MEOPAR Data Management Workshop

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Lenore Bajona

Director Data Management, Ocean Tracking Network
Dalhousie University, 1355 Oxford Street
PO BOX 15000, Halifax, NS, Canada B3H 4R2

Contact: work 902 494-7893; fax 902 494-1123
Email: Lenore.Bajona@dal.ca
Website: http://members.oceantrack.org

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NSERC CRSNG

SSHRC CRSH

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 OTN?

Dr. Sara Iverson,
OTN Scientific Director

- 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.

Courtesy Nikki Beauchamp – December 2013

What does OTN do?

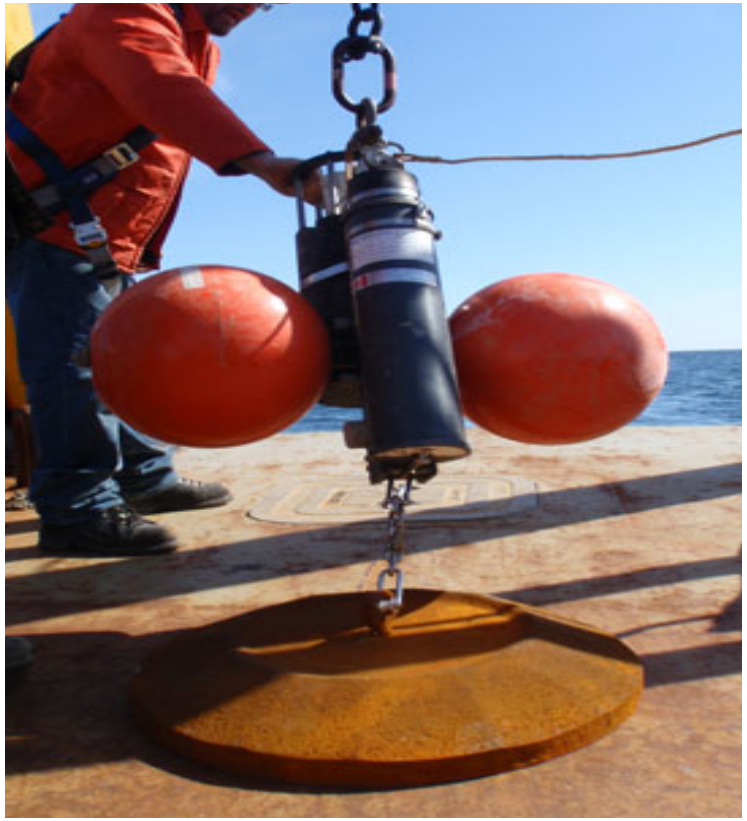
Since 2008, tracks local-to-global **movement and survival of ocean animals using acoustic/satellite telemetry**

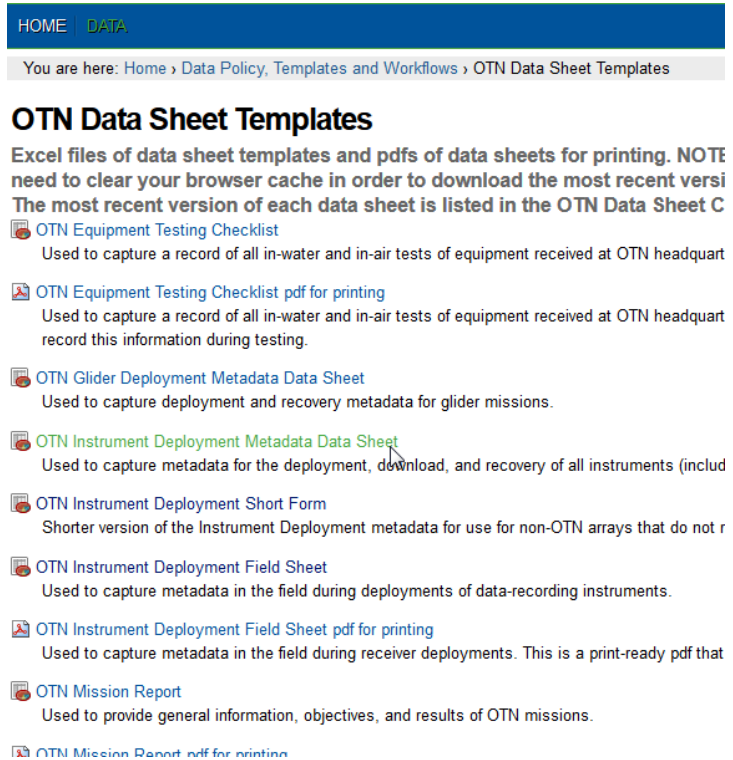
Acoustic receiver unit tracking sturgeon in the Minas Passage, Canada

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





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

OTN Data Sheet Templates

Excel files of data sheet templates and pdfs of data sheets for printing. NOTE: If you previously downloade need to clear your browser cache in order to download the most recent version because your browser stor 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. Th 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 i

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 in

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 ar

OTN Sentinel Tag Mooring Log Sheet
Used to record metadata for OTN sentinel tag moorings.

