

# Peter's Research Program

GEOG 5803

January 16<sup>th</sup>, 2024

Online

# Theoretical Approach

- GIS vs. GiScience

- Map Making vs. Cartography

The screenshot displays the article page for "Geographical information science" by Michael F. Goodchild in the International Journal of Geographical Information Systems. The page includes a header with the journal title, volume/issue information, and a search bar. A sidebar on the left shows metrics: 1,384 Views, 421 CrossRef citations, and 7 Altmetric. The main content area features the article title, author name, and publication details. Below the article title, there are links for "Download citation" and a DOI link. A navigation bar at the bottom of the article section includes links for "References", "Citations", "Metrics", "Reprints & Permissions", and "Get access". The "Abstract" section is visible, starting with "Research papers at conferences such as EGIS and the International Symposia on Spatial Data Handling address a set of intellectual and scientific questions which go well beyond the limited technical capabilities of current technology in geographical information systems." There are also two promotional banners on the right side: "Sign in here to start your access" and "Grow Your Audience Increase your impact Choose Open".

International Journal of Geographical Information Systems  
Volume 6, 1992 - Issue 1

Enter keywords, authors, DOI, ORCID etc This Journal Advanced search

journal homepage

1,384 Views  
421 CrossRef citations to date  
7 Altmetric

Original Articles  
**Geographical information science**  
Michael F. Goodchild  
Pages 31-45 | Published online: 05 Feb 2007  
Download citation <https://doi.org/10.1080/02693799208901893>

References Citations Metrics Reprints & Permissions Get access

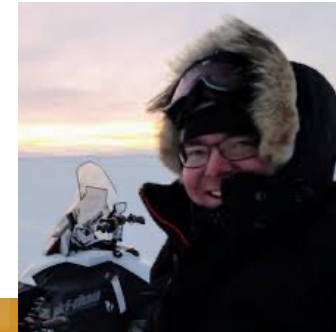
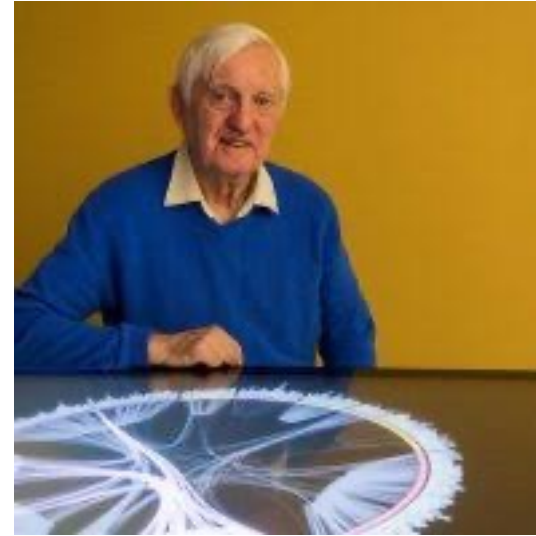
Select Language Translator disclaimer

Sign in here to start your access

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**Abstract.** Research papers at conferences such as EGIS and the International Symposia on Spatial Data Handling address a set of intellectual and scientific questions which go well beyond the limited technical capabilities of current technology in geographical information systems. This paper reviews the topics which might be included in a science of geographical information. Research on these fundamental issues is a better prospect for long-term survival and acceptance in the academy than the development of technical capabilities. This paper reviews the current state of research in a series of key areas and speculates on why progress has been

# Collaboration Approach



Core Concept of Program:  
Interoperability



# Interoperability

- Simple definition: the ability of (geographic) information systems to readily share information and operations.
- Syntactic (e.g. character sets)
- Schematic (e.g. database structure)
- Semantic (e.g. terminology, classification systems, meaning)

# Evolution of Perspective

**Ortho-Image Production for a Small Municipality GIS Using a Standard  
Digital Frame Camera and Low Cost Software**

by

Peter Pulsifer

A thesis submitted to  
the Faculty of Graduate Studies and Research  
in partial fulfillment of  
the requirements for the degree of

Master of Arts

Department of Geography and Environmental Studies

Carleton University  
Ottawa, Ontario  
April, 2002

**An Ontological Exploration of Antarctic Environmental Governance: Towards a  
Model for Geographic Information Mediation**

by

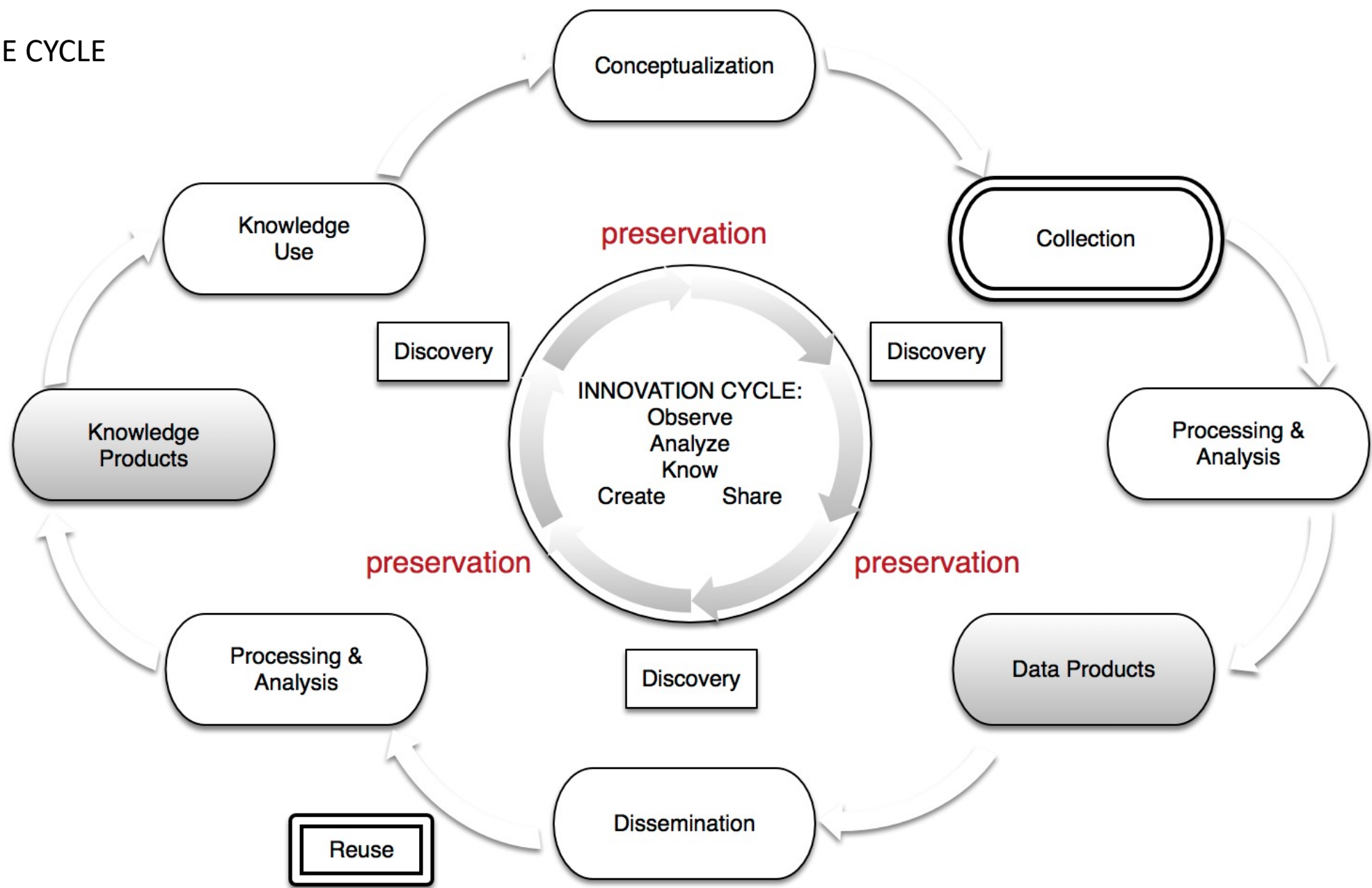
Peter L. Pulsifer

A thesis submitted to  
The Faculty of Graduate Studies and Research  
in partial fulfillment of  
the requirements for the degree of

# Theme 1: Data Management

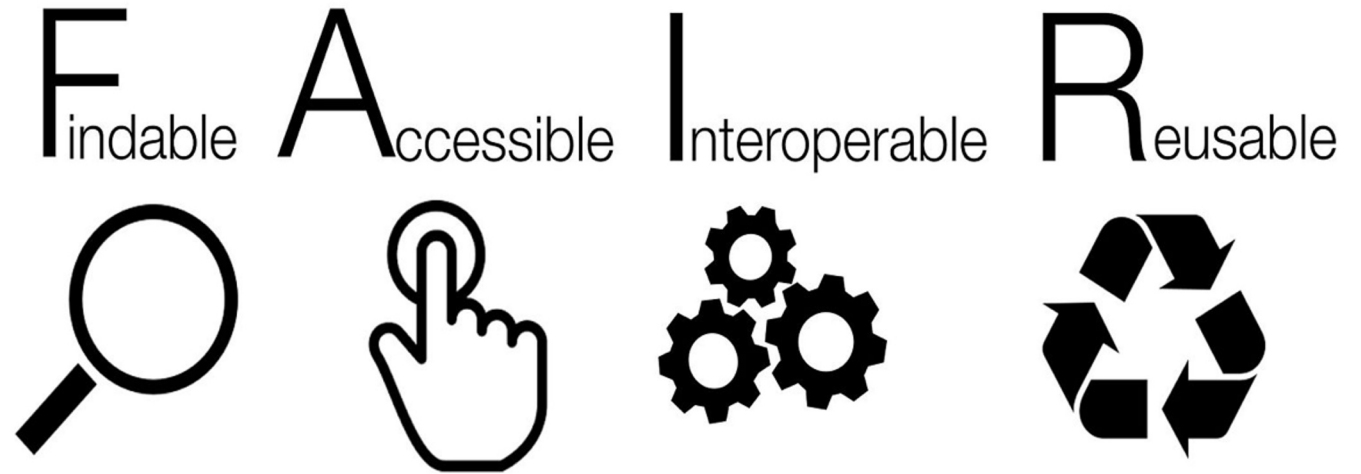
Foundation of interoperability and geomediation

DATA LIFE CYCLE

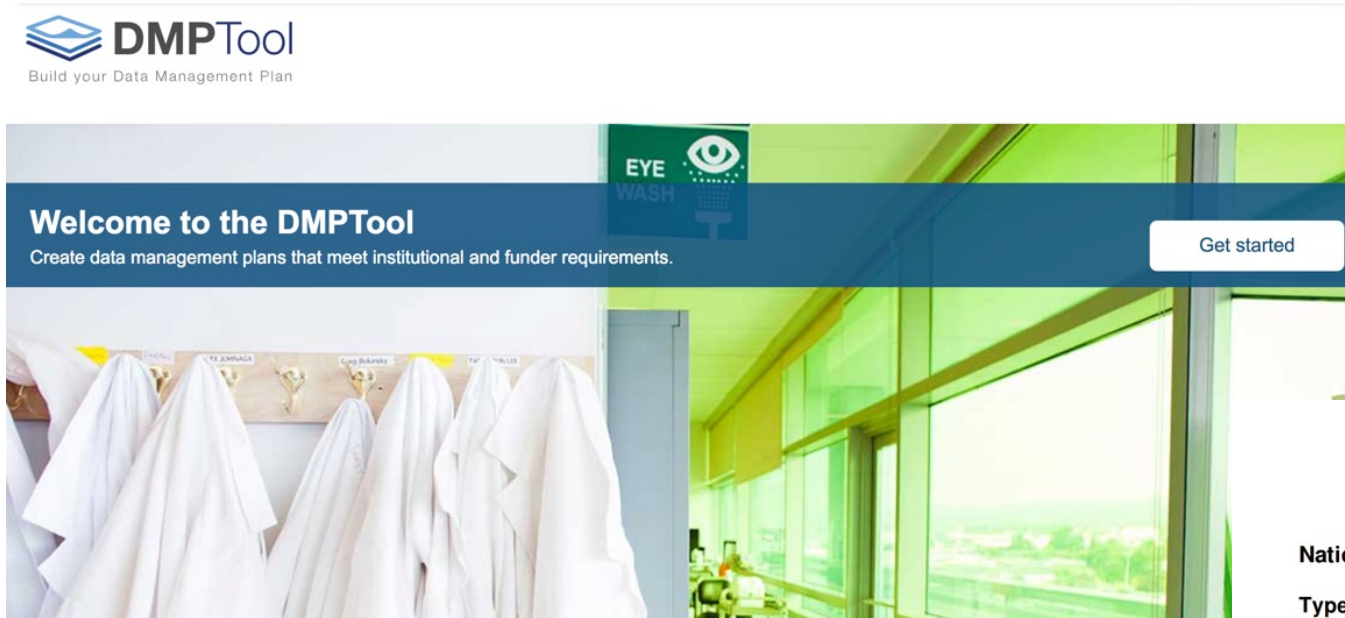


# Grounding the Lifecycle Approach

- **F**indable
- **A**ccessible
- **I**nteroperable
- **R**eusable
- “FAIR” principles



# Data Management Planning



<https://dmptool.org/>

Learn Sign in Language

**DMPTool**  
Build your Data Management Plan

### Funder Requirements

Templates for data management plans are based on the specific requirements listed in funder policy documents. The DMPTool maintains these templates, however, researchers should always consult the program officers and policy documents directly for authoritative guidance. Sample plans are provided by a funder or another trusted party.

Search

| Template  | Download | Funder                            | Last Updated | Funder Links  | Sample Plans (if available) |
|---|----------|-----------------------------------|--------------|---|-----------------------------|
| Alfred P. Sloan Foundation                            | DOCX PDF | Alfred P. Sloan Foundation        | 04-18-2018   | Sloan Grant Proposal Guidelines   |                             |
| Arctic Data Center: NSF Polar Programs [DRAFT]        | DOCX PDF | National Science Foundation (NSF) | 08-23-2018   | NSF Arctic Data Center DMP Resources                                      |                             |
| BCO-DMO NSF OCE: Biological and Chemical Oceanography | DOCX PDF | National Science Foundation (NSF) | 04-24-2018   | NSF OCE Sample and Data Policy<br>NSF GEO Directorate Guidance            |                             |
| Department of Defense (DOD)                           | DOCX PDF | Department of Defense (DOD)       | 09-13-2018   | DOD Public Access Plan<br>Data Archiving Plans for NIJ Funding Applicants |                             |
| Department of Energy (DOE) Generic                    | DOCX     | Department of Energy (DOE)        | 04-26-2018   | DOE Policy for Digital Research Data Management                           |                             |

[https://dmptool.org/public\\_templates](https://dmptool.org/public_templates)

## National Science Foundation (NSF): NSF-GEN: Generic

### Types of data produced

The types of data, samples, physical collections, software, curriculum materials, and other materials to be produced in the course of the project.

Guidance:

- [NSF Proposal & Award Policies & Procedures Guide \(PAPPG\)](#)
- [NSF plans for data management and sharing of the products of research \(PAPPG\)](#)
- [NSF Dissemination and Sharing of Research Results](#)
- [NSF Frequently Asked Questions \(FAQs\) for Public Access](#)

### Data and metadata standards

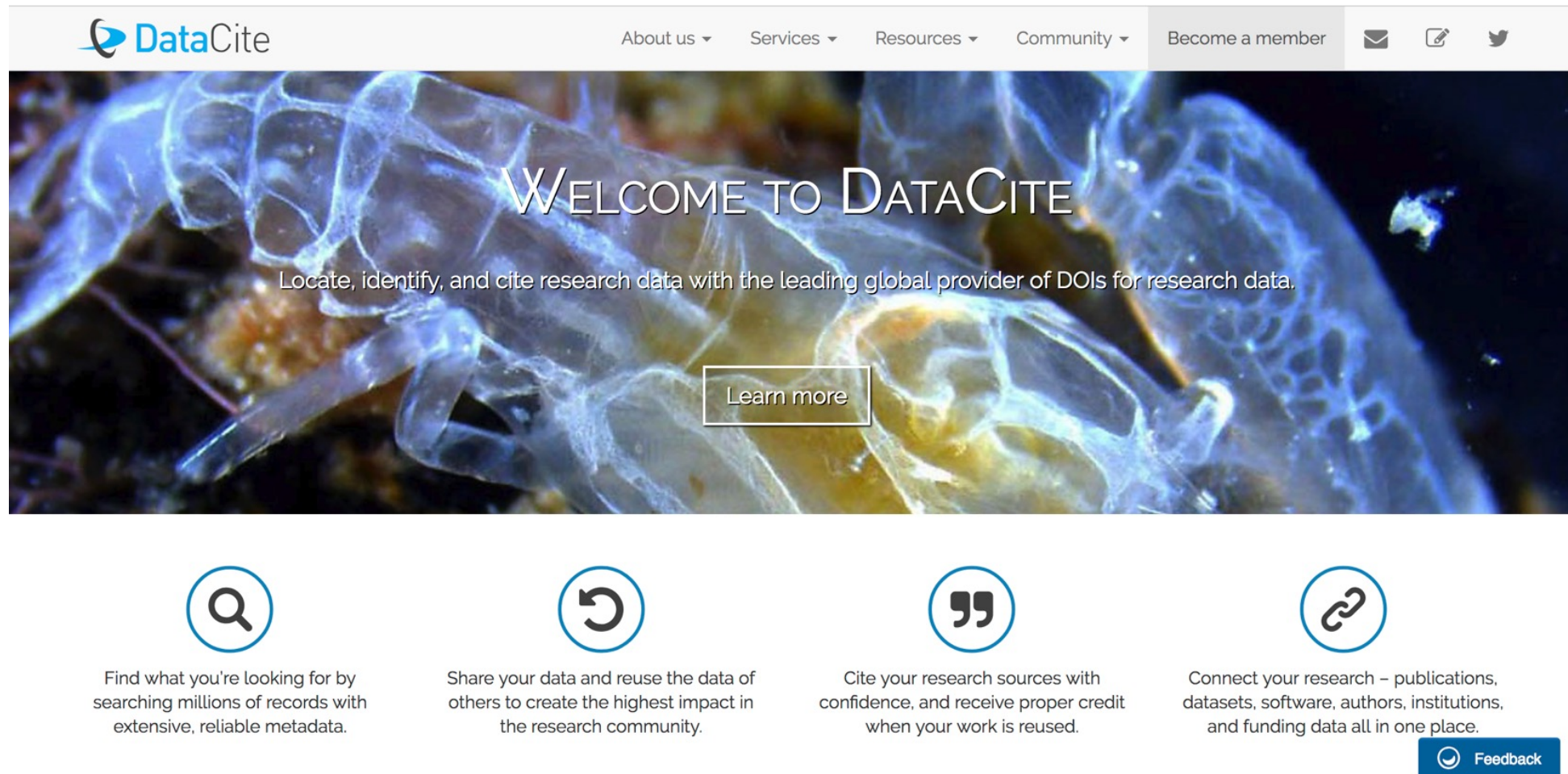
The standards to be used for data and metadata format and content (where existing standards are absent or deemed inadequate, this should be documented along with any proposed solutions or remedies).

Guidance:

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# Data Publication

<https://www.datacite.org/>



The screenshot shows the DataCite website homepage. At the top is a navigation bar with the DataCite logo on the left and links for 'About us', 'Services', 'Resources', 'Community', and 'Become a member' on the right. There are also icons for email, a document, and Twitter. Below the navigation bar is a large hero section with a background image of a translucent jellyfish. The text 'WELCOME TO DATACITE' is centered in a large, white, serif font. Below this, in a smaller white font, is the tagline 'Locate, identify, and cite research data with the leading global provider of DOIs for research data.' A white rectangular button with the text 'Learn more' is positioned below the tagline. At the bottom of the page is a section with four circular icons in blue circles, each representing a different function: a magnifying glass for search, a circular arrow for sharing, a quote mark for citing, and a chain link for connecting research. Each icon is followed by a short description of its function. In the bottom right corner, there is a blue button with a white speech bubble icon and the word 'Feedback'.

**DataCite**

About us ▾ Services ▾ Resources ▾ Community ▾ Become a member

WELCOME TO DATACITE

Locate, identify, and cite research data with the leading global provider of DOIs for research data.

Learn more

**Find what you're looking for by searching millions of records with extensive, reliable metadata.**

**Share your data and reuse the data of others to create the highest impact in the research community.**

**Cite your research sources with confidence, and receive proper credit when your work is reused.**

**Connect your research – publications, datasets, software, authors, institutions, and funding data all in one place.**

Feedback



# Schema.org + Google Data Search



## Welcome to Schema.org

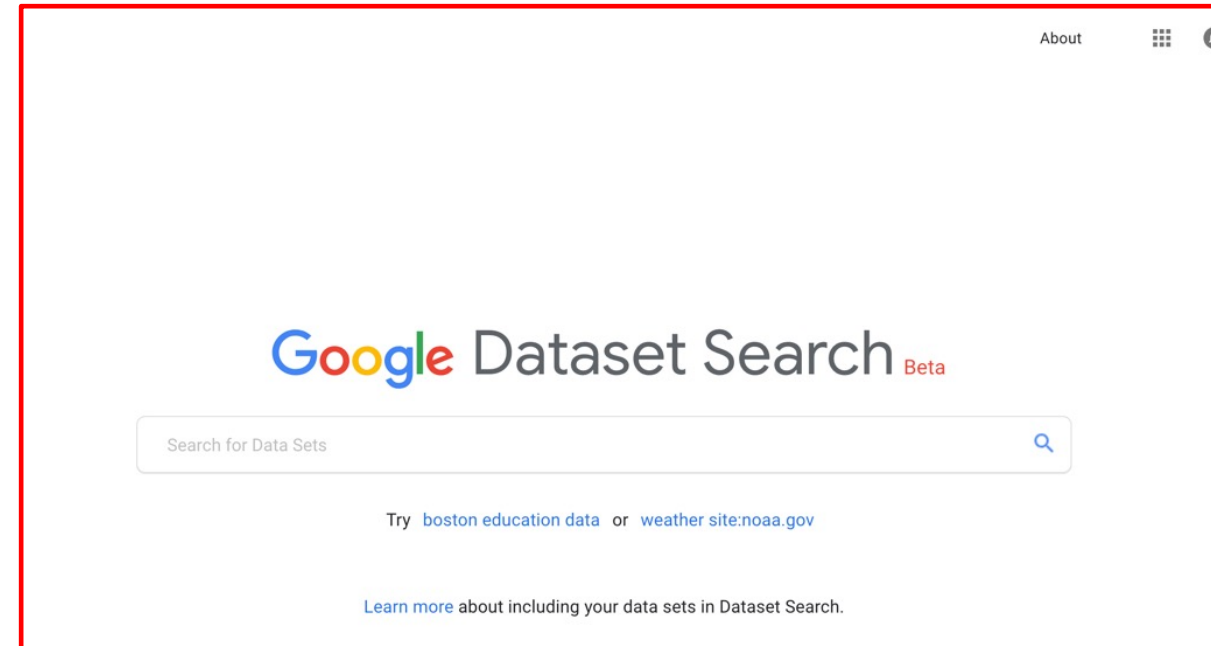
Schema.org is a collaborative, community activity with a mission to create, maintain, and promote schemas for structured data on the Internet, on web pages, in email messages, and beyond.

Schema.org vocabulary can be used with many different encodings, including RDFa, Microdata and JSON-LD. These vocabularies cover entities, relationships between entities and actions, and can easily be extended through a well-documented extension model. Over 10 million sites use Schema.org to markup their web pages and email messages. Many applications from Google, Microsoft, Pinterest, Yandex and others already use these vocabularies to power rich, extensible experiences.

Founded by Google, Microsoft, Yahoo and Yandex, Schema.org vocabularies are developed by an open [community](#) process, using the [public-schemaorg@w3.org](mailto:public-schemaorg@w3.org) mailing list and through [GitHub](#).

A shared vocabulary makes it easier for webmasters and developers to decide on a schema and get the maximum benefit for their efforts. It is in this spirit that the founders, together with the larger community have come together – to provide a shared collection of schemas.

