

# Commercial Marine Shipping in Canada: Understanding the Risks

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North Shore Waterfront Liaison Committee  
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Clear Seas

CENTRE FOR RESPONSIBLE MARINE SHIPPING



# Outcomes:

- A Better Understanding of the Risk Perception of Marine Shipping in Canada
- *Regional Impact on Frequency and Trends of Commercial Marine Shipping Accidents in Canada*
- *The Potential of Marine Shipping Data as an additional Safety Layer*

# Overview:

- Clear Seas - Who we are / How we work
- Angus Reid Institute Poll
- CCA Consensus Report:  
*“Commercial Marine Shipping Accidents:  
Understanding the Risks in Canada”*
- Marine Data Workshop:  
*“Better Decision Making through  
Maritime Traffic Monitoring & Modelling”*

# Clear Seas: Who We Are

- Independent, not-for-profit organization based in Vancouver with national mandate to promote safe and sustainable shipping
- Provide impartial, evidence-based research and information related to all aspects of safe and sustainable shipping operations in Canadian waters
- Facilitate dialogue, share best practices, recommend policy alternatives, advocate for safe and sustainable marine shipping

# Engage

- Coastal Communities
- Indigenous Groups
- Government Agencies
- NGO's
- Shipping Industry
- Academia

# Research

- Independent
- Transparent
- Risks & Benefits
- Best Practices
- Prevention
- Preparedness
- Response

# Advocate

- Improved Policies
- Safe Marine Shipping
- Sustainable Marine Shipping
- Best-in-Class Safety Regime

# Our History

- Established in 2014 after consultation with coastal communities, Aboriginal groups, marine shipping sector, port authorities, NGOs, and other stakeholders
- Created to meet demand for independent voice about safe and sustainable marine shipping operations in Canada
- Mandate is to provide unbiased **research**, **advocate** for world-leading best practices, and **engage** with communities and stakeholders affected by marine shipping

# Angus Reid / Clear Seas Poll

- Purpose: establish a benchmark of Canadians' attitudes concerning marine shipping
- Conducted mid-March with 2,300 Canadians
- Full poll results found at [clearseas.org](https://clearseas.org)

# Poll: Key Findings

- Majority of Canadians (86%) described their overall view of the **marine shipping industry as “positive”**
- Most Canadians have **confidence in existing oversight mechanisms** to ensure industry safety (but have concerns that **not enough attention** is paid to them)
- Canadians’ **top three concerns**: potential oil spills (67%), potential fuel spills (61%) and water pollution (59%)

Vast majority of Canadians (75%) believe **marine shipping makes an important contribution to the economy**, facilitates international trade and benefits coastal communities

Q. How important is the shipping industry for:

THE CANADIAN ECONOMY



CANADA'S ABILITY TO EXPORT



CANADA'S ACCESS TO GOODS

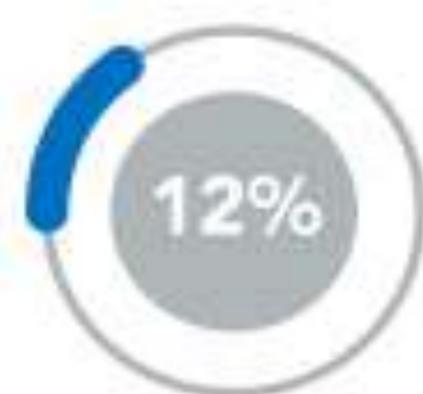


COASTAL COMMUNITIES



Majority of Canadians (64%) are confident  
in the **regulations covering marine shipping in Canada**

