

BEAVER RESEARCH BARIN NEWSLETTER



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BARIN BEAVER PROJECT: UPDATE

By Helen Wheeler (on behalf of the BARIN Team)

We have now reached the end of our BARIN funding from the CINUK program and looking forward to our next steps in the Inuvialuit settlement region. We had a few recent team visits in April (Callum Pearce) and May (myself). Callum has been interviewing Inuvialuit collaborators to get feedback on the BARIN program and we are keen to hear how we can improve the research coproduction around beavers and environmental change in the region. Please do email if you have comments or questions (helen.wheeler@aru.ac.uk). Despite the funding ending we are not finished with this research, and we will keep everyone updated on papers and other products emerging from the BARIN project.

We are now looking to produce a summary booklet for sharing in the region. As a taster of what is to come, below is an illustration that our artist Madison White produced for the project. We hope to have the booklet ready for circulation in August.

We are looking forward to ongoing collaboration with the Imaryuk monitors and Kirt Ruben. Jordan Musetta-Lambert and I, along with team members, are preparing for a visit in July for ongoing research. We are also keen to continue our partnership with Fisheries Joint Management Committee and have been discussing ideas with Aurora Research Institute and are watching for further sources of funding to build further collaborative projects in the region. Thanks so much to everyone for your support, expertise and knowledge, friendliness and kindness throughout BARIN. We really learned a lot and really appreciate your support.



Helen Wheeler

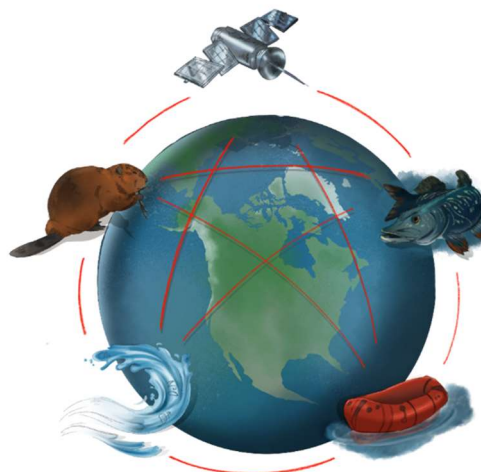


Illustration by Madison White

BEAVER IMPACTS ON HYDROLOGY

By Jackson Seto (Wilfrid Laurier University)

Since the last newsletter, I have processed all lake water level, and beaver dam, data for 39 lakes across Trail Valley and Hans Creek located north of Inuvik along the Inuvik and Tuktoyaktuk Highway. Analysis has focussed on comparing these data across lakes with and without beaver dams for the summers of 2023 and 2024. One aspect of this analysis has focussed on the effects of lake level changes that occur after dams were built, lake levels increased and total water storage capacity increased. As a result, any precipitation event would result in increased lake level and water storage. An important result of dam building is a decrease in streamflow downstream of the lake until full lake storage capacity was reached.

Our analysis shows that for lakes where a dam is already in place and is still being maintained by the beavers, the lake level regime follows similar patterns to lakes with no dams at the outlet, but simply with a higher lake level. We are investigating the effects of dams on allowing some water to continue to flow through the dam later in the summer and into the fall. In this situation, downstream discharge may continue longer into the fall than for lakes with no dams.

Overall, working as a member of the BARIN project has been a great experience. I've learned a lot from my project, and it's been great to collaborate with all the various members of the BARIN team.



Kigiaq Lake Outlet Dam
(Photo by Jackson Seto)

BEAVER IMPACTS ON STREAM DIVERSITY AND FOOD WEBS

By Mathew Mervyn (Wilfrid Laurier University)

Over the past few months, I've made exciting progress on my Master's research investigating how beaver activity and stream characteristics shape aquatic ecosystems in the ISR. My thesis focused on two main questions: how stream characteristics (chemistry, flow, and sediment type) influence stream ecosystems, and if there are any differences in streams with beaver activity. To explore this, I looked at changes in water chemistry, invertebrate communities, and the structure of food webs.

One of the key findings from my research is that natural stream characteristics play a stronger role than beavers in shaping invertebrate communities. In sandy, slow-flowing streams, invertebrate diversity was generally low, while gravel-bottomed streams supported more diverse communities. Beaver presence had little effect on sandy sites, but slightly reduced diversity in gravel streams. Similarly, beavers had minimal impact on overall food web structure, which appeared to be shaped primarily by the physical characteristics of the stream itself. These results show that the natural characteristics of the stream have a bigger impact than beaver dams on invertebrate communities and ecosystem health.

