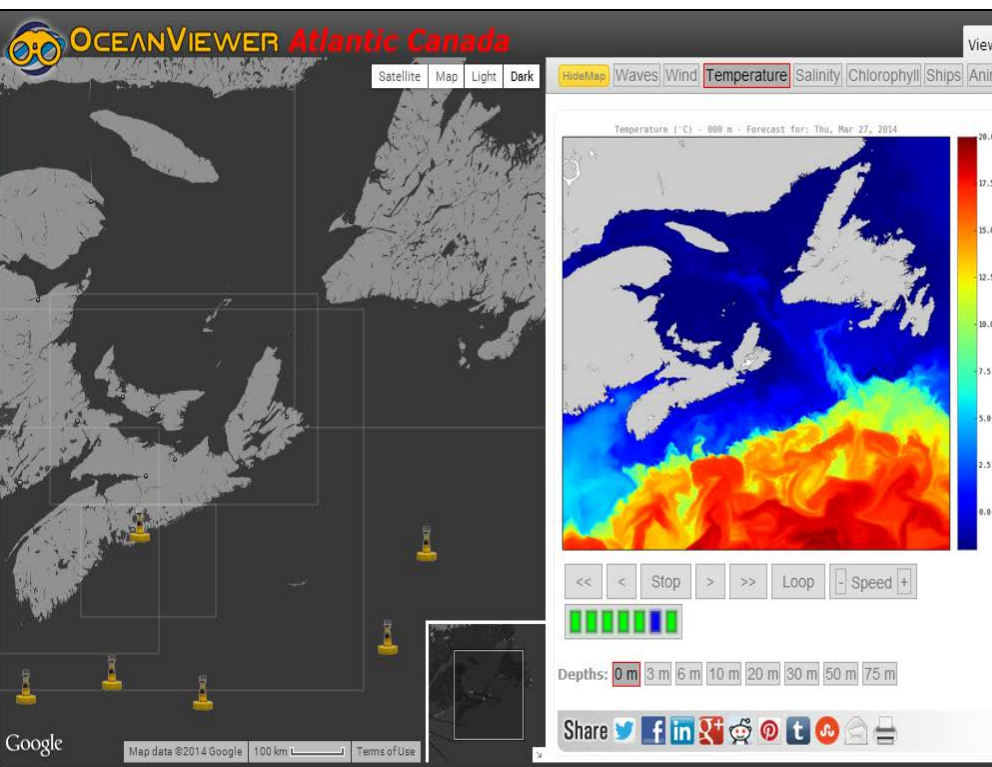




**OCEANVIEWER.org**  
Real-time conditions & Forecasts

***OceanViewer.org*** ...benefits of a  
“one-stop-shop” portal for Real-time Ocean  
Conditions and Forecasts in Atlantic Canada



**Diego Ibarra**

Research Associate  
MEOPAR / Dalhousie University

Mar 24, 2014



**OCEANVIEWER.org**  
Real-time conditions & Forecasts

**Summary:** *OceanViewer.org* is a...

**“one-stop-shop” portal...**

“aggregator” and browser of existing Ocean Data in Atlantic Canada

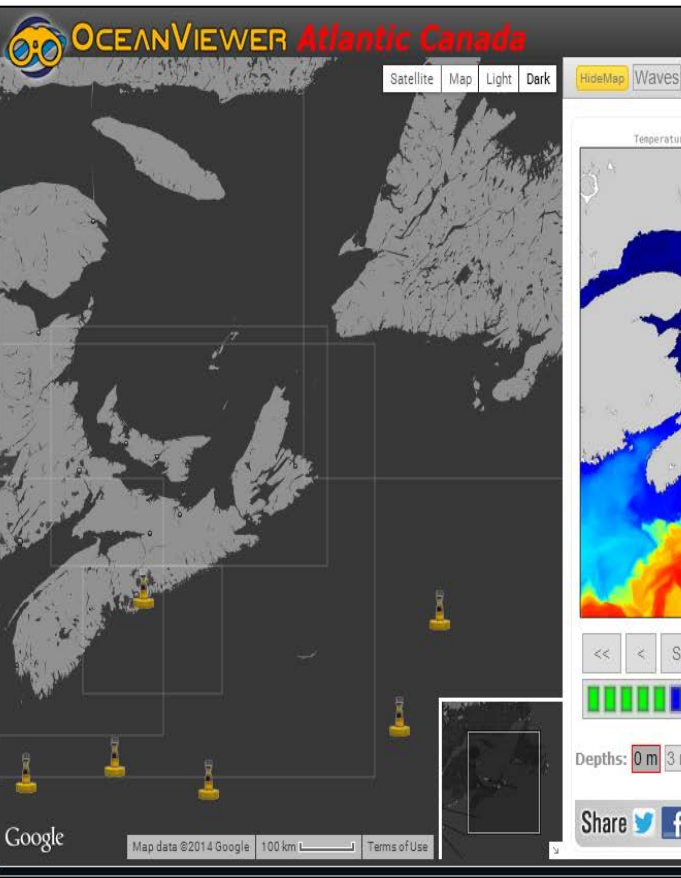
Platform for “Citizen Ocean Science”

and pilot-project of **MEOPAR**



*OceanViewer* is like...

a **kijiji** for Ocean data



# Outline:

**Origins and Motivation  
(past)**



**OCEANVIEWER.org**  
Real-time conditions & forecasts

**(Present)**



**Potential future**

# Origins and motivation:

October 2012

Cape Breton Post > News > Local

## Lobster fishery reaches the boiling point

Chris Hayes  
Published on July 19, 2013

Share 0 Tweet 10 +1 0

2 Comment Send to a friend Print

**SYDNEY – Fisherman Leonard LeBlanc doesn't mince words about the lobster season that came to a close earlier this month in the waters off Cheticamp.**

LeBlanc, the president of the Lobster Council of Canada, told a recent



News / Canada

## Rising water temperatures are hurting Nova Scotia lobster business, fisherman says

A Cape Breton lobster fisherman has told a legislature committee that rising temperatures are hurting the lobster business.

Text size: + - Reset



Report an Error

+ save t

By: The Canadian Press Published on Thu Oct 18 2012

HALIFAX—A Cape Breton lobster fisherman has told a legislature committee that rising water temperatures are hurting the lobster business.

