BEAVER RESEARCH

BARIN NEWSLETTER

ISSUE 2 | AUTUMN 2023 |

BARIN BEAVER PROJECT: UPDATE

By Helen Wheeler (on behalf of the BARIN Team)

I write this as many of us are returning from fieldwork on the BARIN project. It has been great to see all the work taking place for BARIN from different collaborators and project partners. I hope this newsletter gives an idea of the breadth of work this summer. We would really like to thank everyone who has supported the project and made us feel very welcome in the region, sharing their expertise and observations, helping us move the project forward, connecting us with community researchers, wildlife monitors and interview participants. Thank you also to those who participated in the research, keeping us safe in the field and collecting field data with us, sharing knowledge through interviews and providing guidance during workshops.

We are now working through recordings and samples to process the information collected and knowledge shared. We will continue to share updates through our Facebook group and please get in contact with questions, ideas and suggestions via email (helen.wheeler@aru.ac.uk) or Facebook: https://tinyurl.com/Barin1

In November our funder - the Canada Inuit Nunangat United Kingdom research program (CINUK) - is holding a conference for all projects they have funded. We are currently arranging for the Imaryuk monitors to join us in the UK for this to further discuss the project and we look forward to hosting them in Cambridge. We will also post updates and photos from the meeting to share with you all on Facebook.

Thanks again for you support with the research project. We look forward to returning and seeing you soon.

Helen Wheeler

Conducting drone research (pictured left to right: Helen Wheeler, Georgia Melodie Hole, Max Kotokak Jr, George Harrison)

Mapping beaver impacts in Tuk (pictured left to right: Katie Bennett, Helen Wheeler, Malcolm Brockett, Callum Pearce, Ikalualuq, Josh Teddy, Lisa Loreen)

BEAVER IMPACTS ON COMMUNITIES

By Callum Pearce (Anglia Ruskin University)

Over the summer I was in the ISR interviewing people about the impact of beavers. We held a start-up meeting in the council chambers in Tuktuyaaqtuuq with the Imaryuk monitors and representatives of the Tuk Hunters and Trappers Committee and the FJMC, and I spent some time talking to people in Inuvik and Tuktuyaaqtuuq.

One of the things I've been trying to do is to map the impacts of beavers: to see where people have encountered beavers and how beaver dams have affected how people move across the land, in both summer and winter. We tried this out at the meeting in Tuk with Ikalualuq and Josh Teddy, and I've since used the maps in interviews. I will be returning to the ISR in February, when I'll be spending a few weeks in Akłarvik listening to people there. If you would like to talk to me about your experience with beavers, or you know of someone I should speak to, please email me at the address below.

What has come across clearly is that there are widespread concerns in three main areas: about the way beaver dams stop the movement of fish, about the impact of beavers on drinking water, and about how beaver activity disrupts routes and trails across the land. People have shown me how beavers can make the environment more unreliable, especially when travelling on ice in winter, and of the importance of learning to observe your surroundings when out on the land. I look forward to learning more! I can be contacted at callum.pearce@aru.ac.uk.

Meeting with the Tuk HTC. (pictured: Callum Pearce (presenting); clockwise around the table: Lisa Loreen, Ikalualuq, Jim Elias, Davy Krengnektak, Darrel Nasogaluak, Eileen Jacobson.

Katie Bennett taking measurements to assess lake chemistry from a small boat

Floating chambers used to measure gas emissions from lakes

BEAVER IMPACTS ON LAKES

By Katie Bennett (University of Montreal)

I'm Katie Bennett, a PhD student at the University of Montreal in Montreal, QC. I'm studying the impacts of beavers on lake biogeochemistry for BARIN with Dr. Oliver Sonnentag. My research also includes the impacts of permafrost thaw on gas emissions from land and lakes, understanding the impacts of shifting seasons on gas production in lakes, and mapping differences in methane emissions across the Arctic. Before joining the BARIN team, I earned my Master's degree at the University of New Hampshire in the USA, researching the release of methane bubbles from ponds formed by thawing permafrost in northern Sweden.

Over the summer I'm measuring emissions of methane, carbon dioxide, and nitrous oxide gases from multiple lakes near the Trail Valley Creek Research Station. These lakes have varying levels of beaver activity, ranging from no beavers present to beavers currently damming and living in the lake. This allows our team to gain a better understanding of how beavers change lake chemistry and gas emissions and how lakes may recover once beavers are no longer active there. I collect water and gas samples from each lake to bring back to Montreal for further analysis that determines the amount of each gas being released and the amount of different nutrients in the lake water. My favorite part of working in the ISR is getting to paddle around the lakes and getting to know the people in Inuvik and Tuktoyaktuk that our research findings are important to.

