

# Research in the South Slave

# SUMMER UPDATE

JUNE 2024



## Working together towards food sovereignty in the South Slave

*Sarah Rosolen, Manager, South Slave Research Centre*

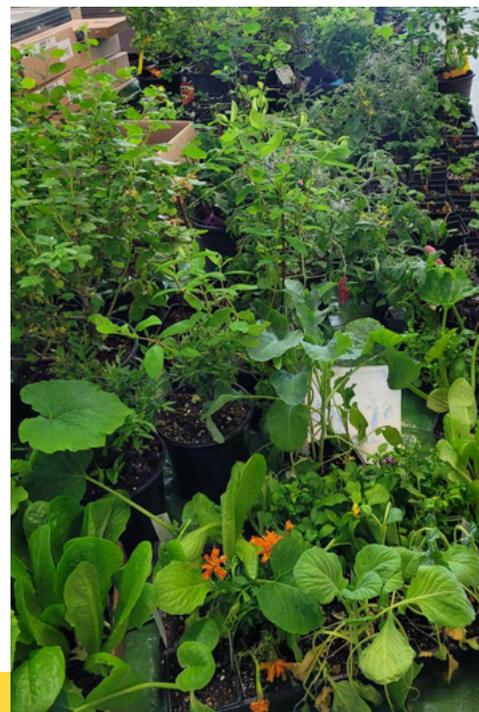
Our office looked like a jungle this spring as we started seedlings and staged berry bushes on behalf of organizations working together on the Boreal Berry Patch Collective in Fort Smith. The concept for the project was underway by the time wildfires hit the region last summer. Food security and sovereignty had long been identified as priorities. Elders had noticed declines in native berries; food plans and capacity building had been identified as ways to help rebuild models of self-sufficiency. However, the importance of local food hit hard when our road closed due to the fires and grocery trucks stopped coming.

The Boreal Berry Patch Collective has brought organizations around town together through the simple act of planting berries, but this is just the backdrop for knowledge sharing, capacity building and important discussions about increasing local food production. Some other neat projects have 'stemmed' out from this work - the NWT Strawberry Research Trials, our partnership with the University of Guelph, our Community Garden work, and the Territorial Agrifood Association's Teen Chef Program. You can read about it all in the first few pages of this issue.

We also have updates on the Makerspace and our STEM outreach programs, the Northern Whooping Crane Festival, and the College's new Environmental Field Camp for youth. There are numerous external research and program stories as well to share information about projects in the South Slave, including climate change, the impacts of the wildfires, soils, water, and energy. There is also a call for research collaboration around Species at Risk.



*Summer students Amelie Aubrey-Smith and Madison Hudson, after unloading the first batch of over 300 berry bushes that were planted by 13 organizations around town this spring.*



## IN THIS ISSUE

- Boreal Berry Patch Collective p. 2
- More local foods projects • p. 4
- Makerspace • p. 5
- Science Rendezvous • p. 6
- Whooping Crane Festival • p. 7
- Staff updates • p. 8
- Youth environmental field camp • p. 9

## RESEARCH PROGRAMS

### Summaries and Introductions

- Species at Risk research • p. 11
- Soil secrets • p. 12
- Wildfires and garter snakes • p. 13
- Wildfire and carbon stocks • p. 14
- Caribou lichen & climate change • p. 15
- Transboundary water research • p. 16
- NWT's Energy Strategy • p. 17

@SouthSlaveResearch



## “BERRIES EVERYWHERE”

The **Boreal Berry Patch Collective** is a collaboration among almost every organization in town - Fort Smith Métis Council, Salt River First Nation, Smith's Landing First Nation, Northwest Territories Health and Social Services Authority Fort Smith Region, JBT Elementary School, PWK High School, Fort Smith Correctional Complex, Northern Life Museum and Cultural Centre, Town of Fort Smith, GNWT - Industry, Tourism, and Investment, Queen Elizabeth Territorial Park, Sutherland House, Aurora College, and the South Slave Research Centre - to build interest and capacity around local foods in Fort Smith. Our vision: “berries everywhere.”

