Long-Term Benthos Monitoring network for identifying vulnerable areas in Arctic benthic ecosystems

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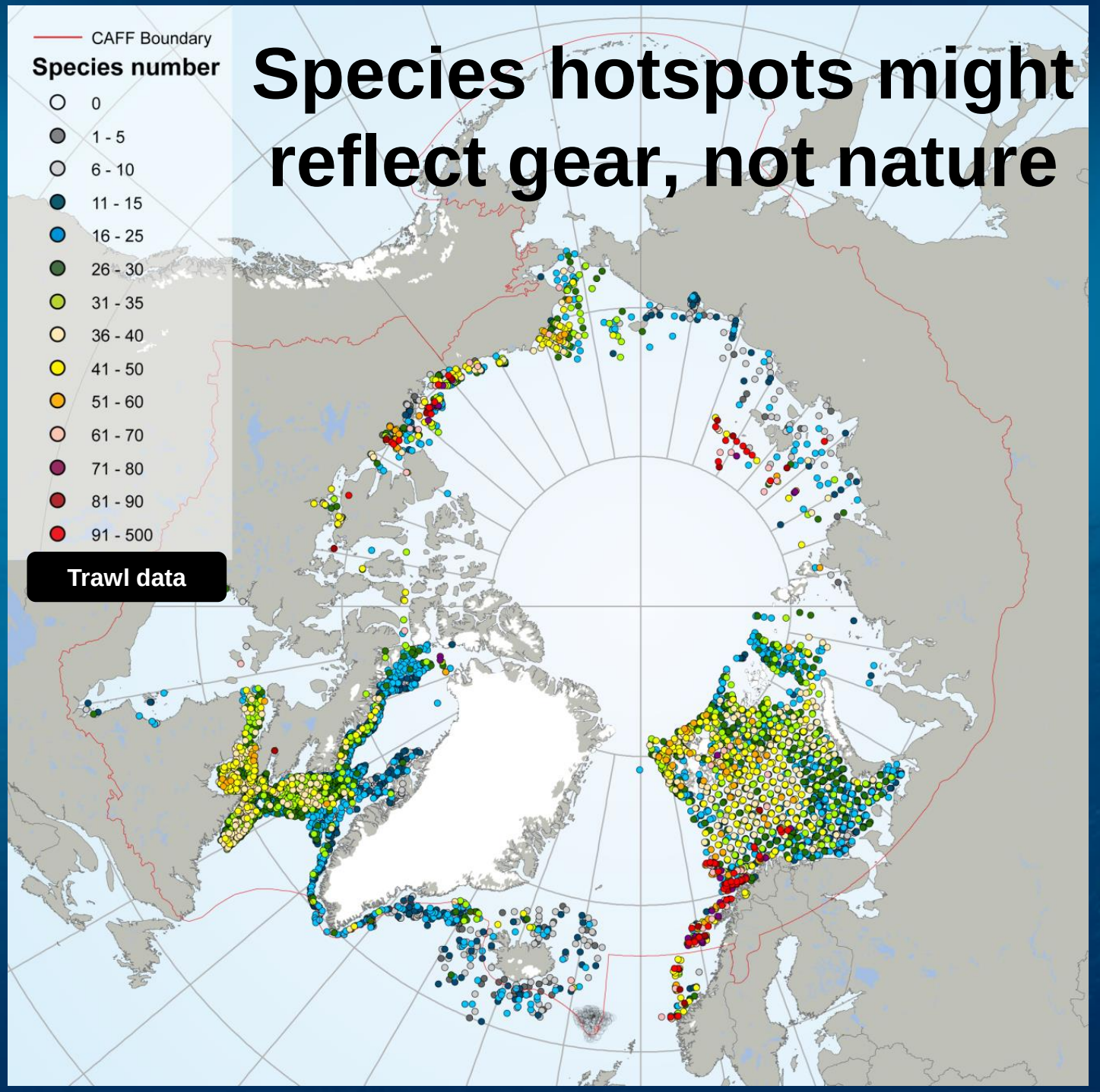
Bergen, Norway
June 26, 2019

State of the Arctic Marine Biodiversity
Key Findings and Advice for Monitoring
CIRCUMPOLAR BIODIVERSITY MONITORING PROGRAM
CAFF
Conservation of Arctic Flora and Fauna
ARCTIC COUNCIL

2017

How did the SAMBR challenge us?

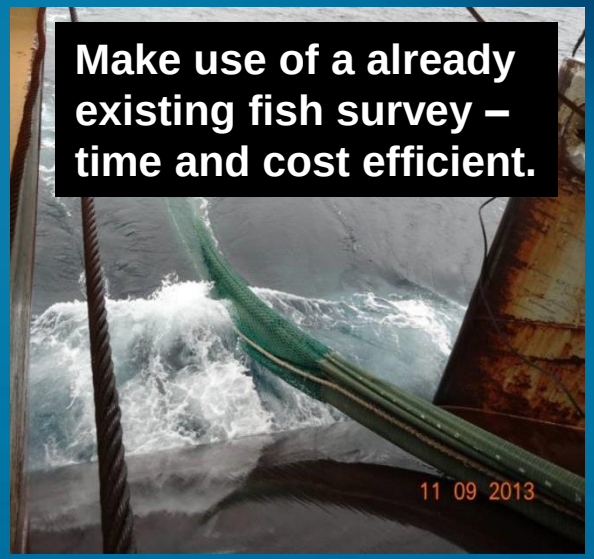
Species hotspots might reflect gear, not nature

