

# MARINE BLACK CARBON EMISSIONS AND CANADA'S ARCTIC EMISSIONS CONTROL AREA (ECA) UPDATE

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# OVERVIEW

- 1. Black Carbon:** Emissions data, research, participation at the IMO
- 2. Canadian Arctic Emission Control Area Proposal:**  
Update on rationale and timeline

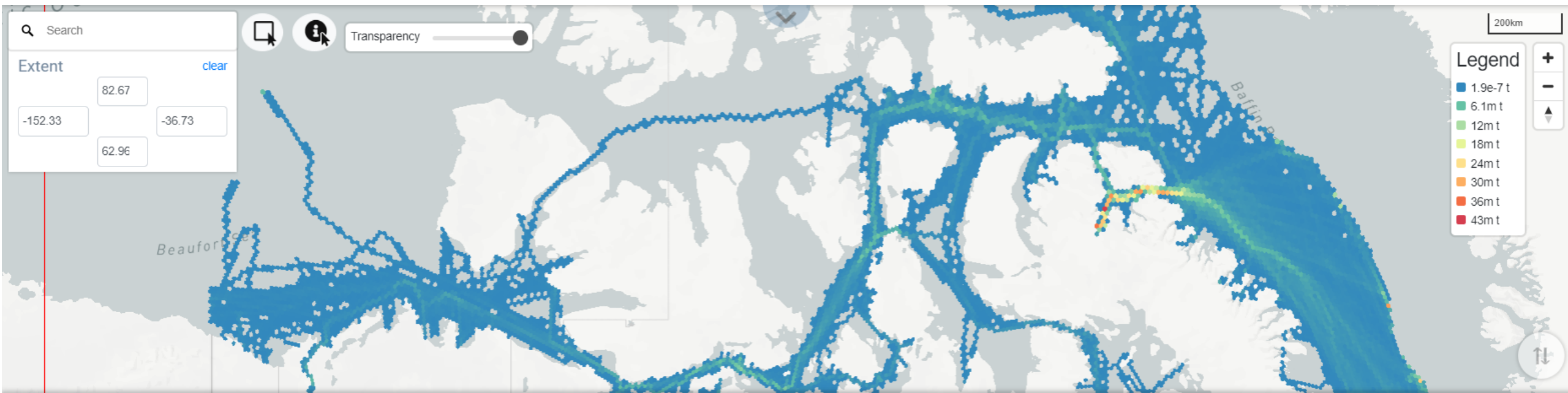
# 1. **Black Carbon:** Emissions data, research, participation at the IMO

# BLACK CARBON SHIPPING EMISSIONS DATA

**Marine Emissions Inventory Tool (MEIT):** Developed and manage MEIT as bottom-up, activity-based emissions inventories (including BC) for all marine vessels operating in Canadian waters

[Marine Emissions Inventory Tool - Canada.ca](https://www.canada.ca/en/environment-climate-change/services/marine-emissions-inventory-tool.html)

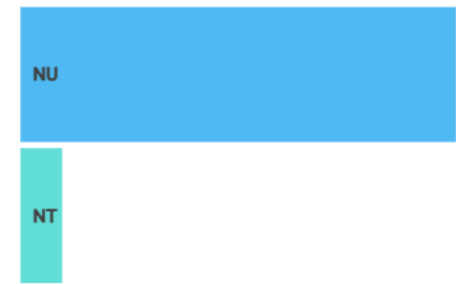
# BLACK CARBON SHIPPING EMISSIONS DATA



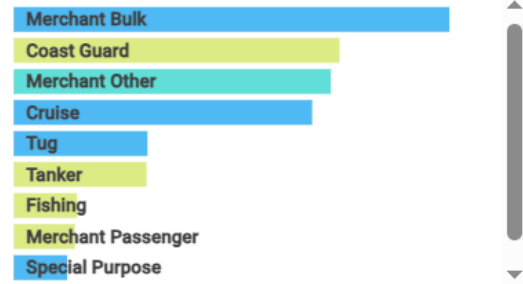
BC : 8.5 tonnes (# of unique trips: 1 279)



