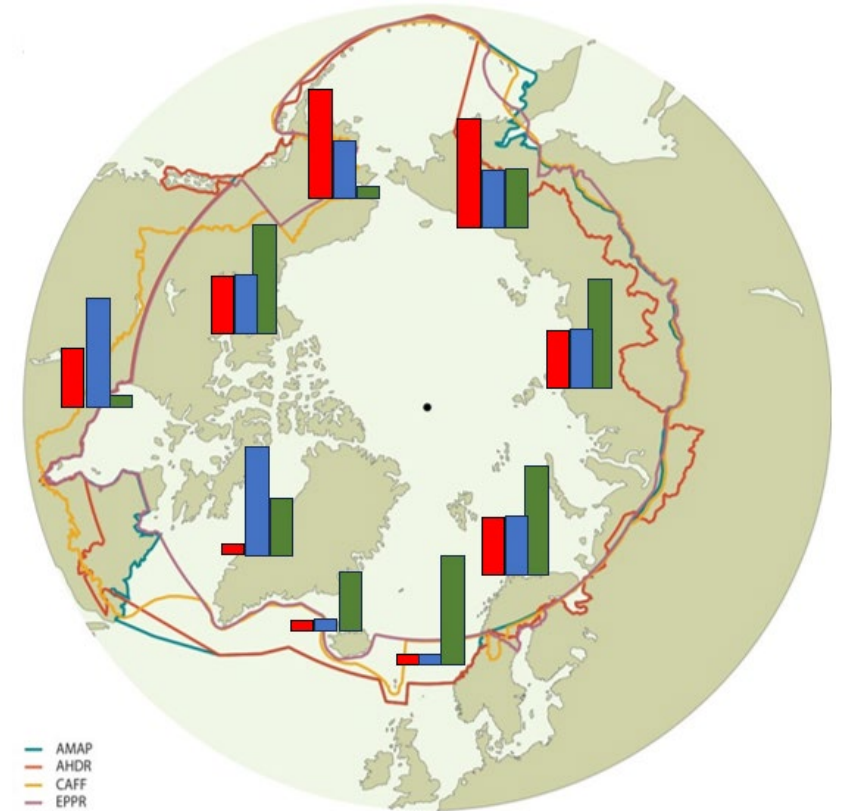


Session - Monitoring and assessment of plastic pollution in the Arctic

Case study of shoreline litter in the Arctic



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What is an assessment?

- *Oxford dictionary* - the evaluation or estimation of the nature, quality, or ability of someone or something
- To monitor or quantify consequences of a plan, policy, program

What do we include as the Arctic?

