2025 Ottawa-Carleton Student Northern Research Symposium

Program and Abstracts

March 7, 2025
St. Patrick's Building 303
Carleton University

Carleton University

uOttawa

Message from the Governor General on the occasion of the 2025 Ottawa-Carleton Student Northern Research Symposium

As a proud Inuk growing up in Nunavik, I learned from my family to live off the land, to respect its natural spaces and creatures, and to celebrate our traditional practices. Today, this way of life is threatened by climate change.

Thinning sea ice. Unpredictable weather patterns and shifts in the behavior of wildlife. More and more ocean pollution. The thawing permafrost causing the decay of homes, nursing stations and roads. The impacts of industrial development and climate change in the North are serious and expanding faster than in most regions of the world.

Although the situation is certainly dire, I remain hopeful that through interdisciplinary co-operation and knowledge sharing we can develop sustainable adaptation strategies. To fully grasp the climate crisis, and find solutions, it is crucial that Inuit knowledge be considered by western science.

I am particularly thankful to students like you who are recognizing the tremendous challenges that exist in the North. Your dedication gives me hope that, in the future, people will continue to enjoy healthy, fulfilling lives in a sustainable Arctic environment.

I wish you a fruitful and enriching conference.

Mary May Simon

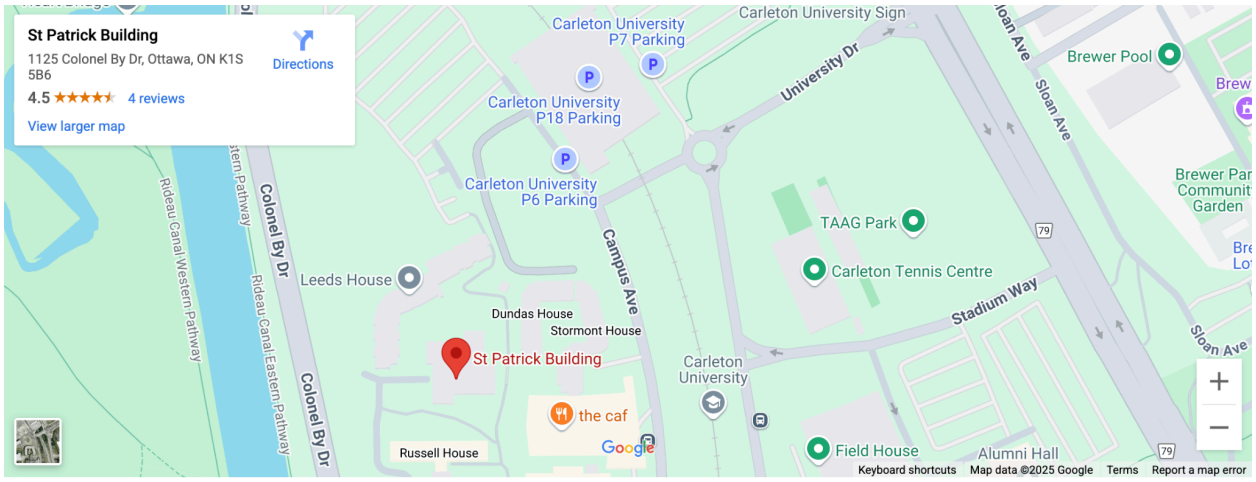
Foreword

Each year, undergraduate and graduate students from the University of Ottawa and Carleton University participate in high-quality research studies related to polar regions in a wide range of disciplines. As a platform to showcase our excellence, common interests, and passion, Carleton University is pleased to host the 2025 Ottawa-Carleton Northern Research Symposium (OCSNRS). This one-day symposium is a great opportunity to foster discussions on many pressing northern issues and strengthen ties between students and researchers from the two universities.

Light lunch and refreshments will be provided throughout the day.

We recognize that we are fortunate to live and work in traditional, never-ceded Algonquin Anishinaabe territory, and we acknowledge our responsibilities to the Algonquin people. We also acknowledge that the national capital region of Ottawa-Gatineau – and, by extension Carleton University and the University of Ottawa – profit from Algonquin stewardship over millennia of the broader landscape of the Kitchissippi watershed. We also recognize the diverse Indigenous lands on which research presented at this symposium takes place and encourage everyone to reacquaint themselves with the status of the Truth and Reconciliation Commission of Canada's 94 Calls to Action.

Location



Carleton University campus can be reached by bus routes 2, 7, 10, and 111 or O-Train Line 2. These stop either near the Nicol Building when coming from the north, or near the Colonel By Child Care Centre when coming from the south. If you're driving, there are several pay-parking lots on campus. Find an interactive version of the map above at: https://carleton.ca/campus/buildings/st-patricks-building/.

Acknowledgements

The organizers would like to thank the Department of Geography and Environmental Studies at Carleton University for providing logistical and financial support for the Symposium, Dr. Derek Mueller for organizational and website support and for aiding with communication at Carleton University, and Drs. Luke Copland and Audrey Giles for aiding with communications at University of Ottawa. Additional funders and sponsors include the Arctic Research Foundation, PermafrostNet, Carleton University Department of Public Policy and Global Affairs, and Carleton University Faculty of Arts and Social Sciences. We thank Dr. David Hik, Chief Scientist and VP, Research at Polar Knowledge Canada for providing our keynote address.

