Coastal Habitat Comprehensive Research Project (CHCRP)
Coastal Monitoring

Research project proposal submitted to
the Nunavik Marine Region Planning Commission

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Research project summary

In 2016, the *Coastal Habitat Comprehensive Research Project* was initiated by Niskamoon Corporation to better understand the current state of a marine plant important to migratory waterfowl, eelgrass *Zostera marina*, and the impact of changes in eelgrass on Canada Geese along the eastern coast of James Bay. The Cree in the Eeyou coastal communities have long emphasized the importance of healthy eelgrass in shaping the stopover sites of migratory waterfowl, especially Canada Geese (short necks) and Atlantic Brant. From 2016 to 2021, to monitor eelgrass and Canada geese populations, researchers and land users in Waskaganish, Eastmain, Wemindji and Chisasibi sampled eelgrass at over 100 different locations (https://www.eeyoucoastalhabitat.ca/). For summer 2023, researchers and lands users will team up to continue to monitor eelgrass in the 4 communities from approximately July 13 to August 15, 2023 using a sampling protocol developed in the *Coastal Habitat Comprehensive Project*. The team aims to visit sites to survey eelgrass condition throughout the coastline and to continue our ongoing monitoring program which includes eelgrass measurements at the bed scale, on shoots and environmental characterization. This program involves observing and making small collections of eelgrass by snorkeling or diving, collecting water and subtidal surface sediments, and measuring underwater light levels using moorings deployed in 2 traplines.

In parallel, researchers will visit traplines to better understand goose habitat enhancement efforts underway by landusers. Habitats enhancement was one of the follow up projects that the Cree land users emphasized during consultations. The team will visit two communities (Chisasibi, Wemindji) in August and engage with land users interested and/or experienced in habitat enhancement. The field activities will mainly consist of documenting past enhancement efforts, including their strengths and limitations, identifying opportunities for future enhancement work, and assisting with the implementation of any on-going habitat enhancement initiatives. Small-scale field-based observations of geese using a spotting scope will also be conducted (method used in 2019 in CH33 and CH34 by M. Leblanc). Some monitoring equipment, like an automatic recording unit, might be tested in the field. The team will also consult with land users from each trapline about activities and practices that could improve waterfowl harvest productivity (e.g., no hunting zones, noise management). The information gathered during the summer-fall season will provide elements to co-develop objectives for an adaptive management plan to enhance waterfowl harvest with Cree land users.

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2016-ᒥ, *ᓯᑦᔮᒥ ᐆᒪᔦᐃᑦ ᓇᔦᒐᖕᒋᓐᓂᒃ ᐃᔪᐃᑦᑐᒥᒃ ᖃᐅᔨᓴᕐᓂᖅ* ᐱᒋᐊᕐᑎᑕᐅᓚᐅᕐᓯᒪᔪᖅ ᓂᔅᑲᒨᓐᑯᓐᓄᑦ ᑐᑭᓯᒋᐊᑦᓯᐊᕈᒪᑦᓱᑎᒃ ᒫᓐᓇ ᖃᓄᐃᓕᖓᓂᖏᓐᓂᒃ ᐃᒪᕐᒥᐅᑌᑦ ᐱᕈᕐᑐᐃᑦ ᐱᒻᒪᕆᐅᔦᑦ ᐃᒪᕐᒥᐊᑕᓄᑦ ᑎᒻᒥᐊᓄᑦ, ᐃᕐᖃᒥ ᐱᕈᕐᑐᐃᑦ *Zostera marina*, ᐊᒻᒪᓗ ᓱᕐᕗᔨᒪᓂᖏᑦ ᐊᓯᑦᔨᓂᖏᑦᑕ ᐃᕐᖃᒥ ᐱᕈᕐᑐᐃᑦ ᓂᕐᓕᓂᒃ ᓯᑦᔭᖕᒐᓂ ᐅᐊᓐᓇᖕᒐᓂ ᔦᒥᔅ ᐯ. ᐊᓪᓗᑦ ᐄᔩ ᓯᑦᔭᖕᒐᑕ ᓄᓇᓕᖏᓐᓂᒥᐅᑦ ᐊᑯᓂᐅᓕᕐᑐᖅ ᐱᒻᒪᕆᐅᑎᑦᓯᓯᒪᔦᑦ ᐱᒻᒪᕆᐅᓂᖏᓐᓂᒃ ᐱᕈᑦᓯᐊᓂᖏᑦ ᐃᕐᖃᒥ ᐱᕈᕐᑐᐃᑦ ᐋᕐᖁᓯᐃᓂᕐᒥ ᓄᕐᖃᕚᕆᓲᖏᓐᓂᒃ ᓅᑦᑕᓲᑦ ᐃᒪᕐᒥᐅᑌᑦᑎᓪᒥᐊᑦ, ᐱᔪᐊᕐᑐᒥᒃ ᓂᕐᔦᑦ (ᖁᖓᓯᑭᓐᓂᓴᑦ) ᐊᒻᒪᓗ ᓂᕐᓕᕈᑦ. 2016-ᒥᑦ 2021-ᒧᑦ, ᖃᐅᔨᓴᕐᓯᑎᒃ ᐃᕐᖃᒥ ᐱᕈᕐᑐᓂᒃ ᐊᒻᒪᓗ ᓂᕐᔦᑦ