Q. How confident are you in the safety rules and regulations covering marine shipping in Canadian waters today?



12%



- VERY CONFIDENT



53%



- FAIRLY CONFIDENT



23%



- NOT THAT CONFIDENT



5%



- NOT CONFIDENT AT ALL



6%

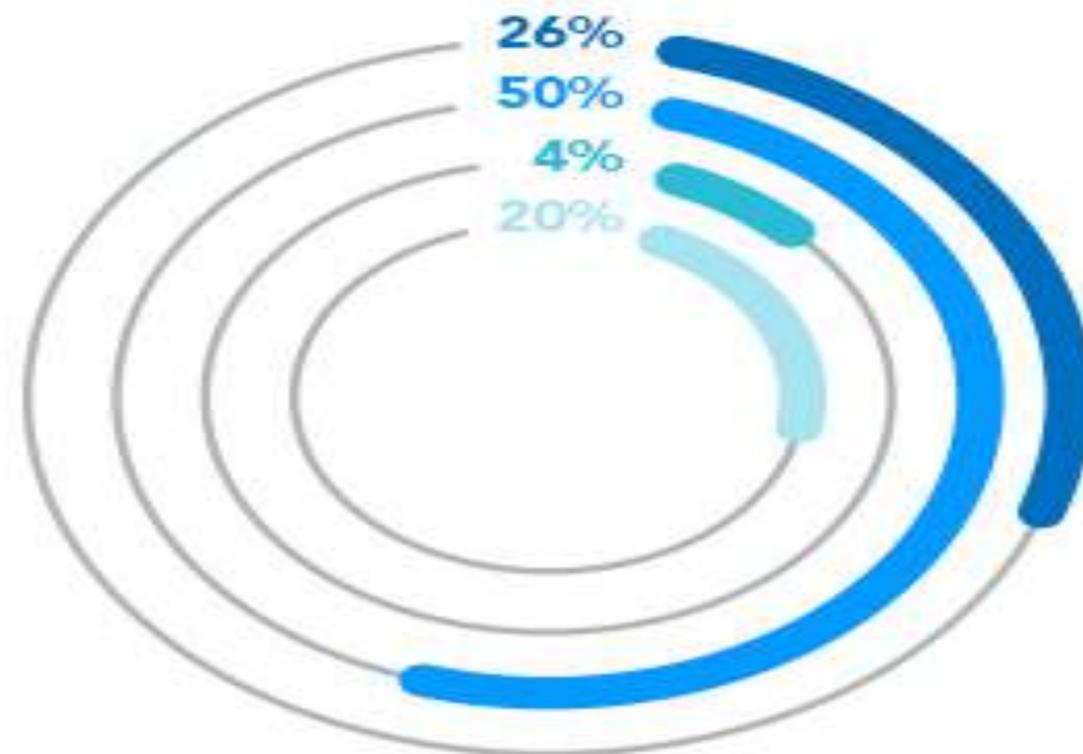


- REALLY CAN'T SAY

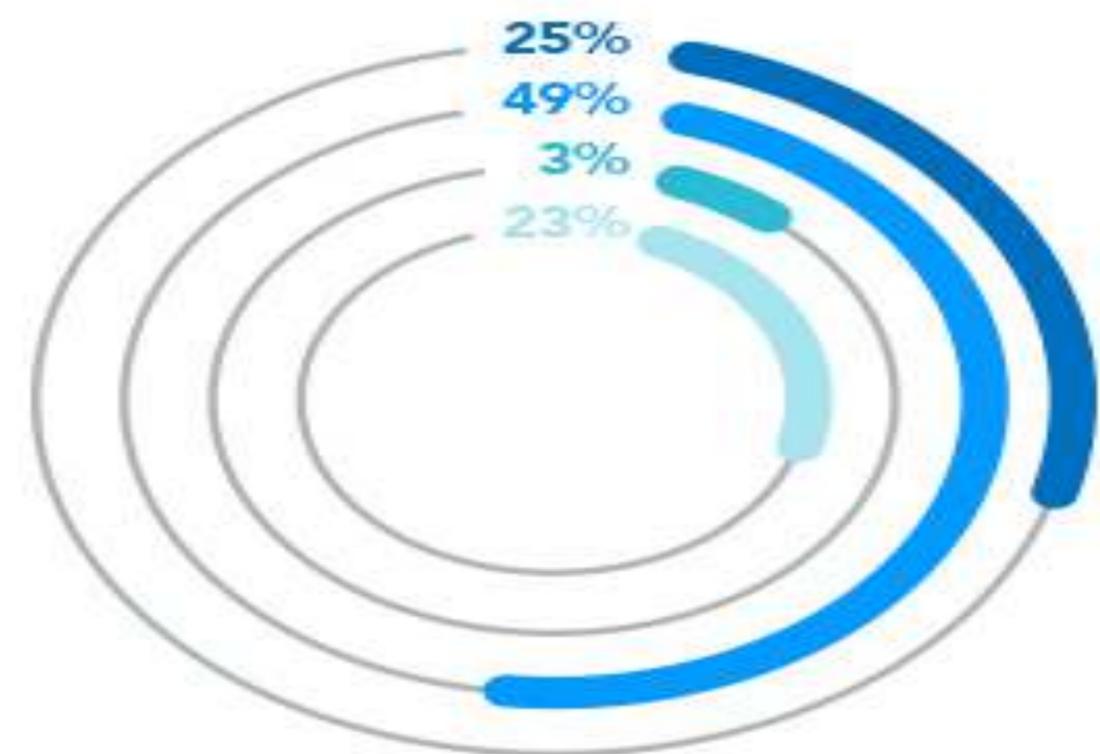
Most Canadians have **confidence in existing oversight mechanisms** to ensure industry safety (but have concerns that not enough attention is paid to them)

Q. Do you think marine shipping safety receives the appropriate amount of:

**ATTENTION ON SAFETY  
POLICIES AND PROCEDURES**



**OVERSIGHT AND  
ENFORCEMENT OF POLICIES**



— Yes, appropriate amount

— No, not enough attention

— No, too much attention

— Really can't say

# Key Research Projects

## Council of Canadian Academies

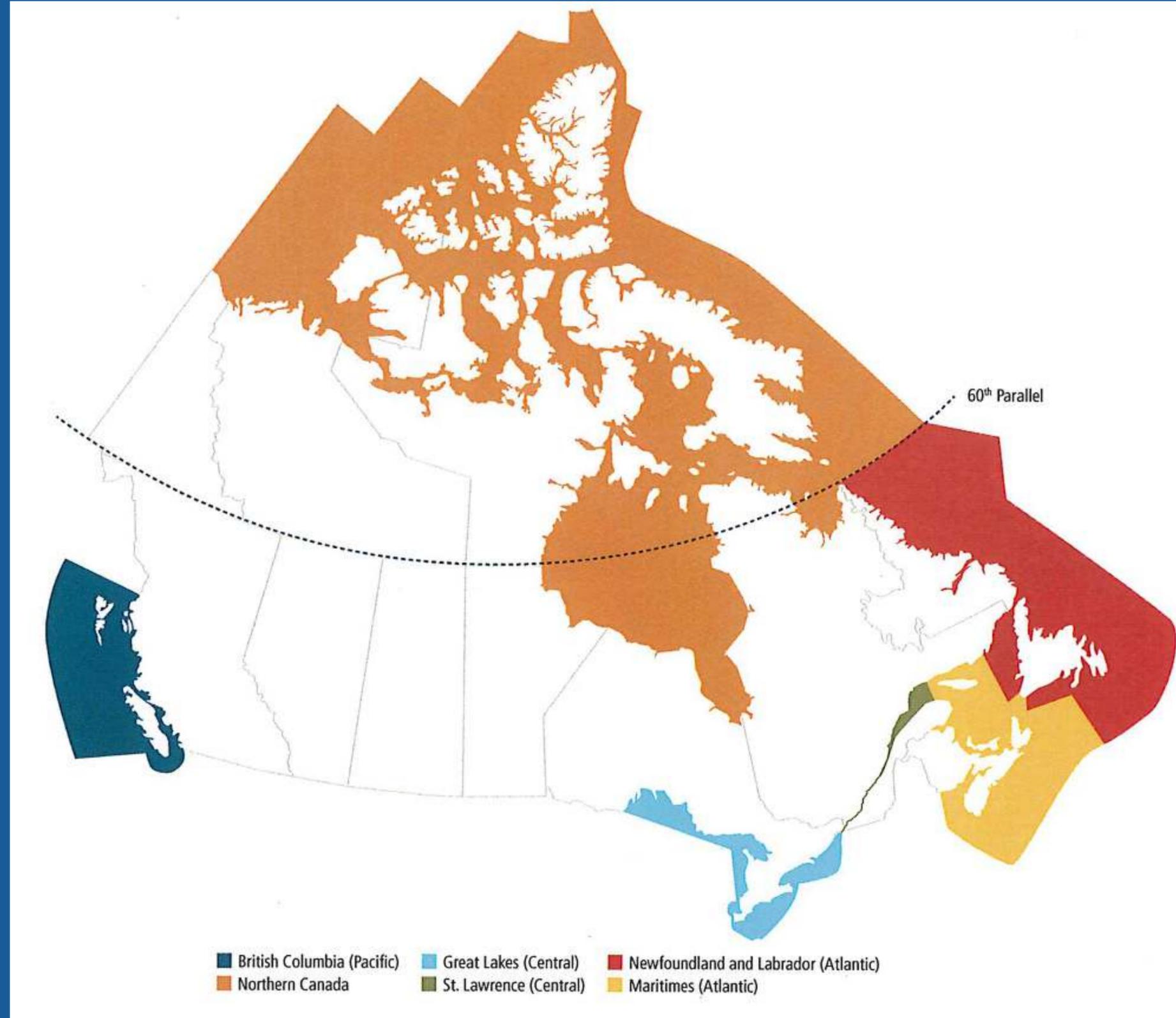
- “Commercial Marine Shipping Accidents: Understanding the Risks in Canada” (released April 28)
- “Social and Economic Value of Commercial Marine Shipping in Canada” (spring 2017)