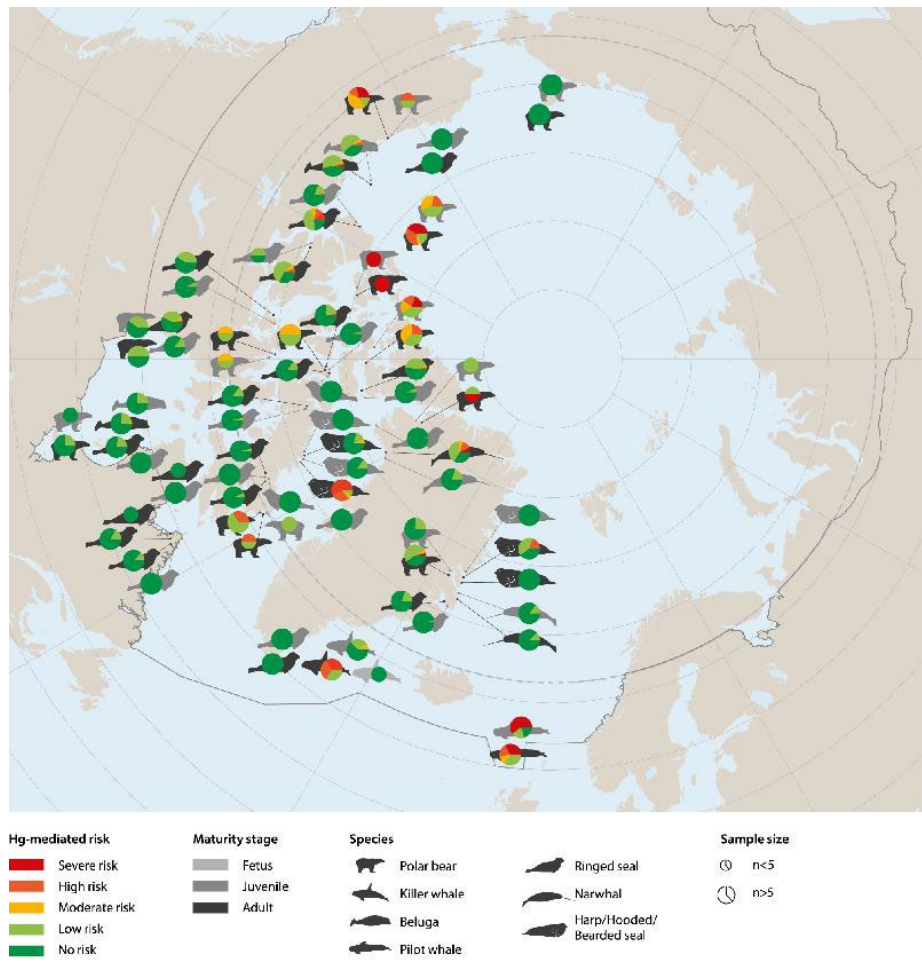
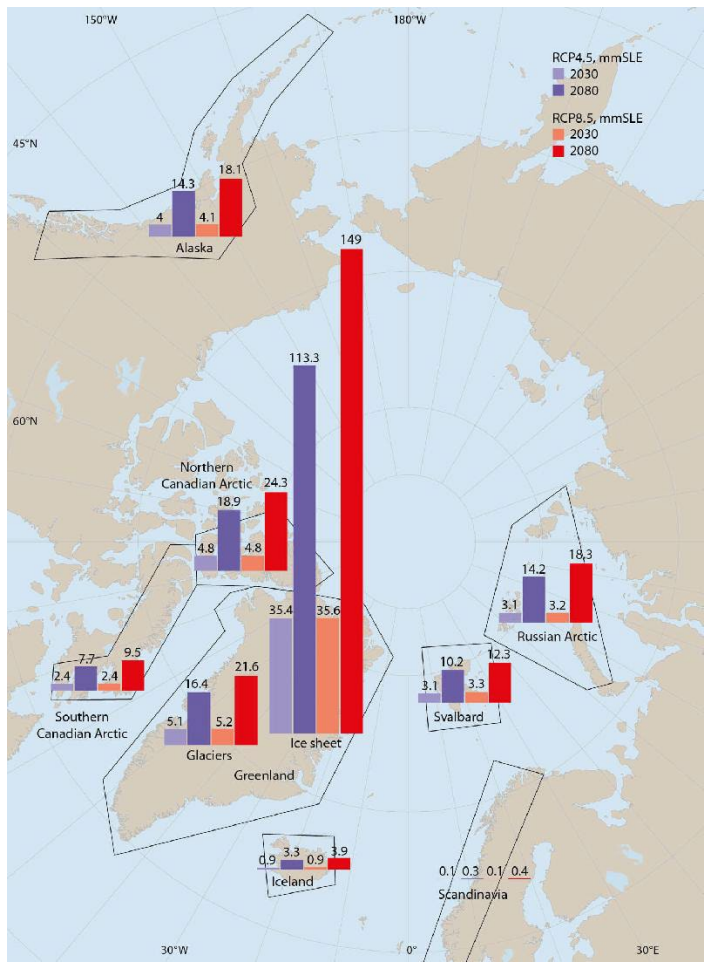
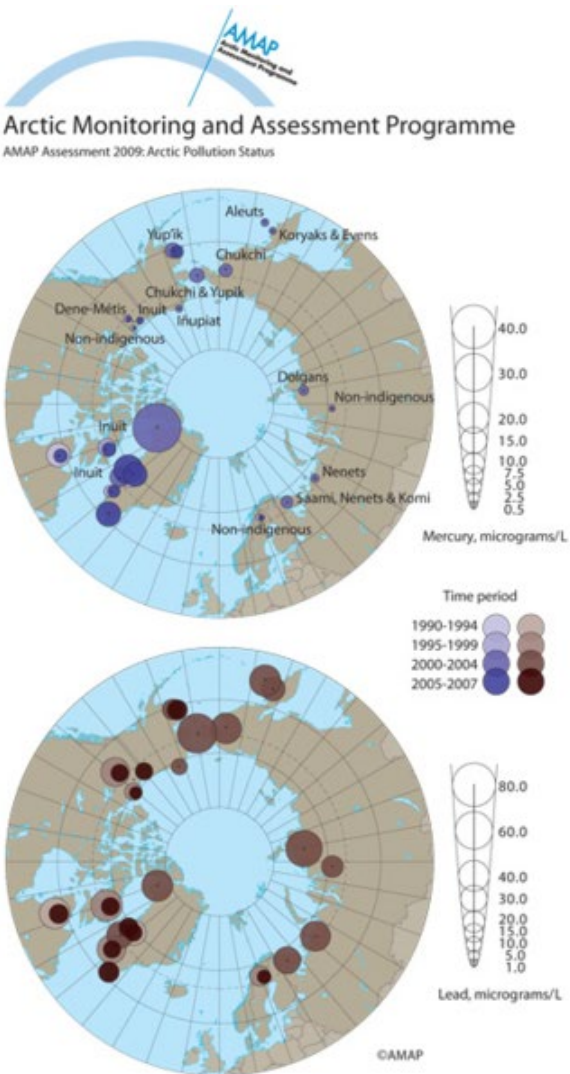
- Even within the Arctic Council working groups there are different definitions

Taken together, the task is pan-Arctic evaluation of plastics in order to inform regional, national, and international policy that aim to reduce the impacts on the environment.



Assessments in the Arctic....

- Long history of assessments of contaminants in the Arctic



What about shoreline litter data?



