

CIOOS

CANADIAN INTEGRATED OCEAN
OBSERVING SYSTEM



SIOOC

SYSTÈME INTÉGRÉ D'OBSERVATION
DES OCÉANS DU CANADA



Explore CIOOS: Canada's home for ocean observing data

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Canadian Marine Shipping Risk Forum - 30 Nov 2023

Funded by :



Fisheries and Oceans
Canada

Pêches et Océans
Canada

Tula
FOUNDATION

From data scarcity to data plenty



Scarcity

Plenty

- Data is an asset & must be protected
- Challenge is accessing the data you need
- Mostly competition
- Short-term gain
- Key issue: data hoarding

- Relationships are an asset, data is a networking tool
- Challenge is finding the data you need
- Mostly cooperation
- Long-term gain
- Key issue: data waste

FAIR Principles

Findable



Accessible



Interoperable



Re-Usable

CARE Principles

Collective Benefit



Authority to Control



Responsibility



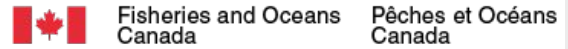
Ethics



Ocean Observing Systems Around The World



Founded Through Collaboration



North American Collaboration



Regional Expertise, National Accessibility

- Engage and work with regional data contributors (all sectors)
- Meet regional data users
- Foster participation in CIOOS
- Continuous communication in CIOOS

*More data =
more robust information system*



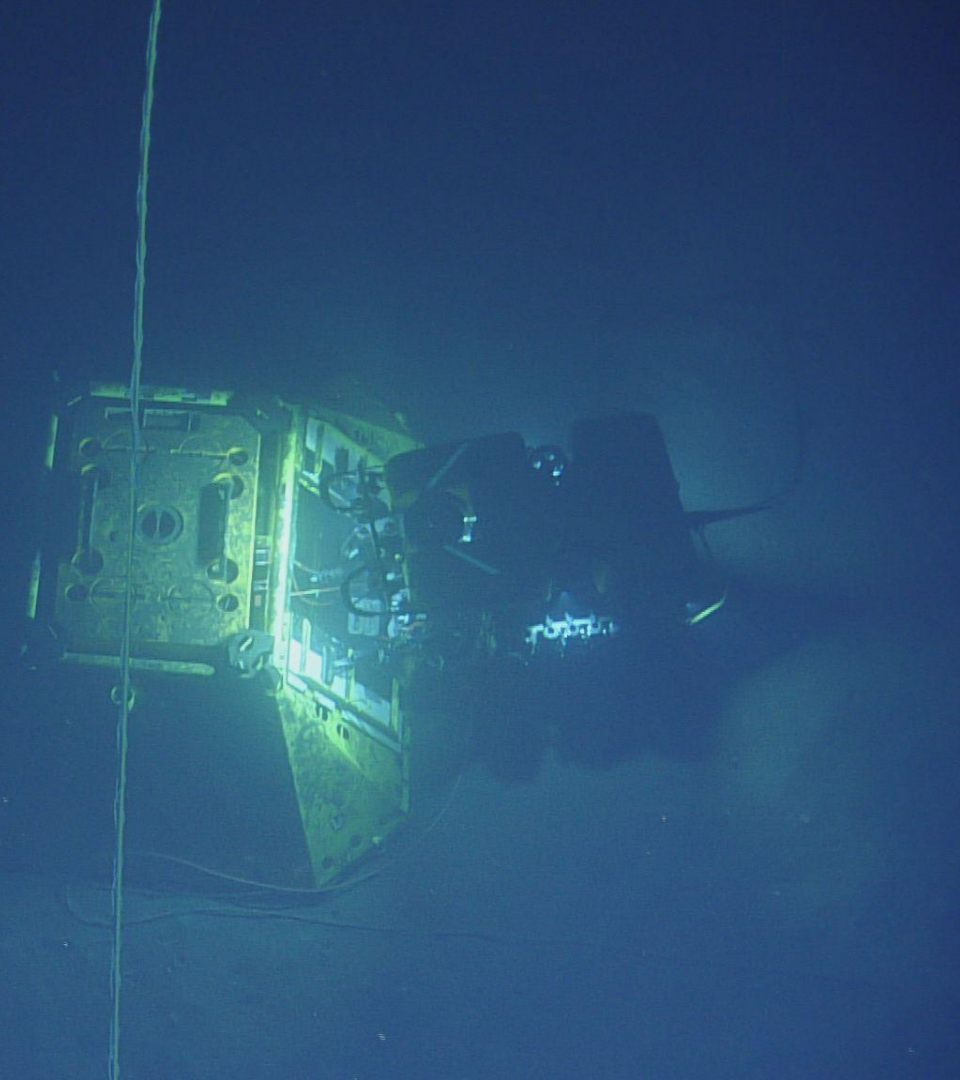
Our Vision

*“As Canada’s nucleus for ocean observing,
CIOOS makes connections
for a sustainable ocean future.”*



How are we doing?

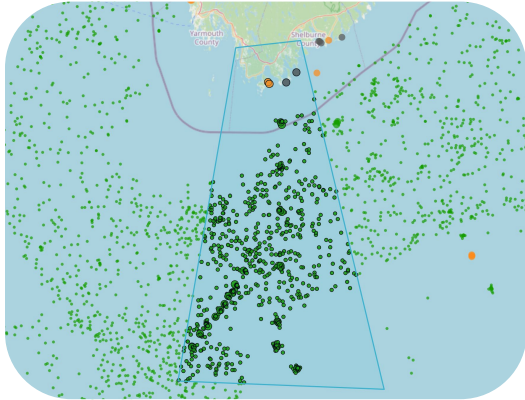
- 2025+ datasets*
- 100+ partner organizations
- 24 data applications
- EOVs in alignment with GOOS
 - Integrating biological + model data



