

***BREA Project
Regional Assessment of Deep
Water Seabed Geohazards for
Oil Spill Prevention
Canadian Beaufort Sea***

**Steve Blasco
Geological Survey of Canada**



Objectives

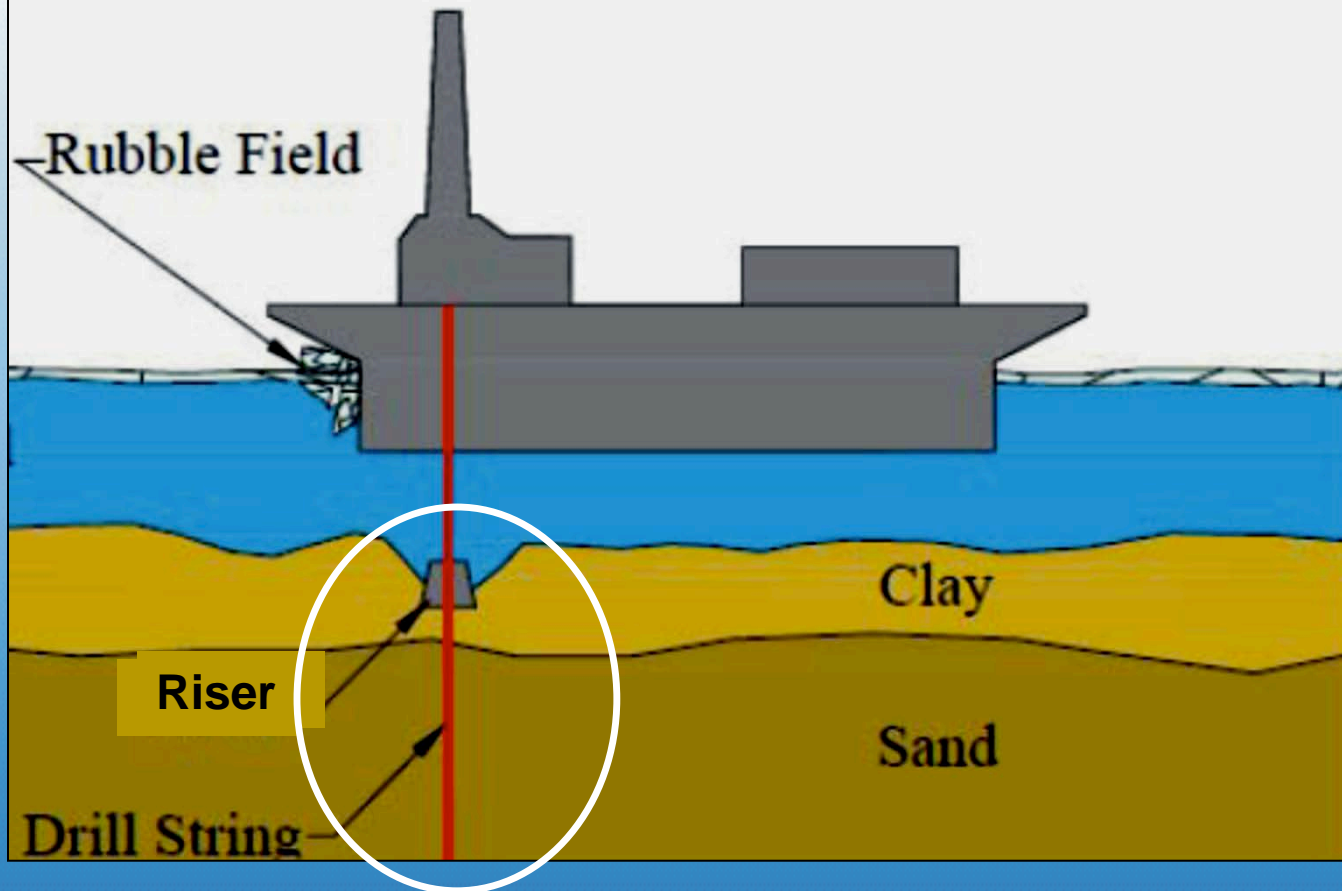
**Provide the Geoscience Knowledge to Feed
The Regional Environmental Impact
Assessment
Deep Water Hydrocarbon Exploration**

**BSTRIPA Recommendations
Feed NEB and Inuvialuit Needs
Feed Other BREA Projects
Feed BSP/IOMP**



Floating Structure

Preventing Oil Spills by Maintaining Well Bore Stability



Oil Spill Prevention Research Canadian Beaufort Sea

3 year Project @ \$354K per Year

**Year 1: 2011-12
Amundsen Data Acquisition**

Oil Spill Prevention Canadian Beaufort Sea 2012/13

- **Amundsen delayed to 2013**
- **Shiptime costs deferred to 2013**
- **Funding: \$140K: continue data acquisition**



Funding 2012/13

- **Processing of multibeam data: \$35K**
- **Processing of Sediment core data: \$45K**
- **Acquisition/processing of multichannel seismic data: \$40K**
- **Aurora College Outreach project: \$20K**

Partnerships

2012/13

| | |
|---|----------|
| • BREA: Data acquisition, processing | \$140K |
| • NRCan: Scientific/technical expertise | \$275K |
| • ESRF :Legacy data Synthesis | \$190K |
| • PERD: Amundsen 2011 Data Analysis | \$210K |
| • IOL/BP: Geophysical, geological data | \$200K |
| • ION GXT Seismic Data | \$500K |
| • Total: | \$1,615K |



