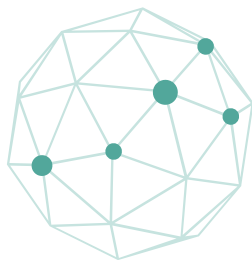


CIOOS

CANADIAN INTEGRATED OCEAN
OBSERVING SYSTEM



SIOOC

SYSTÈME INTÉGRÉ D'OBSERVATION
DES OCÉANS DU CANADA



CIOOS Annual Report

2021 - 2022



From the Executive Committee

As we look back on our growth, improvement and accomplishments of the past year, it is easy to feel hopeful about the future of CIOOS. CIOOS has entered this year with the renewed vision to become Canada’s nucleus for ocean observing. In launching our CIOOS Strategic Plan (2021-2026), we have outlined our intention to become a mature operational system. The Strategic Plan addresses ambitious themes and goals for the next five years, centered around increasing partnerships, elevating data and tools, and supporting ocean modelling.

CIOOS is becoming a recognized leader in ocean observing. However, to establish CIOOS as a nucleus, we must focus on data connectivity, interoperability, and validity as the keys to improving ocean data accessibility. CIOOS connects the dots between ocean data and ocean information to improve decision making which will act as the foundation of Canada’s blue economy.

Over the next few years, the disciplinary scope of CIOOS will broaden. This will require CIOOS to remain open and responsive to new and emerging needs,

projects, and opportunities, particularly, the United Nations Decade of Ocean Science for Sustainable Development.

Achieving sustainability across local, regional, and global scales requires comprehensive understanding of the current and future state of the marine environment. To further this understanding, CIOOS is aligning with the Global Ocean Observing System (GOOS). By adhering to these international standards, we increase access, communication, and collaboration with partners across all ocean sectors. These improvements are leading to new information, new knowledge, and place-based solutions across Canada.

CIOOS’ long-term success will be determined by its ability to integrate information from thematic data repositories, leverage momentum from global connections, and remain relevant to a multidisciplinary community of users. We are committed to making connections for a sustainable ocean future.

Thank you for your continued support,
CIOOS Executive Committee

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Jérémie Leblond



About CIOOS

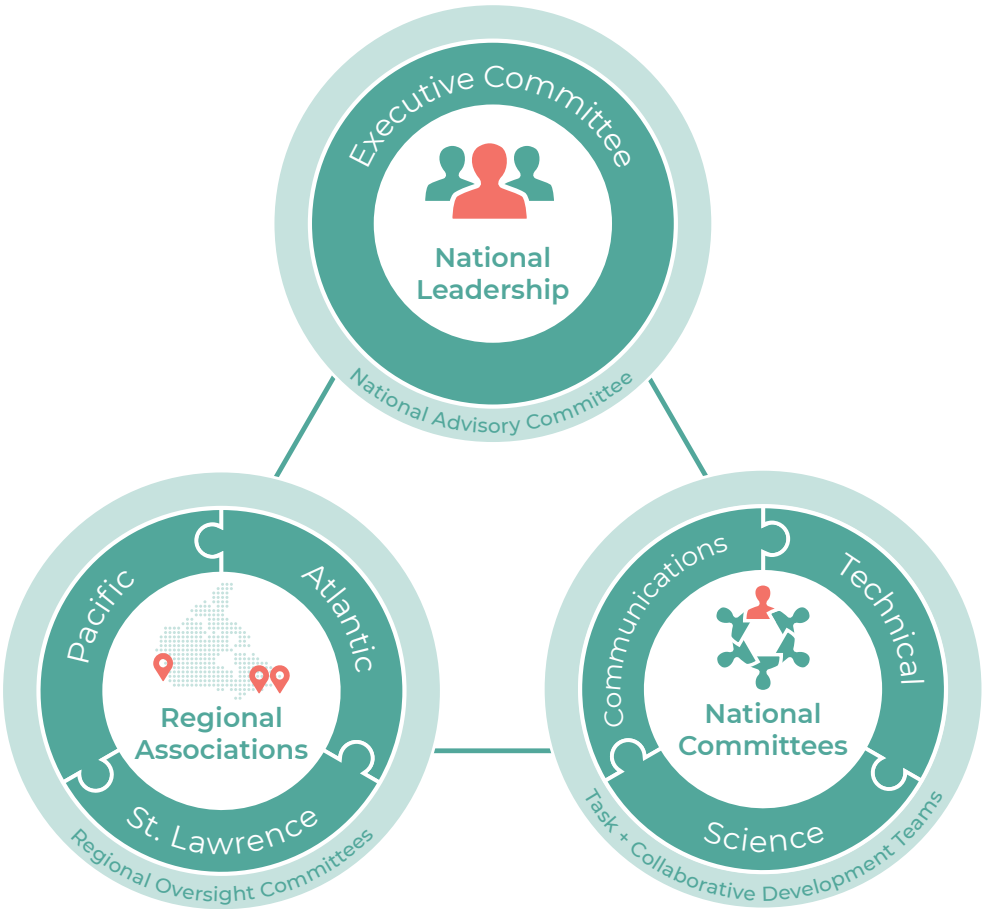
The Canadian Integrated Ocean Observing System (CIOOS) was established in 2019 out of a need to address siloed ocean data and the lack of a formal coordination and collaboration mechanism for the ocean observing community in Canada.

