OCEAN NETWORKS CANADA

Development of broadly distributable metrics of ocean conditions using real-time data and marine 'community-observatories' along the British Columbia coast
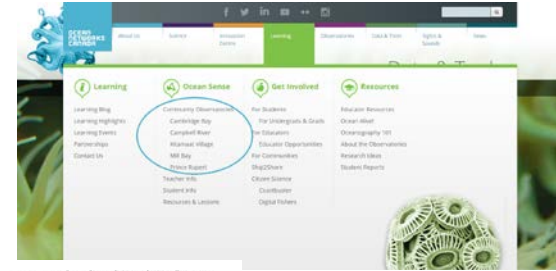
S. Kim Juniper, Maia Hoeberechts, Marlene Jeffries, and Akash Sastri
September 26, 2017

Ocean Networks Canada: Community Observatories

COMMUNITY OBSERVATORIES

Cambridge Bay / Inuit Territory

Prince Rupert / Ts'msyen Territory

Kitamaat Village / Haisla Territory

Churchill

Hudson Bay

NEPTUNE / Nuu-chah-nulth Territory

Campbell River / Kwakwa̱ka̱'wakw / Coast Salish Territory

West Coast Vancouver Island / Nuu-chah-nulth Territory

University of Saskatchewan

University of Victoria

VENUS / Coast Salish Territory

Mill Bay / Coast Salish Territory

Pacific Ocean

Atlantic Ocean

Regional Observatory

Community Observatory (Existing)

Community Observatory (Funded)

Coastal RADAR (Existing)

Data Centre

Data Transfer Line

Fibre-optic Cable

Bathymetry (50 m contour lines)

0

-3500 m

N W E S

University of Victoria

Office of Indigenous Affairs

Ocean Networks Canada, an initiative of the University of Victoria, is actively seeking community input for this map. This is a living document and is supported by the Office of Indigenous Affairs. Data Sources: Smith and Sandwell, USGS Cascadia, NOAA Last Updated: March 31, 2016
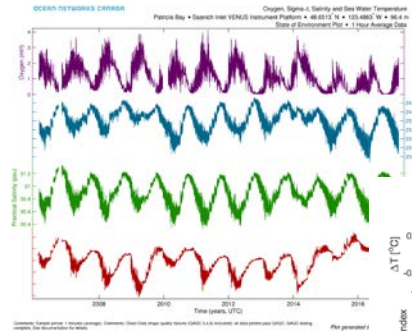
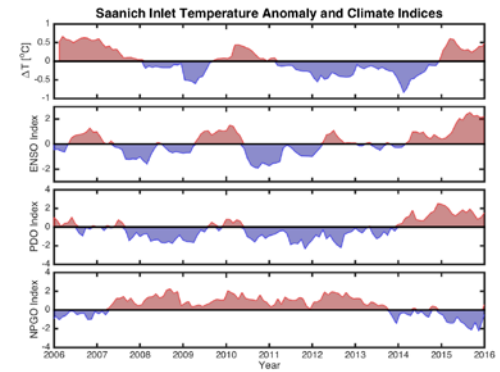# Data Products and Distributable Metrics

