

# Unlocking the Responsible Resource Development Potential of Canada's Seabed

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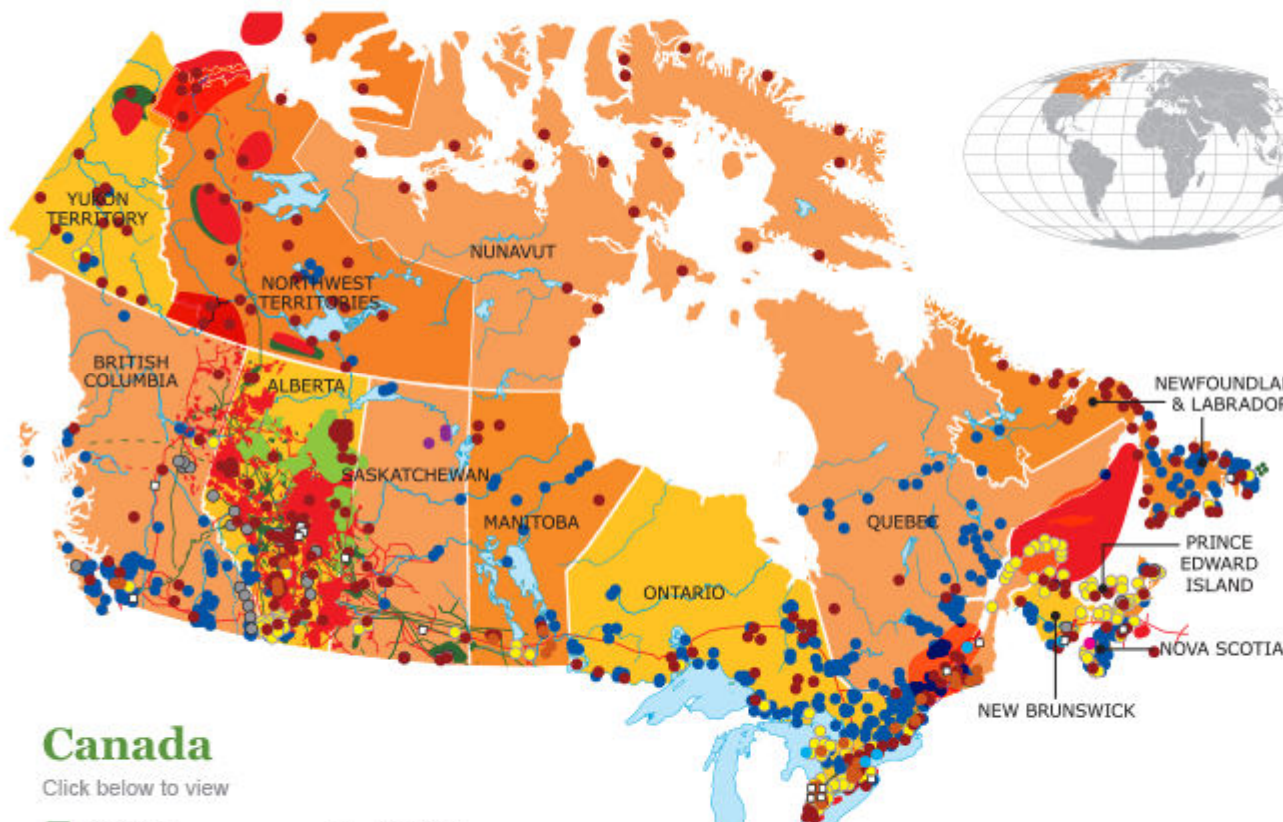
**Canada**

# Presentation Outline

- Importance of natural resources to Canada;
- Role of the Government of Canada in Responsible Resource Development (RRD);
- Relative maturity of the onshore vs. offshore RRD regime;
- GoC's provisional understanding of key gaps in the offshore RRD regime;
- Invitation to comment.

