

Insley SJ, Halliday WD, de Jong T (2017) Seasonal patterns in ocean ambient noise near Sachs Harbour, Northwest Territories. *Arctic* 70: 239-248.

What is the research about?

- Climate change can make the marine environment noisier than it currently is and impact marine mammal movement and behaviour (e.g., communication) in the Arctic Ocean.
- Sea ice dampens underwater ambient noise levels, helping keep the marine environment quiet. Warming temperatures reduce sea ice, which may lead to a noisier marine environment.
- Reduced sea ice enables shipping and industrial development in the Arctic. Marine traffic increases underwater noise levels, which can affect marine mammal movement and behaviour.

What we did:

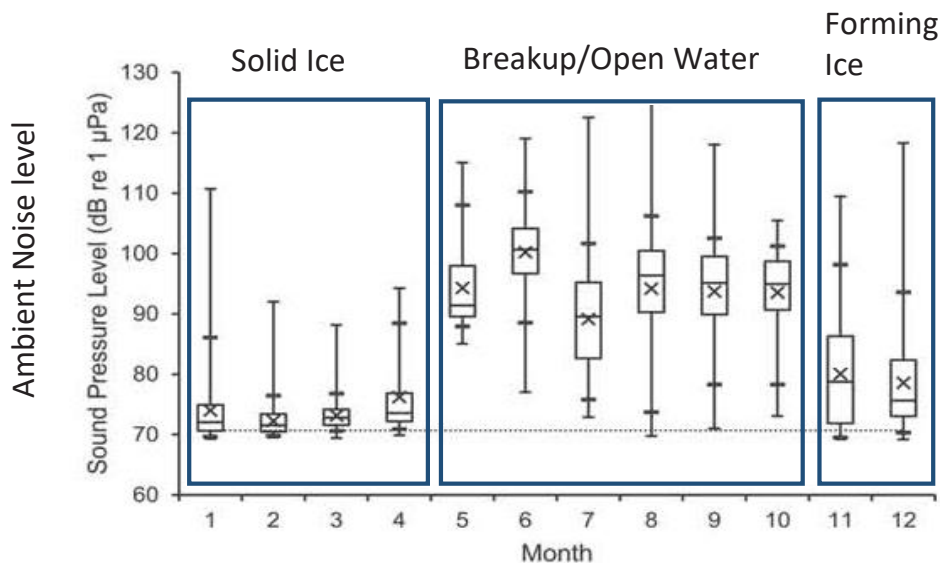
- We recorded local underwater ambient noise levels using two acoustic recorders (hydrophones) anchored to the ocean floor near Sachs Harbour from May 2015 to July 2016.
- We developed statistical models to determine what the best predictor of underwater ambient noise was in the study area.

What we found:

- During January-April, increased sea ice cover helped create quiet conditions underwater. During May to October, it was noisier underwater due to broken sea ice, wind activity, and the interaction of these factors.
- Overall, the underwater marine environment near Sachs Harbour is quiet, with ambient noise levels that are comparable to other places in the western Canadian Arctic and Alaska. Ambient noise levels are much lower than at places in the south.

Key result:

This figure shows the ambient noise levels (measured in decibels, dB) during different phases of ice formation near Sachs Harbour. The noisiest times underwater for marine mammals and fish are during breakup and open water and the quietest times are when ice concentration is highest during the winter.



Our recommendations:

- Maintain monitoring sites (e.g., WCS Canada, DFO) to develop a baseline level measurement of underwater ambient noise in the ISR.
- Expand monitoring sites (e.g., Amundsen Gulf, Darnley Bay, Viscount Melville Sound) to characterize and compare other regions in the eastern Beaufort Sea.
- Use these results to proactively plan for shipping corridors at the western entrance to the Northwest Passage shipping route *before* marine traffic increases. This data could inform the Shipping Working Group as well as Transport Canada and DFO.

Why is this research relevant to the Inuvialuit people?

- Marine mammals such as bowhead whales, beluga whales, bearded seals and ringed seals that live in the region use sound to communicate, find food, mates, and avoid predators. They are also a critical part of Inuvialuit food sovereignty and have been managed by Indigenous communities for millennia.
- Any increase in marine vessel traffic has implications not only for the conservation of marine mammals, but for all the Inuvialuit communities that depend on these mammals for nutrition, cultural, and spiritual values.
- Having scientific baseline information at this location will enable the Inuvialuit to make decisions regarding planning and mitigation due to impacts from increased noise and marine traffic on marine mammals in this region.

How was the community involved?

- This work was conducted out of Sachs Harbour. We are grateful to the Sachs Harbour Hunters and Trappers Committee, Wayne Gully, Betty Haogak, Terrence Lennie, Joe Kudak, and Jeff Kuptana for assistance.

Where can I get more information about this project?

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



Noise can disrupt the behaviour of marine mammals, such as bowhead whales