Arctic ROOS

Arctic Regional Ocean Observing System

EuroGOOS General Assembly

23-25 May 2018

By

S. Sandven, NERSC

Annual meeting 2017

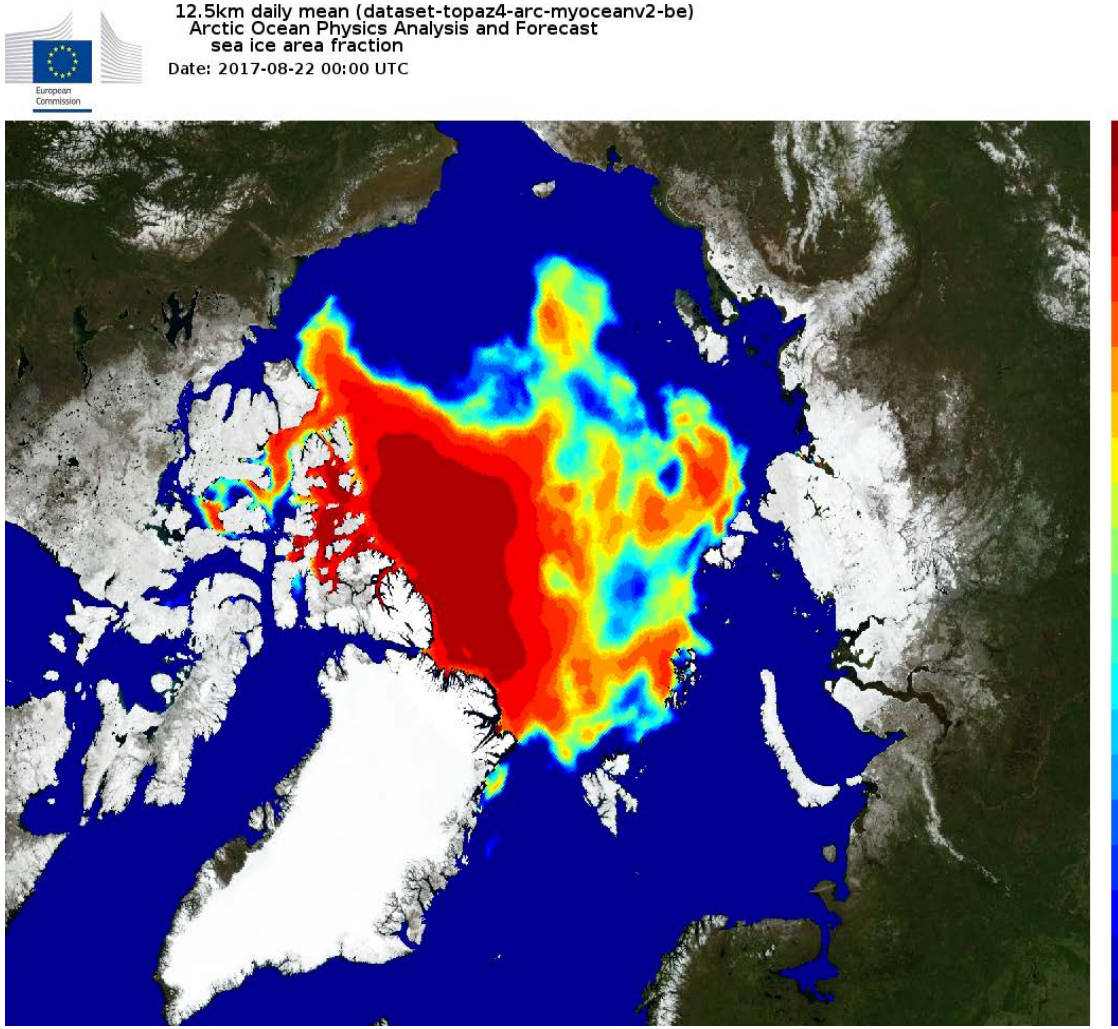
27-28 November at NERSC: 12 participants

Co-leader appointed: Jari Haapala, FMI
Plan to extend the leadership with a steering board

Participation from EuroARGO

Adopted two new member institutions:
•The Scottish Association of Marine Science (SAMS)
•National Institute of Oceanography and Experimental Geophysics (OGS), Italy

The TOPAZ System: CMEMS Arctic component (NERSC, Met.no, IMR)

