Community-led coastal ecosystem assessments in the Hudson Bay Complex (Igloolik, Kinngait, and Naujaat, NU and Whapmagoostui, QC): Synthesis of 2020-2021 field programs

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The Hudson Bay Complex (HBC) is rapidly changing, which is impacting ecosystems and Northern Indigenous communities. To address a knowledge gap in understanding coastal ecosystem, a community-led coastal assessment was completed in four HBC communities to assess the biodiversity of fishes, invertebrates, and their habitats in a program called "Arctic Coast". Communities that participated in the Arctic Coast program from the HBC included: Kinngait, Naujaat, and Igloolik, Nunavut, as well as Whapmagoostui, Quebec. This coastal program captured seasonal and inter-annual differences within and among regions between 2020 and 2021. It also assists in enhancing community research capacity through training and leadership opportunities. This report summarizes species occurrences, biological information on collected species, and describes the habitat of each coastal ecosystem. Data collected across different communities indicates spatial and temporal variation in fishes, invertebrates, and environmental parameters. Overall, the greatest fishing effort took place in Kinngait, which is also where the highest number of fish were captured. Notably, Grubby Sculpin (*Myoxocephalus aenaeus*) was documented in Kinngait, and is the most northern location recorded for this species. During the open water period, the warmest daily average water temperature occurred in Whapmagoostui. Overall, the information documented in this report will provide a baseline in order to assess future change and may aid in the identification and assessment of culturally and ecologically important marine areas.

Résumé

Christie, L. R., McNicholl, D.G. and Dunmall, K.M. 2023. Community-led coastal ecosystem assessments in the Hudson Bay Complex (Igloolik, Kinngait, and Naujaat, NU and Whapmagoostui, QC): Synthesis of 2020-2021 field programs. Can. Tech. Rep. Fish. Aquat. Sci. 3540: xi + 84 p.

Le complexe de la baie d’Hudson (CBH) évolue rapidement, et cela entraîne des répercussions sur les écosystèmes et les communautés autochtones du Nord. Afin de combler un manque de connaissances dans la compréhension des écosystèmes côtiers, des évaluations ont été menées par quatre communautés du CBH pour examiner la biodiversité des poissons et des invertébrés ainsi que leur habitat dans le cadre du programme Arctic Coast. Les communautés du CBH qui ont participé au programme Arctic Coast étaient les suivantes : Kinngait, Naujaat et Igloolik, au Nunavut, et Whapmagoostui, au Québec. Ce programme axé sur le milieu côtier a permis de cerner les différences saisonnières et interannuelles dans les régions et entre celles-ci, entre 2020 et 2021. Il a également contribué à renforcer la capacité de recherche des communautés grâce à des possibilités de formation et de leadership. Le présent rapport fournit un résumé de la présence des espèces et de l’information biologique sur les espèces capturées, puis décrit l’habitat de chacun des écosystèmes côtiers. Les données recueillies par les différentes communautés indiquent une variation spatiale et temporelle chez les poissons et les invertébrés ainsi que dans les paramètres environnementaux. Dans l’ensemble, c’est à Kinngait que les efforts de pêche ont été les plus importants et où l’on a capturé le plus de poissons. Fait notable, le chaboisseau bronzé (*Myoxocephalus aenaeus*) a été consigné dans les données de Kinngait, et ce serait le lieu d’enregistrement le plus au nord pour cette espèce. Durant la période sans couvert glaciel, la température de l’eau moyenne quotidienne la plus élevée a été enregistrée à Whapmagoostui. Globalement, l’information documentée dans ce rapport servira de référence pour évaluer les futurs changements et pourrait faciliter la détermination et l’évaluation des zones marines importantes sur les plans culturel et écologique.

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ᑕᓯᐅᔭᕐᔪᐊᖅ ᐃᓗᐊᓂ (HBC) ᐊᔾᔨᒌᙱᑦᑐᑦ ᓇᔪᕐᕕᖏᑦ ᓱᒃᑲᔪᒃᑯᑦ ᐊᓯᙳᖅᐸᓪᓕᐊᔪᑦ, ᐊᑦᑐᐊᓂᖃᖅᑐᑎᒃ ᐆᒪᔪᑦ ᐊᕙᑎᖓᓐᓄᑦ ᐊᒻᒪ ᐅᑭᐅᖅᑕᖅᑐᒥ ᓄᓇᖃᖅᑳᖅᓯᒪᔪᑦ ᓄᓇᓕᖕᓂᓐᓄᑦ. ᑐᓴᖅᑕᐅᑎᓐᓂᐊᕐᓗᒋᑦ ᖃᐅᔨᒪᔭᐅᔪᑦ ᐊᑲᐅᙱᓕᐅᕈᑕᐅᔪᑦ ᑐᑭᓯᐊᔾᔪᑎᒋᓗᒋᑦ ᓯᕗᔭᐸᓯᒥ ᐆᒪᔪᑦ ᐊᕙᑎᖓᓐᓂᒃ, ᓄᓇᓕᒥ–ᐊᐅᓚᑕᐅᔪᑦ ᓯᕗᔭᐸᓯᒥ ᖃᐅᔨᓴᕐᓂᖅ ᐱᐊᓂᒃᑕᐅᓚᐅᖅᑐᑦ ᑎᓴᒪᓂ ᑕᓯᐅᔭᕐᔪᐊᑉ ᐃᓗᐊᓂ ᐊᔾᔨᒌᙱᑦᑐᑦ ᓇᔪᕐᕕᖏᑦ ᓄᓇᓕᒥᐅᑕᓄᑦ ᖃᐅᔨᓴᕐᓂᐊᖅᑐᑎᒃ ᐆᒪᔪᑦ–ᐊᔾᔨᒌᙱᑦᑐᑦ ᐃᖃᓗᐃᑦ, ᓴᐅᓂᖃᙱᑦᑐᑦ, ᐊᒻᒪ ᓇᔪᕐᕕᖏᑦ ᐱᓕᕆᐊᒃᓴᐅᔪᑦ ᐊᑎᖃᖅᑐᓂ "ᐅᑭᐅᖅᑕᖅᑐᒥ ᓯᕗᔭᐸᓯᒃ". ᓄᓇᓕᒥᐅᑕᐃᑦ ᐃᓚᒋᔭᐅᓚᐅᖅᑐᑦ ᐅᑭᐅᖅᑕᖅᑐᒥ ᓯᕗᔭᐸᓯᒧᑦ ᐱᓕᕆᐊᒃᓴᐃᑦ ᑕᓯᐅᔭᕐᔪᐊᒥᑦ ᐃᓚᒋᔭᐅᔪᑦ: ᑭᙵᐃᑦ, ᓇᐅᔮᑦ. ᐊᒻᒪ ᐃᒡᓗᓕᒃ , ᓄᓇᕗᑦ, ᐊᒻᒪ ᕙᑉᒪᒎᔅᑐᐃ, ᑯᐱᒃ. ᑖᓐᓇ ᓯᕗᔭᐸᓯᒥ ᐱᓕᕆᐊᒃᓴᖅ ᑲᒪᒋᔭᐅᔫᓇᓕᖅᑎᓪᓗᒋᑦ ᐅᑭᐅᑉ ᐃᓗᓂᐊᓂ ᐊᒻᒪ ᑲᒪᒋᔭᐅᖅᑳᖅᑎᓐᓇᒋᑦ-ᐅᑭᐅᒥ ᐊᔾᔨᒌᙱᑦᑐᑦ ᐃᓗᐊᓂ ᐊᒻᒪ ᓯᓚᑖᓂ ᓄᓇᓕᓐᓂ 2020 ᐊᒻᒪ 2021 ᐊᑯᓐᓂᐊᓂ. ᐃᑲᔪᖃᑕᐅᔪᑦ ᐱᕚᓪᓕᕆᐊᕈᑕᐅᓪᓗᑎᒃ ᓄᓇᓕᒥ ᖃᐅᔨᓴᕐᓂᕐᒧᑦ ᐊᔾᔨᒌᙱᑦᑐᓂᒃ ᑲᑎᙵᔪᓂᒃ ᐱᓕᒻᒪᒃ ᓴᕐᓂᕐᒧᑦ ᐊᒻᒪ ᐊᐅᓚᑎᑦᑎᓂᕐᒧᑦ ᐊᑲᐅᓈᕈᑎᒃᓴᓄᑦ. ᑖᓐᓇ ᐅᓂᒃᑳᓕᐊᖅ ᓇᐃᓈᖅᑐᒃᑯᑦ ᐅᓂᒃᑳᑦ ᐆᒪᔪᑦ ᐊᔾᔨᒌᙱᑦᑐᑦ ᑕᐃᒪᐅᓂᖓᑦ, ᐊᔾᔨᒌᙱᑦᑐᑦ ᑐᑭᓯᐊᔾᔪᑎᒃᓴᐃᑦ ᑲᑎᖅᓱᖅᑕᐅᔪᑦ ᐆᒪᔪᓂᑦ, ᐊᒻᒪ ᐅᖃᐅᓯᕆᔭᐅᔪᑦ ᓇᔪᕐᕕᒋᔭᐅᔪᑦ ᐃᒻᒥᒃᑯᑦ ᓯᕗᔭᐸᓯᒥ ᐆᒪᔪᑦ ᐊᕙᑎᖓᑦ. ᑎᑎᕋᖅᓯᒪᔪᑦ ᑲᑎᖅᓱᖅᑕᐅᔪᑦ ᐊᔾᔨᒌᙱᑦᑐᑦ ᓄᓇᓕᓐᓂᙶᖅᑐᑦ ᐅᖃᐅᓯᕆᔭᖃᖅᑐᑦ ᓇᔪᕐᕕᐅᔪᑦ ᐊᒻᒪ ᐊᑯᓂᐅᙱᑦᑐᖅ ᐊᔾᔨᒌᙱᑦᑐᑦ ᐃᖃᓗᐃᑦ, ᓴᐅᓂᖃᙱᑦᑐᑦ, ᐊᒻᒪ ᐊᕙᑎᖓᑦ ᖃᓂᒋᔭᖓᑦ. ᐊᑕᖓᖅᑐᒍ, ᐱᐅᓛᖑᔪᖅ ᐃᖃᓪᓕᐊᕐᓂᖅ ᐱᕚᓪᓕᖅᓯᒪᔪᖅ ᑭᙵᐃᑦ, ᕐᑯᑦᑎᓐᓂᖅᐹᖑᓚᐅᖅᑐᖅ ᐃᖃᓗᒃᑕᐅᔪᑦ. ᐅᑯᐊᖑᔪᑦ ᒍᓇ ᑲᓇᔪᖅ ᑎᑎᕋᖅᑕᐅᓯᒪᔪᑦ ᑭᙵᓂ, ᐊᒻᒪ ᐅᖓᓯᓐᓂᖅᐹᖅ ᐅᑭᐅᖅᑕᖅᑐᒥ ᑎᑎᕋᖅᑕᐅᓯᒪᔪᑦ ᐆᒪᔪᓂᑦ. ᐃᒪᖃᖅᑎᓪᓗᒍ, ᐆᓇᕐᓂᖅᐸᖅ ᐅᓪᓗᖓᓂ ᐃᒻᒪᖅ ᐃᒪᐅᑉ ᐆᓇᕐᓂᖓ ᑎᑎᕋᖅᑕᐅᓯᒪᔪᖅ ᕙᑉᒪᒎᔅᑐᐃᒥ. ᐊᑕᖓᕐᓗᒍ, ᑐᑭᓯᐊᔾᔪᑎᒃᓴᖅ ᑎᑎᕋᖅᑕᐅᓯᒪᑦ ᑖᔅᓯᒪ ᐅᓂᒃᑳᓕᐊᖓᓂ ᑐᓂᓯᓂᐊᖅᑐᑦ ᑐᙵᕕᒃᓴᓄᑦ ᐱᔾᔪᑎᖃᕐᓂᐊᕐᓗᒍ ᓯᕗᓂᒧᑦ ᐊᓯᙳᖅᐸᓪᓕᐊᔪᑦ ᐊᒻᒪ ᐃᑲᔪᕈᑕᐅᔫᓇᖅᑐᑦ ᓇᓗᓇᐃᔭᐃᓂᖅ ᐊᒻᒪ ᖃᐅᔨᓴᕐᓂᕐᒧᑦ ᐃᓕᖅᑯᓯᕆᔭᐅᔪᓄᑦ ᐊᒻᒪ ᐆᒪᔪᓕᕆᓂᕐᒧᑦ ᐱᒻᒪᕆᐅᔪᓄᑦ ᑕᕆᐅᑉ ᐊᕙᑎᖓᓐᓂ.

Abbreviations

DFO –Department of Fisheries and Oceans Canada
HBC – Hudson Bay Complex
HTA – Hunters and Trappers Association
CTA – Cree Trappers Association
HTO – Hunters and Trappers Organization
CEOS – Center for Earth Observation Science
ANMPA – Anguniaqvia Niqiqyuam Marine Protected Area

1.0 Introduction

1.1 Project Background

The Hudson Bay Complex (HBC) is an environmentally-sensitive region of high biodiversity in the Canadian Arctic (Figure 1) (Kuzyk & Candlish, 2019). HBC contains James Bay, Foxe Basin, Hudson Strait, and Hudson Bay, with coastline in Quebec, Ontario, Nunavut, and Manitoba. The HBC region is experiencing several stressors, including increased shipping (Copland et al., 2021; Andrews et al., 2017; Mudryk et al., 2021), climate change (Lukovich et al., 2021; Kowal et al., 2017), plastic pollution (Huntington et al., 2020), and biodiversity shifts (Goldsmit et al., 2020; Florko et al., 2021), among others. The compounded impacts of these stressors are expected to result in significant change to northern ecosystems and the Indigenous Peoples inhabiting the areas. For example, many changes from these stressors have occurred in the region over recent years including warming sea surface temperatures (Brand et al., 2014), sea ice declines (Mudryk et al., 2018; Gupta et al., 2022), energy changes (Bello et al., 2019), northward expansion of species' ranges (Patterson et al., 2021), and river discharge increase due to future climate predictions (MacDonald et al., 2018). While some research has been done in the HBC (Kuzyk & Candlish, 2019), there is a gap with respect to community-based sampling in coastal areas. Coastal fishes, invertebrates, and their associated habitats are not well documented in the Canadian Arctic, despite the environment playing a key role for subsistence species, such as Arctic Char (Stewart & Lockhart, 2004). Community members and scientists both agree that long term monitoring and baseline data are needed to ensure sustainable fisheries, even though there are challenges to obtain the data (Schembri et al., 2019). Many inhabitants rely on the HBC ecosystem for subsistence harvest of marine mammals, marine and freshwater fish, and invertebrates. Harvesting provides subsistence food, clothing, and materials as well as an economic opportunity for communities (Durkalec et al., 2021). This project will help fill part of the knowledge gap by collecting baseline coastal data with the assistance of communities to document current conditions within the HBC.

For this project, we engaged with each of the participating HBC communities regarding this research in an iterative process that began at initiation and continued throughout the design, data collection, and reporting phases (Table 1). During these conversations, including during the initial consultations about the potential research, the need to establish a baseline understanding of the coastal ecosystem was identified by each community. This research was subsequently collaboratively designed to address this gap and to meet the priorities of each community. Methods used in this project have been modified from a larger project known as "Arctic Coast" which has been completed successfully in western Canadian Arctic communities (McNicholl et al., 2020).

As part of the Arctic Coast program, community technicians are trained using standardized approaches to assess and monitor coastal aquatic species and their habitats year round. During the ice covered period, the Arctic Coast program aims to collect environmental data on ice thickness, snow depth, water temperature, and salinity. In the open water period, environmental data are collected on water temperature and salinity at different depths ranging from approximately 5 m to 15 m. Scientific information on biota, including zooplankton, invertebrates, and fishes, is collected year round to assess biodiversity, provide diet insights, and to understand habitat usage. These data are helping to fill the larger coastal ecosystem knowledge gap, and the project enhances community capacity by providing training and leadership opportunities. The scientific information collected will be helpful to understand how coastal ecosystems respond to future stressors.

This research focuses on the HBC communities of Kinngait, Igloolik, and Naujaat, in Nunavut, and Whapmagoostui in Nunavik. Regions of the HBC have been identified as ecologically and biologically significant areas (DFO, 2011), the Southampton Island Area of Interest is being considered for potential marine protected area designation (Government of Canada, 2022), and the region has also been highlighted as requiring baseline research.

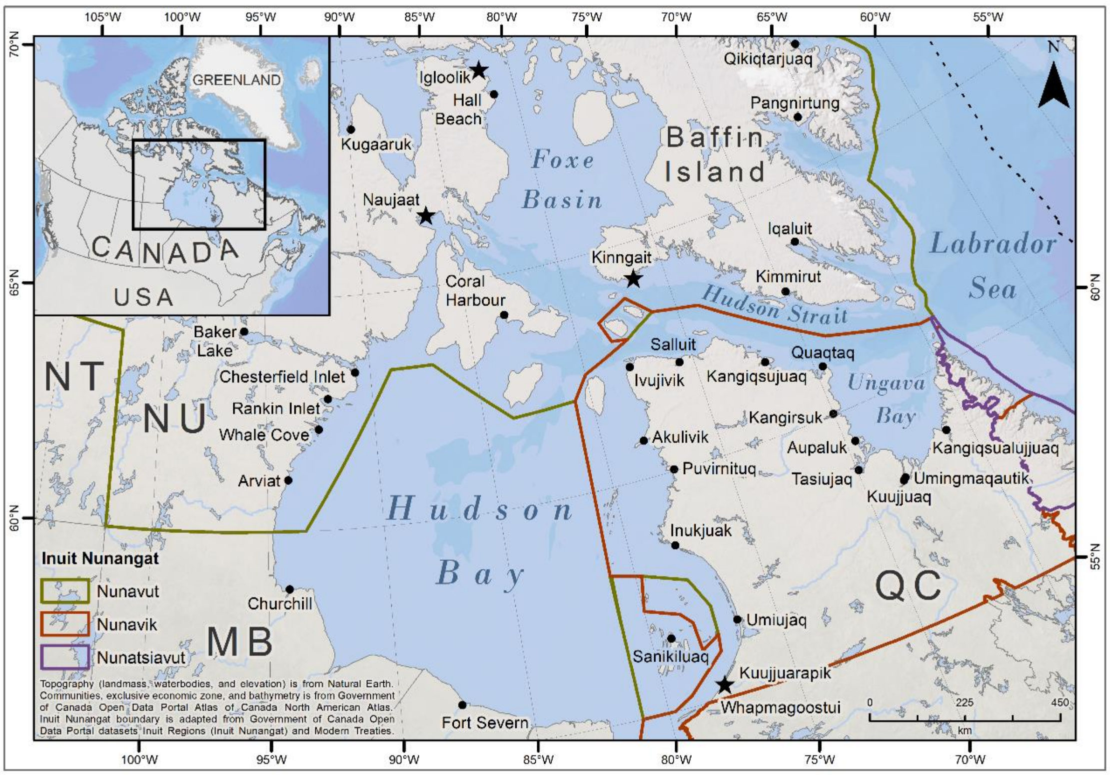


Figure 1: Map of locations of the Arctic Coast program in the HBC. The communities that are marked with stars represent where the Arctic Coast program has taken place in Nunavut and Nunavik from 2020-2021. Map credit: Jarrett Friesen (DFO).

1.1.2 Kinngait (ᑭᙵᐃᑦ)

Kinngait (formerly Cape Dorset) is located in the Qikiqtaaluk region of Nunavut on the southern tip of Baffin Island within the Hudson Strait. Subsistence harvesting takes place in Kinngait for clams, walrus, and seals, among other animals (Aningmiuq and Manning, personal communications). Kinngait also has open water access year round beyond the floe edge in the Hudson Strait (Aningmiuq, personal communications) and there are several lakes nearby that contain Arctic Char and are well known to inhabitants. Kinngait is located on a major shipping route through the Hudson Strait and on an alternative Northwest Passage route.

1.1.3 Igloolik (ᐃᒡᓗᓕᒃ)

Located within the Qikiqtaaluk Region of Nunavut, Igloolik is on a small island in Foxe Basin, near the Melville Peninsula. The nearly 1700 inhabitants in Igloolik (Statistics Canada, 2017a) participate in subsistence harvests for walrus, fish, and seals among other animals (Paulic et al., 2014; Laidler et al., 2009). Igloolik experiences ice covered and open water seasons. The east side of the island is known to locals as having an abundance of fish and the south side of the island has an abundance of seals (Qujannamiik, personal communications).

1.1.4 Naujaat (ᓇᐅᔮᑦ)

Naujaat (formerly Repulse Bay) located within the Kivalliq Region of Nunavut is an Inuit Hamlet with approximately 1100 people (Statistics Canada, 2017b). Naujaat is located on the southern part of the Melville Peninsula, and the north end of Roes Welcome Sound on the Arctic Circle. The area surrounding Naujaat has high fish, marine mammal, and bird biodiversity (NCRI, 2011). Inhabitants of Naujaat participate in subsistence harvest for polar bears, caribou, seals, fish, and walrus, among other animals (NCRI, 2011).

1.1.5 Whapmagoostui (ᐙᐱᒫᑯᔥᑐᐃ)

Whapmagoostui is a community with nearly 1000 inhabitants (Statistics Canada, 2017c) in Nunavik, Quebec located at the mouth of the Great Whale River on James Bay. This community is the most northern Cree community in Quebec and neighbors the Inuit community of Kuujjuarapik, the most southern Inuit community in Canada. Whapmagoostui inhabitants also harvest marine and terrestrial species for subsistence including porcupine, geese, caribou, beaver, muskrat, and ptarmigan, among others (Eeyou Planning Commission, 2017).

2.0 Methods

2.1 Engagement

A continual level of communication occurred among researchers and the communities from October 2019 to present (Table 1). Engagement efforts were focused between DFO researchers and the Igloolik Hunters and Trappers Association (HTA) in Igloolik, NU, the Cree Trappers Association (CTA) in Whapmagoostui, QC, the Aiviq HTA in Kinngait, NU, and the Arviq Hunters and Trappers Organization (HTO) in Naujaat, NU. The engagement occurred across the initiation (including consultation and receiving support), data collection (including training and coastal assessments), and reporting phases of the projects in each community. Efforts initially focused on one sampling season (e.g., ice covered or open water) for all communities and continued into subsequent seasons in Igloolik and Kinngait due to community interest. Travel restrictions due to the COVID-19 pandemic impacted in person community engagement efforts throughout all phases of the projects from March 2020 onward.

2.1.1 Initiation phase

During the initiation phase of the project, the project was proposed to each community, support was received to proceed with the assessments, and a sampling plan and sites were identified. As a first step in this process, a letter was sent to each community that outlined the possibility of a collaborative research opportunity focused on the coastal ecosystem and asked for the opportunity to discuss further in a meeting. At this initial meeting, the concept for community-led coastal fieldwork was discussed, priorities for coastal research were identified, support for the project was received, sites were selected for sampling, and a plan for initiation was identified. The sites selected for sampling by each community are in Figure 2 and coordinates are summarized in Table 2.

This initial meeting occurred in person with the Aiviq HTA in Kinngait (November 2019) and with the Igloolik HTA (October 2019). In addition to identifying coastal sites for sampling, the Aiviq HTA in Kinngait identified lake sites and requested they be included in the sampling design.

In Whapmagoostui and in Naujaat, the initiation phase for this project took place during COVID-19. In-person interactions were not possible due to travel restrictions with the engagement taking place virtually and built on relationships established prior to COVID-19 with those communities and other research programs (e.g., DFO in Whapmagoostui/ Kuujjuarapik and the Center for Earth Observation Science (CEOS) in Naujaat). In Whapmagoostui and in Naujaat, a letter of support was received from the CTA and the Arviq HTO. Sampling sites near Whapmagoostui were identified by the CTA during a meeting and those near Naujaat were selected by the Arviq HTO while working with the CEOS. In Whapmagoostui and in Naujaat, the researchers worked directly with community technicians associated with the CTA and Arviq HTA to design and complete the work.

Table 1: Timeline for projects to take place in the HBC. March 2020 is in red to mark the start of the COVID-19 pandemic in North America.

		2019			2020												2021												2022		
		October	November	December	January	February	March	April	May	June	July	August	September	October	November	December	January	February	March	April	May	June	July	August	September	October	November	December	January	February	March
Kinngait	Consult		✓	✓											✓																
	Support Received		✓					✓								✓				✓											
	Training			✓													✓					✓	✓								
	Project			✓	✓	✓	✓				✓	✓	✓				✓	✓	✓			✓	✓	✓	✓	✓	✓				
	Report							✓						✓	✓	✓			✓											✓	✓
Igloolik	Consult	✓																													
	Support Received	✓							✓									✓													
	Training					✓						✓																			
	Project					✓	✓					✓	✓																		
	Report								✓							✓															
Whapmagoostui	Consult									✓	✓																				
	Support Received									✓																					
	Training											✓																			
	Project											✓	✓	✓																	
	Report														✓																
Naujaat	Consult														✓																
	Support Received																✓	✓													
	Training																		✓												
	Project																		✓			✓									
	Report																							✓							

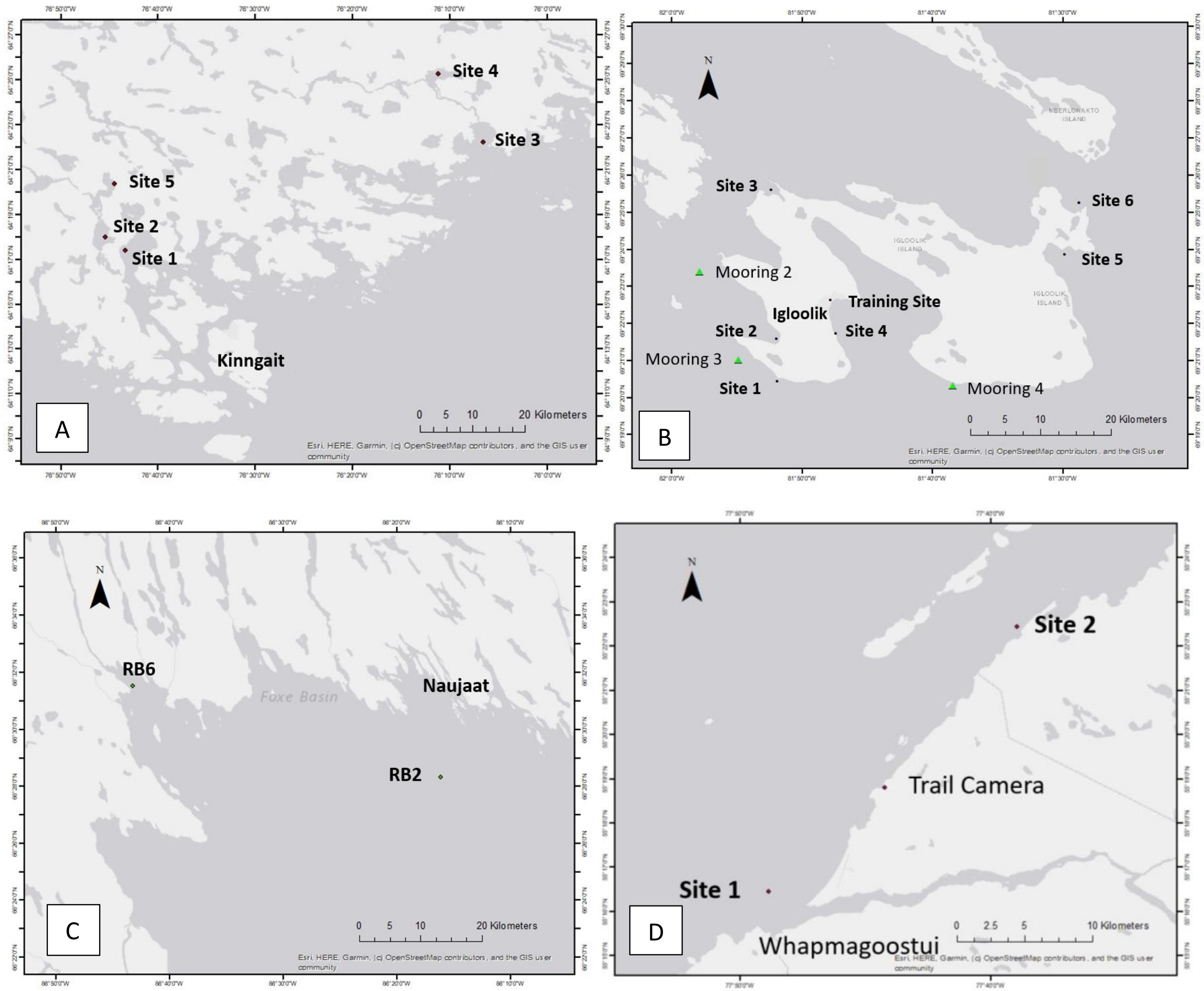


Figure 2: Locations of sampling sites in the Hudson Bay Complex for Kinngait (A), Igloolik (B), Naujaat (C), and Whapmagoostui (D).

Table 2: Latitude and longitude in decimal degrees for each sampling site in the HBC.			
Community	**Site**	**Latitude (DD)**	**Longitude (DD)**
Kinngait	Site 1	64.291509	-76.719600
	Site 2	64.300276	-76.757681
	Site 3	64.371256	-76.110500
	Site 5	64.339889	-76.741700
Igloolik	Site 1	69.340833	-81.865494
	Site 2	69.359893	-81.866226
	Site 3	69.427027	-81.872648
	Site 4	69.338568	-81.640133
	Site 5	69.362269	-81.789766
	Site 6	69.430611	-81.528511
Naujaat	RB2	66.472273	-86.269111
	RB6	66.525465	-86.721444
Whapmagoostui	Site 1	55.274308	-77.814575
	Site 2	55.374301	-77.649543

The data collection phase consisted of training and community-led research (summarized in Table 1) during a mix of ice covered and open water seasons from 2020 to 2021 (summarized in Table 3) at community selected sites (summarized in Table 2). Efforts in Kinngait were completed over two ice covered and two open water field seasons, whereas efforts in Igloolik occurred over one ice covered and one open water season. Community-led coastal research was undertaken in Whapmagoostui over one open water field season and in Naujaat over one ice covered season.

Training took place before all fieldwork efforts. For the 2020 ice covered fieldwork, training took place in-person in Kinngait (January 2020) and Igloolik (February 2020). Although travel was not possible by researchers due to COVID-19, training continued to take place remotely post March 2020. In Kinngait and Igloolik, training for the open water fieldwork took place in August 2020 and built upon the technician experiences in the ice covered field program. In Whapmagoostui, training took place on video calls from June to August 2020. In Kinngait, ice covered training took place remotely in January 2021 and open water training took place in June and July 2021 also by remote methods. Training was completed remotely for Naujaat technicians in March 2021 and a phone call took place in June 2021 between DFO and technicians to refresh the training and answer questions before the start of the spring sampling. Details of the in person training and remote training methods are explained below.

In person training involved two days of training and took place in Kinngait and Igloolik during the winter of 2020. During the morning on the first day, technicians met with DFO researchers at the HTA to discuss safety procedures, try using the InReaches, and to learn the field protocols. In the afternoon of the first day, technicians and researchers travelled to a coastal training site near town where the researchers showed the technicians how to take environmental measurements, use the benthic camera, deploy loggers, and how to record notes. On the second day of training, the researchers and technicians travelled to the same coastal location where the technicians were the research leads and completed the same measurements and deployed the same equipment as the previous day. The researchers were available to answer questions and provide assistance as needed. This acted as a trial for the coastal program for when the technicians would be doing fieldwork without researchers present.

Remote training was adapted for each community by using a combination of training videos, video calls, phone calls, and written instructions. For open water programs, the technicians received a USB or private YouTube link to training videos describing how to deploy the moorings, set the gillnet, complete benthic ponar grabs, and perform zooplankton tows. Written field protocols were provided for each component of the open water and ice covered programs, which were then used by technicians throughout the fieldwork. Sampling protocols and techniques were clarified and questions were addressed during 1-2 phone calls among researchers and technicians in each community prior to fieldwork. If internet speed and technology permitted, a video call also occurred to provide additional training. Technicians were more familiar with the ice covered protocols because they had either completed the open water program or had experience working on similar research projects in the past.

Table 3: Dates of field programs within the HBC.

	Ice Covered	**Open Water**
Kinngait	January 25th – March 18th, 2020 January 20th – March 18th, 2021	August 27th – October 9th, 2020 July 10th – November 10th, 2021
Igloolik	February 12th – March 24th, 2020	August 26th – September 24th, 2020
Whapmagoostui		August 30th – October 30th, 2020
Naujaat	March 17th – March 24th, 2021 June 14th – June 25th, 2021	

2.1.2 Reporting

Reporting back to the community occurred following every field season in the form of a newsletter and also a presentation (virtual or in person), when possible (Table 1, Appendix A, B). The Aiviq HTA in Kinngait received a newsletter in April and November 2020, summarizing the ice covered and open water field seasons, respectively (Appendix A). Researchers met with the Aiviq HTA via teleconference in December 2020 to discuss open water findings, reconfirm support, and plan the ice covered field program. Community technicians and researchers met with the Aiviq HTA board in March 2021 to report on results, with the researchers attending remotely. A newsletter was sent to Kinngait in February 2022 summarizing the open water findings and researchers met with the Aiviq HTA board remotely in March 2022 to report on results (Appendix A). In May and December 2020, the Igloolik HTA received a newsletter summarizing the results of the ice covered and open water field programs, respectively. Researchers also met with the Igloolik HTA remotely in January 2021 to discuss the findings of the ice covered and open water programs. In Whapmagoostui during November 2020, the CTA received a newsletter summarizing the open water program results and the technician gave a presentation, that was co-developed with the researchers, to the CTA (Appendix B). The Arviq

HTA received a newsletter summarizing the open water field program in August 2021 (Appendix A).

2.2 Field methods

The field program aimed to use methods that assessed environmental and biological indicators during both the open water and ice covered seasons. Core oceanography, including methods to document water temperature and salinity, was used as an environmental indicator, as was ice and snow through the use of measurements and timelapse cameras. Inshore fish community observations and biology, zooplankton, and benthic invertebrate composition was used to examine biological and food web indicators. The division by parameter, season, site, and community is provided in Table 4 and Table 5.

While all described methods were discussed with each community organization during the study design, not all methods were selected to be used in all field seasons in all communities (summarized in Table 4 and Table 5). These decisions were made in collaboration with each community organization and were based on the level of capacity within the community, the level of training possible (in person or remote), weather, and the priorities of each HTA/HTO/CTA.

For the purpose of this technical report in the Arctic Coast program, the number and type of samples, as well as the duration of environmental data is described in the results. The methods were piloted in new communities and it was not known exactly how or what scientific information could be collected.

Table 4: Summary of the ice covered parameters assessed during community-led coastal assessments in the HBC for 2020-2021.

		Kinngait	**Igloolik**	**Whapmagoostui**	**Naujaat**
Winter 2020	Core Oceanography	Site 1 Site 2 Site 3 Site 4 Site 5	Site 1 Site 2 Site 3 Site 4 Site 5 Site 6		
	Ice and Snow Measurements	Site 1 Site 2 Site 3 Site 4 Site 5	Site 1 Site 2 Site 3 Site 4 Site 5 Site 6		
	Timelapse camera	Near town	Near town		
	Inshore fish community composition and biology				
	Zooplankton				

	Benthic invertebrate community composition (benthic camera)	Site 1 Site 2 Site 3 Site 4 Site 5	Site 1 Site 2 Site 3 Site 4 Site 5 Site 6		
Winter 2021	Core Oceanography	Site 1 Site 2 Site 3 Site 4			RB2 RB6
	Ice and Snow	Site 1 Site 2 Site 3 Site 4			RB2 RB6
	Timelapse camera	Site 2			
	Inshore fish community composition and biology	Site 2 Site 4			RB2 RB6
	Zooplankton				
	Benthic invertebrate community composition (benthic camera)	Site 1 Site 2 Site 3 Site 4			RB2 RB6
Spring 2021	Core Oceanography				RB2 RB6
	Ice and Snow				RB2 RB6
	Timelapse camera				
	Inshore fish community composition and biology				RB2 RB6
	Zooplankton				
	Benthic invertebrate community composition (benthic camera)				RB2 RB6

Table 5: Summary of parameters assessed during community-led coastal assessments in the HBC during the open water field seasons in 2020-2021.

			Kinngait	**Igloolik**	**Whapmagoostui**	**Naujaat**
Summer and Fall	**Open Water 2020**	Core oceanography	Site 1 Site 3	Site 1 Site 2 Site 3 Site 4	Site 1 Site 2	
		Inshore fish community composition and biology	Site 1 Site 3	Unknown		
		Zooplankton	Site 1 Site 3			
		Benthic invert community composition	Site 1 Site 3			
Summer and Fall	**Open Water 2021**	Core oceanography	Site 1 Site 3			
		Inshore fish community composition and biology	Site 1 Site 3			
		Zooplankton	Site 1 Site 3			
		Benthic invert community composition	Site 1 Site 3			

2.2.1 Environmental Indicators

2.2.1.1 Core Oceanography

Core oceanographic parameters were recorded using CT2X loggers in both the ice covered and open water periods (Figure 3).

Ice covered season

Core oceanographic parameters were measured by deploying temperature and salinity loggers during each sampling in the ice covered field program (Table 4). Temperature and salinity loggers (CT2X Seametrics Smart Sensor) were deployed through an auger hole onto the seafloor, and approximately one meter below the ice (Figure 3). The differences between the sensors were used to compare the difference between benthic and sympatric habitats, and determine the extent of mixing in the water column. The sensors recorded *in situ* temperature (°C), salinity (PSU), conductivity (µS/cm), and total dissolved solids (mg/L) every 15 minutes for the duration of the deployment. Monitors were instructed to deploy the loggers for a minimum of one hour under the ice, if weather permitted.

Open water season

Moorings were deployed during the open water period to record temperature and salinity information at different depths (Table 6). Moorings were created using three HOBO U22 water temperature loggers placed 5 m apart that recorded water temperature (°C) every 15 minutes. There was also a CT2X Seametrics Smart Sensor that recorded bottom temperature (°C), conductivity (µs/cm), total dissolved solids (mg/L), and salinity (PSU) every 15 minutes at 15m depth (Figure 3). The daily average temperature and salinity was then extracted and calculated for each logger.

