

# MEOPAR Data Management Workshop

Marriott Chateau Champlain

Montreal, QC

March 24 & 25, 2014



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# Acknowledgements

This presentation is a combination of slides from other presentations and information sheet with updates where needed and a few new slides:

- Nikki Beauchamp, OTN Communications and Outreach; Information Sheet for Megan Leslie, December 2013
- Kes Morgan, OTN Senior Project Manager; Horizon 202, January 2014
- Bob Branton, OTN Data Management Emeritus; COASTGIS 2013, and OBIS SG, Dec 2013
- Lenore Bajona, OTN Director Data Management; OTN DMC Introduction March 2014

# What is

Dr. Sara Iverson,  
OTN Scientific  
Director

# OTN?

- **Global research and technology development initiative (platform)**
- **\$160-million for ocean research**
  - **\$35 million CFI**
  - **\$10 million NSERC**

# What is the Ocean Tracking Network?

## What does OTN do?

OTN is a unique ocean observing system. It uses acoustic and satellite telemetry to globally document the movements and survival of aquatic animals, and their environmental correlates. This policy relevant information is used: to inform fisheries management, protect public safety, in biodiversity conservation, for marine reserve planning, in impact assessments for proposed ocean developments, and to expand our fundamental knowledge of the oceans. We tag animals 5 cm in length and larger, ranging from jellyfish to white sharks to whales. We also work with bioprobes, which locally are grey seals equipped with satellite linked acoustic receivers that reveal interactions among tagged animals while concurrently measuring oceanographic conditions. OTN also operates a small fleet of autonomous vehicles (AUV's, aka "gliders").

OTN is a biological observing system of the UN's Global Ocean Observing system.

## Infrastructure and Funding

OTN is a Canada Foundation for Innovation (CFI) International Joint Ventures Major Sciences Initiative (\$35 M over 7-9 years, Phase I ends 31 Dec 2016). This funds the development of a **global** acoustic telemetry receiver infrastructure **partnership**. It is headquartered at Dalhousie University.

A \$10M Natural Sciences and Engineering Research Council (NSERC) of Canada Science Network operates in Canada's Atlantic, Pacific and Arctic regions. Participants are drawn from Universities across the country, federal and provincial governments, NGO's and the private sector.

OTN is built primarily on Canadian acoustic telemetry technology, most of which is manufactured here in Halifax by Amirix/Vemco. Other Halifax based suppliers include Romor, and Baker Blue Ocean. Other major Canadian suppliers include Kintama, and Lotek Wireless.

## Personnel

- CFI funds nine positions in Halifax over 7-9 years at \$5.3 M in budgeted CFI Salary Inputs to Halifax, creating 9 positions over approximately seven years.
- NSERC funds an additional two positions at ~\$1M over 7 years.
- Approximately 400 scientists from Canada and globally are currently working with the OTN infrastructure.
- 82 HQP (highly qualified personnel such as students and postdoctoral fellows) were in training by OTN Canada Scientists in 2012-2013 in many institutions across the country. NSERC funding supports some or all of the salaries of these individuals. International partners are also training HQP.



The background image shows two researchers on a beach at sunset. One researcher is standing on the left, looking towards the water. Another researcher is on the right, partially obscured. In the water, an acoustic receiver unit is visible. The sky is filled with soft, colorful clouds from the setting sun.

# What does

# OTN do?

Since 2008, tracks local-to-global movement and survival of ocean animals using acoustic/satellite telemetry

Acoustic receiver unit tracking sturgeon in the Minas Passage, Canada

# Operating Passive Acoustic Moorings

## Acoustic receivers

- ~ 800 metre spacing
- ~ 50-200 metre depth
- models / battery life
  - VR2W / 1 yr
  - VR3 / 3 yr
  - VR4 / 5 yr












HOME | DATA

You are here: Home > Data Policy, Templates and Workflows > OTN Data Sheet Templates

### OTN Data Sheet Templates

Excel files of data sheet templates and pdfs of data sheets for printing. NOTE need to clear your browser cache in order to download the most recent version. The most recent version of each data sheet is listed in the OTN Data Sheet C

-  OTN Equipment Testing Checklist  
Used to capture a record of all in-water and in-air tests of equipment received at OTN headquart
-  OTN Equipment Testing Checklist pdf for printing  
Used to capture a record of all in-water and in-air tests of equipment received at OTN headquart record this information during testing.
-  OTN Glider Deployment Metadata Data Sheet  
Used to capture deployment and recovery metadata for glider missions.
-  OTN Instrument Deployment Metadata Data Sheet  
Used to capture metadata for the deployment, download, and recovery of all instruments (includ
-  OTN Instrument Deployment Short Form  
Shorter version of the Instrument Deployment metadata for use for non-OTN arrays that do not r
-  OTN Instrument Deployment Field Sheet  
Used to capture metadata in the field during deployments of data-recording instruments.
-  OTN Instrument Deployment Field Sheet pdf for printing  
Used to capture metadata in the field during receiver deployments. This is a print-ready pdf that
-  OTN Mission Report  
Used to provide general information, objectives, and results of OTN missions.
-  OTN Mission Report pdf for printing

<http://members.oceantrack.org/data/data-collection/data-sheet-templates>

OTN receives Deployment / Download / Recovery Metadata usually via OTN Template (MS Excel XLS) file which includes Data Dictionary for worksheets/columns, and the Receiver Detection files (raw, VUE converted).

# Surgically Implanted Acoustic Tags

- VEMCO acoustic tags
  - Optional Sensors
    - Temperature
    - Depth
    - Acceleration



[www.vemco.com/products/transmitters](http://www.vemco.com/products/transmitters)



## OTN Data Sheet Templates

Excel files of data sheet templates and pdfs of data sheets for printing. NOTE: If you previously downloaded need to clear your browser cache in order to download the most recent version because your browser stores The most recent version of each data sheet is listed in the OTN Data Sheet Catalogue.

### OTN Equipment Testing Checklist

Used to capture a record of all in-water and in-air tests of equipment received at OTN headquarters or directly by partner institutions.

### OTN Equipment Testing Checklist pdf for printing

Used to capture a record of all in-water and in-air tests of equipment received at OTN headquarters or directly by partner institutions. This record this information during testing.

### OTN Glider Deployment Metadata Data Sheet

Used to capture deployment and recovery metadata for glider missions.

### OTN Instrument Deployment Metadata Data Sheet

Used to capture metadata for the deployment, download, and recovery of all instruments (including receivers, benthic pods, CTDs, and

### OTN Instrument Deployment Short Form

Shorter version of the Instrument Deployment metadata for use for non-OTN arrays that do not require a Mission Report.

### OTN Instrument Deployment Field Sheet

Used to capture metadata in the field during deployments of data-recording instruments.

### OTN Instrument Deployment Field Sheet pdf for printing

Used to capture metadata in the field during receiver deployments. This is a print-ready pdf that can be used to record this information

### OTN Mission Report

Used to provide general information, objectives, and results of OTN missions.

### OTN Mission Report pdf for printing

Used to provide general information, objectives, and results of OTN missions. This is a print-ready pdf that can be used to record this information

### OTN Proposed Station Locations

Used to record lats, longs, and bottom depth of proposed station locations for new OTN arrays and for new stations on existing OTN arrays

### OTN Sentinel Tag Mooring Log Sheet

Used to record metadata for OTN sentinel tag moorings.

### OTN Moored Transmitter Short Form

Used to capture metadata on moored transmitter deployments.

### OTN Tagging Metadata

Used to capture tagging metadata for all animals tagged with acoustic, satellite, or VHF tags.

