



Second Arctic Science Ministerial (ASM2)

Theme 1: STRENGTHENING, INTEGRATING AND SUSTAINING ARCTIC OBSERVATIONS, FACILITATING ACCESS TO ARCTIC DATA, AND SHARING ARCTIC RESEARCH INFRASTRUCTURE

Report from the Arctic Data Committee and Partners

Peter L. Pulsifer (NSIDC U Colorado)

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Chair, IASC-SAON Arctic Data Committee (ADC)

Co-Lead, **IARPC** Arctic Data Sub-Team

Co-Lead GEO Cold Regions Initiative

Marten Tacoma, Stein Tronstad (ADC Co-Chairs)

Pip Bricher, SOOS

Anton Van de Putte, SCADM



Background and Context



VISION: A connected, collaborative, and comprehensive long-term pan-Arctic Observing System that serves societal needs.

GOALS: (from 2018 SAON Strategy)

1. Create a roadmap to a well-integrated Arctic Observing System; (Committee on Networks)
2. **Promote free and ethically open access to all Arctic observational data;** and (Arctic Data Committee)
3. Ensure sustainability of Arctic observing. (Task Team)

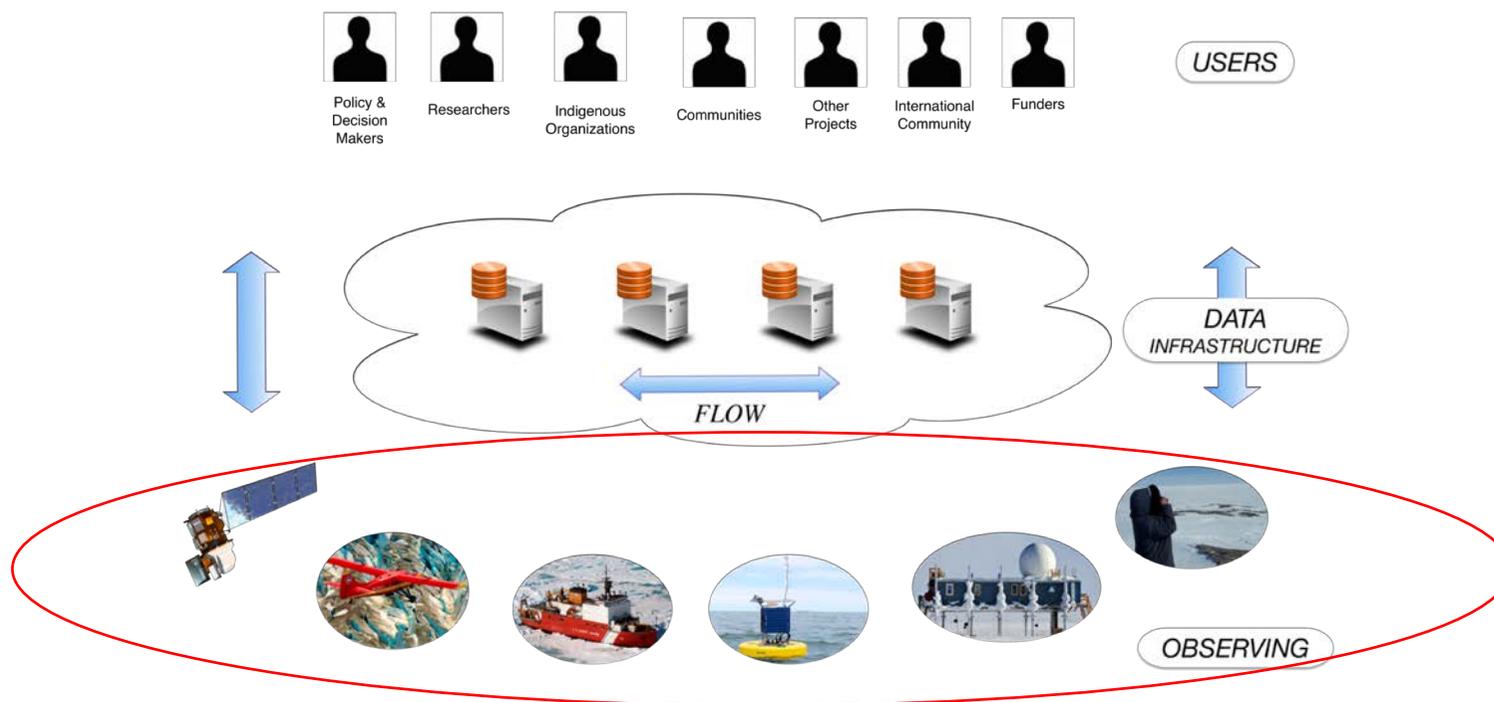
Arctic Data Committee

- Formed Nov '14
- IASC-SAON partnership
- National and voluntary members + Indigenous (2017)
- Promote and enable:
 - **Understanding the system**
 - **Effective data policy**
 - **Infrastructure**
 - **Ethically open access**
 - **Attribution**
 - **Standards and interoperability**

