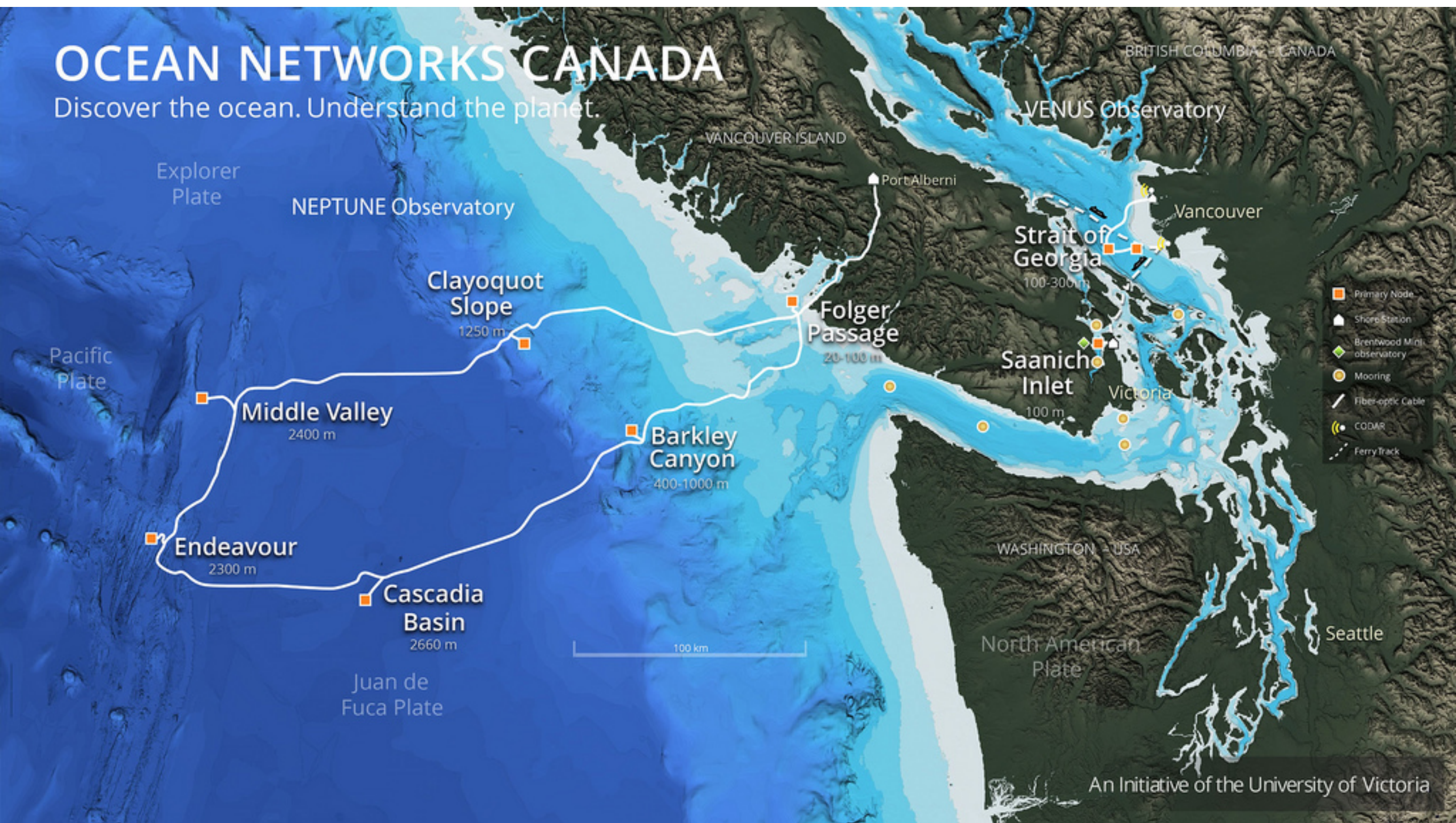OCEAN
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INNOVATION

Data Stewardship for Mobile Platforms at Ocean Networks Canada

Schmidt Ocean Institute
2015 Research Planning Workshop
August 27, 2015
Reyna Jenkyns