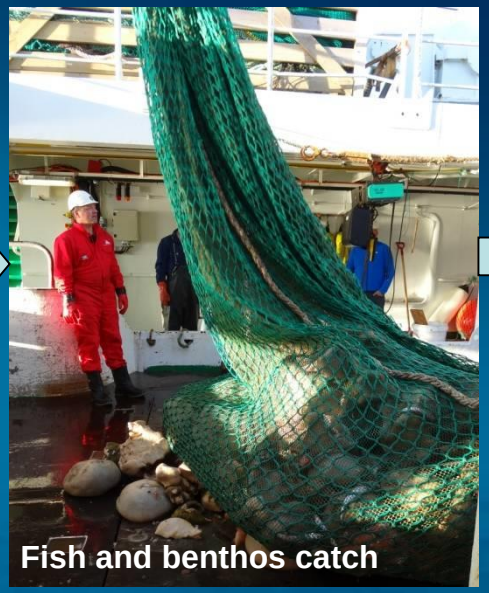


KEY FINDING:
Lack of consistency and methodological standardization

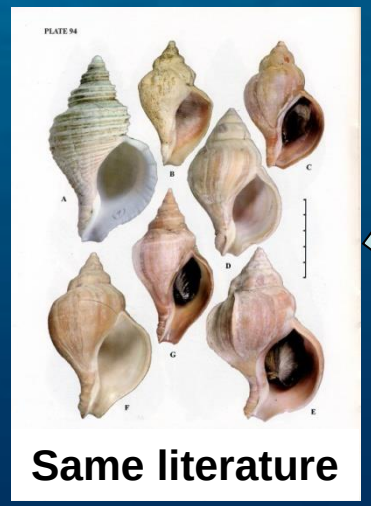
SUGGESTION:
to develop a time- and cost-effective, long-term and standardized monitoring of megabenthic communities in all Arctic regions with regular groundfish assessment surveys.

Regular groundfish assessment surveys



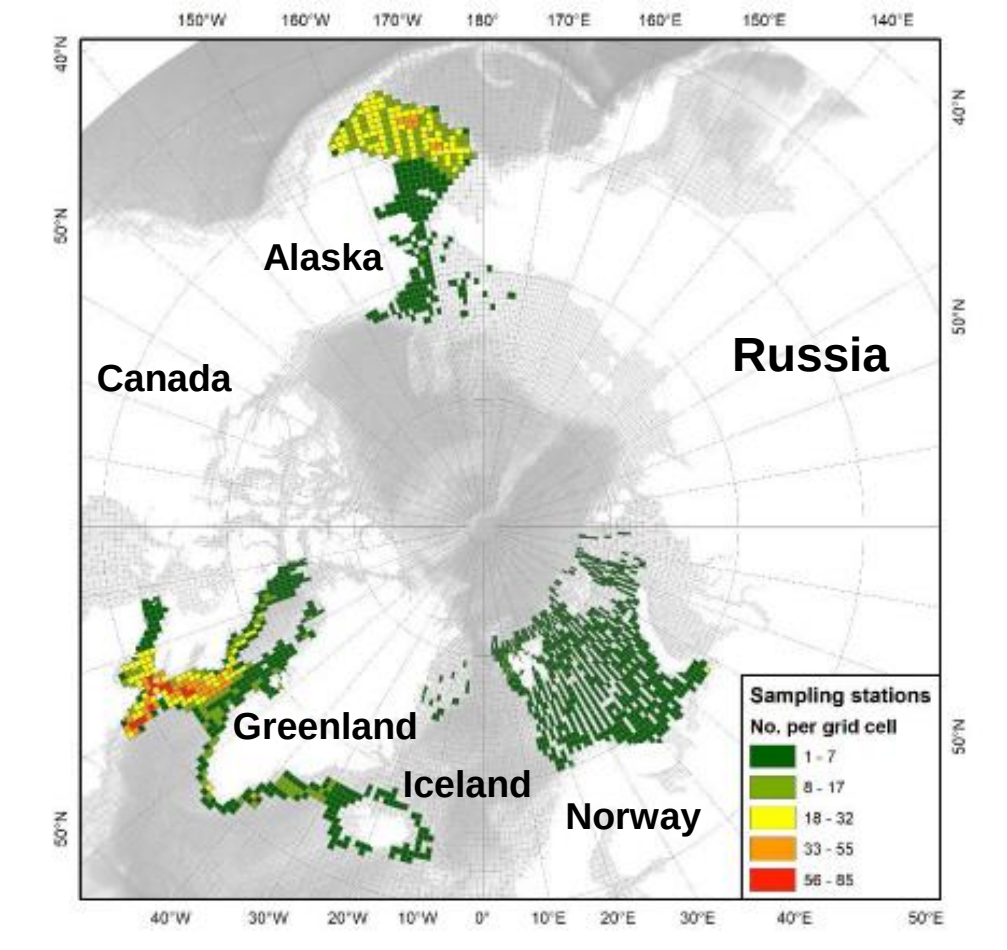


Standardized procedures



Database for temporal standardization

Long-Term Benthos Monitoring network for detecting changes in the Arctic benthic ecosystem (LTM-Benthos) 2017-2020



