



Mapping the threats of oil spills from HFOs to Arctic coastal and marine ecosystems

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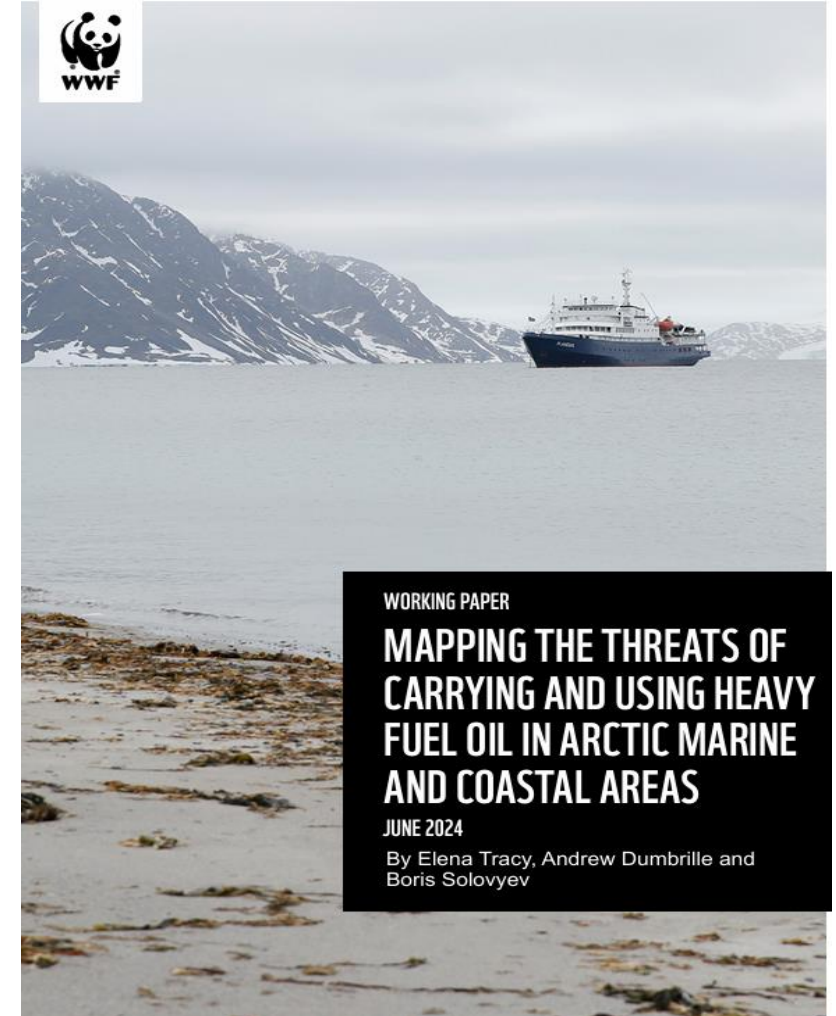
June 25, 2024

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Outline



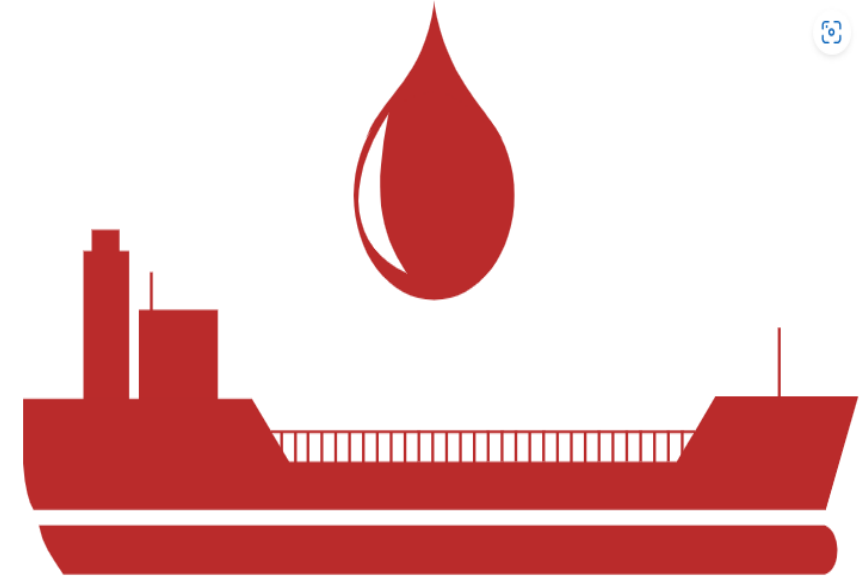
1. Why HFOs are so harmful in the Arctic
2. An analysis of vessel traffic using HFOs in the Arctic
 - Overlying Arctic Council's Arctic Shipping Traffic Data (ASTD) and WWF GAP's marine biodiversity database (ArcNet)
 - Focusing on three shipping bottlenecks/ biodiversity hotspots
3. Recommendations



Heavy Fuel Oil in Arctic Marine Environments



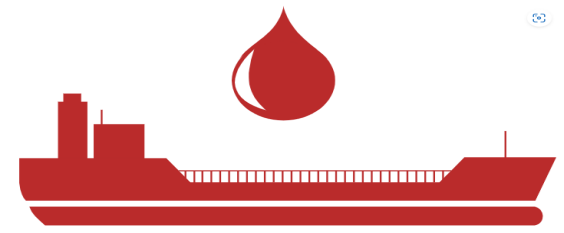
- Persist, does not dissipate
- Sinks and coats the ground
- Emulsifies on water surface
- Mixes with ice or goes beneath ice
- Floats to shorelines, contaminates coastal areas