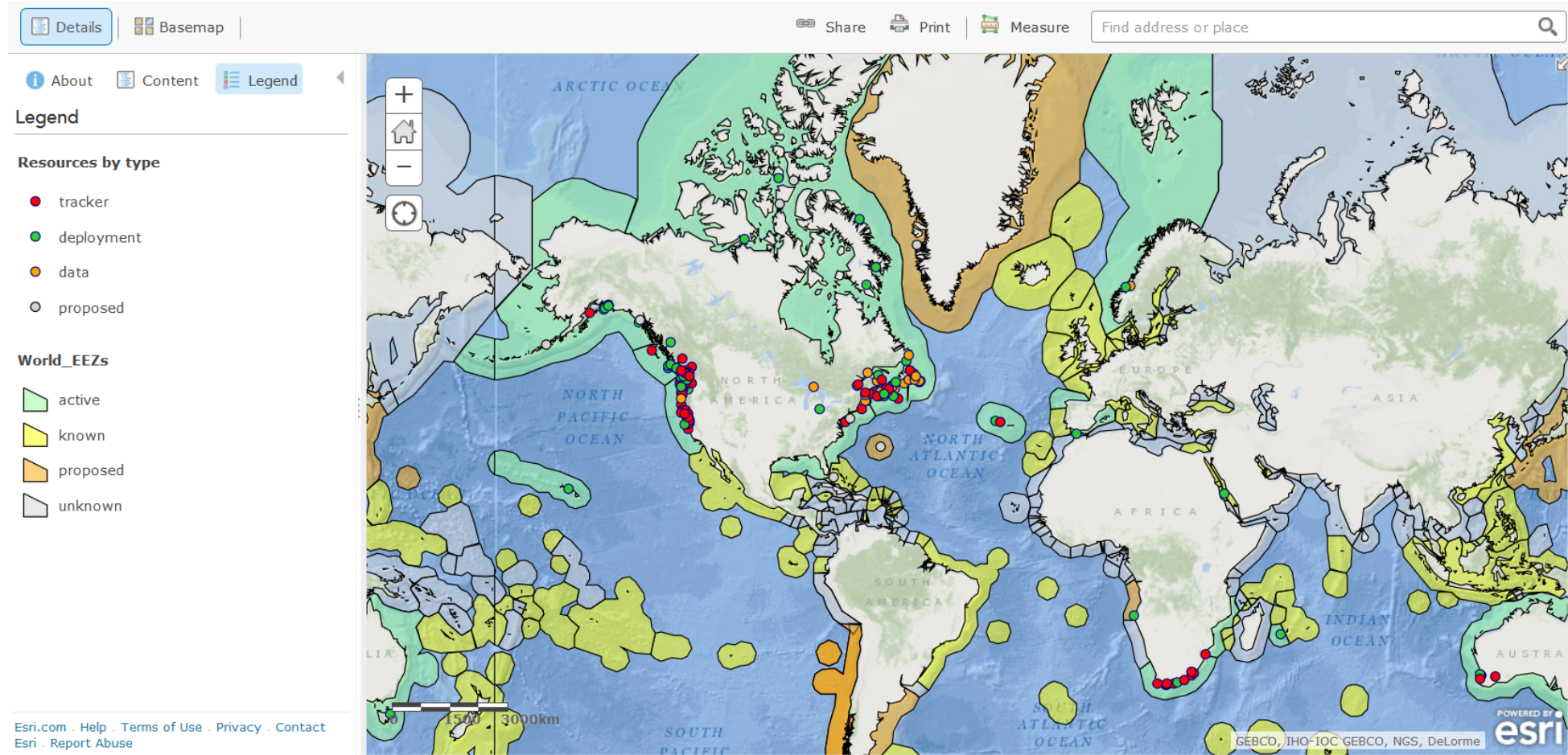
<http://members.oceantrack.org/data/data-collection/data-sheet-templates>

OTN receives Tagging Metadata usually via OTN Template (MS Excel XLS) file which includes Data Dictionary for worksheets/columns. There is also OTN template for Sentinel Tag Mooring Metadata.

# Where?

ArcGIS OTN EEZ Map

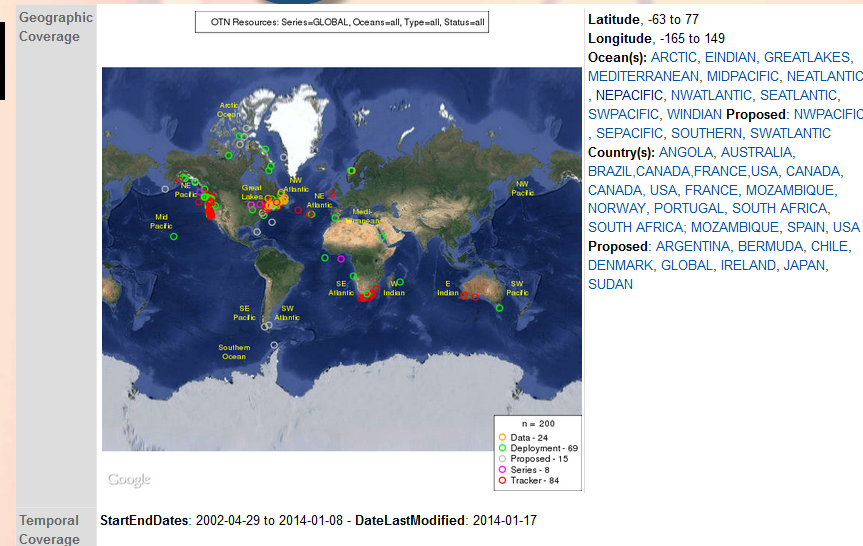
MODIFY MAP [Sign In](#)



Courtesy Bob Branton 2013

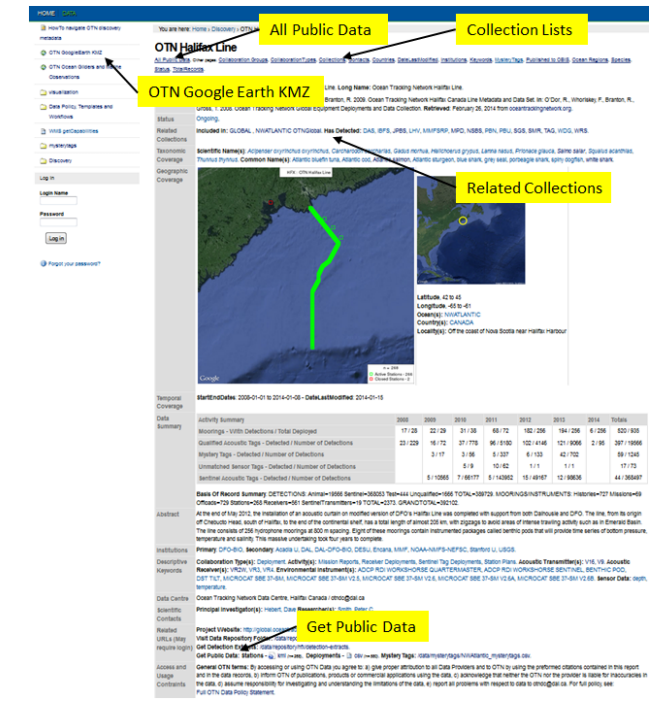
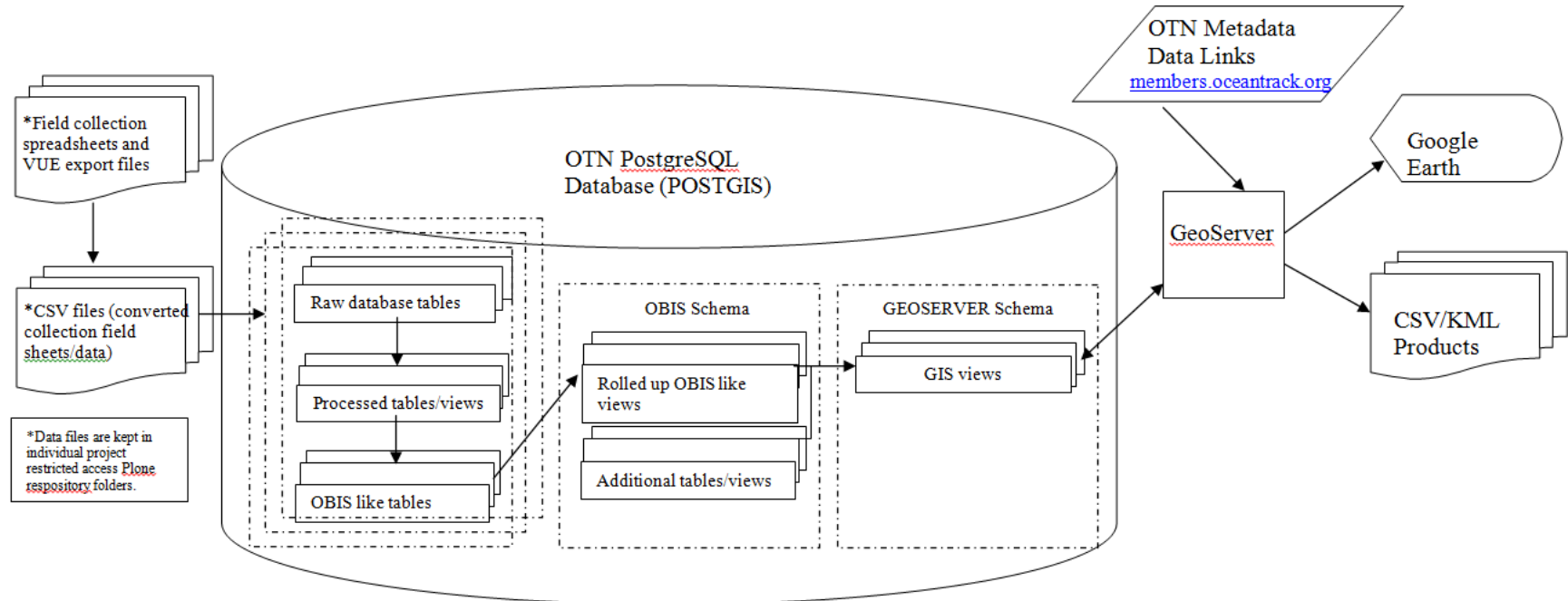
# Data

- **Historic and current**
- **>60 million detection records**
- **>189 collections global**
- **Standards based**
- **Intellectual property**
- **Open access**



OTN data managers at Dalhousie University and around the world are working to make the world's ocean tracking data and related information freely accessible without charge by the broader scientific community as well as respecting the intellectual property rights of its providers. 90% of these data are from non-OTN funded contributors.