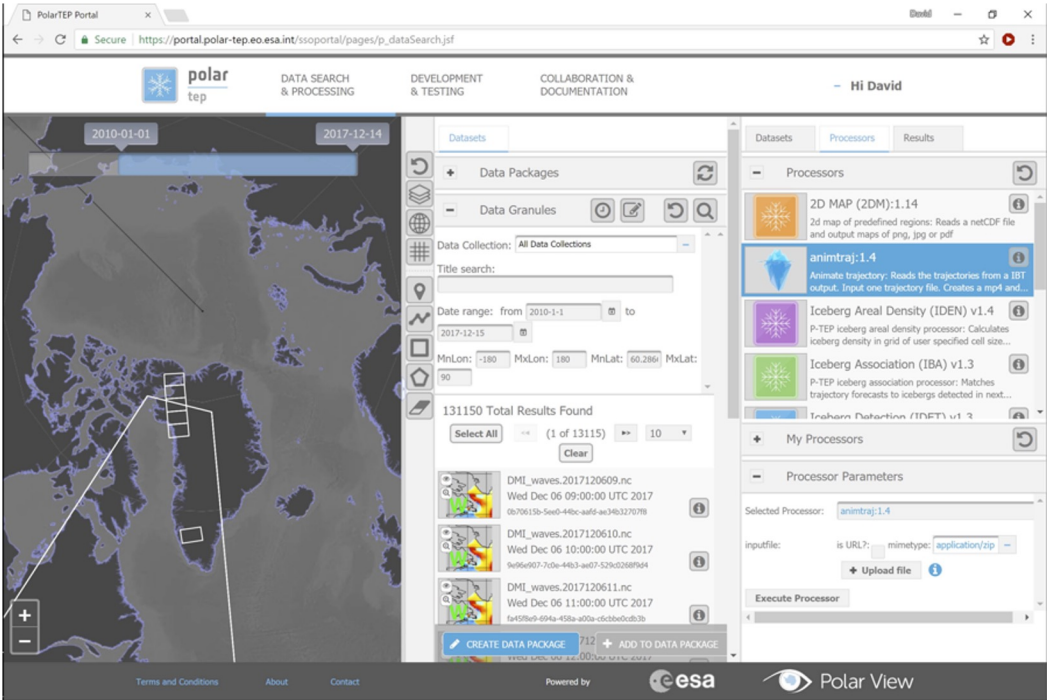
We invite you to [get started!](#)



<https://toolbox.google.com/datasetsearch>

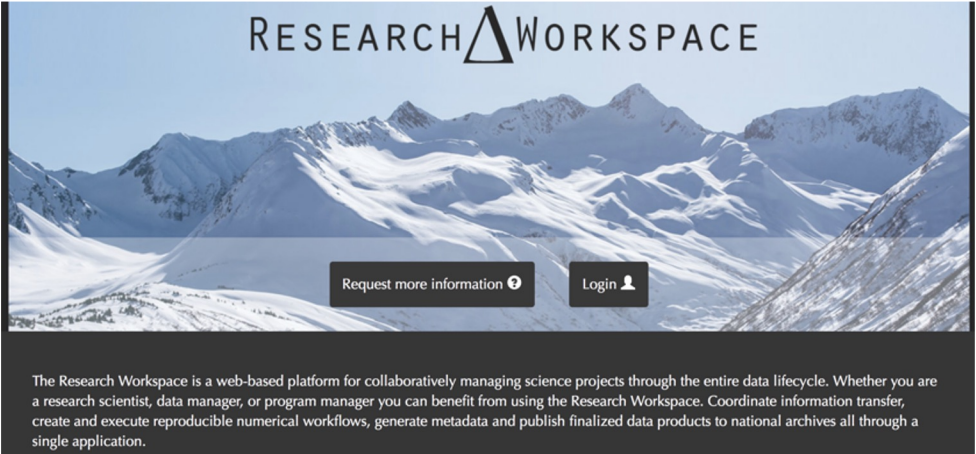
# Cloud Platforms/Virtual Research Environments

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

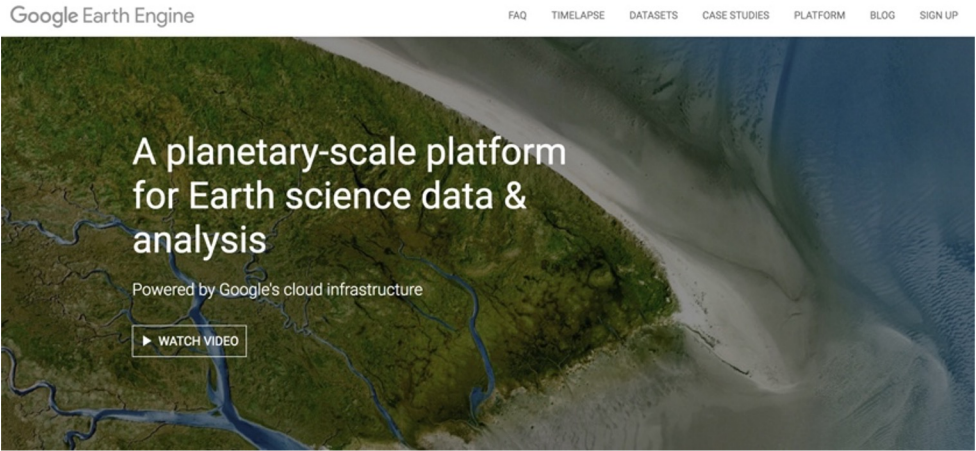


Polar Thematic Exploration Platform

<https://researchworkspace.com>



<https://earthengine.google.com>



Google Earth Engine

# Theme 2: Building Communities of Practice

# TOWARDS AN INTERNATIONAL POLAR DATA COORDINATION NETWORK

***P L Pulsifer<sup>1\*</sup>, L Yarmey<sup>1</sup>, Ø Godøy<sup>2</sup>, J Friddell<sup>3</sup>, M Parsons<sup>4</sup>, W F Vincent<sup>5</sup>, T de Bruin<sup>6</sup>, W Manley<sup>7</sup>, A Gaylord<sup>8</sup>, A Hayes<sup>9</sup>, S Nickels<sup>10</sup>, C Tweedie<sup>11</sup>, J R Larsen<sup>12</sup>, and J Huck<sup>12</sup>***

*<sup>1</sup>National Snow and Ice Data Center, University of Colorado, 449 UCB, University of Colorado, Boulder, CO 80309-0449, USA*

*\*Email: [pulsifer@nsidc.org](mailto:pulsifer@nsidc.org)*

*<sup>2</sup>Norwegian Meteorological Institute, Henrik Mohns plass 1, 0313 Oslo, Norway*

*<sup>3</sup>Canadian Cryospheric Information Network, University of Waterloo, 200 University Ave. W., Waterloo, ON, N2L 3G1, Canada*

*<sup>4</sup>Research Data Alliance, Rensselaer Polytechnic Institute, Troy, NY 12180, USA*

*<sup>5</sup>CEN: Centre d'Etudes Nordiques, Laval University, Quebec City, G1V 0A6, Canada*

*<sup>6</sup>NIOZ Royal Netherlands Institute for Sea Research, Texel, The Netherlands*

*<sup>7</sup>Institute of Alpine and Arctic Research, University of Colorado, Boulder, CO 80309-0450, USA*

*<sup>8</sup>Nuna Technologies, PO Box 1483, Homer, AK 99603, USA*

*<sup>9</sup>Geomatics and Cartographic Research Centre, Carleton University, 1125 Colonel By Dr., Ottawa, ON, K1S 5B6, Canada*

*<sup>10</sup>Inuit Quajisarvingat, Suite 1101, 75 Albert St., Ottawa, Ontario, K1P 5E7, Canada*

*<sup>11</sup>Biology and the Environmental Science and Engineering Program, University of Texas at El Paso, El Paso, TX 79968, USA*

*<sup>12</sup>University of Alberta Libraries, University of Alberta, Edmonton, Alberta, T6G 2J8, Canada*

## ABSTRACT

*Data management is integral to sound polar science. Through analysis of documents reporting on meetings of the Arctic data management community, a set of priorities and strategies are identified. These include the need*

# IASC Data Statement



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

All IASC-endorsed scientific results shall be verifiable and reproducible through ethically open access to all data necessary to produce those results. Data shall be preserved, accessible, and used in accordance with scientific norms of fair attribution and use.

To this end, IASC Council approves the following actions:

1. Endorsement of the Statement of Principles and Practices for Arctic Data Management;
2. Establishment of an IASC Data Standing Committee;
3. To undertake measures towards adoption of national data policies consistent with the principles and practices described below.

### Introduction

IASC seeks to "encourage and facilitate cooperation in all aspects of Arctic research, in all countries engaged in Arctic research, and in all areas of the Arctic region." This mission is increasingly important in a time of very rapid Arctic change and to sustain the increase in



# 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>



1st Meeting of the IASC Data Standing Committee (IDSC) and SAON Committee on Data and Information Services (CDIS)

## Report of the 1<sup>st</sup> Meeting of the Arctic Data Committee



### Meeting Details

**Meeting:** 1st Meeting of the IASC Data Standing Committee (IDSC) and SAON Committee on Data and Information Services (CDIS)

**Time:** 10 November 2014, 14:00 – 18:00; 11 November 08:30 – 13:00 (CET)

**Location:**  
Messe Hotel Potsdam City  
Lange Brücke  
14467 Potsdam  
Germany  
Room: Studio 1+2

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

All IASC-endorsed scientific results shall be verifiable and reproducible through ethically open access to all data necessary to produce those results. Data shall be preserved, accessible, and used in accordance with scientific norms of fair attribution and use.

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# “Polar Data Planning Summit”

22-24 May, 2018, Boulder, Colorado



## PDPS 2018

### Details

Published: 23 August 2016

Page 3 of 6

### Registered Participants

| Name                | Affiliation  | Country         |
|---------------------|--|-----------------|
| David Arthurs       | Polar View   | Denmark         |
| Pip Bricher         | Southern Ocean Observing System  | Australia       |
| Andreas Cziferszky  | British Antarctic Survey / Polar View                                      | United Kingdom  |
| Taco de Bruin       | NIOZ Royal Netherlands Institute for Sea Research                          | The Netherlands |
| Eric Coplin         | Battelle-NEON  | United States   |
| Ruth Duerr          | Ronin Institute for Independent Scholarship                                | United States   |
| Florence Fetterer   | NSIDC  | United States   |
| Daniel Gibson       | Government of Northwest Territories  | Canada          |
| Øystein Godøy       | Norwegian Meteorological Institute   | Norway          |
| Sarah Inman         | University of Washington   | United States   |
| Christopher Jones   | National Center for Ecological Analysis and Synthesis, UC Santa Barbara    | United States   |
| Peter Kirsch        | Polar Data Centre; British Antarctic Survey                                | United Kingdom  |
| Christine Laney     | Battelle-NEON  | United States   |
| Ellsworth LeDrew    | University of Waterloo, Polar Data Catalogue                               | Canada          |
| Corrado Leone       | Italian National Research Council  | Italy           |
| Simona Longo        | CNR  | Italy           |
| William Manley      | University of Colorado, INSTAAR  | United States   |
| Heidi McCann        | CIRES/NSIDC  | United States   |
| Maribeth Murray     | Arctic Institute of North America, University of Calgary                   | Canada          |
| Mark Parsons        | Rensselaer Polytechnic Institute   | United States   |
| Peter L. Pulsifer   | University of Colorado at Boulder  | United States   |
| Yubao QIU           | Institute of Remote Sensing and Digital Earth                              | China           |
| Simon Riopel        | Canada Centre for Mapping and Earth Observation / Natural Resources Canada | Canada          |
| Hannele Savela      | Thule Institute, University of Oulu  | Finland         |
| Serge Scory         | Royal Belgian Institute of Natural Sciences                                | Belgium         |
| Donna Scott         | National Snow and Ice Data Center  | United States   |
| Aleksandr Smirnov   | Arctic Portal  | Iceland         |
| Sandy Starkweather  | NOAA-ESRL/CIRES  | United States   |
| Don Stott           | National Center for Atmospheric Research                                   | United States   |
| Colleen Strawhacker | National Snow and Ice Data Center  | United States   |
| Shane St Savage     | Axiom Data Science (Alaska Ocean Observing System)                         | United States   |
| Marten Tacoma       | NIOZ Royal Netherlands Institute for Sea Research                          | The Netherlands |
| Chris Torrence      | NSIDC  | United States   |
| Taneil Uttal        | NOAA   | United States   |
| Thomas Vandenberghe | Royal Belgian Institute of Natural Sciences                                | Belgium         |
| Naomi Whitty        | Polar Field Services   | United States   |
| Ann Windnagel       | NOAA@NSIDC   | United States   |
| Lynn Yarmey         | Research Data Alliance   | United States   |

PDPS 2018

Agenda

Participants

Use Cases

Resources

Registration, Transportation, Weather, Contact

All Pages



Award 1749243



# Arctic Observing Summit – Davos, June 2018

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



Arctic Observing Summit (AOS)  
Arctic Observing Summit (AOS)

*Foreword*

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

**Co-chairs:** Dr. Peter Pulsifer (National Snow and Ice Data Center); Dr. Oystein Gundersen (Norwegian Meteorological Institute)

**Rapporteur:** Dr. Anja Rosel (Norwegian Polar Institute); Ms. Shannon Christofferson (University of Alaska)

**Thematic Working Group members:** Dr. Paul Berkman (Tufts University); Dr. Mari Stenroos (University of Calgary); Dr. Roberta Pirazzini (Finnish Meteorological Institute); Ms. Sarah Marie Stenroos (Finnish Meteorological Institute); Mr. Mikko Strahlendorff (Finnish Meteorological Institute); Dr. Torgeir Sævi (Norwegian 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

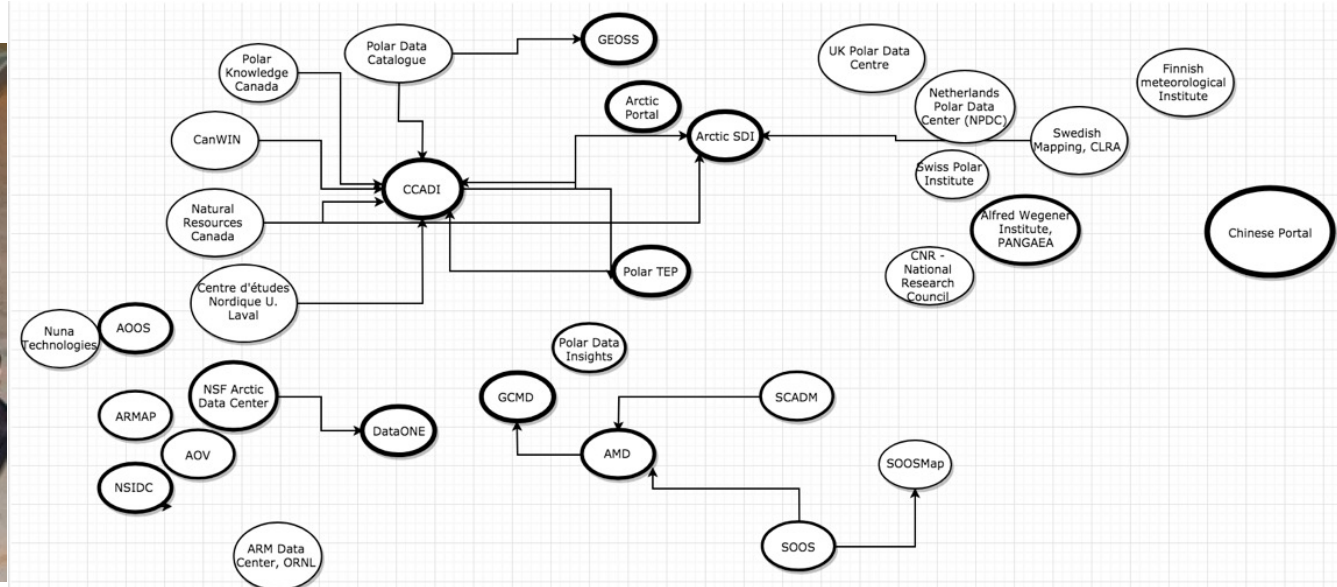
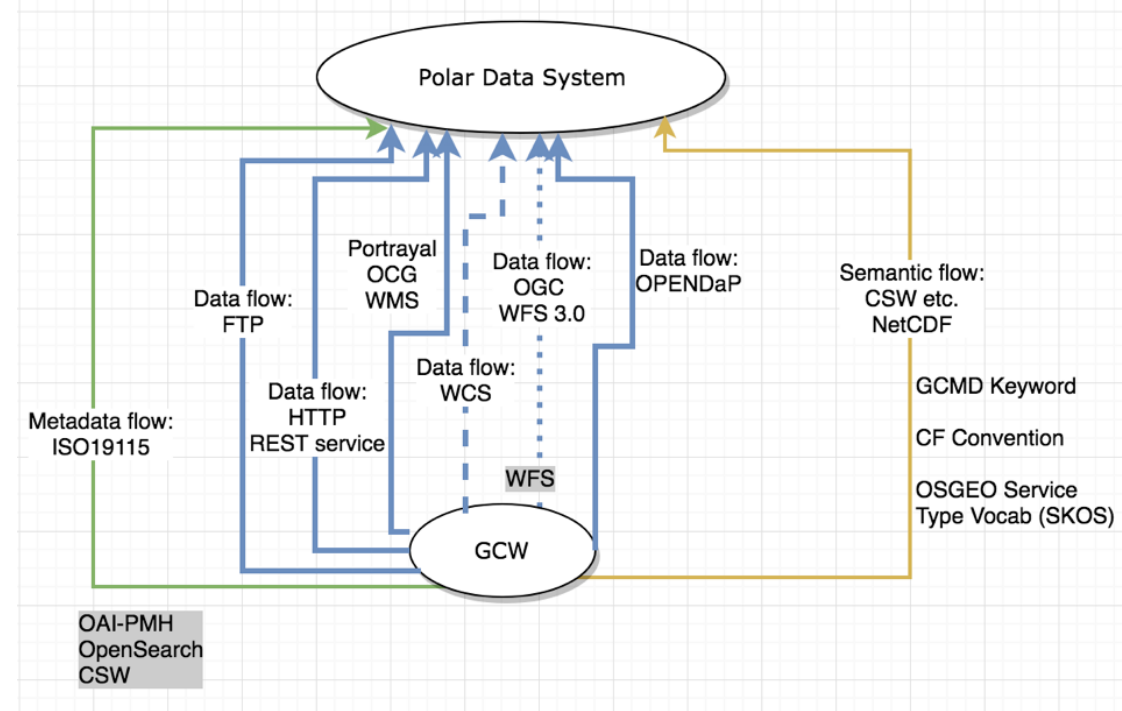
- The Arctic Data Committee
- Standing Committee on Antarctic Data Management
- Southern Ocean Observing System

Main contact person: Peter L. Pulsifer, National Snow and Ice Data Center, University of Colorado, Boulder, USA; e-mail: [peter.pulsifer@colorado.edu](mailto:peter.pulsifer@colorado.edu)

Description of the deliverable

# Polar Data and Systems Architecture Workshop

28 – 30 November 2018, Geneva

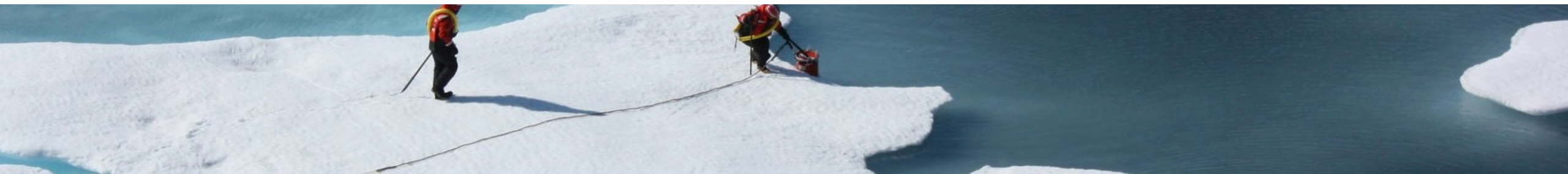




# 2<sup>nd</sup> Arctic Science Ministerial Science Forum (26 Oct 2018, Berlin): policy dimensions



<https://www.arcticscienceministerial.org/en/>



## Polar to Global Online Interoperability and Data Sharing Workshop/Hackathon 21st January 2021

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### Details

📅 Published: 21 December 2020

*21st January 20:00-23:00 UTC*

During the Third Polar Data Forum (PDF) held in Helsinki in November of 2019, members of the Polar Data Community gathered to share information and knowledge and to make practical progress towards greater data sharing and interoperability. PDF III followed on a series of meetings that have resulted in continuing advancements in the areas of federated search, identification and development of shared vocabularies and formal semantics, data policy, community building and other topics. Since PDF III, the dialogue has continued. In March and early April, the Arctic data community met during the online Arctic Observing Summit (<https://aos2020agenda.org/>). The Standing Committee on Arctic Data Management (SCADM) and members of the Southern Ocean Observing System (SOOS) Program have met regularly. There is broad agreement between these groups and the IASC-SAON Arctic Data Committee (ADC) that meeting more frequently will help us to continue making practical progress on our shared goals.

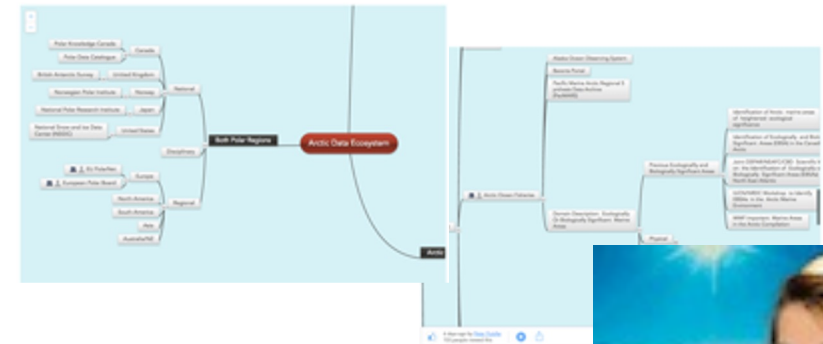
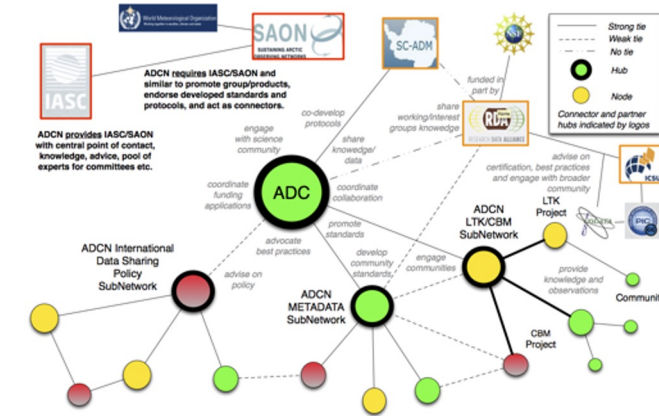
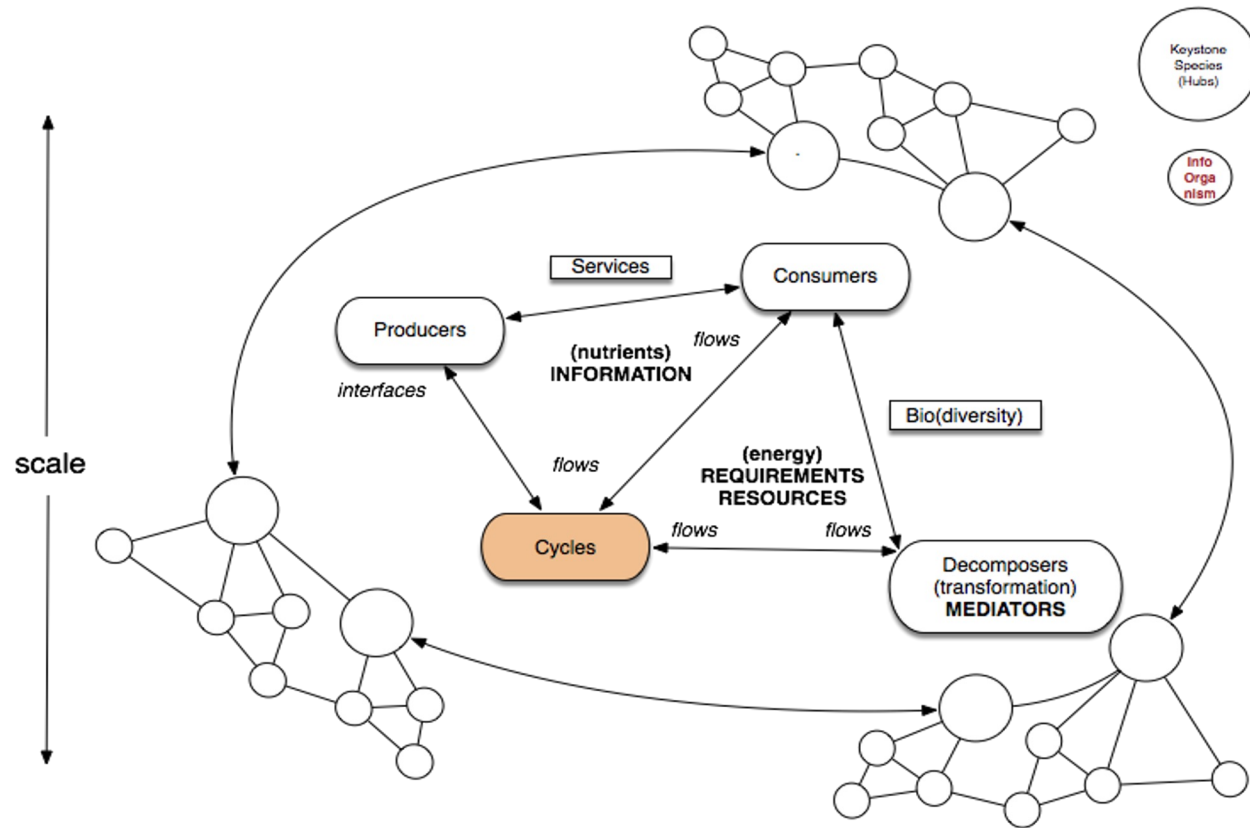
During these challenging times, meeting in person is not feasible. However, recent online events have demonstrated that we can successfully collaborate using virtual tools.

