

iAOS Components

Torill Hamre, NERSC

INTAROS Steering Committee meeting 27 May 2020



iAOS (Integrated Arctic Observation System)

iAOS Portal

[INTAROS Data Catalogue](#)

Links to **services**:

- ARCMAP survey application
- C-PAD (passive acoustic)
- TS-SIC (sea ice concentration stats)
- OpenSearch Catalog client (Sentinel-1)
- OpenDAP/THREDDS Catalog client
- Pangaea Catalog client

...

Links to **applications**:

- Risk management system (DnV)
- Arctic Acoustic Package (NERSC)

...

Links to **resources**:

- software tools, example scripts, tutorial
- data repositories, infrastructures, ...

ARCMAP

<https://ci.nerisc.no/>

Survey:

- Questionnaire A
- Questionnaire B

Analysis

- Plots of maturity, ...

iAOS Cloud Platform

Core services

(ref Pedro's talk; Deliverable D5.8)

Ellip tools

- Ellip Notebooks
- Ellip Workflows.
- Ellip Launchpads
- Ellip Infohubs

Installed **software libraries and tools**:

- pydap
- PAMGuide
- RGeostats

Data access services:

- OpenSearch Catalog client
- OpenDAP/THREDDS Catalog client
- PANGAEA data download service

...

Applications

- Risk management system (DnV)

<https://maps.dnvgl.com/arcticriskmap>

- Arctic Acoustic Package (NERSC)

...



iAOS Portal



INTAROS

Datasets

Organizations

Themes

Services

About

Search



iAOS Portal

In situ, satellite and community-based monitoring data
for the cryosphere, ocean, atmosphere and terrestrial Arctic

Start searching for datasets or the systems that observe the Arctic

Search iAOS datasets

Search INTAROS datasets

Arctic Mapping

Mapping Arctic in situ observing systems

The Arcmap survey application is one of the services offered by INTAROS. Selected stations and moorings from this survey is shown below. Visit the Arcmap site to learn more and register your observing systems.



Click on a marker for more information.

Mapping Arctic in situ observing systems

Welcome to the INTAROS portal



INTAROS



Commission

C-PAD & TS-SIC services

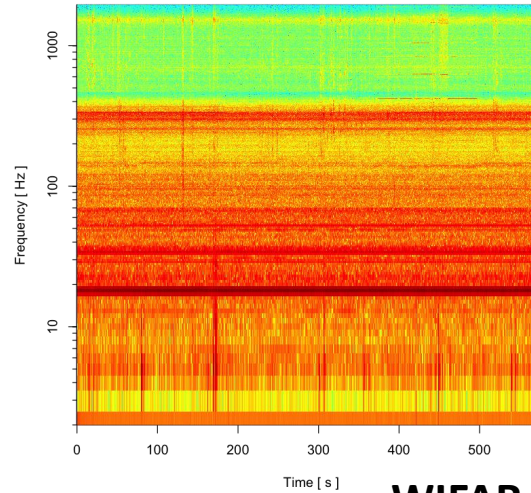
C-PAD

Process and analysis of passive acoustic data; generates spectrograms and noise statistics

