

Community-Driven Monitoring of Sea Ice and Eider Duck Populations around the Belcher Islands, Nunavut

Project Description

This long-term ongoing research and monitoring project was initiated by the community of Sanikiluaq in 1998 in partnership with Environment Canada, and has been administered through the Arctic Eider Society, a Sanikiluaq-based charity, in partnership with the Sanikiluaq Hunters and Trappers Association, Municipality of Sanikiluaq, Environment and Climate Change Canada and other collaborators since 2011. It focuses on the Hudson Bay Common Eider as a key resource for the community and indicator species of environmental change in the region, while also working to more holistically and systematically document key indicators of environmental change and cumulative impacts identified by Inuit, including changing sea ice and oceanographic conditions.

The Hudson Bay eider (*Somateria mollissima sedentaria*) breeds on the east and west coasts of Hudson and James Bay, and on the Belcher, Sleeper, and Ottawa Islands. The harvest of adult Hudson Bay eiders occurs in all months by residents of the Belcher Islands, with an annual harvest of approximately 2000-5000 birds. Eiders are most important to residents during freeze-up in the fall when other bird and mammal species are often inaccessible to hunters. The Municipality of Sanikiluaq is also establishing a commercial eider down harvest. These factors make the eider one of the most economically important species to the community of Sanikiluaq and a key indicator species for the local ecosystem.

Eiders breeding within Hudson Bay spend the winter in open water leads and polynyas near the Belcher Islands and off the west coast of Quebec. In doing so, the Hudson Bay eider is vulnerable to mass die-offs in winter when eiders are concentrated in open-water leads that freeze. In the 1990's the eider population was 70% lower than surveys from the 1980's, due to extreme sea ice conditions that caused a large starvation event. In recent years Inuit have reported changing sea ice and oceanographic conditions, including rapid freeze-ups at polynyas and floe edges that are important habitat for eider ducks and other wildlife including seals and beluga. These factors emphasize the need for sound information on the possible changes occurring in the sea ice habitats and how they influence populations of eider ducks and other wildlife. Our objective is to understand how changing sea ice and oceanographic conditions influence the marine food web as a key resource for the community of Sanikiluaq. This work is now documenting these indicators and wildlife distribution/abundance through more holistic year-round monitoring as a part of regular harvesting activities, and will contribute to baseline data for the proposed Qikiqtait protected areas project that will provide long term stewardship for the region and its wildlife including eiders as priority species.

Methods

The community of Sanikiluaq has driven this program since its inception in 1998. This long-term effort was formalized through creation of the Arctic Eider Society as a Sanikiluaq-based community-driven charity in 2011. The program is based on priorities identified as outcomes of ongoing joint meetings with the Sanikiluaq Hunters and Trappers Association and Municipal Council of Sanikiluaq, held multiple times each year. All work is conducted independently by, or in direct collaboration with, experienced

Inuit hunters and in close consultation with the local Hunters and Trappers Association, whom also rely on project outcomes for local co-management efforts. All results are made accessible to the community in near-real time through our SIKU online interactive platform which also provides long-term ownership, access and control of data stewardship for the community and regional Inuit organizations.

All research is non-invasive and observational. Inuit monitoring teams work independently or in partnership with researchers to document observations including the abundance and distribution of eider populations, other wildlife species and their sea ice habitats (e.g. size and dynamics of polynyas and floe edges) using a variety of photography, video and timelapse monitoring techniques and take additional observational notes using field notebooks or mobile devices (i.e. SIKU app). Observations take place at key habitats around the Belcher Islands identified as priority sites for monitoring by the community. Oceanographic indicators are measured using CTD casts (salinity, temperature depth profilers) and moorings (salinity/temperature probes) and aquadopp current meters to track changes over the winter and open water seasons. Ice core samples and water samples are also taken to document water characteristics over time. Salinity profiling and water sampling is conducted by local hunters deploying a CTD or water sampler (kemmerer) through a small hole in the ice, letting it sink, then immediately pulling it up.

The community of Sanikiluaq, and the Arctic Eider Society recognize the continued need for vigilance regarding the COVID-19 pandemic, particularly as it relates to research practices and Arctic travel. This project will at all times adhere to the public health directives provided by all responsible Municipal, Territorial and Federal health authorities and will continue to follow the guidelines and recommendations of the relevant Inuit Organizations as the pandemic evolves. As the project is driven and led by the community and is primarily based around documenting observations as a part of regular subsistence activities, it has supported food security and monitoring during the pandemic even while researchers were not visiting the community. The project will continue to draw on these strengths in 2021, and researchers will only visit the community if travel restrictions and health guidelines allow.