EXPLORE T

? COMMENT

# Is there an Ocean Temperature Forecasting System?

# Origins and motivation:

October 2012

Cape Breton Post > News > Local

## Lobster fishery reaches the boiling point

Chris Hayes  
Published on July 19, 2013

Share 0 Tweet 10 +1 0

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Text size: + - Reset



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+ save t

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EXPLORE T

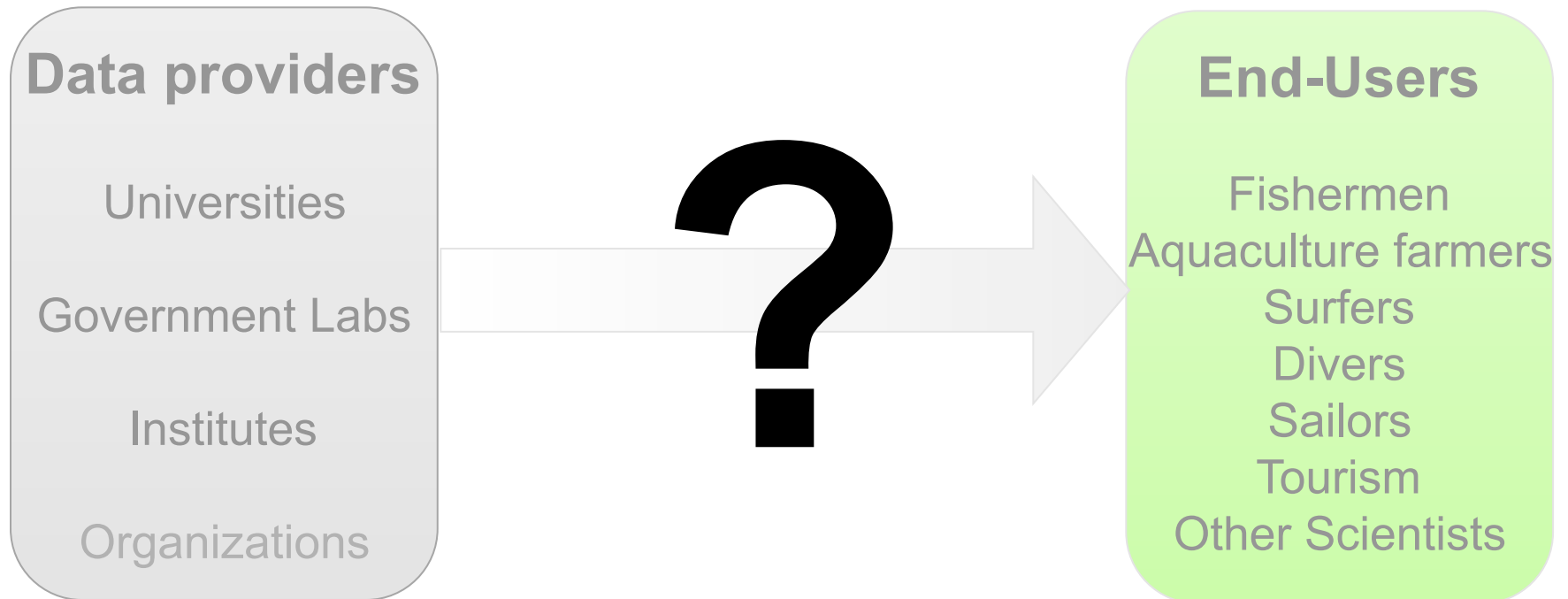
? COMMENT

## Is there an Ocean Temperature Forecasting System?

**Answer:** Yes, but they are hard to find...  
and/or hard to decipher (NetCDF files)

# Origins and motivation:

How is *Ocean Data* transferred from providers to end-users?



# “Ocean Observing System” Sites



# “Commercial” Sites



# “Ocean Observing System” Sites

Visitors: ~100 pageviews / day



# “Commercial” Sites

Visitors: ~50,000 pageviews / day



# “Ocean Observing System” Sites

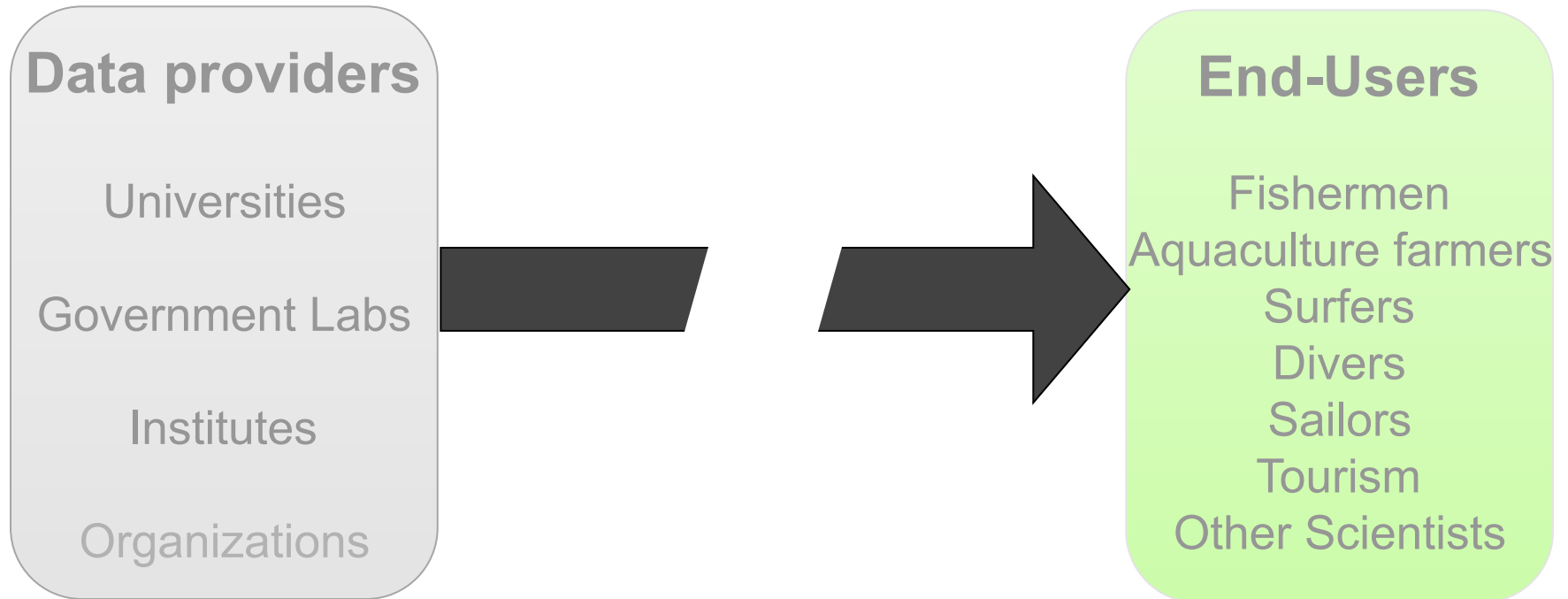
- Visitors: ~100 pageviews / day
- Focused on “the project”
- Hard to find
- Hard to navigate
- Show ALL kinds of ocean data

# “Commercial” Sites

- Visitors: ~50,000 pageviews / day
- Focused on “the user” (but also on making \$\$\$)
- Easier to find
- Easier to navigate
- Show only data with high \$\$\$ return (e.g. wave, wind, temp)

# Origins and motivation:

Missing link between data providers and end-users



# Origins and motivation:

Missing link between data providers and end-users



# Origins and motivation:



Nov 2013, [OceanViewer.org](http://OceanViewer.org), pilot project of MEOPAR

**Main goal:** Narrow the gap between data providers and end-users



**Main emphasis:** Focus on the END-USER!!

# Objectives:



**OCEANVIEWER.org**  
Real-time conditions & forecasts

- 1. Develop an easy-to-use interface** for data browsing and visualization that is **focused on the needs of the end-users.**
- 2. Gather ALL ocean data and forecasts** through synergistic interactions with data providers. All data providers together can accomplish more than the sum of each on their own.
- 3. Create a “citizen ocean science” platform** where end-users can, themselves, participate in collecting and presenting ocean-related data, which are then shared with the broader community.