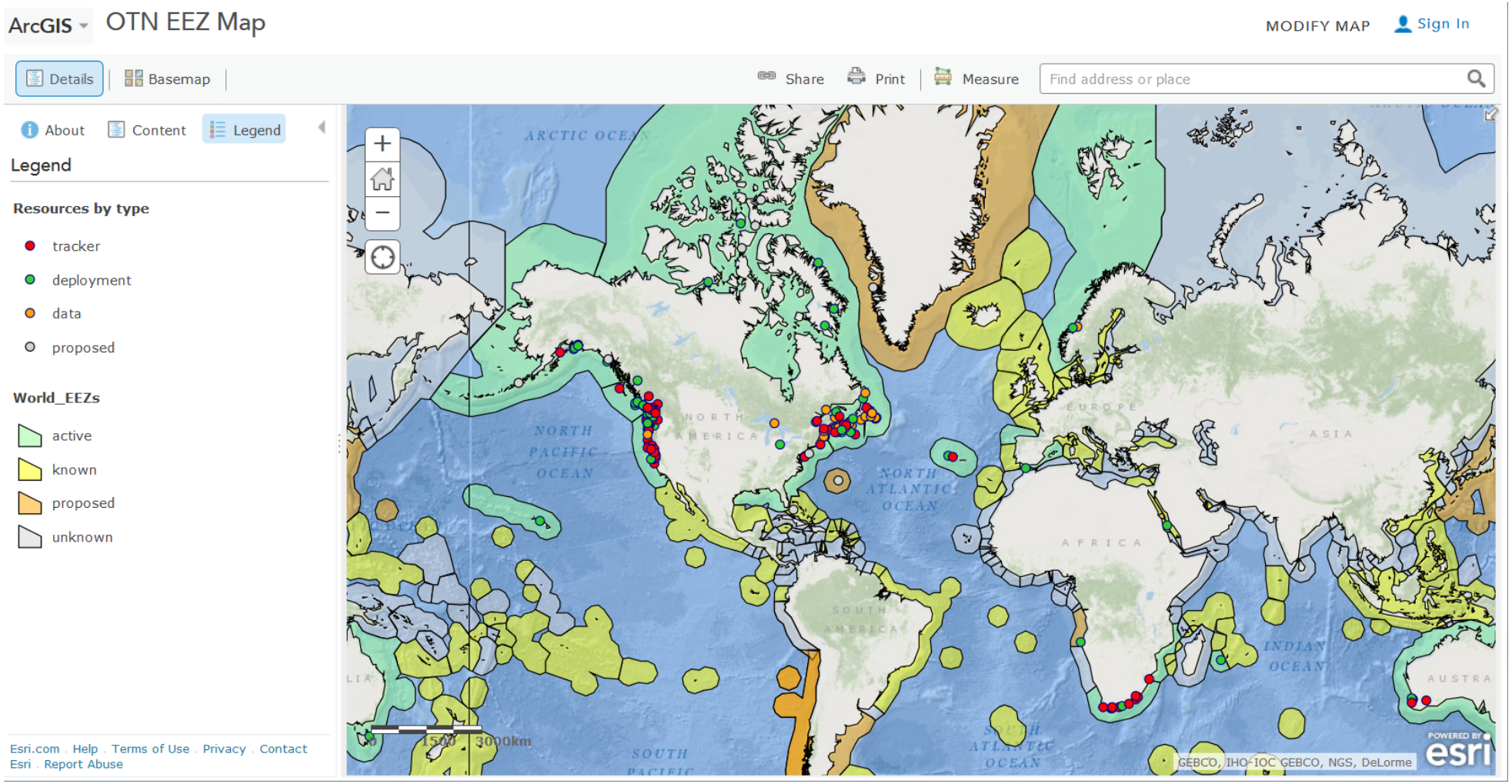
OTN Moored Transmitter Short Form
Used to capture metadata on moored transmitter deployments.

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?