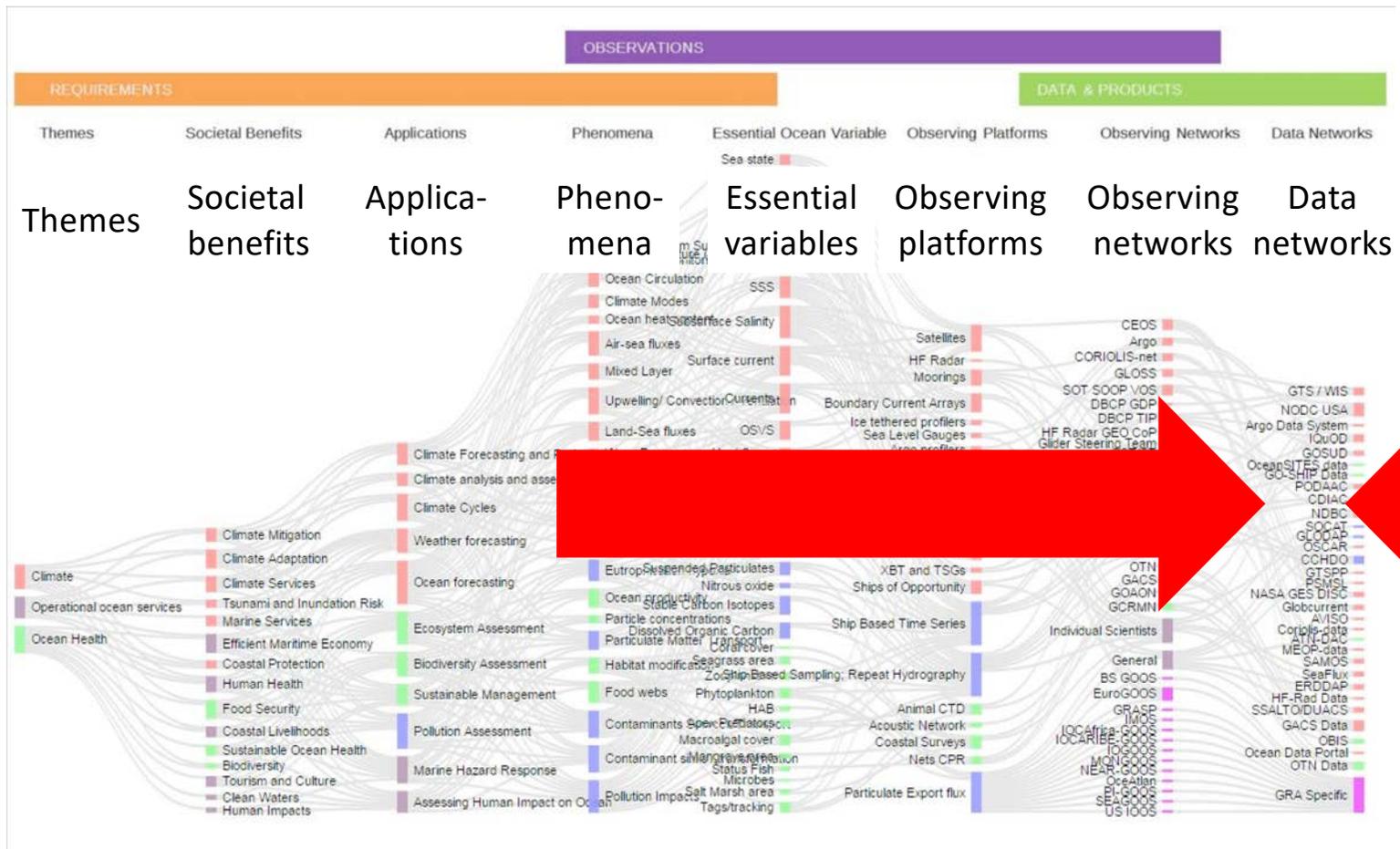


<http://arcticdc.org>

Observations Become Data, Data Serves Applications



AOS Design, Optimization & Implementation WG: From benefits to networks



ASM2 Deliverable Statement

Sub-Theme 2: Implementing and Optimizing a Pan- Arctic Observing System



Arctic Observing Summit (AOS)

Working Group 4: Participants of this group will focus on the role of the observing system implementation.

Co-chairs: Dr. Peter Pulsifer (National Snow and Ice Data Center); Dr. [Name] (Meteorological Institute)

Rapporteur: Dr. Anja Rosel (Norwegian Polar Institute); Ms. Shannon Christoffersen (University of Calgary).

Thematic Working Group members: Dr. Paul Berkman (Tufts University); Dr. Maribeth Murray (University of Calgary); Dr. Roberta Pirazzini (Finnish Meteorological Institute); Ms. Sarah Marie Strand (The University Centre in Svalbard); Mr. Mikko Strahlendorff (Finnish Meteorological Institute); Dr. Taneil Uttal (National Oceanic and Atmospheric Administration).

Title: Developing an architecture for an international, interconnected arctic data system

Funding Programme and/or Organisation

Sustaining Arctic Observing Networks (SAON)

Coordinating organisations and main contact person

- The Arctic Data Committee
- Standing Committee on Antarctic and Southern Ocean Observing Systems
- Southern Ocean Observing System

Main contact person: Peter L. Pulsifer
 Colorado, Boulder, USA; e-mail: peter.pulsifer@noaa.gov

Description of the deliverable

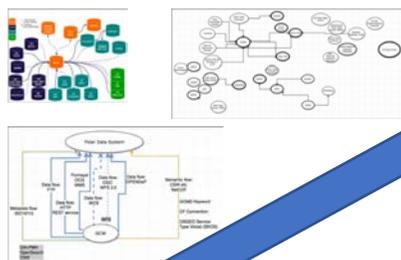
Arctic societies, science and services are entering a new era that increasingly require cross-cultural, interdisciplinary integration of data to provide critical understanding and products. These needs require an integrated Arctic data system that is not only part of the global system, but which also allows exchange and usage of data between disparate data systems. Such a data system will allow enhanced understanding that is critical for mitigating risk to humans and infrastructure, reducing costs of adaptation and development, and supporting much needed research that spans disciplines and knowledge systems, including science and Indigenous Knowledge.

