Integrated Arctic Observation System Development under Horizon 2020

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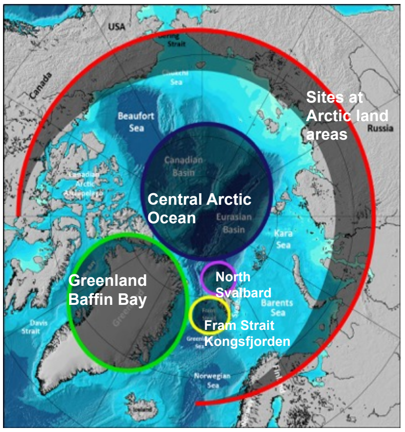
Overall objective

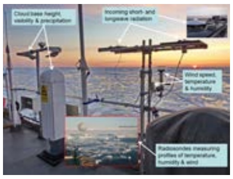
INTAROS will build an efficient integrated Arctic Observing System (iAOS) by extending, improving and unifying existing systems in different regions of the Arctic

Deployment areas for INTAROS observing systems



Multidisciplinary

observing systems covering atmosphere, ocean, sea ice, marine ecosystems, glaciology, snow, hydrology and other land surface processes, natural hazards and community-based systems



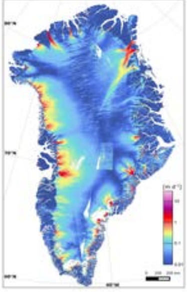
Observing system on icebreakers (I/B Oden)

Community-based observing and capacity-building (NORDECO with partners) Photo: M. Enghoff, PISUNA

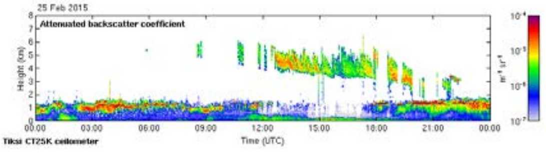
UAV with met sensors (M. Jonassen, FMI)

Marine terminating glacier (W. Walczowski, IOPAN)

Local observers (PISUNA Photo: F. Danielsen)



Surface velocity of the Greenland ice sheet (A. Ahlström, GEUS)



Ceiliometer observations of aerosols, clouds and precipitation (Ewan O'Connor, FMI)

Surveys of atmospheric and sea ice variables with AWI aircraft (T. Vihma)

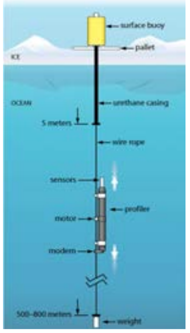
KV Svalbard in the Fram Strait

Pallas global atmosphere watch station (FMI)

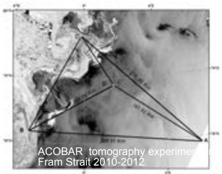
RV Johan Hjort in Longyearbyen (IMR)

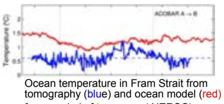
Observatory on the Greenland ice sheet – the EGRIP camp (Peter Voss, GEUS)

Observing station in Alaska (D. Zona, USFD)

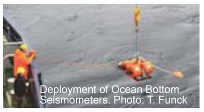


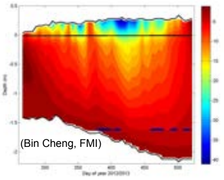
Ice-tethered platforms for measurement of ocean variables under sea ice and data transmisison via Iridium (WHOI)



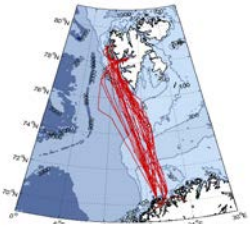


Ocean temperature in Fram Strait from tomography (blue) and ocean model (red) for a period of two years (NERSC)



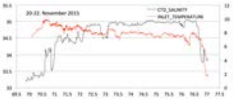


Seasonal thickness and temperature of snow and sea ice from ice mass balance buoys



FerryBox route of MS NORBJØRN colllecting data between Tromsø and Svalbard (NIVA)

Glider experiments in Baffin Bay (Takuvik)

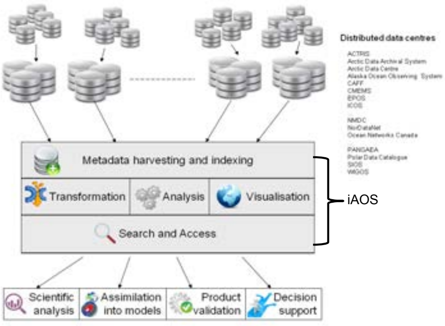


Ferrybox data from MS NORBJØRN(NIVA)

Applications of iAOS towards stakeholders

- Assess the impact of improved observational sea-ice data on climate prediction by data denial experiments
- Advance ecological and environmental understanding by merging and synthesizing iAOS data through ecosystem modelling
- Provide better ice-ocean state estimates to establish background knowledge and constraints in risk assessment for Arctic operations
- Demonstrate the capabilities to integrate data from various databases in modelling using data assimilation
- Identify key processes across disciplines that govern Arctic greenhouse gas cycles and links to climate change
- Demonstrate use of iAOS for mapping of natural hazards aiming towards disaster risk reduction.
- Cross-fertilize community-based and scientific observing
- Assess the economic value and societal benefit of iAOS locally to globally through a suite of selected applications towards industry, governance, local communities and research

Data management and integration



Dissemination and outreach

- Raise awareness of Arctic challenges for the public in general and scientific communities
- Improve understanding of Arctic among key stakeholder communities
- Train the next generation of scientists and policy makers

Impact

- Increase the temporal and geographic coverage of observational data to improve the assessment and prediction of Arctic changes
- Add capacity to existing in-situ observing systems by including new sensors
- Exploit and enhance established research infrastructures across the Pan-Arctic region
- Improve inter-operability of distributed databases
- Enhance data provision for the Copernicus services
- Strengthen the Sustaining Arctic Observing Networks (SAON) process
- Contribute to GEO Cold Region Initiative, Transatlantic Ocean Research Alliance (TORA), Year of Polar Prediction (YOPP), International Arctic Systems for Observing the Atmosphere (IASOA) and Global Cryosphere Watch
- Improved information for decision-makers
- Support Arctic Council and its working groups
- Support EU's Arctic strategy

Consortium members

Norway: NERSC, UIB, IMR, UNIS, NIVA, NORUT, DNV-GL
Greenland/Denmark: GEUS, DTU, GINR, NORDECO, Aarhus University
Sweden: SMHI, Stockholm University
Finland; FMI, University of Helsinki
Germany: AWI, Univ Hamburg, Univ Bremen, MPG, GFZ
UK: University of Sheffield, University of Exeter
Poland: IOPAN, IGPAN, Univ Slaski
France: CNRS, Ifremer, ARMINES
Spain: Polyt. Univ Madrid, Barcelona CS
Portugal: Eurocean
Belgium: EuroGOOS AISBL
Ireland: Maynooth University
Italy: Terradue, JRC
Russia: RIHMI-WDC, NIERSC
USA: UAF, SIO, WHOI, JPL
Canada: U Laval, ONC
China: RADI, NMEFC, PRIC
Japan: NIPR
South Korea: KOPRI

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