ᖃᑦᓯᐅᓂᖏᓐᓂᒃ, ᖃᐅᔨᓴᕐᑏᑦ ᐊᒻᒪᓗ ᓄᓇᒥᒃ ᐊᑐᕐᑏᑦ ᐅᐊᔅᑳᑲᓂᔅᒥ, ᐋᔅᑖᓐᒥ, ᐅᐃᒥᓐᔨᒥ ᐊᒻᒪᓗ ᓵᓯᐱᒥ ᖃᐅᔨᓴᓚᐅᖁᑦ ᐃᕐᖃᒥ ᐱᕈᕐᑐᓂᒃ 100 ᐅᖓᑖᓄᑦ ᐊᑦᔨᖏᖕᖏᑐᓂ ᓄᓇᓂ (https://www.eeyoucoastalhabitat.ca/). ᐅᐱᕐᖔᖓᓄᑦ 2023, ᖃᐅᔨᓴᕐᑏᑦ ᐊᒻᒪᓗ ᓄᓇᒥᒃ ᐊᑐᕐᑏᑦ ᐱᓇᓱᖃᑎᒌᓛᕐᑐᑦ ᑲᔪᓯᓗᑎᒃ ᖃᐅᔨᓴᕐᓂᒥᓂᒃ ᐃᕐᖃᒥ ᐱᕈᕐᑐᓂᒃ ᓄᓇᓕᓐᓂ 4-ᓂ ᔪᓚ 13 ᒥᑦᓵᓂᑦ ᐊᐅᒡᒍᓯ 15-ᒧᑦ, 2023-ᒥ ᐊᑐᕐᓗᑎᒃ ᖃᐅᔨᓴᕐᓂᒥᒃ ᐱᕗᓪᓕᐊᑎᑕᐅᓯᒪᔪᒥᒃ ᓯᑦᔾᒥ ᓇᔪᖅᑭᕐᓂᒃ ᐱᓇᓱᐊᕐᓂᒥᒃ ᐃᓗᐃᑦᑐᒥᒃ. ᖃᐅᔨᓴᕐᑐᑦ ᑐᕌᕐᑕᓖᑦ ᐅᐯᓂᕐᒥᒃ ᓄᓇᓂᒃ ᖃᐅᔨᓴᕆᐊᕐᓗᑎᒃ ᐃᕐᖃᒥ ᐱᕈᕐᑐᐃᑦ ᖁᓄᐃᓕᖓᓕᕐᓂᖏᓐᓂᒃ ᓯᑦᓴᓕᒫᒥ ᐊᒻᒪᓗ ᑲᔪᓯᓗᑎᒃ ᑲᔪᓯᔪᒥᒃ ᖃᐅᔨᓴᕐᓂᑎᓐᓂᒃ ᐃᓚᓕᒻᒥᒃ ᐃᕐᖃᒥ ᐱᕈᕐᑐᓂᒃ ᓱᕐᖁᑎᓇᓂᕐᒥᒃ ᑕᑭᓂᖏᓐᓂᒃ ᐊᒻᒪᓗ ᐊᕙᑎᖓᑕ ᖁᓄᐃᓕᖓᓂᖏᓐᓂᒃ. ᑖᓐᓇ ᐱᓇᓱᐊᕐᓂᖅ ᖃᐅᔨᓴᕐᓂᑕᓕᒃ ᐊᒻᒪᓗ ᒥᑭᔪᓂᒃ ᑲᑎᕐᓱᐃᓂᕐᑕᖅᓱᓂ ᐃᕐᖃᒥ ᐱᕈᕐᑐᓂᒃ ᐊᕐᖃᐅᒪᓂᒃᑯᑦ ᐃᒪᕐᒥ, ᑲᑎᕐᓱᐃᓂᕐᒥᒃ ᐃᒪᕐᒥᒃ ᐊᒻᒪᓗ ᐃᕐᖃᒥᐅᔾᔪᕐᓂᒃ ᓯᐅᕋᕐᓂᒃ, ᐊᒻᒪᓗ ᓱᕐᖁᑎᓇᓂᕐᒥᒃ ᐃᒪᐅᑉ ᐃᓗᐊᓂ ᖃᐅᒪᓂᕐᒥᒃ ᐊᑐᕐᓱᑎᒃ ᐱᑐᕝᕙᓂᒃ ᐋᕐᑭᑕᐅᒪᔪᓂᒃ ᒪᕐᕿᓂ ᒥᑭᑎᐊᕐᓂᐊᕚᓐᓂ.