Data are an integral element in the observing system value chain. Without a data system that makes well documented data accessible, many kinds of observations are ephemeral and their value is limited. As such, we must ensure that the overarching observing

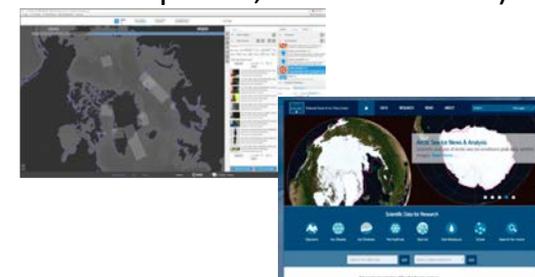
Components of the Data System

Components of the Data System

Infrastructure
(technology, standards, network)



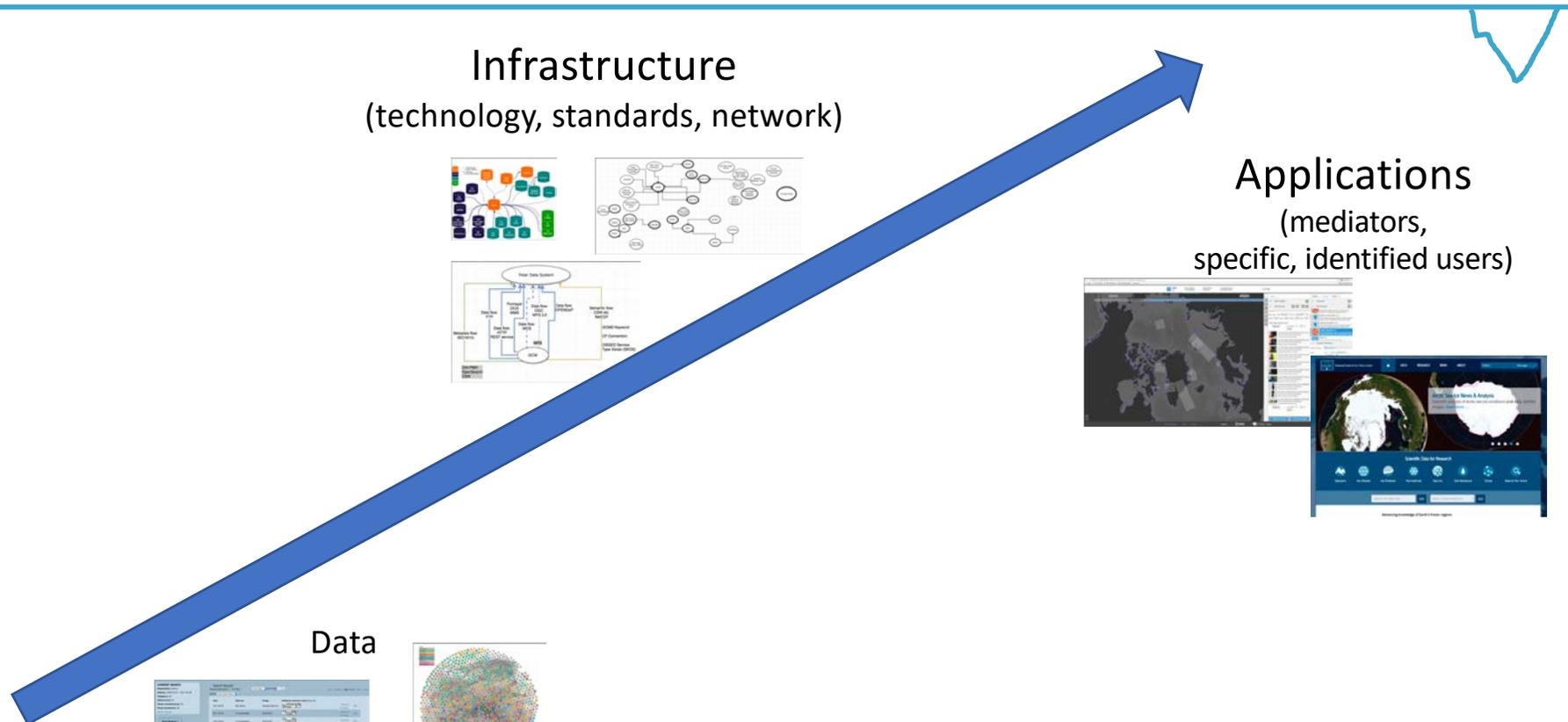
Applications
(mediators, specific, identified users)



