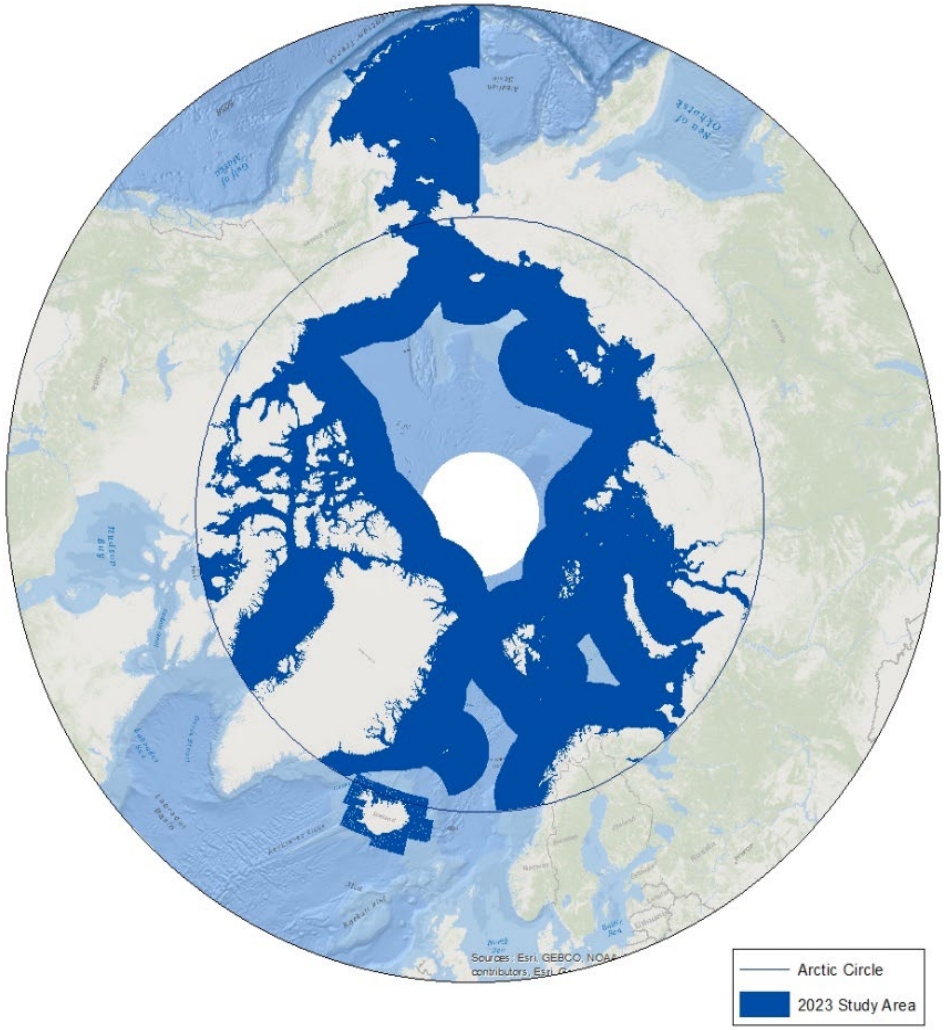


Arctic Hydrographic Risk Assessment

2023 Update

ARHC13 - Nuuk

September 2023

ARCTIC REGIONAL HYDROGRAPHIC COMMISSION

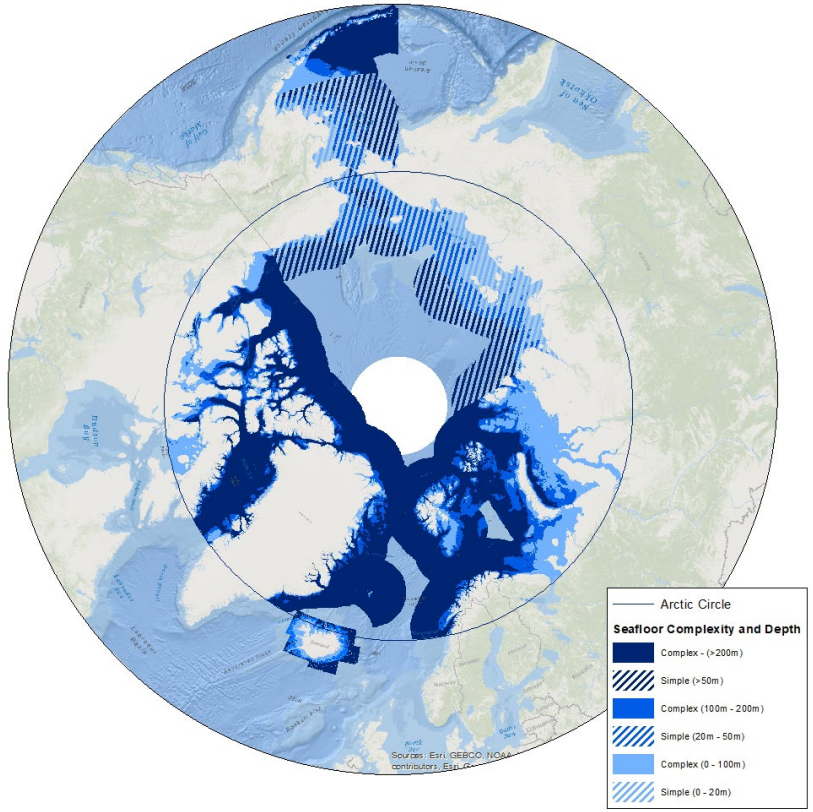
Outline

- Background
- 2023 Updates
- What did we see?
- What did we learn?
- Where do we go from here?

A bowhead whale swims in the Arctic. Credit: Alaska North Slope Borough/Vicki Beaver

Background

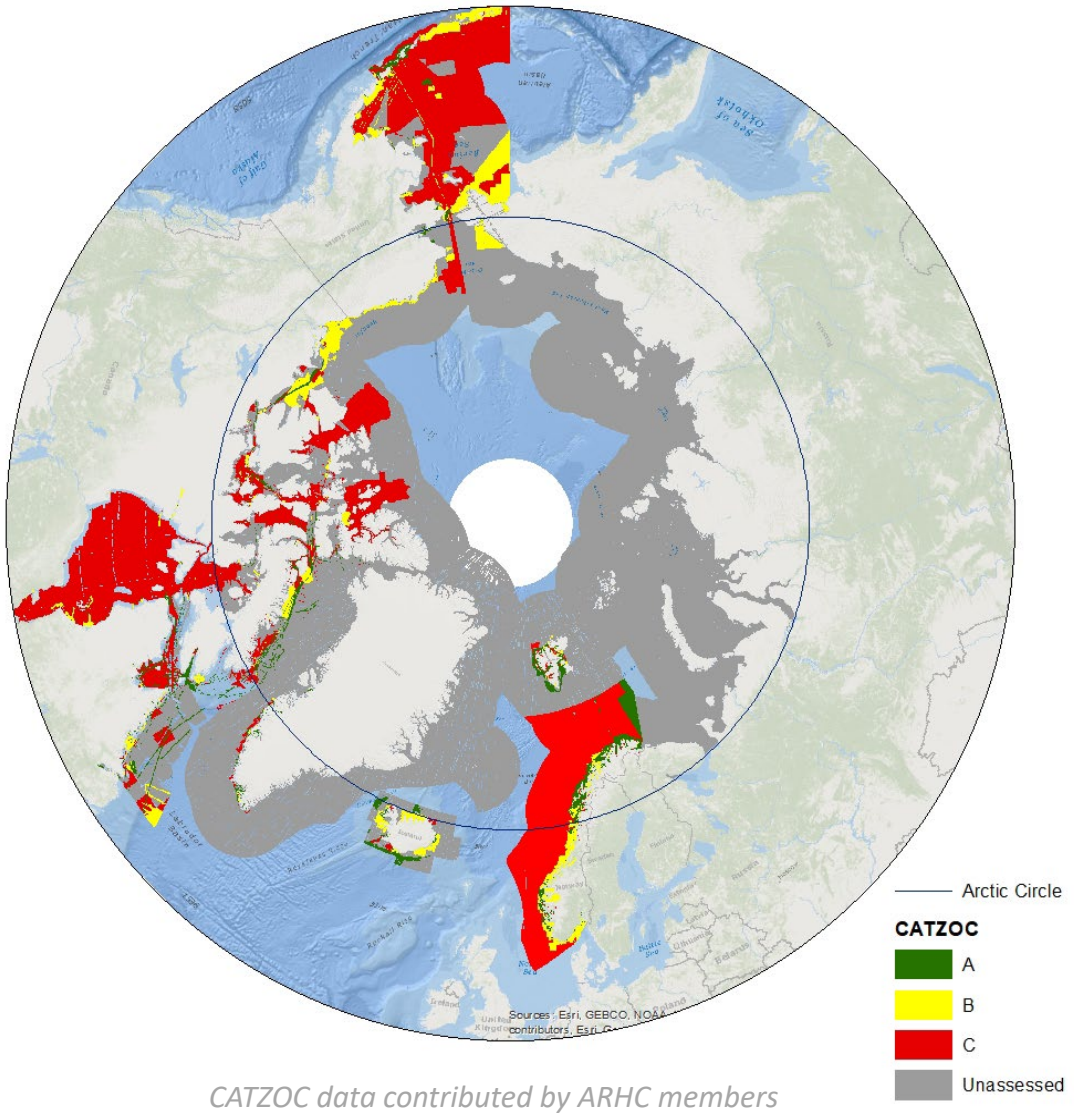
- Continuation of study that started in 2015
  - Last updated in 2018 at ARHC8
- Study analyzes the hydrographic risk across the Arctic
- Essential Question: *How well does our hydrographic data support vessel traffic?*
  - Study identifies areas of concern based on quality of hydrographic data versus seafloor complexity
  - Combined with vessel traffic to get more holistic sense of risk



