

*Shipping risks: science models → system models →
management tools → governance*

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Ocean Frontier Institute (OFI) project
Module N – Safe Navigation and Environmental Protection
(2017-2022)

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Ronald Pelot, Floris Goerlandt, David
Barclay



GOALS

Using interdisciplinary perspectives, Module N investigates how ocean change in the NWA and CEAG shapes our understanding of the risks posed by increased shipping and the search for solutions.



SCOPE

Module N will generate enhanced understanding and applications:

- Maritime risks
- Ship emissions controls
- Ship noise
- Strategizing for oil spill response and SAR capacities in remote areas
- MSP for conflict management
- Regulatory tools



DRIVERS

- Continued loss of sea ice and calving in the CEAG
- Shipping activity is poised to increase in the Canadian Arctic and NWA (e.g., CETA, Corridors)
- Increased shipping will stretch SAR and spill response capacity (e.g., Oceans Action Plan)
- Shipping implications for coastal populations deserve assessment (e.g., public health)
- Ship noise impact in the marine environment is not fully understood and regulated
- Growing interface between shipping and Inuit rights (e.g., Lancaster Sound)

CHANGE

Ocean change

Users

- * Shipping (spatial, icebreaking, emissions, noise)
- * Indigenous (traditional, contemporary)

Governance

- * Policy
- * Law
- * Institutional
- * Management (incl Indigenous)