1) Community Observatory webpages

2) 'State of the Ocean' plots

3) Temperature baseline and anomaly plots
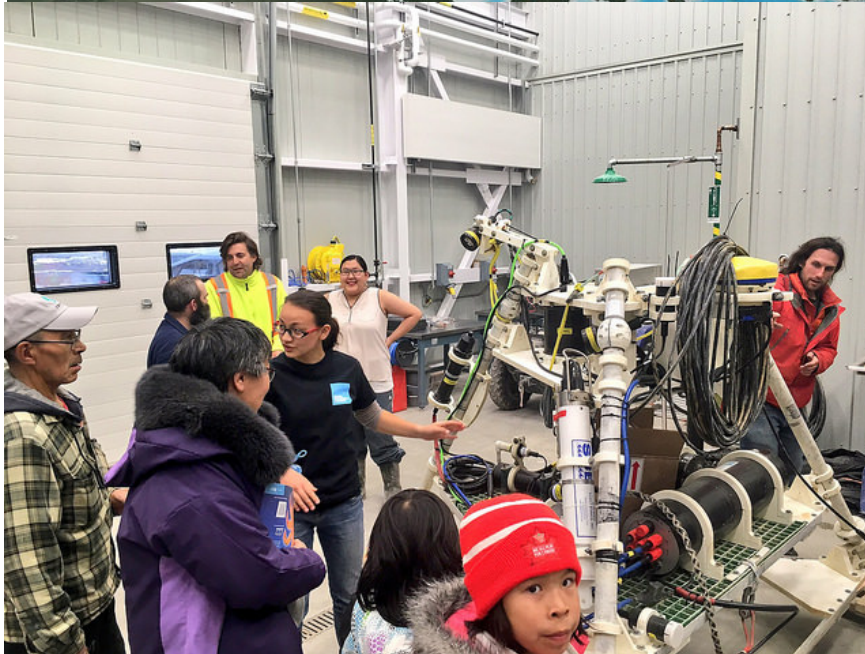
4) Acoustic (ocean noise) baseline and anomaly plots
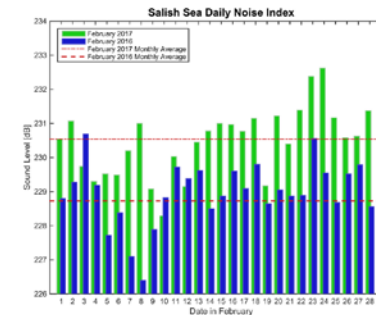
Community Observatory: Cambridge Bay

- Southern coast Victoria Island (69° 06.7870' N 105° 03.8450' W)

- Canadian territory of Nunavut in the Kitikmeot Region

- Small community (<2000); mostly Inuit people; hunting and fishing; transport hub to the Northwest Passage

- Home to the new Canadian High Arctic Research Station (CHARS)

- Shore and underwater sensor platforms since (October 2012)

Community Observatory: Cambridge Bay
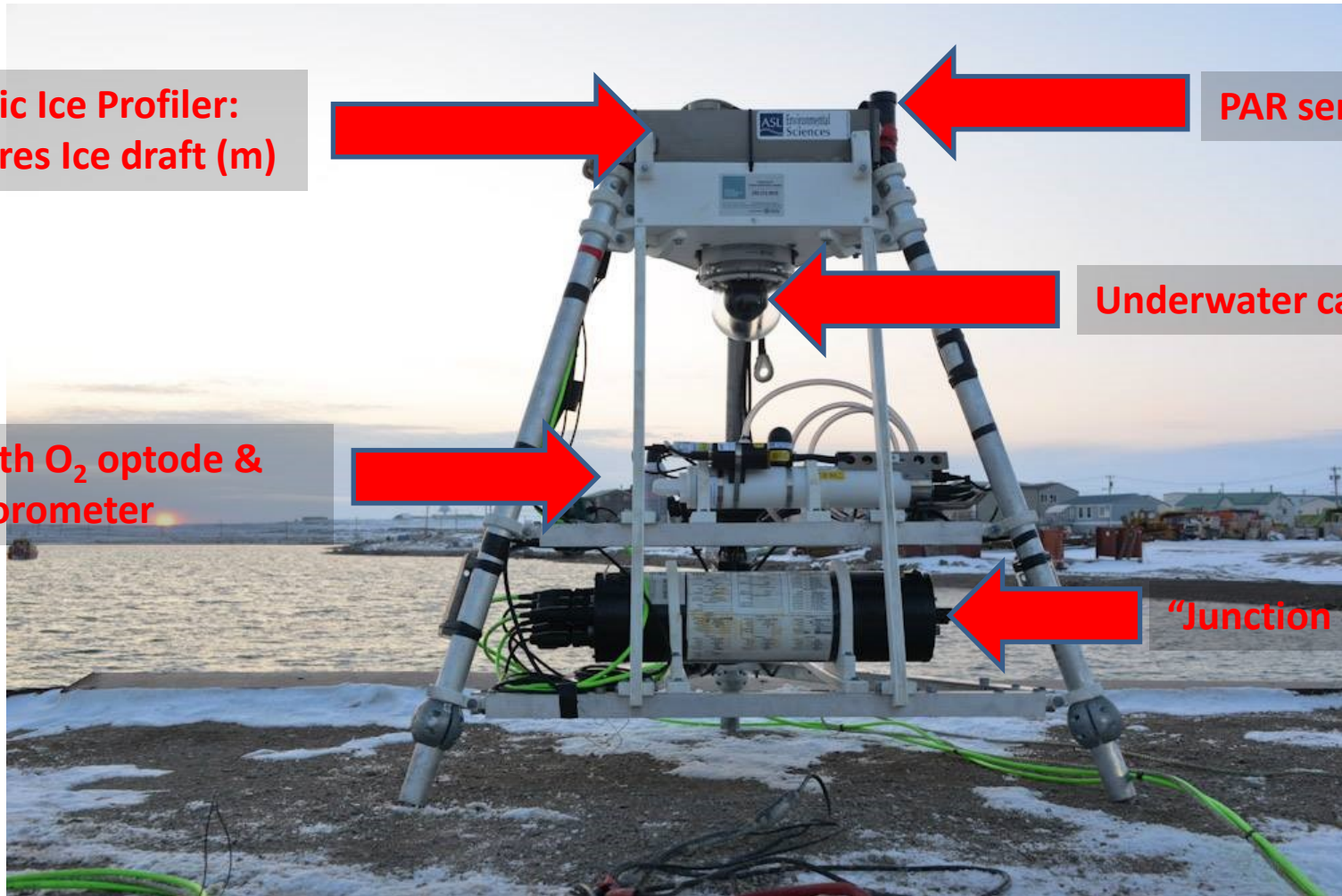
Time series of continuous (1 Hz) measurements (October 2012-present)