Community

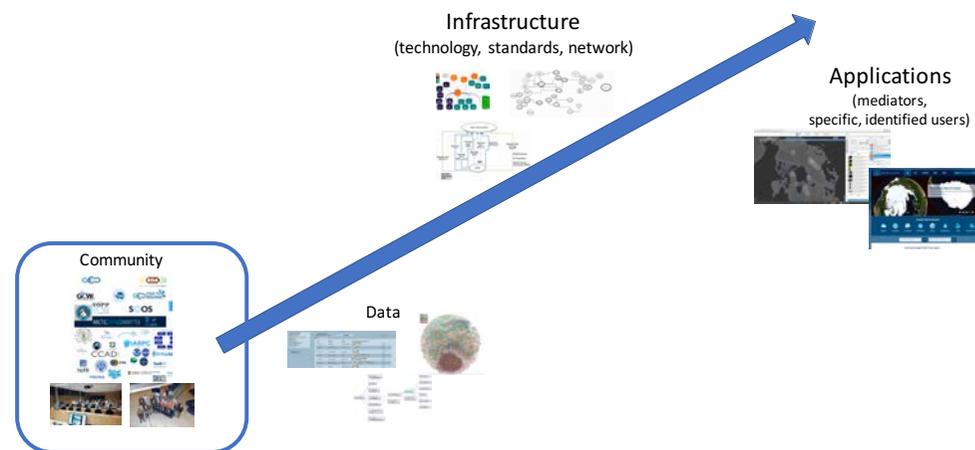


Data



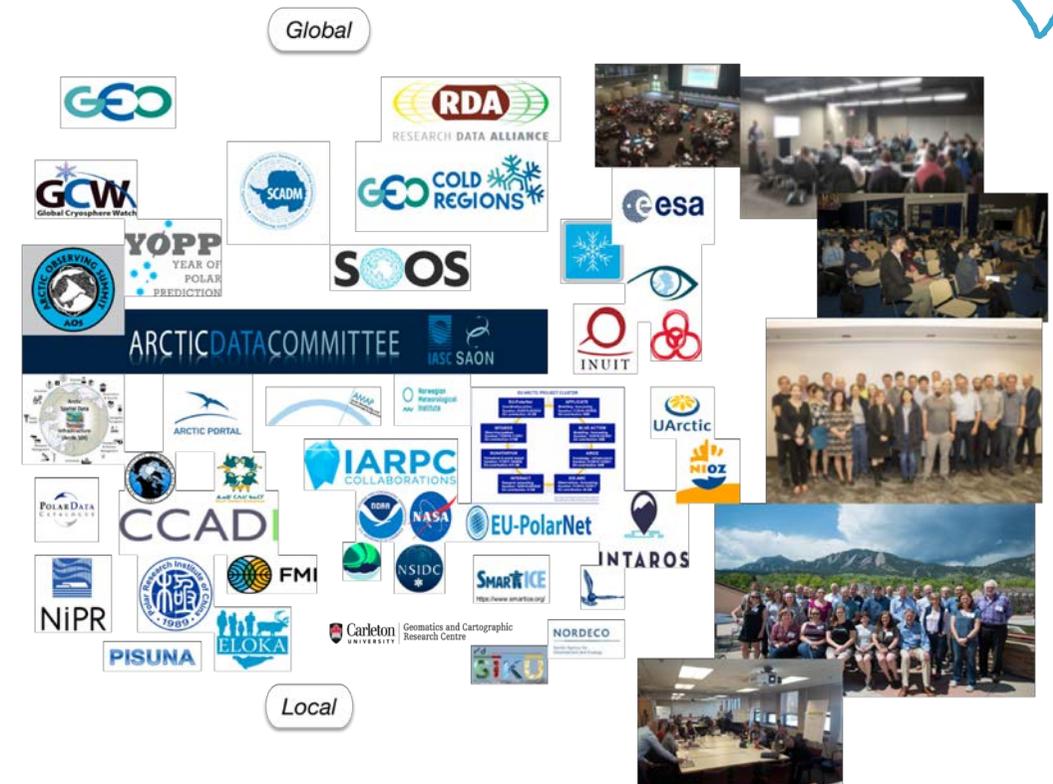
Initiatives

Community

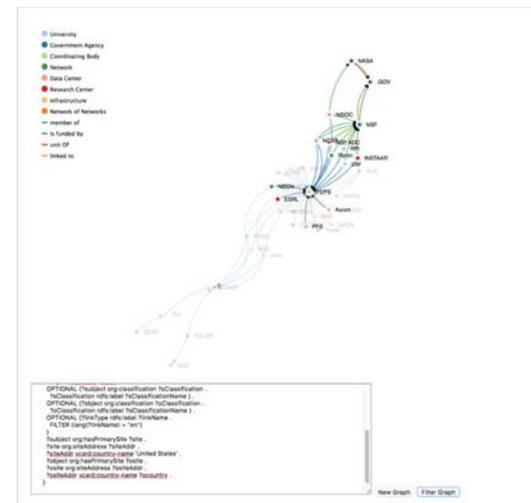
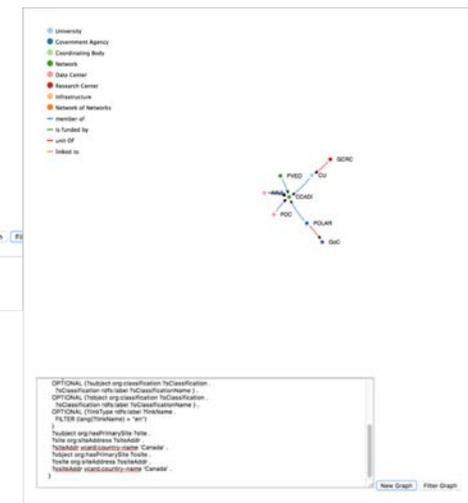
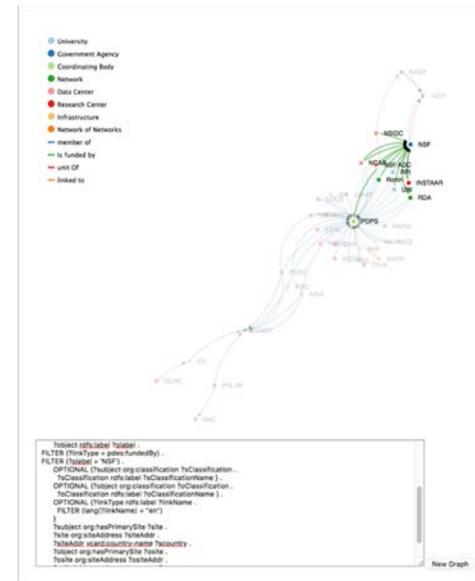
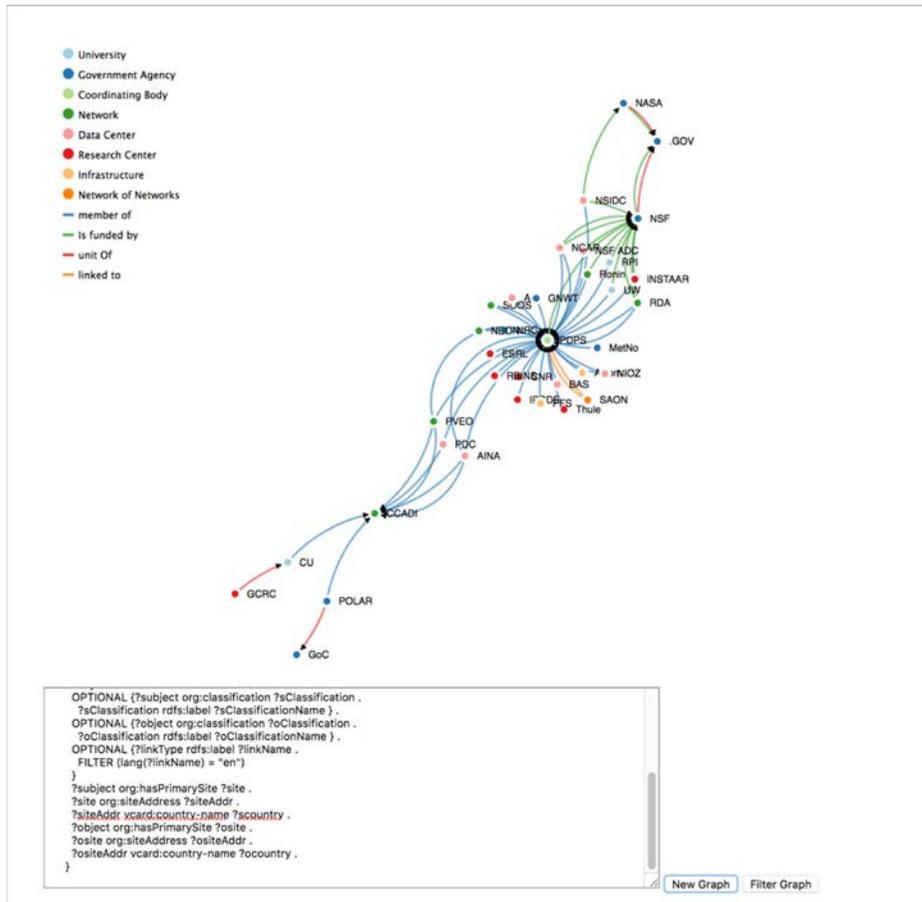


Data Sharing: Cooperation from Local to Global

- Significant progress made since International Polar Year
- Framework for cooperation exists
- Recent collaboration being leveraged to establish concrete “architecture”
- All perspectives and actors must be included

