

BEAVER RESEARCH BARIN NEWSLETTER

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BARIN BEAVER PROJECT: UPDATE

By Helen Wheeler (on behalf of the BARIN Team)

We are now entering year two of the BARIN project (researching 'Beavers and socio-ecological resilience in Inuit Nunangat'). Across the team, people are starting to engage in fieldwork and data collection again. We are taking this opportunity to share our first BARIN newsletter, with updates on the project.

Spring/summer 2022 was the first field season where we focussed on environmental aspects of the project. Thanks to Camelia Gray, Max Kotokak Sr. Josh Teddy, Lennie Emaghok, Lawrence Rogers, Angus Alunik, Trent Gordon, Trevor Kaglik, Troy Tumma and Dale Rogers, who all supported us as community researchers in the field.

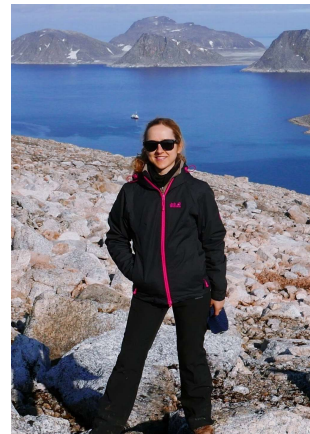
In November 2022, we held an Arctic Beaver Observation Network and BARIN joint meeting in Yellowknife. Thanks to all who participated. A longer report from the meeting will be shared shortly. In the lab and office, the team have been working with satellite imagery to see if we can detect beaver ponds, both now and in the past. We are also analysing shrub pucks to test methods for assessing when beavers were present at various locations in the past.

This summer we will build on the preliminary field work and expand the research to see how the impacts of beavers are affecting people's lives and livelihoods. We will be reaching out to HTC's in Inuvik, Tuktoyaktuk and Aklavik for this work.

We are always interested in ideas and suggestions for the project, so please contact individual researchers or email BARIN@aru.ac.uk. You can also join our facebook group using the following link: <https://tinyurl.com/Barin1>



Helen Wheeler



Georgia Hole

BEAVER OCCUPANCY AND TREE RINGS

Hello, I'm Georgia Hole. I am a postdoctoral researcher at Anglia Ruskin University in the UK, working with Dr Helen Wheeler on the BARIN project. My work is focused on the Inuvik Tuktoyaktuk Highway and Trail Valley Creek camp region, where we are investigating changing beaver populations and how this is altering the environment and impacting Inuvialuit communities. The tools I am using include remote sensing and dendrochronology (tree rings) to look at present and past beaver occupation. We are also prioritising the co-production of knowledge with local communities.

I am a biogeoscientist whose research encompasses physical, biological and social systems in cold environments, with experience in the reconstruction of past environments using long-term records such as tree rings and ocean sediments. I have previously worked on changing Arctic Ocean sea ice, including fieldwork on the Svalbard archipelago, using driftwood to track sea ice movement in the past. I look forward to working with you all!

BEAVER IMPACTS ON HYDROLOGY

I'm Jackson Seto, an MSc student working with Professor Philip Marsh at Wilfrid Laurier University in Canada. My research is concentrated on the Trail Valley and Hans Creek watersheds north of Inuvik, the only sites in the region with long term hydrological measurements. The focus of my BARIN research is the effect of beavers on the hydrology of the region. This research will focus on how beavers influence all aspect of the hydrology, including snow, streamflow, lake/pond water level, area, and storage, water temperature, and water balance of lakes and streams for example. We will measure these components iin streams and lakes in the vicinity of beaver dams, and through comparing conditions upstream vs downstream of the dams. We are also comparing whether beavers tend to build more dams in lake-rich areas (i.e in Hans Creek) vs lake-poor (ie. Trail Valley Creek) areas, and the number of dams in streams vs at lake outlets. Improving our understanding of these hydrological changes is important as these dams can impact fish habitats or even drinking water supplies, and may be required in hydrological models to consider future changes to the hydrology of this region. Below are photos of a beaver lodge and a beaver dam in the Trail Valley watershed.



BEAVER DAM
(photo by Jackson Seto)



BEAVER LODGE
(photo by Jackson Seto)

BEAVER IMPACTS ON PEOPLE

Atitu! I'm Callum, a post-doctoral researcher with BARIN working on the human impact side of the project. I'm from the UK, where I am based at Anglia Ruskin University in Cambridge. I'm a social/cultural anthropologist with experience of working on environmental topics in the Ladakh region of Himalayan India, where I studied knowledge about local spirits and human relations with the landscape. I also worked on a research project looking at the effects of climate change in the same area, where shrinking glaciers have led to water shortages that are greatly disrupting patterns of life.

My role in BARIN is to help document and share local knowledge about environmental change, co-producing materials that will be housed by the Joint Secretariat in the Inuvialuit Traditional and Local Knowledge Library in Inuvik. I will be in the Inuvialuit Settlement Region this summer to talk to people in Inuvik, Aklavik and Tuktoyaaqtuuq about the impact of beavers on livelihoods and wellbeing, carrying out interviews and taking part in mapping workshops. How have changes in beaver population affected hunting, trapping and fishing? What changes have you seen over the last few decades? How have these changes affected traditional practices and relationships with the land? If you want to get in touch, or if you have any advice or suggestions, please email me at callum.pearce@aru.ac.uk.



Callum Pearce

BEAVERS, FOOD WEBS AND MERCURY

By Mathew Mervyn (Wilfrid Laurier University)

Beavers are well known for their remarkable ability to construct dams and impound streams and rivers. These structures not only provide a home for beavers but also transform and create habitat that can be beneficial for a variety of other terrestrial and aquatic species, and connectivity between organisms. How beaver dams influence connectivity and energy flow in food webs of Arctic streams is not well understood. By investigating the impacts of beaver dams on food web structure and composition, we can better understand how beavers influence ecological function in Arctic streams and potentially surrounding ecosystems. By pairing our food web study with a design that considers the potential for mercury bioaccumulation in Arctic streams, we can also investigate beaver dams as a well-known driver of methyl mercury availability in freshwaters. Mercury dynamics are important to understand in the Arctic because it is a contaminant that can accumulate in the bodies of organisms over time and be potentially toxic. This process, known as bioaccumulation, commonly occurs when mercury enters the food web through plants or algae, which are then eaten by larger organisms. This can lead to high levels of mercury in top predators, such as fish, that can pose a risk to human health if consumed.

Our research team will be conducting fieldwork in the Inuvik-Tuktoyaktuk corridor during the summer of 2023. We will be collecting samples of water, sediment, and various organisms covering all food web trophic levels both upstream and downstream from beaver dams. These samples will then be analyzed in the lab to determine the composition of the food webs and the nutrient levels in the water. In addition to collecting samples, we will also be using data loggers to record water temperature, flow, and other environmental variables. We will collaborate with other researchers throughout the BARIN and ABON networks to if a suite of beaver dam characteristics (i.e., age of dam, activity status, etc.) can be used as predictors of methyl-mercury availability in streams. This will allow us to better understand the physical conditions in the streams and how they may be affected by the presence of beaver dams.

Overall, our research project will contribute to a growing body of knowledge about the importance of beavers in ecosystem functioning, particularly in Arctic streams. We look forward to sharing our findings with the scientific community and the public, and hope that our work will help to inform efforts to conserve and protect these unique and valuable habitats.



BEAVER DAM (photo by Mathew Mervyn)



BEAVER DAMS FROM ABOVE (photo by Mathew Mervyn)

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