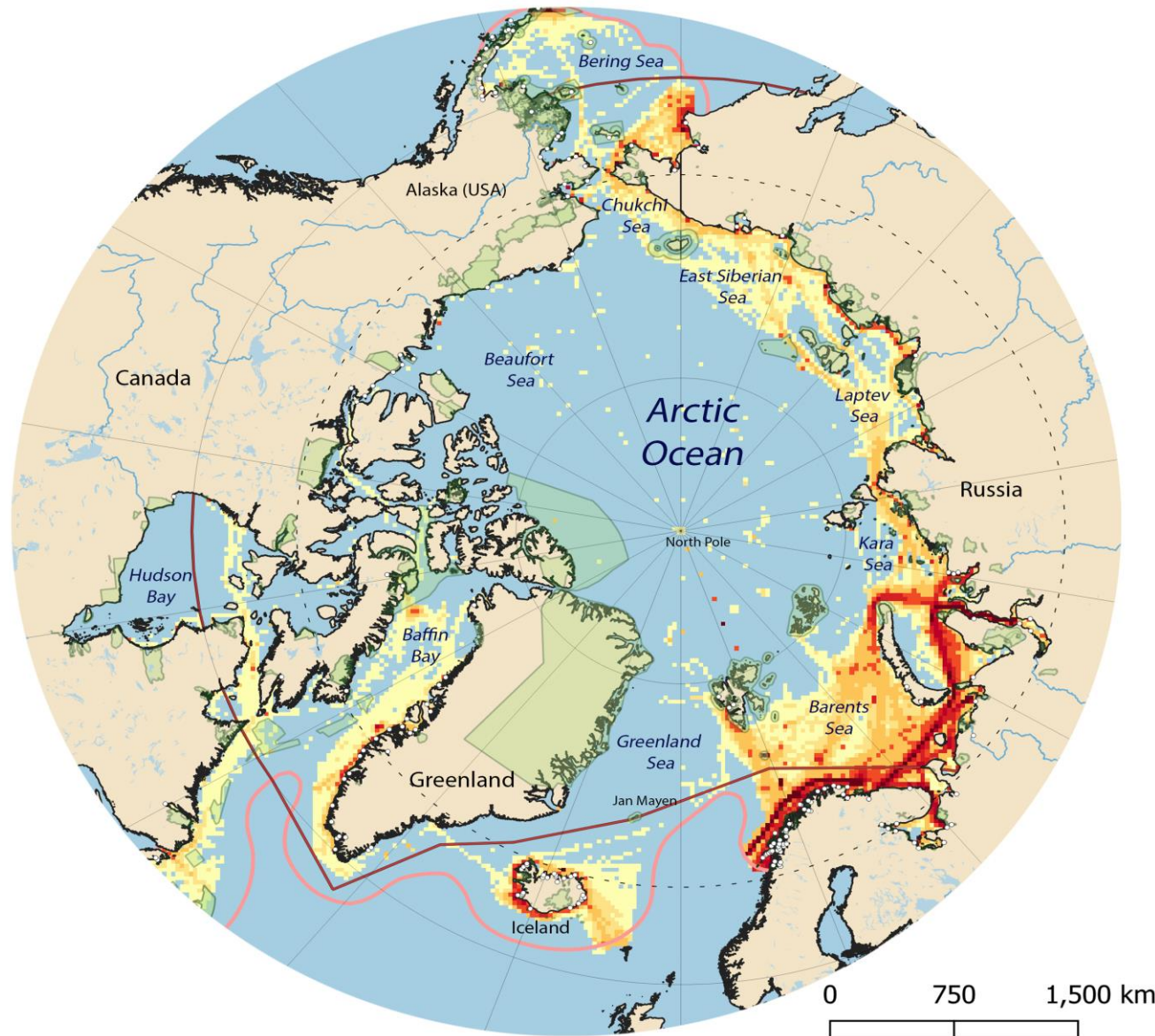
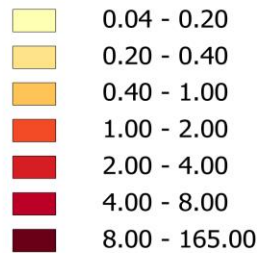