# 1. User-focused site:

**OCEANVIEWER Atlantic Canada**

Viewer Report an animal About

Satellite Map Light Dark HideMap Waves Wind Temperature Salinity **Chlorophyll** Ships Animals Webcams

Satellite Chlorophyll - Composite from Tue, Mar 18 to Sat, Mar 22, 2014

Variable: Chlorophyll  
Units:  $\text{mg m}^{-3}$

Platform: MODIS-A  
Type: Satellite  
Depth: 0 m

Provider: National Air and Space Administration (NASA)

Download data directly from provider

Share [Twitter] [Facebook] [LinkedIn] [Google+] [Reddit] [Pinterest] [Tumblr] [SoundCloud] [Email] [Print]

Other Regional Ocean Observing Systems in this area:

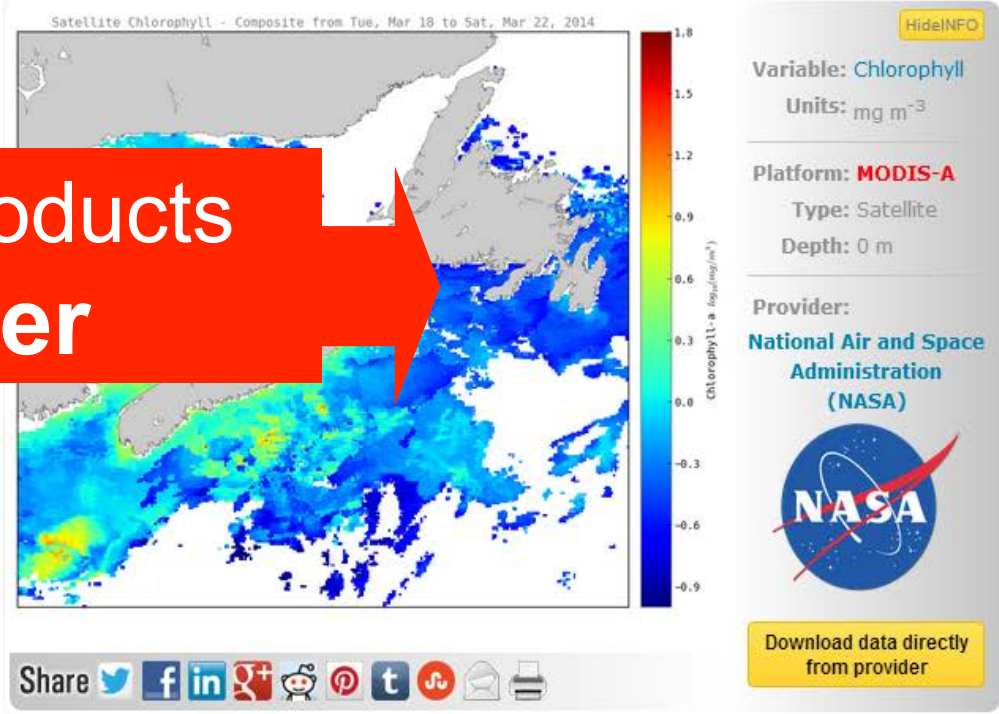
Map data ©2014 Google 100 km Terms of Use