We would like to invite you to join us online on **21st January 20:00-23:00 UTC** to continue our efforts to enhance polar data sharing and interoperability. This is an online workshop in a planned series of bi-monthly online workshops convened by the ADC, SCADM, SOOS, the Arctic Observing Summit Working Group 4, the Global Cryosphere Watch, and the World Data System on behalf of the polar data community.

Data Service or Science?

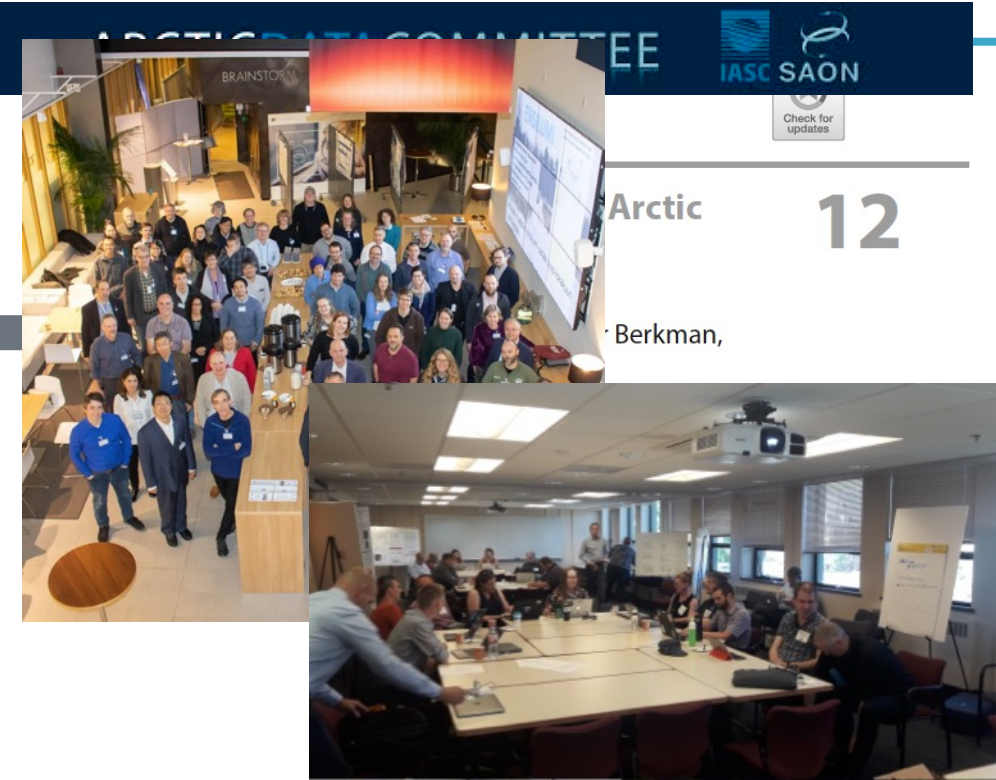
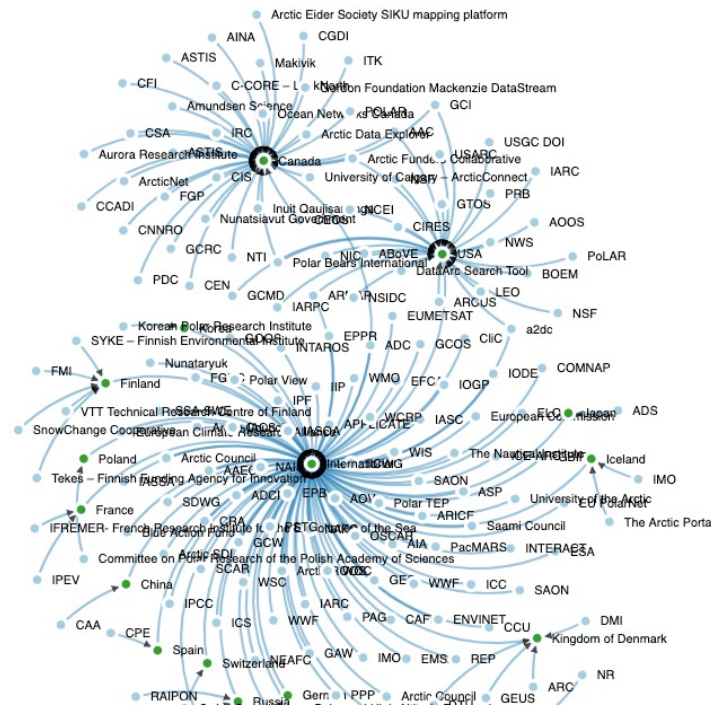
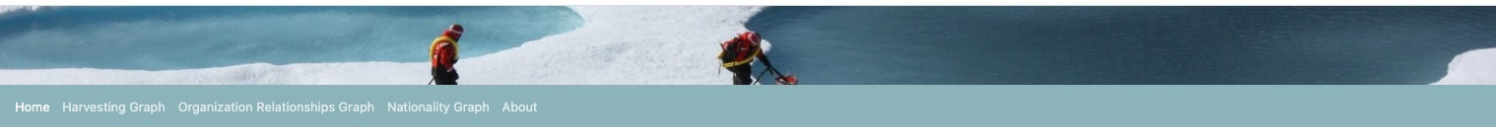


# Using Systems Science and Domain Visualization to Model & Understand the System



Dr. Katia Kontar

# A Complex, Diverse Socio-Technical Polar Information Ecosystem



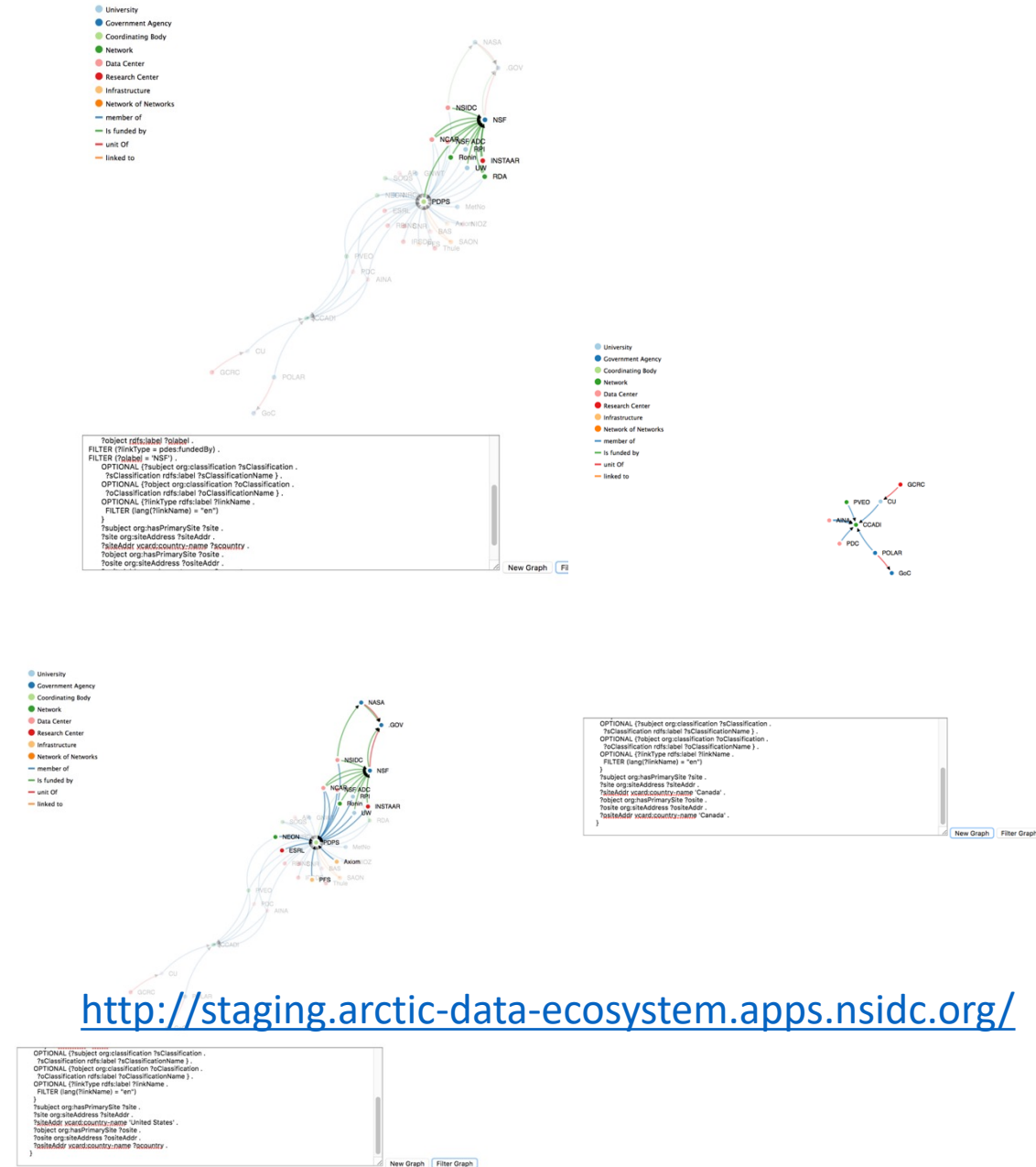
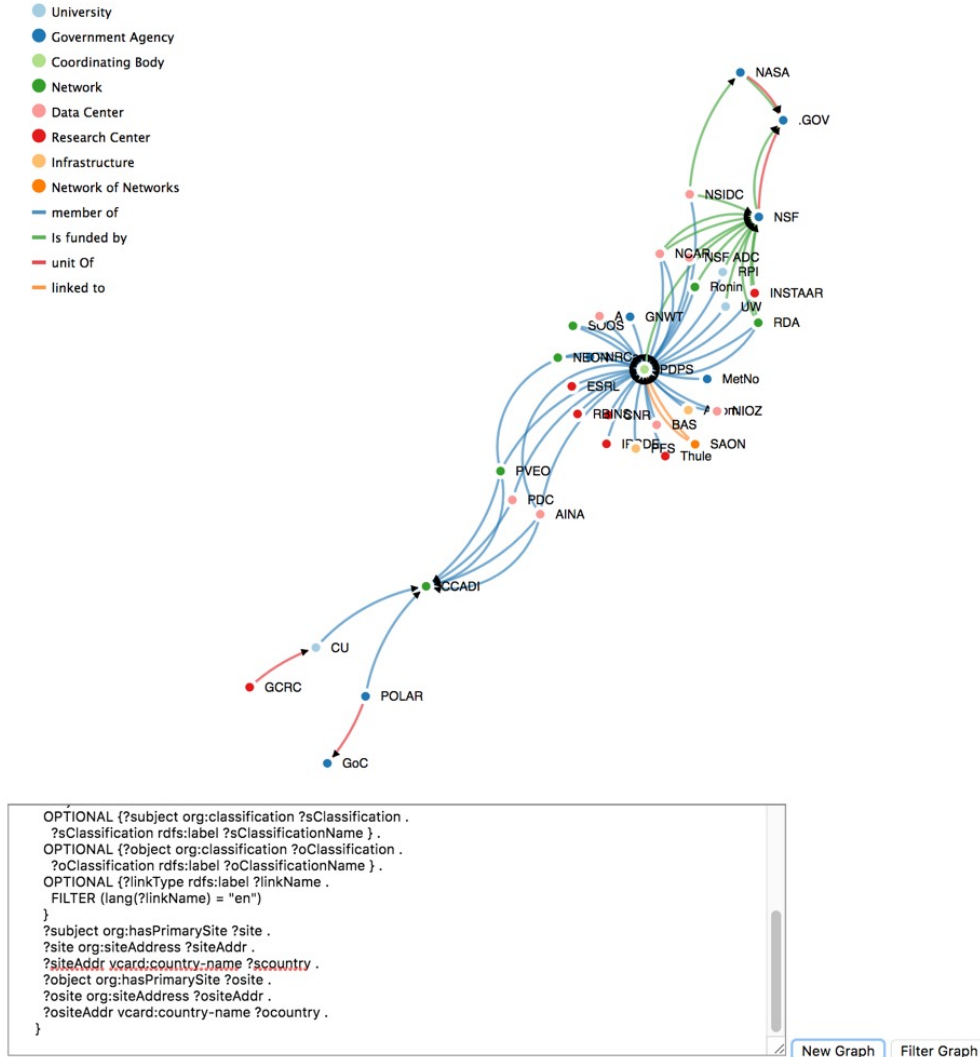
: Data Committee; P. Pulsifer; Polder ; R. Duerr

Pulsifer, P.L. Kontar, Y., Berkman, P.A., Taylor, D.R.F. (2019). Chapter 12. Information Ecology to Map the Arctic Information Landscape. In Sustainability of Shared Marine Regions. Volume 1. Governing Arctic Seas: Regional Lessons from the Bering Strait and Barents Sea, edited by Oran R.Young, P.A. Berkman, P.A. and Alexander N. Vylegzhanin. Springer.



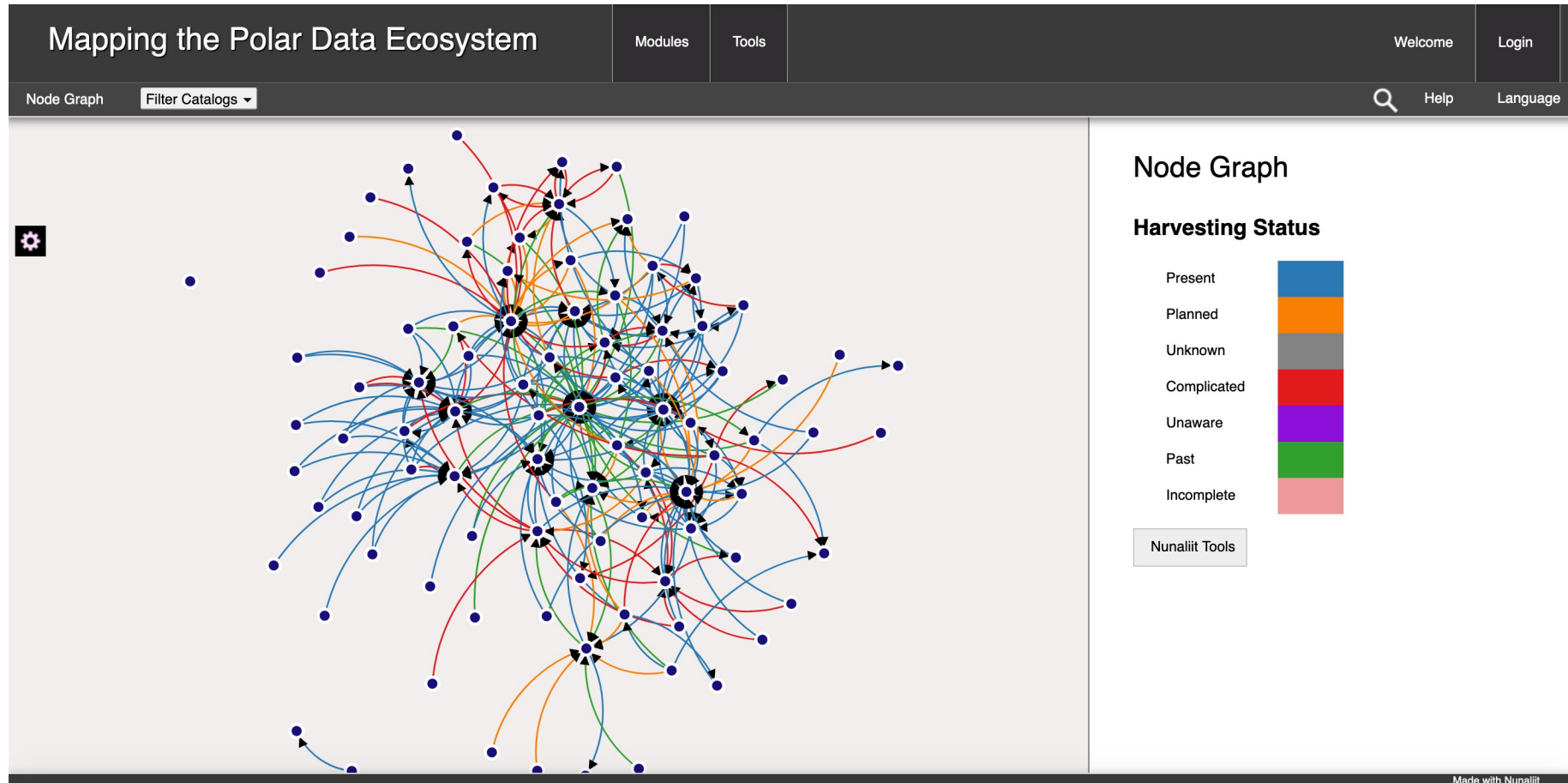


# Modeling Networks



<http://staging.arctic-data-ecosystem.apps.nsidc.org/>

# Prototype Demonstration



<https://develop.gcrc.carleton.ca/mdpe/index.html>

# Themes 1 & 2 Summary

- Fundamental research in the areas of data management methods, standards, and technology is enabling the next generation of (geographic) analysis tools
- Next generation tools are emerging from the intersection of many different areas of expertise and disciplines
- Communities of practice are an integral part of the system
- We need to increase our understanding of how these communities form and thrive

- Berez-Kroeker, Andrea L, Lauren Gawne, Susan Smythe Kung, Barbara F Kelly, Tyler Heston, Gary Holton, Peter Pulsifer, et al. "Reproducible Research in Linguistics: A Position Statement on Data Citation and Attribution in Our Field." *Linguistics* 56, no. 1 (2018): 1–18.
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- Pulsifer, Peter L. "Enhancing a Socio-Technical Data Ecosystem for Societally Relevant, Sustained Arctic Observing." *AGUFM 2017* (2017): C11C–0924.
- Pulsifer, Peter L. "The Cartographer as Mediator: Cartographic Representation from Shared Geographic." *Cybercartography: Theory and Practice*, 2006, 149.
- Pulsifer, Peter L, Yekaterina Kontar, Paul Arthur Berkman, and DR Fraser Taylor. "Information Ecology to Map the Arctic Information Ecosystem." In *Governing Arctic Seas: Regional Lessons from the Bering Strait and Barents Sea*, 269–291. Springer, 2020.
- Pulsifer, Peter L, Sandra McCubbin, Stein Sandven, and Mark A Parsons. "Developments in Polar Data Management 2006-2019 and Beyond: Standardization and Community-Building in Support of Enhanced Interoperability." In *EGU General Assembly Conference Abstracts*, 22498, 2020.
- Pulsifer, Peter L, and DR Fraser Taylor. "The Cartographer as Mediator: Cartographic Representation from Shared Geographic Information." In *Modern Cartography Series*, 4:149–179. Elsevier, 2005.
- Tanhua, Toste, Sylvie Pouliquen, Jessica Hausman, Kevin M O'Brien, Pip Bricher, Taco De Bruin, Justin James Henry Buck, et al. "Ocean FAIR Data Services." *Frontiers in Marine Science* 6 (2019): 440.

Despite the available data resources,  
structures and technologies, we are still  
unable to easily, efficiently and quickly use  
arctic data for interdisciplinary research or  
complex applications...

... we lack effective data mediation  
(mediators)

# Theme 3: Geographic Information Mediation

# Simple Definition of Geographic Information Mediation

“The process of sharing geographic information across differences.”  
(Pulsifer, Parsons)

Note: sharing implies understanding between parties



# Selected Dimensions of Geographic Information Mediation

- Many kinds of mediation
  - (Geo)Informatics: “middleware”
  - Cartography: sensory mediation
  - Communications and media studies, critical theory: social construction of information
  - Cognitive research: knowledge models
  - Legal, diplomacy: dispute resolution
  - Linguistics: translation

## CHAPTER 7

### The Cartographer as Mediator: Cartographic Representation from Shared Geographic Information\*

PETER L. PULSIFER

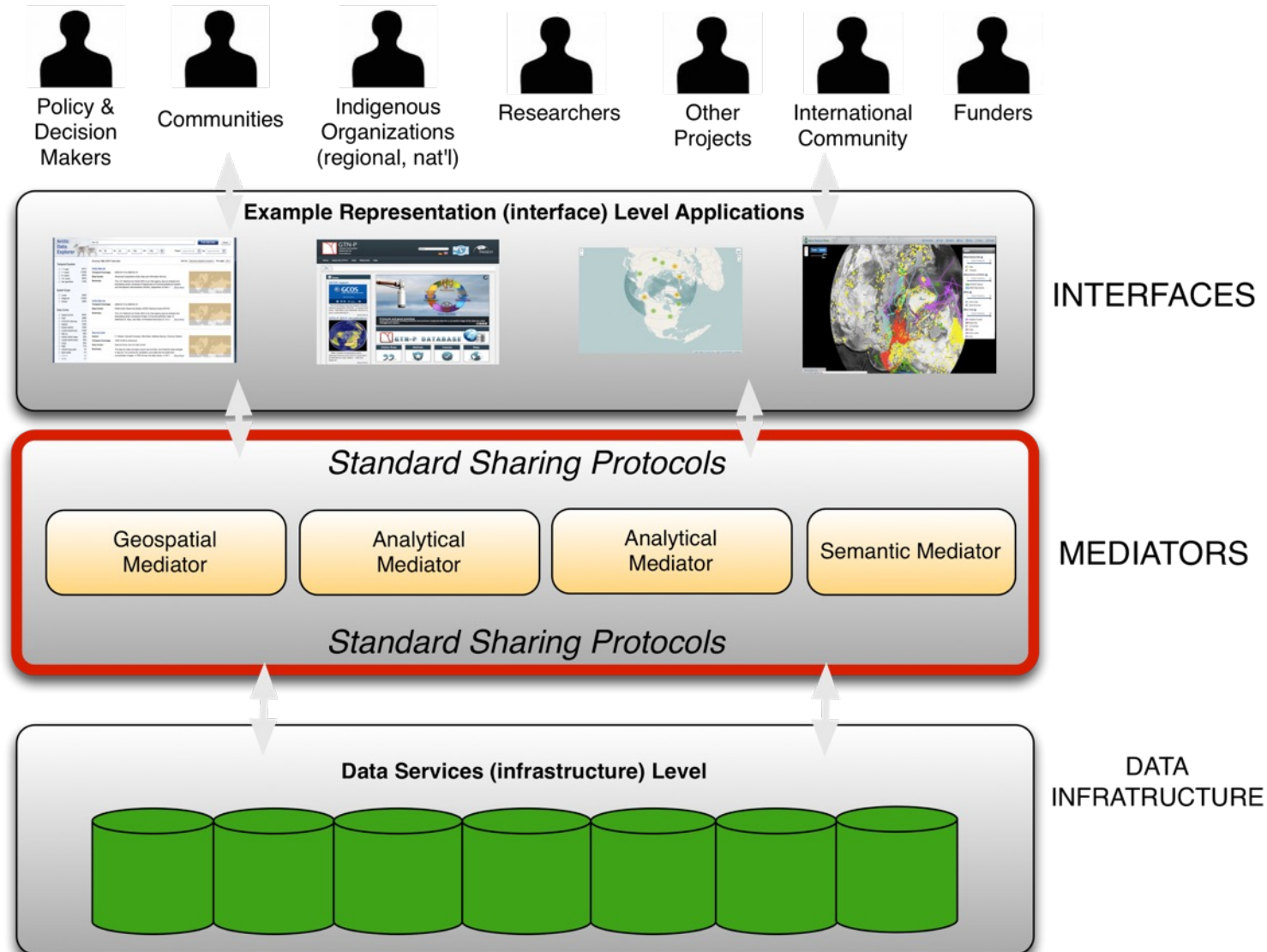
# Technical Mediators

- Full standardization across communities is difficult
- **Mediators** can aggregate, transform, re-distribute
- **Mediators** use infrastructure and can be developed and funded separately
- **Brokering** is emerging as a potential solution to some interoperability issues

<http://gtnp.arcticportal.org/>  
<http://www.esrl.noaa.gov/psd/iasoa/>  
<http://www.arcticobservingviewer.org>  
<https://ace.arsc.edu/>  
<http://eloka-arctic.org>



# Mediation for Serving Multiple Audiences



# Community Mediators

- Frascati 2016 workshop result:

***Key current challenges are social and organizational rather than technical : supporting human networks, promoting standards, and aligning policy with implementation***



# Interdisciplinary Research Approach

Researching mediation requires collaboration and participation:

- **Geographers**
- Indigenous knowledge holders
- Indigenous knowledge scholars
- Social scientists
- Physical scientists
- Computer scientists, Human Computer Interaction
- Linguists
- Science diplomacy, public policy researchers
- Anthropology
- Archaeology

# Influences

- Many Indigenous scholars (e.g. Daniel Wildcat, Jay Johnson, Renee Pualani Louis, Deborah McGregor)
- Susan Leigh Star
- George Lakoff
- Mark Parsons
- Geosemantics (e.g. Barry Smith, Frederico Fonseca, Mark Gahegan)
- Mei Po Kwan
- Fraser Taylor
- Nadine Schuurman
- Daniel Sui
- Arun Agrawal
- Jeremy Crampton
- Nigel Thrift
- ...