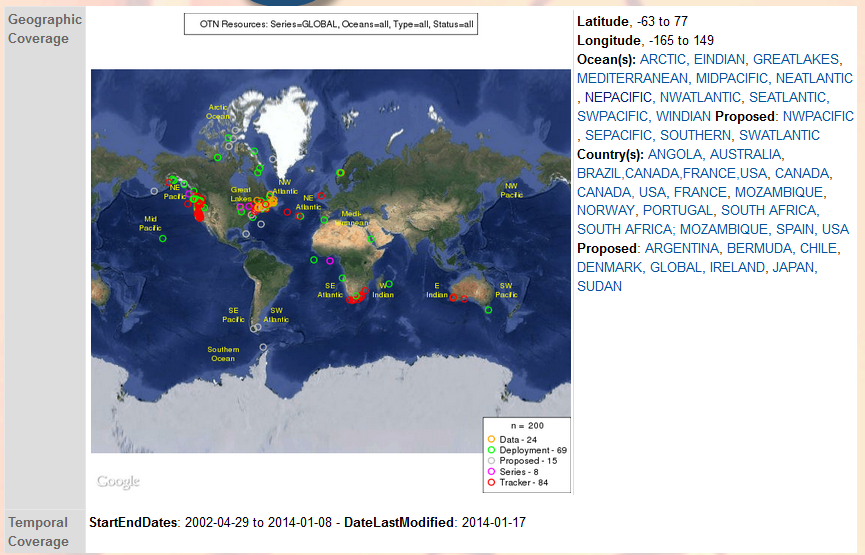


Courtesy Bob Branton 2013

Data

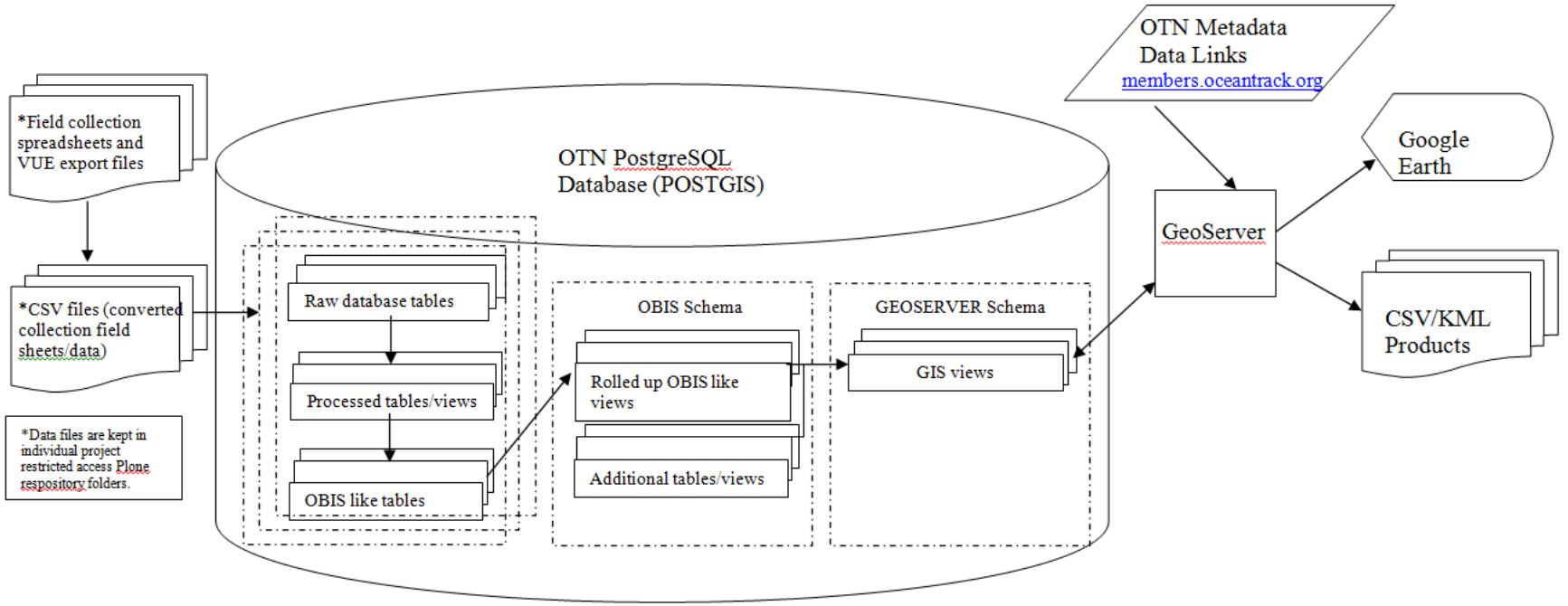
warehousing

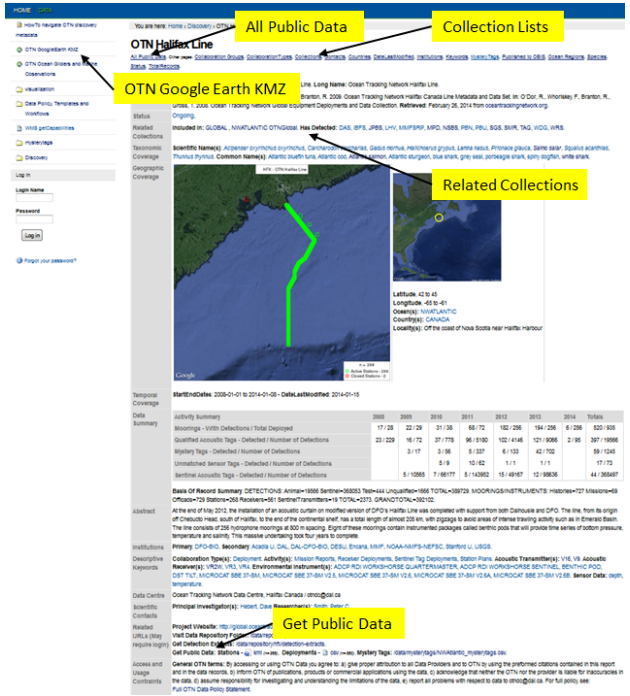
- Historic and current
- >60 million detection records
- >189 collections global
- Standards based
- Intellectual property
- Open access



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:

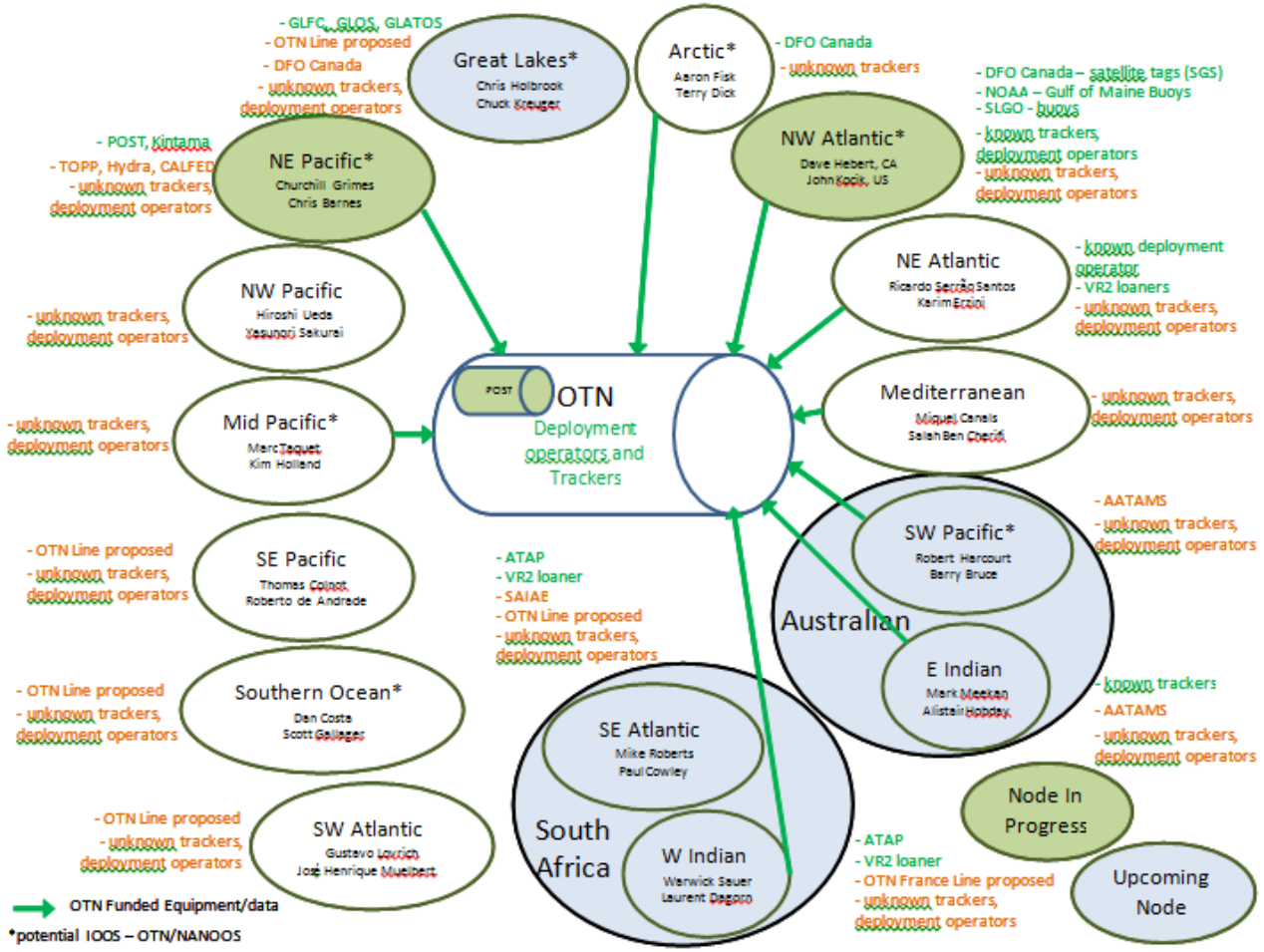
DB	#Projects	#Records	GB	#Stations/Receivers/Deployment	#Tags*/Detect	#MysteryTags/Detect
OTN	88**	373,433,736	90	2,949 /2,684 / 5,766	8K / 41.1M	4.7K / 11.8M
NEPNODE	90 (13 OTN)	51,292,557	23	882 / 1,073 /2,512	15K / 4.6M	4.5K / 4.1M
SAFNODE	11	69,682	.035	76 / 105 / 125	46 / 13,525	1 / 6
TOTAL	189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