Research Team

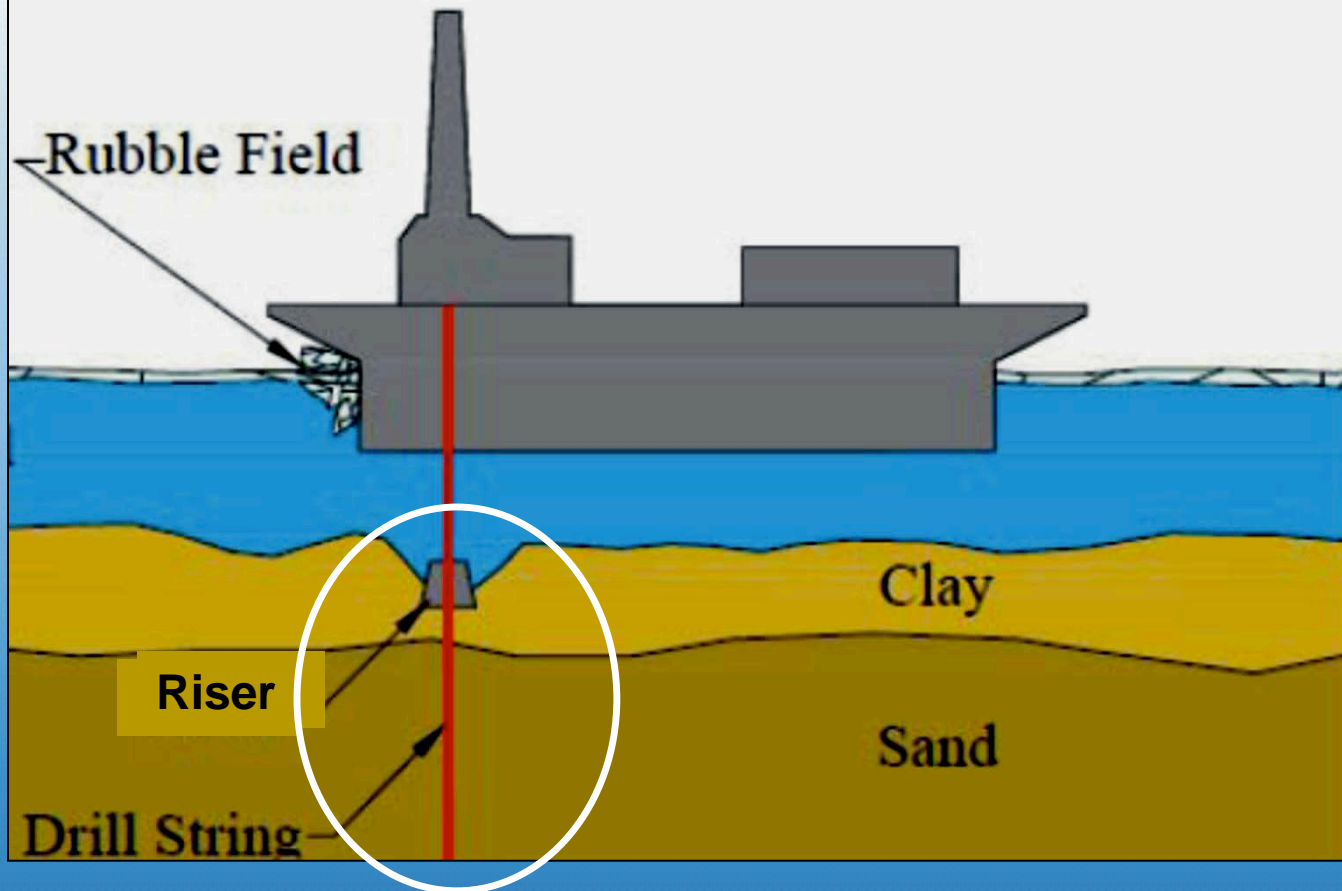
**Geophysics
Geotechnics
Geology
Outreach**

1. Kevin MacKillop: GSC
2. Eric Patton: GSC
3. Kate Jarrett: GSC
4. Jenna Higgins: GSC
5. Barb Szlavko: GSC
6. Scott Dallimore: GSC
7. Joel McAlister: ENRTP
8. John Hughes Clarke: UNB
9. Pim Kuus: UNB
10. Pat Campbell: CSR
11. Erin Carr: CSR
12. Stephen Rankin: CSR
13. Ed Davies: Branta
14. Tom Lakeman: Dalhousie
15. Chantel Nixon: Dalhousie
16. Chris Lynas: Fugro
17. Deanne Duff: Fugro