# Case Study: Linking Documented Indigenous Knowledge & Science

Geo-Semantic Mediation

# https://gcrc.carleton.ca

GCRC

About

Research Areas

Output

Welcome

Login

Atlases

Create Document

Q

Help

Language

## Atlases

---

### Active Project Atlases

---



#### Residential Schools Land Memory Atlas

The work to develop this atlas is based on earlier work on the prototype Residential Schools and EF Wilson Maps with the Shingwauk Residential Schools Centre (Algoma University) and the Geomatics and Cartographic Research Centre (Carleton University), which began in May 2011 under the Lake Huron Treaty Atlas Project (2009-2012, SSHRC Standard Research Grant; 2012-2014 SSHRC Outreach Grant).

In May 2015, the GCRC began working in collaboration with others on the Residential Schools Land Memory Mapping Project (RSLMMP; SSHRC Insight Grant, 2015-2020) to expand the Residential Schools component of the Lake Huron Treaty Atlas into an atlas of its own. The Residential Schools and EF Wilson Maps were moved to this atlas space, and they are being updated as part of the RSLMMP.

We are working in collaboration with others on developing additional maps that reflect a broad view of Residential Schools and reconciliation. This includes mapping digital media, exhibitions, gatherings, sketch mapping of Survivor stories, and news stories reflecting a diverse array of dimensions.

As our work progresses, we will be updating the content in this atlas.

<https://residentialschoolsatlas.org>



#### Clyde River Atlas

In the words of the community, "This cyberatlas is a way to share this work with our community, other communities, and beyond. It is also a tool to support new research and tell our own our stories. We hope this site will be a place for our youth, leaders, and community members to find resources they need for all their interests and activities. For visitors, we hope it shows the depth of Inuit knowledge and the critical importance of local leadership and involvement in researching our environment."

<http://clyderiveratlas.ca>



#### inuitplaces.org

inuitplaces.org is an interactive, multi-media atlas that is bringing together the traditional place names of Inuit peoples

# ELOKA

## <http://eloka-arctic.org/>



### Yup'ik Environmental Knowledge Project

View Media

Tununak dancers (movie small)

#### Yup'ik Atlas

search the atlas

More Info

Tununak Dancers  
Tununak, AK

From the film "Once Our Way"  
by Andrew Chikoyak  
c. 1970s

(TununakDancers.mpr)

Title Tununak dancers (movie small)

### Introduction: local and traditional knowledge and data management in the Arctic

Peter L. Pulsifer, Henry P. Huntington & Gretta T. Pecl

Pages 1-4 | Published online: 16 Apr 2014

Download citation | <https://doi.org/10.1080/1088937X.2014.894591>

Full Article | Figures & data | Citations | Metrics | Reprints & Permissions

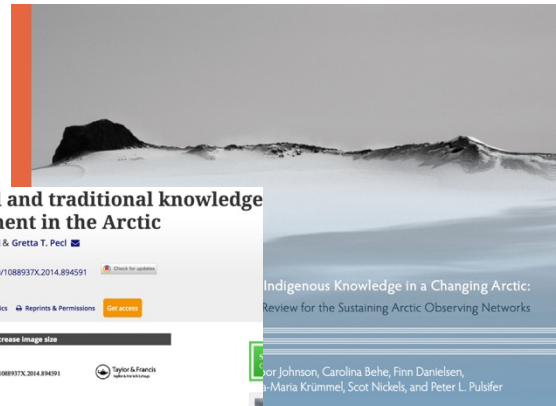
Click to increase image size

Arctic Geography, 2014  
Vol. 27, No. 1, 1-4, <http://dx.doi.org/10.1080/1088937X.2014.894591>

Taylor & Francis

### Introduction: local and traditional knowledge and data management in the Arctic

Understanding the environment in the broadest sense, especially a changing environment such as the Arctic, requires observations of many phenomena, spread over time and space, and involved systematicity. Tununak, Alaska, is a small town in the Arctic region of Alaska, where the Yup'ik people live. The town is located on the coast of the Chukchi Sea, and is known for its traditional Yup'ik culture and knowledge. The town is also known for its traditional knowledge and data management practices, which are passed down from generation to generation. The town is a key location for the Yup'ik Environmental Knowledge Project, which aims to document and preserve the traditional knowledge and data of the Yup'ik people.



### Indigenous Knowledge in a Changing Arctic: Review for the Sustaining Arctic Observing Networks

Robert Johnson, Carolina Behre, Finn Danielsen, Maria Krümmel, Scot Nickels, and Peter L. Pulsifer

Arctic

**CURRENT SEARCH**  
Keyword(s): Walrus  
Date(s): 2006-04-01 - 2017-09-28  
Village(s): All  
Observer(s): All  
Photo contributor(s): All  
Photo location(s): All  
Refine Search  
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**Search Results**  
Showing observations 1 - 20 of 280  
20 per page Go to Page: 1 Go  
Sort by: Date (Latest-Oldest)

| Date       | Observer           | Village            | Additional elements noted (legend) | Transcript                | Edit |
|------------|--------------------|--------------------|------------------------------------|---------------------------|------|
| 2017-06-29 | Billy Adams        | Utqiagvik (Barrow) |                                    | Transcript<br>All details | Edit |
| 2017-06-09 | Curtis Nayokpuk    | Shishmaref         |                                    | Transcript<br>All details | Edit |
| 2017-06-02 | Curtis Nayokpuk    | Shishmaref         |                                    | Transcript<br>All details | Edit |
| 2017-04-12 | Robert Tokenna Jr. | Wales              |                                    | Transcript<br>All details | Edit |
| 2017-03-28 | Curtis Nayokpuk    | Shishmaref         |                                    | Transcript<br>All details | Edit |
| 2017-03-16 | Robert Tokenna Jr. | Wales              |                                    | Transcript<br>All details | Edit |
| 2016-11-01 | Joe Leavitt        | Utqiagvik (Barrow) |                                    | Transcript<br>All details | Edit |

### Local Observations

Seasonal Ice Zone Observing Network (SIZONet)

Home

Search Observations

About

Research methods

Contacts

Add observation

Logged in as ELOKA Team

Log out

The Local Observations database was developed to record, archive, and share indigenous sea ice knowledge and expertise. This information is generously shared with the public by the observers and the communities within which the observers reside. We ask that anyone interested in browsing or using the information review and agree to adhere to the ethical and appropriate use guidelines.

Visit the Contacts link if you have questions or would

### Access to the Observations Catalog

#### Use Agreement

I understand that the observations compiled in this product were made by recognized local sea ice experts and are shared generously by the observers and their communities to help further education, scientific research, and communication between holders of local and indigenous knowledge and research scientists. I also understand that the observations were made in the context of sea ice knowledge and use specific to the different communities that are part of this project; any interpretation of the data should respect this context.

When using or referencing data from this product for research or reporting purposes, I:

1. Must acknowledge and cite the names of the person(s) whose observations are being discussed or analyzed; include the names of the

### Local Observations

Seasonal Ice Zone Observing Network (SIZONet)

Research methods

Contacts

### Observations catalog:

[View All](#)

Search for: Walrus

AND: All observers

AND: All villages

AND: All photo contributors

AND: All photo locations

Date range: 2006-04-01 to 2017-09-28

Search

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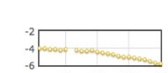
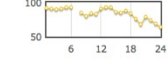
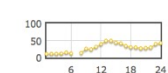
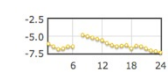
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# Geosemantic Mediation Research and Application Opportunities

# Communicating Inuit Muskoxen and Environmental Knowledge

Challenges of Sharing Knowledge



Language



Omingmak

*Muskox*

*Ovibos moschatus*

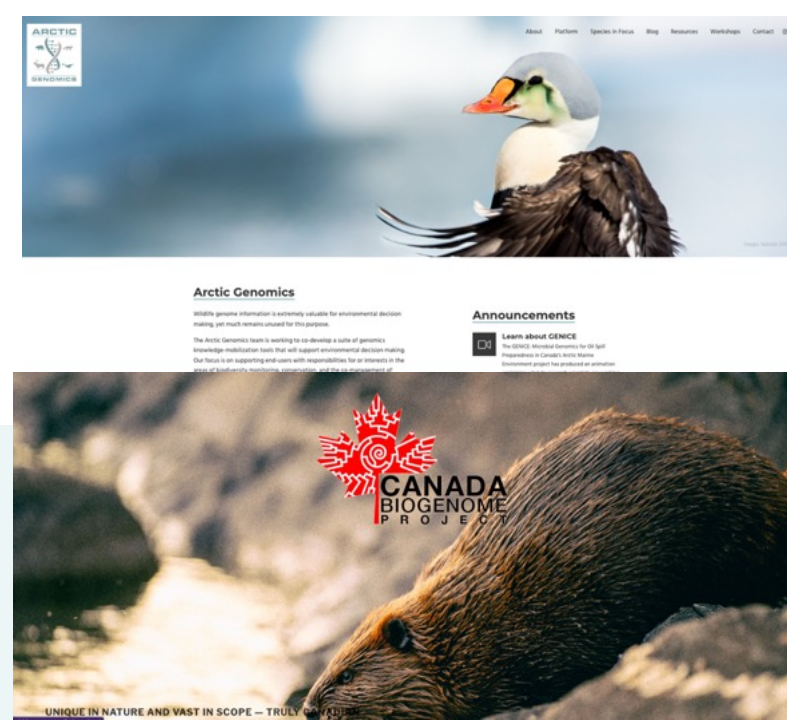
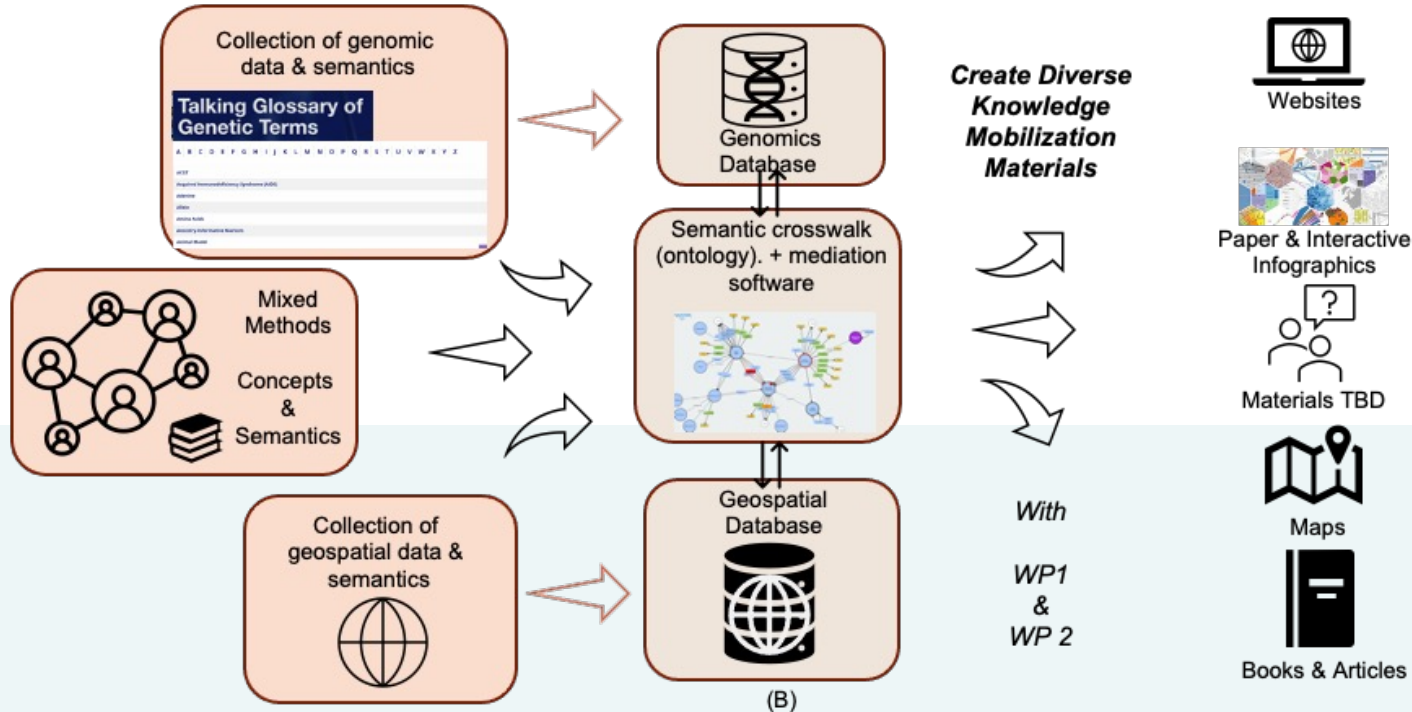
*Tariungmiutaq*

*Arctic Char*

*Salvelinus alpinus*







One of our project activities and outcomes is to mobilize genomics and Indigenous Knowledge for decision making



Cyber tools for information translation for and with end users



Considering the potential practical, economic, legal and ethical issues of mobilizing genomics for decision making – including those pertaining to Indigenous perspectives and rights, Indigenous data sovereignty and national and international frameworks and commitments that may influence policy at different levels of government



# Linked Open Data and Semantic Solutions

# Semantic Methods and Technologies

[HOME PAGE](#) [TODAY'S PAPER](#) [VIDEO](#) [MOST POPULAR](#) [TIMES TOPICS](#)

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### Understanding the New Web Era: Web 3.0, Linked Data, Semantic Web

By RICHARD MACMANUS,  **ReadWriteWeb**  
Published: May 14, 2009

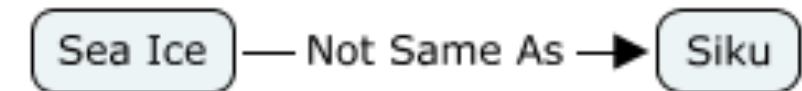
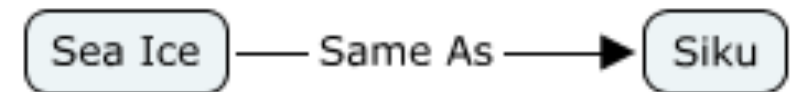
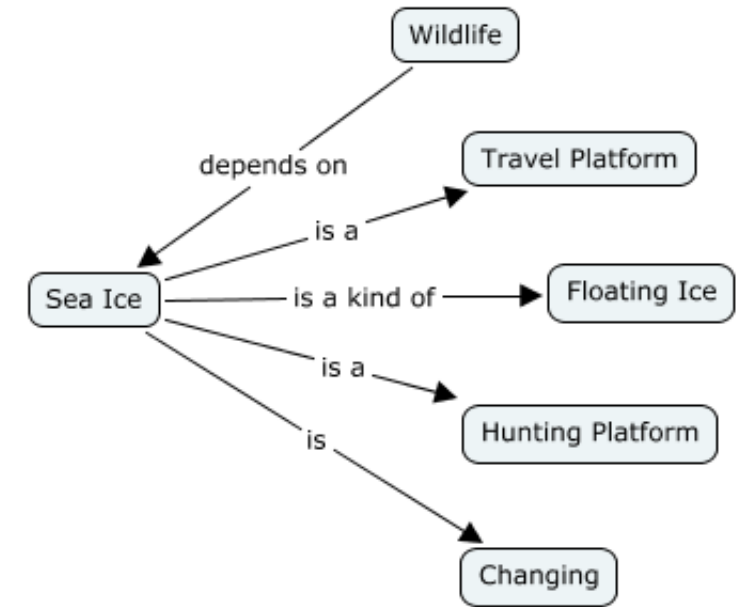
 PRINT

**More News From ReadWriteWeb**

- [Google Search Evolves - But Has Google Finally Lost its Core Focus?](#)
- [Introduction to the Real-Time Web](#)
- [Searchology: State of the Union of Search at Google](#)
- [Twitter Passes NYT, WSJ in Unique Visitors](#)
- [Did Mark Zuckerberg's](#)

I've been following a fascinating [3-part series of posts](#) this week by Greg Boutin, founder of [Growthroute Ventures](#). The series aimed to tie together 3 big trends, all based around structured data: 1) the still nascent "**Web 3.0**" concept, 2) the relatively new kid on the structured Web block, **Linked Data**, and 3) the long-running saga that is the **Semantic Web**. Greg's series is probably the best explanation I've read all year about the way these trends are converging. In this post I'll highlight some of Greg's thoughts and add some of my own.

# Triples



# Linked Open Data & Semantic Web

Google Dataset Search Beta

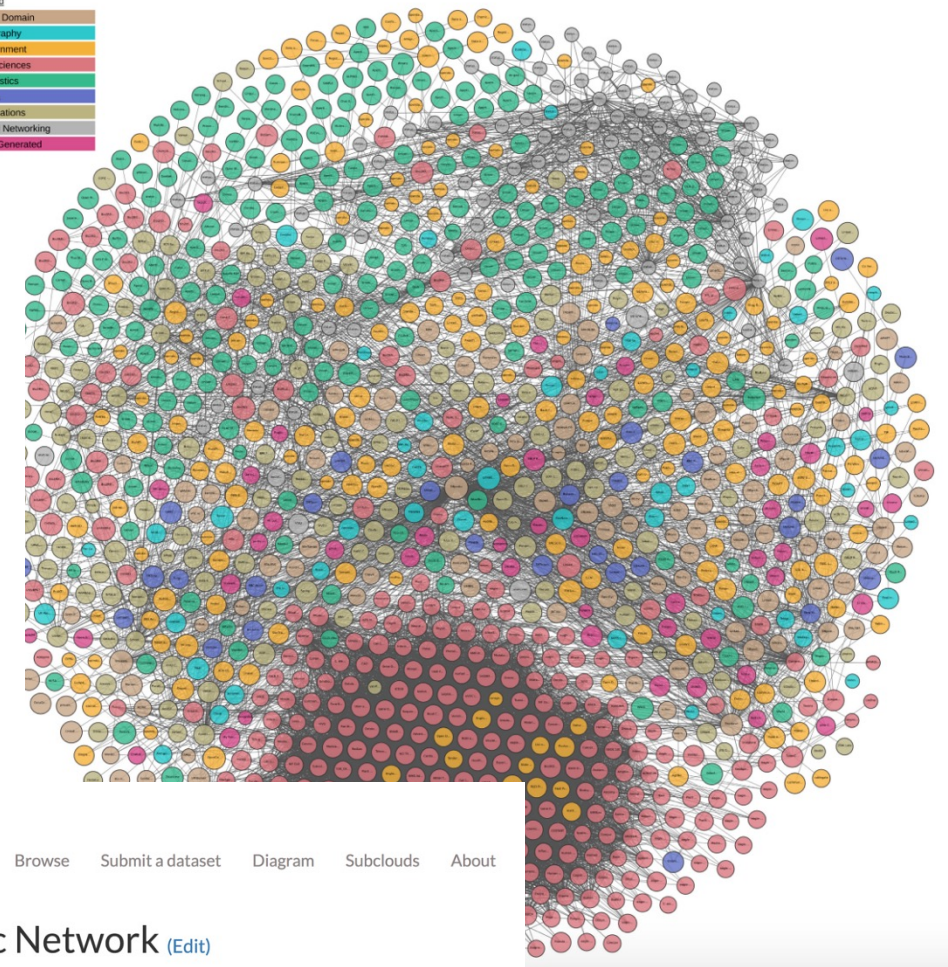
Search for Data Sets



Try [boston education data](#) or [weather site:noaa.gov](#)

[Learn more](#) about including your data sets in Dataset Search.

<https://toolbox.google.com/datasetsearch>



The Linked Open Data Cloud

[Browse](#) [Submit a dataset](#) [Diagram](#) [Subclouds](#) [About](#)

OSM Semantic Network [\(Edit\)](#)



About this dataset

The **OSM Semantic Network** is a Semantic Web resource extracted from the [OpenStreetMap Wiki website] (<http://wiki.openstreetmap.org>), encoded as a SKOS vocabulary. It contains a machine-readable representation of the tags (i.e. terms) used to describe [map features] ([http://wiki.openstreetmap.org/wiki/Map\\_Features](http://wiki.openstreetmap.org/wiki/Map_Features)) in OSM, and several semantic relations between them. The OSM terms are linked to [LinkedGeoData] (<http://datahub.io/dataset/linkedgeodata>) and WordNet. Author & Maintaner: [Andrea Ballatore] (<https://sites.google.com/site/andreaballatore>)  
License: <http://www.opendefinition.org/licenses/odc-odbl>

<https://lod-cloud.net/>

[http://wiki.openstreetmap.org/wiki/OSM\\_Semantic\\_Network](http://wiki.openstreetmap.org/wiki/OSM_Semantic_Network)

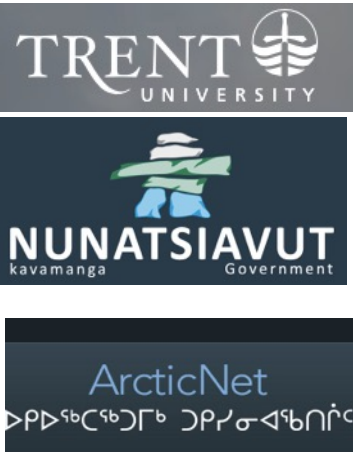
# Opportunities

- Reduced effort in knowledge modeling
- Ability to expand and share representations (models)
- Search, analysis, support of advanced application development
- Powerful linking capabilities across domains
- Potential to infer new knowledge through reasoning

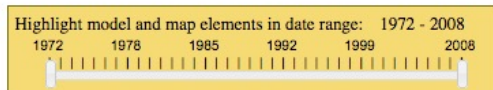
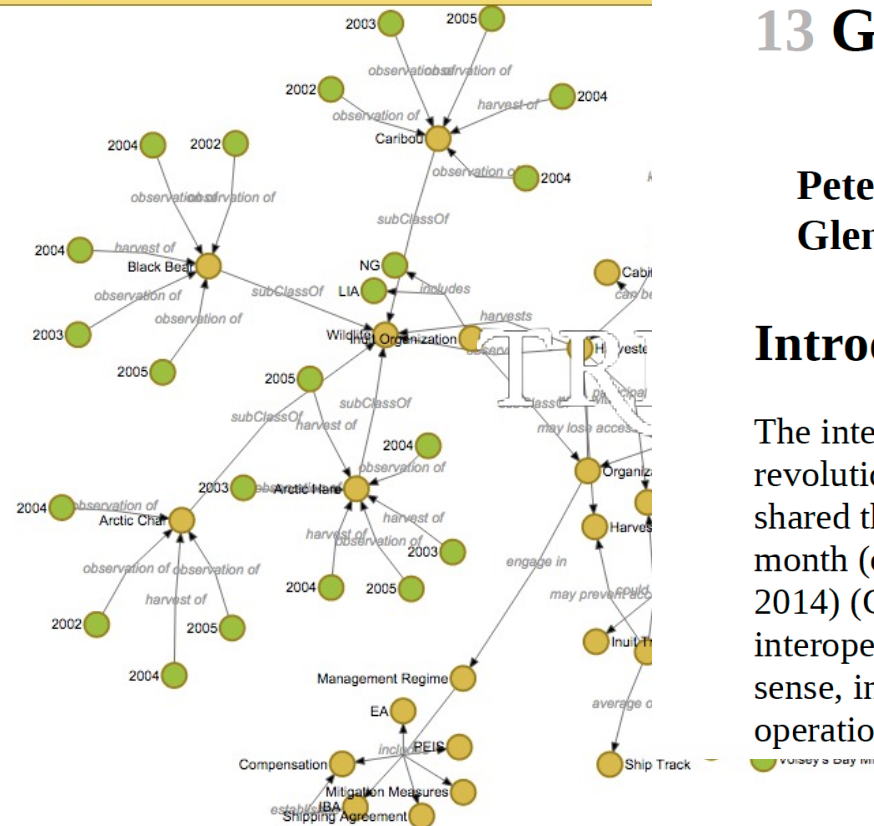


