

# Connecting the dots – how to improve data coverage in the Arctic Ocean across space, time and disciplines

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Arctic Observing Systems - What, why, who and how to improve – webinar - 09 November 2022



## Connecting the dots

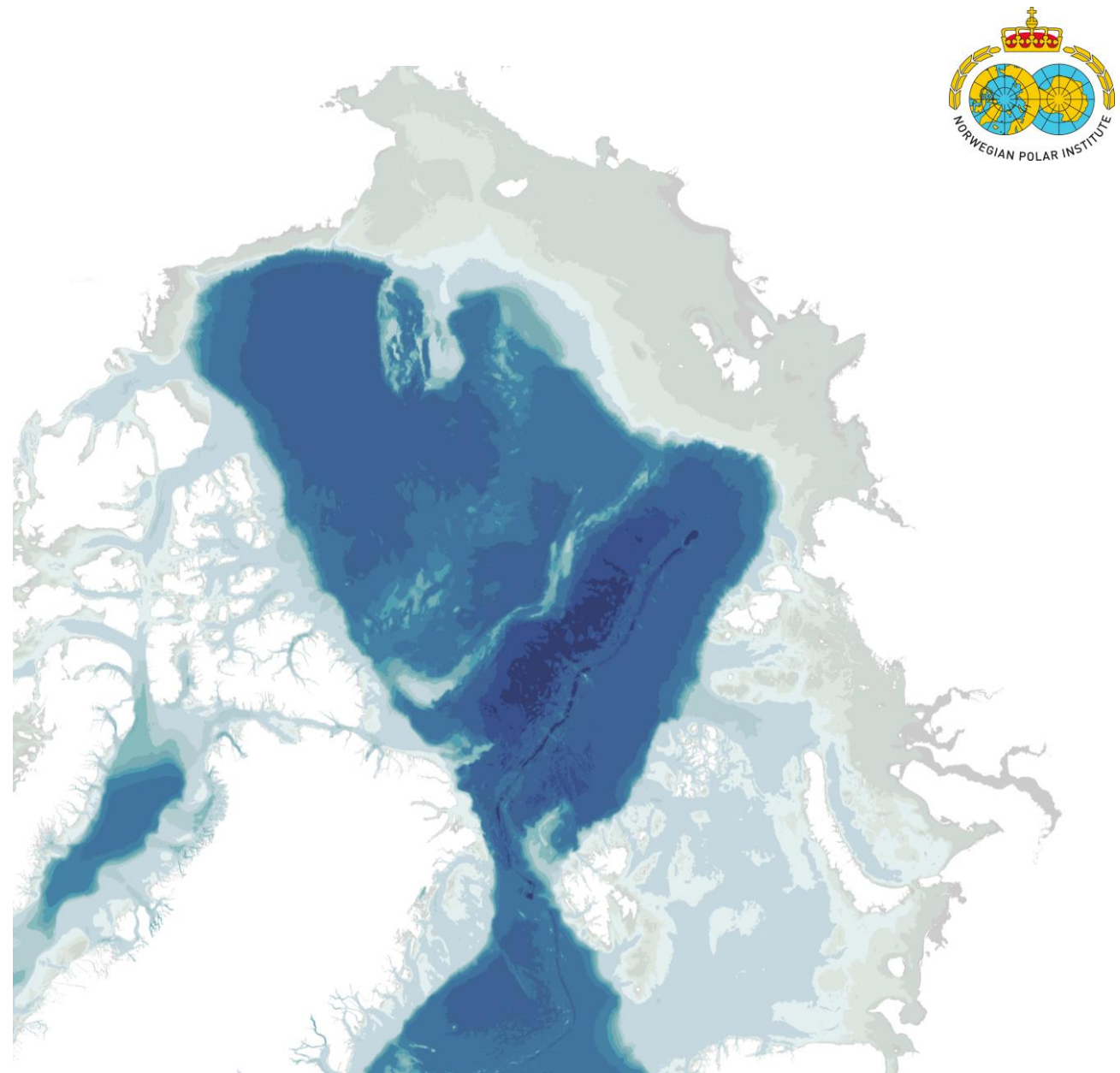
**Ship-based campaigns** are needed for comprehensive inter-disciplinary sampling, and for deployment of other infrastructure.

