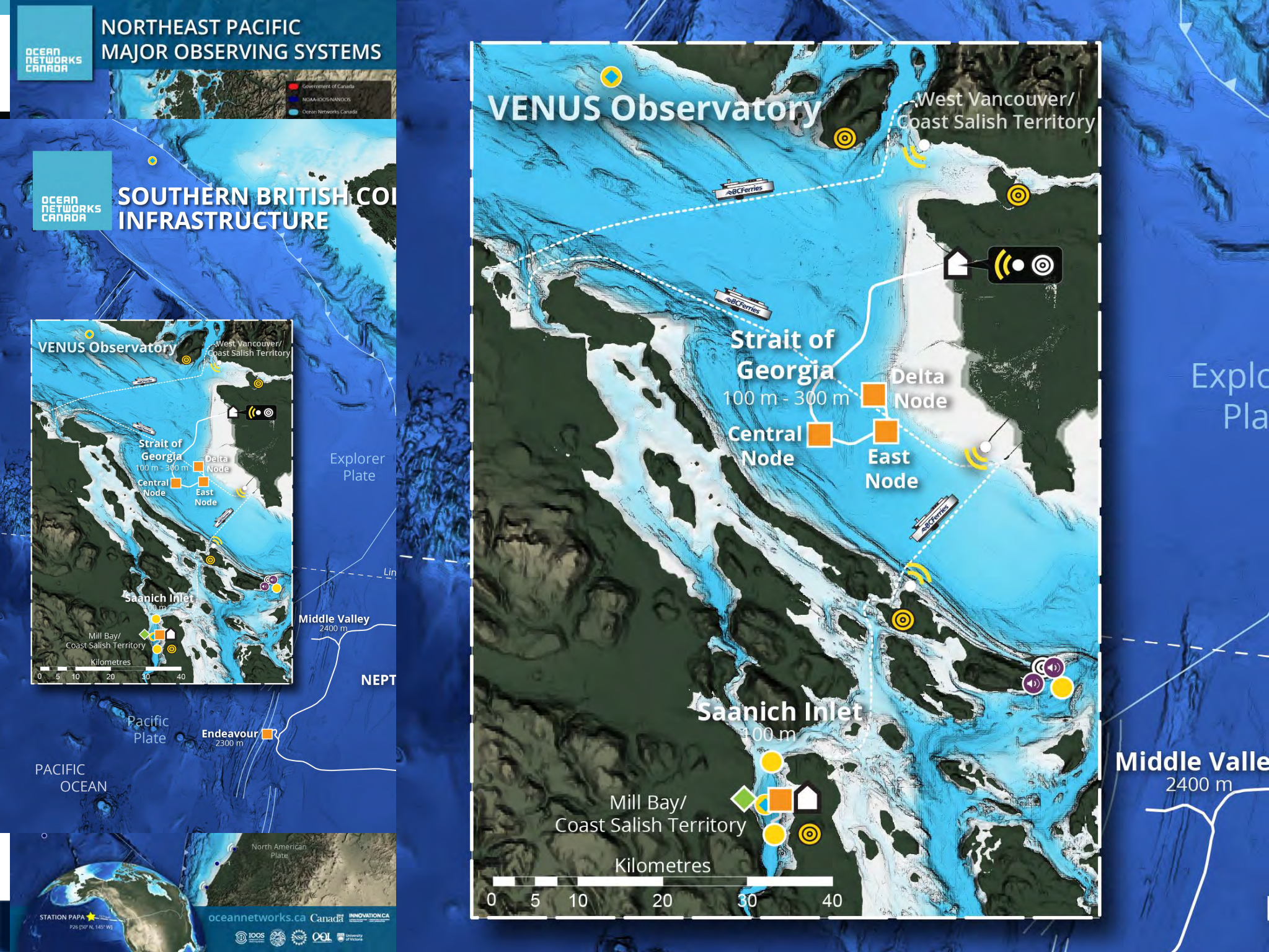
OCEAN NETWORKS CANADA

OCEAN NETWORKS CANADA'S OCEANS 2.0 DATA MANAGEMENT SYSTEM

Richard Dewey, ONC Director of Science
rdewey@uvic.ca


NORTHEAST PACIFIC
MAJOR OBSERVING SYSTEMS
Government of Canada
NOAA-IOOS-NANOOS
Ocean Networks Canada
SOUTHERN BRITISH COL
INFRASTRUCTURE
VENUS Observatory
West Vancouver/
Coast Salish Territory
Strait of
Georgia
100 m - 300 m
Delta
Node
Central
Node
East
Node
Saanich Inlet
100 m
Mill Bay/
Coast Salish Territory
Kilometres
0 5 10 20 30 40
Explorer
Plate
Middle Valley
2400 m
NEPT
Pacific
Plate
Endeavour
2300 m
PACIFIC
OCEAN
North American
Plate
STATION PAPA
P26 [50° N, 145° W]
oceannetworks.ca
Canada
INNOVATION.CA

OCEANS 2.0 – A COMPREHENSIVE DATA MANAGEMENT SYSTEM

- Initiated in 2001 with VENUS in the Salish Sea
- Followed quickly in 2003 by the addition of NEPTUNE
- Original "Data Management and Archiving System" (DMAS)
- Evolved into Oceans 2.0 by 2009 as NEPTUNE came online.