OCSNRS 2025 Organizing Committee

Ada Loewen, Ph.D. Candidate, Geography and Environmental Studies ada.loewen@carleton.ca
Alex Guilllerez, M.Sc. Candidate, Earth Sciences
Anna Brownlee, M.Sc. Candidate, Geography & Environmental Studies
Derek Wilson, M.Sc. Candidate, Earth Sciences
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Olivia King, Ph.D. Candidate, Earth Sciences
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Further details are available at: http://carleton.ca/northernresearch/ocsnrs/

Schedule

OCSNRS 2025
Ottawa-Carleton Student Northern Research Symposium
Friday, March 7th 9:00 AM - 5:00 PM
Carleton University, St. Patrick's Building 303

9:00 AM	**Welcome from 2025 OCSNRS Organizing Committee**	Ada Loewen Ph.D. Geography Carleton University
9:15 AM	**Keynote Speaker: David Hik, Chief Scientist & V.P. Research at Polar Knowledge Canada**	
Session	**Earth sciences (geology and hydrogeochemistry)**	Derek Wilson Earth Science Carleton University
10:00 AM	Age, Environment and Climatic Changes in the Carboniferous Carbonates of the Cache Creek Terrane of the Yukon, Canada	Olivia King Ph.D. Earth Science Carleton University
10:20 AM	Stable isotope composition and analysis of carbon (δ13C) and nitrogen (δ15N) in female Qamanirjuaq caribou (Rangifer tarandus groenlandicus) antlers	Matthew Brenning Ph.D. Earth Science Carleton University
10:40 - 11:00 AM	**COFFEE BREAK**	
11:00 AM	Strontium isotope signature of rock-water interaction in Whitehorse, Yukon groundwater	Jacob Szaranski B.Sc. Earth Science Carleton University
Session	**Contaminants & biogeochemistry of northern ecosystems**	Alex Guillerez M.Sc. Earth Science Carleton University
11:20 AM	Wetland Soil Carbon Mapping in the First Nation of Na-cho Nyäk Dun's Traditional Territory	Adriana Caswell B.Sc. Geography Carleton University
11:40 AM	Biogeochemical cycling in lakebed microbial communities in perennially ice-covered Lake Untersee, Queen Maud Land,	Efe Kemal Koc M.Sc. Geography

	Antarctica	University of Ottawa
Noon - 1:00 PM	**LUNCH**	
1:00 PM	Spatial-temporal variation in mercury and other trace metals in rivers and lakes of the Yukon River Headwaters	Leif Rupke B.Sc. Earth & Env. Science University of Ottawa
1:20 PM	Measuring the chemical contaminant burdens of Arctic nesting geese in Arviat Nunavut – a community-based monitoring project	Emily Wong M.Sc. Biology Carleton University
Session	**Food security and economic development in northern communities**	Frederic Brieger Ph.D. Geography Carleton University
1:40 PM	Infrastructure Development and Community Food Security in the Inuvialuit Settlement Region: Impacts of the Inuvik-Tuktoyaktuk Highway	Camille Slack Ph.D. Geography University of Ottawa
2:00 PM	Food insecurity in Canada's North: An urgent call to address rising food insecurity in Inuit Nunangat communities	Alexandra (Sasha) Kelly B.Sc. Biomedical Science University of Ottawa
2:20 - 2:40 PM	**COFFEE BREAK**	
2:40 PM	Decolonizing research methods to support fishery relationships with Sahtú Got'ine	Carola Ramos-Cortez Postdoc Public Policy Carleton University
3:00 PM	Strengthening Health Promotion Programs and Overall Well-being: A Community-Based Participatory Research Approach in the Moose Cree First Nation	Trisia Mae Balalio M.Sc. Health Science University of Ottawa
3:20 PM	Cool Story Bro: Communicating your research with ArcGIS StoryMaps	Sarah Simpkin and René Duplain Carleton & U Ottawa Libraries
3:40 PM	Photo contest winners, poster session kick off, and thank you's	Olivia King Ph.D. Earth Science Carleton University
3:45 - 5:00 PM	**POSTER SESSION**	
#01	Investigating Impact of Ice Shelf Deterioration on Ice Islands	Erika Brummell

	and Vessel Risks in Arctic Shipping	M.Sc. Geography University of Ottawa
#02	Geological Drivers of Uranium Mobilisation in Groundwater along the Whitehorse Copper Belt, Yukon	Alex Guillerez M.Sc. Earth Science Carleton University
#03	Chemostratigraphy of the Neoproterozoic Kennedy Channel and Ella Bay formations, Ellesmere Island	Rizzieri Balestra B.Sc. Earth Science Carleton University
#04	Morphology and Evolution of the Milne Ice Shelf Basal Channel	Owen Kirkham M.Sc. Geography Carleton University
#05	The influence of hydrogeomorphic setting on wetland vegetation and hydrology in central Yukon wetlands	Leila Rashid M.Sc. Geography Carleton University
#06	Evaporation Modelling at Qikiqtalik Lake, Iqaluit, Nunavut	Jakob Hadden M.Sc. Geography Carleton University
#07	Interweaving different ways of knowing to monitor birds	Laura Boyd B.Sc. Biology Carleton University
#08	Understanding how Llewellyn Glacier’s Proglacial Lake Affects Yukon Headwaters and Surrounding Communities	Isabel Ichiyama M.Sc. Earth Science University of Ottawa
#09	Legacy and modern anthropogenic impacts on aquatic contaminant cycling in Bennett Lake Watershed, Yukon River Headwaters	Kate Rorabeck M.Sc. Earth Science University of Ottawa
#10	"Bears are like family": Indigenous knowledge of human-polar bear coexistence in Churchill, Manitoba	Katharina (Kt) Miller Ph.D. Geography Carleton University

Keynote Speaker

David Hik, Chief Scientist & Vice-President, Research at Polar Knowledge Canada and Professor, Simon Fraser University. Ecology of cold (and cool) places. Science-policy. Reconciliation. Resilience. Climate Change.