Community Observatory: Kitimaat Village

- Head of Douglas Channel on the BC North Coast 53° 58.4798' N 128° 39.4223' W)

- Haisla First Nation centered around the village; Village adjacent to a former smelter location and future LNG terminal

- Community Observatory is located at the Haisla Public Works Waste Treatment compound along the waterfront (Apr. 2017 – present)

- Shore station: weather station and shore camera
- Underwater platform: water quality parameters, underwater sounds of marine mammals and vessels, and underwater livestream video from an camera.
- Automatic Identification System (AIS) antenna to track large vessels in the region.

Community Observatory: Prince Rupert
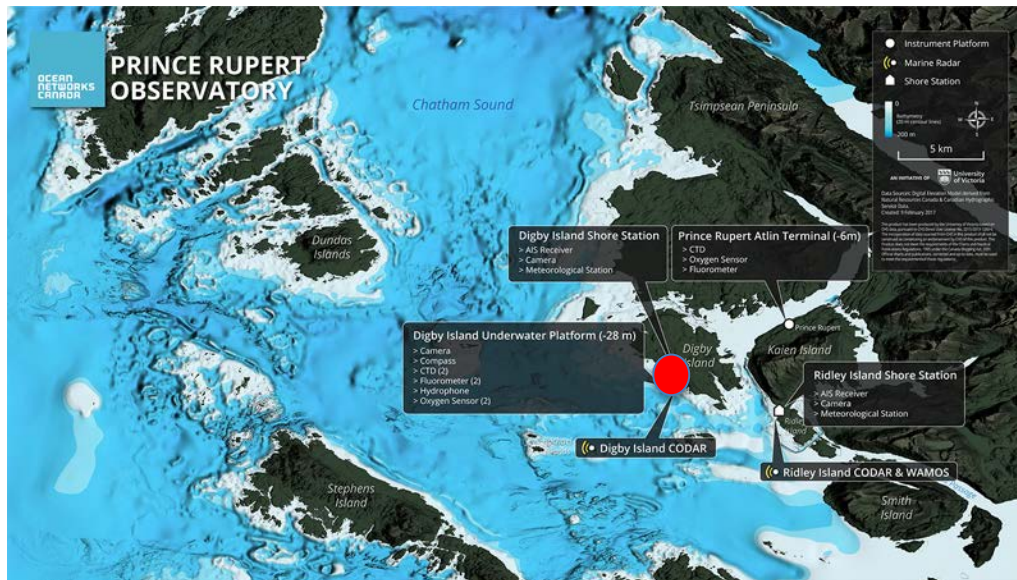
- Prince Rupert is located within Ts'msyen Territory on the west side of Digby Island, North Coast of BC.