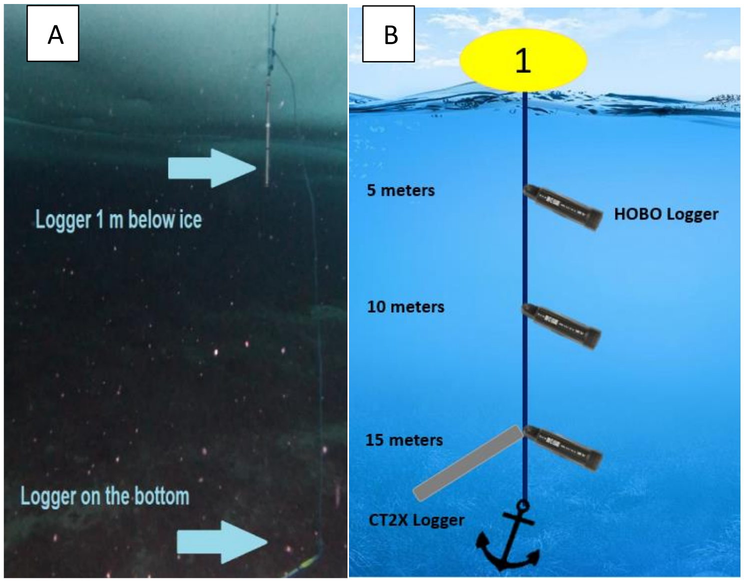


Figure 3: (A) Underwater view of the CT2X loggers being deployed under the ice and on the bottom of the seafloor. (B) Example of a mooring deployed during the open water season with three HOBO U22 water temperature loggers and a CT2X Seametrics Smart Sensor.

Table 6: Location and duration of the mooring deployment per community during the open water period.

Deployment Year	Community	Mooring Number	Latitude (DD)	Longitude (DD)	Deployment Dates
2020	Igloolik	2	69.389981	-81.964123	August 27th – September 24th, 2020
		3	69.350510	-81.914770	
		4	69.338568	-81.640133	
	Kinngait	1	64.291509	-76.719600	August 27th – October 8th, 2020
		3	64.371256	-76.110500	

	Whapmagoostui	1	55.274308	-77.814575	August 30th – October 30th, 2020
		2	55.374301	-77.649543	
2021	Kinngait	1	64.291509	-76.719600	July 14th – August 31st, 2022

2.2.1.2 Ice and Snow

Ice covered season

Snow and ice thickness was identified by communities as a research priority to document coastal and lake conditions. Reconyx timelapse trail cameras were set up to take photos every hour to monitor ice conditions and air temperature was recorded every four hours. The trail camera was set up with a view of the ocean to monitor ice conditions.

Snow and ice thickness was measured during each sampling event. At each site in the winter, the technicians drilled two holes using an ice auger. The first hole was used to take ice and snow measurements and then to deploy the temperature and salinity loggers (Figure 4). The technicians used a tape measure to record the ice thickness (cm), snow thickness (cm) and the freeboard height (cm). Figure 4 describes how the snow, ice, and freeboard measurements were defined. The second hole was used to deploy the benthic camera and jig for fishes.

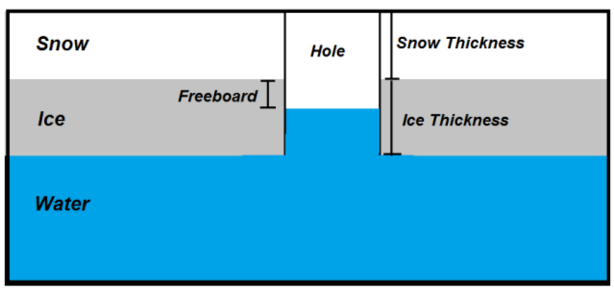


Figure 4: Snow thickness, ice thickness, and freeboard was measured by community technicians during each sampling day in the winter.

2.2.2 Biological and Food Web Indicators

Biological data and samples were collected among three HBC communities to complement oceanographic and environmental data at the same sites. The extent of sampling varied depending on the start date of the project, availability of technicians and season. Among communities with the available community capacity to conduct fieldwork in multiple seasons, invertebrates and fishes were successfully collected to compare seasonal and year-to-year community composition.

2.2.2.1 Inshore Fish Community Observations and Biology

Ice covered season

During the ice covered months, coastal fishes were collected using a second hole in the ice at each site using jigging and hook and line. During winter sampling in 2021 in Kinngait, fishes were collected using gillnets at lake sites under the ice. The gillnets were 6 panel mono multi-mesh gillnets that were 60 m (each panel 10 m), stitched together (0.02, 0.04, 0.06, 0.09, 0.11, 0.13) 1.98 m. Fishes were captured up to a maximum of n=30 per species, euthanized, and frozen for sampling. All other fishes were released or used for subsistence.

Open water season

To assess fish biodiversity, fishes were collected using multi-mesh gillnets. The gillnets were 6 panel nylon multi-mesh gillnets that were 60 m (each panel 10 m), stitched together (0.02, 0.04, 0.06, 0.09, 0.11, 0.13) 1.98 m. Gillnets were set for approximately two hours and checked by community technicians.

Fishes were captured up to a maximum of n=60 per species, euthanized, and frozen for sampling. All other fishes were released or used for subsistence. Fishes that were caught were brought back to the HTA and kept in the freezer. Samples were shipped to the Freshwater Institute (DFO) in Winnipeg for analysis.

Fish Processing

Fish caught during the open water and ice covered seasons were thawed, photographed, measured for morphometric characteristics (total length, fork length, body mass), and processed for sex and maturity status in the lab. The otoliths were removed from the fish to be aged in the aging lab at DFO Winnipeg. The fish abdomen was cut to expose organs. A small incision was made at the top of the esophagus and intestine to remove the stomach and fullness was recorded. Stomachs were sent to a contractor to identify contents. The gonads were removed and weighed to determine the gonadosomatic index. Liver was also removed and weighed to calculate the hepatosomatic index of the fish. Finally, a muscle sample was obtained from above the lateral line. Notes were taken on the fish for any abnormalities and if present, parasites were sampled and preserved for later use.

2.2.2.2 Zooplankton Community Composition

Ice covered season

Zooplankton was not assessed during the ice covered season.

Open water season

To assess lower taxonomic species during the open water field season, plankton was collected using a 150 µm x 0.5 m diameter x 2.2 m plankton net. Technicians recorded the depth of the plankton tow, and lowered the plankton net until it touched the bottom (maximum water depth < 15 m). The technicians waited one minute to let possible sediment settle and then slowly started to lift the plankton net to the surface. When the plankton net reached the surface, technicians swirled the organisms into the cod-end and rinsed with seawater. These samples were then frozen and shipped to DFO Winnipeg for analysis. The zooplankton samples were sent to a contractor for species identification to the nearest taxa.

2.2.2.3 Benthic Invertebrate Community Observations

Ice covered season

Benthic habitat was recorded under the ice using a benthic camera lowered through a hole augured into the sea ice. The goal of deploying the benthic camera was to look at the substrate and investigate the presence of species opportunistically in these videos. The benthic cameras consisted of plastic housing that were custom made with two pieces of rebar (46 cm long, weighing approximately 350 g each) on the side so that when the rebars were deployed to the bottom they held the camera housing approximately 20 cm above the seafloor. A rope was tied onto the end of the plastic housing and a GoPro and light were placed inside. The benthic camera was slowly lowered to the bottom at an approximate rate of 1 m/s and the bottom habitat was recorded for approximately 1 – 10 minutes per site. These GoPros were returned to DFO to examine the footage and images at a later date.

Open water season

Benthic epifauna was collected during the open water period using a petite ponar grab (Wildco ® 15.2 cm x 15.2 cm sample area, weighing approximately 13.6 kg). The technicians recorded the site and depth for each benthic grab. The technicians lowered the petite ponar grab at a rate of approximately 1 m/s to the bottom and then raised it back to the surface. The sample was then sieved using a 595 µm bucket sieve. Technicians placed the bulk sediment and any invertebrates from the grab into a sampling bag. These samples were then frozen and shipped to DFO Winnipeg for analysis.

Benthic invertebrates were identified to the lowest taxonomic level using taxonomic keys from previously published studies from the HBC and given an assigned phylum. Phylum is used here as not all species could be determined to the family level. The estimates for benthic diversity in Kinngait were derived from 23 randomly selected samples at site 1 and 22 randomly selected samples at site 3. Both sites had a range of depths from approximately 7 – 15 m deep.

3.0 Results

The results of each field program from Kinngait, Igloolik, Naujaat, and Whapmagoostui are compiled according to key environmental and biological indicators and priority parameters that were identified by each community and that address knowledge gaps for future management and monitoring. The scope of the field program for each community varied due to the availability of personnel to carry out the work, HTA/HTO/CTA priorities, or due to public health guidelines. As a result, the extent of baseline data collected during 2020-2021 varied among indicators and communities (Table 7).

Table 7: Sampling effort completed by Arctic Coast in 2020 and 2021 among Hudson Bay communities. Environmental parameters include temperature and salinity at depth, snow and ice measurements, and images, whereas biological parameters include biodiversity data and the collection of physical samples for zooplankton, benthic invertebrates, and fishes. These programs include data that are summarized in this report (green), data that were collected but are not summarized (yellow), and communities and/or seasons where no data was collected (grey).

Season	Type	Parameter	Kinngait	Igloolik	Whapmagoostui	Naujaat
Ice Covered 2020 (Jan – March)	**Environmental**	Oceanography	(green)	(green)	(grey)	(grey)
		Timelapse Images	(green)	(green)	(grey)	(grey)
		Snow and Ice	(green)	(green)	(grey)	(grey)
		Benthic Images	(yellow)	(yellow)	(grey)	(grey)
	Biological	Zooplankton	(grey)	(grey)	(grey)	(grey)
		Benthic Epifauna	(grey)	(grey)	(grey)	(grey)
		Fishes	(grey)	(grey)	(grey)	(grey)
Open Water 2020 (Aug – Oct)	**Environmental**	Oceanography	(grey)	(grey)	(green)	(grey)
		Timelapse Images	(green)	(green)	(grey)	(grey)
		Benthic Sediment	(yellow)	(grey)	(grey)	(grey)
	Biological	Zooplankton	(green)	(grey)	(grey)	(grey)
		Benthic Epifauna	(green)	(grey)	(grey)	(grey)
		Fishes	(green)	(grey)	(grey)	(grey)
Ice Covered 2021 (Jan – March)	**Environmental**	Oceanography	(green)	(grey)	(grey)	(green)
		Timelapse Images	(yellow)	(grey)	(grey)	(green)
		Snow and Ice	(green)	(grey)	(grey)	(green)
		Benthic Images	(yellow)	(grey)	(grey)	(green)
	Biological	Zooplankton	(grey)	(grey)	(grey)	(grey)
		Benthic Epifauna	(grey)	(grey)	(grey)	(grey)
		Fishes	(green)	(grey)	(grey)	(green)
Ice Covered 2021 (June)	**Environmental**	Oceanography	(grey)	(grey)	(grey)	(green)
		Timelapse Images	(grey)	(grey)	(grey)	(grey)
		Snow and Ice	(grey)	(grey)	(grey)	(green)
		Benthic Images	(grey)	(grey)	(grey)	(green)
	Biological	Zooplankton	(grey)	(grey)	(grey)	(grey)
		Benthic Epifauna	(grey)	(grey)	(grey)	(grey)
		Fishes	(grey)	(grey)	(grey)	(green)
Open Water 2021 (July – Nov)	**Environmental**	Oceanography	(green)	(grey)	(grey)	(grey)
		Timelapse Images	(yellow)	(grey)	(grey)	(grey)
		Snow and Ice	(yellow)	(grey)	(grey)	(grey)
		Benthic Sediment	(yellow)	(grey)	(grey)	(grey)
	Biological	Zooplankton	(yellow)	(grey)	(grey)	(grey)
		Benthic Epifauna	(green)	(grey)	(grey)	(grey)
		Fishes	(green)	(grey)	(grey)	(grey)

(green)	Data collected and analyzed
(yellow)	Data collected but not analyzed
(grey)	Data not collected in that season

3.1 Environmental Indicators

3.1.1 Core Oceanography

Oceanographic data on water temperature (°C), salinity (PSU), and depth were collected in each HBC community to assess the habitat associations of coastal fishes and invertebrates. These oceanographic data were compared among spatial and temporal scales where possible. The availability of oceanographic data varied according to community, weather conditions, availability of technicians and/or COVID-19 restrictions (Table 7). Loggers were deployed for two consecutive years in Kinngait, where environmental information was collected during the open water and ice covered period each year. Only one open water sampling season was possible in Whapmagoostui. In Naujaat, loggers were deployed in the ice covered season for one season. Loggers were deployed in the open water and ice covered seasons in Igloolik for one year.

Kinngait

Ice-covered Conditions

During the first year of this program in Kinngait, temperature and salinity data were collected by technicians under the ice between February 8th and March 10th, 2020. Mean temperature and salinity data collected during each site visit are summarized in Table 2 based on surface (approximately 1 meter below sea ice) and bottom (up to 12.1 m depth) loggers. Under-ice temperatures were consistently below 0°C, regardless of depth or date of sampling. Lake site 5 (Ivitaarujallik) was the only exception, with a mean bottom temperature of 0.59 ± 0.06 °C and surface temperature (under the ice) of 1.14 ± 0.03°C. Mean surface and bottom temperatures were not notably different. Salinity ranged from 21.23 to 29.74 PSU among coastal sites (1 and 3), and there were some differences between surface and bottom logger readings (Table 8).

In the winter of 2021, community-based technicians replicated the ice covered sampling effort by collecting under-ice temperature and salinity data between January 28th and March 18th, 2021 (Table 9). Bottom temperature ranged from -1.91°C to 0.30°C at coastal sites 1 and 3 and surface loggers recorded temperatures between -3.43°C and -0.15°C. Both surface and bottom temperature measurements were obtained on 4 of the 13 sampling days. The greatest temperature differential was observed on February 24th at site 3, where surface temperature was -0.15 ± 0.17°C and sea floor temperature was -1.88 ± 0.03°C. Interestingly, the under the ice logger appeared to have higher salinity for site 1 during the month of February.

Table 8: Temperature (°C) and salinity (PSU) data collected from approximately 1 m under the ice (surface) and from either the lake or ocean floor (bottom) between February 8th, 2020 and March 10th, 2020 near Kinngait. Measurements are averaged based on approximately 1 hour deployment with readings taken every 15 min.

Date	Habitat	Latitude (DD)	Longitude (DD)	Site	Depth (m)	Bottom Logger		Surface (1 m) Logger	
						Mean Temperature ± SD (°C)	Mean Salinity ± SD (PSU)	Mean Temperature ± SD (°C)	Mean Salinity ± SD (PSU)
8-Feb-20	Coastal	64.239971	-76.531441	Training	3.8	-1.86 ± 0.01	29.33 ± 0.05	-1.95 ± 0.01	29.74 ± 0.05
8-Feb-20	Coastal	64.370919	-76.117100	3	4.9	-1.79 ± 0.00	29.07 ± 0.01	-1.79 ± 0.01	28.56 ± 0.02
18-Feb-20	Lake	64.339889	-76.741700	5	9.8	0.59 ± 0.06	0.07 ± 0.00	1.14 ± 0.03	0.07 ± 0.00
19-Feb-20	Coastal	64.291509	-76.719600	1	8.5	-1.80 ± 0.03	29.39 ± 0.09	-1.81 ± 0.05	28.01 ± 1.66
4-Mar-20	Coastal	64.295255	-76.763492	1	7.2	-1.81 ± 0.03	29.36 ±0.07	-1.91 ± 0.06	29.53 ± 0.10
10-Mar-20	Coastal	64.371256	-76.110500	3	8.2	-1.79 ± 0.01	23.13 ± 1.37	-1.88 ± 0.20	21.23 ± 9.99

Table 9: Temperature (°C) and salinity (PSU) data collected from approximately 1 m under the ice (surface) and from either the lake or ocean floor (bottom) between January 28th 2021 and March 18th, 2021 among Kinngait sites. Measurements are averaged based on approximately 1 hour deployment with readings taken every 15 min. SD is not provided where only one record was taken.

Date	Habitat Type	Latitude (DD)	Longitude (DD)	Bottom Logger				Surface (1m) Logger	
				Site	Depth (m)	Mean Temperature ± SD (°C)	Mean Salinity ± SD (PSU)	Mean Temperature ± SD (°C)	Mean Salinity ± SD (PSU)
28–Jan–21	Coastal	64.371256	-76.110500	3	3.0	-1.84 ± 0.03	27.93 ± 1.81	-3.43	29.17
3-Feb-21	Coastal	64.291509	-76.719600	1	7.6	-1.91 ± 0.17	21.05 ± 1.19	-1.79 ± 0.09	26.40 ± 2.64
10-Feb-21	Coastal	64.291509	-76.719600	1	14.3	-1.79 ± 0.04	NA	-1.74 ± 0.02	29.99 ± 1.10
11-Feb-21	Coastal	64.291509	-76.719600	1	7.2	-1.82	23.24	N/A	N/A
24-Feb-21	Coastal	64.371256	-76.110500	3	3.0	-1.88 ± 0.03	18.12 ± 0.57	-0.15 ± 0.17	N/A
25-Feb-21	Coastal	64.371256	-76.110500	3	5.7	-1.90 ± 0.10	21.06 ± 4.34	N/A	N/A
2-Mar-21	Lake	64.300276	-76.757681	2	8.5	0.97 ± 0.01	0.08 ± 0.00	NA	NA
3-Mar-21	Coastal	64.291509	-76.719600	1	3.0	NA	NA	-1.76 ± 0.01	30.74 ± 0.08
18-Mar-21	Coastal	64.291509	-76.719600	1	17.9	-1.79 ± 0.01	28.54 ± 0.02	-1.78 ± 0.01	29.60 ± 1.45

Open Water Conditions

Water temperature data from moorings at sites 1 (Figure 5) and 3 (Figure 6) indicate a clear and gradual decline in water temperature during the duration of the open water sampling season (August - October). The largest temperature change occurred in surface waters, which were warmer than bottom water during August, and cooler than bottom during October. This temperature inversion is expected as surface waters absorb heat from the atmosphere during the summer, and release heat as the atmosphere cools in fall and early winter. Sites 1 and 3 appear to have very similar average water temperatures across the time of deployment with some variation in temperature that could be attributed to weather. The average water temperature at 5 m was 3.81 ± 1.83°C (site 1) and 3.80 ± 1.60°C (site 3), 10 m was 3.76 ± 1.35°C (site 1) and 3.73 ± 1.21°C (site 3), 14 m was 3.60 ± 0.95°C (site 1) and 15 m 3.64 ± 0.90°C (site 3) (Figure 5, Figure 6). The water temperatures appear to be similar between sites at different depths.

The bottom salinity was recorded at each mooring site and summarized in Figure 7. During this period the average salinity at site 1 was 27.44 ± 4.70 PSU and 26.87 ± 2.26 PSU at site 3. Daily average salinity appears to have some stability at site 3 for the first week of deployment and then some variability.

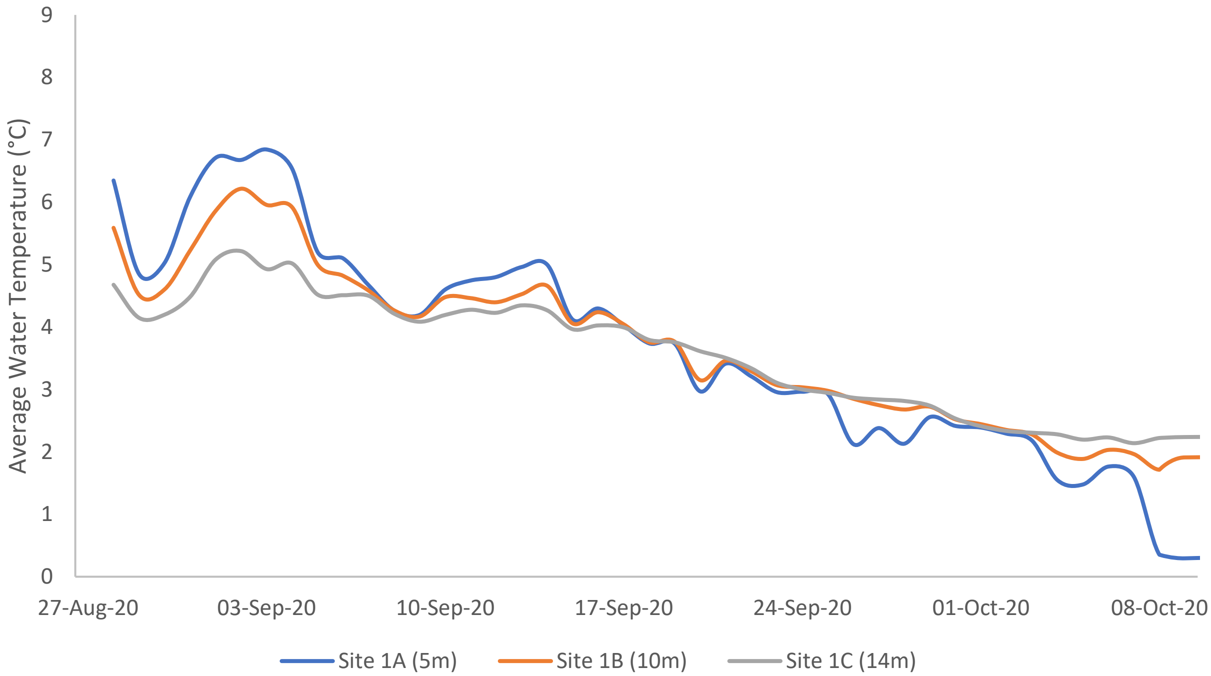


Figure 5: Average daily water temperature data collected from the site #1 mooring deployed in summer 2020 near Kinngait, from August 27th – October 9th, 2020. Temperatures were recorded every 15 minutes at 5 m (1A), 10 m (1B) and 14 m (1C; maximum) depth increments.

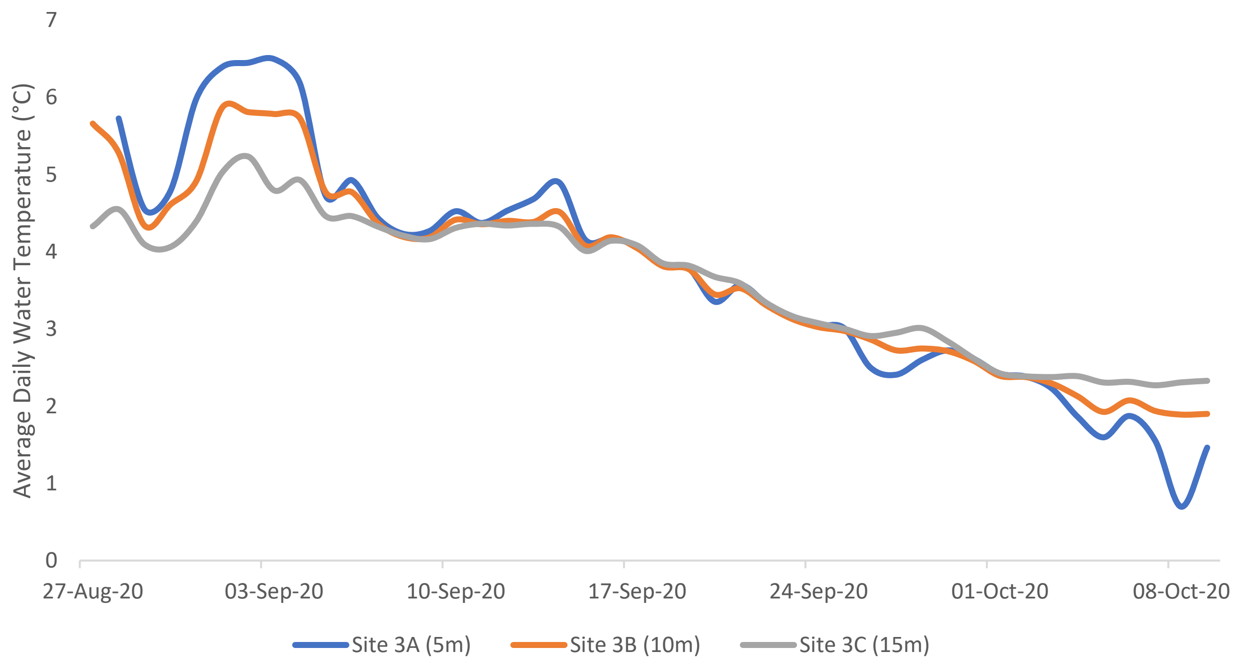


Figure 6: Average daily temperature data collected from the site 3 mooring deployed in summer 2020 near Kinngait, from August 27th – October 9th, 2020. Temperatures were recorded every 15 minutes at 5 m (3A), 10 m (3B) and 13 m (3C; maximum) depth increments.

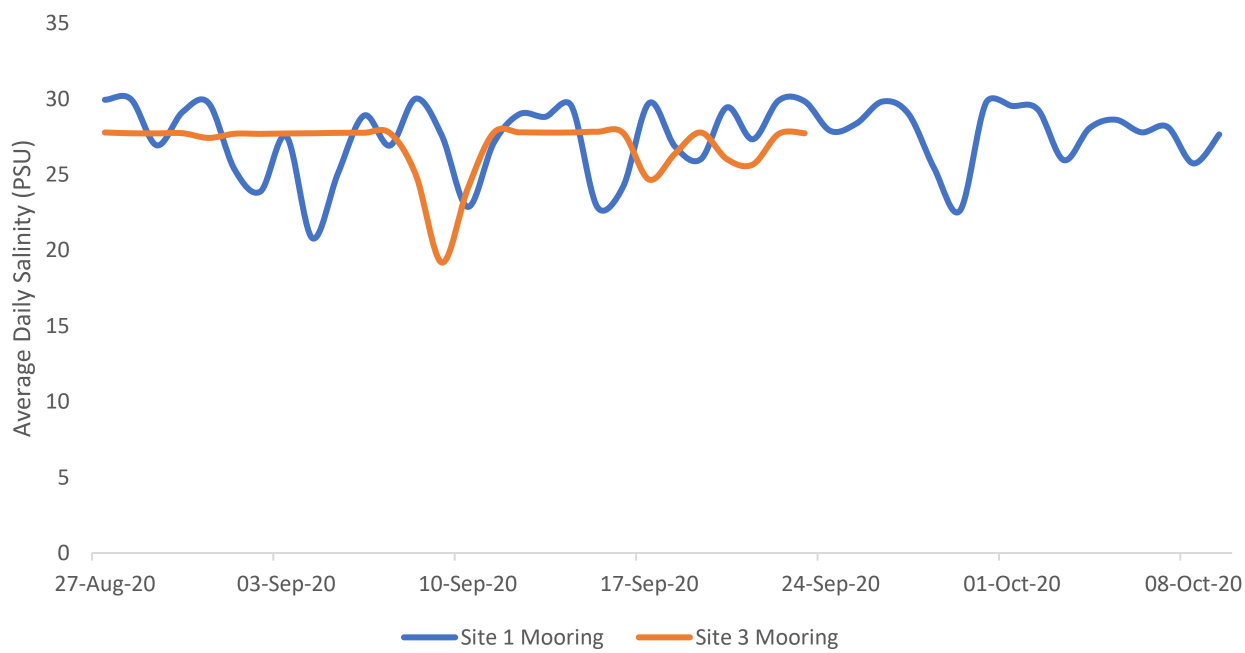


Figure 7: Average daily bottom salinity (PSU) from August 27th – October 9th, 2020 anchored at site 1 and site 3, at 14 m and 13m depths respectively.

In 2021, average daily water column temperature and bottom salinity were only collected by a mooring stationed at site 1, and earlier in the open water season (July – August) than in 2020 (August – October). Figure 8 and Figure 9 summarize the temperature at three depth intervals and bottom salinity between July 14th and August 31st, 2021. The water temperature was consistently colder for the bottom logger compared to the loggers positioned at 5 m and 10 m. The temperature of the loggers in the 5 m and 10 m section of the water column did not differ substantially from each other, but varied throughout the season, ranging from approximately 3.01 to 10.62°C (Figure 8). In 2021, the average daily salinity was 25.60 ± 3.68 PSU. Salinity remained mostly stable through July and then experienced daily fluctuations for the duration of the deployment (Figure 9).

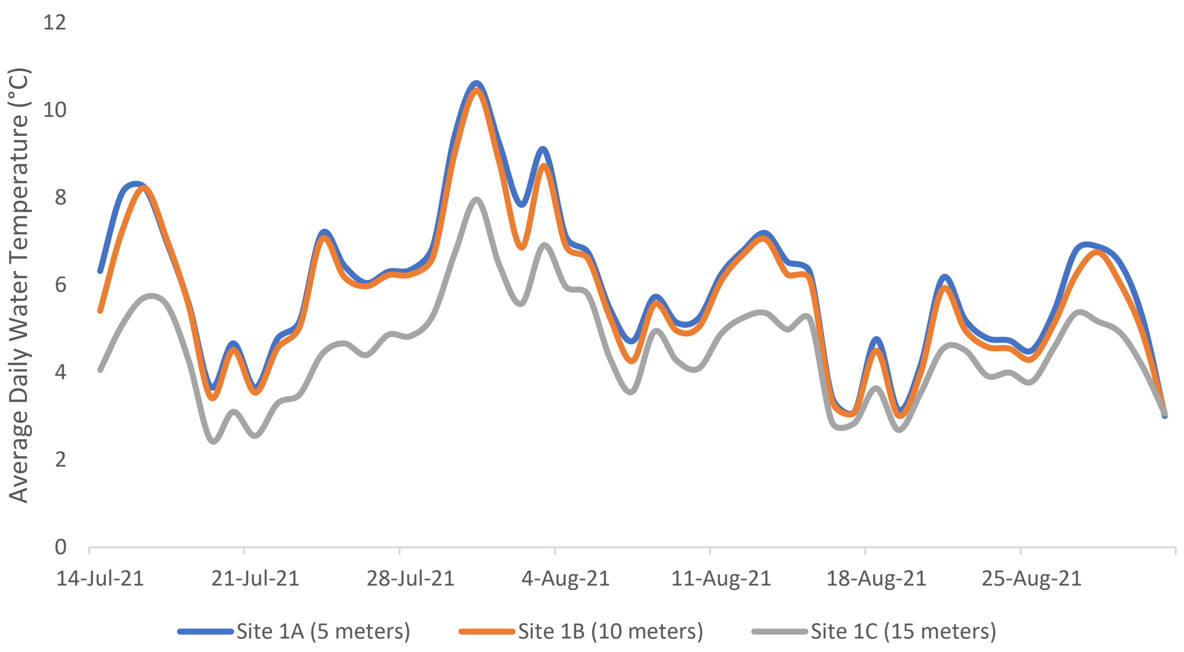


Figure 8: Average daily water temperature at 5m (1A), 10m (1B), and approximately 15m (1C; maximum) depths recorded during July 14th – August 31st, 2021 at site 1 near Kinngait, Nunavut.

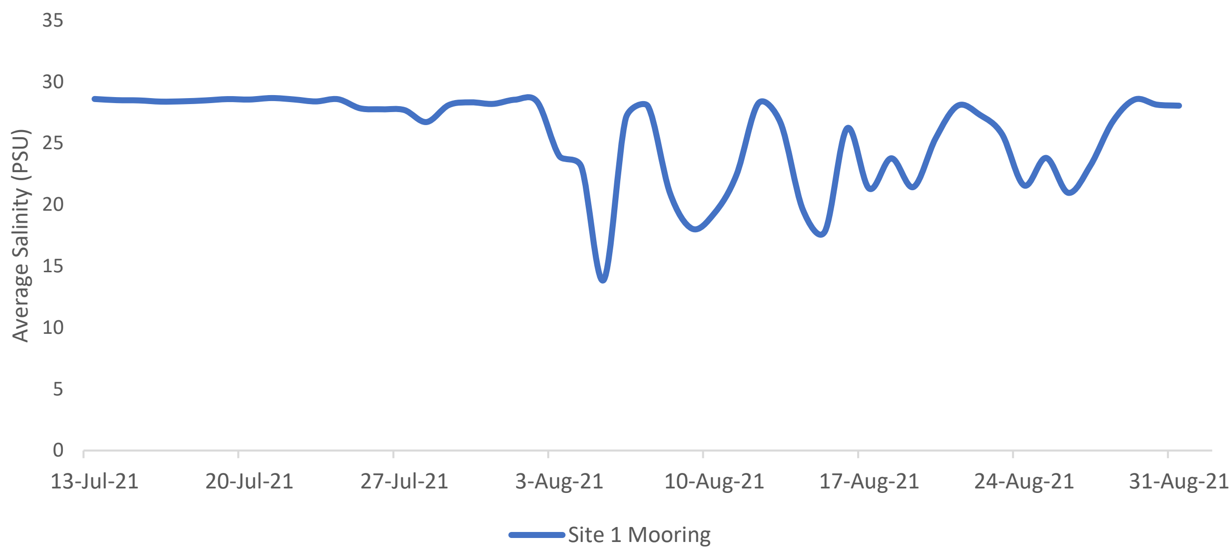


Figure 9: Average daily bottom salinity (PSU) at the moorings surrounding Kinngait using a CT2X sensor. The salinity was measured from July 14th, 2021 until August 31st, 2021.

Igloolik

The winter field program was piloted in Igloolik from February 13th to March 23rd, 2020. Temperature and salinity data were collected under the ice and are summarized in Table 10. Water temperature was below zero for the duration of the sampling period. The average bottom and under the ice water temperatures were relatively similar being at or near freezing. Water temperatures were comparable on both the east (sites 1, 2, 3, 4) and the west site side of Igloolik Island (site 5, 6).

Bottom salinity was generally higher than under the ice salinity among sampling events near Igloolik. Overall, the bottom salinity ranged from 17.82 ± 0.87 PSU to 32.11 ± 0.04 PSU and the salinity under the ice ranged from 18.84 ± 0.20 PSU to 29.55 ± 0.21 PSU. The average salinity was highest overall at site 3 with respect to bottom recordings and under the ice recordings (31.94 ± 0.05 PSU and 29.55 ± 0.21 respectively).

Table 10: Temperature (°C) and salinity (PSU) data collected from approximately 1 m under the surface (ice) and ocean floor between February 13th, 2020 and March 23rd, 2020 among Igloolik Nunavut sites. Measurements are averaged based on approximately 1 hour deployment with readings taken every 15 min, N/A are listed where PSU did not stabilize within the deployment period.