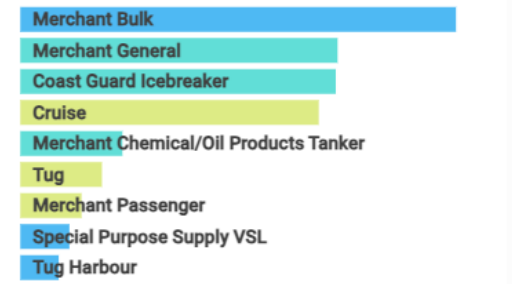
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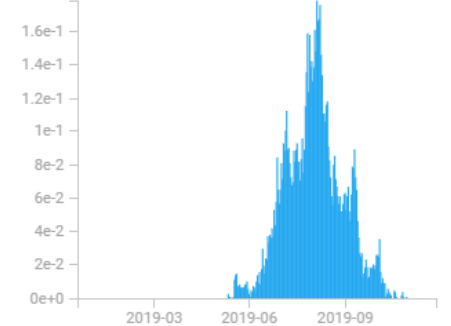
Ship Class



Ship Type



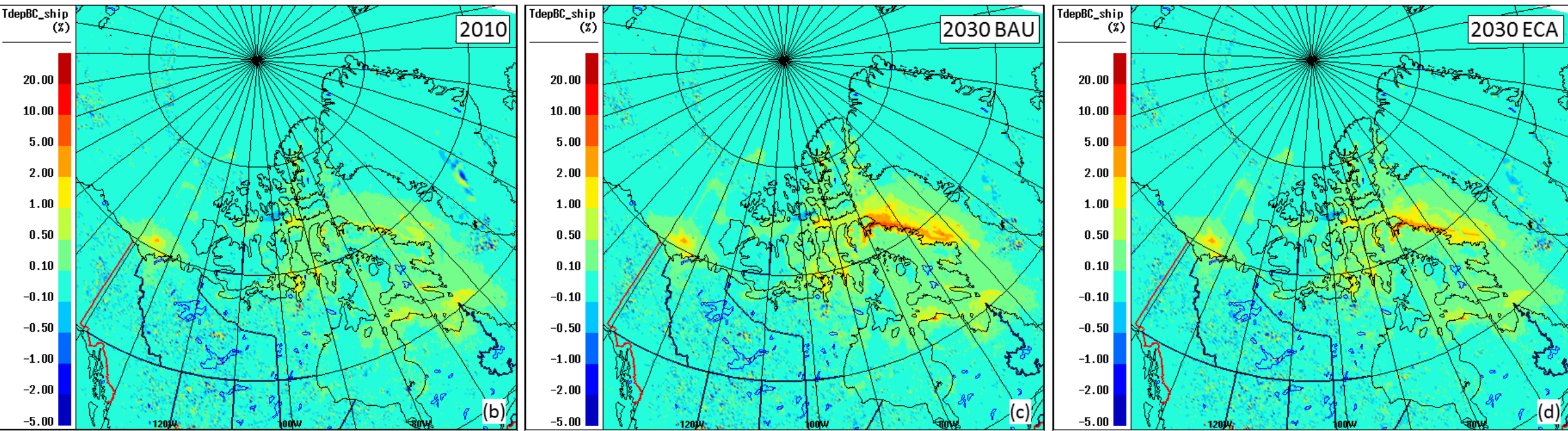
Date range



# BLACK CARBON SHIPPING EMISSIONS RESEARCH

- **Research on impacts of shipping emissions in the Canadian Arctic**
  - Multi-year research project including studies on air emission inventory, ground based measurements and analysis, air quality modelling assessment, and climate modelling, including impacts on BC emissions.
  - Resulted in a publication in 2018 by ECCE scientists, which is the scientific base of our Canadian Arctic ECA proposal.