AN INITIATIVE OF   University of Victoria

Ocean Networks Canada

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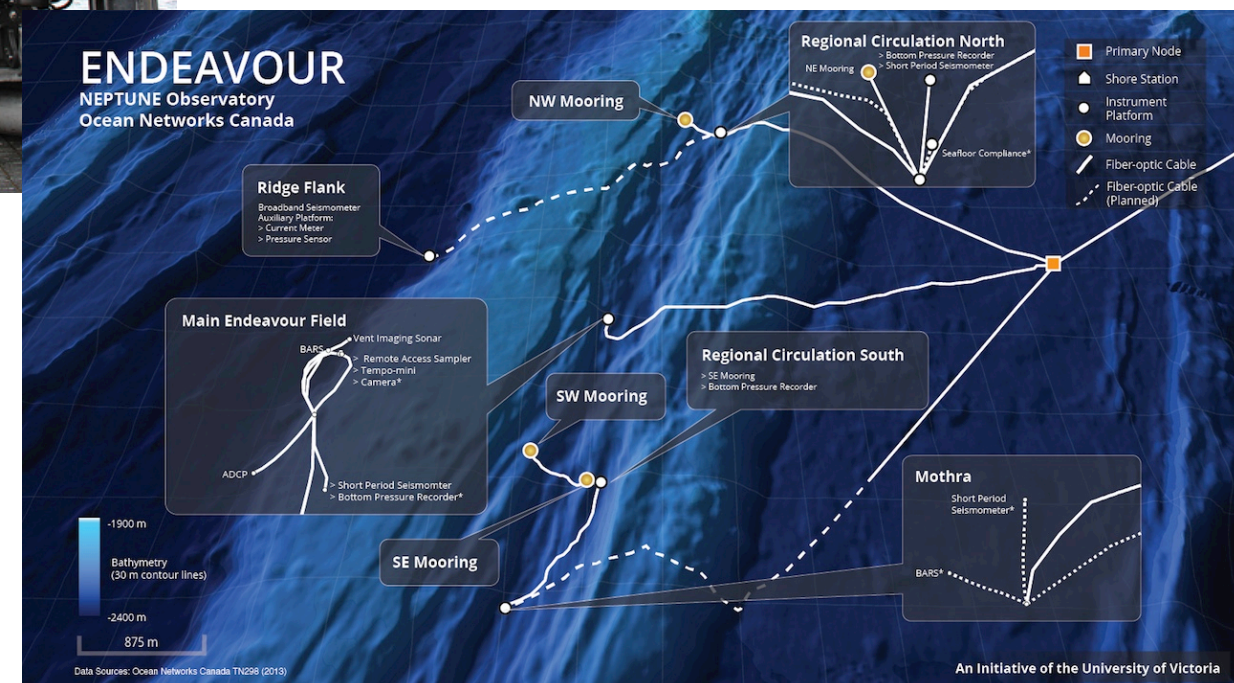# Maintenance Expeditions

Carefully planned ROV dives to ensure expedition objectives achieved

10+ ships

5+ ROVs

NEPTUNE/VENUS maintenance expeditions

Maintenance Expeditions

Maintenance Expeditions

SeaScribe: Dive Logging

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Cruises

- Cruise Name
- Ship Name
- Duration
- Description

Dives

- Description
- Location
- Duration
- Dive Chief
- Dive Reference ID

Observations

- Comment
- Timestamp
- Logger
- Tag

SeaScribe: Dive Logging

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- Records maintenance, survey, and sampling activities