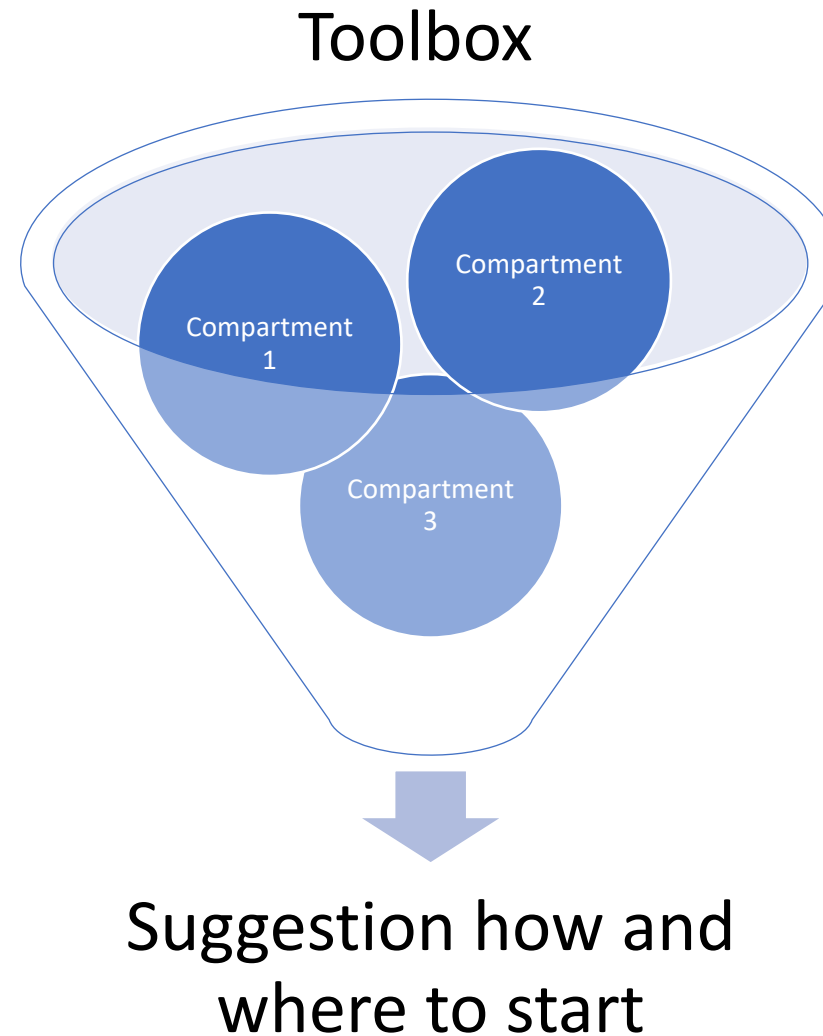
- Easily visible and counted – meso and macroplastics
- Data in some regions go back to the 1970s/80s
- Thousands of datapoints in the Arctic
- Litter data can tell us about
 - Country/region source of litter (e.g. local versus long-range)
 - Sector source of litter (e.g. fishing, tourism, waste management)
 - Size fractions
 - Density of litter on shorelines
 - As high as 7,331 kg/km
 - Seasonal variation (OSPAR spring/summer)

AMAP's Litter and Microplastics Expert Group

Guidelines:
methodological details
(tools)

VS

Monitoring plan:
Prioritisation



266 pages



24 pages

An ecosystem approach to monitoring *physical* litter and microplastics



Shorelines/beaches

Aquatic sediments

Atmospheric deposition

Snow/ice

Water (freshwater and sea)