Traffic density of vessels using residual marine fuel in 2021-2023

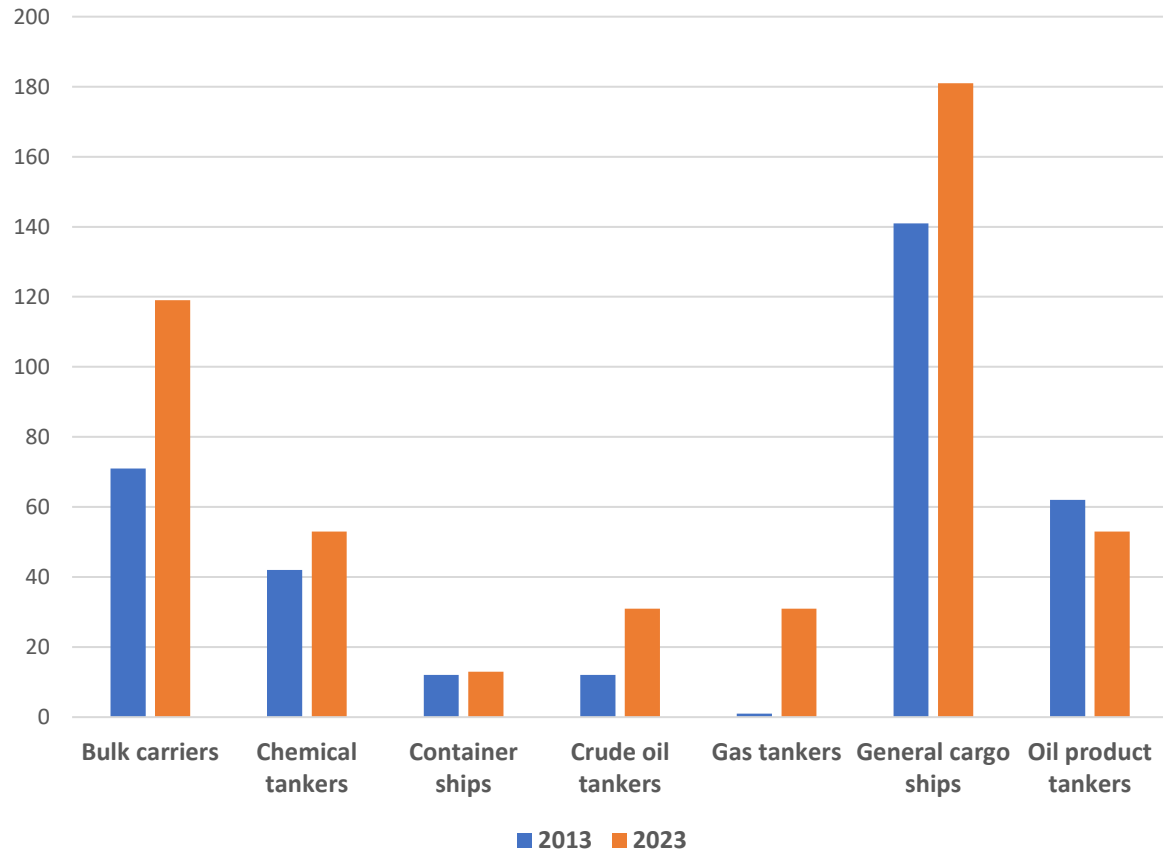
- Port Infrastructure
- - - Arctic Circle
- Polar Code Area Boundary
- Protected Areas
- ArcNet Domain

Shipping Amount

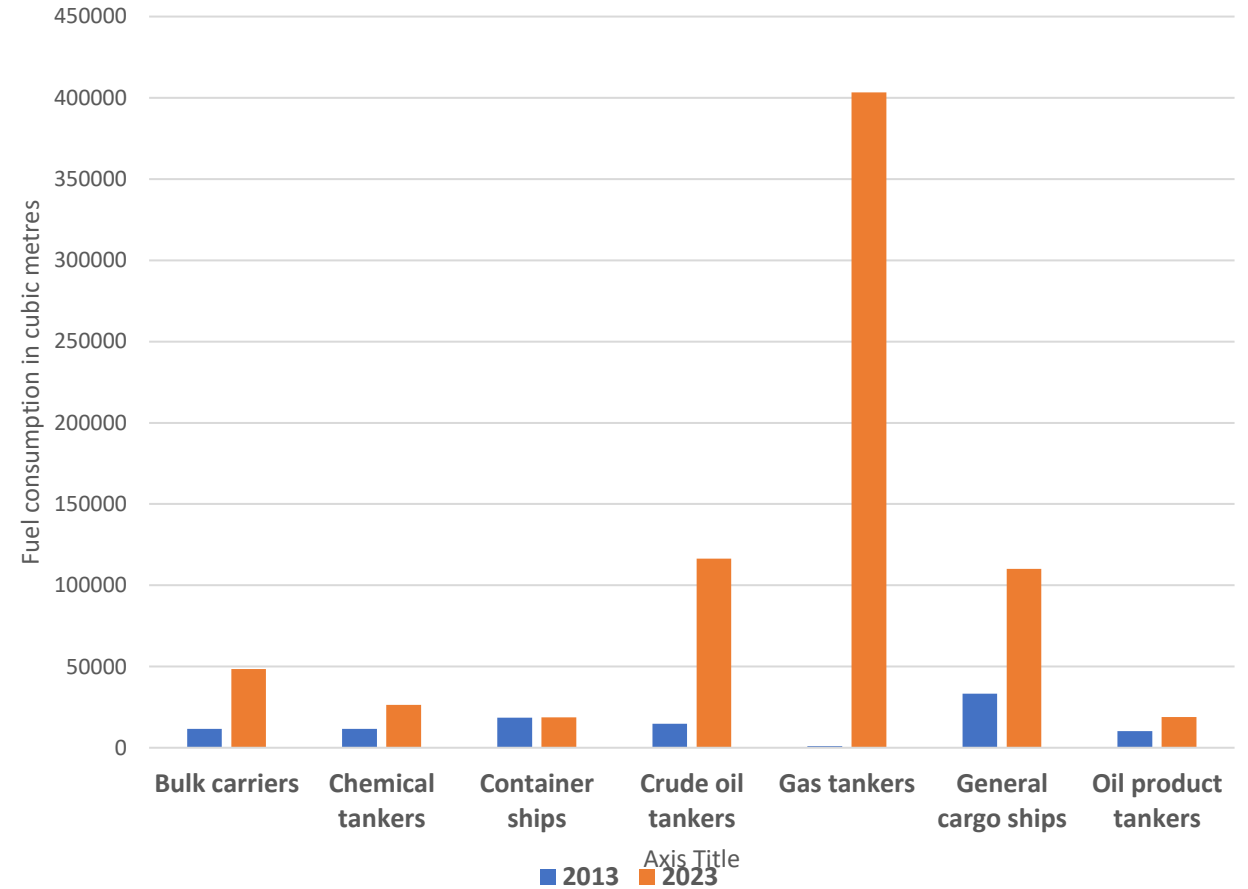


- Bulk carriers
- Passenger ships
- **LNG tankers**
- Oil tankers
- General cargo ships
- Chemical tankers
- Container ships