Oral Presentations

Age, Environment and Climatic Changes in the Carboniferous Carbonates of the Cache Creek Terrane of the Yukon, Canada

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Keywords: Geochemistry, Biostratigraphy, Carboniferous

Abstract:
The Cache Creek Terrane of southeastern Yukon represents a rare opportunity to study a well-preserved, well-exposed Carboniferous to Permian coastal marine environment on the western coast of Pangea. The terrane forms part of a larger tectonic story in the formation of the North American Cordillera, as the terrane moved from a paleoequatorial region northward through the Triassic. However, it remains uncertain what the proximity of this terrane was to the North American continental margin during its deposition in the Carboniferous to Permian. Geochemistry, biostratigraphy and sedimentology, of rare-well preserved units like the shallow marine carbonates of the Horsefeed Formation exposed near Carcross, Yukon may shed light on the age and environment at this critical time in Earth history. Both marine (conodont, fusulinids) and terrestrial (palynology) biostratigraphic samples were collected in the summers of 2023 and 2024 along with numerous sedimentological/geochemical samples. Preliminary conodont analysis indicates a maximum age of Moscovian, however, the presence of larger fusulinids suggests that parts of the studied sections may be early Permian. Geochemical analyses, specifically, carbon and oxygen isotopes will be measured to decipher how the Horsefeed Formation correlates with suggested age equivalent units through chemostratigraphy. While oxygen isotopes will help determine paleo-latitude, temperatures and climate. Trace element concentrations will be utilized to determine the degree of post-depositional alteration and to interpret original seawater chemistry of the depositional environment. Integration of previous biostratigraphic studies on contemporaneous units will be compared to the findings of this study. The Yukon is a key location to understand Carboniferous environmental change, due to its paleogeographic location near the equator. This study aims to advance our understanding

of how the Cache Creek Terrane of the Yukon fits into the global context in this critical interval of Earth's history.

Stable isotope composition and analysis of carbon (δ13C) and nitrogen (δ15N) in female Qamanirjuaq caribou (Rangifer tarandus groenlandicus) antlers

Authors and Affiliations:
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Keywords: Isotopes, Ecology, Conservation

Abstract:
Populations of Arctic barren-ground caribou (Rangifer tarandus groenlandicus) have fluctuated over the past few decades but have overall been in decline. Decline has been linked to climate change, drivers of which act on a decadal – if not longer – timescale. To support conservation efforts of caribou, it is integral to develop a strong ecological baseline utilizing both historical and modern datasets. Caribou are the only extant species where both males and females grow antlers each year. Annual antler collection may prove to be a unique source of sex-specific, year-to-year datasets on caribou diet and migration through variations in their isotopes. Previous studies of δ13CCol and δ15NCol in male antlers from the Qamanirjuaq herd concluded that increases in δ15NCol along the main antler beam aligned with known shifts in seasonal diet and/or the increased energy requirements needed to develop antler tissue. We examined 19 female antlers from the same population to compare δ13CCol and δ15NCol between sexes and among varying reproductive statuses. Female antler was found to be ~0.4‰ lower at the bases of their antlers in δ13CCol compared to males. In both sexes, Qamanirjuaq caribou antler collagen varied among individuals in δ13Ccol by ~2‰ and in δ15Ncol by 5‰. We concluded that δ13CCol differences between sexes is a result of differing diets at the onset of antler formation, corresponding to the different seasons that females and males' initial antler growth. Interestingly, despite dietary differences, both Qamanirjuaq males and females increased in δ15NCol along the antler beam by approximately 11.5‰. Increases in δ15NCol along the antler beam coincide with the increased physiological stress and material demands during antler development likely driving an enrichment in 15N. While δ13CCol in antler tissue correlates with diet, high variation in δ15NCol due to physiological stress complicates dietary predictions based solely on δ13CCol and δ15NCol.

Strontium isotope signature of rock-water interaction in Whitehorse, Yukon groundwater

Authors and Affiliations:
Szaranski, J., Department of Earth Science, Carleton University

Keywords: Strontium, Geochemistry, Hydrogeology

Abstract:
This study examines the utility of strontium (Sr) isotopes to trace lithological origins of divalent alkali earth metal cations responsible for the mobilization of geogenic uranium (U) and degradation of water quality around Whitehorse, Yukon. Due to the links between calcium (Ca), Sr and U geochemical behaviour, Sr isotopes could be used to trace lithological origins of Sr, and by proxy Ca, that mobilizes U by formation of metal-uranyl-carbonate aqueous complexes. 52 rock samples representative of the lithologically heterogeneous study area were analyzed for bulk geochemistry and a subset of 17 rocks were analyzed for 87Sr/86Sr. The most radiogenic rocks were the Hancock carbonate (87Sr/86Sr = 0.70780 ± 0.00019), followed by the Mt. McIntyre Pluton (87Sr/86Sr = 0.70730), the skarns (87Sr/86Sr = 0.70610 ± 0.00028), the Mandanna Member (87Sr/86Sr = 0.70550 ± 0.00088), the Whitehorse Batholith (87Sr/86Sr = 0.70480 ± 0.00039), and the Miles Canyon Basalt (87Sr/86Sr = 0.70390 ± 0.00027). 262 water samples were analyzed for bulk geochemistry and a subset of 60 waters were analyzed for 87Sr/86Sr. Intermediate 87Sr/86Sr values of 0.70580 ± 0.00044 for water samples relative to rock samples indicates waters could be acquiring their Sr isotope signature from various combinations of rock dissolution. Future work involves exploring other geochemical parameters and geospatial analyses to further constrain the lithological source of Sr and Ca in groundwater.