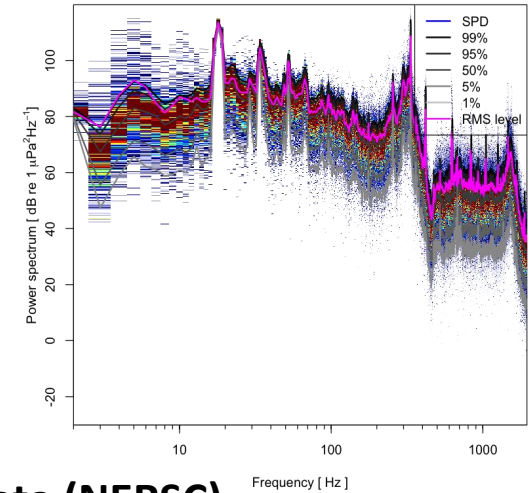
Implementation in R

Libraries: PAMGuide, tuneR, ncd4

Power spectrum spectrogram of rcv_238064010.nc

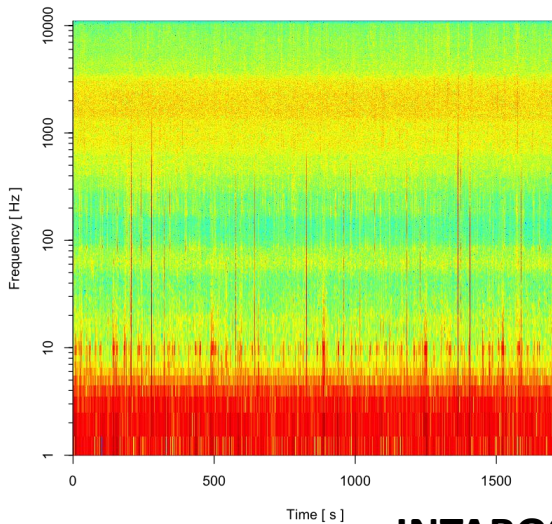


Noise level statistics for rcv_238064010.nc

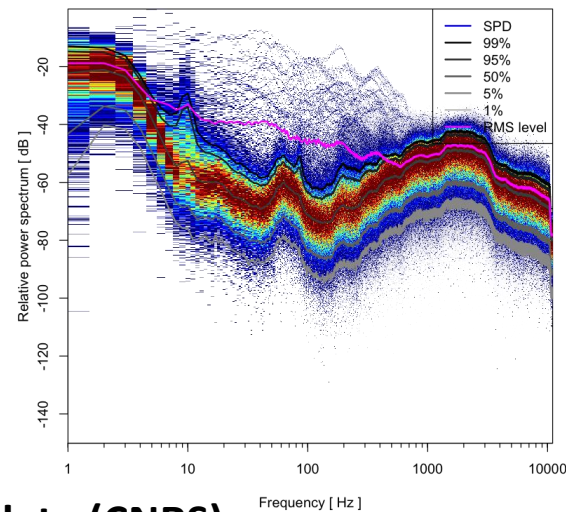


WIFAR data (NERSC)

Power spectrum spectrogram of channelA_2018-09-23_21-18-00_22kHz.v



Noise level statistics for channelA_2018-09-23_21-18-00_22kHz.wav



INTAROS data (CNRS)



