

Meeting The Challenges of the UN SDGs Through Ethical Cartographic And Remote Sensing Practices

Session 8: Diversity, Ethics, and Equality
November 2-4, 2022, Redlands, CA, USA



AUTOCARTO 2022

Dr. Christy Caudill
ccaudill@uwo.ca



Your dedication, expertise and guidance—in geospatial data, methods, frameworks, tools, and platforms—is urgently needed.

The data needs for the SDGs are great, and time is not on our side. Reliable, timely, accessible and disaggregated geospatial information must be brought to bear to measure progress, inform decision-making and ensure effective and inclusive national and sub-national programs that will chart the path towards the 'Geospatial Way to a Better World', to assist in the implementation of the SDGs, and transform our world for the better.

ANTÓNIO GUTERRES, THE SECRETARY-GENERAL OF THE UNITED NATIONS, ADDRESSED THE UN-GGIM DURING THE 1ST UNITED NATIONS WORLD GEOSPATIAL INFORMATION CONGRESS (2018)

Equitable Knowledge Infrastructure

Communities that have been subject to much extraction: data, knowledge, and otherwise

Indigenous Knowledge is increasingly recognized as a parallel and equal knowledge system to that of Western scientific knowledge

It has much to contribute in its own right especially on environmental topics, and is much more than an affirmation of Western knowledge

Challenges of the UN SDGs


In seeking to build a knowledge infrastructure, and to share knowledge, and gain new knowledge and insights – are the ethics surrounding Indigenous peoples included in this?

Rights enshrined in UN Declaration on the Rights of Indigenous Peoples and essential to indigenous peoples' right to self-determination of their economic, political, social and cultural development —

**that goes beyond economic and cultural development,
to include real -time knowledge and data in all its forms**

– What are methodologies by which these basic rights are upheld in an actionable way?


- How might these transformative steps lead to real movement on achieving the SDGs and development of community -needs-informed policy?



Faced with an impossible scenario, and impossible task, you will be forced to revolutionise the way you think in order to move on. Rather than suggest purely technical solutions to the world's problems, Bateson hoped that he might inspire us to shift how we employ technology.

For, 'the major problems in the world,' he wrote 'are the result of the difference between how nature works and the way people think.' Any attempt to put things right with more technological interventions in the same ways can only be another manifestation of the same wrongheadedness.

Gregory Bateson (Cyberneticist, Technologist).
Steps to an Ecology of the Mind



It has been said that cartography is in the midst of an ontological crisis, meaning that it is in the midst of a radical transformation away from a focus on representation, communication and objectivity and toward a focus on performance, reflexivity and narrative – in short, toward a relational approach to understanding.

The new moral consciousness that attends this transformation is characterized by an overarching preoccupation with promoting justice, which includes the enhancement of agency and empowerment, especially in those peoples who have historically been subjugated to a colonial authority, which has in considerable part been justified by colonial maps.

Pyrne et al., 2016, *Residential School Land Memory Atlas*

How then should cartographic sciences and remote sensing practices respond?

ETHICAL AND TRUSTFUL
USE OF EO

CARE AND FAIR
PRINCIPLES

INDIGENOUS MAPPING
AS A TOOL TO REALIZE
UN DECLARATION ON
INDIGENOUS PEOPLES
RIGHTS, AND UN SGDs

INSTITUTE RESEARCH-
VALIDATED AND
RIGOROUS METHODOLOGY
OF PARTICIPATORY
MAPPING AND KNOWLEDGE
COPRODUCTION

Learn the Process by which Indigenous Peoples Relate to their Environment

Interpretive power of Indigenous knowledge in RS

- brings a practical understanding of systems from a starting point of irreducible wholeness
- much more reliable, better data quality, information-rich —more reliable image training with ML
- not only a just approach, but one that is superior in efficacy for meeting the needs of communities, and making real progress on SDGs

Arctic Bay Atlas

Introduction

Spoken Map

Quest Map

PDF Maps

Artists

About

Welcome

Login

Introduction

Help


Language

Welcome to the Arctic Bay Place Name Atlas

The Cybercartographic Atlas of Arctic Bay is an online, community-based atlas project to engage youth and Elders of Arctic Bay, Nunavut in researching, documenting, and representing their multi-faceted spatial knowledge. It involves a partnership between Nunavut Youth Consulting, the Geomatics and Cartographic Research Centre (GCRC) at Carleton University, and Nunavut Arctic College.

The Atlas includes an interactive spoken map of Inuktitut place names in the Arctic Bay Region. These place names are spoken by local Inuktitut speakers. The Atlas also includes an interactive map of the 2008 Nunavut Quest, an annual inter-community dog sled that begins in Igloolik and ends in Arctic Bay.

Arctic Bay is called Ikpiarjuk — "the pocket" — because of the high hills that surround the almost landlocked bay. Arctic Bay is located on Borden Peninsula, a rolling undulating plateau dissected by numerous river valleys. In the northern part of the peninsula, where the Hamlet is located, mountains reach as high as 1,300 metres. Flat-topped King George V Mountain dominates the view to the southeast from the community. As you look southward from the Hamlet toward Adams Sound, Uluksan Point is on your right, while Holy Cross Point is at the end of the long peninsula to your left.