Number of vessels by type in 2013 and 2023



Fuel consumption by vessel type 2013 and 2023



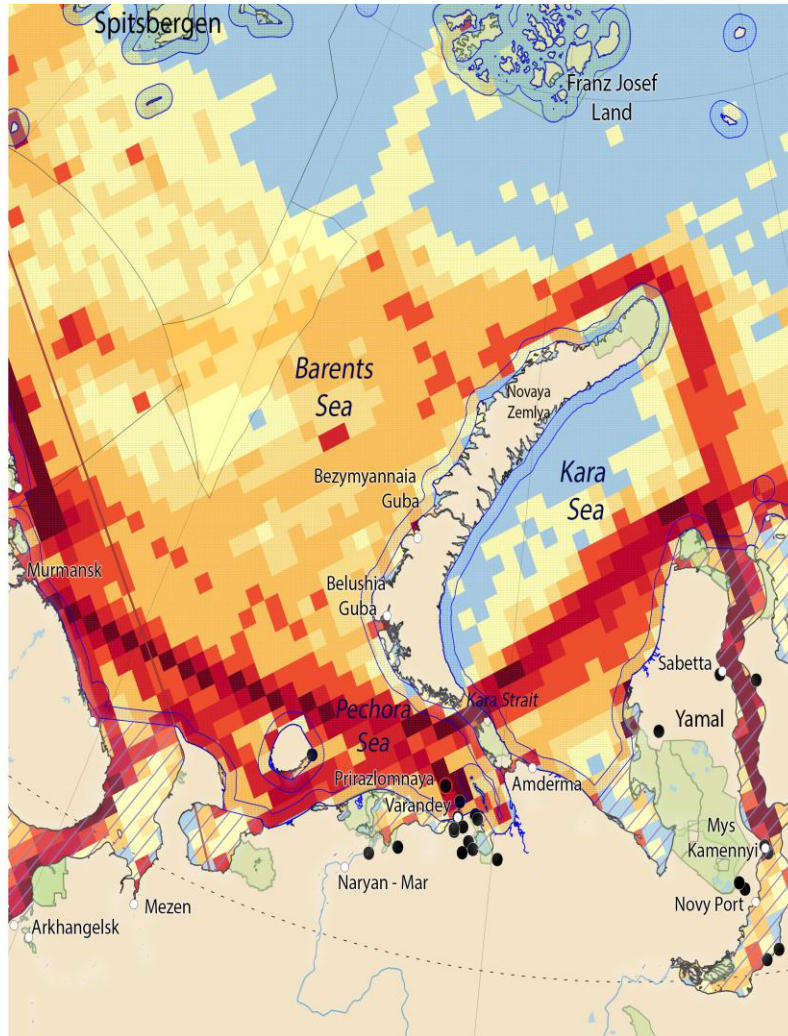
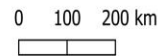
The Kara Strait – Pechora Sea Area



- Oil Terminals and Production Sites
- Prirazlomnaya Oil Platform
- Coastal Communities and Port Facilities
- Arctic Circle
- Polar Code Area Boundary
- Protected Areas
- ∕ Internal Waters
- Territorial Seas
- Exclusive Economic Zone

Shipping Amount

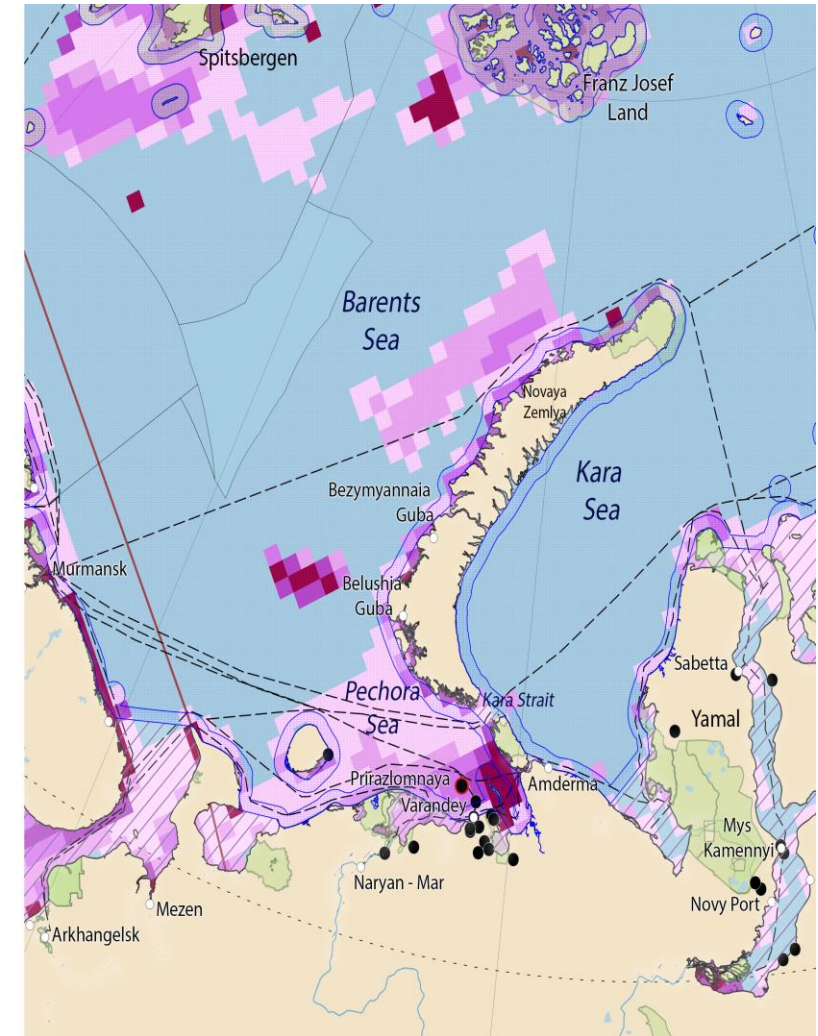
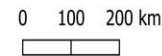
- 0.04 - 0.20
- 0.20 - 0.40
- 0.40 - 1.00
- 1.00 - 2.00
- 2.00 - 4.00
- 4.00 - 8.00
- 8.00 - 165.00



