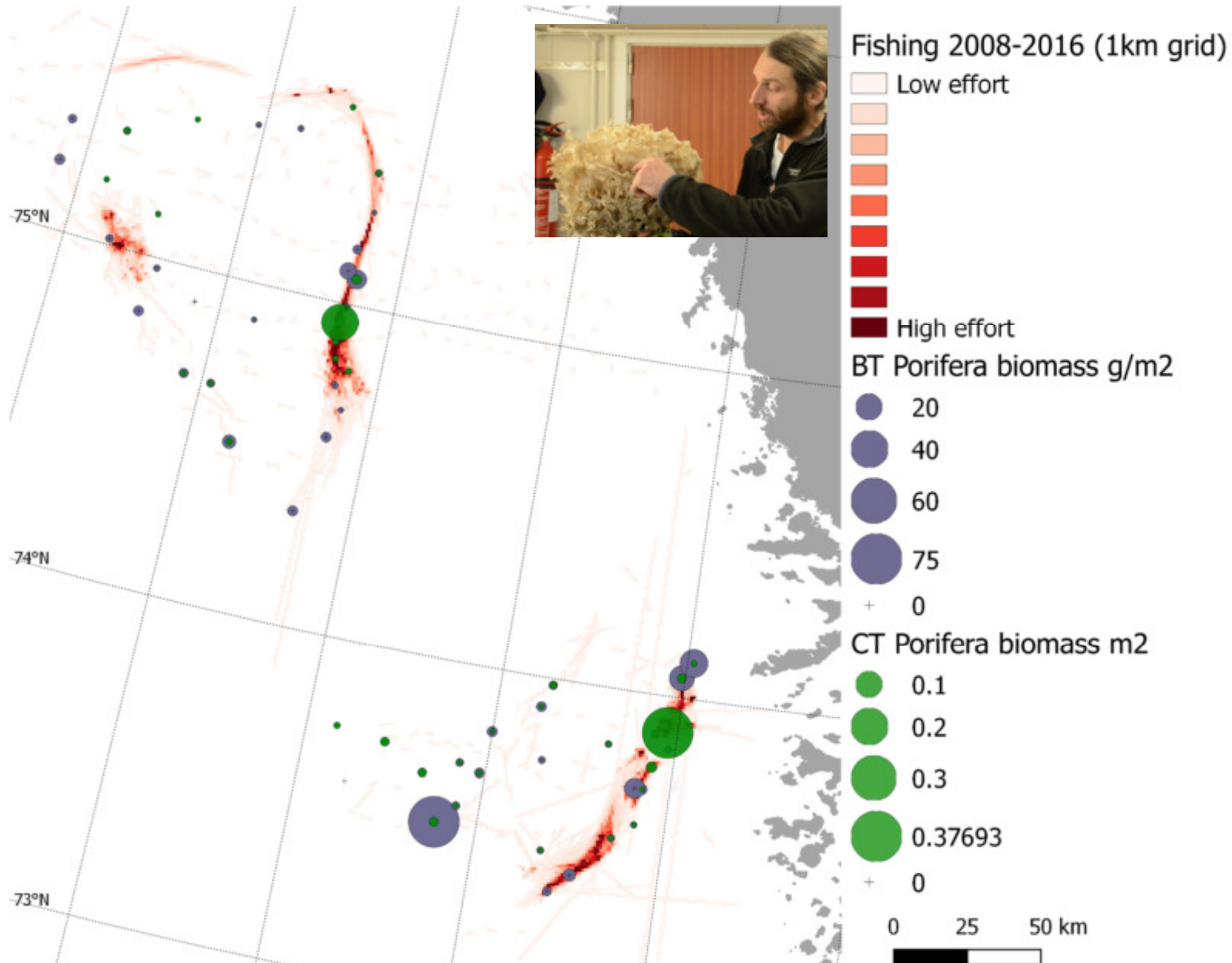


MW, $p=0.006$

VME indicator species were found in the area