CHANGING OCEAN



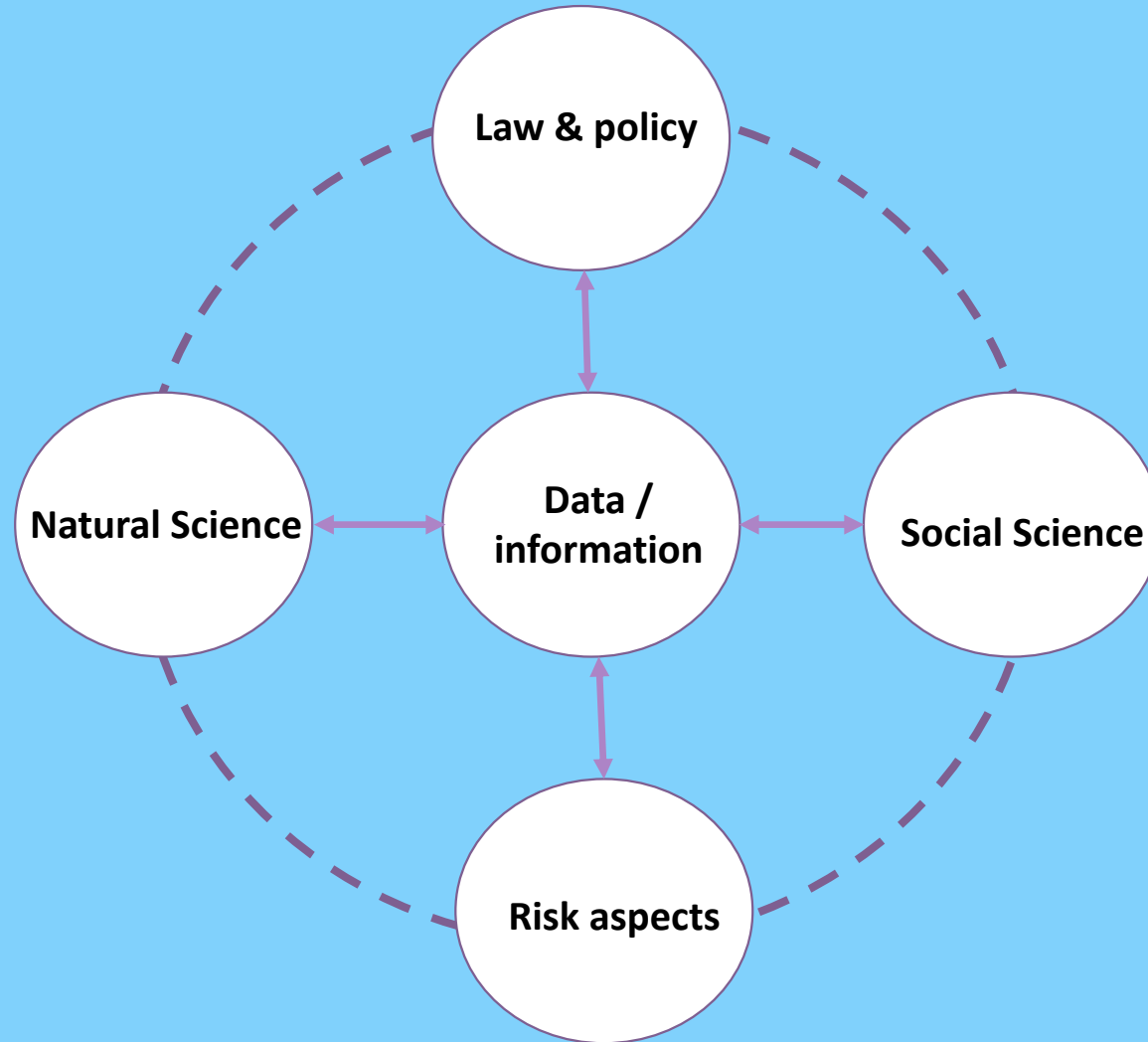
Risks to ships

- Ocean-atmosphere interactions (weather)
- Surface conditions
- Reduced visibility
- Sea ice
- Icebergs
- Other uses
- Etc.

Risks from ships

- Air emissions
- Climate change impacts
- Underwater noise
- Discharges and spills
- Collisions
- Ships/persons in distress
- Public health impacts