# “Commercial Marine Shipping Accidents: Understanding the Risks in Canada”



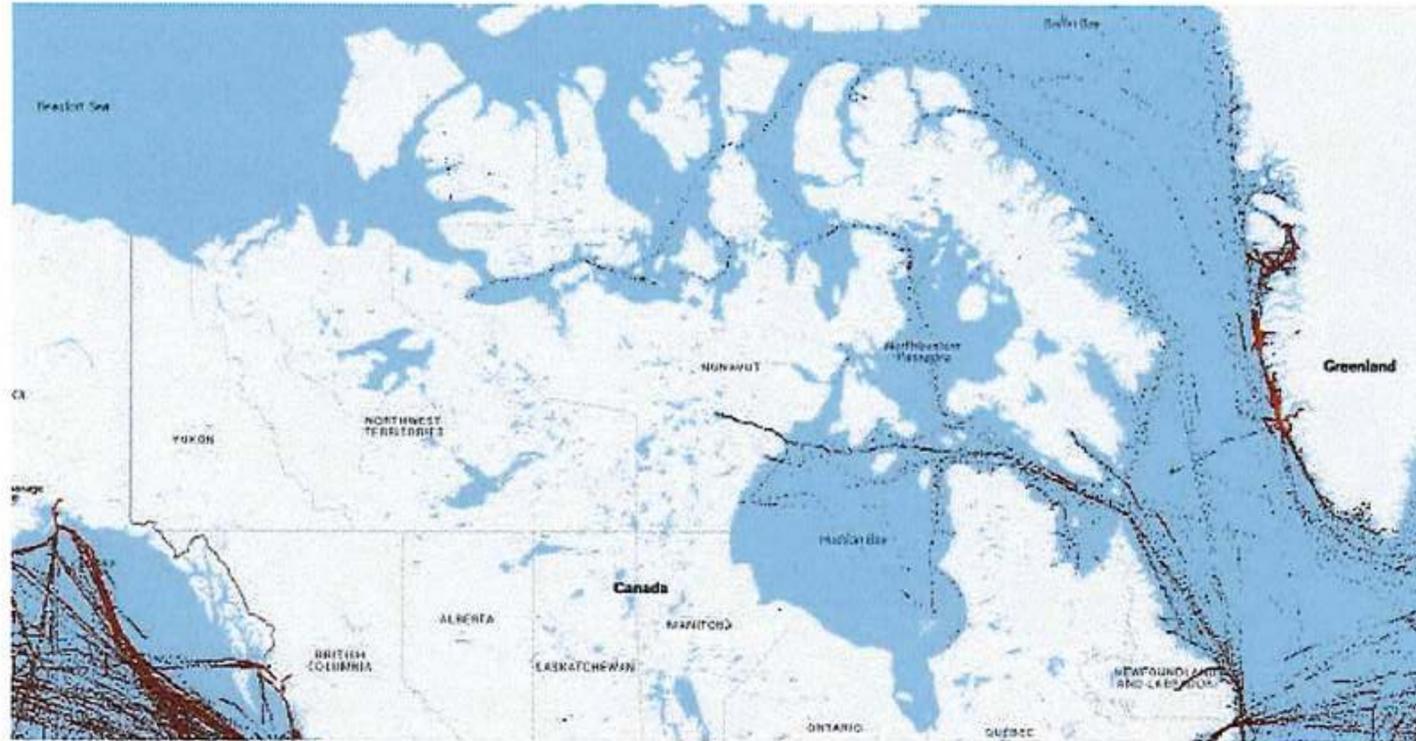
“Current gaps in data and research limit the degree to which Canada’s commercial marine shipping risks can be fully understood and measured. For risks to be better characterized by stage of shipping or by cargo type, data are needed on the causes, the stages at which incidents or accidents occur, and the frequency of shipments by cargo type and region.”