Camp

Most work will take place as a part of day trips from the community. Infrequent overnight trips may be made to the Environment Canada research camp (55° 49.361 N, 79° 53.925 W) to facilitate travel to nearby polynyas and floe edge by snowmachine. We will have a small amount of white gas for cooking and gasoline for the snow machines. We have a spill response plan and will have a spill kit with us at all times.

Melted snow is used for drinking and washing purposes only. Human waste will be buried in a sump away from all water sources and backfilled before leaving camp. All other waste will be transported back to Sanikiluaq and disposed of properly.

Outings will only take place if COVID-19 related health directives allow. In the case that outings are permitted, all relevant health and safety protocols will be strictly adhered to by outing participants.



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 NUNAVUT WATER BOARD
 NUNAVUT IMALIRIYIN KATIMAYIT
 OFFICE DES EAUX DU NUNAVUT

APPLICATION FOR APPROVAL FOR THE USE OF WATER OR DEPOSIT OF WASTE WITHOUT A LICENCE

Refer to the Guide to the Approval for the Use of Water or Deposit of Waste Without a Licence (Guide) in completing this Application.

APPLICATION NO: (for NWB use only)													
1. APPLICANT CONTACT INFORMATION (name, address) Joel Heath Arctic Eider Society House 408B, Sanikiluaq, NU, X0A 0W0 Phone: (613) 416-9607 Fax: 613-701-0326 e-mail: heath.joel@gmail.com	2. APPLICANT REPRESENTATIVE CONTACT INFORMATION if different from Block 1 (name, address) Phone: _____ Fax: _____ e-mail: _____ (Attach authorization letter)												
3. NAME OF THE OWNER OF THE LAND THAT WILL BE USED IN RELATION TO THE WATER TO BE USED OR THE WASTE TO BE DEPOSITED Qikiqtani Inuit Association													
4. NAME OF PROJECT (consistent with the name of the project issued by other regulatory agencies) Community-Driven Monitoring of Sea Ice and Eider Duck Populations around the Belcher Islands, Nunavut													
5. LOCATION OF UNDERTAKING Project Extents (decimal degree format) <table border="0" style="width: 100%;"> <tr> <td>NW</td> <td><u>56.92775</u></td> <td><u>-79.91355</u></td> </tr> <tr> <td>NE</td> <td><u>56.44263</u></td> <td><u>-78.63441</u></td> </tr> <tr> <td>SE</td> <td><u>56.63619</u></td> <td><u>-79.27949</u></td> </tr> <tr> <td>SW</td> <td><u>55.73674</u></td> <td><u>-79.99615</u></td> </tr> </table>		NW	<u>56.92775</u>	<u>-79.91355</u>	NE	<u>56.44263</u>	<u>-78.63441</u>	SE	<u>56.63619</u>	<u>-79.27949</u>	SW	<u>55.73674</u>	<u>-79.99615</u>
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Camp Location(s) (decimal degree format)

55.82784
-79.89205

Name of the Water Management Area in which the Undertaking is located. (Please see Appendix D of the Guide):

Hudson Bay Islands Watershed_____

6. Previous Approvals or Licences Associated with Undertaking (“Type A”, “Type B” or Approval Without a Licence)

NA or

Previous Licence/Approval Number: 8WLC-GBI2021

The Board reminds the Applicant that as stated in s. 46 of the NWNSRTA, the expiry or cancellation of any previous licence does not relieve the holder from any outstanding obligations imposed under the licence.

7. CLASSIFICATION OF UNDERTAKING - Indicate the classification of undertaking by checking one of the following boxes.

<input type="checkbox"/> Industrial <input type="checkbox"/> Mining <input checked="" type="checkbox"/> Conservation <input type="checkbox"/> Municipal	<input type="checkbox"/> Agricultural <input type="checkbox"/> Recreational <input type="checkbox"/> Power <input type="checkbox"/> Other: (describe)
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See Appendix C of the Guide for descriptions of classifications of undertakings.

8. DESCRIPTION OF UNDERTAKING AND EQUIPMENT USED – Provide a brief description of the undertaking including a description of any equipment that will be used in using water or depositing waste.