ᑌᑲᓂᑦᓴᓇᖅ, ᖃᐅᔨᓴᕐᑏᑦ ᐅᐯᓛᕐᑐᑦ ᒥᑭᑎᐊᕐᓂᐊᕚᓐᓂᒃ ᑐᑭᓯᓴᕆᐊᑦᓯᐊᓗᑎᒃ ᓂᕐᓕᑦ ᓇᔪᖓᓐᓂᒃ ᐱᐅᔩᑎᐊᕋᓯᓐᓂᓂᒃ ᐱᓇᓱᐊᕐᑕᐅᔪᓂᒃ ᓄᓇᒥᒃ ᐊᑐᕐᑎᓄᑦ. ᐆᒪᔪᐃᑦ ᓇᔪᖓᓐᓂᒃ ᐱᐅᓯᑎᐊᕆᓂᖅ ᖁᓄᐃᓕᖓᓕᕐᒪᖔᑕ ᖃᐅᔨᓴᕐᓂᐅᓱᓂ ᐱᓇᓱᐊᕐᓂᓄᑦ ᐃᓕᑭᔭᐅᓚᐅᕐᑐᖅ ᐊᓪᓗᑦ ᓄᓇᒥᒃ ᐊᑐᕐᑏᑦ ᐱᒻᒪᕆᐅᑎᓯᒪᔭᖓ ᖃᐅᔨᑭᐊᕐᕕᖃᕐᓂᓂ. ᖃᐅᔨᓴᕐᑏᑦ ᐊᕐᕙᑖᕐᑐᑦ ᒪᕐᕿᓄᑦ ᓄᓈᓐᓄᑦ (ᓵᓯᐱ, ᐅᐃᒥᓐᔨ) ᐊᐅᒡᒍᓯᒥ ᐊᒻᒪᓗ ᐃᓚᐅᑎᑦᓯᓗᑎᒃ ᓄᓇᒥᒃ ᐊᑐᕐᑎᓂᒃ ᐅᓇᒻᒥᓯᑦᑐᓂᒃ ᐊᒻᒪᓗ/ᐅᕝᕙᓘᓐᓃᑦ ᐱᓇᓱᐊᕐᓯᒪᔪᓂᒃ ᐆᒪᔪᐃᑦ ᓇᔪᖓᓐᓂᒃ ᐱᐅᓯᑎᐊᕆᓂᕐᒥᒃ. ᖃᐅᔨᓴᕐᕕᐅᔪᓂ ᐱᓇᓱᐊᕐᓃᑦ ᐃᓚᖃᓗᐊᖕᖑᐊᓛᕐᑐᑦ ᐊᓪᓕᓯᒪᔪᓕᐅᕐᓂᒥᒃ ᑭᖑᓂᑦᑎᓂ ᐱᐅᓯᑎᐊᕆᓚᓯᐊᕐᓂᐅᓯᒪᔪᓂᒃ, ᐃᓚᖃᕐᓗᑎᒃ ᓃᖑᓂᖏᓐᓂᒃ ᐊᒻᒪᓗ ᐱᒍᓐᓇᓂᖏᑦᑕ ᐃᓯᓕᕝᕕᖏᓐᓂᒃ, ᓇᓗᓐᕐᓯᓂᕐᒥᒃ ᐱᕕᑦᓴᓂᒃ ᓯᕗᓂᑦᑎᓂ ᐱᐅᓯᑎᐊᕆᓂᕐᒧᑦ ᐱᓇᓱᐊᕐᓂᓂᒃ, ᐊᒻᒪᓗ ᐃᑲᔪᕐᓗᑎᒃ ᐊᑐᓕᕐᑎᑕᐅᓂᖏᓐᓂ ᓇᐅᑐᐃᓐᓄᑦ ᑲᔪᓯᔪᑦ ᐆᒪᔪᐃᑦ ᓇᔪᖓᓐᓂᒃ ᐱᐅᓯᑎᐊᕆᓂᕐᒧᑦ ᐱᑎᐊᕐᑎᑕᐅᓯᒪᔪᑦ. ᒥᑭᔪᐃᑦ ᖃᐅᔨᓴᕐᕕᐅᔪᓂ ᑐᖕᖓᕕᓖᑦ ᖃᐅᔨᓴᕐᓃᑦ ᓂᕐᓕᓂᒃ ᐊᑐᕐᓗᑎᒃ ᕿᕐᖑᑎᓂᒃ ᐱᓇᓱᐊᕐᑕᐅᓛᕐᒥᔪᑦ (ᖃᐅᔨᓴᕈᓯᖅ ᐊᑐᕐᑕᕙᓂᖅ 2019-ᒥ CH33-ᒥ ᐊᒻᒪᓗ CH34-ᒥ M. Leblanc-ᒧᑦ). ᐃᓚᖏᑦ ᖃᐅᔨᓴᕈᑏᑦ, ᐆᑦᑑᑎᒋᓗᒍ ᐃᒻᒥᓂᕿᔪᖅ ᓂᐱᓕᐅᕆᒍᑎ, ᐆᑦᑐᕋᕐᑕᐅᑐᐃᓐᓇᕆᐊᓕᒃ ᖃᐅᔨᓴᕐᕕᐅᔪᒥ. ᖃᐅᔨᓴᕐᑏᑦ ᖃᐅᔨᒋᐊᕐᕕᖃᓛᕐᒥᔪᑦ ᓄᓇᒥᒃ ᐊᑐᕐᑎᓂᒃ ᒥᑭᑎᐊᕐᓂᐊᕙᐅᔪᓂᑦ ᐊᑐᓂᑦ ᐱᓯᒪᔪᓂᒃ ᐱᓇᓱᐊᕐᓃᑦ ᐱᐅᔩᓪᓗᒥᑦᓵᓄᑦ ᐱᐅᓯᑎᐊᕆᒍᓐᓇᑐᑦ ᐃᒪᕐᒥᐅᑕᓂᒃ ᑎᒻᒥᐊᓂᒃ ᐊᓐᓂᑐᕋᓱᐊᕐᓂᒥᒃ (ᐆᑦᑑᑎᒋᓗᒋᒃ, ᒪᕐᒐᕝᕕᐅᑎᐊᖅᖏᑐᑦ, ᓱᕐᕙᕋᔪᓂᒃ ᐊᐅᓚᑦᓯᓂᖅ). ᖃᐅᔨᓴᕈᑎᕕᓃᑦ ᑲᑎᕐᓱᑕᐅᓯᒪᔪᑦ ᐅᐱᕐᖔᒥ-ᐅᑭᐊᒥ ᐱᑕᖃᕐᑎᓯᓚᖓᔪᑦ ᐃᓗᓕᖏᓐᓂᒃ ᐱᕗᓪᓕᐊᑎᑦᓯᖃᑎᒌᓐᓂᒧᑦ ᑐᕌᒐᕐᓂᒃ ᓱᖏᐅᑎᓴᐅᒍᓇᑐᒥᒃ ᐊᐅᓚᑦᓯᓂᕐᒧᑦ ᐸᕐᓇᓯᒪᐅᑎᒥᒃ ᐱᐅᓯᑎᐊᕆᓂᕐᒧᑦ ᐃᒪᕐᒥᐅᑕᕐᓂᒃ ᑎᒻᒥᐊᓂᒃ ᐊᓐᓂᑐᖃᑦᑕᓂᕐᒥᒃ ᐱᓇᓱᐊᖃᑎᒋᓗᒋᑦ ᐊᓪᓗᑦ ᓄᓇᒥᒃ ᐊᑐᕐᑏᑦ.