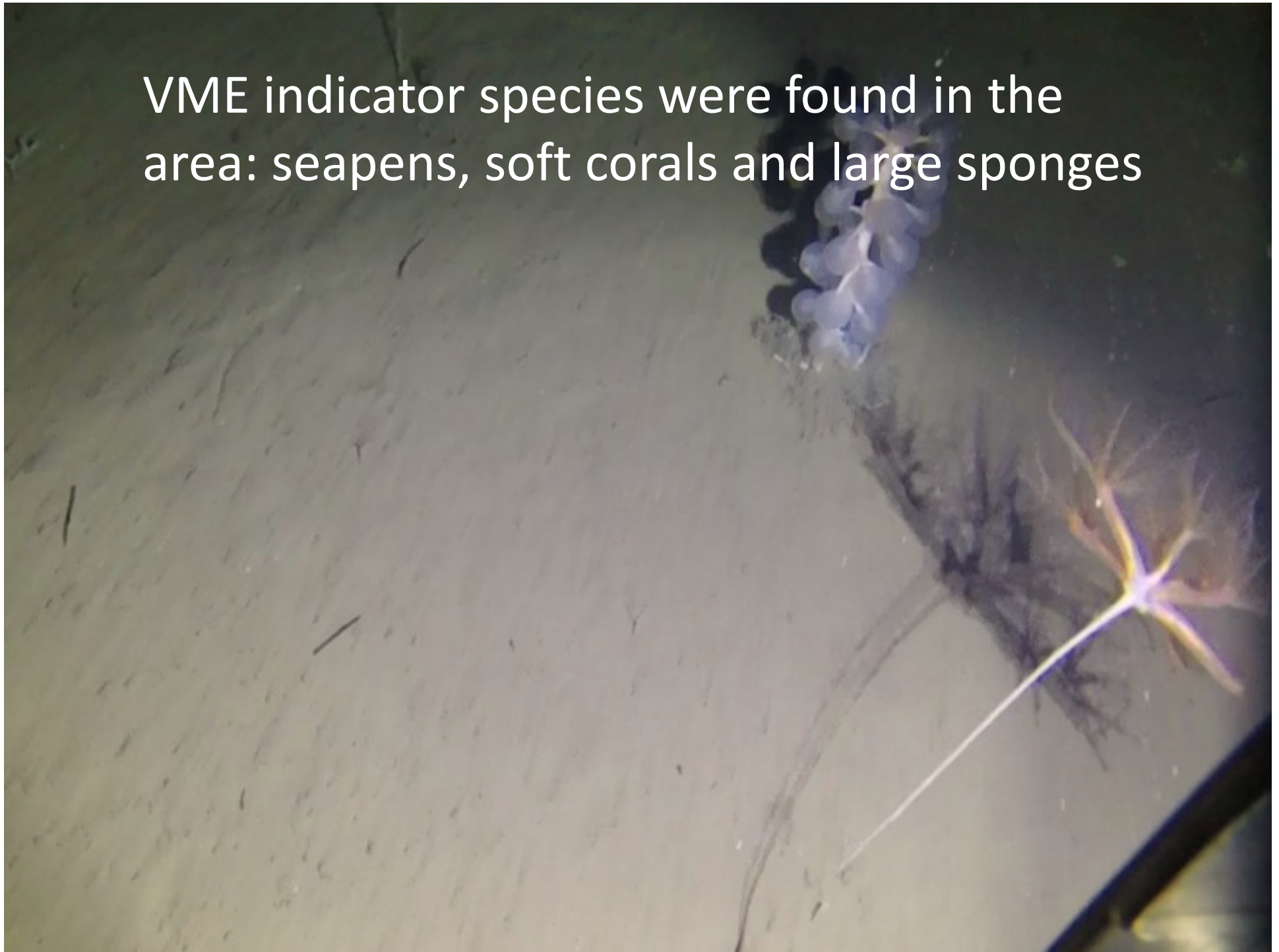
Sponge biomass



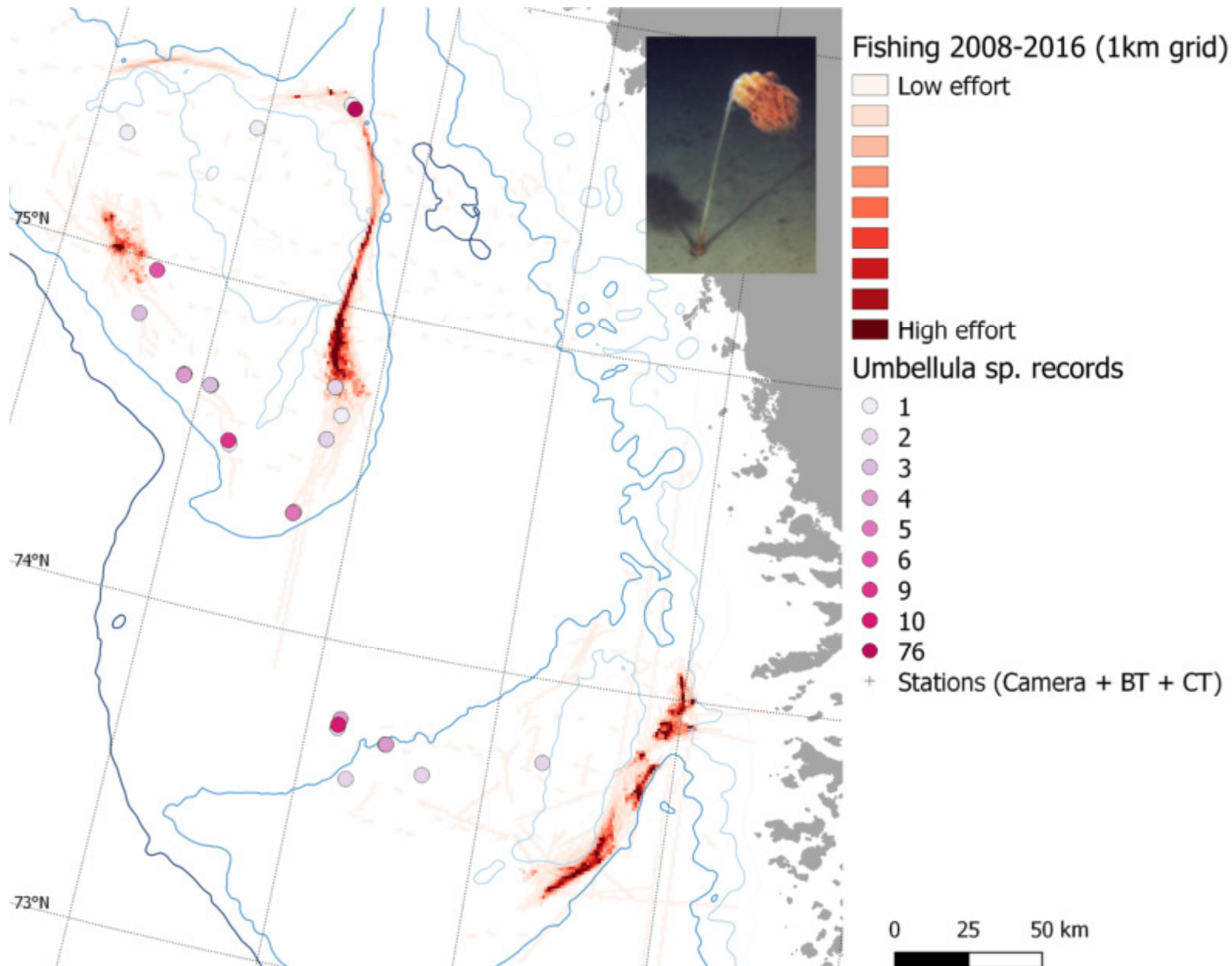
VME indicator species were found in the area: seapens, soft corals and  large sponges



