SAMBR_Benthos

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EBM4 09.10.2018 05-06:30 pm

Benthos Expert Network: Findings and recommendations from the Circumpolar Biodiversity Monitoring Program's State of the Arctic Marine Biodiversity Report

Benthos Chapter co-authors:

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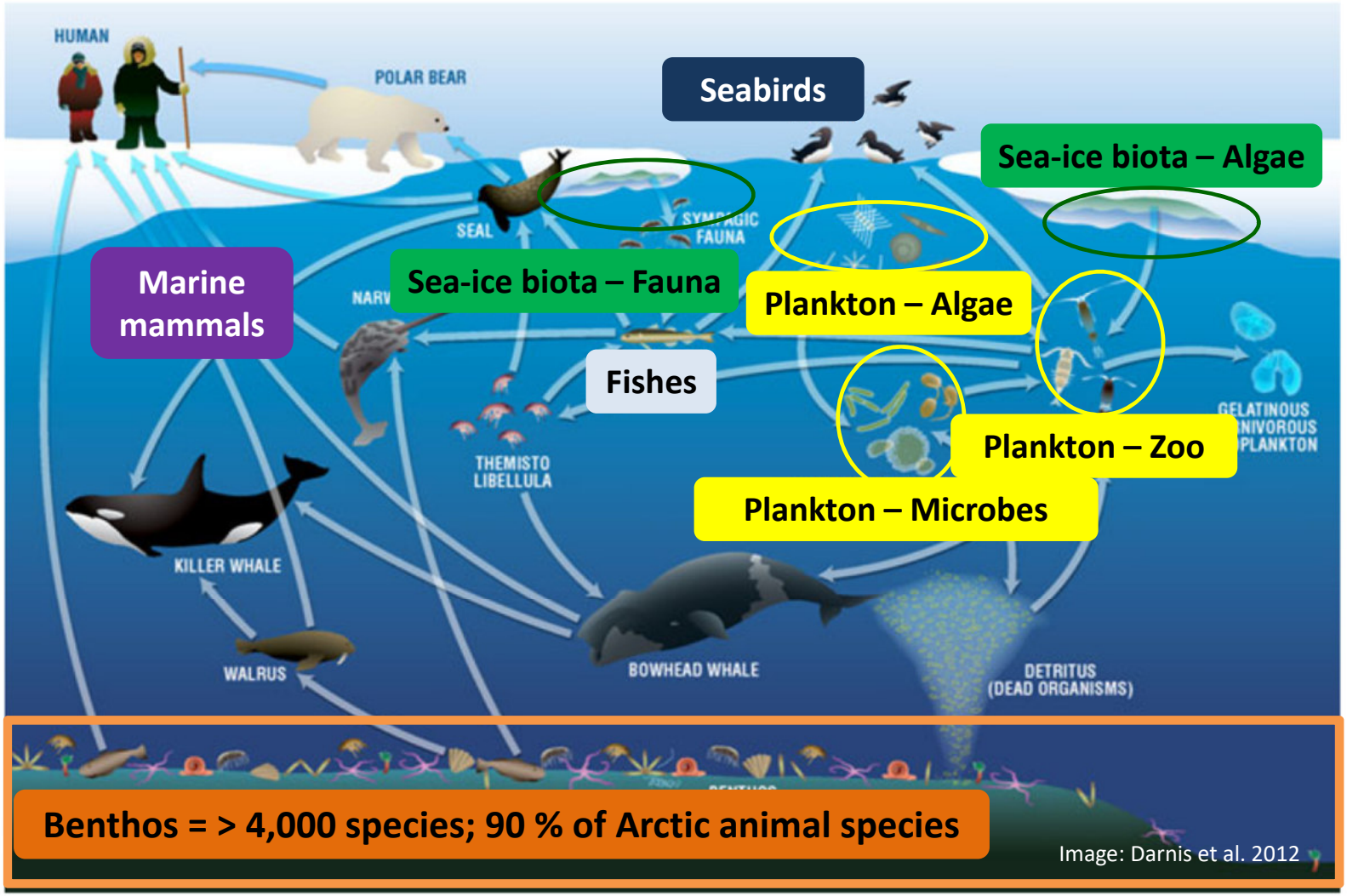
Benthos = 1 of the 6 CBMP expert groups