# Communicating Geo Knowledge from Nunatsiavut

## Visualization of Geospatial Knowledge Models for Nunatsiavut



C. Furgal,  
T. Sheldon Pls



## 13 Geo-Semantic Web

Peter L. Pulsifer  
Glenn Brauen

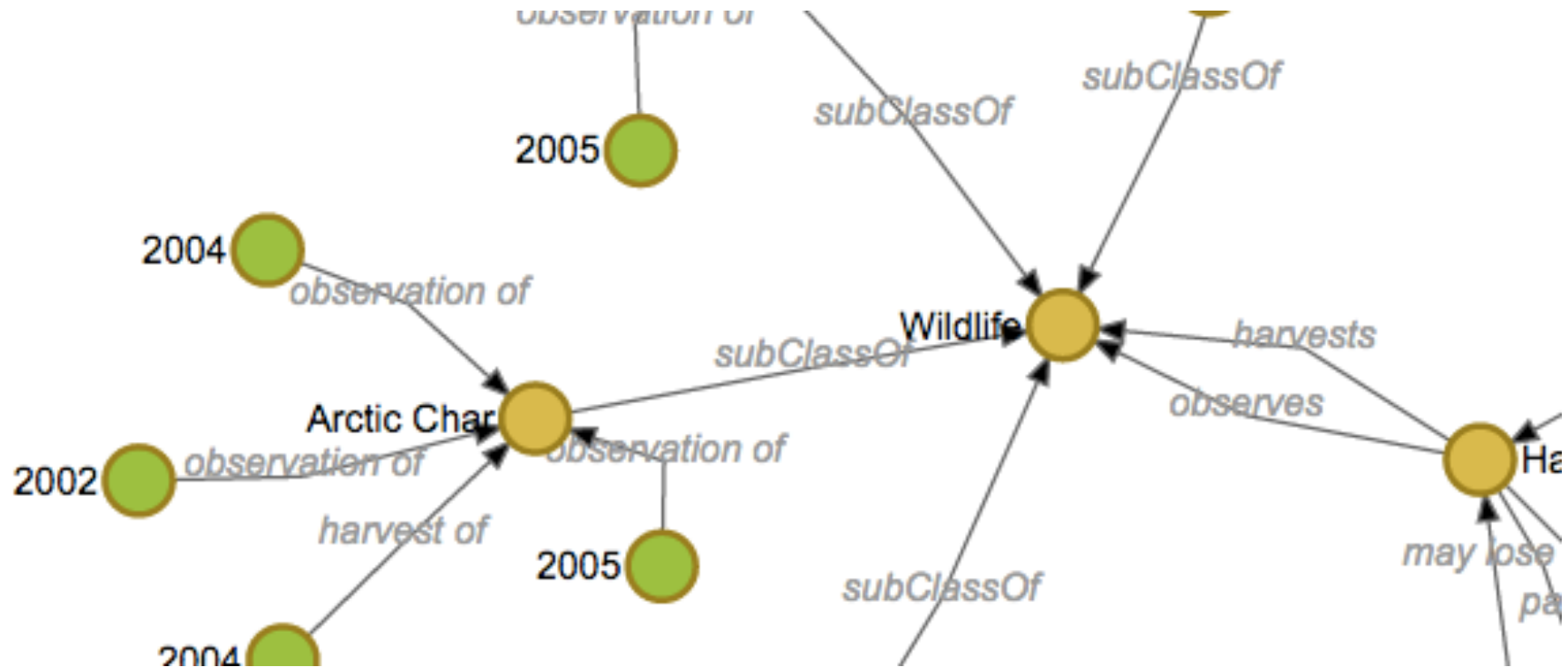
### Introduction

The internet, and the World Wide Web (the web) in particular, have revolutionised how humans share information. Massive volumes of data are now shared through the internet, with an estimated throughput of 60 exabytes per month (one exabyte = 1 billion gigabytes) and over 14 billion devices (as of 2014) (CISCO Systems, 2015). While information exchange is pervasive, interoperability between networked systems is not universal. In a very general sense, interoperability refers to the ability to readily share information and/or operations for a particular purpose across information products or systems,

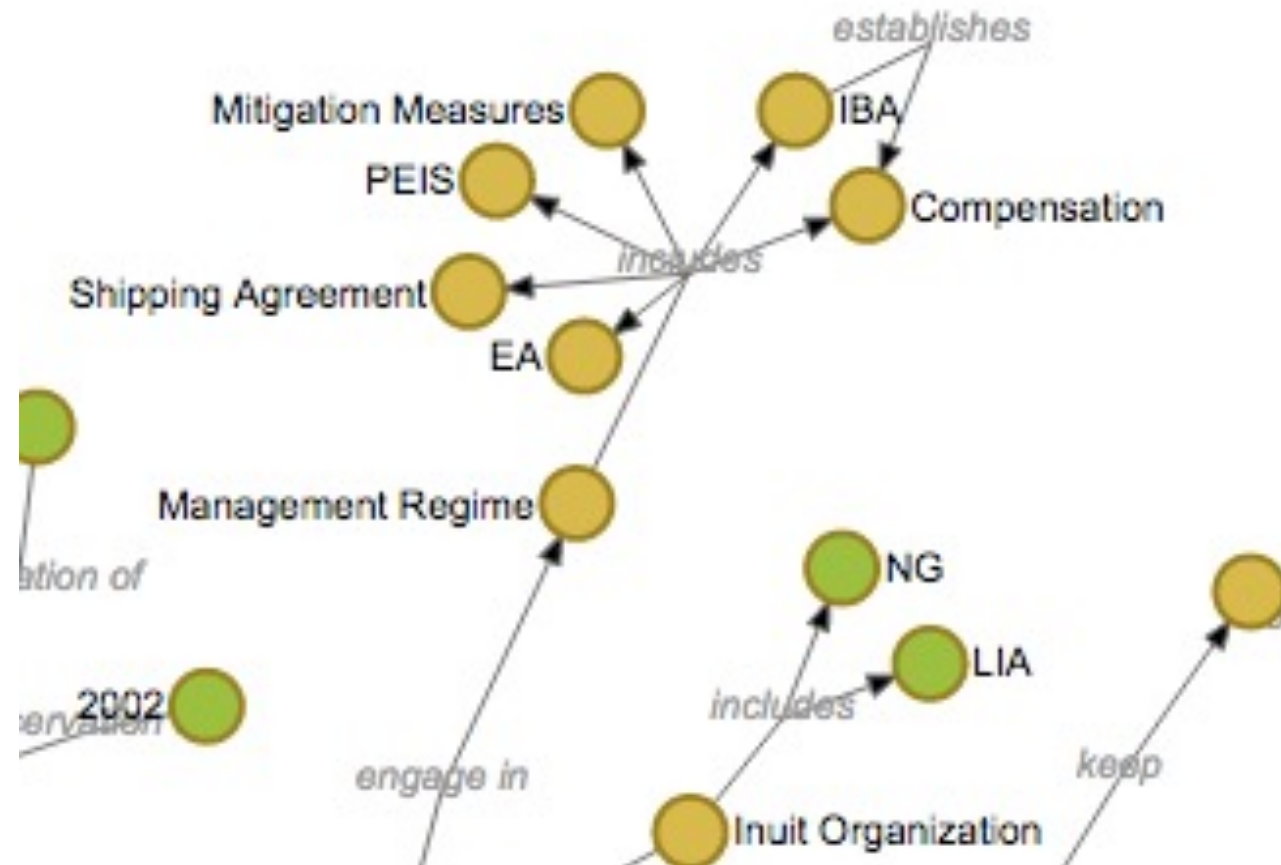
Pulsifer, P.L., Brauen, G. (2017). Geo-Semantic Web. In Understanding Spatial Media, edited by Kitchin, Rob Lauriault, Tracey P. Wilson, Matthew W., Sage , 136-148, Art No. 13, isbn: 9781473949683

Prototype from [http://www.arcticnet.ulaval.ca/research/summary.php?project\\_id=72](http://www.arcticnet.ulaval.ca/research/summary.php?project_id=72)

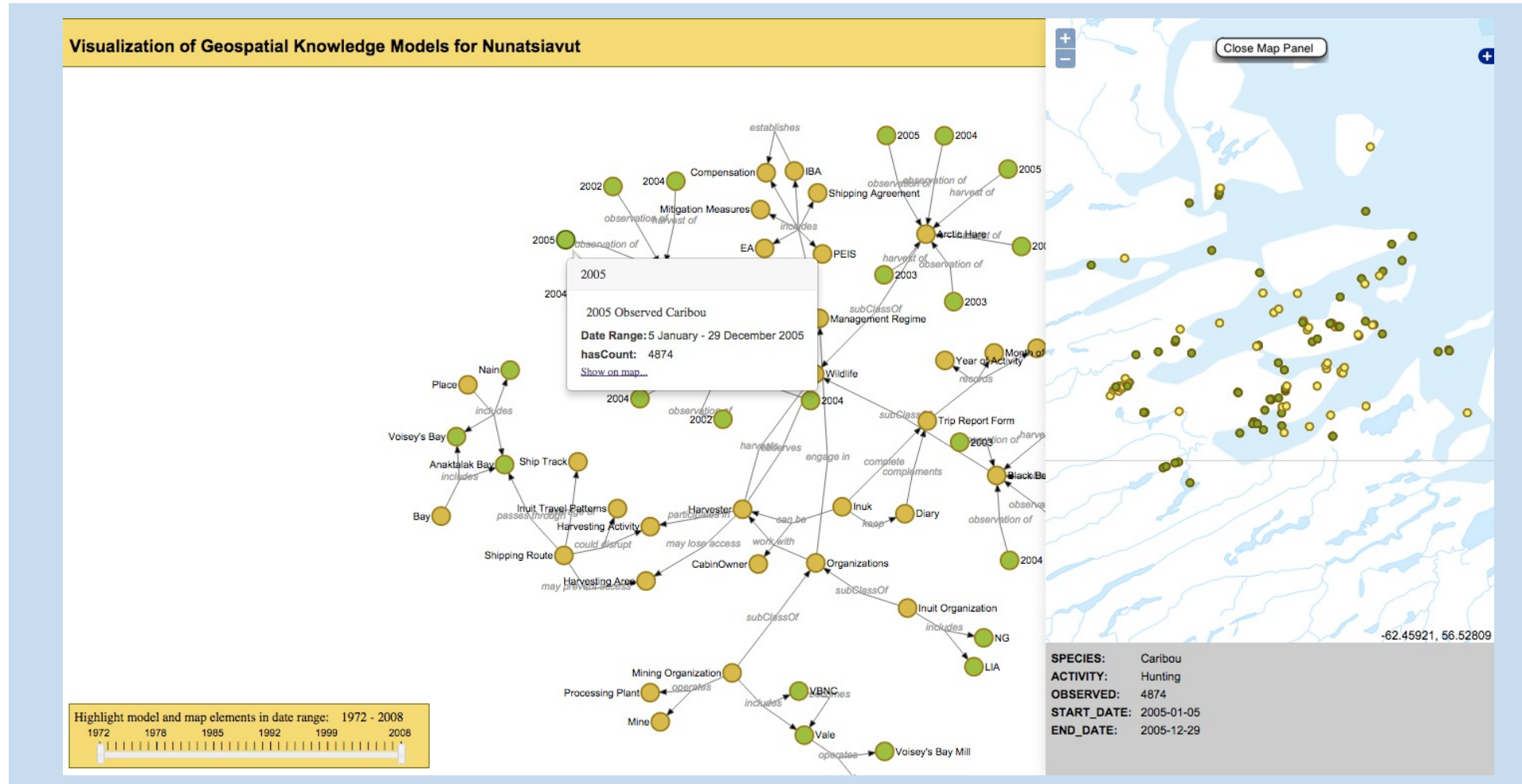
# Wildlife and Subsistence (tangible)



# Policy Frameworks (less tangible)



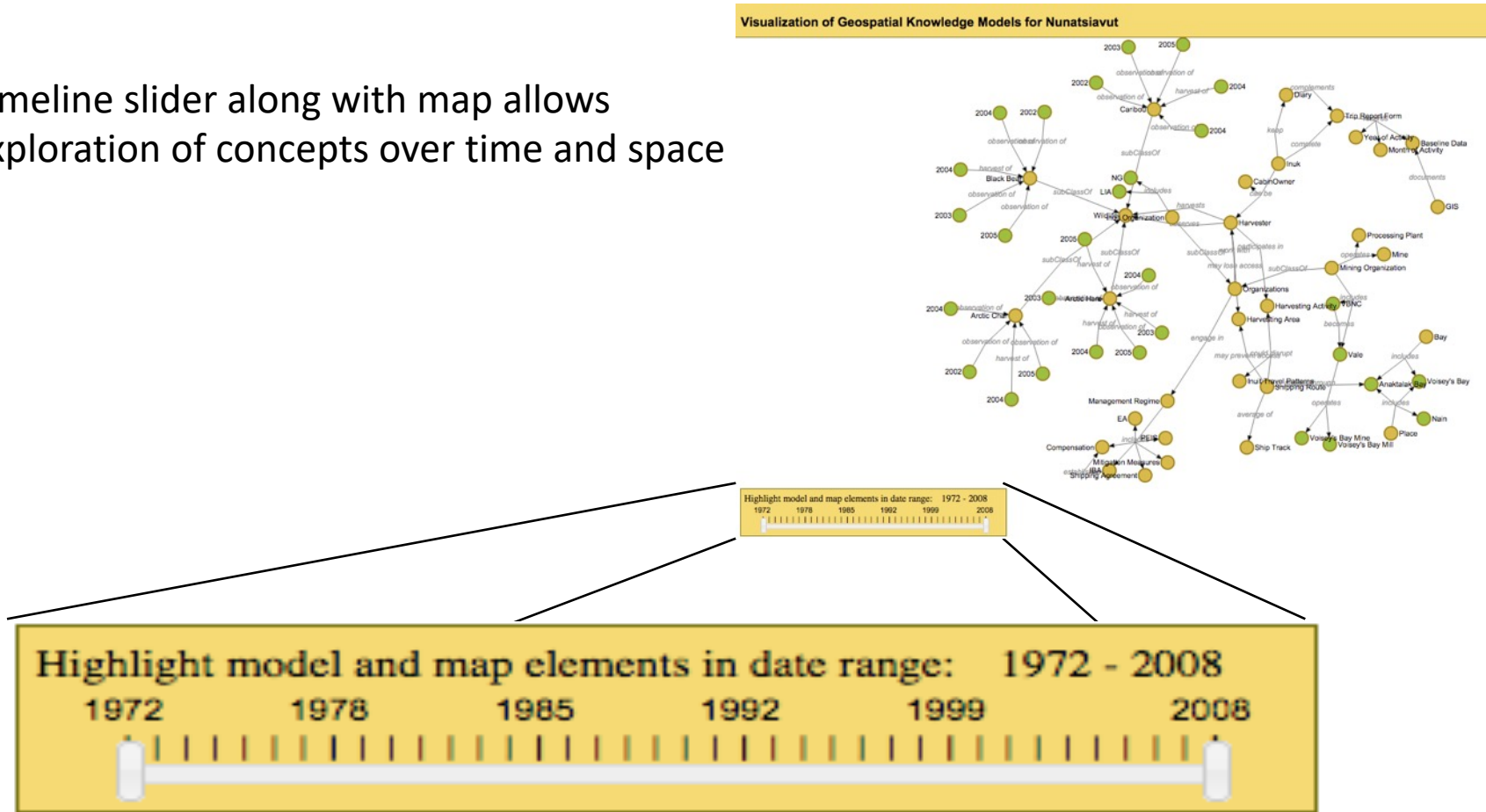
# Communicating Geo Knowledge



Integrated map allows user to explore real world instances of a particular concept (e.g. Caribou)

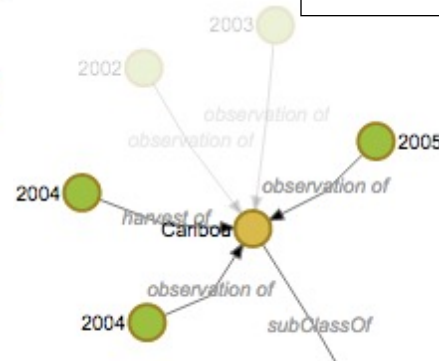
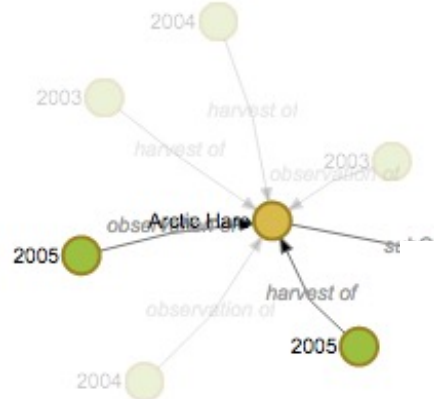
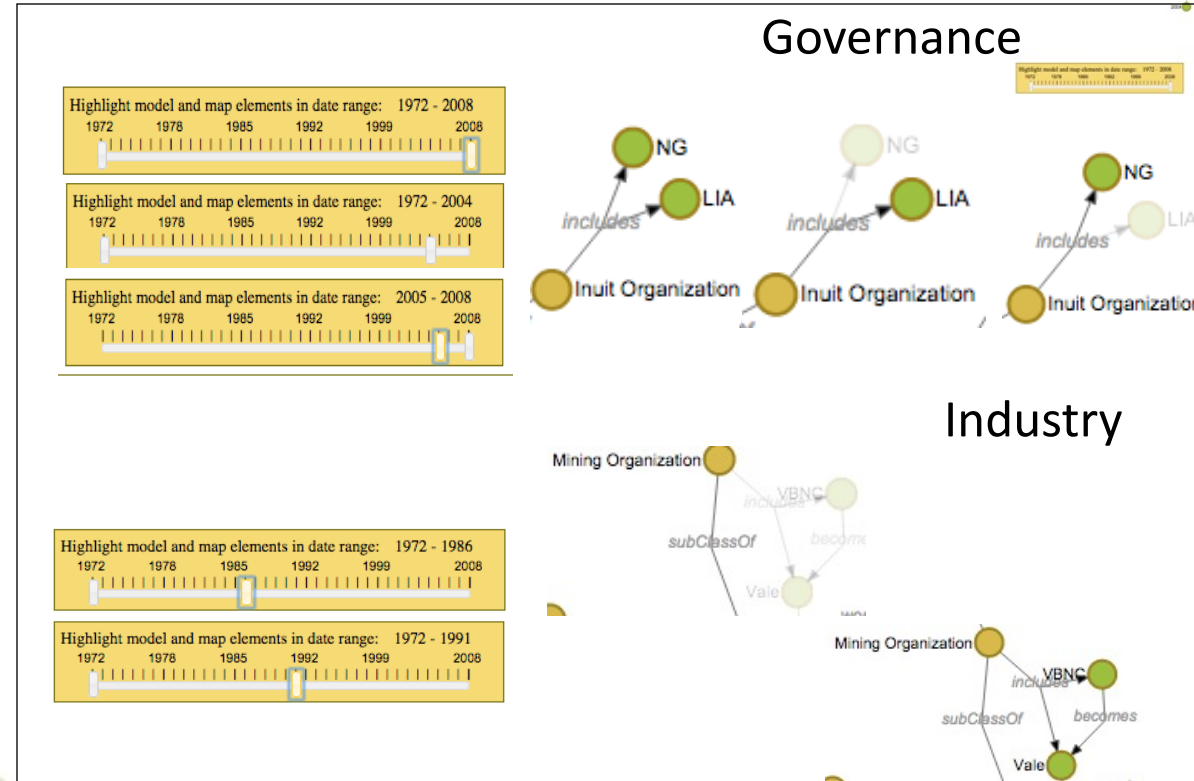
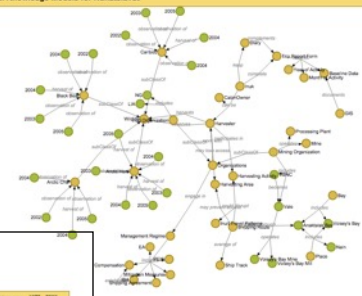
# Space and Time

Timeline slider along with map allows exploration of concepts over time and space





# Temporal Filtering



Understanding change over time is critical, and thus the tool includes the ability to filter results on both the concept and geographic maps based on when a concept or geographic feature existed.

# Understanding Iñupiat Sea Ice Knowledge

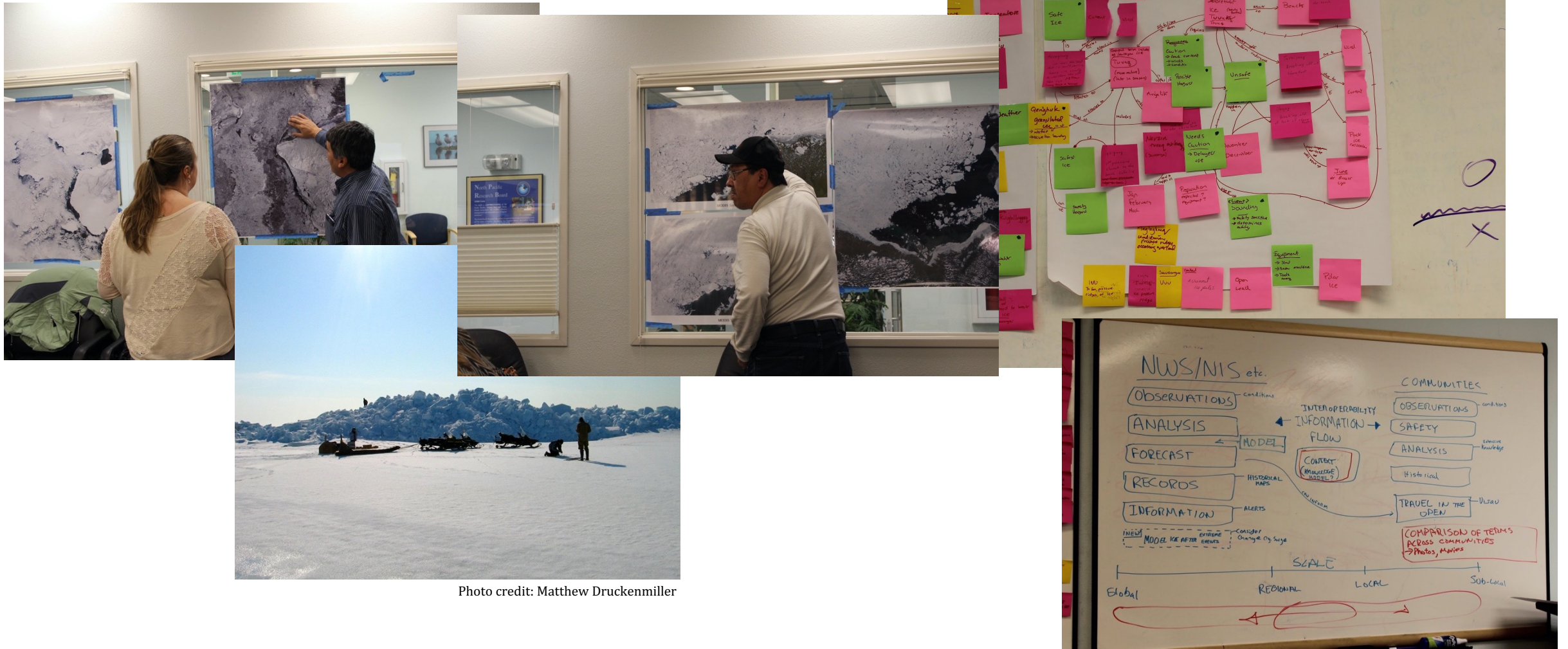
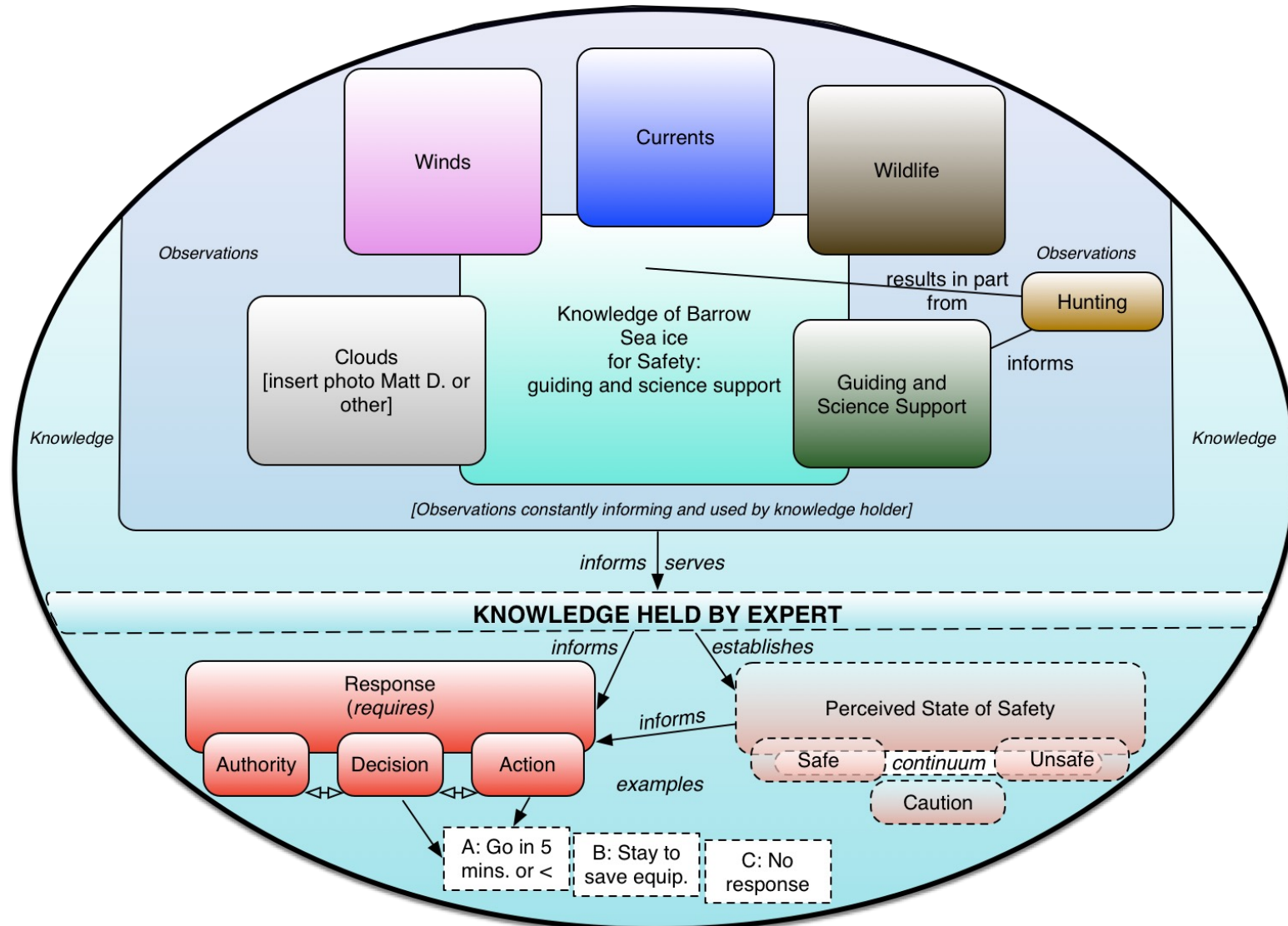