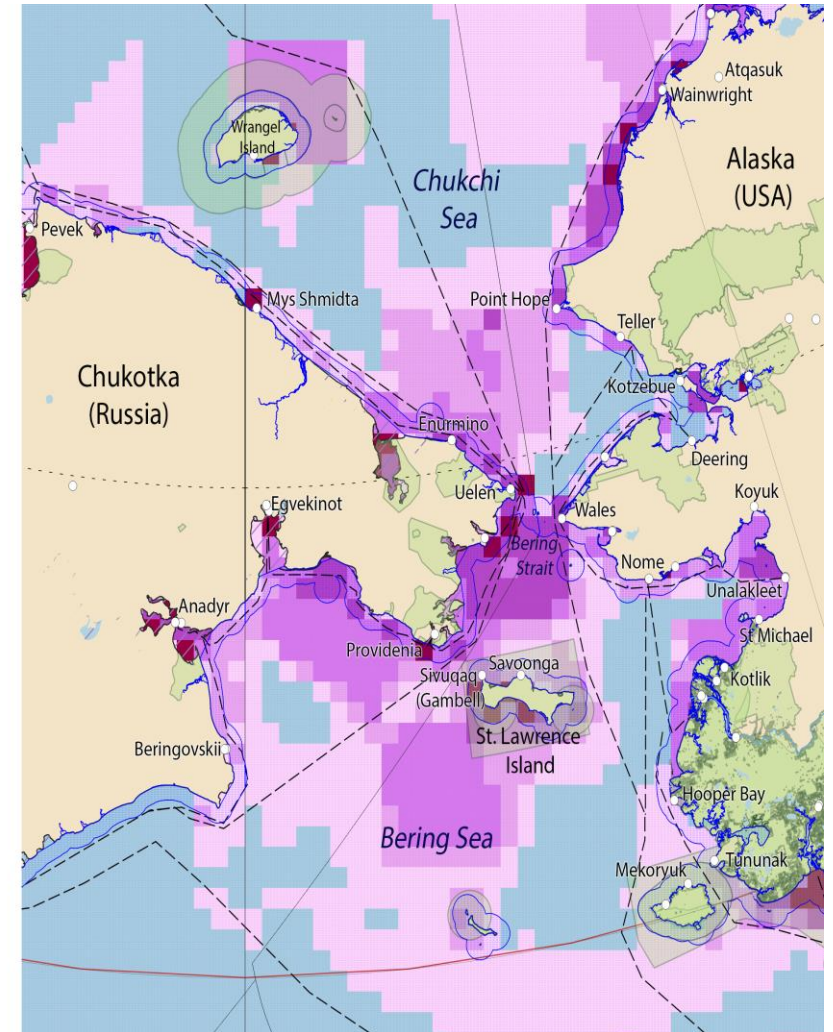
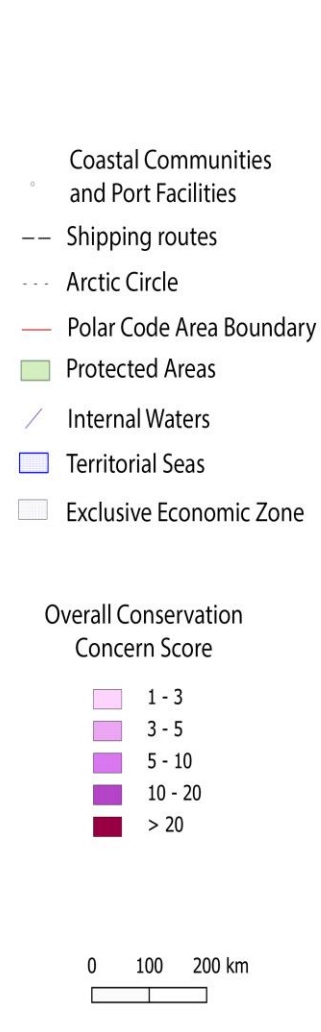
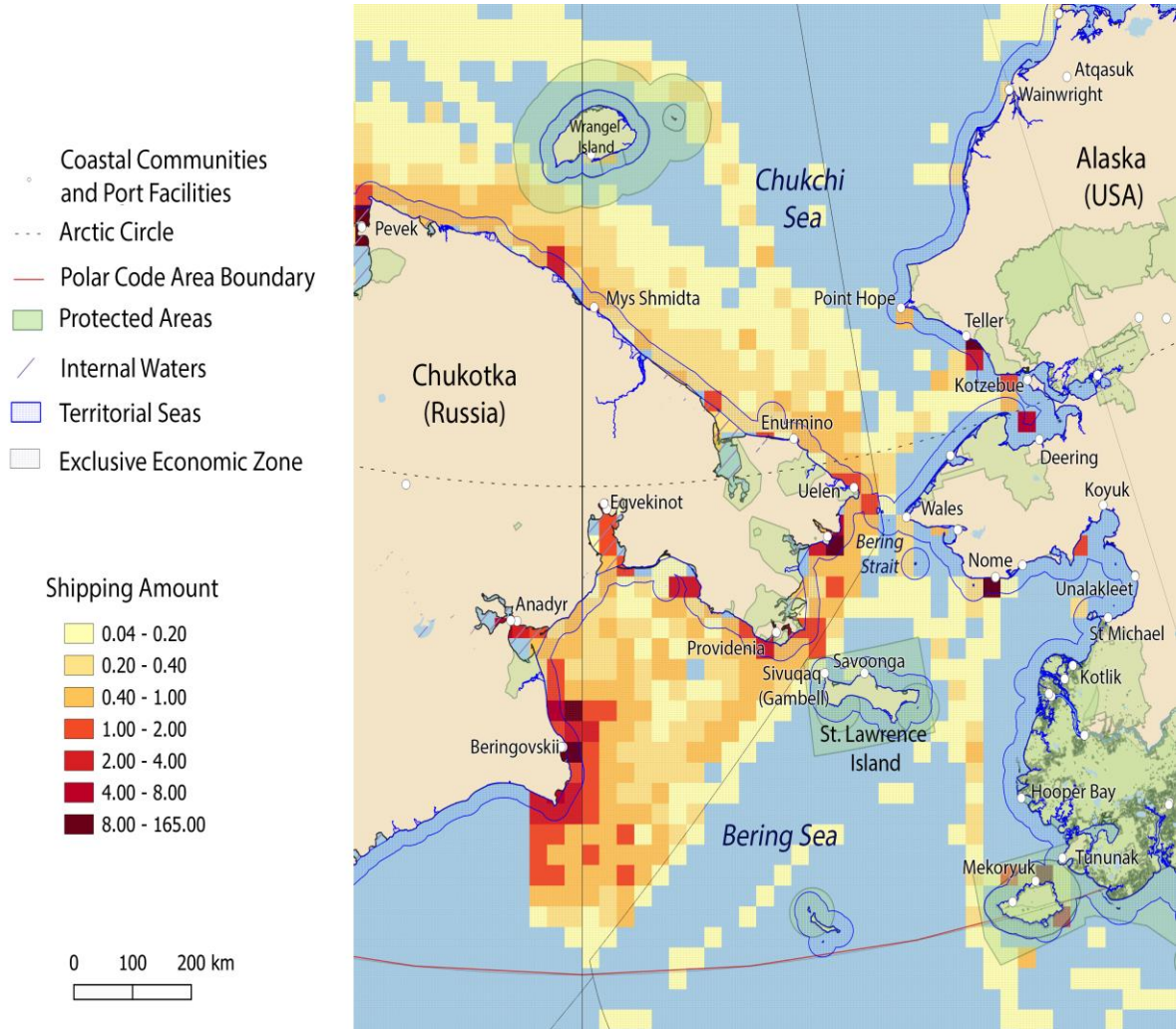
- Oil Terminals and Production Sites
- Prirazlomnaya Oil Platform
- Coastal Communities and Port Facilities
- Shipping routes
- Arctic Circle
- Polar Code Area Boundary
- Protected Areas
- ∕ Internal Waters
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Overall Conservation Concern Score

