European Ocean Observing System

Strategy 2023-2027 launch

# Regions with sparse observations - the Arctic

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(ArcticROOS, Atlantic-Arctic DBO, IASC MWG, SAON Board, EU H2020 INTAROS, EU HE HiAOOS)

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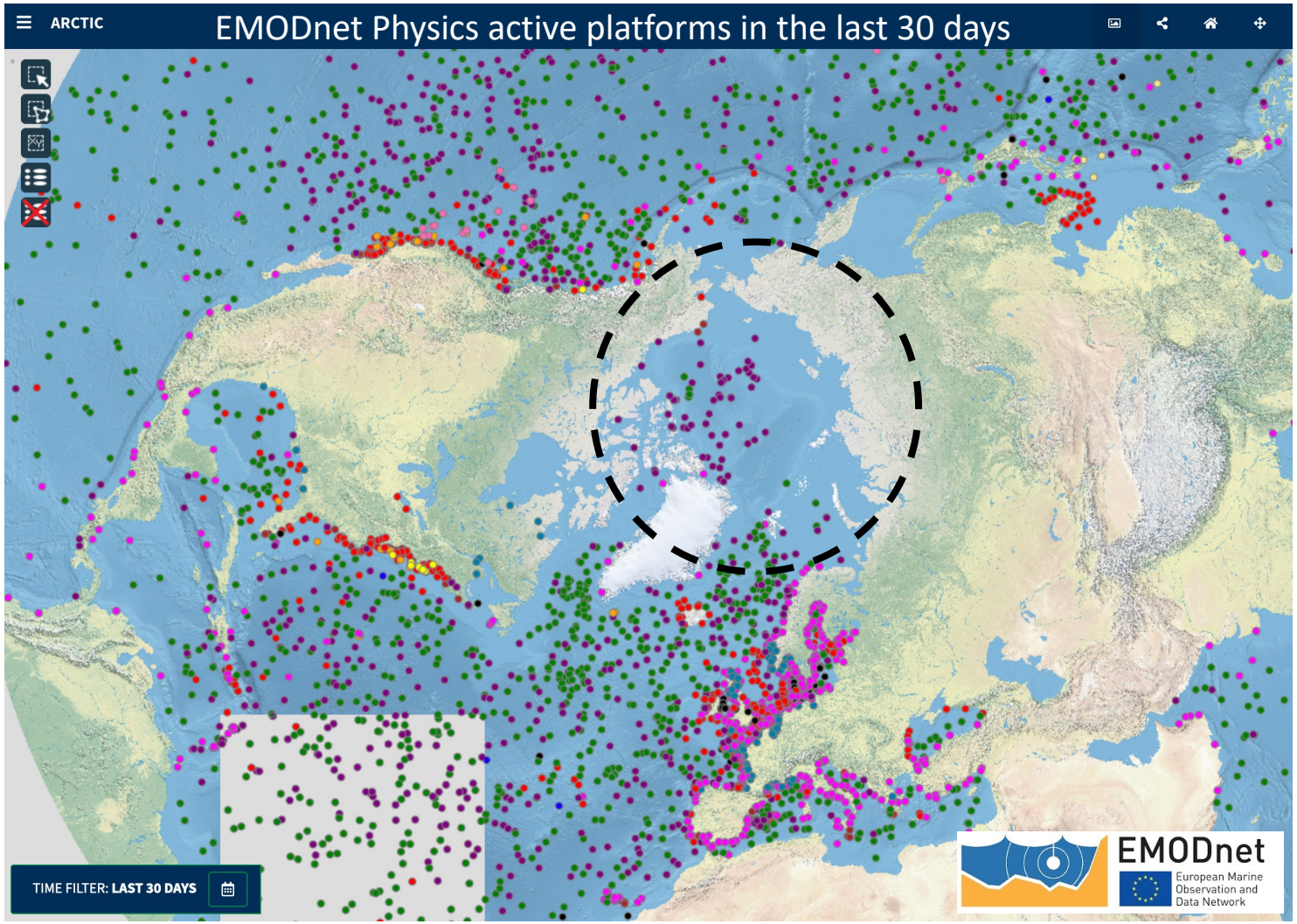
Organised by:

EuroGOOS
European Global Ocean Observing System

European MARINE BOARD
Advancing Seas & Ocean Science

# In situ observations are extremely sprase in the Arctic Ocean and Arctic seas as compared to other regions




eoos European Ocean Observing System

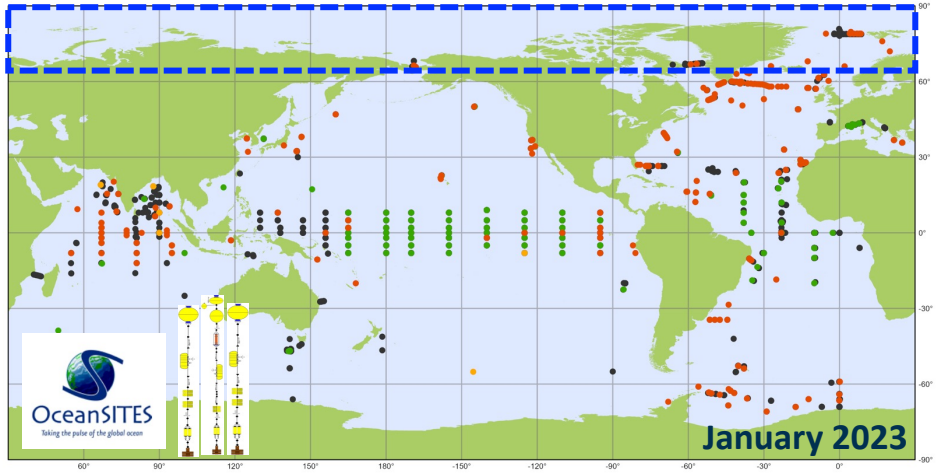
## Challenges of Arctic observing

- **Scales**
  - Different needs for climate, operational fore-cast, constraining models, process studies,…
- **Access**
  - Physical - remote, harsh environment, sea ice
  - Political - critical areas within national EEZs
  - Technological - ice prevents access to critical services (GPS, Iridium), low temperatures, high risk to platforms and sensors
- **Coordination**
  - Scientific - coverage, protocols, priorities
  - Logistics – complex, costly, high risk operations
  - Data and product delivery - timely data provision for services, data curation
- **Scalability/Flexibility**
  - Sustaining long-term integrated measurements
  - Different needs from climate to tactical
  - Evolving with changing environment