Date	Latitude (DD)	Longitude (DD)	Site	Depth (m)	Bottom Logger		Surface (1 m) Logger	
					Mean Temperature ± SD (°C)	Mean Salinity ± SD (PSU)	Mean Temperature ± SD (°C)	Mean Salinity ± SD (PSU)
13-Feb-2020	69.362297	-81.789719	-	6.8	-1.85 ± 0.12	24.65 ± 0.60	-1.89 ± 0.22	N/A
17-Feb-2020	69.340833	-81.865494	1	26.5	-1.75 ± 0.00	29.76 ± 0.01	-1.73 ± 0.00	27.33 ± 1.56
17-Feb-2020	69.359893	-81.866226	2	6.4	-1.98 ± 0.39	N/A	-1.96 ± 0.34	22.86 ± 0.35
17-Feb-2020	69.430611	-81.528511	6	14.1	-2.75 ± 1.92	29.01 ± 0.97	-1.79 ± 0.13	27.54 ± 3.71
21-Feb-2020	69.362269	-81.789766	5	4.5	-1.97 ± 0.33	21.72 ± 0.46	-1.85 ± 0.15	18.84 ± 0.20
21-Feb-2020	69.338568	-81.640133	4	4.0	-1.94 ± 0.16	N/A	-1.72 ± 0.01	N/A
22-Feb-2020	69.427027	-81.872648	3	3.9	-1.63 ± 0.04	31.43 ± 0.05	-1.88 ± 0.21	N/A
22-Feb-2020	69.359893	-81.866226	2	6.4	-1.96 ± 0.30	N/A	-2.14 ± 0.63	N/A
23-Feb-2020	69.340833	-81.865494	1	28.0	-1.75 ± 0.00	29.92 ± 0.02	-1.73 ± 0.01	28.55 ± 0.63
24-Feb-2020	69.427027	-81.872648	3	4.5	-1.66 ± 0.18	31.43 ± 0.31	-1.77 ± 0.09	28.48 ± 0.19
24-Feb-2020	69.359893	-81.866226	2	6.2	-1.85 ± 0.14	20.56 ± 0.17	-1.86 ± 0.19	21.55 ± 1.40
24-Feb-2020	69.340833	-81.865494	1	27.9	-1.83 ± 0.08	18.93 ± 0.20	-1.74 ± 0.02	20.89 ± 0.26
28-Feb-2020	69.430611	-81.528511	6	13.5	-1.88 ± 0.15	23.92 ± 0.98	-1.78 ± 0.08	22.82 ± 0.10
28-Feb-2020	69.362269	-81.789766	5	4.3	-2.03 ± 0.21	23.44 ± 0.68	-1.84 ± 0.10	21.58 ± 0.64
3-Mar-2020	69.427027	-81.872648	3	4.7	-1.81 ± 0.14	29.59 ± 1.82	-1.77 ± 0.10	26.94 ± 1.89
3-Mar-2020	69.359893	-81.866226	2	7.3	-1.87 ± 0.13	22.35 ± 0.48	-2.09 ± 0.57	22.28 ± 0.73
3-Mar-2020	69.340833	-81.865494	1	27.7	-1.82 ± 0.09	23.62 ± 4.41	-1.81 ± 0.14	21.47 ± 1.21
4-Mar-2020	69.338568	-81.640133	4	5.2	-1.79 ± 0.06	26.53 ± 4.37	-1.91 ± 0.28	27.40 ± 2.43
4-Mar-2020	69.362269	-81.789766	5	4.1	-1.92 ± 0.12	17.82 ± 0.87	-1.99 ± 0.37	N/A
4-Mar-2020	69.427027	-81.872648	3	4.3	-1.62 ± 0.02	31.42 ± 0.04	-1.72 ± 0.00	29.18 ± 0.15

4-Mar-2020	69.359893	-81.866226	2	6.9	-1.83 ± 0.11	21.10 ± 0.24	-1.81 ± 0.12	22.61 ± 0.23
9-Mar-2020	69.430611	-81.528511	6	12.6	-1.82 ± 0.05	25.58 ± 1.08	-1.80 ± 0.08	25.64 ± 1.41
9-Mar-2020	69.427027	-81.872648	3	3.7	-1.69 ± 0.05	31.94 ± 0.05	-1.73 ± 0.01	28.49 ± 0.71
9-Mar-2020	69.359893	-81.866226	2	5.4	-1.93 ± 0.26	24.88 ± 0.44	-1.97 ± 0.36	N/A
9-Mar-2020	69.340833	-81.865494	1	25.9	-1.80 ± 0.06	24.40 ± 4.49	-1.85 ± 0.19	22.61 ± 0.63
10-Mar-2020	69.427027	-81.872648	3	4.5	-1.62 ± 0.00	32.11 ± 0.04	-1.73 ± 0.01	29.43 ± 0.06
10-Mar-2020	69.359893	-81.866226	2	6.1	-1.83 ± 0.14	N/A	-1.73 ± 0.01	N/A
10-Mar-2020	69.340833	-81.865494	1	25.9	-1.77 ± 0.01	27.64 ± 1.79	-1.75 ± 0.03	22.52 ± 0.24
16-Mar-2020	69.427027	-81.872648	3	4.5	-1.76 ± 0.01	30.75 ± 0.15	-1.73 ± 0.01	29.55 ± 0.21
16-Mar-2020	69.359893	-81.866226	2	7.1	-1.82 ± 0.11	20.66 ± 0.21	-1.79 ± 0.11	19.82 ± 1.33
16-Mar-2020	69.340833	-81.865494	1	25.9	-1.79 ± 0.02	22.62 ± 0.55	-1.73 ± 0.01	22.66 ± 0.15
18-Mar-2020	69.362269	-81.789766	5	5.5	-1.85 ± 0.11	29.71 ± 0.15	-1.79 ± 0.08	24.84 ± 1.13
18-Mar-2020	69.338568	-81.640133	4	4.1	-2.01 ± 0.22	23.57 ± 0.98	-1.73 ± 0.01	18.95 ± 0.24
21-Mar-2020	69.427027	-81.872648	3	3.8	-1.55 ± 0.10	31.78 ± 0.14	-1.71 ± 0.06	29.46 ± 0.06
21-Mar-2020	69.359893	-81.866226	2	6.0	-1.80 ± 0.07	26.24 ± 2.40	-1.79 ± 0.08	21.86 ± 1.05
21-Mar-2020	69.340833	-81.865494	1	26.5	-2.07 ± 0.66	29.74 ± 0.48	-1.90 ± 0.35	23.16 ± 4.13
23-Mar-2020	69.427027	-81.872648	3	3.5	-1.33 ± 0.47	31.42 ± 0.33	-1.66 ± 0.15	29.44 ± 0.15
23-Mar-2020	69.359893	-81.866226	2	5.3	-1.78 ± 0.02	23.34 ± 0.28	-1.75 ± 0.03	22.35 ± 0.58
23-Mar-2020	69.340833	-81.865494	1	26.2	-1.82 ± 0.08	24.84 ± 1.64	-1.74 ± 0	27.17 ± 1.69

Open Water Conditions

Water column temperature data were recorded at four sites around Igloolik island between August 27th and September 24th, 2020 (Figure 10). The maximum depth at mooring 2C was 14.2 m, mooring 3C was 14.1 m, and mooring 4C was 14.0 m. The average water temperature was warmer at mooring 2 (2.98 ± 0.66°C) compared to mooring 3 (2.35 ± 0.42°C) and mooring 4 (1.92 ± 0.27°C). Mooring 2 also had the highest daily average temperature range (1.98 to 4.73°C), compared to mooring 3 (1.82 to 3.85°C) and mooring 4 (1.39 to 2.54°C). Moorings 2 and 3 indicated there was warmer water at the end of August and then water temperature gradually decreased to around 2°C towards the end of September. Moorings 2 and 3 showed evidence of stratification in the water column towards the end of August, and then more mixing may have occurred in September. Mooring 4 was located on the southeast corner of the island and had little temperature gradients between surface and bottom temperatures throughout with a brief warming period at the beginning and then cooling. The influence of tides (up to approximately 2 m; Environment Canada, 2020) could facilitate mixing of the water between the loggers surrounding Igloolik.

The bottom salinity recorded at each of the mooring sites stationed around Igloolik Island is summarized in Figure 11. The average salinity (± SD) over the open water season at mooring 2 was 26.92 ± 2.49 PSU, and was 27.02 ± 2.00 PSU at mooring 3. The salinity data collected among sites were comparable from the end of August until the middle of September.

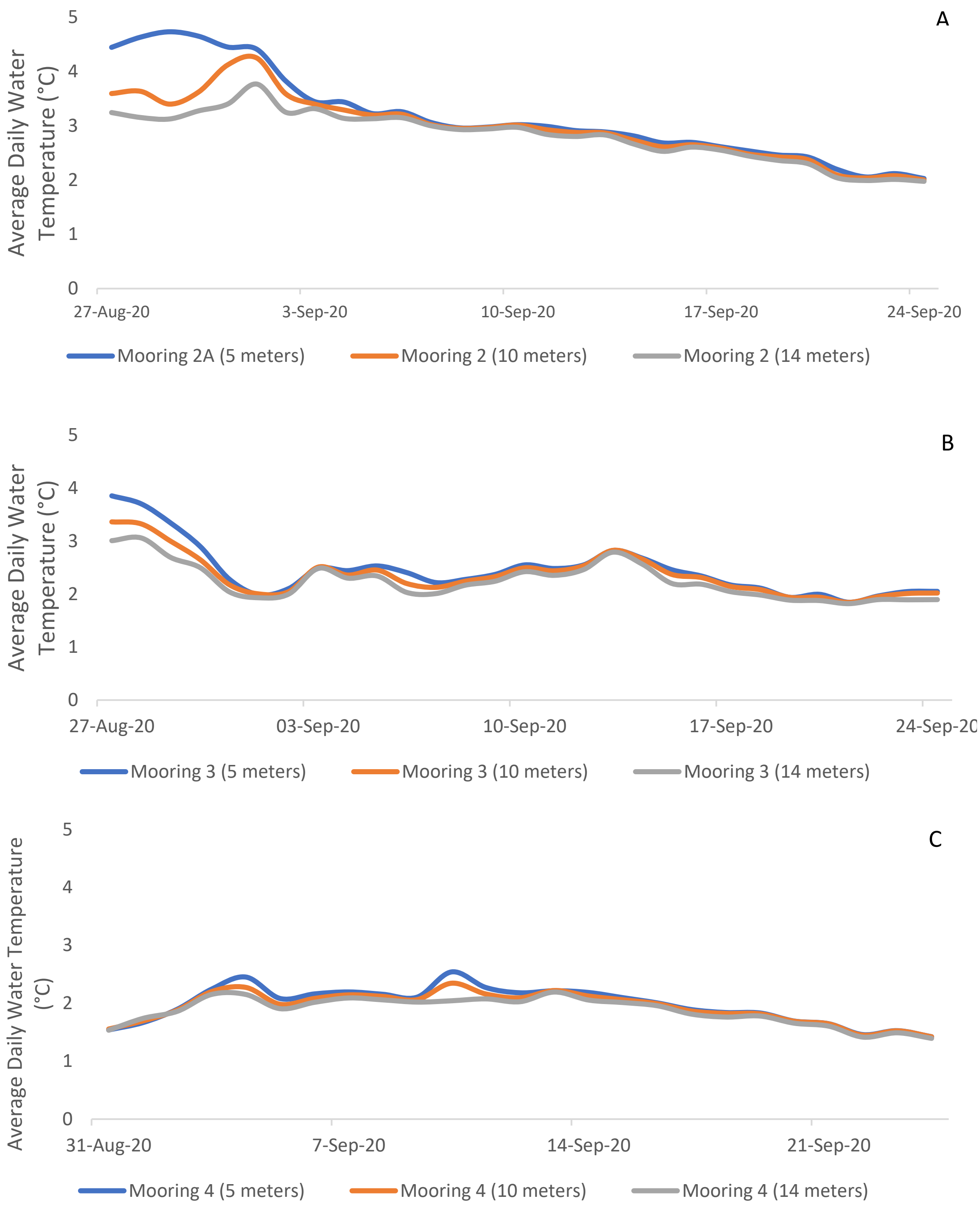


Figure 10: Average daily water temperature (°C) from (A) Mooring 2 (69.389981, -81.964123), (B) Mooring 3 (69.350510; -81.914770) and (C) Mooring 4 (69.338568; -81.640133). These moorings were deployed from approximately August 27th – September 24th, 2020 in the area surrounding Igloolik Island.

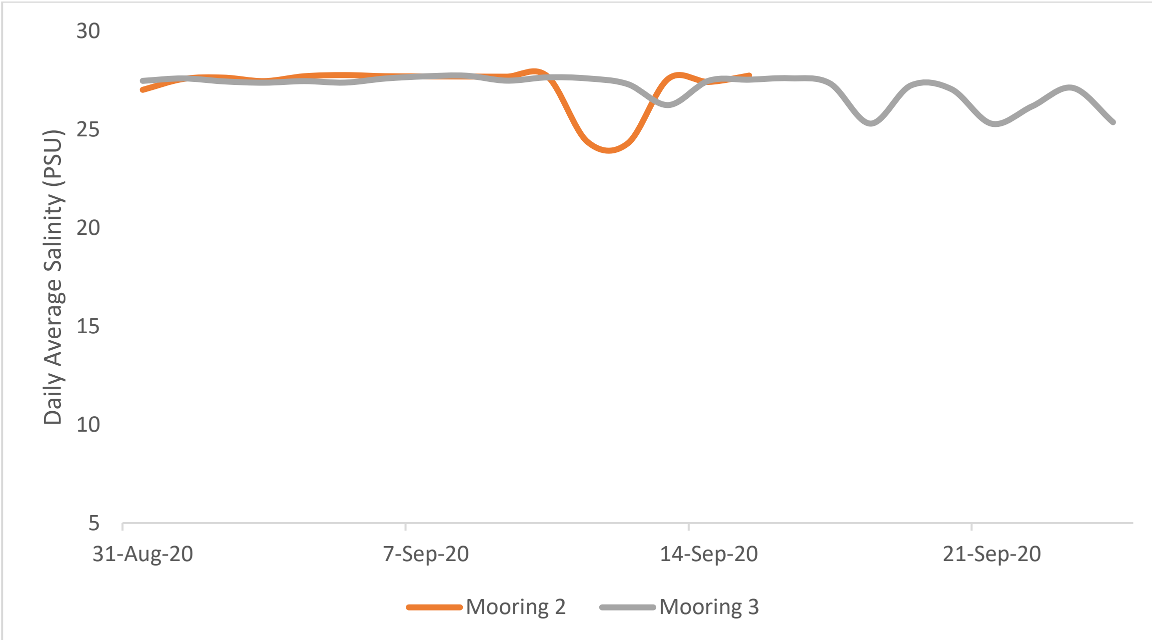


Figure 11: Bottom salinity (PSU) recorded at mooring 2 (69.389981, -81.964123) and mooring 3 (69.350510; -81.914770) deployed near Igloolik, between August 31st and September 24th, 2020.

Naujaat

Water temperature and salinity were recorded at two sites located in Naujaat from March 17th to 24th, 2021 (Table 11). The average temperature under the ice at site RB2 and RB6 stations was consistently near -2°C, despite differences in depth and location. Overall, salinity ranged from 29.28 to 29.80 PSU at the seafloor and 26.15 to 29.46 PSU at the surface, approximately one meter under the ice. The average temperature at the seafloor ranged from -1.87°C to -1.81°C, compared to -1.83°C to -1.79°C under the ice at sites RB2 and RB6. The under the ice logger stopped recording after March 22nd, 2021.

Temperature and salinity were recorded under the ice between June 14th - 25th, 2021 to replicate the effort conducted that same year in March (Table 11). At both sites (RB2 and RB6), the salinity ranged from 26.55 to 26.61 PSU and the water temperature ranged from -1.71°C to -1.33°C. It appears that bottom temperature at RB6 was slightly warmer than RB2 depending on the day of sampling in June (June 22nd, 2021 was the warmest). Salinity has some variation, but remained similar at both sites so the slight difference may be due to input from rivers, or from differences in depth. RB2 is a much deeper location (approximately 75 m) compared to RB6 (approximately 25 m).

Table 11: Average temperature and salinity data collected from C2TX loggers deployed under the ice (approximately 1 m below the ice) and the bottom of the ocean during the March and June sampling effort at two sites located near Naujaat.

					Bottom Logger		**Under the Ice Surface Logger**	
Date	**Site**	**Latitude (DD)**	**Longitude (DD)**	**Depth (m)**	**Average Temperature (°C) +/- SD**	**Average Salinity (PSU) +/- SD**	**Average Temperature (°C) +/- SD**	**Average Salinity (PSU) +/- SD**
17-Mar-21	RB2	66.472273	-86.269111	75.0	-1.82 ± 0.01	29.80 ± 1.23	-1.79 ± 0.00	28.99 ± 0.46
17-Mar-21	RB6	66.525465	-86.721444	22.7	-1.82 ± 0.00	29.50 ± 0.71	-1.79 ± 0.00	29.18 ± 0.03
19-Mar-21	RB2	66.472273	-86.269111	75.0	-1.81 ± 0.00	29.28 ± 0.01	-1.79 ± 0.00	29.46 ± 0.02
19-Mar-21	RB6	66.525465	-86.721444	21.2	-1.87 ± 0.10	29.46 ± 0.08	-1.80 ± 0.00	29.52 ± 0.03
22-Mar-21	RB2	66.472273	-86.269111	75.0	-1.81 ± 0.00	29.33 0.01	-1.79 ± 0.00	26.15 ± 2.01
22-Mar-21	RB6	66.525465	-86.721444	29.8	-1.85 ± 0.04	25.51 ± 1.48	-1.83 ± 0.06	26.15 + 2.09
24-Mar-21	RB2	66.472273	-86.269111	75.0	-1.82 ± 0.01	29.42 ± 0.02	N/A	N/A
24-Mar-21	RB6	66.525465	-86.721444	29.8	-1.83 ± 0.01	28.45 ± 0.88	N/A	N/A
14-Jun-21	RB2	66.472273	-86.269111	75.0	-1.51 ± 0.48	26.55 ± 6.00	N/A	N/A
16-Jun-21	RB2	66.472273	-86.269111	75.0	-1.61 ± 0.01	29.50 ± 0.01	N/A	N/A
16-Jun-21	RB6	66.525465	-86.721444	29.8	-1.62 ± 0.00	29.47 ± 0.02	N/A	N/A
22-Jun-21	RB2	66.472273	-86.269111	75.0	-1.71 ± 0.03	29.51 ± 0.04	N/A	N/A
22-Jun-21	RB6	66.525465	-86.721444	NA	-1.33 ± 0.03	29.19 ± 0.04	N/A	N/A
24-Jun-21	RB2	66.472273	-86.269111	75.0	-1.70 ± 0.00	29.61 ± 0.01	N/A	N/A
24-Jun-21	RB6	66.525465	-86.721444	NA	-1.63 ± 0.00	29.55 ± 0.00	N/A	N/A
25-Jun-21	RB2	66.472273	-86.269111	75.0	-1.67 ± 0.04	29.60 ± 0.02	N/A	N/A
25-Jun-21	RB6	66.525465	-86.721444	NA	-1.62 ± 0.01	29.50 ± 0.00	N/A	N/A

Whapmagoostui

Open Water Conditions

During summer 2020, a mooring was deployed at sites 1 and 2 in Whapmagoostui from August 30th – October 30th, 2020 and water temperatures were recorded at about 5 m depth (Figure 12). During the sampling period, the average water temperature at site 1 was 6.75 ± 2.26°C, and 6.68 ± 2.26°C at site 2. The daily average water temperature at site 1 ranged approximately 8°C from 10.82°C on September 5th, 2020 to 2.34°C on October 29th, 2020. The daily average temperature range was similar at site 2 with a maximum of 10.47°C on September 2nd, 2020 and 2.41°C on October 29th, 2020. The average daily recorded bottom salinity at site 1 was 20.70 +/- 0.61 PSU over the duration of deployment, with a minimum and maximum of 19.11 to 22.19 PSU, respectively (Figure 13).

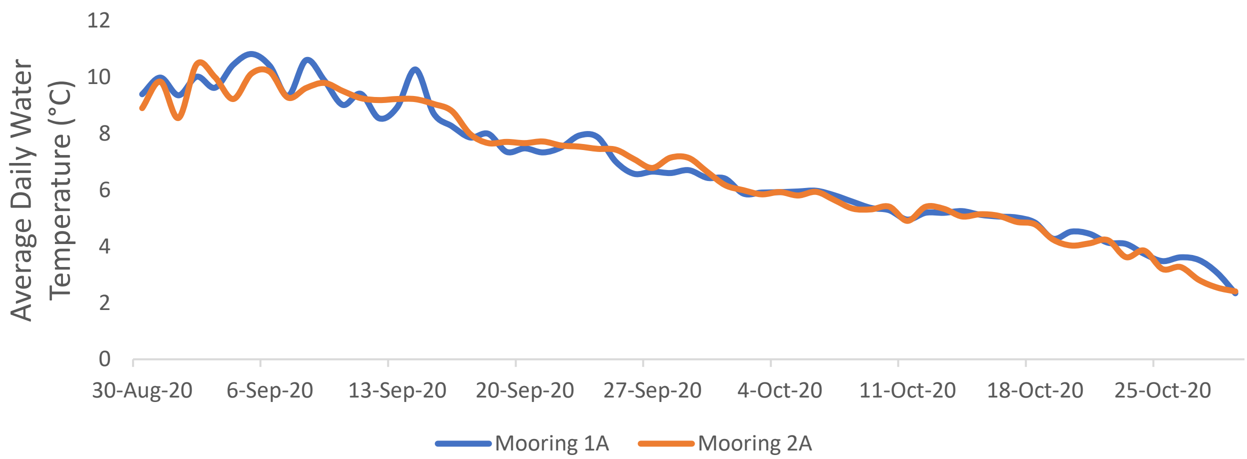


Figure 12: Water temperature (°C) from moorings 1 (55.274308, -77.814575) and 2 (55.374301, -77.649543) deployed near Whapmagoostui at a depth of 5 m, from August 30th – October 30th, 2020.

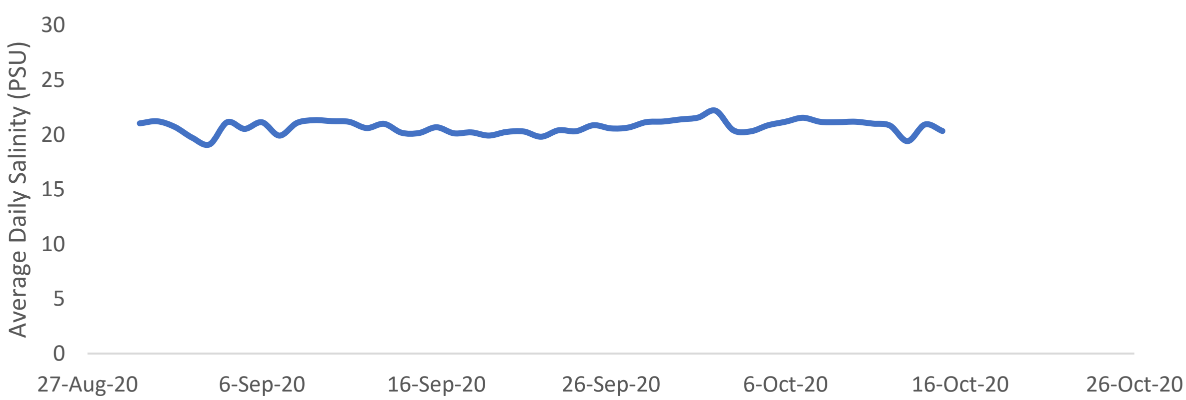


Figure 13: Salinity (PSU) from a mooring deployed at 5 m depth, at site 1 near Whapmagoostui from August 30th – October 15th, 2020.

3.1.2 Ice and Snow

Kinngait

The thickness of snow and ice were recorded at each site located near Kinngait from February 19th to March 4th 2020 (Figure 14, Figure 15). In 2020, the coastal ice thickness ranged from 106.7 to 137.0 cm and the snow depth ranged from 13.0 to 36.8 cm. In 2020, the lake ice thickness ranged from 94.0 to 121.9 cm whereas the snow depth ranged from 5.1 to 23.0 cm. Generally, the lake sites had thinner ice and less snow relative to the coastal sites during the sampling period.

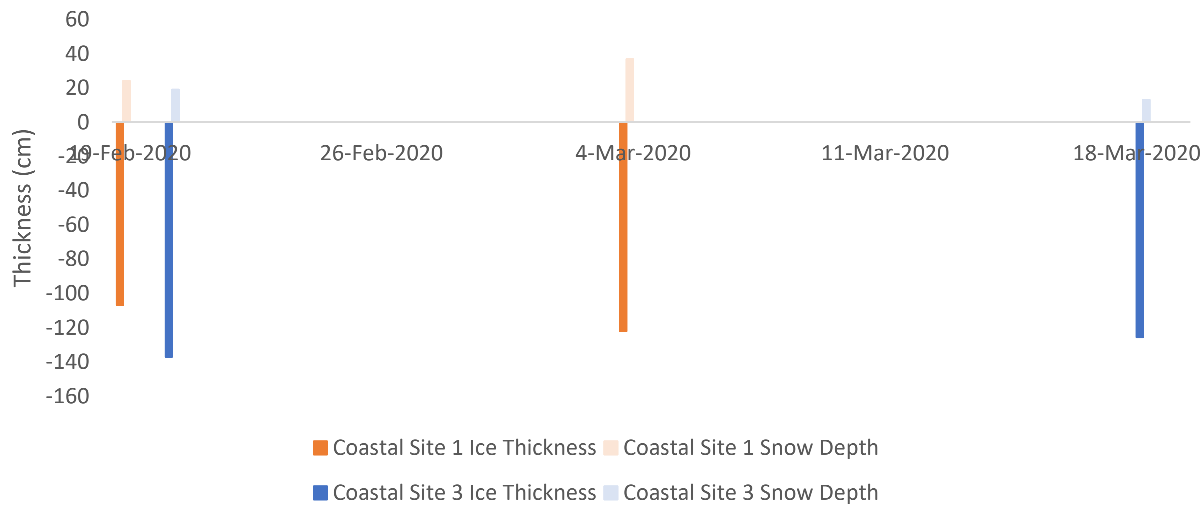


Figure 14: Snow depth (cm) recorded at coastal sites (sites 1 and 3) located near Kinngait, NU between January 25th and March 18th, 2020.

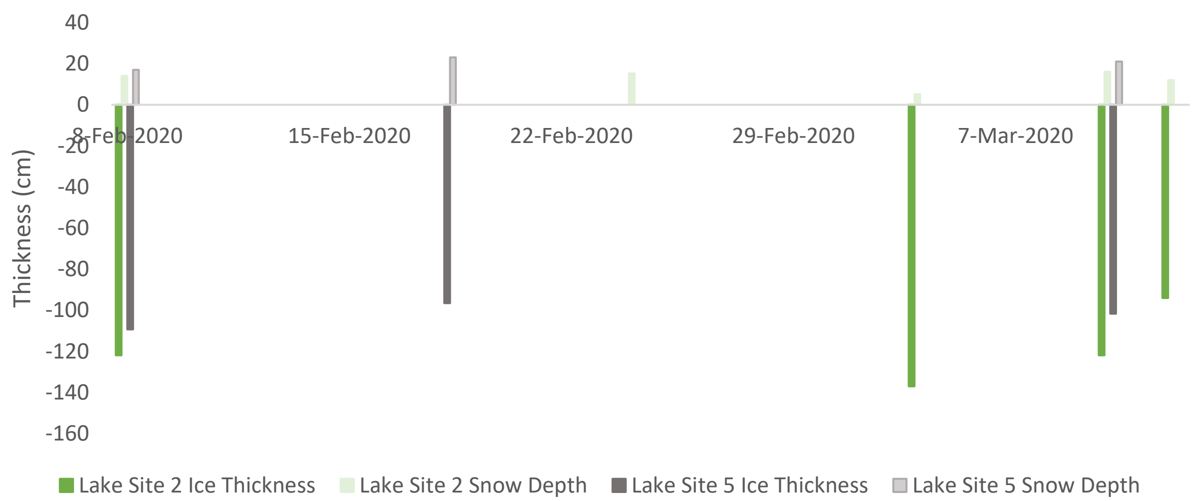


Figure 15: Snow depth and ice thickness (cm) recorded at lake sites (sites 2 and 5) near Kinngait, NU between February 8th and March 18th, 2020.

In 2021, ice thickness and snow depth measurements were recorded each week at the same locations during the second winter season held between January 25th and March 15th, 2021 (Figure 16, Figure 17). The coastal ice thickness ranged from 36.0 to 179.9 cm whereas the lake ice thickness ranged from 59.0 to 104.1 cm (Table 12).

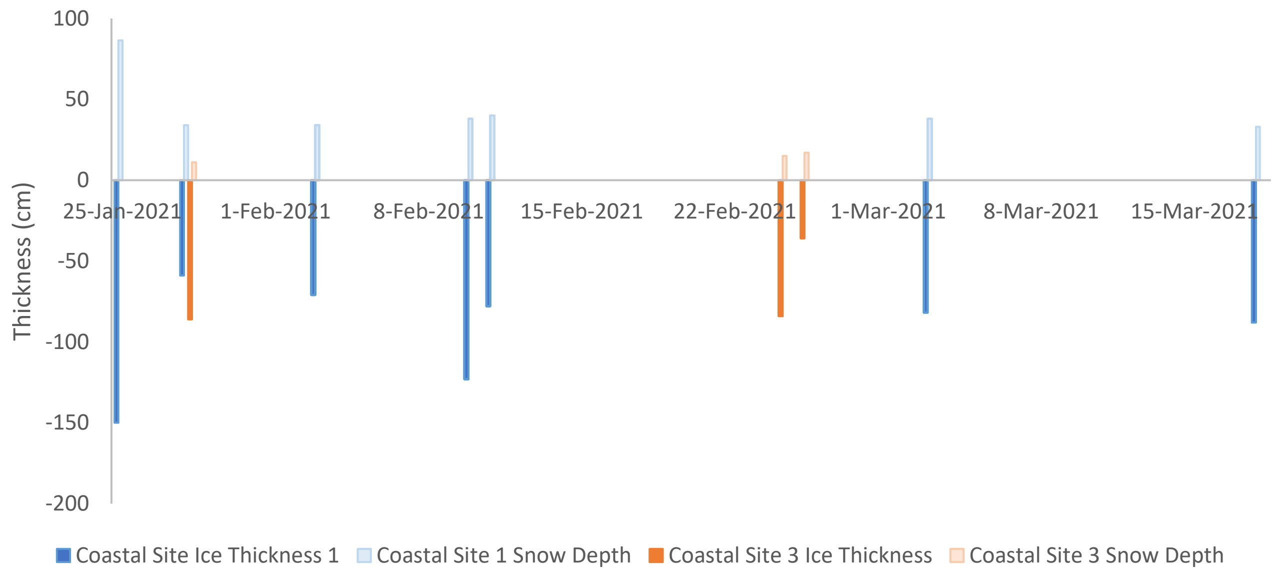


Figure 16: Snow depth and ice thickness (cm) recorded at coastal site 1 and 3 located near Kinngait between January 25th and March 15th, 2021.

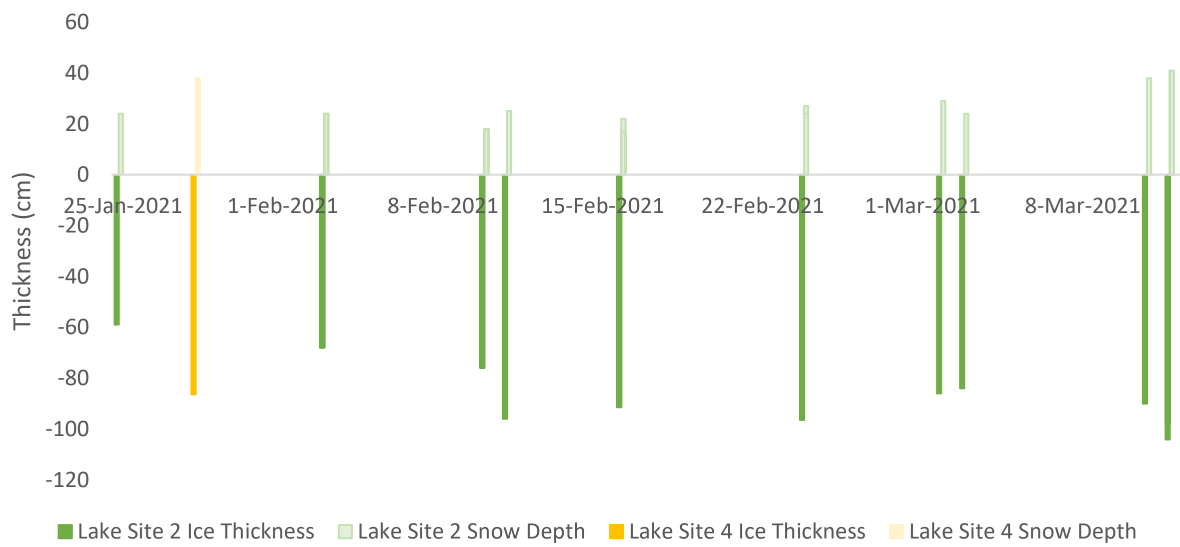


Figure 17: Snow depth and ice thickness surrounding Kinngait during winter 2021 for lake sites 2 and 4 from January 25th – March 12th, 2021.

The average snow and ice thickness over the course of the sampling period were compared between the 2020 and 2021 sampling years and summarized in Table 12. The average ice thickness was thinner in 2021 compared to 2020 for both coastal and lake sites.

Table 12: Summary of average ice thickness (cm) and snow depth (cm) for coastal and lake sites surrounding Kinngait in 2020 and 2021.

	2020			**2021**		
	Average Ice Thickness (cm)	**Average Snow Depth (cm)**	**Number of Visits**	**Average Ice Thickness (cm)**	**Average Snow Depth (cm)**	**Number of Visits**
Coastal Site 1	114.3 ± 10.8	30.4 ± 9.1	2	89.7 ± 27.4	40.6 ± 14.6	12
Coastal Site 3	131.4 ± 8.0	16.0 ± 4.3	2	73.0 ± 24.7	13.5 ± 3.0	3
Lake Site 2	118.7 ± 18.0	12.5 ± 4.4	5	86.5 ± 14.0	25.8 ± 7.0	17
Lake Site 4	N/A	N/A	0	86.4	38.0	1
Lake Site 5	102.5 ± 6.4	20.3 ± 3.1	3	N/A	N/A	0

Air temperature and timelapse camera images of sea ice conditions were collected at a site near Kinngait from January 26th to March 30th, 2020. Figure 18 provides an example of the images collected during this period, and the extent of ridges formed along the shoreline. As cameras were picked up before any periods of significant warming it was not possible to determine break up date. However, their successful deployment provides options for subsequent years of sampling. The average air temperature between January 26th and March 30th, 2020 at this site was -21 ± 6°C (Figure 19).

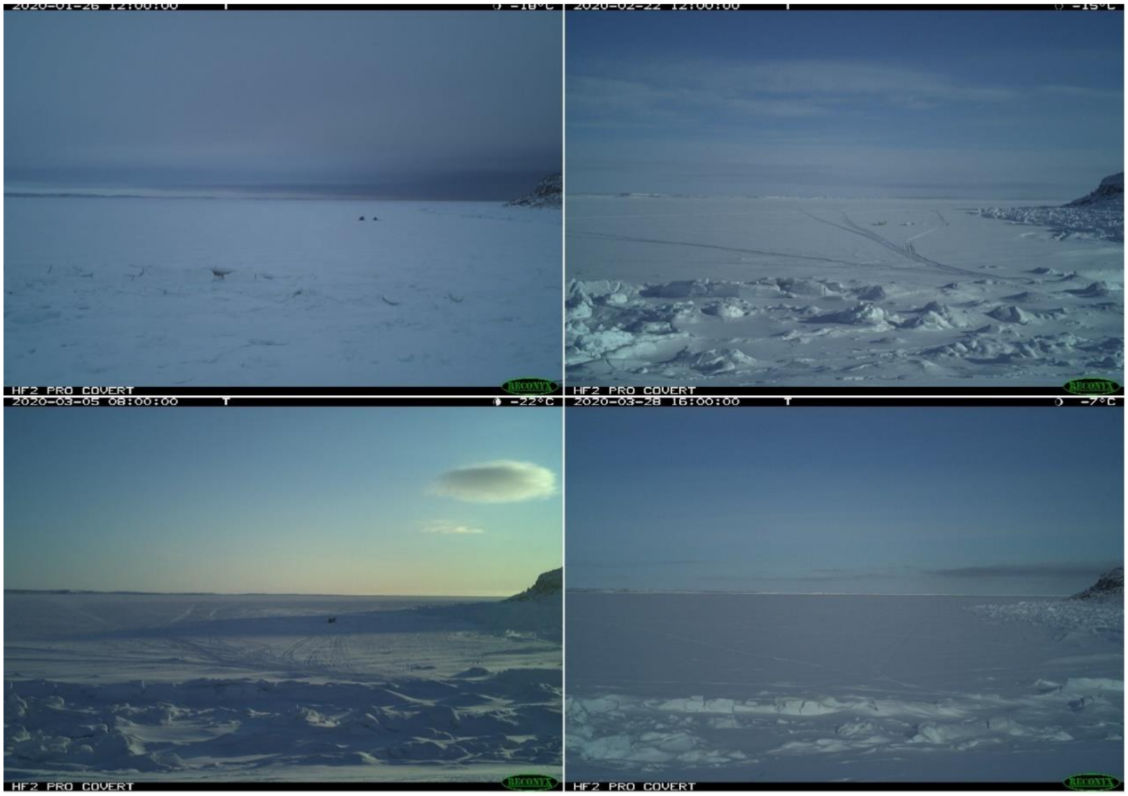


Figure 18: Example of images taken by a Reconyx timelapse camera stationed next to the community of Kinngait that were taken between January 26th and March 30th, 2020.

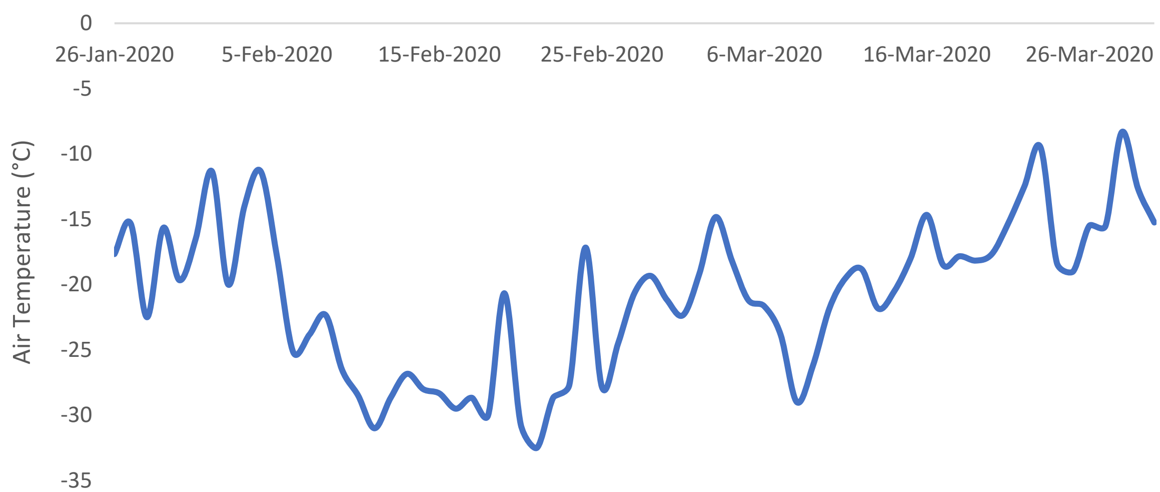


Figure 19: Air temperature (°C) from January 26th until March 30th, 2020 measured by a Reconyx timelapse trail camera located near Kinngait, Nunavut.

Timelapse images of sea ice conditions were collected in 2021 at (site 2) from January 20th – July 10th, 2021 (Figure 20). Ice began to break up on the lake by approximately June 11th, 2021 until open water was observed by June 27th, 2021. Air temperature data were collected at this location, and are available for analyses at a later date.

Figure 20: Example of images taken by a Reconyx timelapse camera stationed near Kinngait from January 20th – July 10th, 2021.

Igloolik

The thickness of snow and ice were recorded at each Igloolik site during the pilot year of the winter field work, from February 12th to March 24th, 2020 (Figure 21, Table 13). The average snow depth among all sites throughout the sampling season program was 27.0 ± 11.5 cm and the average ice thickness was 117.7 ± 14.6 cm.

Sites 1 and 2 located near the south west corner had thicker ice relative to the other locations. Site 4 nearest to Igloolik appeared to have the most variable ice thickness (92.9 ± 9.8 cm) and site 6 had the highest snow depth (35.1 ± 16.0 cm; Table 13).

Table 13: Average ice thickness ± SD and average snow depth ± SD (cm) for the six sites surrounding Igloolik from February 17th – March 24th, 2020.