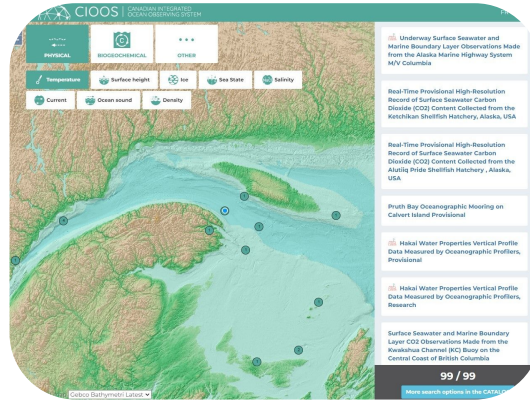


Getting Data Out

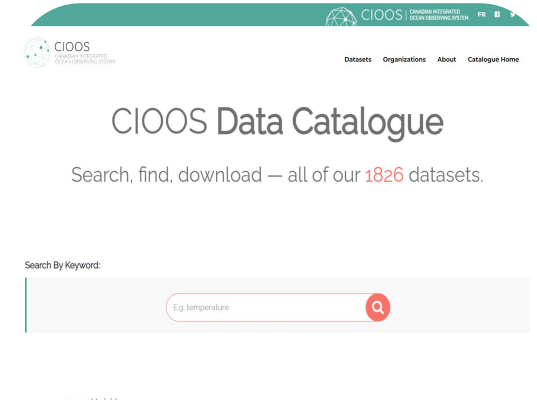
Data Exploration Tools



Data Explorer

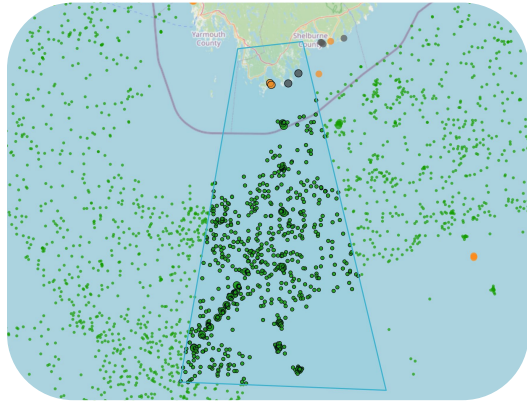


Catalogue Map

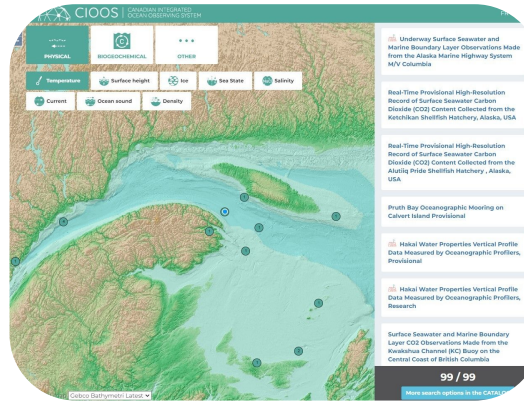


Data Catalogue

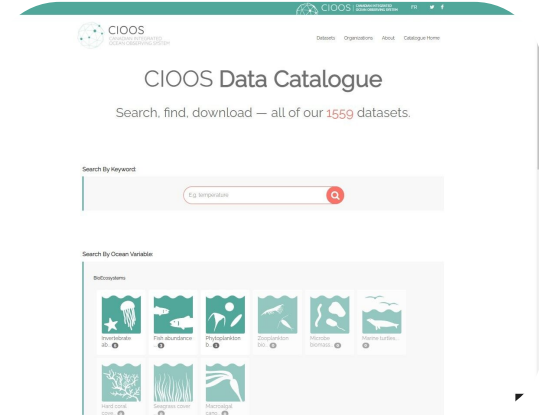
Data Exploration Tools



Data Explorer

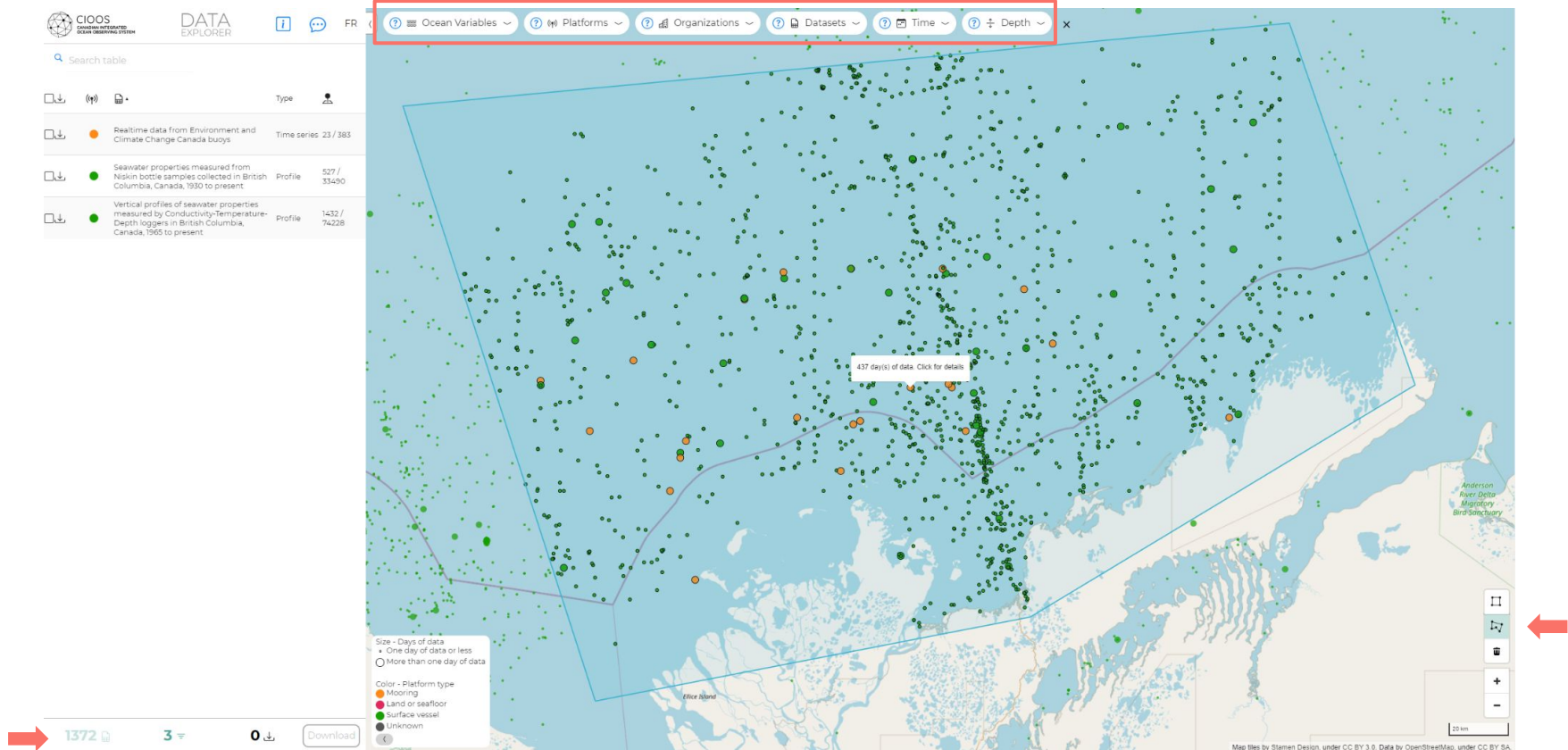


Catalogue Map