About | Contact | Links | Upload data

Copyright 2013 © OceanViewer

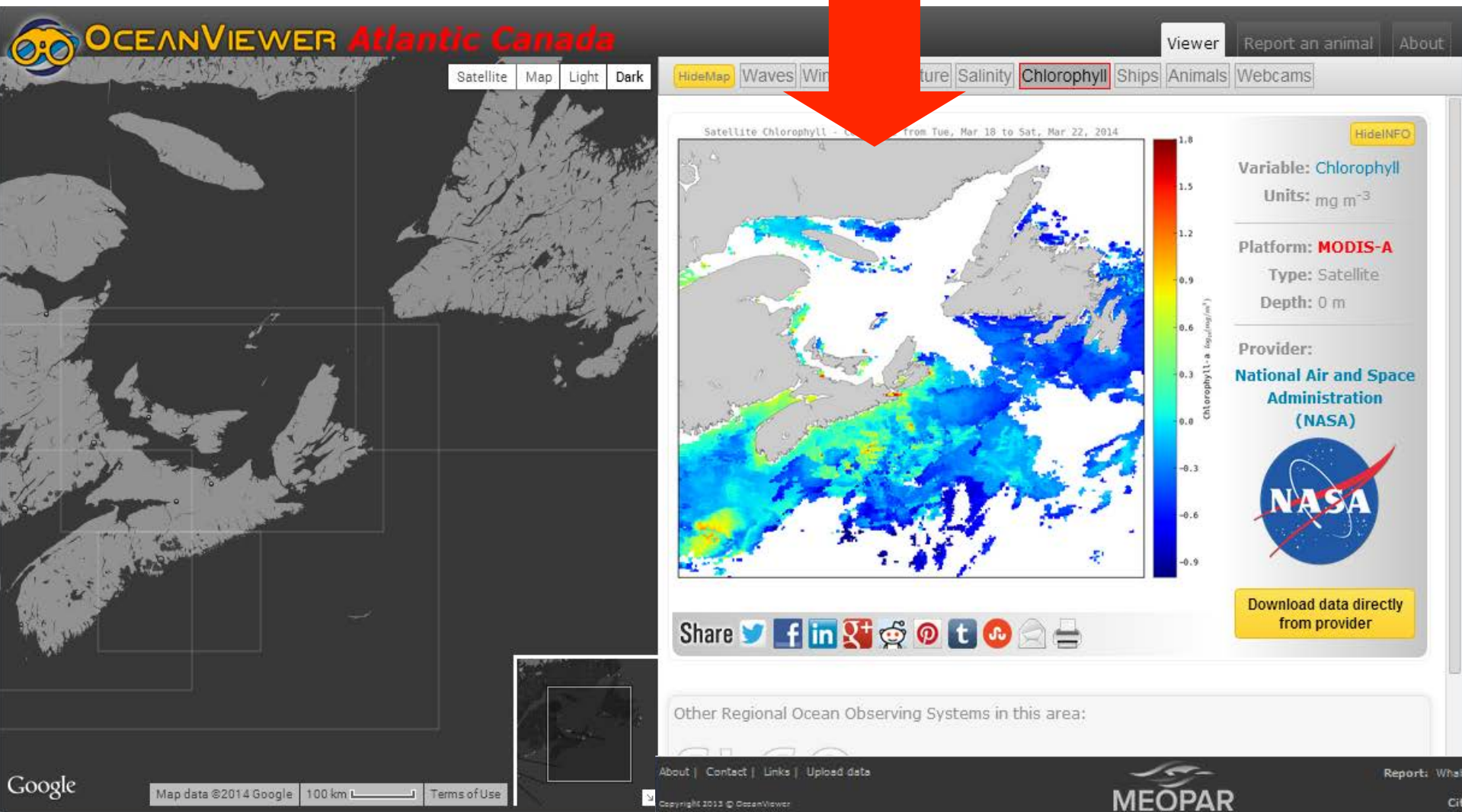
MEOPAR Report: What

Browser and data products  
front and center

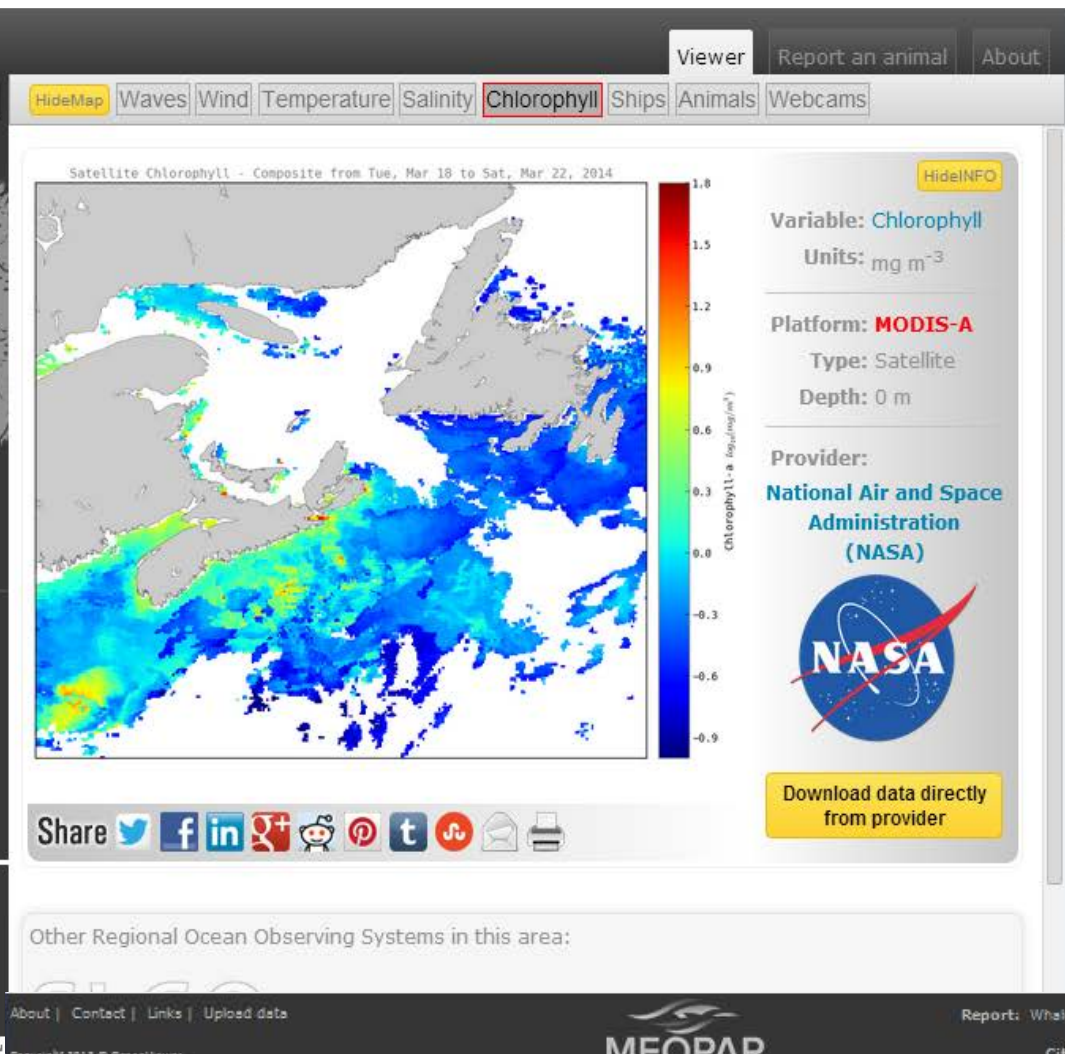
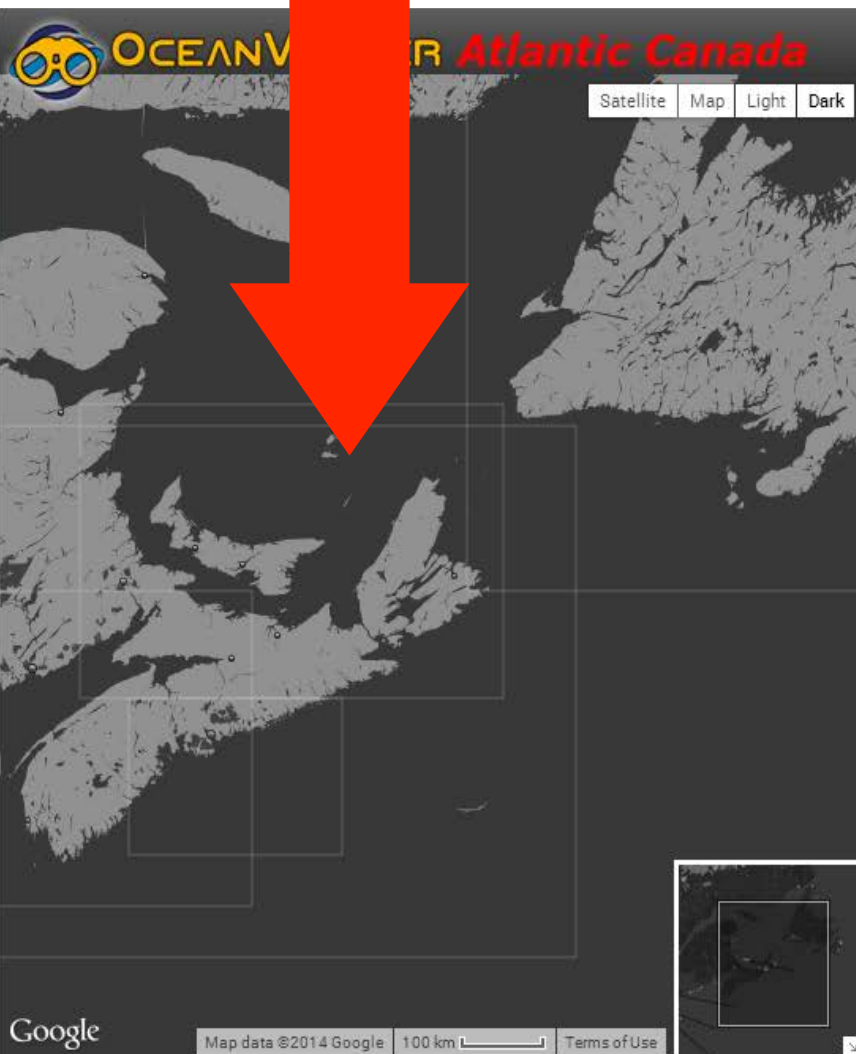


“Project stuff”  
in small links

# Pre-made plots for one-click browsing



# Region browser



# Region browser

The screenshot displays the OceanViewer Nova Scotia interface. At the top left, the logo features a pair of blue goggles with the text "OCEANVIEWER Nova Scotia". Navigation tabs include "Satellite", "Map", "Light", "Dark", "Waves", "Wind", "Temperature", "Salinity", "Chlorophyll", "Ships", "Animals", and "Webcams". The "Chlorophyll" tab is selected and highlighted with a red box. A large red arrow points from the "Region browser" title to a green rectangular box on the main satellite map, which highlights a specific area of the ocean. To the right, a detailed view of the selected area shows a color-coded map of chlorophyll concentration. A vertical color scale on the right of this map ranges from -0.9 (dark blue) to 1.8 (dark red), with a label "Chlorophyll (mg m<sup>-3</sup>)". Below the map, metadata is provided: "Variable: Chlorophyll", "Units: mg m<sup>-3</sup>", "Platform: MODIS-A", "Type: Satellite", "Depth: 0 m", and "Provider: National Air and Space Administration (NASA)". The NASA logo is also present. A yellow button at the bottom right of the metadata section says "Download data directly from provider". Below the map, there is a "Share" section with icons for Twitter, Facebook, LinkedIn, Google+, YouTube, and other social media. At the bottom of the page, there is a section titled "Other Regional Ocean Observing Systems in this area:" with the SLGO logo.