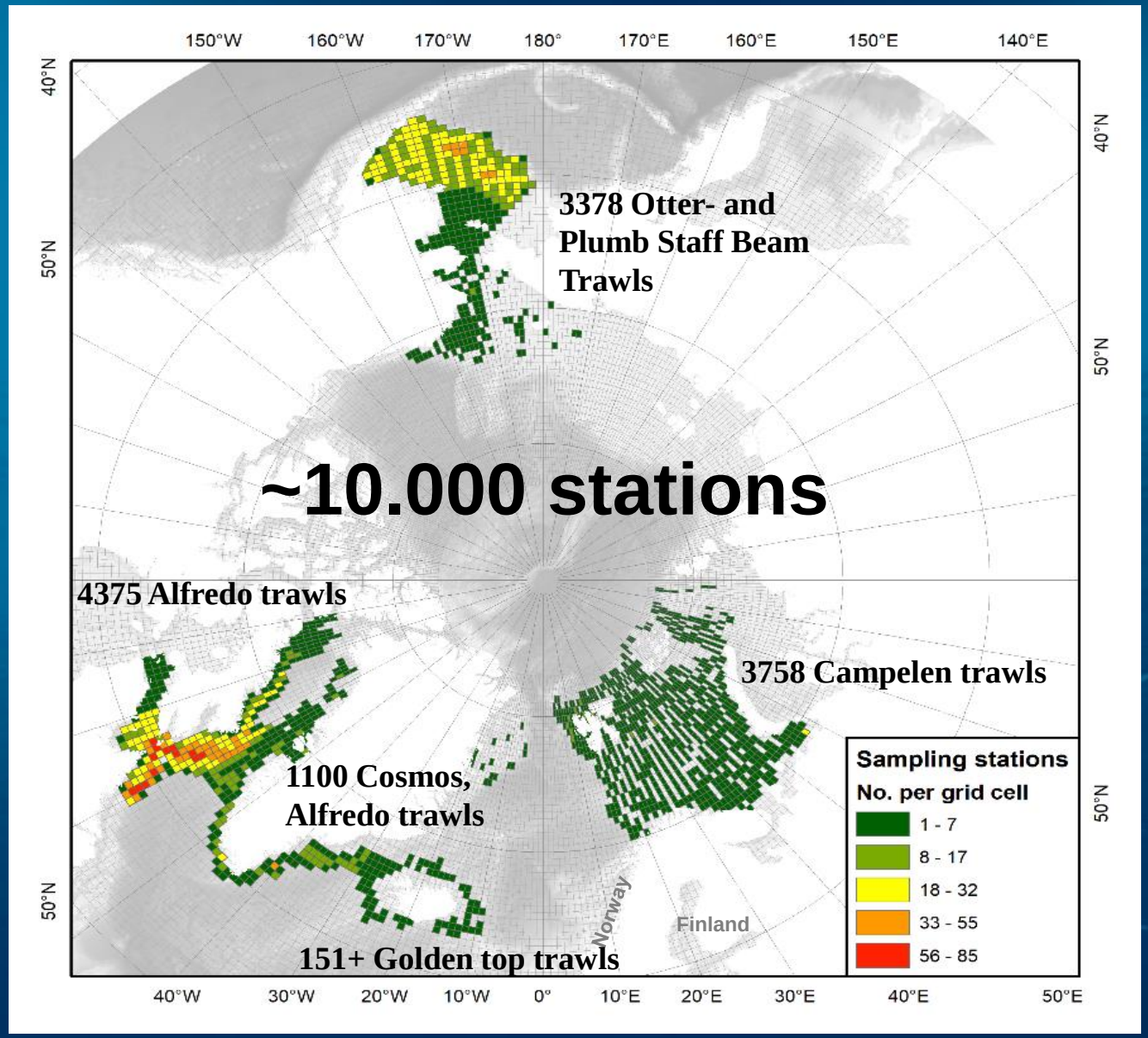
2017 Copenhagen workshop

Funded by the Nordic Council

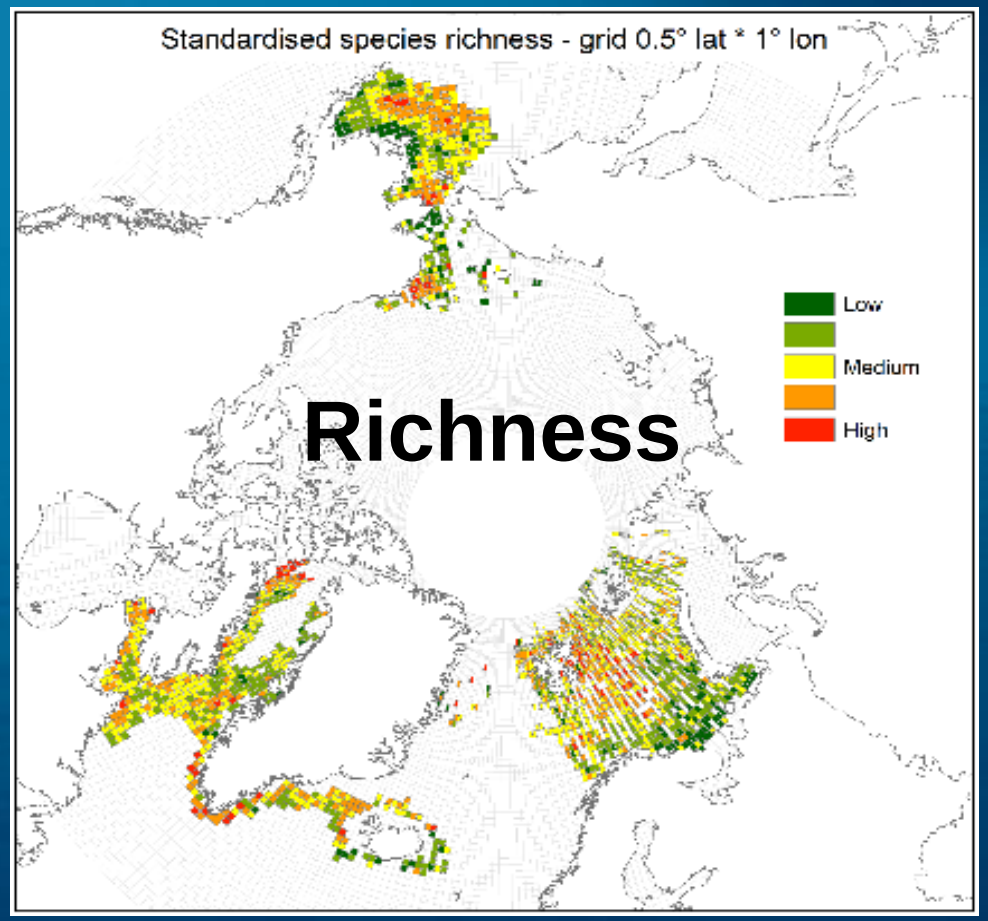
MAIN GOAL

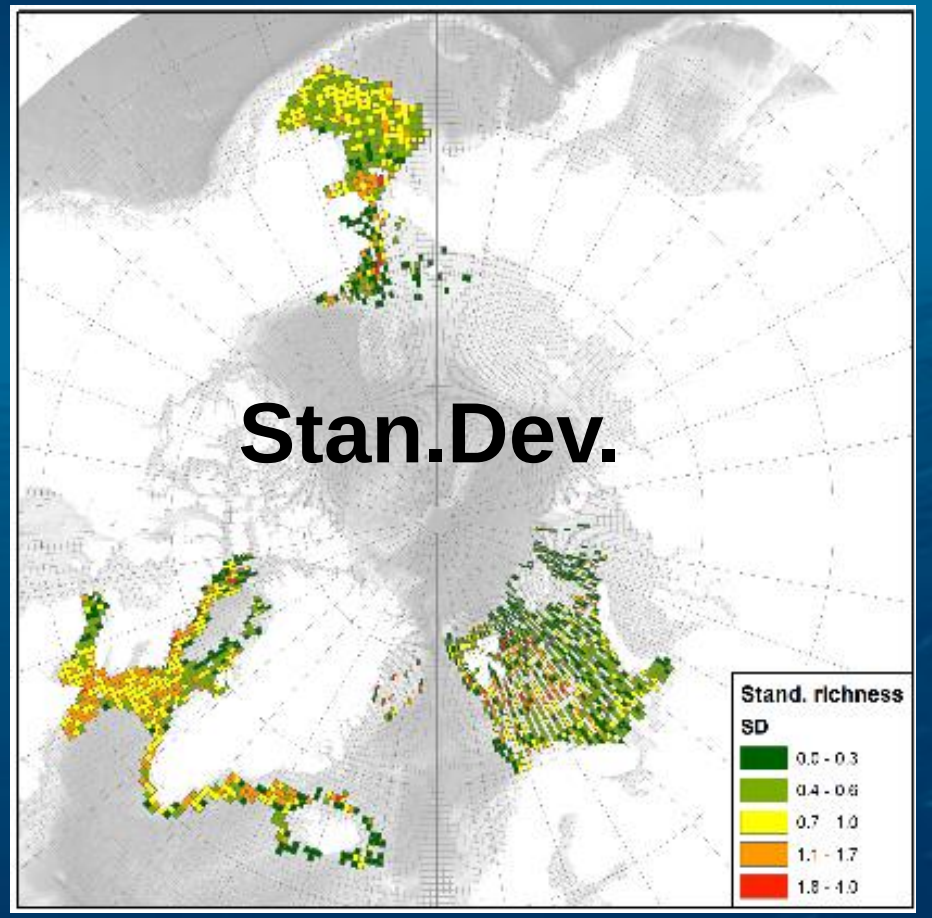
Explore how national groundfish surveys including bycatch can provide relevant data for evaluating the state of benthic communities.

Counts per grid are the number of station samples summed over all survey years 2008-2018.

