



Vessel Underwater Noise Measurement Program: Eclipse Sound, Nunavut

-OVERVIEW-

Research partnership of the University of California San Diego - Scripps Institution of Oceanography, Oceans North, and the Mittimatalik Hunters and Trappers Organization

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OBJECTIVES

1. Measurement of received underwater sound levels from individual ships under controlled operational conditions.
2. Estimate underwater noise source levels for each ship relative to operational characteristics, including vessel speed through the water.
3. Provide original sound recordings and acoustic measurement information to vessel owners/operators and regional resource managers.
4. Contribute to a scientific study of Arctic marine soundscapes and shipping noise.

BACKGROUND

Underwater noise is a concern for management of marine wildlife in Canadian Arctic waters. Recent studies in Canada and Greenland suggest that some species, like narwhal, may be more sensitive to disturbance from ships than other species. Marine mammals are also of vital importance to Inuit in northern communities.

This collaborative research program seeks to provide resource managers and vessel operators with information on underwater noise levels from individual ships and regional patterns of shipping traffic. Vessel owners and operators are invited to contribute to the research by sailing over an acoustic measurement station at the eastern entrance to Eclipse Sound, Nunavut (Figure 1) and filling out a Vessel Transit Data Sheet (Figure 2). Representatives of participating vessels will receive sound measurements and recordings. Measurements will contribute to academic publications and marine spatial planning.

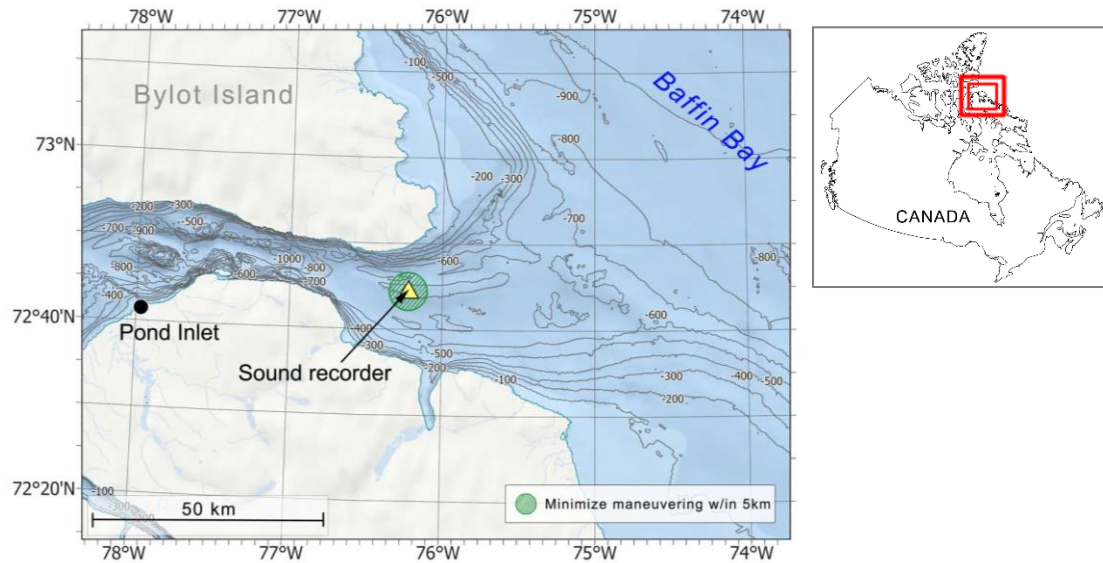


Figure 1. Acoustic recording location on the seafloor at the eastern entrance to Eclipse Sound, Nunavut. Underwater sound is recorded continuously year-round at this location (“Sound recorder”; yellow triangle). Vessels are requested to pass directly over this recording location, holding a constant course and speed while within a 5 km range to recording location (green circle).