Floating Structure

What Adversely Affects Well Bore Stability

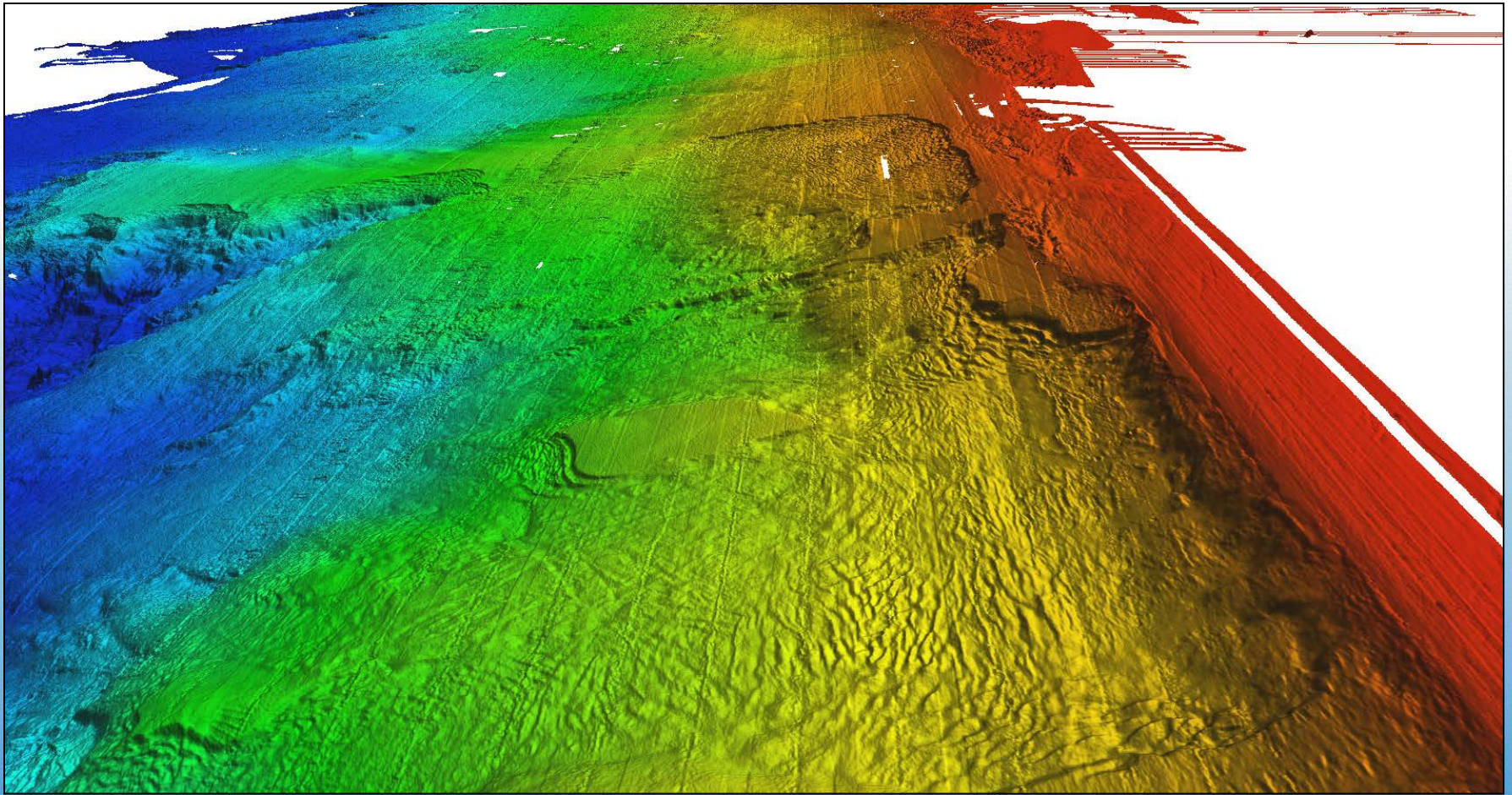


Outer Shelf and Upper slope Seabed Geohazards

1. Submarine landslides
2. Mass transport deposits
3. Low strength sediments
4. Deformation, faults
5. Mud volcanoes, diapirs

6. High sedimentation rates
7. Shallow Gas
8. Overpressure
9. Ice Scouring
10. Eroded sediments
11. Subsea permafrost
12. **Seismicity**
13. **Hydrates**





