

**MEMORANDUM ATTACHMENT A
ARCTIC BOUNDARY MAPS**



Figure 1 – Arctic Ocean regional seas

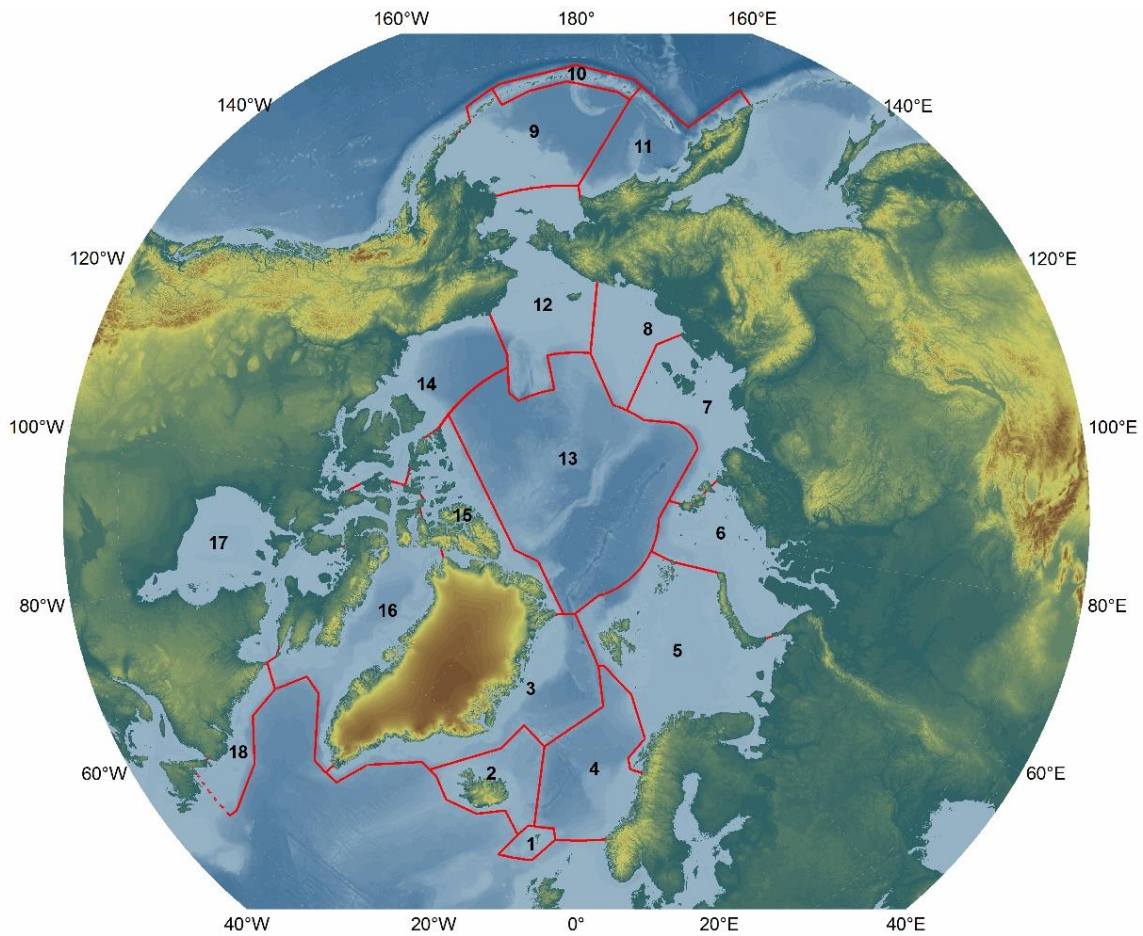


Figure 2 – Arctic Council PAME LMEs utilized by the IPCC

- | | |
|------------------------------|--|
| 1: Faroe Plateau LME | 10: Aleutian Islands LME |
| 2: Iceland Shelf and Sea LME | 11: West Bering Sea LME |
| 3: Greenland Sea LME | 12: Northern Bering - Chukchi Seas LME |
| 4: Norwegian Sea LME | 13: Central Arctic LME |
| 5: Barents Sea LME | 14: Beaufort Sea LME |
| 6: Kara Sea LME | 15: Canadian High Arctic - North Greenland LME |
| 7: Laptev Sea LME | 16: Canadian Eastern Arctic - West Greenland LME |
| 8: East Siberian Sea LME | 17: Hudson Bay Complex LME |
| 9: East Bering Sea LME | 18: Labrador – Newfoundland LME |