# CCA - Risk Study: Regions considered



# CCA - Risk Study: Shipping Activities

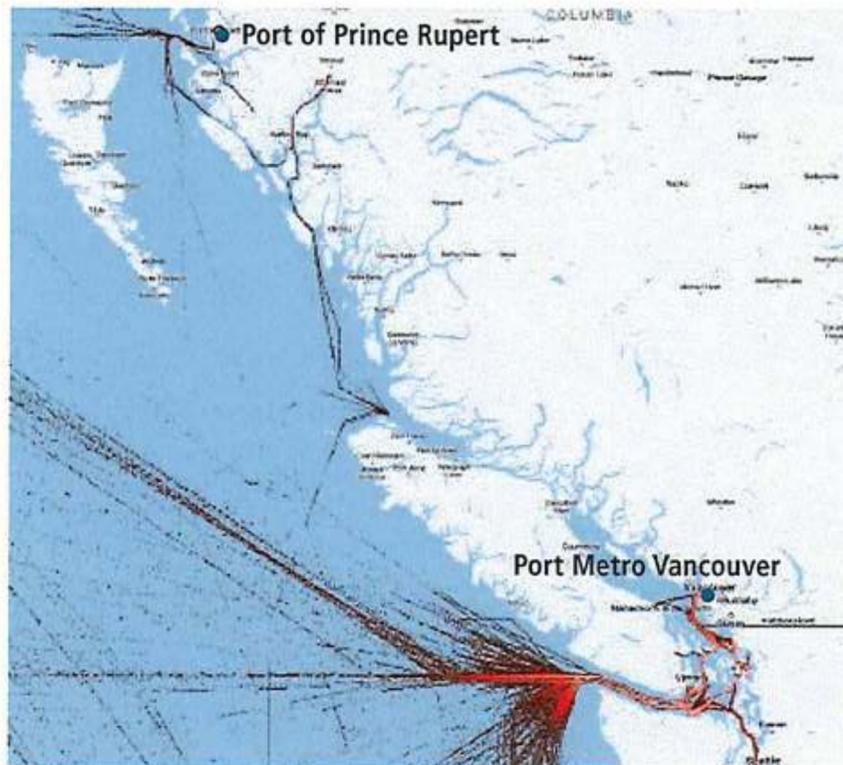
Northern Canada and Labrador



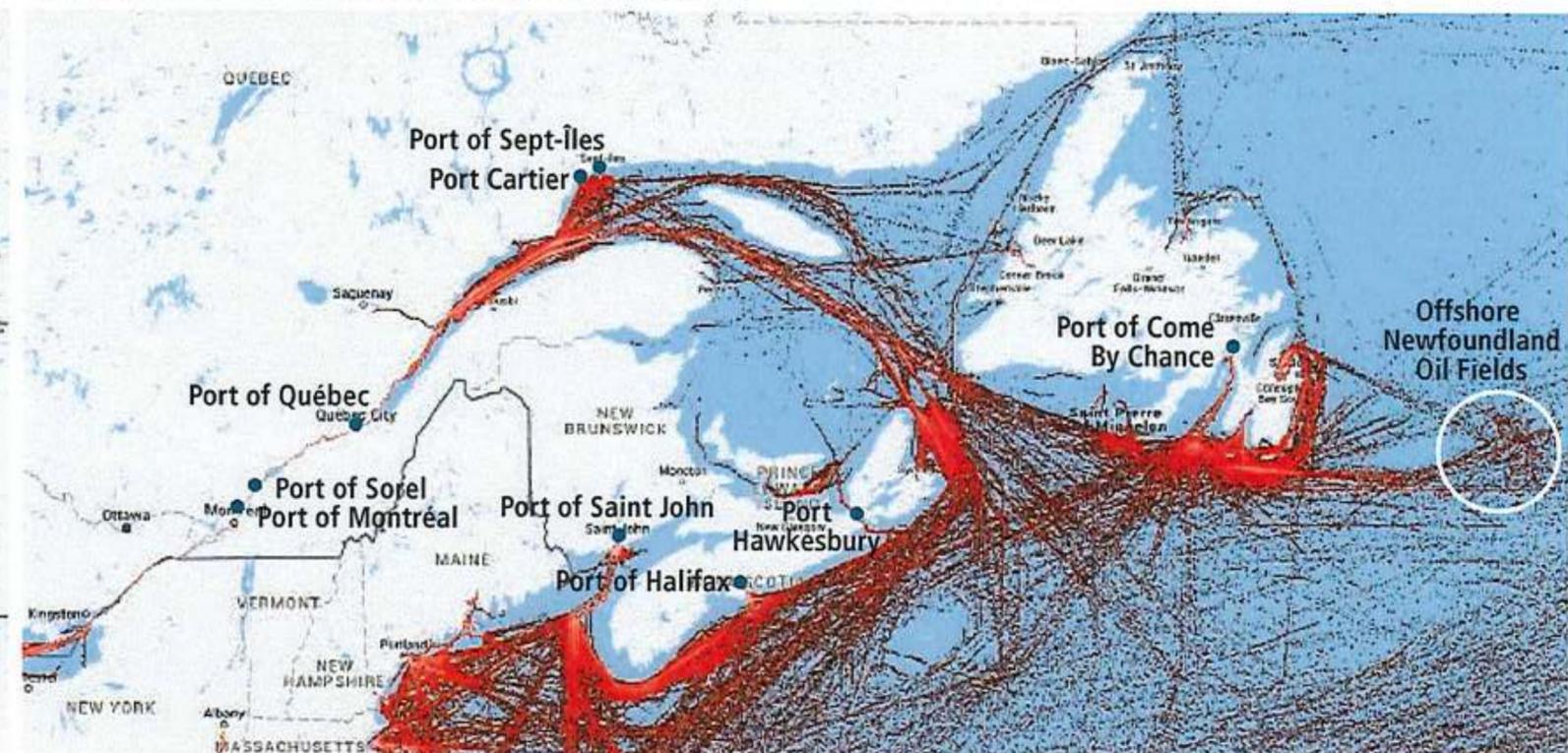
Great Lakes



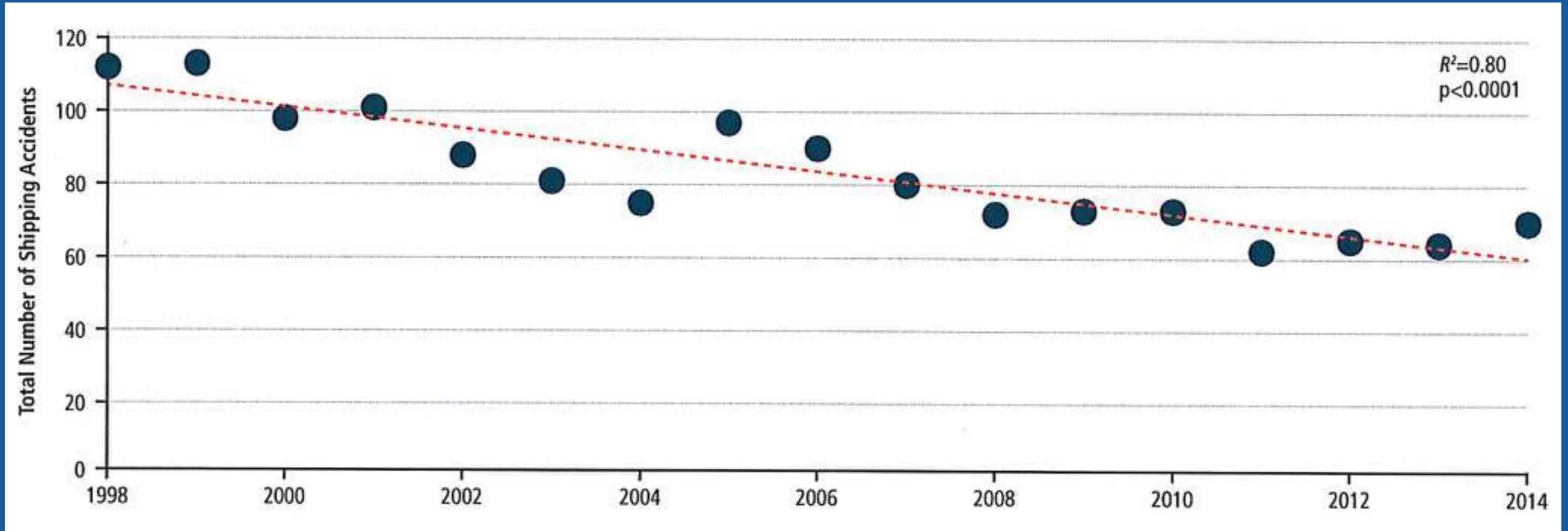
British Columbia



St. Lawrence, Maritimes, and Newfoundland



# CCA - Risk Study: Incidents and Accidents



# CCA - Risk Study: Incidents and Accidents

## Liquid Cargo Vessels

Chemical and Product Tankers

Crude Tankers

Combination Carriers

Liquified Gas Carriers

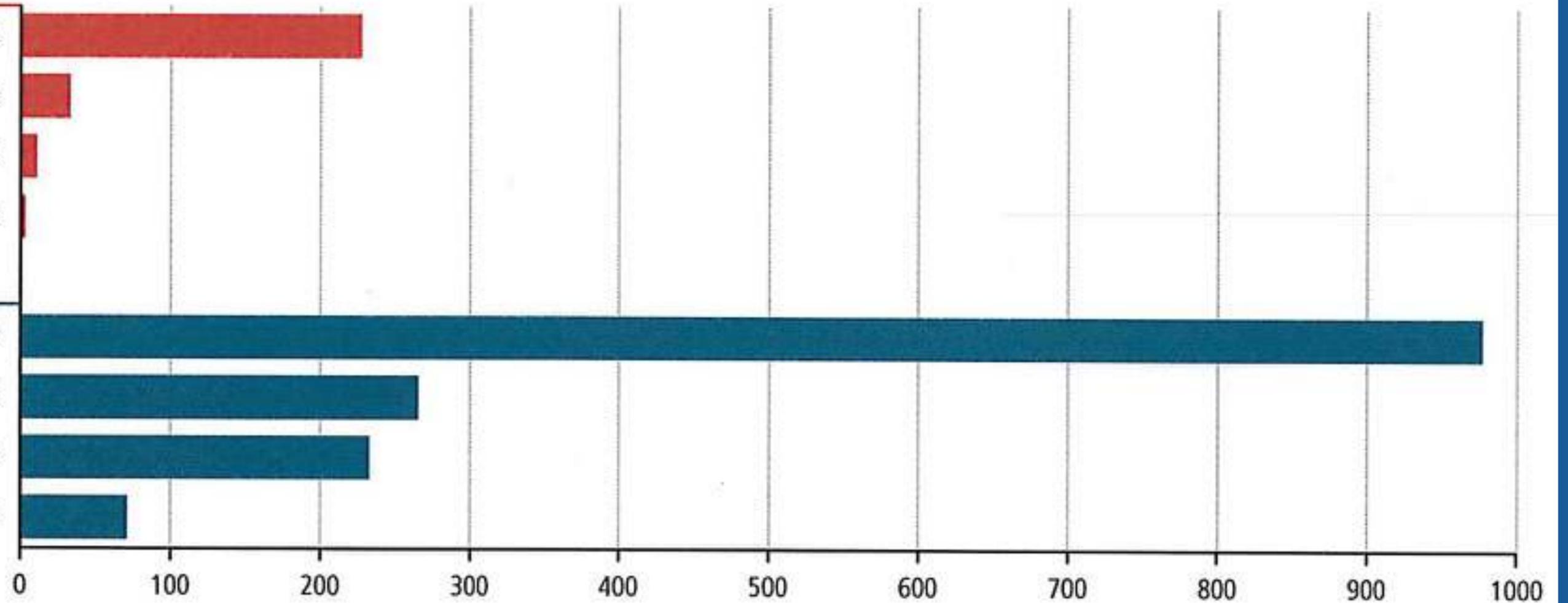
## Solid Cargo Vessels

Bulk Carriers

Container Ships

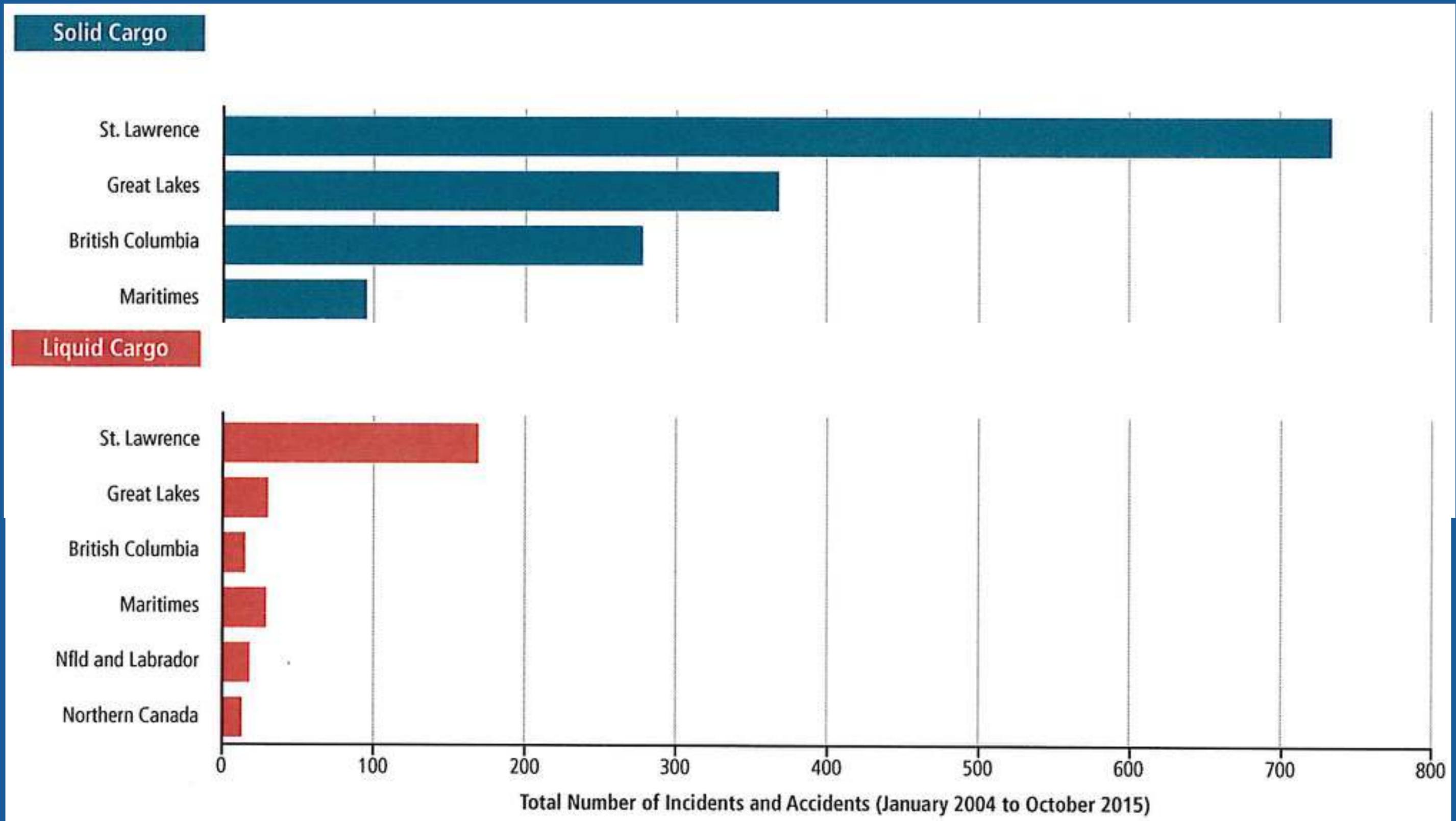
General Solid Cargo Ships

Heavy Load and Ro-Ro Ships



Total Number of Incidents and Accidents (January 2004 to October 2015)

# CCA - Risk Study: Incidents and Accidents



# CCA - Risk Study: Incidents and Accidents

Factor	Ranking of Factor in Region				
	Atlantic	Central	North	Pacific	Canada
<b>Human and organizational issues:</b> inadequate crew training, exhaustion of watch-keeping personnel, poor bridge resource management, poor communication	2	1	4	3	1
<b>Safety culture:</b> failure of shipping companies to take ownership of safety (i.e., failure to promote a culture that goes beyond complying with regulations by doing the "bare minimum")	4	7	7	6	2