This research has been extremely rewarding, and I'm thankful for the opportunity to carry it out in the ISR. I've learned a great deal from the land, the water, and from those who have supported this work, and I look forward to sharing my final results soon.



**Water Sampling at Inuvik
(Photo by Mathew Mervyn)**

BEAVER IMPACTS ON MERCURY AND FOOD WEBS

By Megan Cullen (Wilfrid Laurier University)

Hello! I'm pleased to share that I've been making exciting progress on the BARIN project! To catch you up, I'm a Master's student at Wilfrid Laurier University (WLU), supervised by Dr. Jordan Musetta-Lambert (Environment and Climate Change Canada) and Dr. Heidi Swanson (WLU). My contributions with the BARIN stream health team focuses on whether beavers are affecting contaminants like mercury and basal food web resources for aquatic life in streams in the Inuvialuit Settlement Region (ISR).

This fall and winter, samples collected from beaver-impacted streams in summer 2024, with the Imaryuk monitors, were either sent to specialized labs or processed by me, with expert support. Water and sediment samples from both within and upstream of beaver ponds went to Biotron (a mercury lab) to measure various mercury forms, helping us understand if beavers are increasing total mercury and/or making it more bioavailable for aquatic life. I was also fortunate to visit Dr. Suzanne Tank's lab at the University of Alberta and the National Hydrology Research Centre in Saskatoon to work with Dr. Musetta-Lambert. There, I used a fluorescence spectrophotometer (seen in my photo) to analyze water samples and gain information on the structure and origins of dissolved organic matter, to then understanding how basal resources are flowing through stream food webs impacted by beavers.

With nearly all the lab work complete, I've started on data analysis and will soon have preliminary results to discuss with collaborators and then to share further!

This past December, I was very thankful to attend the CINUK annual science meeting and the ArcticNet conference. It was great to connect with our BARIN collaborators and learn from the many inspiring projects and presentations. These meetings offered valuable lessons in Arctic collaboration and communication that I'm excited to apply moving forward.

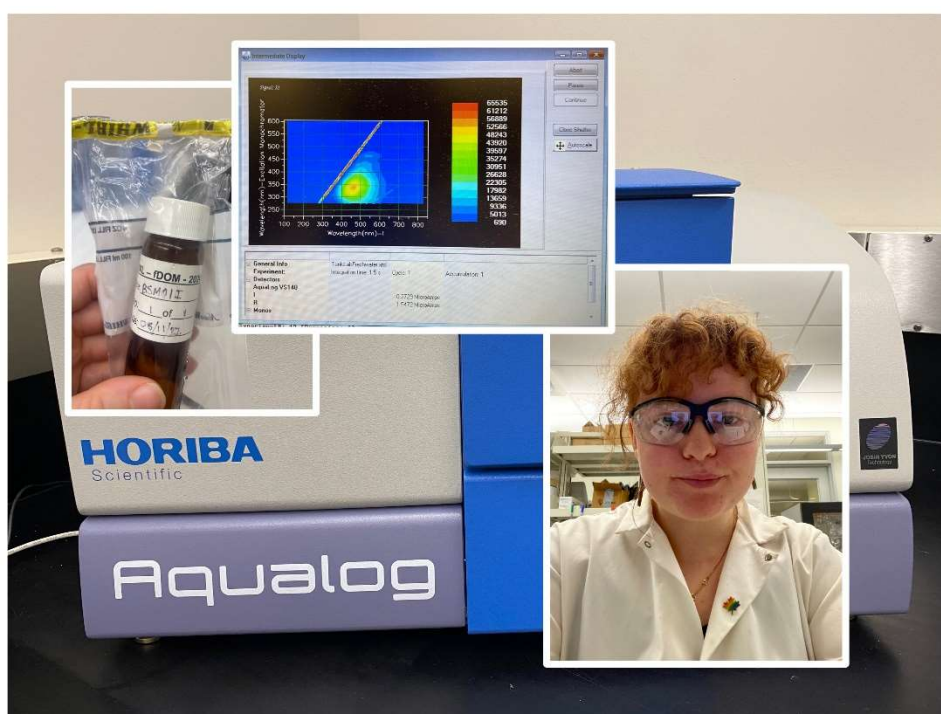


Photo: A collage of laboratory photos including the fluorescence spectrophotometer (largest photo), a sample in its amber vial (left), the plot of a sample being analyzed by the equipment (centre) and a lab coat selfie!