C-PAD & TS-SIC services

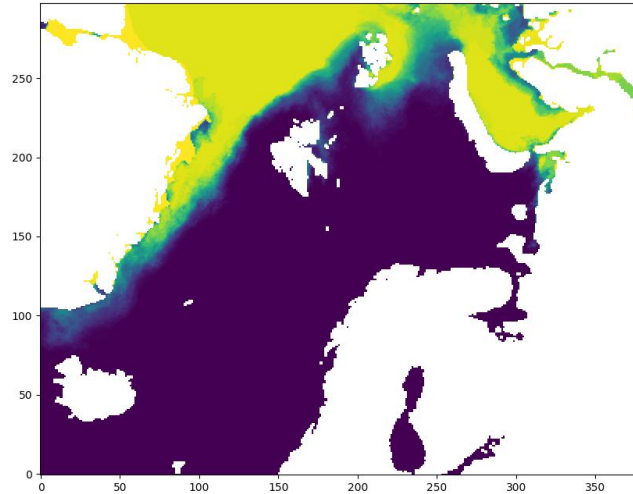
TS-SIC

Generate monthly mean SIC (sea ice concentration) from CMEMS daily SIC maps

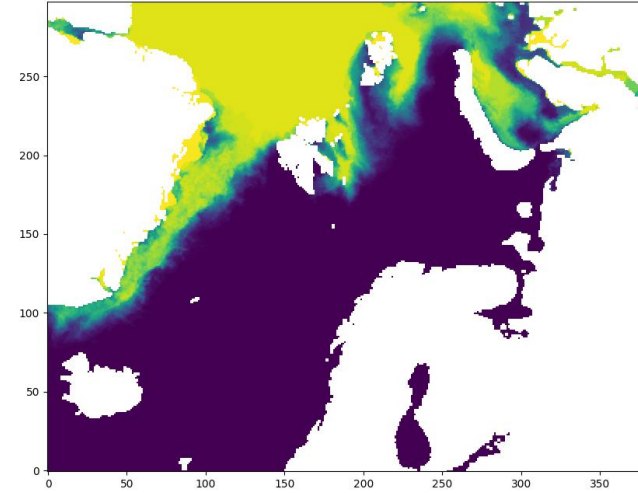
Implementation in Python

Libraries: netcdf4, matplotlib

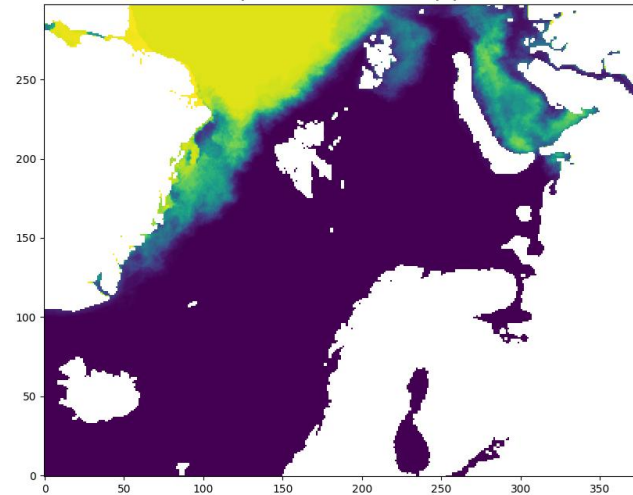
Monthly mean sea ice concentration June 2018



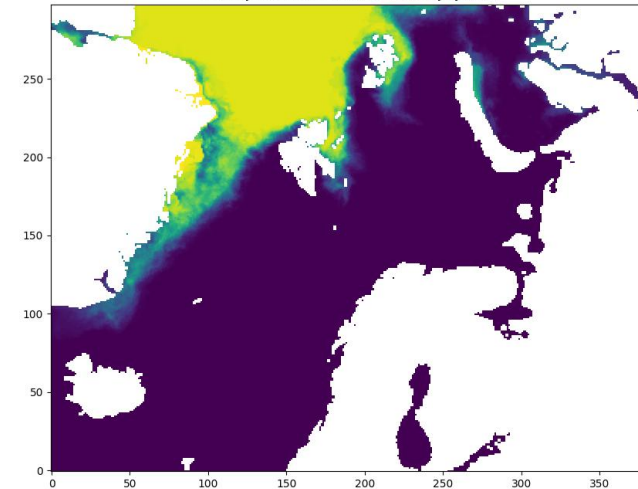
Monthly mean sea ice concentration June 2019



Monthly mean sea ice concentration July 2018



Monthly mean sea ice concentration July 2019



ARCMAP survey application

ARCMAP

Moved from Google Forms solution to Django REST and WQ.IO open source frameworks; data stored in database