# Importance of Natural Resources to Canada Energy:

Energy Facts & Statistics > Maps: Canada > Canada



## Canada

Click below to view

- CRUDE OIL
- NATURAL GAS
- OIL SANDS
- NATURAL GAS PIPELINE
- CRUDE OIL PIPELINE
- NUCLEAR
- REFINERY
- HYDROELECTRIC PLANT
- COAL MINE
- WIND FARM
- THERMAL ELECTRIC FACILITY
- URANIUM MINES

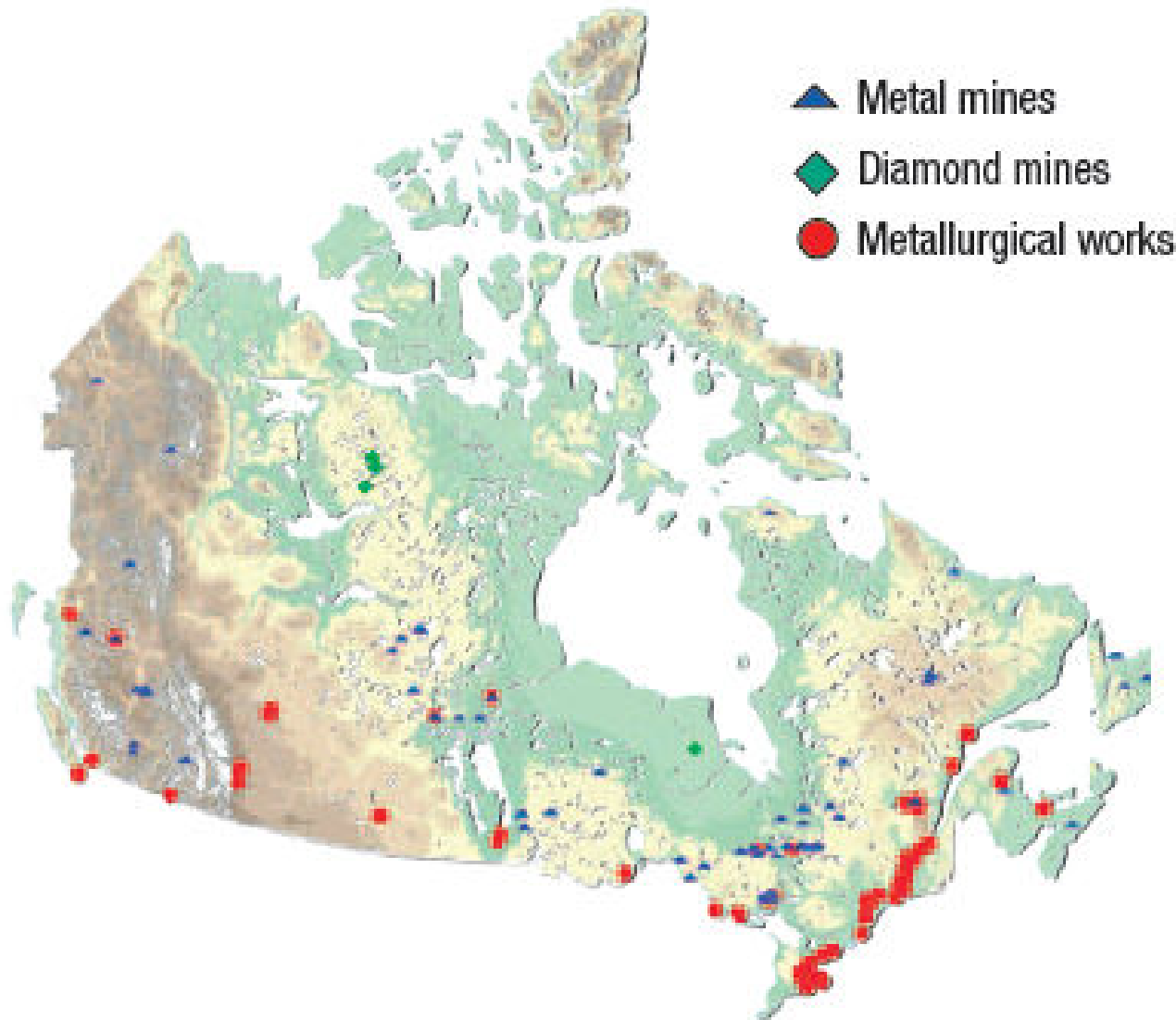
### Canada - World rankings:

- 3rd largest natural gas producer;
- 6th largest crude oil producer;
- 5th largest energy producer'.

