

Providing infrastructure platforms for Arctic PASSION

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Leader, NPI's Arctic Ocean Programme

The future of research infrastructure in the Arctic, Brussels, 27th October 2022



*The key motivation behind **Arctic PASSION** is the co-creation and implementation of a coherent, integrated Arctic observing system: the 'Pan-Arctic Observing System of Systems - pan-AOSS'. It aims to overcome known flaws in the present observing system by refining its operability, improving, and extending pan-Arctic scientific and community-based monitoring and the integration with Indigenous and Local knowledge, by streamlining the access and interoperability of Arctic Data systems and services, and by ensuring the economic viability and sustainability of the observing system for years to come.*

The focus of this presentation is on the marine in situ component; the sea ice cover and the water column in the deep interior Arctic Ocean.

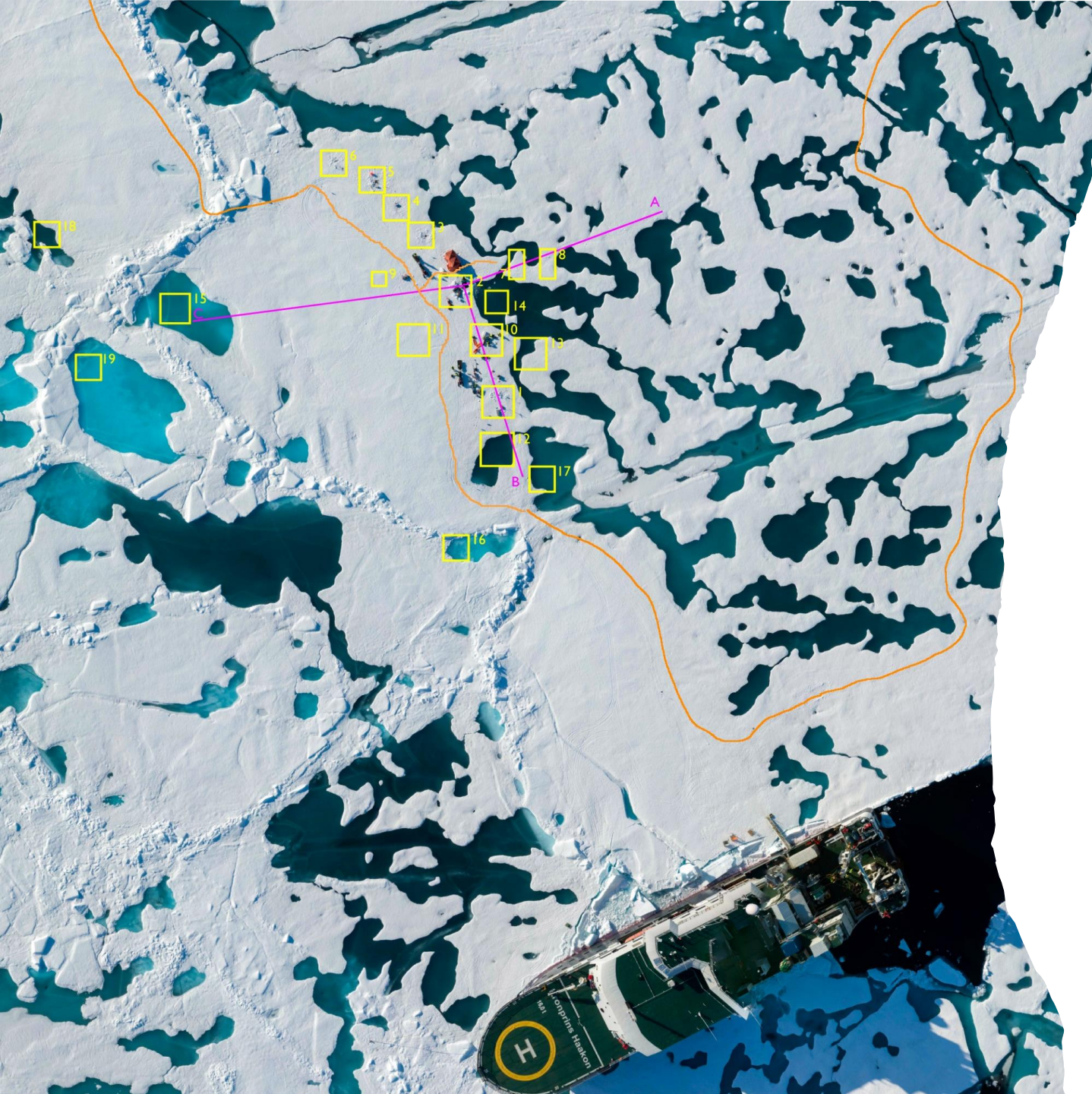
With the retreating ice cover and availability of modern ice breakers it is more feasible to establish a long-term observational system in the Central Arctic Ocean.