# Arctic observations are growing in number but still underrepresented in the main global ocean networks

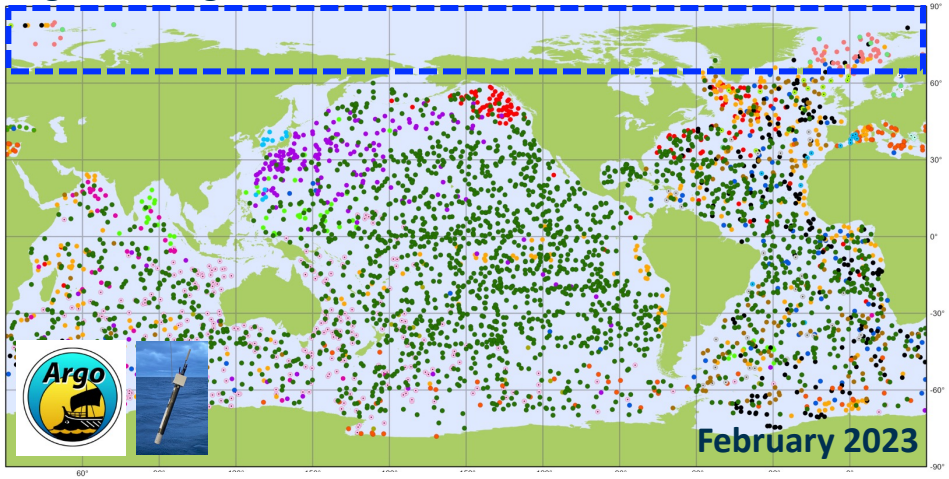
European Ocean Observing System

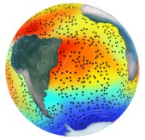
## Sustained Mooring Deployments




OceanSITES

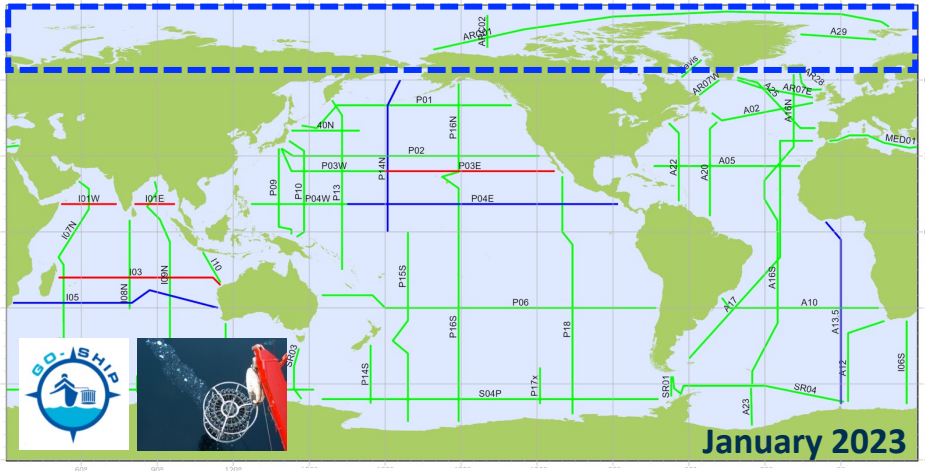
## Argo Profiling Float Network



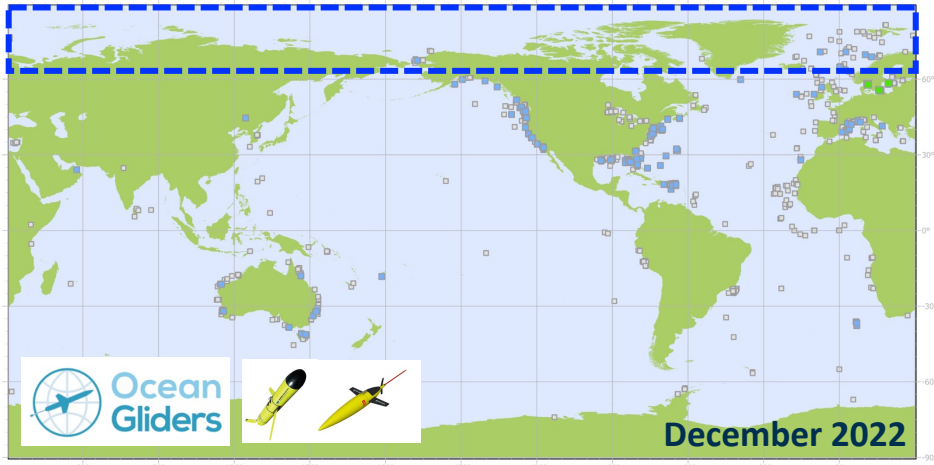
*Generated by ocean-ops.org*

Argo




GO-SHIP

## Sustained GO-SHIP Core Lines




OceanGliders

## Ocean Gliders Deployments

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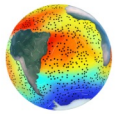
**EOOS Strategy 2023-2027 launch**