Site #	Average ice thickness ± SD (cm)	Average snow depth ± SD (cm)	Number of Visits
Site 1	127.2 ± 5.9	32.7 ± 4.8	8
Site 2	127.5 ± 4.4	23.4 ± 7.0	10
Site 3	122.4 ± 14.5	23.9 ± 12.9	10
Site 4	92.9 ± 9.8	34.3 ± 15.9	4
Site 5	114.5 ± 5.9	23.2 ± 11.0	7
Site 6	109.5 ± 9.9	35.1 ± 16.0	5

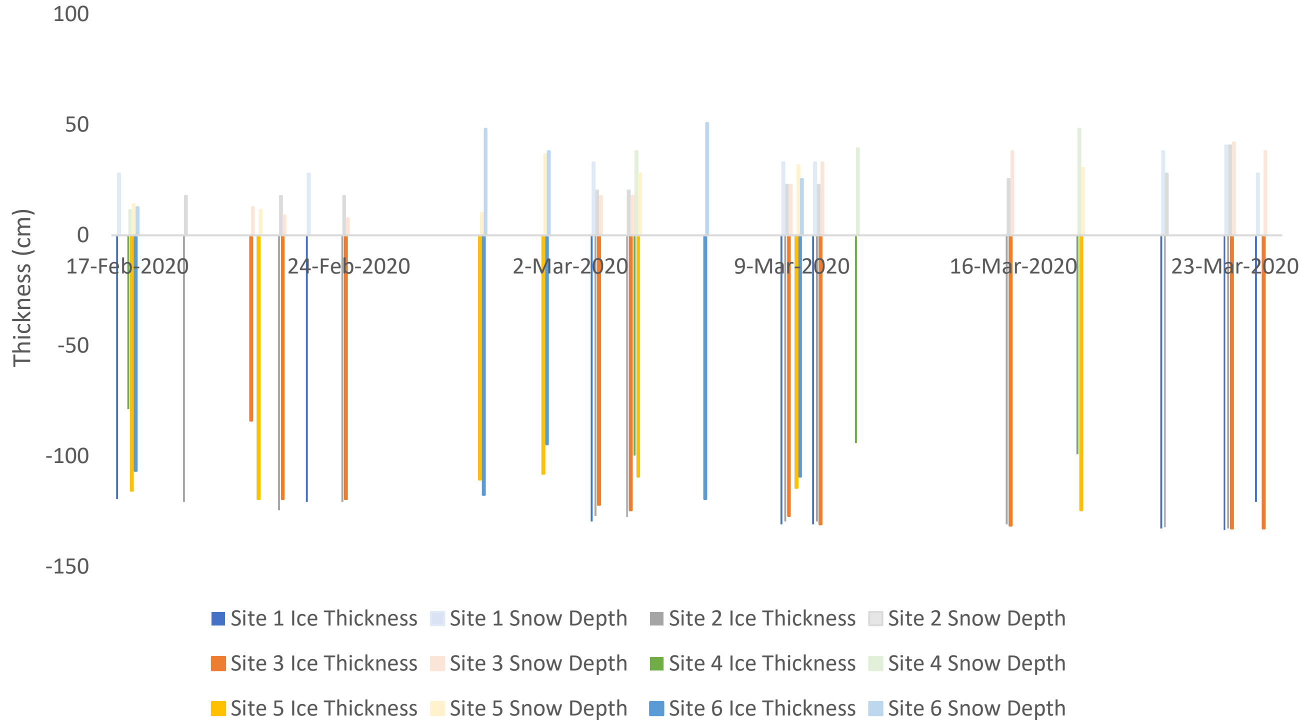


Figure 21: Snow and ice thickness (cm) measurements compiled from coastal sites 1-6 surrounding Igloolik, NU from February 12th - March 24th, 2020.

Air temperature, and timelapse images of sea ice conditions were collected at a site located next to the community of Igloolik from February 13th to March 21st, 2020 (Figure 22, Figure 23). The average air temperature during this period was -30°C ± 4°C. Timelapse images indicated little change in sea ice coverage during this time, which was consistent with ice thickness measurements. The timelapse camera was picked up prior to the onset of sea ice breakup.

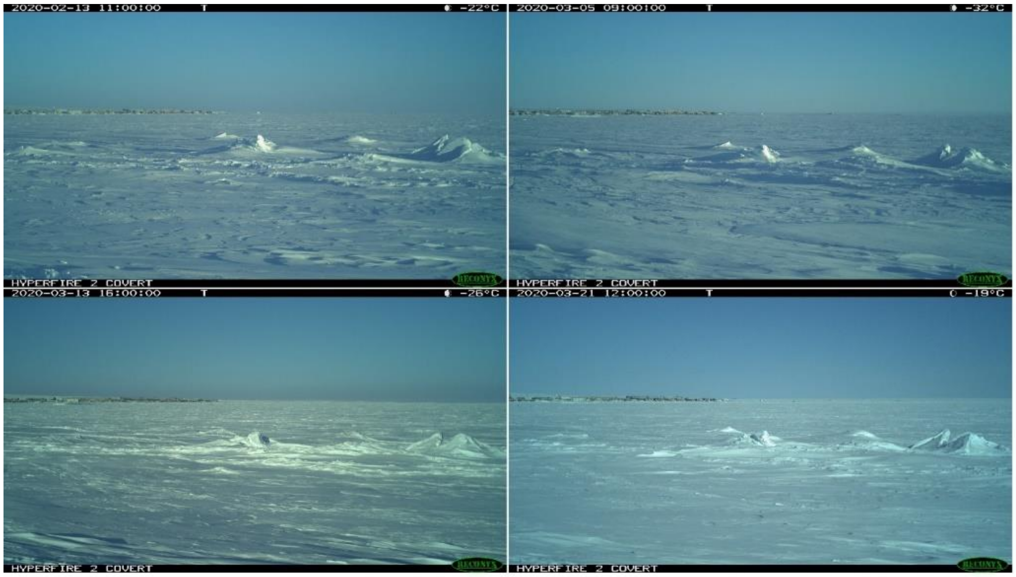


Figure 22: Images taken by a Reconyx timelapse camera stationed next to the community of Igloolik from February 13th – March 21st, 2020.

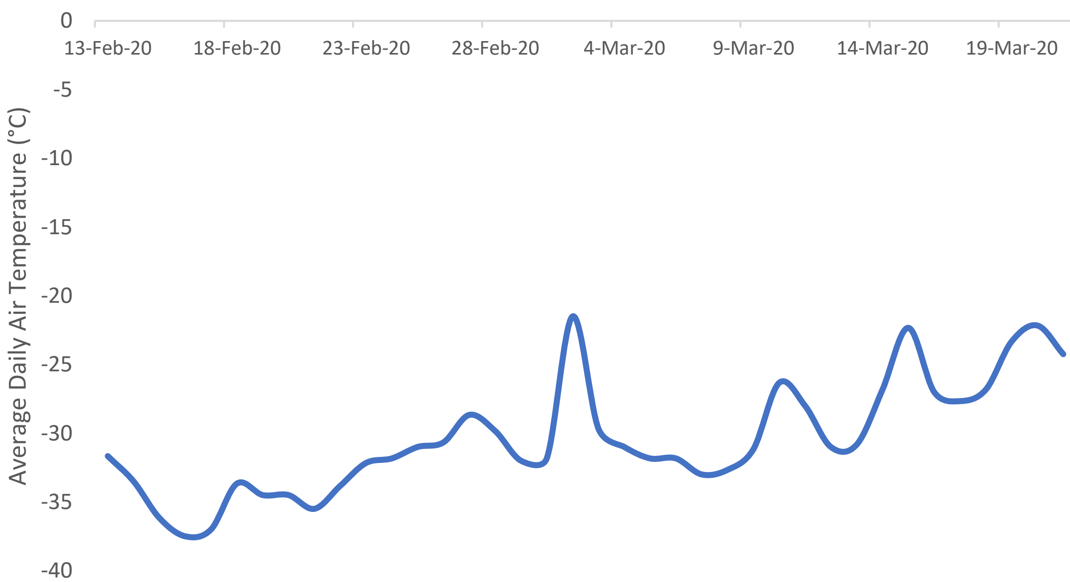


Figure 23: Average daily air temperature (°C) in Igloolik from February 13th – March 21st, 2020 measured using a Reconyx trail camera.

Naujaat

The thickness of snow and ice were recorded at two sites located near Naujaat, between March 17th – 24th, 2021 (Figure 24). The average ice thickness was lower at RB2 (105.5 ± 2.9 cm) compared to RB6 (149.1 ± 2.7 cm) in March 2021. The variability of snow depth and ice thickness was minimal at both locations. Maximum snow depth was higher at RB2 (21.5 ± 1.9 cm), compared to RB6 (7.5 ± 1.7 cm).

The thickness of snow and ice were recorded during the spring season at two sites located near Naujaat, from June 14th – 25th, 2021 (Figure 25). In June, the average ice thickness was thinner at RB2 (124.0 ± 14.7 cm) compared to RB6 (172.7 ± 12.2 cm). Average snow depth was almost negligible at RB2 (1.0 ± 0.7 cm) and there was no snow at RB6 during the this sampling period.

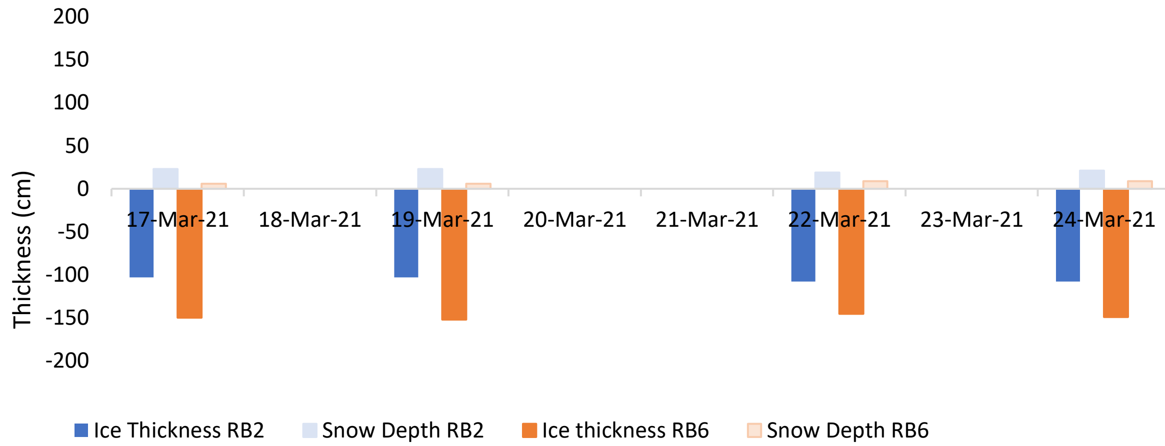


Figure 24: Snow and ice thickness in Naujaat in winter 2021, collected March 17-24th, 2021 measured by technicians at sites RB2 and RB6.

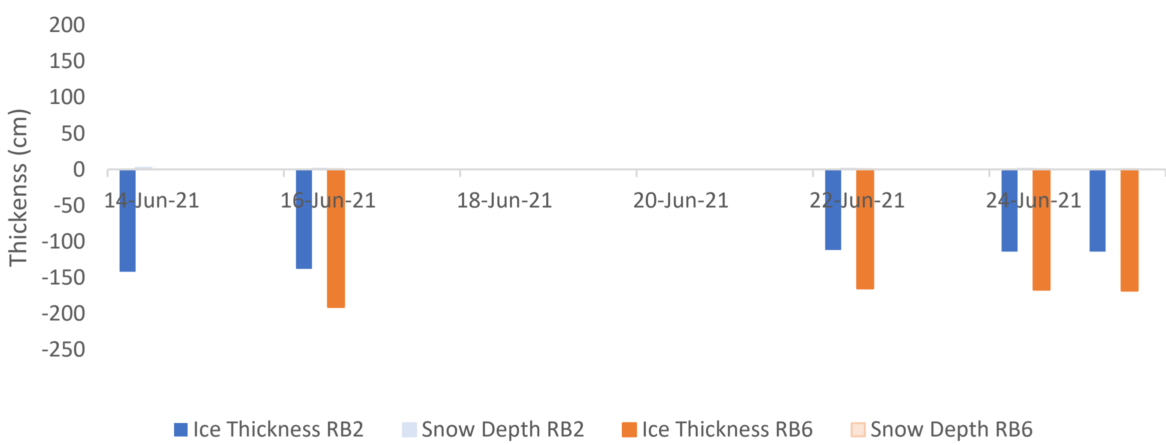


Figure 25: Snow and ice thickness in Naujaat in spring 2021, collected June 14th - 24th measured by technicians at sites RB2 and RB6.

Whapmagoostui:

Air temperature and timelapse images of water conditions were collected at a site located next to the community of Whapmagoostui from October 17th, 2020 to June 1st, 2021 (Figure 26, Figure 27). The timelapse images in Whapmagoostui indicate that sea ice was fairly consistently covering the ocean throughout the winter months. The camera lens was snow covered for most of December; the first day with images of sea ice is December 20th, 2020 (Figure 26). By December

27th, 2020 the ocean appeared to be ice covered. The sea ice remained until approximately April 28th, 2021. The shift from ice covered to open water occurred overnight on May 16th, 2021. More ice came into the area May 28th, 2021 and stayed till the camera was picked up on June 2nd, 2021. The average air temperature in the fall was -6 ± 5°C (October 17th - December 20th, 2020), the winter was -15 ± 6°C (December 21st, 2020 – March 19th, 2021), and the spring was 0 ± 6°C (March 20th – June 1st, 2021). The timelapse camera was implemented as a way to monitor ice coverage, and served as a pilot study to test if a camera could be set up for nine months for future research in other coastal communities.

Figure 26: Example of images taken by a Reconyx timelapse camera stationed near Whapmagoostui, QC that were taken between October 17th 2020 and June 1st, 2021.

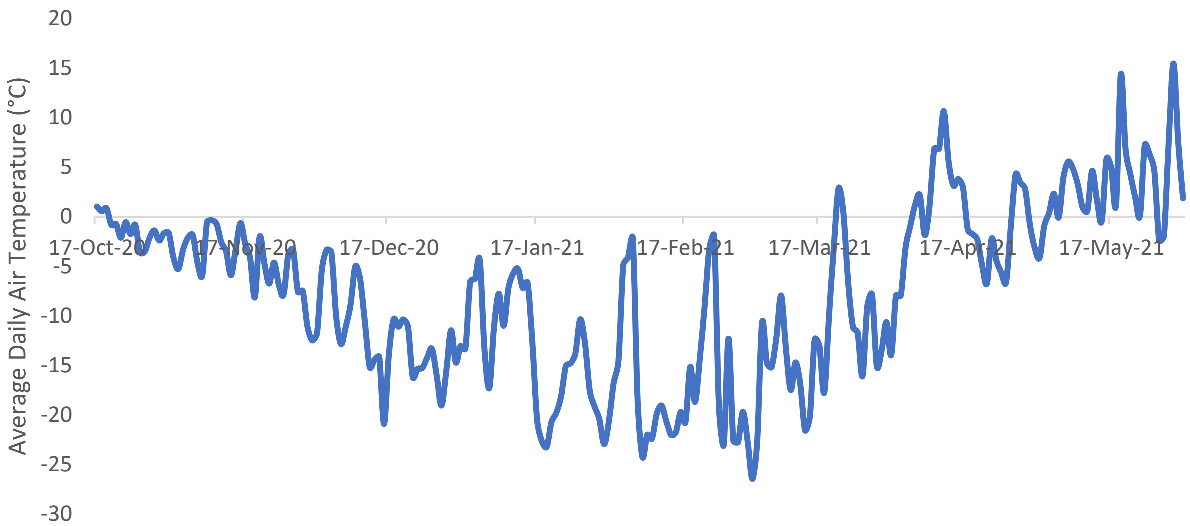


Figure 27: Daily average air temperature (°C) from October 17, 2020 until June 1, 2021 in Whapmagoostui, QC measured by a Reconyx timelapse trail camera set up by technicians.

3.2 Biological and Food Web Integrity Indicators

3.2.1 Inshore Fish Community Composition and Biology

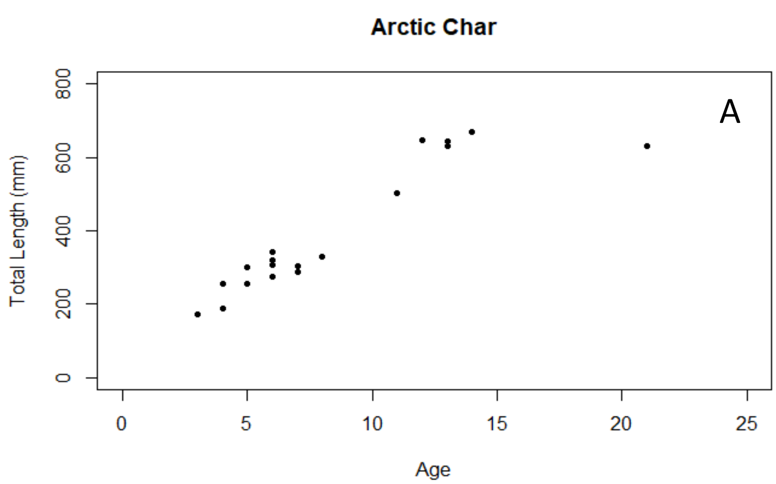
Kinngait

Fish were collected in Kinngait from August 25th to October 8th, 2020, approximately once a week between August 25th and October 8th, 2020 at two pre-determined coastal sites (supplementary, Figure 29). Fish that were captured and sampled during this period were: Arctic Char (*Salvelinus alpinus)* (n=19), Grubby Sculpin (*Myoxocephalus aenaeus*) (n=27), Shorthorn Sculpin (*Myoxocephalus scorpius*) (n=4), and one unidentifiable Cottidae family fish (n=1). All fish captured in 2020 were < 650 mm total length and the majority were female among all species. The total length range of Arctic Char captured was between 172 mm to 646 mm, and most individuals were immature (92%). The total length range for Shorthorn Sculpin was 161 mm to 279 mm, which is within range of the biological range for this species (Coad and Reist, 2018). The total length range of Grubby Sculpin was 111 mm to 270 mm, which exceeds the length of 194 mm previous recorded for a Grubby Sculpin documented in the Canadian Arctic (Coad and Reist, 2018). There was 1 male Grubby Sculpin, 3 Grubby Sculpins that could not be sexed, and the rest captured were female (n=23). The Grubby Sculpin captured here were primarily all mature and ripe. There are relatively few documented Grubby Sculpin in the Hudson Strait and, to our knowledge, these are the first recorded in Kinngait and the most northern recorded occurrence up to 2020 (Coad and Reist, 2018).

Ages of fishes captured in 2020 sampling are summarized in Figure 28. The total length increases with age of the fish for all species. The oldest and youngest fish captured were Arctic Char that were 3 and 21 years old. With Arctic Char, there appears to be two clusters of fish, those that are less than 10 years old and below 400 mm, and those fish that are above 10 years old and over 400 mm. There are two distinct groups of Shorthorn Sculpin, with one group around 5 years old and a second group around 15 years old.

Table 14: Biological data of inshore fishes collected at coastal sites 1 and 3, near the community of Kinngait, NU between August 25th – September 16th, 2020.

Species	***n***	**Total Length ± SD (mm)**	**Fork Length ± SD (mm)**	**Mean Mass ± SD (g)**	**Mean Gonad Mass ± SD (g)**	**Mean Liver Mass ± SD (g)**	**Sex M:F:U**	**Maturity**				
								Immature (M:F)	**Mature (M:F)**	**Ripe (M:F)**	**Spent (M:F)**	**Resting (M:F)**
Arctic Char	19	392.0 ± 174.9	330.1 ± 151.0	745.8 ± 1129.0	3.2 ± 6.7	26.8 ± 38.1	4:9:6	1:7	1:0	0:0	0:0	2:2
Grubby Sculpin	27	220.9 ± 37.5	N/A	220.2 ± 97.8	20.3 ± 13.4	15.5 ± 8.9	1:23:3	0:1	0:0	1:22	0:0	0:0
Shorthorn Sculpin	4	239.5 ± 53.3	N/A	221.5 ± 115.6	5.2 ± 4.9	6.4 ± 3.8	3:0:1	0:0	2:0	1:0	0:0	0:0
Cottidae Family	1	N/A	N/A	8.8	< 0.1	0.2	1:0:0	1:0	0:0	0:0	0:0	0:0



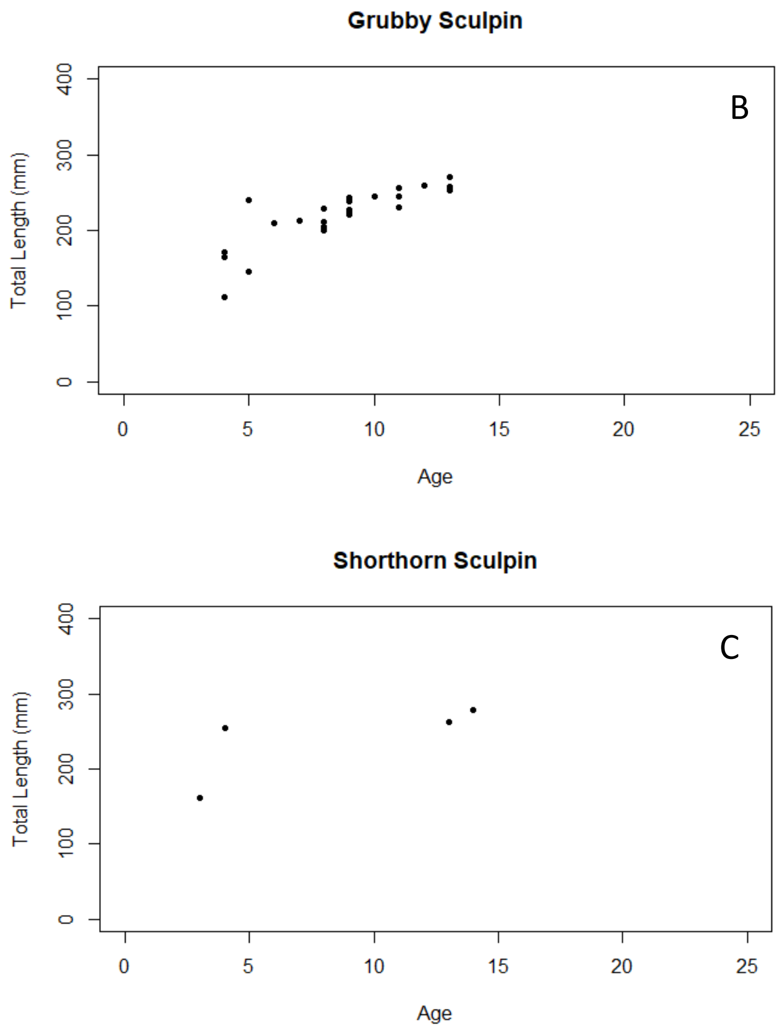


Figure 28: Total length (mm) compared to age of fish (years) for the Arctic Char (A), Grubby Sculpin (B), and Shorthorn Sculpin (C) near Kinngait in 2020.

During winter, only Arctic Char were captured at lake sites 2 (Tessikakjuak Lake), 5 (Ivitaarujallik), and 4 (Iqalupili Lake). Although it is possible other subsistence species may reside in these lakes, none were observed in this study. Video footage obtained from under the ice at site 2 (Tessikakjuak Lake) documented several occurrences of schooling Three-spine Stickleback (*Gasterosteus aculeatus*), though none were collected while using subsistence-style collection methods such as jigging.

Arctic Char was the only species captured during the winter of 2021. The total length range of Arctic Char was 192-712 mm which is within range of the size expected of Arctic Char for the Canadian Arctic (Coad and Reist, 2018). The total length of males versus females did not differ substantially; 177 to 658 mm and 179 to 646 mm respectfully. Most of the Arctic Char captured had empty stomachs (73%) relative to those with contents (27%). Most were also immature (69% for males; 71% for females) (Table 15).

Table 15: Biological data of inshore fishes collected at lake sites 2, 4, 5, near the community of Kinngait, NU in January, February, and March 2021.												
Species	**n**	**Total Length ± SD (mm)**	**Fork Length ± SD (mm)**	**Mean Mass ± SD (g)**	**Mean Gonad Mass ± SD (g)**	**Mean Liver Mass ± SD (g)**	**Sex M:F**	**Maturity**				
								Immature (M:F)	**Mature (M:F)**	**Ripe (M:F)**	**Spent (M:F)**	**Resting (M:F)**
Arctic Char	30	468.7 ± 162.5	446.2 ± 154.3	1229.3 ± 1035.1	7.3 ± 10.1	21.1 ± 21.5	13:17	9:5	4:5	0:0	0:0	0:7

Fish were captured the second summer of sampling in 2021 at site 3 (Shartowuok Bay) and site 1 (Tasiujajuaq) between July 17th, 2021 and October 5th, 2021 (supplementary, Figure 30). The Arctic Char captured ranged in total length from 378-775 mm and the sculpins ranged from 145-281 mm. These species are all within the maximum recorded biological range for the species for the Canadian Arctic (Coad and Reist, 2018). There were more female Arctic Char captured (71%) compared to males (29%), while mature and immature fish were equally distributed (Table 16).

Table 16: Biological data of inshore fishes collected at coastal sites 1 and 3, near the community of Kinngait, NU between July 27th and October 5th, 2021.												
Species	n	Total Length ± SD (mm)	Fork Length ± SD (mm)	Mean Mass ± SD (g)	Mean Gonad Mass ± SD (g)	Mean Liver Mass ± SD (g)	Sex M:F:U	Maturity				
								Immature (M:F)	**Mature (M:F)**	**Ripe (M:F)**	**Spent (M:F)**	**Resting (M:F)**
Arctic Char	31	546.6 ± 108.5	517.1 ± 105	1475.9 ± 972.9	20.0 ± 42.3	30.5 ± 25.1	5:16:0	2:7	3:5	0:0	0:0	0:0
Gadidae family	1	193	185	43.0	NA	NA	1:0:0	1:0	0:0	0:0	0:0	0:0
Cottidae Family	6	214.7 ± 47.0	NA	153.7 ± 97.4	15.7 ± 14.9	7.7 ± 8.4	2:4:0	1:0	1:4	0:0	0:0	0:0

Igloolik

In total, two Fourhorn Sculpin (*Myoxocephalus quadricornis*) were collected on August 27th, 2020. There was one male and one female Fourhorn Sculpin captured (Table 17).

Table 17: Biological characteristics of fish caught in Igloolik in summer 2020.												
Species	n	Total Length ± SD (mm)	Fork Length ± SD (mm)	Mean Mass ± SD (g)	Mean Gonad Mass ± SD (g)	Mean Liver Mass ± SD (g)	Sex M:F:U	Maturity				
								Immature (M:F)	**Mature (M:F)**	**Ripe (M:F)**	**Spent (M:F)**	**Resting (M:F)**
Fourhorn Sculpin	2	205.5 ± 14.8	NA	101.9 ± 26.7	4.1 ± 2.3	4.9 ± 2.1	1:1	0:0	1:1	0:0	0:0	0:0

Naujaat

The extent of fish sampling in Naujaat was minimal in March and June 2021. The low fish collection was due to a short season. In the sampling period, two species of sculpin were captured, including Shorthorn Sculpin and Arctic Staghorn Sculpin. In addition one *Cottidae* species, that could not be identified further, was captured. See Table 18.

Table 18: Biological characteristics of fish caught in Naujaat in from March 19th – 23rd, 2021 and June 21st – 26th, 2021 at RB2 and RB6.												
Species	n	Total Length ± SD (mm)	Fork Length ± SD (mm)	Mean Mass ± SD (g)	Mean Gonad Mass ± SD (g)	Mean Liver Mass ± SD (g)	Sex M:F:U	Maturity				
March								**Immature (M:F)**	**Mature (M:F)**	**Ripe (M:F)**	**Spent (M:F)**	**Resting (M:F)**
Cottidae Species	1	238	NA	168.4	6.9	3.8	M	0:0	1:0	0:0	0:0	0:0
Shorthorn Sculpin	1	260	NA	202.8	3.7	6	M	0:0	1:0	0:0	0:0	0:0
June								**Immature (M:F)**	**Mature (M:F)**	**Ripe (M:F)**	**Spent (M:F)**	**Resting (M:F)**
Shorthorn Sculpin	3	255.67 ± 26.95	NA	225.33 ± 55.87	2.20 ± 0.50	5.02 ± 3.02	3:0:0	0:0	0:0	0:0	0:0	0:0
Arctic Staghorn Sculpin	1	214	NA	286	1.64	8.31	1:0:0	0:0	0:0	0:0	0:0	0:0

3.2.2 Zooplankton Community Composition

Kinngait

Zooplankton was collected weekly in 2020 during September and October, such that eight tows were successfully completed at sites 1 and 3. Taxonomy indicates that the samples were primarily composed of Arthropoda, Ochrophyta, and Chaetognatha phylum. These samples will be further analyzed at a later date.

Zooplankton sampling also took place in 2021 in Kinngait. There were approximately 94 plankton tows completed approximately 1-2 times per week from July 15th – November 10th, 2021. The depth ranged from approximately 7.4 to 15.0 m and tows were completed at coastal sites 1 and 3. These samples have been preserved for future identification and analyses at a later date.

3.2.3 Benthic Invertebrate Community Composition

Kinngait

Benthic samples were collected from coastal sites 1 and 3 between September 9th to October 8th, 2020 captured at approximately 5-15 m depth. Figure 31 in supplementary describes the benthic invertebrates to the phylum level, which was the broadest possible level for classification. As this was the pilot year for this study, samples were identified but their biomass was not recorded. The most commonly occurring taxa by count were Annelids (26% of identified taxa), Arthropoda (29% of identified taxa), and Mollusca (25% of identified taxa).

Benthic sampling was repeated from July 15th – November 10th, 2021. During this period n=168 grabs were completed at sites 1 and 3. At both sites 1 and 3, the majority of identified taxa were from the Mollusca phylum. Site 1 appears to contain primarily individuals from the Mollusca and Annelida phylum, whereas site 3 also contained Arthropoda and Echinodermata. Although there were more phyla represented at site 3, taxonomy to species level is still required to determine if biodiversity differed between sites (supplementary Figures 32, 33).

4.0 Discussion

This section is organized into themes of indicator and location, project significance, future research, as well as community engagement and leadership.

Monitoring programs, such as Arctic Coast, help to address coastal knowledge gaps among Arctic coastal communities, and enhance community leadership in the research process. This report addresses knowledge gaps in the HBC by summarizing baseline data related to coastal marine biodiversity and ecosystems in four Nunavut communities that was collected by community technicians. These baseline data were collected as part of the Arctic Coast monitoring program, in order to contribute to our understanding of current conditions. The data collected here will act as a stepping stone to guide future research and may contribute to long term monitoring to understand change in the four communities and beyond. Long term monitoring is essential to understanding changes taking place in an ecosystem. Training provided to community technicians is transferrable to other programs helping enhance research capacity within the HBC. For example, technicians were trained on sample and data management, data recording, safety procedures, and field protocols. Returning community technicians were able to train new community technicians which helped monitor aquatic biodiversity change throughout the entire year. Furthermore, by working with communities in the Arctic, we are enhancing relationships, providing opportunities to expand technical and research skills, and collaborating to bring more research autonomy to the North.

4.1 Environmental and Oceanography:

The methods used for oceanography across all sites were used to pilot measuring water temperature and salinity during the open water and ice covered seasons. Some of the variability within the water temperature and salinity is not typical of what would be expected for oceanography measurements and caution is needed for interpretation. As there is little to no current information available for coastal ecosystems in these areas, however, there is also a need to report all usable data to better understand the level of variability present and to begin baseline data collections.

For instance, there is variability within some of our salinity and water temperature readings using the CT2X loggers. During the ice covered season, the technicians lowered the CT2X loggers underneath the ice to the bottom, but it is unknown if all measurements were taken at the bottom, and in some cases, it is unknown at what depth the measurements were taken. It is assumed that all locations are consistent at similar depths, but weather conditions and other factors can influence the location of auger holes in the ice. The bathymetry and water inputs (e.g., rivers, currents) at many of the sites studied is unknown and there is not enough information available to understand the level of variability observed. During the open water season, the CT2X loggers were placed near the bottom. The logger may have been influenced by the anchor or sediment may have wedged the logger into the ground. Further data needs to be collected using alternative research methods such as castaways and RBRs to understand how water temperature and salinity may change with depth during the open water and ice covered seasons.

4.1.1 Kinngait

The ice was thinner and snow depth was relatively thicker in 2021 compared to 2020 for both coastal and lake sites. This may have been the result of fluctuating higher air temperatures, more cloud cover, or increased precipitation (Imrit et al., 2022). Generally, ice thickness was more variable in lake sites compared to coastal sites that were sampled. This variability may have been due to heat fluxes from the lake as well as ridges and snow drifts on the lakes (Yang et al., 2012).

During the open water season, there was some variability in water temperature at the moorings. Generally, the water temperature declined from the late summer to fall in the area around Kinngait in 2020. In 2021, the mooring recorded water temperature from mid-July to the end of August. There was more variation in water temperature over this period, but the bottom logger appeared to be more consistently colder than the loggers at 5 meter or 10 meter depths. Local factors, such as the input of water from nearby lakes and rivers or proximity to the coast, may have influenced some of the temperature fluctuations.

Salinity was variable among all moorings deployed at coastal sites near Kinngait. The technicians suggested that the variability in salinity at the site near town may be due to freshwater inputs from several small rivers draining into the area. During a debrief with the technicians, they explained that in summer 2021, at low tide, salinity decreases, but at high tide, salinity increases. Technicians also explained that the river water levels were high, and there was quite a bit of heavy rain, and more fog than usual, which may have influenced salinity in 2021.

Water temperature data recorded by moorings in 2020 and 2021 provided an indication of changing oceanographic conditions in response to seasonal shift from summer to fall. Due to the different deployment periods of the moorings, only readings between August 27th to August 31st

can be used to compare between years. The temperature did not appear to be very different during this period, suggesting stable conditions. The differences in deployment date, however, provided an indication that temperatures can fluctuate in the summer, yet remain consistently above 4°C throughout the water column until the beginning of September. During this period, water temperature showed a steady decline and eventually an inversion, such that bottom temperature was warmer than the upper portion of the water column.

Salinity had some variation in 2020 and 2021 across all sites in Kinngait. Year-to-year variability could only be compared at one site between August 27th and 31st due to different start dates. Future deployments at the same time each year are needed in order to compare year-to-year variation. Despite differences in deployment date, both years indicated substantial variability in salinity in August at the site closest to the freshwater input of Tessikakjuak Lake. The technicians indicated that summer 2021 was unusually rainy, windy, and stormy, which could have facilitated more mixing with the freshwater river nearby or input of freshwater by precipitation.

4.1.2 Igloolik

The data collected throughout 2020 in or near Igloolik serves as baseline data for oceanography in the region at different times of year.

During the ice covered season in 2020, the ice thickness and snow depth appeared to remain relatively consistent (within < 20 cm) at each site in Igloolik. The slight variation may be due to wind, tides, ridges and snow drifts within the coastal ecosystem during the winter months. The timelapse camera set up near town during the winter shows indications of ridges and snow drifts that could have contributed to variability.

During the open water period in 2020, all moorings deployed around Igloolik appeared to follow a similar temperature pattern. The average daily water temperature at the northwest site was higher compared to the other moorings, potentially because of water mass circulation and other local factors. The moorings located on the west side of the island appear to show similar temperature patterns compared to the mooring on the southeast side of the mooring potentially due to similar water mass inputs. In early September, all loggers recorded similar temperatures regardless of depth. The technicians noted during the field program that there was sea ice surrounding the island. Fluctuations in water temperature observed towards the end of September may be in response to the movement and formation of sea ice (Li and Fedorov, 2021). The average water temperature was consistently below -1°C in the ice covered months, and above 1°C in the open water months.

Overall, salinity appeared to be slightly variable in the winter, and more stable in the summer. Salinity may have been more variable in winter due to mixing, and the shorter length of time that the loggers were deployed relative to summer. Salinity in the summer was fairly stable, but minor variability may be a reflection of open water conditions, sea ice dynamics, tidal influences, and/ or mixing from Fury and Hecla Strait. As only one season of ice covered and open water data was collected, it is not possible to do inter-annual comparison.

4.1.3 Naujaat

In the area surrounding Naujaat during the ice covered season (spring and winter), the shallower site had thicker ice and less snow than the deeper site. The deeper site is more exposed compared to the shallower and closer to land site. In Naujaat, the lower snow depth in the spring versus the winter was most likely because of warmer air temperatures, and increased sunlight. The ice was thicker in June than March perhaps due to more seasonal build up and snow melt.

Overall, oceanographic conditions appear to be similar across sites. The water temperatures were similar at Naujaat sites, indicating that there is likely mixing occurring at both locations. There appears to be more variability in the water temperature at the deeper site compared to the shallower site which may be because of depth and influence from nearby rivers. The salinity had some variation suggesting that perhaps some measurements may have not been taken at depth.

4.1.3 Whapmagoostui

Water temperature was similar at locations near Whapmagoostui throughout the sampling period. Both sites showed consistent average daily water temperature declines from the end of August until the end of October. During the duration of the moorings, the technicians indicated that the conditions were windy. Environment Canada (2022) recorded maximum wind gusts of 32-96 km/hour during the duration of deployment from August 30th – October 30th, 2020. It is possible that the increased wind and swells could have contributed to more mixing in the upper layers of the water.

Bottom salinity levels remained relatively consistent in Whapmagoostui with only a few small fluctuations. The bottom salinity during this period may have been influenced by freshwater input from the nearby Great Whale River. The overall consistent salinity may suggest that regional drivers do not have a large influence on salinity in the region.

4.1.4 Comparing Oceanography Between Communities

Comparing all three locations that had moorings during the open water period in 2020, Whapmagoostui appears to have the warmest average daily water temperatures in early fall. In early to mid-September Kinngait also appears to have warmer daily average water temperature compared to Igloolik. Igloolik is the most northern location, followed by Kinngait and Whapmagoostui which may explain these average daily water temperature trends. Almost all of the average water temperature readings across all communities were below 0°C during the ice covered periods. The salinity during the open water and the ice covered season had some variation so it is difficult to make large comparisons between communities. The salinity in Whapmagoostui appeared to be the most consistent of all of the open water moorings that were deployed.