Wetland Soil Carbon Mapping in the First Nation of Na-cho Nyäk Dun's Traditional Territory

Authors and Affiliations:
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Keywords: Soil Carbon Mapping

Abstract:
Wetland soil is capable of storing large quantities of carbon making northern wetlands an important carbon sink. Climate change and anthropogenic activities, like placer mining, can disturb these wetlands and cause carbon loss. However, without an initial estimate of carbon storage, it is difficult to quantify the climate-related benefits of protecting or restoring these wetlands. In this study, I quantify wetland soil organic carbon (SOC) stocks in the Stewart River Watershed of the Traditional Territory of the First Nation of Na-cho Nyäk Dun (FNNND), Yukon Territory. I also use environmental variables observable at the surface to predict wetland SOC stocks in the Stewart River Watershed using machine learning random forest regression. To achieve this, I collected soil samples of a known volume to the full depth of the peat layer from plots across the Stewart River Watershed. I calculated SOC stocks for each plot by determining

the bulk density and loss on ignition of organic matter for each sample. Carbon/nitrogen analysis was performed on select samples to relate organic matter content to carbon content. For each 1 meter by 1 meter plot where soil was sampled, I conducted a species-level vegetation survey, and measured active layer depth, water table depth, and maximum vegetation height. Remotely sensed optical indices, terrain derivatives, land classification datasets, and in-field observations were used to identify relationships with SOC stocks and develop the random forest regressions to predict wetland SOC in the Stewart River Watershed.

Biogeochemical cycling in lakebed microbial communities in perennially ice-covered Lake Untersee, Queen Maud Land, Antarctica

Authors and Affiliations:
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Keywords: Antarctica, Stromatolite, Isotope Analysis

Abstract:
Lake Untersee is a large and deep perennially ice-covered lake in Queen Maud Land, East Antarctica. It provides a unique environment to study microbial life in extreme conditions, a potential analog to both early Earth stages and ice-covered oceans of Saturn's icy moon Enceladus. In 2011, benthic phototrophic and heterotrophic microbial communities (unique large conical stromatolites, mats, and pinnacles) were discovered in Lake Untersee. In this study, we will investigate nutrient cycling, carbon and nitrogen dynamics of the stromatolites and microbial mats at various depths in the lake. We aim to better understand the role of biogeochemical cycling in the formation and growth of microbial structures in a nutrient-poor and light-deprived environment. The objective is reached by i) characterizing the stratigraphy and geochemistry of microbial mats using x-ray scans and multi-sensor scanners and ii) determining the carbon-nitrogen abundance, C/N ratios, stable isotope compositions (δ13C) and 14C. Additionally, potential nutrient and gas input to Lake Untersee will be investigated using noble gas abundance and isotope ratios. The findings will enhance our comprehension of biogeochemical processes in Lake Untersee and their potential relevance to astrobiology, guiding future research in the search for extraterrestrial life.

Spatial-temporal variation in mercury and other trace metals in rivers and lakes of the Yukon River Headwaters

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Keywords: Yukon River, Mercury, Trace metals

Abstract:
In recent decades, climate change has significantly increased air temperatures and altered precipitation patterns across the Arctic, with cascading effects for aquatic ecosystems. In some regions, this has resulted in the release of both legacy and modern contaminants from glaciers and permafrost into downstream aquatic ecosystems. Intensive human activities like gold mining and hydroelectric production potentially compound these global environmental pressures and act as other sources of contaminants. Originating in the glacierized mountains of northern British Columbia and southern Yukon, the Yukon River, the fifth largest in the Arctic, is an indispensable waterway for communities and ecosystems alike. Despite being an ecological, economical, and cultural centerpiece for over 85% of the Yukon population, very little is known about how changes in the 15,968 sq. km headwater region, encompassing Atlin, Tagish, Bennett, Nares and Marsh Lakes, will affect water quality downstream. In 2024, we measured concentrations of mercury and other trace metals in 15 glacial and non-glacial headwater tributaries, 3 downstream lake outflows and through lake water column profiles in collaboration with the Carcross/Tagish and Taku River Tlingit First Nations. Preliminary spatial and temporal variation in concentrations of mercury (THg, MeHg) and other trace metals (Pb, Zn, As, Co, Cd, Be, V, Se, Mn, Cr, Fe, Ni, Cu, Sb) will be presented. In the coming years, we aim to continue these surveys while further exploring the seasonal and spatial variation of these contaminants through aquatic ecosystems across the Yukon River Headwaters region.

Measuring the chemical contaminant burdens of Arctic nesting geese in Arviat Nunavut – a community-based monitoring project

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Keywords: Plastic additives, Country food, Ecotoxicology

Abstract:
This research investigates the chemical contaminant profiles of Arctic-nesting geese through an Inuit-led project with the Aqqiumavvik Society, a community research organization in Arviat, Nunavut. Geese are a vital country food for Inuit and protected migratory birds in North America. This is one part of a larger project exploring whether increasing goose harvest is sustainable and could improve Inuit food sovereignty in Nunavut. There are three co-developed research

questions for this project. (1) What are the levels of contaminants in geese, and do they differ by species or tissue? (2) Does cooking change the concentration of metals in goose breast meat? (3) Do eggs collected near Arviat contain higher contaminants than those collected from remote areas?

Inuit youth in Aqqiumavvik Society's Ujjiqsuiniq Young Hunters Program participated in geese hunting, dissection, and egg picking between 2022 and 2024 with the team. We sampled snow geese (n=18), Ross's geese (n=15), and cackling geese (n=22) breast muscle, gizzard, liver, and eggs (n=60) for 32 trace metals, legacy contaminants (PBDEs, PCBs, DDT) and contaminants of emerging Arctic concern (UV stabilizers, PFAS, OPEs). Guided by Elders, we prepared and sampled matched raw, boiled, and roasted breast meat. All samples are currently being processed at the National Wildlife Research Centre (NWRC) to quantify contaminant levels. Working with Aqqiumavvik Society we will interpret these findings together, specifically relating results to egg-picking locations and community consumption patterns to elucidate implications for goose consumption in Arviat.

