HORIZON 2020

Research and Innovation action

Grant Agreement No. 730965

ARICE: Arctic Research Icebreaker Consortium:

A strategy for meeting the needs for marine-based research in the Arctic

Deliverable 7.5. Agreement on procedures for virtual access to the ARICE cruises

Submission of Deliverable

Work Package	WP7
Deliverable no. & title	D7.5. Agreement on procedures for virtual access to the ARICE cruises
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Dissemination level	☒ PU-Public ☐ PP- Restricted to programme partners ☐ RE- Restricted to a group specified by the consortium ☐ CO- Confidential, only for members of the consortium
Lead Beneficiary	AWI
Contributors	☒ 1 – AWI, ☒ 2 – SPRS, ☒ 3 - NPI, ☒ 4 - ULAVAL, ☒ 5 – UAF/CFOS, ☒ 6 – AP, ☐ 7 – CSIC-UTM, ☐ 8 – CNR, ☐ 9 - WOC, ☐ 10 – IOPAN, ☐ 11 – FMI, ☐ 12 - CNRS, ☒ 13 – NERC-BAS, ☐ 14 – DTU-AQUA, ☒ 15 – ARCTIA
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1. Introduction

With their global capability and diverse array of sensors, research vessels are essential mobile observing platforms for ocean science. Data collected on every expedition are of high value, given the high cost and increasingly limited resources for ocean exploration.

Virtual access is the free of charge provision of access to widely used resources needed for research that are openly and freely available through communication networks. For non-commercial use, interested parties can have access to datasets and metadata collected by the ARICE icebreakers, when available, without visiting the research infrastructures. In this virtual data access, there is no need for a comparative selection of users and there is thus no selection procedure.

This deliverable provides detailed information on where cruise information and cruise data can be accessed publicly; and if this data is not publicly available, whether there is an agreement to access this data.

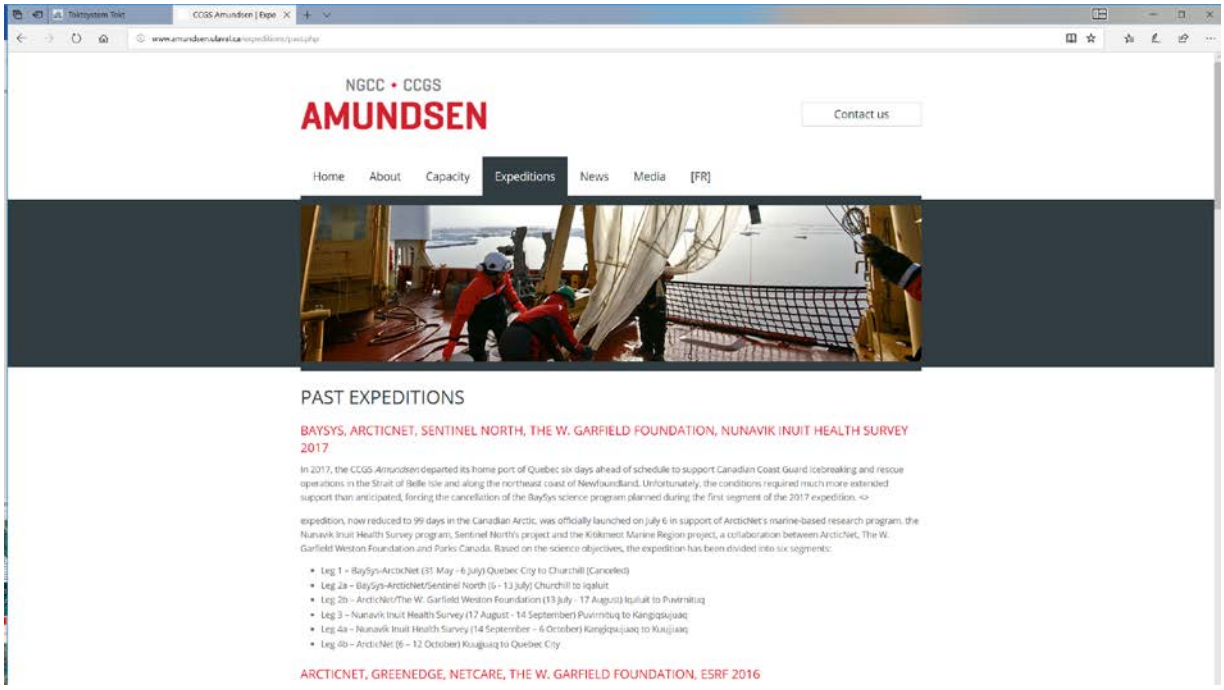
2. Cruise data from ARICE icebreakers

CCGS Amundsen (Canada)

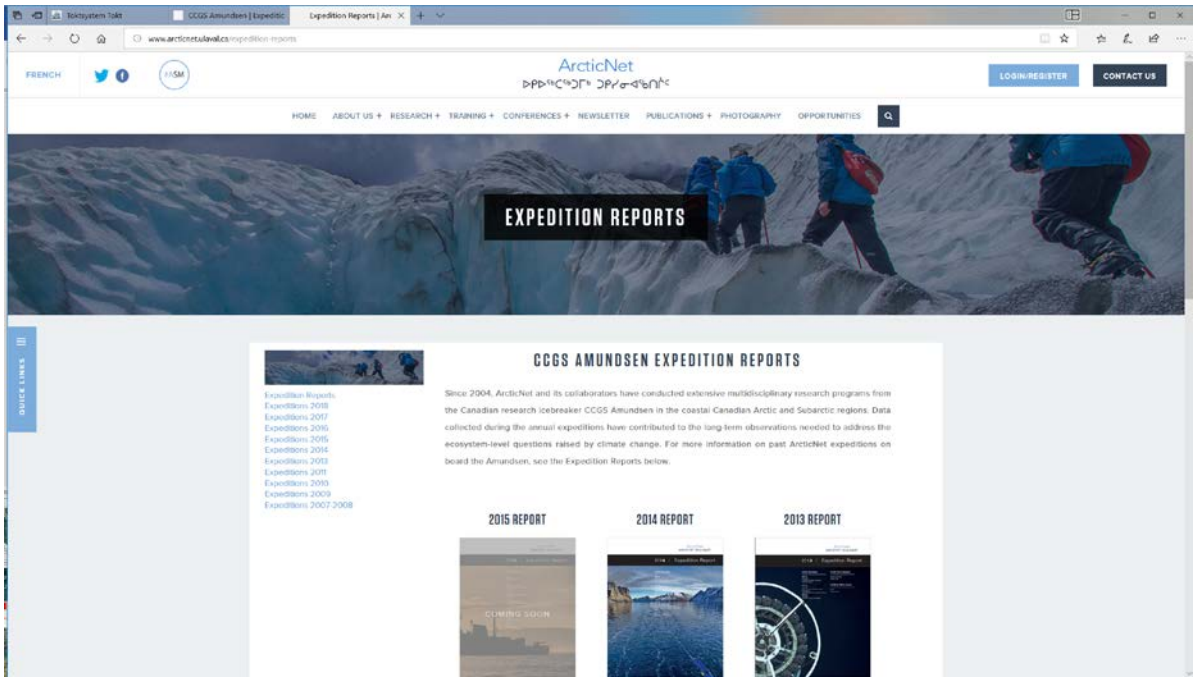
Cruise database:

All CCGS Amundsen's past and current expeditions are listed on the Amundsen website at the following link:

http://www.amundsen.ulaval.ca/expeditions/past-fr.php.



From winter 2020, the annual cruise reports will also be uploaded on http://www.amundsen.ulaval.ca/. In the meantime, these reports are also available on the ArcticNet Website, an important user program of the facility: http://www.arcticnet.ulaval.ca/fr/rapports-dexpedition-damundsen.



Datasets collected by the vessel:

There are two ''types of data collected on board the ship'': the core data from the central pool of equipment, managed by Amundsen Science, and the data collected directly by the scientists and user programs mobilizing the ship.

The core datasets consist of physical data from the CTD rosette, Moving Vessel Profiler, Imagery (ROV, Multibeam, Subbotom, 360 cameras around the ship, EK80 and SX90 sonars), Current meters (punctual and continuous), meteorology AVOS, TSG or thermosalinograph (continuous surface sampling), and moorings.

Metadata and data from the central pool of equipment are, for the majority archived, on the Polar Data Catalogue (www.polardata.ca). Besides, the new Amundsen Science website (available in January 2020) will display a page on our data policy, data management principles and the access links to the datasets of Amundsen Science Data Collection, on the PDC or elsewhere.

Our new website will also display a list of all available data (or soon to be available) not directly available online. The contact information to access these data is Amundsen.data@as.ulaval.ca.

Metadata and data under the responsibility of the scientists and user programs should follow the policies of their funding agencies.

Amundsen Science core datasets are open and freely available on the PDC or by contacting us at amundsen.data@as.ulaval.ca

Planning/schedules

Not available for security issues.

Real time data:

CCGS Amundsen is broadcasting real-time data on the expedition page: https://data.amundsen.ulaval.ca/. The list of variables is below.

Navigation Data

. Time (UTC)

. Position

. Speed

. Track

Atmospheric Data

. Wind speed (knt)

. Wind direction (deg)

. Pressure (hPa)

. Temperature (deg C)

. Humidity (%)

Sea Water Surface Data (7 meter-depth)

. Temperature (deg C)

. Salinity (psu)

. Fluorescence (ug/L)

. Sound velocity (m/s)

For an example of the displaying page, please see our demo from the 2018 cruise at: https://data.amundsen.ulaval.ca/simu_360.html. Transmittance is not available anymore.

Agreement on data accessibility:

No special agreement is needed, as data is publicly available.

RV Sir David Attenborough (United Kingdom)

Although the RRS Sir David Attenborough vessel is not operational yet, it is likely that the future RRS Sir David Attenborough data workflow will operate in a similar way to the existing RRS James Clark Ross data workflow.

Cruise database:

A cruise inventory of cruise reports from UK fleet voyages is established at the British Oceanographic Data Centre (BODC). In order to avoid duplication of efforts full cruise reports from BAS vessels are being submitted to the BODC inventory (https://www.bodc.ac.uk/resources/inventories/cruise_inventory/search/) either directly by the cruise Principle Scientific Officer (PSO) or the UK Polar Data Centre (UK PDC) at BAS submit the cruise report on behalf of the PSO. The same holds also for the Cruise Summary Reports that form the content of the web-based records in the inventory.
Example:
https://www.bodc.ac.uk/resources/inventories/cruise_inventory/report/16402/

Datasets collected by the vessel:

All raw cruise data recorded by instrumentation linked to the ship's data network is at the end of each cruise archived at BAS in a UNIX file system.
All metadata from BAS-operated marine platforms is processed and stored in an oracle database at UK PDC. At the moment the database is not publicly available but PDC is developing an end-user interface that will enable to search BAS vessels metadata of cruises from 1965 onwards.

Agreement on data accessibility:

Usually, cruise data are under embargo for two years from the end of data collection. Upon request, PSO can grant access to some cruise data during this time. Raw cruise data can be requested at UK PDC at polardatacentre@bas.ac.uk. Increasingly data are available via the UK PDC Discovery Metadata Catalogue (https://www.bas.ac.uk/project/dms/).

Real time data:

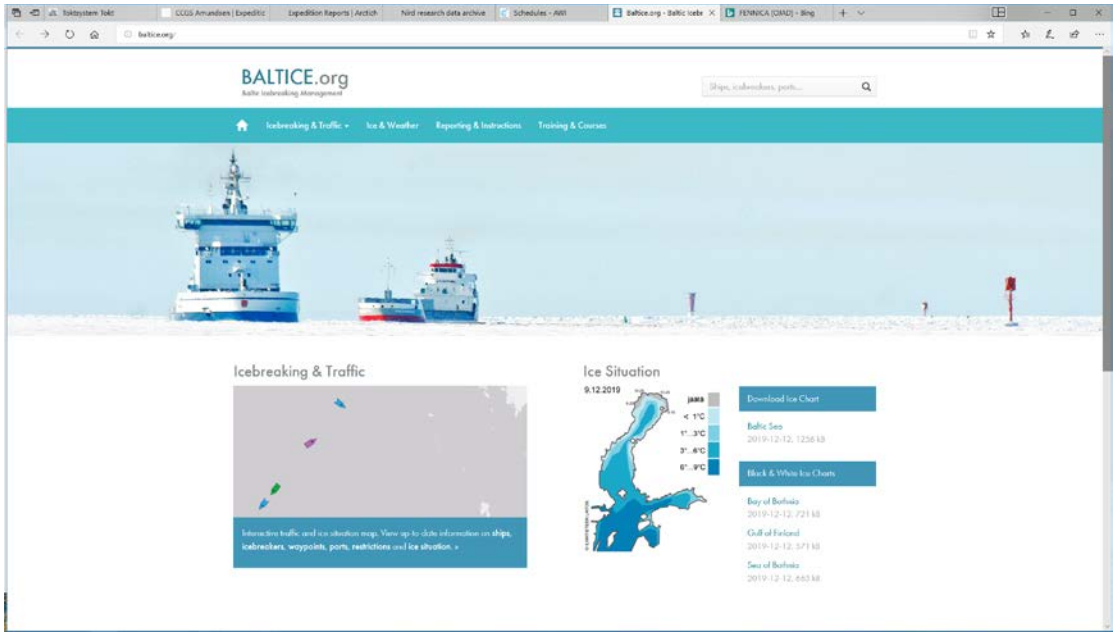
The RRS Sir David Attenborough will likely have the capability to broadcast real-time data but details cannot be provided yet since the RRS Sir David Attenborough data acquisition systems are currently being developed.

MSV Fennica (Finland)

Although MSV Fennica sometimes performs research activities, it is actually not a research vessel and cruise data is property of the private companies hiring the vessel.

When performing ice management in the Baltic Sea, the position of the vessel can be seen at:

http://baltice.org/



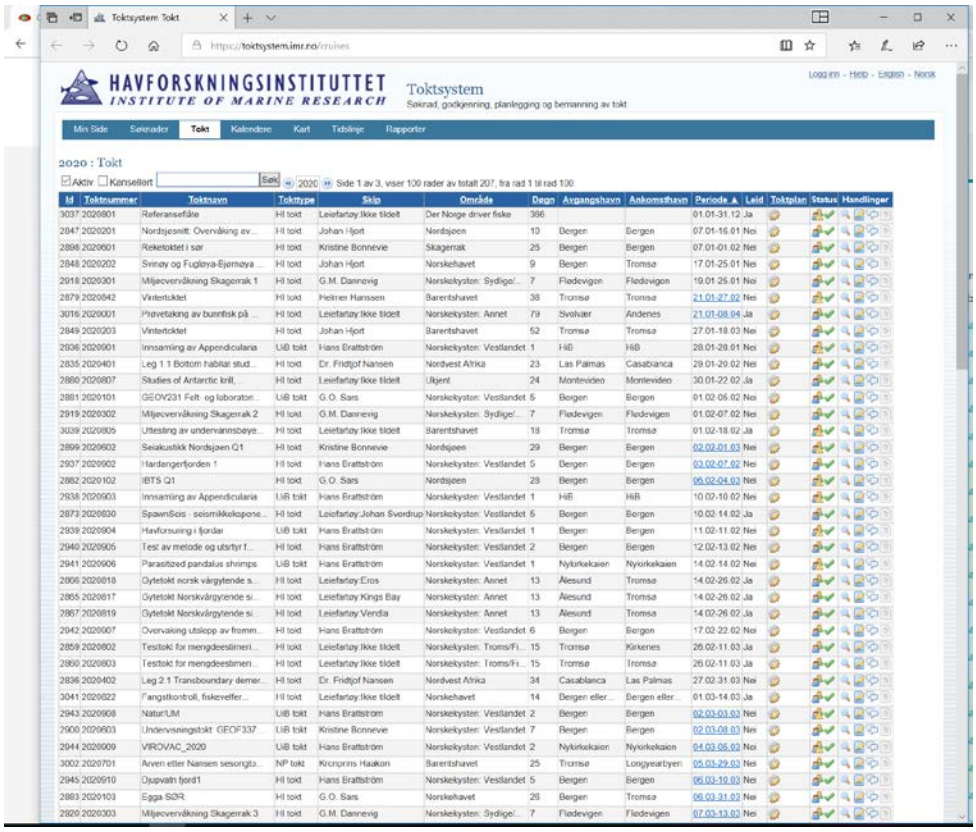
Agreement on data accessibility:

No special agreement is available, as data collected is property of the private companies hiring the vessel.

RV Kronprins Haakon (Norway)

Cruise database:

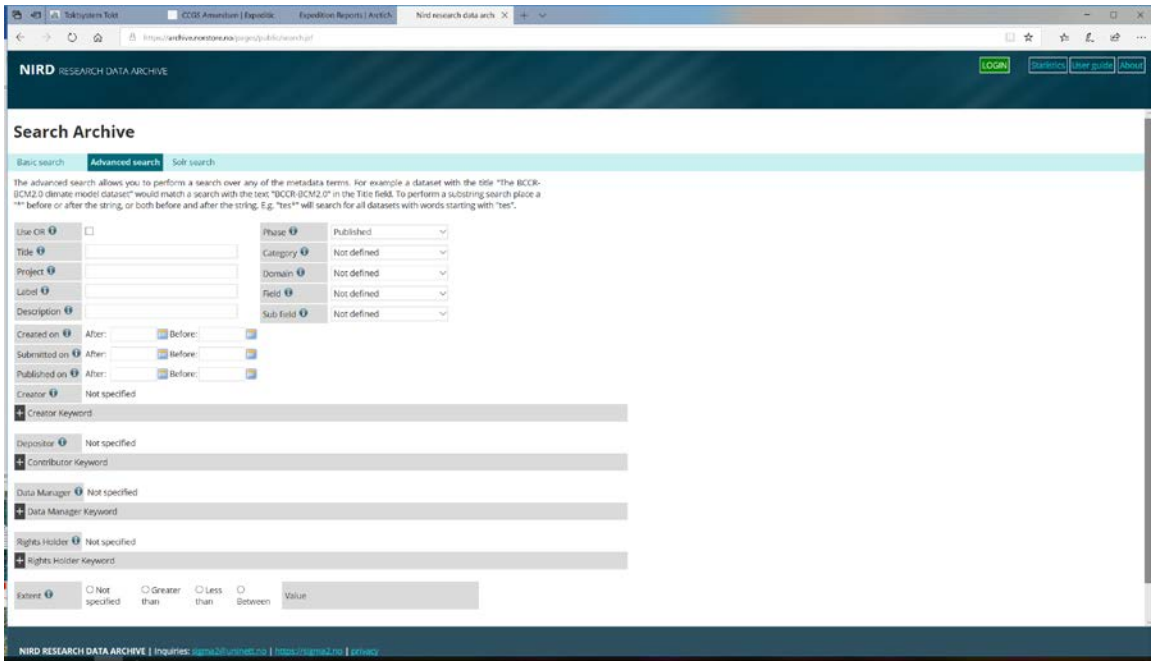
Applications and cruises operated by the Institute of Marine Research use a platform for application, approval, planning and staffing of cruises. This is managed through the following address. Access to the list of cruises is open, but applicants need a validated email address
https://toktsystem.imr.no/cruises



Datasets collected by the vessel:

Datasets collected by RV Kronprins Haakon are stored at The Research Data Archive. The Research Data Archive is a repository that provides long-term storage for research data and is compliant with the Open Archival Information System (OAIS) reference model.

The aim of the archive is to provide (public) access to published research data and to promote cross-disciplinary studies. Published datasets are accessible at: https://archive.norstore.no/



Real time data:

The ship's position originate from the LRIT system, AIS satellites and coastal stations - which means that there is global coverage for this vessel.

Agreement on data accessibility:

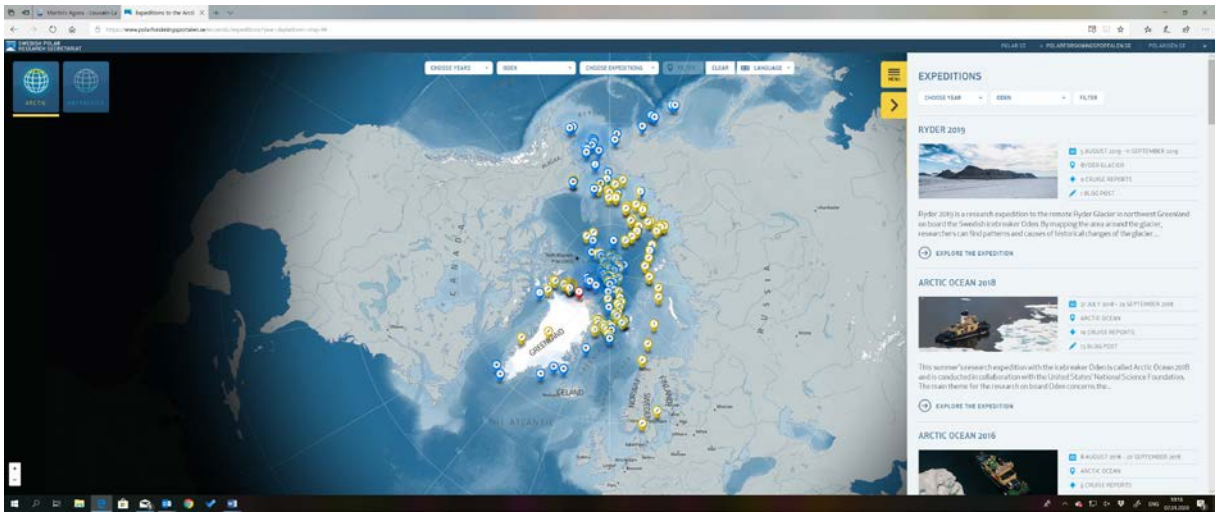
Real time data access agreement: The real time data is currently under migration and access will be changed from JSON object from out ftp server to a token based API. As of February 2020 any system willing to retrieve the JSON object will need to issue a https request.

IB Oden (Sweden)

Cruise database:

The Polar Research Portal presents information about Swedish polar research expeditions from 1999 onwards. Photos, cruise reports and expedition blogs by polar researchers gives a unique insight into work and everyday life during research expeditions in the Arctic and Antarctica.

The portal can be accessed here www.polarforskningsportalen.se



Datasets collected by the vessel:

The data continuously measured via SPRS are uploaded on the Swedish National Data Service: https://snd.gu.se/sv

The data from each science project on board is uploaded in servers identified well in advance of each expedition.

Real time data:

Weather data from the icebreaker Oden:

The icebreaker Oden operates mainly in the Arctic and The Gulf of Bottnia. Through a collaboration between SMHI, the Swedish Maritime Administration and the Polar Research Secretariat, real time weather data is accessible here:

http://www.smhi.se/data/2.1090

Meteorological parameters represent 30 meters above sea level.

Water temperatures:

The water temperature is measured at 4 meters below the surface. Temperature and relative humidity is measured from both starboard and port side, but is somewhat affected by heating from the ship.

http://www.smhi.se/data/oceanografi/ladda-ner-oceanografiska-observationer#param=seatemperature,stations=all,stationid=38006

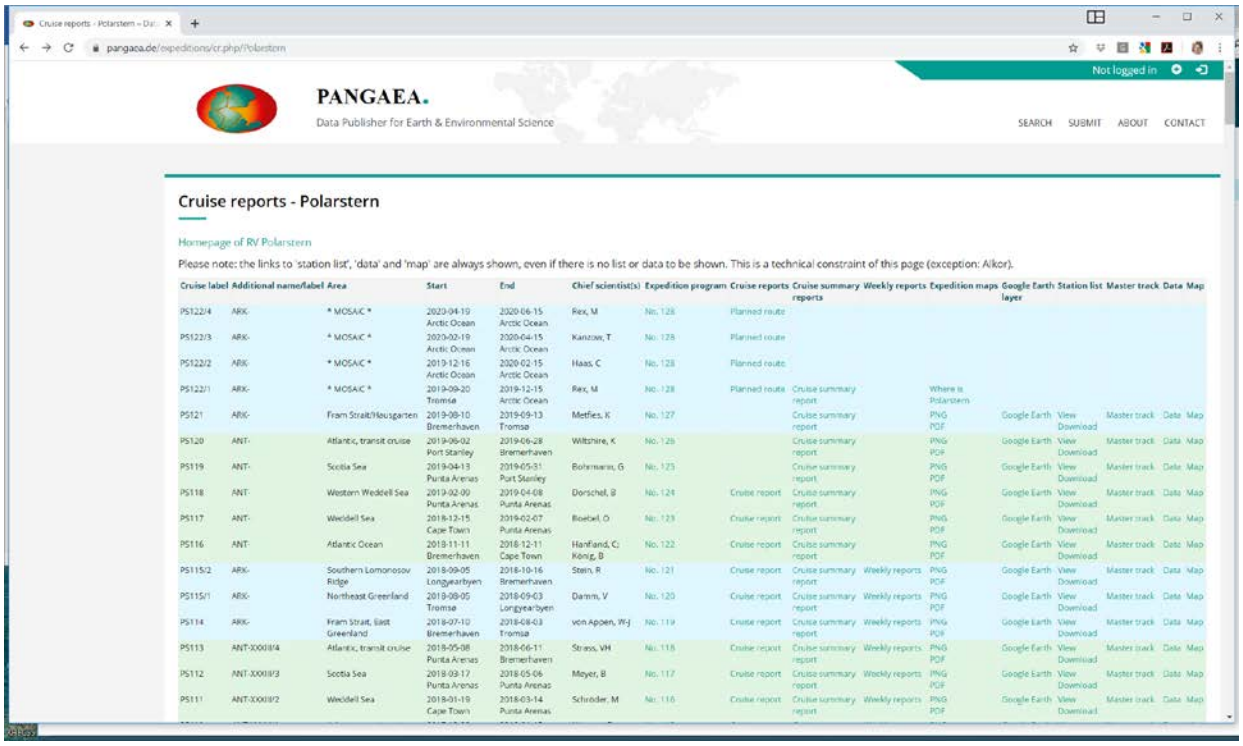
Agreement on data accessibility:

No special agreement is needed, as data is publicly available.

PRV Polarstern (Germany)

Cruise database:

PRV Polarstern information on cruises/data is stored at the information system PANGAEA https://www.pangaea.de/expeditions/cr.php/Polarstern



The information system PANGAEA is an Open Access library aiming at archiving, publishing and distributing georeferenced data from earth system research. The system guarantees long-term availability of its content through a commitment of the hosting institutions.

Datasets collected by the vessel:

Most of the data are freely available and can be used under the terms of the license mentioned on the data set description. A few password-protected data sets are under moratorium from ongoing projects. The description of each data set is always visible and includes the principle investigator (PI) who may be asked for access.

Each dataset can be identified, shared, published and cited by using a Digital Object Identifier (DOI Name). PANGAEA also allows data to be published as supplements to science articles (example) or as citable data collections in combination with data journals like ESSD, Geoscience Data Journal, Scientific Data, or others.

The PANGAEA data editorial ensures the integrity and authenticity as well as a high usability of your data. Archived data are machine readable and mirrored into our data warehouse, which allows efficient compilations of data.

PANGAEA is open to any project, institution, or individual scientist to use or to archive and publish data. Start a data submission here.

A team of data editors, project managers, and IT specialists operate PANGAEA. The editors are scientists with expertise in all fields of earth and environmental science and have a profound knowledge for the review and processing of scientific data.

The World Data Center PANGAEA is member of the World Data System (WDS) of the International Science Council (ISC). It is further hosting the World Radiation Monitoring Center (WRMC) of the Baseline Surface Radiation Network (BSRN) and as such accredited as a "Data Collection and

Processing Center" (DCPC) of the World Meteorological Organisation (WMO) Information System (WIS). PANGAEA is a CoreTrustSeal certified repository.

The Alfred Wegener Institute, Helmholtz Center for Polar and Marine Research (AWI) and the Center for Marine Environmental Sciences, University of Bremen (MARUM) are hosting PANGAEA.

Policies

Archiving follows the European Commission Guidelines on Open Access to Scientific Publications and Research Data in Horizon 2020 and the DFG recommendations for safeguarding good scientific practice. PANGAEA is further aligned with the OECD Principles and Guidelines for Access to Research Data from Public Funding as well as with the FAIR Guiding Principles for scientific data management and stewardship.

Interoperability / Services

PANGAEA is furnished with a well developed interoperability framework thus allowing to disseminate metadata and data to registries, data portals, and other service providers.

The search engine is powered by the open-source software Elasticsearch and metadata processing is provided by panFMP (PANGAEA Framework for Metadata Portals).

Planning/schedules

The cruise plan of PRV Polarstern is published at the AWI logistics site.

https://www.awi.de/en/about-us/logistics/schedules.html

Real time data:

Near real time data for air and water temperature can be accessed and is presented in hourly averages. No quality control is applied.

https://data.awi.de/?site=home&qf=platforms.name/Polarstern

Agreement on data accessibility:

No special agreement is needed, as data is publicly available.

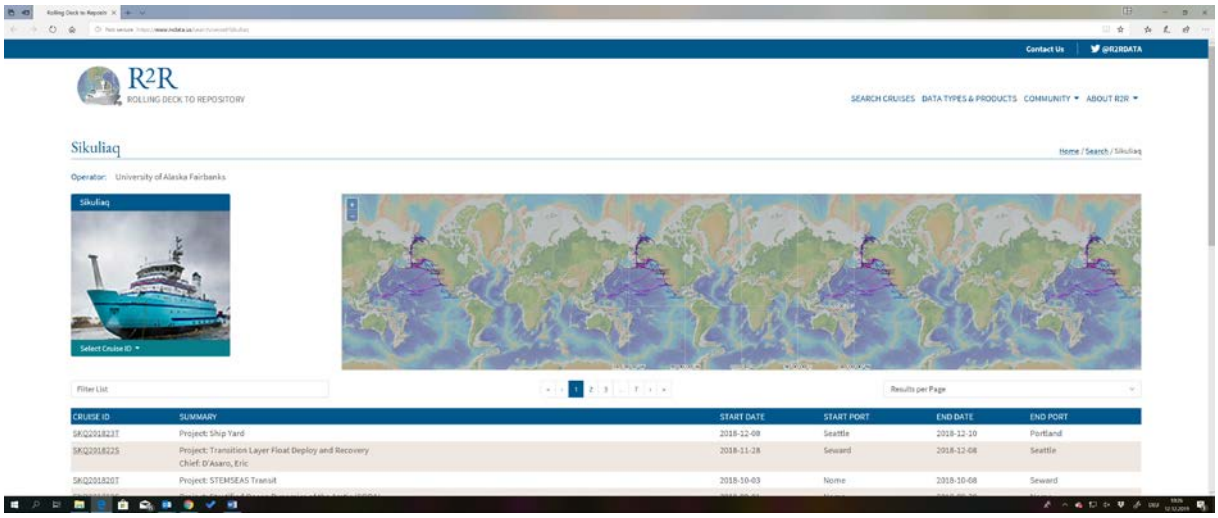
RV Sikuliaq (United States of America)

All of Sikuliaq's cruise data are submitted to the Rolling Deck to Repository (R2R) program (https://www.rvdata.us/). The Rolling Deck to Repository (R2R) program provides fleet-wide management of underway data to ensure preservation of, and access to, the USA national oceanographic research assets.

R2R catalogs and submits the underway environmental sensor data routinely acquired on research expeditions to long-term public archives, including the NOAA National Centers for Environmental Information (NCEI). Data from each cruise are submitted directly to R2R by the vessel operator, rather than by the science party.

R2R provides essential documentation and standard products for each expedition, as well as tools to document shipboard data acquisition activities while underway. Post-cruise quality assessment of selected underway data types is provided, designed to evaluate the completeness of data and data

documentation and to provide measures of instrument operation. Assessment of underway meteorological data is implemented in near real time in partnership with the SAMOS program at FSU.



Cruise database:

https://www.rvdata.us/search/vessel/Sikuliaq

Planning/schedules

Not available for security issues.

Datasets collected by the vessel:

Datasets collected by RV Sikuliaq can also be accessed through the R2D repository:
https://www.rvdata.us/search/vessel/Sikuliaq

Real time data:

Sikuliaq participates in the World Wide Voluntary Observing Ship Program through the USA's National Weather Service (https://www.vos.noaa.gov/).

Agreement on data accessibility:

The VOS data can accessed by requesting a username and password at the following email address myvos@noaa.gov