- Growing deep water container and future LNG export terminal: mouth of the Skeena River (salmon)

- The community is interested in baseline information on water quality and soundscape in advance of planned development

- Underwater and shore station time series = August 2016-present

- Future HF Radar and AIS antennae

Community Observatory: Campbell River

- Campbell River is a coastal city in BC; east coast of Vancouver Island at the south end of Discovery Passage: Discovery Pier, (50° 01.2410' N 125° 14.1180' W)

- Located within 2 first nations territories (Kwakwa̲ka̲'wakw and Coast Salish)

- Economic hub for N. Van. Island.; Port facility; potential LNG terminal ; lies along the important coastal Inside Passage shipping route

- Time series of underwater and shore-based data since August 2016

- AIS and HF Radar

Community Observatory Webpages

- Each community observatory has its own landing page.

- Pages designed specifically for coastal community members, local leadership, educators, students, and the general public.

- Permits interactive exploration of live data, presents background on the site and community, and all data collected at the site through the state of the ocean plots.
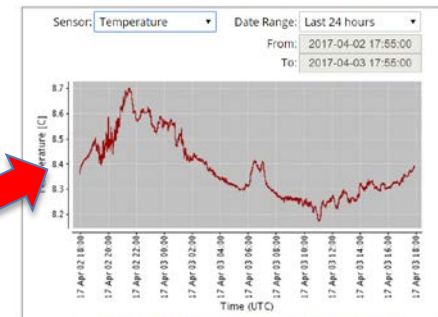

Latest Readings from Campbell River

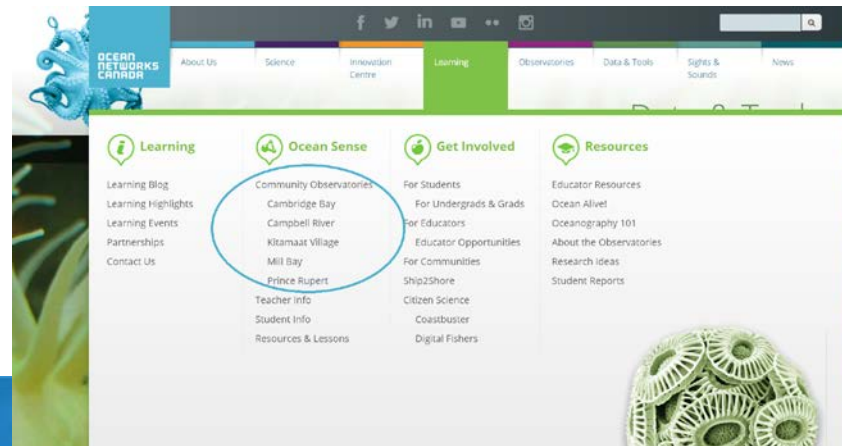| Sensor Name	Reading	Last Updated (UTC)
Air Temperature (°C)	6.69	03-Apr-2017 17:56:00
Solar Radiation (S/m)	579.65	03-Apr-2017 17:56:00
Water Temperature (°C)	8.39	03-Apr-2017 17:56:52
Density (kg/m³)	1022.5	03-Apr-2017 17:56:52
Salinity (psu)	28.93	03-Apr-2017 17:56:52
Pressure (decibar)	9.1	03-Apr-2017 17:56:52
Oxygen (ml/l)	3.35	03-Apr-2017 17:56:52
Chlorophyll (µg/l)	0.95	03-Apr-2017 17:56:52
Turbidity (NTU)	1.93	03-Apr-2017 17:56:52

Legend:

✓ Current Data
✗ Data ... than 7 days. Please refer to the Instrument Health section.