Over 60 million detections of 32,2001 tags.

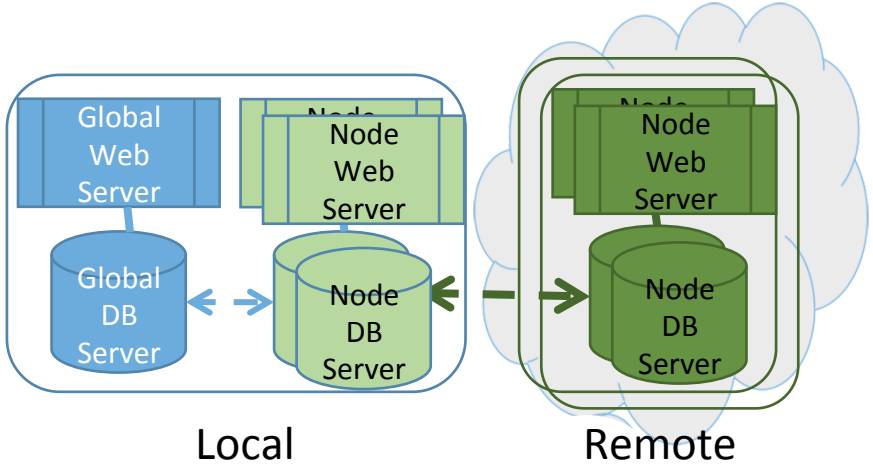
*Number of acoustic tags detected, more acoustic tags have been released; does not include sensor acoustic tags and satellite tags. ** 58 projects are NW Atlantic.

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)



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)



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.	
Visualiz-ation	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.

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 (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.

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	
IT-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	2014-08-31	
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	
IT-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	

Principles, Guidelines and Policies

OECD

CFI / NSERC

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

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 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 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

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

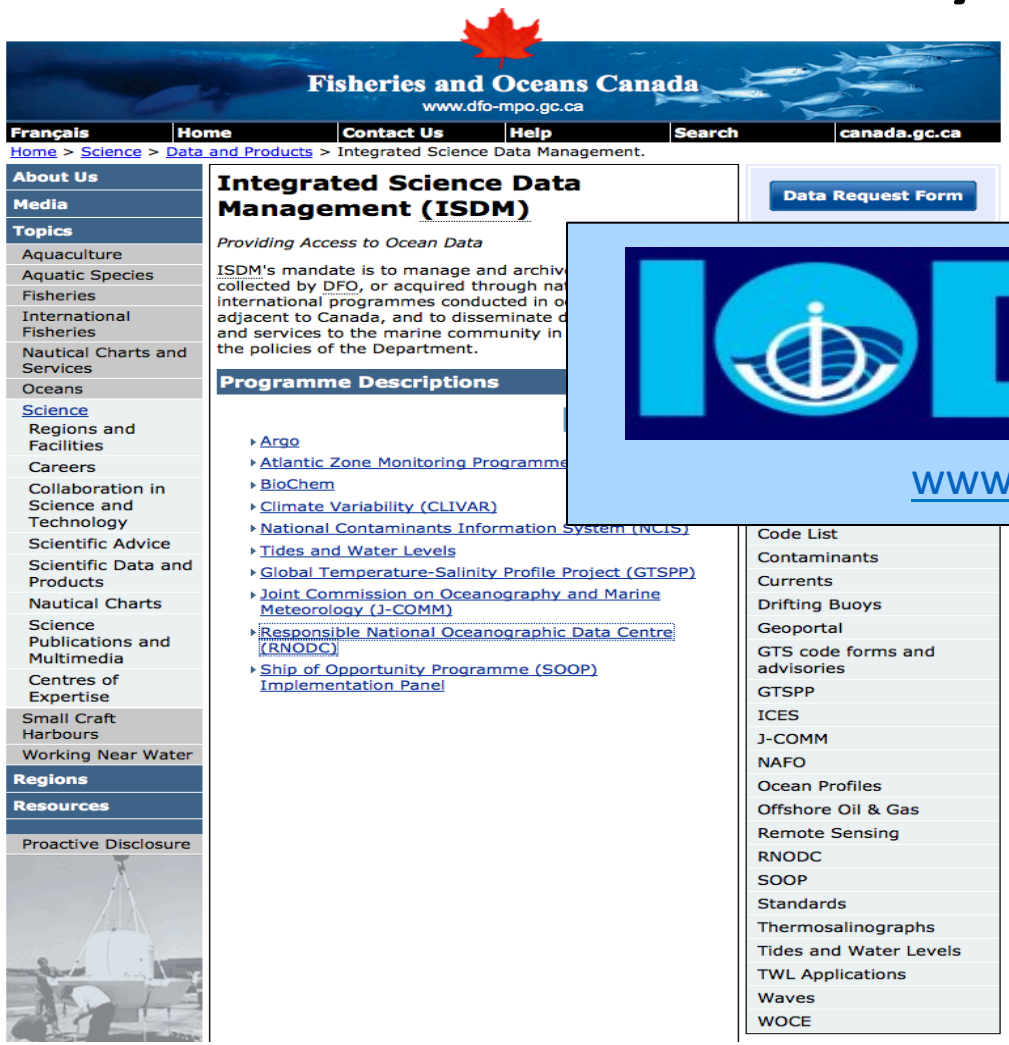
- NEPNODE created, but now needs to be managed by NEP personnel (gap in DMC), though currently (very slowly) working on data exchange with Hydra, not going to provide for OTN Node Management.
- SAFNODE underdevelopment (Paul Cowley, South African Institute for Aquatic Biodiversity (SAIAB))

