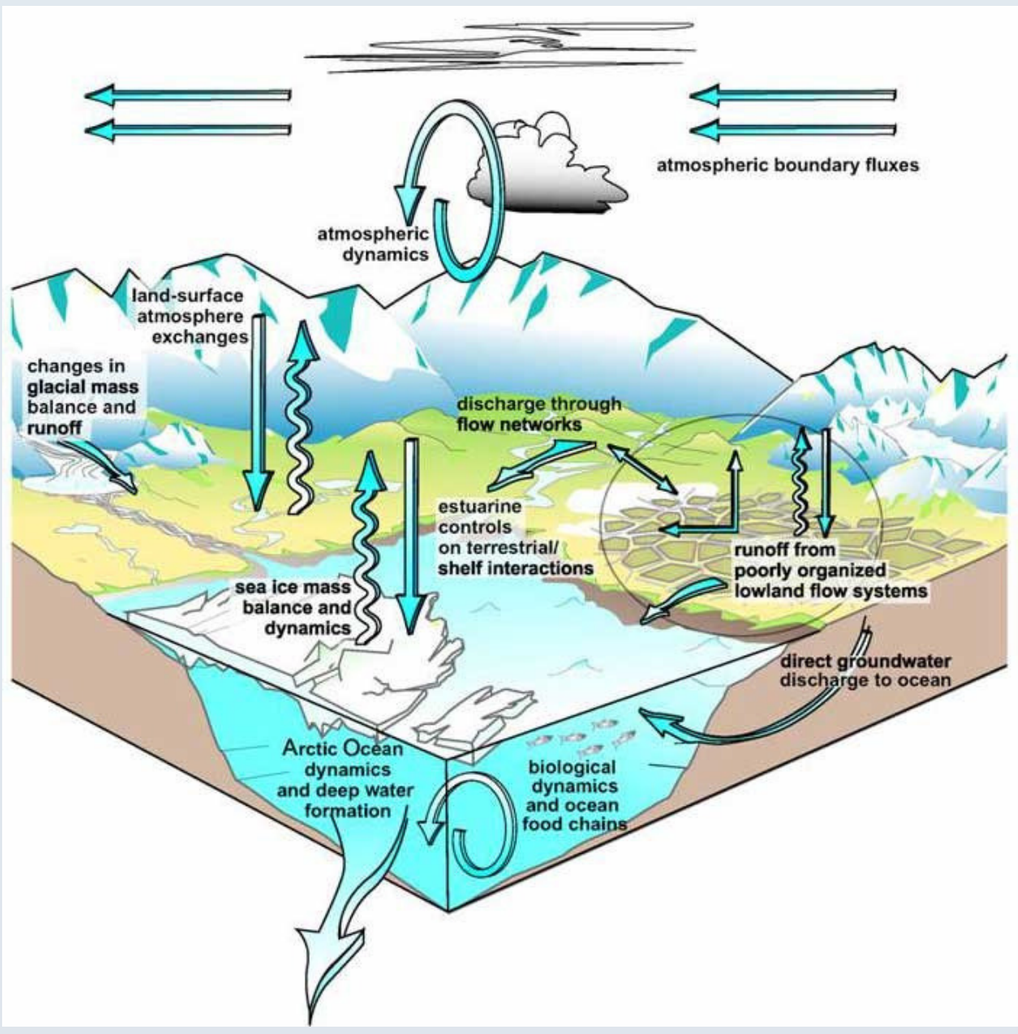
Mapping requirements for observations in the Arctic

Erik Buch, Michael Tjernström, Shaun Quegan, Andreas Ahlstrøm, George Heygster, Thomas Soltwedel, Finn Danielsen, Geir Ottersen, Truls Johannesen, Stein Sandven

An integrated approach to the Arctic is critical to further our understanding of this complex and sensitive environment. Furthermore, this will inform any decision making in the Arctic, to the benefit of the environment, people living in the region, and sustainable commercial activities.