4.2 Biological Food Web Connectivity

4.2.1 Kinngait

Fish

In Kinngait, the biodiversity of captured coastal fish was relatively low (n=6), such that the most common species captured was Arctic Char. However, this program successfully documented Grubby Sculpin, which represents the first known occurrence for Kinngait (Coad and Reist, 2018), although it is known to occur in Hudson Strait. This observance does not necessarily mean that this species is new to the area, but signifies the need for more baseline assessments in the region to accurately assess biodiversity and monitor for change. The only species of fish captured during the winter in Kinngait was Arctic Char, though Three-spine Stickleback were observed using under-ice benthic cameras. Arctic Char are anadromous whereby they feed in the ocean during the summer months and then fish will migrate to spawn and/or overwinter in freshwater in the fall and winter, but some fish always remain in the fresh water (Schembri et al., 2019). The technicians were asked if Arctic Char are the only fish that they usually capture in the lakes when they are out on the land and they explained that there are sometimes salmon during the late-summer or fall months.

There was one fish captured near Kinngait that belonged to the Gadidae family in the summer. This fish could not be identified to the species level due to degrading during shipping. Stewart and Lockhart (2005) recorded species from the Gadidae Family including: Polar Cod (*Arctogadus glacialis*), Arctic Cod (*Boreogadus saida*), Atlantic Cod (*Gadus morhua*), and Greenland Cod (*Gadus macrocephalus*). It is most likely that the fish belonging to the Gadidae family captured near Kinngait is one of the above species.

Benthic

Benthic fauna can be a good indicator of ecosystem health and stability due to their low mobility as well as their importance to fish and other organisms diet (Pierrejean et al., 2019). Benthic diversity in the HBC remains relatively understudied in the coastal environments, but 643 taxa have been identified to date (Pierrejean et al., 2019). In this report, benthic species were identified to phylum level. The majority of species were Mollusca and Annelida in 2021 whereas in 2020 there was more Arthropoda specimens captured.

The capacity for benthic grabs was higher in 2021 (170 samples) compared to 2020 (12 samples) because technicians were more familiar with the project and there were more sampling days available. As the number of grabs was higher in 2021 relative to 2020, the shift in species composition likely is not a reflection ecosystem shifts, but rather a difference in sampling effort. The benthic data will act as a baseline to help understand how benthic communities surrounding Kinngait may change over time.

Plankton

Lower trophic level species, such as plankton, play an important role in understanding coastal food web dynamics as well as provide insight into environmental changes taking place (Hall et al., 2022). To our knowledge, little documentation has been completed to understand zooplankton diversity in the Kinngait area. However, within the HBC there have been 586 taxa of plankton identified (Archambault et al., 2010) which is likely an underrepresentation of the actual diversity (Justrabo et al., 2021). Species identified to phylum in Kinngait for summer 2020 included: Arthropoda, Ochrophyta, and Chaetognatha. The zooplankton taxa and their proportions is still being analyzed for 2021. Capacity for plankton tows was much higher in 2021 (approximately 93 tows) compared to 2020 (approximately 5 tows) in the Kinngait area because the technicians were more familiar with the sampling protocol and had more sampling days.

4.2.2 Igloolik

Fish

Overall, the opportunities were limited to document fish biodiversity in Igloolik. The technicians explained that there was a lot of ice surrounding the island in the coastal area which prevented them from setting more nets during the open water period. The only fish species documented was Fourhorn Sculpin (n=2), which is expected to be an underrepresentation of overall fish biodiversity given that other fishes, such as Arctic Char, are known to the area (NCRI, 2008). Technicians explained that during the project in late August and September, many of the fish had returned to the lakes and there were not very many fish in the ocean. In order to adequately document fish biodiversity, more sampling is needed across a longer temporal scale.

4.2.3 Naujaat

Similar to the other sites, the biodiversity captured in Naujaat is likely an underestimation of fish biodiversity. The only fish caught were from the Cottidae family. There were also Shorthorn and Arctic Staghorn Sculpin (*Gymnocanthus tricuspis*) captured by technicians. These findings align with the Nunavut Coastal Resource Inventory for Naujaat (Arctic Staghorn Sculpin, Shorthorn Sculpin, and Twohorn Sculpin [*Icelus bicornis*]; NCRI, 2011).

Comparing Fish Between Communities

Among the three communities where fish were sampled, the number of fish species captured was relatively low based on local knowledge of species and previously published literature (example: Coad and Reist, 2018). Fishes captured in this HBC study belonged to three families: Salmonids, Cottidae, and Gadidae. It is recognized that fishes captured in this study is likely are an underrepresentation of total fish diversity within the HBC because to date there have been at least 61 recorded fish species in the HBC (Schembri et al., 2019; Vladykov 1933; Morin and Dodson 1986; Stewart and Lockhart, 2005). However, it is important to note that the number of coastal fish species will be lower as not all of these fish species targeted in that study are known to inhabit coastal shallow areas (below 15 m).

The fishing effort varied in each community due to the technician availabilities, COVID-19 restrictions, and weather. Technicians in Kinngait captured more fish because of greater technician availability, a longer sampling season, and more net sets compared to the other communities. Technicians in Igloolik were unable to set as many nets due to ice and unsafe weather conditions prevented nets from being set in Whapmagoostui.

Seasonally, there were not equal numbers of fish collected. Fewer fishes were collected in winter, which may have been due to fewer sampling days and sampling methods (jigging and nets under the ice). In 2021, there were 30 fish sampled using under the ice gillnets in Kinngait and 5 fish sampled using jigging in Naujaat. Jigging captures fish that may be seeking out food on the bait compared to gillnets that capture fish more opportunistically and with less effort. More effort is needed to better understand coastal fish communities seasonally.

The Cottidae family of fish was the only family that was captured in Igloolik, Kinngait, and Naujaat. The Cottidae fish caught were: the Shorthorn Sculpin, Grubby Sculpin, Arctic staghorn Sculpin, and the Fourhorn Sculpin. To our knowledge, the most Northern recorded occurrences for Grubby Sculpin were documented in Kinngait. The Grubby Sculpin may not be new to the area, but that this was the first record of the species in scientific literature in that area. Grubby Sculpin have a wide temperature threshold (0°C - 21.1°C) are commonly found in coastal areas (up to 130 m) ideally in muddy, sandy, rocky, or gravel like bottom areas (Coad and Reist, 2018). These ideal conditions are similar to the bottom habitat surrounding Kinngait.

4.3 Project Significance

The Arctic Coast program aimed to develop a process for collaborative research among Indigenous knowledge holders and scientists. This program has been successful in Nunavut, Nunavik, and the Northwest Territories. The engagement and collaboration with northern communities to complete community-led monitoring projects is helping to bring research autonomy to Northern communities. Information and methods summarized in this report can be used to better understand and monitor coastal ecosystems and biodiversity in understudied regions of the Canadian Arctic. By summarizing this information, it will help understand how ecosystems may respond to future stressors.

The Arctic Coast program in the HBC is providing environmental (e.g., snow depth, ice thickness, water temperature and salinity, timelapse cameras) and biological (e.g., zooplankton, benthic, fish morphometrics) baseline data to four communities. Baseline data documents current conditions, which can be useful to assess change. Baseline data provides an understanding of variability over spatial and temporal scales. By understanding this spatial and temporal variation, it is possible to better determine what may be natural variability and what may be attributed to stressors within an ecosystem. Each of the communities in the HBC have different concerns related to shipping, climate change, resource extraction, and development. Research autonomy in Northern communities, including opportunities provided by community-led coastal assessments, are helping communities address their concerns. Data that the community collects is shared with the HTA/HTO/CTA as it belongs to each community.

Community-led approaches provide invaluable collaboration and the ability to collect data that otherwise would be difficult and expensive to obtain. By working together, we can better understand, manage, adapt to current conditions, and prepare for future scenarios. Furthermore, information summarized in this report may be used to contribute to the establishment of future marine protected areas that support the Government of Canada's goal to having 30% of Canada's Oceans protected by 2030.

4.4 Future Research

The four participating HBC communities in Arctic Coast completed pilot programs, which will help guide future research. The pilot programs were an opportunity to train technicians, test the protocols, establish relationships with the HTO/HTA/CTA's, and build the research program. The pilot programs were very successful to learn about the respective ecosystems and revise protocols.

Despite the successful pilot programs, it is recognized that more research is needed to gain a more complete understanding of the HBC coastal ecosystem. There were limitations in the timing of net sets to capture fish among all communities because of pandemic restrictions and technician availability. For example, in the future, fish sampling needs to be expanded because of the key role they play in the ecosystem. In the future, it would be ideal for fishing effort to occur throughout the entire summer, fall, and winter months to capture more coastal fish diversity.

Oceanography is important to understand habitat, which likely plays a role in how species may adapt to temporal change. Future research should also place moorings for a longer duration in the same locations during the open and ice covered water seasons each year as well as adding CT2X loggers at different depths and different types of devices should be used to assess variability. Longer mooring deployment would provide more information on temporal variability of oceanographic conditions. Under the ice permanent loggers would provide data to better understand temporal variation and how regional drivers may influence oceanography and habitat during the ice covered period. Research should also be expanded to include other oceanography metrics such as using castaways to understand salinity, temperature and pH depth gradients.

There is currently a knowledge gap understanding how benthic, zooplankton, and fish species all interact with one another in the Arctic ecosystem. Ideally, all of the methods discussed would have been completed in each HBC community. Future research would benefit from long term, year round monitoring at each site to ensure temporal and spatial variation is documented in the HBC. This documentation will be important to understand natural variability and from stressors in the HBC.

4.5 Community Leadership and Engagement

The majority of this project took place during the COVID-19 pandemic when travel was not possible to remote communities by DFO researchers. Pandemic restrictions posed challenges to provide training for communities that had not yet participated in Arctic Coast. All training with the onset of COVID-19 in March 2020 was completed virtually. After the pilot season in Igloolik and Kinngait, the returning technicians assisted with training new technicians in subsequent seasons. Returning technicians played a key role in ensuring program success and consistency. This was especially noted in Kinngait where the greatest number of technicians were trained.

Throughout the program, technicians attended and reported to the HTA/HTO/CTA board meetings on behalf of the Arctic Coast program to provide updates on project progress. These meetings were in addition to remote meetings that took place with DFO researchers and the respective boards. Having the technicians attend the board meetings provided a leadership opportunity for technicians because they were able to provide their own feedback and interpretation on the findings of the field program to the Boards. The Boards were happy to have the technicians attend and answer their questions. Technicians also took the initiative to complete project outreach on the radio, by word of mouth, and on community specific social media pages. Reporting to Kinngait, Igloolik, Naujaat, and Whapmagoostui by DFO included result newsletters written accessibly and then translated into South Qikiqtaaluk, North Qikiqtaaluk, Aivilingmiutut, or Cree (Appendix A). Additionally, updates on the project were regularly posted on social media. Community members are encouraged to ask questions and engage on the social media pages.

The Arctic Coast program worked directly with northern rightsholders and community members to enhance capacity among HBC communities. We recognize that there is a balance between remote training and in person training which helps foster relationships, provide feedback, and gives an opportunity for more in depth discussions. The feedback DFO received from communities was positive and encouraged future programs.

5.0 Conclusion

Coastal assessments were completed in four HBC communities as part of the Arctic Coast program. These efforts were supported and guided by the leadership of each community, and the fieldwork was conducted by community members trained according to established protocols. The data collected are intended to document current conditions, monitor for change, and will assist with decision-making by community partners and co-management groups moving forward. This report is also helping to fill a data gap in the Canadian Arctic with respect to coastal ecosystems, and especially those near communities, and will be useful as the Arctic faces ecosystem change.

The Arctic Coast program has also enhanced community research capacity within the North and provided community members with the opportunity to lead research to address community priorities. Documenting coastal biodiversity conditions will be imperative for understanding changes taking place to these ecosystems. Broadly, community-led monitoring provides potential for long term year round monitoring, enhance community compacity, and improve collaborations between researchers and communities. Experiences through the Arctic Coast program reinforce the need and capacity for Northern communities to have research autonomy.

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License to Fish for Scientific Purposes:
Igloolik Winter 2020: S-19-20-10-57
Igloolik Summer 2020: S-20/21-1008-NU
Naujaat winter 2021: S-20-21-30-25
Naujaat spring 2021: S-21/22-1001-NU
Kinngait winter 2020: S-19-20-10-57
Kinngait summer 2020: S-20/21 1008-NU
Kinngait winter 2021: S-20-21-30-25
Kinngait summer 2021: S-21/22-1001-NU
Whapmagoostui summer 2020: IML-2020-024

Animal Use Protocols:

AUP winter 2020 Kinngait: FWI-ACC-2020-04
AUP summer 2020 Kinngait: FWI-ACC-2020-34
AUP summer 2021 Kinngait: FWI-ACC-2021-18
AUP winter 2021 Kinngait: FWI-ACC-2021-05
AUP summer 2020 Igloolik: FWI-ACC-2020-34
AUP spring 2021 Naujaat: S-20/21-3025-YK-A1
AUP winter 2021 Naujaat: FWI-ACC-2021-05
AUP Whapmagoostui: DFO Quebec

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Supplementary: Additional Figures

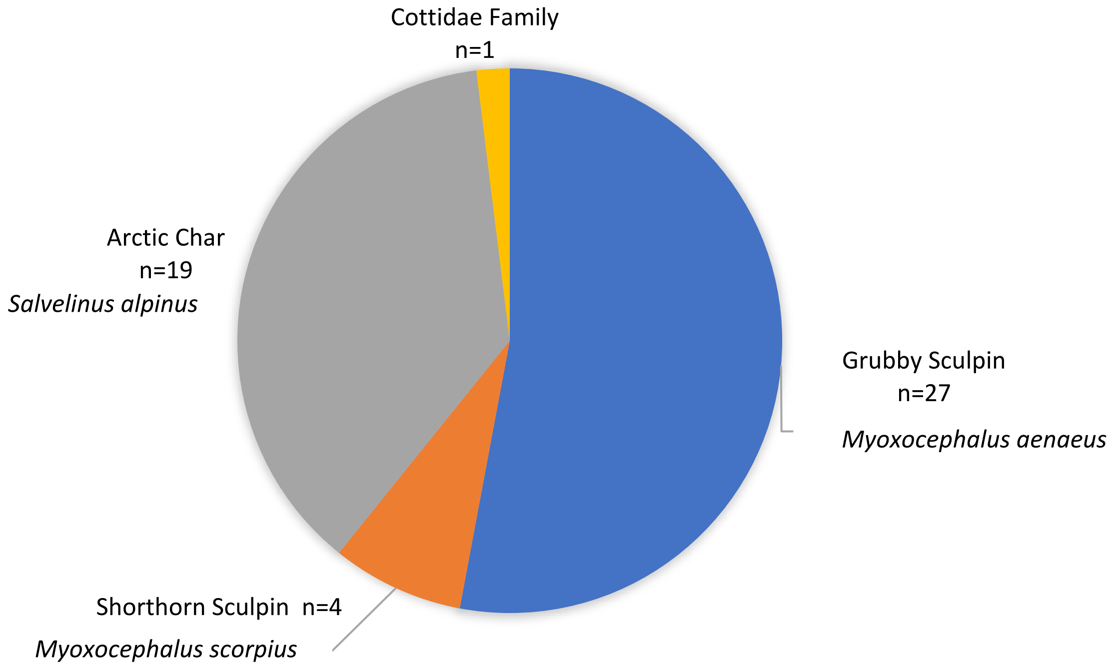


Figure 29: Sample sizes of collected fishes collected in Kinngait, NU between August 25th – September 16th, 2020.

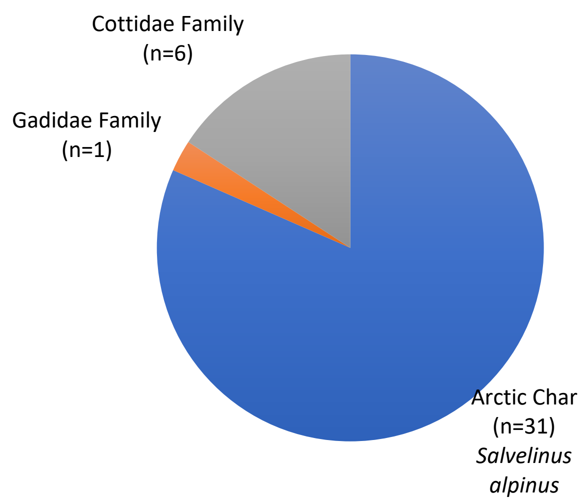


Figure 30: Sample sizes of collected fishes sampled at sites 1 and 3, near Kinngait, Nunavut between July 27th and October 5th, 2021.

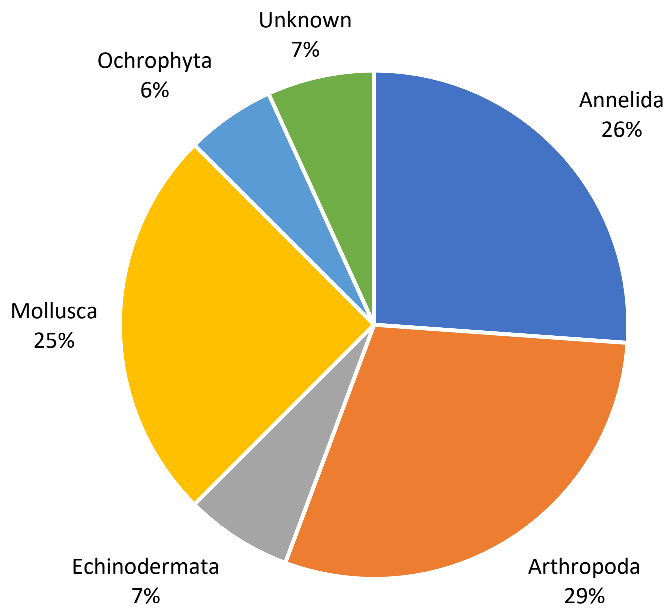


Figure 31: Percentage of invertebrate phylums by approximate count obtained in ponar grabs at sites 1 and 3, located near Kinngait NU between from September 9th to October 8th, 2020.

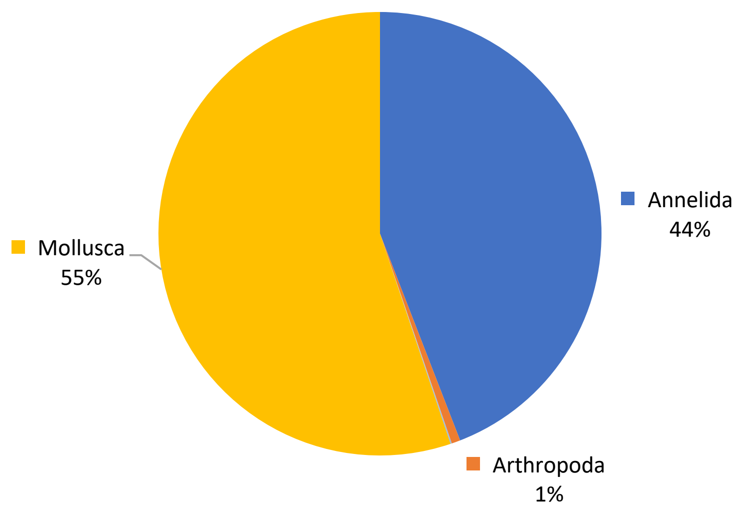


Figure 32: Proportion of phyla biomass of benthic species found at Site 1 during summer 2021.

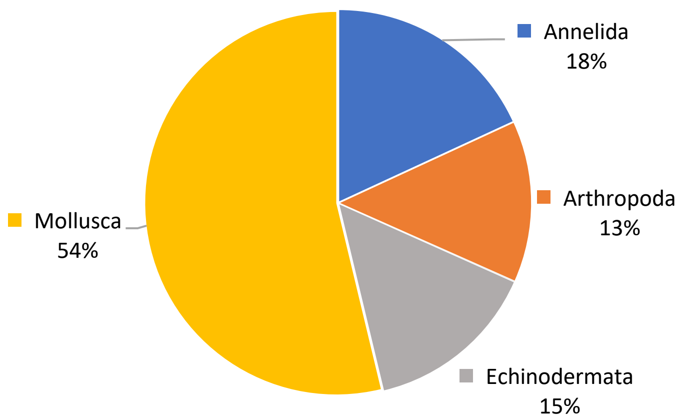


Figure 33: Proportion of phyla biomass of benthic species found at site 3 during summer 2021.

Appendix A: Community Reporting Newsletters

The following newsletters were provided to the respective communities summarizing initial findings after the conclusion of the respective field program. Newsletters were translated into South Qikiqtaaluk (Kinngait), North Qikiqtaaluk (Igloolik), Aivilingmiutut (Naujaat), or Cree (Whapmagoostui).

1.0 Kinngait:

Arctic Coast - Kinngait

Community-Based Winter Survey

Jan - Mar 2020 Results

The winter survey was conducted near Kinngait, Nunavut. The objectives this year (January 25th to March 18th, 2020) were to:

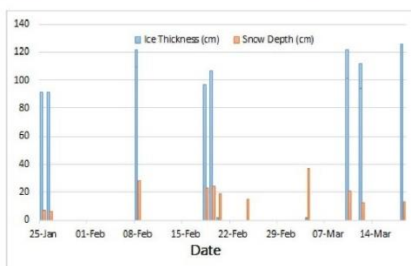
- Complete survey using standardized methods and build capacity for future community-led research.
- Collect data on ice thickness, snow depth, temperature (air and water), and salinity (saltiness).
- Collect fishes and biota from under the ice, examine species, and their diets.
- Collaborate with the Aiviq HTA for future projects.

Sites surveyed by monitors

Key Findings

- Four community technicians successfully completed weekly stations, where they collected habitat information, video, and fishes between January 25th and March 18th, 2020.
- Two time lapse cameras were set up to take pictures of the ice for the duration of the project.
- Video of bottom habitats was recorded under the sea ice.
- Temperatures and salinities (saltiness) were recorded at all sites, and can be compared to summer observations.
- Only one fish was captured (sculpin).

Lowering video camera under the ice

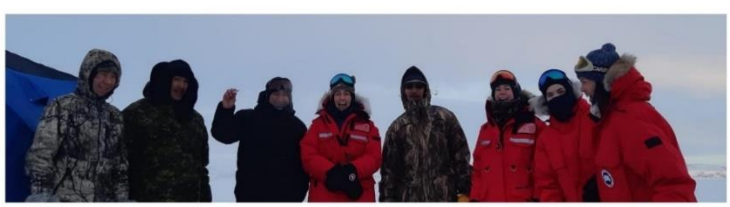


Ice thickness measurements among sites from Jan 25th to Mar 18th, 2020, measurements are averaged for each day of sampling.

Crews sampled both marine and freshwater sites

We thank the Aiviq HTA for their support on this project and the hard work of the community-based monitors!

Nakurmiik!



Field Crew (left to right): Quppaik Samaynalie, Joe Tuimie, Joshua Saila, Karen Dunmall (DFO), Luke Aniqmiuq, Darcy McNicholl (DFO), Miranda Bilous (DFO), Vivian Nguyen (Carleton University)

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Darcy.McNicholl@dfo-mpo.gc.ca

ᐅᑭᐅᖅᑕᖅᑑᑉ ᓯᓈᖓ - ᑭᙵᐃᑦ
ᓄᓇᓕᖕᓂᒃ ᑐᙵᕕᓕ ᐅᑭᐅᒃᑯᑦ ᖃᐅᔨᓴᕐᓂ

ᔮᓐᓄᐊᕆ-ᒫᑦᓯ
2020
ᖃᐅᔨᓯᐅᔪᑦ

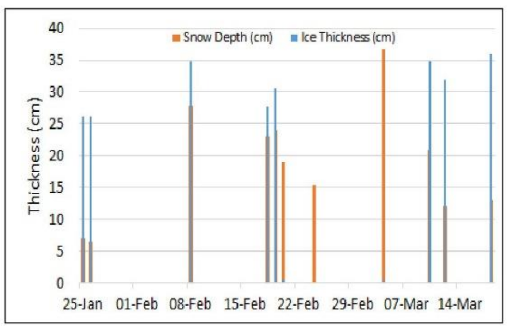
ᐅᑭᐅᒃᑯᑦ ᖃᐅᔨᓴᕐᓂᖅᑕᖃᔪᔪᖅ ᑭᙵᐃᑦ ᓴᓂᐊᓂ, ᓄᓇᕗᒻᒥ. ᑐᕌᒐᐃᑦ ᑕᕝᕙᓂ ᐊᕐᕌᒍᕐᒥ (ᔮᓐᓄᐊᕆ 25— ᒫᑦᓯ 18, 2020) ᐃᒪᐃᑦᓯᒪᑦᓯᑎᒃ:

- ᖃᐅᔨᓴᕐᓂᖃᕐᓗᑎᒃ ᐊᑐᕐᓗᑎᒃ ᐊᐅᓚᓂᐅᒥᐊᓕᖕᓂᒃ ᐱᕈᖅᐸᓪᓕᐊᑎᑦᓯᓗᑎᓪᓗ ᓯᕗᓂᑦᑎᓐᓂ ᓄᓇᓕᖕᓂ ᓯᕗᓕᖅᑕᓂᒃ ᖃᐅᔨᓴᕐᓂᐅᔪᓂᒃ.
- ᑲᑎᖅᓱᐃᓗᑎᒃ ᓯᑰᑉ ᐃᔾᔪᓂᖏᓐᓂᒃ, ᐊᐳᑏᑦ ᐃᑎᓂᖏᓐᓂᒃ, ᓂᓪᓚᓱᓐᓂᖅ (ᓯᓚ, ᐃᒪᕐᓗ) ᐊᒻᒪᓗ ᑕᕆᐅᖑᓂᖓ.
- ᓄᐊᑦᓯᓗᑎᒃ ᐃᖃᓗᓐᓂᒃ ᐆᒪᔪᕐᐊᔪᓂᓪᓗ ᓯᑰᑉ ᐊᑖᓂᒃ, ᕿᒥᕐᕈᓗᑦᓯ, ᓱᓇᑐᓱᕐᒍᒻᒪᕐᓛᑕᓗ.
- ᑲᑐᔾᔨᖃᑎᒌᓗᒋᑦ ᐊᐃᕕᖅ ᐆᒪᔪᕐᓂᐊᖅᑎᒃᑯᑦ ᓯᕗᓂᑦᑎᓐᓂ ᐊᐅᓚᓂᑦᓴᓄᑦ.

ᖃᐅᔨᓴᓪᓗᐊᑕᐃᑦ

- ᓯᑕᒪᑦ ᓄᓇᓕᖕᓂ ᖃᐅᔨᓴᖅᑏᑦ ᐱᔨᓐᓂᑦᓯᐊᔪᔪᑦ ᐱᓇᓱᐊᕈᓯᑖᖅᓯᐅᑎᓂᒃ, ᓄᐊᑦᓯᑦᓯᑎᒃ ᐆᒪᔪᙱᓐᓂᒃ, ᑕᕿᓴᓕᐅᖅᓯᑎᒃ, ᐊᒻᒪᓗ ᐃᖃᓗᐃᑦ ᐊᑯᖓᓐᓂ ᔮᓂᐊᓇ 25 ᐊᒻᒪᓗ ᒫᑦᓯ 18, 2020.
- ᒪᕿᒃ ᐊᔾᔨᓕᐅᕆᓕᐅᒥᔫᖅᑑᒃ ᐊᔾᔨᓕᐅᕈᑏᒃ ᐋᖅᑭᑦᑕᐅᔫᒃ ᐊᔾᔨᓕᐅᕆᔪᑦ ᓯᑯᒥᒃ ᐊᐅᓚᓂᖅ ᐃᓐᑎᕐᕋᓂᖃᕐᓂᙵᓂ.
- ᑕᕿᓴᓕᐅᖅᑕᐅᓯᒪᔪᑦ ᐆᒪᔭᐃᑦ ᓯᑰᑉ ᐊᑖᓂᑦᑐᑦ.
- ᓂᓪᓚᓱᓐᓃᑦ ᑕᕆᐅᖑᓂᓪᓗ ᑎᑎᕋᖅᑕᐅᓯᒪᔪᑦ ᐃᓂᐅᔪᓕᒫᓂ ᕿᒥᕈᔭᐅᒍᓇᓵᖅᓯᑎᒃ ᐊᐅᔭᓂᕐᑕᐃᑦ ᕿᒥᕈᔭᐅᓕᖅᐸᑕ.
- ᐊᑕᐅᓯᑐᐊᕐᒥᒃ ᐃᖃᓗᔪᑦ (ᑲᓇᔪᖅ).

ᐊᐸᖅᑎᓇᔪᖅ ᑕᕿᓴᓕᐅᕈᑎᒥᒃ ᓯᑰᑉ ᐊᑖᓄᑦ.



ᓯᑰᑉ ᐃᔾᔪᓂᖏᑦ ᐃᓪᓗᓕᒻᒥ ᔮᓄᐊᕆ 25-ᒥᒃ ᒫᑦᓯ 18, 2020–ᒧᑦ, ᐆᑦᑐᕋᖅᑕᐅᔪᑦ ᖃᐅᑕᒫᑦ ᖃᐅᔨᓴᕋᓴᓂᒃ.

ᖃᐅᔨᓴᖅᑏᑦ ᖃᐅᔨᓴᕐᓂᖅᑲᔪᑦ ᑕᓯᕐᒥ ᐊᒻᒪᓗ ᐃᒪᕕᒻᒥ.

ᐃᓂᐅᔪᑦ ᖃᐅᔨᓴᖅᑕᐅᓯᒪᔪᑦ

ᖁᔭᓐᓇᒦᖅᑕᕗᑦ ᐊᐃᕕᖅ ᐆᒪᔪᕐᓂᐊᖅᑎᒃᑯᑦ ᐃᑲᔪᖅᓯᓯᒪᓂᕆᓐᓄᑦ ᐊᐅᓚᓂᐅᔪᒥᒃ ᐃᖅᑲᓇᐃᔭᑦᓯᐊᕐᓂᕆᓚᐅᖅᑕᕆᓐᓂᓪᓗ ᓄᓇᓕᖕᓂ ᖃᐅᔨᓴᖅᑏᑦ! ᓇᑯᕐᒦᒃ!

ᐃᖅᑲᓇᐃᔭᖅᑏᑦ (ᓴᐅᒥᐊᓂᒃ ᑕᓕᖅᐱᒻᒧᑦ): ᖁᑉᐸᐱᒃ ᓵᒻᒪᔪᐊᓕ, ᔫ ᑐᐃᒥ, ᔫᓯᐊ ᓴᐃᓚ, ᑭᐅᕋᓐ ᑕᓐᒫᓪ (ᐃᒪᕐᒥᐅᑕᓕᕆᔨᒃᑯᑦ), ᕘᒃ ᐊᓐᓂᕐᒥᐅᖅ, ᑖᕐᓯ ᒪᒃᓂᑯᓪ (ᐃᒪᕐᒥᐅᑕᓕᕆᔨᒃᑯᑦ), ᒥᕋᓐᑕ ᕙᓚᔅ (ᐃᒪᕐᒥᐅᑕᓕᕆᔨᒃᑯᑦ) ᕙᕙᐊᓐ ᖑᔭᓐ (ᑳᐳᑕᓐ ᓯᓚᑦᑐᓴᕐᕕᒃᔪᐊᖅ)

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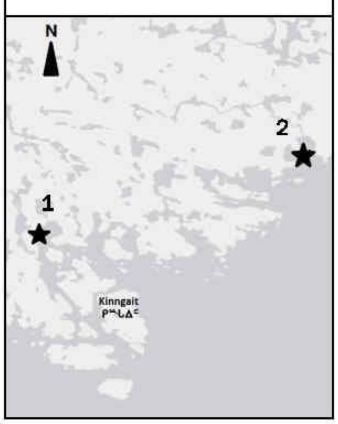
Arctic Coast - Kinngait
Community-Based Summer Survey

Aug-Oct 2020 Results

- The summer survey was conducted near Kinngait, Nunavut (Aug 13th to Oct 9th, 2020). The objectives this year were to:
- Train, build capacity and experience of community monitors for surveying and monitoring.
- Complete a survey using standardized methods.
- Collect environmental data for water (temperature/ saltiness) at different depths.
- Collect fishes to investigate biodiversity, diet, and habitat use.
- Collect invertebrates from the sea floor and plankton from the water column.
- Collaborate with the Aiviq HTA for future projects.



Sites sampled each week during summer season

Key Findings

- Monitors completed 11 days of field work at two sites that were previously sampled in the winter season.
- Fish, plankton, bottom samples, and environmental data were collected.
- Grubby sculpin collected at both sites, which are he first confirmed observations of this species in the area (although likely not new to the area).
- Average bottom water temperature was 3.6 $\pm$ 1.1°C
- In total the following fish were collected and will be processed for follow-on analyses:
  - Arctic Char = 19
  - Grubby Sculpin = 27
  - Shorthorn Sculpin = 4

Luke and Oloosie Aningmiuq, summer field work leads

Arctic Char collected at stie 1 (left)

Grubby Sculpin collected at site 1 (right), this is the first confirmed observation of this species in the area

Sam Curley using bottom grab to collect sediment and inverts

Crew checked in with DFO using an Inreach each day

Oloosie using a plankton net to sample water column

We thank the Aiviq HTA and Annie Suvega for their support on this project and the hard work of the community-based monitors, Luke Aningmiuq, Oloosie Aningmiuq and Sam Curley!

Fisheries and Oceans Canada   Pêches et Océans Canada

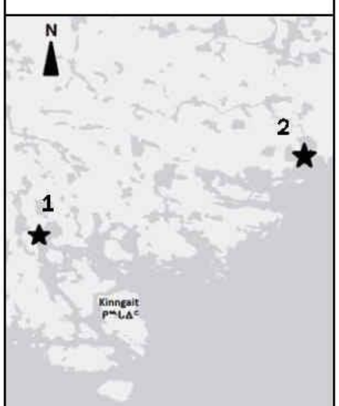
Karen.Dunmall@dfo-mpo.gc.ca   Darcy.McNicholl@dfo-mpo.gc.ca

ᐊᐅᒡᒍᓯ-ᐊᑦᑑᕝᕙ
2020
ᖃᐅᔨᓴᐅᔪᑦ

ᐅᑭᐅᖅᑕᖅᑑᑉ ᓯᓈᖓ-ᑭᙵᐃᑦ

ᓄᓇᓕᓐᓂᒃ ᑐᙵᕝᕕᑦ – ᐊᐅᔭᒃᑯᑦ ᖃᐅᔨᓴᕐᓂᖅ

- ᐊᐅᔭᒃᑯᑦ ᖃᐅᔨᓴᕐᓂᖅᑕᖃᕐᕕᖅ ᑭᙵᐃᑦ ᓴᓂᐊᓂ, ᓄᓇᒋᒻᒥ (ᐊᐅᒡᒍᓯ 13-ᐅᑦᑑᕝᕙ 9, 2020H. ᑐᕌᒐᐅᓚᐅᖅᑐᑦ ᑖᕝᕙ ᐊᕿᒍᕐᒥ:
- ᐃᓕᓐᓂᐊᑎᕋᓂᖅ, ᐃᖅᑲᓇᐃᔭᖅᑎᖃᕐᓂᕐᒧ ᐱᓕᒻᒪᕆᒪᕕᓂᒃ ᓄᓇᓕᓐᓂ ᖃᐅᔨᓴᖅᑎᓂᒃ ᖃᐅᔨᓴᓂᕐᒧᑦ.
- ᖃᐅᔨᓴᕐᒧᑎᒃ ᐊᑐᕐᒧᑎᒃ ᖃᐅᔨᓴᐅᑕᐅᕐᑯᔭᐅᕙᓂᒃ.
- ᓄᐊᕋᓯᓂᖅ ᐊᕙᑎᒨᖓᕙᓂᒃ ᑲᑎᖅᓯᕆᐊᓕᓐᓂᒃ ᐃᒪᕐᒥᒃ (ᓂᕈᒻᓂᓂᖅ/ᑕᕆᐅᖑᓂᖅ) ᐃᑎᓂᓕᕇᑐᓂ.
- ᓄᐊᕋᓯᓂᖅ ᐃᖃᓗᓐᓂᒃ ᖃᐅᔨᓴᕈᑎᒋᓗᒋᑦ ᐋᕿᒌᙳᓐᓂᕐᒋᓐᓂᒃ, ᓂᕿᕐᒋᓐᓂᒃ, ᓇᕙᖕᒋᓐᓂᓪᓗ.
- ᓄᐊᕋᓯᓂᖅ ᓴᐅᓂᖃᙱᑦᑐᓂᒃ ᑕᕆᐅᖅ ᐃᖅᑲᖓᓂᒃ ᐆᒪᕙᐊᕙᐊᓂᓪᓗ ᐃᒪᕐᒥᒃ.
- ᑲᑐᔾᔨᖃᑎᖃᕐᓂᖅ ᐊᐃᕙᖅ ᐆᒪᕙᓂᐊᑎᒃᑯᓐᓂᒃ ᓯᕗᓂᑦᑎᓐᓂ ᐊᐅᓚᕆᓄᑦ.