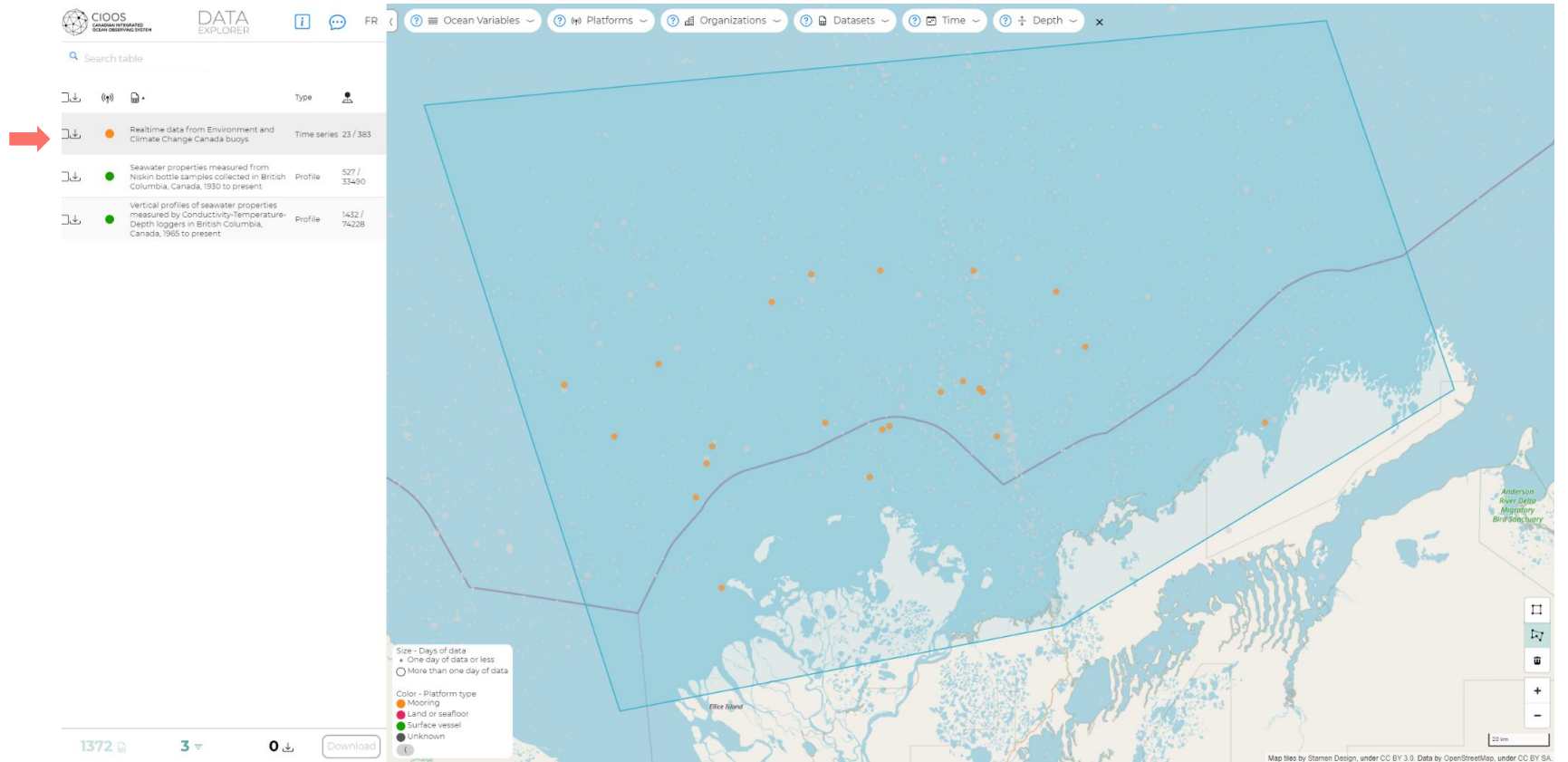


Data Catalogue

Data Explorer - Discovery



Data Explorer - Discovery



Data Explorer - Data Preview

Table

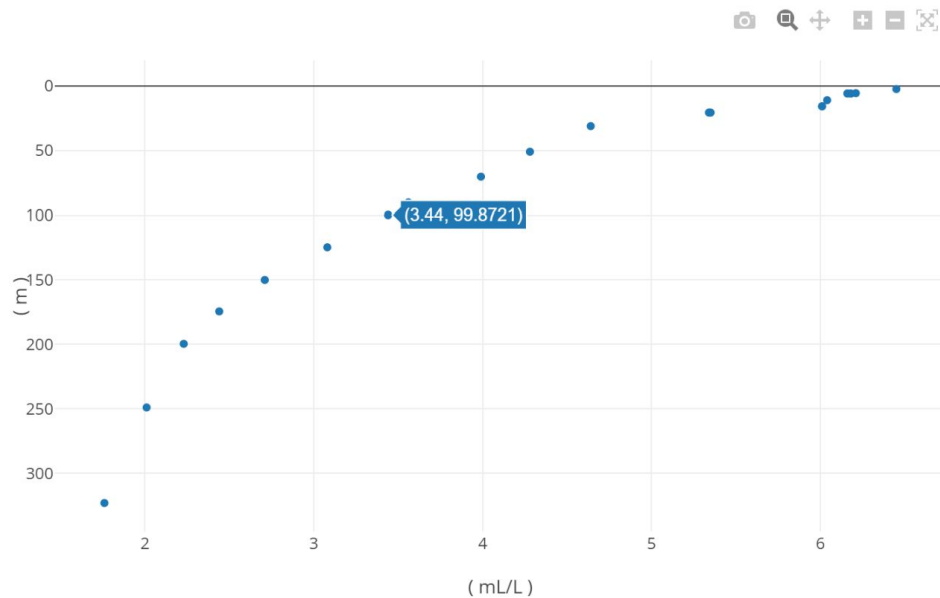
Plot

IOS Rosette Bottle Data: 2010-036-0075

×

X axis: DOXZZ01 ▾

Y axis: depth ▾



Data Explorer - 1 GB Limits

[Back](#) ? [-130.3, 54.0][-129.8, 54.4][-129.9, 55.2][-130.2, 55.2]...[-130.6, 53.9]