Mandate:

- Manage all infrastructure systems and sub-systems
- Manage all instrument connections, control, and data flow
- Secure all data acquisition from all distributed sensors
- Manage all the metadata and calibration information
- Prepare the data and metadata for user/client access
- Provide means for users to discover, explore, and acquire data, data products, and metadata.
- Enable publication of innovative research with impact!

oceannetworks.ca → data.oceannetworks.ca

https://data.oceannetworks.ca/home?TREETYPE=1&LOCATION=58&TIMECONFIG=0

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Ocean Networks Canada Data Preview

Oceans 2.0

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Sort by: Instruments by Location

Filter on: No Filter

- Ocean Networks Canada
  - Arctic
    - Cambridge Bay
    - Dease Strait
    - Gascoyne Inlet
  - Atlantic
    - Bay of Fundy
  - Mobile Platforms
    - British Columbia Ferries
  - Pacific
    - British Columbia North Coast
    - Northeast Pacific Ocean
    - Salish Sea
      - Discovery Passage
      - Saanich Inlet
      - Strait of Georgia
        - Central
        - Delta
        - East
          - Strait of Georgia East VENUS Instrument Platfor
            - Bioacoustic Echosounder AZFP
            - ADCP 150 kHz
            - CTD
              - Conductivity
              - Density
              - Practical Salinity
              - Pressure
              - Sigma-t
              - Sigma-theta (0 dbar)
              - Sound Speed
              - Temperature
            - Current Meter
            - Hydrophone
            - Oxygen Sensor
            - Turbidity Meter
            - Underwater Listening Station

Summary | Day | Month

Instruments by Location: Ocean Networks Canada - Pacific

Click image to enlarge

Description: The Pacific region includes the NEPTUNE and VENUS cabled observatories, the Mill Bay community-based observatory, mobile platforms, and a few autonomous stations.

British Columbia North Coast

Northeast Pacific Ocean

Description: The Northeast Pacific Ocean includes marine and coastal waters along the west coast of North America. The NEPTUNE observatory is located in this region.

Salish Sea

Description: The Salish Sea includes a network of channels and coastal waters near Vancouver Island. The Salish Sea includes the Strait of Georgia, Strait of Juan de Fuca, Saanich Inlet and Puget Sound. The VENUS and Mill Bay observatories are located in the Salish Sea.

Vancouver Island

Description: Vancouver Island is located on the west coast of British Columbia. It is enclosed by the inner coastal waters of the Salish Sea and the Pacific Ocean.