CTD Instrument Data

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Legend:

✅ Current Data

❌ Data older than 7 days. Please refer to the **Instr**

CTD Instrument Data

Sensor: [Temperature ▾]   Date Range: [Last 24 hours ▾]

From: 2017-04-02 17:55:00
To: 2017-04-03 17:55:00
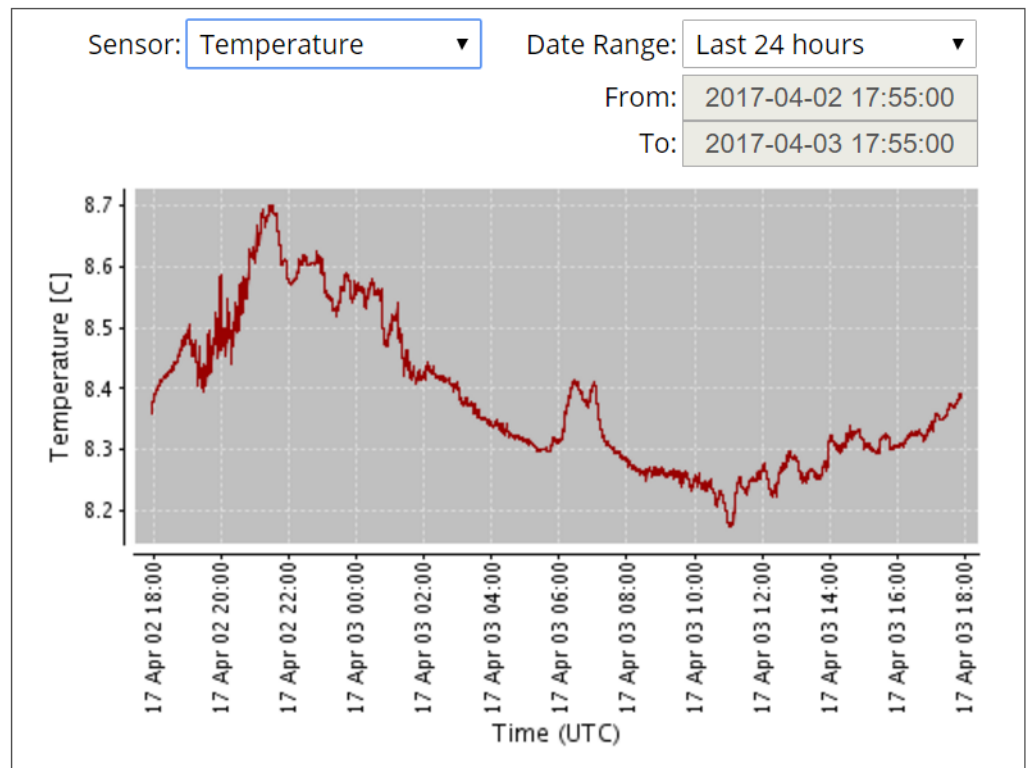
Save plot as: **png** file.   **View this in Plotting Utility.   Embed this.**
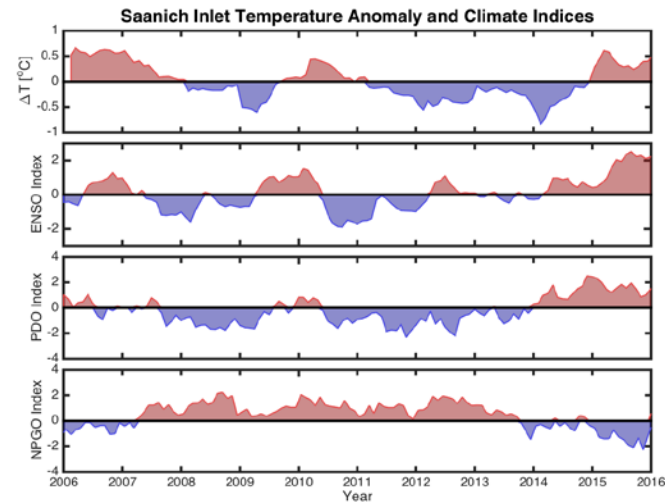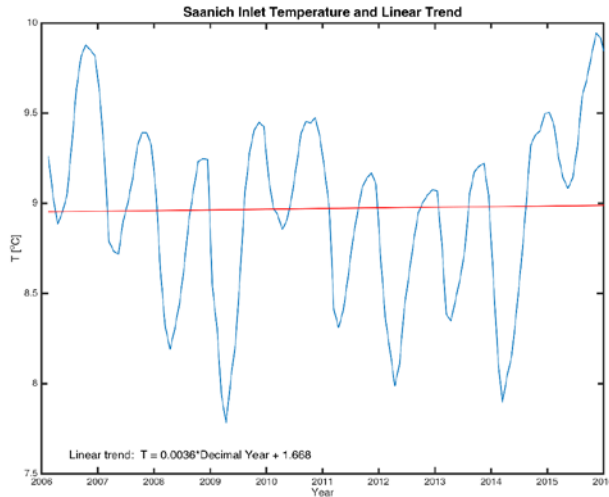
'State of the Ocean' plots

- Visualization of long-term trends and seasonal variations.