Ship-based campaigns combined with long-term instrument installations (ocean moorings) and regular deployments of drifting buoys and ice-tethered instruments allows us to cover core variables across seasonality and space.



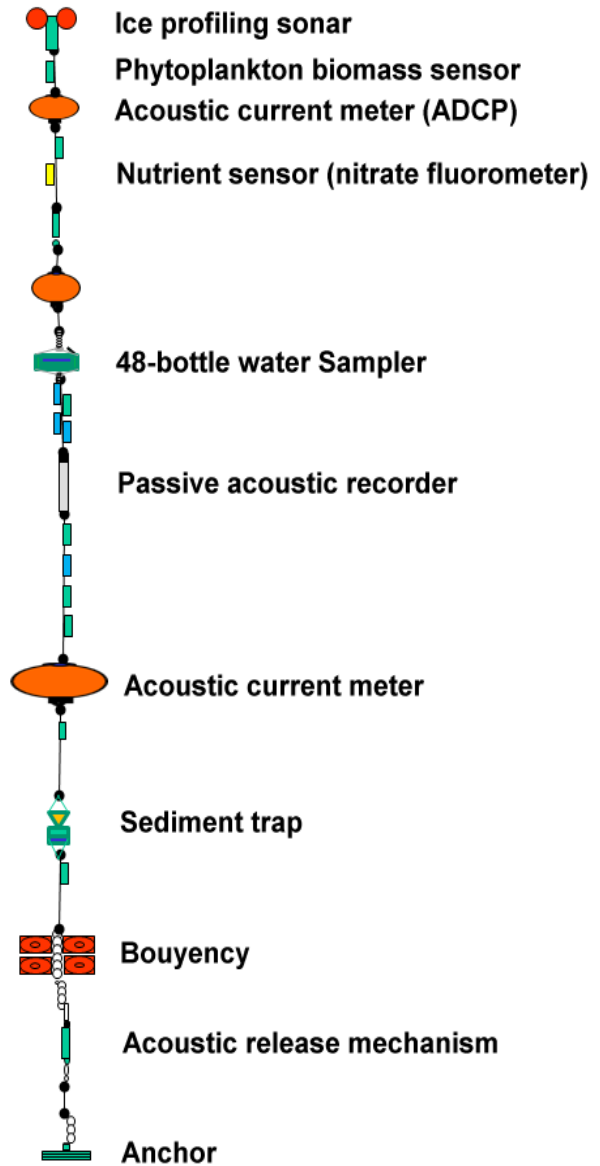
Ships are still needed for interdisciplinary measurements!