ᐃᓂᐅᔪᑦ ᖃᐅᔨᓴᖅᑕᐃᑦ ᐱᓇᓱᐊᕈᓯᑕᒫᑦ ᐊᐅᔭᒃᑯᑦ

ᖃᐅᔨᔾᔪᑎᓄᐊᑕᐅᔪᑦ

- ᖃᐅᔨᓴᖅᑏᑦ ᐅᓪᓗᓂᒃ 11-ᓂᒃ ᐱᔭᕇᔪᑦ ᑖᖅᑲᓂ ᒪᕿᓐᓂ ᐃᓂᐅᔫᓂ ᖃᐅᔨᓴᖅᑕᐅᓯᒫᓂ ᐅᑭᐅᒃᑯᑦ.
- ᐃᖃᓗᐃᑦ, ᐆᒪᔪᐊᕐᔪᐊᐃᑦ, ᐃᖅᑳᓐᙵᖅᑐᑦ, ᐊᒻᒪᓗ ᐊᕙᑎᒨᖓᔪᑦ ᑲᑎᖅᓱᖅᑕᐅᔪᑦ ᓄᐊᑕᐅᔫᑦ.
- ᑲᓇᔪᖅᑕᔫᑦ ᑕᒪᒃᑮᓐᓂ ᐃᓂᐅᔫᓐᓂᒃ (Grubby), ᑖᒃᑯᐊᓗ ᓯᕗᓪᓕᖅᐸᐅᑦᓯᑎᒃ ᓇᓗᓇᐃᖅᑕᐅᓂᖕᒥᒃ ᑕᒫᓂ (ᑕᒪᐅᙵᓇᐅᖅᑐᕋᐅᖕᒋᒃᑲᓗᐊᖅᑎᓪᓗᒋᑦ).
- ᐃᖅᑳᑕ ᐃᒪᐅᑉ ᓂᒡᓕᓐᓂᖓ ᐃᒪᐃᑦᑑᒐᔪᓚᐅᖅᑐᖅ 3.6 ± 1.1°C
- ᑲᑎᕐᓯᑎᒃ ᐅᑯᐊ ᐃᖃᓗᐃᑦ ᓄᐊᑕᐅᔪᒧᑦ ᑲᒥᔭᐅᓚᖅᓯᑎᓪᓗ ᐅᑯᓄᖓ ᕿᒥᕈᓂᐅᔪᓄᑦ.
  - ᐃᖃᓗᒃᐲᑦ = 19
  - ᑲᓇᔪᐃᑦ (Grubby) = 27
  - ᑲᓇᔪᐃᑦ (Shorthorn) = 4

ᓘᒃ ᐊᒻᒪᓗ ᐅᔫᓯ ᐋᓂᕐᒥᐅᖅ, ᐊᐅᔭᒃᑯᑦ ᑖᖅᑲᓂ ᓯᕗᓕᖅᑑᒃ

ᐃᖃᓗᒃᐱᒃ ᐱᔭᐅᔪᑦ ᐃᓂᐅᔪᒥ 1 (ᓴᐅᒥᐊᓂ)

ᑲᓇᔪᖅ (Grubby) ᐱᔭᐅᔪᖅ ᐃᓂᐅᔪᒥ 1 (ᑕᓕᖅᐱᐊᓂᒃ), ᑖᓐᓇ ᓯᕗᓪᓕᖅᐹᖅ ᓇᓗᓇᐃᔭᖅᑕᐅᔪ ᓂ ᑕᐃᒪᐃᑦᑐᓂᒃ ᑕᒫᓂ.

ᓵᓚ ᑰᓕ ᐊᑐᖅᑐᖅ ᐃᖅᑲᕐᓂᐅᑎᒥᒃ ᓄᐊᑦᓯᑦᓯᓂ ᐃᖅᑲᕐᒧᑯᓂᒃ ᓴᐅᓂᖃᙱᑦᑐᓂᓪᓗ

ᖃᐅᔨᓴᖅᑏᑦ ᖃᐅᑕᒫᑦ ᐃᖃᓗᓕᕆᔾᔨᑯᓐᓄᑦ ᐃᒪᕐᒥᐅᑕᓕᕆᔾᔨᑯᓐᓄᓪᓗ ᑲᓯᖅᐸᑦᑐᑦ

ᐅᔫᓯ ᐊᑐᖅᑐᖅ ᖁᐱᕐᕈᐊᕐᔪᐊᓄᑦ ᖃᓄᓯᒍᑎᒥᒃ ᐃᒪᕐᒥᒃ ᖃᐅᔨᓴᕈᑎᑦᓯᒍ

ᖁᔭᓐᓇᒦᖅᑕᕗᑦ ᐊᐃᕙᖅ ᐆᒪᔪᓂᐊᖅᑎᒃᑯᖏᑦ ᐊᒻᒪᓗ ᐋᓂ ᓯᕙᒐ ᐃᑲᔪᖅᑐᕐᓂᖓᓄᑦ ᐊᐅᓚᓂᐅᔪᒥᒃ ᐊᒻᒪᓗ ᐱᓕᕆᖃᑎᒋᓂᕐᒋᓐᓄᑦ ᓄᓇᓕᓐᓂᒃ ᑐᙵᕝᕙᖅᖅᓯᑎᒃ ᖃᐅᔨᓴᖅᑏᑦ, ᓘᒃ ᐋᓂᕐᒥᐅᖅ, ᐅᔫᓯ ᐋᓂᕐᒥᐅᖅ ᐊᒻᒪᓗ ᓵᓚ ᑰᓕ!

ᓇᑯᕐᒦᒃ!

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ARCTIC COAST - KINNGAIT

COMMUNITY-LED WINTER RESEARCH

JAN - MAR 2021 RESULTS

Winter coastal research was conducted near Kinngait, Nunavut from January 20 to March 25, 2021.

The objectives were to:

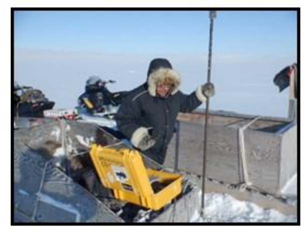
- Complete fieldwork using standardized methods and build capacity for future research.
- Collect data on ice thickness, snow depth, temperature (water), and salinity (saltiness).
- Collect fish and biota from under the ice. Identify species and diet.
- Document Indigenous Knowledge on coastal biodiversity through the co-development of a questionnaire.
- Collaborate with the Aiviq HTA for future projects.

Key Findings

- Five community technicians successfully completed fieldwork at weekly stations, where they collected habitat information, video, and fish.
- Two time lapse cameras were set up to take pictures of the ice for the duration of the project.
- Video of bottom habitats was recorded under the sea ice.
- Temperatures and salinities (saltiness) was recorded at all sites.
- Technicians captured 38 Arctic Char using gill nets under the ice.
- Three community technicians co-developed a questionnaire documenting Indigenous Knowledge of coastal biodiversity. The questionnaire was then filled out by 40 participants in Kinngait.

Fishing under the ice (top) and an Arctic Char (bottom).

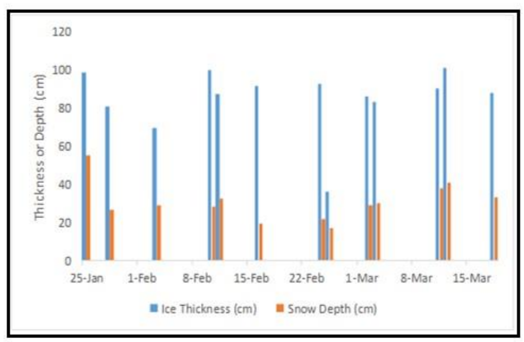
The time lapse camera that was set up to take pictures of the ice formation and break up.



Completing coastal fieldwork.

Map of the field sites near Kinngait.

Keeping detailed notes for the coastal fieldwork.



Ice thickness and snow depth measurements from January 20 to March 18, 2021. Measurements were averaged among all sites per day of sampling.

Community technicians (Pudloo Qiatsuq, Ooloosie Manning, Sheojuk Peter) working on the Indigenous Knowledge questionnaire development.

Picture of the fish on the bottom of the lake near town.

We thank the Aiviq HTA for their support on this project and the hard work of the community based monitors! Nakurmiik! Funding was provided by DFO Results Fund.

Fisheries and Oceans Canada / Pêches et Océans Canada

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ᐅᑭᐅᖅᑕᖅᑐᒥ ᐃᒪᖓᓃᑦᑐᑦ – ᑭᙵᑦ

ᓄᓇᓕᒻᒥᐅᑕᓄᑦ ᓯᕗᒃᑲᖅᑕᐅᓪᓗᓂ ᐅᑭᐅᒃᑯᑦ ᖃᐅᔨᓴᕐᓂᖅ

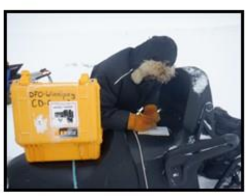
ᔫᓐᓄᐊᕆ - ᒫᑦᔨ
2021
ᓴᖅᑭᖅᓯᒪᓂᖏᑦ
ᖃᐅᔨᓴᒥᓃᑦ

ᐅᑭᐅᒃᑯᑦ ᐃᒪᕐᒥᑦᑐᓂᑦ ᖃᐅᔨᓴᓚᐅᖅᓯᒪᔪᑦ ᑭᙵᐃᑦ ᖃᓂᒋᔭᖓᓂ, ᓄᓇᕗᒻᒥ ᔫᓐᓄᐊᕆ 20-ᒥ ᑎᑭᑦᑐᒍ ᒫᑦᔨ 25, 2021-ᒧᑦ.

ᐱᓇᓱᐊᒐᖃᓚᐅᖅᐳᑦ ᐃᒪᓐᓇᐃᓕᐅᕐᓗᑎᑦ:

ᐱᔭᕇᖅᑕᐅᓗᑎᑦ ᓯᓚᒥ ᖃᐅᔨᓴᕐᓂᖏᑦ ᐊᑐᖅᑐᑎᑦ ᐊᔾᔨᒋᑦᑐᒡᒎᑕᐅᔪᓂᑦ ᐋᖅᑭᓱᖅᑕᐅᓯᒪᔪᑦ ᖃᐅᔨᓴᐅᔾᔫᑦ ᐊᒻᒪᓗ ᐱᓕᕆᐊᖃᖅᑐᑎᑦ ᓯᕗᓂᒃᓴᒥ ᓇᖏᓂᖅ ᖃᐅᔨᓴᕈᓐᓇᖁᖁᑎᒃᓴᑦ. ᑐᑭᓯᒋᐊᕈᑎᓂᑦ ᓄᐊᑦᑎᓗᑎᑦ ᓯᑯᑉ ᓯᑕᓐᓂᖓᓂᒃ, ᖃᓄᑎᒋ ᒪᐅᔭᐅᒻᒪᖔᖅ ᐊᐳᑎ, ᐆᓇᕐᓂᖓ (ᐃᒪᑉ), ᐊᒻᒪᓗ ᐱᐊᓐᓂᖓ (ᐱᐊᓐᓂᖓ). ᓄᐊᑦᑎᓗᑎᑦ ᐃᖃᓗᓐᓂᑦ ᐊᒻᒪᓗ ᐆᒪᔪᕐᓚᓂᑦ ᓯᑯᑉ ᐊᑖᓂ. ᓇᓗᓇᐃᖅᑕᐅᓗᑎᑦ ᐆᒪᔪᑦ ᐊᒻᒪᓗ ᓂᕆᔭᑦᑕᖏᑦ. ᑎᑎᕋᖅᑕᐅᓗᑎᑦ

ᓄᓇᙳᐊᖓ ᖃᐅᔨᓴᕝᕕᐅᓯᒪᔪᑦ ᑭᙵᐃᑦ ᖃᓂᒋᔭᖓᓂ.



ᑎᑎᕋᑦᑎᐊᖅᓯᒪᔪᒧᓐᓂᒃ ᐱᓯᒪᑦᑎᓂᐊᕐᒪᑕ ᑎᑎᕋᖅᑐᑦ

ᓄᓇᓕᒻᒥᐅᑦ ᖃᐅᔨᓴᖅᑎᖏᑦ (ᐸᓪᓗᖅ ᕿᐊᑦᓯᒃ, ᐅᓘᓯ ᒫᓂᖕ, ᓯᐅᕐᔪᒃ ᐋᑕ) ᐃᖅᑲᓇᐃᔭᖅᑐᑦ ᓄᓇᖃᖅᑳᖅᓯᒪᔪᑦ ᖃᐅᔨᒪᓂᖏᖕᓄᑦ ᐊᐱᖅᑯᑎᓕᐅᖅᑐᑎᑦ.

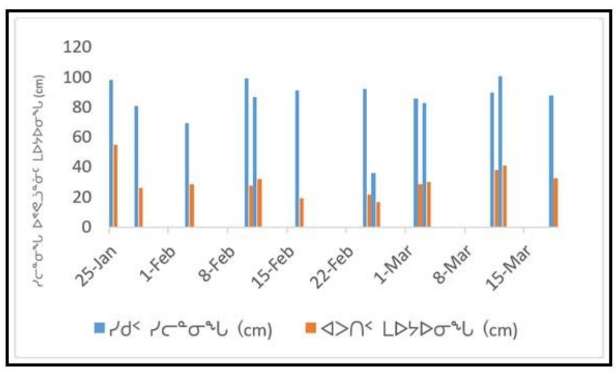
ᖃᐅᔨᔭᐅᓪᓗᐊᖅᓯᒪᔪᑦ

- ᑕᒪᓕᒫᑦ ᓄᓇᓕᒻᒥᐅᑦ ᐱᓕᕆᔩᖏᑦ ᐱᔭᕇᖅᓯᓚᐅᖅᓯᒪᔪᑦ ᖃᐅᔨᓴᖅᑐᑎᑦ ᐱᓇᓱᐊᕈᓯᑕᓖᑦ ᖃᐅᔨᓴᕝᕕᖏᓐᓂ, ᓄᐊᑦᑎᓚᐅᖅᑐᑎᑦ ᐆᒪᔪᐃᑦ ᓇᔪᒐᖏᑕ ᑐᑭᓯᒋᐊᕈᑎᖏᓐᓂᑦ, ᑕᑦᑎᔫᖕᓯᓚᐅᖅᑐᑎᑦ, ᐊᒻᒪᓗ ᓄᐊᑦᑎᓪᓗᑎᑦ ᐃᖃᓗᓐᓂ.
- ᒪᕿᐹ ᓱᒃᑲᓕᓕᖅᑎᑕᐅᓯᒪᔫᑉ ᑕᑦᑎᔫᖕᓯᓕᐅᕈᑕᐅᓂᐊᖅᑐᑦ ᐋᖅᑭᒃᑕᓕᐅᖅᓯᒪᔪᑦ ᐊᔾᔨᓕᐅᕆᖃᑦᑕᕐᓂᐊᕐᒪᑎᒃ ᓯᑯᒥ ᐊᑯᓂᐅᓂᖓᓂᒃ ᐱᓕᕆᐊᕆᔭᐅᓂᖓᑕ.
- ᑕᑦᑎᔫᖕᓴᖅ ᐃᖅᑲᕐᒥ ᓂᐱᓕᐊᕆᔭᐅᓚᐅᖅᓯᒪᓕᕐᓗᓂ ᓯᑯᐸ ᐊᑖᓂ ᐃᒪᕐᒥ.
- ᐆᓇᕐᓂᖏᑦ ᐊᒻᒪᓗ ᐱᐊᓐᓂᖏᑦ ᑎᑎᕋᖅᑕᐅᒃᑲᓐᓇᖅᑐᑦ ᑕᒪᐃᓐᓂ ᖃᐅᔨᓴᕝᕕᒥ.
- ᐱᓕᕆᔩᑦ ᐃᖃᓗᓚᐅᖅᑐᑦ 38-ᓂᑦ ᓄᓗᐃᖅᑐᑎᑦ.
- ᐱᖓᓱᑦ ᓄᓇᓕᒻᒥᐅᑦ ᖃᐅᔨᓴᖅᑏᑦ ᐋᖅᑭᒃᓯᐃᖃᑎᖃᓚᐅᖅᓯᒪᔪᑦ ᐊᐱᖅᑯᑎᒃᓴᓂᑦ ᑎᑎᕋᖅᑕᐅᑯᓪᓗᑎᑦ ᓄᓇᖃᖅᑳᖅᓯᒪᔪᑦ ᖃᐅᔨᓴᓂᖏᑦ ᐃᒪᕐᒥ ᐆᒪᔪᐃᑦ ᐊᔾᔨᒌᙱᓐᓂᖏᖕᓂ. ᐊᐱᖅᑯᑏᑦ ᓈᑎᖅᑕᐅᓚᐅᖅᓯᒪᔪᑦ 40-ᓄᑦ ᑭᙵᒥᐅᑕᓄᑦ.

ᐃᖃᓗᓯᒪᐊᖅᑐᑦ ᓯᑯᒥ ᐊᒻᒪᓗ ᐃᖃᓗᒃ ᐃᖅᑲᒥ.

ᐊᓂᒎᖅᐸᓪᓚᐊᑎᓪᓗᒍ ᐊᔾᔨᓕᐅᕈᑎ ᐋᖅᑭᒃᑕᐅᓚᐅᖅᑐᖅ ᐊᔾᔨᓕᐅᕆᓂᐊᕐᒥ

ᐱᔭᕇᖅᓯᓪᓗᑎᑦ ᓯᑯᒥ ᖃᐅᔨᓴᖅᑐᑎᑦ.



ᓯᑯᐸ ᓯᑕᓐᓂᖓ ᐊᒻᒪᓗ ᐊᐳᑎᐸ ᒪᐅᔭᐅᑎᒋᓂᖓᑕ ᖃᐅᔨᓴᖅᑕᐅᓪᓗᑎᑦ ᔫᓐᓄᐊᕆ 20–ᒥ ᑎᑭᑦᑐᒍ ᒫᑦᔨ 18, 2021-ᒧᑦ. ᖃᐅᔨᓵᕆᔭᐅᕙᓪᓕᐅᖅᑐᑦ ᑕᒪᐃᓐᓂ ᖃᐅᔨᓴᕝᕕᐅᔪᓂᑦ ᐅᓪᓗᑕᒫᑦ.

ᐅᔾᔨᙳᐊᖅ ᐃᖃᓗᒃ ᑕᓯᐸ ᐃᖅᑲᖓᓂ ᓄᓇᓕᐸ ᖃᓂᒋᔭᖓᓃᑦᑐᓂ.

ᖁᔭᓐᓇᒦᕈᒪᕗᒍᑦ ᐊᐃᕙᒃ ᐆᒪᔪᓂᐊᕐᓂᒃᑯᑦ ᑲᑐᔾᔨᖃᑎᒌᖕᒋᑦ ᐃᑲᔪᖅᑐᐃᓚᐅᖅᓯᓂᖏᖕᓄᑦ ᑖᔅᓱᒥᖓ ᐱᓕᕆᐊᖑᑉ ᐊᒻᒪᓗ ᐋᓯᕈᖅᑐᑎᑦ ᐱᓕᕆᓚᐅᕋᑕ ᓄᓇᓕᒻᒥᐅᑕᑦ ᖃᐅᔨᓴᖅᑎᖏᓐᓂ! ᓇᑯᕐᒦᒃ! ᑮᓇᐅᔭᒃᑲᖅᑎᑕᐅᓚᐅᖅᑐᖅ ᐃᖃᓗᓕᕆᓂᕐᒧᑦ ᐃᒪᕐᒥᐅᑕᓕᕆᓂᕐᒧᑦ ᖃᐅᔨᓵᑦ ᖃᐅᔨᔭᐅᓯᒪᓂᖏᑦ ᓴᖅᑭᖅᑎᑕᐅᖁᓪᓗᒋᑦ ᑮᓇᐅᔭᒃᑲᖕᓂᒃᑯᑦ.

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ARCTIC COAST - KINNGAIT
COMMUNITY-LED SUMMER AND FALL RESEARCH

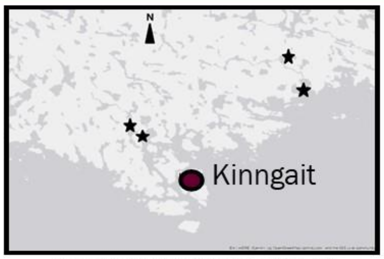
JUNE - NOV
2021
RESULTS

Project Objectives

- Advance capacity and provide experience to community monitors.
- Complete coastal research using standardized methods.
- Collect water temperature and salinity at different depths.
- Collect fishes to examine biodiversity, diet, and habitat use.
- Collect invertebrates from the sea floor and plankton from the water.
- Collaborate with the Aiviq HTA for future projects.

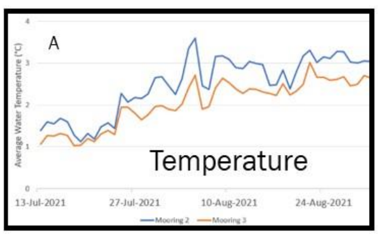
Key Findings

- Seven community technicians successfully completed fieldwork at weekly stations.
- ~150 total bottom grabs and 94 plankton tows were completed.
- Technicians captured 32 Arctic Char, and 7 Sculpin using gill nets.
- Two moorings monitored water temperature and salinity (saltiness).



Map of the field sites near Kinngait.


Deploying the zooplankton net into the water.



Moorings recorded water temperature (on top) and salinity (on bottom) data in July and August.



Collecting benthic samples from the sea floor. Invertebrates will be identified in the lab.



Collecting fish samples from around Kinngait. These fish are then processed in Winnipeg for fish measurements, their tissues are examined, stomach items are looked at, and their otoliths are removed. Different parts of the fish can provide information on diet and habitat use.

Thank you to all of the community technicians! We also thank the Aiviq HTA for their guidance and support. Funding was provided by DFO Results Fund.

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ᐅᑭᐅᖅᑕᖅᑰᑉ ᓱᕐᓴᖓᓂ — ᑭᙵᐃᑦ

ᓄᓇᓕᓐᓂ ᓱᕗᓕᖅᑕᐅᔪᒥ ᐅᐱᕐᕋᒃᑯᑦ ᐅᑭᐊᑦᓵᒃᑯᓪᓗ ᖃᐅᔨᓴᖅᑐᓕᕆᓂᖅ

ᔩᓂ - ᓅᕕᐱᕆ
2021
ᓴᖅᑭᑦᑕᐅᓯᒪᔪᑦ

ᐱᓕᕆᐊᕐᓯᒧᑦ ᑐᕌᒐᕆᓴᐅᔪᑦ

- ᐱᔪᓐᓇᖅᑎᑦᓯᒋᐊᒃᑲᓐᓂᕐᓂᖅ ᐊᑐᕆᐅᖅᓴᑎᑦᓯᓂᕐᓗ ᓄᓇᓕᓐᓂ ᖃᐅᔨᓴᖅᑎᓂᒃ.
- ᖃᐅᔨᓴᕐᓂᖅ ᓱᕐᓃᓂ ᐱᓴᕇᖅᑕᐅᓗᓂ ᐊᑐᖅᑕᐅᓗᑎᑦ ᐋᖅᑭᑦᑕᐅᓯᒪᔪᑦ ᖃᐅᔨᓴᕐᓂᕐᒧᑦ ᐊᑐᐊᒐᐃᑦ.
- ᑲᑎᖅᓱᐃᓂᖅ ᖃᓄᑎᒋ ᓂᓪᓕᓇᕐᓂᖅᑲᕐᓂᖓᓂᒃ ᑕᕆᐅᖅᑲᕐᓂᖓᓂᓪᓗ ᐊᔾᔨᒌᙱᑦᑑᑎᓂ ᐃᑎᓂᐅᔪᓂ.
- ᑲᑎᖅᓱᐃᓂᖅ ᐃᖃᓗᓐᓂᒃ ᕿᒥᕐᕈᒍᑎᒋᓗᑎᑦ ᐊᔾᔨᒌᙱᑦᑑᑕᐅᓂᖏᑦ, ᓂᕆᓯᑦᑕᖏᑦ, ᓇᔪᖓᒋᓐᓂᓪᓗ ᐱᐅᓯᕆᓯᑦᑕᖏᑦ.
- ᑲᑎᖅᓱᐃᓂᖅ ᓴᐅᓂᖃᙱᑦᑐᓂᒃ ᐃᖅᑲᖓᓂᒃ ᖁᐱᕐᕈᐊᕈᓯᕐᓂᓪᓗ ᑕᕆᐅᕐᒥᒃ.
- ᐱᓇᓱᐊᖃᑎᖃᕐᓂᖅ ᐊᐃᕙᖅ ᐆᒪᔪᕐᓂᐊᖅᑏᑦ ᑲᑐᔾᔨᖃᑎᒌᒃᑯᖏᓐᓂᒃ ᓱᕗᓂᕐᑎᓐᓂ ᐱᓕᐊᕐᓭᑦ

ᓇᓗᓇᐃᖅᓯᒍᑎᐅᓚᐅᖅᑐᑦ

- ᐱᖓᓲᔭᙱᓚᖅᑐᑦ ᐱᓕᕆᔩᑦ ᐱᔭᕇᕐᓂᖃᕐᓯᐊᓚᐅᖅᑐᑦ ᖃᐅᔨᓴᕐᓂᕐᒥᓐᓂ ᐱᓇᓱᐊᕈᓯᑖᓪᓚᑦ ᐱᓕᕆᕙᓪᓕᓂ.
- ~150 ᑲᑎᓕᒫᕐᓗᒋᑦ ᐃᖅᑲᖓᓂᒃ ᐱᓴᐅᔪᑦ ᐊᒻᒪᓗ 94ᖏᕋᖅᑐᒍ ᖁᐱᕐᕈᐊᕈᓯᕐᓂᒃ ᑲᑎᖅᓱᐃᒍᑎᖃᓚᐅᖅᑐᑦ
- ᐱᓕᕆᔾᔪᑦ ᐃᖃᓗᓚᐅᖅᑐᑦ 32ᓂᒃ ᐃᖃᓗᑉᐱᓂᒃ, ᐊᒻᒪᓗ 7ᓂᒃ ᑲᓇᔪᕐᓂᒃ ᐊᑐᖅᑐᑎᑦ ᓄᓗᐊᕐᓂᒃ.
- ᒪᕐᕈᒃ ᐳᑦᑕᔫᒃ ᖃᐅᔨᓴᖃᑦᑕᓚᐅᖅᑰᒃ ᑕᕆᐅᑉ ᓂᓪᓕᓇᕐᓂᖓᓂᒃ ᑕᕆᐅᖃᕐᓂᖓᓂᓪᓗ.

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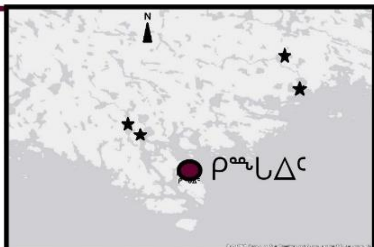
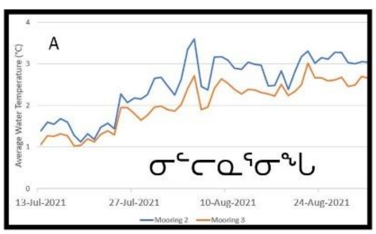
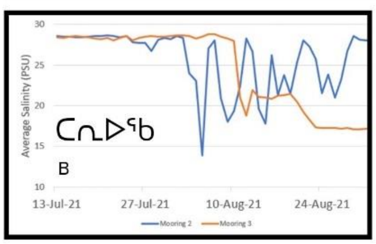


Map of the field sites near Kinngait.

ᓄᓗᐊᕐᓂᒃ ᖁᕕᕐᕈᐊᕈᓯᕐᓂᐅᑎᓂᒃ ᐃᒫᖅᓯᔪᖅ.





ᐳᑦᑕᔪᐃᑦ ᖃᐅᔨᓴᕐᓂᕐᖃᓚᐅᖅᑐᑦ ᑕᕆᐅᑉ ᓂᓪᓕᓇᕐᓂᖓᓂᒃ (ᖁᓚᓃᑦᑐᖅ) ᑕᕆᐅᖅᑲᕐᓂᖓᓂᓪᓗ (ᐊᑖᓃᑦᑐᖅ)

ᑲᑎᖅᓱᐃᓂᖅ ᐃᖅᑲᖕᒥᐅᑦᑕᕐᓂᒃ ᖃᐅᔨᓴᕋᑦᓴᓂᒃ ᐃᖅᑲᓅᖓᕐᓂᖅ. ᓴᐅᓂᖅᑲᙱᑦᑐᑦ

ᑲᑎᖅᓱᐃᔪᑦ ᖃᐅᔨᓴᕋᑦᓴᓂᒃ ᐃᖃᓗᓐᓂᒃ ᐊᕙᑎᐊᓂ ᑭᙵᐃᑦ. ᑖᒃᑯᐊ ᐃᖃᓗᐃᑦ ᐱᓕᕆᐊᕐᔪᓯᓪᓗᑎᑦ ᐅᐃᓂᐋᕐᒥ ᖃᐅᔨᓴᖅᑕᐅᓪᓗᑎᑦ ᑕᑭᓂᖏᑦ ᓯᓕᓐᓂᖏᓪᓗ, ᑎᒥᖓᓃᑦᑐᑦ ᕿᒥᕐᕈᔭᐅᓪᓗᑎᑦ, ᐊᖁᐊᕿᒥᖏᑦ ᕿᒥᕐᕈᔭᐅᓪᓗᑎᑦ, ᓯᐅᑎᖏᑕᓪᓗ ᓴᐅᓂᖏᑦ ᐲᖅᑕᐅᓪᓗᑎᑦ.

ᓇᑯᕐᒦᖅᑕᕗᑦ ᐃᓅᓐᓇᑎᑦ ᓄᓇᓕᓐᓂ ᖃᐅᔨᓴᖅᑎᐅᓚᐅᖅᑐᑦ! ᓇᑯᕐᒦᕐᒥᔭᕗᑦ ᐊᐃᕙᖅ ᐆᒪᔪᕐᓂᐊᖅᑏᑦ ᑲᑐᔾᔨᖃᑎᒌᖏᑦ ᐊᔭᐅᖅᑐᐃᒋᐊᕈᓐᓇᓚᐅᕐᓂᖏᓐᓂᑦ ᐃᑲᔪᖅᓯᓚᐅᕐᓂᖏᓐᓄᓪᓗ.
ᑮᓇᐅᔭᖃᖅᑎᑕᐅᓚᐅᖅᑐᑦ ᐃᖃᓗᓕᕆᔨᕐᔪᐊᒃᑯᓐᓄᑦ ᓴᖅᑭᑎᑕᐅᔪᓂᒃ ᑮᓇᐅᔭᖃᖅᑎᑕᐅᒍᑎᓄᑦ

2.0 Igloolik:

ARCTIC COAST - IGLOOLIK
COMMUNITY-BASED WINTER SURVEY

FEB - MAR
2020
RESULTS

The winter survey was conducted near Igloolik, Nunavut. The objectives this year (February 12th to March 24th, 2020) were to:

- Complete survey using standardized methods and build capacity for future community-led research.
- Collect data on ice thickness, snow depth, temperature (air and water), and salinity (saltiness).
- Collect fishes and biota from under the ice, examine species, and their diets.
- Collaborate with the Igloolik HTA for future projects.

Field sites (stars) located on Igloolik Island, chosen by the IHTA

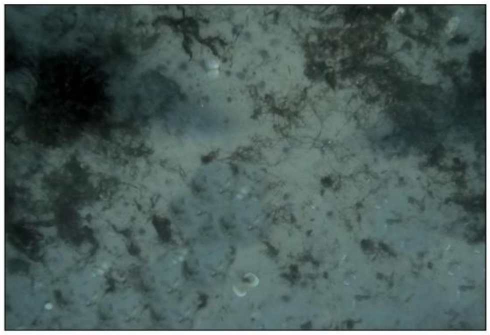
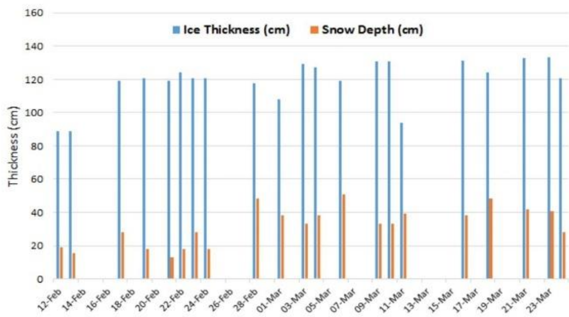


Image from under the ice (6.8 meters deep); site 1



Ice thickness measurements among Igloolik sites from Feb 12th to Mar 24th, 2020, measurements are averaged for each day of sampling.

Drilling holes into the ice

Simon Qamanirq recording data

We thank the Igloolik HTA for their support on this project. Qujannamiik!

Key Findings

- Four community technicians successfully completed weekly stations, where they collected habitat information, video and fishes between Feb 12th and March 24th, 2020.
- Two time lapse cameras were set up to take pictures of the ice for the duration of the project.
- Video of bottom habitats was recorded at three different sites.
- Temperatures and salinities (saltiness) were recorded at all sites, and can be compared to summer observations.
- Plankton tows were completed under the ice at two sites.
- Only one fish was captured (sculpin).

Field Crew (left to right): Karen Dunmall (DFO), Darcy McNicholl (DFO), Melvin Taqqaugak, Dean Ittuksarjuat, Richard Amaroalik, Laurissa Christie (DFO) and Simon Qamanirq

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ᐅᑭᐅᖅᑕᖅᑐᑉ ᑕᕆᐅᖓᓂ - ᐃᒡᓗᓕᒃ

ᓄᓇᓕᖕᒥ ᐅᑭᐅᒻᒥ ᖃᐅᔨᓴᕐᓂᖅ

ᕓᑉᕿᐊᕆ - ᒫᑦᓯ
2020
ᖃᐅᔨᓴᕐᓂᑯᑦ

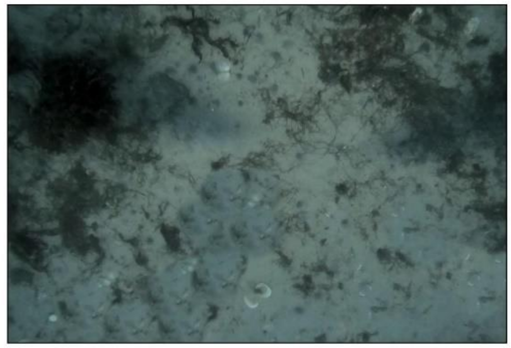
ᐅᑭᐅᒻᒥ ᖃᐅᔨᓴᕐᓂᖅ ᐱᓕᕆᐊᕐᒍᓚᐅᖅᑐᖅ ᐃᒡᓗᓕᐅᑉ ᓄᓇᕗᒻᒥ ᖃᓂᒋᔮᖓᓂ. ᑐᕌᒐᕆᓗᐊᖅᑕᖏᑦ ᐊᕌᒍᒻᒥ (ᕓᑉᕿᐊᕆ 12 ᐅᕝᕙ ᒫᑦᓯ 24, 2020) ᐅᑯᐊᖑᓚᐅᖅᐳᑦ:

- ᖃᐅᔨᓴᕐᓂᑯᑦ ᐊᑐᒐᐅᓯᖅᑐᓂᒃ ᖃᐅᔨᓴᕐᓂᕐᒧᑦ ᐊᑐᖅᖢᑎᒃ ᐃᓂᖃᖅᑎᑦᓯᐸᓗᑎᒡᓗ ᓯᕗᓂᕐᒥ ᓄᓇᓕᖕᓄᑦ ᐊᐅᓚᑕᐅᔪᒥᒃ ᖃᐅᔨᓴᕐᓂᕐᒥᒃ.
- ᖃᓇᑕᐅᔭᑯᑦ ᑲᑎᖅᓱᐃᐸᓗᑎᒃ ᓯᑯᐸ ᐃᐸᔪᓂᖓᓂᒃ, ᐊᐅᔭᓇᖏᓂᕐᒥᒃ, ᐅᓇᕐᓂᖓᓂᒃ ᓂᒡᓚᕐᓂᖓᓂᒡᓗ (ᓯᓚᐅᑉ ᐃᒪᐅᐸ) ᐊᒻᒪ ᑕᕆᐅᖃᕐᓂᖓᓂᒃ.
- ᑲᑎᖅᓱᐃᓗᑎᒃ ᐃᖃᓗᖕᓂᒃ ᐱᕈᖅᑐᓂᒡᓗ ᓯᑯᐸ ᐊᑕᖓᓂᑦ, ᖃᓄᐃᑐᓂᖏᓐᓂᒃ ᖃᐅᔨᓴᕐᓗᑎᒃ ᐊᒻᒪ ᓂᕆᔭᒃᑕᖏᓐᓂᒃ.
- ᐱᓕᕆᖃᑎᖃᕐᓗᓂ ᐃᒡᓗᓕᐅᑉ ᐊᖑᓇᓱᒃᑎᑦ ᑲᑎᒪᔨᖏᓐᓂᒃ ᓯᕗᓂᕐᒥ ᐱᓕᕆᐊᖑᓂᐊᖅᑐᓂᒥᒃ.

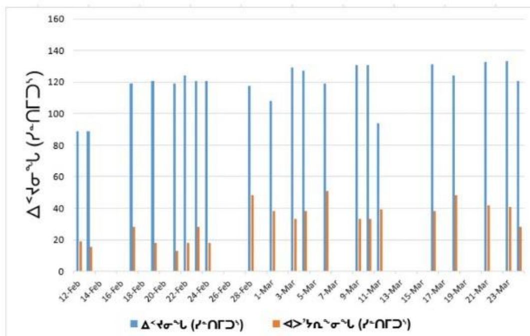
ᓴᐃᒪᓐ ᖃᒪᓂᖅ ᖃᐅᔨᓴᕐᓂᑯᓂᒃ ᓂᐱᓕᐅᕆᔪᖅ

ᖁᔭᓐᓇᒦᖅᐸᕗᑦ ᐃᒡᓗᓕᐅᑉ ᐊᖑᓇᓱᒃᑎᑦ ᑲᑎᒪᔨᖏᑦ ᐃᑲᔪᖅᑐᐃᓚᐅᕐᒪᑕ ᑕᐃᓯᒥᖓ ᐱᓕᕆᐊᕐᒥᒃ. ᖁᔭᓐᓇᒦᒃ!

ᓄᓇᑦ ᖃᐅᔨᓴᕐᕕᐅᓂᐊᖅᑐᑦ ᐃᒡᓗᓕᐅᑉ ᕿᑭᖅᑕᖓᓂ, ᓂᕈᐊᒐᐅᔪᑦ ᐃᓄᐃᑦ ᐃᒡᓗᓕᐅᑉ ᐊᖑᓇᓱᒃᑎᑦ ᑲᑎᒪᔨᖏᓄᑦ



ᐊᔾᔨᒐᖅ ᓯᑯᑉ ᐊᑖᓂ (6.8 ᒥᑐᕐ ᐃᑎᓂᖓ); ᐱᓕᕆᕝᕕᒃ 1



ᓯᑯᐸ ᐃᐸᔪᓂᖓᓂᒃ ᖃᐅᔨᓴᖅᑐᑦ ᐃᔾᔪᓕᐅᑉ ᓄᓇᖁᑎᖓᓂ ᐊᑯᓐᓂᖓᓂ ᕓᑉᕿᐊᕆ 12 ᑎᑭᓪᓗᒍ ᒫᑦᓯ 24, 2020, ᐅᐸᒍᑕᒪᑦ ᖃᐅᔨᓴᖅᐸᒃᖢᑎᒃ.