Benthos Network Objectives

1. Compile historical and recent benthos data to assess species richness;
2. Evaluate if these data have a sufficient spatial and temporal coverage to assess status and trends of biodiversity (where monitoring is really occurring?);
3. Evaluate drivers of observed trends
4. Assess monitoring gaps

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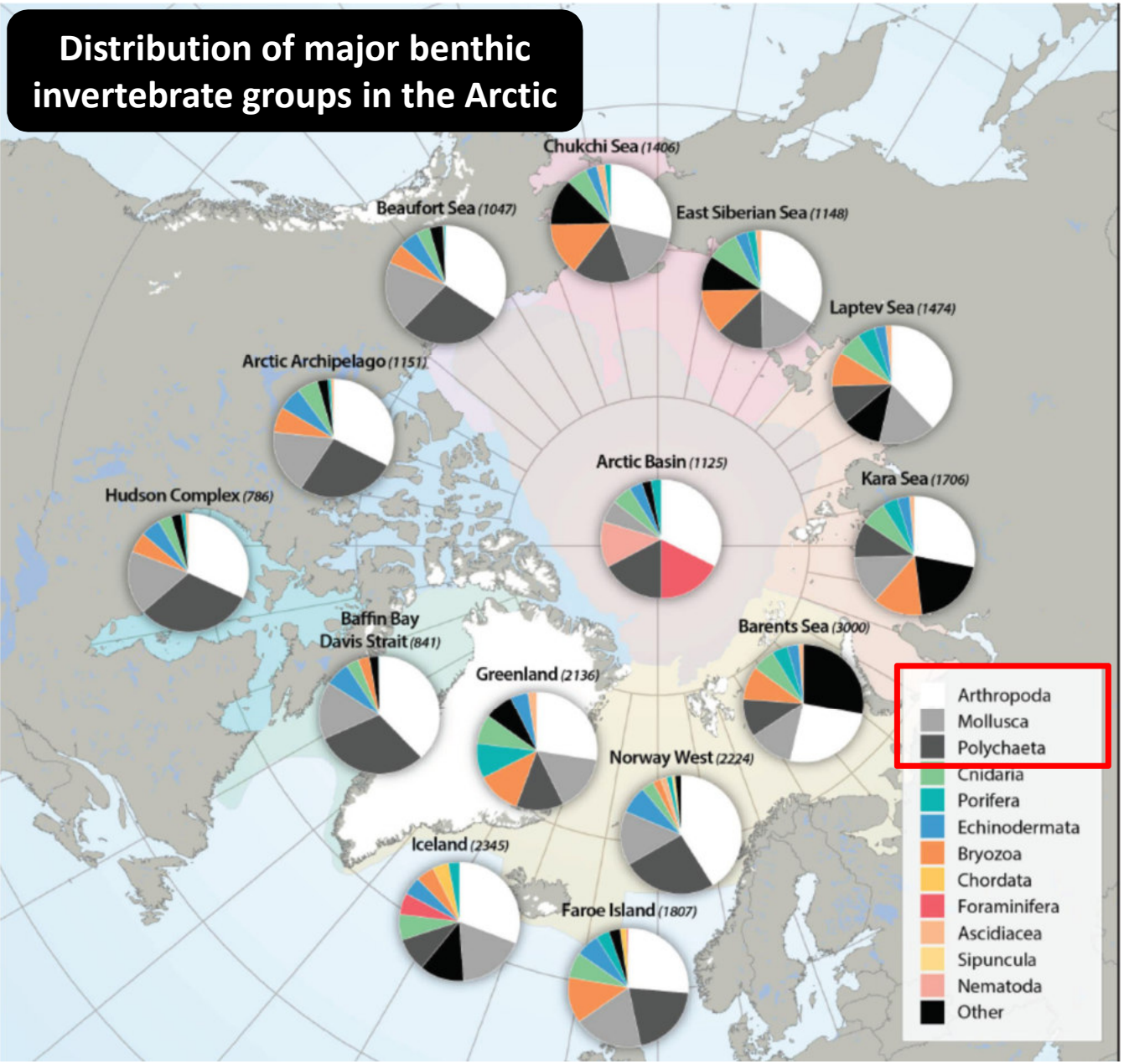
METHODS: Define Focal Ecosystem Components for Benthos

MACROBENTHOS (box corers, grabs)

MEGABENTHOS (trawls)