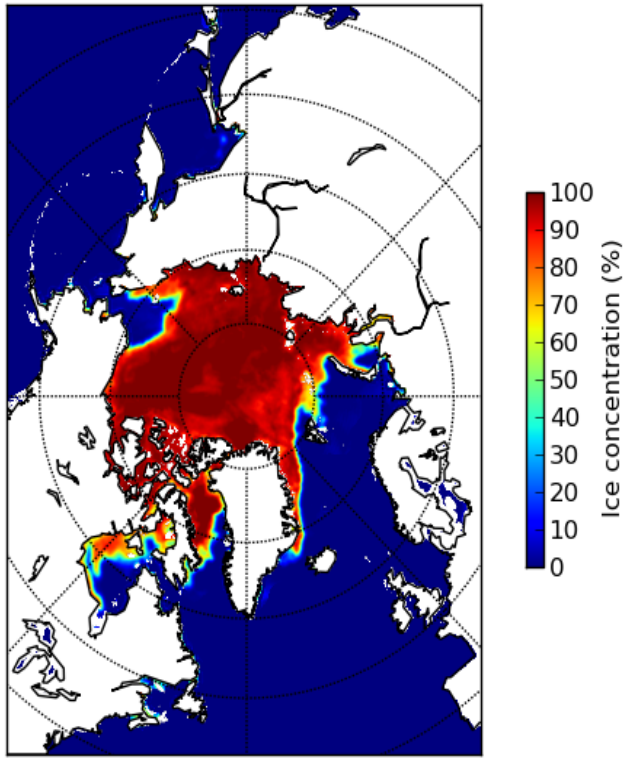


Sea ice concentration forecast on 22 August 2017

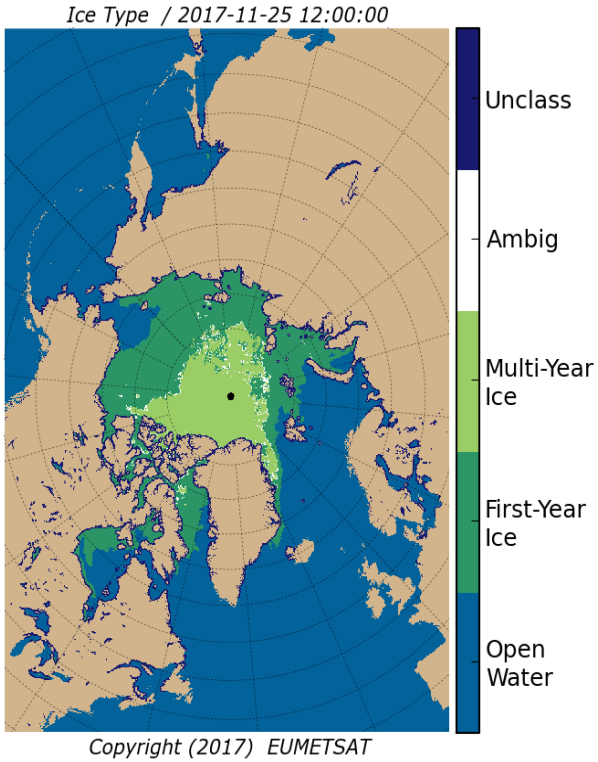
- Run operationally at MET Norway
- EnKF data assimilation
- Coupled ecosystem model
- Coupled sea-ice model
- 10-day forecast performed once a day
- Provide daily mean of 3D variables and hourly mean of surface variables
- Freely available through CMEMS

OSI SAF operational sea ice products

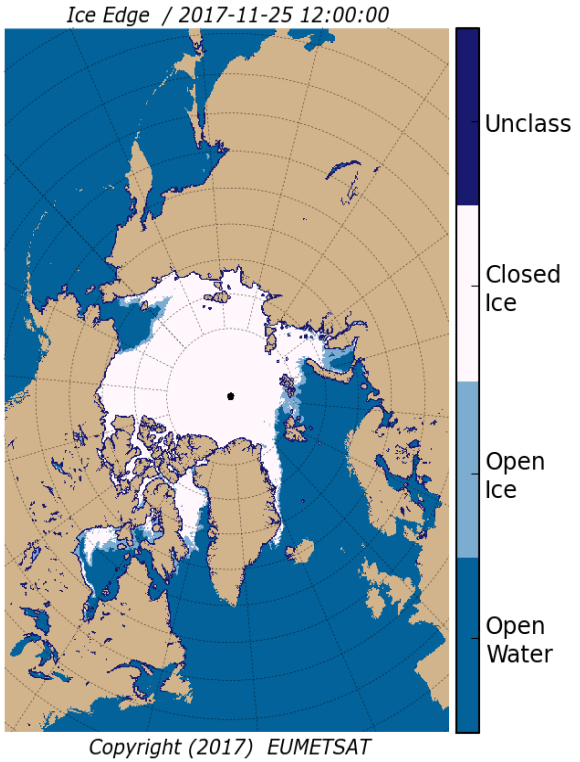
- MET Norway (together with DMI) run the polar node of the EUMETSAT OSI SAF: 24/7 production of sea ice and SSTs:



Sea Ice Concentration

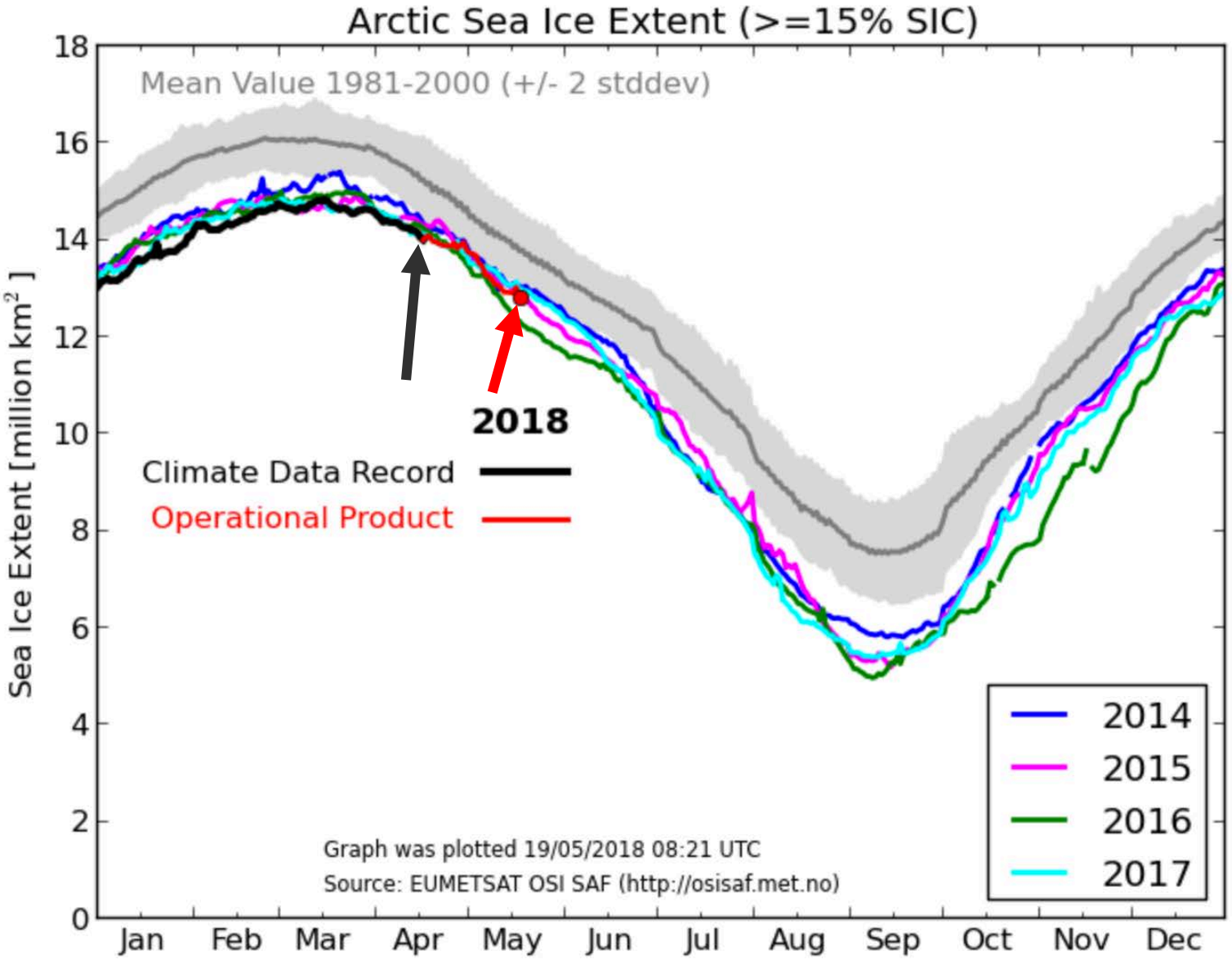


Sea Ice Type
(First- and Multi-Year Ice)