In this presentation, we will discuss preliminary results from egg sampling relating to PFAS, UV stabilizers and trace metals (which have already been discussed with project partners). We will also share successes and lessons learned from our efforts to draw together the expertise of Inuit hunters, elders, youth, and non-Inuit researchers to generate knowledge that is meaningful at both local and national levels.

Infrastructure Development and Community Food Security in the Inuvialuit Settlement Region: Impacts of the Inuvik-Tuktoyaktuk Highway

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(2) Sonia Wesche, Department of Geography, Environment and Geomatics, University of Ottawa
(3) Tiff-Annie Kenny, Département de nutrition, Université de Montréal
(4) Charmaine Teddy, Community Researcher, Tuktoyaktuk NWT
(5) Kim Mathieu, Department of Geography, Environment and Geomatics, University of Ottawa
(6) Mataya Gillis, Community Researcher, Inuvik NWT

Keywords: Indigenous Food Security, Road Infrastructure Development, Mixed Food Systems

Abstract:
To decrease the high cost of living, increase access to resources and create opportunities for economic growth, road infrastructure development projects have become increasingly favoured in Arctic regions. Working with community research leads and regional partners, this research explores the role of roads as instruments of development in rural areas and their impacts on livelihoods, culture, well-being, and identities. This research addresses current gaps in the

literature through a collaborative project with the community of Tuktoyaktuk (population=937), a hamlet in the Inuvialuit Settlement Region that gained all-season road access with the 2017 opening of the Inuvik-Tuktoyaktuk Highway (ITH). Drawing on two community focus groups (n=14; 2018), seven interviews conducted by an Inuvialuk youth (2021), eight follow-up interviews (2023), and feedback from community presentations, we examine local perspectives on the impacts of the ITH, including key trends connected to food access, harvesting, travel and community wellbeing. Prior to the road opening, anticipated benefits of the ITH expressed by community members included: lower cost of living, food, and travel; and increased access to external services and employment opportunities. Our results indicate that while these benefits were suggested in various territorial planning documents, they may not all have been realized at the local scale, and there is no apparent monitoring framework to ensure their delivery. Our findings highlight both direct and indirect impacts of the ITH on food security (including both market food and country food impacts), connectivity to external services, cost of living, substance use, and tourism. There are also substantive intra-community disparities in benefits experienced from the highway. It is anticipated that this research will contribute to improved decision-making regarding the impacts of major infrastructure development projects on local food systems and economies, as well as improved monitoring structures which reflect the priorities and lived experiences of impacted communities.

Food insecurity in Canada's North: An urgent call to address rising food insecurity in Inuit Nunangat communities

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Little, M., School of Public Health and Social Policy, University of Victoria

Keywords: Food Security, Food Sovereignty, Food Systems

Abstract:
Inuit living in Inuit Nunangat (IN) make up approximately 0.13% of Canada's population and reside in the Arctic regions of the Inuvialuit Settlement Region, Nunavut, Nunavik, and Nunatsiavut (Statistics Canada, 2021). In 2017, over half of Inuit from IN reported experiencing food insecurity (Arriagada, 2017), with rates exceeding those observed among First Nations and Métis peoples (Statistics Canada, 2024). The Inuit food system consists of both traditional and market foods, but access to both can be limited due to environmental and socioeconomic barriers (Wesche & Chan, 2010). Unfortunately, it is only recently that we have developed a deeper understanding of the long-term physical, mental, and social effects of food insecurity in Northern communities. From the December 9th, 2024 ArcticNet Inuit Food Security and Sovereignty Knowledge Sharing Workshop we have compiled the emerging and underlying issues that were discussed and documented by notetakers from break out groups of 7 to 12 participants for each food security theme: effectiveness of food security initiatives and programs,

wildlife co-management and commercial harvesting, country food harvesting (challenges and opportunities), retail food sector and food policy, and food safety challenges. Building on the existing literature, this report aims to emphasize these themes from the documented workshop discussions, with the goal of shaping future governmental policies to better align with the interests of rights holders, community members, local governments, and Inuit representative organizations. Through collaborative efforts, we strive to address the Inuit population's sustainable food system goals for 2025 and use this workshop to explore emerging topics and highlight successful community initiatives.

Decolonizing research methods to support fishery relationships with Sahtú Got'ine

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(5) Johann Strube, Carleton University

Keywords: Decolonizing research, fishery relationships, disturbances

Abstract:
The Sahtú Got'ine (People of Great Bear Lake) have historically lived off fisheries, hunting and trapping around the Sahtú (Great Bear Lake) region in the Northwest Territories, Canada. In the context of processes of colonization and climate change, human disturbances in the Sahtú watershed, such as resource exploitation, sport fishing and hunting, fishery governance changes, and forced settlement, have altered Sahtúgot'ine's relationships to fish and harvesting. This study reflects on the ongoing collaborative research project undertaken to document these impacts on Dene na'oweré (knowledge) and Dene ts'ıl̨ (way of life) in relation to fish. We follow a framework based on the co-evolution of knowledge, which relies on Dene cultural identity and knowledge and Western science. Drawing on decolonial methodologies and the concept of disturbances, we discuss lessons learned about decolonizing research methods while gaining a better understanding of fishery relationships.