Implementation in Python and JavaScript

Questionnaire A data from INTAROS (2018) imported ; respondents is updating now

QA data from Russian and Chinese partners to be imported

QA from external parties to be imported

QB to be defined; simplify; data from INTAROS to be imported



2020-6-3

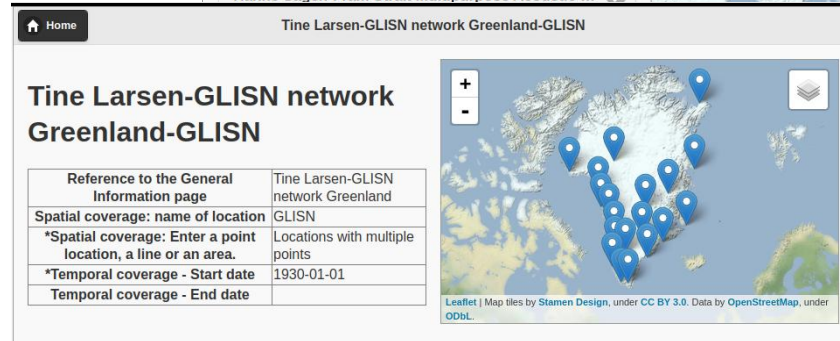
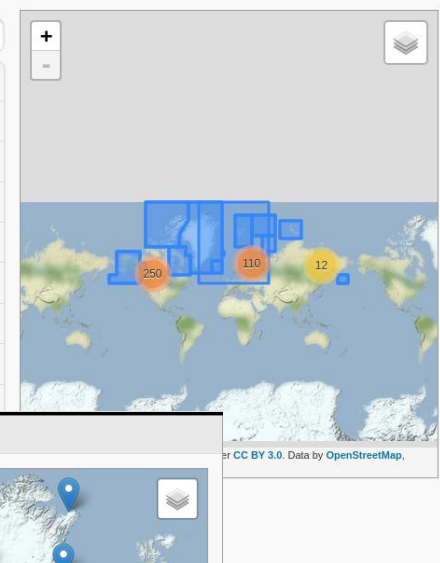
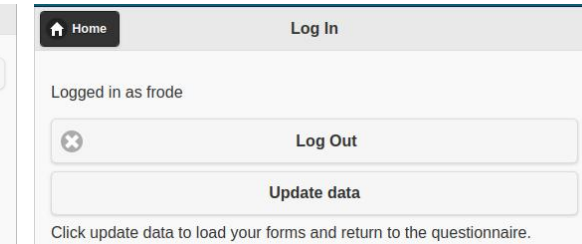
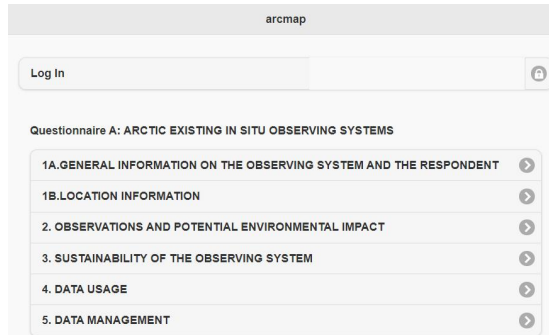
INTAROS



European
Commission

ARCMAP survey application

- **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
- Version 1 released mid Nov 2019 for Polar Data Forum 3
- Updated since with e.g. rich plotting capabilities
- **ARCMAP** can be accessed from <https://ci.nersc.no/>
- To get access please contact: kjetil.lygre@nersc.no



2020-6-3

INTAROS



ARCMAP survey application

- Easy to register new systems and data collections; parts can be stored individually

arcmap

Log In

Questionnaire A: ARCTIC EXISTING IN SITU OBSERVING SYSTEMS

- 1A.GENERAL INFORMATION ON THE OBSERVING SYSTEM AND THE RESPONDENT
- 1B.LOCATION INFORMATION
- 2. OBSERVATIONS AND POTENTIAL ENVIRONMENTAL IMPACT
- 3. SUSTAINABILITY OF THE OBSERVING SYSTEM
- 4. DATA USAGE
- 5. DATA MANAGEMENT

How to fill in the questionnaire.

It consists of 6 sub-sections - pages - that are saved separately, meaning you can save parts of the work and getting back to it later.

After login, press update data to activate your forms and return here.

For a new form, always start with page 1A (General Information).

To fill another page (1B, ..., 5), press 'Next Page' to get to the next page for filling in.

Page 1B (Location Information) can be filled in several times in case of multiple locations or deployments of an otherwise similar observation system. Take care to provide a unique name in the field 'Spatial coverage: name of location' for each location.

For any questions, please contact kjetil.lygre@nersc.no

Nansen Environmental and Remote Sensing Center
arcmap v0.1.6 • powered by [yii](#) and the [DjangoRest framework](#)

Home Edit Questionnaire A: 4. DATA USAGE Delete

Reference to 1A General Information

Hanne Sagen-Fram Strait Multipurpose Acoustic System

Chose a form name for an observing systems General information page to connect this page to

Category of the observation network/system

- Broad network (it includes a broad range of interdisciplinary observations and projects)
- Focused network (is confined to specific themes or disciplines)
- Commercial network (provide observational data for profit)
- Operational network (feeding data into weather service and forecasting entities)
- Resource-extraction network (conducts monitoring or baseline observations specifically for planned or ongoing resource extraction activities)
- Distributed data (from many local networks)

Categories are defined according to Eicken et al. 2013. Dual-purpose Arctic observing networks: Lessons from SEARCH on frameworks for prioritiz...