Distribution of major benthic invertebrate groups in the Arctic



Obj. 1: Compile historical and recent benthos data to assess species richness

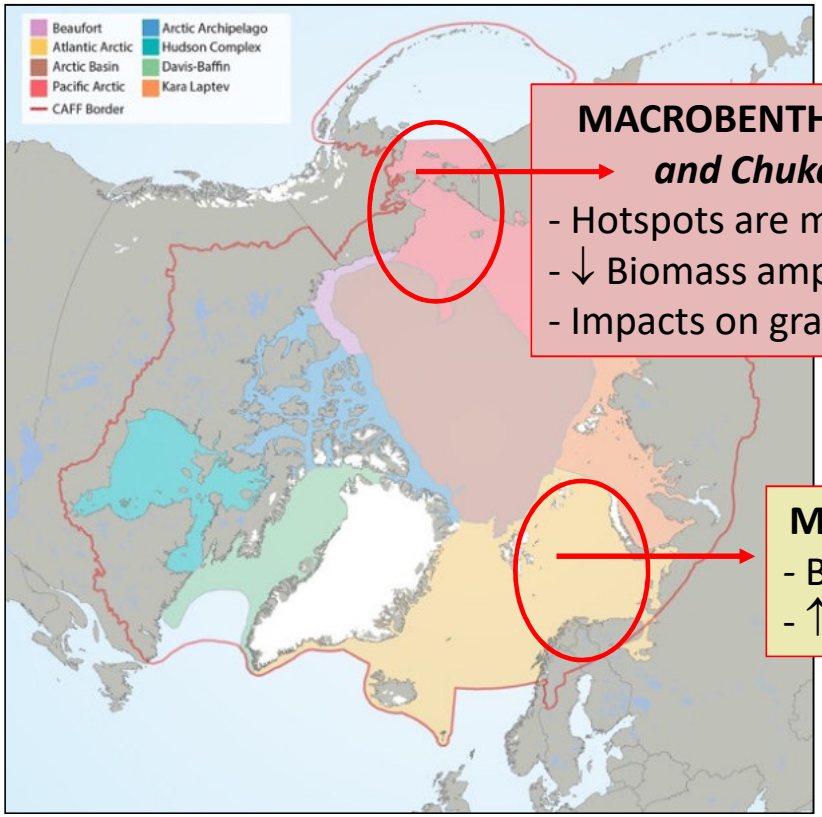
786 to 3,000 taxa per region

Dominant Groups – Richness

1. **Arthropods** (e.g., shrimps, crabs, sea spiders, amphipods, isopods)
2. **Polychaetes** (e.g., bristle worms)
3. **Mollusks** (e.g., gastropods, bivalves)

Obj. 2: Evaluate Status and Trends of Focal Ecosystem Components

KEY FINDING: Despite extensive benthic research in various regions of the Arctic, there are **only few regions that have been systematically sampled** over sufficiently long time periods to allow a reliable assessment of potential changes in benthos.



MACROBENTHOS - *Northern Bering Sea and Chukchi Sea (1970s-2010s)*
- Hotspots are moving north
- ↓ Biomass amphipods, bivalves
- Impacts on gray whales and walruses

MEGABENTHOS - *Barents Sea (2007-2015)*
- Borealization of benthic communities
- ↑ snow crab invasion

Coastal Alaskan Indigenous Knowledge

When we hunt, harvest, and process walrus, we enjoy the benthic species found in the stomach. Over time, we observed a decreasing volume of benthic prey, particularly clams, and an increasing volume of pelagic fishes, or simply sand, in walrus stomachs.