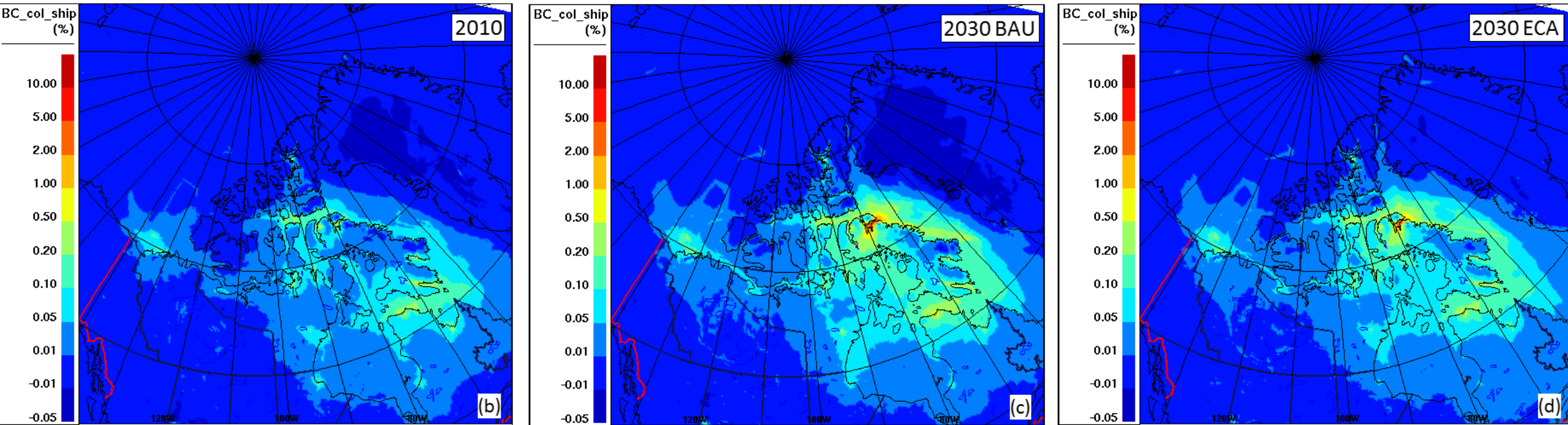
# BLACK CARBON DEPOSITION



[ACP - Assessing the impact of shipping emissions on air pollution in the Canadian Arctic and northern regions: current and future modelled scenarios \(copernicus.org\)](https://www.copernicus.org/)



# BLACK CARBON COLUMN LOADING



[ACP - Assessing the impact of shipping emissions on air pollution in the Canadian Arctic and northern regions: current and future modelled scenarios \(copernicus.org\)](https://www.copernicus.org/)