Potential Concern for Navigation				
	Confidence Level			
	A	B	C	U
Depth Band				
Shallow	Low	Medium	High	High
Mid-depth	Low	Medium	High	High
Deep	Low	Low	Low	Medium

2023 Updates

- Title changed from "*Arctic Hydrographic Adequacy*" to "*Arctic Hydrographic Risk Assessment*"
  - "Adequacy" has come to have specific meanings under C-55, as well as IHO SPI 1.2.2 and 2.2.1
  - "Risk Assessment" more appropriately captures objectives of study
- Complete CATZOC data sets
  - Simplifies analysis and allows for direct comparisons across the region
  - Thank you for your data contributions!
- New source for AIS data
  - Commercial vendor used by partners at NGA
  - Provided high resolution data aggregated into total vessel hours per cell, allowing for greatly simplified analysis



CATZOC data contributed by ARHC members

What did we see?

Areas of Potential Concern with High Consequence Traffic

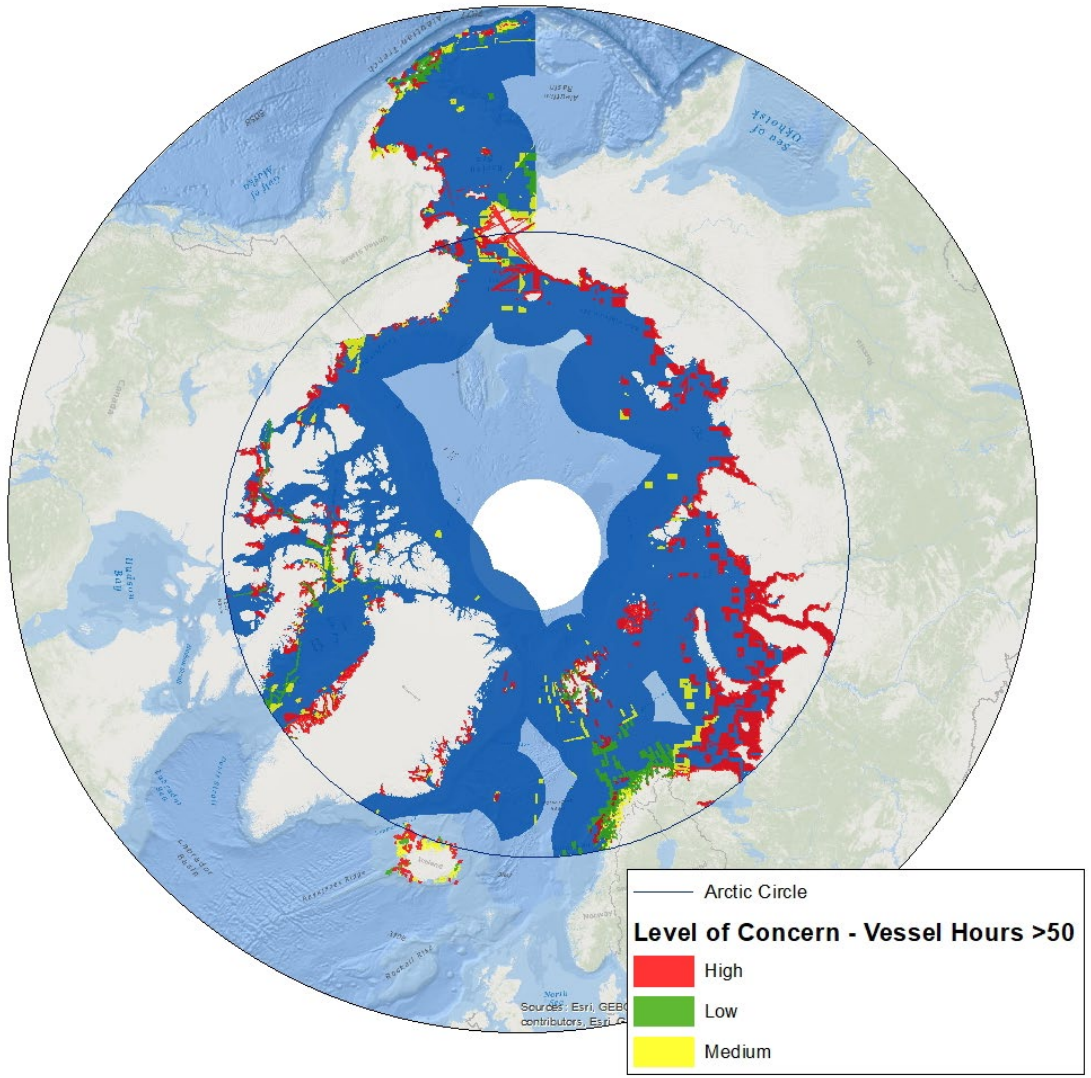
	High			Medium			Low			Total		
Depth Bands	M km^2	% of Study Area	% of Traffic Area	M km^2	% of Study Area	% of Traffic Area	M km^2	% of Study Area	% of Traffic Area	M km^2	% of Study Area	% of Traffic Area