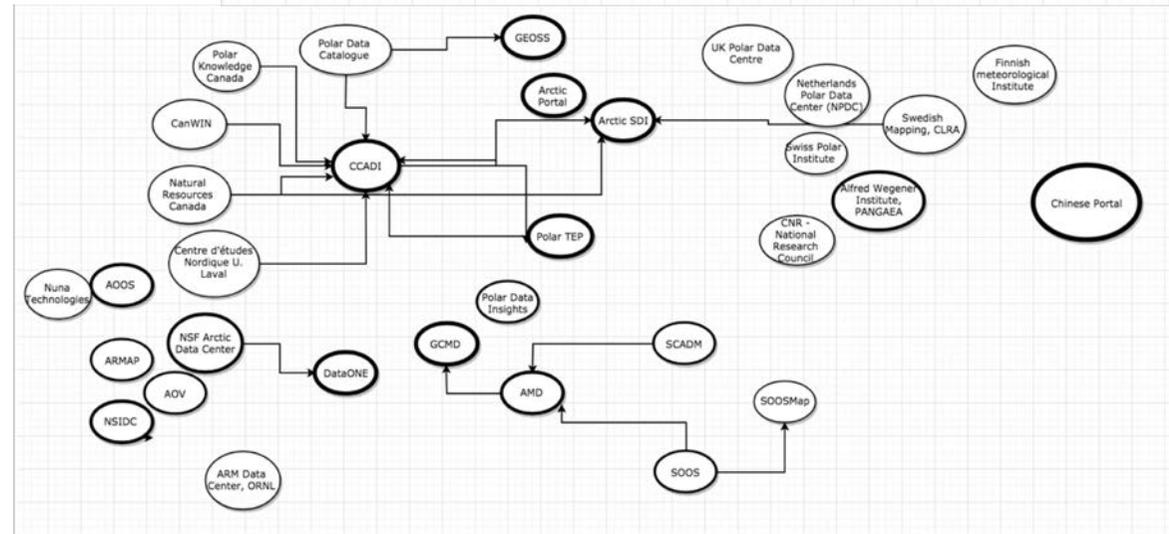
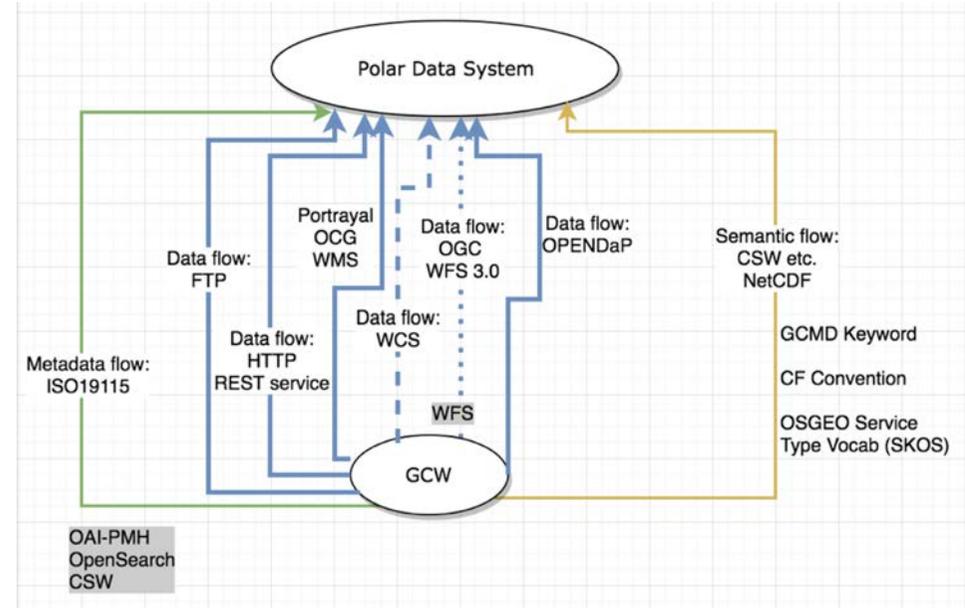