BEAVERS, FOOD WEBS AND MERCURY

By Mathew Mervyn (Wilfrid Laurier University)

In early July, the WLU/ECCC team (led by Joseph Culp and Jordan Musetta-Lambert) visited Inuvik for the first round of sampling this year. This sampling is part of Mathew Mervyn's MSc thesis investigating the impacts of beaver activity on stream food web structure and mercury bioaccumulation.

The trip started by taking a helicopter north of Inuvik to find beaver-impacted streams away from the ITH. We found six streams impacted by beavers that were also large enough to carry fish populations. In each stream, we sampled downstream of a beaver dam and upstream – to an area that is not currently occupied by beavers. Downstream from the dam, we installed conductivity loggers and upstream we installed water level loggers. These will allow us to monitor the stream when we're not in Inuvik.

We also installed packs of dried leaves to collect benthic macroinvertebrates. These organisms can tell us about the food web and the health of these streams. Additionally, we measured various water quality metrics such as pH, temperature, dissolved oxygen and turbidity. Finally, we assessed the stream's width and depth, along with the size of the dams.

We will return to Inuvik in August to collect additional benthic macroinvertebrates, fish and vegetation. This will allow us to measure mercury bioaccumulation through the entire food web, from plants to fish. Our work will continue into September when we remove all our loggers. Thank you to Max Kotokak Sr. (Imaryuk Monitors) for coming out into the field with us and stay tuned for more exciting updates as our research progresses!

Water sampling at Inuvik (photo by Mathew Mervyn)

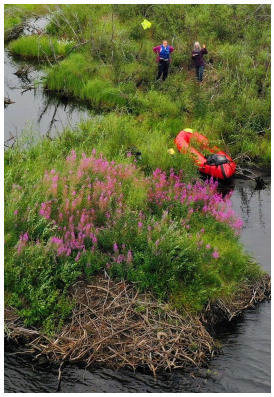
Beaver dam at Inuvik (photo by Mathew Mervyn)

PHOTO GALLERY

Here are some photos from this summer's field work…

Beaver lodge

Left to right: Georgia Hole, Max Kotokak Jr



Left to right: Helen Wheeler, Georgia Hole

Left to right: Max Kotokak Jr, Helen Wheeler, George Harrison

Left to right: Max Kotokak Jr, Helen Wheeler

BEAVER OCCUPANCY AND TREE RINGS

By Georgia Melodie Hole (Anglia Ruskin University)

Since our last newsletter I have spent the summer in the ISR with the BARIN project team - working in the beautiful environment of the shrub tundra between Inuvik and Tuktoyaktuk alongside local people to survey signs of beaver occupation and their impacts. The main goal for my time on the Inuvik-Tuktoyaktuk Highway was to find signs of beaver occupation such as beaver houses and dams, and at such sites to locate and take samples of shrubs cut by beavers.

We worked with some great wildlife monitors and community researchers such as George Harrison, Max Kotokak Jr, Raymond Cockney, Miles Dillon, Todd Gruben, and the Imaryuk Monitors who were invaluable in their help with local knowledge of the landscape and beaver habitats, as well as working with us in the data collection processes. It was also great to learn from them, the Inuvik and Tuktoyaktuk HTCs and local community members we spoke with about the changes being seen in the environment that relate to beaver range expansion, and how these are impacting ecosystems and the people of the ISR.

I now have over 800 shrub samples to be working on back in Cambridge, UK, where I will be preparing each sample and measuring the tree rings to hopefully gain information on when beavers were present at the sites we found, and how established or temporary populations have been. I am also testing to see if the side branches that grow after beaver-cutting can be used as a quicker way to date beaver presence, which would enable further insights with shrubs collected across the ISR, and possibly lead to future options for local monitoring.

I look forward to the CINUK meeting in November where we hope to welcome some of the Imaryuk monitors to the UK and update them on the progress of our work.

Beaver cut marks on willow shrub

Georgia Hole wearing a protective mask for preparing shrub samples in the lab

THANK YOU TO OUR FUNDERS AND SUPPORTERS

Thank you to CINUK (Canada – Inuit Nunangat – United Kingdom Arctic Research Programme), Polar Knowledge Canada (POLAR), Fonds de recherche du Québec (FRQ), the International Arctic Science Committee, and UK Research and Innovation (UKRI) for supporting and funding the BARIN project. We are also grateful to the Inuvialuit Game Council and Inuvik, Tuktoyaktuk and Aklavik HTCs for their support.

BARIN research is conducted through a collaboration of the following institutions: Anglia Ruskin University (UK); Wilfrid Laurier University (Canada); Fisheries Joint Management Committee, Inuvialuit Joint Secretariat (Canada), University of Guelph (Canada), University of Cambridge (UK), Université de Montréal (Canada); University College London (UK), University of Kent (UK), Government of Northwest Territories (Canada), Environment and Climate Change Canada, University of Saskatchewan (Canada).

The BARIN Newsletter is edited by Jennifer Ramsay. Please send any contributions or suggestions to jennifer.ramsay@aru.ac.uk