



Integrated Arctic Observation System

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Deliverable 2.3

Catalogue of products and services based on ocean and sea ice data

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4	MISU		27	NIVA	0.3
5	AWI	5	28	CNRS	
6	IOPAN		29	U Helsinki	
7	DTU	7.77	30	GFZ	
8	AU		31	ARMINE	
9	GEUS		32	IGPAN	
10	FMI		33	U SLASKI	
11	UNIS		34	BSC	
12	NORDECO		35	DNV GL	
13	SMHI		36	RIHMI-WDC	
14	USFD	5	37	NIERSC	
15	NUIM		38	WHOI	
16	IFREMER	3.35	39	SIO	
17	MPG		40	UAF	
18	EUROGOOS		41	U Laval	
19	EUROCEAN		42	ONC	
20	UPM		43	NMEFC	
21	UB	8	44	RADI	
22	UHAM		45	KOPRI	
23	NORUT		46	NIPR	
			47	PRIC	

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PU	Public, fully open	X
CO	Confidential, restricted under conditions set out in Model Grant Agreement	
CI	Classified, information as referred to in Commission Decision 2001/844/EC	

EXECUTIVE SUMMARY

This document contains the description of the INTAROS online data catalogue, which includes data collections that were not previously available, and of the effort done in INTAROS to make selected in situ and satellite ocean and sea ice data collections accessible through existing repositories.

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1. Introduction

This document contains the description of the INTAROS online data catalogue (Chapter 2) that includes data collections that were not previously available, and of the effort done in INTAROS to make selected in situ and satellite ocean and sea ice data collections accessible through existing repositories (Chapter 3). Purpose of the dynamic, web-based catalogue is to give an overview of the present observing capability after exploitation in WP2, and to provide the necessary metadata to allow for the exploration of datasets by users, and for the data usage in the demonstrative applications (WP6).

2. The INTAROS data catalogue

2.1 Purpose and content

The INTAROS data catalogue will contain descriptions of and links to all datasets collected or generated through exploiting existing datasets and/or estimating new parameters within the project. In the first version of the INTAROS data catalogue, released at end November 2018, partners have registered the datasets that are resulting from their work in WP2 (Exploitation of existing observing systems) during the two first years of the INTAROS project. The data catalogue is the tool for displaying the data collected and/or exploited within INTAROS. It is therefore a major component of the IAOS portal described in INTAROS D5.4. The main technical development of the data catalogue is therefore carried out in WP 5 - Task 5.6. Details about the design and implementation is found in D5.4.

Each dataset is described by a set of metadata elements that capture key characteristics of the dataset. The following metadata elements have been defined in the first version of the INTAROS data catalogue:

- Title (mandatory): A descriptive title of the dataset.
- URL (mandatory): A link (URL) to the dataset within the data catalogue.
- Parameter name(s): A list of the parameters contained in the dataset.
- Project/program name(s): The project(s)/program(s) that supported data collection and/or preparation. The funding agency (e.g. European Commission) and the contract number should be included here.
- Observing system name: The name of the observing systems (if any) that collected the measurements on which the dataset is based.
- Description: A short text describing the content of the dataset. The following elements could be included
 - o What kind of parameters are included in the dataset.
 - o Geographic area (by name) and time period covered by the dataset.
 - o Summary of processing to generate the dataset (e.g. with reference to paper or report).
 - o Indication of possible use of the dataset (e.g. model validation).

- **Tags:** Keywords associated with the dataset, e.g. “ocean acoustics”, “sea ice”. These keywords will be used a way to quickly search for data.
- **License:** What license the data are/will be provided under. A list of commonly used licenses is provided in the data catalogue.
- **Organisation:** Which organisation the dataset belongs to.
- **Visibility:** This is a flag controlling the publication of a dataset registration. If the datasets description is not completed yet selecting “private” will ensure the entry is only visible to the metadata editor. When the dataset description has been completed this flag can be changed to “public” to make the description visible to all users.
- **Source:** a link (URL) to the dataset file(s), e.g. on a Thredds Data Server or a FTP server.
- **Version:** A number denoting the version of the dataset.
- **Principal Investigator:** The name of the PI for dataset. Multiple persons can be named.
- **PI Email:** The e-mail address of the PI
- **Data Curator:** The name of the person in charge of maintaining the dataset and its metadata.
- **Data Curator Email:** The e-mail address of the data curator.