<b>Age and condition of vessel:</b> poor vessel design or maintenance	5	5	9	6	3
<b>Ocean and weather conditions:</b> unfavourable tides, currents, weather (including increased frequency or intensity of storms from climate change), and presence of ice	1	8	3	5	4
<b>Regulatory complexity:</b> interaction of a multitude of federal, provincial, and state regulations (particularly environmental) that can be overlapping and confusing (e.g., Canada shares waters with the United States)	–	4	–	–	5
<b>Maps, charts, aids to navigation:</b> physical and electronic aids to navigation, sailing directions, bathymetry maps, other maps or charts, or weather information may be poor, out-dated, or lacking	8	8	1	9	6
<b>Shipping, port, and ice-breaking infrastructure and capacity:</b> infrastructure may be lacking or poorly maintained	8	5	1	–	7
<b>Geographical constraints:</b> confined waterways, including narrow passages such as canals	5	1	6	2	8
<b>Traffic density and volume:</b> increased traffic and changes in traffic patterns or routes, leading to congestion	5	1	7	1	9
<b>Cargo declarations:</b> incorrect declarations due to loading errors or misstated manifests (inaccurate cargo type or weight)	10	10	–	6	10
<b>Presence or abundance of marine animals or marine protected areas:</b> poor traffic management to avoid sensitive species and environments	3	–	4	4	11

# CCA - Risk Study: Impacts

Type and Degree of Environmental Impact for Various Cargo Types

Environmental Impacts	Cargo Types					
	Crude Oil	Refined Hydrocarbons	LNG	HNS	Dry Bulk	Container
Decrease in air quality	***	***	***	*	***	***
Decrease in water quality	***	***	**	*	**	***
Alteration of physical habitat	***	***	**	*	**	***
Impact on ecosystem structure and function <sup>+</sup>	*	**	***	***	***	***
Acute and chronic effects on plants	**	**	***	***	***	***
Acute and chronic effects on invertebrates	***	**	***	***	***	***
Acute and chronic effects on fish	***	**	***	***	***	***
Acute and chronic effects on birds	***	***	***	***	***	***
Acute and chronic effects on marine mammals	***	***	***	***	***	***
Acute and chronic effects on marine reptiles and amphibians	***	***	***	***	***	***

<sup>+</sup>E.g., impact on predator-prey relationships, changes in thresholds and tipping points

■ High Impact   
 ■ Medium Impact   
 ■ Low Impact   
 \*\*\* High Certainty   
 \*\* Medium Certainty   
 \* Low Certainty