- Disrupting ice routes
- Coastal economies
- Etc.

Multi-disciplinary research



Select Partners & participants

University

- Dalhousie
- MUN
- Other Canadian
- UBO
- Kiel
- WMU

Government

- TC
- DFO
- CCG
- DRDC
- ECCC

Indigenous

- ICC
- Inuit Elders

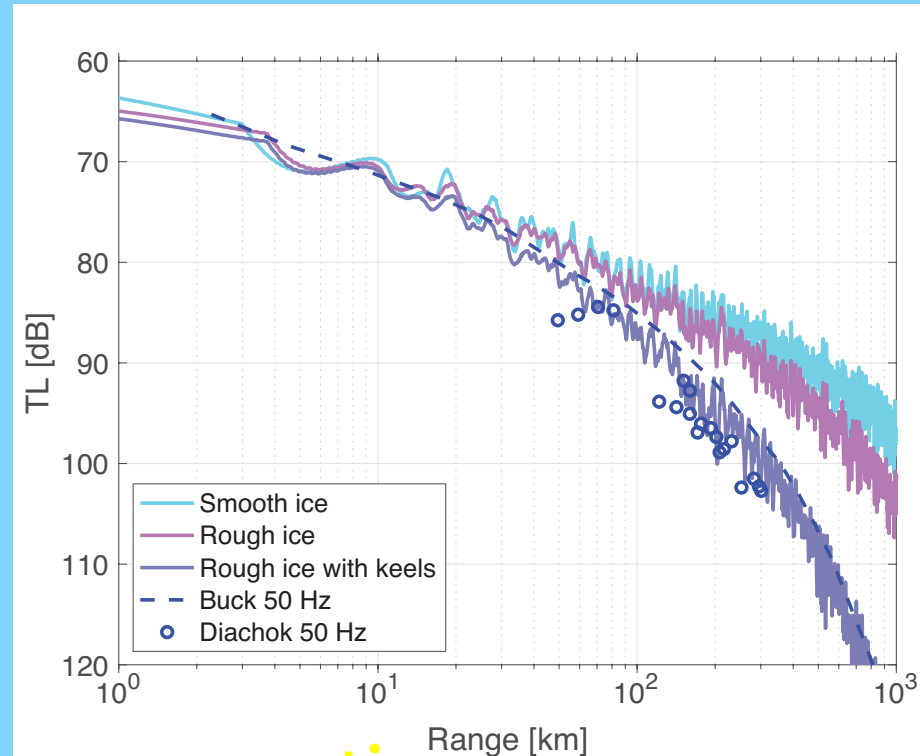
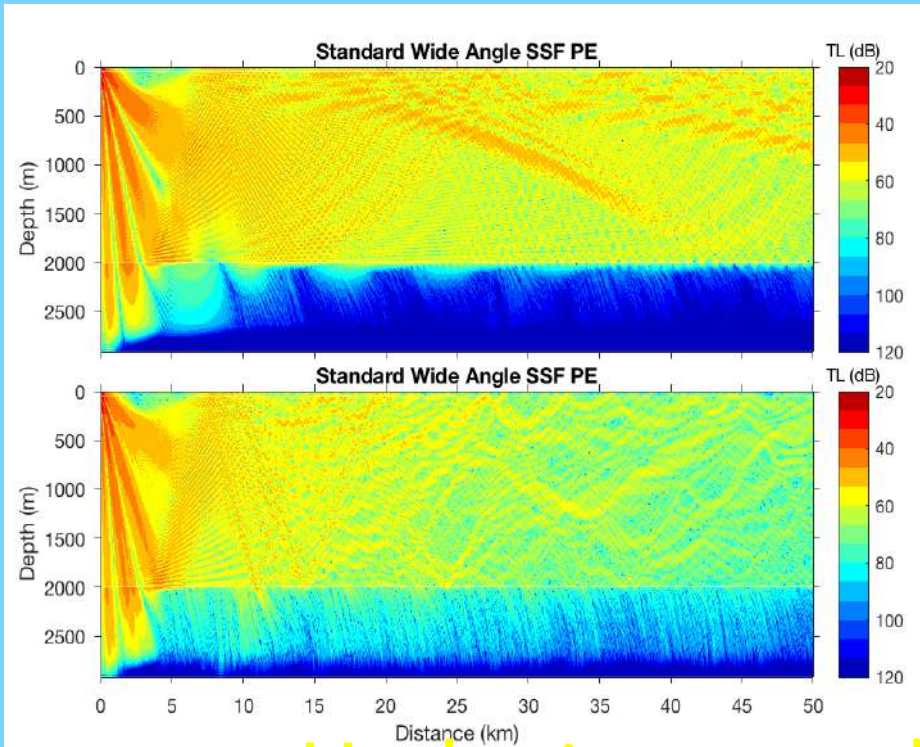
Industry