Multibeam Mosaic Beaufort Outer Shelf and Upper Slope

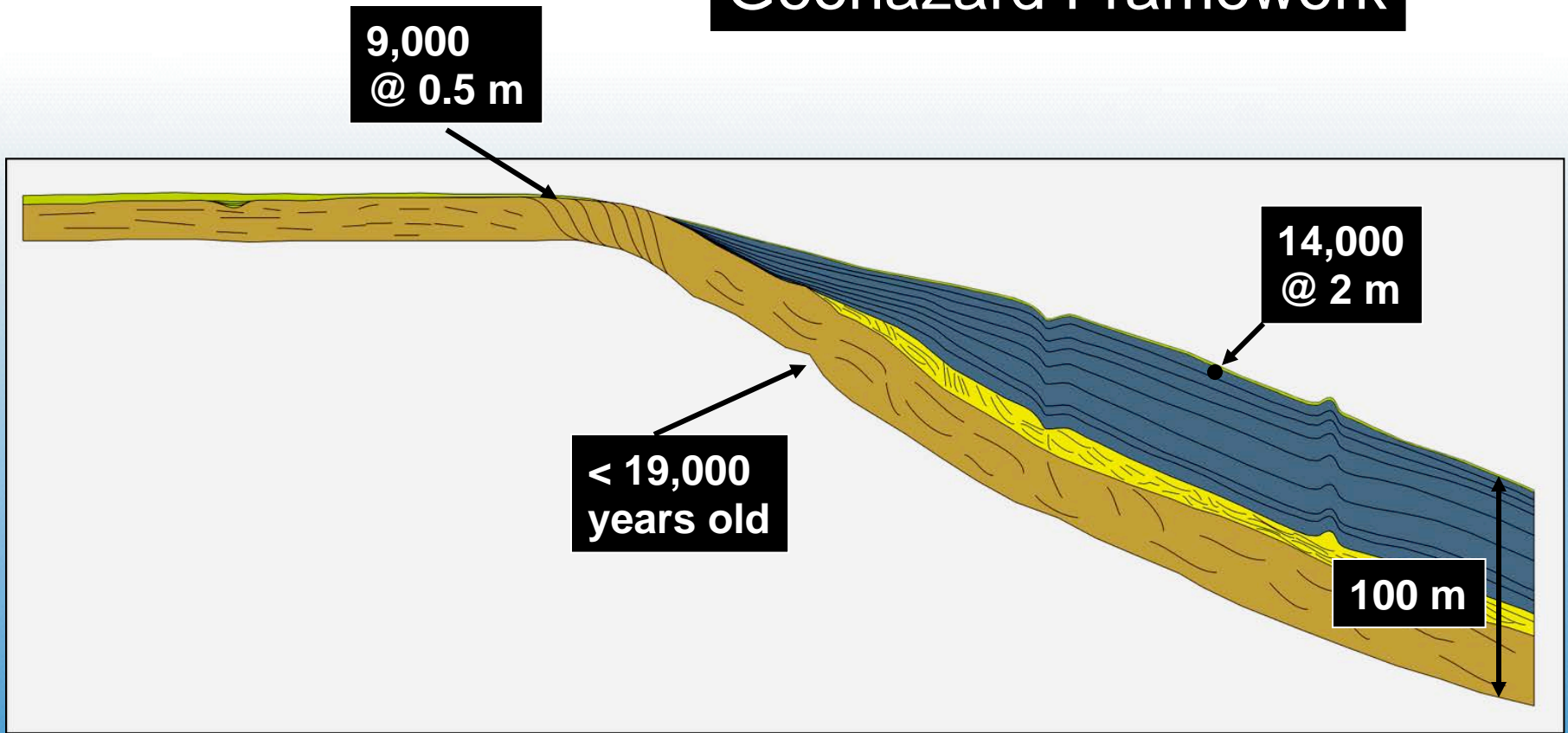


Natural Resources
Canada

Ressources naturelles
Canada

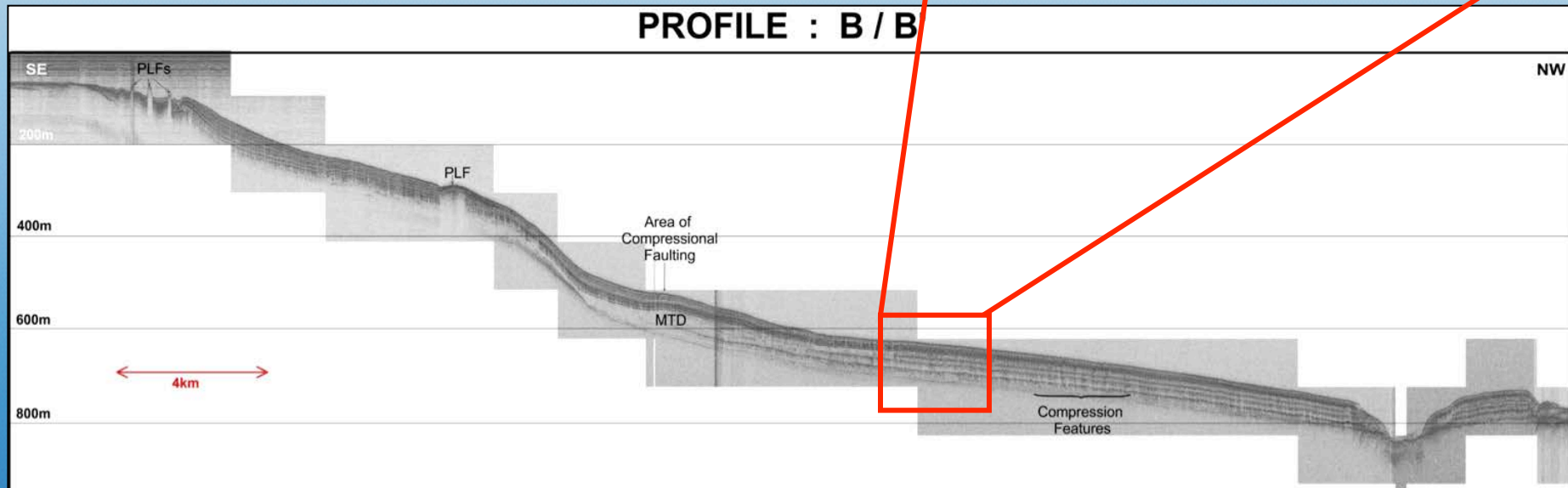
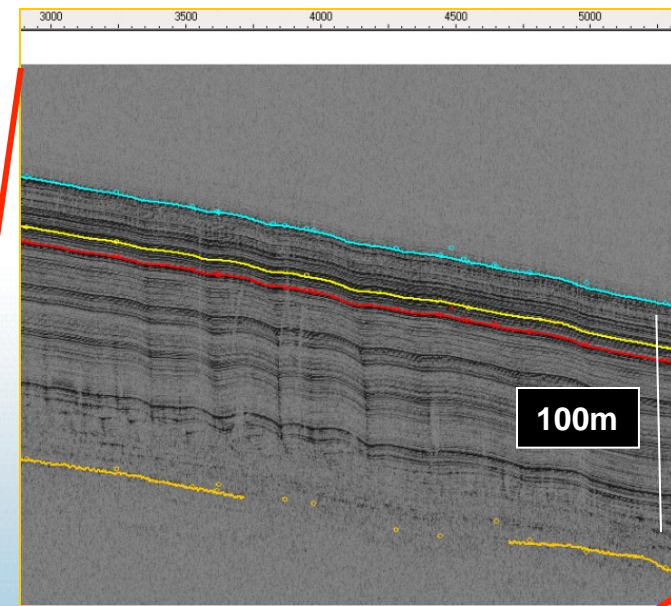
Canada 

Geohazard Framework

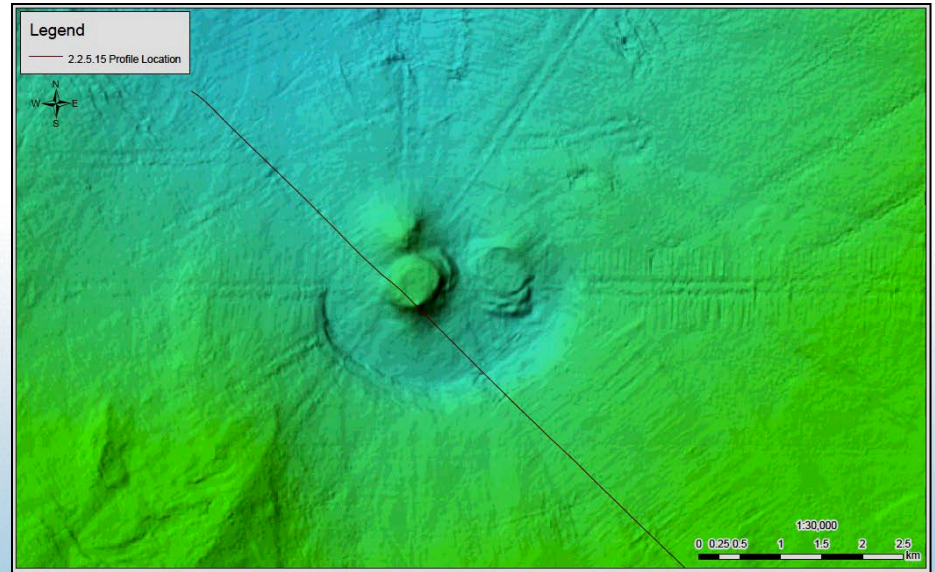


North-South Cross Section Outer Shelf and Upper Slope

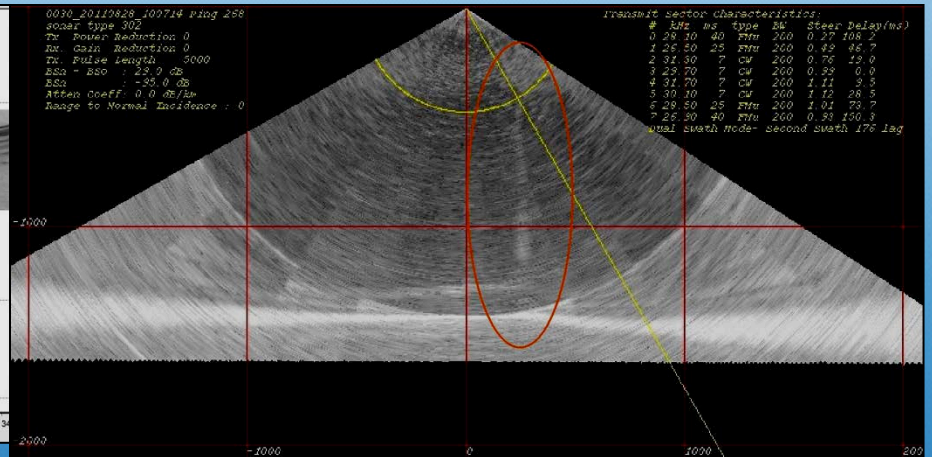
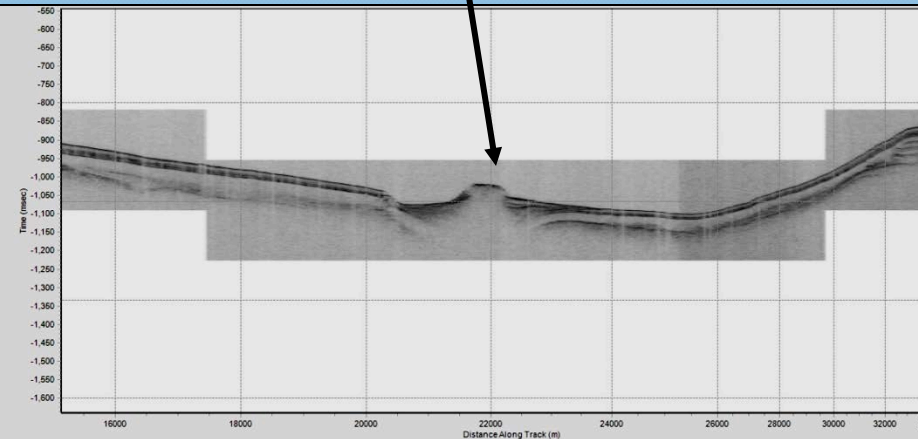
Beaufort Shelf Edge and Upper Slope: Distribution of Low Strength Sediments?