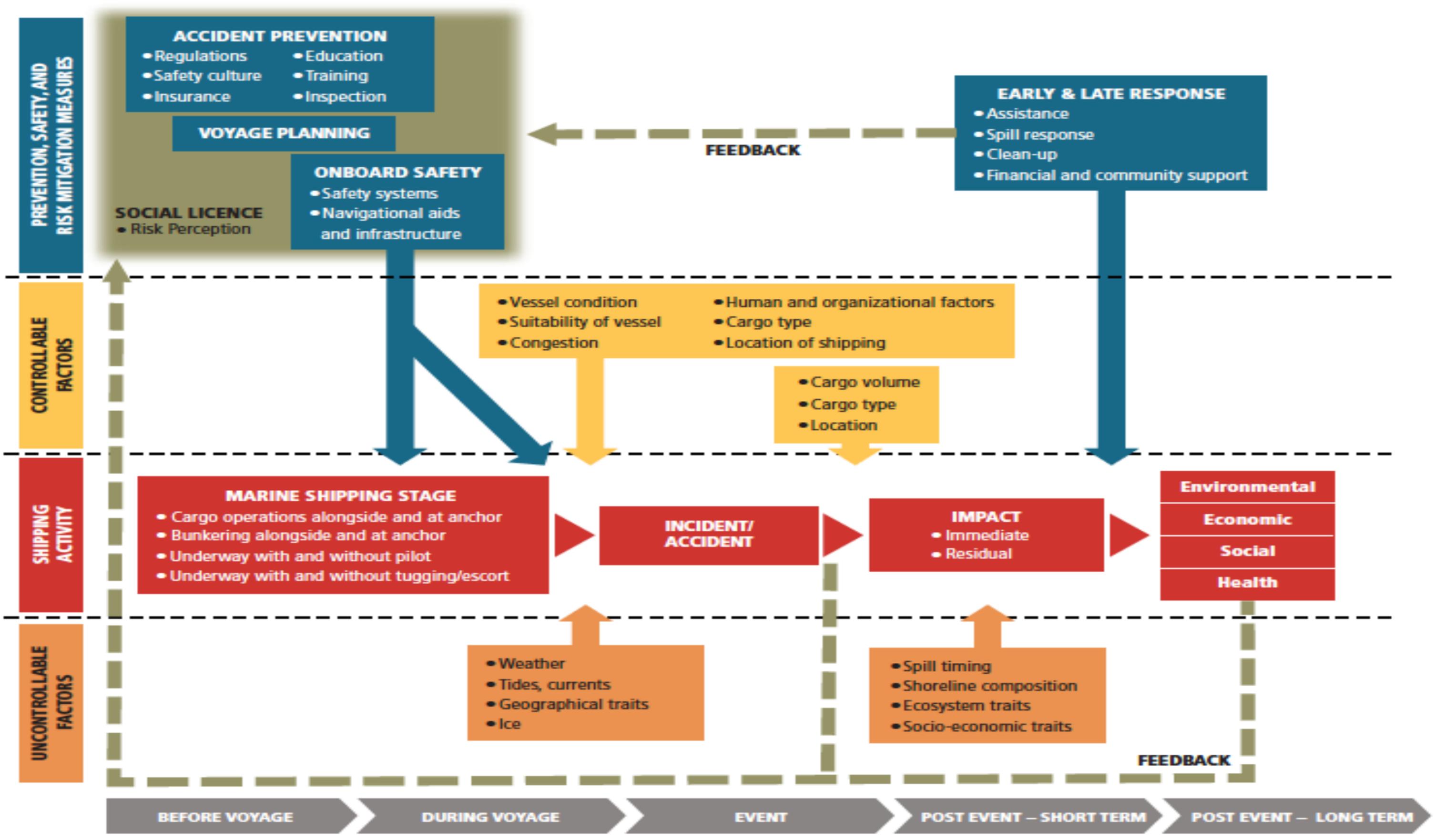
# Risk Report: Key findings

- Marine shipping risks in Canada are largely mitigated by regulations, safety protocols /practices and navigation technologies
- Better-quality marine shipping data is needed to improve understanding of incidents and accidents
- Further research is needed to address gaps in marine shipping risks
- Industry's social licence to operate is influenced by public satisfaction with response measures

# Risk Report: Building Social Licence

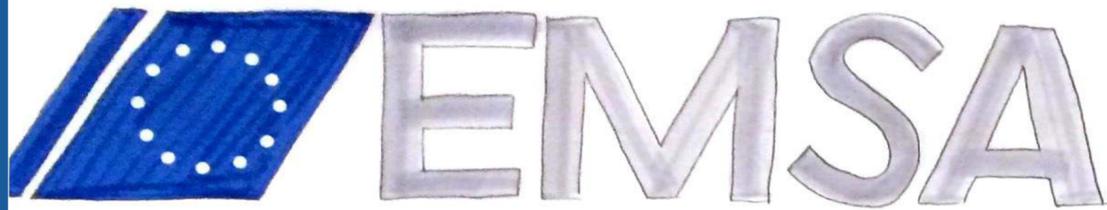
Report looked at importance of feedback loop to influence social licence to operate (risk perception):

- **Uncontrollable factors:** weather, tides, geography ...
- **Shipping activity:** all stages of shipping
- **Controllable factors:** vessel condition, congestion, cargo type ...
- **Prevention and risk mitigation:** response measures, regulations, insurance, training, inspections ...



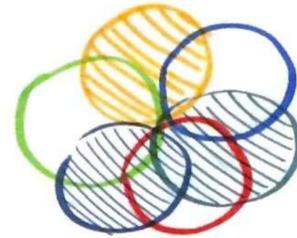
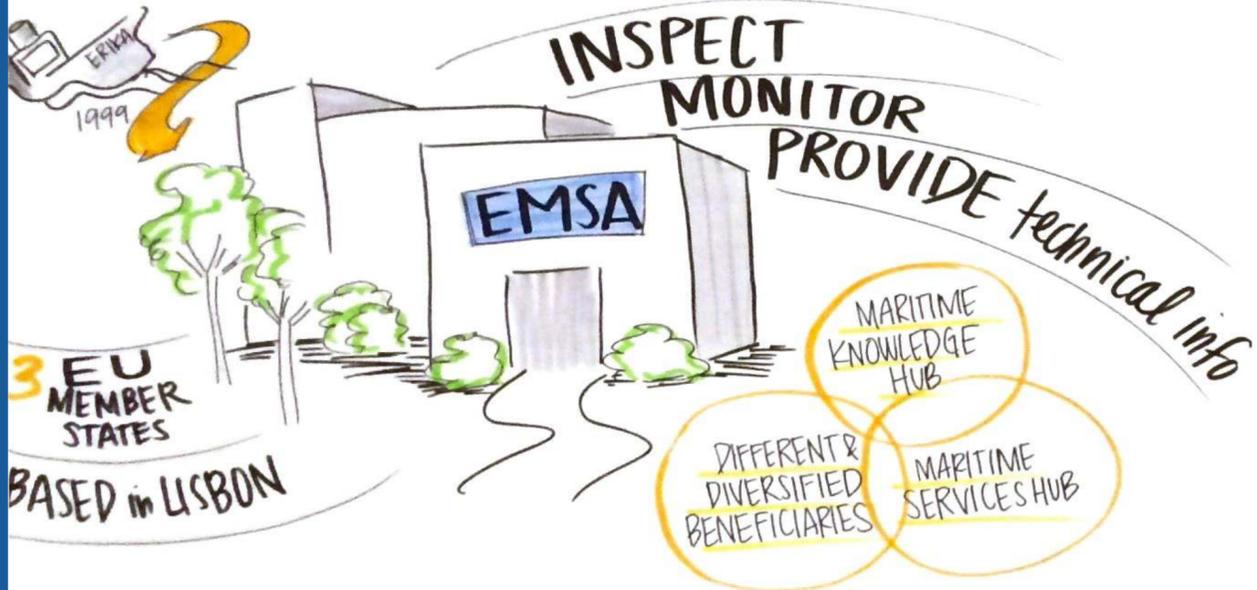
# Clear Seas: Workshop