Arctic Bay in the fall time - Ron Elliott

Arctic Bay Atlas

Introduction

Spoken Map

Quest Map

PDF Maps

Artists

About

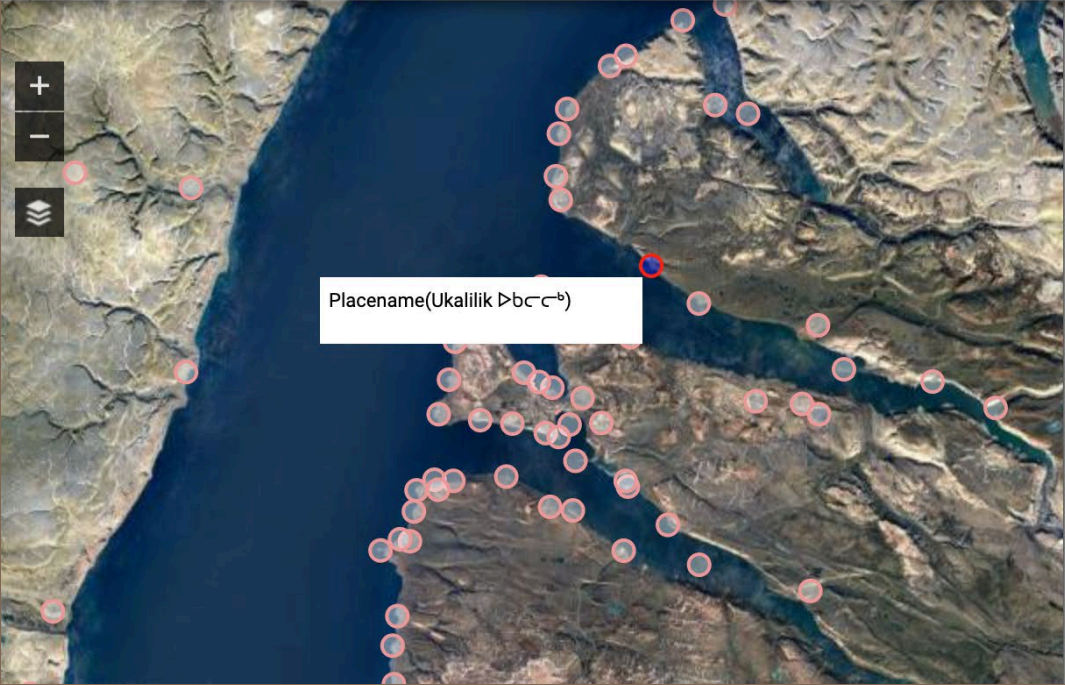
Welcome

Login

Spoken Map

Help

Language



Name (Roman Orthography)

Ukalilik

Name (Syllabic Orthography)

ᐃᑭᑭᑭᑭ

Description

Abundance of arctic hare.

Feature Type

valley

Sources

Arctic Bay Atlas

Hover Sound

[Media\(Spoken place name\)](#)

Add Related Item

Find on Map

Geometries

Media (2)

Note (1)

CYBERCARTOGRAPHY AND KNOWLEDGE CO-PRODUCTION

Moving beyond consultation, and to
engagement, participation, and co-design

Rigorous Research Methodologies and Successful Implementation

Participatory Mapping and Knowledge Co-Production

- 2-way dialogue that radically changes the way that mapping and data collection is approached
- local community and Indigenous peoples EO capacity-building for natural and cultural preservation
- Mapping Agencies learn how to grapple with systems of irreducible complexity—
Indigenous wisdom has brought to projects knowledge of biodiversity, forest fires, coastal areas, sea ice, and interpretation of data through Systems Mapping

Google Earth in Transition Workshop
NASA and
Anishnabee Elders and Community

Cindy Schmidt, NASA Applied Sciences: “This is the understanding we need to accept from other ways of knowing, and different methodologies of knowing. Storytelling methodology of story in data gathering in Indigenous ways of knowing just as important as the data collection from a technical standpoint.”

Melanie Goodchild, Anishnabee and Systems Theorist “You go on the land and meet with the people; you hear on the land and with the land of the feedback loops of Indigenous Systems Thinking as a relational mapmaking approach.”

Ethical and Trustful Use of EO

Be FAIR and CARE.

CARE Principles for Indigenous Data Governance

Collective Benefit
Authority to Control
Responsibility, and
Ethics

Developed in consultation with Indigenous Peoples, scholars, nonprofit organizations, and governments

CARE Principles are people and purpose-oriented, reflecting the crucial role of data in advancing innovation, governance, and self-determination among Indigenous Peoples

CARE Principles complement the existing data-centric approach of **FAIR Guiding Principles** for scientific data management and stewardship (Findable, Accessible, Interoperable, Reusable)

Ethical and Trustful Use of EO

Be FAIR and CARE.