# OTN Data Centre Internal Telemetry Data Flow



There are currently three (animal telemetry) databases in OTNDC with a combined size of ~123 GB. The current databases are South Africa Node (SAFNODE), Northeast Pacific Node (NEPNODE, consists of POST and additional OTN NEPacific Collections) and OTN (the rest, so not just Northwest Atlantic (including DFO), but also Australia, Arctic, Azores, Great Lakes, etc.). Separate “nodes” are developed with the intent of these being moved to local infrastructure and data management.

As of March 16, 2014, 15 Ocean Regions including Great Lakes, over 35K animal tag metadata records of 52 species, 72 institutes from 14 countries:

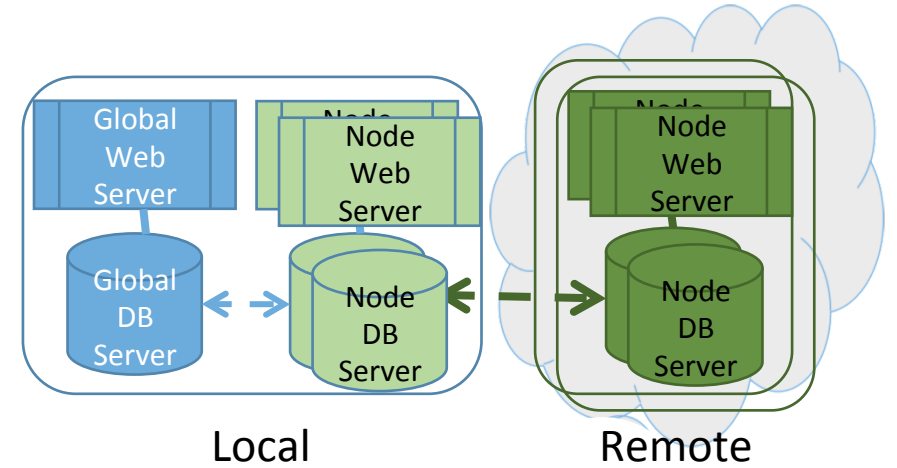
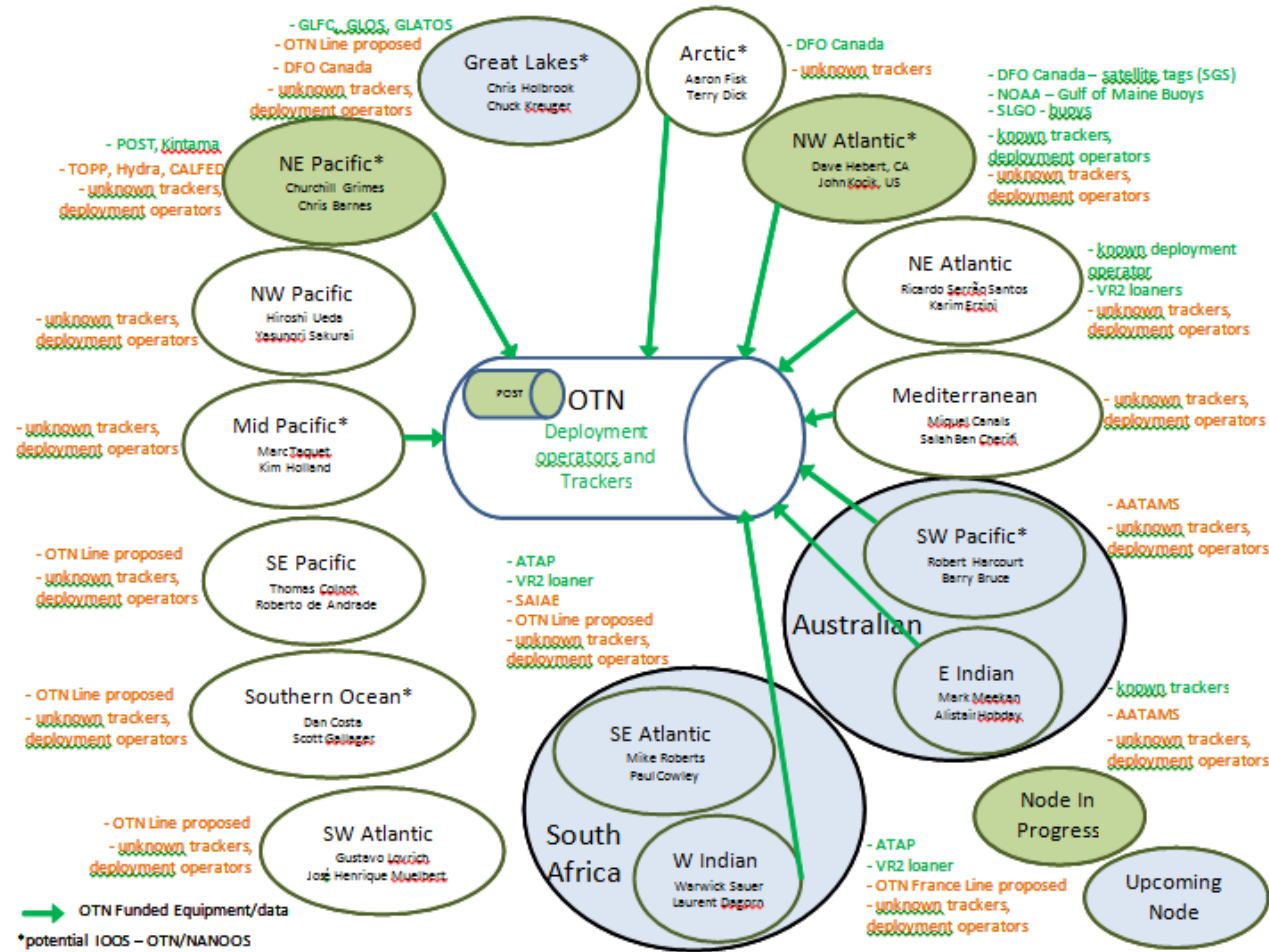
DB	#Projects	#Records	GB	#Stations/Receivers/Deployment	#Tags*/Detect	#MysteryTags/Detect
OTN	88**	373,433,736	90	2,949 / 2,684 / 5,766	8K / 41.1M	4.7K / 11.8M
NEPNODE	90 (13 OTN)	51,292,557	23	882 / 1,073 / 2,512	15K / 4.6M	4.5K / 4.1M
SAFNODE	11	69,682	.035	76 / 105 / 125	46 / 13,525	1 / 6
<b>TOTAL</b>	<b>189</b>	<b>424,795,975</b>	<b>113.035</b>	<b>3,907 / 3,862 / 8,403</b>	<b>23K / 45.7M</b>	<b>9.2K / 15.9M</b>

Over 60 million detections of 32,2001 tags.

\*Number of acoustic tags detected, more acoustic tags have been released; does not include sensor acoustic tags and satellite tags. \*\* 58 projects are NW Atlantic.

Separate “nodes” are developed with the intent of these being moved to local infrastructure and data management.

**OTN current and anticipated nodes and collaborators**  
(July 2012)



Courtesy: Donnie Lambert – Dal ITS

OTNDataCentre's 20 Year Outlook

Drivers	Next 2 years 2013-2014	Years 3-5 2015-2017	Years 6-20 2018 - 2033
Data Sources	-Growth of OTNGlobal to include all regions. -Growth of OTNCanada deployment and tracker activity. -New institutional and commercial partners. -Rapid introduction of benthic pods and near real time transceivers, buoys and gliders.	-Growth of existing institutional and commercial partners. -More institutional and commercial partners. -Ongoing OTN Global and Canada activity.	-Growth of existing institutional and commercial partners. -Some new institutional and commercial partners. -Ongoing OTN Global.
Processing Methods	-Initiating data flow into archives. -Initiating replacement of manual processes with automated methods. -Develop standardized data citations following GBIF guidelines including use of DOIs.	-Developing, maintaining and operating a blend of manual and automated processes.	-Maintaining many automated processes and operating a few manual ones.
Software	Using open source software as is with a few local extensions.	Begin engaging open source development community.	Actively participating in various open source projects.
Data Volumes	100 million records - 10^8	10 billion - 10^10	1 trillion plus - 10^12
Industry Partnering	Restricted provision of instrument specifications metadata from a few sources.	Industry provides free and open access to all instrument specification metadata including shared and/or coordinated use of code spaces.	
Hardware	-Fully exploit current hardware -Experiment with commercial clouds	-Use already allocated funds to acquire new in-house equipment and/or to use commercial clouds.	-Coordinate soliciting of new funds and or in-kind contributions to maintain regional nodes.
Nodes	Emergence of regional nodes including: North East Pacific, Southern Africa and Australia.	Rapid expansion to include all OTN and IOOS regions.	Occasional introduction of new nodes.
Linkages	Global Node submitting data GBIF and WMO via NODCs, IOOS and OBISCanada.		Regional nodes submitting directly to WMO and GBIF.
Access	Continuing focus on CSV&KML via Geoserver while implementing NETCDF via ERRDAP.	Expanding to include OGC SOS.	
Visualization	Development of basic data formats and associated visualizations.	Automate publishing of basic visualizations.	
Staffing	Mostly at global node with some help from regional data managers.		Mostly at regional nodes with coordination from global node.