- Updated plots generated on a daily basis for each site

- Key variables: oxygen, seawater density, salinity, temperature
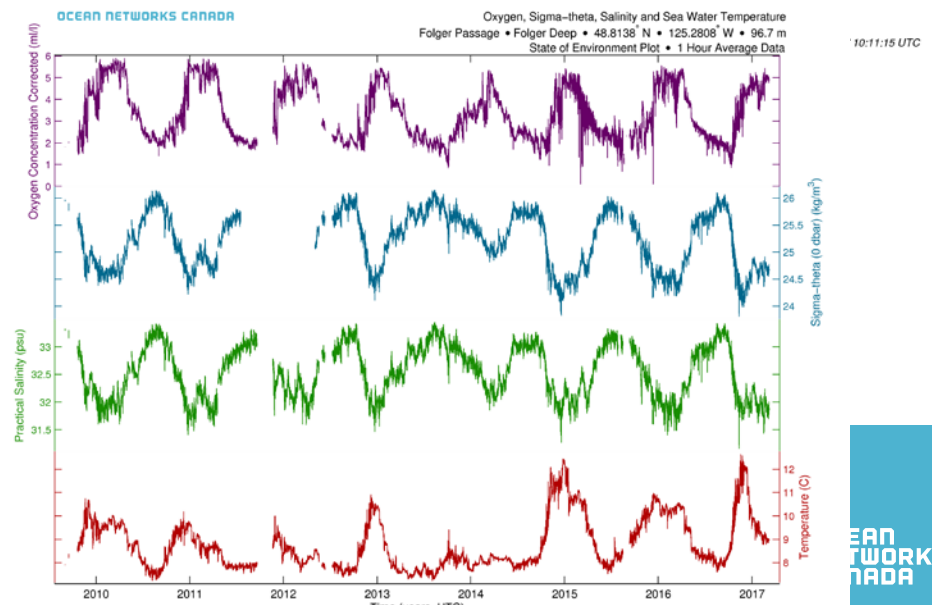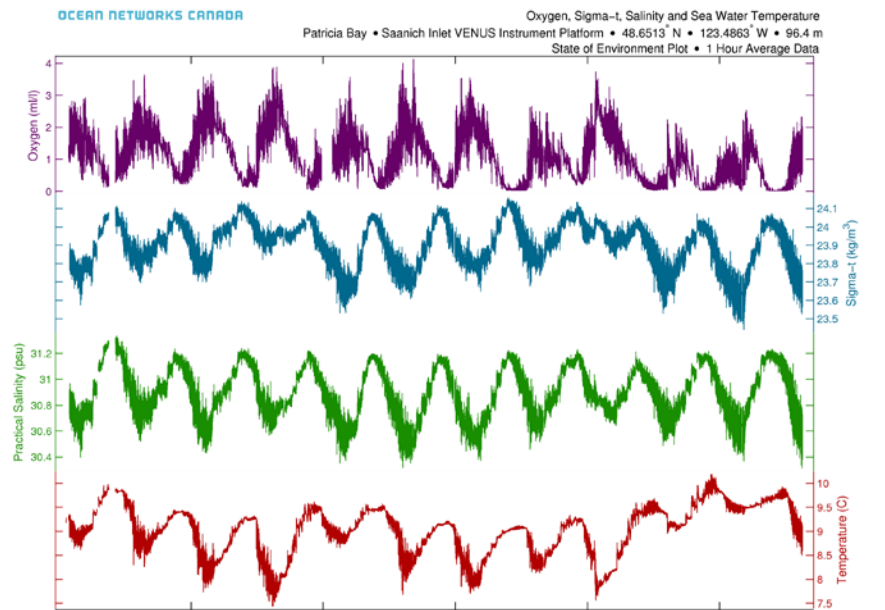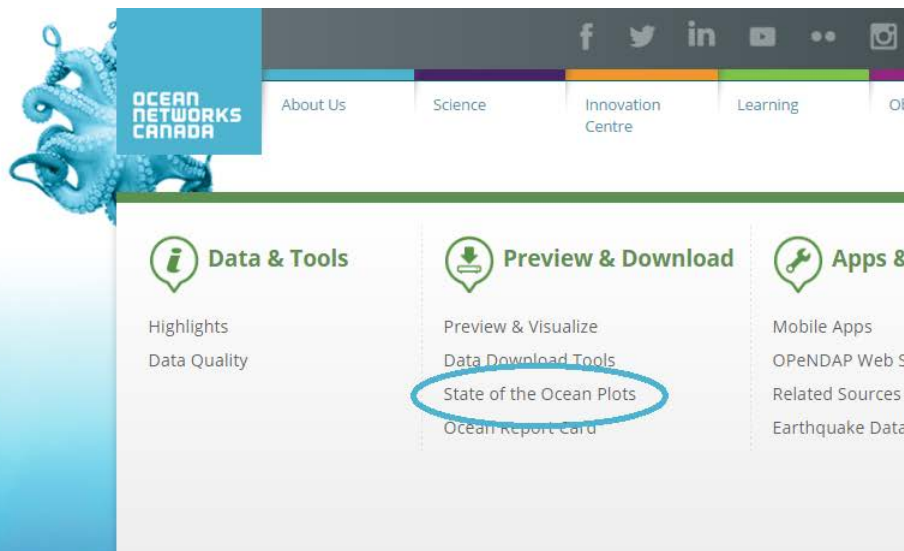
Temperature baseline and anomaly plots