Sea Ice Edge

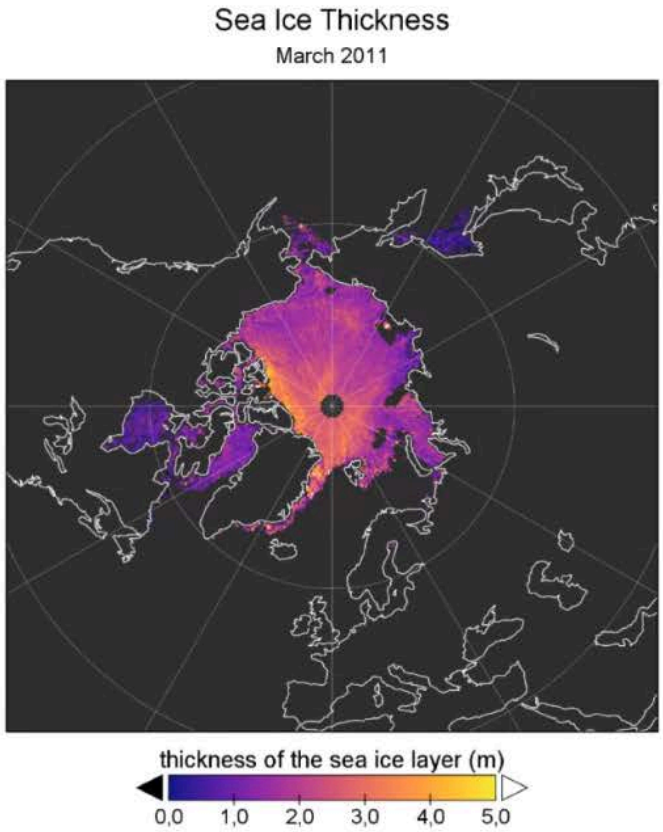
Operational and climate sea ice extent product