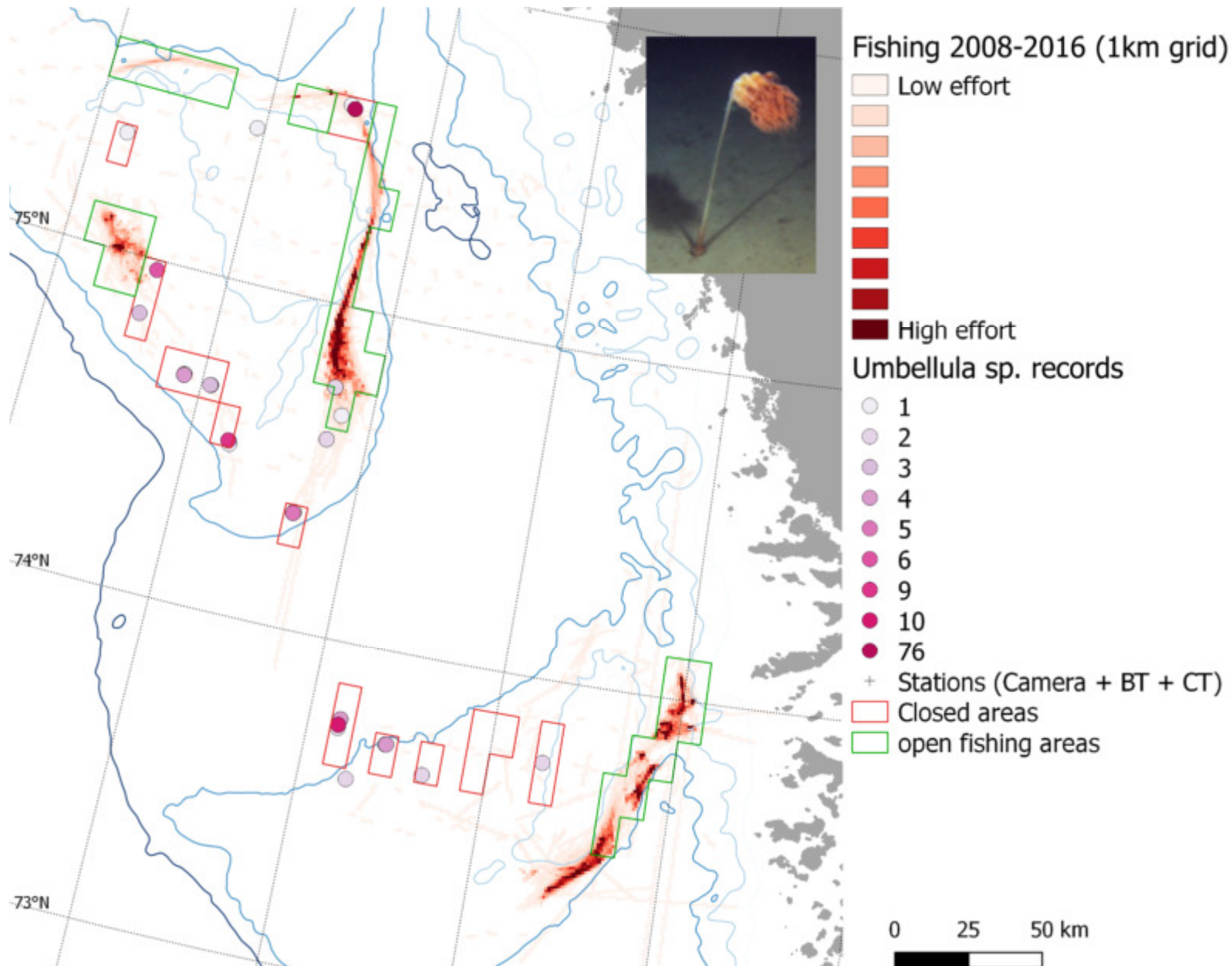
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Umbellula sp. was not recorded inside highly fished areas