- Shipping Federation of Canada
- Fednav

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Shipping Noise

David Barclay

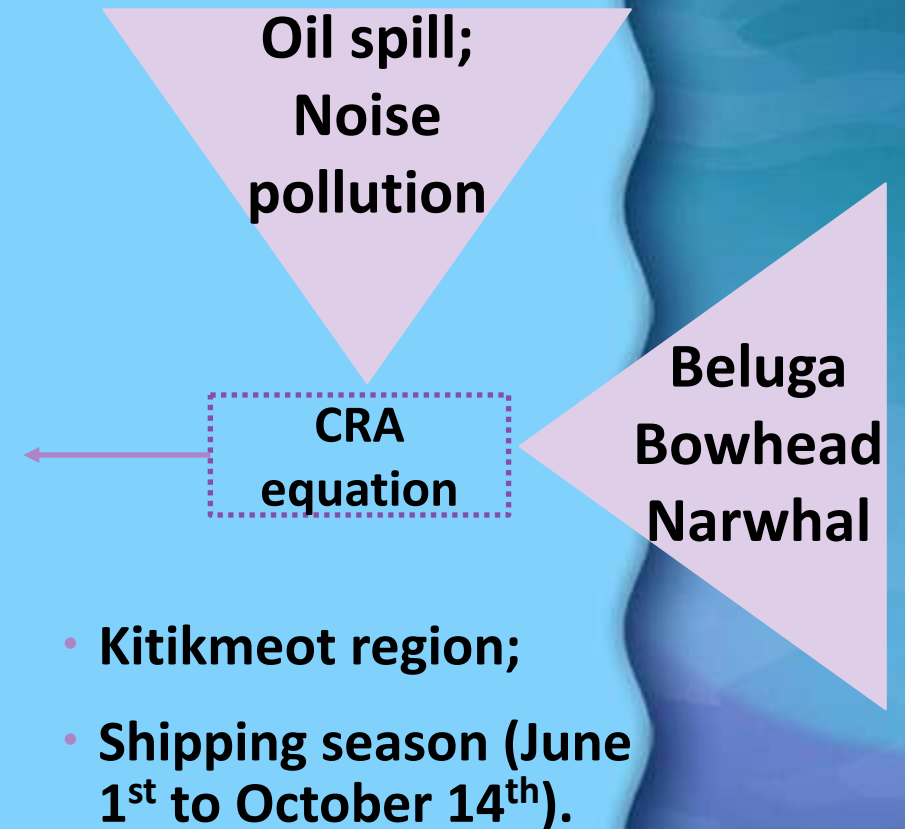
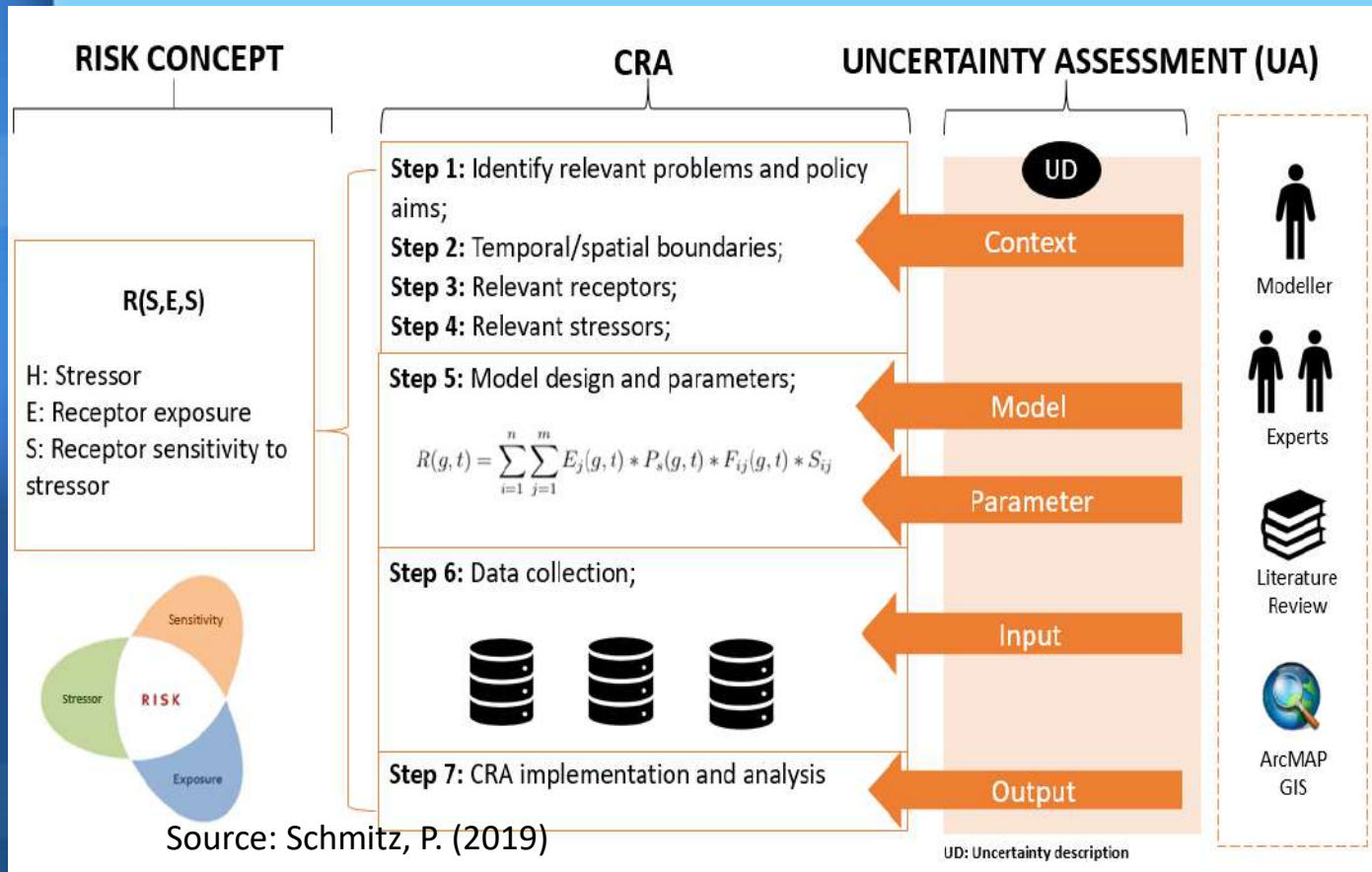


Under-ice sound propagation model

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Shipping Cumulative Risk Assessment