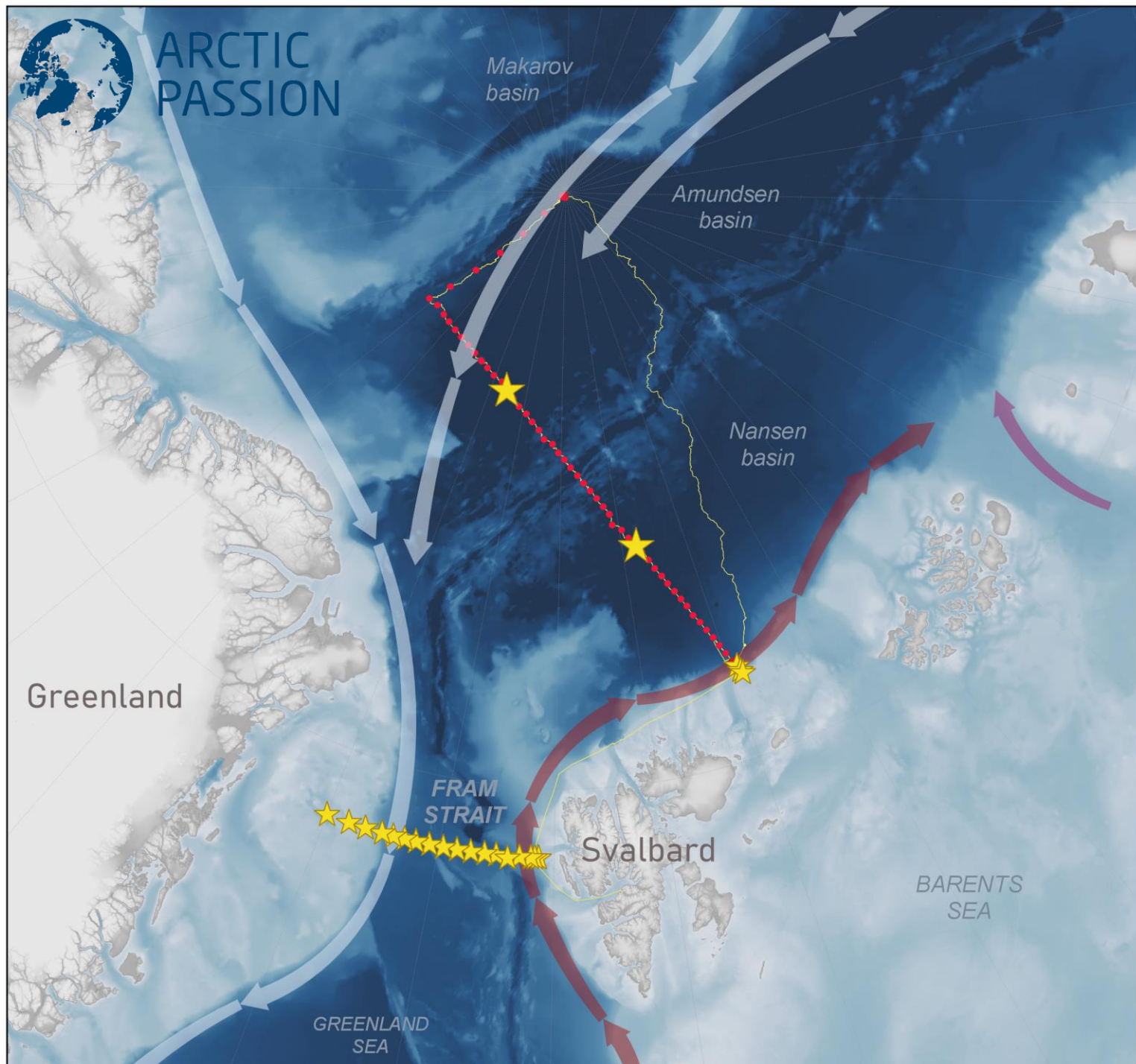
- For example, chemical fluxes through sea ice, algal growth under the ice, or abundance of different species in the water column, can not be adequately observed and assessed through remote sensing or autonomous platforms.
- We need to provide space on board – and collect samples/do operations for those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



