

RESEARCH DOSSIER

Marine Transportation

Marine transportation-related research work and capacity in the MEOPAR Network

Innovations in ship design, technology, industrial processes and community infrastructure are bringing rapid change to Canada's marine transportation industries and the communities who depend on marine transportation as part of their day-to-day lives. This change is running in parallel with environmental change, which affects the industry through changing patterns in weather and accessibility to shipping routes.

MEOPAR is mobilizing academic research capacity to help partners anticipate and respond to environmental changes that impact marine transportation, and better understand and mitigate marine transportation impacts on both the environment and the socio-economic well-being of Canadian industries and coastal communities.

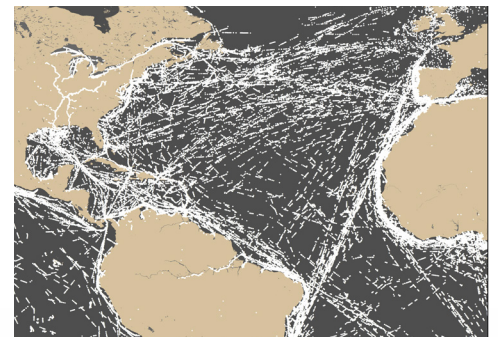
Marine Weather & Ocean Conditions

MEOPAR supports research and development related to observing and predicting weather and ocean phenomena that pose risks to marine transportation including fog, sea ice, extreme waves and rapidly-developing storms.

- **Developing Tools & Technology:** Developing new, and/or modifying existing, tools and technology to accurately observe ocean conditions both at sea and in high priority coastal areas (e.g. high density regions like the Salish Sea).
- **Integrating Ocean Data:** Advancing the sharing and integration of ocean observation data between organizations; Developing best practices for managing, sharing and integrating ocean observational data.
- **Improving Forecasts:** Improving the accuracy of forecasting models (both short-term and long-term) by increasing resolution, evaluating biases, and integrating new variables and data streams.

Sea Ice Forecasting

Dr. Randy Scharien (University of Victoria) is developing tools that will improve the accuracy of sea ice forecasts in Canada's North.



Ship Traffic Modelling

In partnership with exactEarth Ltd., MEOPAR researchers are using global Automatic Identification System (AIS) data to identify patterns, trends and anomalies in maritime traffic.



Socio-Economic Impacts

Understanding and preparing for the socio-economic impacts of the marine transportation industry on coastal communities and the industry itself is critical to reducing vulnerability and strengthening opportunity.

- **Safety at Sea:** analyzing patterns in maritime traffic and marine accidents; understanding mariner attitudes towards safety; integrating non-commercial maritime traffic into marine navigation, safety and emergency infrastructure and response planning
- **Transportation Disruption:** Understanding the risk that transportation disruption poses to communities dependent on marine transportation for critical supplies; developing mitigation and preparation strategies for vulnerable communities
- **Northern Marine Transportation Corridors (NMTC):** Strengthening the NMTC Initiative by analyzing historic shipping patterns in the Arctic, assessing non-commercial marine transportation in the region, and by integrating regions of socio-economic and/or cultural importance to Northern Aboriginal communities

Partner Engagement

MEOPAR's research, training and knowledge mobilization activities are conceived and delivered in response to specific partner needs. We aim to supply partners with knowledge, tools, people and pathways that strengthen their resilience and opportunity in Canada's marine environment.

Environmental Impacts

MEOPAR researchers are improving our ability to understand and mitigate the environmental impacts of marine transportation.

- **Ship-Marine Mammal Interactions:** developing new technology, models, analysis and response plans to understand the impact of ships on marine mammals, including underwater noise and ship strikes, and to inform mitigation strategies
- **Oil Spills & Contaminants:** improving observing technology and forecasting models; gathering environmental baseline data; identifying high risk regions; supporting emergency infrastructure planning
- **Air Quality:** investigating the impact of marine transportation on coastal air quality
- **Invasive Species:** informing ballast water exchange strategies to reduce the spread of invasive species



Ship-Strike Mitigation

Dr. Chris Taggart (Dalhousie University) is using underwater gliders to identify critical whale habitat, which will inform modifications to shipping lanes and speed zones. His team is also developing technology to warn ships in real time when a whale is in their vicinity.

About MEOPAR

Established in 2012 through Canada's federal Networks of Centres of Excellence Program, the Marine Environmental Observation Prediction and Response (MEOPAR) Network is a national network of academic researchers and students, government scientists, and partners in the private, NGO and community sectors working together to reduce vulnerability and strengthen opportunity in Canada's marine environment.

Marine Environmental Observation Prediction and Response Network

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