Most work will take place as a part of day trips from the community. Infrequent overnight trips may be made to the Environment Canada research camp (55° 49.361 N, 79° 53.925 W) to facilitate travel to nearby polynyas and floe edge by snowmachine. We will have a small amount of white gas for cooking and gasoline for the snow machines. We have a spill response plan and will have a spill kit with us at all times.

Melted ice is used for drinking and washing purposes only. Human waste will be buried in a sump away from all water sources and backfilled before leaving camp. All other waste will be transported back to Sanikiluaq and disposed of properly.

9. SCHEDULE – Applicants are advised that approvals without a licence are issued for a one year term.

Proposed Start Date: 01/11/2021
(Day/Month/Year)
Proposed Completion Date: 01/10/2022
(Day/Month/Year)

10. TYPE OF USE OF WATER WITHOUT A LICENCE PROPOSED - Check the box that applies to the type of water use proposed. If none of the water uses listed below applies to the proposed water use, an application for a water licence will be required. See the NWB's Guide 4 – Completing and Submitting a Water Licence Application for a New Licence.

- For an undertaking other than a Power undertaking and for a use of water related to the construction of a structure across a watercourse that is less than 5 metres wide at the ordinary high water mark at the point of construction.
- For an undertaking other than a Power undertaking and for a use of water related to the training of an intermittent watercourse.
- For an undertaking other than a Power undertaking and for a use of water related to the training of a watercourse that is less than 5 metres wide at the ordinary high water mark at the point of training.
- For an undertaking other than a Power undertaking and for a use of water related to the training of a watercourse that involves the infilling of the watercourse, if the watercourse has no inflow or outflow and a surface area of less than 0.5 hectares.
- For an undertaking other than a Power undertaking and for a use of water related to the training of a watercourse that involves removal or placement of less than 100 m³ of material.
- For an undertaking other than a Power undertaking and for a use of water related to the construction of a temporary structure in a watercourse for the purpose of flood control.
- For an undertaking other than a Power undertaking and for any use of water related to the storage of 2,500 m³ or less.
- For an undertaking other than a Power undertaking and for any use of water less than 50 m³ per day.

11. QUANTITY AND QUALITY OF WATER INVOLVED - For each type of water use indicated in Block 10, provide the source of water, the estimated quantity to be used in cubic metres per day, and the periods during which water will be extracted.

Type of Water Use indicated in Block 10	Name of water source	Estimated quantity of water to be used in cubic metres per day	Periods during which water will be extracted
Drinking/Washing	Melted ice	<3	Jan 11, 2021 to Jan 10, 2022

12. TYPE OF DEPOSIT OF WASTE PROPOSED - Check the box that applies to the type of deposit of waste proposed. If none of the deposits of waste listed below apply to the proposed deposit of waste, an application for a water licence will be required. See the NWB's Guide 4 – Completing and Submitting a Water Licence Application for a New Licence.

- For an Industrial undertaking, for an activity related to hydrostatic testing or cleaning of storage tanks and pipelines, and for any deposit of waste resulting from hydrostatic testing or cleaning of unused storage tanks or pipelines.
- For an Industrial undertaking, for an activity related to quarrying and gravel washing, and for any deposit of waste that is not deposited to surface water and that results from quarrying or gravel washing above the ordinary high water mark.
- For a Mining undertaking, for an activity related to exploratory work, any deposit of sewage to a sump.
- For a Power undertaking, any deposit of sewage to a sump.
- For an Agricultural undertaking, any deposit of sewage to a sump.
- For a Conservation undertaking, any deposit of sewage to a sump.
- For a Recreation undertaking, any deposit of sewage to a sump.
- For any Other type of undertaking not listed above, other than Municipal, any deposit of sewage to a sump.

13. QUANTITY AND QUALITY OF WASTE INVOLVED – For each type of waste indicated in Block 12, describe the quantity in cubic metres/day, measures to avoid or mitigate adverse impacts, and periods of deposition.

Type of Waste indicated in Block 12	Quantity to be deposited in cubic metres per day	Measures to avoid or mitigate any adverse impacts	Periods during which waste will be deposited
Sewage – Human Waste	<0.02	Sump located >100m away from water source and buried before leaving camp	Jan 11, 2021 to Jan 10, 2022
Grey Water – Dish Water	<0.1	Sump located >100m away from water source and buried before leaving camp	Jan 11, 2021 to Jan 10, 2022

Solid Waste – Garbage	0	All garbage and other solid waste will be transported back to town (Sanikiluaq) for disposal	Jan 11, 2021 to Jan 10, 2022
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14. SIGNATURE

I, Joel Heath (print name), certify that the information given on this form is, to the best of my knowledge, correct and complete.