One or more links to datasets and/or illustrations of the content can be added to the description. These data resources are described by:

- **Name:** A title of the graphics or link to the dataset.
- **Description:** A short description of what the graphics is illustrating, or link is referring to.
- **Format:** What format the graphic resource is stored in or protocol of the data access link.

2.2 Catalogue

The INTAROS data catalogue is online at <https://catalog-intaros.nersc.no/>. The following shows some illustration of its contents at the time of writing.

Figure 1 shows the home page of the INTAROS data catalogue. This page is comprised of a search component (upper left), short statistics of how many datasets and organisations are registered (middle left) and a general information component identifying the areas and spheres addressed by INTAROS (right). From the home page, users can also get access to Dataset pages, Organisation pages, Group pages (currently not used) and the About page. It also provides a link to the login in page (top right).

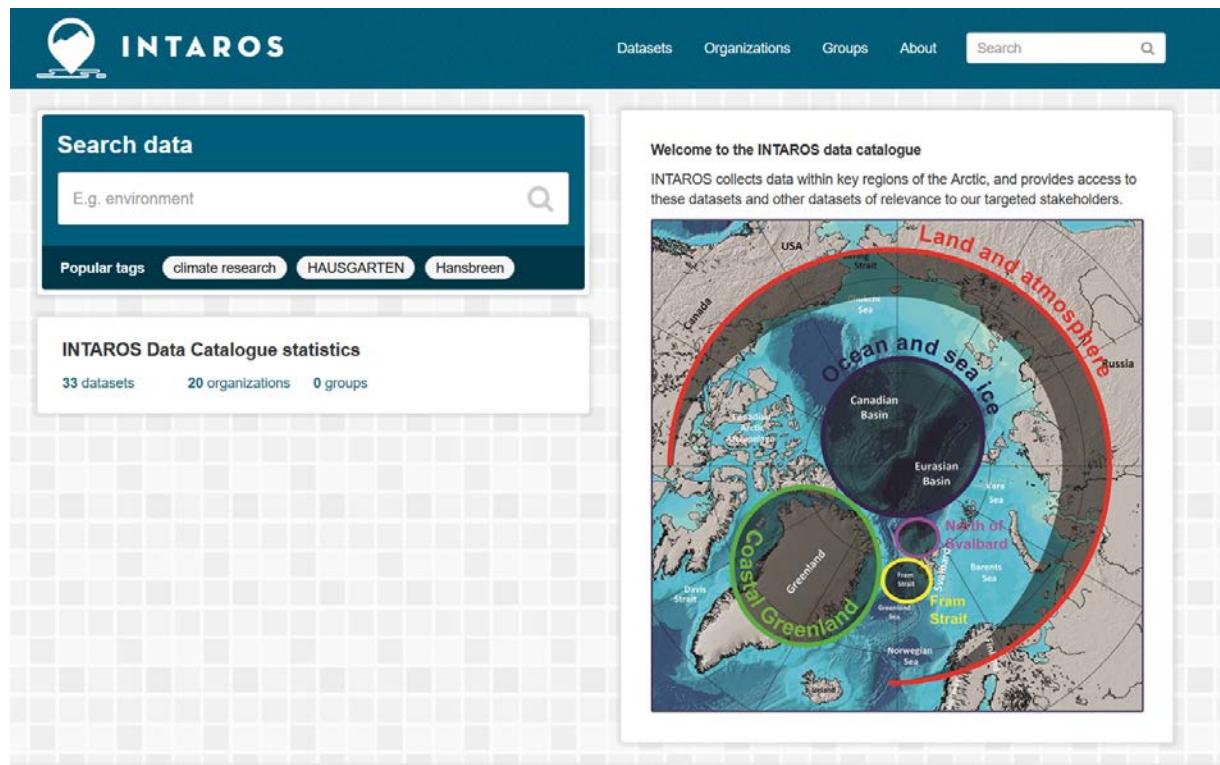
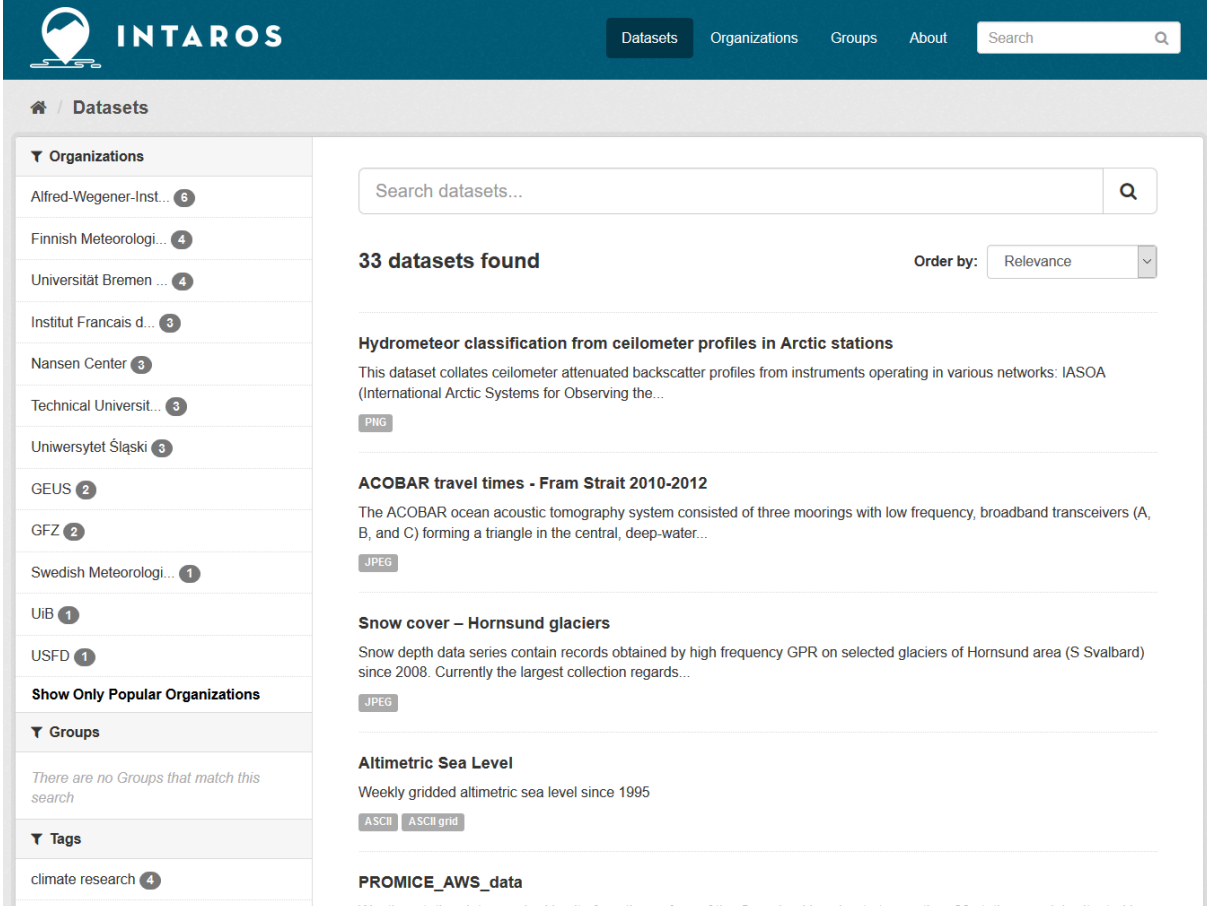