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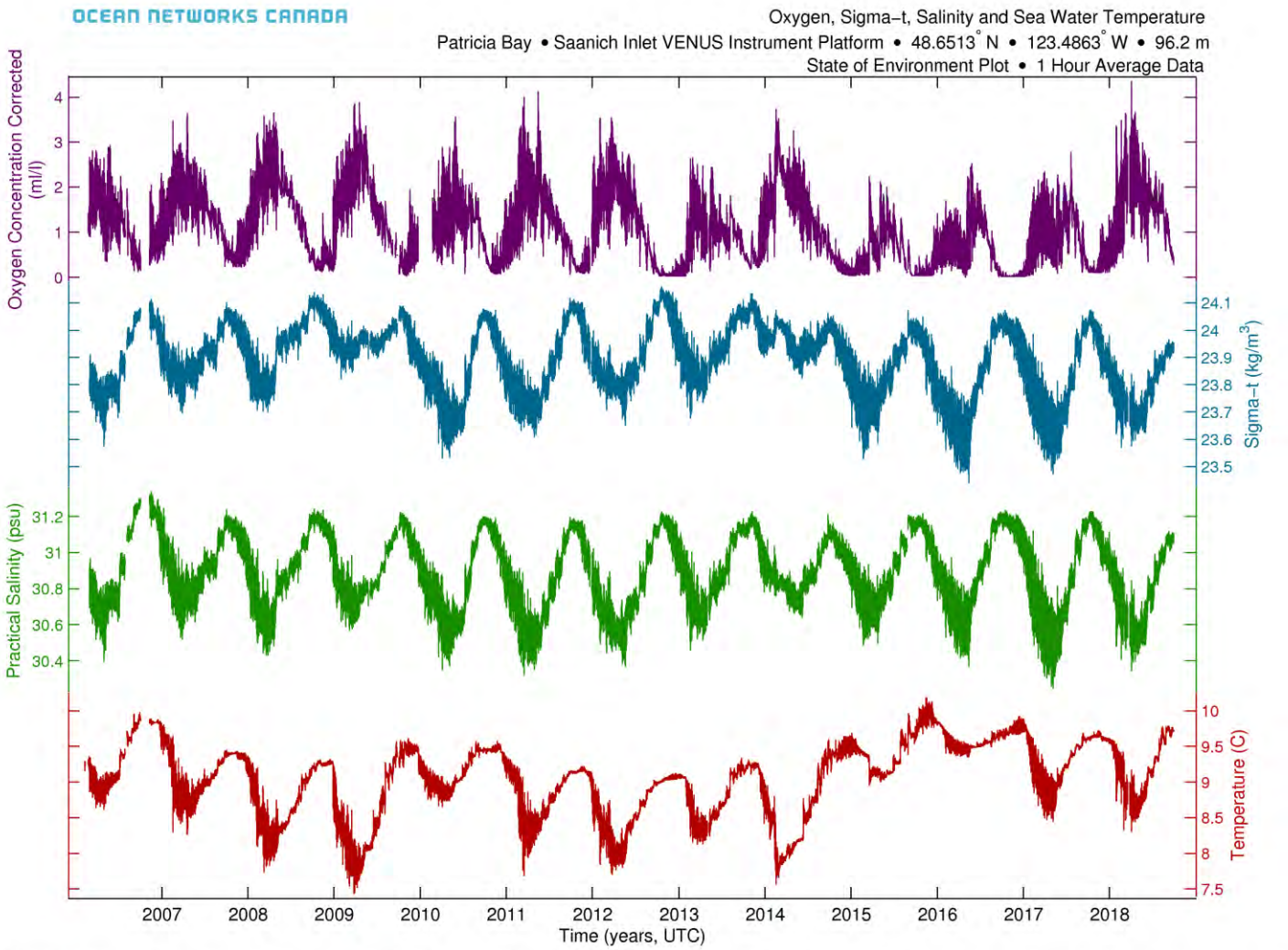
Sort by: Instruments by Location

Filter on: No Filter

- Ocean Networks Canada
  - Arctic
    - Cambridge Bay
    - Dease Strait
    - Gascoyne Inlet
  - Atlantic
    - Bay of Fundy
  - Mobile Platforms
    - British Columbia Ferries
  - Pacific
    - British Columbia North Coast
    - Northeast Pacific Ocean
    - Salish Sea
      - Discovery Passage
      - Saanich Inlet
        - Patricia Bay
          - Saanich Inlet VENUS Instrument P
            - CTD A
            - Oxygen Aanderaa
            - Oxygen Rinko
            - Oxygen SBE43
            - Echosounder, Bioacoustic
            - Gas Tension Device
            - Hydrophone
        - Yarrow Point
      - Strait of Georgia
        - Central
        - Delta
        - East
          - Strait of Georgia East VENUS Instr
            - Bioacoustic Echosounder AZFP
            - ADCP 150 kHz
            - CTD
              - Conductivity
              - Density
              - Practical Salinity

Summary | Day | Month

Instruments by Location: Ocean Networks Canada - Pacific - Salish Sea - Saanich Inlet - Patricia Bay - Saanich Inlet VENUS Instrument Platform



Sample period: 1 minutes (average). Comments: Clean Data (major quality failures (QAQC 3,4,6) excluded): all data plotted pass QAQC. QAQC testing complete. See documentation for details.

Plot generated 24–Oct–2018 10:11:45 UTC

https://data.oceannetworks.ca/PlottingUtility?TREETYPE=26&LOCATION=1410&DEVICECATEGORY=5&...

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Instruments | Saved Plots | Help

- Ocean Networks Canada
  - Arctic
    - Cambridge Bay
      - Diver Data
      - Safe Passage Buoy
      - Shore Station
      - Underwater Network
    - Darnley Bay
    - Davis Strait
    - Dease Strait
    - Franklin Strait
    - Gascoyne Inlet
    - Peel Sound
    - Queen Maud Gulf
    - Victoria Strait
  - Atlantic
  - Mobile Platforms
  - Pacific
    - British Columbia North Coast
    - Northeast Pacific Ocean
      - Barkley Canyon
        - Axis
        - Barkley Node
          - CTD
            - Conductivity
            - Density
            - Practical Salinity
            - Pressure
            - Sigma-t
            - Sigma-theta (0 dbar)
            - Sound Speed
            - Temperature
          - Hydrophone
          - Junction Box
          - Oxygen Sensor
          - Tiltmeter
        - Canyon Head