Strengthening Health Promotion Programs and Overall Well-being: A Community-Based Participatory Research Approach in the Moose Cree First Nation

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Keywords: Community-based participatory research, health promotion

Abstract:
Indigenous people in remote northern communities in Canada continue to face barriers to accessing primary health care and experience a disproportionate burden of health disparities, as compared to the general population. Health promotion programs are essential in building preventive measures and encouraging healthy behaviors by addressing lifestyle risk factors such as poor diet, physical inactivity, and related behaviors for different age groups to improve health outcomes. However, there is a critical need to understand how these programs can be optimized to meet communities' unique needs and priorities. In Moose Cree First Nation (MCFN), the Healthy Babies, Healthy Children Program (HBHCP) and the Diabetes Prevention Program (DPP) offered by the Moose Factory Health Center (MFHC) have been instrumental in promoting family and community health, despite limited resources. HBHCP supports families with children aged 0-6 through parenting education and support, while DPP focuses on preventing diabetes and chronic diseases through nutrition education, support groups, cooking workshops, and healthcare referrals. This project, conducted in collaboration with the HBHCP and DPP program coordinators, who also serve as co-researchers throughout the process, aims to understand the strengths, facilitators, and barriers and co-develop actionable strategies that contribute to an effective health promotion program tailored to community needs. Recognizing the critical role of community engagement and better supporting the healing process within this cultural context, our approach is grounded in community-based participatory research (CBPR) principles. The study was conducted in multiple stages of fieldwork in Moose Factory involving informative discussion with program coordinators, hands-on involvement with program activities, and program evaluation and feedback from community members. This collaborative approach ensures culturally relevant and community-driven insights to strengthen program delivery.

Cool Story Bro: Communicating your research with ArcGIS StoryMaps

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Keywords: ArcGIS StoryMaps, science communication, knowledge mobilization

Abstract:
ArcGIS StoryMaps is a powerful tool that combines maps, multimedia, and narrative text to create engaging and interactive stories. In this session, presenters from the University of Ottawa and Carleton University libraries will demonstrate how researchers can leverage the platform to visualize and share their work with a wide audience. Using a story map developed to

communicate findings from a permafrost study as an example, this presentation will include strategies for developing a cohesive narrative, communicating scientific findings, and explore the strengths and limitations of the ArcGIS StoryMaps platform as a knowledge dissemination tool.

Poster Session

Investigating Impact of Ice Shelf Deterioration on Ice Islands and Vessel Risks in Arctic Shipping

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Keywords: Ice Islands, Shipping, Ice Shelf

Abstract:
Arctic amplification and the disproportionate warming of the Arctic has resulted in glacier mass losses in the Canadian North, where ice discharge from deteriorating ice shelves is responsible for the production of ice islands. The recent collapse of the Milne Ice shelf, observed in 2020 offshore northern Ellesmere Island has resulted in the production of large numbers of these tabular ice features, which may present a risk to vessels and infrastructure in the Western Arctic, including the Beaufort Sea. Observations indicate that reductions in sea ice extent have contributed to more diverse vessel activity in this region. Additional observations indicate that vessels with little or no ice strengthening are operating in Arctic regions with increased frequencies, indicating that more vessels are now able to navigate major shipping routes, such as the Northwest Passage. However, knowledge gaps exist to inform how ice islands present risks to vessels operating in ice island infested waters, how this risk changes depending on vessel type, and if this risk has changed in the years following the collapse of the Milne Ice Shelf.

In this study, we combine iceberg tracking beacon data, satellite imagery, and in-situ observations from the Meteorological Service of Canada's Canadian Ice Service and International Arctic Buoy Program, to assess how the collapse of the Milne Ice Shelf has contributed to ice island distribution in the Beaufort Sea. Ship and iceberg interactions are explored using Automatic Identification System Data available throughout the study period to provide insight into the changing distribution of vessel types in the Beaufort Sea. This dataset combined with ice island information will enable the evaluation of how the potential risks of

ice-related shipping hazards have changed following the 2020 collapse of the Milne Ice Shelf and if these risks will pose continued hazards in a changing climate.

Geological Drivers of Uranium Mobilisation in Groundwater along the Whitehorse Copper Belt, Yukon

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Keywords: Groundwater, Uranium Contamination, Geochemistry

Abstract:
Uranium (U) is a global geogenic groundwater contaminant that can cause adverse health effects in humans. Geological U enrichment occurs in a variety of settings, and U can be mobilized in circumneutral-pH groundwater as aqueous uranyl-calcium-carbonate complexes. Preliminary studies in Whitehorse, Yukon show that groundwater U concentrations locally exceed Canadian guidelines for drinking-water quality. Key lithologies include granitoid intrusions into marine siliciclastic and carbonate rocks. Skarn-hosted copper deposits of the Whitehorse Copper Belt occur along the contact between intrusive and sedimentary rocks, and U is a parameter of environmental concern at local historic mine sites. Carbonate dissolution is predicted to enhance U mobilization, yet U distribution and mineralogy among these rock types is unknown.

This project sampled bedrock units found along the length of the Whitehorse Copper Belt, with a focus on geochemical characterization of skarn, adjacent granitoids, and sedimentary rock. Inductively coupled plasma mass spectrometry analyses reveal two rock types with elevated median U concentrations relative to average upper continental crust (2.7 ppm): calc-silicate skarn (3.4 ppm) and the Whitehorse Pluton (3.3 ppm). The highest U concentrations were observed in iron oxide- and clay-rich weathering products collected from a minor fault zone (up to 5.8 to 9.5 ppm). Acid-base accounting based on inorganic carbon and sulfur concentrations indicates most lithologies are non-acid-generating, consistent with circumneutral to alkaline groundwater (pH 6.6 – 9.0) and significant dissolved calcium and alkalinity values (median values of 60 mg/L and 190 mg/L as $CaCO_3$, respectively). Ongoing efforts aim to constrain U mineralogy in rock samples and U mobility using leaching experiments. This project improves groundwater resource management in aquifers and mining environments that are susceptible to U mobilization.