**Long-term instrument installations - ocean moorings** - allow us to collect data throughout the year, from near the surface to the ocean floor.

**Drifting sea ice buoys and ice-tethered instruments** capture spatial and temporal differences.

All of these together allow us to cover key variables across seasons and space.

Must be combined with remote sensing and coupled models to understand the whole system.



## Ships are still needed for interdisciplinary measurements!

- For example, chemical fluxes through sea ice, algal growth under the ice, or abundance of different species in the water column, can not be adequately observed and assessed through remote sensing or autonomous platforms.
- We need to provide space for people on board – and collect samples/do operations for those who cannot join themselves.

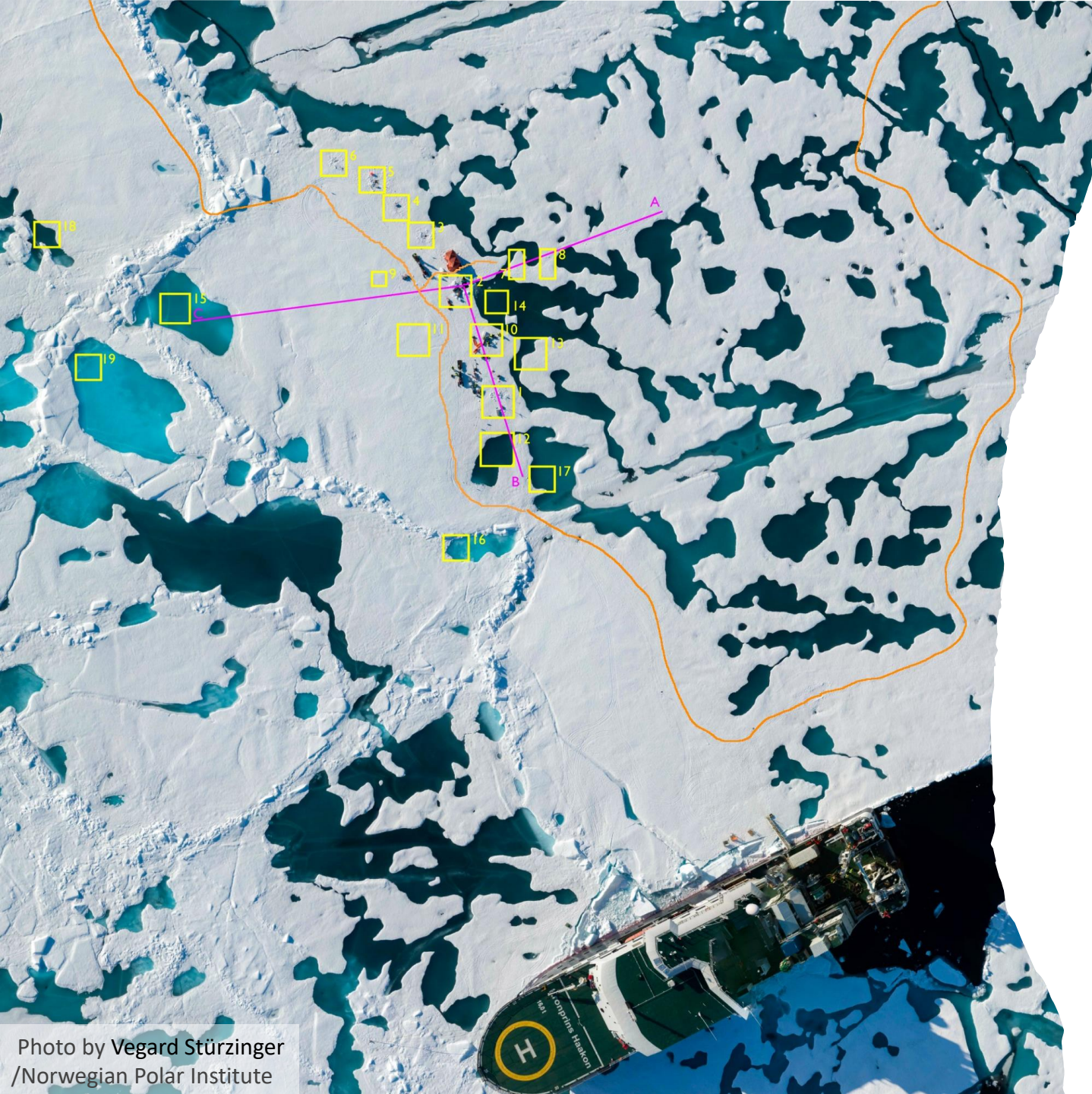


Photo by Vegard Stürzinger /Norwegian Polar Institute



Photo by Aleksander Eeg

# NPI's Arctic Ocean cruise summer 2022

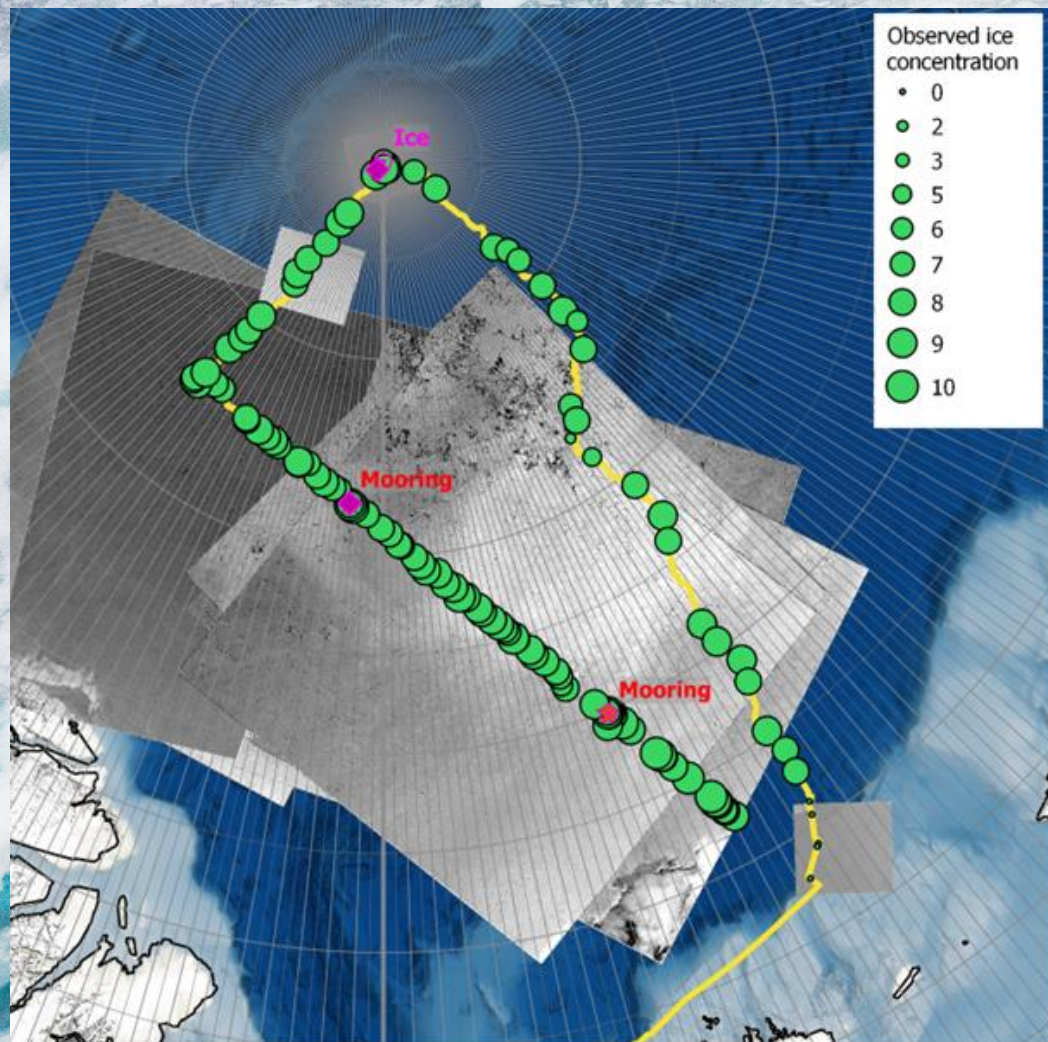
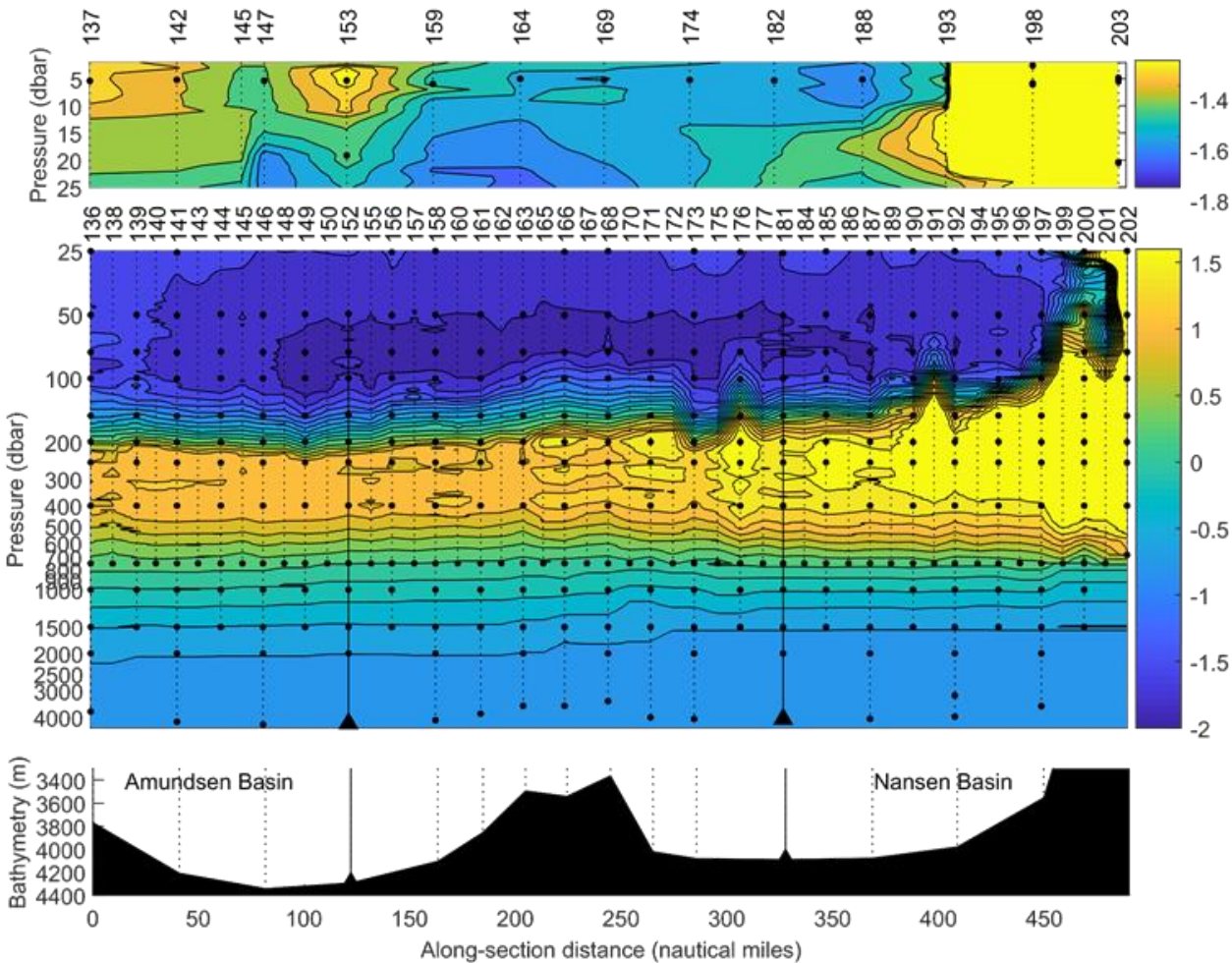
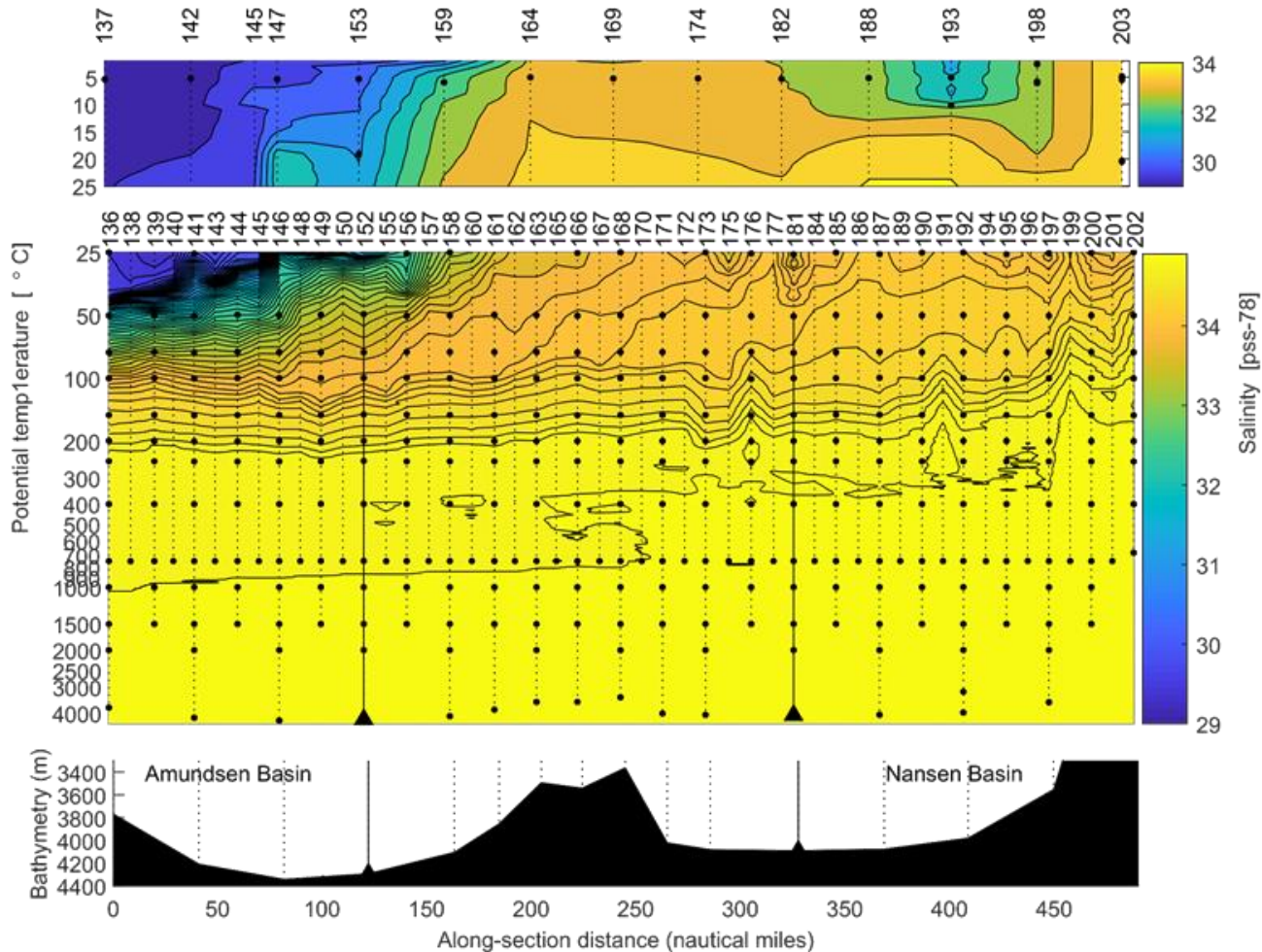