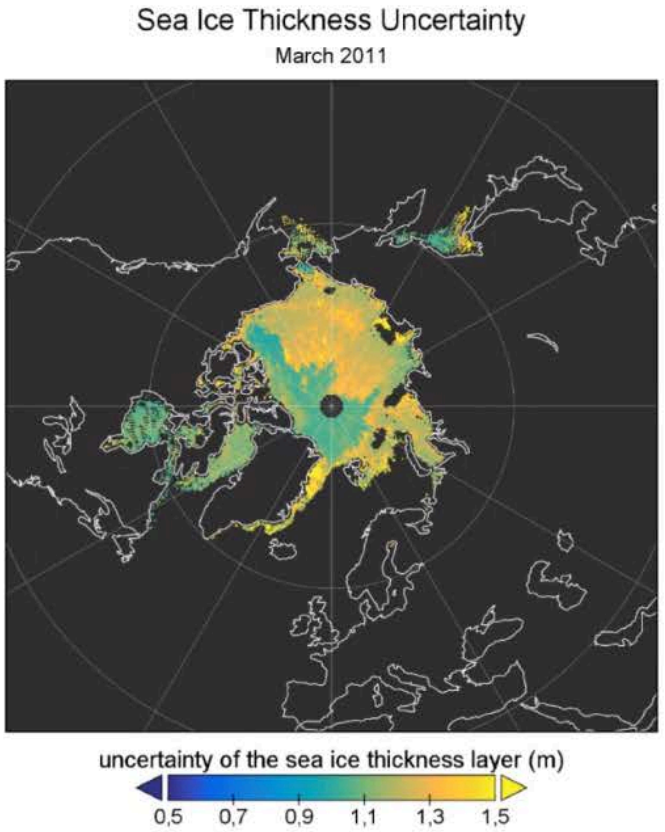


Sea ice products ingested in Copernicus climate services by ECMWF

Climate Change

SIT CDR - Parameters

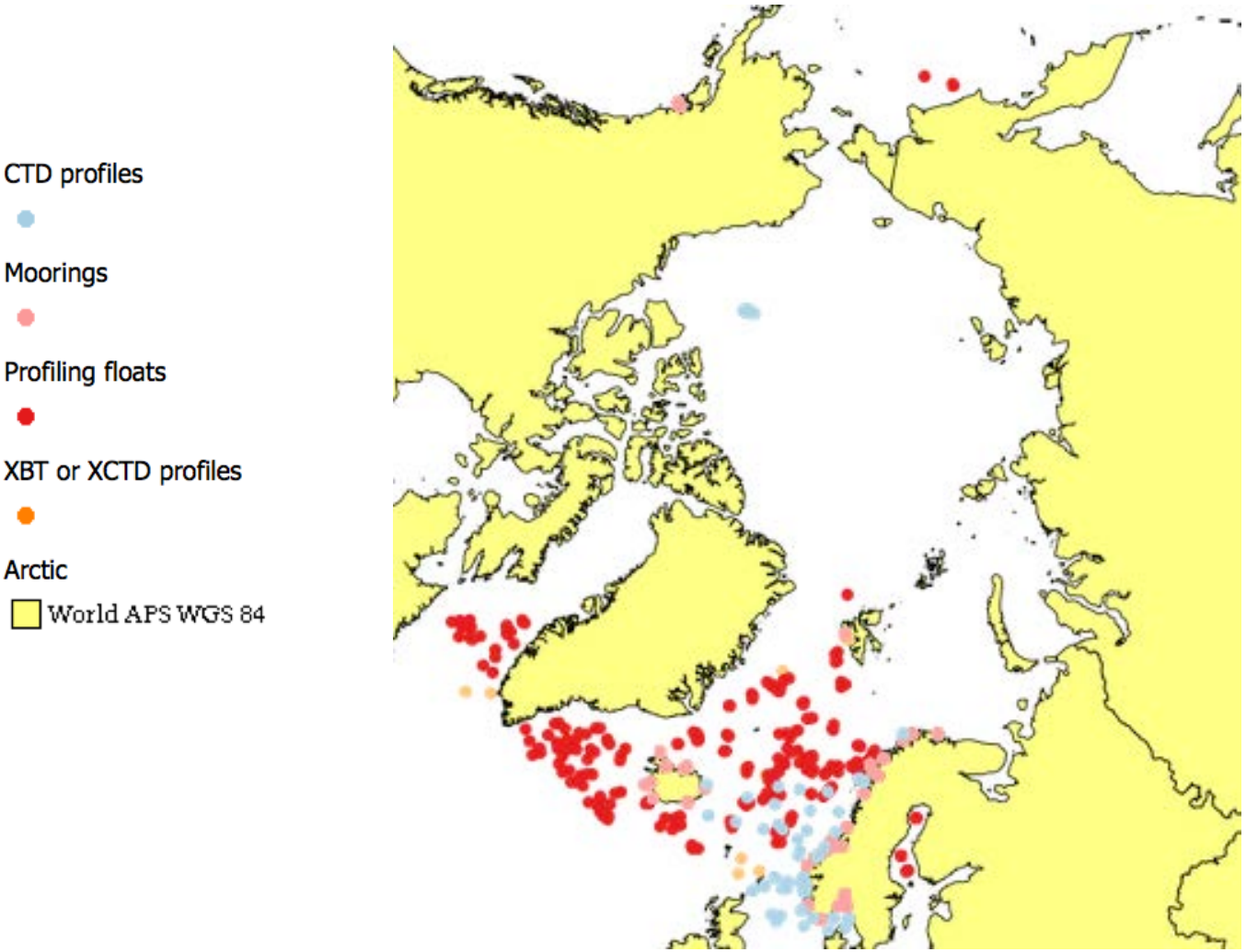




Provided by AWI

Arctic ROOS

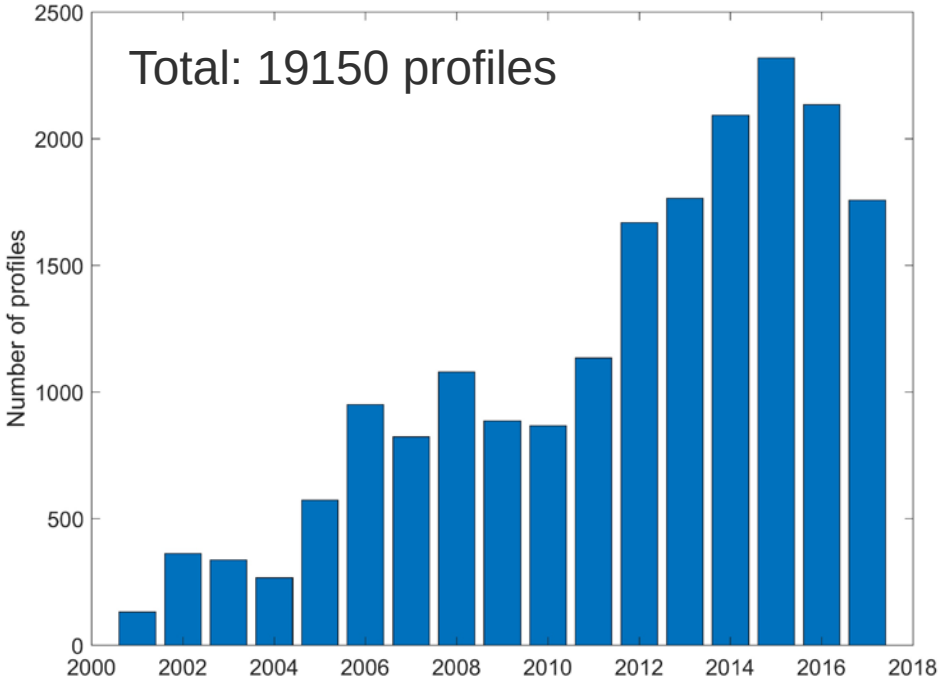
Oceanographical data from the Arctic



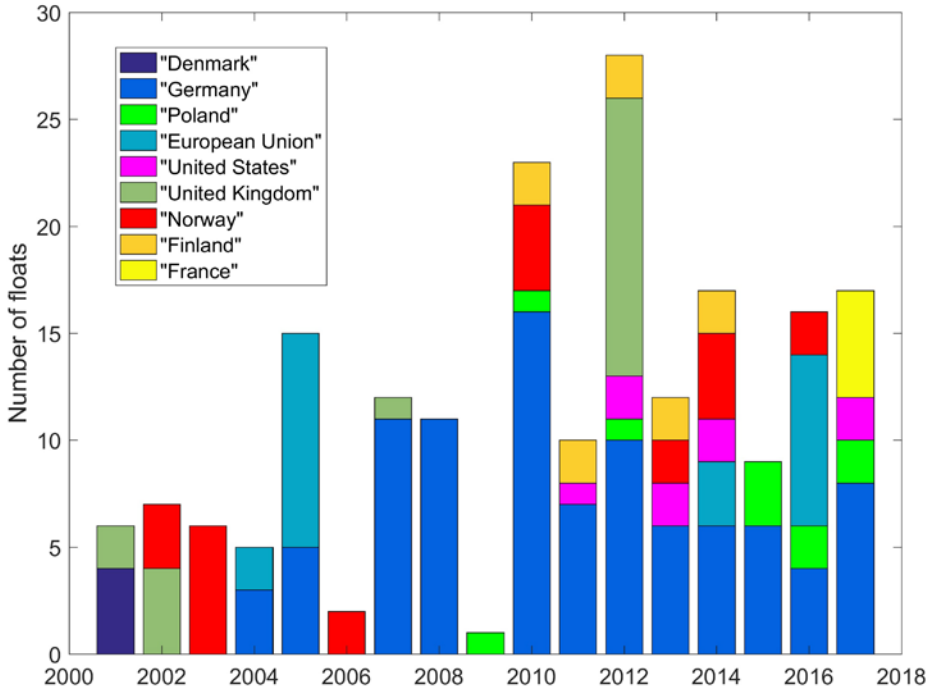
Profile data available in near-real time, north of 60 N, last 30 days from 18 May 2018. http://arctic-roos.org