- Documents scientific observations of seafloor substrate and biology

- Increases searchability and usability of dive video

- Supports derivative applications, such as comparison or training automated classifiers and generation of geodatabase layers
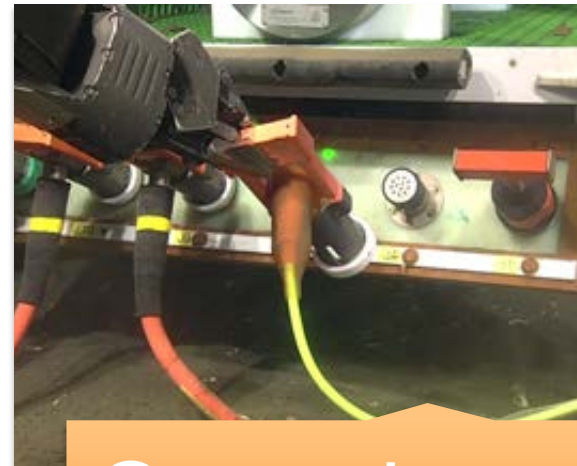
Operations
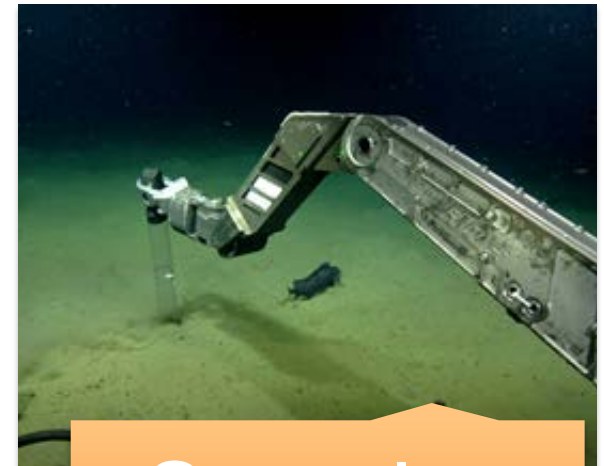
Samples
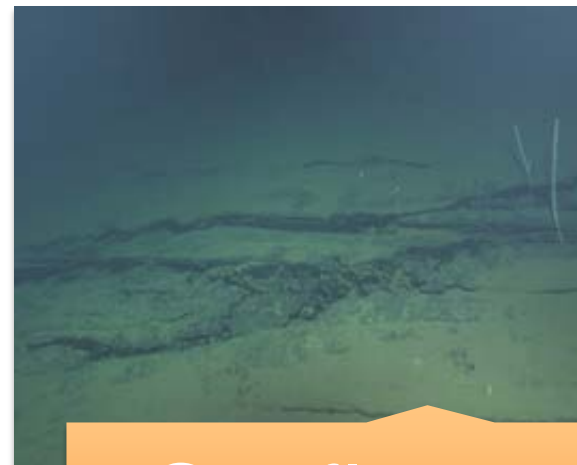
Seafloor
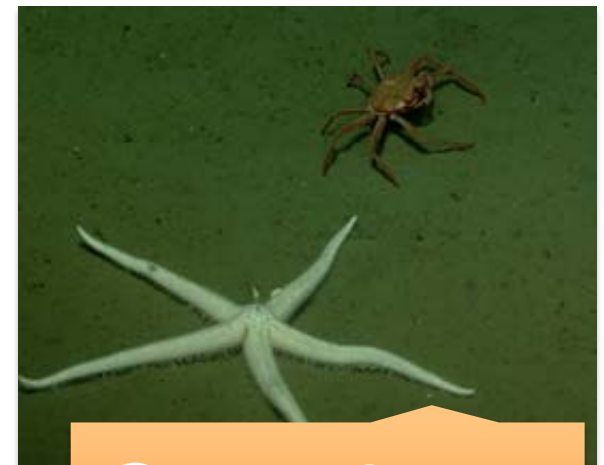
Organisms

SeaScribe: Dive Logging

SeaTube

Telepresence

- SeaScribe dive logging supports up to 10 server instances (including from shore), mutually synced as communications permit
- Ship-based data acquisition that transmits data to shore and automatically integrates into Oceans 2.0
- Video streams shown live on cruise website and recorded for viewing in Oceans 2.0
- Intercom system connected to shore
- Substantial shore support operations
- Remote scientist participation to direct ROV dives
- Teachers on-board and remote classroom participation

Wiring The Abyss

2013 Falkor Expedition available: http://www.oceannetworks.ca/cruise13/

Data Ingestion

Falkor Datasets:

- Shipboard Systems: multibeam sonars, 75 kHz ADCP, flow-through sensors
- ROPOS ROV: video, digital stills, navigation, CTD/O2, physical samples
- Profiling platforms: CTD Rosette, Moving Vessel Profiler
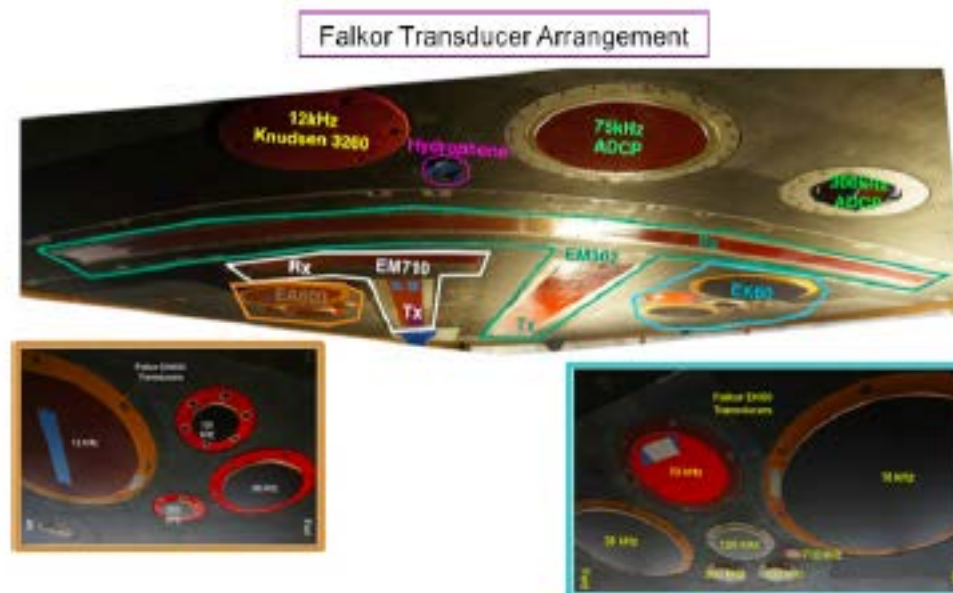
Figure 28: A view of the Falkor Transducers from below the Gondola looking forward.

