



Best Practices at Ocean Networks Canada: Indigenous Data Management, the Canadian Integrated Ocean Observing System, and Supporting Research in Marine Carbon Dioxide

Date: May 14, 2024

Location: University of Victoria, Queenswood Campus, 2474 Arbutus Road, Victoria CA

Format: Hybrid

Virtual link: <https://us02web.zoom.us/j/87253992347>

As part of the OCG-15 meeting, Ocean Networks Canada is hosting a best practices workshop that will focus on Indigenous-led ocean observing, introducing the Canadian Integrated Ocean Observing System (CIOOS), and the support of research in marine carbon dioxide removal solutions.

Moderator: Daniela Look

Background

Ocean Networks Canada (ONC) operates world-leading observatories in the deep ocean, in coastal waters, and on land to observe the Pacific, Atlantic, Arctic and Southern ocean. ONC collects ocean data that accelerate scientific discovery and make possible services and solutions that support life on our planet. ONC, an initiative of the University of Victoria (UVic), is Canada's national ocean observatory.

In addition, ONC has installations and local partnerships with Indigenous and coastal communities on all three coasts of Canada, and registers more than 32,000 users per year for our data products. The ocean data collected by ONC's cabled, mobile, and community-led observatories are accessible openly through ONC's Oceans 3.0 data portal.

Indigenous ocean observing [Maia Hoeberechts & Sean Tippet]

ONC's coastal community observatories, developed in partnership with Indigenous community partners, connect oceanographic instruments, training, and scientific support with Indigenous Knowledge and stewardship built over generations. Through ONC's Community Fishers program, community partners are using mobile instruments to monitor

local ocean conditions at more than 350 locations on the Pacific, Atlantic, and Arctic coast of Canada. ONC provides training and support for partners to collect and upload high-quality ocean data into the ONC Oceans 3.0 data portal using a custom-designed app, and supports the development of ocean monitoring programs that meet local needs. Together, the data from the observatories and Community Fishers programs provide an invaluable time-series of coastal data which supports local interests along with national and international projects.

ONC is working with Indigenous communities and other partners to explore best approaches for supporting Indigenous Peoples' sovereignty over their own ocean data as part of a broader drive towards decolonization of data acquisition and ownership. Partners of ONC, including Indigenous communities, enter into formal data agreements with ONC which govern the implementation of data management services, including provisions for owner attribution and restriction of sensitive data. With members from Indigenous coastal communities, ONC and the Canadian Integrated Ocean Observing System launched a year-long pilot program in March 2023 to explore a new digital marker tool. Developed by the global initiative "Local Contexts", this tool is a suite of customizable labels that can be applied to data to reinforce Indigenous sovereignty over any given dataset. These digital markers help communities gain control over how data within territories are collected, managed, accessed, and used in the future. ONC is an early adopter in Canada of these Traditional Knowledge (TK) and BioCultural (BC) labels and notices, the latter being used by researchers and institutions to identify Indigenous collections and interests in data. FAIR + CARE principles, and OCAP training will also be discussed.

Session objectives:

- Provide an overview of ocean monitoring programs conducted in partnership with Indigenous communities.
- Explore how these principles can be integrated into data standards.
- Investigate options for Indigenous data sovereignty in metadata.
- Sharing experiences, projects and collaborations with Indigenous groups in ocean observing

Discussion topics:

- Highlighting the benefits of connecting Indigenous knowledge to Ocean Observing
- What can the networks learn in terms of practices and lessons learned to build successful partnerships with Indigenous communities?
- How are the CARE principles being applied?

CIOOS [Brad deYoung]

The Canadian Integrated Ocean Observing System (CIOOS) is a GOOS Regional Alliance (GRA) that was established in 2019 to address inaccessible ocean data and the lack of a mechanism for coordination and collaboration in Canada's ocean observing community. CIOOS works to integrate fragmented and isolated ocean data by creating an open-access national platform that facilitates data discovery for end-users, and ONC is actively contributing to this catalog. CIOOS also curates Essential Ocean Variables (EOVs) collected in Canadian waters aligned with the Global Ocean Observing System (GOOS).

Session objectives:

- How can CIOOS better support access to ocean data, availability of near-real time data and the development of information services?
- What are the remaining gaps for Canadian data under CIOOS to be integrated into GOOS and other users such as WMO?

Discussion topics:

- Are the connections between CIOOS and OCG networks clear, functional and strong - have clear areas of intersection been identified? How well integrated with the networks
- How can CIOOS + GOOS collaborate better, what are some projects of interest to CIOOS? What could potential future and regional collaboration look like, both in and outside the context of the UN Decade?
- How is the data framework compatible with the OCG's strategy? Is more integration of coastal observations and networks possible, for example, through ODIS/WIS2.0?

Ocean-based Climate Mitigation Solutions: monitoring, reporting and verification [Kohen Bauer and Martin Scherwath]

Ocean-based carbon dioxide removal (CDR) has significant potential for addressing the climate crisis. ONC's existing observatories offer the perfect testing and monitoring infrastructure for various CDR approaches and technologies in a range of ocean environments.

One CDR solution well underway is the ONC- led Solid Carbon project, which aims to remove atmospheric carbon dioxide (CO₂) via direct air capture and inject it below the seafloor's sediment layer. The project is ready to advance to a field demonstration at Cascadia Basin where it can be monitored by ONC using the NEPTUNE observatory.

ONC is also supporting the research into other CDR approaches such as carbon dioxide (CO₂) captured from the atmosphere by marine plants and algae and sunk in the ocean, or methods that would increase the alkalinity of the ocean, allowing it to absorb more CO₂. Finally other methods such as artificial upwelling or ocean seeding merit proper research to determine their efficiency, identify possible side effects and assess their scalability.

Of interest to this meeting are the questions of reliable, standard monitoring of these solutions during demonstration and beyond.

Session objectives:

- Determine possible GOOS support for the definition of Essential Ocean Variables (EOV's) specific to MRV activities.
- Reconciling with data quality control and challenges around biogeochemical measurements (support on data management + from the sensor side).
- Discuss carbon specific expanded EOVs, through supporting Transforming Climate Action (TCA), and links to expanded World Meteorological Organization (WMO) mandate.

Discussion topics:

- What is the baseline against which ocean carbon efforts are evaluated - how to approach this problem? Is the GOOS work in this space helpful, what connections could exist?
- Mechanism to verify, collaboration, etc. Involvement of GOOS, private sectors, other groups.
- How GOOS can help make the connection needed?

General workshop objectives

These sessions will cover recommendations on lessons learned, key monitoring variables, and best data practices. A primary objective is to determine support for new standards in these emerging fields and to discuss recommendations.

Session agenda

9:00 - 9:05	Welcome and overview	11:00-11:45	CIOOS
9:05 - 10:30	Indigenous Ocean Observing	11:45-12:45	Ocean Carbon Solutions
10:30 - 11:00	Coffee break	12:45	Adjourn