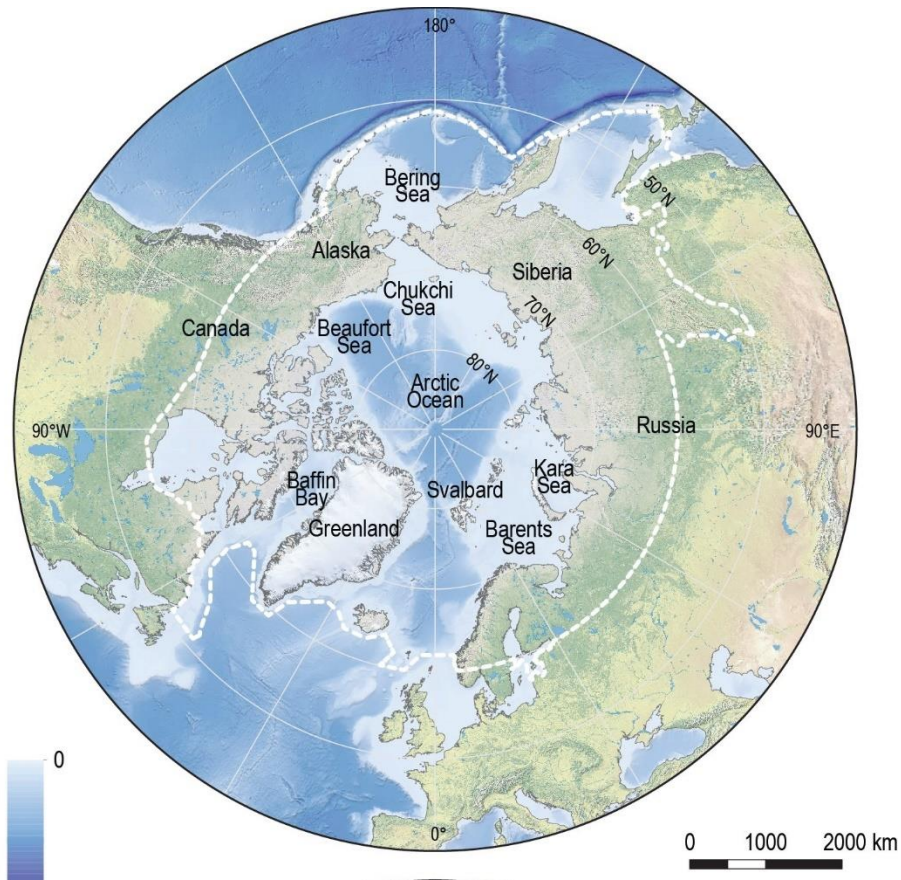


Figure 3 – IPCC Arctic Boundary reflecting Arctic Council PAME LMEs



Figure 4 – IMO Polar Code Arctic Waters boundary

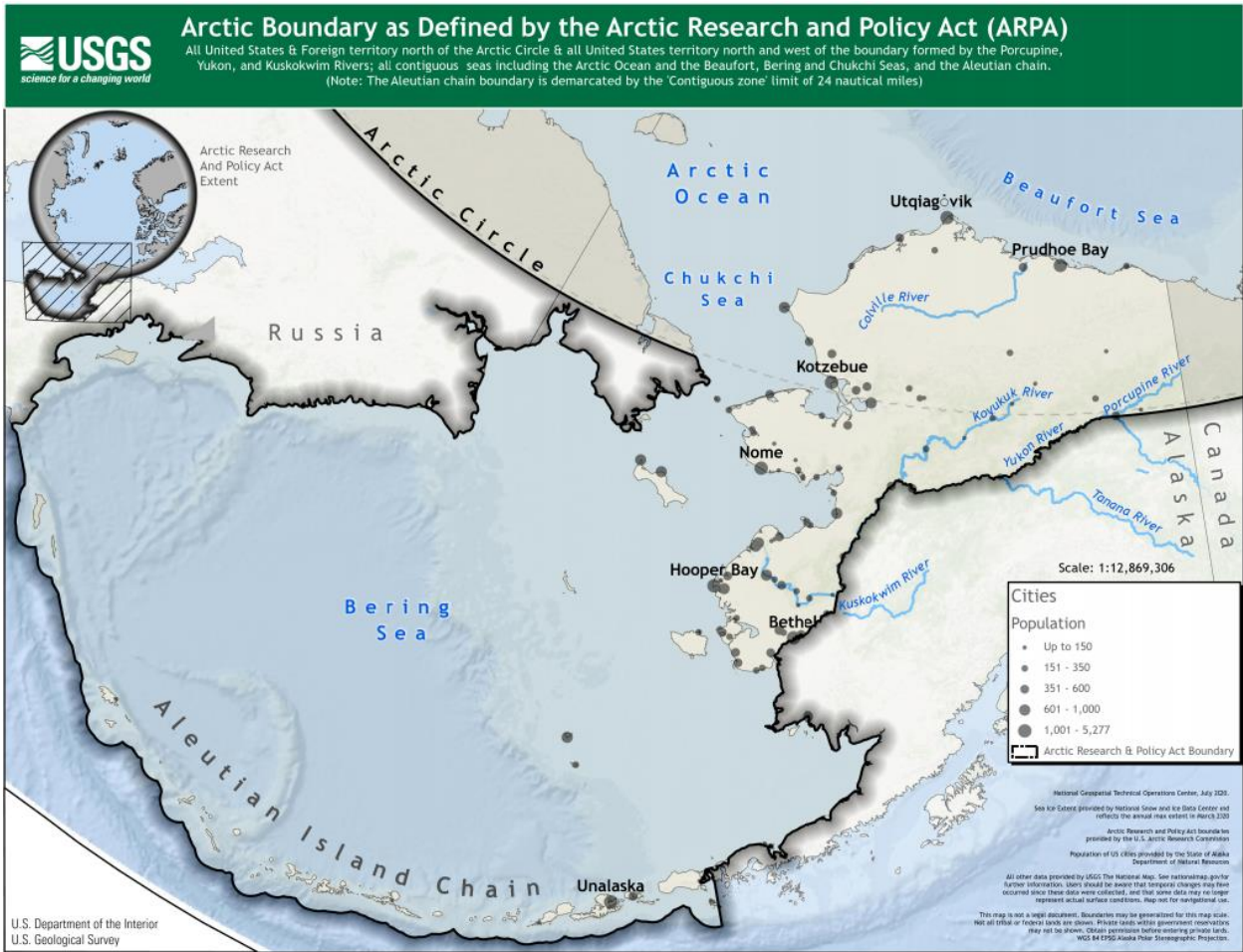


Figure 5 – Arctic Boundary as defined by 15 USC § 4111



Figure 6 – Detail of the Arctic Circle, referenced in 15 USC § 4111

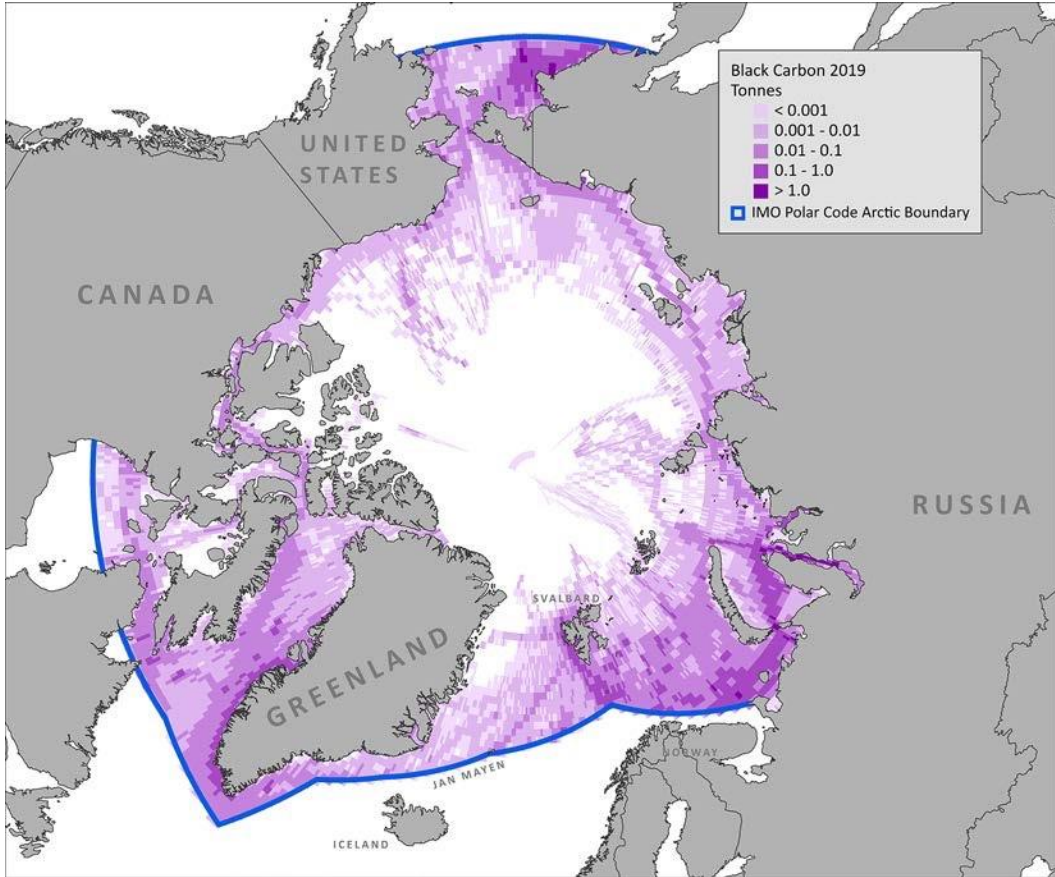


Figure 7 – Black carbon emissions from shipping within Polar Code Arctic boundaries

ATTACHMENT A REFERENCES

Figure 1 – Arctic Ocean regional seas

National Snow and Ice Data Center, *Map of the Arctic Ocean*
<<https://nsidc.org/arcticseaicenews/map-of-the-arctic-ocean/>>

Figure 2 – Arctic Council PAME LMEs utilized by the IPCC

Arctic Council, Protection of the Arctic Marine Environment Working Group, *Large Marine Ecosystems (LME's) of the Arctic*