OceanViewer Nova Scotia

Satellite Map Light Dark

HideMap Waves Wind Temperature Salinity Chlorophyll Ships Animals Webcams

Satellite Chlorophyll - Composite from Tue, Mar 18 to Sat, Mar 22, 2014

Variable: Chlorophyll  
Units: mg m<sup>-3</sup>

Platform: MODIS-A  
Type: Satellite  
Depth: 0 m

Provider:  
National Air and Space Administration (NASA)

Download data directly from provider

Share

Other Regional Ocean Observing Systems in this area:

SLGO

Map data ©2014 Google 100 km Terms of Use

# Depth browser

The screenshot displays the OceanViewer Atlantic Canada web application. The main interface is divided into several sections:

- Header:** "OCEANVIEWER Atlantic Canada" logo and navigation buttons for "Satellite", "Map", "Light", and "Dark".
- Viewer Panel:** A horizontal menu with tabs for "Waves", "Wind", "Temperature" (highlighted with a red border), "Salinity", "Chlorophyll", "Ships", "Animals", and "Webcams".
- Main Map:** A satellite-style map of the Atlantic Ocean region with a grid overlay. A large red arrow points from the "Temperature" tab to this map.
- Temperature Data Panel:** A detailed view of temperature data at 000 m depth. It includes a color-coded map of the region and a vertical color scale legend on the right labeled "Temperature (°C)" ranging from 0.0 to 20.0. The legend shows a gradient from dark blue (0.0) to red (20.0).
- Metadata Panel:** Information about the data source:
  - Variable: Temperature
  - Units: °C
  - Platform: RTOFS-daily
  - Type: Data Assimilated Model
  - Depth: 0 m
  - Provider: National Ocean and Atmosphere Administration (NOAA)
- NOAA Logo:** The official logo of the National Ocean and Atmosphere Administration (NOAA), U.S. Department of Commerce.
- Controls:** Navigation buttons for "Stop", "Loop", and "Speed", along with a "HideMap" button and a "HideINFO" button.
- Depth Selection:** A row of buttons for selecting different depths: "0 m" (highlighted with a red border), "3 m", "6 m", "10 m", "20 m", "30 m", "50 m", and "75 m".
- Footer:** "Google" logo, "Map data ©2014 Google", a "100 km" scale bar, and "Terms of Use" link.
- Share Panel:** Social media sharing icons for Twitter, Facebook, LinkedIn, Google+, YouTube, and Print.
- Download Button:** A yellow button labeled "Download data directly from provider".

# Depth browser

The screenshot displays the OceanViewer Atlantic Canada web application. The main interface is divided into several sections:

- Header:** "OCEANVIEWER Atlantic Canada" logo and navigation tabs: "Satellite", "Map", "Light", "Dark".
- Viewer:** A row of tabs for different data layers: "HideMap", "Waves", "Wind", "Temperature" (highlighted with a red box), "Salinity", "Chlorophyll", "Ships", "Animals", "Webcams".
- Main Content Area:**
  - Temperature Map:** A map of the Atlantic region showing temperature at 75 m depth. A color scale on the right ranges from 0.0 (blue) to 20.0 (red).
  - Metadata Panel:**
    - Variable: Temperature
    - Units: °C
    - Platform: RTOFS-daily
    - Type: Data Assimilated Model
    - Depth: 75 m
    - Provider: National Ocean and Atmosphere Administration (NOAA)
  - Controls:** Playback buttons (stop, play, loop, speed) and a depth selection menu.
- Footer:** "Google" logo, "Map data ©2014 Google", "100 km" scale bar, and "Terms of Use".

A large red arrow points from the "Depth browser" title to the depth selection menu, which is currently set to 75 m.

# Variable browser



**OCEANVIEWER Atlantic Canada**

Satellite Map Light Dark

HideMap Waves Wind **Temperature** Salinity Chlorophyll Ships Animals Webcams

Viewer Report an animal About

Temperature (°C) - 075 m - Forecast for: Wed, Mar 26, 2014

Variable: **Temperature**  
Units: °C

Platform: **RTOFS-daily**  
Type: Data  
Assimilated Model  
Depth: 75 m

Provider:  
**National Ocean and Atmosphere Administration (NOAA)**

Download data directly from provider

Map data ©2014 Google 100 km Terms of Use

Share

# Variable browser

The screenshot displays the Oceanviewer Atlantic Canada web application. A large red arrow points from the title 'Variable browser' to the 'Salinity' variable selected in the variable browser menu. The main map shows a color-coded salinity distribution in the Atlantic Ocean, with a color scale on the right ranging from 30.4 to 36.8 psu. The interface includes a top navigation bar with 'Viewer', 'Report an animal', and 'About' buttons. Below the navigation bar is a menu of variables: 'Waves', 'Wind', 'Temperature', 'Salinity', 'Chlorophyll', 'Ships', 'Animals', and 'Webcams'. The 'Salinity' variable is currently selected. To the right of the map, a metadata panel provides details: Variable: Salinity, Units: psu, Platform: RTOFS-daily, Type: Data Assimilated Model, Depth: 75 m, and Provider: National Ocean and Atmospheric Administration (NOAA). The NOAA logo is also visible. At the bottom right, there is a yellow button that says 'Download data directly from provider'. The bottom left corner features the Google logo and map data information.

Oceanviewer Atlantic Canada

Satellite Map Light Dark

HideMap Waves Wind Temperature Salinity Chlorophyll Ships Animals Webcams

Viewer Report an animal About

Salinity (psu) - 075 m - Forecast for: Wed, Mar 26, 2014

Variable: Salinity  
Units: psu

Platform: RTOFS-daily  
Type: Data Assimilated Model  
Depth: 75 m

Provider: National Ocean and Atmospheric Administration (NOAA)

NOAA  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
U.S. DEPARTMENT OF COMMERCE

Download data directly from provider

Share

Map data ©2014 Google 100 km Terms of Use

# Variable browser



**OCEANVIEWER Atlantic Canada**

Satellite Map Light Dark

HideMap Waves **Wind** Temperature Salinity Chlorophyll Ships Animals Webcams

Viewer Report an animal About

EC Wind Forecast for: Sun, Mar 23, 2014 18:00 UTC

Variable: Wind Speed  
Units:  $m\ s^{-1}$

Platform: EC Wind  
Type: Data  
Assimilated Model  
Depth: 0 m

Provider:  
Environment Canada (EC)

Download data directly from provider

<< < Stop > >> Loop - Speed +

Depths: 0 m

Share

Map data ©2014 Google 100 km Terms of Use

# Variable browser



**OCEANVIEWER Atlantic Canada**

Satellite Map Light Dark

Viewer Report an animal About

HideMap **Waves** Wind Temperature Salinity Chlorophyll Ships Animals Webcams

Waves

ww3 from BIO - Forecast for: Sat, Mar 22, 2014 19:00 UTC

Significant Wave Height, ms (m)

Variable: Wave height  
Units: m  
Platform: **BIO Wave Model**  
Type: Model  
Depth: 0 m  
Provider: **Bedford Institute of Oceanography (BIO)**