### Industry's impact on the Canadian economy:

- Employs 550,00 (direct & indirect);
- Invested \$62BN in Canada in 2011;
- Accounts for 20% of value on Toronto Stock Exchange;
- Paid \$18BN in taxes in 2011.

# Importance of Natural Resources to Canada Minerals & Metals



## The Canadian mining industry contributed:

- \$52.6BN to Canada's GDP in 2012;
- \$71 BN in taxes and royalties over the last decade (2003-2012);
- 20.4% of the value of Canadian exports in 2012;
- \$47 BN in mineral production in 2012.

## A major employer:

- More than 418,000 jobs in Canada work – highest average salary of any sector;
- Largest private sector employer of Aborigines;
- Canada has one of the largest mining supply sectors globally with more than 3,200 companies supplying engineering, geotechnical, environmental, financial and other services to mining operations.

# The Role of the GoC in Responsible Resource Development (RRD)

## **Establish conditions to support private-sector investments:**

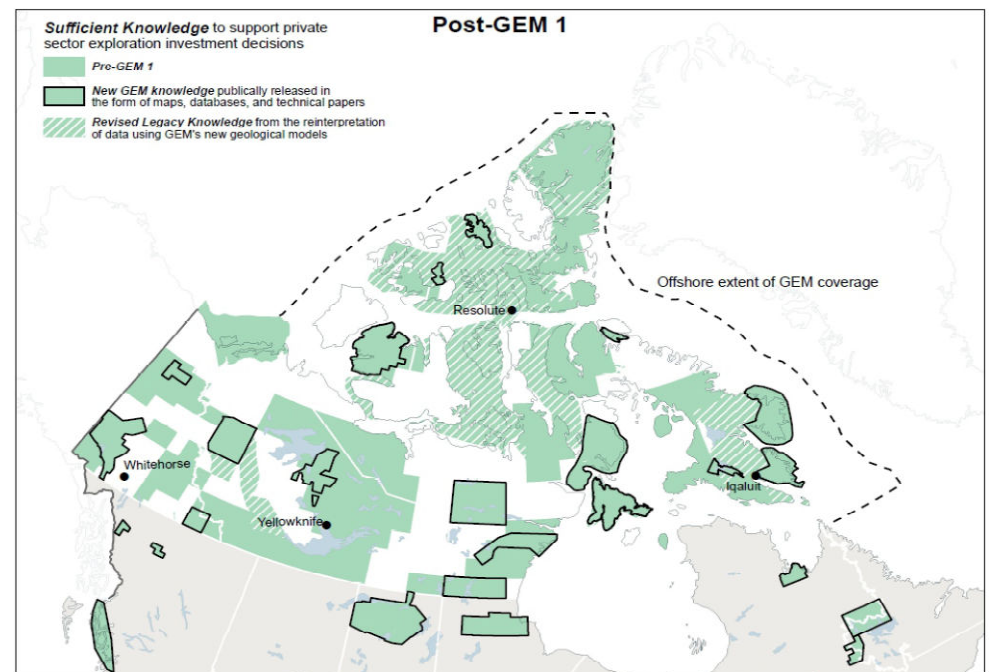
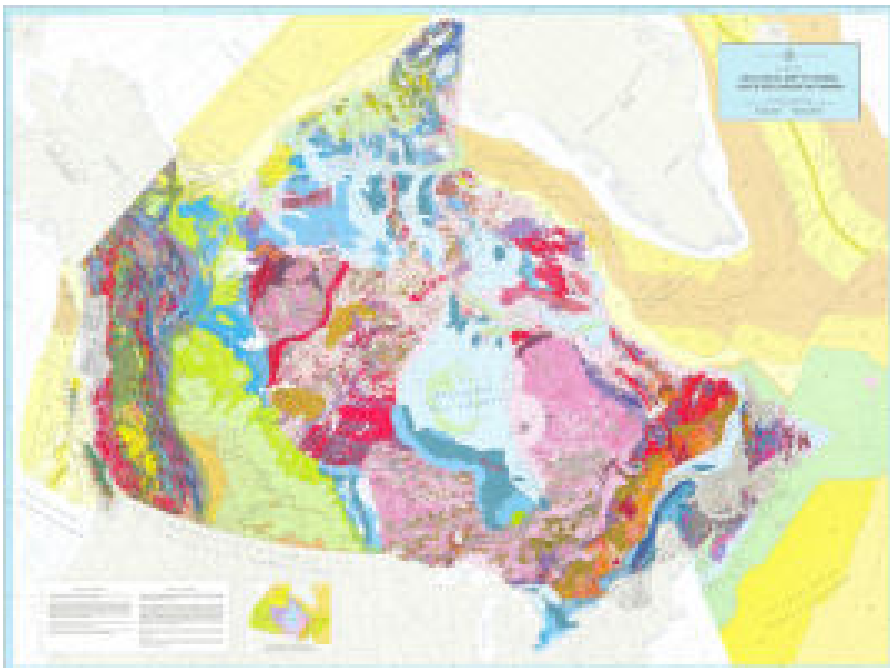
- Provision of framework landmass knowledge;
- Developing & upholding secure property rights regimes;
- Streamlined regulatory regime – eliminate duplication & provide predictable processes & timelines.

