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
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.

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

Equitable Knowledge Infrastructure
Challenges of the UN SGDs

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 CO-PRODUCTION**
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
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 Annishnabee 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, Annishnabee 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.”
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

CODATA Data Science Committee
CARE Principles for Indigenous Data Governance
Ethical and Trustful Use of EO

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.
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 Sharing, Ownership and Permissions
8. Equitably Fund Inuit Representation and Knowledge

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