

Halliday WD, Scharffenberg K, MacPhee S, Hilliard RC, Mouy X, Whalen D, Loseto LL, Insley SJ (2019) Beluga Vocalizations Decrease in Response to Vessel Traffic in the Mackenzie River Estuary. *Arctic* 72: 337-346.

What is the research about?

- Ship traffic is increasing throughout the Arctic and may impact marine life, such as beluga whales.
- Belugas have been shown to react to ships that are as far away as 50 km.
- Given that belugas will likely be exposed to an increasing numbers of ships in the future, it is important to understand how increased ship traffic will impact belugas.

What we did:

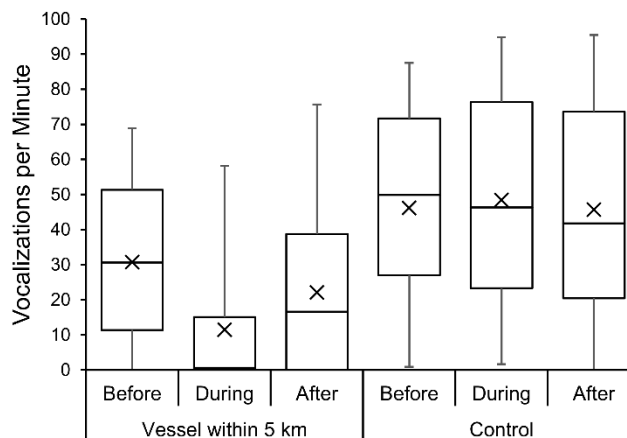
- We recorded underwater acoustic data in Kugmallit Bay of the Mackenzie River estuary each summer, between 2015 and 2018, at multiple sites.
- We counted the number of beluga vocalizations in all of the recordings.
- We used satellite tracking data of ships to see how close individual ships were to each recording site, and then compared the number of beluga vocalizations to the distance to the nearest ship.
- We tested statistically if the number of beluga vocalizations changed in response to ships.

What we found:

- We counted 15 different times when belugas were actively vocalizing and ships were within 10 km and 11 different times when belugas were actively vocalizing and ships were within 5 km of the acoustic recorders.
- The number of beluga vocalizations decreased when ships were within 5 km of recorders.
- Belugas either stopped vocalizing when ships were nearby or they fled the area.
- This result confirms observations by Inuvialuit people who have seen belugas actively moving away from ships.

Key result:

This figure shows that the number of beluga vocalizations decrease when ships are within 5 km of the acoustic recorder, compared to a control period when no ships were within 30 km.



Our recommendations:

- Maintain acoustic monitoring sites (e.g., WCS Canada, DFO) to track the distribution of beluga whales in the western Arctic and to see if belugas change locations when ships are around.
- Find ways to directly measure how belugas and other marine mammals respond to ships, such as by using data from satellite telemetry/tagging studies.
- Use these results to proactively plan for shipping corridors in relation to important marine mammal areas at the western entrance to the Northwest Passage shipping route *before* marine traffic increases. These data could inform the work of the Shipping Working Group as well as Transport Canada and DFO.

Why is this research relevant to the Inuvialuit people?

- Beluga whales and other marine mammals in the region are a critical part of Inuvialuit food sovereignty and have been managed by Indigenous communities for millennia.
- Any impacts of vessel traffic on marine mammals could negatively affect these populations of marine mammals, thereby impacting the Inuvialuit people who rely on them.
- Although this study confirms what the Inuvialuit people have known for years with respect to how belugas react to ships, it is a starting place for future investigations of how belugas and other marine mammals react to ship traffic.

Was the community involved?

- Yes. This work was conducted by DFO and NRCan out of Tuktoyaktuk. We are grateful to assistance in the field by E. Way-Nee, J. Pascal, D. Swainson, K. Tingmiak, A. Gordon Jr., J. Pokiak, A. Robertson, P. Lennie, and our camp hosts, C. Day, B. Joe, and F. Angasuk.

Where can I get more information about this project?

- William Halliday and Stephen Insley are scientists with Wildlife Conservation Society (WCS) Canada (www.wcscanada.org): whalliday@wcs.org; sinsley@wcs.org
- Other information: <http://data.nwtresearch.com/Scientific/16330>; <http://data.nwtresearch.com/Scientific/15470>; www.arcticnoise.ca