The project kicked off with an Open House in February to celebrate local foods and get people excited about the project. We organized a number of panel discussions for local experts to share knowledge and had lots of samples of different local food products. 😊

We are thankful to our local greenhouse, Roots and Ruminants, who helped us choose what plants would be best for the project and then special-ordered what every partner chose. Everything arrived in May, and over the past month everyone has been hard at work planting more than 300 strawberries, haskaps, saskatoons, raspberries, blueberries, gooseberries, lingonberries, rhubarb, as well as crab apple and cherry trees around town. (Continued on Page 3)



### Better Together

This summer we are super stoked to be hosting a **Fort Smith Métis Council** summer student at the South Slave Research Centre to support collaboration between the two organizations. Welcome to Thebacha Campus, Fort Smith Métis Council and **Madison Hudson!**

*Hi, my name is Madison Hudson. I have lived in Fort Smith, NT for most of my life. I am going into my third year of a four-year Bachelor of Arts degree in Psychology with a minor in Indigenous studies at Concordia University of Edmonton. I am working for the Fort Smith Métis Council this summer as a summer student, helping with the Local Foods Outreach program. We are partnering with the South Slave Research Centre on the Boreal Berry Patch Collective. I am very excited about this project because I have always wanted to learn how to garden, and planting/tending to berries throughout the summer will allow me to gain some gardening experience.*



## BOREAL BERRY PATCH (CONT)



*Chris Westwell, Sandra Jaque, Trent Stokes, John Goodwin, and Veronique Bazinet share their knowledge at the Local Foods Open House in Fort Smith in February.*

A big part of the Collective is sharing knowledge and building capacity. Each partner is carrying out projects to help reach as many people as possible. Here are a few of the highlights so far:

- Local Foods Open House in February - numerous panel discussions and booths to support sharing knowledge. At least 100 people attended.
- Over 300 berry plants, bushes and trees were planted at 22 partner sites - several partners turned this into an opportunity for youth and Elders to plant together.
- Numerous growing and harvesting workshops have already happened through the various partners, and there are many more to come.
- A local growers network was started to share knowledge and ideas - we have been meeting about once a month.
- A Facebook page - **Thebacha Food Growers and Wild Plant Harvesters** - was created to keep us connected and share information about upcoming events.
- The BBPC has participated at several community events such as Thebacha Trade Show, Science Rendezvous, JBT on-the-land day, National Indigenous Peoples Day and will also be getting involved with day camps and other youth programming this summer.
- We are also helping with the Fort Smith Community Garden this year and have an experienced gardener, Trent Stokes, on-site to answer questions and help people get started (see next page for more information).



Finally, we are excited that two grad students from **University of Guelph** are coming to the South Slave Region to support soils work this summer. They will be staying in Fort Smith, but working around Hay River and K'atl'odeeche First Nation as well. See page 12 for more info.



Thebacha Food Growers  
and Wild Plant Harvesters

This project is funded by Industry, Tourism and Investment (Sustainable Canada Agriculture Project) and the Climate Change Health Adaptation Program (Indigenous Services Canada).

**More local foods projects...**

**FORT SMITH COMMUNITY GARDEN**

The South Slave Research Centre is infusing energy into Fort Smith's Community Garden this summer. Trent Stokes, our horticulture technician, will be on-site most weekday mornings. He is always eager to help and share his knowledge with anyone, whether or not you have a plot in the garden.

We have a plot going for the Food Bank - if you are interested in helping out or just have questions, please reach out to us at: [borealberry@auroracollege.nt.ca](mailto:borealberry@auroracollege.nt.ca)

*The Fort Smith Community Garden is supported by GNWT - Industry, Tourism and Investment.*



*Trent Stokes at the garden*

**TEEN CHEF PROGRAM** Territorial Agrifood Association is helping teens across the NWT get connected with food. Four teens in Fort Smith have signed up and are receiving gift cards from Kaesers (and eventually the farmer's market when it opens). They will share their cooking prowess on social media - we can't wait to see what they cook up! There are still two spots left! Contact [borealberry@auroracollege.nt.ca](mailto:borealberry@auroracollege.nt.ca) to sign up.



**NWT STRAWBERRY RESEARCH TRIALS**

SSRC is part of a project carrying out research on strawberries at three sites in the NWT: Fort Smith, Samba K'e (Trout Lake) First Nation, and Yellowknife (with Northern Roots Consulting). We are all growing the same three varieties of strawberry under different treatments (hoops and mulches) to develop better knowledge about growing strawberries in the North. Kim Neider from the Upernaviarsuk Research Station in

Greenland is doing commercial-scale strawberry research there and is sharing his expertise with the project. The South Slave site is located at the Fort Smith Community Garden. Feel free to drop by and check it out, just please don't eat the berries ... yet! Taste testing will definitely be part of the research, but we need to collect some other data, too!