ᐃᑯᑕᖅᑐᑦ ᓯᑯᒥ

ᑐᑭᓯᔭᐅᓚᐅᖅᑐᑦ

- ᓄᓇᓕᖕᓂ ᓯᑕᒪᓂ ᖃᐅᔨᓴᖅᑎᑦ ᐱᓇᓱᐊᕈᓯᑕᒪᑦ ᖃᐅᔨᓴᖅᐸᒃᖢᑎᒃ ᐱᐊᓂᓚᐅᖅᐳᑦ, ᓂᕆᐅᑎᑦ ᓄᓇᖁᑎᖏᓐᓂᒃ ᖃᐅᔨᓴᖅᖢᑎᒃ, ᐊᔾᔨᐅᓇᐅᓗᑎᒡᓗ ᐃᖃᓗᖕᓂᒃ ᐊᑯᓐᓂᖓᓂ ᕓᑉᕿᐊᕆ 12 ᐊᒻᒪ ᒫᑦᓯ 24, 2020.
- ᐊᔾᔨᐅᓇᑎᖃᓚᐅᕐᒪᑕ ᖃᐅᔨᓴᐅᑎᖃᖅᑐᖕᓂᒃ ᓯᑯᒥᒃ ᐊᔾᔨᐅᓇᖕᒋᓗᑎᒃ ᐱᓕᕆᐊᑉ ᐃᓗᐊᓂ.
- ᓯᑯᑉ ᐊᑖᓂ ᐊᔾᔨᐅᓇᔪᖃᓚᐅᕐᒥᖕᒪᑦ ᓂᕆᔭᐅᖕᒋᑐᓂᒃ ᐱᖓᓱᐃᓕᖕᒐᔪᓂᒃ ᓄᑕᖅᖢᑎᒃ.
- ᑕᕆᐅᑉ ᐅᓇᕐᓂᖓ ᑕᕆᐅᖃᕐᓂᖓᓄ ᖃᐅᔨᓴᒐᐅᓚᐅᕐᒪᑕ ᑕᒪᐃᓐᓂ, ᐊᐅᔭᒥᒧᑦ ᐅᑐᕋᒐᐅᑉᓗᑎᒃ ᐅᓇᕐᓂᖏᑦ.
- ᐱᕈᖅᑐᑦ ᐱᐊᓂᒃᑕᐅᒪᕆᒪᑕ ᓯᑯᑉ ᐊᑖᓂ ᒪᕈᐃᖑᔪᖕᓂ ᖃᐅᔨᓴᕐᕕᖕᓂ.
- ᐊᑕᐅᓯᑐᐊᕐᒥᒃ ᐃᖃᓗᓚᐅᖅᐳᑦ (ᑲᓇᔪᒥᒃ).

ᐃᖃᓇᐃᔭᓚᐅᖅᑐᑦ (ᓴᐅᒥᐊᓂᑦ ᑕᓕᖅᐱᖓᓄᑦ): ᑭᐊᕆᓐ ᑕᓐᒪᐅ (ᐃᒪᕐᒥᐅᑕᓕᕆᔨ) ᑕᐊᓯ ᒪᒃᓂᑯᓪ (ᐃᒪᕐᒥᐅᑕᓕᕆᔨ) ᒥᐅᕕᓐ ᑕᖃᐅᒐᖅ, ᑎᐃᓐᓂ ᐃᑐᒃᓴᓪᔪᐊᖅ, ᓇᑦᓯᑦ ᐊᒪᕈᐊᓕᒃ, ᓚᐅᕋᓴ ᑯᕋᔅᑎ (ᐃᒪᕐᒥᐅᑕᓕᕆᔨᑦ) ᐊᒻᒪ ᓴᐃᒪᓐ ᖃᒪᓂᖅ

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Arctic Coast - Igloolik
Community-Based summer Survey

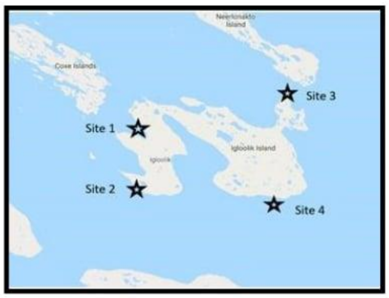
Aug - Oct 2020 Results

The summer survey was conducted near Igloolik, Nunavut. The objectives this year (August – October, 2020) were to:

- Complete the survey using standardized methods and build capacity for future community-led research.
- Collect data on coastal habitat (water temperature and saltiness).
- Collect fishes to examine species, diet and habitat usage.
- Provide training to community-based technicians on scientific data collection and communication technologies.
- Collaborate with the Igloolik HTA for future projects.

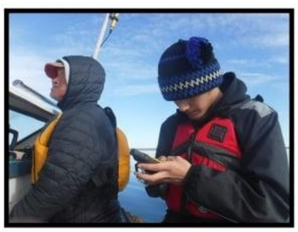
Key Findings

- Three community-based technicians successfully completed weekly stations, where they collected habitat information and fishes between August 25th and September 24th, 2020.
- One time lapse camera was set up in October to take pictures to capture ice freeze up (2020) and break up (spring 2021).
- Four moorings in approximately 45 feet of water were placed in the water to measure saltiness and temperature from August 26th to September 24th, 2020. The coldest bottom water temperature was at site 3 (0.5°C) and the warmest bottom temperature was at site 2 (4.4°C).
- Two fish were captured (sculpin species) that are being analyzed to understand habitat and diet.

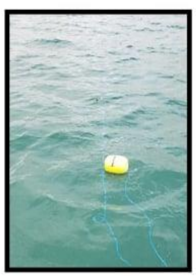


Field sites (stars) located near Igloolik Island, chosen by the Igloolik HTA.

A time-lapse cameras was set up in October, 2020 to monitor ice freeze up and break up.



Using the InReach to send a message during field work. InReach allows community-based technicians to "text" DFO to provide updates and ensure everyone stays safe.



Mooring placed in the water to monitor temperature and saltiness.

Sculpin species captured near Igloolik.

Checking on one of the moorings this summer.

We would like to thank the Igloolik HTA and Jacob Malliki for their support with this project. We would also like to thank our community-based technicians: Nujaliah Iyerak, James Evaluarjuk, and Simon Qamanirq for all of their hard work to make this project a success! Qujannamiik!

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ᐅᑭᐅᖅᑕᖅᑐᒥ ᓯᒡᔭᑦ ᐃᒡᓗᓕᒃ ᐊᐅᔭᒃᑯᑦ ᓄᓇᓕᖕᓂ ᖃᐅᔨᓴᕐᓂᖅ

ᐊᐅᒡᒎᓯᑎᒥ ᐅᑐᐱᕆ 2020ᒧᑦ ᐅᓂᒃᑳᑦ

ᐊᐅᔭᖅ ᖃᐅᔨᓴᓚᐅᖅᑐᖅ ᐃᒡᓗᓕᒃ, ᓄᓇᕗᑦ ᖃᓂᒌᔭᓂ. ᑐᕌᒐᕆᓚᐅᖅᑕᕗᑦ ᑕᒪᑐᒪᓂ (ᐊᐅᒡᒎᓯᑎᒥ ᐅᑐᐱᕆᒧᑦ 2020) ᐅᑯᐊᖑᔪᑦ:

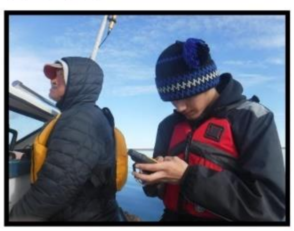
- ᖃᐅᔨᓴᕐᓂᖅ ᐱᔭᕇᖅᑕᐅᓗᓂ ᐊᖅᑭᒃᓱᖅᑕᐅᓯᒪᔪᑦ ᖃᐅᔨᓴᕈᑎᑦ ᐊᑐᕐᓗᒋᑦ ᓯᕗᓂᒃᓴᒧᓪᓗ ᓄᓇᓕᖕᓂ ᖃᐅᔨᓴᕐᓂᐅᓚᖅᑐᖅ ᐋᖅᑭᒃᓴᕐᓗᒋᑦ
- ᓯᒡᔭᒥ ᐆᒪᔪᖃᕐᕕᑦ ᖃᐅᔨᓴᕈᑎᖏᑦ ᑲᑎᖅᓱᕐᓗᒋᑦ (ᐃᒪᐅᑉ ᓂᒡᓚᓇᕐᓂᖓ ᑕᕆᐅᕆᖕᓂᖓᓗ)
- ᐃᖃᓗᖕᓂ ᖃᑎᖅᓱᐃᓗᑎᒃ ᖃᓄᐃᑦᑑᓂᖏᑦ, ᓂᕿᖏᑦ, ᓇᓂᖅᐸᔫᕐᒪᖔᑕᓗ ᖃᐅᔨᓴᕐᓗᒋᑦ
- ᐃᓕᓐᓂᐊᖅᑎᑦᑎᓗᑎᒃ ᓄᓇᓕᖕᓂ ᖃᐅᔨᓴᖅᑎᐅᓂᐊᖅᑐᓂᒃ ᖃᑎᖅᓱᐃᔪᓐᓇᕐᑯᓗᒋᑦ ᖃᐅᔨᓴᖅᑏᑦ ᖃᐅᔨᓴᕈᑎᖏᓐᓄᑦ ᐊᒻᒪᓗ ᐊᑐᕐᓗᑎᒃ ᓄᓇᓖᑦ ᖃᐅᔨᒪᔨᖏᓐᓂᒃ.
- ᖃᑦᔨᖃᑎᖃᕐᓗᑎᒃ ᐃᒡᓗᓕᖕᒥ ᐊᖑᓇᓱᒃᑐᓕᕆᔨᒃᑯᓐᓂ ᐱᓕᕆᐊᒃᓴᖃᕈᓐᓇᕐᑯᓪᓗᑕ ᓯᕗᓂᑦᑎᓐᓂ

ᖃᐅᔨᔭᐅᓪᓗᐊᑕᖅᓯᒪᔪᑦ

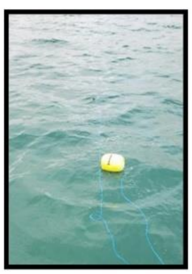
- ᓄᓇᓕᖕᓂᙱᖅᑐᑦ ᖃᐅᔨᓴᖅᑏᑦ ᐱᖕᒐᓱᑦ ᐱᐊᓂᑦᑎᐊᓚᐅᖅᑐᑦ ᐱᓇᓱᐊᕈᓯᑕᓖᑦ ᖃᐅᔨᓴᕐᓂᕆᔭᒥᓂᒃ ᖃᑎᖅᓱᐃᓪᓗᑎ ᑐᓴᒃᓴᓂᒃ ᐃᖃᓗᖕᓂᓪᓗ ᐊᐅᒡᒍᓯᑎ 25ᒥ ᓯᑎᐱᕆ 24, 2020ᒧᑦ.
- ᐊᔾᔨᓕᐅᕈᑎᒥᒃ ᖃᐅᔨᓴᐅᑎᑏᑦᑐᒥᒃ ᐊᑕᐅᓯᕐᒥᒃ ᓇᑉᐸᖅᓯᓚᐅᖅᑐᑦ ᐅᑐᐱᕆᐅᑎᓪᓗᒍ ᐊᔾᔨᓕᐅᕆᓂᐊᖅᑐᒥᒃ ᓯᑯᕚᓕᐊᔭᒥᒃ (2020ᒥ) ᓯᑯᐃᔭᕐᓂᖓᓂᓪᓗ (ᐅᐱᕐᖓᒃ 20 21).
- ᑎᓴᒪᓂᒃ ᐃᖅᑲᕐᒧᐊᕆᐊᓕᖕᓂᒃ 45 ᐃᓯᒐᓄᑦ ᑎᑭᓪᓗᒋ ᐃᖅᑲᕐᒧᐊᖅᑎᑦᑎᓚᐅᖅᑐᑦ ᑕᕆᐅᕆᖕᓂᖓ ᓂᒡᓚᓇᕐᓂᖓᓗ ᖃᐅᔨᓴᖅᑕᐅᓪᓗᑎᒃ ᐊᐅᒡᒍᓯᑎ 26ᒥ ᓯᑎᐱᕆ 24ᒧᑦ. ᐃᖅᑲᖓ ᓂᒡᓚᓈᖑᓚᐅᖅᑐᖅ ᖃᐅᔨᓴᕐᕕᐅᔪᒥ 3ᒥ (0.5ᒥ ᓂ ᒡᓚᓇᕐᓂᖅᑲᓂ) ᐆᓇᔫᖑᓚᐅᖅᑐᖅ ᖃᐅᔨᓴᕐᕕᐅᔪᒥ 2ᒥ (4.4ᒥ ᐆᓇᔪᓐᓂᓕᖕᒥ).
- ᐃᖃᓗᓚᐅᖅᑐᑦ ᒪᕐᕉᖕᓂᒃ (ᑲᓇᔪᓚᐅᖅᑐᑦ) ᒫᓇ ᖃᐅᔨᓴᖅᑕᐅᔪᑦ ᑐᑭᓯᔪᒪᓪᓗᑎᒃ ᑭᓯᑑᓯᖑᒪᓚᖓᑕ ᓇᓂᖅᐹᓯᖑᒪᓚᖓᑕᓗ.

ᖃᐅᔨᓴᕐᕕᐅᓚᐅᖅᑐᑦ (ᐅᓪᓗᓇᐊᖑᐊᑦ) ᐃᒡᓗᓕᐅᑉ ᖃᓂᒌᔭᓂ ᐊᖑᓇᓱᒃᑐᓕᕆᔨᒃᑯᓐᓂ ᑎᒃᑯᐊᖅᑕᐅᓯᒪᔪᑦ.

ᐊᔾᔨᓕᐅᕈᑎ ᖃᐅᔨᓴᐅᑏᑦᑐᖅ ᐋᖅᑭᒃᑕᐅᓚᐅᖅᑐᖅ ᐅᑐᐱᕆ 2020ᒥ ᓯᑯᕚᓕᐊᔪᒥᒃ ᓯᑯᐃᖅᐸᓕᐊᔪᒥᒡᓗ ᐊᔾᔨᓕᐅᕆᓂᐊᖅᑐᒥᒃ.



ᓯᓚᒃᑯᐊᕈᑎ ᐊᑎᖅᑲᖅᑐᖅ InReachᒥᒃ ᖃᐅᔨᓴᖅᑎᓪᓗᒋᑦ ᑎᑎᖅᑲᓂᒃ ᐊᐅᓪᓚᖅᑎᔾᔪᑕ ᐅᖃᑦᑕᓚᐅᖅᑐᖅ.



ᐃᖅᑲᖓᓗᓄᐊᕆᐊᓕᒃ ᐃᒫᓂᑦᑐᖅ ᖃᐅᔨᓴᖅᓱᓂ ᓂᒡᓚᓇᕐᓂᕐᒥᒃ

ᑲᓇᔪᖅᑕᐅᓚᐅᖅᑐᖅ ᐃᒡᓗᓕᐅᑉ ᖃᓂᒌᔭᓂ.

ᐊᐅᔭᒃᑯᑦ ᐃᖅᑲᖓᓖᓂᑕᐅᔪᒥᒃ ᖃᐅᔨᓴᕆᐊᖅᑐᖅᑐᖅ.

ᐃᒡᓗᓕᖕᒥ ᐊᖑᓇᓱᒃᑐᓕᕆᔨᒃᑯᑦ ᔭᐃᑯᐱ ᒪᓕᑭᓗ ᖁᔭᓐᓇᒦᖅᑕᕗᑦ ᑕᒪᑐᒥᖓ ᐱᓕᕆᐊᑎᓐᓂ ᐃᑲᔪᖅᑐᑎᐊᓚᐅᕐᒪᑕ. ᖁᔭᓐᓇᒦᕈᒪᖕᒥᔭᕗᑦ ᓄᓇᓕᖕᓂᙱᖅᑐᑦ ᖃᐅᔨᓴᖅᑎᕆᓚᐅᖅᑕᕗᑦ: ᓄᔭᓕᐊ ᐃᔨᕋᖅ, ᔭᐃᒥᓯ ᐃᕙᓗᐊᕐᔪᒃ ᐊᒻᒪ ᓴᐃᒪᓐ ᖃᒪᓂᖅ ᐱᓕᕆᐊᖃᑎᒋᓚᐅᕐᒪᑕ ᑕᒪᓐᓇ ᖃᐅᔨᓴᕐᓂᖅ ᐱᐊᓂᑦᑎᐊᕈᓐᓇᕐᑯᓪᓗᒍ! ᖁᔭᓐᓇᒦᒃ!

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3.0 Whapmagoostui:

Fisheries and Oceans Canada | Pêches et Océans Canada

Ecosystem Change in Hudson Bay Complex

- The Arctic is undergoing rapid changes affecting all northern ecosystems and species.
- Study of the Hudson Bay Complex is important because of the influence of climate change on the marine ecosystem and the potential for increased shipping and development.
- Baseline data of present conditions are needed for monitoring the effects of these changes on Arctic coastal ecosystems and species.

Kinngait, NU in the HBC.

Research Goals:

By studying coastal habitats using community-based and experimental approaches, this project will:

a) Work with communities to establish baselines and monitor the coastal ecosystem;
b) Assess shifts in species distribution and consequences of ecosystem change.

Community Monitoring:

Objectives:

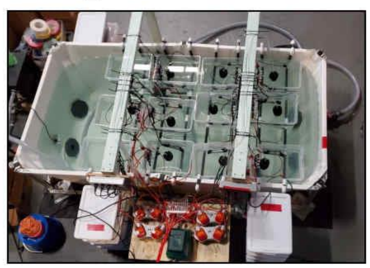
1) Study the coastal ecosystem to better document which species are present, their habitats, and their diets;
2) Develop a baseline of local and scientific knowledge of Arctic coastal ecosystems in key areas identified as important by northern communities.

Locations of the HBC Ecosystem Change project.

Experimental Component:

Objectives:

1) Experimentally examine responses of species under different environmental conditions (e.g. temperature);
2) Use current distribution patterns and experimental data to model and predict future species distributions in a warming Arctic.



Equipment to determine response to different conditions.

Relevance of This Work:

- Bringing Arctic communities and scientists together to monitor the coastal environment.
- Combining information from across multiple Arctic communities allows us to study change locally as well as regionally.
- Will enable a well rounded approach to understand Arctic ecosystem change.

Organizations Involved:

University of Waterloo · University of Manitoba · UQAR Université du Québec à Rimouski · Carleton University · Center d'Études Nordiques' · EeyouMarineRegion

Fisheries and Oceans Canada | Pêches et Océans Canada

Kuujjuarapik Local Nunavimmi Umajulivijiit Katujiqatigininga

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Erinn.Ipsen@dfo-mpo.gc.ca

Monitoring for Ecosystem Change in Whapmagoostui – Kuujjuarapik Region:

Fisheries and Oceans Canada / Pêches et Océans Canada

- Partnerships were formed between Fisheries and Oceans Canada and the Whapmagoostui Cree Trappers Association, Eeyou Marine Region Wildlife Board, Center d'Études Nordiques', Kuujjuarapik LNUK and Nunavik Marine Region Wildlife board to assess environmental change in the Kuujjuarapik-Whapmagoostui region.

Progress Report Summer and Fall 2020:

Community Monitoring:

1) Habitat information for key species was collected in the region during summer and fall 2020.
2) Two moorings were placed in the coastal ecosystem to monitor water temperature and saltiness.
3) A camera was set up to monitor ice freeze up and break up.

A time lapse camera was set up to monitor ice freeze and breakup.

4) Community-based technicians were trained to: deploy moorings, set nets, sample fish, set up time lapse cameras, complete benthic sampling, and use GPS and inReach.

Experimental Component:

1) Fish (e.g. sculpins), and invertebrates were collected from community harvesters.
2) Studies of species tolerances to temperature were developed in Rimouski, QC; these can be moved to the community in the future.

Poster used to advertise the collection of fish samples and the experimental set up.

Next Steps:

- Explore the potential for a winter community-monitoring program.
- Expand field programs to include more fish and invertebrate sampling.
- Increase remote training and support for community technicians.
- Analyze environmental data to understand habitat. Analyze fish and invertebrate samples to estimate diet, habitat use, and energy content.
- Transfer experimental set up to the community.

Thank You:

University of Waterloo; UQAR Université du Québec à Rimouski; University of Manitoba; Carleton University; Center d'Études Nordiques'; EeyouMarineRegion; Fisheries and Oceans Canada / Pêches et Océans Canada; Kuujjuarapik Local Nunavimmi Umajulivijiit Katujiqatigininga

CTA: Roy Mamianskum, Natasha Louttit, Robert Kawapit; **Kuujjuarapik LNUK**: Salamiva Weetaltuk; **CEN**: Patrick Lacerte; **EMRWB:** Felix Boulanger, Angela Coxon; Communities of Whapmagoostui & Kuujjuarapik!

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·ᐋᐱᒫᑯᐢᑐᐦᐤ ᑮᔮᐦ ᑰᒋ·ᐋᕂᐱᒃ ᐋᐦ ᐅᐦᒋ ᓈᑭᑎ·ᐋᔮᐦᒌᑯᐦᐤ ᐋᓐ ᐋᔑ ᐋᐦᒋᐱᔮᐤ ᓂᓇᐦᑮᐤ ᒫ·ᑳᓐ ᐅᒌᐦ ᐹᒫᑎᓰᒥᑮᐦᐤ:

Fisheries and Oceans Canada Pêches et Océans Canada

- ᒌᐦ ·ᐃᔫᔮᐦᒌᑭᓂᐅ ᒫᒨ ᒐ ·ᐋᒐᐱᑎᓯᒥᑐᐤ ᐊᓂᒌ ᐅᒌᐦ ᑳᐦᓈᒌᐦ ᑎᐹᔮᐦᒋᒐᓯᓈᐦᐤ ᐋᐦ ᐅᐦᒋ ᓈᓈᑭᒋᐢᒌᑭᓂ·ᐃᐤ ᐋᐦ ᓅᑎᒫᓵᓂ·ᐃᐤ ᑮᔮᐦ ᒋᐦᒋᑭᒋᐦ ᑮᔮᐦ ᐊᓂᒌ ᐋᐦ ᒫᒨᐱᐤ ·ᐃᓂᐦᐋᒐᓰᐤ ᐊᓂᒑᐦ ·ᐋᐱᒫᑯᐢᑐᐦᐤ, ·ᐋᓂᐹᑯᐦᐤ ᐋᒑᐦᒐ ᐋᐦ ᐅᐦᒋ ᓇᓈᑭᒋᐦᒌᑭᓂ·ᐃᐤ ·ᐋᓂᐹᑯᐦᐤ ᐋᐦ ᐋᐦᑎᑯᐦᐤ ᓂᑑᐦᐆ·ᐃᓐ, ᐋᐦ ᓈᓂᑑᒋᐢᒐᔮᐦᒌᑯᐦᐤ ᒫ·ᑳᓐ ᐅᒌᐦ ᐊᑎᒫᐲᓯᐤ ᒋᐢᑯᑎᒫᑐᑭᒋᑯ, ᑰᒋ·ᐋᕂᐱᐤ ᓅᓈᕬ ᑎᐹᔮᐦᒋᒐ·ᐃᓐ ᑮᔮᐦ ᓅᓈᕬ ᐋᐦ ᒫᒨᐱᐢᑎᑭᓂ·ᐃᐤ ·ᐋᓂᐹᑯᐦᐤ ᐋᐦ ᐃᐦᑎᑯᐦᐤ ᓂᑑᐦᐆ·ᐃᓐ ᒫ ᒌᐦ ·ᐃᔫᔮᐦᑎᐦᐤ ᐋᐢᐱᔮᐦᐋ·ᐋᔮᐤ ᓈᐢᐤ ᐋᔮᐦᐤ ᐋᐦ ᐋᒐᔮᐦᒌᑯᓂᔮᐤ ᒌᔑᑯᔮᐤ ᑮᔮᐦ ᑯᑎᒋᔮᐤ ᒫ·ᑲᔮᐤ ᐅᒌᐦ ᑰᒋ·ᐋᕂᐱᐤ ᑮᔮᐦ ·ᐋᐲᒫᑯᐢᑐᐦᐤ ᐋᒑᐦᒐₓ

ᑎ<ᒋᒨᓯᓂᐦᐋᑭᓐ ᐋᐦ ·ᐋᐦᒌᑯᐦᐤ ᑳ ᐊᑎ ᐃᔅᐱᔅᐤ ᒫ·ᑳᓐ ᑳ ᓃᐱᐦᐤ ᑮᔮᐦ ᑳ ᑎ·ᑳᒥᐦᐤ 2020:

ᐋᔮᔮᐅᐢᒌᐦᐤ ᑮᔮᐦ ᐋᐢᒌᒫᐅᐢᒌᐦᐤ ᐋᐦ ᐅᐦᒋ ᓈᑭᑎ·ᐋᔮᐦᒌᑯᐦᐤ ᒫ·ᑳᓐ:

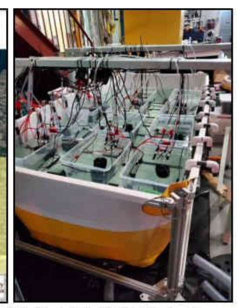
1) ᐊᓂᒌᐦ ᐋᑎ ᐃᔮᐦᑎᑯᐦᐤ ᓂᑑᐦᐆ·ᐃᓐ ᐅᐦᒋ ᓂᓇᐦᑮᐤ ᐋᑎ ᐃᔮᔑᓈᑯᐦᐤ ᓃᑳᓐ ᐋᐦ ᒌᐦ ·ᐃᔫᔮᐦᒌᑯᐦᐤ ᒌᐦ ᒫᐅᐦᑐᓂᑭᓂᐅ ᐅᑎᐦ ·ᐋᐢᑳ ᒫ·ᑲᐤ ᑳ ᓃᐱᐦᐤ ᑮᔮᐦ ᑳ ᑎ·ᑳᒥᐦᐤ 2020ₓ
2) ᓃᓵᔮᐤ ᒌᐦ ᐃᐦᑎᑎᑭᓂᐤ ᐊᓂᑎᐦ ᒐ ᒌᐦ ᐅᐦᒋ ᓈᓈᑭᒋᐢᒌᑭᓂ·ᐃᐤ ᐋᐢᐱᔑ ᑎᐦᒋᑭᒋᐤ ᓂᐋ ᑮᔮᐦ ᐊᓐ ᐋᐢᐱᔑ ᔒ·ᐋᐳ·ᐃᐤₓ
3) ᒥᓯᓈᐱᑭᐦᐋᑭᓐ ᑮᔮᐦ ᒌᐦ ᐃᐦᑎᒌᑭᓂᐆ ᐊᓂᑎᐦ ᒐ ᒌᐦ ᐅᐦᒋ ᑭᓂ·ᐋᐱᐦᑎᑭᓂ·ᐃᐤ ᐋᑎ ᐃᔅᐱᔅᐤ ᐋᐦ ᒥᐢᑭ·ᐃᑎᐦᐤ ᑮᔮᐦ ᐋᐦ ᒫᒋᐢᑎᐦᐤₓ

ᐊᓐ ᒫᑊ ᒥᓯᓈᐱᐢᑭᐦᐋᑭᓐ ᐋᑯᒌᐦ ᑳ ᐋᔑᓈᑯᐦᐤ ᐋᐦ ᒋᔑᐱᔮᐦᒌᑭᓂ·ᐃᐤ ᒐ ᓅᑯᐦᐤ ᓂᐦᐋᐤ ᐋᑎ ᐃᔅᐱᔅᐤ ᐋᐦ ᒥᐢᑭ·ᐃᑎᐦᐤ ᑮᔮᐦ ᐋᐦ ᒫᒋᐢᑎᐦᐤₓ

4) ᐋᑯᑎᐦ ᐊᓂᑎᐦ ᐃᐦᒌ·ᐃᓂᐦᐤ ᑳ ᐅᐦᑎᓈᑭᓂᐅ·ᐃᐤ ᐊ·ᐋᓂᒌ ᒐ ᒌᐦ ᐱᒥᐱᔮᐦᒌᐤ ᐊᓂᔮ ᒐ·ᑲᔮᐤ ᐃᔮᐱᑎᓂᔮᐤ; ᒐ ᒌᐦ ᐋᔮᐢᑭ·ᐃᐢᒌᐤ ᑮᔮᐦ ᒐ ᐅ·ᐋᔮᐢᒌᐤ ᐊᓂᔮᐦ ᒐ ᐋᐱᑎᓂᔮᐦ, ᒐ ᐱᒋᐢᑎᐦ·ᐋᐤ, ᒐ ᐅ·ᐋᔮᐢᒌᐤ ᒥᓯᓈᐱᐦᑭᐦᐋᑭᓐᐦ, ᒐ ᒌᐢᑐᑎᐦᐤ ᐊᓂᔮ ᐋᓈᑎᓪ ᒐ·ᑲᔮᐤ ·ᐋᐦ ᓈᓂᑑᒋᐢᒐᔮᐦᒌᑯᓂᔮᐤ ᑮᔮᐦ ᒐ ᒌᐦ ᐋᐱᒋᐦᒌᐤ ᐊᓂᔮ ᒐ·ᑲᔮᐤ ᐃᔮᐱᑎᓂᔮᐤ ᐋᐦ ·ᐋᐦ ᒋᐢᒐᔮᐦᒌᑯᓂᔮᐤ ᐊᓂᑎᐦ ᐋᑎ ᐃᔮᐦᒌᓂ·ᐃ·ᐃᔮᐤ ᑮᔮᐦ ᐊᓂᒌᐦ ᒌᔑᑯᐦᐤ ᐋᐦ ·ᐋᐢᑳᐱᔮᔮᐤ ᐋᐦ ᐅᐦᒋ ·ᐋᐦᒌᑯᓂᔮᐤ ᒐ·ᑲᔮᐤ ᐅᒌᐦ ᐋᔑ ᐊᐢᒌᐦᐤₓ

ᐊᓐ ᒐ·ᑳᓐ ᑳ ᓈᓂᑑᒋᐢᒐᔮᐦᒌᑯᐦᐤ:

1) ᓂᒫᓯᐤ (ᐱᑯᓂᒐ: ᑳᐦᑮᔮᐦ·ᑳᐅᐤ), ᑮᔮᐦ ᐊᓂᒌ ᐋᑳ ·ᐋᐅᑭᓂᑭᓂᐤ ᐋᐦ ᐃᐦᒌᐤ ᐊᓂᒌᐦ ᓂᐋᐦᐤ ᒌᐦ ᒫᐅᐦᑐᓈᑭᓂᐅ·ᐃᐤ ᐊᓂᒌᐦ ᐅᐦᒋ ᐃᐦᒌ·ᐃᓂᐦᐤ ᑳ ᐋᐱᑎᔒᐤ ᐊ·ᐋᓂᒌ ᐋᐦ ᒌᐦ ᒫᐅᒥᐦ·ᐋᐤₓ
2) ᐋᐦ ᒌᐦ ᓈᓂᑑᒋᐢᒐᔮᒪᑭᓂᐅ·ᐃᐤ ᑮᔮᐦ ᐋᐦ ᒌᐦ ᒥᓯᓂᐦᐋᑭᓂ·ᐃᐤ ᐅᐦᒋ ᐋᐦ ᐃᐦᑐᒌᑯᐤ ᐊᓂᔮ ᐋᑎ ᐃᔅᐱᔮᔮᐤ ᓂᑐᒋᑭᓂᔮᐤ ᐅᒌᐦ ᓇᒨᐢᑮ, ᑯᐯᑊ ᐋᐦ ᒌᐦ ᐅᔑᐦᒌᑭᓂ·ᐃᐤ; ᐅᒌᐦ ᐃᐦᒌ·ᐃᓂᐦᐤ ᐊᑯᒌᐦ ᒐ ᒌᐦ ᐋᔑ ᐊᐦᒋᐢᒌᑭᓂ·ᐃᐤ ᒐᑊ ᐊᓂᒌᐦ ᐋᔑ ᓃᐢᒌᒥᐦᐤₓ



ᐊᓐ ᒥᓯᓈᐱᐢᑭᐦᐋᑭᓐ ᑳ ᐅᔑᐦᒌᑭᓂ·ᐃᐤ ᒐ ᒌᐦ ᓅᑯᐦᐤ ᑳ ᒫᐅᐦᑐᓈᑭᓂᐅ·ᐃᐤ ᓂᒫᓯᐤ ᑮᔮᐦ ᐊᓂᒌᐦ ᑳ ᐋᔑᓈᐦᒌᑭᓂ·ᐃᐤ ᐊᓂᑎᐦ ᒐ ᒌᐦ ᐅᐦᒋ ᓈᓂᑑᒋᐢᒐᔮᐦᒌᑯᐦᐤ ᒐ·ᑳᓐₓ

ᐊᓐ ᒦᓐ ᐲ·ᐋᐦᐤ ᒑ ᐃᐦᑎᓈᓂ·ᐃᐤ:

- ᒐ ᓈᓂᑑᒋᐢᒐᔮᐦᒌᑯᐦᐤ ᒐ ᒌᐦ ᐋᔑᓈᑯᓂᑳ ᒐ ᒌᐦ ᓈᓈᑭᒋᐢᒌᑭᓂ·ᐃᐤ ᒐ·ᑳᓐ ᒫ·ᑲᐤ ᐋᐦ ᐱᐳᐦᐤₓ
- ᐊᑎᑎᐤ ᒐ ᒌᐦ ᐃᐦᑎᑯᐦᐤ ᐦ ·ᐃᔮ·ᐋᑎᒥᐦᐤ ᐋᐦ ᐱᒥᐱᔮᐦᒌᑭᓂ·ᐃᐤ ᒐ·ᑳᓐ ᐅᐦᒋ ᓂᒫᓯᐤ ᑮᔮᐦ ᐊᓂᒌ ᐋᑳ ·ᐋᐅᑭᓂᑭᓂᐤ ᐋᐦ ᒫᐅᐦᑐᓈᑭᓂᐅ·ᐃᐤ ᒐᑊ ᒐ ᒌᐦ ᓈᓂᑑᒋᐢᒐᔮᒪᑭᓂᐅ·ᐃᐤₓ
- ᐊᑎᑎᐤ ·ᐋᐦᔮᐤ ᒐ ᒌᐦ ᐅᐦᒋ ᒋᐢᑯᑎᒫᐦᐤ ᐊ·ᐋᓂᒌ ᑮᔮᐦ ᒐ ᔒᑐᐢᑭ·ᐋᑭᓂᐅ·ᐃᐤ ᐊᓂᒌ ᐊ·ᐋᓂᒌ ·ᐋᐦ ᐱᒥᐱᔮᐦᒌᐤ ᒐ·ᑲᔮᐤ ᐋᑎ ᐃᔮᐱᑎᓂᔮᐤ ᑮᔮᐦ ·ᐋᔮ·ᐋᐤ ᒐ ᒌᐦ ᐱᒌᐦᑭᐦᐤ ᐦₓ
- ᐊᓂᑎᐦ ᒐ ᒌᐦ ᐅᐦᒋ ᒋᐢᒐᔮᐦᒌᑯᐦᐤ ᑮᔮᐦ ᒐ ᒌᐦ ᐅᐦᒋ ᓂᓯᑐᐦᒌᑭᓂ·ᐃᐤ ᒐ·ᑳᓐ ᐊᓂᑎᐦ ᐋᑎᔮᐦᑎᑯᐦᐤₓ ᑮᔮᐦ ᐊᓂᒌ ᓂᒫᓯᐤ ᑮᔮᐦ ᐊᓂᒌ ᐋᑳ ·ᐋᐅᑭᓂᑭᓂᐤ ᐋᐦ ᒌᐦ ᒫᐅᐦᑐᓈᑭᓂᐅ·ᐃᐤ ᒐ ᒌᐦ ᐅᐦᒋ ᒋᐢᒐᔮᐦᒌᑯᓂᔮᐤ ·ᐊ·ᐋᓵ·ᐊ ᒐ·ᑲᔮᐤ ᒫᒋᐤ, ᐋᔑ ᐋᐱᒋᐦᒌᐤ ᐊᓂᑎᐦ ᐋᑎ ᐃᔮᐦᒌᐤ ᑮᔮᐦ ᐋᔑ ᐃᔮᔮᐦᒌᐤₓ
- ᐊᓂᒌᐦ ᐃᐦᒌ·ᐃᓂᐦᐤ ᒐ ᒌᐦ ᐋᔑ ᐋᐦᒋᐢᒌᑭᓂ·ᐃᐤ ᐊᓂᑎᐦ ᑳ ᐅᐦᒋ ᓈᓂᑑᒋᐢᒐᔮᐦᒌᑯᐦᐤ ᒐ·ᑳᓐₓ

ᒋᓂᐢᑯᒥᑎᓈᓐ:

UNIVERSITY OF WATERLOO · UQAR Université du Québec à Rimouski · University of Manitoba · Carleton University · ᐋᐦ ᓈᓂᑑᒋᐢᒐᔮᐦᒌᑯᐦᐤ ᒐ·ᑳᓐ ᐅᒌᐦ ᐊᑎᒫᐲᓯᐤ ᒋᐢᑯᑎᒫᑐᑭᒋᑯ · Eeyou Marine Region · Fisheries and Oceans Canada · Pêches et Océans Canada · ᑰᒋ·ᐋᕂᐱᐤ ᐃᐦᒌ·ᐃᓂᐦᐤ ᓅᓈᐋᒥ ᐅᒫᑯᓀᐋᔮᐨ ᑲᑐᔮᑲᑎᑭᓂᑲ

·ᐃᓂᐦᐋᒐᓰᐤ ᐋᐦ ᒫᒨᐱᐤ: ·ᕂᐃ ᒫᒥᔮᓂᐢᑭᐤ, ᓇᒑᔕ ᔔᑎᐨ, ·ᕂᐱᐨᐨ ᑲ·ᐊᐱᐨ; **ᑰᒋ·ᐋᕂᐱᐤ ᐋᐢᒌᒫᐅᐤ ᓅᓈᕬ:** ᓴᓚᒦᐋ ·ᐋᒑᓪᑐᐤ; **ᒋᐢᑯᑎᒫᑐᑭᒋᑯ ᐋᐦ ᓈᓂᑑᒋᐢᒐᔮᐦᒌᑯᐦᐤ ᒐ·ᑳᓐ ᐊᑎᒫᐲᓯᐤ:** ᐸᕂᓇᑊ ᓀᓯᕂᕂ, **ᐋᔮᔮᐅᐤ ᒐᐢᑎᐱᐢᑎᐦᐤ ᓂᑑᐦᐆ·ᐃᓂᔮᐤ ᐊᓂᒌᐦ ·ᐋᓂᐹᑯᐦᐤ:** ᐋᓕᑊᐢ ᐳ·ᓀᐦᔑᓇᐁ, ᐊᐦᒋᓀ ·ᑲᑭ·ᓴᓐ; ᐃᐦᒌ·ᐃᓐᐦ ·ᐋᐱᒫᑯᐢᑐᐦᐤ ᑮᔮᐦ ᑰᒋ·ᐋᕂᐱᐤ!