Green text are in progress data collection activities while orange text are NOT in progress (those orange with OTN Line Proposed, means we do not currently have an established plan for the OTN Line in that Ocean Region)

# OTN Data Management Committee

Introductory Teleconference, March 18, 2014

## OTN Data Management Committee Membership

(chair, voting, non-voting, \*staff)

Name	Institution and Position
Francisco Hernandez	Manager, Data Center Division, Flanders Marine Institute Platform for Marine Research
Jon Burgess	Software Engineer/Database Administrator, Integrated Marine Observing System
Joanna Mills Flemming	Associate Professor, Dalhousie University
Hassan Moustafhid	Biology Project Manager, Integrated Ocean Observing System
Tania Pinnell	Department of Fisheries, Western Australia
Tim Stone	Director of Product Development – Software, VEMCO Limited
*Lenore Bajona	Portal Manager, OTN Global
*Kes Morton	Senior Project Manager, OTN Global
*Fred Whoriskey	Executive Director, OTN Global

OTN Data Management Committee High-Level Strategic Goals  
(extractions from OTN Strategic Plan and Management Plan OTN)

Strategic Plan 2013 – 2018: “Building the knowledge base for ocean resource management – a global challenge”. Management Plan: “A Companion to the Strategic Plan 2013 – 2018”

Inputs: IT infrastructure for data storage, data product generation, and internet delivery capacity. IT long term data archives from DFO.

Outputs: Trusted, relevant, high-quality knowledge products, data and metadata. Fast and reliable internet data delivery system. Access to highly relevant, timely global data and information that is not available through other means.

Activities: Manage a world class IT system – data archive, preservation, repository and access system.

Committee actions need to be driven by management priorities as set in the management plan, which include:

- Implement a global data base of telemetry information and related physical, chemical and biological data.
- Ensure breadth and ease of access to the OTN data warehouse
- Ensure access to time-series data on global and national movements and survival of marine animals, and data on how these are related to environmental conditions including change initiated by global warming
- Establish effective communications and outreach capabilities to assist end users with data uptakes
- Pursue and secure sustained funding and other essential resources
- Foster international collaboration for Canadian researchers, institutions and partner organizations
- Promote, enhance and support the use of OTN data and research results for management and Canadian public policy development

Foster:

- broader uptake of the data
- creation of regional data nodes - The knowledge required for quality assurance and quality control of OTN data lies in the geographic areas where the data is collected.
- inter-operability with other large national (e.g. CHONE, ArcticNET) and international (IOOS, IMOS) networks
- collaboration with researchers in development of oceanographic data integration with animal movement

Enrich:

- data and metadata policies for OTN – expected to evolve with new data-accessibility standards being developed for publically-funded research projects in Canada
- reliability of data acquisition and the effectiveness of data archiving, security and storage provisions

Improve:

- identification and resolution of issues
- OTN Data Plan - for efficient (automation) and effective access to quality assured/assured data and metadata with appropriate documentation
- efficiency and cost-effectiveness for sustainability
- identification of data gaps and possible contacts for establishing links for filling

Performance Measurement	Deliverable	Milestone Date
Reports on Metrics (for OTNDC, OTNHQ, partners, researchers, collaborators)	MILESTONE: Launch CFI Receivers and NSERC Tags Cost Reporting	2013-09-30
quality (and timeliness) of data	MILESTONE: (Current) Historic Data Cleanup Complete	2014-01-31
timely and easy access for users: Use by/for policy makers	MILESTONE: Launch OTN ERDDAP Phase I	2014-03-31
timely and easy access for users: Use by/for policy makers; Number of 'mystery tags' (Reduce number of mystery tags)	MILESTONE: OTN CMS Public Metadata and Data Products Improved and/or Additions	2014-03-31
quality (and timeliness) of data	MILESTONE: Lost/Found/Moved Layer Launched	2014-03-31
analysis tools and visualization software; user interface tools/retrieval tools	MILESTONE: OTN Line Performance Reporting Launched	2014-03-31
timely and easy access for users: Use by/for policy makers	MILESTONE: Automated glider metadata/missions reporting launched	2014-03-31
Number of data records; Node Distribution; foster creation of regional data nodes;	MILESTONE: nep node repatriation	2014-06-30
Manage a world class IT system (IT infrastructure for data storage, data product generation, and internet delivery capacity. )	MILESTONE: LATEST/GREATEST PR WEBSITE COMPLETE	2014-06-30
Number of tools developed; new tools to mine the database; analysis tools and visualization software; user interface tools/retrieval tools	MILESTONE: Launch automated mark-recapture tool - Gateway for tools prominently displayed on website	2014-06-30
Manage a world class IT system (IT infrastructure for data storage, data product generation, and internet delivery capacity. )	establish data management committee	2014-02-28
Node Distribution; foster creation of regional data nodes;	draft list of potential Nodes and plan for data management committee	2014-03-31
Data access policy; Use by/for policy makers	establish scientific names expert consultant to report to data management committee	2014-03-31
Manage a world class IT system (IT infrastructure for data storage, data product generation, and internet delivery capacity. )	First DMC Meeting/Conference	2014-06-30
	MILESTONE: Functioning, directive, involved DMC	2014-06-30
Number of tools developed; new tools to mine the database; analysis tools and visualization software; user interface tools/retrieval tools	MILESTONE: Launch automated interval data tool	2014-06-30
Number of data downloads; Number of users; Locations of users	MILESTONE: Complete Tracking/Reporting on Data and Tools Usage	2014-06-30
Time from data detection to availability for (PIs) users (also see automation of data transfer to data warehouse)	MILESTONE: Launch completed automated detection extractions and emails to PIs	2014-06-30
Time from data detection to availability for users (also see automation of data transfer to data warehouse)	MILESTONE: Launch VR2C Automation Real-time detections	2014-06-30
(If long term data archives from DFO; security of data (including backup systems)	MILESTONE: OTN PROD Data Automation to ISDM Archive	2014-06-30
Number of tools developed; new tools to mine the database; analysis tools and visualization software; user interface tools/retrieval tools	MILESTONE: Launch automated cohorts tool	2014-06-30
Reports on Metrics (for OTNDC, OTNHQ, partners, researchers, collaborators)	MILESTONE: Launch OTN HQ Queries	2014-06-30
Number of data downloads; Number of users; Locations of users	MILESTONE: OTN Effective Communication of Data	2014-06-30
Number of tools developed; new tools to mine the database; analysis tools and visualization software; user interface tools/retrieval tools	MILESTONE: SPERA Project Completed	2014-06-31
timely and easy access for users: Use by/for policy makers	MILESTONE: OTN Oceanographic Data Public Availability	2014-08-31
timely and easy access for users: Use by/for policy makers	MILESTONE: OTN Data Access/Maps Improved and/or Additions	2014-08-31
Number of tools developed; new tools to mine the database; analysis tools and visualization software; user interface tools/retrieval tools	MILESTONE: Launch automated false filtering and compression tool	2014-09-30
data integration integration physical/chemical oceanograph	MILESTONE: integration with OBIS fully operational	2014-09-30
timely and easy access for users: Use by/for policy makers	MILESTONE: Data Pushes to PROD no longer impacting Public Product Access	2014-09-30
Data warehouse complete documentation; good documentation on all tools	MILESTONE: OTN DC Documentation Current	2014-09-30
(If long term data archives from DFO; security of data (including backup systems)	MILESTONE: OTN RAW Data Automation to ISDM Archive	2014-10-31
Automation of data transfer to data warehouse (can only be done for "standard formats")	MILESTONE: Launch Semi-Automation Receiver Deployment Metadata Files	2014-12-31
Node Distribution; foster creation of regional data nodes;	MILESTONE: OTN/IOOS Formal Data Exchange	2014-12-31
Number of data downloads; Number of users; Locations of users	MILESTONE: Launch Extended Data Use Tracking using DOIs	2014-12-31

## OTN Data Management Committee (DMC) Terms of Reference

### Mandate:

The committee reports to the Executive Director and provides oversight to ensure the OTN data management model is implemented and operated reliably and efficiently. The Executive Director reports to the Council on the data management function, policies and issues.