Yes No

OR

I, _____ (print name), as an authorized representative of the Applicant, _____, certify that the information given on this form is, to the best of my knowledge, correct and complete.

Yes No

I certify that the Nunavut Planning Commission's land use planning requirements under Article 11 of the Nunavut Land Claims Agreement have been met.

Yes No

I certify that the Nunavut Impact Review Board's development impact review requirements under Article 12 of the NLCA have been met.

Yes No

I certify that the proposed water use is of a type set out in column 2 of Schedule 2 of the Regulations that is further specified by column 3, in respect of an undertaking set out in column 1. See list in Block 10.

Yes NA No

I certify that the proposed deposit of waste is an activity that is set out and then further specified in columns 2 and 3 of Schedule 3 of the Regulations, in respect of an undertaking that is set out in column 1 of Schedule 3. See list in Block 12.

Yes NA No

I certify that the proposed water use or deposit of waste will not substantially affect the quality, quantity or flow of the watercourse whose waters are used.

Yes No

I certify that the proposed water use or deposit of waste will not substantially affect the quality, quantity or flow of waters flowing through Inuit Owned Lands.

Yes No

I certify that the proposed water use or deposit of waste will not affect the use of waters by a person who would be entitled to compensation under sections 58 or 60 of the Nunavut Waters Nunavut Surface Rights Tribunal Act (Act) if their use of these waters were to be adversely affected by an applicant for a licence.

Yes No

I certify that a licence is not required for another use of water, or deposit of waste in respect of the proposed undertaking.

Yes No

I have read and agree to comply with the following conditions outlined in sections 4(3), 5(4), 5(5) and 6 of the Nunavut Waters Regulations:

1. In the case of an applicant who has a mineral right and who intends to use waters or deposit waste in relation to that right, the applicant shall respect the priority conferred on Inuit by section 62 of the Act as if that applicant had a licence for the use or deposit.
2. Measures must be taken prior to using water to minimize any alteration to the bed or banks of a watercourse whose waters are to be used, and the measures shall be maintained during the operation of the undertaking.
3. No waste is to be deposited to surface water or within 31 metres of the ordinary high water mark of any body of water.
4. The waste shall not contain more than 15 milligrams per litre of petroleum or petroleum product and must not have a visible hydrocarbon sheen.
5. Prior to the closure or abandonment of the undertaking or end of the period authorized for the use of water or deposit of waste without a licence, whichever occurs first, the site shall be restored — to the extent practicable — to the state in which it was before the water was used or the waste was deposited.^a
6. An applicant who is authorized under the Regulations to use waters or deposit waste without a licence shall:
 - a. maintain accurate and detailed books and records of:
 - i. the quantity of water, in cubic metres, used each day,
 - ii. the quantity, in cubic metres, of waste deposited each day,
 - iii. the type of waste deposited each day,
 - iv. where the waste is deposited,
 - v. the concentration of the substance, or substances, in the deposited solid or liquid that has the effect of making the deposit waste,
 - vi. the methodology used to calculate or determine the information referred to in items (i) to (iv), and
 - vii. the measures that were taken to avoid or mitigate any adverse impacts of the deposit of waste.
 - b. keep the books and records on the site of the undertaking during the period of its operation and make them available during that period to an inspector on request;
 - c. submit to the Board a report containing a summary description and supporting photographs of the restoration of the site of the undertaking within 30 days after the earliest of (i) the day on which the undertaking is closed or abandoned, and (ii) the last day of the period authorized for the use or deposit without a licence;^b and
 - d. keep the books and records for two years after submitting the report describing the restoration of the site of the undertaking.

Notes:

a) A site need not be restored prior to the end of the period authorized for the water use or deposit of waste without a licence, as required by Item 5, if the Board issues a licence for the use of water or deposit of waste on that site prior to the end of that period.

b) An applicant need not submit the report referred to in Item 6 (c), to the Board if the applicant obtains the Board's approval for a use of water or deposit of waste without a licence, or a licence for a use of water or deposit of waste, on the same site within thirty (30) days after the last day of the period authorized for the use or deposit.

Yes No

I understand that any approval granted by the Board for the use of water or deposit of waste without a licence will be authorized for a period of one year after the day on which the Board approves the Application.