Photo credit: Matthew Druckenmiller

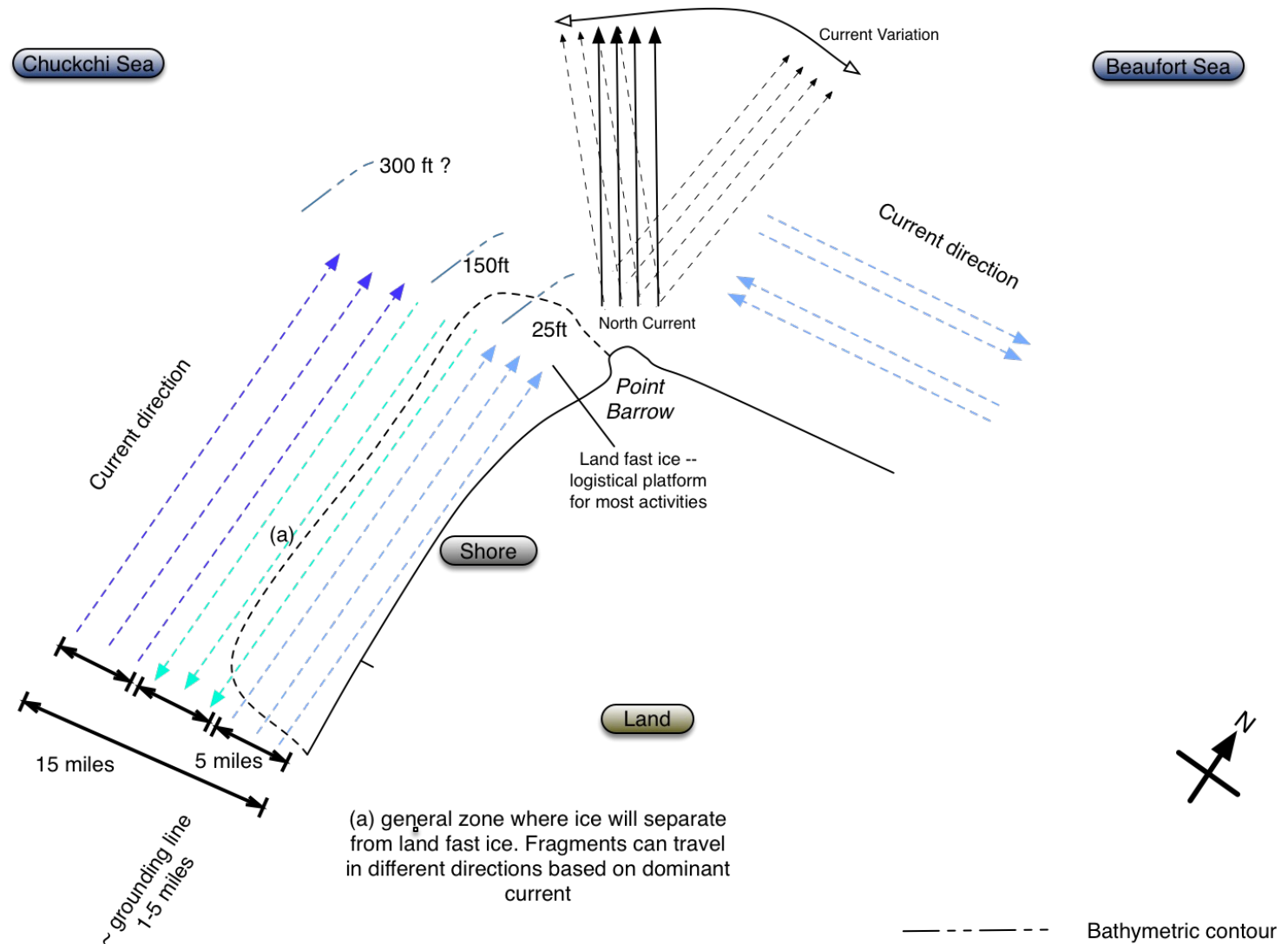
# Concept Mapping with Iñupiat Sea Ice Expert



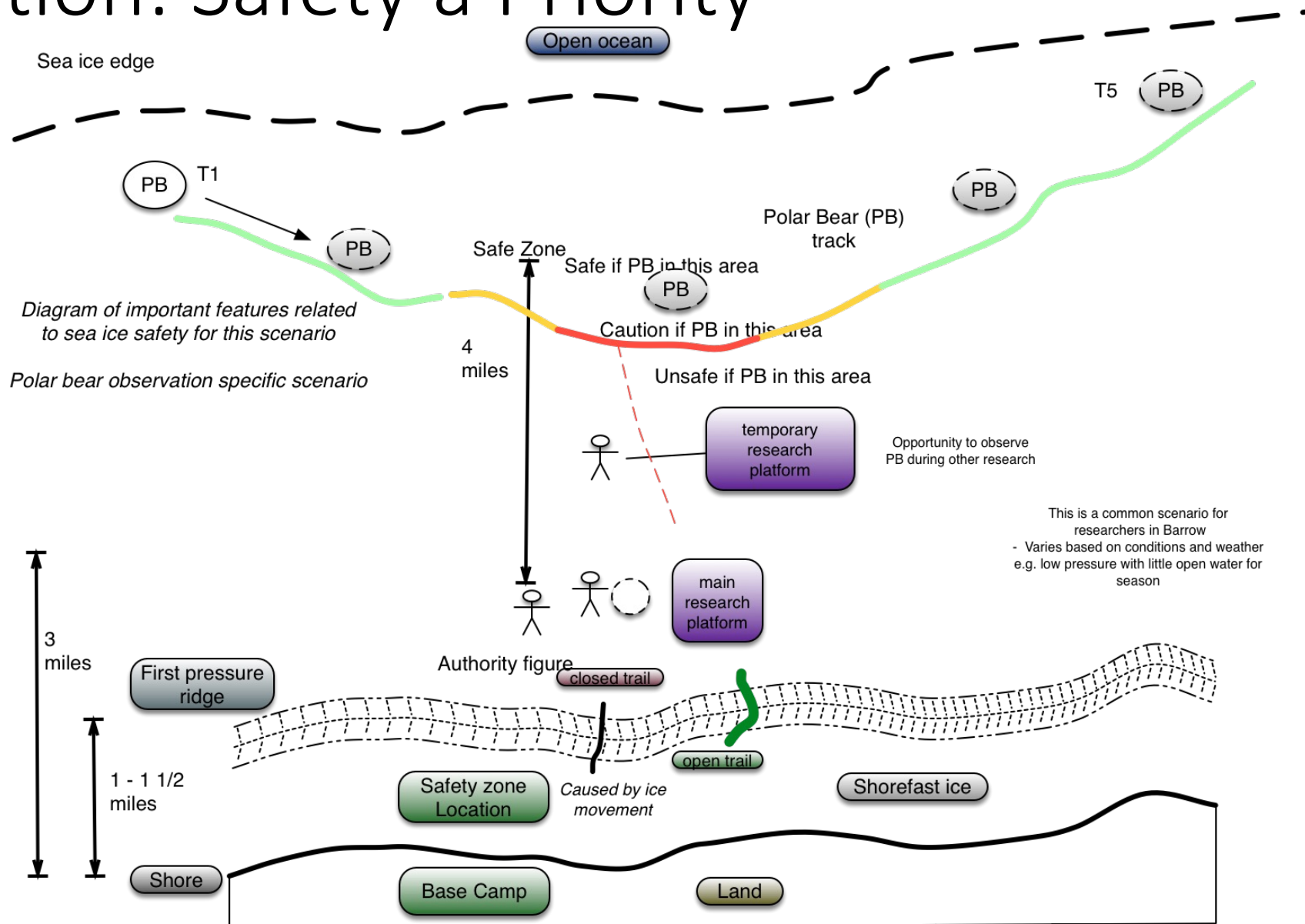
Lewis Brower  
Utqiagvik, Alaska



# Focus on Processes

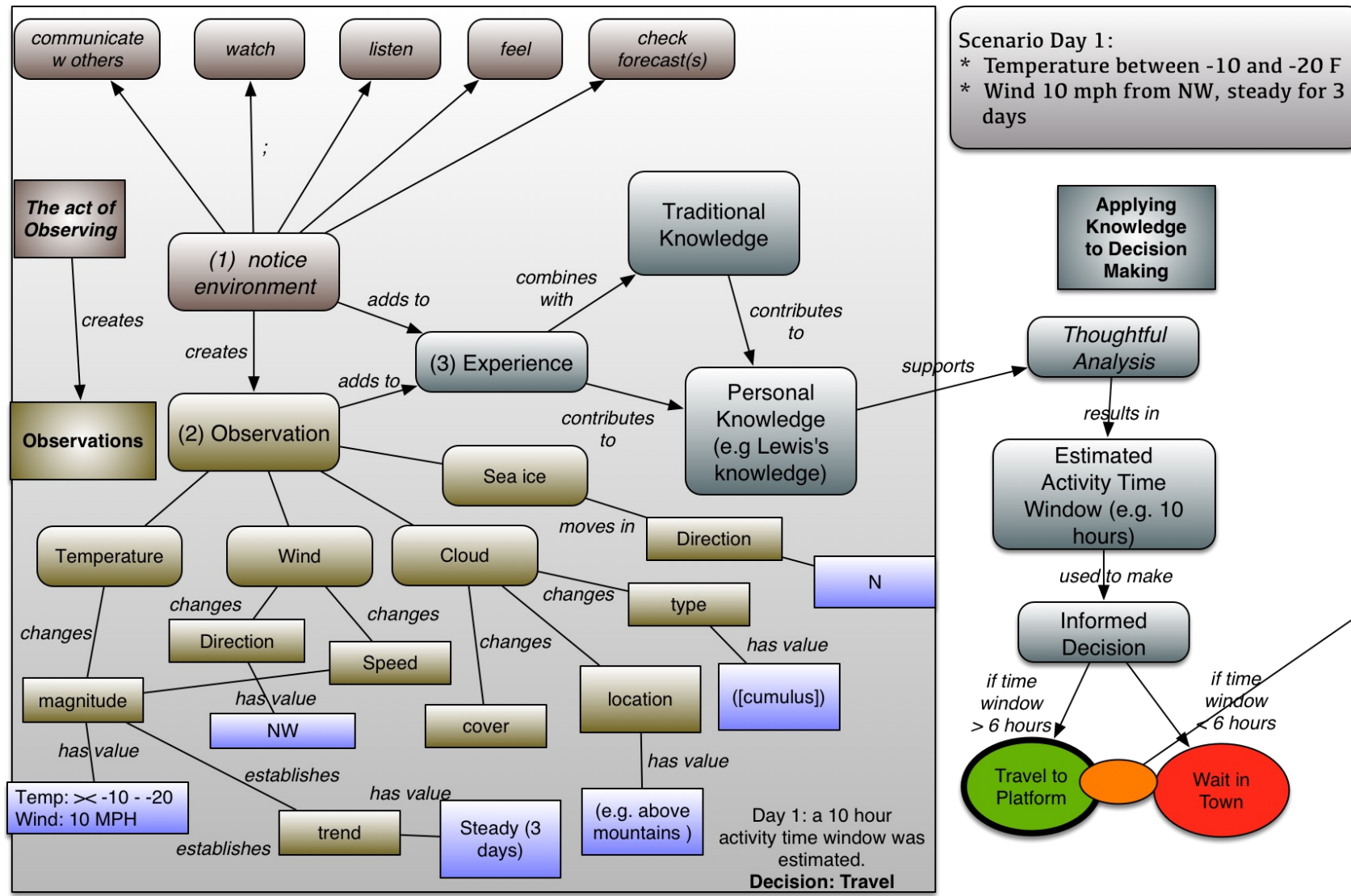


# Function: Safety a Priority

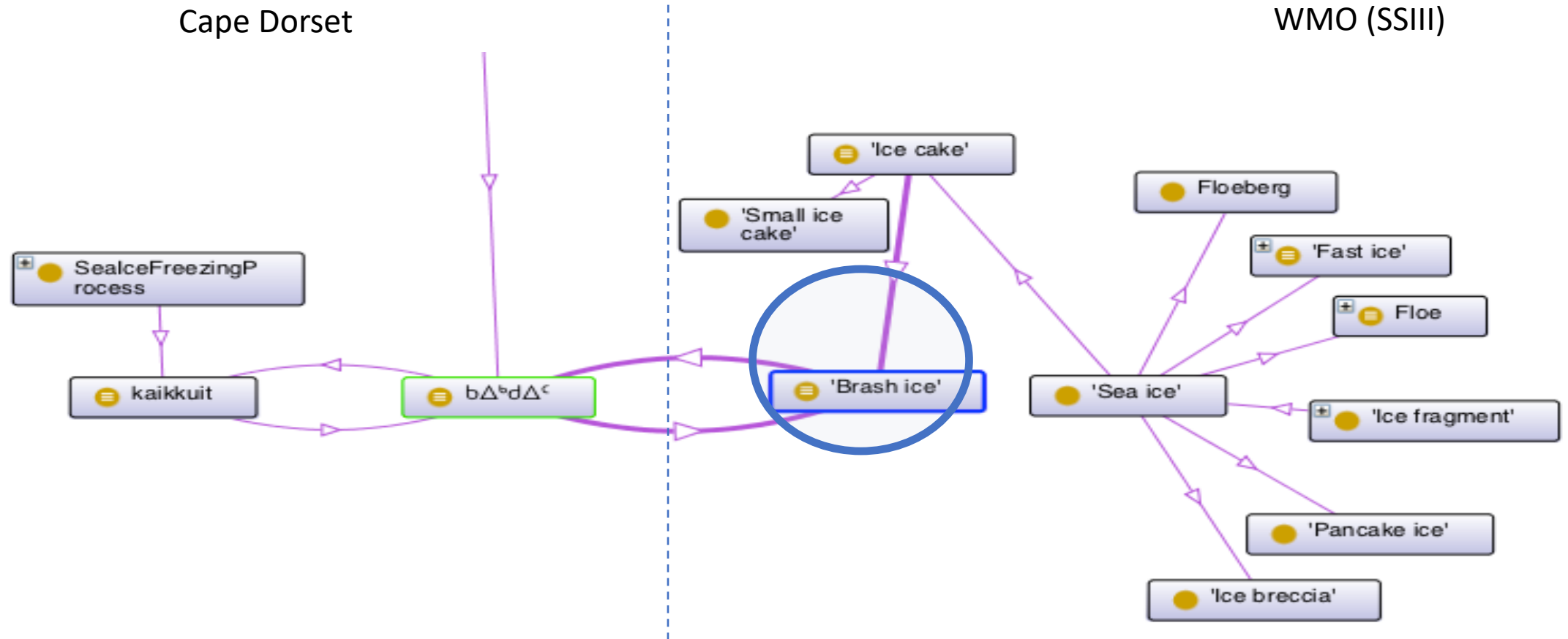




# Intricate Environmental Observing Process



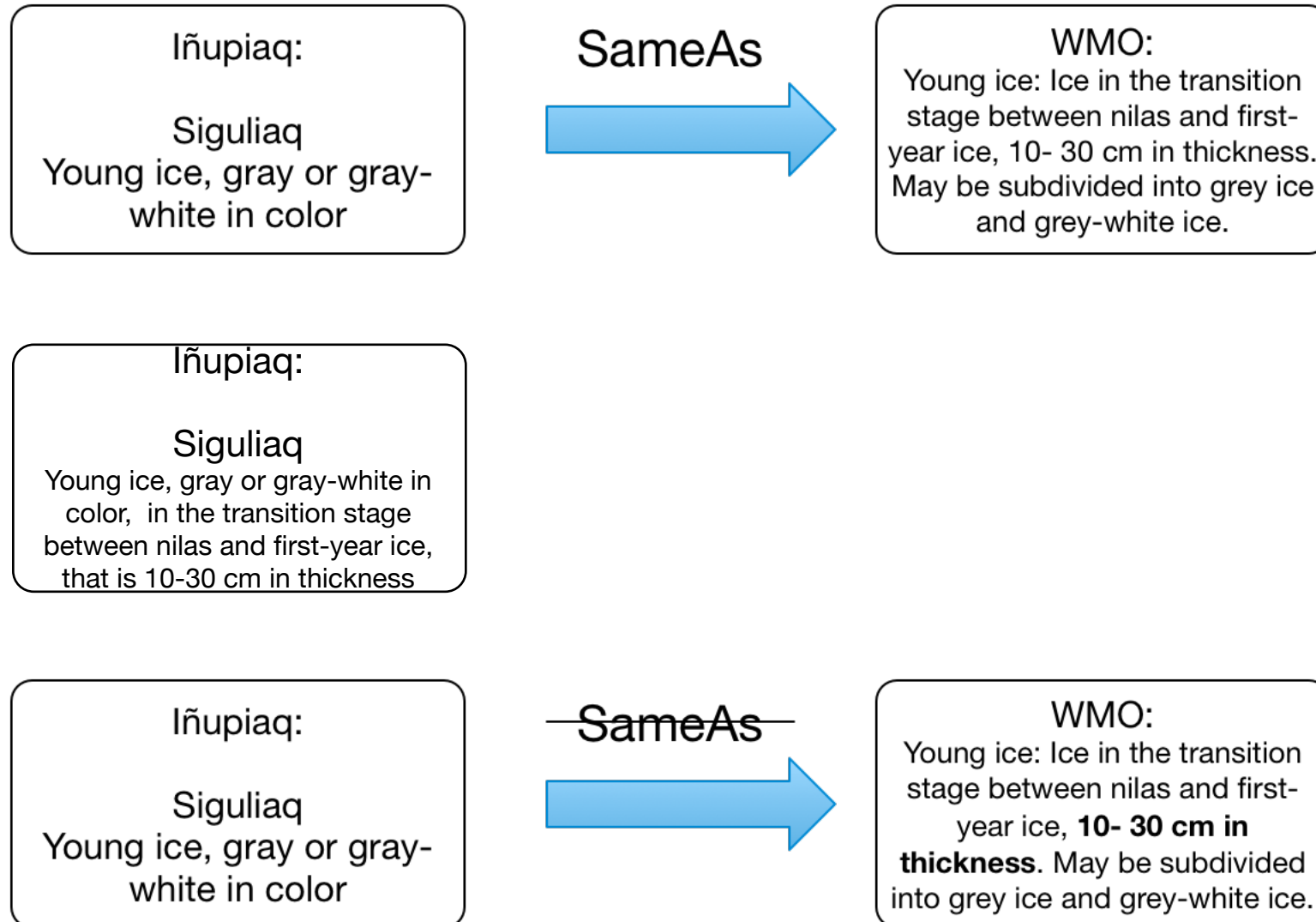
# Goal: Geo-Semantic Mediation Across Knowledge Domains (ideal)



<https://sikuatlas.ca/index.html>

## WMO Nomenclature

# Semantic Challenges



# Critical Ontology Questions

- The development of new knowledge modeling and representation techniques raises important questions