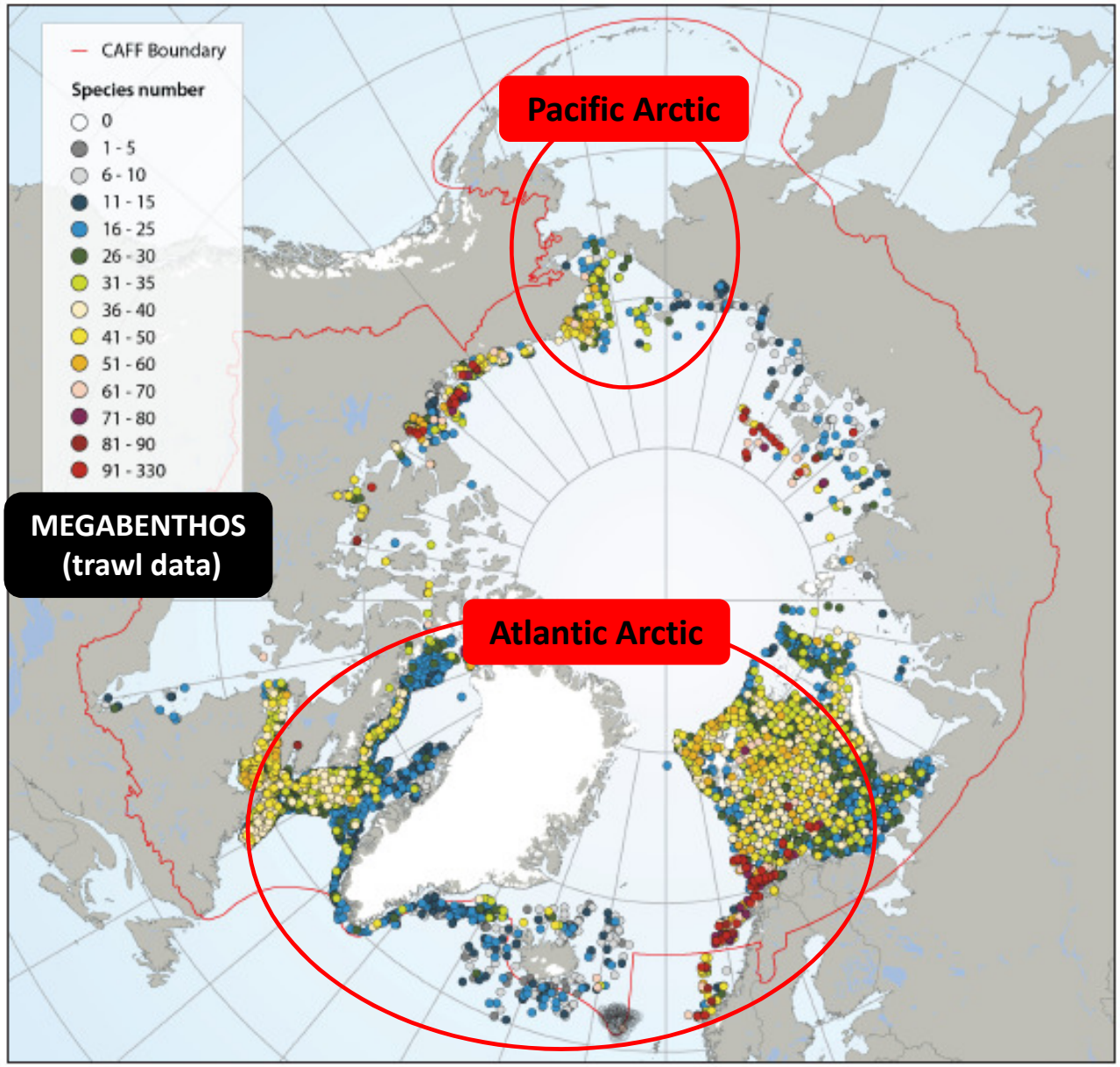
Obj. 3: Evaluate drivers of observed trends

KEY FINDING: The CBMP Benthos Expert Network provided their first assessment of the importance of six major drivers of change, along with their cumulative impact for different Arctic regions.

- **Low** cumulative score (1-2) = 2 areas; **Intermediate** cumulative score (3-4) = 6 areas; **High** score (5-6) = none.

6 major drivers: Sea-ice dynamics, bottom-water temperature change, commercial bottom trawling, ocean acidification, river/glacier freshwater discharge and introduction of non-indigenous species.

No attempt has been made, however, to weigh or prioritize these drivers because of the lack of quantitative information in many regions.