## **Strengthen environmental protection:**

- Increase enforcement;
- Increase penalties;

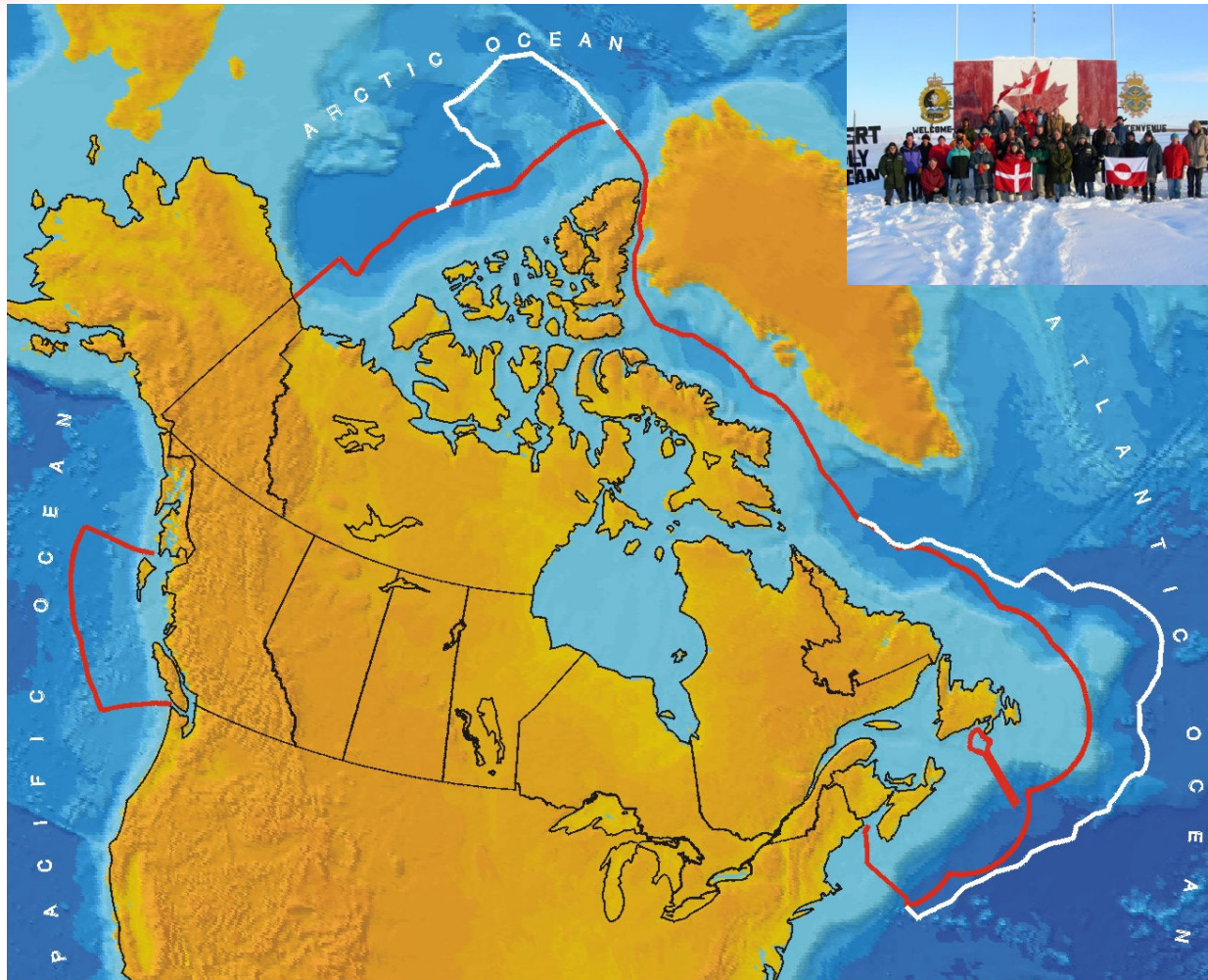
# Relative maturity of onshore vs offshore RRD regimes - *onshore*