Terrestrial soils

Seabed

Mammals

Birds

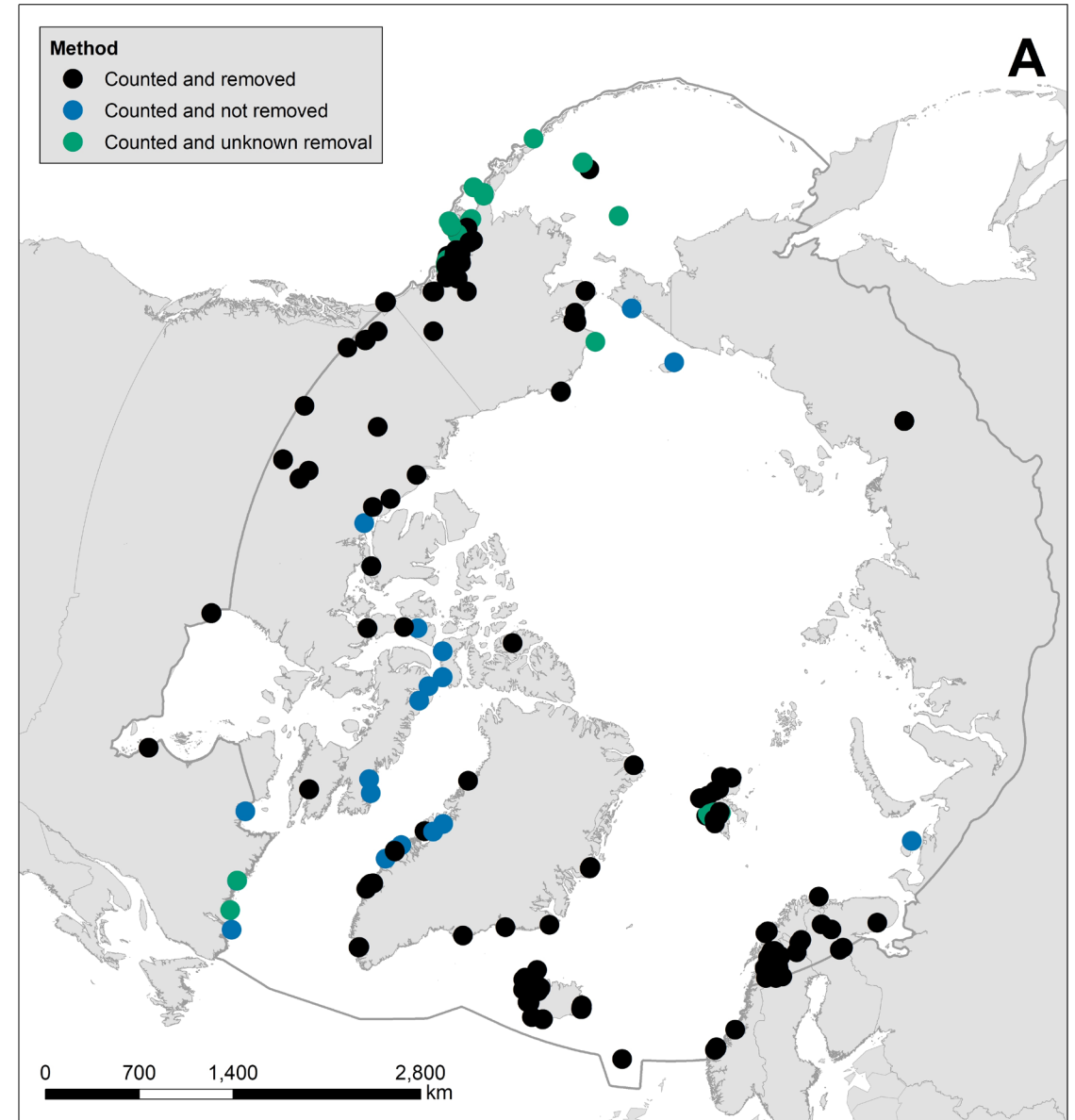
Fish

Invertebrates



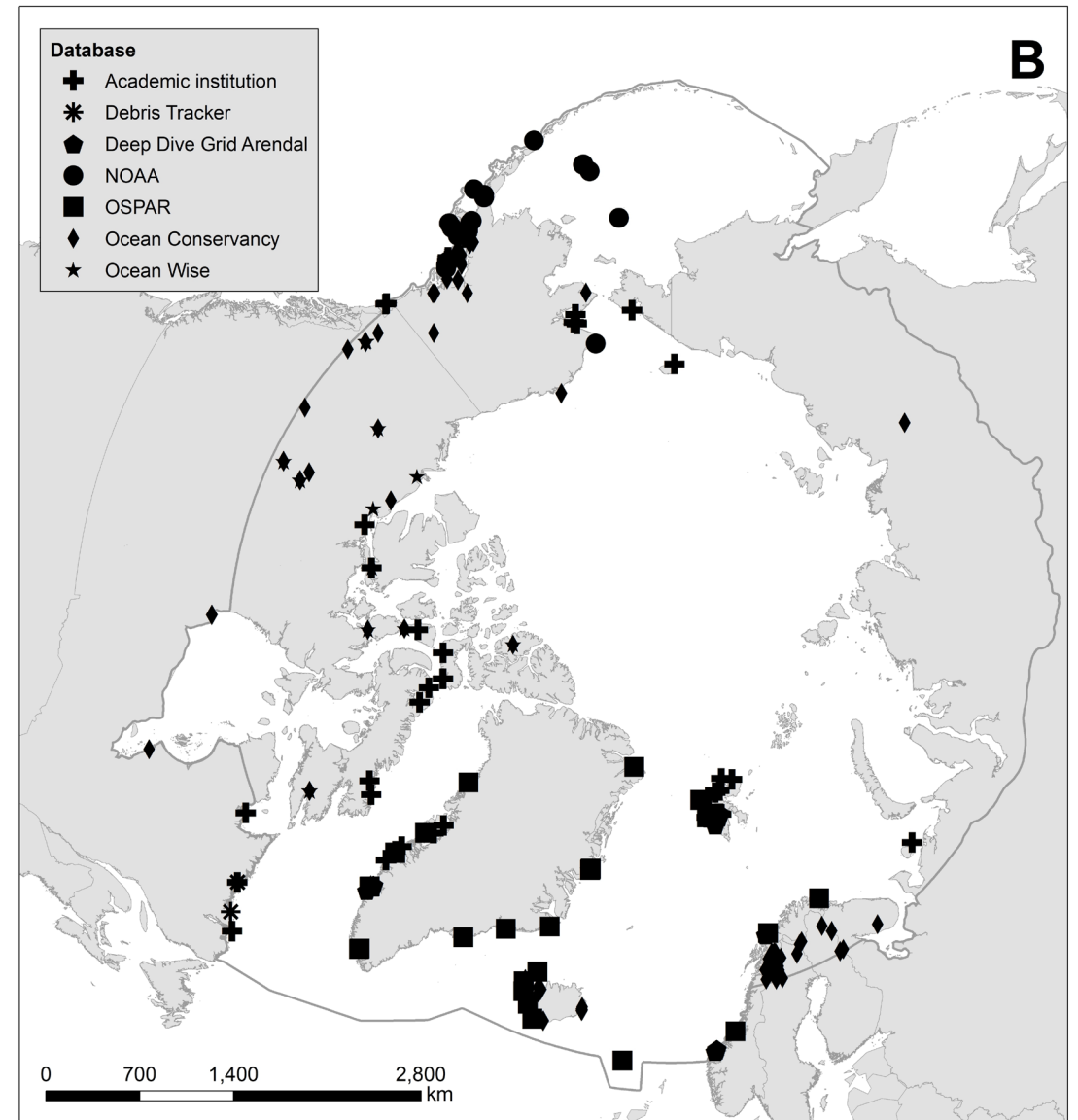
What methods have been used?