Download data directly from provider

Google

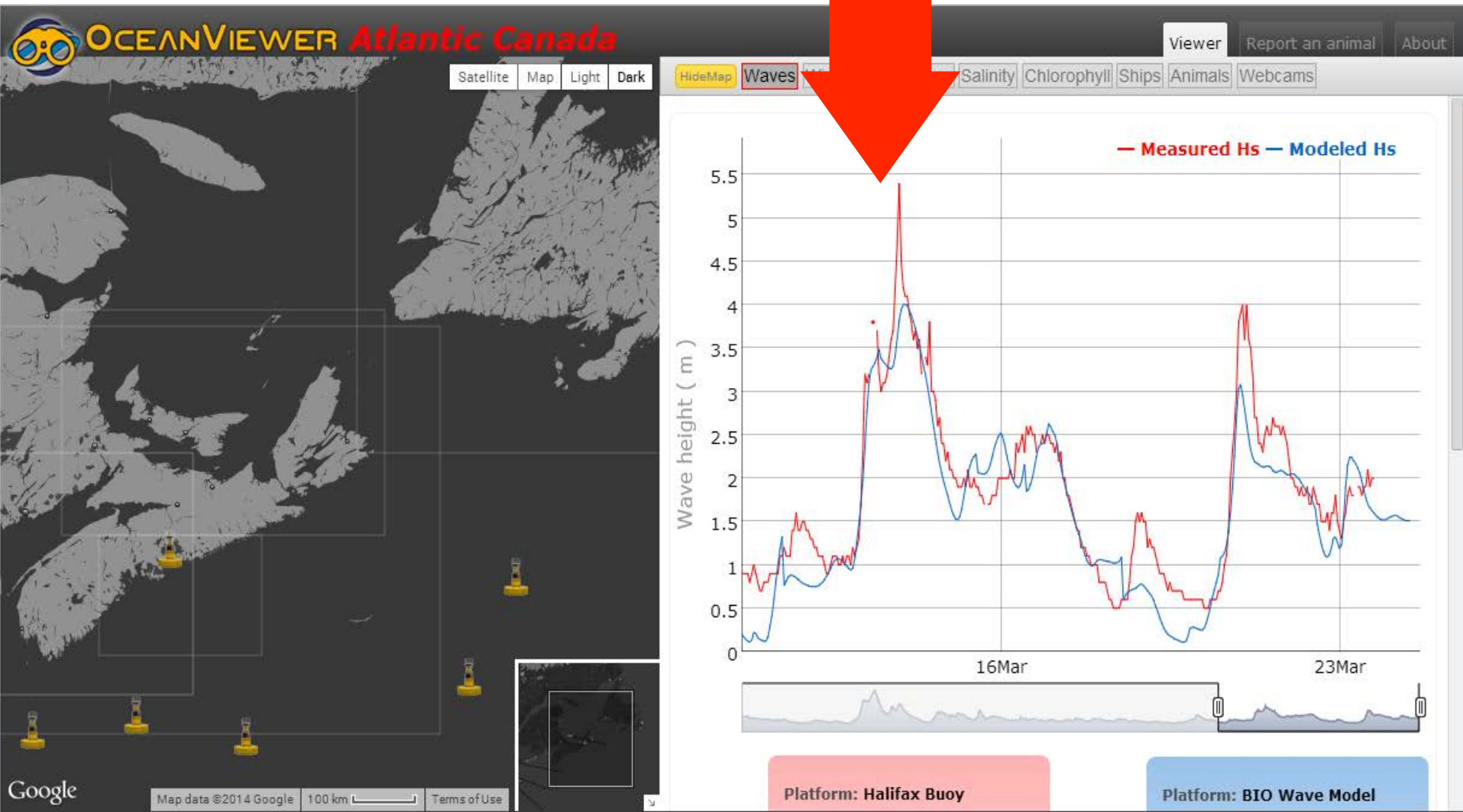
Map data ©2014 Google 100 km Terms of Use

Depths: 0 m

Control panel: << < Stop > >> Loop - Speed +

Progress bar: 100% (all green)

# Data-model comparisons



# Variable browser



**OCEANVIEWER Atlantic Canada**


Satellite Map Light Dark

HideMap Waves Wind Temperature Salinity Chlorophyll Ships **Animals** Webcams

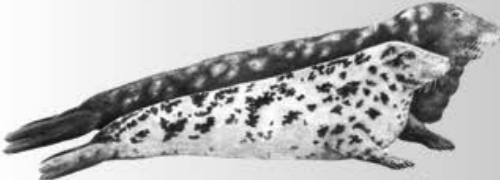
\*\*\* Animal Tracking \*\*\*

Name: **OTN Seal 124**

Provider: Ocean Tracking Network ( OTN )



Species: Grey seal  
( *Halichoerus grypus* )



? 🌐 📷 📄 eOL W 📷


Date tagged: March 2, 2014, 12:43 p.m.

Location tagged: Canada

Length: 1 m

Weight: 50 kg

Photo of tagged individual:



Map data ©2014 Google 100 km Terms of Use

# Variable browser



**OCEANVIEWER Atlantic Canada**

Satellite Map Light Dark

Viewer Report an animal About

HideMap Waves Wind Temperature Salinity Chlorophyll **Ships** Animals Webcams

Map data ©2014 Google 100 km Terms of Use

590" 56986 238 83

Coordinates: N50°19'53.17" W062°33'22.14" (50.3314, -062.5562)

Ships shown on map: Hanjin Sabbab, Ams, Geeta, Ariadne, Mont-Louis, Marcoux, Gotland Carolina, Swift Arrow, Valencia Express, Oceanex Col, Gallipoli, Beothuk, Sir William Alexander, Strait Explorer, Great Eastern 2, Seatra Sport, Oceanprovider 1, Lady Melissa, Westport, Ronja, Belgium, Richard J. li, Venture Sea.

Bottom right text: \$70 Myrtle Beach Ho myrtle-beach.trivago.ca Find the best deal on 2 Camera 2001 bekin

# Variable browser

**OCEANVIEWER Atlantic Canada**

Viewer | [View an animal](#) | [About](#)

Satellite | Map | Light | Dark

HideMap | Waves | Wind | Temperature | Salinity | Chlorophyll | Ships | Animals | **Webcams**

Platform: **Sambro Harbour Webcam**

Type: Webcam

Depth: 0 m

Provider: **Nova Scotia Webcams (Nova Scotia Webcams)**

**NOVA SCOTIA WEBCAMS**  
*Imagine yourself there!*

See real-time feed from provider

Other Regional Ocean Observing Systems in this area:

See all Observing Systems in [TABLE](#) or [MAP](#)

Google | Map data ©2014 Google | 100 km | [Terms of Use](#)

# Objectives:



**OCEANVIEWER.org**  
Real-time conditions & forecasts

1. Develop an easy-to-use interface for data browsing and visualization that is focused on the needs of the end-users.
- 2. Gather ALL ocean data and forecasts** through synergistic interactions with data providers. All data providers together can accomplish more than the sum of each on their own.
3. Create a “citizen ocean science” platform where end-users can, themselves, participate in collecting and presenting ocean-related data, which are then shared with the broader community.