- Topographic mapping of Canada complete;
- Geological mapping at scales to support private sector investment in natural resource development complete south of 60°N & on-track for completion in the North by 2020;
- Land Tenure &, Land Title Acts and Registries in-place;

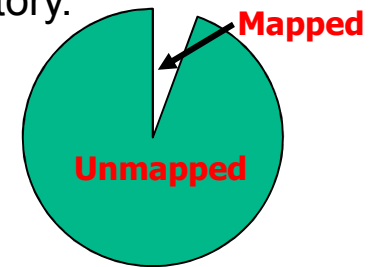




# Relative maturity of onshore vs offshore RRD regimes - offshore



GoC has a long-standing leadership role in ocean mapping & surveying, with partners from all sectors of the economy..... however, much remains to be done to complete mapping in Canada;s 9.8M km<sup>2</sup> of ocean territory.

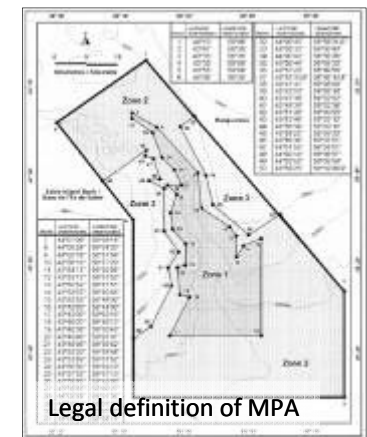
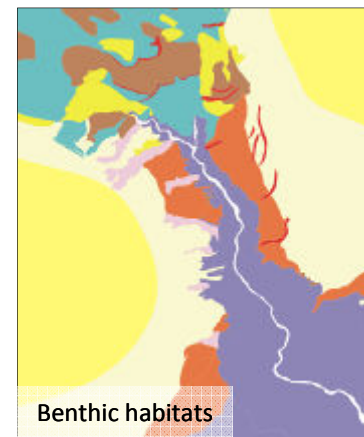
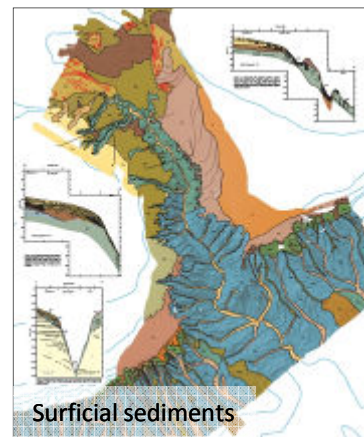
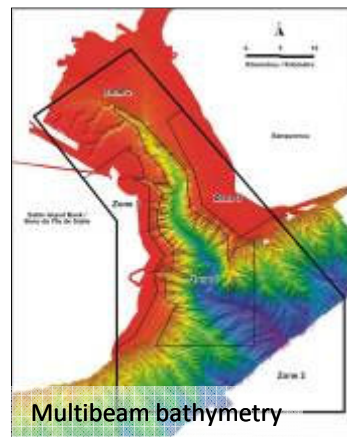
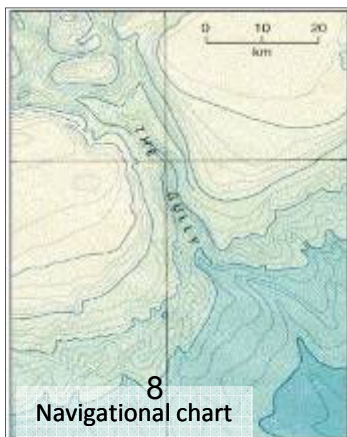