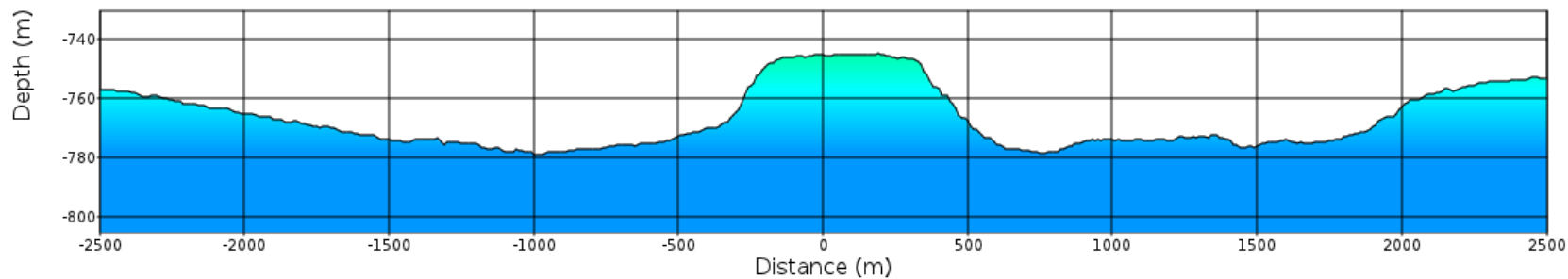
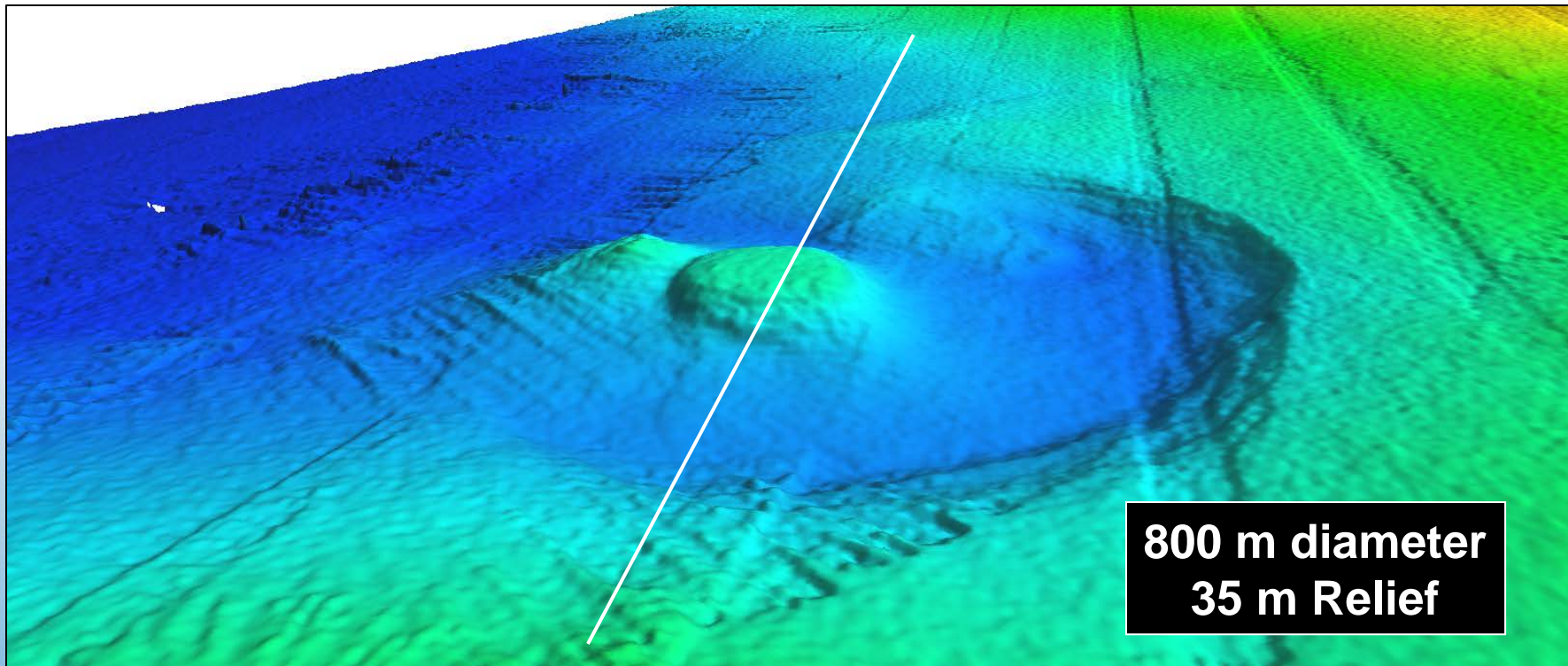