Argo floats in the Nordic Seas

Number of Argo profiles per year



Number of deployed Argo floats per year

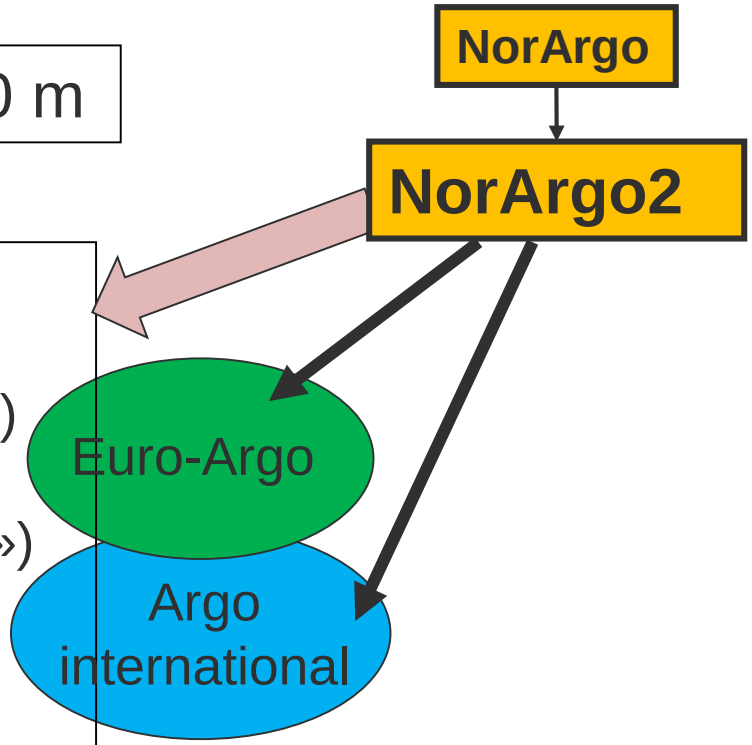


Norway will contribute to the extension of Argo

The ocean is undergoing major pressure due to climate change:
heating, acidification, ice melting, nutrient supply, ocean circulation changes, ...

Argo core (T, S) in the upper 2000 m

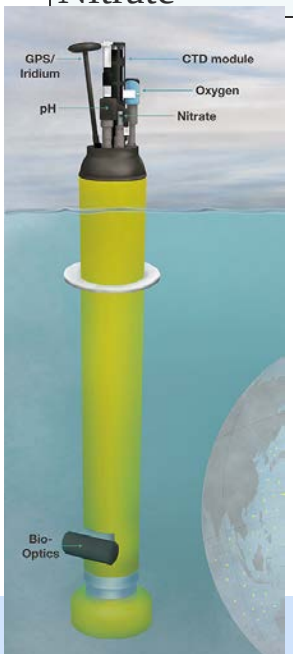
- ❑ Argo core («core-Argo»)
- ❑ Biogeochemical ocean («BGC-Argo»)
- ❑ Deep ocean, 0-6000 m («Deep-Argo»)
- ❑ Marginal Seas
- ❑ High latitudes/polar areas