- Some account for effort
 - Monitoring programs – standard sites
 - Regional programs
 - Opportunistic sampling – from tourism vessels
- So do not account for effort
 - Citizen science apps – debris tracker
- Some remove the litter
- Some don't remove the litter
 - As per regulatory and permitting guidelines



Where is the shoreline litter data?

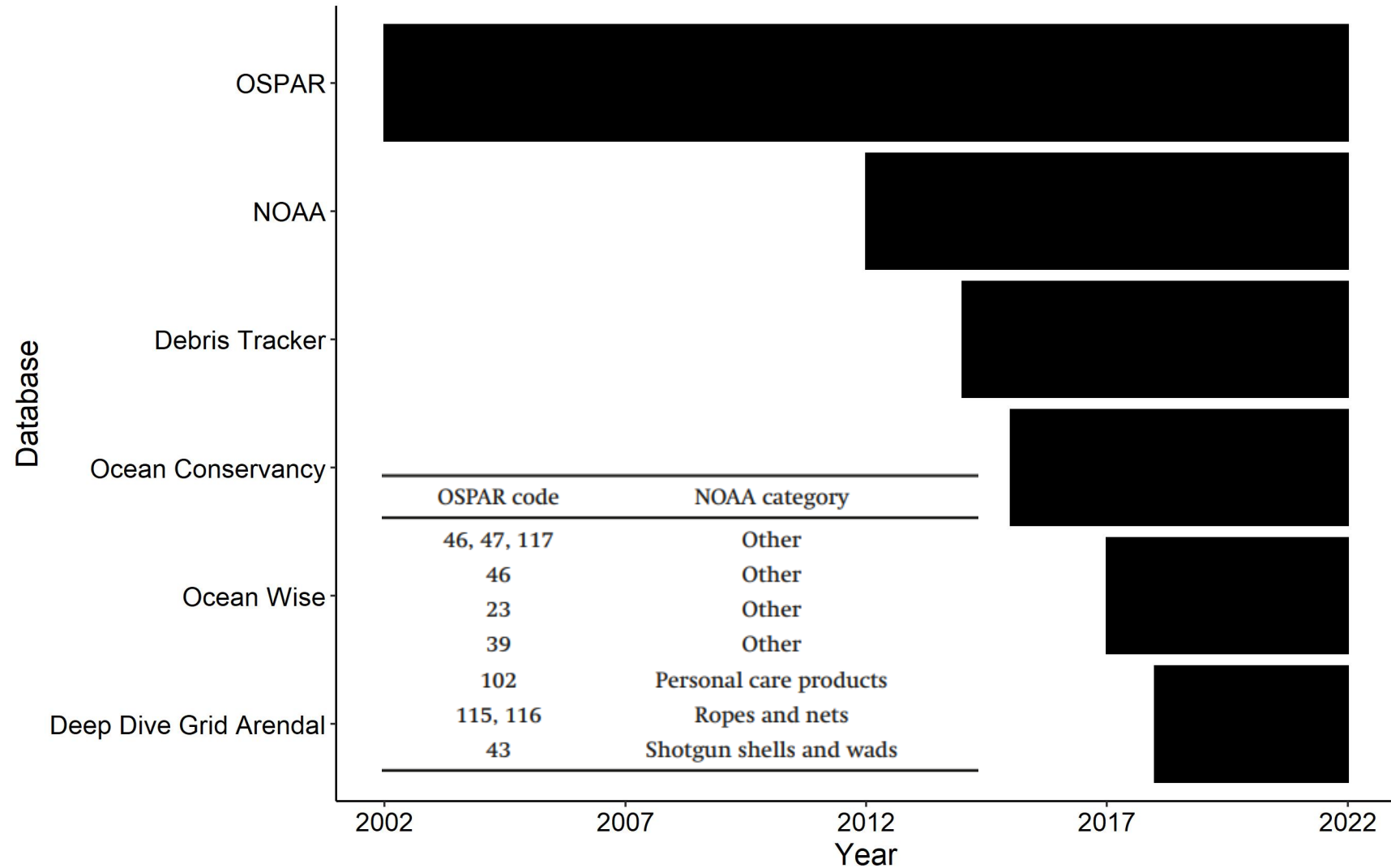
- Long term datasets from monitoring programs
 - NOAA Marine Debris (US)
 - OSPAR
 - Typically available, and organized and analyzed regularly
- Citizen science programs
 - Ocean Wise
 - Ocean Conservancy
 - Available upon request, not analysed regularly
- Academic institutions, may be Open Access, may be not...



How far back does the data go (in the Arctic)?

- Different databases use different frames
- Different taxonomies/ categories are also used

All of this means – all these differences impede the merging of datasets and comparative analyses



The good news...