\*With internal waterways, EEZs, contiguous zones, continental margin and territorial waters (Crickard and Haydon 1994).

# Relative maturity of onshore vs offshore RRD regimes - offshore

Products	Estimated Progress	Roles
Navigational charts	60%	CHS (DFO)
Multibeam mapping	<10%	CHS/NRCan (GSC)
Geological maps (1:50 000 scale)	<5%	NRCan (GSC)
Benthic habitat maps	<1%	DFO/NRCan
Marine Cadastre & Legal Surveys	Cadastre not in place, but some legal surveys associated with protected areas	NRCan (SGB) & 20 OGDs with offshore administration mandates

- In 2013, offshore oil and gas development accounted for just 6.6% of the total oil and gas produced in Canada. No offshore mineral development.

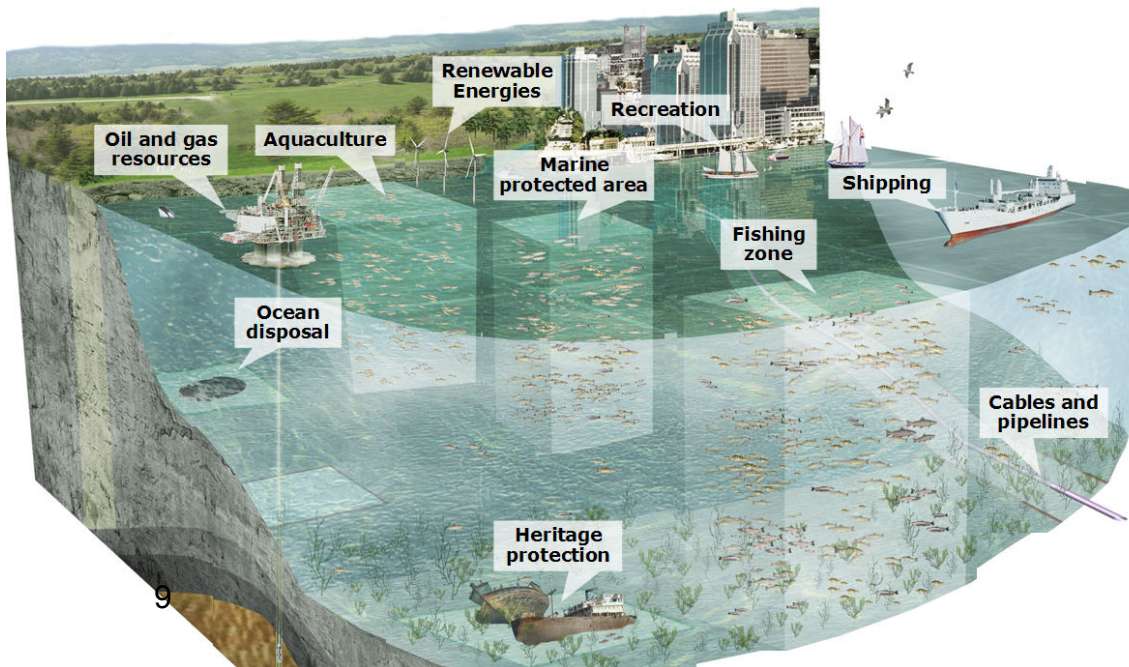




# The Potential Impacts of Ocean Mapping

## Mapping Canada's seabed will provide:

- An important spatial planning tool for all coastal and offshore activities;
- A baseline for streamlined environmental assessments;
- Input for a predictable and streamlined regulatory and EA process for major offshore project;
- Input for resource management and disaster