## 2. Gather ALL products:

**kijiji** 199km

Offering  
Wanted (376)

Additional Info:  
**All**  
[Ads with images](#)  
[Ads with video](#)

Featured Ads:  
**All Featured Ads**  
[Urgent Ads](#)  
[CarProof Included](#)  
[Certified Pre-owned](#)

Price:  
from - to

For Sale By:  
[Owner \(9661\)](#)  
[Dealer \(5267\)](#)  
[View more options...](#)

	<b>WE APPROVE EVERYONE FOR FINANCING... ONLY \$499.95 DOWN</b> Simply Automotive Truro 2005 Chevrolet Monte Carlo LT WE APPROVE EVERYONE FOR AUTO FINANCING WE USE PRIVATE LENDERS THAT NEVER SAY NO! ONLY \$499.95 DOWN & DRIVE AWAY TODAY CALL US OR GO ONLINE ... <b>Every Vehicle Has A Guarantee! Every Customer Is Important! We Want Your Business!</b> 210468 km   Automatic	\$5,999.00	
	<b>2008 Ford Escape XLT 3.0L V6 4X4</b> Greenwood Auto Sales 2008 Ford Escape XLT 3.0L V6 4X4 XLT,V6, POWER OPTIONS, CRUISE CONTROL, AUTO HEATED SEATS, POWER DRIVERS SEAT, AC, 12 MONTH COMPLIMENTARY WALKAWAY FINANCING PROTECTION, FINANCING ... 159575 km   Automatic	\$9,990.00	
	<b>2005 GMC Sierra 1500 LOWKM REDUCED !!!!!</b> 2005 gmc sierra 1500 5.3 v 8 LOWWWWWW KM FULLY LOADED ON THE SPOT FINANCING ON ALL VEHICLES AND CAMPERS COME APPLY TODAY!!!!!!!!!!!!!! Vehicle is located at F.Mack Auto Sales Ltd, 25 Welton st. on Ashby ... 27284 km	\$9,900.00	
	<b>2007 Dodge Caliber R/T AWD, LEATHER!</b> Greenwood Auto Sales 2007 Dodge Caliber R/T AWD, LEATHER! AWD, RT, HEATED SEATS, CRUISE CONTROL, ALLOYS, POWER OPTIONS, AC, AUTOMATIC, CARPROOF VEHICLE HISTORY, 7 DAY EXCHANGE POLICY, FLEXIBLE FINANCING ...	\$10,890.00	

A “One-Stop-Shop” website is **Good** for everybody...

**Good** for users... i.e. easy to find data products

**Good** for data providers... i.e. increased traffic to their sites

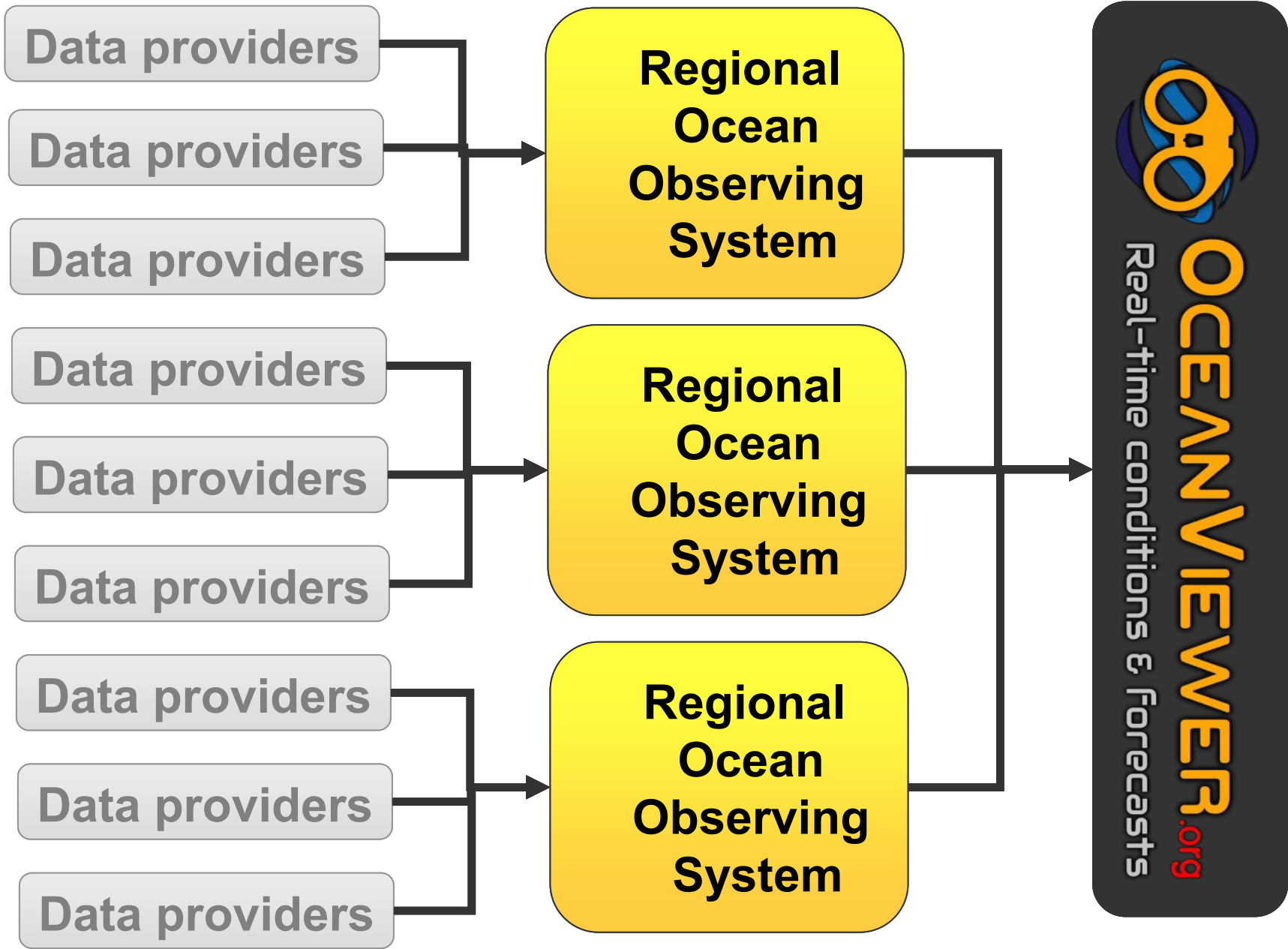
# 2. Gather ALL products:

“Pictures”

Links to Regional Ocean Observing Systems

Links back to providers

The screenshot displays the OCEANVIEWER Atlantic Canada web interface. On the left is a satellite-style map of the Atlantic region. The main area shows a temperature map with a color scale from 0.0 to 12.5 degrees Celsius. A NOAA logo is visible in the top right corner of the map area, along with a 'Download data directly from provider' button. Below the map are navigation controls and depth selection options (0 m, 3 m, 5 m, 10 m, 20 m, 30 m, 50 m, 75 m). At the bottom, there are logos for SLGO, SmartAtlantic, and NERACOOS, and a footer with 'MEOPAR' and various report categories like Whale, Dolphin, Seal, Turtle, Shark, Fish, Temperature, and Secchi depth.



# 2. Gather ALL products:



Temp, Waves  
Model wind

*SmartAtlantic* Temp, Waves



BIO

Wave model

Fisheries and Oceans Canada  
Pêches et Océans Canada



Temp and salinity  
model



Gliders  
Seal locations



Chlorophyll  
Satellite images  
(Thank you Emmanuel!)