Oceanographic Moorings

long-time series from singular locations





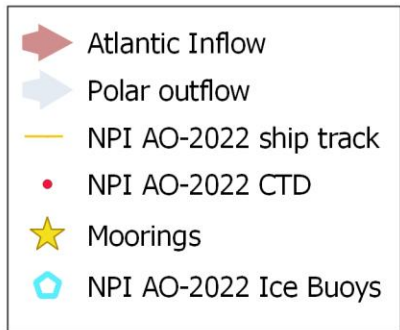
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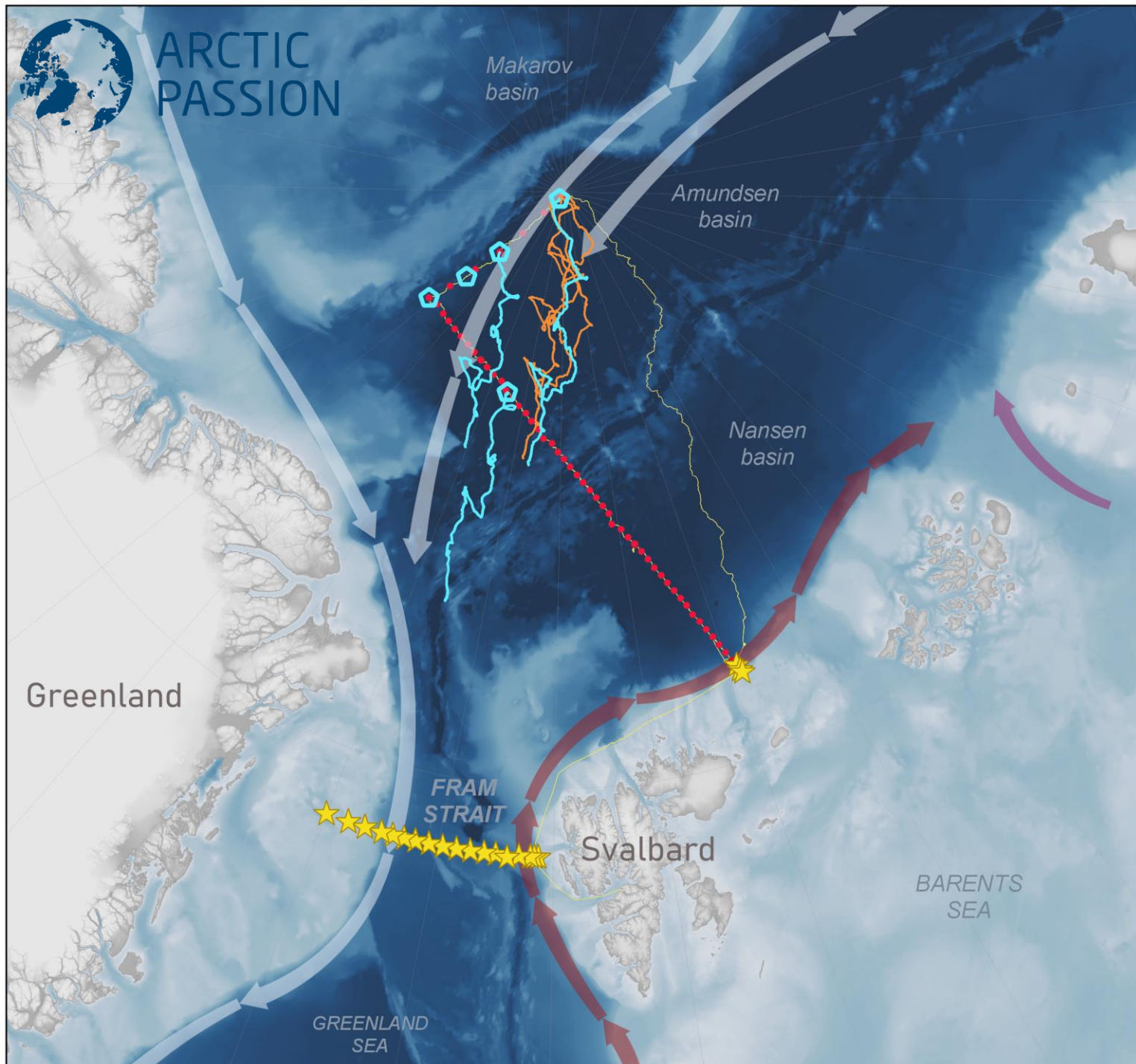