Team members

Two parallel research teams will be sampling for the CHCRP project. The team investigating eelgrass status will be composed of 4 members. Caroline Fink-Mercier (ISMER-UQAR research coordinator) will coordinate the eelgrass sampling and Mélanie Santo (ISMER-UQAR research assistant), Kaleigh Davis (UBC Ph.D. candidate) and a UBC post-doctoral researcher (to be hired) will assist in the sampling. Mary O'Connor (UBC) and Fanny Noisette (ISMER-UQAR) will also be present for part of the time. The other team will be composed of Frédéric LeTourneux (McGill post-doctoral researcher), Julián Idrobo (UBC research associate), along with Mélanie Leblanc (Niskamoon Wildlife Biologist Researcher) and Manuelle Landry-Cuerrier (McGill research coordinator). F. Letourneux will focus on documenting past enhancement efforts and J. Idrobo will be leading consultations with land

users about their practices. M. Leblanc and M. Landry-Cuerrier will assist both of them in their fieldwork. The research teams will be accompanied by 2 to 4 experienced land users during fieldwork (this number could increase for traplines needing overnighting), whose involvement will be facilitated by Niskamoon local officers.

Study area

The study area is located in the Cree territory of Eeyou Istchee. It encompasses the Eeyou Marine Region and Nunavik Marine Region overlap zone (Zone C) and therefore the project is submitted to both entities.

The eelgrass sampling team will sample in coastal nearshore waters along the 4 coastal cree communities (Waskaganish, Eastmain, Wemindji and Chisasibi) from July 13 to August 15 while the goose habitat enhancement team will visit all coastal traplines in Chisasibi and Wemindji in August, except CH4, CH5 and CH6. All sites are within 70 km of the nearest community, except for sites in CH7 which is about 125 km away from Chisasibi.