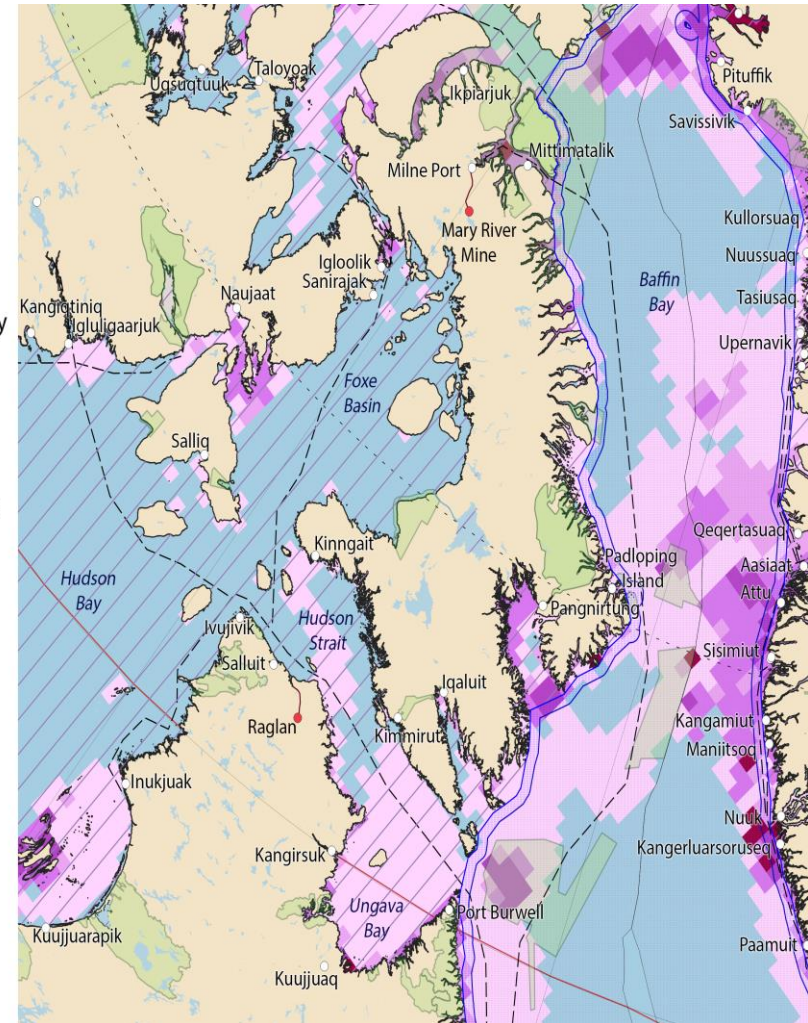
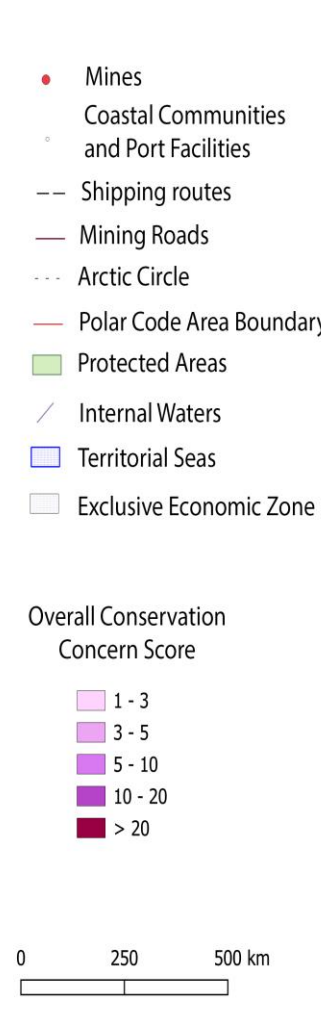
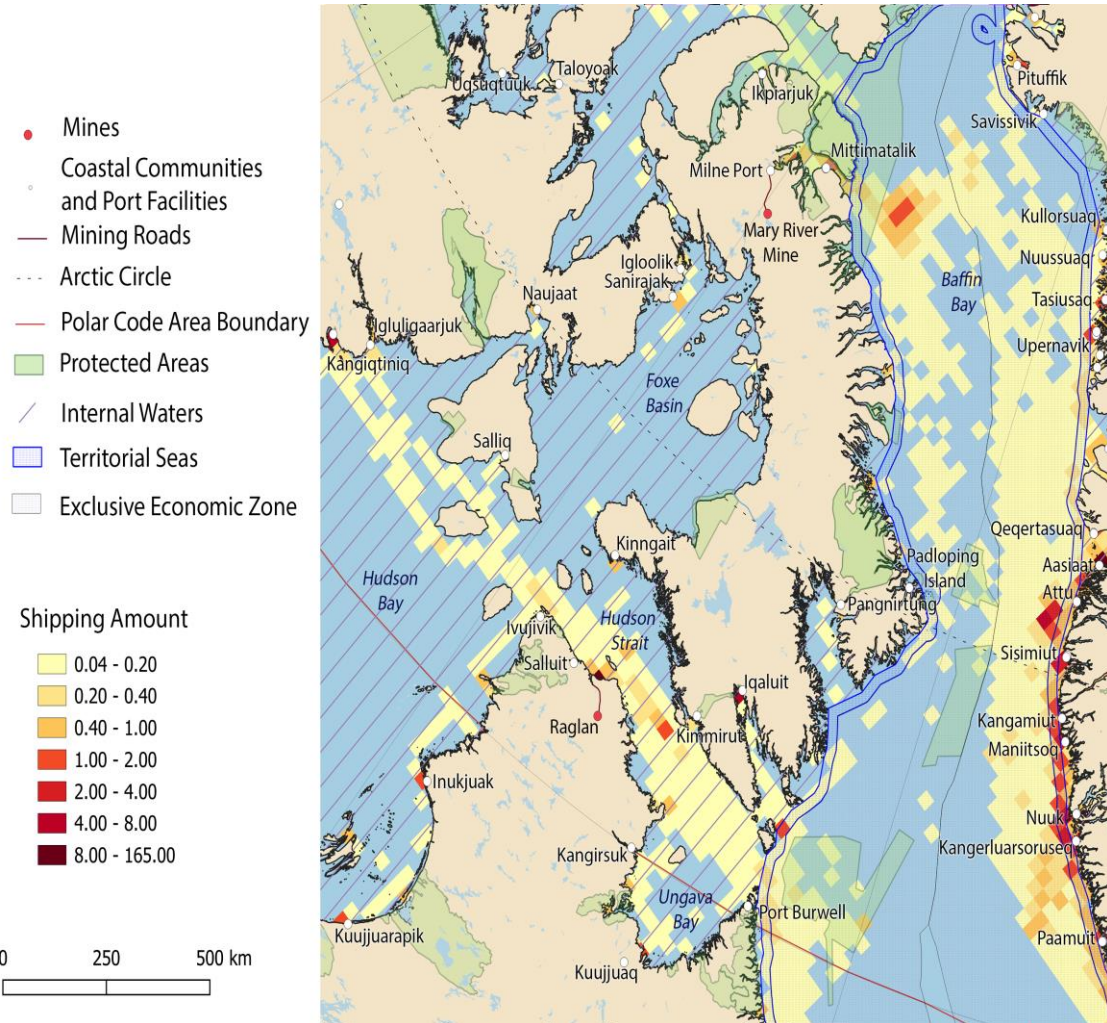
- 1 - 3
- 3 - 5
- 5 - 10
- 10 - 20
- > 20