Data Ingestion

Falkor Cruise 2013: CTD and MVP Planning Map
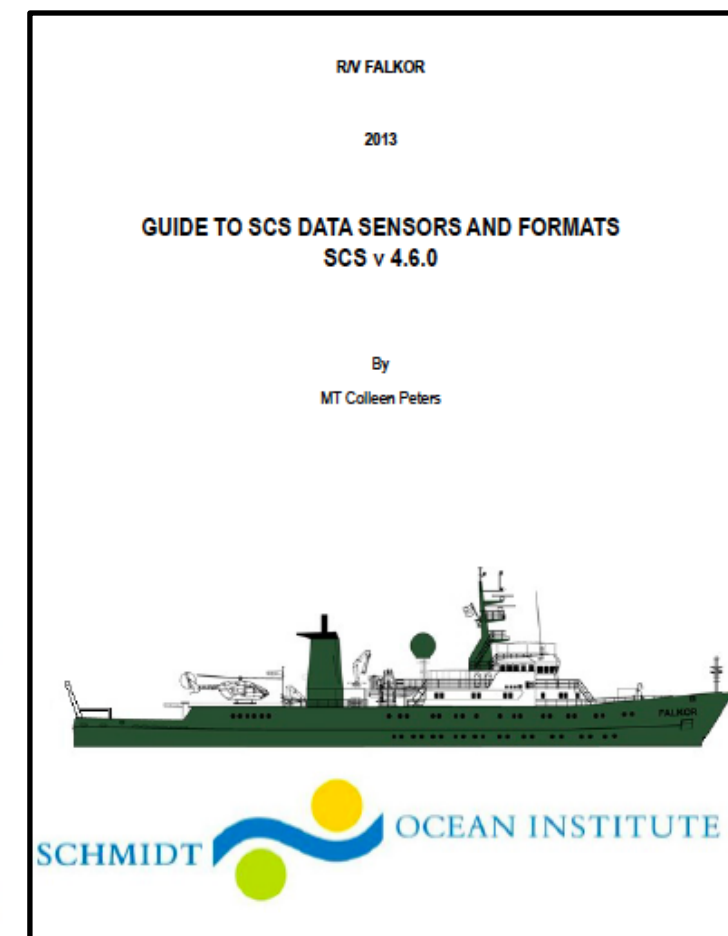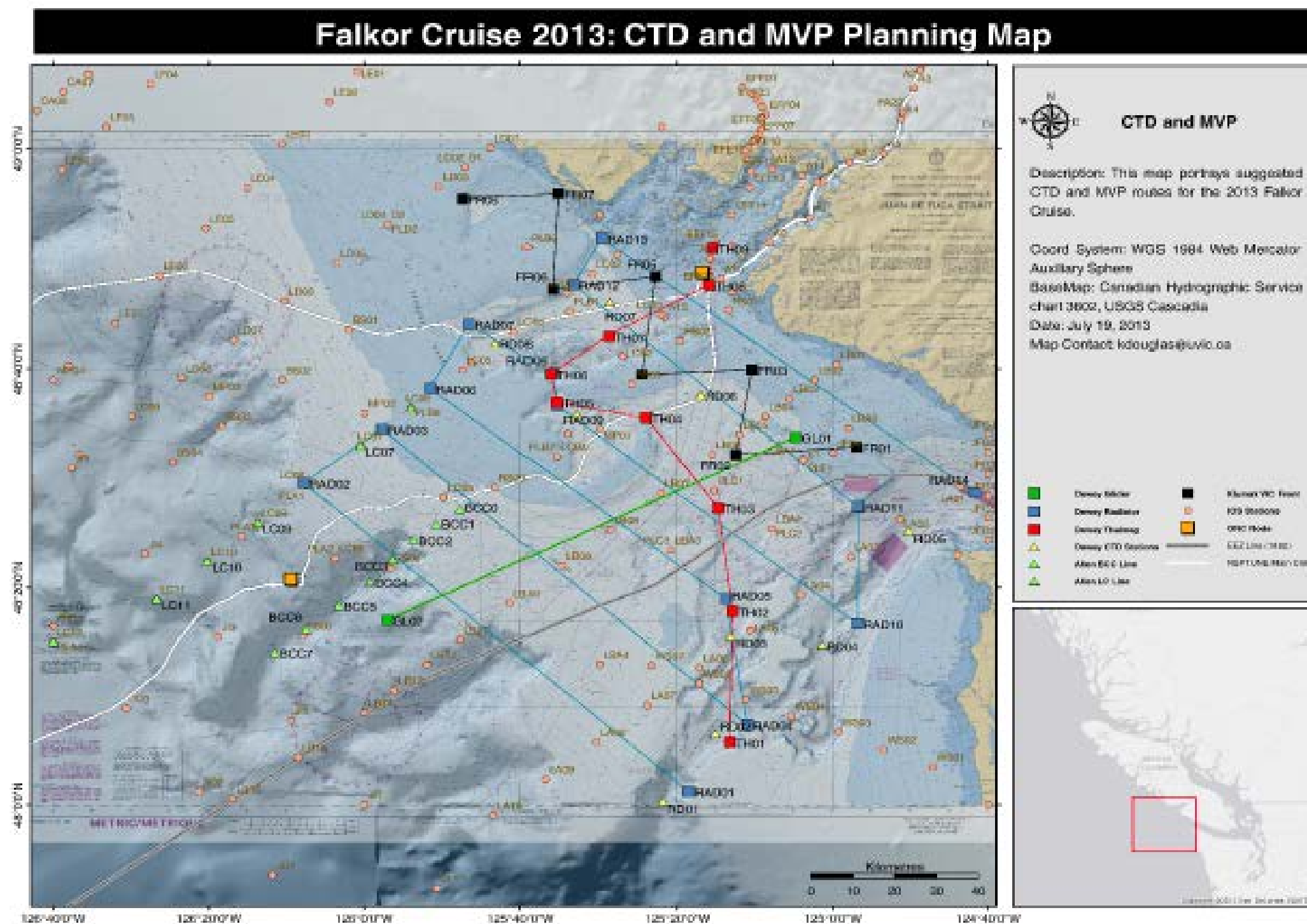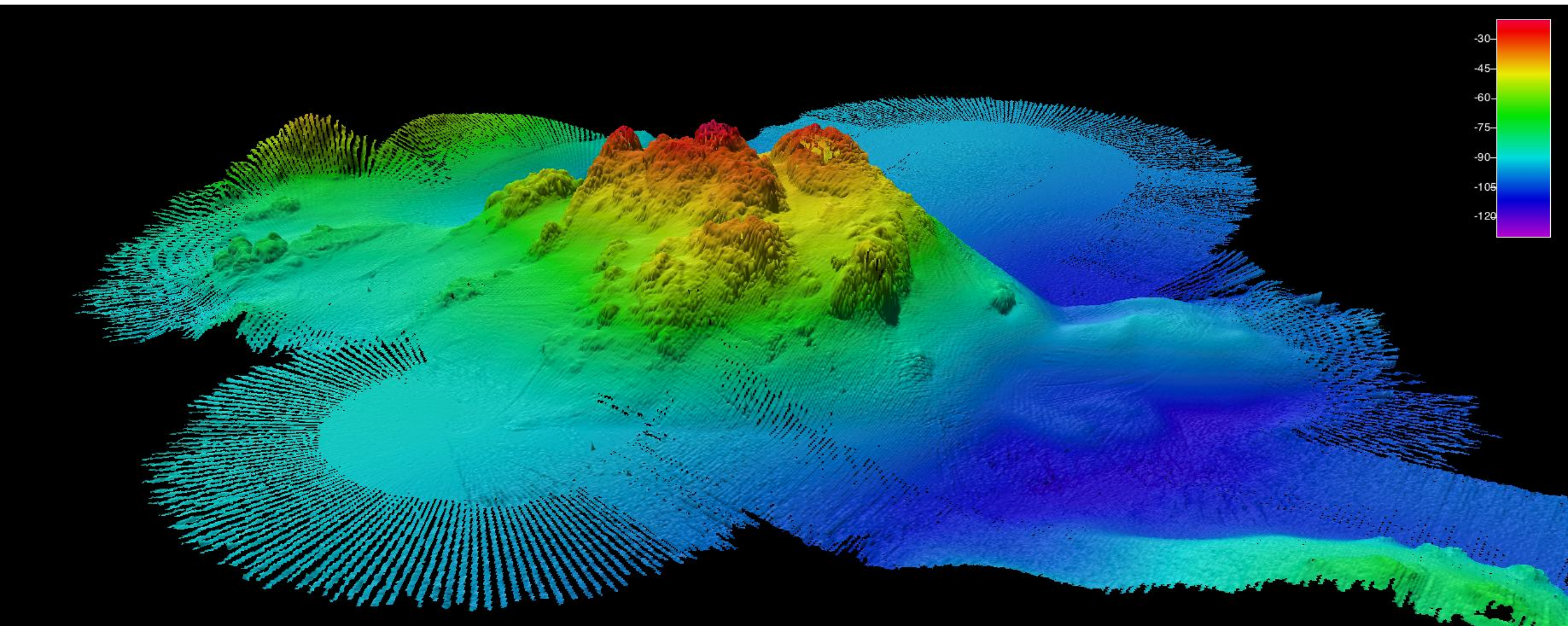
Data Ingestion