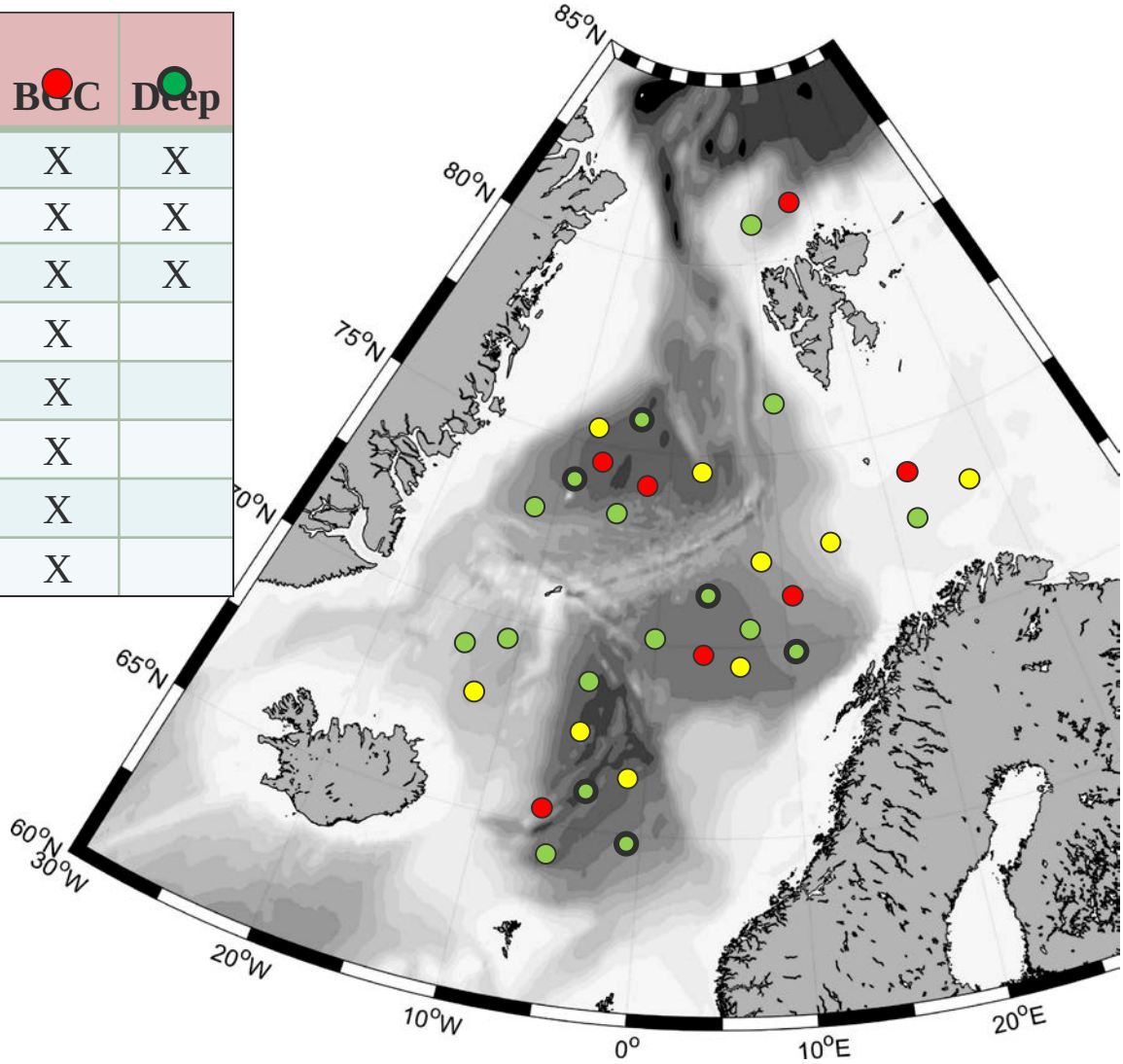
The Norwegian Argo infrastructure

Argo floats with different properties

Variables / Sensors	Core	Bio	BGC	Deep
Press, temp., salinity	X	X	X	X
Drift (surface, subsurface)	X	X	X	X
Oxygen		X	X	X
Chlorophyll-Fluor.		X	X	
Particle concentr. (backsc.)		X	X	
Irradiance, PAR		X	X	
pH			X	
Nitrate			X	



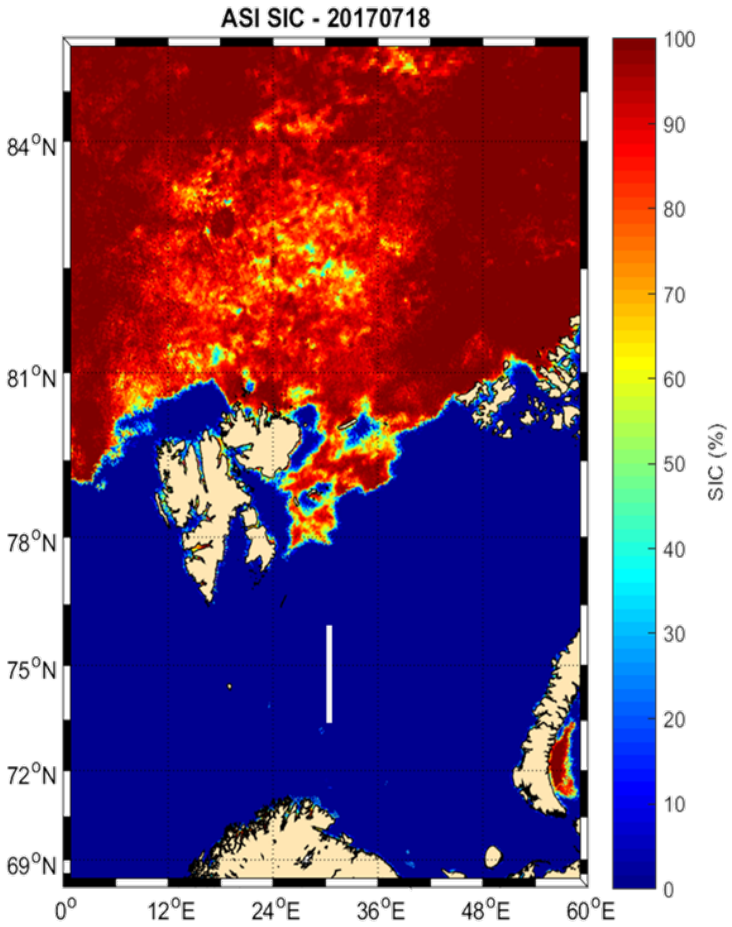
BGC-Argo

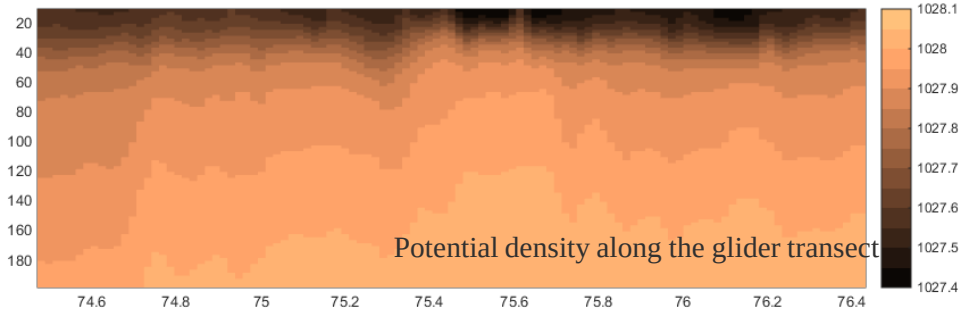


will have ~33 operational Argo floats

Gliders in the Barents Sea 2017 – Part of the Arctic PRIZE project

- 2 week glider trial between 74.5°N and 76.5°N on the 30°E line
- From the 17th – 31st July 2017
- With CTD, PAR, CDOM, Chla, backscatter and DO sensors