Time Period Selection

Date From (UTC): 24-Oct-2018 17:01:11

Date To (UTC): 24-Oct-2018 17:11:11

Time Presets: Last 10 Minutes

Reset Time Fields

Refresh Plot(s): Plot

Auto Refresh: 15 sec

Time Range History

22-Oct-2018 17:07:18 - 24-Oct-2018 17:07:18
24-Oct-2018 15:10:54 - 24-Oct-2018 17:10:54
24-Oct-2018 15:11:06 - 24-Oct-2018 17:11:06
24-Oct-2018 17:01:11 - 24-Oct-2018 17:11:11

<< Previous UTC Time Period | Next UTC Time Period >> | Clear All | Save Plot(s)...

Plot 4 | Hints | Options

Multiple Curves

Pacific - Northeast Pacific Ocean - Barkley Canyon - Barkley Node - CTD (Details|Docs) - Temperature (15690) - Clean - Data Values - Not Downsampled - Download Data

Pacific - Northeast Pacific Ocean - Barkley Canyon - Barkley Node - CTD (Details|Docs) - Temperature (15690) - Clean - Data Values - Not Downsampled - Download Data

https://data.oceannetworks.ca/PlottingUtility?TREETYPE=26&LOCATION=27&DEVICECATEGORY=

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Instruments | Saved Plots | Help

- Saved Plots
  - CBO Checksum
  - Microcat 8425 March 2012
  - New Session 1331229481416
  - Slocum Glider Sept 4 2014
  - UBC Workshop 001
  - VENUS CTDs (SI & SoG)
  - VENUS Temperatures (SI & SoG)
  - 2014 North East Pacific Warming Comes A
- Public Plots

Time Period Selection

Date From (UTC): 01-Sep-2014 00:00:00

Date To (UTC): 01-Jan-2015 00:00:00

Time Presets: Custom

Reset Time Fields

Refresh Plot(s): Plot

Auto Refresh: Inactive

Time Range History

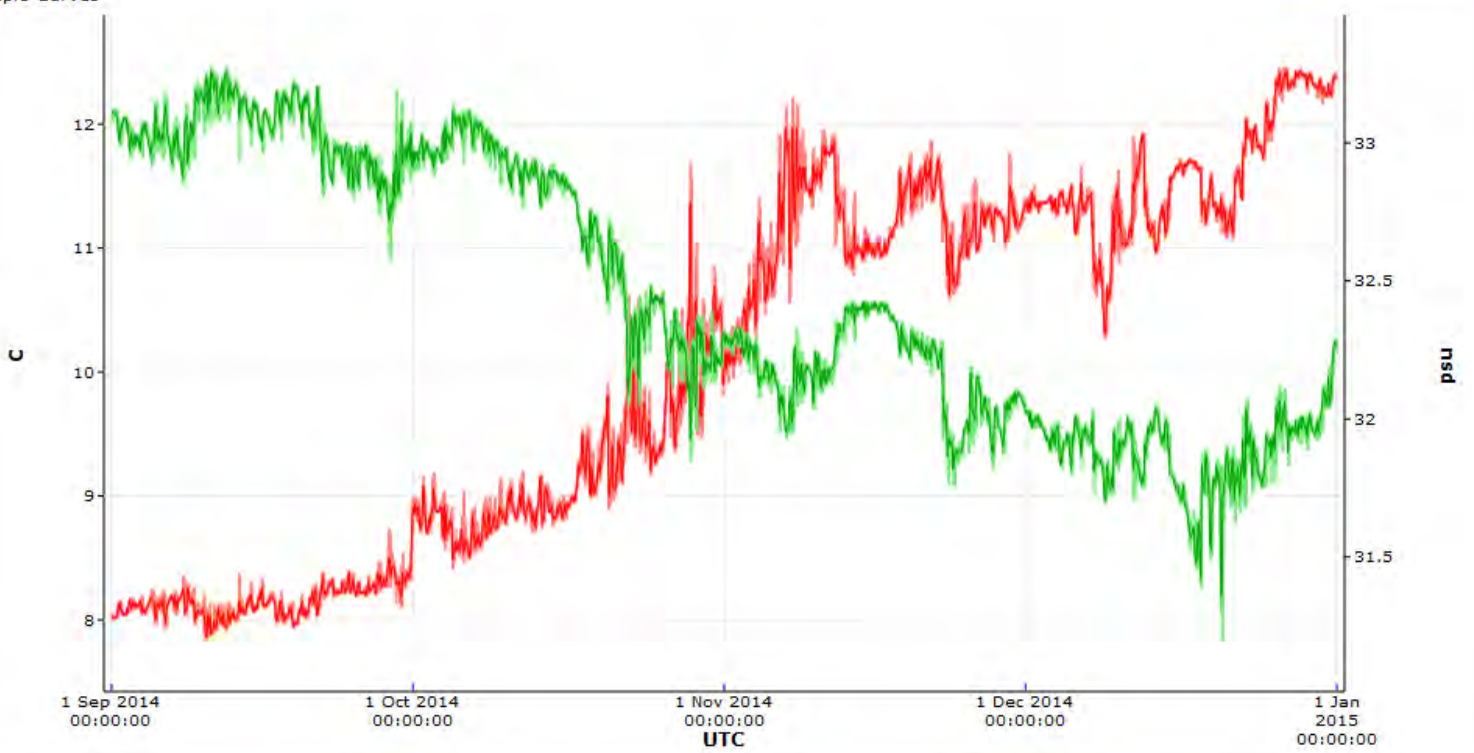
01-Nov-2014 00:00:00 - 19-Mar-2015 20:20:37
01-Sep-2014 00:00:00 - 19-Mar-2015 20:20:37
01-Sep-2014 00:00:00 - 01-Jan-2015 20:20:37
01-Sep-2014 00:00:00 - 01-Jan-2015 00:00:00