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

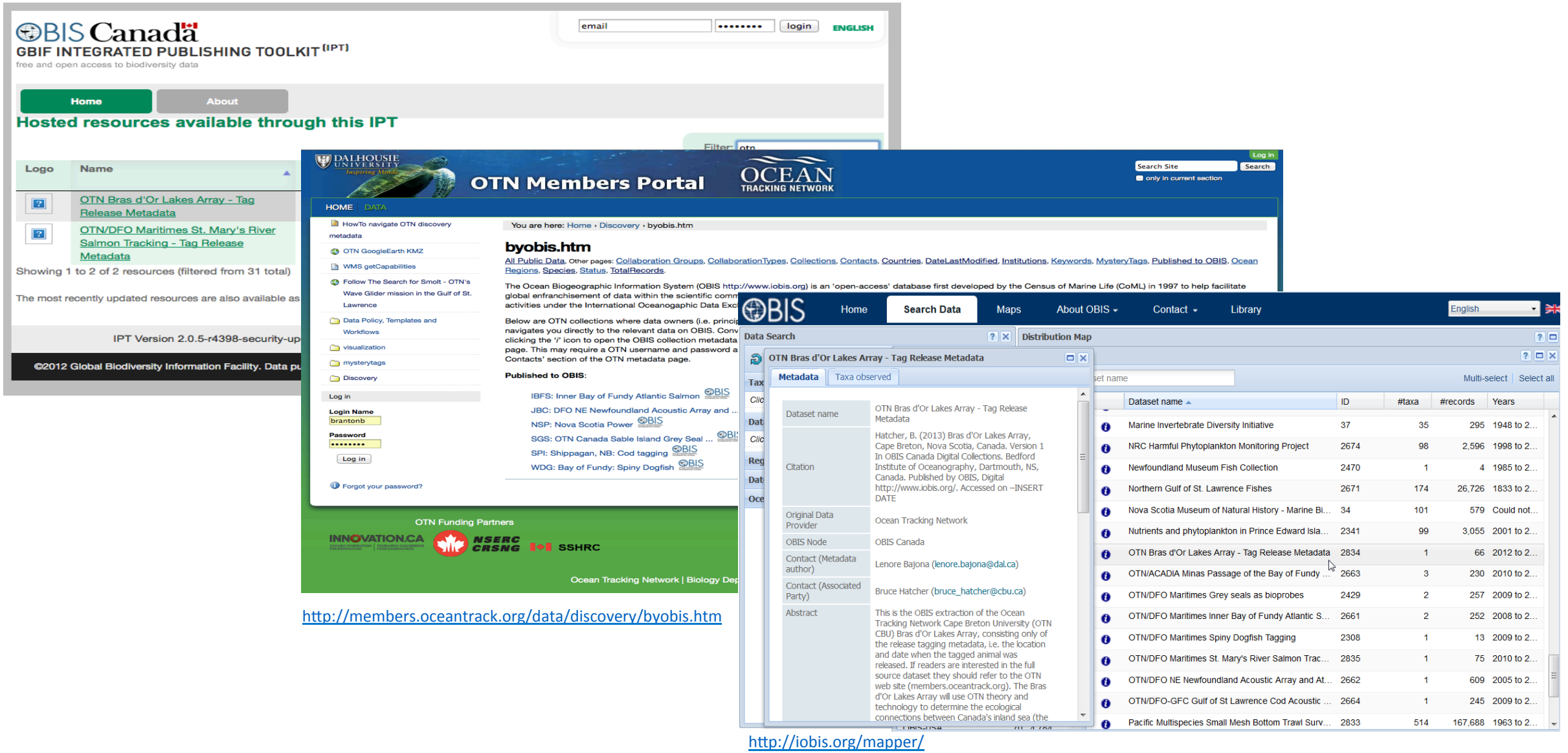
Sustainability and Availability…



www.meds-sdmm.dfo-mpo.gc.ca/isdm-gdsi/index-eng.html

http://iobis.org/mapper/?resource_id=2308

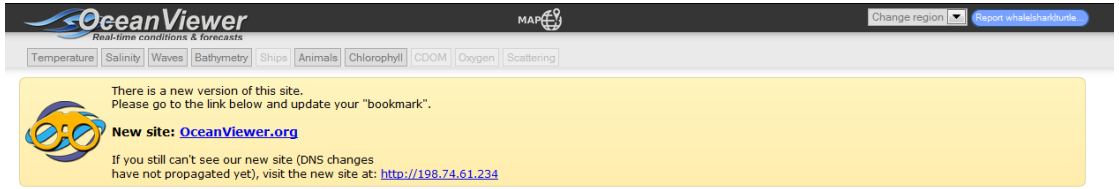
OTN data on OBIS

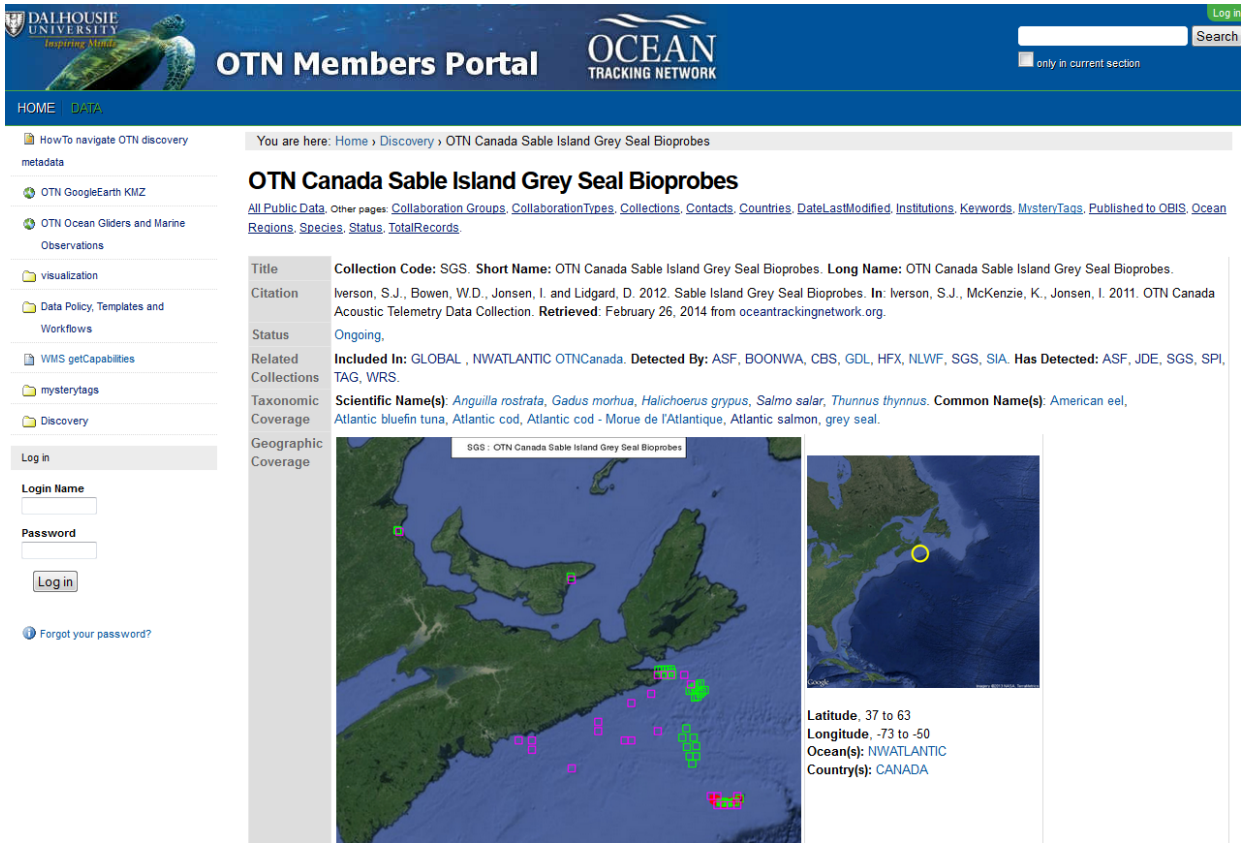


http://members.oceantrack.org/data/discovery/byobis.htm

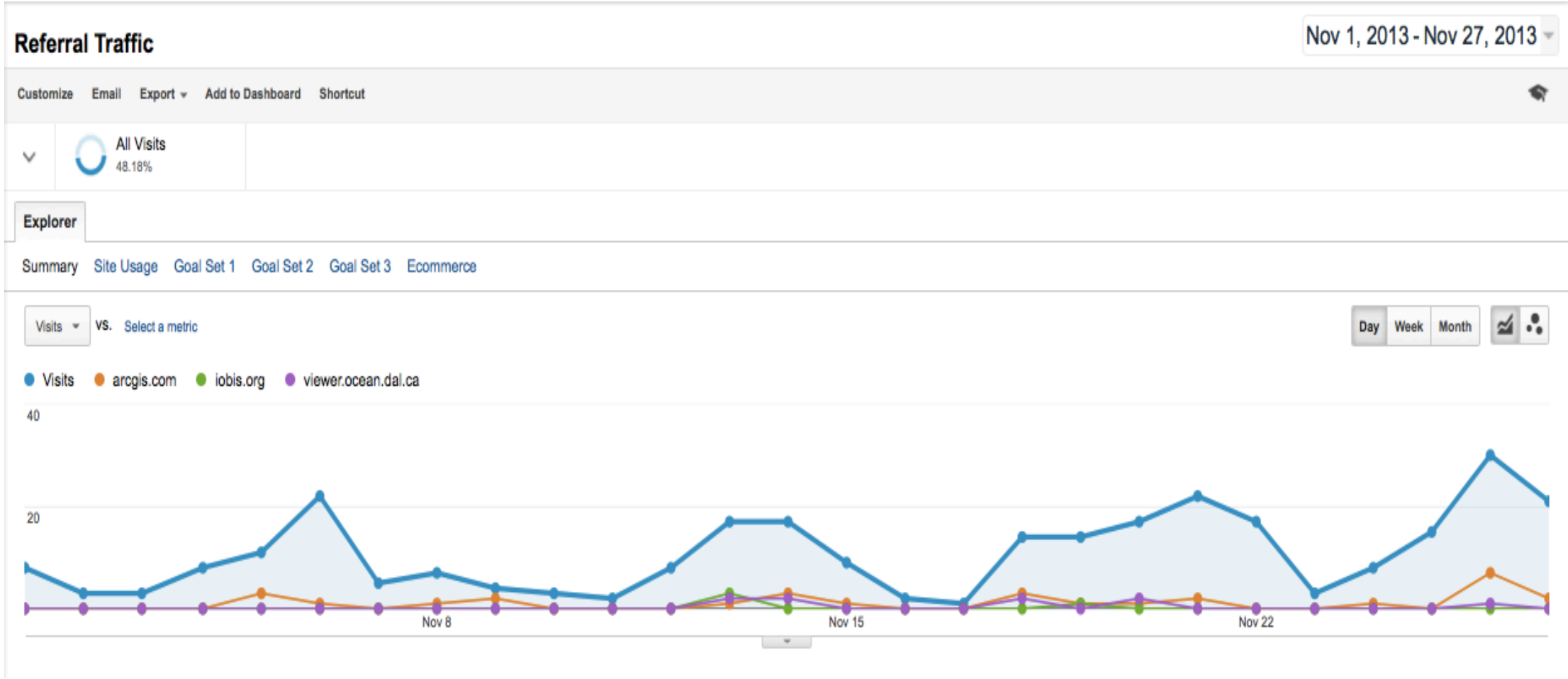
http://iobis.org/mapper/