Figure 1 INTAROS Data Catalogue home page.

When entering the Dataset page (Figure 2), users can easily search using free text search or by selecting on of the tags associated with the dataset. It is also easy to select all datasets from a specific organization (Figure 3). After identifying a dataset of interest, the user can view its metadata and proceed to view or download the dataset.



INTAROS Datasets Organizations Groups About Search

Home / Datasets

Organizations

- Alfred-Wegener-Inst... 6
- Finnish Meteorologi... 4
- Universität Bremen ... 4
- Institut Francais d... 3
- Nansen Center 3
- Technical Universit... 3
- Uniwersytet Śląski 3
- GEUS 2
- GFZ 2
- Swedish Meteorologi... 1
- UiB 1
- USFD 1

Show Only Popular Organizations

Groups

There are no Groups that match this search

Tags

- climate research 4

Search datasets... Q

33 datasets found Order by: Relevance

Hydrometeor classification from ceilometer profiles in Arctic stations
 This dataset collates ceilometer attenuated backscatter profiles from instruments operating in various networks: IASOA (International Arctic Systems for Observing the...
 PNG

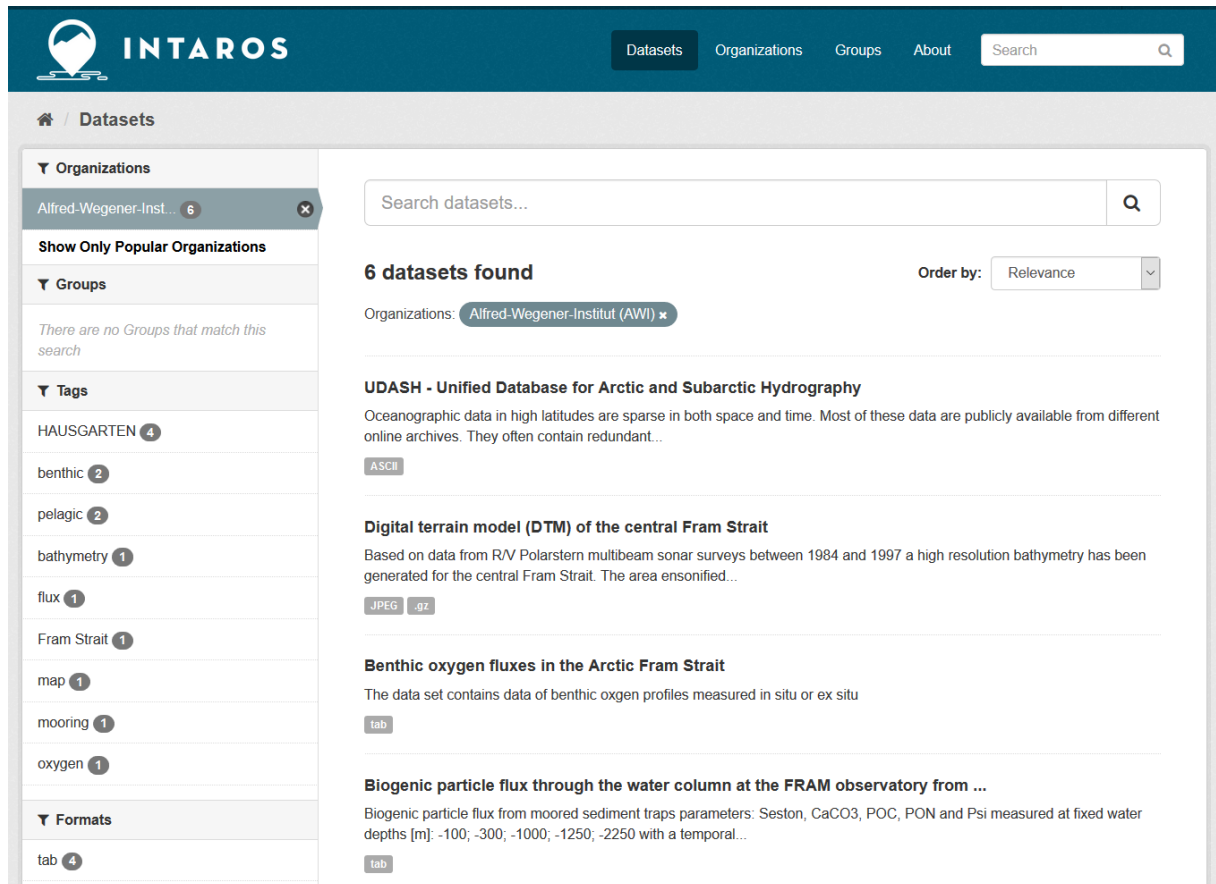
ACOBAR travel times - Fram Strait 2010-2012
 The ACOBAR ocean acoustic tomography system consisted of three moorings with low frequency, broadband transceivers (A, B, and C) forming a triangle in the central, deep-water...
 JPEG

Snow cover - Hornsund glaciers
 Snow depth data series contain records obtained by high frequency GPR on selected glaciers of Hornsund area (S Svalbard) since 2008. Currently the largest collection regards...
 JPEG

Altimetric Sea Level
 Weekly gridded altimetric sea level since 1995
 ASCII ASCII grid

PROMICE_AWS_data
 Weather station data acquired in situ from the surface of the Greenland ice sheet at more than 20 stations, mainly situated in

Figure 2 INTAROS Data Catalogue - Datasets page.