<< Previous UTC Time Period | Next UTC Time Period >> | Clear All | Save Plot(s)...

Plot 3

Multiple Curves

Hints | Options



Sea-Bird SeaCAT SBE16plus V2 6812 (Details|Docs) - Temperature (8511) - Clean - MinMax - Downsampled - Download Data

Sea-Bird SeaCAT SBE16plus V2 6812 (Details|Docs) - Temperature (8511) - Clean - Avg - Downsampled - Download Data

Sea-Bird SeaCAT SBE16plus V2 6812 (Details|Docs) - Practical Salinity (8508) - Clean - MinMax - Downsampled - Download Data

https://data.oceannetworks.ca/DataSearch

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Step 1. Choose Data Source | Step 2. Select Data Product | Step 3. View Cart (0 items)

Data Search Help

Data Source Filters

Apply

Depth Range

From (m): All

To (m): All

Time Period Selection

From (UTC):

To (UTC):

All Available

Reset Time Fields

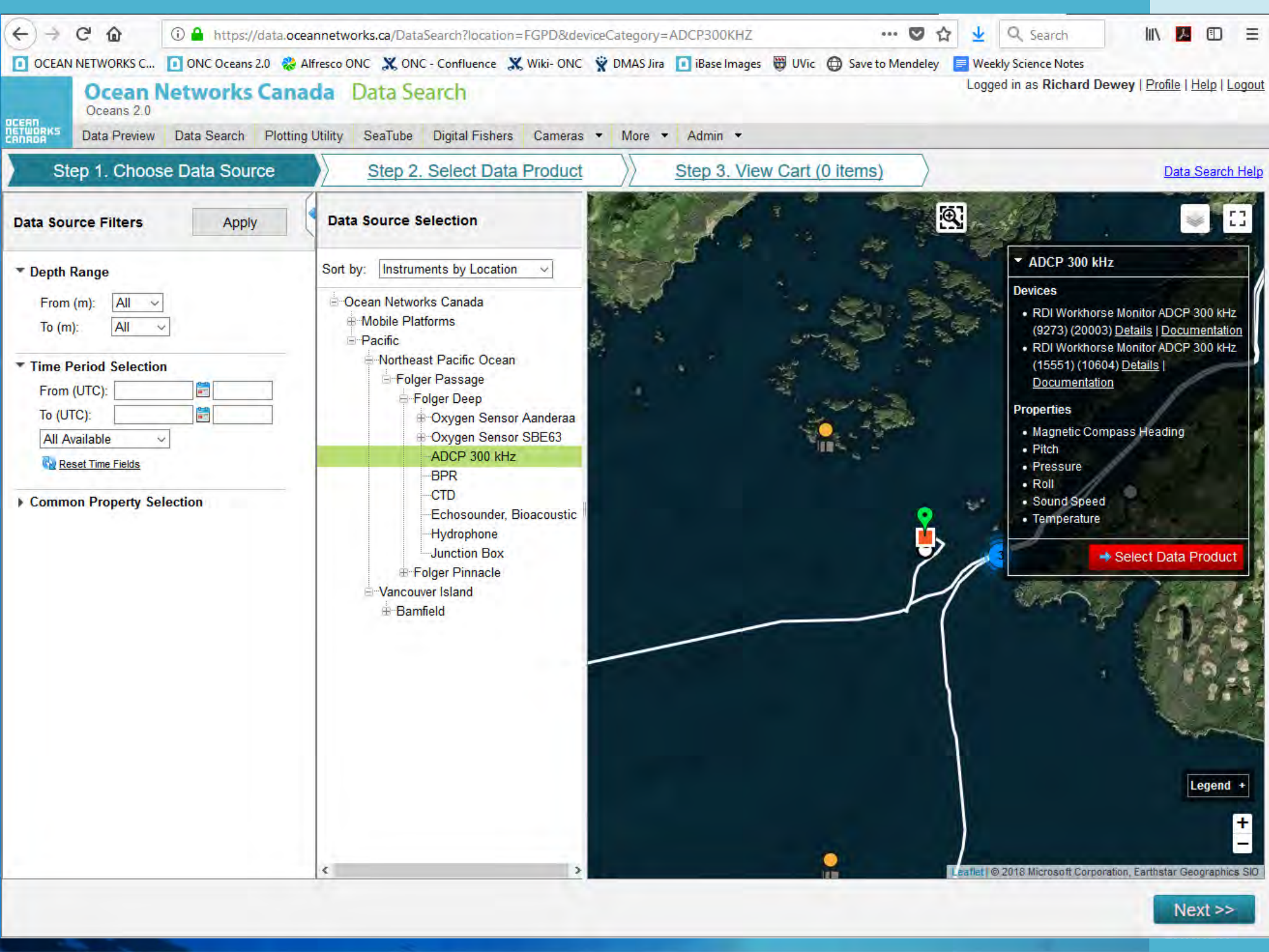
Common Property Selection

Data Source Selection

Sort by: Instruments by Location

- Ocean Networks Canada
  - Mobile Platforms
  - Pacific
    - Northeast Pacific Ocean
      - Barkley Canyon
      - Cascadia Basin
      - Clayoquot Slope
      - Endeavour
      - Folger Passage
    - Salish Sea
      - Boundary Pass
      - Discovery Passage
      - Juan de Fuca Strait
      - Saanich Inlet
      - Salish Sea Marine Survival Proj
      - Strait of Georgia
    - Vancouver Island
      - Albert Head
      - Bamfield
      - Beaver Cove
      - Brooks Peninsula
      - Eliza Dome
      - Holberg
      - Kyuquot
      - Lake Cowichan
      - Nootka Lighthouse
      - North Saanich
      - Port Alberni
      - Port Alice
      - Port Renfrew

Next >>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Admin
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Step 2. Select Data Product
Step 3. View Cart (0 items)
Data Search Help
Data Source Filters
Apply
Depth Range
From (m): All
To (m): All
