

Dingwall J, Halliday WD, Diogou N, Niemi A, Steiner N, Insley SJ (2024) The Arctic marine soundscape of the Amundsen Gulf, Western Canadian Arctic. *Marine Pollution Bulletin* 204: 116510.

What is the research about?

- Vocalizations made by Arctic marine mammals are critical for hunting, social behaviour, and more. These vocalizations, however, are part of the ocean soundscape, joining many more sources of sounds including wind, ship noise, and the collision of ice.
- With climate change and increased vessel traffic, the soundscape is changing.
- Understanding the primary drivers of the soundscape can provide information for evidence-based conservation planning and decision making.

What we did.

- Measured underwater sound at three sites in the Amundsen Gulf from September 2018 to September 2019, specifically at Pearce Point (350 m depth) and two sites near Cape Bathurst (depths of 50 and 300 m).
- We analyzed the data for the presence of sounds from vessel traffic and sea ice. We also looked for the presence of signals made by marine mammals.
- We took the measured underwater sound levels and assessed how different factors such as weather (air temperature, and wind speed) and sea ice (concentration and thickness), vessel traffic, and marine mammal vocalizations affected sound levels.

What we found.

- The presence of vessel traffic, and particularly large vessels > 100 m, raised sound levels well over background levels. Farther vessels were also quieter than closer vessels.
- When present, bearded seal vocalizations raised sound levels over background levels. Other marine mammal vocalizations were found, on average, to not raise sound levels over background levels.
- Broadband (typically attributed to sea ice collision and cracking) and high frequency (> 4 KHz) signals generated by sea ice raised sound levels over background levels.
- The shallower site had a different soundscapes than the deeper sites.

Our Recommendation

- Maintain long-term acoustic recorder monitoring to track changes in environmental, anthropogenic, and biological interactions with the soundscape as climate change progresses.