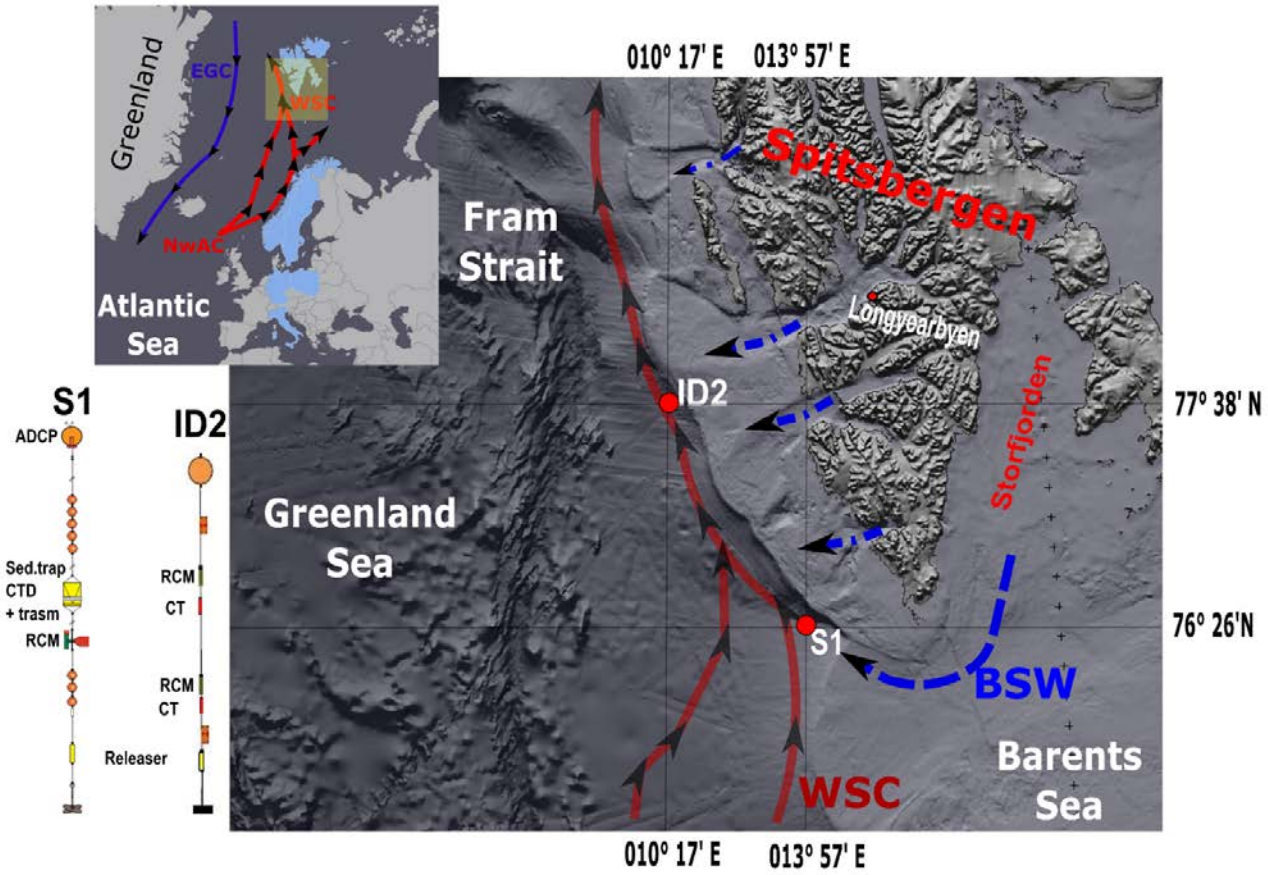


Potential density along the glider transect

The glider was released south of the ice pack in an area of recent ice occupation.
We successfully collected high resolution data along the transect and we were largely successful in navigating in the 30+ cm/s currents

National Institute of Oceanography and Experimental Geophysics (OGS)

Shelf and slope dynamics offshore the west Svalbard continental margin



WSC = West Spitsbergen Current (Atlantic water)
BSW = Brine-Enriched Shelf Water
EGC = East Greenland current

Bensi Manuel
Project DEFROST - DEep Flow Regime Off SpiTsbergen (PNRA - Italian Arctic and Antarctic Research Program)

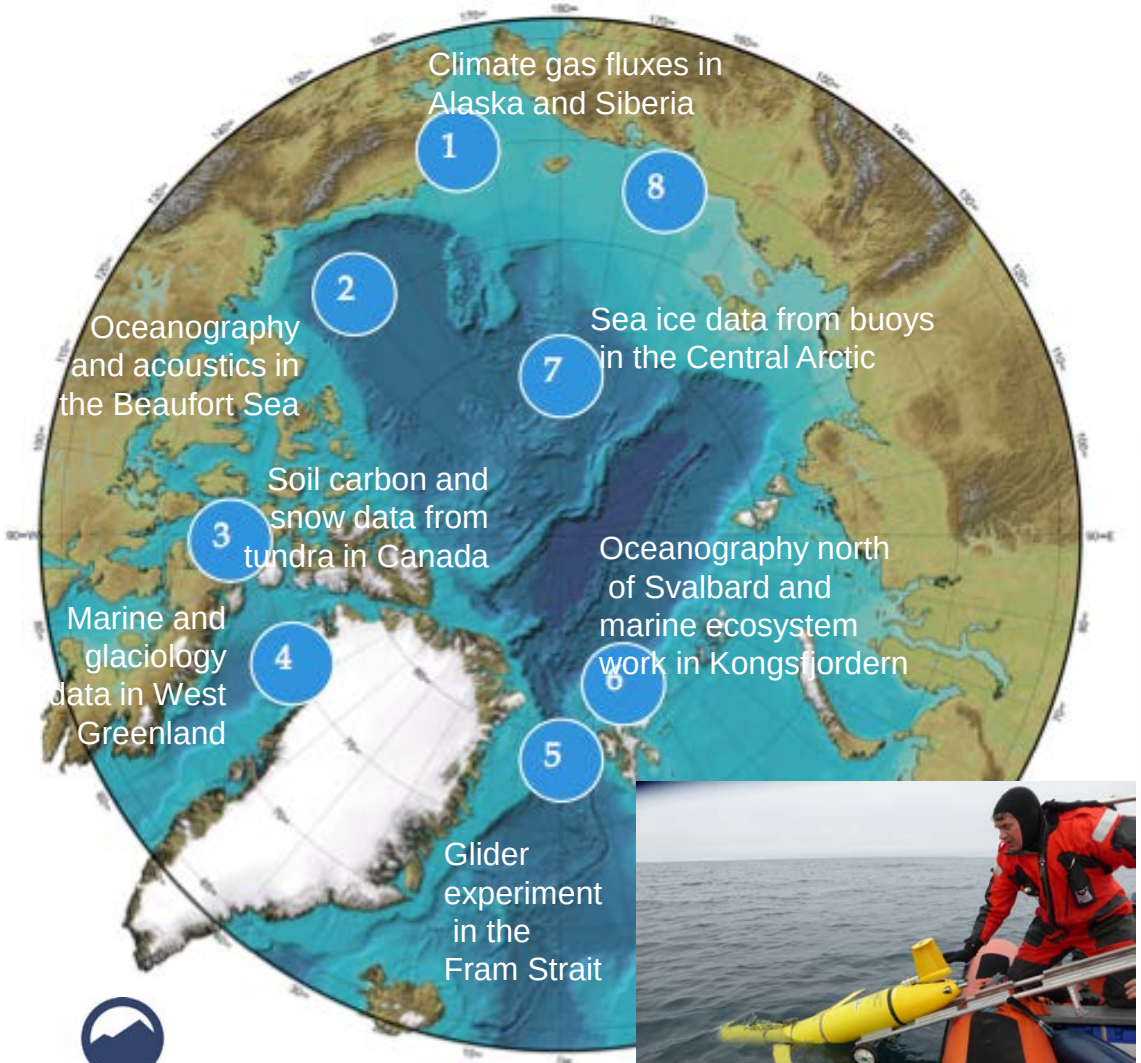
INTAROS

INTAROS: Integrated Arctic Observing System (BG09-H2020)