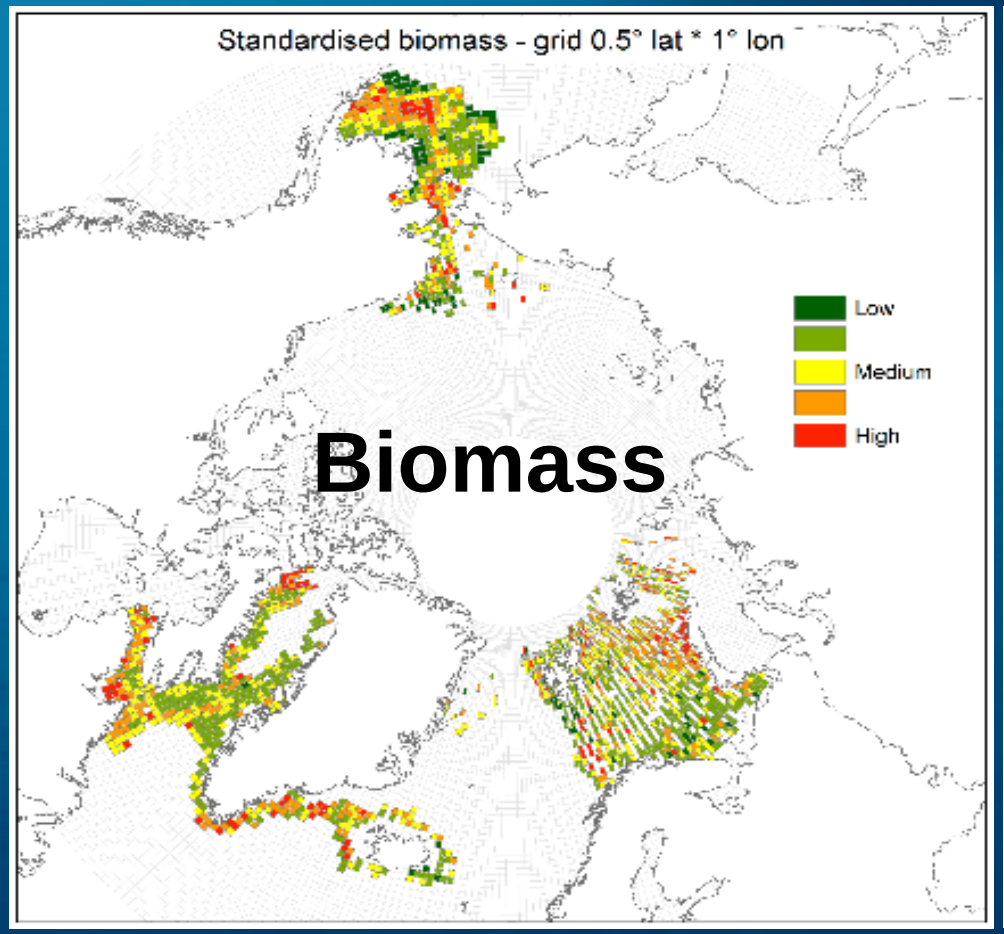


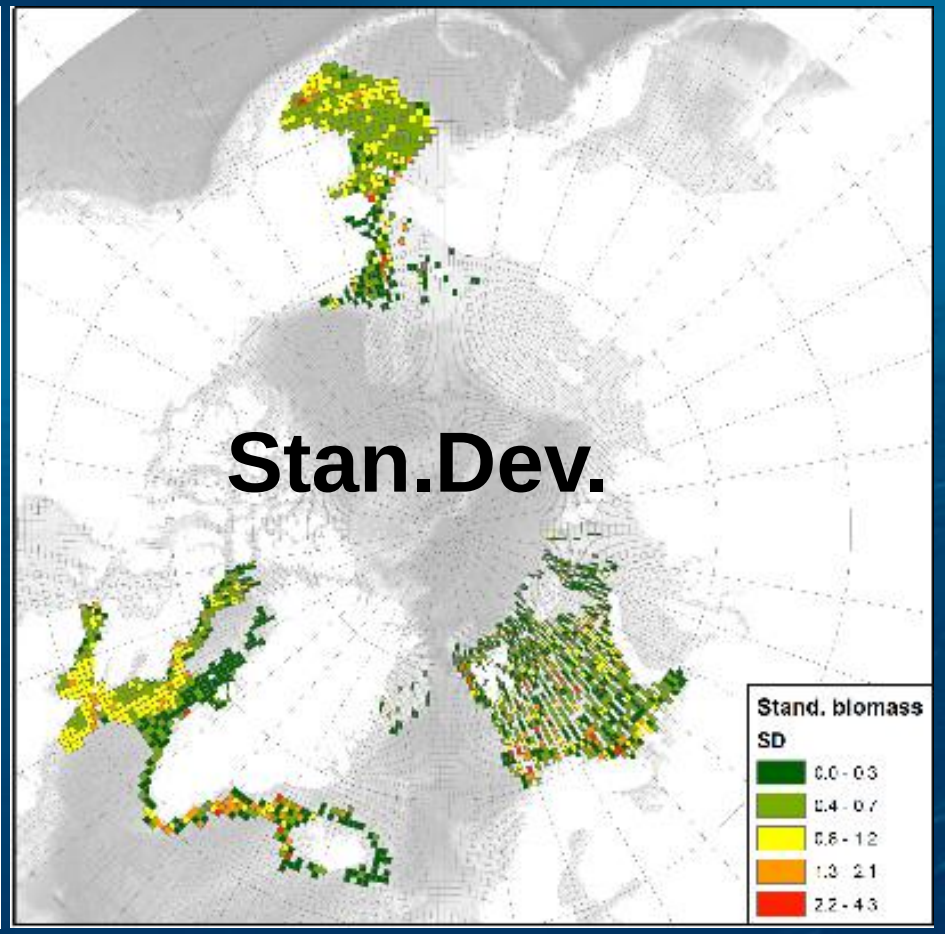
Species richness





Biomass


Standardised biomass - grid 0.5° lat * 1° lon
Low
Medium
High
Biomass


Stan.Dev.
Stand. biomass
SD

Next step:
Anthropogenic stressors

Using species trait analyses to identify where we find trawl vulnerable areas

2019 workshop – Tromsø

2018 workshop – Reykjavík

The Arctic Traits Database

About | Data per taxon | Trait definitions | Download data | Login

Welcome to the Arctic Traits Database!

This is a freely accessible online platform to facilitate exchange of biological trait information among researchers working in the field of Arctic benthic ecology.