Mapping the Arctic Data Ecosystem



Polar Data and Systems Architecture Workshop

28 – 30 November 2018, Geneva

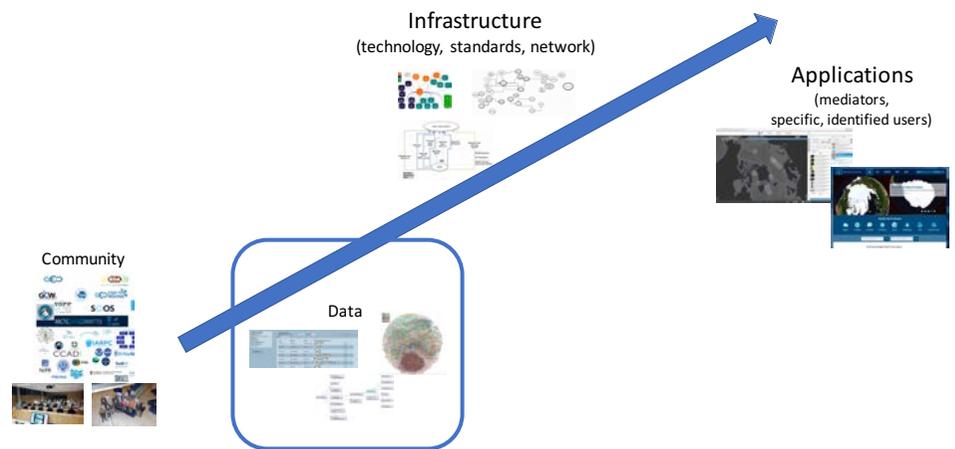


Indigenous Knowledge, CBM and Information Systems

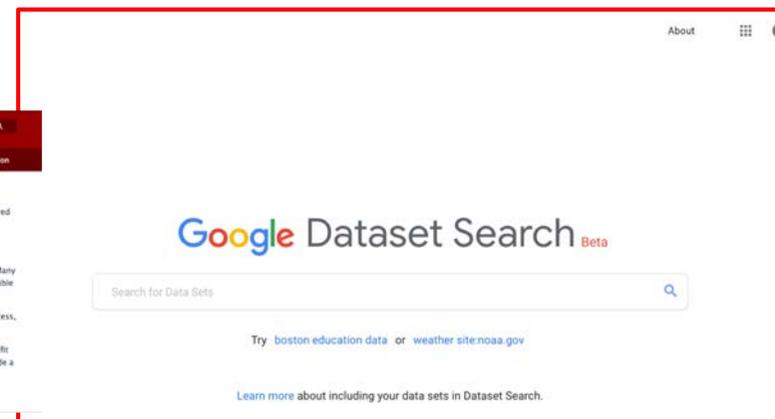
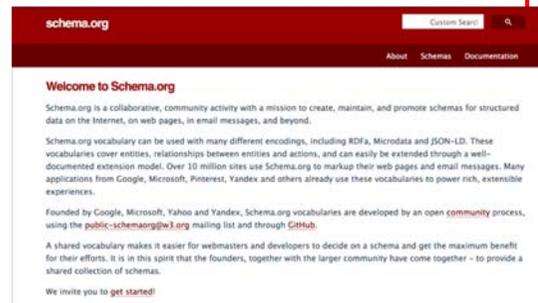
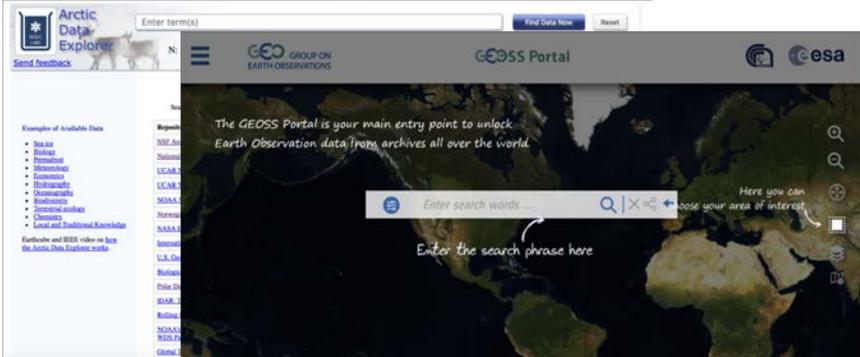
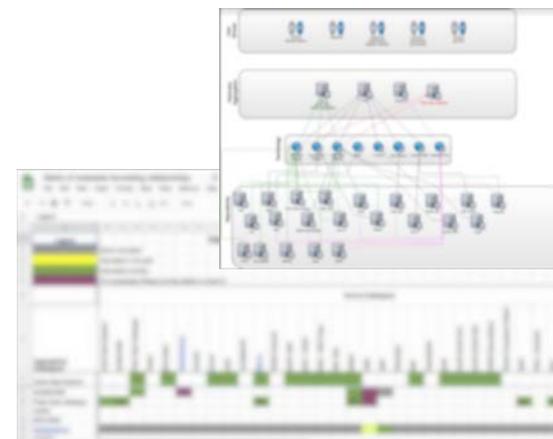
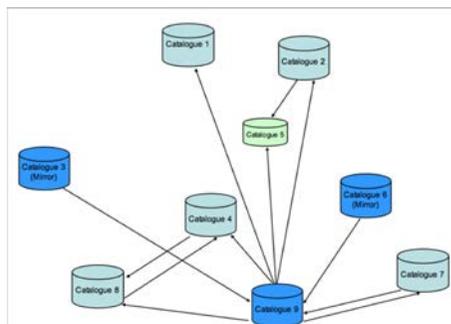
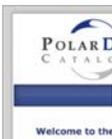
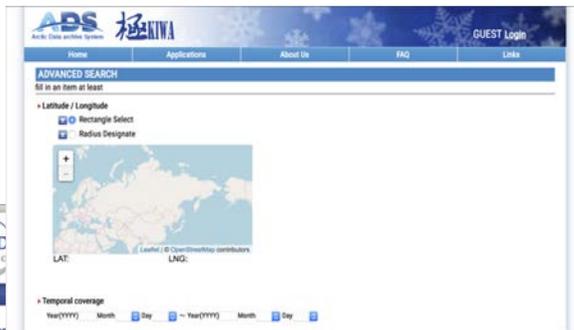
- Growing group actively working to share Indigenous Knowledge, information and data
- Progress needed on bridging worldviews, concepts and semantics represented in information systems
- Indigenous Peoples must lead engagement and work with their knowledge – information sovereignty important



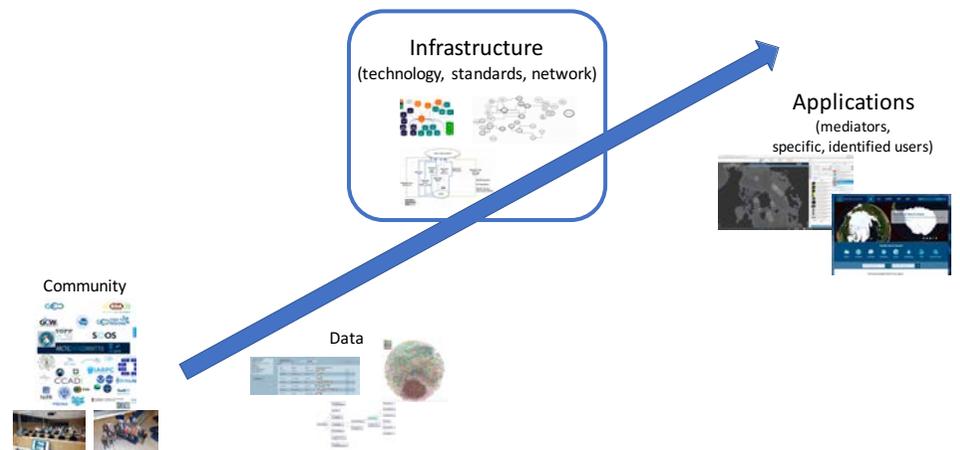
Data



Data (Discovery)