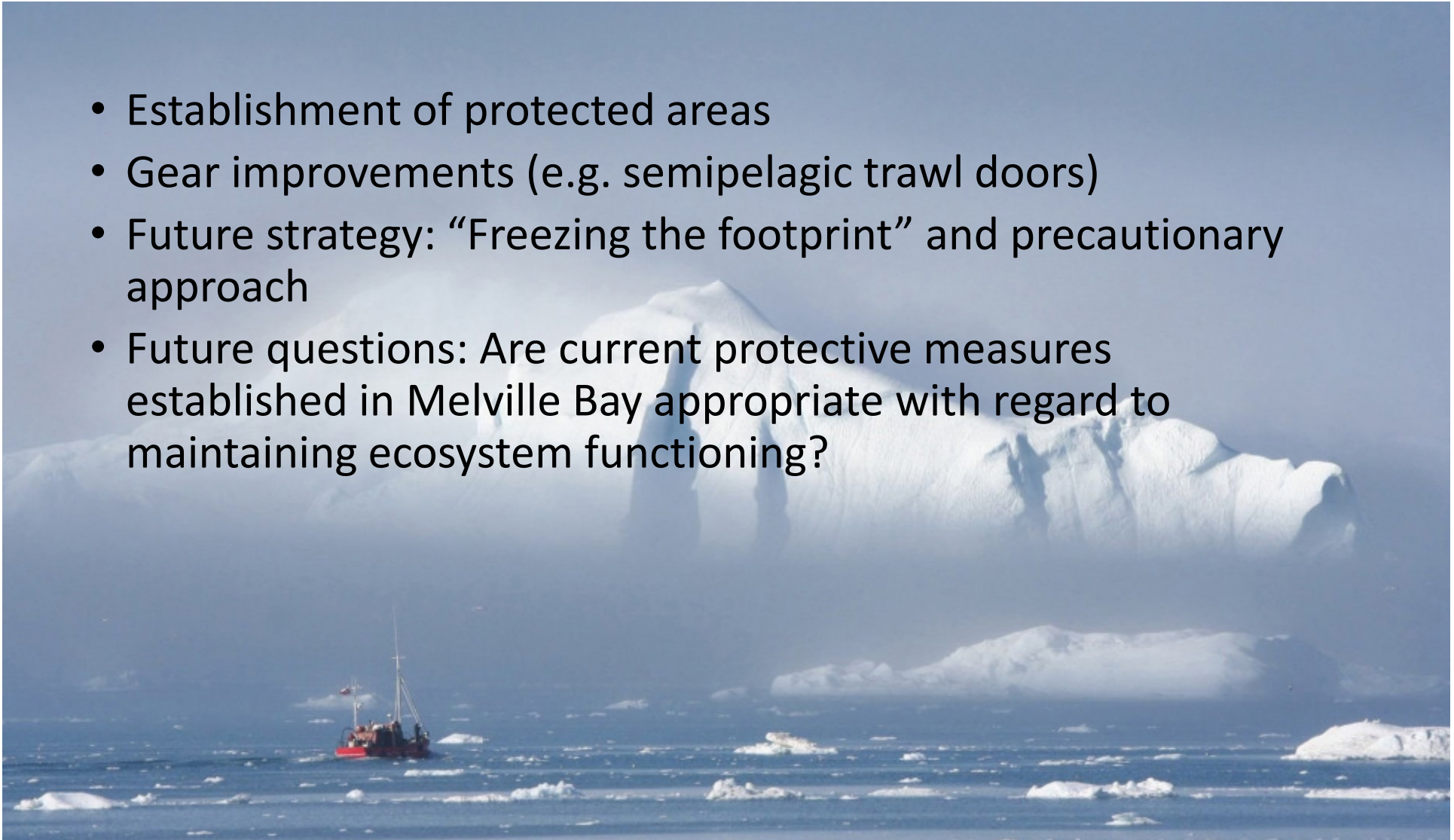


Umbellula sp. was not recorded inside highly fished areas



Our science has led to changes in management and fishery practises

- Establishment of protected areas
- Gear improvements (e.g. semipelagic trawl doors)
- Future strategy: “Freezing the footprint” and precautionary approach
- Future questions: Are current protective measures established in Melville Bay appropriate with regard to maintaining ecosystem functioning?



Read more:

- www.zsl.org/greenland
- Watch 360° video onboard the RV Paamiut
<https://youtu.be/E0iOTRkFbHQ>
- Track a fishery at the MSC website:
<https://fisheries.msc.org/en/fisheries/>
- MSC website: greenland-seafloor-stories.msc.org
- Yesson, C., et al. (2016). The impact of trawling on the epibenthic megafauna of the west Greenland shelf. ICES J. Mar. Sci. 74(3): 866-876