Oceanographic Moorings

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 cruise, 3 institutions had buoys deployed.
- Buoy and sensors owners should build “clusters” to cover more variables together.




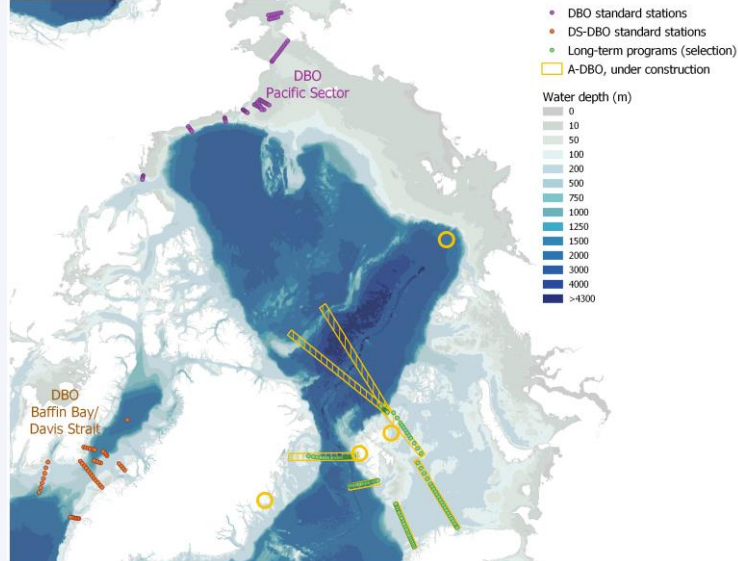
 NPI AO-2022 Ice Buoys

Photo by Trine Lise Sviggum Helgerud
@Norwegian Polar Institute

for getting involved are listed in Upcoming Events below.



The transect lines of all three Distributed Biological Observatories overlaid on a bathymetric map of the Arctic Ocean (BCAO V4.2 Grid/Jakobsson et al. 2000).
The A-DBO is under construction, please join the process to shape it for best use of existing and future data!

UPCOMING EVENTS

A-DBO Autumn Meeting 2022

31 October (11:00 CET) – 1 November (11:00 CET), in Bergen, Norway (+ via TEAMS)

Welcome to our first A-DBO dedicated autumn meeting!

Focus will be put on defining the fundamental spatio-temporal characteristics of the A-DBO and the associated core parameters to sample. We will also make time for planning of cruise activities in upcoming seasons, and for sharing provisional results and metadata from recent sampling activities.

The meeting is open to all who have an interest in joining these collaborative network activities.

Please find the agenda and registration form [here](#). The registration is open until 25 October!

ASSW2023 DBO Sessions

17 – 24 February, in Vienna, Austria

All DBOs (Atlantic, Pacific, Davis Strait) will be represented at the Arctic Science Summit Week 2023:

- ASSW 2023 Business and Community Meetings (17 - 21 February 2023)
- ASSW 2023 Science Symposium (21 - 24 February 2023)

- [Session ID11: Integrating knowledge from regional marine observatories to pan-Arctic perspectives](#)

The Atlantic-Arctic Distributed Biological Observatory

- a comprehensive marine observing system for climate and environment

- Identify key locations for collaborative monitoring
- Joint and open planning - better use and sharing of infrastructure
- Sharing of data, common protocols
- Create win-win situations between institutions with long-term funding and mandates, and those working on project basis with more focused research objectives

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 for underwater navigation.