Application areas

- Climate Research and monitoring
- Process oriented research
- Research supporting operational services
- Operational services
- Climate services
- Public exploitation
- Commercial exploitation
- Environmental assessment
- Risk assessment
- Other:

The ACOBAR moorings (2010-2012) were also used for glider navigation

Select the application area(s) that is(are) most relevant for your observing system

If you could not provide an answer to some of the questions of this section, please explain why. Include here eventual additional comments on this section.

Back Save



ARCMAP survey application

- Easy to update information; just edit rele

Home Edit Questionnaire A: 1A. GENERAL INFORMATI... Delete

*Name of the respondent
Tine Larsen

*Affiliation of the respondent
GEUS

*Email address of the respondent
tbi@geus.dk

*Country of the respondent
Denmark

*Domain of the observing system

Atmosphere

Ocean and sea ice

Land including terrestrial cryosphere

You can select multiple domains

*Category of the observing system

ATMOSPHERE: Surface-layer

ATMOSPHERE: Tropospheric profiles

ATMOSPHERE: Surface and tropospheric observations collected during field campaigns

OCEAN: Fixed moorings

OCEAN: Repeated sections

OCEAN: Floats

Home Tine Larsen-GLISN network Greenland Edit


Tine Larsen-GLISN network Greenland

*Name of the respondent	Tine Larsen
*Affiliation of the respondent	GEUS
*Email address of the respondent	tbi@geus.dk
*Country of the respondent	Denmark
*Domain of the observing system	Land including terrestrial cryosphere,
*Category of the observing system	LAND: Permanent and temporary seismic stations,
Add other categories	
*Provide the name (or identification) of the observing system	GLISN network Greenland
General comments on the observing system	Real-time broad-band seismographs. Station spacing is very large, and some parts of the Arctic are not sufficiently covered
Project(s) or Monitoring Program under which framework the observing system was established (if relevant)	Danish Seismological Network and GLISN
*Contact details (email) for the observing system	seismology@geus.dk
URL of the observing system (if it exists)	http://glisn.info
*Institutional body coordinating the observing system or managing the observing platforms	GEUS (seismology@geus.dk), IRIS, GEOFON

Home Tine Larsen-GLISN network Greenland-GLISN

Tine Larsen-GLISN network Greenland-GLISN

Reference to the General Information page	Tine Larsen-GLISN network Greenland
Spatial coverage: name of location	GLISN
*Spatial coverage: Enter a point location, a line or an area.	Locations with multiple points
*Temporal coverage - Start date	1930-01-01
Temporal coverage - End date	



Leaflet | Map tiles by Stamen Design, under CC BY 3.0. Data by OpenStreetMap, under ODbL.



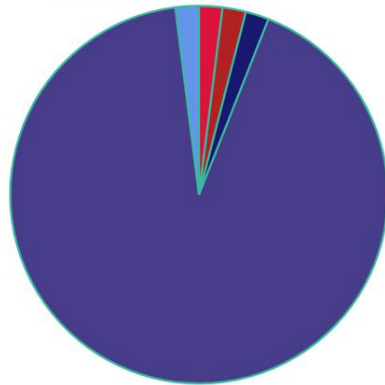
ARCMAP survey application

- Information is stored in database;
flexible extraction and presentation

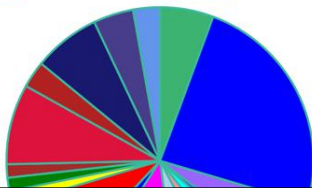
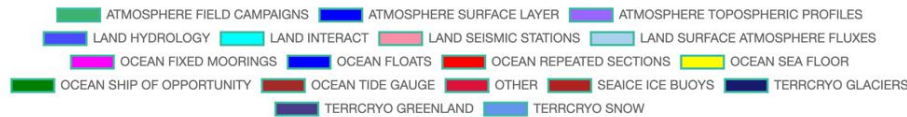
ARCMAP Client Home