- Can we observe changes in long time-series of ocean temperature data?

- Data product demonstrated on Saanich Inlet dataset (100 m depth, February 2006-present)

Saanich Inlet Temperature and Linear Trend

Linear trend: T = 0.0036*Decimal Year + 1.668

Saanich Inlet Temperature Anomaly and Climate Indices

Acoustic (ocean noise) baseline and anomaly plots

- How is the ocean soundscape changing over time?

- Data product demonstrated on Barkley Canyon Upper Slope dataset (400 m depth, June 2013, 2014, 2015)
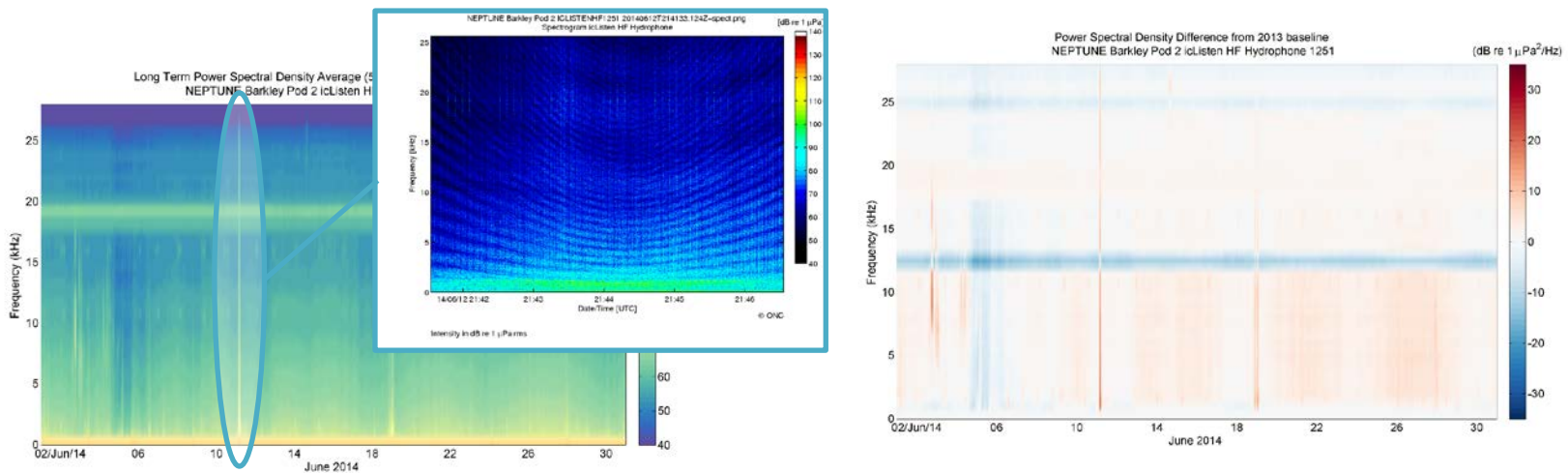
"Exploring the Salish Sea" iBook