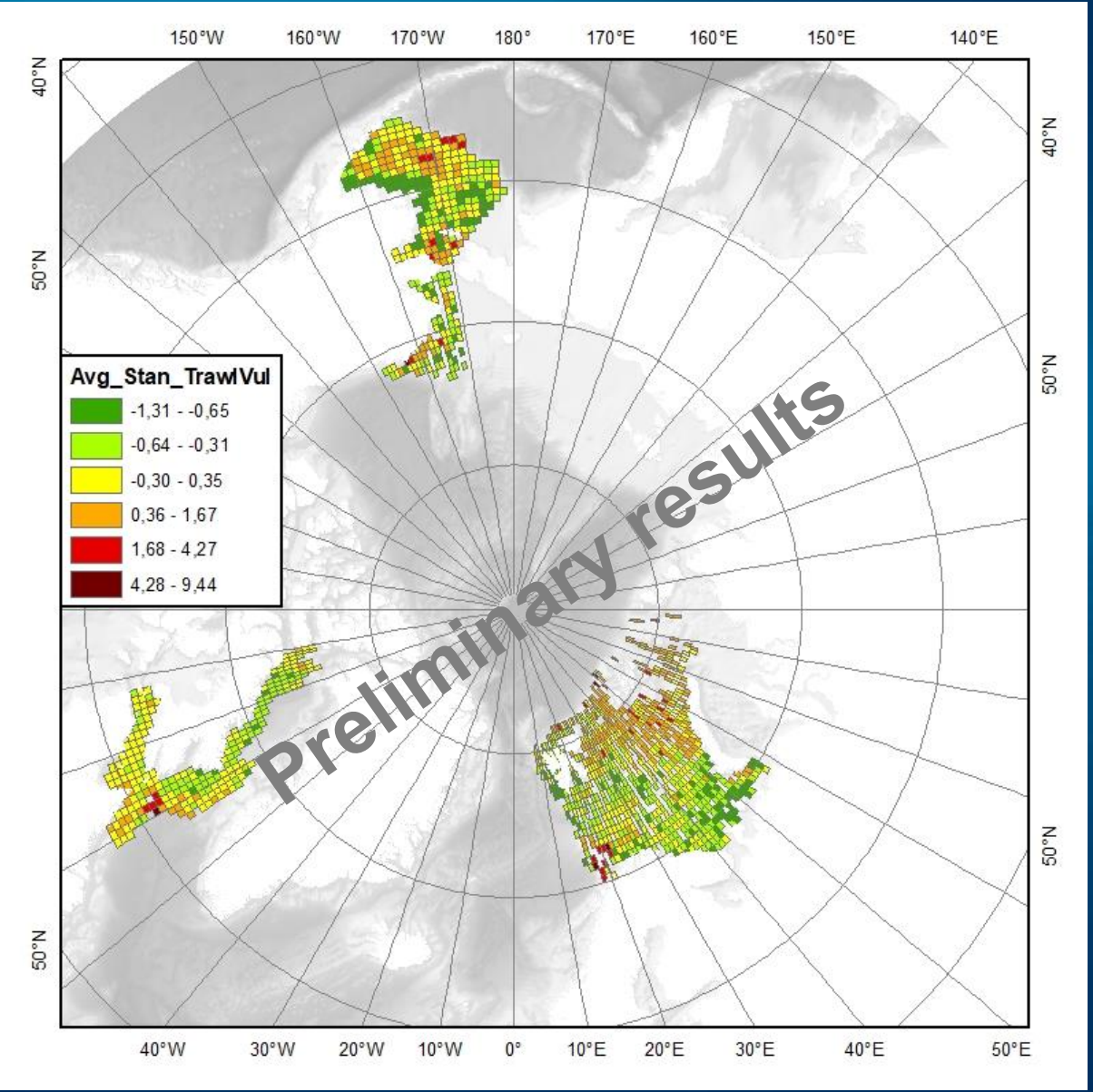
The focus is set on benthic invertebrates from Arctic regions, and the currently 19 traits and 80 trait categories are chosen to reflect the morphology, life history, and behavior of species within these groups. Trait information per species is provided in text format (original literature source and quote provided) and in a 'fuzzy coded' mode (scores from 0 to 3). Taxon names are synchronized with the World Register of Marine Species (WoRMS). More detailed information can be found in the associated publication "The Arctic Traits Database – A repository of arctic benthic invertebrate traits" and in the "Fuzzy codes" section.

