Mapping Arctic Observing Systems and In Situ Data Collections

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Mapping Arctic Observing Systems

H2020 INTAROS (2016-2021)

- Project under BG-09-2016 An integrated Arctic observation system coordinated by NERSC
- 35 partners from Europe; 12 international partners
- A survey of in situ observation systems and data collections was conducted
- Results used in gap analysis of Arctic in situ observation capacity
- Strong recommendations from EC and SAON to continue and extend the survey

INTAROS; https://intaros.eu/
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Arctic Mapping: From Mapping to Knowledge

- Spin off project from INTAROS funded by the Norwegian Ministry for Climate and Environment
- Builds on and extends the INTAROS survey
- Develops methodology and tools for keeping survey information updated and analyzing evolution over time
- Additional support from NERSC Basic Funding
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- **ARCMAP** is a survey application for in situ observation systems and their data collections.
- Developed using open source frameworks wq and Django rest.
- Runs in browser; no extra plugins needed.
- Updated since with e.g. rich plotting capabilities.
- To get access please contact: kjetil.lygre@nersc.no
Mapping Arctic Observing Systems

• Easy to register new systems and data collections; parts can be stored individually
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- Easy to update information; just edit relevant parts
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- Information is stored in database; flexible extraction and presentation
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- **ARCMAP** provides statistics and aggregated information for the surveyed observation systems, e.g.
  - Domain (sphere)
  - Application area
  - Variables observed
  - System maturity
  - Data storage
  - Observation period

Total number of systems registered: 60

- 24 systems (40.0%)
- 16 systems (26.7%)
- 28 systems (46.7%)

**Percentage of observing systems for each application area**

Ocean and sea ice

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Amount of systems observing each variable

Ocean and sea ice

- PHYSICS: Subsurface temperature
- PHYSICS: Subsurface salinity
- PHYSICS: Sea surface temperature
- PHYSICS: Subsurface currents
- BIOGEOCHEMISTRY: Oxygen
- PHYSICS: Surface current
- BIOGEOCHEMISTRY: Nutrients e.g. chloride, phosphate, silicate
- BIOGEOCHEMISTRY: Primary production
- BIOGEOCHEMISTRY: Secondary production
- BIOGEOCHEMISTRY: Marine biodiversity
- PHYSICS: Tides and waves
- BIOGEOCHEMISTRY: Forgetting carbon
- BIOGEOCHEMISTRY: Ocean colour
- BIOGEOCHEMISTRY: Suspended particulates
- BIOGEOCHEMISTRY: Fish abundance and distribution
- BIOGEOCHEMISTRY: Marine mammals and polar bears
- PHYSICS: Sea level
- BIOGEOCHEMISTRY: Dissolved/organic carbon
- PHYSICS: Sea state
- BIOGEOCHEMISTRY: Traceant tracers
- BIOGEOCHEMISTRY: Stable carbon isotopes
- PHYSICS: Ocean surface stress

Landbased and terrestrial cryosphere

- BOREAL-I: Snow
- CRYOSPHERE: Ice
- CRYOSPHERE: Glaciers
- CRYOSPHERE: Snow
- CRYOSPHERE: Salt lakes
- HYDROLOGICAL: Soil moisture
- HYDROLOGICAL: River discharge
- HYDROLOGICAL: Leaf area index
- HYDROLOGICAL: Above ground biomass
- BIOMASS: Soil carbon
- BIOMASS: Soil nitrogen
- BIOMASS: Aboveground biomass
- BIOMASS: Leaf area index

Number of observing systems
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Data Repository for each Observation system

- http://www.gswp3.org/data_catalogue_glacihdial/
- http://ysimics.org
- http://vds.kris.edu/seismiquery/virtual_net.htm
- http://data.g-e-m.dk/
- http://www.barfs.de/GORD/EN/PA_spiddbtSSIP41_ARID0/arcisticHyco.html?ver=201890
- http://ameriflux.lbl.gov/
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- **ARCMAP** planned extensions
  - Enhance map component and integrate in iAOS Portal
  - Develop new indicators and improve presentation capabilities further
  - Work with other projects and initiatives to develop exchange protocols for observing assets metadata

- **ARCMAP** can be accessed from https://ci.nersc.no/
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Thank you!

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