Questionnaire Summary

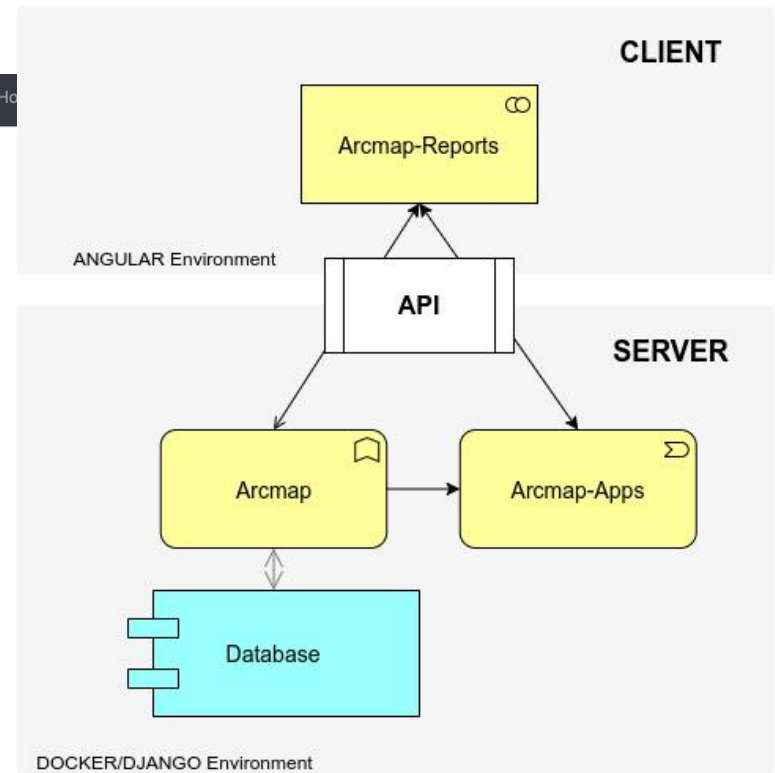
Funding Sources



Categories



ARCMAP Infrastructure

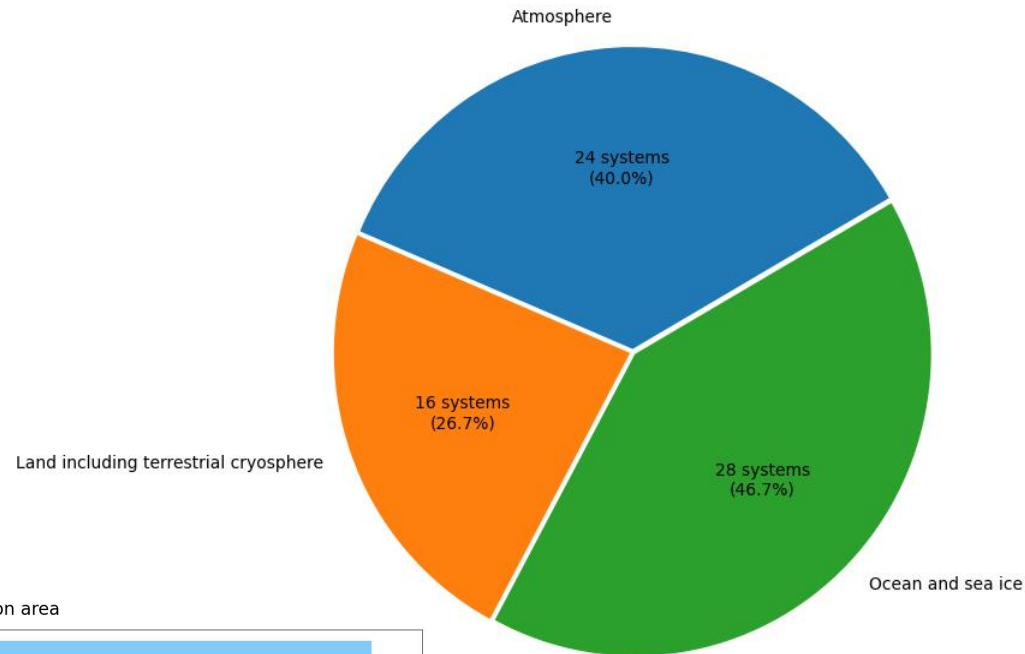


European Commission

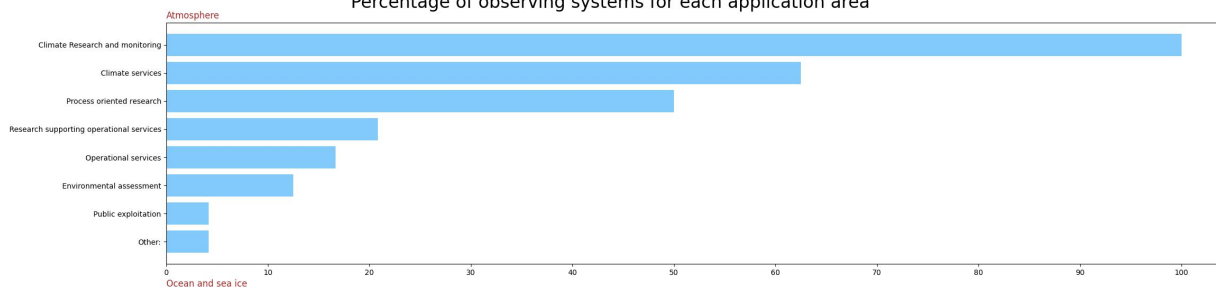
ARCMAP survey application

Total number of systems registered : 60