INTAROS Datasets Organizations Groups About Search

Home / Datasets

Organizations

Alfred-Wegener-Inst... 6

Show Only Popular Organizations

Groups

There are no Groups that match this search

Tags

HAUSGARTEN 4

benthic 2

pelagic 2

bathymetry 1

flux 1

Fram Strait 1

map 1

mooring 1

oxygen 1

Formats

tab 4

Search datasets... Q

6 datasets found Order by: Relevance

Organizations: Alfred-Wegener-Institut (AWI)

UDASH - Unified Database for Arctic and Subarctic Hydrography

Oceanographic data in high latitudes are sparse in both space and time. Most of these data are publicly available from different online archives. They often contain redundant...

ASCII

Digital terrain model (DTM) of the central Fram Strait

Based on data from R/V Polarstern multibeam sonar surveys between 1984 and 1997 a high resolution bathymetry has been generated for the central Fram Strait. The area ensonified...

JPEG .gz

Benthic oxygen fluxes in the Arctic Fram Strait

The data set contains data of benthic oxygen profiles measured in situ or ex situ

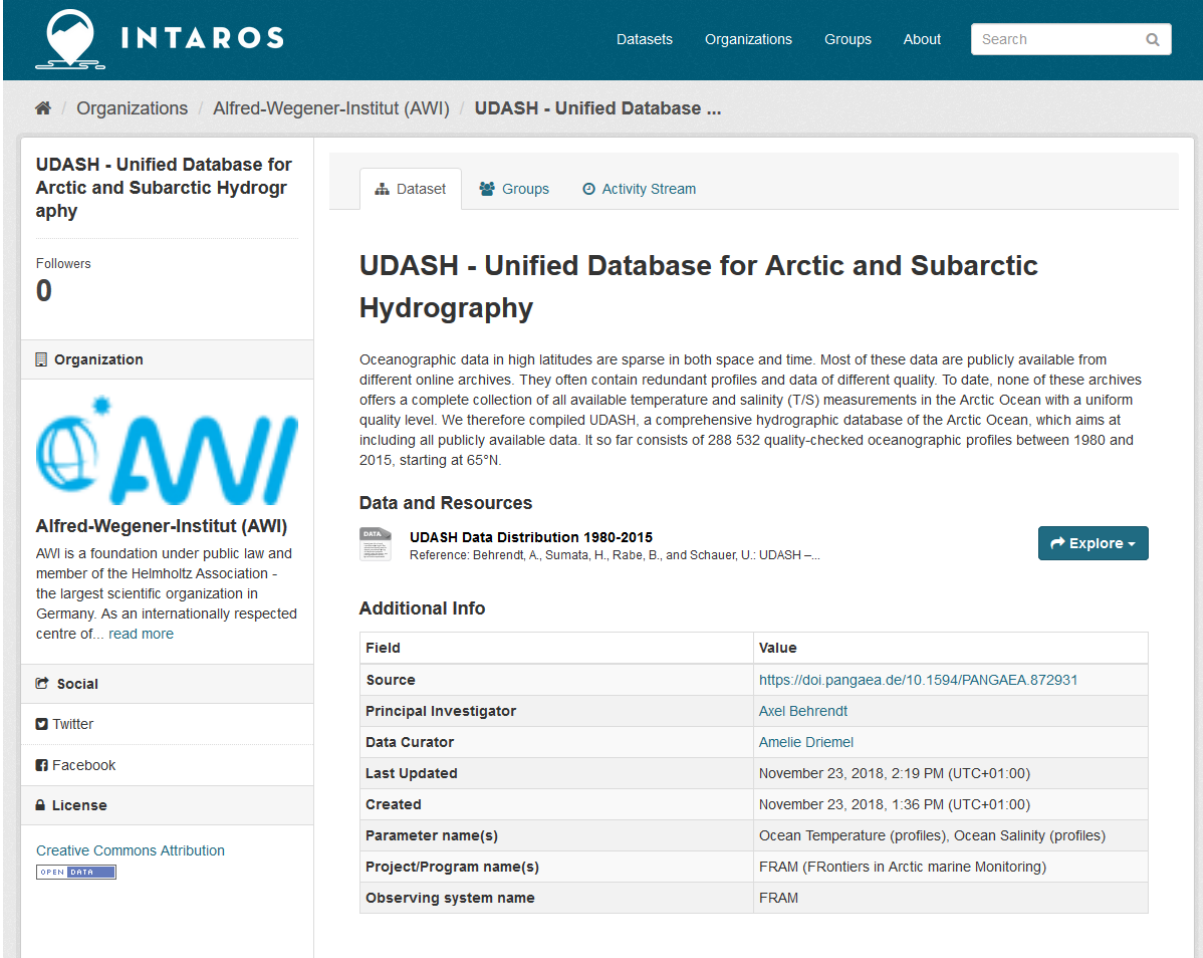
tab

Biogenic particle flux through the water column at the FRAM observatory from ...