Actively Fluid Expulsion Feature



Venting Gas





Active Fluid Expulsion Feature



KEY Products

**NEB Arctic Drilling Review 2011
State of Knowledge of seabed geohazards**

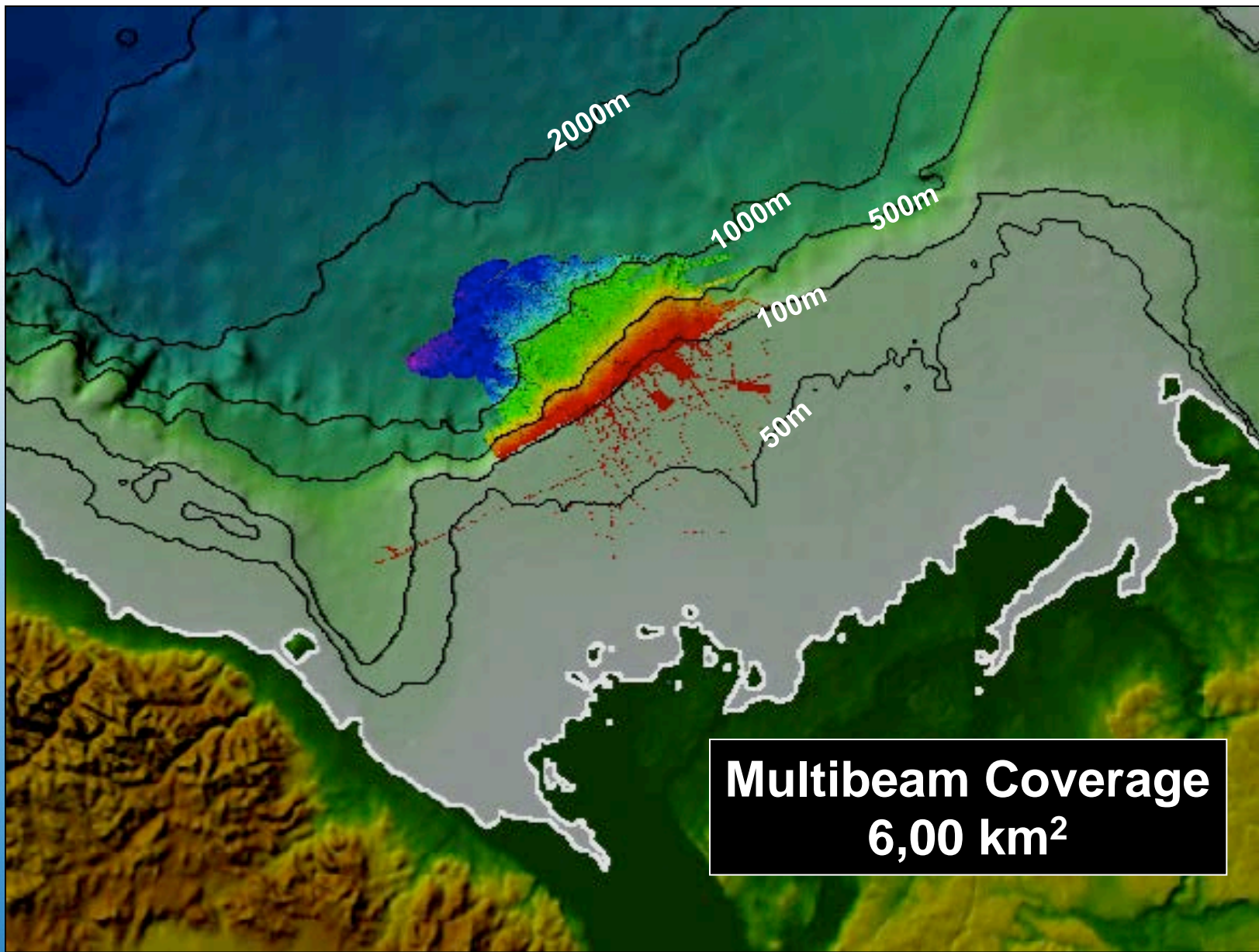
**Update 2014
Deep Water Geohazards**