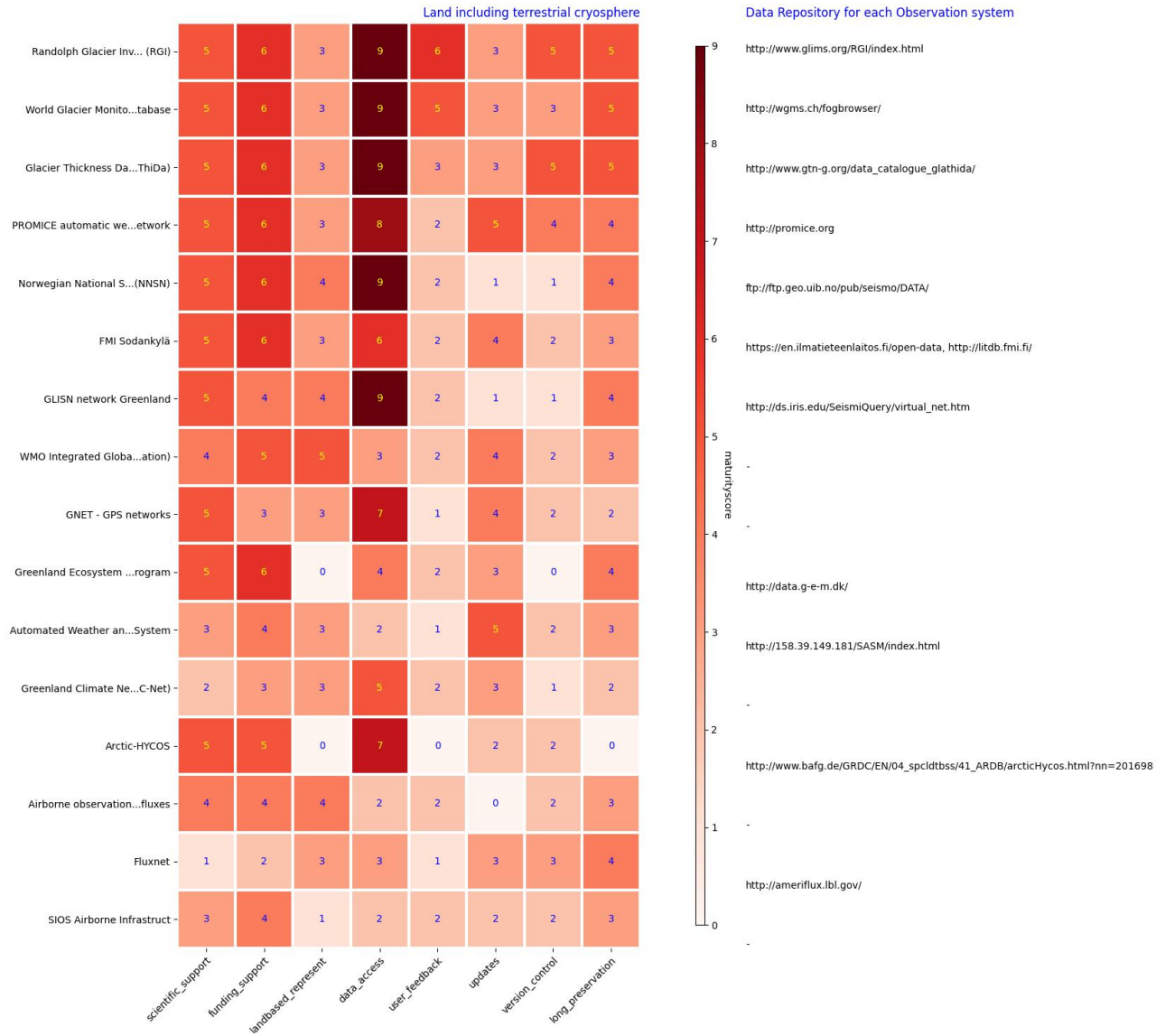
- **ARCMAP** provides statistics and aggregated information for the surveyed observation systems, e.g.
 - Domain (sphere)
 - Application area
 - Variables observed
 - System maturity
 - Data storage
 - Observation period