Photo by Vegard Stürzinger /Norwegian Polar Institute

## Temperature



## Salinity

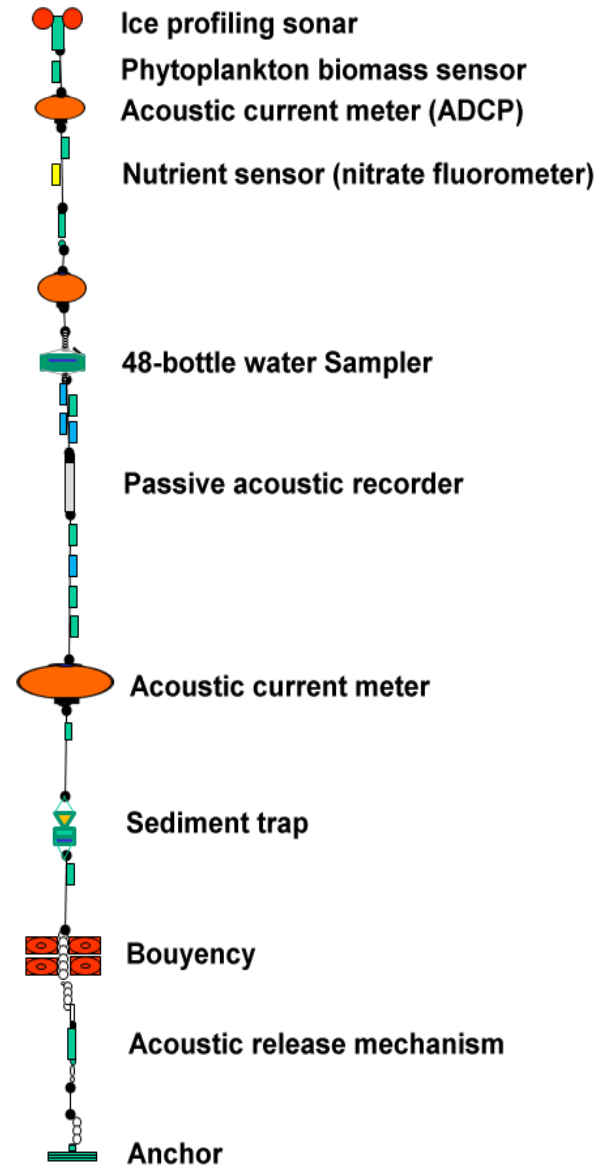


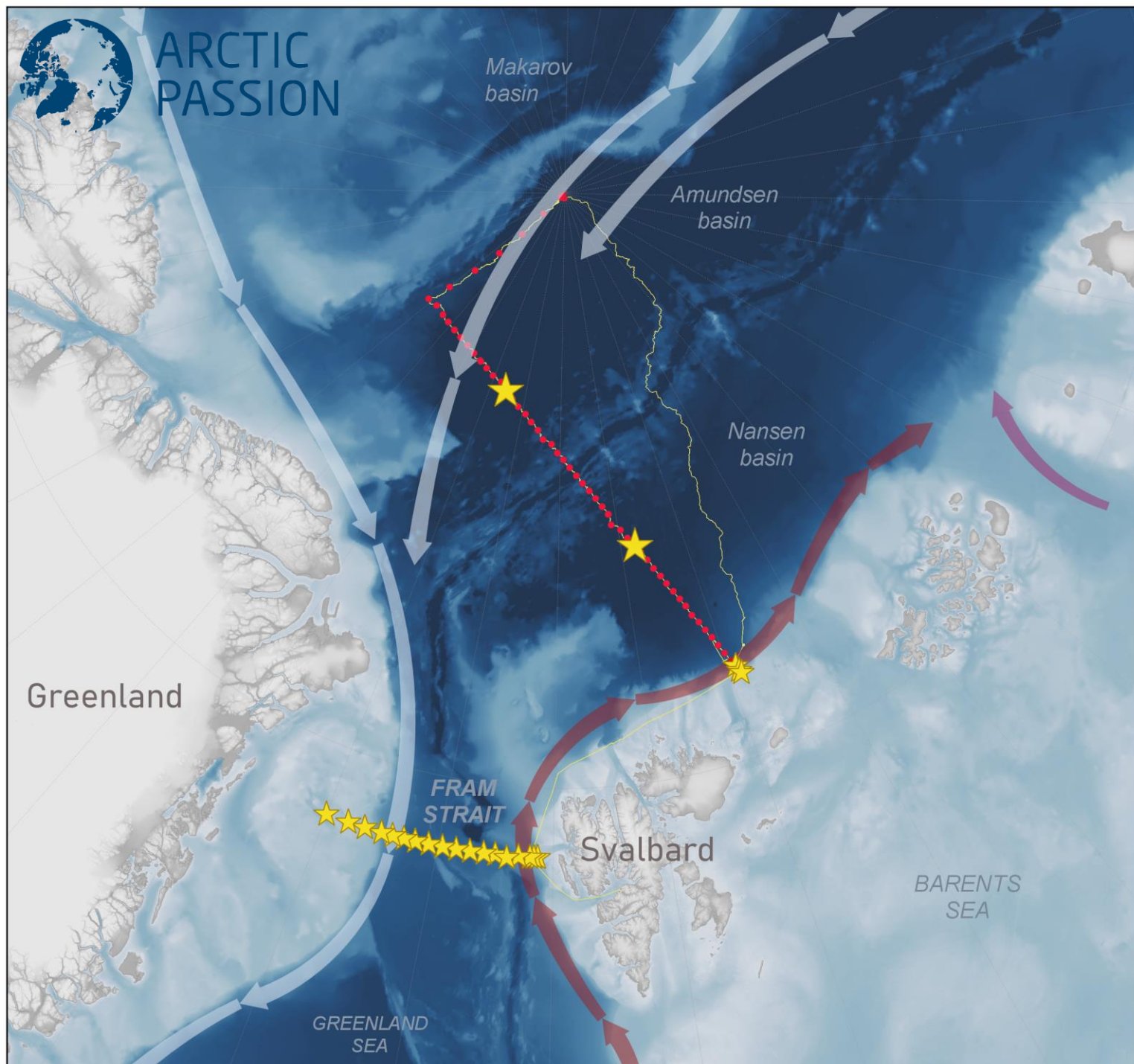
# Oceanographic Moorings

long time series from singular locations



Photo by Trine Lise Sviggum Helgerud  
/Norwegian Polar Institute





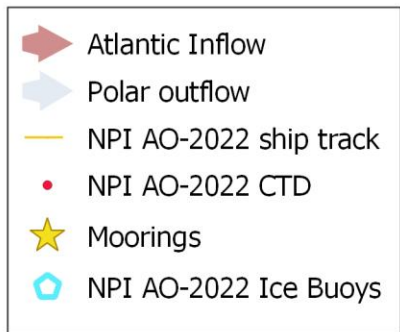
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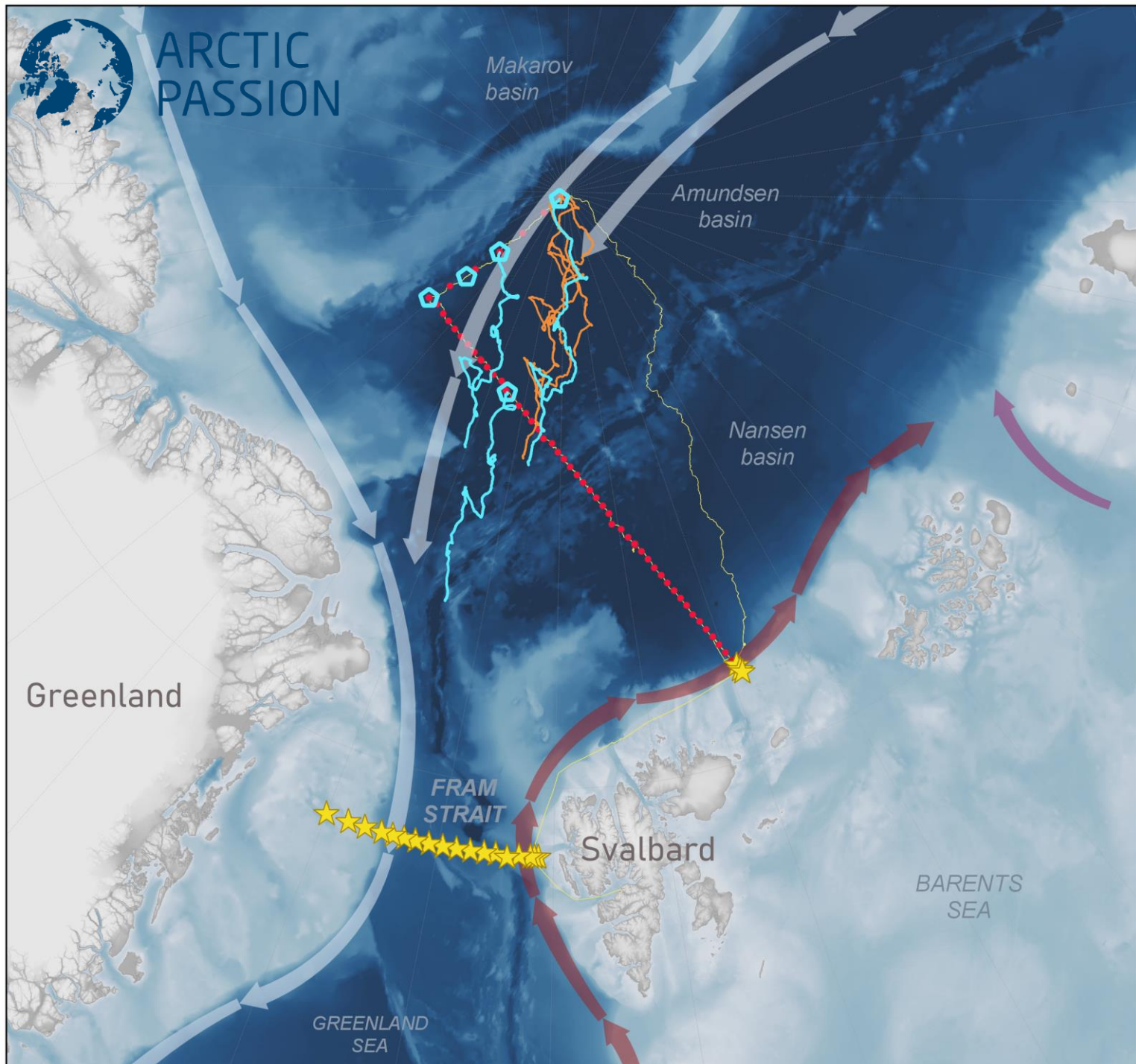


## Oceanographic Moorings

long time series from singular locations

- Need to co-ordinate between institutions/programs to decide locations and core variables to be measured
- Mooring owners should provide space on the moorings, i.e. allow others to add their sensors to the infrastructure
- On the new moorings deployed in summer 2022 there are instruments from or in collaboration with five different institutions.