Biogenic particle flux from moored sediment traps parameters: Seston, CaCO₃, POC, PON and Psi measured at fixed water depths [m]: -100; -300; -1000; -1250; -2250 with a temporal...

tab

Figure 3 INTAROS Data Catalogue – Searching all dataset from a given organisation.




The screenshot shows the INTAROS Data Catalogue interface. The top navigation bar includes 'Datasets', 'Organizations', 'Groups', 'About', and a search box. The breadcrumb trail indicates the path: Home / Organizations / Alfred-Wegener-Institut (AWI) / UDASH - Unified Database ...

UDASH - Unified Database for Arctic and Subarctic Hydrography

Followers: 0

Organization



Alfred-Wegener-Institut (AWI)
AWI is a foundation under public law and member of the Helmholtz Association - the largest scientific organization in Germany. As an internationally respected centre of... [read more](#)

Social

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License


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[OPEN DATA](#)

UDASH - Unified Database for Arctic and Subarctic Hydrography

Oceanographic data in high latitudes are sparse in both space and time. Most of these data are publicly available from different online archives. They often contain redundant profiles and data of different quality. To date, none of these archives offers a complete collection of all available temperature and salinity (T/S) measurements in the Arctic Ocean with a uniform quality level. We therefore compiled UDASH, a comprehensive hydrographic database of the Arctic Ocean, which aims at including all publicly available data. It so far consists of 288 532 quality-checked oceanographic profiles between 1980 and 2015, starting at 65°N.

Data and Resources

 **UDASH Data Distribution 1980-2015**
Reference: Behrendt, A., Sumata, H., Rabe, B., and Schauer, U.: UDASH --... [Explore](#)

Additional Info

Field	Value
Source	https://doi.pangaea.de/10.1594/PANGAEA.872931
Principal Investigator	Axel Behrendt
Data Curator	Amelie Driemel
Last Updated	November 23, 2018, 2:19 PM (UTC+01:00)
Created	November 23, 2018, 1:36 PM (UTC+01:00)
Parameter name(s)	Ocean Temperature (profiles), Ocean Salinity (profiles)
Project/Program name(s)	FRAM (FRontiers in Arctic marine Monitoring)
Observing system name	FRAM

Figure 4 INTAROS Data Catalogue – Viewing (some of the) metadata for a selected dataset.

3 Integration of in situ data collections into existing data repositories

This chapter provides a short description of the steps taken by the partners to make their data openly accessible and integratable into the iAOS. Different institutions have very different levels of data management and data infrastructure maturity, therefore the undertaken work is very diversified. In those cases when the data infrastructure is under building, an outlook of data repositories that will be utilized and a timeline of the work is provided.

3.1 NERSC: Acoustic travel time data and acoustically derived temperature

Acoustic travel time data were collected by NERSC as part of three different research projects EU-DAMOCLES, EU-ACOBAR, and RCN-UNDER-ICE. Data from DAMOCLES and ACOBAR has been inverted to mean ocean sound speed and converted to mean ocean

temperature. These data are being prepared for publication in NetCDF format, and made available through NERSC thredds server, and distributed through Norwegian Marine Data Centre. UNDER-ICE travel time data has been collected and the inversion to sound speed is ongoing.

As part of the project above oceanographic sections were taken to support the inversion of acoustic data. The sections were obtained using XBT and XCTDs. these data will also be included into the INTAROS data catalogue. All data in NetCDF format including metadata.

During the UNDER-ICE field experiment 2016 a 20 days sailbuoy mission was carried out to collect ocean acidification parameters in the central Fram Strait. These data are also included in the INTAROS data catalogue. Data are in NetCDF format including metadata.

Travel time data has been collected by SIO (US partner without EU funding) in the Beaufort Sea as part of the ONR funded project CANAPE. These data are undergoing processing and inversion analysis, and will be made available when results are published in a refereed Journal.

3.2AWI: Integration of data-collections from the FRAM observatory via the PANGAEA data-library

An established O2A (Observations to Archives) data stream from the LTER-HAUSGARTEN extension FRAM provides mainly delayed mode biogeochemical data from the high oceanic Fram Strait and from the central Arctic.