- 49 partners from 20 countries
- 12 Arctic ROOS members + EuroGOOS
- Focus on in situ observations (satellite observations grows strongly through Sentinel)
- Ongoing survey of existing observing systems
- Collaboration with many international initiatives in Europe and in the Pan-Arctic region (SAON, GEOSS and others)

INTAROS: Integrated Arctic Observation System

Observation activities in 2017



The main objective is to extend, improve and unify existing and evolving observing systems in different parts of the Arctic

The observations include:

- *atmosphere,*
- *ocean & seafloor,*
- *sea ice,*
- *marine ecosystem,*
- *glaciology,*
- *terrestrial themes,*
- *natural hazards, and*
- *community-based monitoring*

INTAROS

Coordinated Arctic Acoustic Thermometry Experiment (CAATEX)

A joint Norway-USA project (2018-2022) as part of MOSAIC

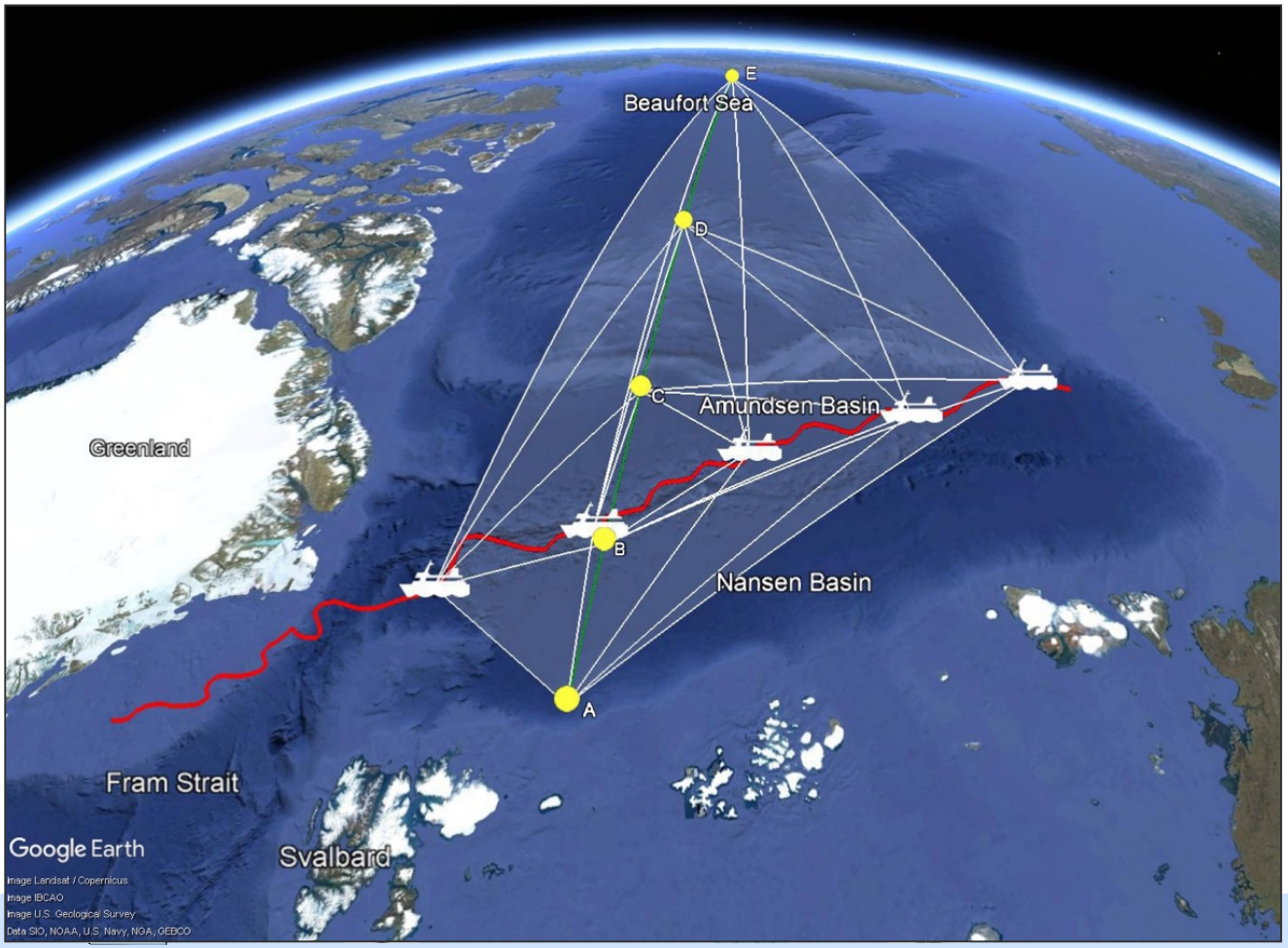
Norwegian part leder: Hanne Sagen (NERSC)
US part leader: Matthew Dzieciuch (SIO)

Partners:

- Nansen Environmental and Remote Sensing Center (NERSC)
- Scripps Institution of Oceanography (SIO)
- Woods Hole Oceanographic Institution (WHOI)
- University of Texas at Austin (UT)
- Norwegian Polar Institute (NPI)

Funding:

- POLARPROG/NFR
- ONR
- H2020 INTAROS



Arctic ROOS

MOSAiC
·The 2019/20 Arctic drift experiment·

Activities in 2018

- Continue to develop collaboration with European initiatives (e.g. EuroARGO, Copernicus services, etc.)
- Extend collaboration with in partners in USA, Canada, China, Japan, South Korea
- Deployment of ITPs, IMBs, moorings in several Arctic locations from icebreaker expeditions
- Contribution to Arctic Observing Summit (24-26 June)
- Planning of White Paper to OceanObs'19
- Contribution to Arctic Science Ministerial, Berlin 25-26 October
- Arctic ROOS annual meeting + workshop in November