CIOOS works to address these issues by creating an open-access national system that facilitates discovery of previously inaccessible and undiscoverable data to end-users in industry, academia, government, Indigenous and coastal communities, and Non-Governmental Organizations. CIOOS helps manage ocean data on a national scale and, critically, is adaptable to growing needs and a changing environment.

As the nucleus for integrated ocean science and observing activities, CIOOS places Canada among the leaders of global ocean observation. CIOOS is well-positioned to support Canada's commitment to the United Nations Decade of Ocean Science for Sustainable Development by contributing to the UN Decade societal goals, which include efforts to create a predictable and accessible ocean for generations to come. By aligning with the existing best practices and standards developed by the Global Ocean Observing System (GOOS), CIOOS can take advantage of existing frameworks and international recognition.



Governance



Strong governance and oversight is crucial to ensure the success of a cross-Canada and multi-partner initiative. CIOOS currently consists of three distinct Regional Associations (RA). Coordination of regional activities and national leadership is conducted by the Executive Committee, which is also responsible for strategic planning and decision-making in accordance with our vision and mission. Finally, the national committees have representation from all Regional Associations, ensuring a consistent national approach and opportunity for sharing of best practices.



Executive Committee

In 2021-2022, the Executive Committee welcomed some new members:

- Brad de Young
- Jeff Cullis
- Pauline Chauvet

Their experience and ideas are valued additions to the team.

A special mention must go to Denis D'Amours (previous Executive Director of CIOOS Pacific) and Mike Smit (previous co-chair of the Technical Committee) for their invaluable contributions to CIOOS over the years. You will be missed!

The Executive Committee also approved the CIOOS 2021-2026 Strategic Plan which will unify our path forward. It details our key values, areas of societal impact, and a vision for ocean observing in Canada.

Name	Representation
Brad De Young	Pacific RA
Andréane Bastien	St Lawrence RA
Shayla Fitzsimmons	Atlantic RA
Keith Lennon	Fisheries and Oceans Canada
Andrew Stewart	Fisheries and Oceans Canada
Douglas Wallace	MEOPAR
Eric Peterson	Tula Foundation
Ève Morin Desrosiers	Communications Committee
Ray Brunsting	Technical Committee & Data Stewardship Node
Jeff Cullis	Technical Committee
Jennifer Jackson	Science Committee
Pauline Chauvet	National Web Presence
Kacie Conrad	Fisheries and Oceans Canada
Isabelle Tremblay	MEOPAR
Naomi Boon	CIOOS National



Strategic Plan

We have identified four main themes that this work will include:

- Strengthen partnerships for improved ocean observations and service delivery.
- Improve the discoverability, accessibility and interoperability of Canadian oceanographic data.
- Convert ocean data into information and knowledge through the development and use of tools, products and applications.
- Increase the ability to understand current states and predict future states of Canada's ocean spaces by supporting modelling efforts and sharing ocean model results.



Successes & Developments

CIOOS is a maturing system with a new strategic and implementation plan governing work across the country.



1559 Datasets

+77 new datasets
integrated, discoverable,
and accessible

In alignment with the vision and mission, each committee and Regional Association are working towards achieving the four themes in the strategic plan. Practically this has meant new metadata standards, an expanded list of essential ocean variables (now including biological data), new tools in development for both data contribution and discovery and multiple new visualizations and applications.

We're developing partnerships to improve data interoperability in the Arctic and the Great Lakes, and are eager to work with others to advance the goals of the Ocean Decade.