- An interactive guide to the Salish Sea
- Chapters:
  - Ocean Networks Canada
    - Background on ONC
  - The Salish Sea
    - People of the Salish Sea
    - Installations
  - Salish Sea Marine Life
    - Highlights some key species
  - Oceans 2.0
    - Data access guide
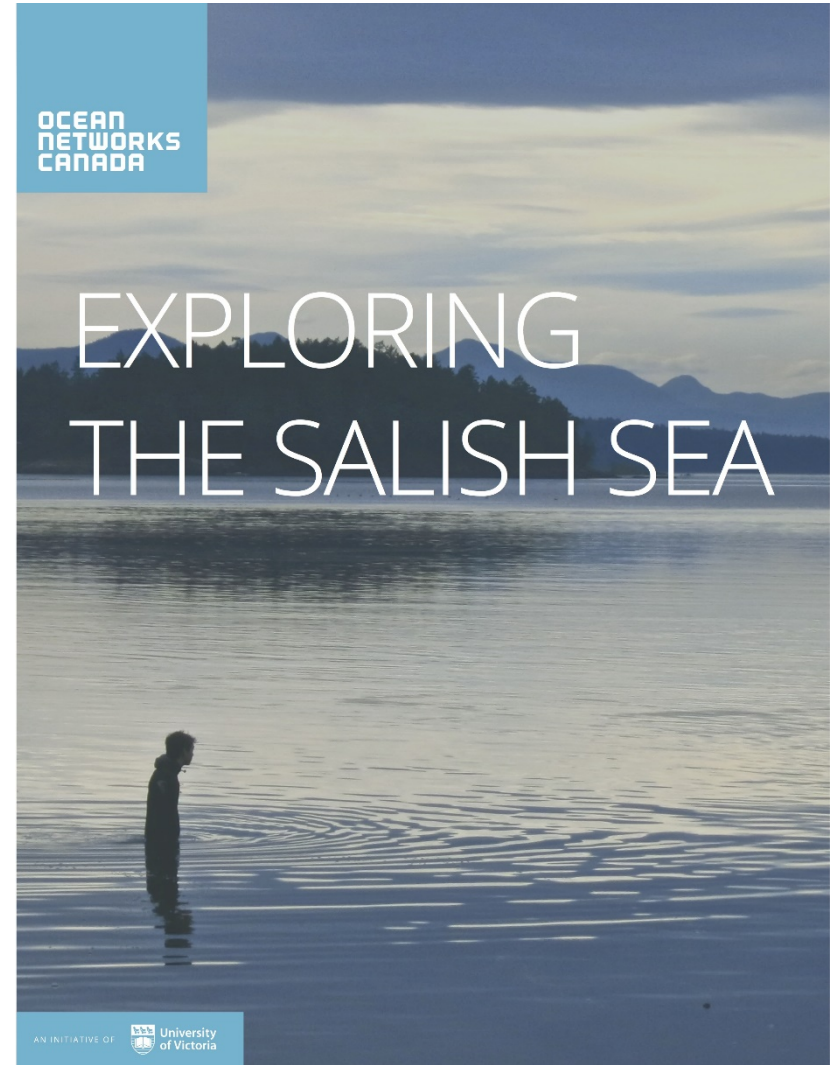
"Ocean Data in Practice" iBook

- An interactive overview of community observatories and data products
- Chapters:
  - Ocean Networks Canada
    - Background on ONC
  - Site Information
    - Overview of each community observatory site
  - Instrumentation
    - Easy to understand guide to selected ocean instrumentation
  - Data Products
    - Description of Marine Safety, Marine Traffic, and Ocean Health data products
  - Oceans 2.0
    - Data access guide

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OCEAN DATA IN PRACTICE

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THANK YOU!

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