Shallow	1.06	8.61%	25.42%	0.14	1.14%	3.36%	0.06	0.49%	1.44%	1.26	10.24%	30.22%
Mid-Depth	0.77	6.26%	18.47%	0.09	0.73%	2.16%	0.06	0.49%	1.44%	0.92	7.47%	22.06%
Deep	-	0.00%	0.00%	0.78	6.34%	18.71%	1.21	9.83%	29.02%	1.99	16.17%	47.72%
Total	**1.83**	**14.87%**	**43.88%**	**1.01**	**8.20%**	**24.22%**	**1.33**	**10.80%**	**31.89%**	**4.17**	**33.87%**	**100.00%**

High Consequence Traffic: Tankers, Cargo, Fishing, Icebreakers, Passengers, etc.

Difference Between 2018 and 2023 Reports for Areas of Potential Concern with Traffic

	High			Medium			Low			Total		
Depth Bands	Δ M km^2	Δ % of Study Area	Δ % of Traffic Area	Δ M km^2	Δ % of Study Area	Δ % of Traffic Area	Δ M km^2	Δ % of Study Area	Δ % of Traffic Area	Δ M km^2	Δ % of Study Area	Δ % of Traffic Area
Shallow	0.36	2.61%	4.42%	0.04	0.14%	1.36%	0.06	0.49%	1.44%	0.46	3.24%	7.22%
Mid-Depth	0.17	0.26%	-2.53%	0.09	0.73%	1.16%	0.06	0.49%	1.44%	0.32	1.47%	0.06%
Deep	-	0.00%	0.00%	(0.02)	-0.66%	-7.29%	0.41	2.83%	1.02%	0.39	2.17%	-6.28%
Total	**0.53**	**2.87%**	**1.88%**	**0.11**	**0.20%**	**-4.78%**	**0.53**	**3.80%**	**3.89%**	**1.17**	**6.87%**	**1.00%**