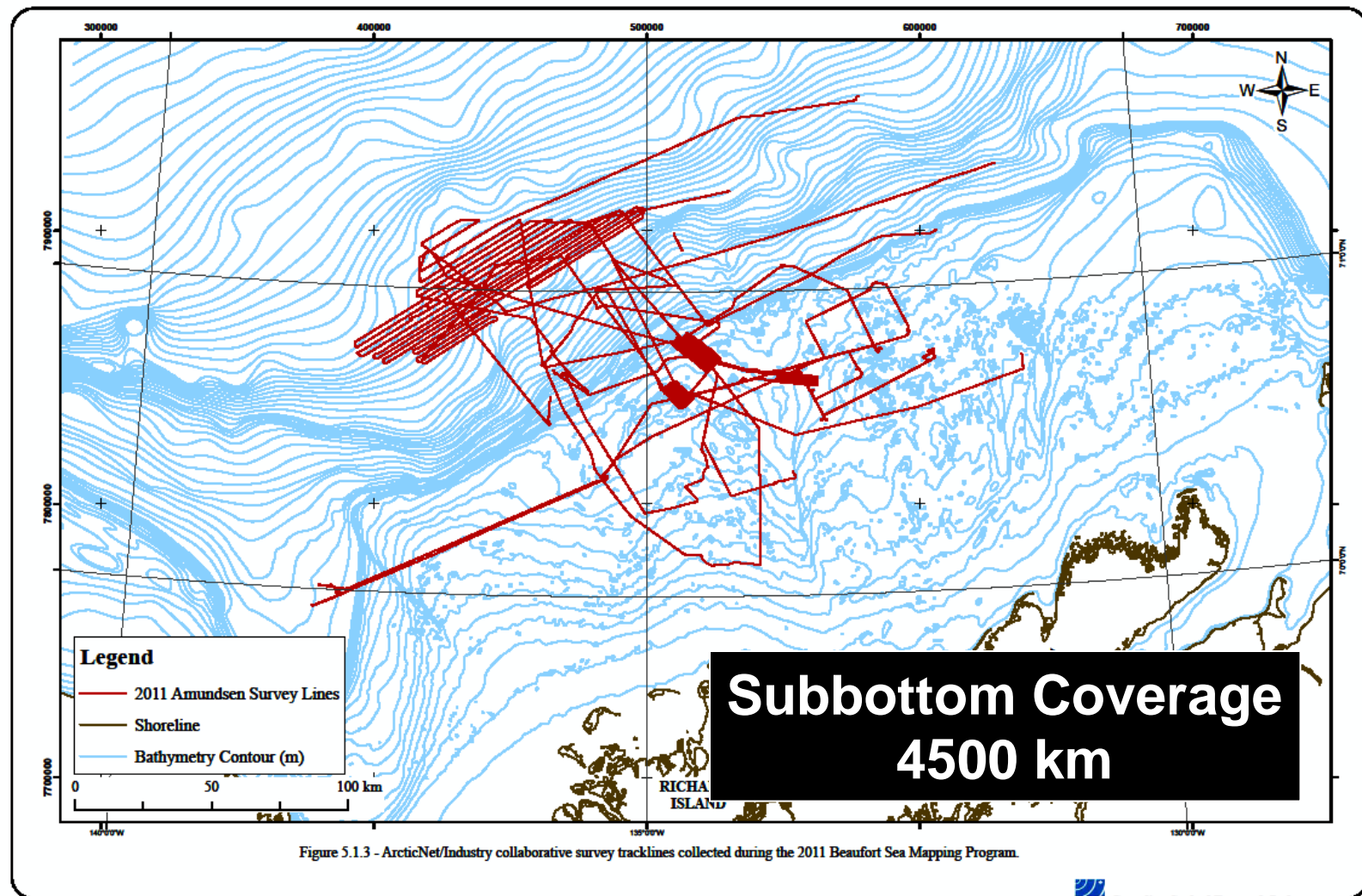
Data Management

- **Polar Data Catalogue: Meta Data**
- **NRCan link to Polar Data Catalogue**

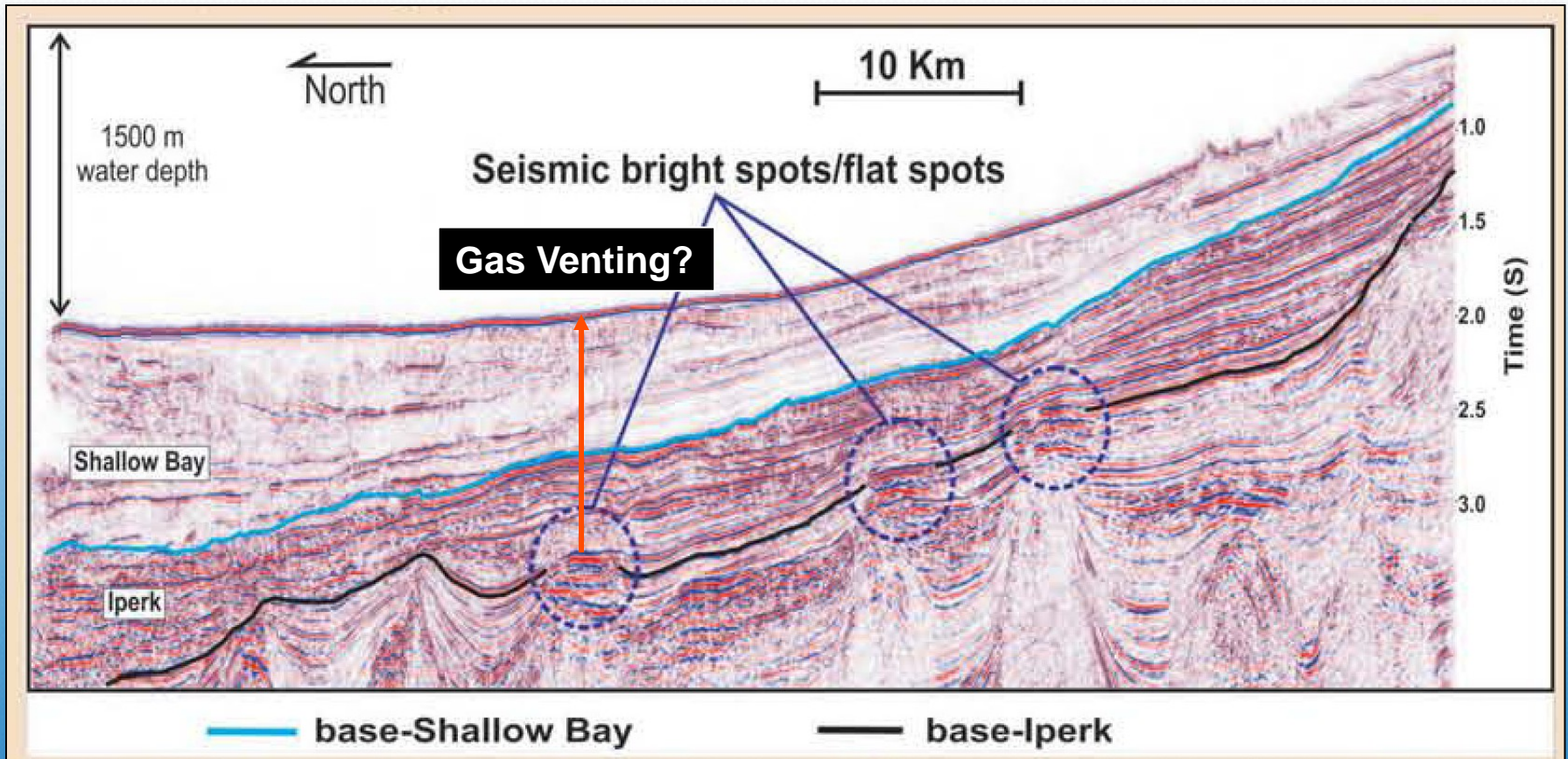
Data

- **Multibeam**
- **Subbottom**
- **Seismic**