NWT Scientific Research Licence # 17558

This project is funded by the Sustainable Canada Agriculture Program



Congratulations to **Renee Rodgers** and her family on the arrival of their baby boy! We wish our energetic and passionate Boreal Berry Patch Collective Coordinator all the best as she takes some time off to enjoy her new addition. Huge kudos and heartfelt gratitude for all of the hard work she did to get the project off the ground!

## A SPACE TO CREATE!

*Whitney Locken, Makerspace Coordinator, South Slave Research Centre*



The Thebacha Makerspace at Aurora College in Fort Smith is a community space to try different tools and equipment, collaborate, and learn new skills. Thebacha Makerspace is a part of ARI's Makerspace Ecosystem Project, funded by CanNor and ITI.

The project aims to establish and support Makerspaces all across the NWT by providing resources such as equipment and training. The space is also expanding as we are partnering with Aurora College Trades to store our larger equipment and offer some workshops at their old Heavy Equipment Operator building. The building features a classroom and one of three bays that will be shared for Makerspace activities!

Don't be shy - drop by and check out the space and tools:

- A "Maker Night" happens **Wednesday evenings from 6:30-9 pm** where anyone (age 14 and under require supervision) can come and try out the space and equipment. We have some new tools!
- On Friday afternoons during the school year we host Tinker Lab with ARI's STEM Outreach team. We have done a number of hands-on creating projects including Star Wars Challenges coding R2D2 and building spaceships, hydraulics, making a rain gauge, 3-D print and design, and making light-up holiday cards.
- Up to three workshops are held each month, where participants are given an opportunity to use different tools and take home a finished product. Workshops hosted over the last year include making bat houses, plant markers, pottery, tufting, sewing with fur, cabin sign making, and more. Look out for our future workshops including: projector sewing, laser cut earrings, garden harvest baskets and many others.

Follow us on Facebook **@Thebacha Makerspace** to learn about upcoming workshops and events.

If you are interested in establishing a Makerspace or offering workshops outside of Fort Smith, please contact **wlocken@auroracollege.nt.ca** to discuss how we can help out.



Thebacha Makerspace

## STEM OUTREACH UPDATE

Hilary Turko, Outreach Coordinator, South Slave Research Centre



### SCIENCE RENDEZVOUS

On Saturday May 11, Thebacha Campus came alive with science at our 2nd, hopefully annual, Science Rendezvous. Science Rendezvous is part of a national celebration of STEM held at post-secondary institutions across Canada.

We had 33 volunteers supporting various family-friendly hands-on STEM and arts activities including giving people a chance to try flying a drone, building a robot, testing how fast they could run against a radar detector, designing a t-shirt, using a pottery wheel, and exploring interactions between saltwater and freshwater.

**TEACHER PD** In March, the ARI's STEM Outreach Team hosted two days of hands-on STEM learning for teachers at Thebacha Campus. Sixteen teachers from Inuvik, Yellowknife, Hay River, Fort Smith and Fort Resolution participated. The project was supported by Actua and Polar Knowledge Canada.





We are going to try this again. The first Northern Whooping Crane Festival is being planned for the weekend of September 6-8 2024 in Fort Smith/Thebacha. The event will include panel discussions, excursions, on-the-land activities, and guest speakers from the International Crane Foundation, the Canadian Wildlife Service and the Calgary Zoo. Follow us on Facebook for more details!



@northernwhoopers

## SSRC STAFFING UPDATES

**Robyn Brown, Research Ethics Coordinator:** I facilitate the ethics review process for research projects across the NWT. My goal is to connect researchers with community members to support collaboration and research that benefits our northern communities. Growing up in the NWT, my family lived in the Dehcho and Tłı̨chǫ before moving to Fort Smith. I hold an Environment and Natural Resources Technology Diploma from Aurora College. I highly value on-the-land experience and environmental stewardship, and I love staying active outdoors with my dog, a lab/husky named Pan.



**Trent Stokes, Community Garden Horticulture Technician:** My name is Trent Stokes and I am from Fort Smith. I am extremely passionate about gardening and taking care of my planet. We are currently bringing life to the community garden. Getting it cleaned and prepared for the townsfolk. We are excited for this summer! I love to make herbal medicine from natural inputs. I love composting and have a few methods working as you read this. Vermicomposting, mealworms and darkling beetles, and hot composting. I love my planet! Drop by the community garden weekday mornings to say hi!