<<https://www.pame.is/projects/ecosystem-approach/arctic-large-marine-ecosystems-lme-s>>

Figure 3 – IPCC Arctic Boundary reflecting Arctic Council PAME LMEs

Intergovernmental Panel on Climate Change, *The Ocean and Cryosphere in a Changing Climate* (Sept 2019) ch 3, 211, figure 3.2 <<https://www.ipcc.ch/srocc/>> <<https://www.ipcc.ch/srocc/chapter/chapter-3-2/>>

Figure 4 – IMO Polar Code Arctic Waters boundary

International Maritime Organization, *International Code for Ships Operating in Polar Waters*, MEPC 68/21/Add.1 Annex 10, 3 (2015) figure 2, *Maximum extent of Arctic waters application*
<<https://www.wcdn.imo.org/localresources/en/MediaCentre/HotTopics/Documents/POLAR%20CODE%20TEXT%20AS%20ADOPTED.pdf>>

Figure 5 – Arctic Boundary as defined by 15 USC § 4111

United States Geological Survey, *Arctic Boundary as Defined by the Arctic Research and Policy Act – AK* (Dec 23, 2020)
<<https://www.usgs.gov/media/images/arctic-boundary-defined-arctic-research-and-policy-act-ak>>

Figure 6 – Detail of the Arctic Circle, referenced in 15 USC § 4111

Ohio State University, *Beyond Penguins and Polar Bears, Where Does the Arctic Begin? End?*
<<https://beyondpenguins.ehe.osu.edu/where-does-the-arctic-begin-end>>

Figure 7 – Black carbon emissions from shipping within Polar Code boundaries

International Council on Clean Transportation, Bryan Comer, et al, *White Paper: The International Maritime Organization's Proposed Arctic Heavy Fuel Oil Ban: Likely Impacts and Opportunities for Improvement* (Sept 2020) figure 3, *Black carbon emissions from Arctic shipping (all fuels) in 2019*
<<https://theicct.org/publications/analysis-HFO-ban-IMO-2020>>