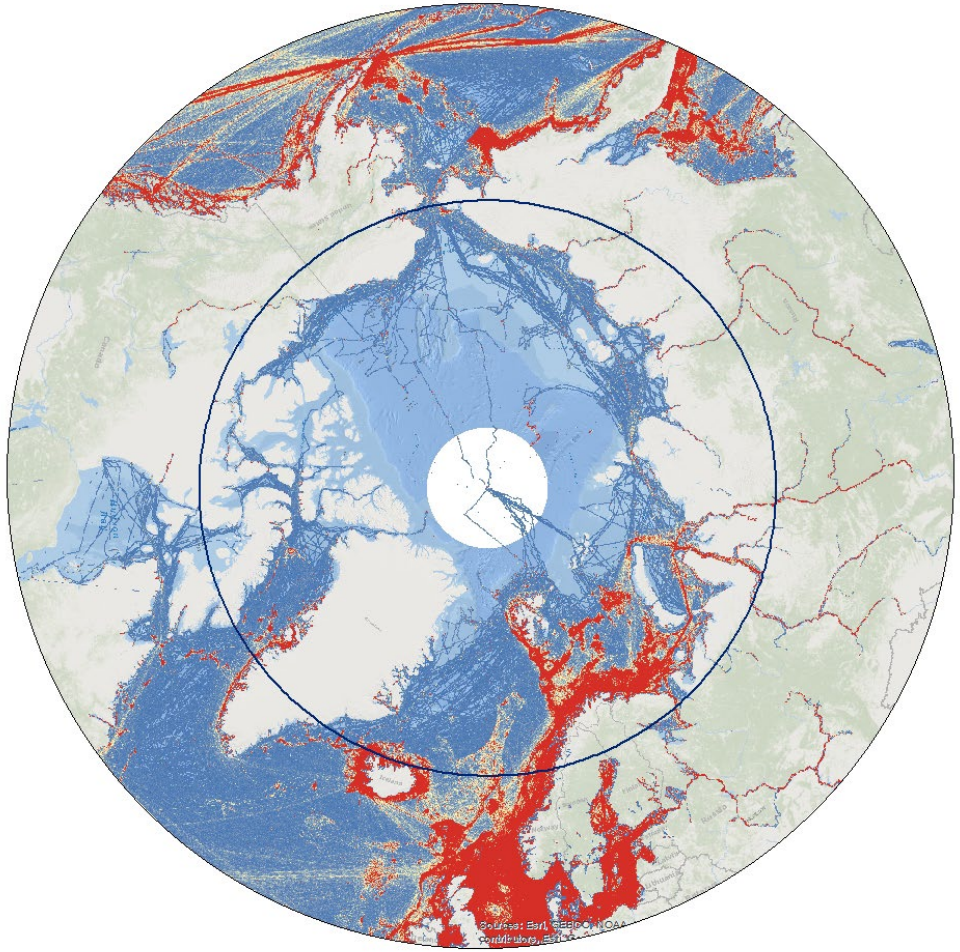
Positive values indicate an increase from 2018 to 2023, negative values indicate a decrease



Heat map showing areas of highest concern with highest vessel use

What did we learn?

- Traffic still appears to be increasing in region, but highest concerns are still limited to small areas
  - Focused survey efforts can have significant positive outcomes
- Higher traffic growth in areas of low concern than high concern
  - Attributed to survey efforts & improved CATZOC attribution
- Improvements in data sources, CATZOC and AIS, allowed for a simpler and faster process
  - Makes studies like this more approachable to others



Heat map of vessel traffic for 2023 for high consequence vessels

Where do we go from here (long term)?

- Continuing to regularly perform this broad analysis provides a baseline and helps us define more focused questions such as:
  - What types of vessels create the most risk?
    - Can a better understanding of vessel activities help refine this analysis?
  - How does seasonality and ice influence traffic patterns?
    - Can ice models help us focus surveying resources?
  - How does the potential risk relate to the potential consequences?
    - Can we take social/cultural impacts into account as we work to address the various navigation risks in our region?
  - How might risks change with a new Arctic port, or established routes?
    - Sensitivity analysis to possible changes to traffic patterns or to surveyed area

Where do we go from here (short term)?

- We welcome the ARHC's feedback to:
  - Discuss the report and this presentation
  - Offer guidance on any recommended revisions
  - Provide guidance on submission to PAME
  - Take any other actions deemed warranted

Whale Bone Arch, Utqiaġvik, Alaska

Thank you!

Questions?

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