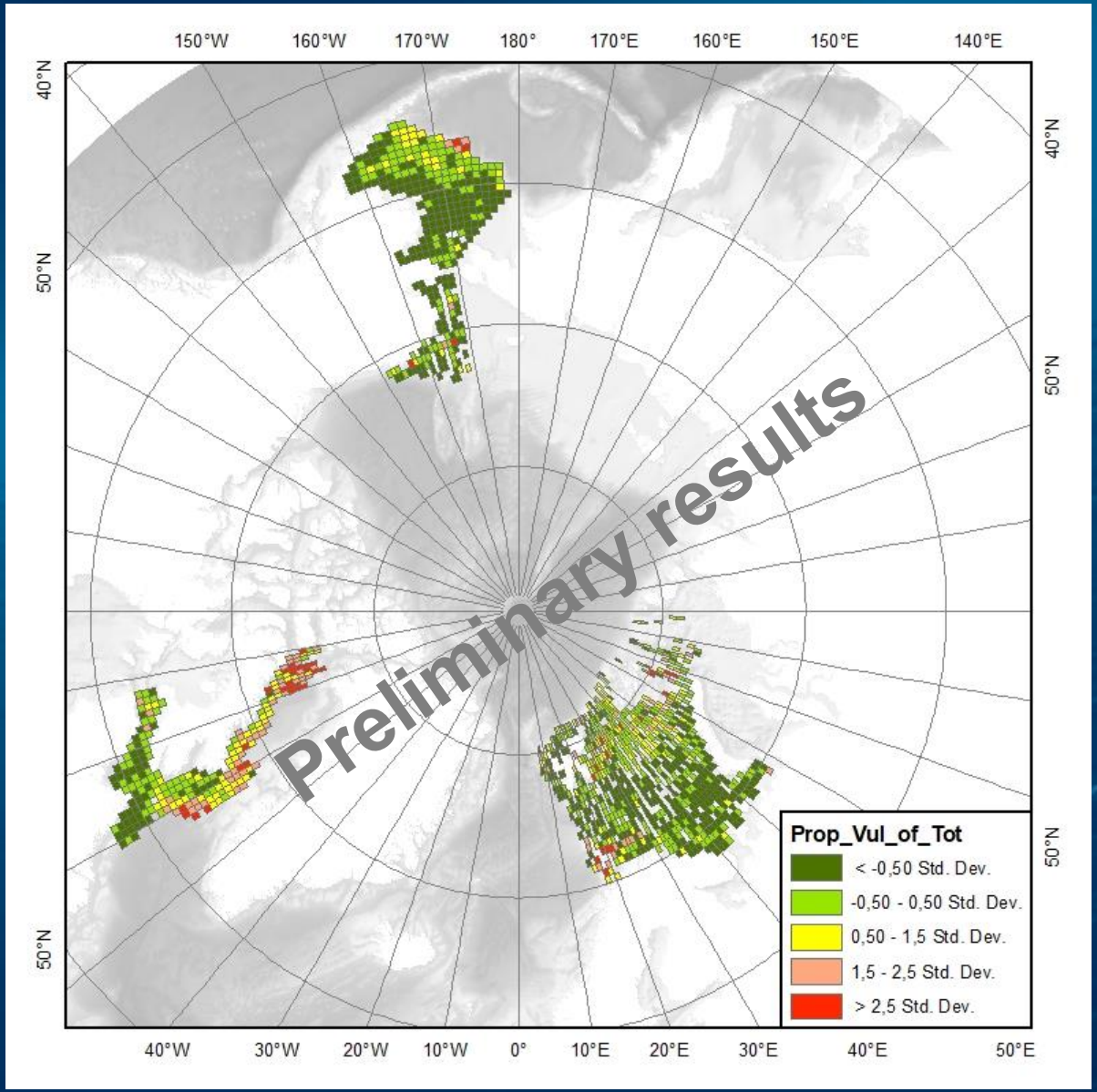
https://www.univie.ac.at/arctictraits/

Body Form		
globulose	(BF1)	Round or oval (e.g. sea urchin, sponge, some bivalves)
vermiform, elongate	(BF2)	Worm-like or thin, elongate body form
dorso-ventral compressed	(BF3)	Species that are flat, or encrusting (e.g. starfish, sponge)
laterally compressed	(BF4)	Thin (e.g. isopods, amphipods, some bivalves)
upright	(BF5)	E.g. coral, basket star, sponge

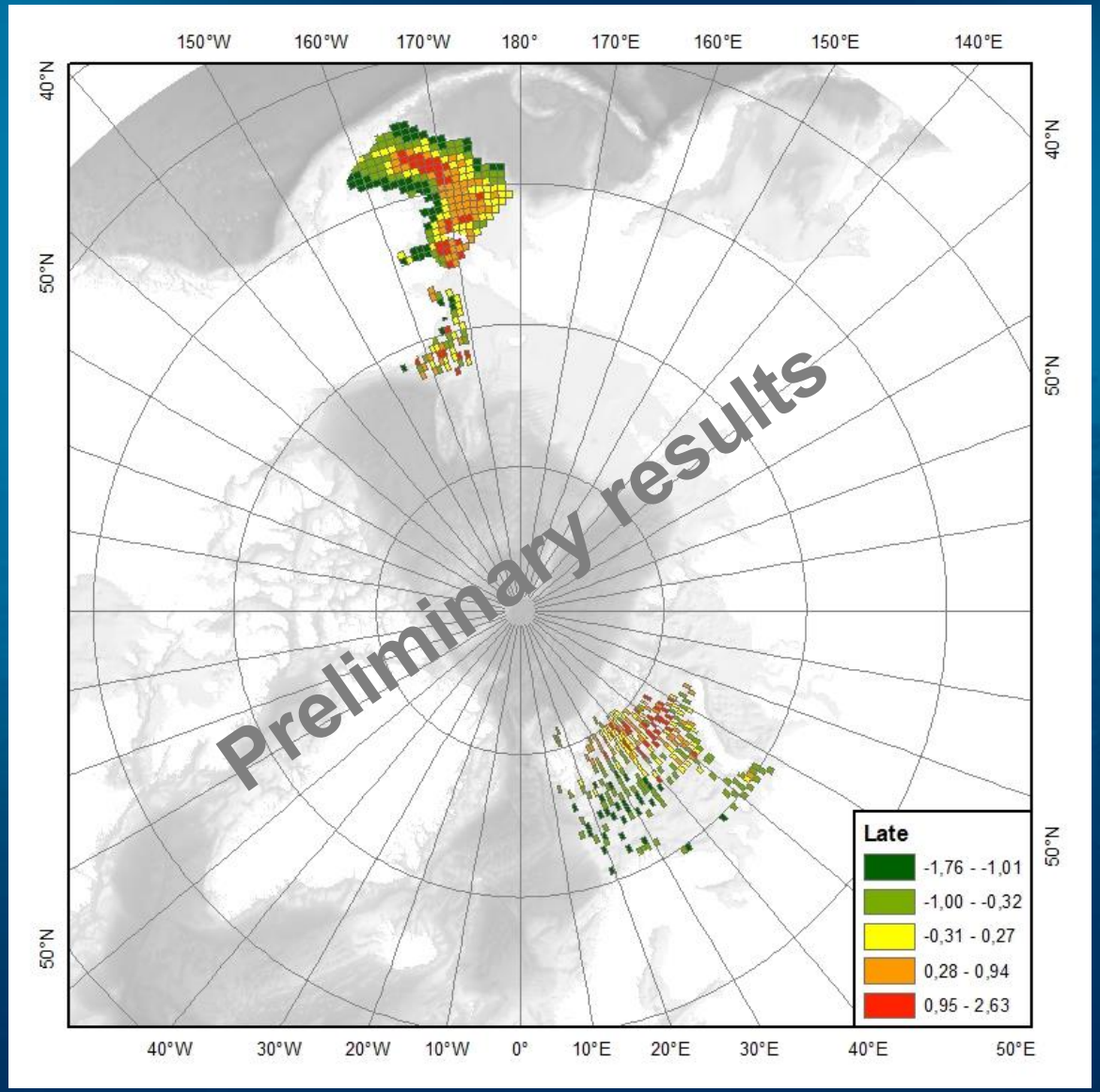
Adult movement		
sessile/none	(MV1)	No movement as adult (sponge, coral)
burrower	(MV2)	Movement in the sediment (e.g. annelids, echinoderms, crusta dwellers.
crawler	(MV3)	An organism that moves along on the substratum via moveme muscles (e.g. crab, snail)
swimmer (facultative)	(MV4)	Movement above the sediment (e.g. Amphipoda)