The use or deposit is not authorized until the Board approves the Application and it is only valid as long as the applicant is in compliance with the conditions set out in the declaration above.


Yes

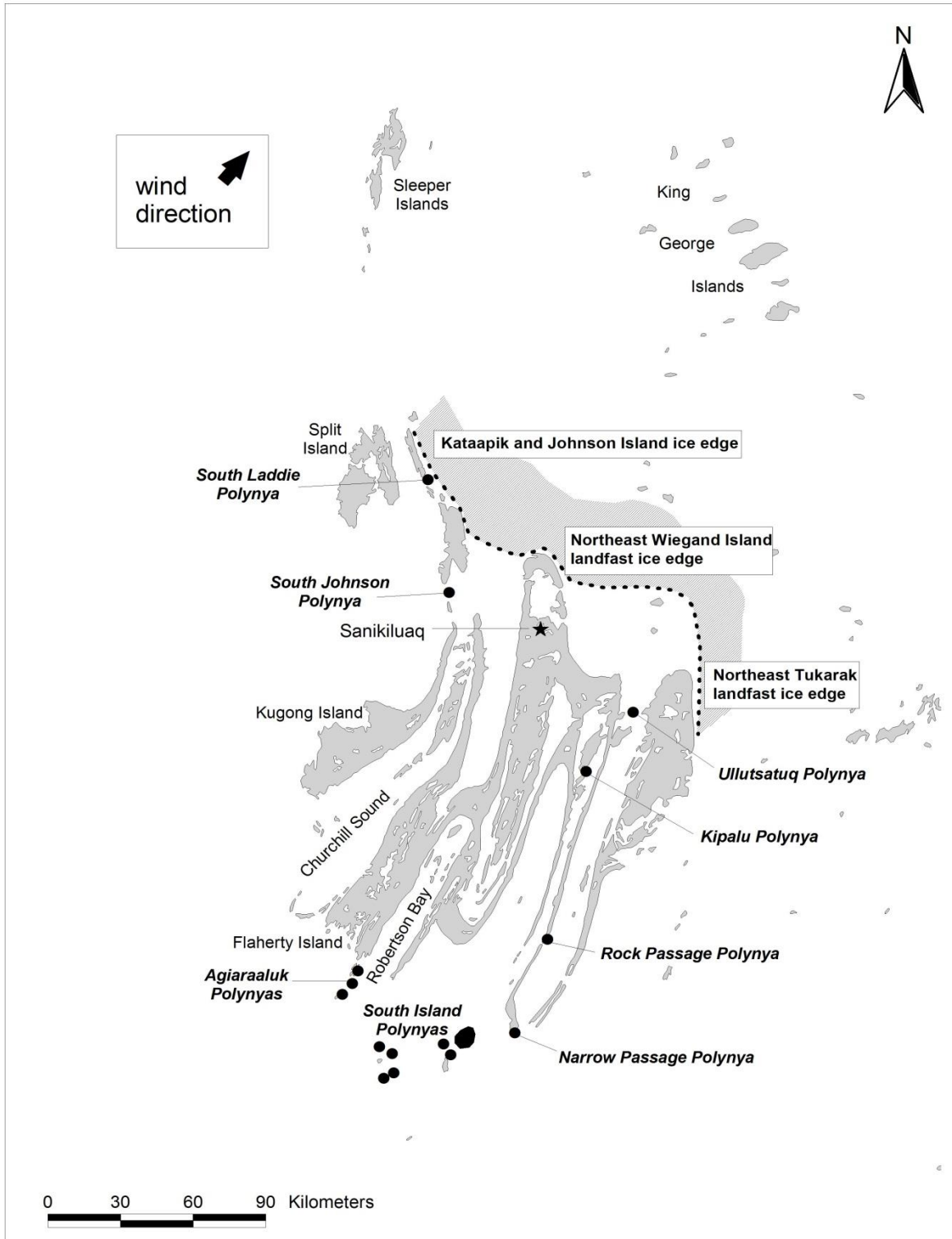
No

I understand that if I have answered "No" to any of the above statements a water licence is required from the Nunavut Water Board prior to the use of water or deposit of waste.

Yes

No

Joel Heath Name (Print)	Ph.D. Executive Director, Arctic Eider Society Title (Print)	 Signature	Nov 5 2020 Date
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This study will take place near winter open water leads and polynyas in the southern Belcher Island Archipelago.