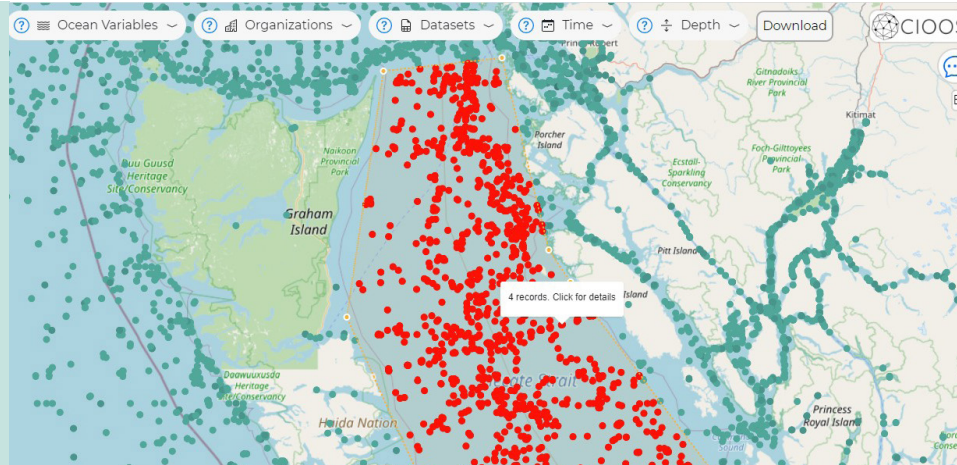
CIOOS is reaching an ever expanding audience with the addition of promotional outlets and training materials, yet there is still much work to be done. CIOOS is still fairly new in the Canadian ocean landscape and in the year ahead we will be launching a communications and engagement campaign that will reach new users, understand their needs, and provide feedback that will improve the system.



98 Partners

+21 additional partnering
organizations

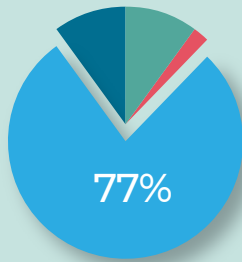
CIOOS
Data Explorer



4 records. Click for details

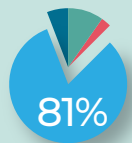
Data downloading is now easier than ever with the release of the Data Explorer—a tool that allows users to search and filter observations across datasets.

Online Stats & Social Media



77%

103K*
Page Views



81%

26K*
New Users

← Most users access CIOOS through SLGO, who were established in 2005—14 years before the national organization.

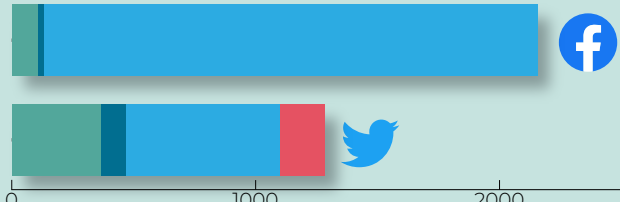
↓ The national social media strategy was launched and our audience is growing fast!

National

Pacific

SLGO

Atlantic



Followers

* Based on Oct 1, 2021 - Mar 31, 2022



Regional Updates

Place-based solutions for a stronger blue economy start by engaging with our regional partners. Here's a sample of what has been happening around the country.

CIOOS Pacific

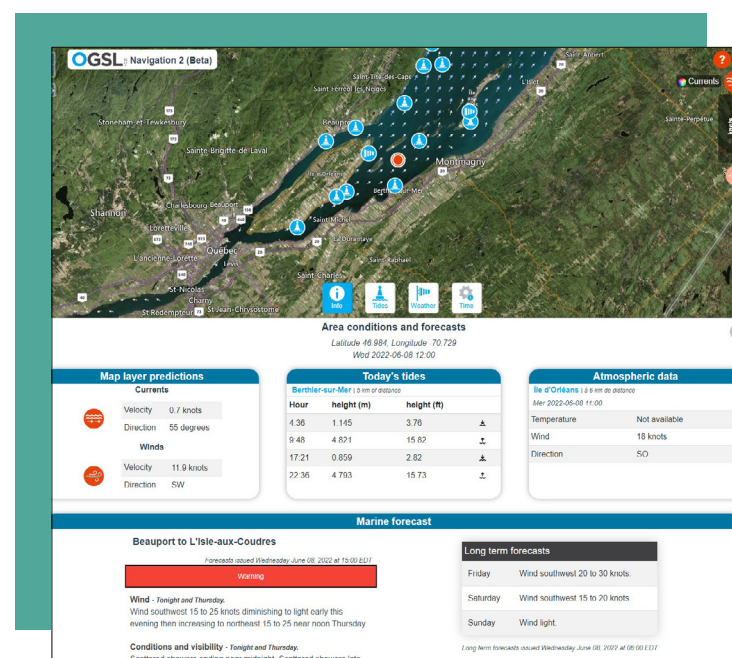
- Developed, tested, and launched [CIOOS Data Explorer](#), a new data visualization application
- Published feature length science explainer on marine heatwaves, [A Fever on Canada's Pacific Coast](#) and accompanying [monitor](#)
- Continued engagement with First Nations, scientific, and industry partners
- Integrated 37 new datasets including the first biological records uploaded into OBIS

