

Martin MJ, Halliday WD, Ferguson SH, Young BG, Charish R, Dawson J, Fortune SME, Juanes F, Qaunaq L, Insley SJ (2024) Exposure of satellite tagged bowhead whales (*Balaena mysticetus*) to transiting vessels in the Eastern Canadian Arctic. *Marine Mammal Science* 40: e13125.

What is the research about?

- Increases in vessel traffic due to climate change will cause increases in underwater noise pollution in the Arctic. Bowhead whales are an Arctic resident species, which rely on sound to communicate. Their sounds overlap in the same frequency band with vessel noise.
- Eastern Canada-West Greenland (ECWG) bowhead whales migrate through areas with the highest levels of vessel traffic in the Canadian Arctic. This puts the whales at risk of vessel strike, high noise exposures, and many other potential threats that could harm the population.

What we did:

- We developed a method to document the overlap in space and time between 36 satellite-tagged ECWG bowhead whales and vessels in the Eastern Canadian Arctic during 2012–2017.
- The current study reports locations from satellite tagged ECWG bowhead whales in conjunction with vessel locations derived from satellites, and summarizes the number of vessels encountered by tagged individual whales. We calculated whale encounter rates with vessels on a monthly basis for each year.
- We provide a map of potential hotspot locations for ECWG bowhead whale close encounters with vessels in the Eastern Canadian Arctic.

What we found:

- We report 1,145 occasions when a vessel was within 125 km of a tagged whale during 2012–2018. Of these, 306 occurrences were within distances less than 50 km.
- Our results indicate that ECWG bowhead whales encounter the majority (79%) of vessels annually during August–October, with the highest number of encounters (42%) observed in September. Encounter rates ranged from 0.25 to 0.51 vessels encountered per day per whale during August–October compared to <0.07 vessels per day in all other months in this study.

Our recommendations:

- To better inform conservation strategies, further research is required to assess bowhead whale behavioral responses relative to distance from vessels.

Why is the research relevant to the Inuit people?

- Bowhead whales are of cultural and ecological importance to Inuit.

- It is important to understand how increasing vessel presence could negatively affect the behavior and population status of bowhead whales and therefore have an impact on the Inuit people who rely on them.

Was the community involved?

- Yes. Invaluable logistical support was provided by the Hunters and Trappers Organizations in Igloolik, Sanirajak, and Pangnirtung. Field assistance and vessel operations were provided by Levi Qaunaq and Natalino Piugattak from Igloolik, and Noah Ishulutaq and Timeosie Akpalialuk from Pangnirtung. Levi Qaunaq is a co-author of the publication resulting from this study.