# Most of operational data provided by the ice-based platforms drifting in the ice covered Arctic regions



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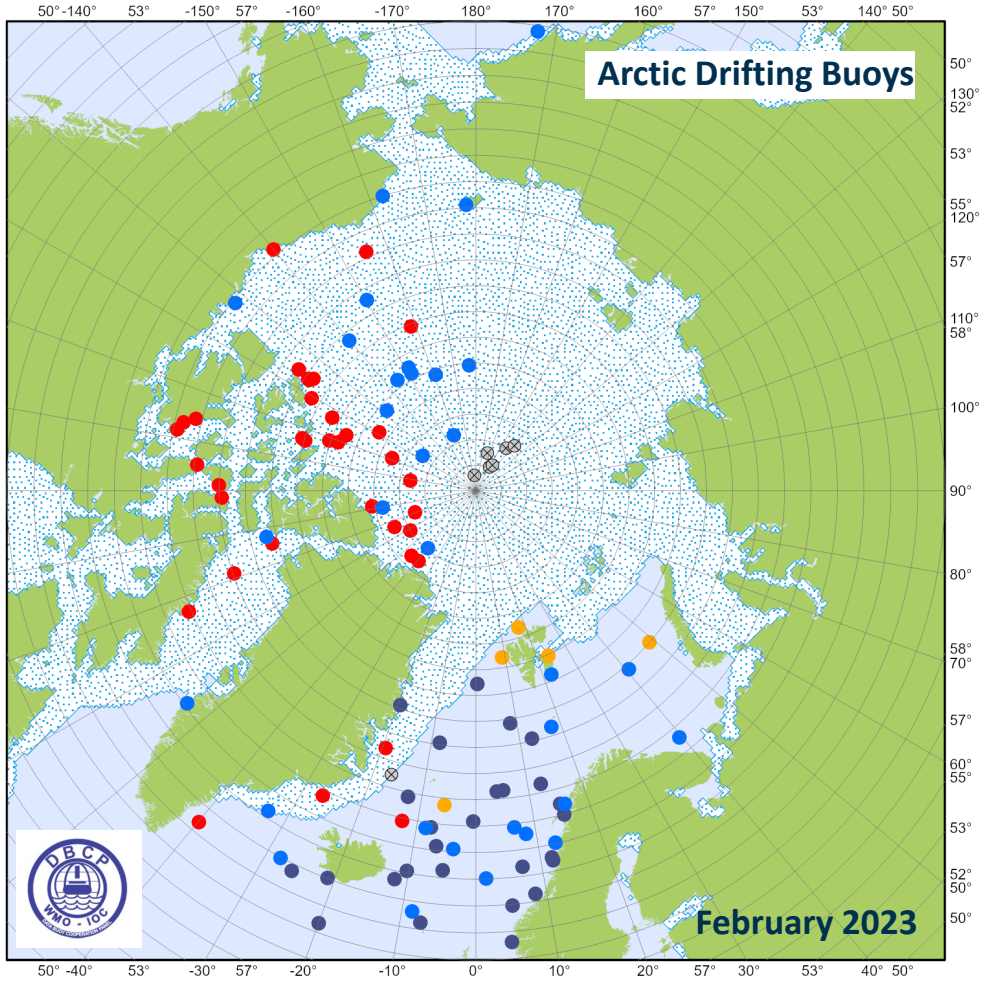
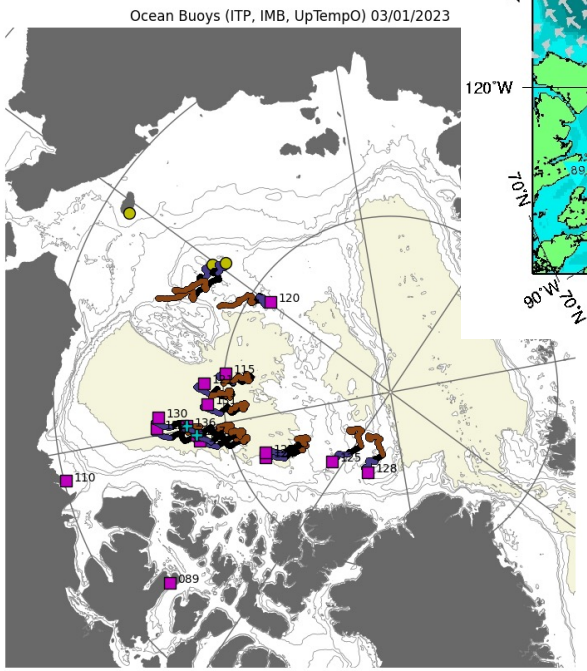
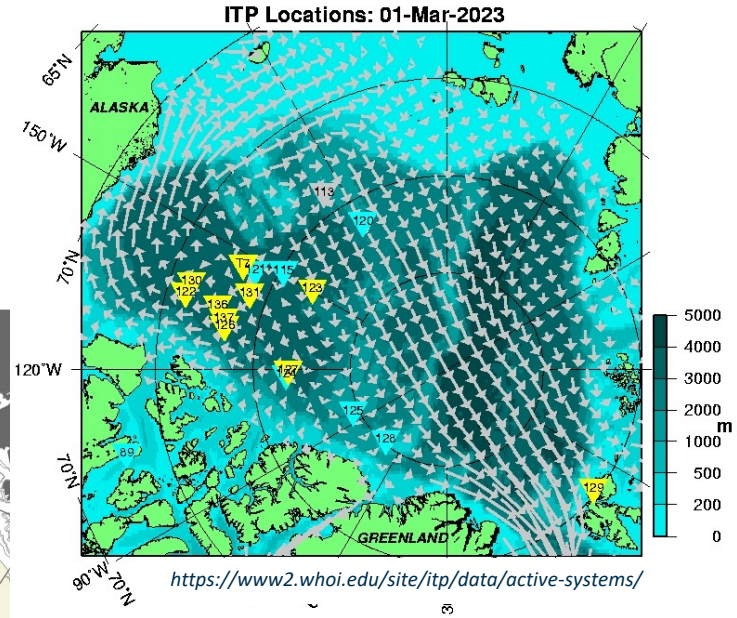