PANGAEA provides a service which queries the data warehouse and returns values in a text file, based on search criteria that (1) specify a bounding box in time and space (latitude, longitude and water depth), and (2) specify a list of parameters.

Based on the described PANGAEA direct download service (DDS) AWI provides for 23 parameters and one data-product in total, dynamic data-warehouse links ready for integration into the iAOS. Those DDS-links also provide for selected parameters targeted data-mining capabilities in time and space.

The generated tab-delimited text-files of a query contain:

- Date/Time
- Latitude; Longitude;
- Waterdepth
- Parameter Name
- Origin of Values (DOI which leads to the original full PANGAEA dataset with full metadata information)

With each DDS-query also a 'classical' PANGAEA-query is provided, which leads to a complementing list of relevant data-sets with full meta-information.

3.3IFREMER: satellite-based sea ice concentration and displacement

Long term satellite datasets of sea ice concentration and displacement will be made available for iAOS through the archiving system at IFREMER.

FTP links to all data are available. Data and metadata services for search and subsetting are provided through the Thredds/OpenDAP service. If necessary, remaining data can also be included. The product catalogue will be migrated to the Ifremer "sextant" catalogue, used in several EU projects dealing with data portal such as SeaDataNet. Once it is there, the product metadata can be queried through various OGC protocols (CSW) in ISO format.

3.4 UB: satellite-based sea ice concentration

Long term satellite datasets of sea ice concentration will be made available for iAOS through the archiving system at University Bremen.

The Sea-Ice Portal of partners from University Bremen (seaice.uni-bremen.de) provides high-quality data of seaice-thickness and ice-concentration, which has high relevance of many research tasks within INTAROS. All data can be found in the data archive, which is accessible via FTP and HTTP:

For FTP access, connect to "seaice.uni-bremen.de" (use a ftp client, browser will not work). The products are available in the given directories, e.g., "amsr2" for the AMSR2 data. Please set your ftp client to "active mode". Otherwise no connection is possible. The user name is "anonymous" and no password is needed.

For HTTP access, visit <https://seaice.uni-bremen.de/data>, the structure is the same as for FTP.

To quickly browse the data, a dedicated Databrowser is provided.

However, neither FTP nor HTTP provides sufficient APIs for search and retrieval functionalities in basis of machine to machine communication. Due to this partners are looking for an adequate solution to implement an openDAP service. Since Uni-Bremen does not have the manpower to maintain such a server solution it was decided to establish here a use case where Terradue will provide a 'remote openDAP' solution.

It was decided that apart from seaice-thickness, ice-concentration data-sets seem to be most attractive to share with a greater community.

3.5 DTU: satellite-based and in situ (gauge)-based sea level data

One of the datasets planned to release for INTAROS on satellite based sea level has undergone major revision during the last 6 month and is expected to be ready until the end of the deliverable. However, the last updates to the datasets are necessary but generally tests for integration into the iAOS could be done on the preliminary datasets.

DTU data are all available via anonymous ftp at the DTU space ftp/web portal (ftp.space.dtu.dk/pub/ARCTIC_SEALEVEL).

Furthermore DTU has processed monthly sea surface height data from 52 tide gauge stations from the PSMSL-network. Each timeseries has been quality checked and errors have been removed. A matlab-script for updating the netcdf-file with most recent data is available. In addition high resolution 5-min sea surface height data from 4 DTU controlled tide gauge stations on Greenland are provided. All data are accessible at <ftp.space.dtu.dk/pub/EU-INTAROS>.

3.6 NIVA: NIVA Barents Sea Opening FerryBox

NIVA plans to deliver FerryBox measurements collected in the Barents Sea Opening (Tromsø-Svalbard). Already at very short notice they will provide parameters like: time, date, lat, long, depth (fixed depth), salinity, temperature, chlorophyll a fluorescence, turbidity.

Possibly in the future data for pH, pCO₂, cDOM, CO₂- and integrated sphere absorption spectra will be provided also. Generally new datasets will be available within 6-12 months.

Except for spectral data, the repositories are already selected. They use API for communication, filtering and data selection. No more detailed information so far.

Used data formats follow protocols developed by MyOcean, JERICO-RI, CMEMS, and EMODnet. This includes netCDF formatting, flagging (good, bad, unknown), and metadata for all variables.

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INTAROS

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Project partners:

