

Arctic Data and Systems Interoperability: report on Polar Connections Workshop

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Opportunities, Challenges and the Way Forward



Recommendations & Observations Arising From the 'International Polar Data Forum'

15-16 October 2013, Tokyo (Japan)

Participants in the International Polar Data Forum (comprising of data managers, scientists, and research coordinators) share their observations about the current state of polar data activities and their recommendations for enhancing and sustaining core data services into the future.

General Remarks

Despite the focus generated by the International Polar Year 2007-2008 (<http://www.ipy.org/>) there are still unresolved deficiencies in the way polar data are managed. These shortcomings continue to hamper our ability to discover and reuse existing and new data assets. The significant public investment made through national and international research programs is accompanied by an expectation that data should be preserved and be openly available for reuse and verification purposes. This is the responsibility of both scientists and science funders supported by data managers. Achieving these goals requires implementation of open data policies, development of long-term funding strategies to support data repositories, and a change in scientific practices to require the sharing and citation of data. In addition, the ideas and interpretations that have traditionally underpinned research publication need to be updated accordingly. Scientists must factor the costs of managing and publishing data in their research/monitoring funding proposals, and explicitly address these tasks in research/observing system plans.

Sustaining Arctic Observing Network (SAON)

SAON Data Management Workshop Report

Developing a Strategic Approach

Prepared By:
Gillian B. Lichota, NOAA Arctic Research Program
Simon Wilson, AMAP



The Importance of the Polar Regions for Humankind

The polar regions are experiencing dramatic change. Understanding their complex dimensions (environmental, climatic, social, economic, and geophysical) is critical to grasping the global system and defining our future. Data are an invaluable resource. The coordinated capture, analysis, storage,

Canada, to address these challenges. Data managers, scientists, funding program managers, Indigenous people and their representatives, students, and others from eighteen nations shared their knowledge, experience, and ideas on how to make polar data more useful and valuable in solving global problems.

In 2013, at the First Polar Data Forum (PDF I) in



Coordination at IPY 2012, Montreal

A Coordination Network will be held at IPY 2012, Montreal, Friday 27 April, 13:30-17:00, Room 512G

A strategy and proposed structure for an Arctic Data Coordination Network (ADCN) under the auspices of SAON, IASC, and the Arctic Council was proposed to the US National Science Foundation for a Research Coordination Network to make this all possible. The idea is to use the network and then use this workshop to define practical ways to move forward. A short report will be prepared and submitted to the SAON Board.

re particularly invite:
entatives

Report on WORKSHOP ON CYBERINFRASTRUCTURE FOR POLAR SCIENCES

Minneapolis, MN
September 10-12, 2013

Data Management for Arctic Observing

A Community White Paper
Prepared for the Arctic Observing Summit 2013

Response to the

Open Geospatial Con Request for Informa Arctic Spatial Da

by the

Polar Data Commu

OPEN GEOSPATIAL CONSORTIUM (OGC)

PHASE 1 REPORT: SPATIAL DATA SHARING FOR THE ARCTIC

OGC Arctic Spatial Data Pilot

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Interoperability

Interoperability: Interoperability, the ability to easily share data across systems and users, is one of the most important priorities identified by the polar data community. An interoperable system must enable data access that can support many different users. This may require visualization or other mediation such as translating vocabularies to make data usable by different communities. Achieving interoperability will require adequate resources, a certain level of standardization, and a connected community.



The Importance of the Polar Regions for Humankind

The polar regions are experiencing dramatic change. Understanding their complex dimensions (environmental, climatic, social, economic, and geophysical) is critical to grasping the global system and defining our future. Data are an invaluable resource. The coordinated capture, analysis, storage, stewardship, and sharing of scientific data along with Indigenous knowledge helps society better understand the regional and global impacts of polar changes. But these data management activities present considerable technical, social, policy, and economic challenges.

Canada, to address these challenges. Data managers, scientists, funding program managers, Indigenous people and their representatives, students, and others from eighteen nations shared their knowledge, experience, and ideas on how to make polar data more useful and valuable in solving global problems.

In 2013, at the First Polar Data Forum (PDF I) in Tokyo, Japan, the community identified issues and made observations and recommendations on polar data management. PDF I focused on improving how people and systems can share data in a meaningful way. The goal was to move towards open and connected systems based on a culture of trust and acknowledgement of data production and use.

The Second Polar Data Forum

In October 2015, more than 110 people gathered at the Second Polar Data Forum (PDF II) at the University of Waterloo,

PDF II highlighted the significant progress in polar data management made since PDF I and also identified priorities as we move forward. The community reconfirmed the themes of PDF I, identified key new themes that have evolved,



[Home](#) > [Meetings](#) > [ADC Meetings](#) > [Polar Connections](#)

Polar Connections

Details

📅 Published: 23 August 2016

Interoperability Workshop and Assessment Process



<http://arcticdc.org/meetings/adc-meetings/interoperability-workshop>

Meeting Overview

- 3 combined meetings:
EU-PolarNet, Workshop,
ADC
- 60 participants from 17
countries
- Combination of thematic
plenary and ‘lightning’
talks
- Most of the two days
were working sessions
- Focus on practical
outcomes

Interoperability Workshop and Assessment Process



7 - 10 November 2016

European Space Agency ESRIN
Via Galileo Galilei
Casella Postale 6400044 Frascati (Roma)
Italy

*** BE PART OF THE PROCESS - TAKE OUR BRIEF SURVEY ***

Related Events

- EU-PolarNet Task 3.3 Annual Meeting (Open) : Afternoon and evening of **November 7th** Agenda
 - Gathering at 14:45 at the **Old Reception in Building 1**
- Interoperability Workshop: **November 8th, 9th** Draft Agenda: Polar Connections Interoperability Workshop and Assessment Process
 - Registration from 8:30 at the reception desk close to the **Big Hall in Building 14**
- Third Meeting of the Arctic Data Committee (Open) : **November 10th** (Draft Agenda)
 - Gathering at 8:20 at the **Old Reception in Building 1**

Access to the ESRIN site is restricted to persons pre-registered using the online conference registration system, **presenting a print of the email sent on 2 November** and an original valid form of ID, as you are already registered, security has received your name on the list of participants for the conference. For security reasons, cars cannot be parked inside the ESRIN premises. A private parking area (open until 23:40) is available close to ESA/ESRIN in Via delle Perazzeta (Frascati) in front of the Train Station Tor Vergata.



IMG_0222
by Eupeodes



IMG_0231.jpg
by Eupeodes



0227.jpg
by Eupeodes



Data Discovery and Documentation

- Dominant technical topic
- Federated search needed
- Open components in place (e.g. ADIwg; ADE etc); community actively working to establish solution

The image displays three screenshots of web portals related to data discovery and documentation in the Arctic region.

Top Left: wiki.met.no
This is the homepage of the Polar Metadata Profile. It features a sidebar with navigation links: "The project", "Participants", "Original website", "Activities", "Tasks", "Minutes", "Reports", and "Products". The main content area includes a "Get started" section with a search bar and a "Browse resources" section with a "Dataset" icon and a "612" count. A cookie consent banner is visible at the top.


Top Right: Arctic Biodiversity Data Service (ABDS) Data Portal
This portal provides access to data and software from NSF Arctic research. It includes a search bar and a "Sign in" button.

Bottom: Arctic Data Explorer
This is a comprehensive data discovery portal. It features a search bar with a "Find Data Now" button and a "Reset" button. Below the search bar, there are filters for "N: 90", "S: 45", "E: 180", and "W: -180". A "Diverse Arctic Research Data" section lists various repositories and their dataset counts. A table of datasets is provided below.

Repository Name	Datasets
Advanced Cooperative Arctic Data and Information Service (ACADIS Gateway)	temporarily unavailable
National Snow and Ice Data Center (NSIDC)	517
UCAR NCAR - Earth Observing Laboratory (UCAR NCAR EOL)	2023
UCAR NCAR Research Data Archive (UCAR NCAR RDA)	161
NOAA National Oceanographic Data Center (NOAA NODC)	9919
Nonwegian Meteorological Institute (Met.no)	120
NASA Earth Observing System (EOS) Clearing House (ECHO) (NASA ECHO)	13873
International Council for the Exploration of the Sea (ICES)	470
U.S. Geological Survey ScienceBase (USGS ScienceBase)	524
Biological and Chemical Oceanography Data Management Office (BCO-DMO)	1352
Polar Data Catalogue (PDC)	2436
IDAR: The Digital Archaeological Record (IDAR)	81
Rolling Deck to Repository (R2R)	842

Data as a Service

- Service model becoming increasingly mature – data centers actively implementing
- Need education and training (e.g. reference implementations) to move to mainstream
- More important is stability – “infrastructure”



CANADIAN CRYOSPHERIC INFORMATION NETWORK

ABOUT CANADA

Home » About Us »

CCIN Interact

1. OAI – PMH Harvesting!
Our OAI-PMH set standard and the link to it is:

a. OAI-PMH link 1
• <http://www.polaris.ca>

The above link will
JOAI (further info)
<http://www.openarctic.ca>

2. GeoServ
CCIN utilizes Geo
are shared using
below are used for

a. Selected geos
their original form

WFS link (this can
• <https://polarisdata.ca>

Workshop Recommendations

Workshop participants were asked to list top polar CI component needs. When responses were categorized and integrated, four stood out as priorities for the coming 2-5 years:

1 DATA AS A SERVICE (DAAS). DaaS is clearly a common denominator and should be emphasized in program opportunities within the next two years. The goals are to provide on-demand data sharing through discovery, access, transportation, and delivery to the end user. The DaaS recommendation includes both data production and consumption, since the interface between the two requires interoperability on each side; this should be viewed, managed, and implemented according to system engineering best practices to ensure openness and platform independence.

Interoperable and customizable data access to *Arctic of the Coast* maps and source data are enabled via the following OGC specifications:

Service	Version	Description
Web Map Service (WMS)	1.1.1	Provides map and legend images of selected data layers and base maps.
Web Feature Service (WFS)	1.1.0	Provides vector source data (points, lines, and polygons) in Geography Markup Language (GML) format.
Web Coverage Service (WCS)	1.1.1	Provides raster source data (rectangular grids of data values) in GeoTIFF format.

Using these services, maps and source data can be accessed remotely for your spatial region and layers of interest either directly through a URL, using more on this below) or through the various OGC-compatible clients available for accessing these services, such as QGIS, MapServer, ArcGIS, etc. (see the links below).

Table of Contents:

- GetCapabilities Request
- Web Map Service (WMS)
- Web Feature Service (WFS)
- Web Coverage Service (WCS)

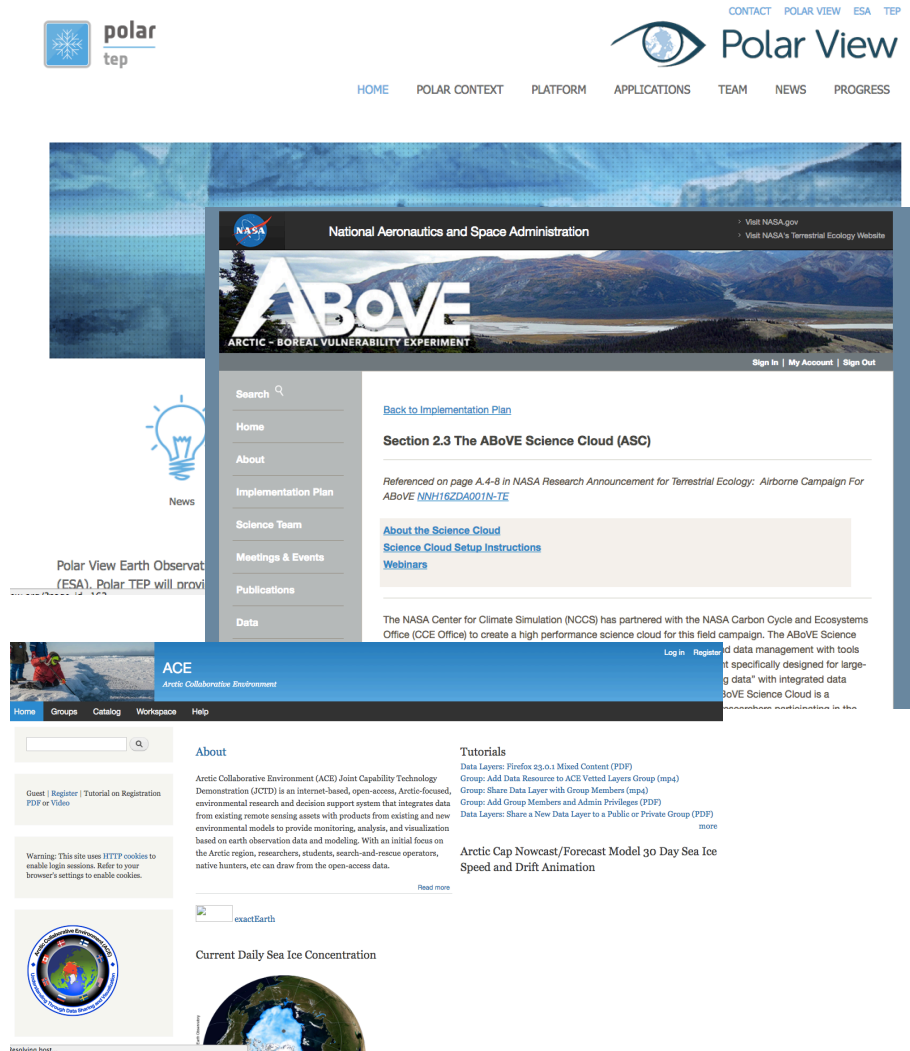
PHASE 1 REPO

THE

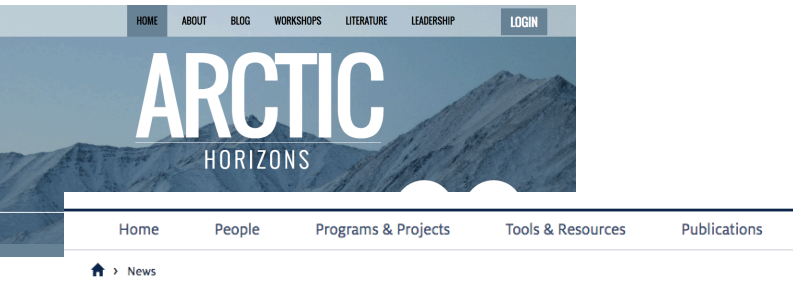
OGC Arctic Spatial Data Pilot

Cloud Data and Computing Platforms

- Increasingly important, potentially “keystone species” in the data ecosystem
- Brings code to the data rather than data to the code
- These platforms are becoming aggregators/hubs
- New challenges for interoperability

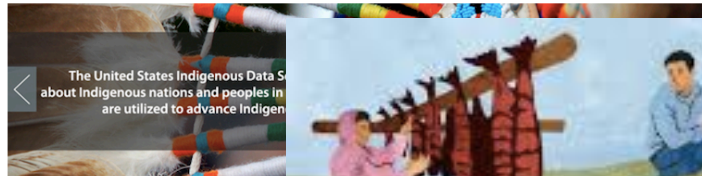


Social Sciences, Indigenous Knowledge, Community Based Observing



US Indigenous Data Sovereignty Network

04/20/16 11:00:am



It is with great excitement that NNI introduces the USIDSN, which follows in the footsteps of the Australian Indigenous Data Sovereignty Network (AIDSN) by introducing a new utility, relevance, and protection of Indigenous data.

Indigenous Knowledge

Statement from the *Sharing Knowledge Workshop*
Organized by the Exchange



- Need more direct engagement with Indigenous organizations and communities
- Resources to “do data” and engage required
- Understand the context and sensitivities
- Outcome: recognition of new groups; representation on ADC

Indigenous peoples are increasingly leading and contributing to science and research activities across the Arctic. Indigenous knowledge is being documented in myriad ways in these activities

Connecting to the Global

- Many global bodies working on relevant issues
- Polar community can benefit from AND contribute to
- Move towards more proactive engagement –
- SAON/GEO;
- ADC-SCADAM/RDA

The screenshot displays the Research Data Alliance (RDA) website. The top navigation bar includes links for 'RESEARCH DATA SHARING WITHOUT BARRIERS', 'RDA EU', 'RDA US', 'CONTACT US', 'LOGIN', and 'REGISTRATION'. Below this, a secondary bar lists 'ABOUT RDA', 'GET INVOLVED', 'GROUPS', 'RECOMMENDATIONS & OUTPUTS', 'RDA FOR DISCIPLINES', 'PLENARIES', 'EVENTS', and 'NEWS & MEDIA'. The main content area features a 'News' section with articles such as 'Call For The RDA Europe Science Workshop 2018' and 'Realising the European Open Science Cloud - a reality by 2020'. An 'RDA Events' section lists upcoming meetings like the '5th RDA WG/IG Collaboration Meeting' and the 'DPASSH 2017 Conference'. A 'Request for comments' section is also present. The bottom of the page includes a 'WMO Extranet' section with links to various WMO Technical Commissions and a banner for the 'GEO-XIII PLENARY' in St. Petersburg, Russian Federation, with a call to action for side event registration.

Governance & Sustainability

- Strongest message: **main challenges today are social and organizational rather than technical**
- Coordination, appropriate level of governance required (command-control -> anarchy)
- Enhance existing bodies rather than adding more to crowded landscape (resource implications)
- ADC/SCADM/SOOS MoC ; SAON + GEOCRI work plan



Statement of Principles and Practices for Arctic Data Management April 16, 2013

All IASC-endorsed scientific results have open access to all data necessary to produce them, used in accordance with scientific best practices.

To this end, IASC Council approves the following:

1. Endorsement of the Statement of Principles and Practices for Arctic Data Management:

January 21, 2016

Guggenheim Partners Endorses World Economic Forum's Arctic Investment Protocol

Guggenheim Partners has become the first financial services firm to formally endorse the Arctic Investment Protocol.

- First Financial Firm to Endorse Landmark Blueprint for Sustainable Development in the Region
- Estimated US\$1 Trillion in Arctic Infrastructure Needs Identified Over the Next 15 Years

DAVOS, Switzerland – Guggenheim Partners today announced that it has become the first financial services firm to formally endorse the Arctic Investment Protocol, a World Economic Forum ("WEF") initiative that sets forth foundational and formative principles for responsible investment in the Arctic region.

Statement from the *Sharing Knowledge Workshop* held
Organized by the Exchange for Information

Indigenous peoples are increasingly across the Arctic. Indigenous knowledge

Next Steps

- Process records of the meeting
- Collaborative development of report, including recommendations and scenarios
- Dissemination to sponsor organizations
- Actively seeking resources for community efforts