Design of a fit-for purpose Arctic observation network includes several steps:

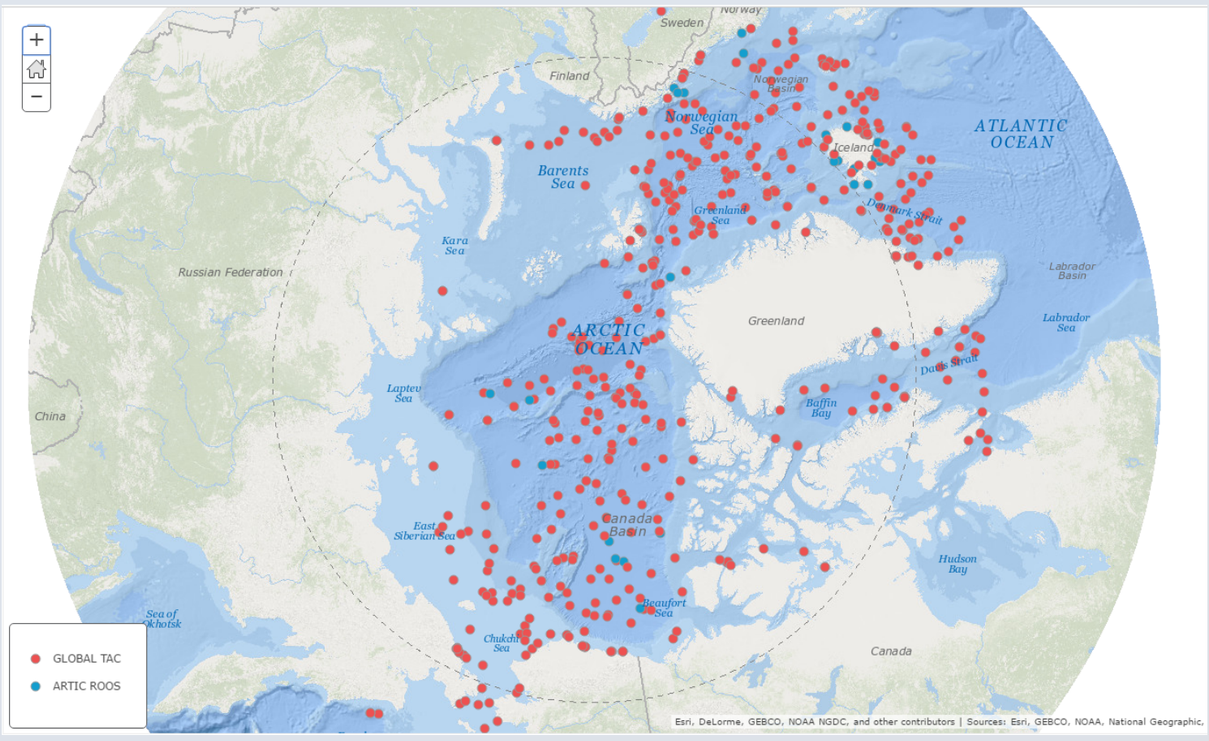
- Map societal and policy needs for knowledge, information and services;
- Analyse what phenomena and essential variables to observe;
- Set up requirements (resolution in time and space, quality, timeliness) for observations;
- Evaluate existing observation system;
- Identify gaps in: Observation network, Data availability, Sustainability, Technologies



The Arctic is very sensitive to environmental changes. There is a close interrelation and delicate balance between atmosphere, terrestrial, cryosphere, sea ice and ocean, especially in relation to solar energy, radiation budget and hydrological cycle. This has a great impact on physical, chemical and biological processes in the area.

Due to the hostile environment, there is a great lack of basic observations in the Arctic that can support scientific understanding of key processes. Most of the existing data are collected via time-limited research projects. This lack of knowledge is reflected in big errors in forecasting models, both operational and climate.

It is foreseen that a future Arctic observation system will rely on satellite observations supplemented by in situ platforms, such as ships, profiling floats, gliders, moorings, AUV's. In all countries around the Arctic, there are community-based observing systems representing a strong potential for further development. Existing activities should form the basis of a future integrated and sustained Arctic Observing System.



INTAROS initial requirements report is available for download at:
https://intaros.nersc.no/sites/intaros.nersc.no/files/D1.1%20Initial%20Requirement%20Report%20-%20FINALm.pdf