**Amelie Aubrey-Smith (she/her), Research Assistant (summer student):** This is my second summer at Aurora College. This year, I am working on the Boreal Berry Patch Collective project, strawberry research trials and a bit of STEM outreach. I am stoked to be back and look forward to seeing some familiar faces and new ones too! I am a Fort Smith local and currently completing my Bachelor of Science degree in the biology program at Trent University. Outside of this I enjoy cooking, paddling, travelling and finding some time to occasionally pick up a book. I am always up for any summer reading suggestions or future travel recommendations. Feel free to reach out and share.



**Anaïs Aubrey-Smith (she/her), Research Assistant (summer student):** I'm a chemical engineering student at McGill University working with ARI this summer. Living and growing up in Fort Smith has fostered my love of the outdoors. I'm super excited to be part of the ARI team so I can be involved in presenting STEM in creative ways to make it accessible and understandable for everyone as well as to hone my creativity and hands-on skills in the Makerspace. My favorite part about STEM would have to be that I'm always learning. Science is the world around us and it's constantly changing, which is why I believe that it is so important to get northern youth involved and eager to learn and ask questions. My advice to youth would be to pursue their passions; there's no such thing as "not smart enough for STEM" because we're all always learning!



**Helena Katz (she/her), Communications Coordinator:** My sisters think I don't know what I want to be when I grow up. I'm just curious about a lot of things. I've worked as a reporter, authored four nonfiction books, run a youth hostel in Ireland and base camp trips into Ivvavik National Park. I have a background in developing, delivering and marketing tourism experiences. As co-owner of an alpaca farm for 14 years, I also learned what to do with fleece and how to train our livestock guardian dogs.

## YOUTH FIELD CAMP: AUGUST 2024

*Dr. Linh Nguyen, Program Head, Environment and Natural Resources Technology, Aurora College*



Aurora College's Environment and Natural Resources Technology Program is piloting a Youth ENRTP field course August 7-14, 2024. The fly-in camp will be held at Tsu Lake, 60 km north of Fort Smith. This immersive, seven-day educational program is for 10 NWT high school or home-schooled students entering Grade 11 and 12, who are interested in science and the outdoors. Aurora College educators and elders as well as researchers are collaborating to provide a unique, on-the-land learning experience. Students will be immersed in an interactive learning environment.

Participants will learn about Indigenous knowledge, human activities and impacts on natural resources, along with other science-based disciplines such as geology, wildlife biology, and aquatic ecology through engaging land-based sessions. They will learn to make connections between different ways of knowing by getting hands-on experience with field techniques in wildlife research, botanical sampling, environmental monitoring, aquatic studies and geology. They will learn traditional skills and knowledge from an elder, and hear about on-site research projects studying the boreal forest ecosystem. The Youth ENRTP Field Course is an opportunity for students to see what the Environment and Natural Resources Technology Program can offer towards a career in this field.

There are still spaces available! For more information contact Linh Nguyen:  
LNguyen@auroracollege.nt.ca Phone: 867-872-7576

## RESEARCH PROJECT HIGHLIGHTS & INTRODUCTIONS



Research opportunity: Indigenous and community knowledge  
Joslyn Oosenbrug, NWT Species at Risk Secretariat  
Page 11



Soil secrets: Unearthing soil fertility and sustainability in the NWT  
Catherine Dieleman, University of Guelph  
Page 12



Impact of wildfire on garter snakes  
Johanna Stewart, Thompson Rivers University  
Page 13



Wildfire and carbon stocks  
Dr. Thea Whitman, University of Wisconsin  
Page 14



Caribou lichen and climate change  
Katerina Coveny, Wilfrid Laurier University  
Page 15



Transboundary water research  
Allison Rubin, Dan Utting, Dan Palombi  
Alberta Geological Survey  
Page 16



Toward a Renewed Energy Strategy  
Page 17



## RESEARCH OPPORTUNITY: INDIGENOUS AND COMMUNITY KNOWLEDGE

*Joslyn Oosenbrug, NWT Species at Risk Secretariat*

Did you know? Every year, the biological status of certain plant and animal species is examined to determine whether they are at risk of disappearing from the Northwest Territories. The Species at Risk Committee uses the best available information from Indigenous and community knowledge and science to assess the risk of extirpation or extinction.