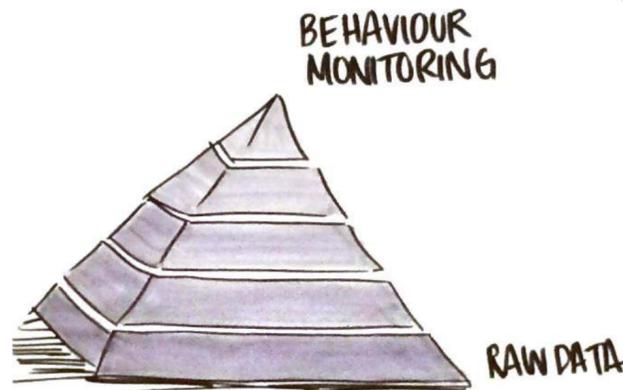
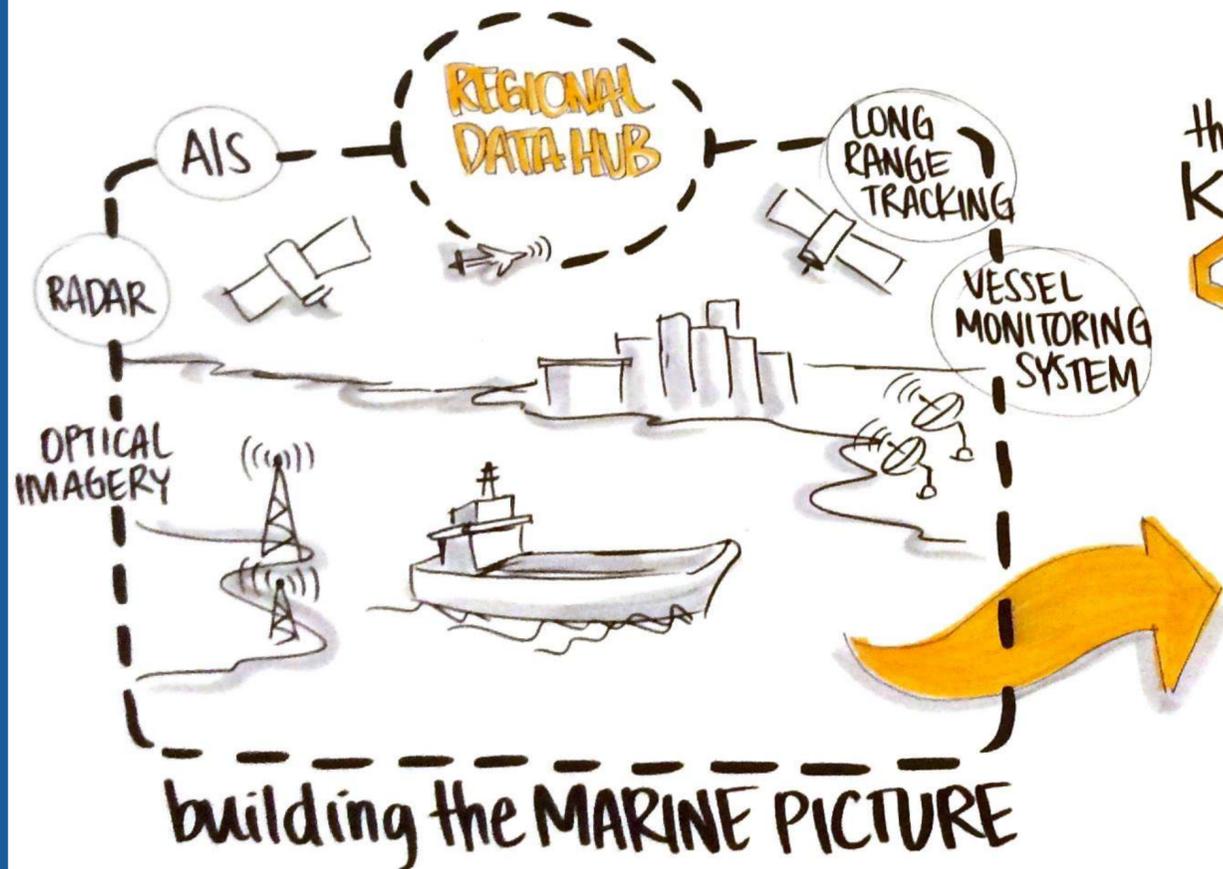
**MARKKU MYLLY** EXECUTIVE DIRECTOR  
EMSA

USING SENSORS and DATA to BUILD a BETTER MARITIME PICTURE



INTEGRATED MARITIME SERVICES:

- VESSEL MONITORING
- OIL POLLUTION DETECTION
- SEARCH and RESCUE
- MARITIME BORDER CONTROL
- ANTI-PIRACY
- FISHERIES MONITORING



the KEY getting the RIGHT DATA TIME WAY

FUTURE TECHNOLOGIES  
Aerial drones  
Videostreaming  
Mobile applications



COLLABORATION & SUPPORT

- EU Member states
- EU Agencies
- IPA & ENP Countries
- European Fisheries Control Agencies

# NEXT STEPS & ACTION PLANNING

## MARITIME DATA ACQUISITION, MODELLING & APPLICATION

- ✓ STANDARDIZATION of RISK ASSESSMENTS METHODOLOGY
- DATA ACCESS - COST, EASE
- ✓ ID DATA NEEDS of GROUPS
- ✓ DATA for SMALLER VESSELS
- ✓ CREATING DATA in USEABLE FORMS

## ENGAGEMENT: COMMUNITIES & GOVT

- ✓ TRUE ENGAGEMENT vs PUBLIC RELATIONS
  - 2 WAY PROCESS
- ✓ START PROCESS with COMMUNITIES
- ✓ HOW DOES DATA become USEFUL for POLICY?
- ✓ QUALITY CONTROL for REVIEWS
- ✓ IMPROVE TIMELINES for REVIEW
- ✓ MEASURE CUMULATIVE IMPACTS
- ✓ CANADA-US COORDINATION IMPROVED
- ✓ ONE COORDINATING BODY
  - SO WE ARE NOT DUPLICATING ENGAGEMENT PROCESSES

## DATA, RESOURCE SHARING & COLLABORATION

- ✓ COORDINATE, CENTRALIZE DATA
- ✓ PRIVACY CONCERNS
- ✓ REPRESENTATIVE DATA
- ✓ COLLABORATION on TOR for what DATA LOOKS LIKE
- ✓ WHO PAYS for DATA?
- ✓ WHO AUTHENTICATES DATA?
- ✓ DATA LICENSING CRITERIA
- ✓ DASHBOARD with FREE or PAID use of DATA

## POLICY DEVELOPMENT & IMPLEMENTATION

- ✓ PROBLEM needs to be DEFINED COLLABORATIVELY
- ✓ MODELLING CUMULATIVE EFFECTS of SHIPPING
- ✓ ROUNDTABLE to INFORM POLICY
- ✓ ROLE of PROVINCIAL GOVT in PREVENTION
- ✓ HOW to SHIFT from TALKING to IMPLEMENTING

# Safe and Sustainable Marine Shipping: What does it take?

- **Listening** to concerns of communities and stakeholders
- **Facilitating** impartial, fact-based research
- **Sharing** our ideas, experiences and best practices
- **Engaging** in open, informed and constructive dialogue
- **Speaking** as one voice to encourage change (policy, protocols ...)



[www.clearseas.org](http://www.clearseas.org)

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