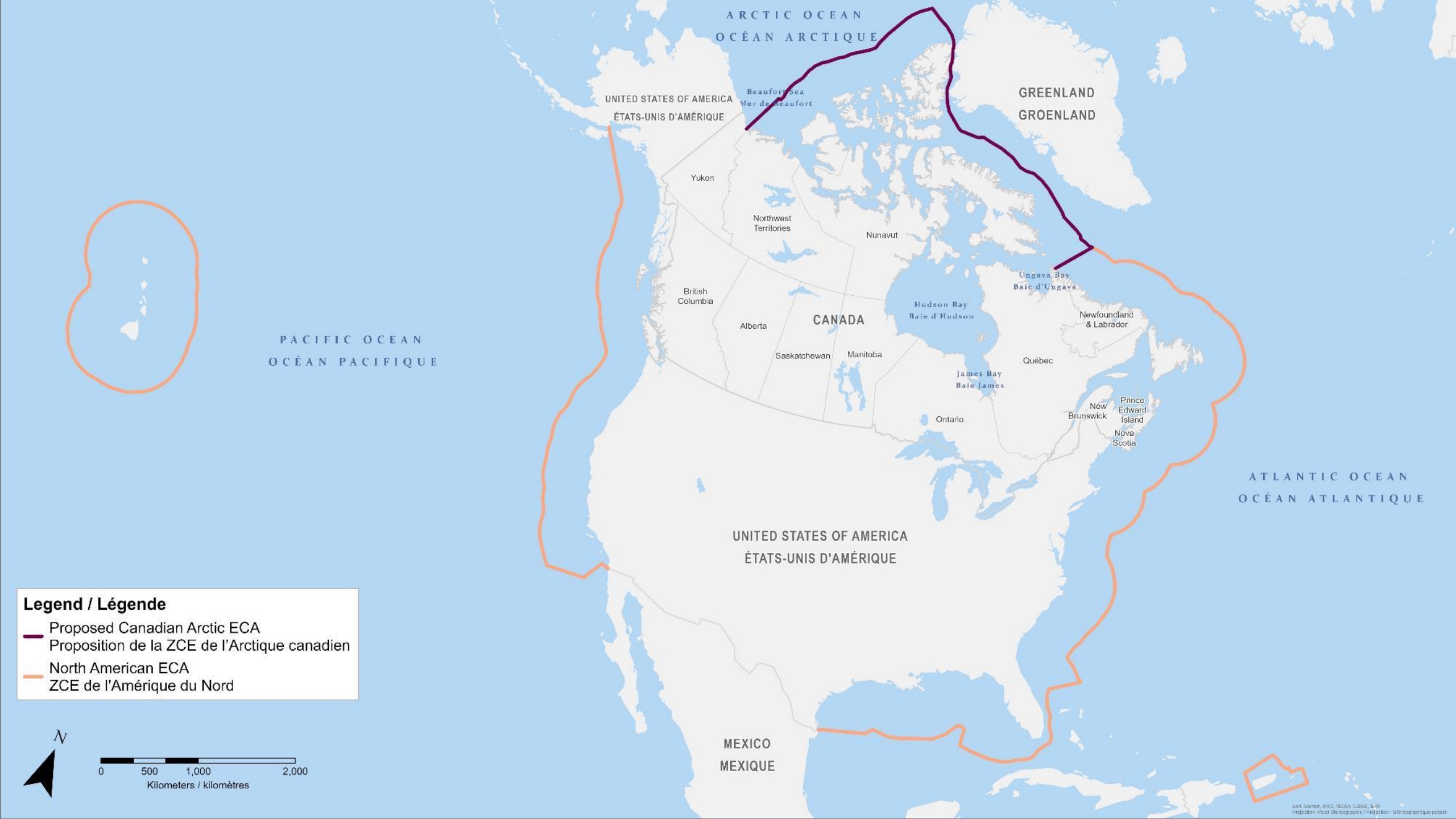
# ENGAGEMENT AT THE IMO

- **Engagement at the International Maritime Organization (IMO)**
  - Support and participate in IMO meetings on issue of black carbon emissions from shipping in the Arctic.
- **Emission Control Area Proposal**
  - Development of a Canadian Arctic ECA Proposal which, if vessels comply using cleaner fuels, reduces black carbon emissions from vessels.

## **2. Canadian Arctic Emission Control Area Proposal:** Update on rationale and timeline

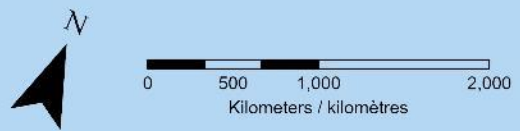
# CANADIAN ARCTIC ECA - RATIONALE

- 1. What is an Emission Control Area:** a sea area in which stricter controls are established to reduce airborne NOx and SOx emissions from ships.
  - 2. The Arctic is less protected than the rest of North America:**
    - North America already has an ECA, but it stops at 60 deg N, excluding the Arctic.
    - Marine areas and populations in North America have seen the benefits of an ECA since 2013.
    - The Arctic was excluded from the NA ECA due to a lack of data and less shipping activity in the region at the time.
  - 3. Shipping activity and resulting air pollution and climate impacts is increasing in the Arctic:**
    - Increased air pollution greatly impacts health and the environment.
    - ECAs can also help reduce climate impacts (e.g., black carbon).
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**Legend / Légende**