Chemostratigraphy of the Neoproterozoic Kennedy Channel and Ella Bay formations, Ellesmere Island

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Keywords: Geochemistry, Stratigraphy, Sedimentology

Abstract:
The Ediacaran Period (635–~535 Ma) marks a time when biogeochemical cycling underwent revolutionary changes that broadly coincided with the appearance of macroscopic, multicellular organisms. In northeastern Ellesmere Island, the lowest preserved stratigraphic units, the Kennedy Channel and Ella Bay formations, were putatively deposited during the Ediacaran, based on the preservation of Cambrian body and trace fossils in the overlying Ellesmere Group. These strata preserve a progradational (shallowing-upward) succession associated with the establishment of a NW-facing passive continental margin. This study presents carbon, oxygen and strontium isotopic measurements (δ13C and δ18O) and petrographic observations of carbonate samples collected from six stratigraphic sections of the Kennedy Channel and Ella Bay formations along a N-S transect, oblique to the paleo-continental margin. The recognition of a large negative δ13C anomaly, with carbonate values reaching as low as -12‰, supports correlation to the globally recognized Shuram-Wonoka δ13C excursion (574.0 ± 4.7–567.3 ± 3.0 Ma), consistent with an Ediacaran age for this succession. While the Shuram-Wonoka δ13C excursion has been variably attributed to local or diagenetic controls, the diachroneity of carbonate facies along a transect of the Kennedy Channel and Ella Bay formations allow interrogation of the δ13C-facies-relationships predicted by these hypotheses. We find that the observed δ13C trends are instead consistent with a synchronous marine carbon cycle perturbation preserved on a progradational margin. These findings refine temporal and stratigraphic correlation of the Kennedy Channel and Ella Bay formations and contribute to understanding the largest negative carbon isotope excursion in Earth history.

Morphology and Evolution of the Milne Ice Shelf Basal Channel

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Keywords: ROV, Basal channel, Ice shelf

Abstract:
The Milne Ice Shelf (MIS), found within Canada’s newly designated Tuvaijuittuq Marine Protected Area, is a habitat for vulnerable ice-dependent ecosystems. One of these habitats is

an epishelf lake, a warm freshwater layer floating on top of ocean water dammed between the MIS and Milne Glacier. Over time, warm epishelf lake water has been carved into the ice shelf's base, creating a basal channel. Ice benches protruding from the base of the channel have accumulated glacial sediment over time, creating a unique habitat for benthic organisms. Despite a significant calving event that reduced the ice shelf's area by 40%, a large section of the basal channel remains. The rapid degradation of the ice shelf has prompted a sense of urgency to understand this special environment before it is potentially lost forever.

This study will evaluate the hypothesis that channel meanders created by thermal erosion can account for the formation of ice benches. Accordingly, the research objectives are to constrain the geomorphology of the basal channel, measure the outflow water velocity across the channel to determine if the velocity is higher towards the outer walls of a meander, and infer the geomorphological evolution of the channel over time. To meet these objectives, a Remotely Operated Vehicle (ROV) will be deployed through a melt hole in the roof of the channel to conduct photo, sonar and water velocity surveys. The sonar data will be used to generate a comprehensive point cloud of the channel, allowing its size and shape to be visualized. The water velocity data and channel shape along a reach of the channel will be used to evaluate whether channel meanders created by thermal erosion, similar to those observed in supraglacial streams, can account for the formation of the ice benches.

The influence of hydrogeomorphic setting on wetland vegetation and hydrology in central Yukon wetlands

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Keywords: Wetland hydrology, Hydrogeomorphic setting, GIS

Abstract:
Mining activities within the Traditional Territory of the First Nation of Na-Cho Nyak Dun (FNNND) in central Yukon pose a significant threat to wetlands and the critical ecosystem services they provide. In response, the Yukon Government released a new territorial Wetland Stewardship Policy in 2023 to support land and water resource management. However, existing regulations do not require comprehensive quantitative or qualitative assessments of wetland impacts from mining development.

This study aims to explore an efficient method for estimating a wetland's hydrologic function within the ecosystem based on its hydrogeomorphic setting. Understanding a wetland's hydrologic function is important because it influences both the vegetation it supports and how it connects to the larger groundwater system. Specifically, the objectives are to: (1) characterize dominant hydrologic regimes and water sources using hydrometric monitoring, geochemical

analysis, and stable water isotopes; (2) identify landscape controls on wetland type and distribution through digital terrain analysis and statistical modelling; and (3) assess wetland vegetation communities and their relationship to hydrologic conditions across different hydrogeomorphic settings.

To achieve these objectives, hydrometric instruments (wells and piezometers) were installed at nine wetland sites to measure water table fluctuations and vertical groundwater movement. Water isotope and geochemical analyses were used in combination with these observations to characterize hydrologic regimes. Finally, these results will be statistically compared to a GIS-based digital terrain analysis to estimate wetland function using DEM-derived terrain indices.

Through ongoing collaboration, the results of this work will inform FNNND land-use planning in support of wetland conservation and water quality protection.

Evaporation Modelling at Qikiqtalik Lake, Iqaluit, Nunavut

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Keywords: Hydrology, Modelling, Evaporation

Abstract:
Qikiqtalik Lake, a small Arctic lake located approximately 5 km from Iqaluit, Nunavut, is a focal point for research on northern water systems. Although there is an increasing body of literature on small northern lakes, the remote nature of these systems complicates long-term data collection. Evaporation models provide a valuable tool for estimating water budgets in the absence of direct data collection. Lake evaporation is controlled by both the water and energy budgets of the lake. The water budget quantifies the mass or volume of water entering and exiting the reservoir, leading to changes in storage, whereas the energy budget describes the distribution of net radiation, heat fluxes, and the energetic processes that control evaporation rates. The energy budget includes both the incoming solar radiation and the heat exchanged between the lake and the atmosphere, with latent heat flux driving evaporation. A comprehensive understanding of water availability is critical for addressing both current and future water demand. Iqaluit has faced recurrent water shortages, largely due to the limitations of its existing water sources, such as Lake Geraldine and, in emergencies, water pumped from the Apex River. In response, the city is developing a larger water reservoir sourced from Qikiqtalik Lake. This study investigates the evaporation rates and their controlling factors at Qikiqtalik Lake to evaluate its viability as a long-term water supply. This research aims to assess the performance of six existing empirical evaporation models using eddy covariance measurements.