Bathymetric data at Folger Pinnacle

Data Ingestion

General Process

- Establish data agreement
- Collect and organize instrument inventory, metadata and documentation
- Review, rename and archive data files – *reliable timestamps critical!*
- Develop parser or other post-processing algorithms for data format
- Setup automated QAQC tests
- Process data files and enable access

```
08/21/2013,01:12:00.135,t1= 16.1393, c1= 4.06533, s= 32.0044, sv=1505.218, t2= 15.6423
08/21/2013,01:12:01.571,t1= 16.1398, c1= 4.06529, s= 32.0036, sv=1505.218, t2= 15.6424
08/21/2013,01:12:01.571,t1= 16.1400, c1= 4.06523, s= 32.0030, sv=1505.217, t2= 15.6425
08/21/2013,01:12:03.213,t1= 16.1397, c1= 4.06523, s= 32.0032, sv=1505.218, t2= 15.6427
```

Since the instrument takes a reading roughly every second, we can maybe assume that the duplicated timestamp should be at 08/21/2013,01:12:**02**. instead of 01:12:01..

Data Stewardship & Sharing

SOI Strategic Focus Area #5: Open Sharing of Information, Data, and Research Outcomes

Schmidt Ocean Institute supports open sharing of information about the ocean to stimulate the growth of its applications and user community, and amplify further exploration, discovery, and deeper understanding of our environment. These efforts are supported through partnerships with data management experts in the oceanographic community to enable standards-compliant sharing of scientific information and data collected during research cruises.

World Data System (WDS)
- Membership based on criteria such as access to high quality data, data stewardship, and participation in broad harmonization and interoperability efforts
- Working groups: Publish Data, Knowledge Network, Certification
- ONC became a member in July 2014

Data Access

EarthCube iSamples RCN

Seeks to advance the use of innovative cyberinfrastructure to connect physical samples and sample collections across the Earth Sciences with digital data infrastructures to revolutionize their utility for science. The ultimate goal of this RCN is to dramatically improve the **discovery, access, sharing, analysis, and curation of physical samples** and the data generated by their study for the benefit of science and society. *PI: Kerstin Lehnert, Lamont-Doherty*

Working Groups

1. Identifiers & Metadata
2. User Stories & Science Requirements
3. Communication, Training & Education
4. Architecture & Workflows
5. Physical Infrastructure, Digitizing, Cataloguing & Sample Rescue