Time Period Selection
From (UTC):
To (UTC):
All Available
Reset Time Fields
Common Property Selection
Data Source Selection
Sort by: Instruments by Location
Ocean Networks Canada
Mobile Platforms
Pacific
Northeast Pacific Ocean
Folger Passage
Folger Deep
Oxygen Sensor Aanderaa
Oxygen Sensor SBE63
ADCP 300 kHz
BPR
CTD
Echosounder, Bioacoustic
Hydrophone
Junction Box
Folger Pinnacle
Vancouver Island
Bamfield
ADCP 300 kHz
Devices
RDI Workhorse Monitor ADCP 300 kHz (9273) (20003) Details | Documentation
RDI Workhorse Monitor ADCP 300 kHz (15551) (10604) Details | Documentation
Properties
Magnetic Compass Heading
Pitch
Pressure
Roll
Sound Speed
Temperature
Select Data Product
Legend
Leaflet | © 2018 Microsoft Corporation, Earthstar Geographics SIO
Next >>

ADCP 300 kHz

RDI Workhorse Monitor ADCP 300 kHz (9273) (20003) Details | Documentation

RDI Workhorse Monitor ADCP 300 kHz (15551) (10604) Details | Documentation

Date From (UTC): 17-Oct-2018 17:21:03 Last 7 Days

Date To (UTC): 24-Oct-2018 17:21:03 Reset Time Fields

Data Availability: Green bars mark periods of available data.
Click-drag to zoom; double-click to see full history.

24 Jun 2010 | 26 May 2011 | 26 Apr 2012 | 28 Mar 2013 | 27 Feb 2014 | 29 Jan 2015 | 31 Dec 2015 | 01 Dec 2016 | 02 Nov 2017 | 04 Oct 2018

	Time Series Scalar Data				Time Series Scalar Plot		Log File		RDI ADCP Time Series			RDI Daily Current Plot		RDI Daily Intensity Plot	
	CSV	MAT 7	TXT	ODV	PNG	PDF	TXT		RDI	MAT 7	NetCDF	PNG	PDF	PNG	PDF
ADCP 300 kHz 276 Annotations **(Disable Pop-up Blocker to See All)**	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐
Magnetic Compass Heading (8221, 8561)	☐	☐	☐	☐	☐	☐									
Pitch (8222, 8562)	☐	☐	☐	☐	☐	☐									
Pressure (8225, 8565) 2 Annotations	☐	☐	☐	☐	☐	☐									
Roll (8223, 8563)	☐	☐	☐	☐	☐	☐									
Sound Speed (8220, 8560)	☐	☐	☐	☐	☐	☐									
Temperature (8224, 8564)	☐	☐	☐	☐	☐	☐									