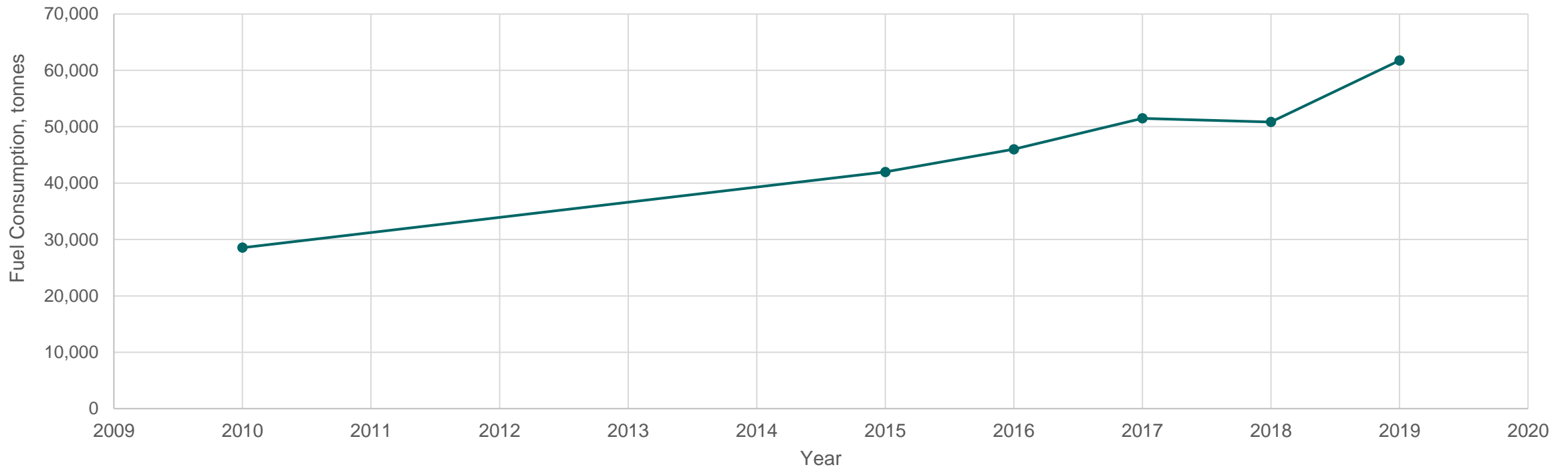
- Proposed Canadian Arctic ECA  
Proposition de la ZCE de l'Arctique canadien
- North American ECA  
ZCE de l'Amérique du Nord



# INCREASED SHIPPING ACTIVITY

- Between 2010 and 2019, fuel consumption by cruise, merchant, and tanker ships in the Canadian Arctic more than doubled.

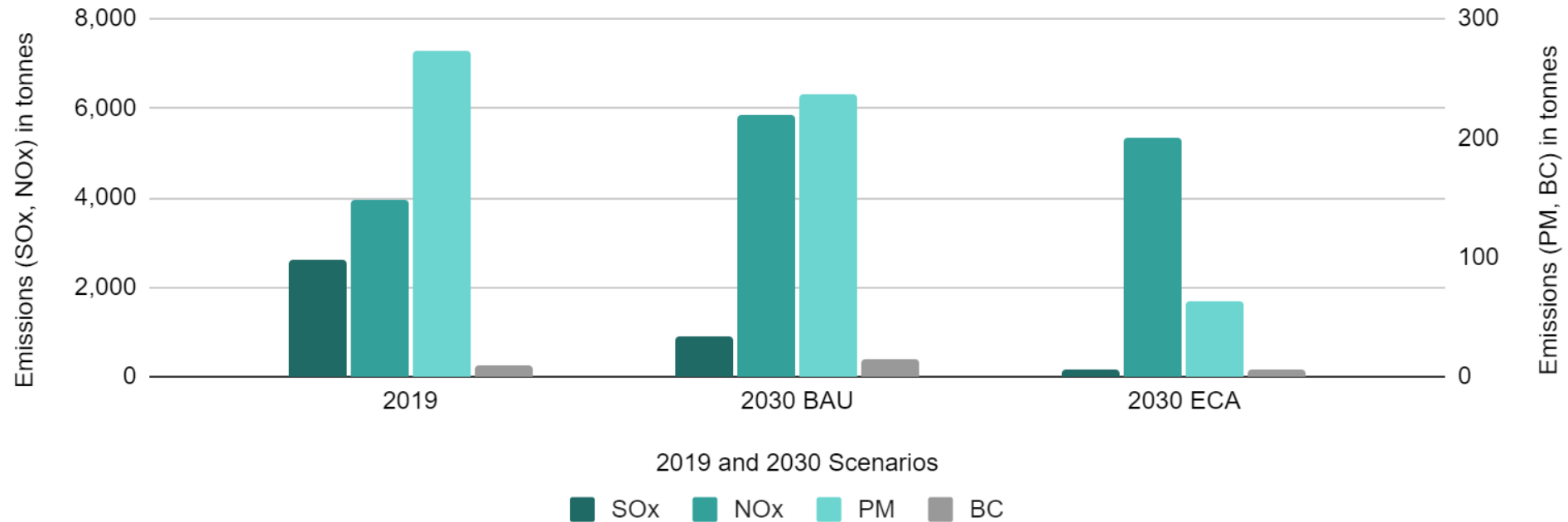
Canadian Arctic fuel consumption (2010-2019) by domestic and international cruise, merchant, and tanker vessels