Search table

<input type="checkbox"/>			Type		Estimated download size	CDE downloadable	External download
<input checked="" type="checkbox"/>			BC Lightstation data	Timeseries 2 / 33	1.3MB / 49.95MB		ERDDAP
<input type="checkbox"/>			Chatham Sound Conductivity Temperature Depth Deployed 2016-03-30	Timeseries 1	24.8GB / 24.8GB		ERDDAP
<input checked="" type="checkbox"/>			IOS CTD Profile Data	Profile 723 / 74228	49.81MB / 9.68GB		ERDDAP
<input checked="" type="checkbox"/>			IOS Moored ADCP Profile Data	Timeseries / Profile 8 / 324	46.32MB / 2.91GB		ERDDAP
<input checked="" type="checkbox"/>			IOS Moored Current Meter Data	Timeseries 1 / 151	1.99MB / 5.25GB		ERDDAP
<input checked="" type="checkbox"/>			IOS Rosette Bottle Data	Profile 802 / 33490	2.86MB / 140.8MB		ERDDAP
<input type="checkbox"/>			Prince Rupert Atlin Terminal Station Conductivity Temperature Depth Deployed 2017-01-12	Timeseries 1	20.1GB / 20.1GB		ERDDAP
<input checked="" type="checkbox"/>			Realtime data from Environment and Climate Change Canada buoys	Timeseries 3 / 383	1.13MB / 2.25GB		ERDDAP

Datasets **smaller than 1GB** are CDE downloadable. Datasets **larger than 1GB** are not CDE downloadable.

Datasets **6 / 8**

Download size **113.4MB / 65.2GB**

Training for ERDDAP



CIOOS
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**Accessing CIOOS Data
Through ERDDAP**

<https://cioos.ca/training/>

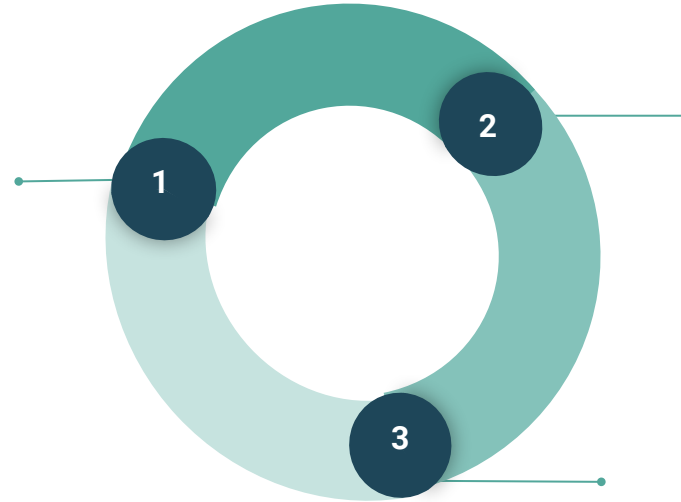


Getting Data In

Getting Data In

1. Engagement Specialist

Your initial point of contact with CIOOS who will help guide you through the process of integrating your data & metadata. They will also liaise with the technical team



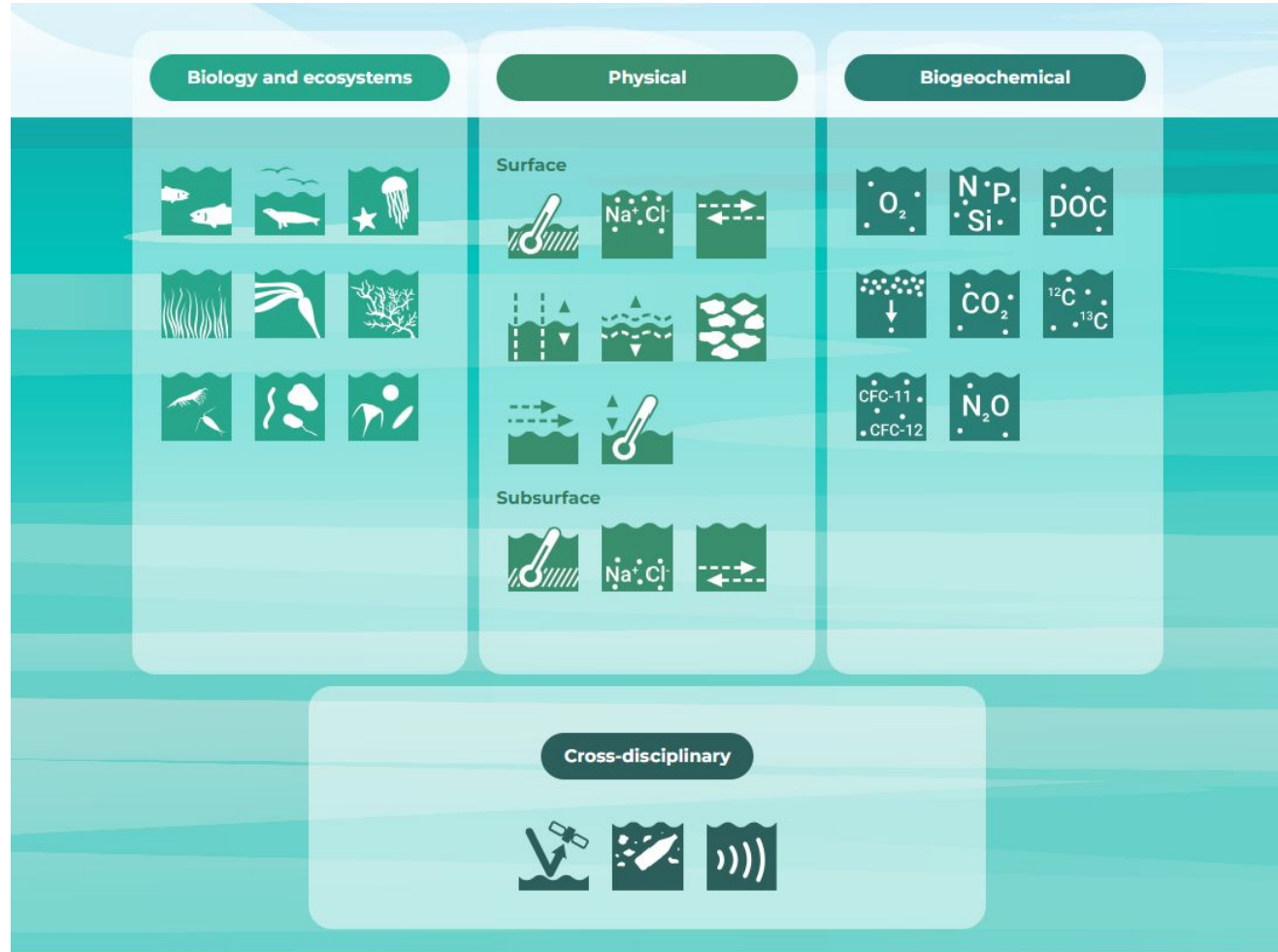
2. Data Specialist

The person who will work in tandem with you and your engagement specialist to bring your data & metadata into CIOOS

3. Review and Iterate

Once your data & metadata have been integrated it will be open for review and refinement before being made public

What are we accepting?