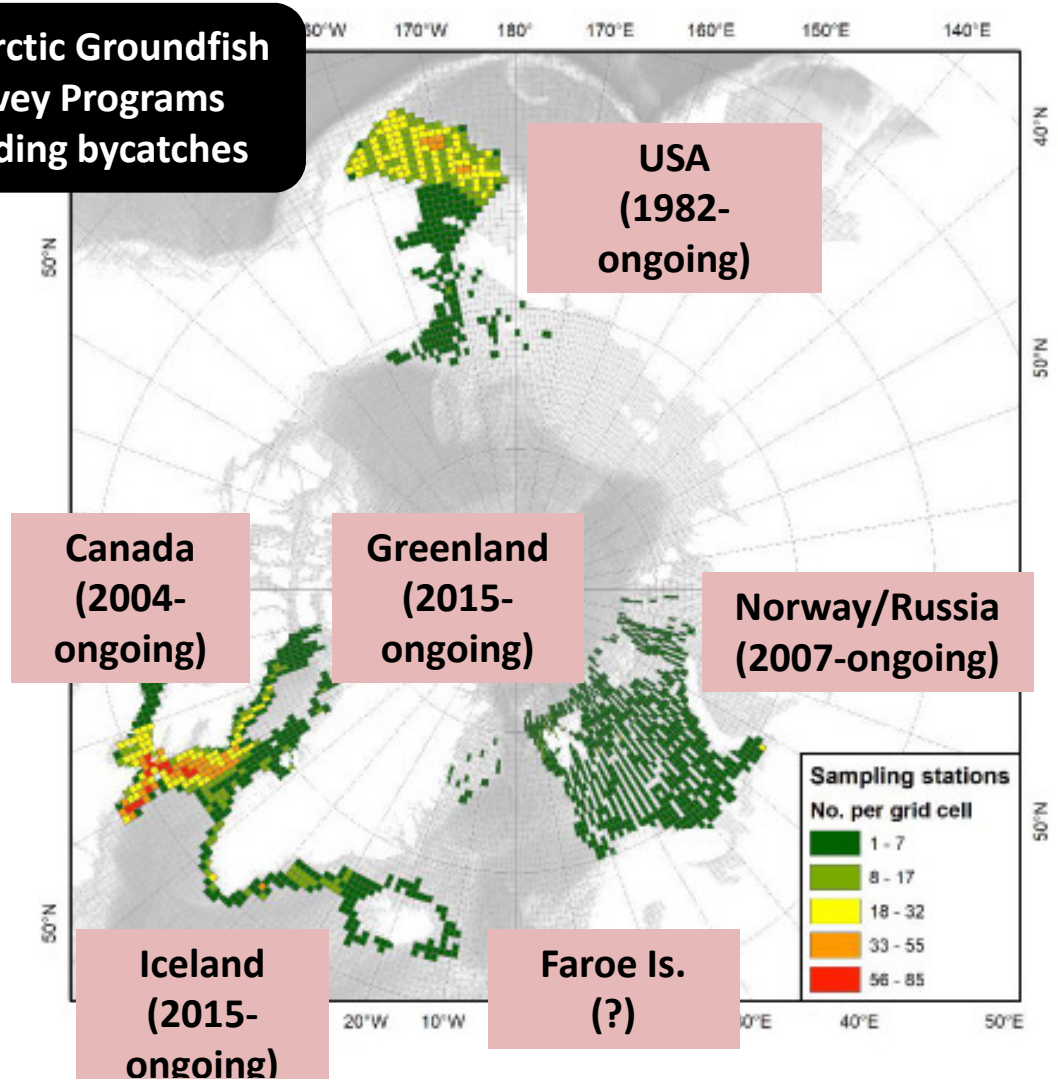
Obj. 4: Assess monitoring gaps

KEY FINDING: Lack of consistency and methodological standardization in combination with limited geographic coverage that limits our ability to assess large-scale and long-term dynamics in benthic communities.

SUGGESTION: As a first step towards an international collaborative monitoring framework, we recommend to **develop a time- and cost-effective, long-term and standardized monitoring** of megabenthic communities in all Arctic regions with regular groundfish assessment surveys.

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

Pan-Arctic Groundfish Survey Programs including bycatches



2017 Copenhagen workshop

Founded by the Nordic Council

MAIN GOAL

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

Talk to be given in KNO4 11.oct. at 10:30-12 am

Main Conclusions and Recommendations

Status of Knowledge on Biodiversity

Current monitoring efforts have focused on macro- and megabenthic species

- micro- and meiofauna still lacking behind

Temporal Trends and Drivers

Decadal changes in benthos biodiversity are observed in some well-studied regions, such as the Barents Sea and Chukchi Sea

- little-known regions: deep-sea Arctic basins, the high Canadian Arctic Archipelago

Long-term Monitoring

Arctic regions with regular groundfish assessment surveys

- develop standardized monitoring of megabenthic communities based on bycatches.

Other regions

- research programs, which are usually short-termed and do not guarantee spatial consistency in sampling, but still provide valuable information on benthic biodiversity and community patterns.

Acknowledgements

State of the Arctic Marine Biodiversity Report, Benthos Chapter co-authors:

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