*Drifting buoys providing data to the GTS*

## Ocean and Ice Buoys (IABP)




*https://iabp.apl.uw.edu/IABP_OceanMap.html*




*https://www2.whoi.edu/site/itp/data/active-systems/*

**Ice-Tethered Profilers (WHOI) providing the in situ data from ocean under the sea ice**

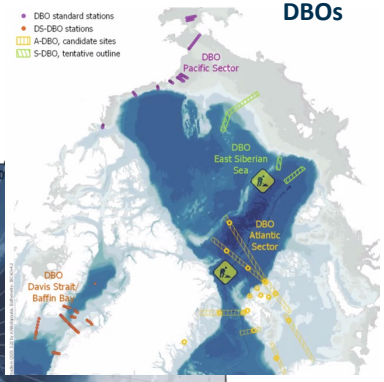
- **Shrinking and thinning sea ice cover**
- **Problems with operating in the Marginal Ice Zone**

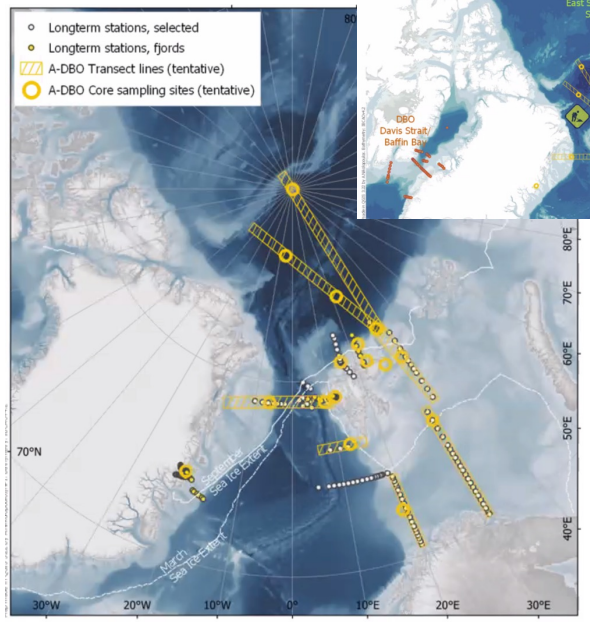
# European Arctic observation networks are fragmented and only weakly connected to global and other regional observing systems…