- Data focused studies have shown that OSPAR and NOAA (among other non-Arctic projects) databases can be relatively easily merged and compared (Hapich et al. 2022 - Trash Taxonomy Tool)

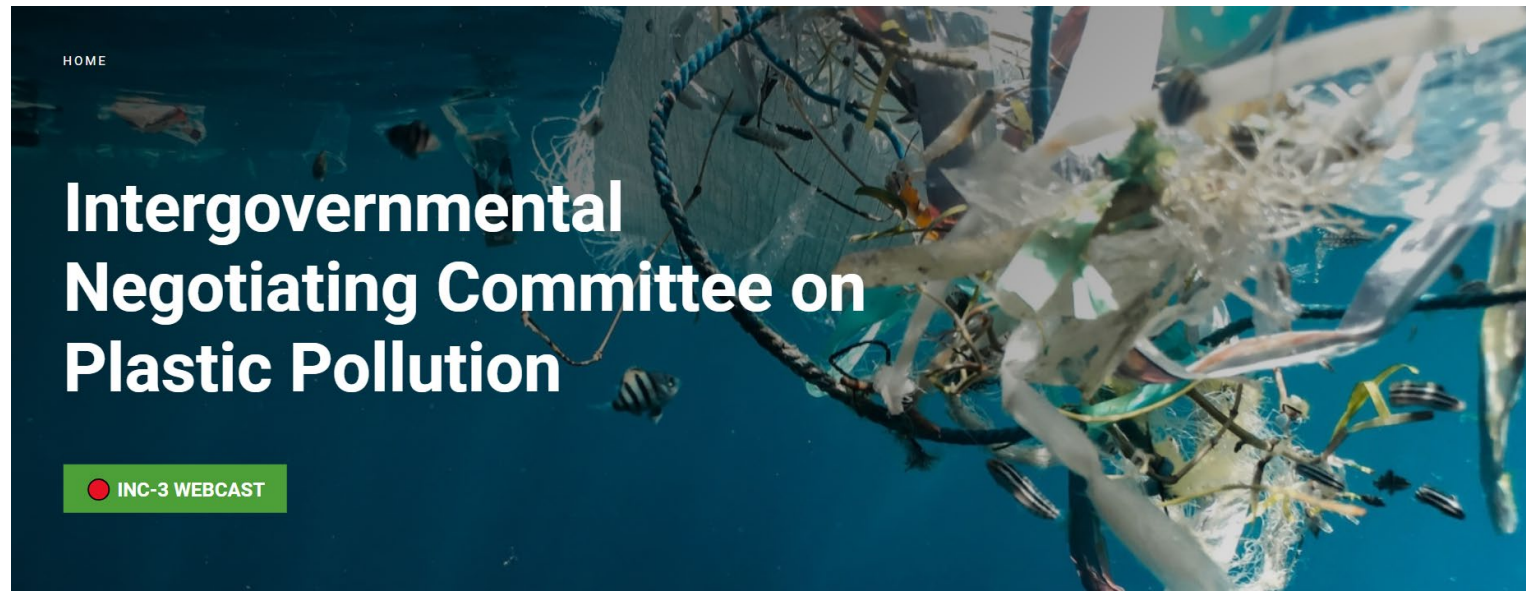
So, while we need invest in this....



... we need to invest in the data side of things.



Why does this matter?



- Arctic policy makers need to know what types of plastics are most common on shorelines
- International policy makers need to know what may be coming from sources outside the Arctic
- All policy makers need to track trends in relation to policy implementation
- Industry needs to know how they are contributing, so they can take action
- Communities need to know what local actions are needed
- Communities need to know what for planning removal actions
- Wildlife conservation people need to know where the hotspots are, and if clean-up efforts need to target critical habitat areas