Interweaving different ways of knowing to monitor birds

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Keywords: Two-eyed seeing, Acoustic monitoring, birds

Abstract:
Fort Severn, at the mouth of the Fort Severn River, is an important subarctic area for avian diversity - both as a stopover and breeding habitat for shorebirds and boreal songbirds. Fort Severn First Nation have observed significant changes in bird migration with climate change, notably in geese which are a predominant food source and culturally important. Given an unprecedented amount of lithium mining claims and exploration in the headwaters, Fort Severn First Nation are concerned about the downstream effects of future mining activities. To provide information about biodiversity in culturally important areas around Fort Severn, we placed acoustic recorders at 17 sites from spring to summer with guidance from the community. We captured the arrival of birds in the spring and explored the diversity of species across seasons and between sites. We will work with knowledge holders to relate bird species heard in soundscape recordings to observed changes. The braiding of traditional knowledge and western techniques will foster a collaborative approach to conservation. We will bring this information together to support the community in developing a land-use plan so that Fort Severn may effectively and equally engage in policy development.

Understanding how Llewellyn Glacier’s Proglacial Lake Affects Yukon Headwaters and Surrounding Communities

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Keywords: Biogeochemistry, Proglacial lakes, Limnology

Abstract:
Proglacial lakes, created as glaciers retreat and melt, are becoming larger and more numerous as climate change continues. It is predicted that 60 to 100% of glaciers in western Canada will

disappear by 2100, creating new lakes, feeding watersheds, and evolving glacial areas. Llewellyn Glacier (433km²), located within Taku River Tlingit First Nation traditional territory in northern British Columbia, has already seen two of its terminal lobes turn into one over the past two decades, creating a large proglacial lake at its terminus. Little is known about this lake even though it comes from the largest glacier in B.C., and it is an important part of the headwaters of the Yukon River. A key resource for hydroelectric power, food and water, and recreation in both northern B.C. and the Yukon. Glacier shrinkage has been known to increase probability of natural hazards like landslides and outburst floods as well as release contaminants such as mercury and nitrate, which can be pushed into downstream ecosystems. Llewellyn feeds into Atlin Lake, a large lake that has been supplying local communities with water and fish since time immemorial. In 2024, our lab collected preliminary water quality samples from both the Llewellyn catchment and downstream in Atlin Lake. In the current project, we will be conducting detailed biogeochemical surveys of the Llewellyn proglacial lake, including physical (temperature, oxygen, depth, turbidity, trapping efficiency), chemical (dissolved organic carbon, trace metals, nutrients, and pH) and biological parameters. As glacierized watersheds continue to change, it is imperative that we understand how proglacial lakes will affect their most immediate communities as well as the broader implications for land-use planning and aquatic ecosystem management across northern regions.

Legacy and modern anthropogenic impacts on aquatic contaminant cycling in Bennett Lake Watershed, Yukon River Headwaters

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Keywords: Water Quality, Contaminants, Sediment Cores

Abstract:
The Southern Lakes region of the Yukon has a legacy of mining, hydroelectric production, and rail infrastructure, continuing to this day. These activities have led to the release of metals and organic contaminants into freshwater ecosystems. The community of Carcross, home to the Carcross/Tagish First Nation (C/TFN) is surrounded by freshwater, but owing to numerous contaminated sites across their Traditional Territory, have to have potable water delivered by truck. A key concern for C/TFN is Bennett Lake, a popular site for fishing and other recreational activities. This research aims to: 1) establish a historical record of metal and organic contaminants using sediment cores from Bennett Lake, 2) quantify contaminant distribution in water, soils, plant material, and invertebrates within the Bennett Lake watershed, and 3) track contaminant movement from the watershed into Bennett Lake. In summer 2025, two sediment cores will be collected at sites selected with community input. These will be analyzed for trace metals, carbon and nitrogen content, organic contaminants (PAHs), and dated using Isotope-Ratio Mass Spectrometry. Water samples will be collected five times over 30 days

during the summer from sites selected based on community concern and known industrial activity. At each site, physiochemical measurements and water samples will be analyzed for trace metals, organics, nutrients, and carbon. Solid samples (plants, invertebrates, sediment) will be collected at sites of concern selected by C/TFN and analyzed for contaminants. Contaminant flux data and distribution profiles will be generated by relating contaminant concentrations to river discharge data from Water Survey Canada, quantifying modern contaminant movement from tributaries into Bennett Lake. These profiles will be compared against lake water column and sediment core profiles to understand contaminant fate and movement across the watershed. This project is guided by C/TFN, ensuring that the research conducted has direct outlets for mobilization.

"Bears are like family": Indigenous knowledge of human-polar bear coexistence in Churchill, Manitoba

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Keywords: Indigenous knowledge, coproduction of knowledge, social-ecological systems

Abstract:
Polar bears are coming into northern communities more frequently, and human-polar bear conflict is increasing. However, in the community of Churchill, Manitoba, Canada, people live alongside polar bears with high tolerance and reciprocal respect. Through this case study, we explored human-polar bear coexistence in the community through Indigenous voices, documented social-ecological change, and mobilized recommendations as future visions to inform inclusive management and research strategies: elevate Indigenous knowledge, support proactive management and less invasive research, cultivate a culture of coexistence, improve education and safety awareness, and protect polar bears to support tourism. We used community-based participatory research, coproduction of knowledge, hands back, hands forward, and storytelling, mixing methods from the social sciences and Indigenous ways of knowing. Our study revealed coexistence can be a tool to bridge social and ecological knowledge, examine and facilitate wildlife conservation, and promote well-being through applied research on global issues at the local level.