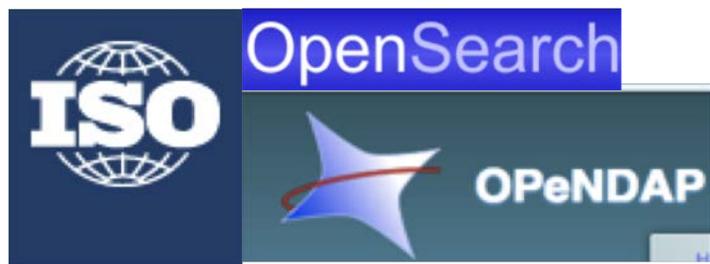


Infrastructure

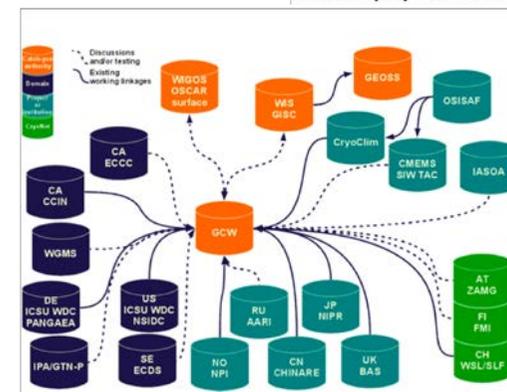
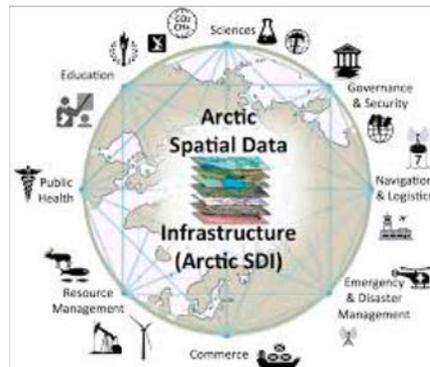


Infrastructure

Technology, standards, networks, interoperability

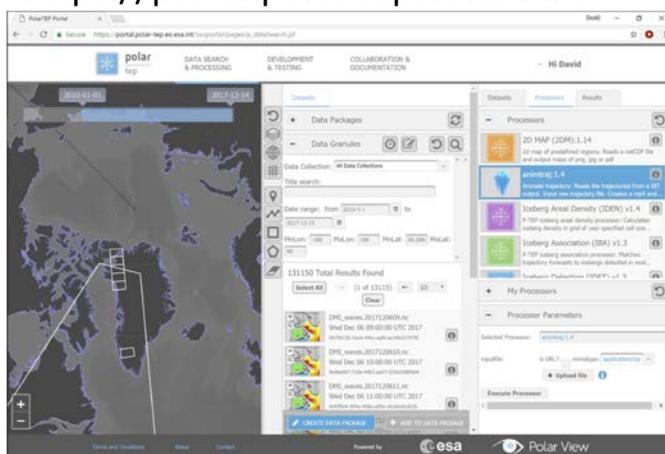


INTAROS



Applications

<https://portal.polar-tep.eo.esa.int>

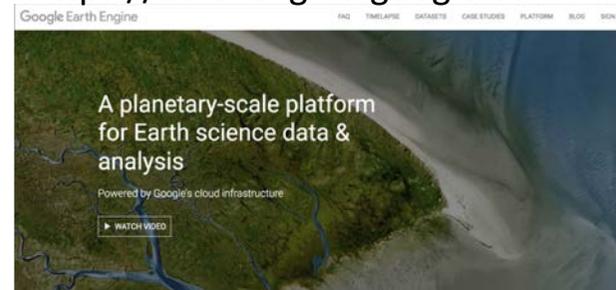


Polar Thematic Exploitation Platform

<https://researchworkspace.com>



<https://earthengine.google.com>



Google Earth Engine

The Way Forward

Primary Impediments

- “Glue funding” to maintain momentum, productivity and community cohesion
- Uncoordinated effort and fragmentation of initiatives
- Limited number of mechanisms for international co-funding

Build on Successful Model

- Maintain community building momentum and productivity:
 - Third Polar Data Forum - 18-22 November 2019, Helsinki, Finland
 - Interim virtual “hackathon”
 - Reporting on recent activities (publications, synthesis papers, data system “map”)
 - AOS 2020, ASM3 etc.
 - Welcome and cultivate new partners

Innovate

- Develop new resources: Polar Data Community (including Arctic Data Committee) is establishing the "***Polar Data Project***", focusing on linking together existing resources and developing substantial resources to continue to develop the system:
 - Leverages existing entities (e.g. GCW, ASDI, Arctic Portal, CCADI, Polar TEP, NSF ADC, INTAROS, GEO CRI and many others)
 - Focus on concrete proposals to achieve workplan (e.g. ASM2 Deliverable, CCADI + ADC with T-MOSAIC)
 - Plan to work with funding agencies to enhance alignment, reduce fragmentation, promote effective governance and establish co-funding mechanisms
 - In close collaboration with Arctic communities and Indigenous organizations, observing community (SAON, AOS and related implementation projects), science community (IASC), private sector, and others



Thank you!