Concerns about secondary use of data and limited opportunities for benefit-sharing have focused attention on the tension that Indigenous communities feel between:

- (1) protecting Indigenous rights and interests in Indigenous data (including traditional knowledges) and
- (2) supporting open data, machine learning, broad data sharing, and big data initiatives.

Developed by International Indigenous Data Sovereignty Interest Group (within the Research Data Alliance), a network of nation-state based Indigenous data sovereignty networks and individuals

Ethical and Trustful Use of EO



The First Nations Information Governance Centre

First Nations Principles of OCAP

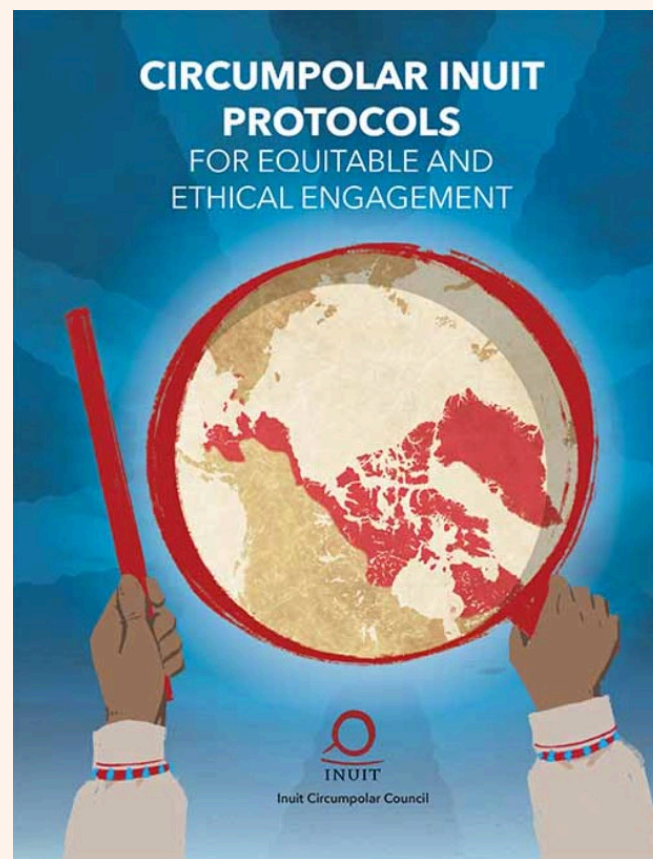
Ownership refers to the relationship of First Nations to their cultural knowledge, data, and information. This principle states that a community or group owns information collectively in the same way that an individual owns his or her personal information.

Control affirms that First Nations, their communities, and representative bodies are within their rights to seek control over all aspects of research and information management processes that impact them. First Nations control of research can include all stages of a particular research project from start to finish. The principle extends to the control of resources and review processes, the planning process, management of the information and so on.

Access refers to the fact that First Nations must have access to information and data about themselves and their communities regardless of where it is held. The principle of access also refers to the right of First Nations' communities and organizations to manage and make decisions regarding access to their collective information. This may be achieved, in practice, through standardized, formal protocols.

Possession: While ownership identifies the relationship between a people and their information in principle, possession or stewardship is more concrete: it refers to the physical control of data. Possession is the mechanism by which ownership can be asserted and protected.

Circumpolar Inuit Protocols for Equitable and Ethical Engagement



Inuit Circumpolar Council (ICC)

8 protocols for engagement include:

1. Nothing About us Without us
2. Recognise Indigenous Knowledge in its Own Right
3. Practice Good Governance
4. Communicate with Intent
5. Exercise Accountability - Building Trust
6. Build meaningful partnerships
7. Information and Data Snaring, Ownership and Permissions
8. Equitably Fund Inuit Representation and Knowledge

Although written from an Inuit perspective these protocols have wider applicability.



Co-Design and Knowledge Co-Production

From Data-Centric, to Human-Centric

Foster discourse around the urgent need for equitable knowledge exchange in a growing digital knowledge infrastructure

Co-creation of knowledge is important, but not enough
Perspective that mapping must first and foremost meet the needs of Indigenous peoples—the definition and control of that mapping must reside with these groups in the first instance, not with the NMO who have a secondary role

Defining “Authoritative” Map and Data Types

For Indigenous people, qualitative data is authoritative data

NMOs deliver the authoritative base maps and data, but it is within the realm of self-determination for Indigenous peoples to have control over narrative, place names, symbols, and data and its use

Giving Precedent to Indigenous Worldviews

Sought as systems that hold various dimensions (e.g., technical and scientific knowledge; Systems Thinking Complexity Theory); Indigenous people’s narrative or non-linear organization of knowledge can be represented spatially through multi-modal participatory mapping and thus encourages an autonomous decision-making and land management

Meeting The Challenges of the UN SDGs Through Ethical Cartographic And Remote Sensing Practices

Session 8: Diversity, Ethics, and Equality
November 2-4, 2022, Redlands, CA, USA



AUTOCARTO 2022

Dr. Christy Caudill
ccaudill@uwo.ca