EarthCube iSample Survey Result
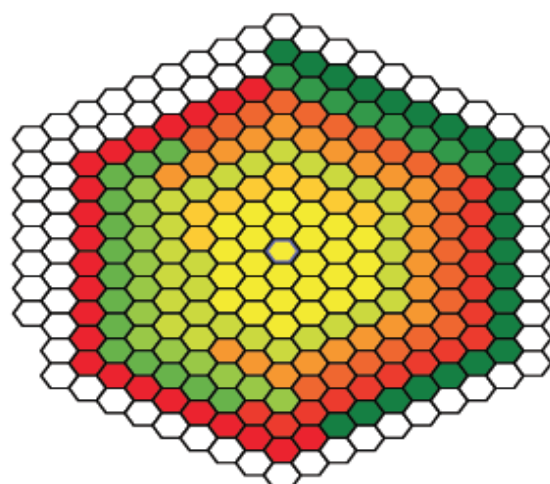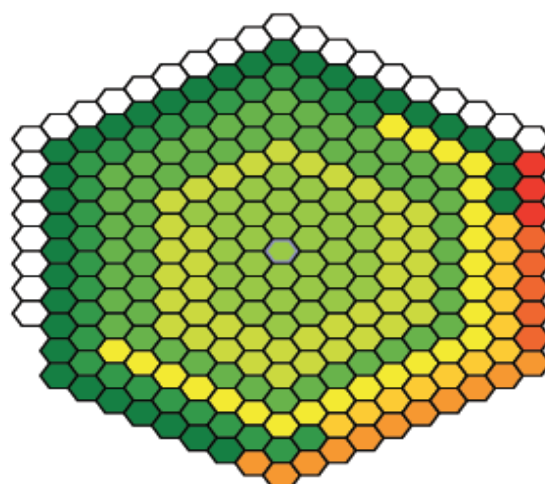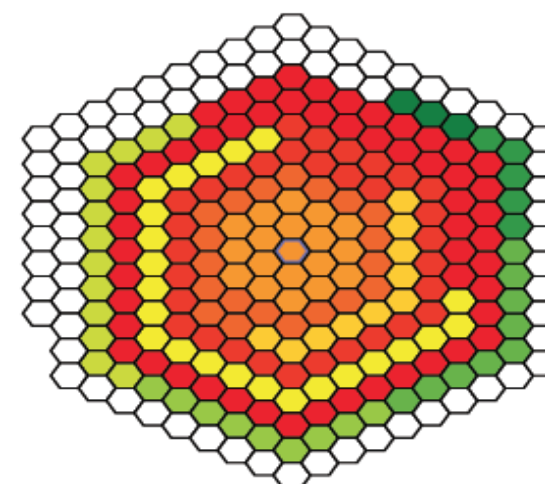
σ: 0.32 x̄: 0.48 n: 268   σ: 0.22 x̄: 0.70 n: 268   σ: 0.28 x̄: 0.29 n: 268

My **employer/organization** values and rewards **sharing physical samples or digital data about physical samples.**	**.48 (.32)**
Colleagues in my field/discipline recognize and value **sharing physical samples or digital data about physical samples.**	**.70 (.22)**
The **tenure and/or promotion process in my organization** recognizes and Values sharing physical samples or digital data about physical samples**.**	**.29 (.28)**

Ongoing Efforts

- Dive logging: guidelines, vocabularies, syntax, interface, training (especially surveys, sampling and substrate)
- Video workflow: streamlined transcodes, repeatable recording process, manipulation features in Oceans 2.0
- Data acquisition: increased use of ship-to-shore acquisition system, better documented data ingestion processes and tools
- Digital stills: better systems for capture, downloading, archiving and distribution
- Rosette: better data model for cast data

Further Info & Current Expeditions

OCEAN NETWORKS CANADA INNOVATION

Email: reyna@uvic.ca
Website: http://www.oceannetworks.ca/
Oceans 2.0: http://dmas.uvic.ca

Find me after for a live demo of any of our tools.

Maintenance Expeditions Underway
Cambridge Bay maintenance with divers
VENUS, NEPTUNE and moorings with E/V Nautilus & Hercules ROV
NEPTUNE with R/V Thompson & Jason ROV starts Sept 2

http://www.oceannetworks.ca/expeditions/2015/august/