CIOOS Atlantic

- Joined the DataCite consortium and are now able to issue DOIs
- Made available two aquaculture siting [visualization products](#) developed by the Centre for Marine Applied Research and 3D Wave Design
- Published literature review, *Indigenous Traditional Ecological Knowledge and Ocean Observing: A Review of Successful Partnerships in Frontiers in Marine Science*
- Hosted webinar series with NERACOOS, [We're All in the Same Boat](#) which followed the USCG Healy from Baffin Bay → Gulf of Maine
- Integrated 13 new datasets and over 16 million lines of data

St. Lawrence Global Observatory

- Launched *Au coeur des données - Taking Data to the Next Level*, a communications campaign
- Debuted new visualization tools, including [Navigation](#), the [St. Lawrence Species Explorer](#) (FR only), and [Toxic Algae](#)
- Hosted >10 data management training sessions, for >130 attendees, focused on dataset sharing and biodiversity standardization
- Added 14 Partners, 53 new datasets, 12 new EOVS



SLGO's Navigation application went live in September 2021.

Committee Updates

Utilizing national expertise, our work across the country elevates CIOOS infrastructure and standards to the global stage.

Science

- Recommended CIOOS adopt all GOOS EOVS, including emerging EOVS, and mapped existing non-GOOS EOVS used in CIOOS to the revised set of GOOS EOVS
- Provided guidance and best practices for dataset naming
- Working to adopt CARE and OCAP data governance principles for Indigenous data
- Identified priorities for CIOOS in aligning with the UN Decade of Ocean Science for Sustainable Development

Technical

- Made progress towards integrating model data outputs and biodiversity information into CIOOS
- Engaged with Canadian Consortium for Arctic Data Interoperability (CCADI) and the Great Lakes Observing System (GLOS) on technical interoperability
- Continued collaboration with the US IOOS DMAC community
- Enhanced collaborative development work through creation of expert groups and increased sprint-style working
- Developed Metadata Entry Tool to aid dataset ingestion

Communications

- Aligned Communications Plan with CIOOS Strategic Plan 2021-2026
- Launched the national newsletter, promotional video, and social media strategy
- New design for all CIOOS websites and updated content
- Presented at MEOPAR Annual Scientific Meeting and coordinated national internal face-to-face series





Testimonies



Bill Carter Director, Centre for Applied Ocean Technology, Marine Institute

In the limited time that CIOOS has been operational, the idea of making data available to others has gone from being practically unheard of in some sectors, to now being a logical part of data management discussions.



Alain Arseneault Captain & Pilot, Corporation Saint-Laurent Central
President, National Centre of Expertise on Maritime Pilotage

Given the specificity of the St. Lawrence River, all it takes is a brief moment of inattention and we can leave the navigating channel. This is why the Marine Conditions application developed by SLGO is used extensively by pilots. The data is collected in one place and formatted according to our needs.



Andrea Hilborn Physical Scientist, Institute of Ocean Sciences - DFO

The CIOOS platform has been really useful – I have been accessing the data frequently through R and have had no issues downloading and using it. Looking forward to more local datasets on there in the future!

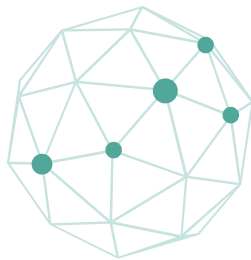
The Course Ahead

- Formation of a National Advisory Committee which will provide external guidance and help CIOOS maintain its relevance in the national and international ocean observing space
- Actively participate in international working groups, the UN Ocean Decade for Sustainable Development and become a fully recognized Regional Alliance of the Global Ocean Observing System (GOOS)
- Contribute CIOOS data to international harvesters and registries for target data types e.g. OBIS and GBIF for biological observations
- Develop a Portage CIOOS template to demonstrate a data preservation plan to our data providers
- Develop and implement early phases of engagement plan to grow users and contributors
- Increase number of datasets and partner organizations from whom CIOOS gets data and data products
- Increase usage of observational data in modelling by supporting model validation and data assimilation workflows in ocean models
- Establish CIOOS model metadata standards that are based on international standards in order to promote the overall use of model data
- Develop a process for assigning and implementing persistent identifiers for the research objects, e.g. DOIs for data, ORCIDs for individuals, and RORs for organizations, to enable and support data citation



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DES OCÉANS DU CANADA

What discoveries can be made
if we just connect the dots?



info@cioos.ca
cioos.ca

Regional websites:

cioospacific.ca

slgo.ca

cioosatlantic.ca

Funding partners



Fisheries and Oceans Canada
Pêches et Océans Canada



Tula
TULA FOUNDATION