Metadata Entry Tool

- Ensures required fields are completed and does automatic translations
- Added features for region selection, bilingual translations

Metadata Entry Tool

CIOOS CANADIAN INTEGRATED OCEAN OBSERVING SYSTEM EN

Welcome to the CIOOS Metadata Entry Tool. To get started, please select the region where your data was collected.

CIOOS PACIFIC
REGIONAL ASSOCIATION OF THE
CANADIAN INTEGRATED OCEAN OBSERVING SYSTEM

CIOOS Pacific is focused on ocean data from Canada's West Coast

SLGO
St. Lawrence
Global Observatory

The St. Lawrence Global Observatory integrates multidisciplinary data and information about the St. Lawrence's global system, from the Great Lakes to the Gulf.

CIOOS ATLANTIC
REGIONAL ASSOCIATION OF THE
CANADIAN INTEGRATED OCEAN OBSERVING SYSTEM

CIOOS Atlantic is focused on the integration of oceanographic data from the Atlantic seaboard, a region spanning from Labrador to the USA.

FAIR Principles

Findable



Accessible



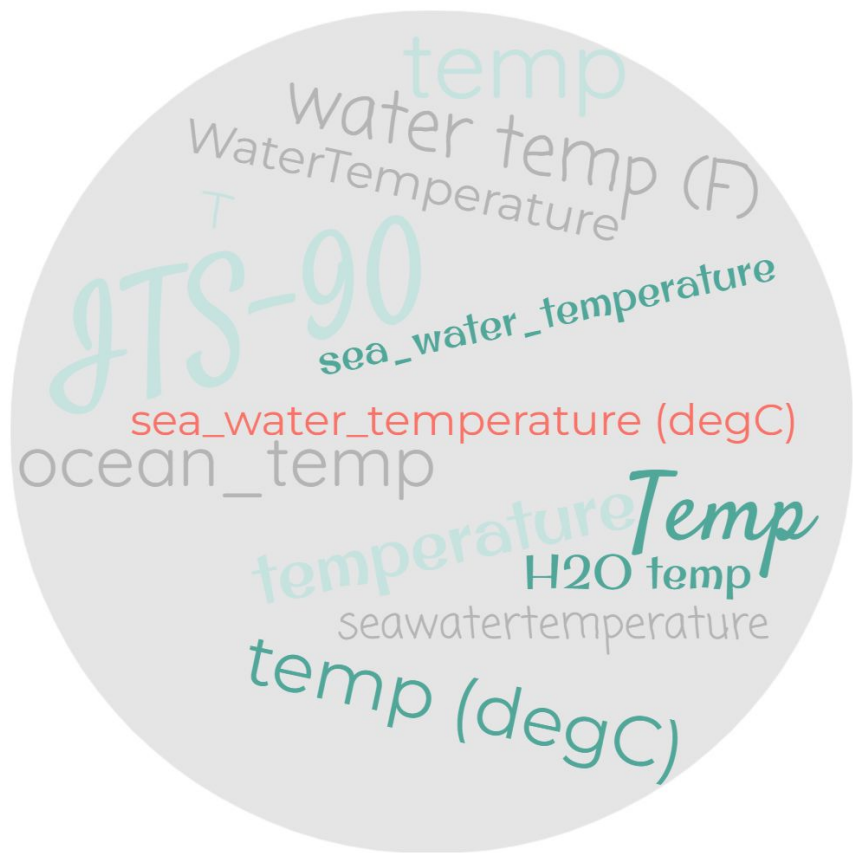
Interoperable



Re-Usable

Why is Interoperability Important?

- The Problem
 - Inconsistent naming
 - Inconsistent units
 - Time for end user to make conversions
- Data Interoperability
 - Ensures that data created is structured such that it may be combined and aggregated with other datasets



Standards for Names, Dates, and Coordinates

- Names:
 - Climate and Forecast Conventions
 - [Cfconventions.org](https://cfconventions.org)
 - Darwin Core for Biology
 - dwc.tdwg.org
- Date:
 - YYYY-MM-DD
 - ex: 2022-03-09
- Time:
 - 2022-03-09T12:00:00-00:00 or 2022-03-09T12:00:00Z
 - Always record the time zone
 - Ideally use UTC time to make time comparisons easier
 - ISO 8601 standard
- Coordinates
 - dd.dddd -dd.dddd
 - ex: 57.7997 -125.3327



Example data transformation

Before

Platform	Date	Time	Lat	Lon	Temp	Pressure	Calibration coeff
Buoy123	2022-03-08	12:00:00	45° 7' 48"N	123° 13' 48" W	10	40.2	5.4
...							

After

platform	date	latitude	longitude	sea_water_tem perature (Celsius)	sea_water_pressu re (dbar)
Buoy123	2022-03-08T16:00:00Z	45.13	-123.23	10	40.2
...					



