INTAROS: Achievements and recommendations for an Arctic Observation System

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INTAROS has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 727890

INTAROS result areas

- Extensive field work with collection of new data
- Development/improvement of observing sensors and platforms

INTAROS

ologies and methods

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- Support to long-term observing programmes
- Strengthening of Community-Based monitoring
- Data services and access to data repositories
- A common data catalogue for all data from the project
- Demonstrate use of data in application studies
- Education and outreach activities

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Strengthening international collaboration



The main INTAROS achievments – plattforms & sensors

- An integrated Arctic information system has demonstrated use of many different platforms and sensors, focusing on *in situ* measurements covering atmosphere, ocean and terrestrial sciences:
- <u>Land</u>; Sensors operated at permanent research stations and temporarily camps.
- <u>Open ocean</u>: Ships, floats, gliders, moorings, sea floor observatories and many surface platforms
- <u>Ice covered ocean</u>: Icebreakers are required for deployment and recovery of ice based platforms and under water moorings

INTAROS data collection 2017-2022



INTAROS Data delivery chain







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Technology development for long-term operations

The following requirements are important:

(i) Robust sensors adapted for Arctic conditions, considering cost and power consumption

(ii) Autonomous observing platforms, capable of long-term operations in changing Arctic conditions (e.g. with less sea ice cover)

(iii) Improved power systems, and

(iv) Improved satellite data transmission, including use of evolving broadband services covering the whole Arctic.

iAOS Functionalities and Applications

- Portal and Data Catalogue
 - Promotion of applications and tools
 - Search of and access to data
- Applications
 - Geo-statistics library and tools
 - Sea ice concentration services
 - Sea ice reanalysis
 - Passive marine acoustic tools & services
 - Seismic activity monitoring
 - Risk assessment system



DNV GL's Risk assessment system. Sea ice persistence plotted with frequency of ice above given threshold (here 15 %) in April (1990-2020). Contour line represents 15 % probability.

INTAROS policy recommendations

- Arctic observations must continue and be extended without harming the environment
- Arctic observations must strive for excellent data sets
- Collaboration is essential for developing and operating Arctic observations systems
- Capacity building is important for engaging Arctic communities in planning and implementation of observation systems, including data management
- Building sustained observations for creating new knowledge is important for sustainable development in the Arctic.

Horizon Europe: High Arctic Ocean Observation System (HiAOOS)

Project start: 1.1.2023. Project end: 31.12.2027



The HiAOOS System serves underwater GPS and observations of the ocean under the sea ice including acoustic thermometry, and point measurements. New mooring and acoustic technology North of Svalbard.

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Coordinator: Hanne Sagen. Nansen Environmental and Remote Sensing Center, Norway

Thank you for your attention!

Farewell and list of results at INTAROS public webpage



INTAROS had 48 partner institutions from 20 countries. More than 300 Scientists.

Coordinator: Stein Sandven. Nansen Environmental and Remote Sensing Center, Norway Reports are found at Zenodo



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