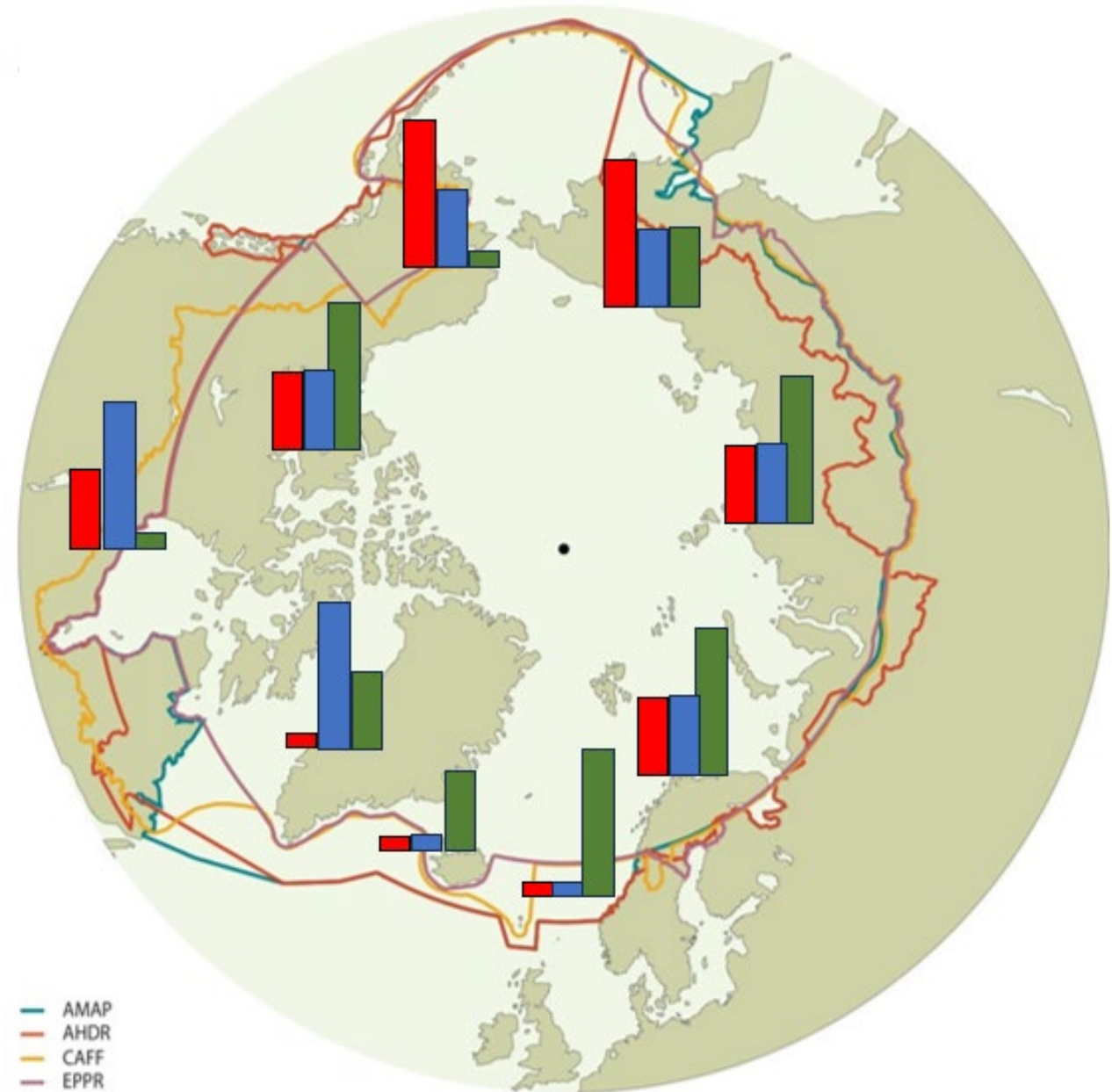
Understanding impacts of entanglement...

.... depends on good understanding of patterns of litter in the environment.



The challenge to us all

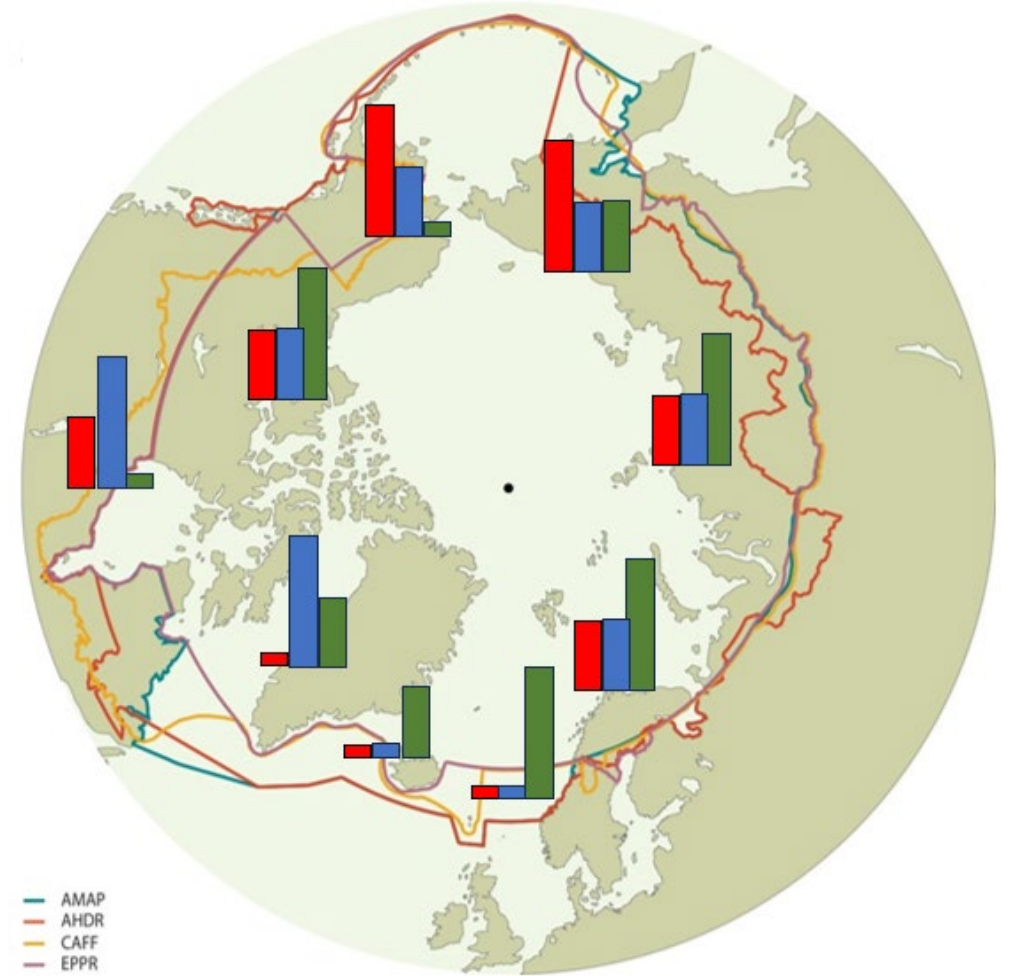
At our next Plastics in the Arctic meeting, can we have a map like this for shoreline plastics?