From Data To Information

Daunting Tables vs. Interactive Applications



**CIOOS
PACIFIC**
Regional Association of the Canadian
Integrated Ocean Observing System

CIOOS Pacific ERDDAP
Easier access to scientific data

English

ERDDAP > tabledap > Data Access Form

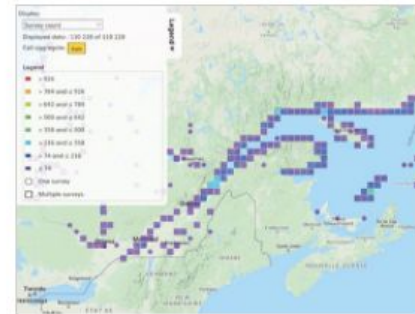
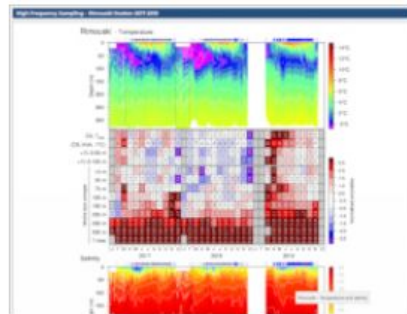
Dataset Title: **IOS Moored CTD Data**

Institution: Institute of Ocean Sciences (Dataset ID: IOS_CTD_Moorings)

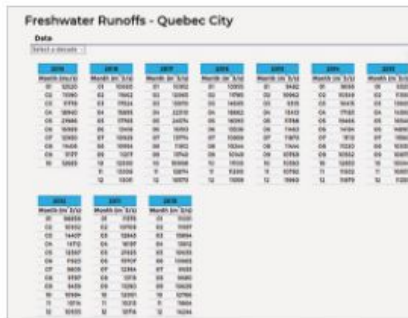
Information: [Summary](#) | [License](#) | [ISO 19115](#) | [Metadata](#) | [Background](#) | [Subset](#) | [Files](#) | [Make a graph](#)

Variable Check All Uncheck All

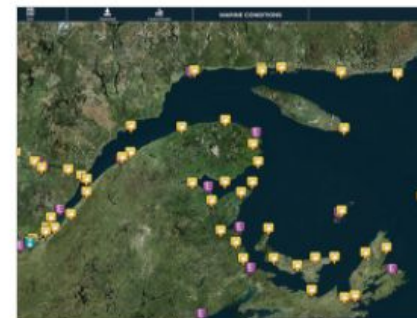
Variable	Optional Constraint #1	Optional Constraint #2	Minimum or a List of Values	Maximum
<input checked="" type="checkbox"/> profile	>=	<=	"1989-000-0000"	"2020-069-0059"
<input checked="" type="checkbox"/> filename	>=	<=	"A1_20090524_200909..."	"zuc1_20150801..."
<input checked="" type="checkbox"/> country	>=	<=		
<input checked="" type="checkbox"/> mission_id	>=	<=		
<input checked="" type="checkbox"/> scientist	>=	<=		
<input checked="" type="checkbox"/> project	>=	<=	"AMP 2"	"WCTSS-C"
<input checked="" type="checkbox"/> agency	>=	<=		
<input checked="" type="checkbox"/> platform	>=	<=		
<input checked="" type="checkbox"/> instrument_type	>=	<=		
<input checked="" type="checkbox"/> instrument_model	>=	<=	"1184"	"Sea-Bird SBE39"
<input checked="" type="checkbox"/> instrument_serial_number	>=	<=	"113"	"SBE37SMP-ODC"
<input checked="" type="checkbox"/> geographic_area	>=	<=		
<input checked="" type="checkbox"/> event_number	>=	<=	"0000"	"8"
<input checked="" type="checkbox"/> latitude (degrees_north)	>=	<=	48.38346	54.5273
<input checked="" type="checkbox"/> longitude (degrees_east)	>=	<=	-131.7131	-123.1233
<input checked="" type="checkbox"/> time (UTC)	>= 2020-07-30T00:00:00Z	<= 2020-08-06T23:00:58Z	1989-07-07T19:45:00Z	2020-08-06T23:00:00Z
<input checked="" type="checkbox"/> PRESPR01 (Pressure, decibar)	>=	<=	-99.0	778.844
<input checked="" type="checkbox"/> instrument_depth (m)	>=	<=	12.0	1590.0
<input checked="" type="checkbox"/> depth (m)	>=	<=	-98.18143	9.96921E36
<input checked="" type="checkbox"/> sea_water_temperature (degC)	>=	<=	5.3285	9.96921E36
<input checked="" type="checkbox"/> sea_water_practical_salinity (PSS-78)	>=	<=	-99.0	9.96921E36
<input checked="" type="checkbox"/> sea_water_pressure (Pressure, dbar)	>=	<=	-99.0	9.96921E36
<input checked="" type="checkbox"/> TEMPS901 (Sea Water Temperature, deg C)	>=	<=	5.3285	16.1721
<input checked="" type="checkbox"/> TEMPS902 (Sea Water Temperature, deg C)	>=	<=		
<input checked="" type="checkbox"/> TEMPS601 (Sea Water Temperature, deg C)	>=	<=		



Atlantic Zone Monitoring



Biodiversity



Freshwater Runoffs

Marine Conditions

SLGO's Visualization Tools - Marine Conditions

OGSL | Carte | Tableau | Télécharger | Centre Contrôle | **CONDITIONS MARITIMES** | [User Profile] | [Share] | [Settings] | [Help]

Catalogue de données

- ▼ Eau
 - ▶ Vague
 - ▼ Physico-chimie
 - Fluorescence CDOM
 - Chlorophyllie
 - Densité
 - Salinité
 - Température
 - ▶ Courant
 - Niveau
 - ▶ Station
 - ▶ Air