Ships across this period used various marine fuels, such as HFO, MDO or VLSFO. The fuel efficiencies of different types of marine fuels differ. For consistency, the values above are all converted to equivalent consumption of HFO.

# EMISSIONS REDUCTIONS

Air Pollutant Emissions from Shipping in the Canadian Arctic



% change from 2030 BAU to ECA	SOx	NOx	Total PM	BC
	-80.3%	-8.4%	-73.7%	-58.8%

**2030 BAU (business-as-usual) scenario:** the scenario in 2030 if no additional emissions regulations have been implemented (includes global S cap).

**2030 ECA scenario:** the scenario in 2030 if ECA and HFO ban regulations have been implemented.

# ENVIRONMENTAL & HEALTH BENEFITS

- **Air Pollution and Deposition:**
  - Reduce the warming effects due to Black Carbon\*
    - Should vessels comply with cleaner fuels, we will see black carbon emission reductions from vessels as a result of an ECA
  - Reduce the effects of air pollution, acidification, and eutrophication in the Arctic - Critical loads are already reaching exceedance or are exceeded.
- **Indigenous Populations and Health:**
  - Lower ship emissions:
    - Will reduce impacts to culturally significant areas, upon which Indigenous communities depend for their food security, cultural identity, and way of life.
    - Will help to protect vulnerable populations which can be more sensitive to the adverse health effects of pollution.

*\*Compliance with the use of scrubbers would not result in the black carbon benefits, however Canada plans to work with the maritime industry to develop a path forward to address the use of scrubbers and the issue of washwater discharge in Canadian waters on a permanent basis.*



# WHY DO WE NEED BOTH ECA + THE HFO BAN?

## The HFO ban is a spill risk reduction measure:

- It is necessary to have an ECA + HFO ban because some high-polluting fuels (higher-Sulphur fuels which do not meet the definition of HFO) would otherwise be allowed with just the HFO ban.

## The ECA is an air pollution reduction measure:

- If vessels comply with the ban by using an ECA compliant fuel, then there is no incremental impact of the ECA on existing vessels.

## There is already encouragement for vessels to use cleaner fuels in the Arctic:

- The ECA will ensure the black carbon reductions hoped for though voluntary actions are achieved by regulations for all vessels, which levels the playing field.

## NOx emissions:

- The ECA requires newly built vessels to reduce NOx emissions; the HFO ban does not.

# POTENTIAL ARCTIC ECA TIMELINE

Step	Timeline
<b>Develop the proposal, initial outreach</b> to Indigenous organizations and communities, preliminary international engagement, and stakeholder engagement – <b>ongoing</b>	Now – Dec, 2023
<b>Submit intent paper proposal to IMO – Completed</b> <i>(submission deadline is 9 weeks before meeting).</i>	May 2023
<b>Intent Paper Circulated for Marine Environmental Protection Committee (MEPC) 80th Session – Completed</b>	July 3-7, 2023
<b>Submit proposal to IMO</b> <i>(submission deadline is 13 weeks before meeting).</i>	December, 2023
<b>Proposal approved at MEPC 81th Session</b> <i>(review proposal in plenary, establish technical working group to review proposal, review outcome/recommendations of technical working group, approve proposal if recommended by technical working group).</i>	March 18-22 , 2024
<b>Adoption of ECA at MEPC 82</b> <i>(if approved at MEPC 81, adoption is expected at MEPC 82).</i>	Fall 2024
<b>The Government of Canada will undertake further domestic engagement and incorporate ECA into federal legislation under the <i>Canada Shipping Act</i> (If adopted by the IMO).</b>	2024-2026
<b>ECA entry into force</b>	2027

# CONTACTS

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