Priscilla Schmitz, Ron Pelot, Floris Goerlandt



MODULE N Subproject

Spills and air emissions prevention

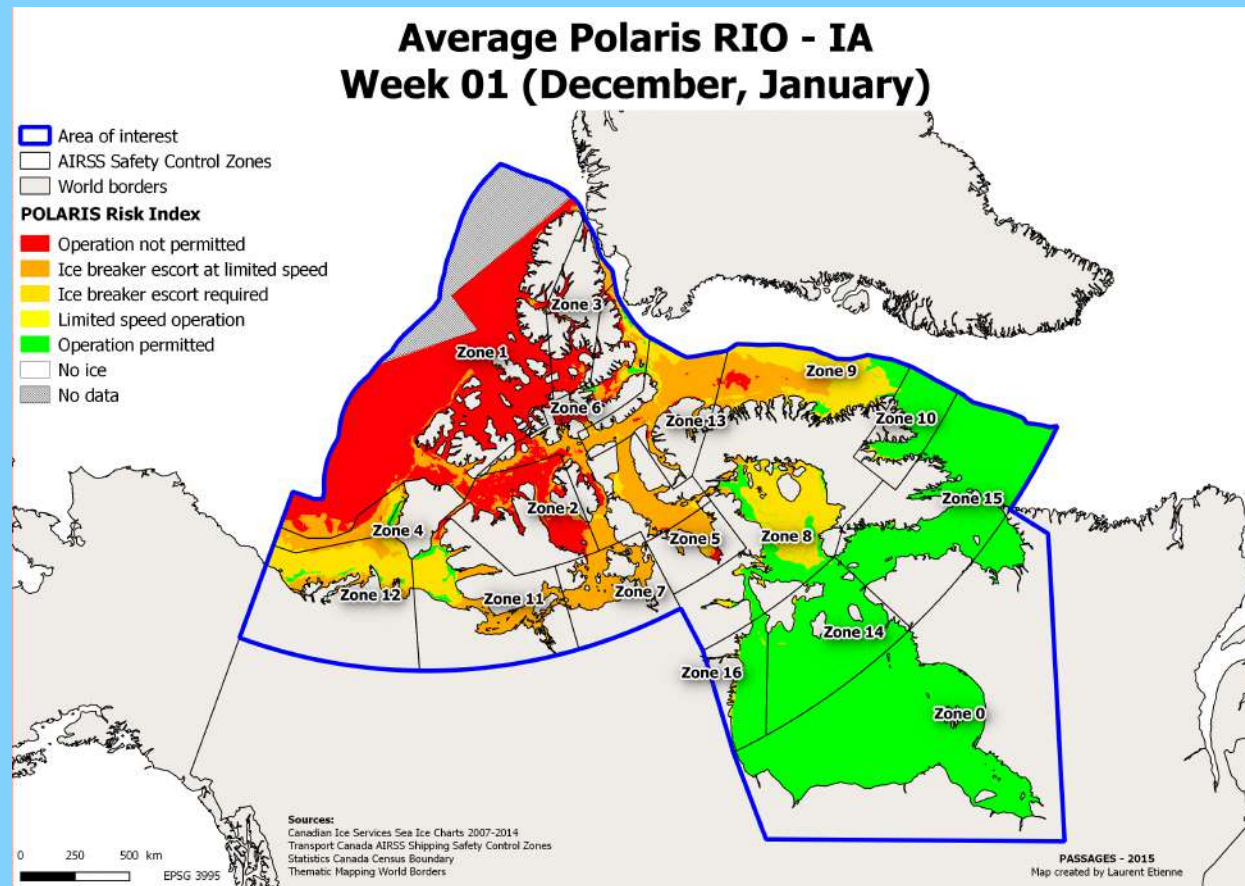
Floris Goerlandt and Sarah Hughes

- HFO is banned in the Antarctic and the Polar Code (2017) encourages similar application in the Arctic.
- O1. Identify use of FSA in the case of the proposed ban of HFO in the Arctic and the reasoning behind this decision-making;
- O2. Identify the scope of application of the ISO 31000 Guiding Principles in the context of marine environmental protection issues at the IMO;
- O3. Analyze stakeholder views on the risk framing of HFO and ascertain how it affects high-level shipping risk management and governance.

MODULE N Subproject

Northern shipping risks in ice – POLARIS

Mark Stoddard and Ron Pelot



MODULE N Subproject

Marine Spatial Planning

Claudio Aporta and Weishan Wang

- How can Marine Spatial Planning add value to ocean management in the NWA and EAG by helping mitigate risks from air pollution from ships, noise, vessel spills and conflicts with Inuit interests?
- A particular focus of this project is to understand how Inuit knowledge and Inuit approaches can be understood and potentially shape MSP practices
- Multiple engagements with northern residents

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Regulatory Assessment

Aldo Chircop et al.

- **Work:**
 - Policy and regulatory analyses of safety and environmental (incl. emissions, noise) regulation
 - Assessment of tools for interface of shipping with other ocean uses, Indigenous uses, conservation measures
 - Assessment of the Canadian and international polar shipping regulatory landscape
- **Applications:**
 - Proposals for evidence-based policy and regulatory options to enable Canada meet its international obligations while protecting its vital interests in the NWA/CEAG.

MODULE N Subproject

Next Big Steps

- Stakeholder workshop: August 2020
- Book to be published in 2020
 - ***“Governance of Arctic Shipping: Rethinking Risk, Human Impacts and Regulation”*** (16 chapters)
- Increased alignment/nesting of:
 - Risk analysis → System analysis → Risk Management → Risk Governance
- IRGC Framework (Integrated Governance, Risk and Compliance)