Regions with sparse observations - the Arctic

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(ArcticROOS, Atlantic-Arctic DBO, IASC MWG, SAON Board, EU H2020 INTAROS, EU HE HiAOOS)
In situ observations are extremely sparse in the Arctic Ocean and Arctic seas as compared to other regions.

Challenges of Arctic observing

- **Scales**
  - Different needs for climate, operational forecast, 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

EMODnet Physics active platforms in the last 30 days
Arctic observations are growing in number but still underrepresented in the main global ocean networks.
Most of operational data provided by the ice-based platforms drifting in the ice covered Arctic regions.

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

EOOS Strategy 2023-2027 launch
European Arctic observation networks are fragmented and only weakly connected to global and other regional observing systems...

- Atlantic Arctic Distributed Biological Observatory (A-DBO)

- Svalbard Integrated Arctic Earth Observing System (SIOS) - marine component
  
  Regional, international, coordinated, cross-domain

- Fram Strait Arctic Outflow Observatory (NPI, Norway)

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

Established and developing DBOs

Examples of national observatories:
regiona, different scales, different level of coordination

EU Polar Cluster projects with the focus on an Arctic (including ocean) observing systems:
INTAROS, Arctic PASSION, HiAOOS, ...
Existing and emerging initiatives and processes on better integration and coordination of a (pan)Arctic 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

- 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

- 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

- 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)

- 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

- 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