How do we get there...

- Ask yourself the purpose of the shoreline litter counts!
 - Local assessments are valuable and needed, but consider how data is contributing to existing databases
 - Beach cleanups for education and outreach are valuable and needed, but consider how effort can be measured, what framework is being used
- Pick an existing methods framework – STOP MAKING NEW METHODS AND NEW DATABASES!!!
- Archive data and ensure that it is downloadable
- Data accessibility and planned analyses – OPSAR, NOAA
- **Invest in data management and analyses – without this, we will continue to be impeded to carry out assessments.**

Map your policy endpoints to ensure your science is impactful!

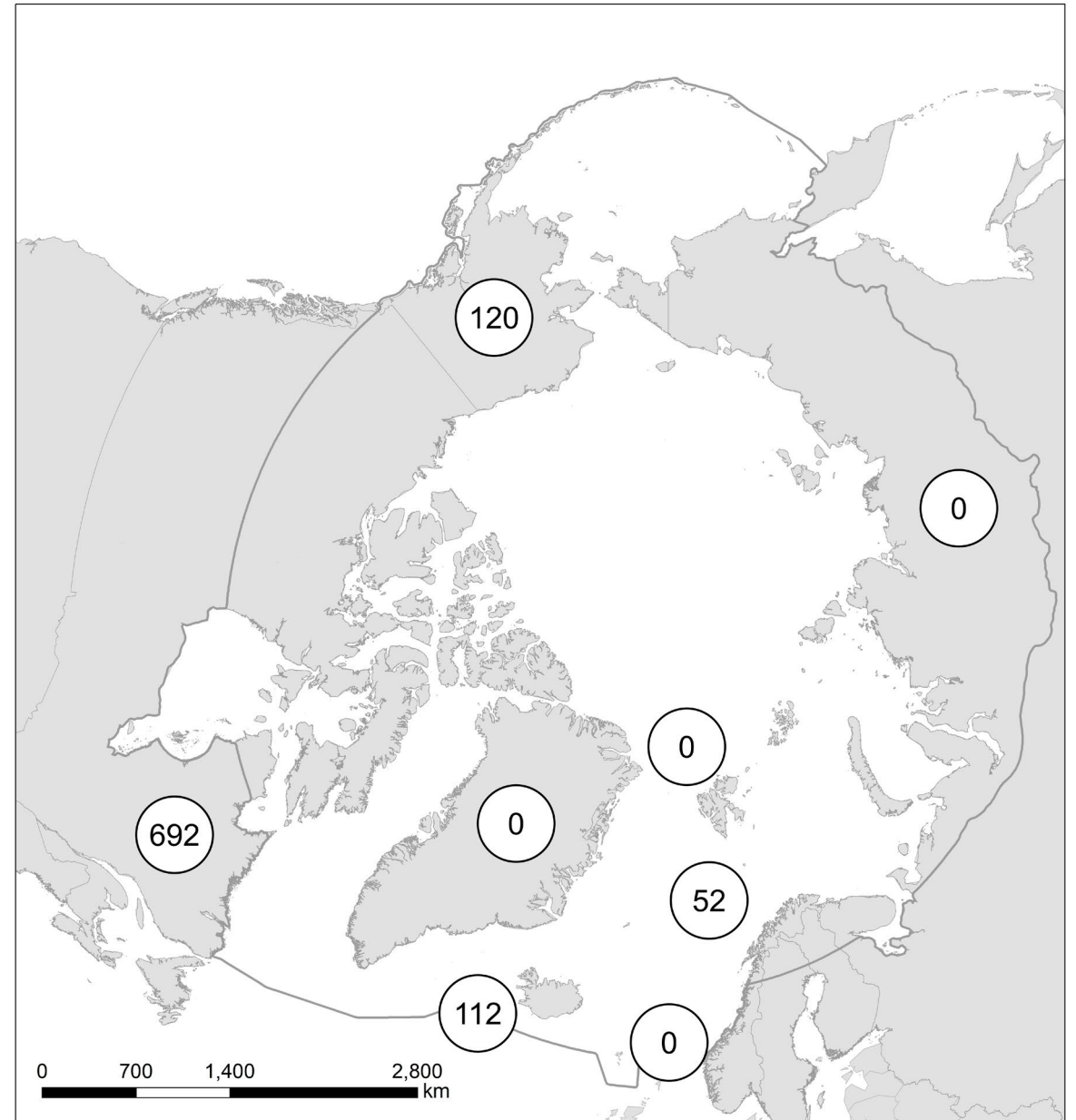


Data observations – collections – handling/management – analysis

Questions



Debris Tracker entries



The challenge to us all