(Photos by Megan Cullen)

BEAVER IMPACTS ON COMMUNITIES

By Callum Pearce (Anglia Ruskin University)

As the BARIN project comes to an end, we're now moving towards publishing the results of the work. The IGC have given their approval for a paper describing how beavers impact Inuvialuit harvesting activities ('In every river, in every lake': Impacts of beaver population change on Indigenous livelihoods and wellbeing in the Inuvialuit Settlement Region, Canada), so that is now on its way. We will be sending a second paper on the history of beaver management in the lower Mackenzie Delta to relevant HTC's for review ('Animals we've never seen before': Historical wildlife management and Indigenous relations with beavers in the mainland Inuvialuit Settlement Region, Canada). This talks about what happened with beavers in the early and mid-twentieth century: about the fur trade, government efforts to promote beaver numbers in the 1950s, and the fall in the price of beaver pelts.

In April I was back in Inuvik for the FJMC meeting, where I updated the board on our work so far. While I was there, I took the opportunity to attend meetings of the Inuvik and Tuktoyaaqtuuq HTC's, getting a lift from the Imaryuk Monitors to go up to Tuk (with thanks to Max, Borge, Lennie and Josh). I also carried out a few interviews with people who have worked with BARIN, asking about what we could do better when collaborating with Inuvialuit and Inuvialuit organisations. We will be working up the results of these conversations into a written piece, co-authored with interviewees.

The last two years have been a fantastic experience. It has been a privilege to spend time in Inuvialuit communities, and to get to know people who have invited us in and shared their time and knowledge. Quyanainni!



**The Imaryuk Monitors inspecting
skidoos en route from Inuvik to Tuk
(Photo by Callum Pearce)**

BEAVER IMPACTS ON LAKE CHEMISTRY

By Katie Bennett (University of Montreal)

I have been bringing together final results from the lakes team from our three years of field work! I am writing a research article that I plan to publish this summer in a scientific journal. Over our three years of field data collection, the lakes team found that beaver activity changes greenhouse gas emissions in small areas within lakes directly next to beaver dams compared to areas farther away from beaver dams. However, we found that beaver activity in a lake does not change overall lake biogeochemical functioning, or how carbon and nitrogen move in and out of a lake, compared to lakes without beaver activity. These are important findings to improve our understanding of how lakes in the ISR are responding to changes from beaver activity and climate stressors like warming temperatures and permafrost thaw.

Our team is looking forward to sharing these results in more detail in the BARN synthesis report. We also plan to present our results at research conferences in the coming year including the ArcticNet Annual Scientific Meeting.

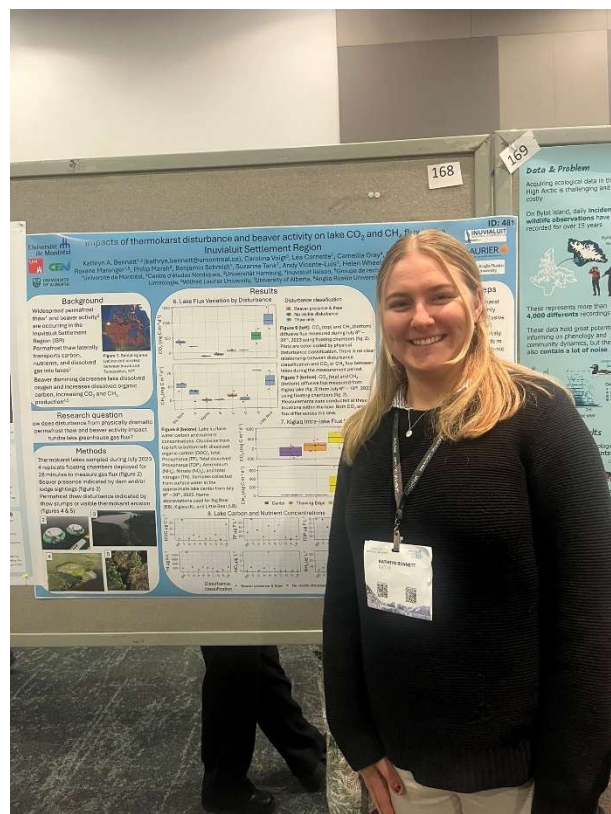


PHOTO: Katie Bennet presenting results at the ArcticNet Arctic Change conference in Ottawa.

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