HOW TO PARTICIPATE

Individual vessels participate in underwater sound measurements through controlled ship transits over an acoustic recording station at the eastern entrance of Eclipse Sound, Nunavut. To participate:

- Pass directly over an acoustic measurement station (Figure 1). The recorder is on the seafloor. No surface buoy is present.
- Hold course and speed within a distance of 5 km on either side of the location.
- Fill out a Vessel Transit Data Sheet (VTDS; Figure 2) for each passage over the measurement station. The VTDS provides operational, environmental, and ship specification information to the research team.
- If practicable, vessels conduct two or more measurement passes at a different speeds through the water each time.
- Email VTDS for each measurement transit to the research team (Joshua Jones; j8jones@ucsd.edu)

Sound recorder location (Valid Aug 1, 2024)

Latitude: 72.7489 N

Longitude: 76.2276 W

Depth: 560 m

NOTE: Sound recorder location will be updated on or about Aug 1, 2024

WHERE WILL MEASUREMENTS GO?

- UCSD will provide participating vessel owners/operators with original sound recordings and acoustic measurement information.
- Acoustic measurements of all ships transiting the region will be provided to local and regional resource managers.
- Recordings and analysis results may be available on public website, www.TariupNipingit.ca.
- Vessel noise characteristics may be published in peer-reviewed studies of Arctic shipping and underwater sounds.

Vessel transit data sheet			CLEAR FORM
<p>Please complete one of these forms for each vessel transit over the underwater recording location. Forms may be completed and saved digitally or printed and filled out. Vessel location, operational information, and environmental conditions (winds, sea state) should be filled in if practicable at the start, at closest point of approach to the sound recorder location (CPA), and at the end of the ship transit operation.</p> <p>If filling the form digitally, press [CLEAR FORM] to reset/clear fields on form. Press [SAVE COMPLETED FORM] to save to computer. NOTE: File must be saved with new filename for each transit. All times in UTC.</p>			
Name of vessel: MS Baranof		Date of transit (UTC): Aug 1, 2023	
Time of CPA to recording location (UTC): 15:05:30			
TRANSIT START			
Latitude: 72.526N		Longitude: 74.803W	
Time of transit start (UTC): 12:20:05	Range to recorder (km): 49.8	Heading (T): 284	
Course over ground (T): 282	Speed over ground (kts): 9	Speed through water (kts): 8.8	
True wind direction (T): 079	True wind speed (kts): 20	Sea state (Beaufort): 5	
Main propulsion RPM: 300	Auxiliary generators and RPM: 2 on; 900		
Draught (dynamic): 5.6 m	Notes:		
CLOSEST POINT OF APPROACH (CPA)			
Latitude: 72.300N		Longitude: 76.223W	
Time of CPA (UTC): 15:05:30	Range to recorder (km): 0.1	Heading (T): 284	
Course over ground (T): 282	Speed over ground (kts): 8.9	Speed through water (kts): 8.8	
True wind direction (T): 085	True wind speed (kts): 10	Sea state (Beaufort): 4	
Main propulsion RPM: 300	Auxiliary generators and RPM: 2 on; 900		
Draught (dynamic): 5.6 m	Notes:		
TRANSIT END			
Latitude: 72.821N		Longitude: 77.705W	
Time of transit end (UTC): 17:50:45	Range to recorder (km): 50.1	Heading (T): 282	
Course over ground (T): 282	Speed over ground (kts): 9	Speed through water (kts): 9.1	
True wind direction (T): 102	True wind speed (kts): 5	Sea state (Beaufort): 3	
Main propulsion RPM: 300	Auxiliary generators and RPM: 2 on; 900		
Draught (dynamic): 5.6	Notes:		
ADDITIONAL INFORMATION:			
[e.g. other significant machinery in operation]:			
Main fire pumps on for fire drill 16:00:00 to 17:00:00.			

SAVE COMPLETED FORM

Please return completed vessel transit data sheets to Joshua Jones, Scripps Institution of Oceanography.
 Email: j8jones@ucsd.edu; Phone: +1 (206) 306-5979

Figure 2. Example Vessel Transit Data Sheet (VTDS). Fill out on the bridge for each measurement. Email completed VTDS to Joshua Jones (j8jones@ucsd.edu)