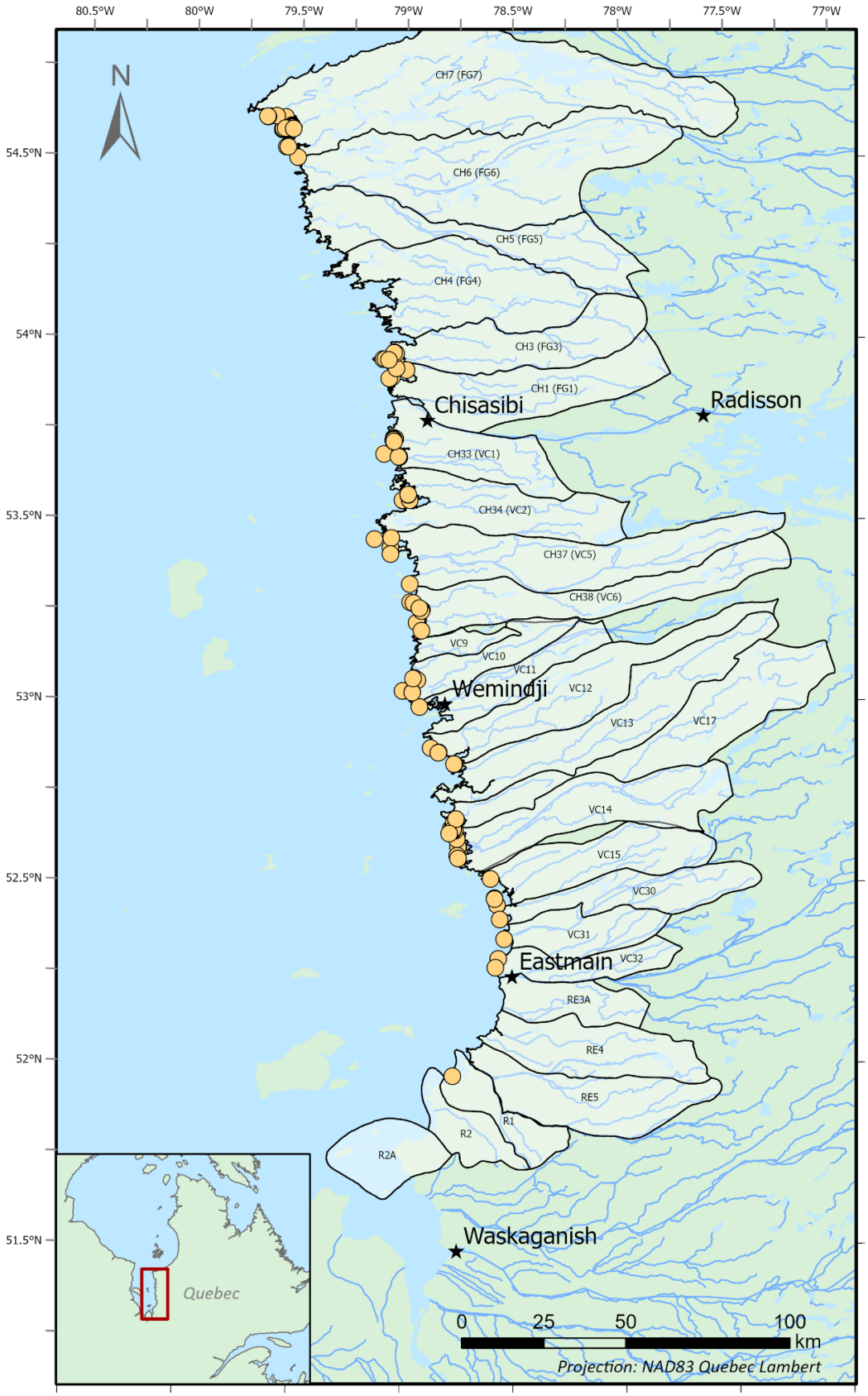

Figure: Map of planned sampling sites of the eelgrass team based on sites sampled from 2019 to 2021.