EOOS European Ocean Observing System

*Basin-wide, international, under development, interdisciplinary, bottom-up initiative*

**Established and developing DBOs**




**Atlantic Arctic Distributed Biological Observatory (A-DBO)**

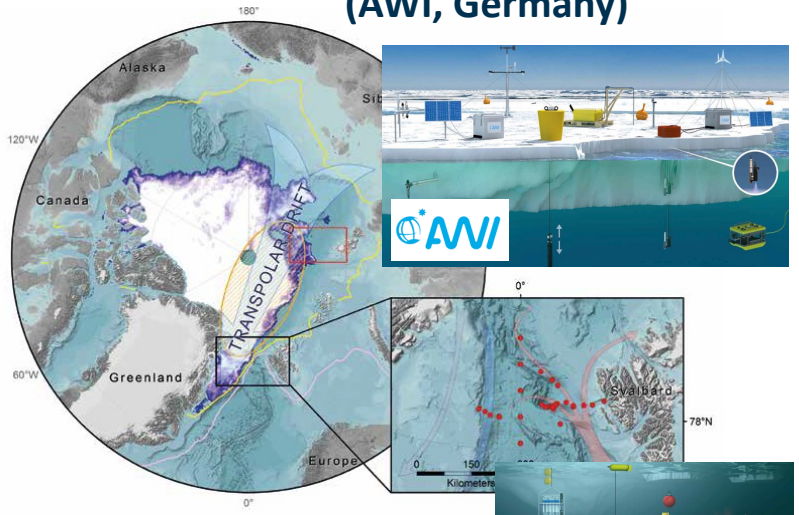

**Svalbard Integrated Arctic Earth Observing System (SIOS) - marine component**

*Regional, international, coordinated, cross-domain*

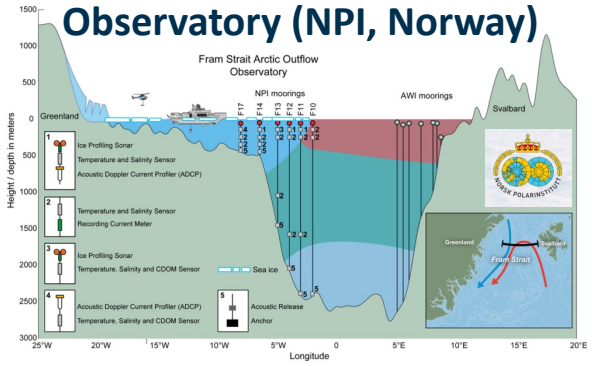
EU Polar Cluster

**EU Polar Cluster** projects with the focus on an Arctic (including ocean) observing systems: **INTAROS, Arctic PASSION, HiAOOS, …**