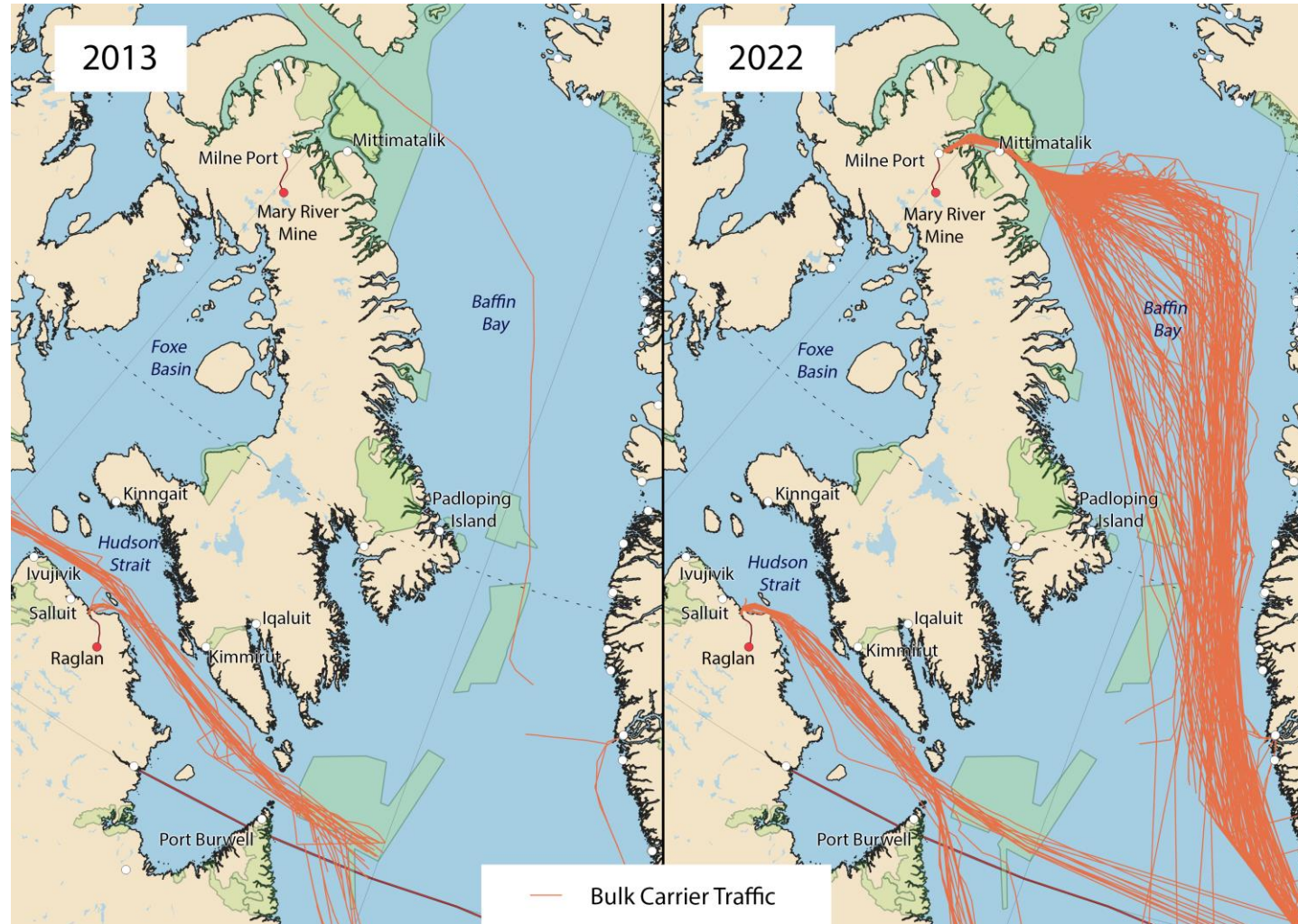
The Bering Strait Area



The Davis Strait, Baffin Bay and Hudson Strait Area



Changes in Bulk Carrier Traffic , 2013 and 2023



Fully implement the HFO Ban (no waivers to domestic vessels by Arctic coastal states, no exemptions because of design/ fuel tank)

- Switch to cleaner fuels/ alternative propulsion; establish more Emission Control Areas (ECAs)
- **Area-based conservation measures:** keeping vessels away from marine sensitive areas and harvesting sites of animals (areas to avoid, speed reduction, re-routing, special pilotage regimes to reduce impact on biodiversity)
- Mandating oil and gas tankers, LNG tankers, bulk carriers and cargo vessels operating in the Arctic to meet the ice strengthening requirements of the Polar Code

“To understand the sea is to embrace its complexity and beauty, to appreciate its power and vulnerability”

Rachel Carson, *The Sea Around Us* (1951)



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