## ENERGY and MINERALS

- Oil and gas, gas hydrates, renewable energy (tidal, wave, ocean thermal, offshore wind, biomass), nodules, polymetallic sulphides, placer deposits, chromium, gold, sand and gravel extraction.

## SECURITY and SAFETY

- Sovereignty, navigation safety, hazards to offshore development.

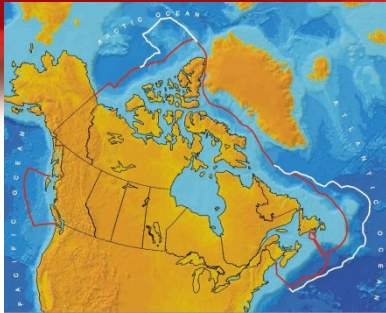
## ENVIRONMENT

- Biodiversity, marine protected areas, carbon sequestration, climate and coastal change.

## INFRASTRUCTURE

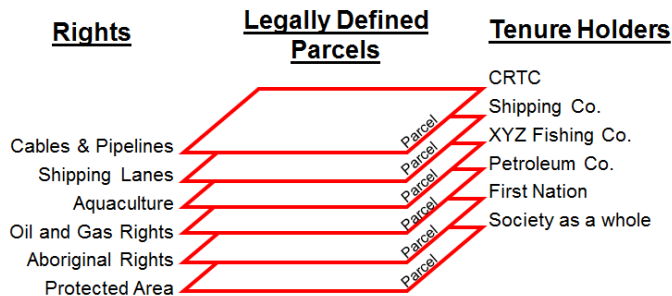
- Underwater communication and power cables, pipelines, coastal infrastructure

# Key Gaps in the RRD Regime



9.9 million km<sup>2</sup> of submerged landmass;  
 <10% is known to modern standards

- Conditions on and under Canada's vast submerged landmass are largely unknown.



- Absence of an integrated system for recording legal interests, restrictions, and responsibilities related to ocean space.

**UNCLOS:** 1 terabyte/year; secure, but not open or accessible <sup>3</sup>

**TOMS:** >5 terabytes/year; secure, open & accessible

- Economic value could be generated from an enormous flow of location-based offshore data.

***"[A] key challenge is to provide comprehensive mapping of geological conditions in Canada's vast coastal and marine areas, in particular in the Arctic. Wide-ranging coverage of geological, bathymetric, and hydrographic mapping of Canada's three ocean basins is essential to address the research questions in this theme, along with many of the other questions."***  
 Canadian Council of Academies Report 2013

# The Path Forward

NRCan and DFO are undertaking a comprehensive evaluation of:

- The approaches & technologies best suited to filling these knowledge gaps;
- The information management & dissemination practices that would be meaningful for key users;
- The regions and issues for near-term focus;
- The Partners who are willing to contribute;

As stakeholders in Canada's ocean environment your opinions matter, we invite you to email your thoughts on these topics to:

***[TOMS@NRCAN-RNCAN.GC.CA](mailto:TOMS@NRCAN-RNCAN.GC.CA)***



***Thank you!***



## ANNEX – Challenges for Canadian Ocean Science

- The state of human capacity in ocean science cannot be adequately assessed because of data limitations.
- Canada has a substantial but aging research fleet.
- Canada has several world-class systems for ocean observation and monitoring; however, challenges exist in achieving geographical coverage (e.g. Arctic) and integration of data management.
- Although funding for ocean science in Canadian universities is increasing, trends in total funding are unclear (no gov't data).
- Canada ranks among the top countries in output and impact of ocean science papers, but ocean science is losing ground relative to other fields faster in Canada than in other countries