# Implications of Translating Knowledge to Code

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- <Ontology xml:base="http://www.semanticweb.org/ontologies/2012/3/capedorsetseaiceontology.owl" ontologyIRI="http://www.semanticweb.org/ontologies/2012/3/capedorsetseaiceontology.owl">
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</Literal>
```



# Reflexive Approach to Mediation Research

- Are these methods appropriate for modeling all kinds of knowledge (e.g. Indigenous)?
- How might modeling in this way affect knowledge access and control?
- What are the risks of misrepresentation?
- Will linking to other knowledges 'dilute' or negatively transform different kinds of knowledge?
- Increased risk of knowledge appropriation?

- Duerr, Ruth E, James McCusker, Mark A Parsons, SiriJodha Singh Khalsa, Peter L Pulsifer, Cassidy Thompson, Rui Yan, Deborah L McGuinness, and Peter Fox. "Formalizing the Semantics of Sea Ice." *Earth Science Informatics* 8, no. 1 (2015): 51–62.
- Eicken, Hajo, Finn Danielsen, Matthew Druckenmiller, Maryann Fidel, Donna Hauser, Lisbeth Iversen, Noor Johnson, et al. "Community-Based Observations Help Interface Indigenous and Local Knowledge, Scientific Research, and Education in Response to Rapid Arctic Coastal Change." In *EGU General Assembly Conference Abstracts*, 12248, 2020.
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# Theme 4: GCRC



## Research Team

Some of the Geomatics and Cartographic Research Centre team (from left to right: Stephanie Pyne, Amos Hayes, Jean-Pierre Fiset, Kumiko Murasugi, Jason Wong, Leah Ronayne, Robert Oikle, Fraser Taylor, Tracey Lauriault, Adam Stone, Romola Trebilcock, Tara McWhinney, Peter Pulsifer, Opoku Asenso)

# ITK National Inuit Strategy on Research (NISR) 2018



<https://www.itk.ca/wp-content/uploads/2020/10/ITK-National-Inuit-Strategy-on-Research.pdf>



# NISR Priority Area 4: Ensure Inuit access, ownership, and control over data and information

## Actions:

- 4.1 Advocate for the consistent production and sharing of Inuit-specific and Inuit-relevant indicators and data, including the Inuit Health Survey
- 4.2 Invest in culturally-relevant, community-based technology to facilitate access to and management of data and information
- 4.3 Develop Inuit-specific guidelines on data accessibility, ownership, and control
- 4.4 Create and invest in digital Inuit Nunangat data repositories that are inclusive of Inuit knowledge in ways that are respectful of its distinctive forms as well as the Inuit norms that govern its use and sharing

# Nunaliit

- Collect, organize, present, preserve, collaborate
- Multiple representations (oral histories, maps, graphs, timelines, spoken features, custom visualizations, etc.)
- Relate qualitative and quantitative data
- Multiple simultaneous uses from single system
- Distributed architecture
- Co-developed with communities
- Open Standards, Open Source

Nunaliit Distributed Data Management Network for Local And Traditional Knowledge



**Partner with Nunaliit data centre**

Geomatics and Cartographic Research Centre  
Exchange for Local Observations and Knowledge of the Arctic (ELOKA)  
CentroGeo

**Relationships**

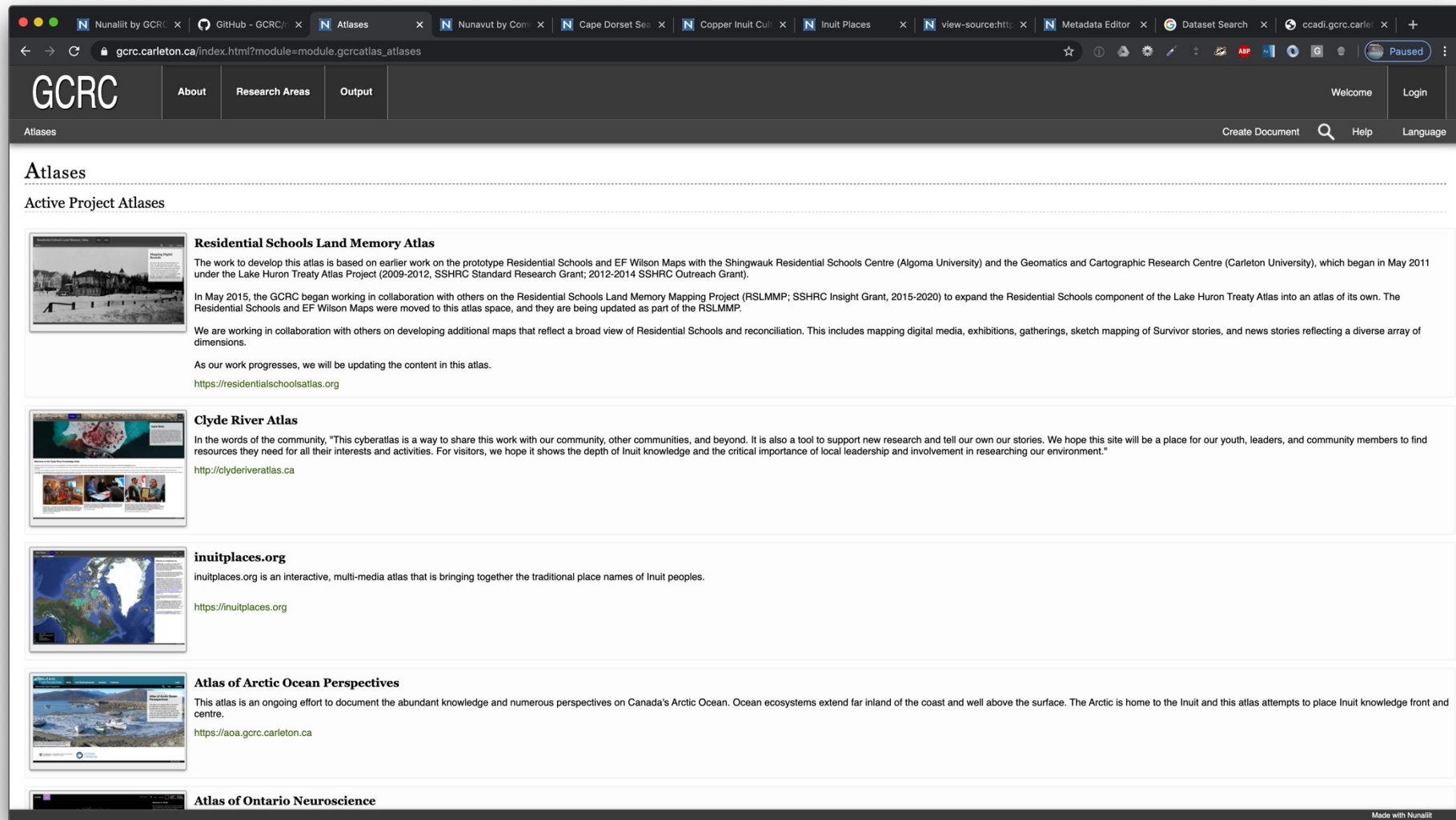
**Partner with local Nunaliit server**

Kitikmeot Heritage Society  
University of São Paulo  
University of São Luís  
Gjoa Haven Hunters and Trappers Association

**Network hosted partners and projects**

Government of Nunavut  
Ittaq Heritage and Research Centre  
Sahtú Renewable Resources Board  
Nunavut Tunngavik Inc.  
National Museum of Denmark  
Inuit Circumpolar Council  
Slave River Coalition  
Inuit Tapiriit Kanatami  
Robertson Huron Signatories  
Terrar Peninsular  
University of Alaska Fairbanks  
Inuit Places Atlas  
Thule Atlas  
Towards a Sustainable Fishery for Nunavummiut Atlas  
Nunavut Coastal Resource Inventory Atlas  
Clyde River Knowledge Atlas  
Residential Schools Land Memory Mapping Project  
Pan Inuit Trails Atlas  
Lake Huron Treaty Atlas  
Views from the North  
Atlas of the Languages of Iran  
Inuktitut Lexicon Atlas  
Paipai Atlas  
Kumeyaay Atlas  
Lençois Maranhenses Atlas  
Community Knowledge Bank Project  
Chesterfield Inlet Atlas  
Naryn Atlas  
Gwich'in Place Names Atlas (CA)  
Gwich'in Place Names Atlas (US)  
Yu'pik Environmental Knowledge Project  
Alaska Native Placenames Project  
Atlas of Community-Based Monitoring in a Changing Arctic  
Local Observations from the Seasonal Ice Zone Observing Network (SIZONet)  
PISUNA-Net  
Nunaput: Our Land, Community Atlas for Chevak, Alaska  
Deg Hit'an Dingan' Atlas  
Koyukuk River Traditional Place Names Atlas  
Evenki Atlas

GCRC and its partners around the world are using and hosting instances of Nunaliit. This map highlights the network of Indigenous and local knowledge initiatives making use of the framework and contributing to its development as of 2019.



Atlas examples:  
<http://gcr.ccarleton.ca/atlases/>



# Arctic Bay Atlas

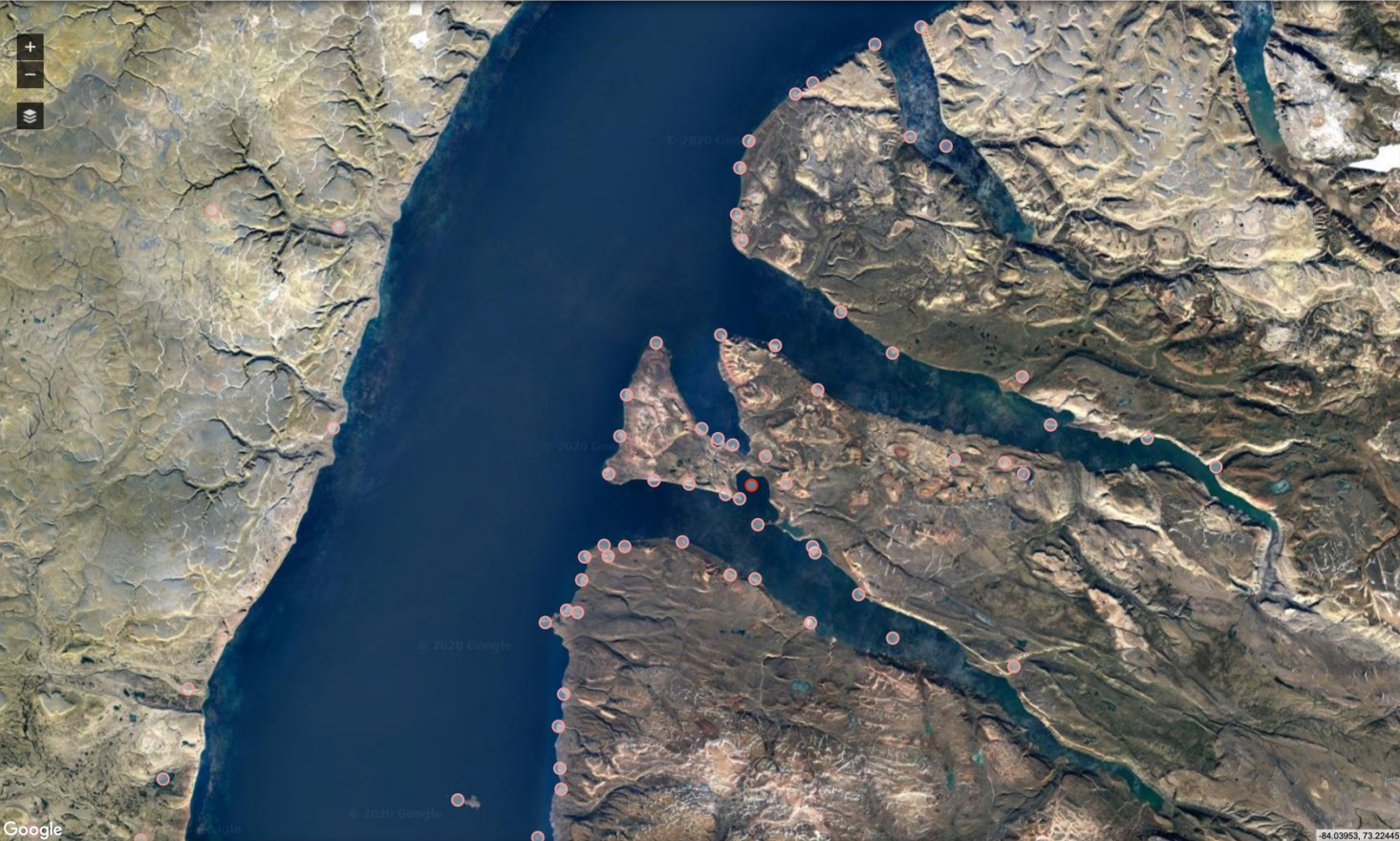
[Introduction](#)[Spoken Map](#)[Quest Map](#)[PDF Maps](#)[Artists](#)[About](#)

WelcomeLogin

Spoken Map

+


-



Google

-84.03953, 73.22445

Media




More Info

Media

Caption

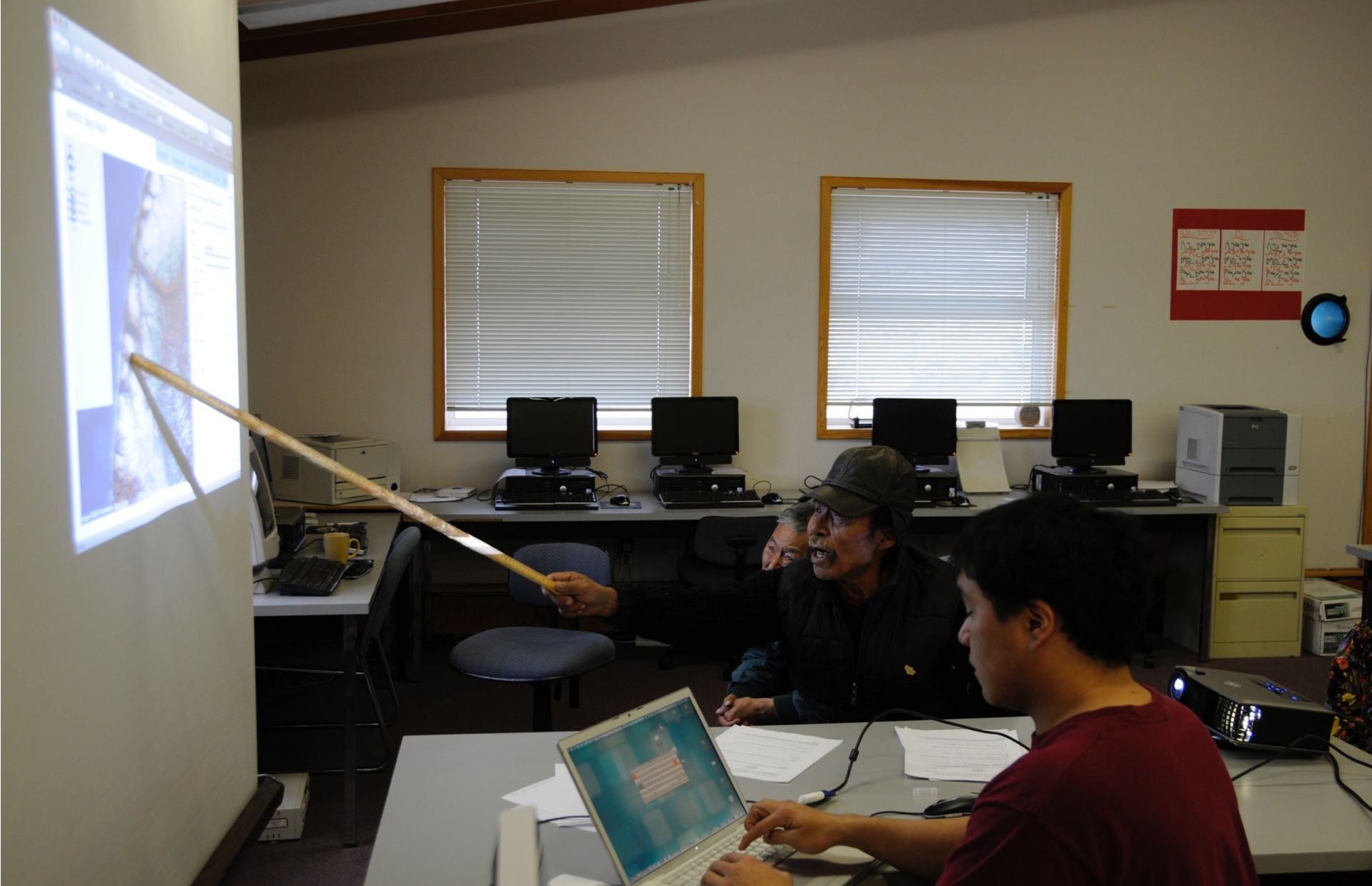
Artwork courtesy art students of Innujaq School



Made with Nunalit

The Arctic Bay Atlas spoken map contains local place names collected from Elders by youth in the community. You would also record the pronunciation of the place names and add them to the atlas along with photos, video, and artwork.





Arctic Bay Elders work with Rex Willie to edit the spoken place names map, now also a part of [inuitplaces.org](http://inuitplaces.org)



Inuit Places

Map

About

Tools

Welcome

Login

Inuit Places

All Contributors

Create Document

search the atlas

Help

Language

+

-

Cluster of places

Cluster of places (including spoken 🗣️)

Inuit place

Inuit place (spoken 🗣️)

With Additional Media 📷📹🎧

Paaliaryuk

Unknown

Feature Type inlet

Sources KHS; Kitikmeot Atlas Project

Add Related Item


Geometries

Source (1)

Media (1)

Media

Caption Frank Analok talks about Paaliaryuk inlet and how people used to fish in weirs there.



More Info

71.39455, 69.40363

Made with Nunaliit

Frank Analok describes Inuit places in the [inuitplaces.org](https://inuitplaces.org) atlas, a joint effort between the Kitikmeot Heritage Society, the Geomatics and Cartographic Research Centre, and several knowledge holders to offer a comprehensive view of Inuit places without national or territorial boundaries.





Kitikmeot Heritage Society researcher Darren Keith works with board members Margaret Ohina, Jimmy Ohina, and Doris Koihok on the Inuit Places atlas using a touch screen connected to their local Nunaliit server installed in Cambridge Bay.

Inuktut Lexicon Atlas

Word List

Dialect Chart

Sculptionary

Community Map

About

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Body Parts

search the atlas

Help

Language

Inuinnaqtun



### taliq

English equivalent

arm

Type

Noun - Singular

Category

Body Parts

Dialect

Inuinnaqtun

Community

Source

THA; Angulalik (2012)

Add Related Item

+ Category (1)

+ Dialect (1)

+ Sculptionary Hotspot (1)

Made with Nunaliit

The Inuktut Lexicon Atlas has several modules designed to help document and explore Inuktut dialects. The Sculptionary (pictured) uses an Inuit carving by Nelson Takkiruk (1930-1999) of Gjoa Haven to teach words for body parts in twelve Inuit dialects.



Inuinait Knowledge Bank

IKB Grid

IKB Map

Tools

Welcome

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IKB Grid Canvas










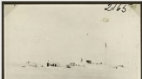


























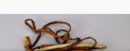







Types

Cultural Groups

Institutions

Create Document

Language

|   |  |  |  |  |   |  |   |   |
|---|--|--|--|--|---|--|---|---|
|    |   |   |   |   |    |   |    |    |