Biomass of trawl vulnerable species

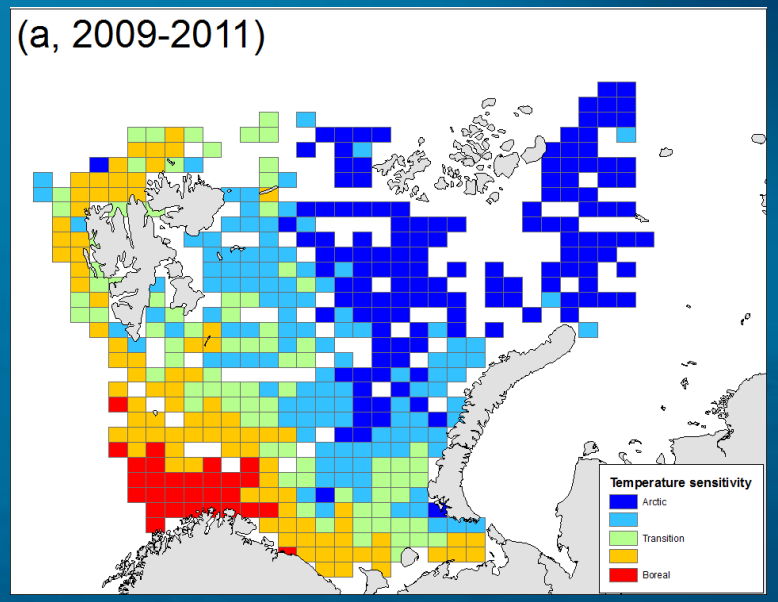




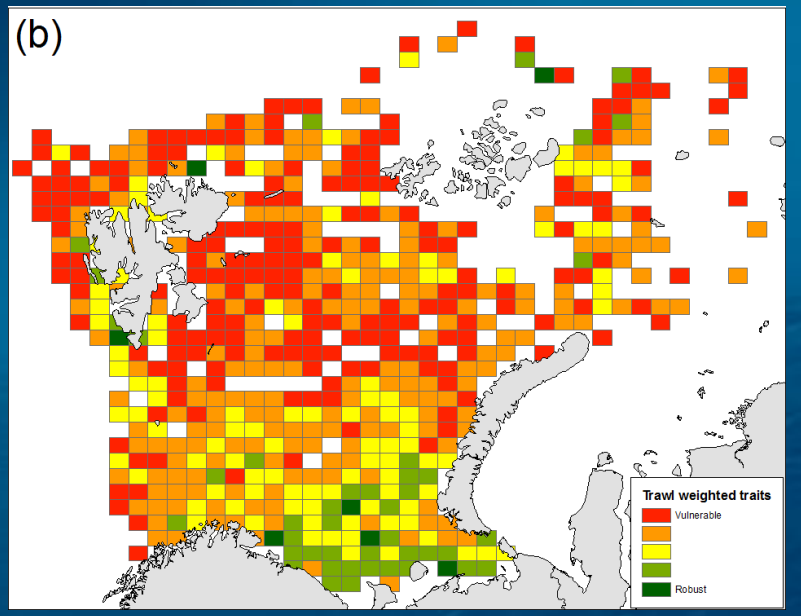
Biomass distribution of coldwater species



Next step: combine temperature and trawl-impact sensitivity to identify vulnerable areas



Mean "*species temperature sensitivity*"



Mean "*species trawl-impact sensitivity*"

Jørgensen LL, Primicerio R, Ingvaldsen RB, Fossheim M, Strelkova N, Thangstad TH, Manushin I, Zakharov D (accepted 28 Aug 2018) Impact of multiple stressors on sea bed fauna in a warming Arctic. Marine Ecology Progress Series.

Thanks to:

Renovation species

O2-healthcare species

Organic enrichment species

3D structuring species for nursery and feeding,

The species that are food for humans and animals