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





Google Analytic - Referral Tracking



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

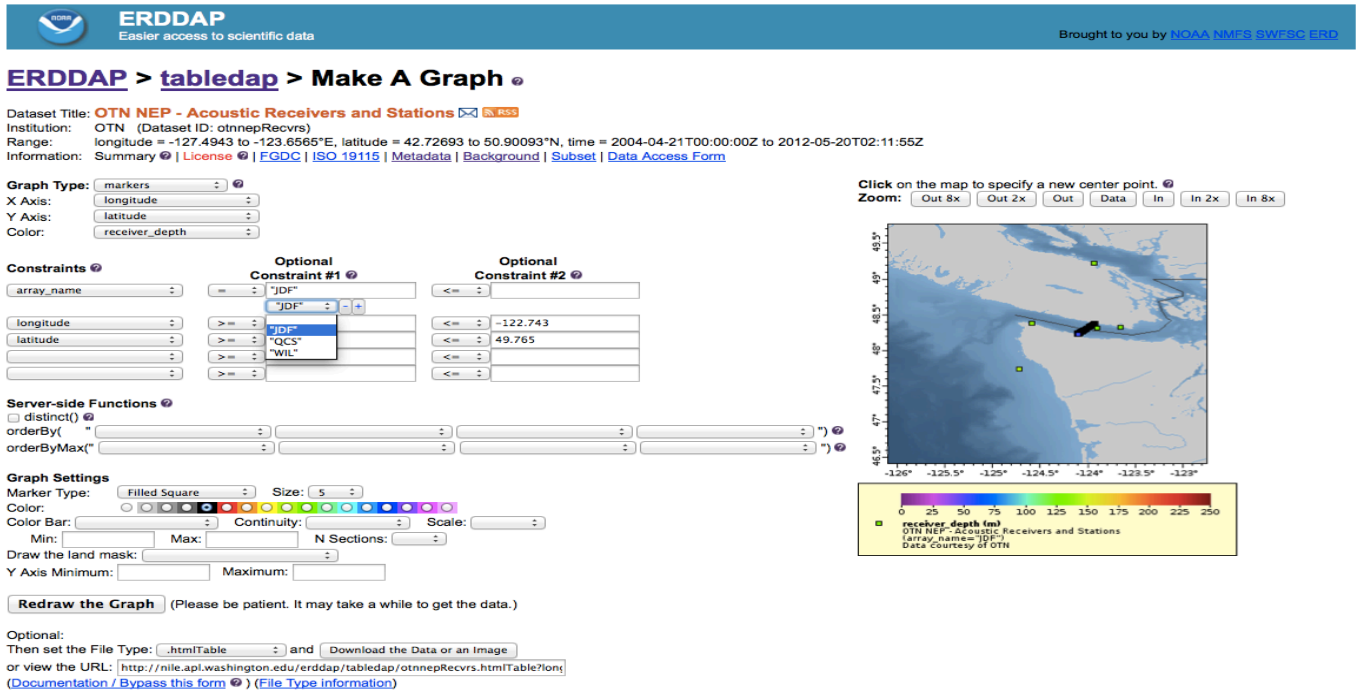
Animal Telemetry: *OTN, a project of Global Ocean Observing System (GOOS), led by Canada, has accepted to adopt the Animal Acoustic Telemetry (AAT) Data solutions recently reconciled by U.S. IOOS, NANOOS, OTN, and Australia's Integrated Marine Observing System (IMOS) and other partners. These data solutions 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



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 FDGC .xml metadata files

-Request data directly from R and python desktop analytics

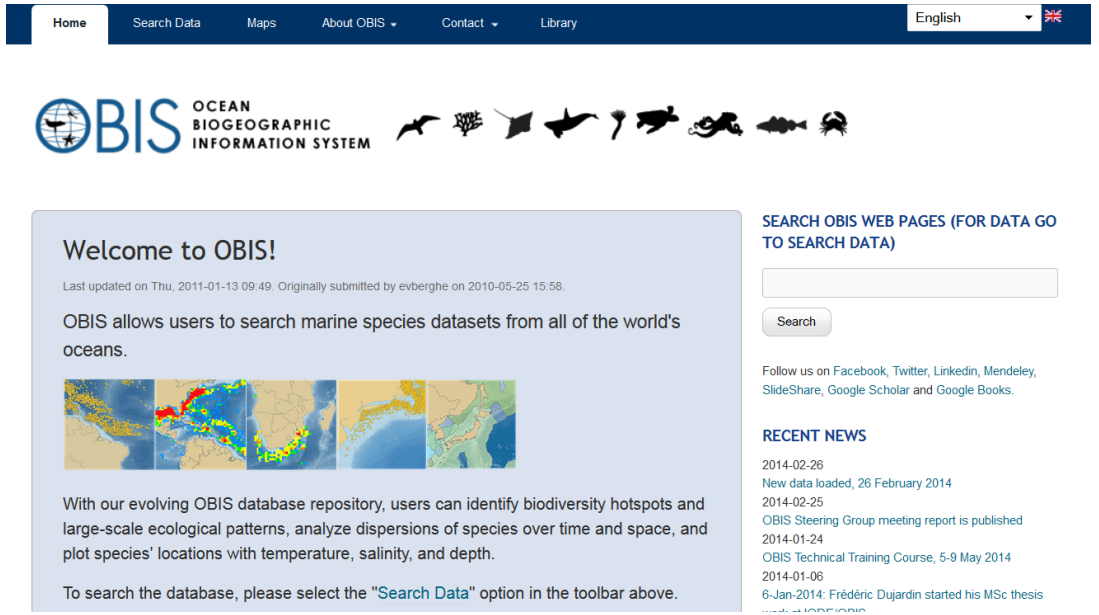
Ocean Teacher Academy – OBIS Technical training course

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)



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 19th.