## Drifting sea ice buoys

spatial coverage of dynamic “interface”

- Need to co-ordinate between institutions to decide locations and core variables.
- Cruise operators must facilitate deployment of partner buoys, either with people on board or on their behalf. On the NPI 2022 AO cruise, 3 institutions had buoys deployed.
- Buoy and sensors owners should build “clusters” to cover more variables together.



 NPI AO-2022 Ice Buoys

Photo by Trine Lise Sviggum Helgerud /Norwegian Polar Institute



## The Atlantic-Arctic Distributed Biological Observatory

- a comprehensive marine observing system for climate and environment

- Identify key locations for collaborative monitoring and research
- Joint and open planning - better use and sharing of infrastructure
- Better and more open sharing of data, common protocols for data processing and handling
- Create win-win situations between institutions with long-term funding and mandates, and those working on project basis with more focused research objectives
- For more information, please visit <https://arcticpassion.eu/adbo/>



Note: preliminary A-DBO map, to be further refined

# The road ahead; under-water navigation of drifters and gliders

New EU H2020 project **High Arctic Ocean Observation System (HiAOOS)**

Led by NERSC, 13 partners, 5 years, starting in January 2023

Call: HORIZON-INFRA-2022-TECH-01 - Next generation of scientific instrumentation, tools and methods.

The HiAOOS System will deploy ocean moorings with observational sensors as well as transponders that may be used for future underwater navigation.