Velocity Bin-mapping:
◉ Nearest vertical bin (always matches winADCP) ○ As configured on the device (matches processing on device - EXxxxx1) ○ None ○ Linear interpolation (Ott method)

Three-Beam Solutions: ◉ Off ○ As configured on the device (matches winADCP - EXxxx1x) ○ On

Low Correlation Screen Threshold: ◉ 64 counts (RDI default) ○ As configured on the device (matches winADCP - WC) ○ 0 counts (off) ○ 16 counts ○ 32 counts ○ 128 counts

Error Velocity Screen Threshold: ◉ 2 m/s (RDI default) ○ As configured on the device (matches winADCP - WE) ○ 0 m/s (off) ○ 5 m/s ○ 1 m/s ○ 0.5 m/s ○ 0.25 m/s ○ 0.1 m/s

False Target

NOTE: Most data products have additional Metadata automatically generated and added to the Cart. + Add to Cart

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https://data.oceannetworks.ca/SeaTube

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Ocean Networks Canada SeaTube Pro

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Videos | Playlists

- VENUS Maintenance 2016-10 (Oct 2016)
- DFO Expedition 2016-08 (Aug 2016)
- NEPTUNE 2016-06/07 SKQ201609S (Jun
- NEPTUNE 2016-06 RV Sikuliaq SKQ2016(
- NEPTUNE Maintenance 2016-05 EV Nautil
- VENUS Maintenance 2016-04/05 (Apr 201
- NEPTUNE Maintenance 2015-09 TGT (Se
- ONC Maintenance 2015-08/09 Nautilus (A
- NOAA 2015 PRS-15-RTC (Jun 2015)
- NEPTUNE Maintenance Cruise 2015-05 (M
- VENUS Maintenance Cruise #24 2014-09
- NEPTUNE Maintenance Cruise 2014-05 (M
- NEPTUNE Maintenance Cruise 2013-06 TI
- VENUS Maintenance Cruise #21 2013-04/
- NEPTUNE Maintenance Cruise 2013-05 (M
- NEPTUNE Maintenance Cruise 2012-05/0(
- NEPTUNE Maintenance Cruise 2011-09 (S
- NEPTUNE Maintenance Cruise 2011-07 (J
- VENUS Maintenance Cruise 2011-07 (Jul 2
- NEPTUNE Maintenance Cruise 2010-09/1(
  - R1384 - 2010-Oct-07 17:47:57 - Endea
  - R1383 - 2010-Oct-07 09:06:30 - Endea
  - R1382 - 2010-Oct-06 04:22:03 - Casca
  - R1381 - 2010-Oct-05 17:06:44 - Barkle
  - R1380 - 2010-Oct-02 12:03:34 - Endea
  - R1379 - 2010-Oct-01 07:46:21 - Endea
  - R1378 - 2010-Sep-29 18:05:26 - Ende
  - R1377 - 2010-Sep-29 05:47:52 - Ende
  - R1376 - 2010-Sep-28 09:40:47 - Ende
  - R1375 - 2010-Sep-27 17:46:52 - Ende
  - R1374 - 2010-Sep-26 16:30:00 - Ende
  - R1373 - 2010-Sep-23 15:34:22 - Ende
  - R1372 - 2010-Sep-21 21:19:01 - Ende
  - R1371 - 2010-Sep-21 04:11:36 - Ende

Resolution: Low

Time: 27-Sep-2010 22:01:52 Latitude: 47.9734 Longitude: -129.08225 Depth: 2156.7 Heading: 218.38

Insite Pacific Mini Zeus HD Camera #mzs116 | Digital Still Camera:

Map | Profile | Detail

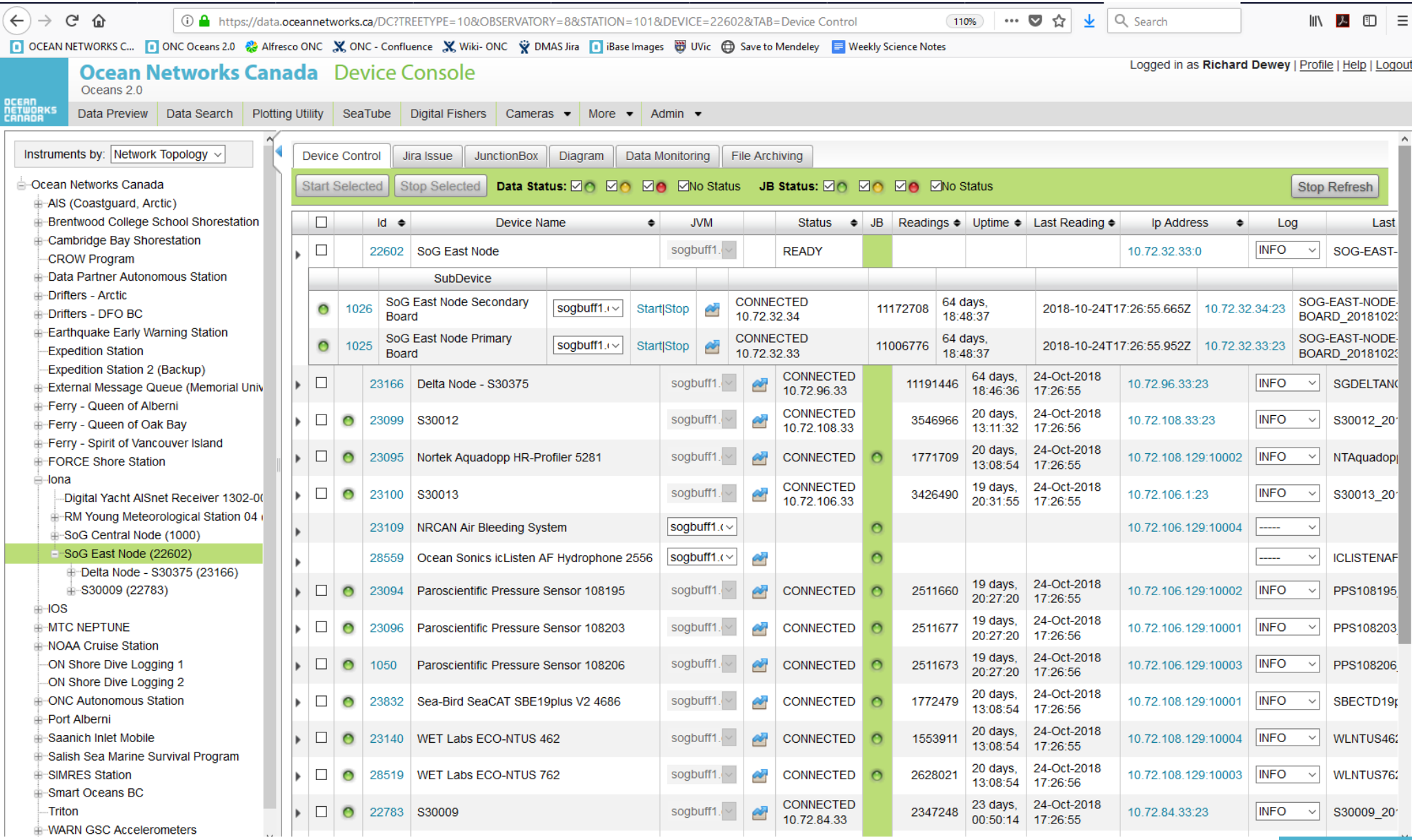
Map | Satellite

Search Comments [ ] Find Next

Dive Log Entries | My Annotations

Start Date (UTC)	End Date (UTC)	Comment	Latitude	Longitude	Depth	Origin	Action
27-Sep-2010 22:01:02	27-Sep-2010 22:01:02	DSC: Shows connection between old cable and OTDR for testing	47.97343	-129.0822	2156.7	IRLS	
		DSC: PleasShowing the					

All Infrastructure Monitoring and Control



Shore Station
Network power and control
"Drivers" talks to instruments (raw)
Scalar data is time stamped, parsed, converted/derived into variables
Complex data time stamped (raw)
Buffered (up to two weeks)

Extras
Logging in has benefits (save, share, more info, etc.)
All time series have annotation "tracks"
Complex data viewers (active and passive acoustics)
Sandbox local computing environment
Access to entire workflow/instrument management

~200 GB/day
~700 TB

Archiver
Receives data every second from SS drivers
Central SS to ingest/reprocess non-streaming data
Scalar data ingested into Cassandra (Apache) DB
Raw (and complex) archived by a file/AD system
Metadata managed in a PostgreSQL

Seismic/Acoustic

Military/Antelope

IRIS/ONC

User Interface
Graphic User Interface (Oceans 2.0)
Application Programming Interface
ERDDAP, linked directly to Cassandra
Processing required spawns VTM

ONC's Oceans 2.0
Discovery, Explore, and Download
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oceannetworks.ca

rdewey@uvic.ca
Ocean Networks Canada