Couches affichées

- Marégraphe
- Bouée
- Station météo
- Radar
- Hauteur libre dynamique

slgo.ca/conditions

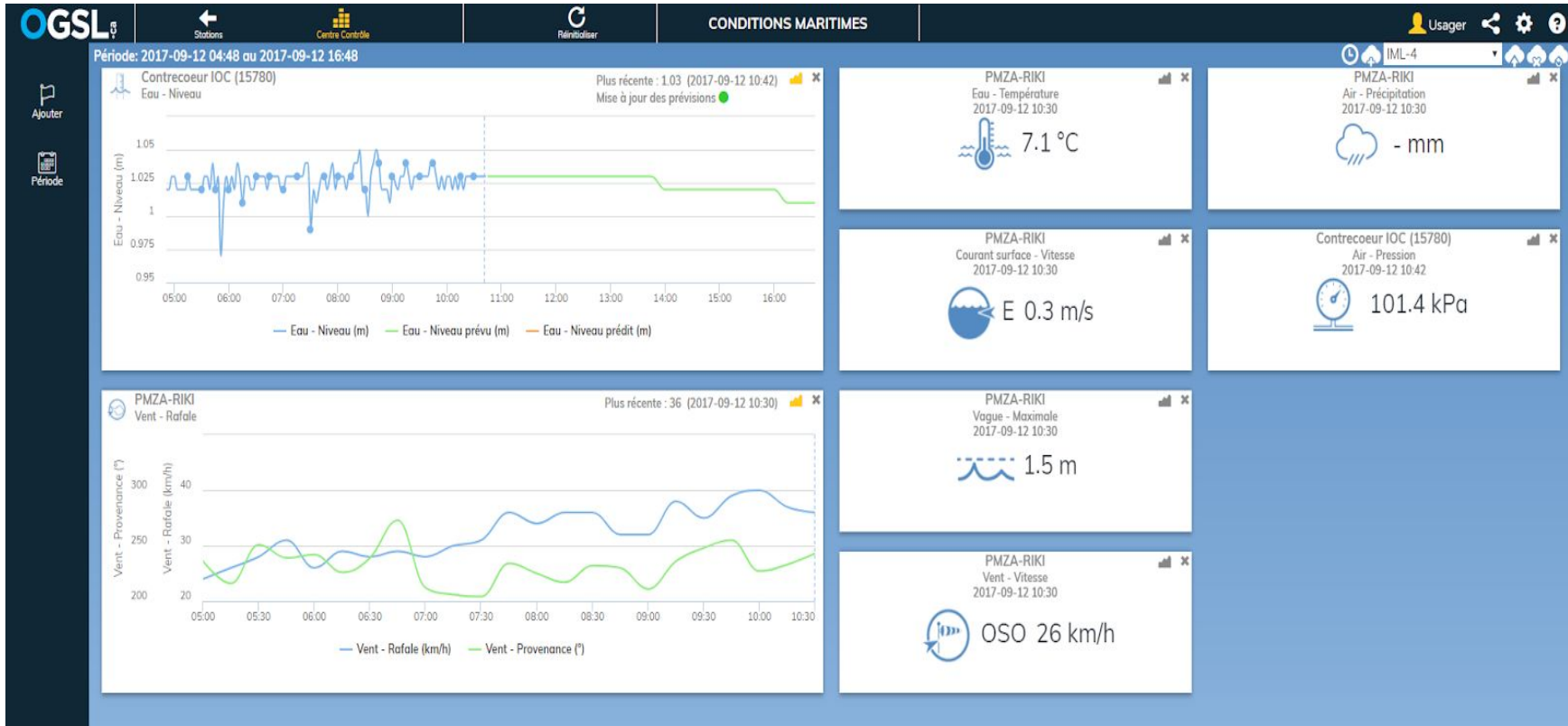
Bouée

Fournisseur	Pêches et Océans Canada - MPO
Station	PMZA-RIKI
Données de la station	[Graph]
Tableau de bord	[Icon]
Type	Bouée
Position	48° 40 002' N 68° 34 998' O
Date/Heure (local)	2018-08-20 16:00
Air - Humidité relative (%)	81
Air - Pression (kPa)	101.89
Air - Radiation PAR (quanta/cm²sec)	4.34e+16
Air - Température (°C)	13.7
Courant 6m - Direction (°)	68.8
Courant 6m - Vitesse (m/s)	0.11
Courant surface - Direction (°)	309

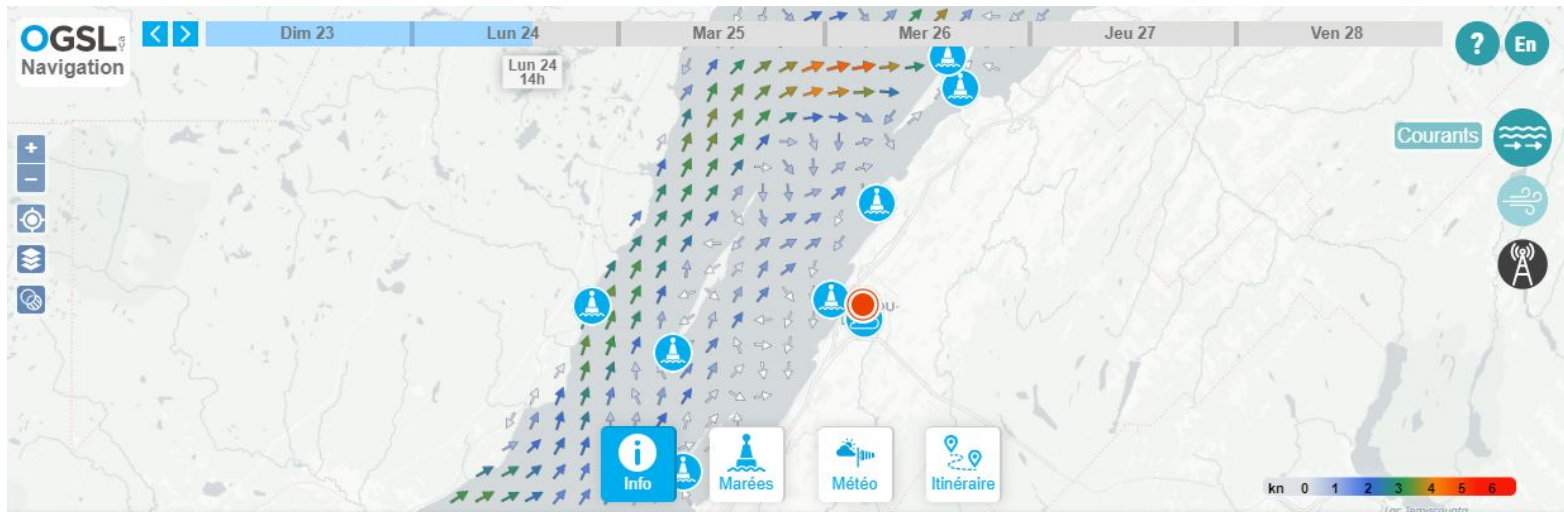
2018-08-20 16:05 | À JOUR

Vue aérienne | Légende

SLGO's Visualization Tools - Marine Conditions - Dashboard



SLGO - Navigation




Informations sur le secteur

Latitude 47.842, Longitude -69.531

Lun 2023-04-24 14:00

Prédictions - position sur carte

Courants | Modèle du SHC

 Pas de données de courant disponible pour votre position

Vents | Modèle SHRPD

 Vitesse 5.8 noeuds
Direction N

Rafales de vent | Modèle SHRPD

 Vitesse 6.7 noeuds

Marées du jour

Rivière-du-Loup | 3 km de distance

Heure	hauteur (m)	hauteur (pieds)	
-------	-------------	-----------------	--

0:08	1.223	4.01	
------	-------	------	---

6:23	4.861	15.95	
------	-------	-------	---

13:00	1.035	3.4	
-------	-------	-----	---

18:53	3.82	12.53	
-------	------	-------	---

Météo

Météo - lundi

Rivière-du-Loup



Généralement nuageux avec 40 pour cent de probabilité d'averses. Vents devenant du nord-est à 20 km/h avec rafales à 40 cet après-midi. Maximum 10. Indice UV de 6 ou élevé.