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Fisheries and Oceans Canada | Pêches et Océans Canada

ᐊᓐ ᒥᓯᐧᐋ ᒫᐧᑳᓐ ᐋᐦ ᐱᒫᑎᓰᒥᑭᐦᐦ ᐄᔨᐦᐦ ᐋᐦ ᐄᔅᐱᔨᒡ ᐅᑖᐦ ᐦᐊᑦᓯᓐ ᐯᐃᐦ

ᑭᓂᑳᐃᑦ, ᓅᓈᐳᑦ ᐅᑖᐦ ᐦᐊᑦᓯᓐ ᐯᐃᐦ

- ᐅᑖᐦ ᒫᒃ ᒋᔥ ᐊᑎᒫᐱᓯᒻ ᒫᐧᒃᒡ ᓈᐦᒡ ᒋᔑᐱᔨᐤ ᐄᔨᐦᐦ ᐋᐦ ᐄᔅᐱᔨᒡ ᐅᐦᒋ ᐊᓐ ᐋᑎ ᐃᔨᑖᔨᐦᑖᐦᐦ ᑎᔮᐦᑭᐦᐄᒫᐱᔨᒡ ᐅᑖᐦ ᐊᑎᒫᐱᓯᒻ ᐋᑎ ᓂᓂᐦᑖᐅᒥᐦᐦ ᑭᔮᐦ ᐸᒫᑎᓰᒥᑭᐦᐦ ᒫᐧᑳᓐ ᑭᔮᐦ ᐊᓂᒌ ᒥᓯᐧᐋ ᓂᓈᐦᑭᐤ ᐋᐦ ᐄᓯᓈᑯᓯᒡ ᐊᐧᐋᓂᒌx
- ᐊᓐ ᒫᒃ ᒫ ᒌᐦ ᓅᓂᑑᒋᔅᒫᔨᐦᑖᐦᐦ ᒫᐧᑳᓐ ᐅᑖᐦ ᐦᐊᑦᓯᓐ ᐯᐃᐦ ᓈᐦᑖᐧᐹᐦ ᒥᐦᑎᒫᐧᐃᓐ ᐅᐦᒋ ᐊᓐ ᐋᐦ ᐄᔑ ᑖᐦᑭᐦᐄᒫᐱᔨᒡ ᓈᐦᒡ ᐄᔨᐦᐦ ᐋᐦ ᐊᑎ ᐃᔨᑖᔨᐦᑖᐦᐦ ᒌᔑᐟ ᐅᑖᐦ ᐄᐧᓂᐹᐦᐦ ᐋᐦ ᐃᐦᑎᑯᐦᐦ ᒫᐧᑳᓐ ᑭᔮᐦ ᐊᑎᑎᐤ ᒫ ᒌᐦ ᐄᔅᑯᐱᔨᒡ ᐋᐦ ᐃᔫᐅᑎᐦᐅᑖᑭᓂᐧᐃᒡ ᒫᐧᑳᓐ ᑭᔮᐦ ᐋᐦ ᐋᐱᑎᓰᓈᓂᐧᐃᒡx
- ᐊᓐ ᒫᒃ ᓃᐦᑎᒻ ᑳ ᒋᔅᒫᔨᐦᑖᐦᐦ ᑭᔮᐦ ᑳ ᒥᓯᓂᐦᐄᑭᓂᐧᐃᒡ ᐆ ᐊᐧᑯᐦᐦ ᐋᑖᔨᐦᑖᐦᐦ ᐋᐅᐤ ᓈᑎᐧᐋᔨᐦᑖᐦᐦ ᒫ ᒌᐦ ᓈᑭᑎᐧᐋᔨᐦᑎᑭᓂᐧᐃᒡ ᐊᓐ ᒫᐧᑳᓐ ᐄᔨᐦᐦ ᐋᔑ ᑖᐦᑭᐦᐄᒫᐱᔨᒡ ᐅᑖᐦ ᒋᔥ ᐊᑎᒫᐱᓯᒻ ᐅᑖᐦ ᔮᔮᐤ ᐄᐧᓂᐹᐅᒡ ᐋᑎ ᓂᓂᐦᑖᐅᒥᐦᐦ ᒫᐧᑳᓐ ᑭᔮᐦ ᐋᔑᓈᑯᐦᐦ ᐊᓐ ᓂᓈᐦᑭᐤ ᒫᐧᑳᓐ ᐅᑖᐦ ᐋᑎ ᐸᐸᒫᑎᓰᒥᑭᐦᐦx

ᐊᓐ ᐧᐋᐦ ᐃᐦᑐᑎᑭᓂᐧᐃᒡ ᐋᐦ ᓅᓂᑑᒋᔅᒫᔨᐦᑖᐦᐦ ᒫᐧᑳᓐ:

ᐊᓐ ᐋᐦ ᐧᐄᐦ ᓈᓂᑑᒋᔅᒫᔨᐦᑖᐦᐦ ᐊᓂᑖᐦ ᐋᑎ ᐃᔨᐦᑎᑯᐦᐦ ᒫᐧᑳᓐ ᑭᔮᐦ ᐸᒫᑎᓰᒥᑭᐦᐦ ᐅᑖᐦ ᔮᔮᐤ ᐄᐧᓂᐹᐅᒡ ᐊᓂᑖᐦ ᐄᐦᒌᒫᐅᔅᒌᐦᐦ ᑭᔮᐦ ᐄᔨᔨᐅᔅᒌᐦᐦ ᐋᐦ ᐅᐦᒋ ᐱᒥᐱᔨᐦᑖᑭᓂᐧᐃᐦ ᑭᔮᐦ ᐊᓂᑖᐦ ᒫ ᐄᔑᓈᑯᐦᐦ ᐋᐦ ᓈᓂᑑᒋᔅᒫᔨᐦᑖᐦᐦ ᒫᐧᑳᓐ, ᒫᐅᑖᐦ ᒫ ᐃᐦᑐᑎᑭᓂᐧᐃᒡ ᐆ ᐊᐱᑎᓰᐧᐃᓐ:

a) ᒫ ᐧᐄᒫᐱᑎᓰᒫᑭᓂᐅᐧᐃᒡ ᐄᔨᔨᐅᒡ ᑭᔮᐦ ᐄᐦᒌᒫᐅᒡ ᐊᓂᑖᐦ ᐅᑎᐦᑖᐧᐃᓂᐧᐋᐦᐦ ᐊᓂᑎᐦ ᒫ ᒌᐦ ᐅᐦᒋ ᒋᔅᒫᔨᐦᑖᐦᐦ ᑳ ᐸᒋ ᐄᔑᓈᑯᐦᐦ ᐋᐦᒫᔮᐦ ᐅᐦᒋ ᐱᒫᔨᐦᑎᑭᓂᐧᐃᒡ ᑭᔮᐦ ᐄᔨᐦᐦ ᐄᔅᐱᔨᒡ ᒫᐧᑳᓐ ᑭᔮᐦ ᐊᓂᑖᐦ ᒫ ᐄᔑ ᓈᓈᑭᒥᐦᑖᑭᓂᐧᐃᒡ ᐊᓐ ᐋᔑ ᐱᒫᑎᓰᒥᑭᐦᐦ ᒫᐧᑳᓐ ᐅᑖᐦ ᔮᔮᐤ ᐄᐧᓂᐹᐅᒡ;

b) ᒫ ᐧᐄᐦ ᒋᔅᒫᔨᐦᑖᐦᐦ ᐄᔨᐦᐦ ᐋᔅᐱᔨᑳ ᐊᓂᑖᐦ ᐋᑎ ᐃᔨᐦᑖᒡ ᐊᐧᐋᓂᒌ ᑭᔮᐦ ᑖᓐ ᐋᔅᐱᔨᐦᐄᐧᐋᒡ ᐊᓐ ᐄᔨᐦᐦ ᐋᐦ ᐊᑎ ᐃᔨᔅᐱᔨᒡ ᑳ ᐄᐦᐱᔑ ᐄᔨᐦᐦ ᐄᑖᔨᐦᑖᐦᐦ ᐊᓐ ᒥᓯᐧᐋ ᒫᐧᑳᓐ ᐸᒫᑎᓰᒥᑭᐦᐦ ᐅᑎᐦx

ᐄᔨᔨᐅᔅᒌᐦᐦ ᑭᔮᐦ ᐄᐦᒌᒫᐅᔅᒌᐦᐦ ᐋᐦ ᐅᐦᒋ ᓈᑭᑎᐧᐋᔨᐦᑖᐦᐦ ᒫᐧᑳᓐ:

ᐊᓐ ᔮᔨᑖ ᐧᐋᐦ ᐃᐦᑐᑎᑭᓂᐧᐃᒡ:

1) ᒫ ᓈᓂᑑᒋᔅᒫᔨᐦᑖᐦᐦ ᐅᑖᐦ ᔮᔮᐤ ᐄᐧᓂᐹᐅᒡ ᐊᓂᑖᐦ ᐊᑎᑎᐤ ᒫ ᒥᐧᔮᒡ ᒫ ᒌᐦ ᓈᑭᑎᐧᐋᔨᐦᑖᐦᐦ ᐅᐦᒋ ᐋᑎ ᐃᔨᔅᐱᔨᒡ ᒫᐧᑳᓐ, ᐊᓯᓈᑯᓯᒡ ᐊᓂᒌ ᐊᓂᑎᐦ ᐋᐦ ᐃᐦᑖᒡ, ᐊᓂᑖᐦ ᒨᔥ ᐋᑎ ᐃᔨᐦᑖᒡ, ᑭᔮᐦ ᐊᓂᔮ ᒫᐧᑳᔨᐤ ᐋᑎ ᒥᒌᒥᒡ;

2) ᒫ ᐅᔑᐦᐋᑭᓂᐧᐃᒡ ᐊᓐ ᔖᔥ ᐊᓂᑖᐦ ᐅᑖᐦᐦ ᑳ ᐄᔑ ᐸᒋ ᒋᔅᒫᔨᐦᑖᐦᐦ ᐅᑖᐦ ᐄᔨᔨᐅᔅᒌᐦᐦ ᑭᔮᐦ ᐄᐦᒌᒫᐅᔅᒌᐦᐦ ᑭᔮᐦ ᐊᓐ ᒋᔅᒫᔨᐦᑎᒧᐧᐃᓐ ᐅᐦᒋ ᒥᓯᐧᐋ ᒫᐧᑳᓐ ᐅᑎᐦ ᐊᔅᒌᐦᐦ, ᓂᐲᐦᐦ ᑭᔮᐦ ᒌᔑᑯᐦᐦ ᐊᓂᑖᐦ ᐋᑎ ᑭᒥᐦᑖᔨᐦᑎᐦᐦ ᐅᑖᐦ ᐊᐧᐋᓂᒌ ᐊᑎᒫᐱᓯᒻx

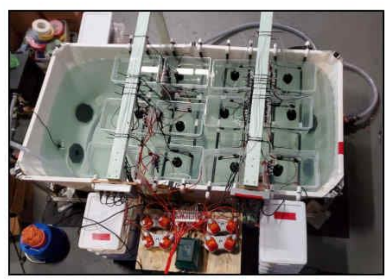
ᐊᓂᑖᐦ ᒫ ᐅᐦᒋ ᐊᐱᑎᓲᐦᑎᑭᓂᐧᐃᒡ ᐦᐊᑦᓯᓐ ᐯᐃᐦ ᐋᐦ ᐄᔑ ᐋᐦᒋᐱᔨᒡ ᒫᐧᑳᓐ

ᐊᓐ ᒫ ᐋᐦᒋᐱᔨᒡ ᐋᐦ ᓈᓂᑑᒋᔅᒫᔨᐦᑖᐦᐦ ᒫᐧᑳᓐ:

ᐊᓐ ᔮᔨᑖ ᐧᐋᐦ ᐃᐦᑐᑎᑭᓂᐧᐃᒡ:

1) ᒫ ᓈᓂᑑᒋᔅᒫᔨᐦᑎᑭᓂᐧᐃᒡ ᐄᔭᐦᒋᐱᔨᐧᑳ ᒫᐧᑳᓐ ᐅᐦᒋ ᐊᓐ ᓂᓈᐦᑭᐤ ᐋᐦ ᐊᑎ ᐃᔨᑖᔨᐦᑖᐦᐦ (ᐱᑯᓂᒫ: ᐊᓐ ᐋᐦᐱᔑ ᒋᔑᑖᒡ ᑭᔮᐦ ᒫᒃ ᑎᐦᑳᔮᒡ);

2) ᒫ ᐋᐱᑎᐦᐦ ᐊᓐ ᒫᐧᒃᒡ ᐋᑎ ᐃᔨᐦᑎᑯᐦᐦ ᒫᐧᑳᓐ ᑭᔮᐦ ᐊᓐ ᔖᔥ ᑳ ᐄᔑ ᓈᓂᑑᒋᔅᒫᔨᐦᑖᐦᐦ ᐊᓂᑎᐦ ᒫ ᒌᐦ ᐅᐦᒋ ᒋᔅᒥᓂᐧᐋᐱᐦᑎᑭᓂᐧᐃᒡ ᑭᔮᐦ ᐧᐄᐦ ᒋᔅᒫᔨᐦᑖᐦᐦ ᐊᓂᑖᐦ ᒫ ᐄᔅᐱᔨᒡ ᒫᐧᑳᓐ ᐅᑖᐦ ᐄᔑ ᓃᐦᑖᒥᒡ ᓈᓈᓂᒌᒡ ᐋᐸ ᐊᑎ ᑎᐦᑳᔮᒡ ᐅᑖᐦ ᒋᔥ ᐊᑎᒫᐱᓯᒻx



ᐊᓐ ᒫᐧᑳᓐ ᓈᑎᐧᐋᔨᐦᑖᐦᐦ ᐊᓂᑎᐦ ᒫ ᒌᐦ ᐅᐦᒋ ᐧᐄᐦᑎᒫᒫᐱᔨᒡ ᐊᓐ ᐋᑎ ᐃᔨᔅᐱᔨᒡ ᒫᐧᑳᓐ ᐅᐦᒋ ᐊᓐ ᓂᓈᐦᑭᐤ ᐋᐦ ᐄᑖᔨᐦᑖᐦᐦ ᒌᔑᐟ ᑭᔮᐦ ᑯᑎᒡ ᒫᐧᑳᓐx

ᐊᓂᑖᐦ ᒫ ᐄᔑ ᐧᐄᒥᐦᐄᐧᐋᐱᔨᒡ ᐆ ᐋᐱᑎᓰᐧᐃᓐ:

- ᒫᒨ ᒫ ᐊᐱᑎᓲᐦᑎᑭᓂᐧᐃᒡ ᑭᔮᐦ ᒫ ᐧᐄᒫᐱᑎᓰᒧᑦ ᐊᐧᐋᓂᒌ ᑭᔮᐦ ᐊᓂᒌ ᐋᐦ ᓈᓂᑑᒋᔅᒫᔨᐦᑎᐦᐦ ᓂᓈᐦᑭᐤ ᒫᐧᑳᔨᐤ ᐅᑖᐦ ᔮᔮᐤ ᐄᐧᓂᐹᐅᒡ ᑭᔮᐦ ᒫ ᒌᐦ ᓈᓈᑭᒥᐦᑖᑭᓂᐧᐃᔨᒡ ᐊᑎ ᐃᔨᔅᐱᔨᔨᒡ ᒫᐧᑳᔨᐤx
- ᐋᐦ ᒫᒨᓂᑭᓂᐧᐃᒡ ᐊᓐ ᐋᔑ ᒥᔅᑭᐋᐦᑖᑭᓂᐧᐃᒡ ᒥᓯᐧᐋ ᐊᓂᑖᐦ ᒋᔥ ᐊᑎᒫᐱᓯᒻ ᐃᐦᑖᐧᐃᓂᐦᐦ ᑭᔮᐦ ᐊᑯᑎᐦ ᒫ ᒌᐦᐦ ᐅᐦᒋ ᒋᔅᒫᔨᐦᑖᐦᐦ ᐊᓐ ᐋᑎ ᐃᔨᔅᐱᔨᒡ ᒫᐧᑳᓐ ᐅᑎᐦ ᐃᐦᑖᐧᐃᓂᐦᐦ ᑭᔮᐦ ᐅᑖᐦ ᐧᐋᐦᑳx
- ᐋᑯᑎᐦ ᑭᔮᐦ ᑯᐃᐦᒡ ᒫ ᒌᐦ ᐅᐦᒋ ᐅᐧᐋᔮᐦᑖᑭᓂᐧᐃᒡ ᐊᓂᑖᐦ ᒫ ᒌᐦ ᐄᔑ ᐊᐱᑎᓲᐦᑎᑭᓂᐧᐃᒡ ᑯᐃᐦᒡ ᒫ ᒌᐦ ᐄᔑ ᓂᓯᑐᐦᑖᐦᐦ ᐊᓂᑖᐦ ᓂᓈᐦᑭᐤ ᐋᐦ ᐄᔑ ᐋᐦᒋᐱᔨᒡ ᒫᐧᑳᓐ ᐸᒫᑎᓰᒥᑭᐦᐦ ᐅᑖᐦ ᐄᔑ ᒋᔥ ᐊᑎᒫᐱᓯᒻx

ᐊᓂᒌ ᐊᐧᐋᓂᒌ ᐧᐋᒥᐦᐄᐧᐋᐤ:

University of Waterloo | University of Manitoba | UQAR Université du Québec à Rimouski | Carleton University
ᐋᐦ ᓈᓂᑑᒋᔅᒫᔨᐦᑖᐦᐦ ᒫᐧᑳᓐ ᐅᑖᐦ ᐊᑎᒫᐱᓯᒻ ᒋᔅᑯᑎᒫᑐᐱᒥᐤ
EeyouMarineRegion
ᑯᒋᐧᐋᔅᐱᐤ ᐃᐦᑖᐧᐃᓂᐦᐦ ᓅᓈᕕᒥ ᐅᒫᔪᓖᐧᐊᐦᐨ ᑲᑐᔾᑲᑎᑭᓂᑲ
Fisheries and Oceans Canada | Pêches et Océans Canada

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4.0 Naujaat:

MARCH - JUNE 2021

ARCTIC COAST - NAUJAAT

COMMUNITY-LED WINTER AND SPRING RESEARCH

Winter and spring coastal research was conducted near Naujaat, Nunavut in 2021 as part of the Arctic Coast program. Arctic Coast is a community-led coastal research and monitoring program that has worked with over 6 communities across the Canadian Arctic from 2017 to 2021 to better understand current conditions in coastal ecosystems near communities in the Canadian Arctic and help to assess for change.

Winter research in Naujaat took place March 17—24 and spring research was from June 14—25, 2021.

The objectives were to:

- Complete fieldwork using standardized methods and build capacity for future research.
- Collect data on ice thickness, snow depth, temperature (water), and salinity (saltiness).
- Collect fish from under the ice to understand diet and the ecosystem.
- Provide training to community-based technicians on sampling techniques.

Key Findings:

- Three community technicians successfully completed fieldwork, where they collected fish and habitat information.
- One time lapse camera was set up to take pictures of the sea ice to collect data on melt and break up.
- Video of bottom (called benthic) habitats was recorded under the sea ice using a GoPro bottom camera.
- Temperatures and salinities (saltiness) were recorded at all sites.
- Technicians captured Arctic char and sculpin species under the ice using jigging which will be analyzed to understand diet.

Technicians collecting benthic, environmental, and fish samples near Naujaat, NU.

Map of the sites sampled.

Collecting more data in the field!

Next Steps:

- Once the data and equipment have been received in Winnipeg, we will analyze the information:
- The fish will be sampled to collect information on their length and what they eat.
- The logger and camera data will be analyzed to collect information on water temperature, ice, and coastal habitat.
- The results will be discussed with the Arviq HTO and reported back to the community.

We thank the Arviq HTO for their support on this project and the hard work of the community based monitors! Nakurmiik! Funding was provided by DFO Results Fund.

Fisheries and Oceans Canada / Pêches et Océans Canada

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Karen.Dunmall@dfo-mpo.gc.ca

ᐅᑭᐅᖅᑕᖅᑐᑉ ᑕᕆᐅᖓ - ᓇᐅᔾᔭᑦ

ᓄᓇᓕᖕᒧᑦ ᐅᑭᐅᒥ ᐅᐱᕐᖕᖏᒥᒍ ᖃᐅᔨᓴᕐᓂᖅ

ᒫᐊᑦᓯ -
ᔫᓂᒥᒍ
2021
ᖃᐅᔨᓴᕐᓂᑯᑦ

ᐅᑭᐅᒥ ᐅᐱᕐᖕᖏᒥᒍ ᑕᕆᐅᑉ ᓯᓈᓂ ᖃᐅᔨᓴᓚᐅᕐᒪᑕ ᓇᐅᔮᓂ, ᓄᓇᕗᒥ ᐃᒧᐊᓂ 2021 ᐃᓚᐅᑉᐳᓐᓂ ᐅᑭᐅᖅᑕᖅᑐᑉ ᑕᕆᐅᖓᓐᓂ. ᐅᕿᐅᖅᑕᖅᑐᑉ ᑕᕆᐅᖓ ᓄᓇᓕᖕᒥ ᖃᐅᔨᓴᕐᓂᖅ ᐊᑐᒐᐅᓚᐅᕐᒪᑦ ᓄᓇᓕᖕᓂᒃ 6-ᓂᒃ ᑲᓇᑕᐅᑉ ᐅᑭᐅᖅᑕᖅᑐᖓᓐᓂ ᐃᒧᐊᓂ 2017 ᐅᕗᖓ 2021 ᑐᑭᓯᑲᓂᕐᓂᓗᒡᓗᑎᒃ ᐃᓕᕐᑯᓯᖕᖏᓐᓂᒃ ᑕᕆᐅᑉ ᐅᒪᔪᖕᓇᖅᑐᓗᒃᑕᑦ ᐊᕙᑎᖕᖏᓐᓂᒃ ᓄᓇᓕᖕᓂ ᑲᓇᑕᐅᑉ ᐅᑭᐅᖅᑕᖅᑐᖓᓐᓂ ᖃᐅᔨᓴᖅᓱᑎᒡᓗ ᐊᓯᐊᖅᐸᓕᐊᓂᖕᖏᓐᓂᒃ.

ᐅᑭᐅᒥ ᖃᐅᔨᓴᓚᐅᕐᒪᑕ ᓇᐅᔾᔭᓐᓂ ᒪᐊᕐᓯ 17—24 ᐊᒻᒪ ᐅᐱᕐᖕᖏᒥ ᖃᐅᔨᓴᓚᐅᕐᒪᑕ ᔪᓐᓂ 14—25, 2021.

ᐅᑯᐊ ᑐᕌᒐᐅᓚᐅᖅᑐᑦ ᖃᐅᔨᓴᕐᓃᑦ:
ᓄᓇᒥ ᖃᐅᔨᓴᕐᓂᖅ ᐊᑐᒐᐅᓯᖅᑐᓐᓂᒃ ᖃᐅᔨᓴᕈᑎᖃᖅᓱᑎᒃ ᐊᒻᒪ ᓯᕗᓂᕐᒥ ᖃᐅᔨᓴᕐᓂᐅᔫᒪᖅᑐᑦ ᐊᑐᒐᐅᑉᓗᑎᒃ.
ᑲᑎᖅᓱᐃᑉᐳᑎᒃ ᓯᑯᑉ ᐃᑉᔪᓂᖓᓐᓂ, ᐋᐳᑎᑉ ᐃᑉᔪᓂᖓᓐᓂᒃ, ᐆᓇᕐᓂᖓᓐᓂᒃ (ᐃᒥᐅᑉ) ᐊᒻᒪᓗ ᑕᕆᐅᕐᑲᕐᓂᖓᓐᓂᒃ.
ᑲᑎᖅᓱᐃᑉᐳᑎᒃ ᐃᖃᓗᖕᓂᒃ ᓯᑯᑉ ᐊᑖᓂᑦ ᓂᕆᓯᒐᐃᓐᓂᒃ ᐊᒻᒪ ᐊᕙᑎᖕᖏᓐᓂᒃ ᖃᐅᔾᓂᓗᒃᓱᑎᒃ.
ᐃᓕᓐᓂᐊᖅᑎᑦᓯᑉᐳᑎᒃ ᓄᓇᓕᖕᒥᐅᓐᓂᒃ ᖃᐅᔨᓴᕐᓂᕐᒥᒃ ᐊᑐᖅᐸᒐᐃᓐᓂᒃ.
ᐱᓕᕆᖃᑎᖃᖅᓱᑎᒃ ᐊᕐᕕᖅ ᒪᕐᑲᐃᑦ ᑲᑎᒪᔨᖕᖏᓐᓂᒃ ᓯᕗᓂᕐᒥ ᐱᓕᕆᐊᖑᓂᐊᖅᑐᓐᓂᒃ.

ᖃᐅᔾᔭᐅᓚᐅᖅᑐᑦ:

- ᐱᖓᓱᑦ ᖃᐅᔨᓴᖅᑎᑦ ᐱᐊᓂᓚᐅᕐᒪᑕ ᓄᓇᒥ ᖃᐅᔨᓴᕐᓂᕐᒥᒃ, ᑲᑎᖅᓱᐃᑉᐳᑎᒃ ᐃᖃᓗᖕᓂᒃ ᐊᒻᒪ ᓄᓇᕐᑯᑎᖕᖏᓐᓂᒥᒃ.
- ᐊᔾᔨᓕᐅᕈᑦ ᐅᐊᔫᓐᓂᒃ ᐊᔾᔨᓕᐅᓯᖅᑐᖅ ᓱᑯᒥ ᑲᑎᖅᓱᐃᓚᐅᕐᒪᑦ ᓱᑯᑉ ᐊᐅᒃᐸᓕᐊᓂᖓᓐᓂ ᓱᕐᑯᑎᖅᐸᓕᐊᓂᖓᓐᓂᒧ.
- ᐅᐊᔪᓕᐅᕈᑦ ᓄᓇᕐᑯᑎᖕᖏᓐᓂᒃ ᐅᐊᔪᓕᐅᓚᐅᕐᒪᑦ ᓱᑯᑉ ᐊᑖᓂ ᐊᑐᕐᓗᓐᓂ GoPro ᐅᐊᔪᓕᐅᕈᒻᒥᒃ.
- ᑕᕆᐅᑉ ᐆᓇᕐᓂᖓ ᑕᕆᐅᕐᑲᕐᓂᖓᓗ ᖃᐅᔨᓴᕋᐅᓚᐅᕐᒪᑦ
- ᖃᐅᔨᓴᖅᑎᑦ ᐃᖃᓗᒃᐱᓚᐅᕐᒪᑕ ᐊᒻᒪ ᑲᓇᔪᕐᓂᒃ ᓱᑯᑉ ᐊᑖᓂ ᖃᐅᔨᓴᕋᐅᓂᐊᖅᑐᑦ ᓂᕆᕙᒃᑕᖕᖏᓐᓂᒃ ᖃᐅᔨᓴᕐᓗᑎᒃ.

ᖃᐅᔨᓴᖅᑎᑦ ᑕᕆᐅᒥᒃ, ᐊᕙᑎᖓᓐᓂᒃ ᐊᒻᒪ ᐃᖃᓗᖕᓂᒃ ᓇᐅᔾᔭᑦ, ᓄᓇᕗᒻᒥᓕ

ᓄᓇᙳᐊᖅ ᖃᐅᔨᓴᕝᕕᐅᓚᐅᖅᑐᖅ

ᓄᓇᒥ ᑲᑎᖅᓱᐃᑲᓐᓂᑐᑦ!

ᖃᓄᐃᓕᐅᕈᑎᑦ:

- ᑲᑎᑕᐅᓯᒪᔪᑦ ᕿᓂᐱᖕᒥ ᑎᑭᑐᐊᖅᐸᑕ ᖃᐅᔨᓴᕐᓂᑯᑦ ᐱᓕᕆᐊᖑᓂᐊᖅᐳᑦ:
- ᐃᖃᓗᐃᑦ ᑕᑭᓂᖕᖏᓐᓂᒃ ᓂᕆᓯᒐᐃᓐᓂᒃ ᖃᐅᔨᓴᕋᐅᓗᑎᒃ.
- ᖃᐅᔨᓴᕈᑎᑦ ᐊᔾᔨᓕᐅᕈᑎᑦᓗ ᖃᐅᔨᓴᕋᐅᓗᑎᒃ ᑕᕆᐅᑉ ᐃᒪᖓᑕ ᐆᓇᕐᓂᖓᓐᓂᒃ, ᓯᑯᑉ ᐊᒻᒪ ᓯᓈᓂ ᓄᓇᒥᒃ.
- ᖃᐅᔨᓴᕐᓂᑯᑦ ᐅᖃᐅᓯᐅᓗᑎᒃ ᐊᕐᕕᖅ ᒪᕐᑲᐃᑦ ᑲᑎᒪᔨᖕᖏᓄᑦ ᐊᒪ ᓄᓇᓕᖕᒧᑦ ᐅᖃᐅᓯᐅᓗᑎᒃ

ᖁᔭᓐᓇᒦᒃ ᐊᕐᕕᖅ ᒪᕐᑲᐃᑎ ᑲᑎᒪᔨᖏ ᐃᑲᔪᓚᐅᕐᒪᑕ ᐊᒻᒪ ᓄᓇᓕᖕᒥᐅᑦ ᐱᓕᕆᓚᐅᕐᒪᑕ ᖃᐅᔨᓴᖅᑎᓐᓂᒃ ᑎᓕᓯᐳᑎᒃ! ᓇᑯᕐᒦᒃ! ᕿᓇᐅᔭᖃᖅᑎᑕᐅᓚᐅᖅᑐᖅ ᐃᒪᕐᒥᐅᑕᓕᕆᔨᓄᑦ ᖃᐅᔨᓴᕐᓂᕐᒧᑦ.

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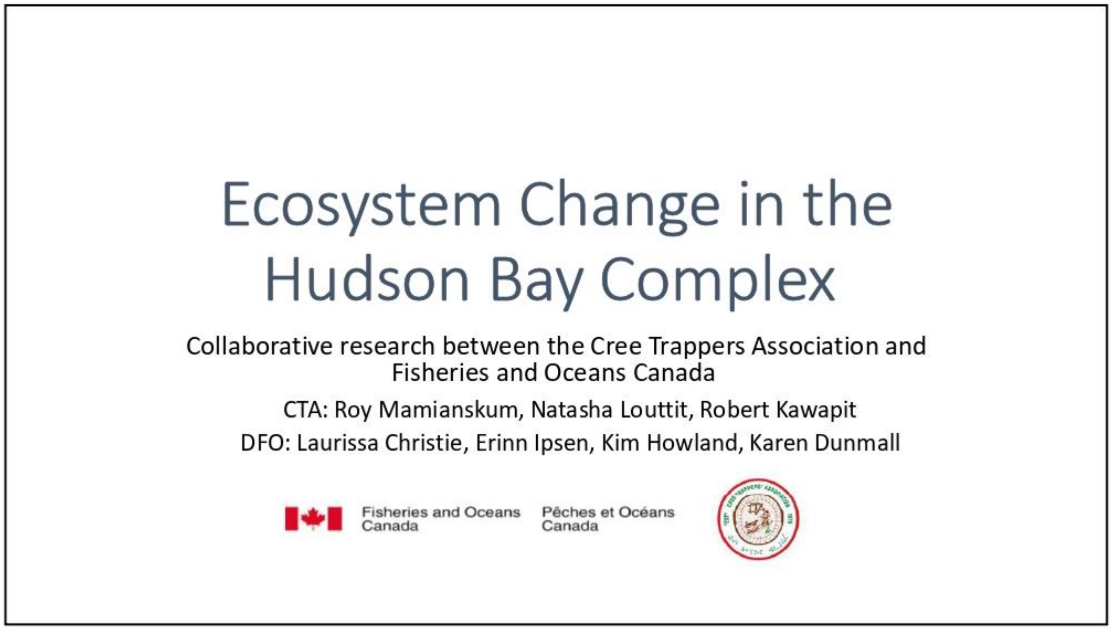
Appendix B: Reporting Presentations

1.0 Whapmagoostui:

The following presentation was presented by community technician, Roy Mamianskum in Whapmagoostui to the Cree Trappers Association in November 2020. This presentation was compiled by DFO researchers and Roy Mamianskum.



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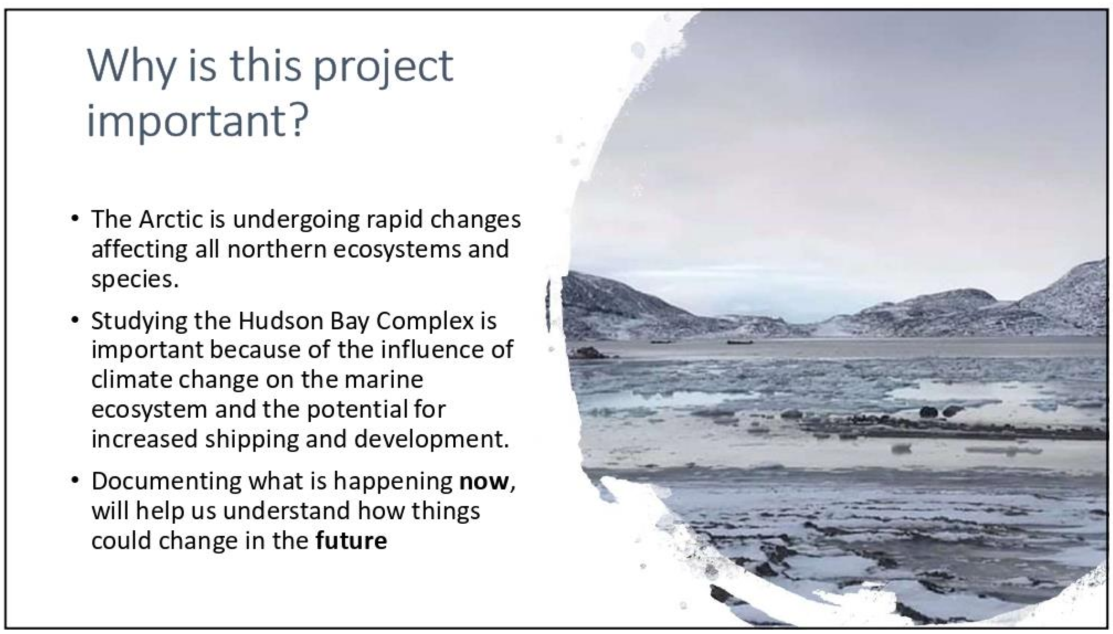


2

How has this project progressed?

- Community visit
- Consultations with CTA
- Planning field program with the community recommendations
- Training technicians
- Field work
- Reporting and feedback

3

What has been done so far?

(1) Community Coastal Monitoring Component

(2) Community fish and invertebrate gift card program

4

(1) Community Monitoring Component

- Habitat information for key species was collected.
- Two moorings were placed in the coastal ecosystem to monitor water temperature and saltiness.
- Camera was set up to monitor ice freeze up and break up.
- Technicians received scientific training.

5

(2) Community fish and invertebrate gift card program

- Poster was put up requesting fish and invertebrates be exchanged for gift cards
- Thank you to those who have brought in samples so far!

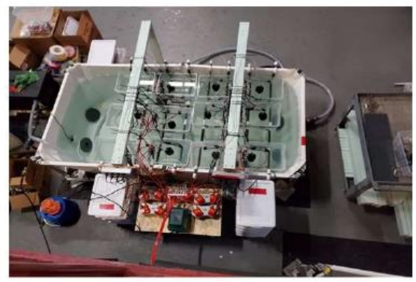
6

Next Steps:

- Fish and invertebrates collected from community harvesters will be used to understand:
  - Energy content
  - Diet
  - Habitat usage

- A series of tanks were developed in Rimouski, QC to monitor species tolerance and temperature.

- Tanks are designed to be moved to the community in the future.



7

How can you get involved?

- Bring in ANY fish and invertebrate samples to the CTA!
- Collecting samples ALL fall and winter!
- You will receive a $50 Whale-mart gift card!
- Any questions talk to Roy at the CTA
- DFO contact: Erinn.Ipsen@dfo-mpo.gc.ca

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Thank You!

- Everyone who has brought in samples so far!
- Communities of Whapmagoostui and Kuujjuarapik;
- **CTA:** Roy Mamianskum, Natasha Louttit, Robert Kawapit;
- **Kuujjuarapik LNUK**: Salamiva Weetaltuk;
- **CEN**: Patrick Lacerte, Mickael Lemay, Alaku Calvin, Samson Tooktoo;
- **EMRWB:** Felix Boulanger, Angela Coxon;
- **DFO:** Karen Dumnall, Kim Howland, Laurissa Christie, Erinn Ipsen, Darcy McNicholl

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