The committee:

- Oversees the OTN Data Plan
- Designs policies, internationally standardized procedures and data quality assurance activities at all levels for staff to implement
- Provides direction on the format of the OTN database
- Assists with the development of the OTN Data Warehouse
- Helps identify new opportunities for data synergy among the partners
- Collaborates with Network researchers in the development of new analytical and data visualization tools

The committee meets by teleconference twice a year, and annually in person.

### Membership:

The Data management committee consists of up to 10 members appointed by the OTN Executive Director. Membership includes national and international telemetry, oceanography and data experts in OTN's global areas of operation. The membership also includes Director of Data Management, the Senior Project Manager and the Executive Director of OTN (all ex-officio). Any member may be removed upon resolution of the Council. Following the establishment of the committee, future nominations of members to the committee will be made by the committee members. Members shall be appointed for a two year term, renewable.

# Principles, Guidelines and Policies

OECD

**OECD Principles and Guidelines for Access to Research Data from Public Funding**

CFI / NSERC



**The 2011 Canadian Research Data Summit**

Intelligent open access



# Implementing Tag Embargo/Release

Greetings

The Ocean Tracking Network (OTN) has been operating for almost 4 years and now holds more than 66 million detection records. According to OTN's data policy ...

*OTNDC provides free and open access to all discovery, deployment, and release metadata, as well as detection data to scientists and members of the public who register to use it via the OTN website. Exceptions to this rule are: a) Tag IDs where OTNDC has received manufacturers' and trackers' metadata will be subjected to a two year renewable embargo (two years after tag life expiration) b) Where the OTN project coordinator has received proof of a scientific license for work on endangered species, release metadata and tag IDs will be subjected to a maximum ten year renewable embargo. Embargoed data can be obtained by contacting the principal investigator(s), or the embargo can be shortened at the request of the principal investigator(s). See: [members.oceantrack.org/data/data-collection/policyhighlights](http://members.oceantrack.org/data/data-collection/policyhighlights)*

Given this, OTN Data Centre (OTNDC) staff at Dalhousie University are now working to provide public access to all animal release metadata and to tagIDs and associated detections for tags expired on or before December 31, 2011. Please now take time to view OTN's contacts list at [members.oceantrack.org/data/discovery/contacts](http://members.oceantrack.org/data/discovery/contacts) and associated data collection metadata to determine if the renewable embargo period for tags that you have released should be extended or shortened. Embargo change requests (see below) from designated PIs must be received at [Lenore.Bajona@dal.ca](mailto:Lenore.Bajona@dal.ca) on or before April 30, 2014. Embargo extension requests will be forwarded to OTN's Deployment Committee and Director Data Management for review and approval.

===== OTN Embargo Change Request Form =====

Collection Code(s):

Principal Investigator(s):

Delay initial release start date to (yyyy-mm-dd) :

Change "renewable embargo" period to (0-10 yr) :

Reason for Change:

=====

In addition, OTNDC is developing improved tracker metadata reports for display on <http://members.oceantrack.org>. A sample for OTNCanada as a whole was presented at the recent OTNCanada Science Advisory Committee meeting and is attached to this email. Principal investigators will find their improved tracker reports in their respective Repository Folders, which highlight the number of tags that will be released to the public now and into the future (also by species if the project has more than one species). These reports will be released to the public with implementation of above noted public access to animal releases and detections. See attached example from PSS2 (OTN Canada Pacific Sockeye Salmon Tagging Project 2) for details interpreting number of tags that will be flagged for public release and/or embargoed.

Sincerely, Fred Whoriskey

# Data Use

- By accessing or using OTN Data you agree to:
  - give proper attribution to all Data Providers and to OTN by using the preformed citations contained in this report and in the data records, for example ...

*Barnes, C., Grimes, C. 2009. Ocean Tracking Network Northeast Pacific Metadata and Data Series.  
In: Ocean Tracking Network Global Metadata and Data Atlas.*

- inform OTN of publications, products or commercial applications using the data,
- acknowledge that neither the OTN nor the provider is liable for inaccuracies in the data,
- assume responsibility for investigating and understanding the limitations of the data,
- report all problems with respect to data to [otndc@dal.ca](mailto:otndc@dal.ca)

# Issues with Making Data Public

- Acoustic telemetry based tracking involves inherent conflict
  - Trackers want to keep their data private until they have had time to publish
  - Receiver operators are required by their funders to make data public ASAP
- Trackers and receiver operators need each other
  - trackers need detections from receivers to make conclusions about behavior of tagged species they tag
  - line operators need the trackers to make useful discoveries in order to justify the cost of the lines to funding agencies
- Both parties generally agreeing that it is desirable for all tracking data to be maintained for posterity and eventually to become fully public
- Policies arrived at by OTN are compromises that attempt to allow sufficient time for taggers to publish their work while satisfying the funders of receiver arrays
- Subtle points important to long-term success of such policies are:
  - requiring tracking metadata to be submitted immediately while enabling trackers to keep those data temporarily private makes it less likely that the data will be lost as trackers move on to other projects, priorities and jobs;
  - requesting equipment specifications directly from the manufacturer greatly improves the ability of databases to acquire and keep important equipment specification together with tag release metadata, and
  - flexibility on the part of data managers to deal with individual cases, since researchers may need to keep a list of non-standard data fields private, or to modify the length or quality of private data periods under some circumstances.

# OTN DM Issues Continued ...

1. Broader uptake of the data

2. Visualization and Analysis

3. creation of regional data nodes

- NEPNODE created, but now needs to be managed by NEP personnel (gap in DMC), though currently (very slowly) working on data exchange with Hydra, not going to provide for OTN Node Management.

- SAFNODE underdevelopment (Paul Cowley, South African Institute for Aquatic Biodiversity (SAIAB))

4. Inter-operability with other large national (e.g. CHONE, ArcticNET) and international (IOOS, IMOS) networks

5. Collaboration with researchers in development of oceanographic data integration with animal movement

6. Data and metadata policies for OTN – expected to evolve with new data-accessibility standards being developed for publically-funded research projects in Canada

- international partners may have different, legally enshrined, data access policies, OTN will have to negotiate with international partners to deal with data policy conflicts

- should be implementing Digital Object Identifiers (DOI), through Data Cite or “make” our own as done by IPY DAC (Scott Tomlinson at Research Data Canada, Data Management, Webinar, Sept. 17, 2014; now Canadian Polar Data Network)

7. Access to data from unregistered tags is time consuming – OTN has attempted processes with Vemco, but still not the optimum situation

8. Identifying and developing commercial opportunities which may be present in the development of data management, analysis and visualization tools

# Sustainability and Availability...



**Fisheries and Oceans Canada**  
www.dfo-mpo.gc.ca

Français Home Contact Us Help Search canada.gc.ca

Home > Science > Data and Products > Integrated Science Data Management.

**Integrated Science Data Management (ISDM)**  
Providing Access to Ocean Data

ISDM's mandate is to manage and archive collected by DFO, or acquired through national international programmes conducted in or adjacent to Canada, and to disseminate data and services to the marine community in line with the policies of the Department.

**Programme Descriptions**

- ▶ [Argo](#)
- ▶ [Atlantic Zone Monitoring Programme](#)
- ▶ [BioChem](#)
- ▶ [Climate Variability \(CLIVAR\)](#)
- ▶ [National Contaminants Information System \(NCIS\)](#)
- ▶ [Tides and Water Levels](#)
- ▶ [Global Temperature-Salinity Profile Project \(GTSP\)](#)
- ▶ [Joint Commission on Oceanography and Marine Meteorology \(J-COMM\)](#)
- ▶ [Responsible National Oceanographic Data Centre \(RNODC\)](#)
- ▶ [Ship of Opportunity Programme \(SOOP\) Implementation Panel](#)

**Data Request Form**

**Code List**

- Contaminants
- Currents
- Drifting Buoys
- Geoportal
- GTS code forms and advisories
- GTSP
- ICES
- J-COMM
- NAFO
- Ocean Profiles
- Offshore Oil & Gas
- Remote Sensing
- RNODC
- SOOP
- Standards
- Thermosalinographs
- Tides and Water Levels
- TWL Applications
- Waves
- WOCE



**INTERNATIONAL OCEANOGRAPHIC DATA & INFORMATION EXCHANGE**

[www.iode.org](http://www.iode.org)

Home Search Data Maps About OBIS Contact English

**OBIS OCEAN BIOGEOGRAPHIC INFORMATION SYSTEM**

Welcome to OBIS!