- **Sediment cores**



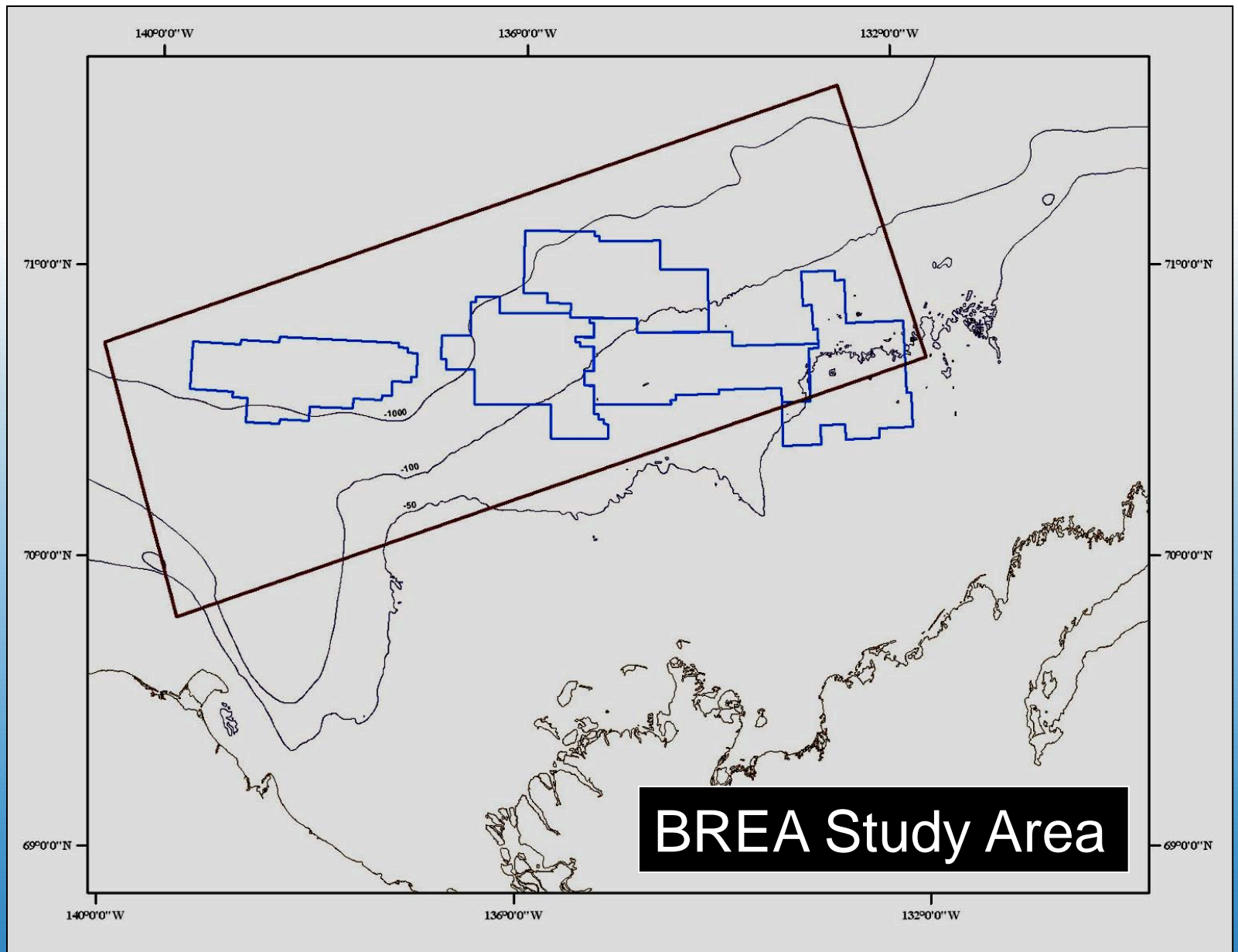


Multichannel Seismic



FGP Seismic Line





2013/14



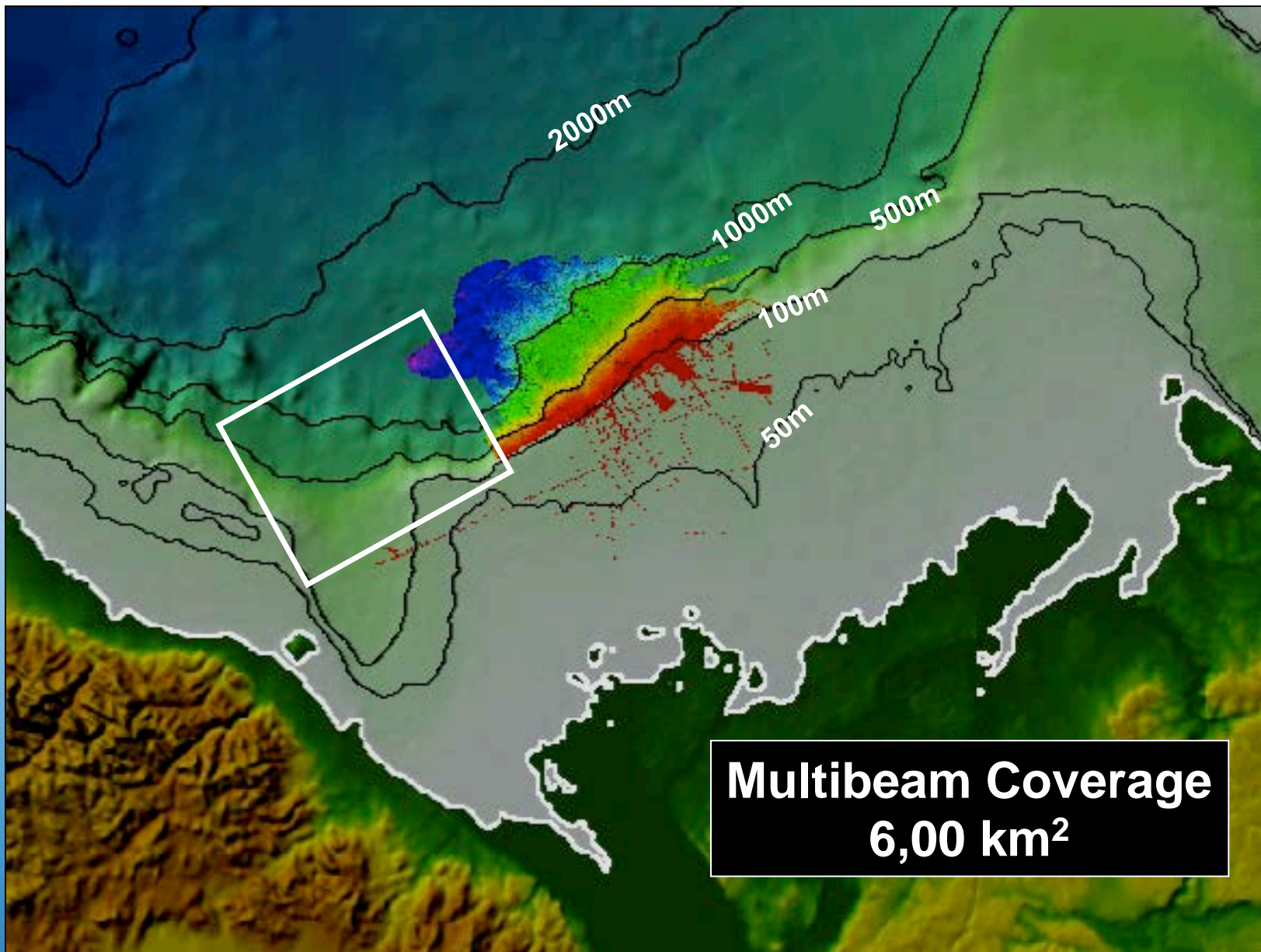
CCGS Amundsen



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