Observations

Rivière-du-Loup

Lun 2023-04-24 13:00

à 1 km de distance

Température: 7.0 °C

Atlantic - Hurricane Dashboard - Coming



[Home](#) / [Active Storms](#) / [Historical Storms](#) / [About Hurricanes](#)

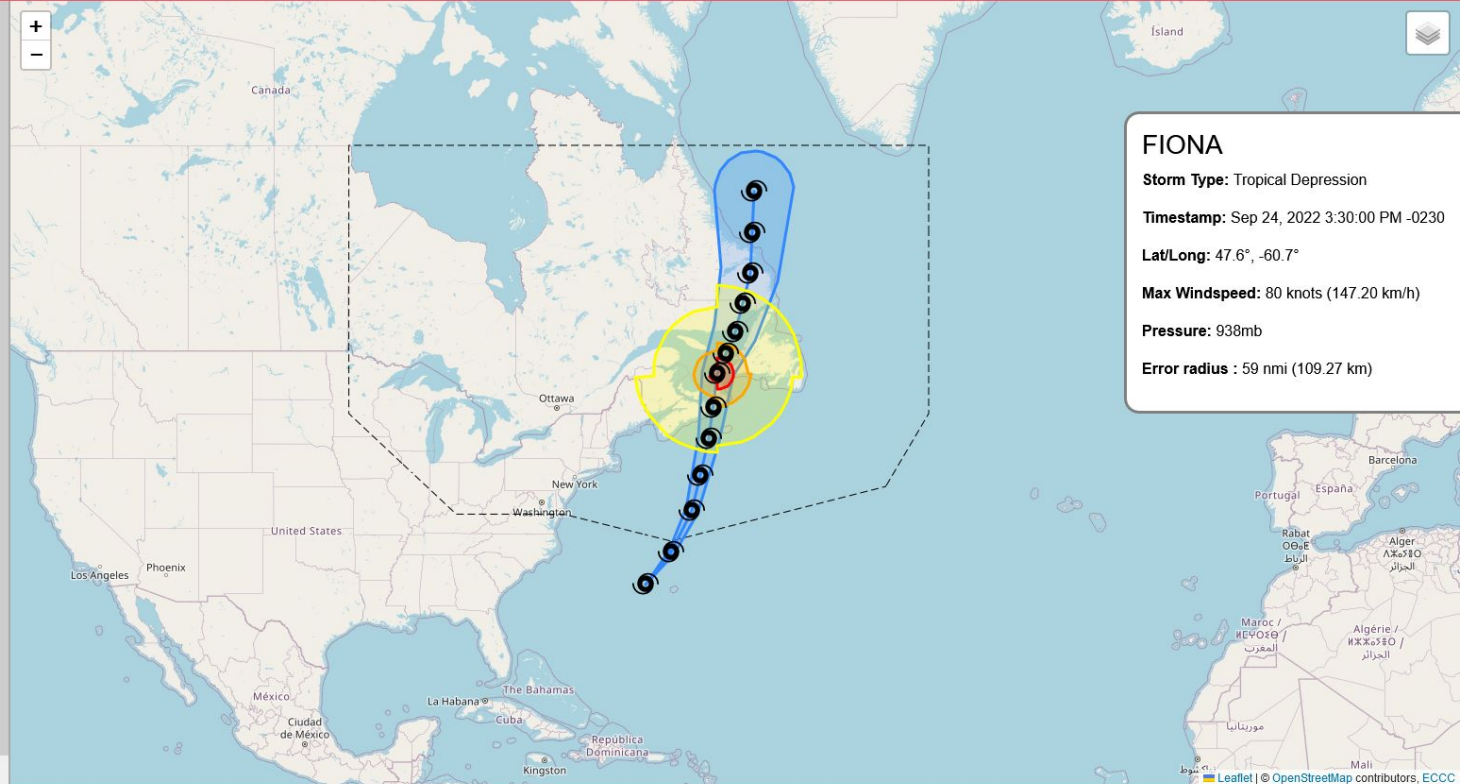
Find Storm:

- FIONA (2022)

FIONA (2022) - Source: eccc

Forecasts (Newest First)

- Sep 25, 2022
 - 09:30 -0230 (1200 UTC)
 - 03:30 -0230 (0600 UTC)
 - 21:30 -0230 (0000 UTC)
- Sep 24, 2022
 - 15:30 -0230 (1800 UTC)
 - 09:30 -0230 (1200 UTC)
 - 03:30 -0230 (0600 UTC)
 - 21:30 -0230 (0000 UTC)
- Sep 23, 2022
 - 15:30 -0230 (1800 UTC)
 - 09:30 -0230 (1200 UTC)
 - **03:30 -0230 (0600 UTC)**
 - 21:30 -0230 (0000 UTC)
- Sep 22, 2022
 - 15:30 -0230 (1800 UTC)
 - 09:30 -0230 (1200 UTC)
 - 21:30 -0230 (0000 UTC)
- Sep 21, 2022
 - 15:30 -0230 (1800 UTC)



Metadata Improvements

- Improving the controlled vocabulary
- Links to external repositories
- Indigenous data tags and support for Traditional Ecological Knowledge



BC Consent Verified
(BC CV)



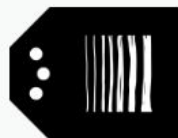
BC Consent Non-Verified
(BC CNV)



BC Research Use
(BC R)



BC Open to Collaboration
(BC CB)



BC Provenance
(BC P)



BC Multiple Communities
(BC MC)



BC Open to Commercialization
(BC OC)



BC Outreach
(BC O)



BC Clan
(BC CL)

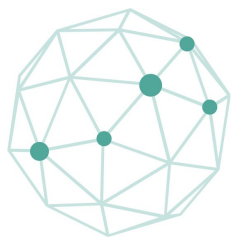


BC Non-Commercial
(BC NC)

CIOOS is here for YOU!

- More data from more sources
- Easier to get data out and in
- Making CIOOS even more useful
- Your feedback makes us better





CIOOS

CANADIAN INTEGRATED
OCEAN OBSERVING SYSTEM

CIOOS would not be possible without the financial support and the continued involvement of these organizations :



Fisheries and Oceans
Canada

Pêches et Océans
Canada

Tula
FOUNDATION



cioos.ca | siooc.ca



info@cioos.ca



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