SEARCH OBIS PAGES

IOBIS.ORG VERSION 2

Looking for the version of the IOBIS website from before September 2010? IOBIS version 2 is still running here

RECENT NEWS

- 2010-09-21 Launch of the new OBIS web site imminent
- 2010-09-02 Prototype OBIS web site becomes available
- 2010-09-02 IOBIS node manager on study visit
- 2010-08-02 New Data on OBIS
- 2010-07-15 New members of staff

OTN/DFO Bay of Fundy Spiny Dogfish

OTN/DFO Marlin Spiny Dogfish Tagging

OBIS strives to document the ocean's diversity, distribution and abundance of life. Created by the Census of Marine Life, OBIS is now part of the Intergovernmental Oceanographic Commission of UNESCO, under its International Oceanographic Data and Information Exchange programme

# OTN data on OBIS

**BIS Canada**  
GBIF INTEGRATED PUBLISHING TOOLKIT (IPT)  
free and open access to biodiversity data

Home About

Hosted resources available through this IPT

Logo	Name
	<a href="#">OTN Bras d'Or Lakes Array - Tag Release Metadata</a>
	<a href="#">OTN/DFO Maritimes St. Mary's River Salmon Tracking - Tag Release Metadata</a>

Showing 1 to 2 of 2 resources (filtered from 31 total)

The most recently updated resources are also available as

IPT Version 2.0.5-r4398-security-up

©2012 Global Biodiversity Information Facility. Data pu

**DALHOUSIE UNIVERSITY**  
Inspiring Minds

**OTN Members Portal**

OCEAN TRACKING NETWORK

HOME DATA

You are here: Home > Discovery > byobis.htm

### byobis.htm

All Public Data. Other pages: [Collaboration Groups](#), [Collaboration Types](#), [Collections](#), [Contacts](#), [Countries](#), [DateLastModified](#), [Institutions](#), [Keywords](#), [MysteryTags](#), [Published to OBIS](#), [Ocean Regions](#), [Species](#), [Status](#), [TotalRecords](#).

The Ocean Biogeographic Information System (OBIS <http://www.iobis.org>) is an 'open-access' database first developed by the Census of Marine Life (CoML) in 1997 to help facilitate global enfranchisement of data within the scientific community activities under the International Oceanographic Data Exchange.

Below are OTN collections where data owners (i.e. principal investigators) have navigated you directly to the relevant data on OBIS. Clicking the 'i' icon to open the OBIS collection metadata page. This may require a OTN username and password a Contacts' section of the OTN metadata page.

**Published to OBIS:**

- IBFS: Inner Bay of Fundy Atlantic Salmon
- JBC: DFO NE Newfoundland Acoustic Array and ...
- NSP: Nova Scotia Power
- SGS: OTN Canada Sable Island Grey Seal ...
- SPI: Shippagan, NB: Cod tagging
- WDG: Bay of Fundy: Spiny Dogfish

OTN Funding Partners

INNOVATION.CA NSERC CRNSG SSHRC

Ocean Tracking Network | Biology Dep

<http://members.oceantrack.org/data/discovery/byobis.htm>

OBIS Home Search Data Maps About OBIS Contact Library

Data Search Distribution Map

OTN Bras d'Or Lakes Array - Tag Release Metadata

Dataset name	ID	#taxa	#records	Years
Marine Invertebrate Diversity Initiative	37	35	295	1948 to 2...
NRC Harmful Phytoplankton Monitoring Project	2674	98	2,596	1998 to 2...
Newfoundland Museum Fish Collection	2470	1	4	1985 to 2...
Northern Gulf of St. Lawrence Fishes	2671	174	26,726	1833 to 2...
Nova Scotia Museum of Natural History - Marine Bi...	34	101	579	Could not...
Nutrients and phytoplankton in Prince Edward Isla...	2341	99	3,055	2001 to 2...
OTN Bras d'Or Lakes Array - Tag Release Metadata	2834	1	66	2012 to 2...
OTN/ACADIA Minas Passage of the Bay of Fundy ...	2663	3	230	2010 to 2...
OTN/DFO Maritimes Grey seals as bioprobes	2429	2	257	2009 to 2...
OTN/DFO Maritimes Inner Bay of Fundy Atlantic S...	2661	2	252	2008 to 2...
OTN/DFO Maritimes Spiny Dogfish Tagging	2308	1	13	2009 to 2...
OTN/DFO Maritimes St. Mary's River Salmon Trac...	2835	1	75	2010 to 2...
OTN/DFO NE Newfoundland Acoustic Array and At...	2662	1	609	2005 to 2...
OTN/DFO-GFC Gulf of St Lawrence Cod Acoustic ...	2664	1	245	2009 to 2...
Pacific Multispecies Small Mesh Bottom Trawl Surv...	2833	514	167,688	1963 to 2...

<http://iobis.org/mapper/>

# Grey Seals “real-time” Data Display on Ocean Viewer

**Ocean Viewer**  
Real-time conditions & forecasts

Temperature | Salinity | Waves | Bathymetry | Ships | Animals | Chlorophyll | CDOM | Oxygen | Scattering

There is a new version of this site. Please go to the link below and update your "bookmark".

**New site: [OceanViewer.org](http://OceanViewer.org)**

If you still can't see our new site (DNS changes have not propagated yet), visit the new site at: <http://198.74.61.234>

Product name: OTN Canada Sable Island Grey Seal Bioprobes  
Provider: [Ocean Tracking Network](http://OceanTrackingNetwork.org)

**OCEAN TRACKING NETWORK**

[Download data directly from provider](#)

**DALHOUSIE UNIVERSITY**  
Inspiring Minds

**OTN Members Portal**

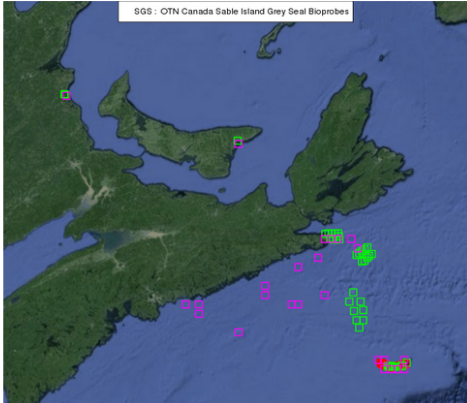
**OCEAN TRACKING NETWORK**

HOME | DATA

You are here: Home > Discovery > OTN Canada Sable Island Grey Seal Bioprobes

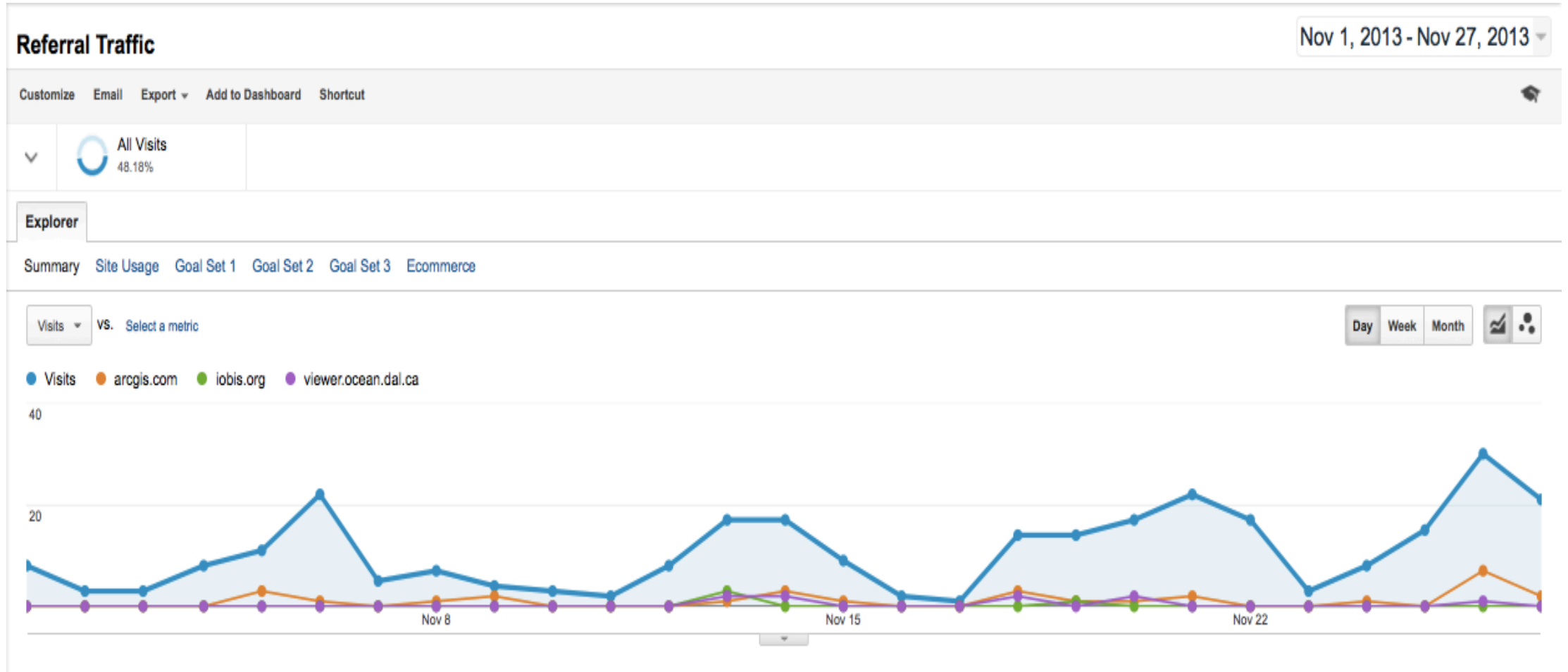
### OTN Canada Sable Island Grey Seal Bioprobes