**FRAM (Frontiers in Arctic Marine Monitoring) (AWI, Germany)**




**Fram Strait Arctic Outflow Observatory (NPI, Norway)**

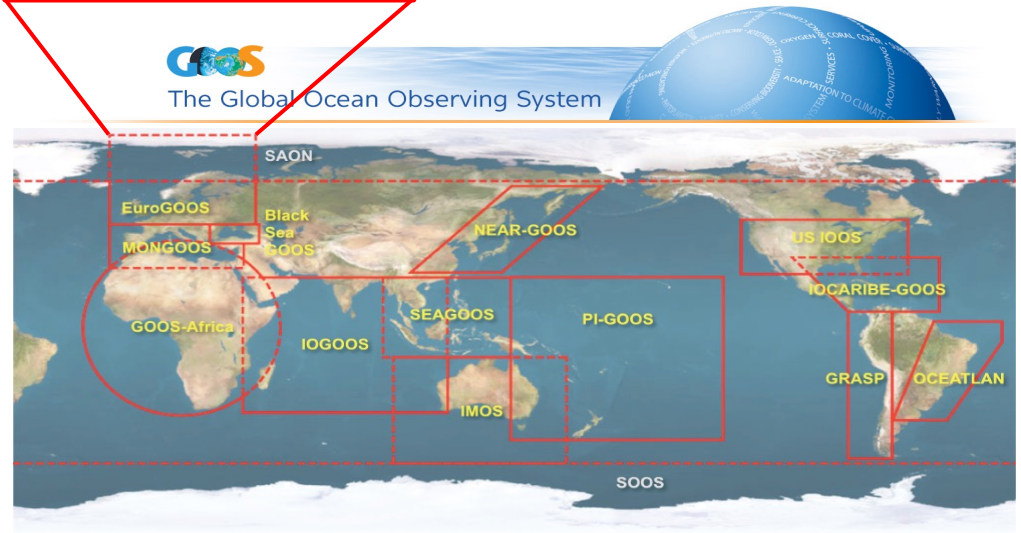



*Examples of national observatories: regional, different scales, different level of coordination*

# Existing and emerging initiatives and processes on better integration and coordination of a (pan)Arctic ocean observing system


ArcticROOS
EuroGOOS Arctic Regional Ocean Observing System

Arctic Regional Ocean Observing System – a regional node under EuroGOOS, the European Global Ocean Observing System




- **SAON** (Sustained Arctic Observing Networks) **ROADS (Roadmap for Arctic Observing and Data System) process** – cross-domain, high level planning, strong links to Arctic Council and IASC, based on SBA value tree analysis and developing Shared Arctic Variables (SAVs)
- **EuroGOOS** and **ArcticROOS** initiative (in partnership with other groups and networks) of developing a **pan-Arctic alliance for ocean and sea ice observing**, with the possibility of establishing it as a **GOOS Regional Alliance (GRA)** in the future – advanced with the roundtable discussion during ASSW2023
- **IASC MWG** Strategic Plan defining research priorities to support implementation of the **UN DOS Arctic Action Plan** - establishing an **Arctic Regional Programme Office**, potentially developing into an **Arctic DCC** (Decade Collaborative Centre)
- Contributions to **ICARP IV** (2022-2026) and **5th IPY** (2032-2033)

# How can an Arctic observing system be improved with a coordinated European Ocean Observing System?


- Better recognize users and stakeholders needs and priorities for Arctic data and products
- Improve uptake and integration of Arctic data into services and products


- Exchange and adapt best practices for specific requirements of data collection, operations and technology in the Arctic
- Promote FAIR sharing of Arctic data/products by enhancing their availability through EOOS related services (EMODnet, SDN, CMEMS)


- Improve overview of ocean observing networks in the European Arctic, include them in the performance monitoring
- Enhance visibility and accessibility of Arctic observing assets in OceanOPS


- Help to improve integration between coastal observing and deep ocean and between physical, biogeochemical and biological observatories
- Establish dialog and align activities with different organizations/initiatives focused on coordination and integration of Arctic observing


- Forster and promote innovations and technology developments critical for Arctic ocean observing
- Include needs and requirements for Arctic-capable technologies when in dialogue with developers and suppliers


- Identify and communicate societal/economical value and benefits of including Arctic observations in the EOOS value chain
- Identify and explore synergies between EuroGOOS and a potential future Arctic GRA