Equipment, anticipated impacts and permits

At each site, the team will collect eelgrass by snorkeling or SCUBA to measure eelgrass morphometrics (shoot length, width and leaf area index) together with biomass and density for some sites, take underwater photos of eelgrass where possible, collect water samples with a Niskin bottle to measure nutrients, suspended particulate matter (SPM) and colored dissolved organic matter (CDOM), take water parameters measurements using a multiparameter probe (YSI/CTD) and collect surface sediment using a hand corer. Additionally, a total of moorings continuously recording light levels in the water will be deployed in 2 traplines (CH33 and CH34).

The eelgrass sampling protocol requires collecting a small number of shoots and rhizomes for morphometric measurements and biomass. To minimize the impacts on the eelgrass beds, the eelgrass will be collected manually with roots and rhizomes being left intact. We do not collect shoots if there are only a few shoots present. Collection of a few shoots, < 1% of those present, is not problematic for eelgrass. Eelgrass grows mainly by spreading, and removing a few shoots does not slow growth at the meadow scale. The collection of surface sediment will be done using a hand corer of 5 cm diameter, and will have a very limited impact on surface disturbance and the release of sediment. The deployment of moorings does not impact the environment and the mooring will be taken out at the end of our stay. Moorings are structures with a 10 kg anchor, attached to a buoy by a chain, with probes attached to the chain to continuously measure underwater light levels. Other sampling methods of the eelgrass team (underwater photos, water sample collection and measurements) and documentation efforts of the goose habitat enhancement team do not meaningfully impact the environment. To the best of our knowledge, we do not require a permit to carry on the described activities.

To our knowledge, there is no sensitive area identified in the surrounding study area that could be impacted by the submitted project and we do not anticipate impacts on Inuit rights and their use of the land, water and natural resources. This project has not been submitted to the Nunavik Marine Region Planning commission before.

Logistics

The team will travel to the communities by car. The Niskamoon local officers in each visited community will facilitate the coordination of the sampling trips with Cree land users with whom we have been working over the past 6 years. Trips to coastal sites will be done by freighter canoes departing from the nearest community (Waskaganish, Eastmain, Wemindji or Chisasibi). Regular gasoline will be used to fuel the boats and will be brought in sufficient quantity to travel to the sampling sites, mostly within an hour drive, and back to the communities. The fuel will be stored in Jerry can type containers.

The research team will stay in the communities, except when traveling to CH07, and maybe CH38, because the trip cannot be made in one day. In this case, the team will stay in Reggie Scipio's (CH07) and Louis Kanatewat's camps (CH38). All waste will be brought back and disposed of in Chisasibi or Wemindji.

Preparedness and safety

The team has a diverse experience in sampling in remote areas. C. Fink-Mercier, K.Davis, J. Ibrodo, M. Leblanc and M. Landry-Cuerrier have worked on Eeyou coastal waters several times in the past using these methods and working with the same community members. SCUBA and snorkel protocols and plans are approved and under the sanction of the Canadian Association for Underwater Science (CAUS), an organization that maintains dive safety standards in accordance with provincial and federal worksafe laws. The UBC team will be operating under a reviewed and approved safety plan through UBC, and the ISMER-UQAR team will follow the code of conduct of the institution. The team will be equipped with InReach devices with remote emergency response coverage in case a team member needs to be evacuated. The team will always carry an emergency bag with a first aid kit and emergency food. ISMER-UQAR and UBC team members are also trained in first aid in remote regions.

Public consultations summary

This project builds on the partnership developed during the first phase of the CHCRP with Niskamoon Corporation. It draws upon consultations with the communities and Cree representatives during Eelgrass Symposium held in Chisasibi in September 2022 where the conclusions on the first phase of the CHCRP study were shared and during a meeting with Niskamoon and Cree representatives in March 2023 to plan the activities of the second phase of the CHCRP. Participants mentioned the desire to continue to monitor eelgrass with a special focus on healthy beds to better protect them, and to focus on goose habitat enhancement strategies.

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