[All Public Data](#) Other pages: [Collaboration Groups](#), [Collaboration Types](#), [Collections](#), [Contacts](#), [Countries](#), [DateLastModified](#), [Institutions](#), [Keywords](#), [MysteryTags](#), [Published to OBIS](#), [Ocean Regions](#), [Species](#), [Status](#), [TotalRecords](#)

Title	<b>Collection Code:</b> SGS. <b>Short Name:</b> OTN Canada Sable Island Grey Seal Bioprobes. <b>Long Name:</b> OTN Canada Sable Island Grey Seal Bioprobes.
Citation	Iverson, S.J., Bowen, W.D., Jonsen, I. and Lidgard, D. 2012. Sable Island Grey Seal Bioprobes. In: Iverson, S.J., McKenzie, K., Jonsen, I. 2011. OTN Canada Acoustic Telemetry Data Collection. Retrieved: February 26, 2014 from <a href="http://oceantrackingnetwork.org">oceantrackingnetwork.org</a> .
Status	Ongoing.
Related Collections	<b>Included In:</b> GLOBAL, NWATLANTIC OTNCanada. <b>Detected By:</b> ASF, BOONWA, CBS, GDL, HFX, NLWF, SGS, SIA. <b>Has Detected:</b> ASF, JDE, SGS, SPI, TAG, WRS.
Taxonomic Coverage	<b>Scientific Name(s):</b> <i>Anguilla rostrata</i> , <i>Gadus morhua</i> , <i>Halichoerus grypus</i> , <i>Salmo salar</i> , <i>Thunnus thynnus</i> . <b>Common Name(s):</b> American eel, Atlantic bluefin tuna, Atlantic cod, Atlantic cod - Morue de l'Atlantique, Atlantic salmon, grey seal.
Geographic Coverage	

Latitude, 37 to 63  
Longitude, -73 to -50  
Ocean(s): NWATLANTIC  
Country(s): CANADA

# Google Analytic - Referral Tracking



## Breaking News: IOOS® Z-GRAM – 28 June 2013

*Animal Telemetry: OTN, a project of Global Ocean Observing System (GOOS), led by Canada, has accepted to adopt the Animal Acoustic Telemetry (AAT) Data solutions recently reconciled by U.S. IOOS, NANOOS, OTN, and Australia's Integrated Marine Observing System (IMOS) and other partners. These data solutions include a) standard AAT data content and standard discovery metadata (based on FGDC and ISO) and b) standard access using ERDDAP and GEOSERVER services. These AAT data solutions are expected to facilitate data exchange between data centers, unite oceanographers and trackers and users getting the data they want in formats they need.*

See also: <https://code.google.com/p/ioostech/wiki/AnimalAcousticTelData>

# Recent Developments

## “Improving Access to Animal Acoustic Telemetry Observations Project”

Seattle Demo Workshop June 13, 2013

The screenshot shows the ERDDAP web interface. At the top, it says "ERDDAP Easier access to scientific data" and "Brought to you by NOAA NMF's SWFSC ERD". The main heading is "ERDDAP > tabledap > Make A Graph".

Dataset Title: **OTN NEP - Acoustic Receivers and Stations** (Dataset ID: otnepRecvrs)

Institution: OTN (Dataset ID: otnepRecvrs)

Range: longitude = -127.4943 to -123.6565°E, latitude = 42.72693 to 50.90093°N, time = 2004-04-21T00:00:00Z to 2012-05-20T02:11:55Z

Information: Summary | License | FGDC | ISO 19115 | Metadata | Background | Subset | Data Access Form

**Graph Type:** markers

X Axis: longitude

Y Axis: latitude

Color: receiver\_depth

**Constraints**

Optional Constraint #1	Optional Constraint #2
array_name = "JDF"	
longitude >= "JDF"	<= -122.743
latitude >= "QCS"	<= 49.765
latitude >= "WIL"	

**Server-side Functions**

distinct()

orderBy( " " )

orderByMax( " " )

**Graph Settings**

Marker Type: Filled Square Size: 5

Color: [Color Bar]

Color Bar: [Min: 0, Max: 250, Continuity: [ ], Scale: [ ]]

Draw the land mask: [ ]

Y Axis Minimum: [ ] Maximum: [ ]

**Redraw the Graph** (Please be patient. It may take a while to get the data.)

Optional:  
Then set the File Type: .htmlTable and Download the Data or an image  
or view the URL: [http://nile.api.washington.edu/erddap/tabledap/otnepRecvrs.htmlTable?lon=-127.4943,-123.6565&lat=42.72693,50.90093&time=2004-04-21T00:00:00Z,2012-05-20T02:11:55Z&array\\_name=JDF](http://nile.api.washington.edu/erddap/tabledap/otnepRecvrs.htmlTable?lon=-127.4943,-123.6565&lat=42.72693,50.90093&time=2004-04-21T00:00:00Z,2012-05-20T02:11:55Z&array_name=JDF)  
(Documentation / Bypass this form) (File Type Information)

Click on the map to specify a new center point.

Zoom: Out 8x Out 2x Out Data In In 2x In 8x

receiver\_depth.html  
OTN NEP - Acoustic Receivers and Stations  
array\_name = "JDF"  
Data Courtesy of OTN

**IOOS and OTN working to unite trackers and oceanographers!**

- Parallel ERDDAP and GeoServer web services
- Climate forecasting (CF) based acoustic telemetry data exchange metadata convention
- Ocean Observing (IOOS) ERDDAP interface
- get the data you want, in the format you want, including: csv, netCDF, kml
- web accessible (WAF) ISO 9115-2 and FGDC .xml metadata files
- Request data directly from R and python desktop analytics

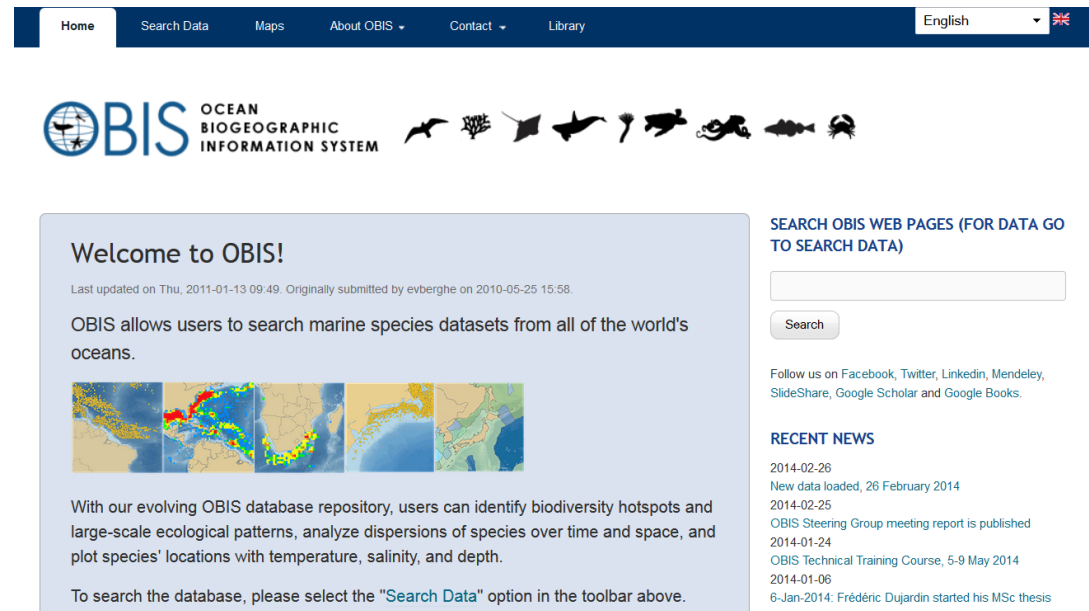
# Ocean Teacher Academy – OBIS Technical training course

5- 9 May 2014, Oostende, Belgium

Target Audience: OBIS nodes and large OBIS data providers

## Training Course content:

- Getting data and metadata out of OBIS (web portal, web services, OBIS stage database)
- Introduction to the OBIS issue tracking system
- Getting data and metadata in OBIS:
  - Data Quality Control tools (e.g., LifeWatch QC tools, and Name Matching Strategy)
  - Data and metadata standards and vocabularies (what information, where and how)
  - Setting-up and maintenance of IPT
- Data enhancements, new data types and applications (group discussion on how to solve this)
- Scientific data analysis exercises
- Open topics (based on needs assessment via application form)



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**OBIS** OCEAN BIOGEOGRAPHIC INFORMATION SYSTEM

Welcome to OBIS!