| Man's inner coat  | Man's outer coat   | Man's outer coat   | Man's outer coat   | Man's outer coat   | Man's outer coat  | Man's outer coat   | Man's outer coat  | Man's outer coat  |
|   |   |   |   |   |    |   |    |    |
| Man's outer coat  | An encampment of snow huts. The picture is most likely captured on the journey between King William Island and Liston Island in the period between the 1st and 2nd of July 1916. | Two persons in an ice-house built for fall. To the left it is most likely Mr. H. Clarke, who was the administrator of trade at Kent Peninsula and also the manager of the station. | Two persons in an ice-house built for fall. To the left it is most likely Mr. H. Clarke, who was the administrator of trade at Kent Peninsula and also the manager of the station. | Two persons (names unknown) in the middle of a settlement of snow huts. The picture is most likely captured on the journey between King William Island and Liston Island in the period between the 1st and 2nd of July 1916. | Two persons in the entrance to a snow hut. The picture is most likely captured in the area around Sutton and Liston Island in Dolphin and Union Strait. | Two persons (names unknown) are building a snow hut from big blocks of ice. The picture is most likely captured on the journey between King William Island and Liston Island in the period between the 1st and 2nd of July 1916. | Iqtuqhit Skin Stretcher   | Inuujaq Doll Lena Kamoayok  |
|    |   |   |   |   |    |   |    |    |
| Seal indicator 1910 / 1916-07-13 IV-D-94 r5 a,b Coronation Gulf, Nunavut            | Halukhit Skin Scraper  | Ivalunut mitqutaut Sinew thread bag Mary Avalak  | Ulu Ulu knife  | Inuujaq Doll Lena Kamoayok   | Tuullip amia mitqutaut Loon skin sewing bag Mary Avalak   | Halukhit Scraper Mabel Angulalik   | Halukhit Skin Scraper   | Halukhit Skin scraper   |
|    |   |   |   |   |    |   |    |    |
| Kimaliq ulu Sewing ulu Mary Kilaadluk   | Leister 1910 / 1916 IV-D-106 Coppermine River, Nunavut   | Harpoon line 1910 / 1916 IV-D-112 a-b  | Archaeology at Iqaluktuuq Pitquhirnikkut Ilihautiniq   | Archaeology at Halukuit Pitquhirnikkut Ilihautiniq   | Archaeology at Halukuit Pitquhirnikkut Ilihautiniq  | Archaeology at Iqaluktuuq Pitquhirnikkut Ilihautiniq   | Archaeologist Max Friesen speaks to a group of Cambridge Bay Elders regarding archaeological sites at Iqaluktuuq Pitquhirnikkut | Fishing rod 1910 / 1916 IV-D-375 Bernard Harbour                                      |
|  |   |   |   |   |    |   |    |  |
| Man's outer coat  | Man's outer coat   | Man's outer coat   | Man's outer coat   | Man's outer coat   | Man's outer coat  | Man's outer coat   | Man's outer coat  | Man's outer coat  |

National Museum of Denmark Object

Artifact type

Man's outer coat

Cultural group

Inuinait

Key Media

Man's outer coat, 37351 National Museum of Denmark

Object ID

37351

Old Artifact Number

P30.9

Number of pieces

1

Collection name

Ethnographic collection

Measurements

Circumference 156 cm  
Length 107 cm  
Height 75 cm

Place of Manufacture

Kent Peninsula

Place of Collection

Kent Peninsula

Material

Marmot skin, dog skin

Add Related Item

National Museum of Denmark Media (1)


National Museum of Denmark Media

Caption

Man's outer coat, 37351

Credit

National Museum of Denmark



The Inuinait Knowledge Bank is being built to house digital records retrieved from dozens of museums and cultural institutions around the world





Clyde River Knowledge Atlas

Our Stories

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Welcome

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Clyde River Old Settlement

Q

Help

Δεϋϋϋ

+

-

Base Layer

Clyde River Basemap

Overlays

Traditional Place Names

Notable Place Names

Old Settlement Buildings

Clyde River - Old Settlement 2b

Old Settlement

Inuit were a nomadic people until government policies moved them into communities starting in the 1950s. The settlement of Clyde River was originally established on the opposite side of the bay from where it is today. Only a few pieces of the old structures remain at the site these days, but preserving the history of the original location is of interest to the community.

Using old hand drawn maps and aerial photos, combined with old family photos, videos, memories and stories, we are using this module to document the history of the original Clyde River settlement. Click on the map to explore the old buildings and view photos, videos, and stories shared by community members.

Zoom in and click on the map

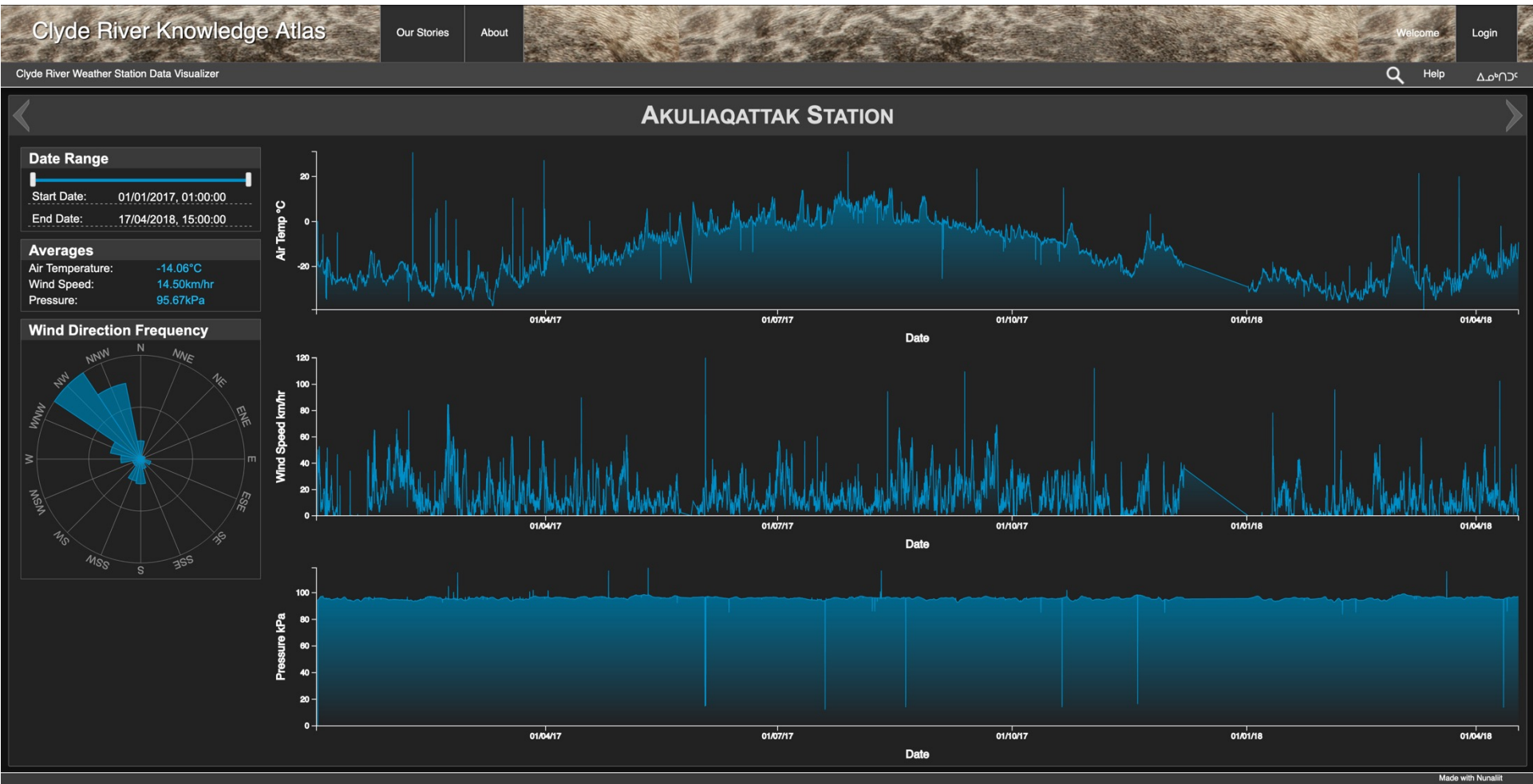
Photograph of old settlement buildings (Photo Credit: Arvid L Nelson, 1945-1946, © Clyde River, NU)

516403, 7816843

Made with Nunaliit

Using old hand drawn maps and aerial photos, combined with old family photos, videos, memories and stories, Ittaq are using this module to document the history of the original Clyde River settlement.





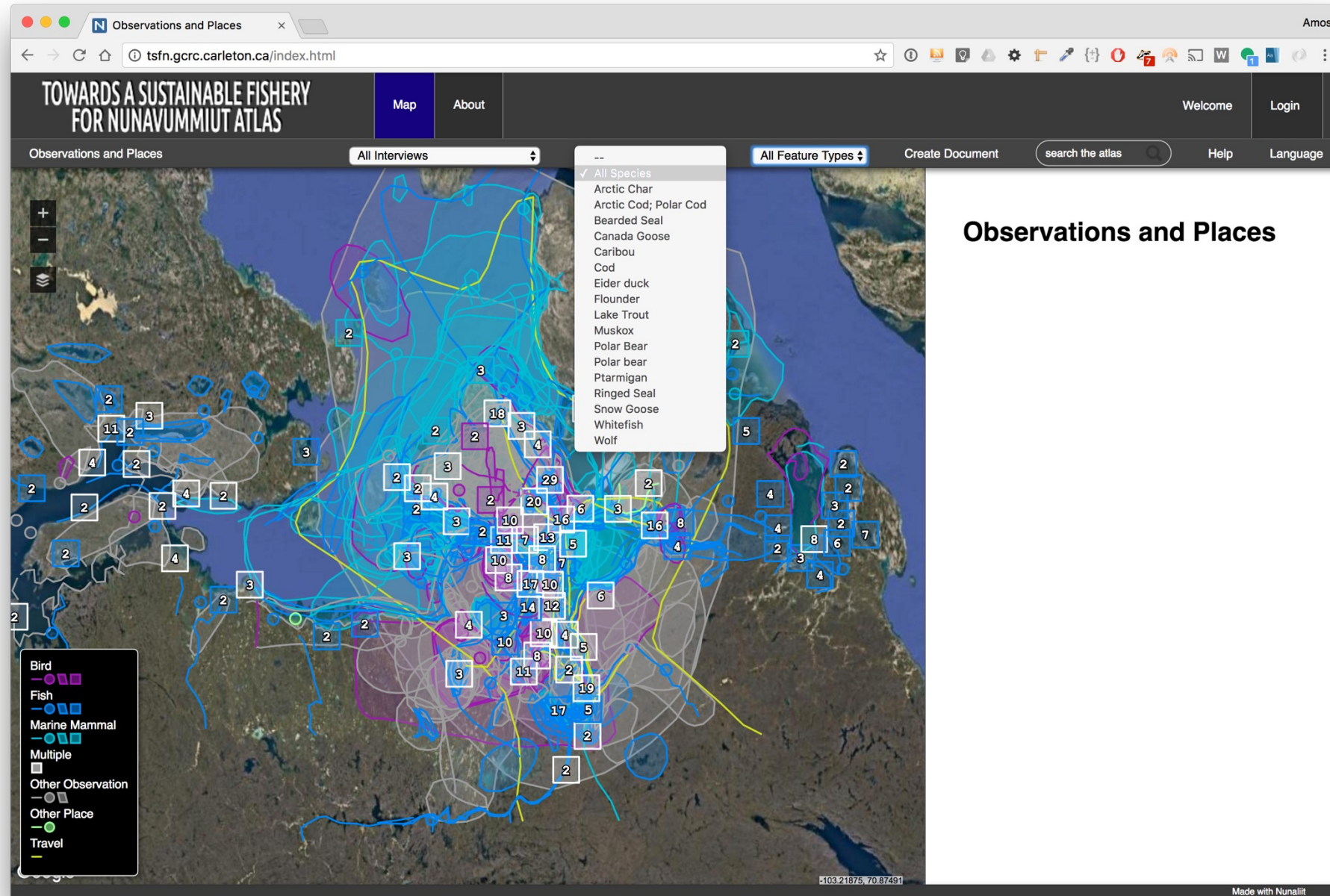
Clyde River Weather Station Data Visualizer

<https://clyderiveratlas.ca/index.html?module=module.clyderiver.weatherstationdatavisualizer>



Members of the Clyde River Atlas team (clockwise from left: Peter Pulsifer, Jean-Pierre Fiset, Mike Jaypoody, and Robert Kautuk) explore local knowledge about marine habitats available in the atlas thanks to support from Tides Canada and a partnership between the Ittaq Heritage and Research Centre, the Nunavut Coastal Resource Inventory team at the Government of Nunavut, ELOKA, and the Geomatics and Cartographic Research Centre at Carleton University.



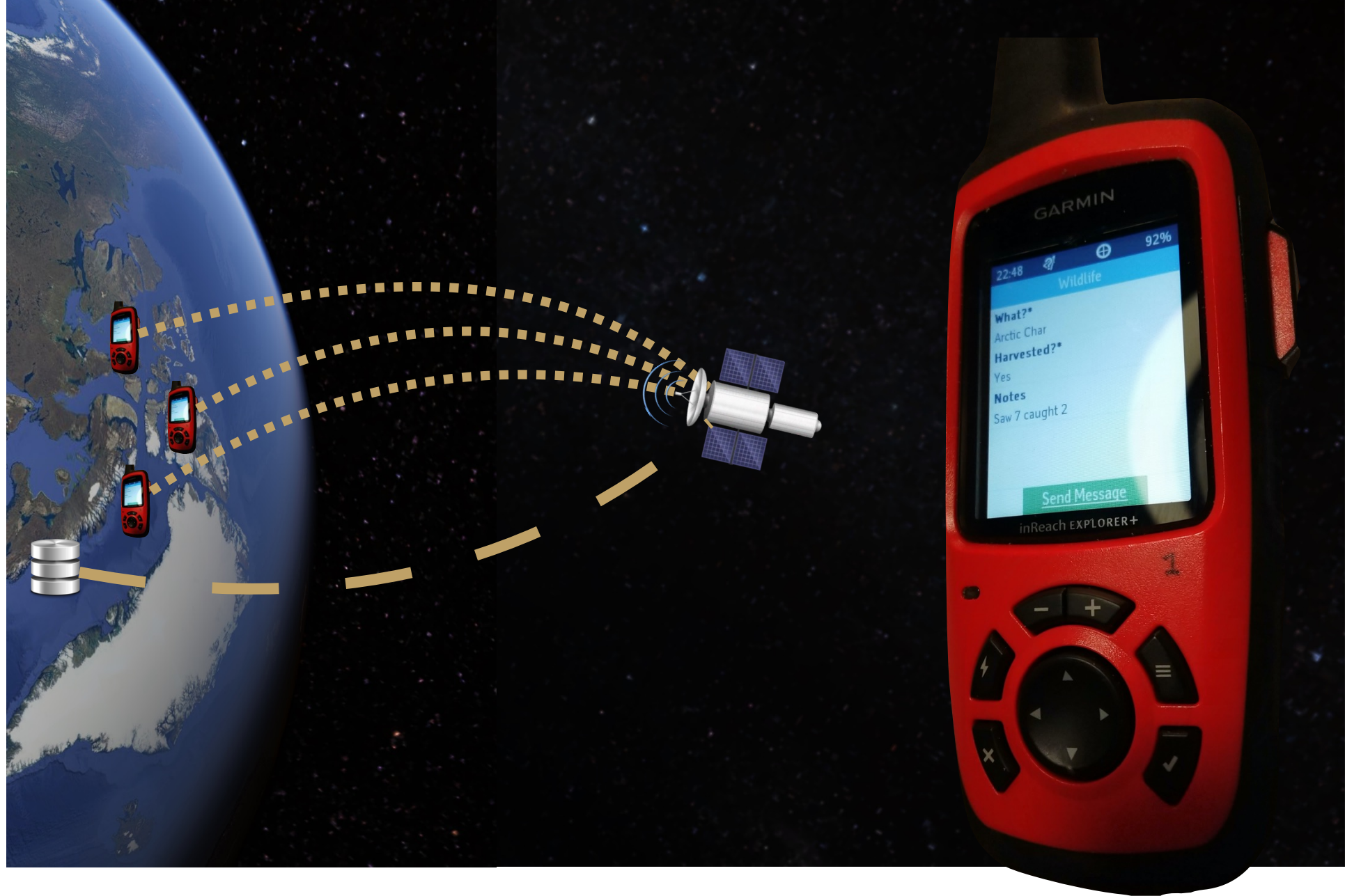


The atlas created for the "Towards a Sustainable Fishery for Nunavummiut" project uses the model developed by the Nunavut Coastal Resource Inventory to document local knowledge of species locations and behaviours as well as points of interest for hunters.





Allen Kaloon, Jordan Takkirug, Brent Puqignak, and Simon Okpakok update the Gjoa Haven harvest study atlas with their observations from the land. The device sends data via the Iridium satellite network and Qiniq into the community's Nunaliit-based atlas to be stored and immediately displayed for local use. *(Photo: Stephen Wolfe, Geological Survey of Canada)*



Custom forms co-designed with hunters allow reporting of geolocated wildlife and vessel sightings, harvests, places of interest, weather conditions, equipment troubles, and safety issues in a standardized format that ends up in systems owned by Inuit organizations.







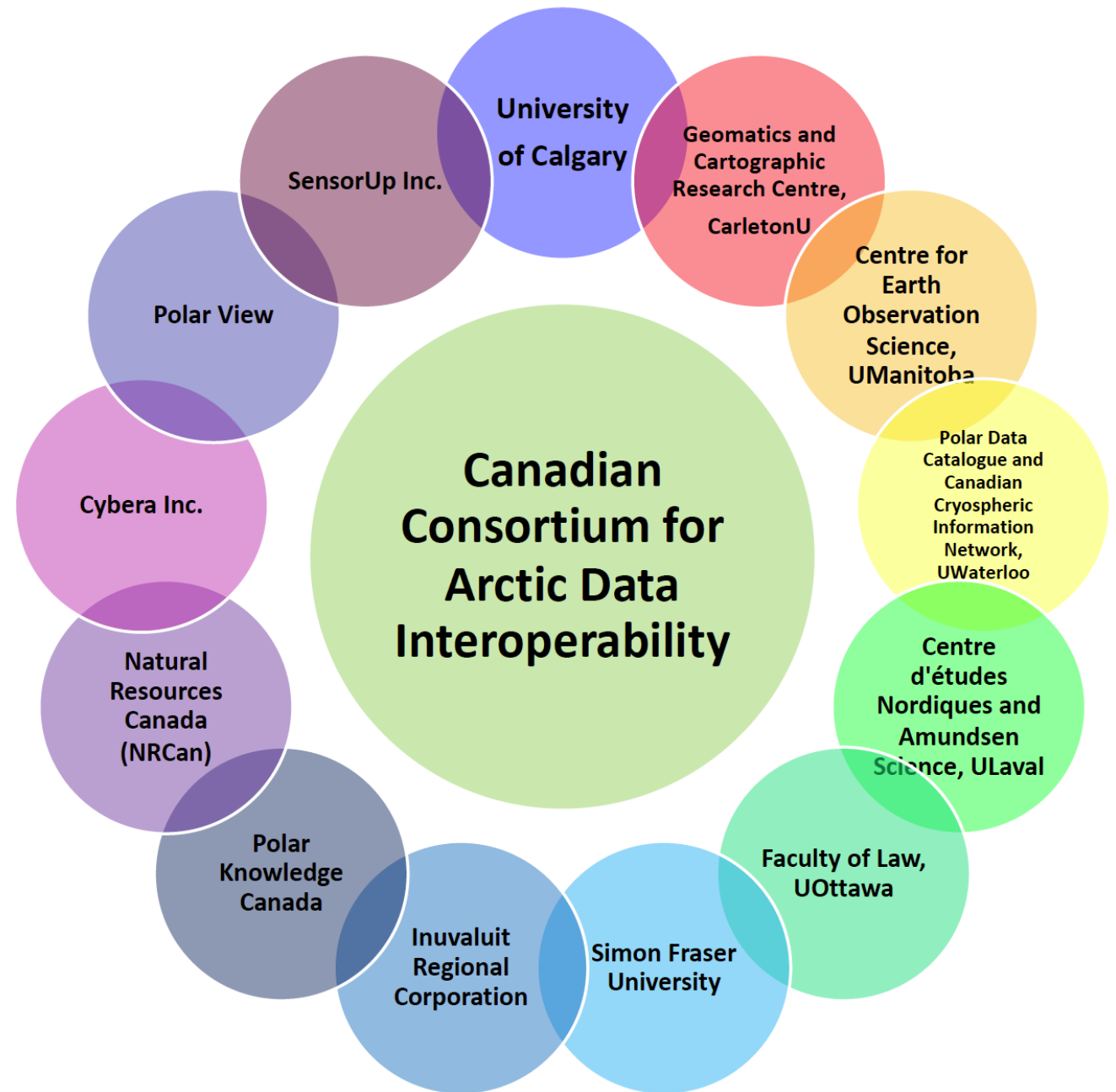


David Anaija Jr., Willy Aglukkaq, Joseph Gee, Amos Hayes, and Jordan Takkirug celebrate the installation of the Nunaliit-based "Who Is Out TV" system in the Gjoa Haven Hunters and Trappers Association office. The screen provides up to the minute locations and status reports sent by hunters in the field who sign out customized devices from the association.

# Theme 5: CCADI



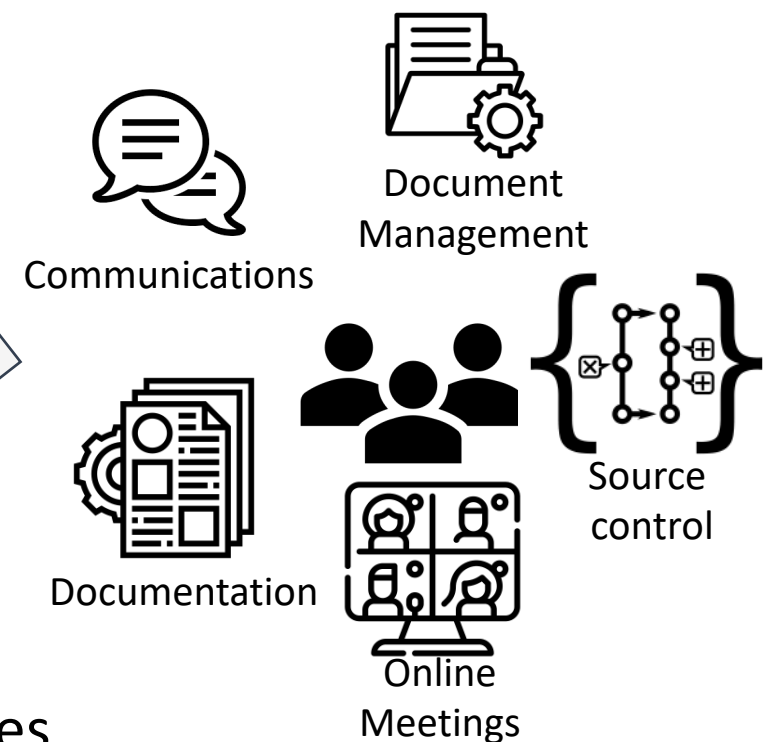
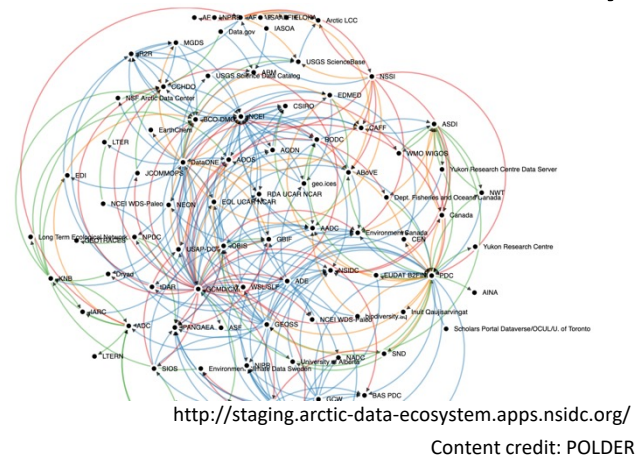
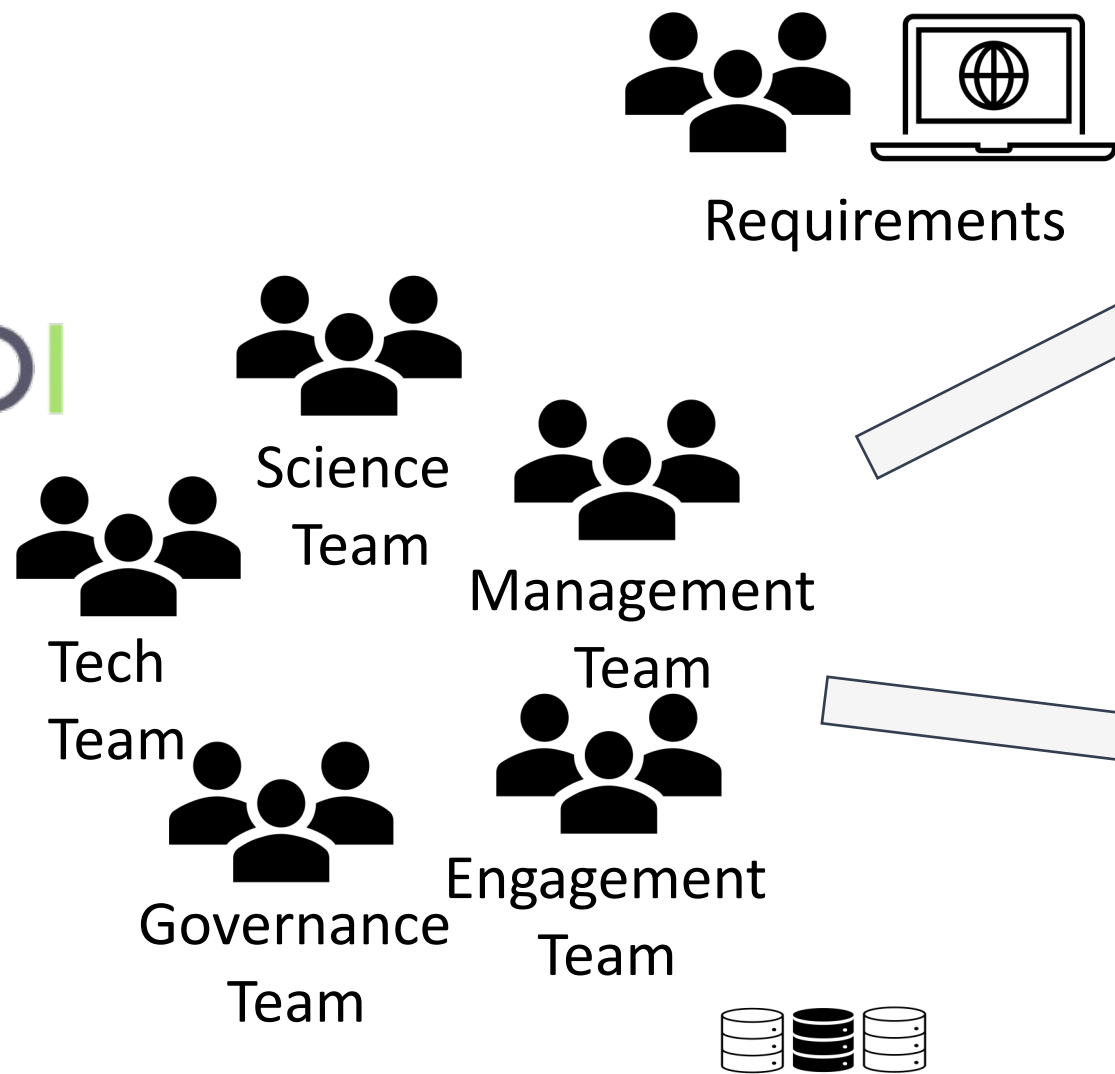
# Current Membership



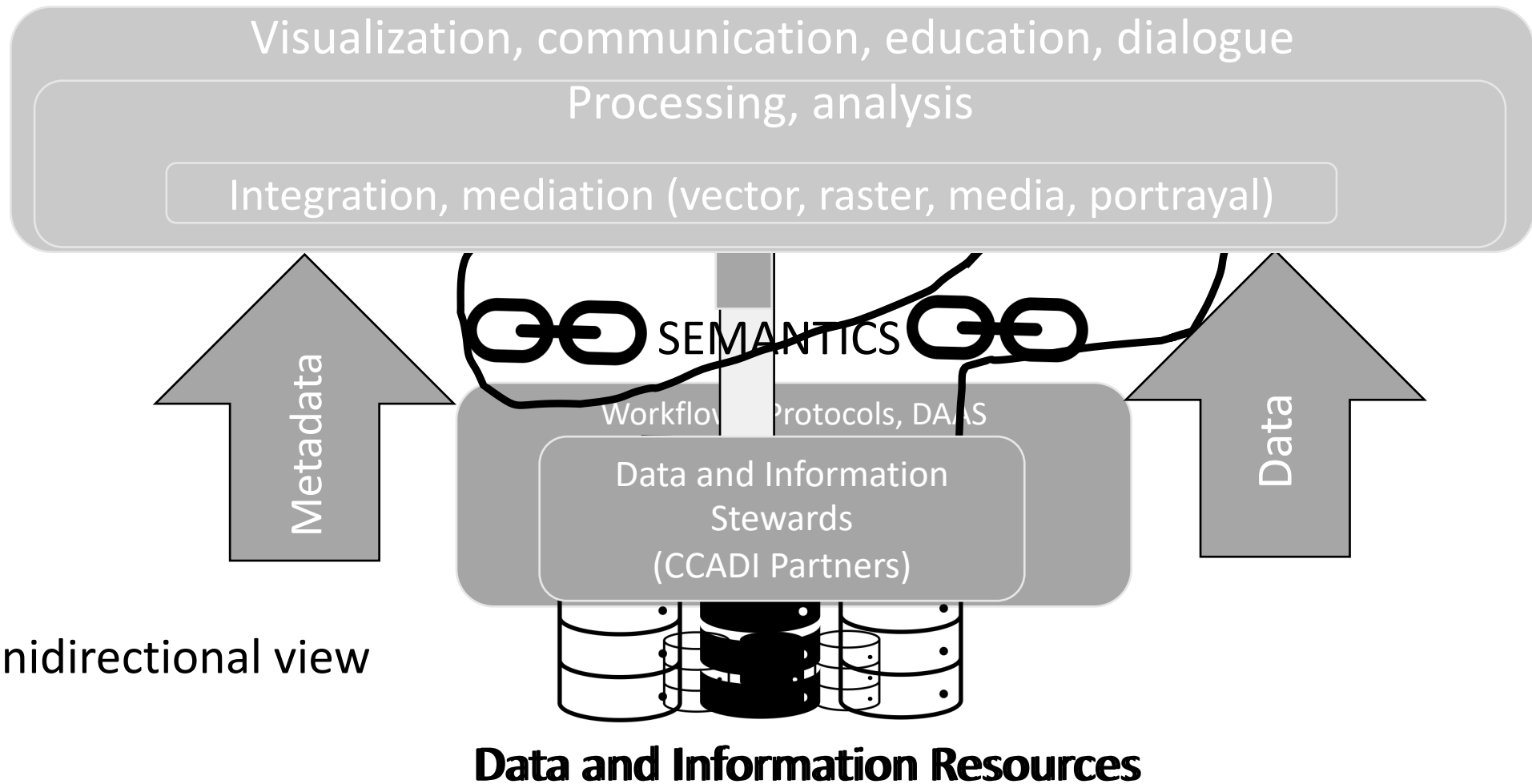
# Socio-technical System

# Broader Data Community

CCAD

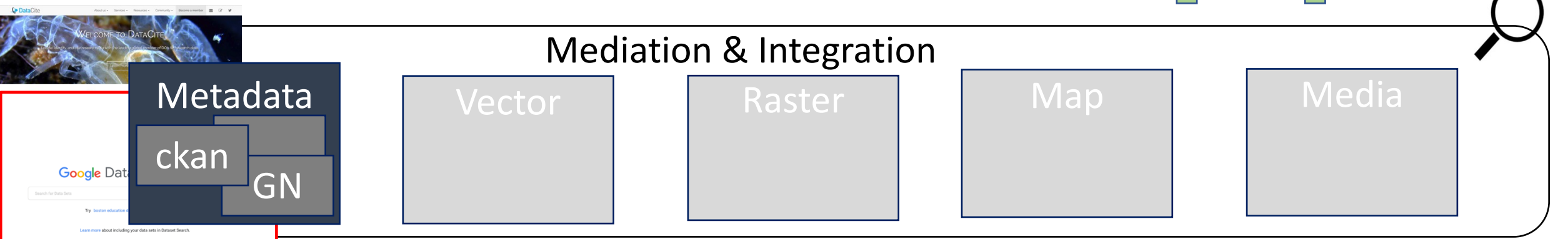


# Serving Applications through Interoperability and Mediation: data and information flows

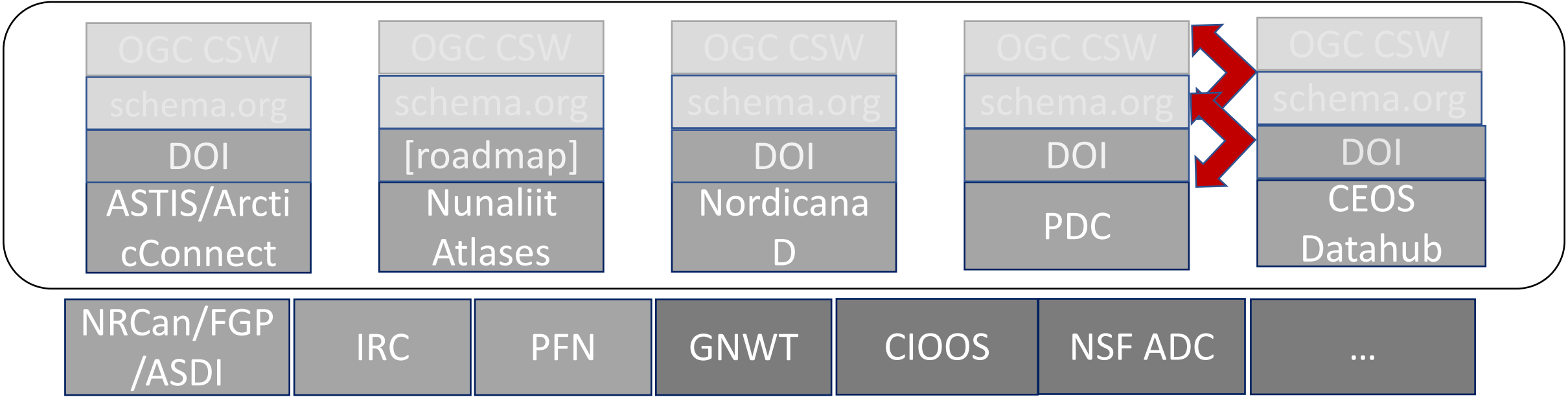


Simplified, unidirectional view

# Findable: CCADI Metadata Interoperability



DOI: http, handle etc. Schema.org JSON-LD XML ISO19139 Profiles/schemas: under active development



## Mediation & Integration

Metadata



Vector  
HTTP/FTP  
OPeNDAP/GCW  
[SOS]  
OGC STA  
OGC WFS  
APIs

Raster/Grid  
HTTP/FTP  
OPeNDAP  
OGC WCS  
APIs

Map

HTTP/FTP  
OGC WMST  
Google/Bing  
APIs

Media

(ERDDAP, GeoServer, OGC STA etc.)



## USE CASES

ASTIS/Arctic  
Connect

Nordicana  
D

PDC

IRC

ITK

Nunaliit  
Atlases

NRCan/FGP  
/ASDI

CEOS  
Datahub

PFN

...

GNWT

CIOSS

NSF ADC

...

SEMANTICS, <sup>R</sup><sub>Reusable</sub>  
LOD, PIDs etc. 



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## Welcome

<https://ccadi.org/>