Temp  
Salinity

# Objectives:

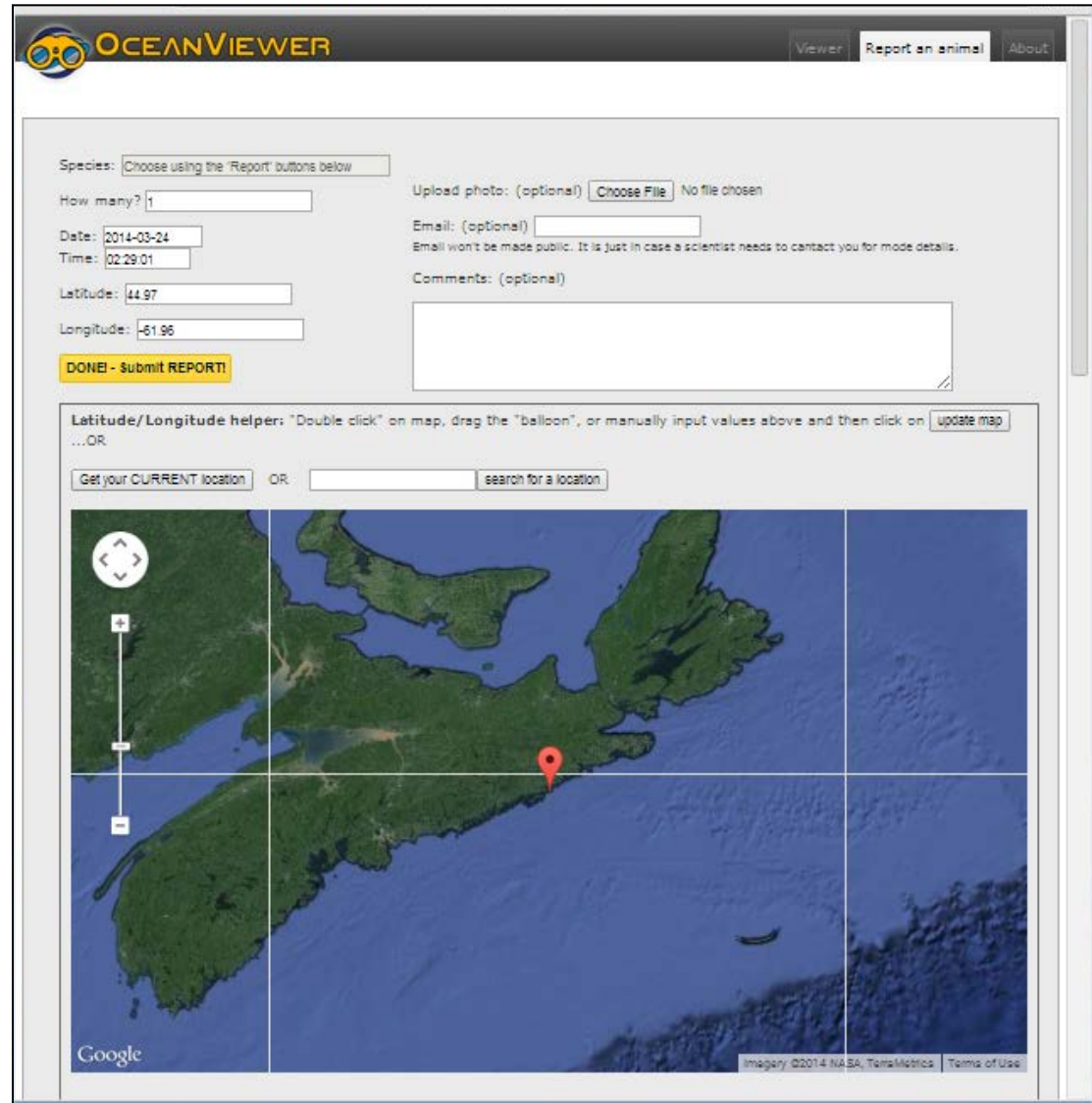
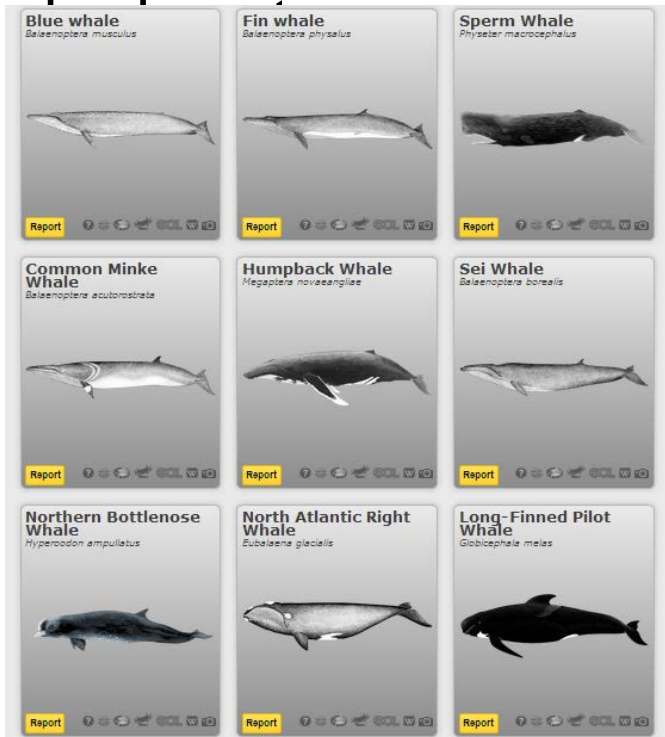


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3. Create a “**citizen ocean science**” platform where end-users can, themselves, participate in collecting and presenting ocean-related data, which are then shared with the broader community.

# 3. Citizen Science:

Utility to report  
“sightings” of  
whales, turtles,



# 3. Citizen Science:

Utility to upload  
“temperature data”

We gave fishermen  
temperature loggers  
to put on their lobster  
traps and/or wharfs.

Data is plotted and  
“shared with the  
world” immediately  
after upload

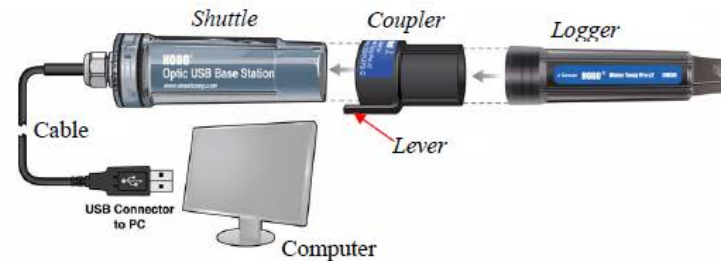
## Citizen Oceanography Program

MANUAL  
(v0.1 | 12-06-2013)

This manual explains how to operate the temperature loggers, and how to upload data to our webpage.

### Overview

- **Initial set up** - These are steps that you need to do **ONLY ONCE**. These are:
  - Open box with instrument and familiarize yourself with all the parts (see Figure below)
  - Install software in your computer
  - Launch the *Loggers* (and the *Shuttle*)
  - Deploy *Loggers* (on a wharf or lobster trap, etc.)
- **Daily routine** - These are steps that you need to do every day (or as often as you can)
  - Download data from *Loggers* to *Shuttle* (in the field)
  - Take *Shuttle* home and download data from *Shuttle* to your computer
  - Upload data from your computer to our website



NOTE: For more information, see the *Logger's* website: <http://www.onsetcomp.com/products/data-loggers/u22-001>

### Initial setup

1. Install included software (i.e. CD with HOBOWare software) in your computer
2. Connect USB cable to computer
3. Connect USB cable to *Shuttle* (it may take a minute for your computer to recognize the USB device)
4. Open HOBOWare
5. From the menu [Device], click on [Manage Shuttle]

# Future steps:

- Add more data products (ice, rain, etc) in Atlantic Canada
- Improve the browser/visualization interface
- Add the capability for users to create their own “picture/link” products (i.e. a true “Ocean Kijiji”)
- Perhaps expand to other regions (e.g. Arctic?, Pacific Canada?)





**OCEANVIEWER.org**  
Real-time conditions & Forecasts

<http://oceanviewer.org>

**Questions?**

*Diego.Ibarra@dal.ca*