Last updated on Thu, 2011-01-13 09:49. Originally submitted by evberghel on 2010-05-25 15:58.

OBIS allows users to search marine species datasets from all of the world's oceans.

With our evolving OBIS database repository, users can identify biodiversity hotspots and large-scale ecological patterns, analyze dispersions of species over time and space, and plot species' locations with temperature, salinity, and depth.

To search the database, please select the "Search Data" option in the toolbar above.

SEARCH OBIS WEB PAGES (FOR DATA GO TO SEARCH DATA)

Search

Follow us on Facebook, Twitter, LinkedIn, Mendeley, SlideShare, Google Scholar and Google Books.

RECENT NEWS

2014-02-26  
New data loaded, 26 February 2014

2014-02-25  
OBIS Steering Group meeting report is published

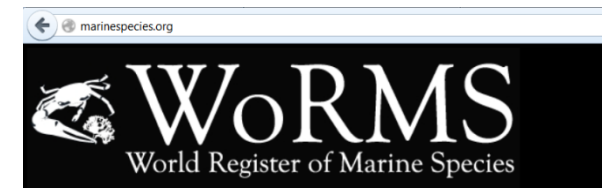
2014-01-24  
OBIS Technical Training Course, 5-9 May 2014

2014-01-06  
6-Jan-2014: Frédéric Dujardin started his MSc thesis

Per initial discussions with OTN DMC Chair (Francisco Hernandez, Flanders Marine Institute)

- OTN should consider becoming an OBIS Thematic Node (vs IODE ADM vs GOOS Affiliation)
- OTN might consider linking to Oceanographic measurements via (NOAA) World Ocean Data Base which OBIS is already using
- OTN may be able to obtain species morphologic (length range) and designation (SAR) from WoRMS for data quality control
- OBIS may be able to provide assistance with and infrastructure for OTN European Node

Discussions will continue in May.





The **Coastal Zone Canada 2014 Conference**, to be held from June 15 to 19, 2014, will mark the 20th anniversary of the first CZC conference. CZC 2014 will be held at the [World Trade and Convention Centre \(WTCC\)](#) in the beautiful and historic coastal city of [Halifax, Nova Scotia](#), where it all began in 1994.

OTN's Abstract under sub-theme 6. Knowledge and Information: Data Use and Accessibility, Information Management was accepted for oral presentation.

Lenore will also be attending COINAtlantic Geospatial Tools Training Workshop, June 19<sup>th</sup>.

#### Ocean Tracking Network - Cooperation and Interoperability

Lenore Bajona, Robert M. Branton  
Ocean Tracking Network

The Ocean Tracking Network (OTN) at Dalhousie University is a leading example of cooperation and interoperability between national and international centers of expertise in ocean observation. Since inception in 2008 and following on from the Census of Marine Life, OTN has the Global Ocean Observing System mandate for integrating acoustic receiver array data from all of the world oceans plus the Mediterranean Sea and Great Lakes. OTN uses Organization of Economic Cooperation and Development principles and guidelines as a basis for policies covering the sharing of data from acoustic transmitters and receivers, most of which it does not own. OTN's secure and easy to use Internet based data system continues to grow in content, functionality, accessibility and connectivity. Data are acquired, quality controlled and managed on a by contributor basis whereas production of public metadata and data are pre-scheduled. Current holdings include: 45M detections by 70 receiver arrays of 34K animals (66 species) released by 110 tracking projects. In addition OTN has 18M detections of 12K unknown tags listed in ocean scale mystery tag reports whereby previously unknown trackers can become associated with OTN. Targets for integrative products include: International Oceanographic Commission – Ocean Biogeographic Information System, World Meteorological Organization – Global Telecommunication System, the United States - Integrated Ocean Observing System. Underway are: involvement with the Dalhousie Library's new research data management initiative, entry of OTN Arctic and Antarctic collections into the [ArcticNet](#) - Polar Data Catalog, application for inclusion in the International Science Union's World Data System.

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Social Sciences and Humanities  
Research Council of Canada

Conseil de recherches en  
sciences humaines du Canada

Canada



**OCEAN  
TRACKING NETWORK**

Ocean Tracking Network  
Dalhousie University  
Halifax, Nova Scotia Canada

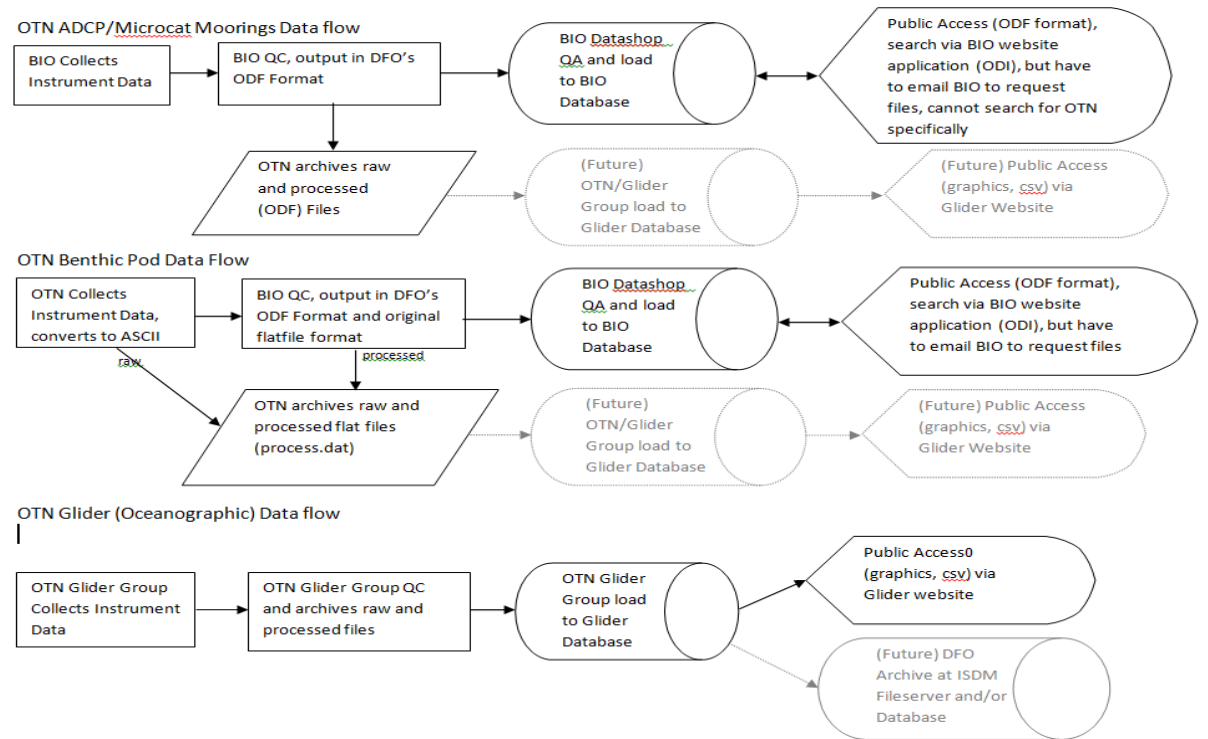
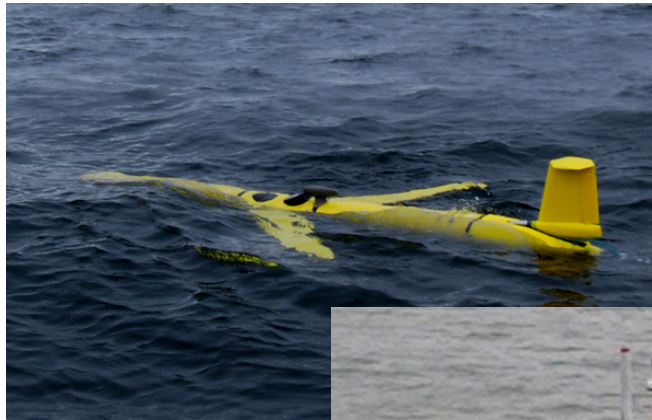
[fwhoriskey@dal.ca](mailto:fwhoriskey@dal.ca)  
1 (902) 494-4095

[www.oceantrackingnetwork.org](http://www.oceantrackingnetwork.org)  
Twitter @OceanTracking

# OTN Oceanographic Data Flow

OTN's ADCP/Microcat data: three moorings off the Halifax Line, each mooring consists of an ADCP RDI Workhorse and a Seabird SBE 37-SM Microcat. OTN's Benthic Pod data: 10 on Halifax Line, 2 on Strait of Belle Isle and 1-3 in the Arctic.

OTN's Glider data: two Teledyne Webb Research Slocum electric gliders and a Liquid Robotics wave glider.



# OTN National/International Data Flow