Percentage of observing systems for each application area



ARCMAP survey application



ARCMAP survey application

- **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
- Ingest data from Russian and Chinese INTAROS partners

ARCMAP survey application

Open issues

- **Engaging external institutions** in the assessment
 - Arctic Mapping focus on marine data (Norwegian institutions)
 - What about other spheres, other countries?
- **Exchange** of sensor/platform/network descriptions with external systems
 - Arctic Observing Viewer (AOV)
 - SIOS Observation Facility Catalogue
 - Use WIGOS (WMO Integrated Global Observing System) metadata standard?
- **Data license**
 - What data to share with e.g. AOV or SIOS?
 - How to protect our investment? (and remain FAIR...)
 - Can some parts be shared openly? E.g. observing system name, parameters measured, location, time period, owner (institution)
 - What parts should be restricted (e.g. name, email - ref GDPR; assessment - the “core” of the survey)



2020-6-3



Roadmap input

Data management

- base input on (revised) D1.6 Data Governance Framework, WIGOS, GEO, GEOSS, ENVRI-FAIR, SeaDataNet, SIOS
- **recommendations for standard data formats** for each sphere
 - formats which can embed metadata inside file w data preferred
 - still sphere/domains where standards are missing, e.g. for mooring data
 - need to revive the Data Providers Working Group
 - formats + best (common) practices for data processing and quality control
 - have collected some standards / documents (in googledocs folder)
- **recommendations for data repositories**
 - must provide DOI, and help desk/email support
 - must have long-term funding
 - documented procedures for data ingestion and curation, certified?
- **recommendations for best (common) practices**
 - contribute to **operationalization of data delivery chain**



2020-6-3



Roadmap input

iAOS Portal

- must **build on INTAROS Data Catalogue**
 - several WP5 deliverables can provide material
 - technological solution (CKAN) is mature and widely used; many “plugins” available for reuse/modification
 - extend with **harvested metadata from other repositories**
 - add **new features**, e.g. data collections, a service catalogue
 - **run services** through WPS (Web Processing Service)
 - new sections can be added on tutorials, useful software tools
 - documents, e.g.
 - ENVRI-FAIR D5.1 Requirement analysis, technology review and gap analysis of environmental research infrastructures
 - ENVri-FAIR D8.1 Atmosphere subdomain FAIRness Assessment
 - ENVRI-FAIR D9.1 Marine subdomain FAIRness roadmap
 - ENVRI-FAIR D9.2 Marine subdomain implementation plan
- available from <https://envri.eu/deliverables/>



2020-6-3

INTAROS



European
Commission