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.

Ocean Tracking Network
Dalhousie University
Halifax, Nova Scotia Canada

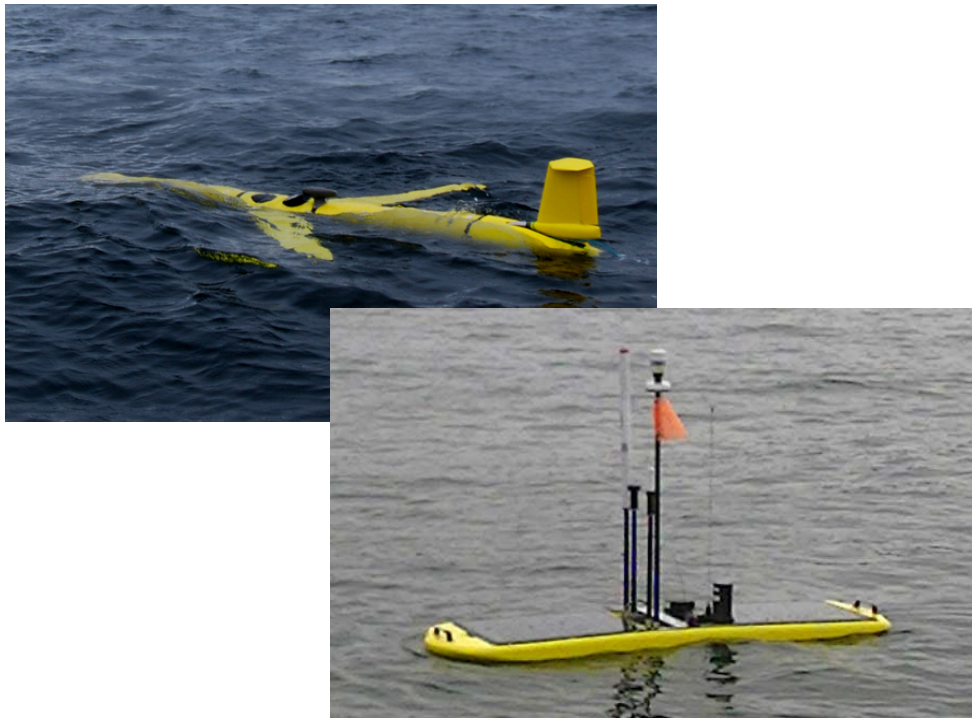
fwhoriskey@dal.ca
1 (902) 494-4095

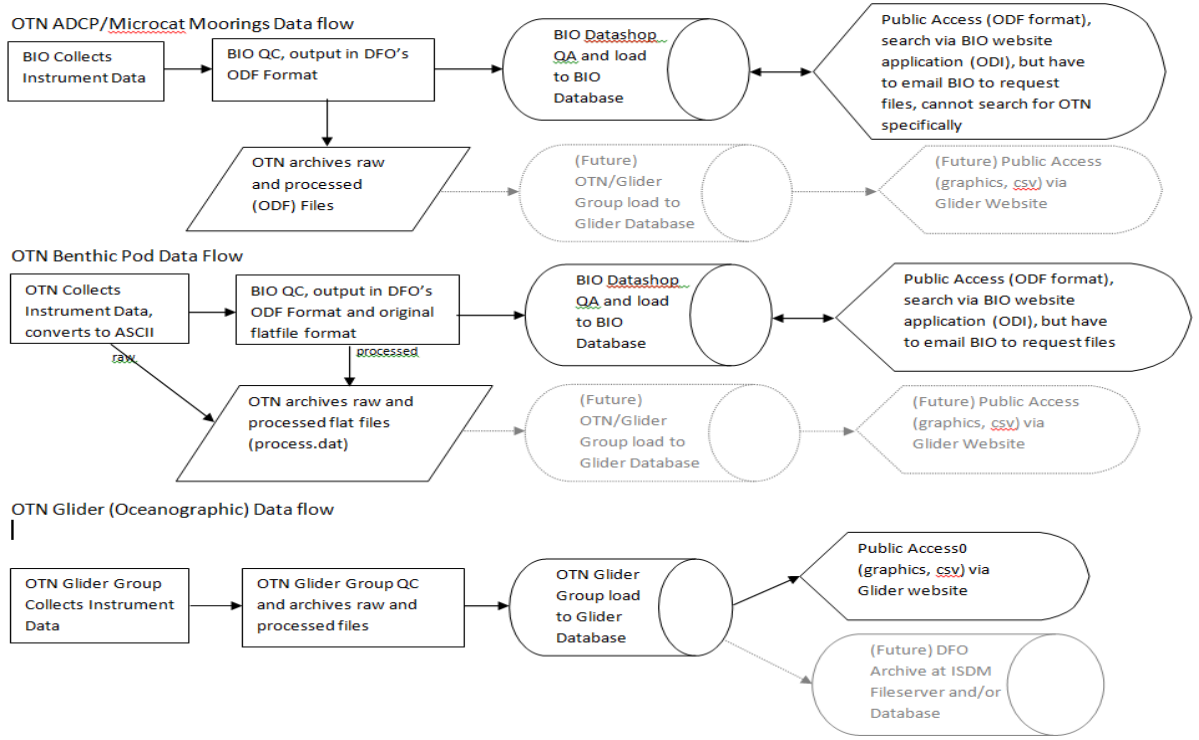
www.oceantrackingnetwork.org
Twitter @OceanTracking

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