In the coming years, the following species will be assessed:

2025 – Northern leopard frog, western toad, Canadian toad

2026 – Wood bison, common muskrat, rock cranberry

2027 – Bats (northern myotis, little brown myotis), barren-ground caribou

2028 – Muskoxen



The Species at Risk Committee needs your help! An accurate assessment depends on good information. Documented Indigenous and community knowledge on certain species is limited.

We are looking for information on:

- Observed changes to these species, including where it's found, its abundance, habitat, movements and range use.
- How cultural relationships and practices have been affected by declines or changes in the species and/or habitat.
- How often people talk about the species disappearing, and their level of concern.
- The level of concern expressed about threats impacting the species.

If you are doing research on a species at risk or a species identified for assessment, let us know!

We are also happy to discuss specific research needs and potential funding sources.

Contact the NWT Species at Risk Secretariat:

PO Box 1320, Yellowknife, NT, X1A 2L9

Toll-free: 1 (855) 783-4301

Email: [SARA@gov.nt.ca](mailto:SARA@gov.nt.ca)

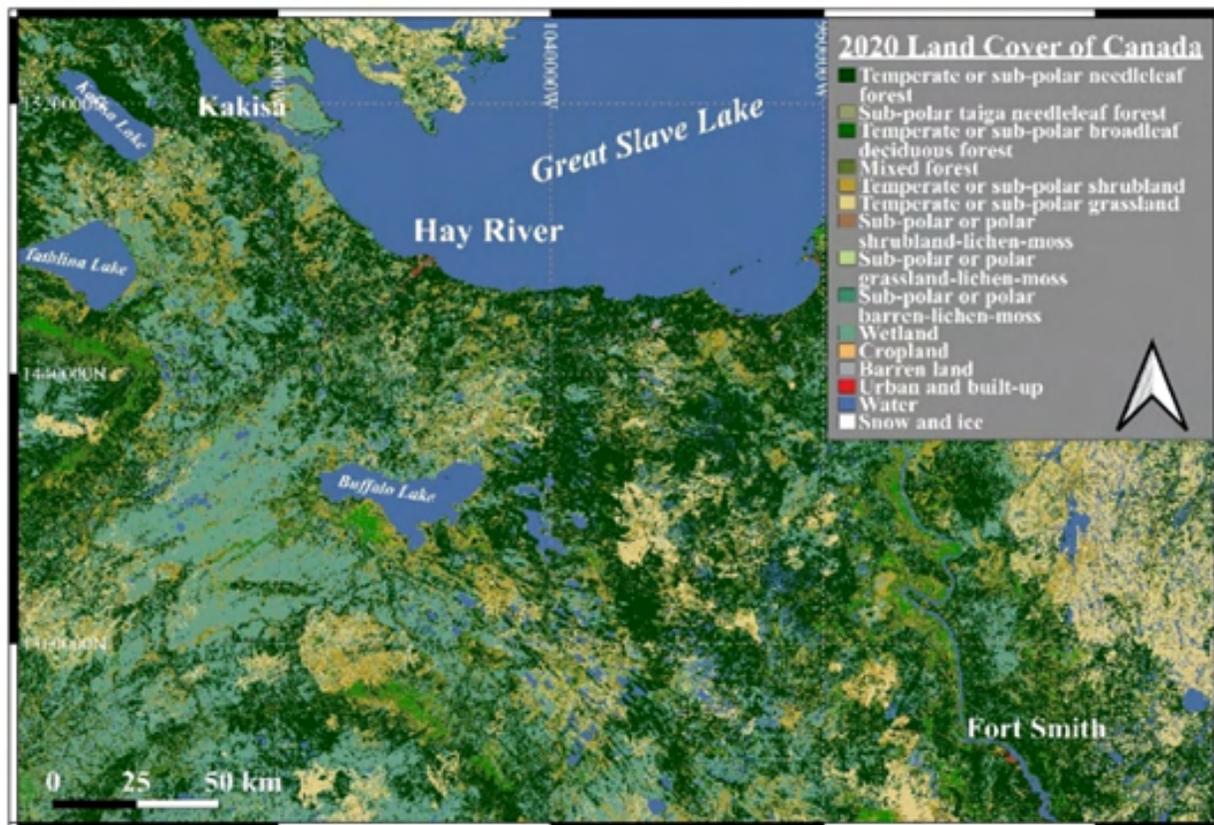


## SOIL SECRETS: UNEARTHING SOIL FERTILITY AND SUSTAINABILITY IN THE NWT

*Catherine Dieleman, University of Guelph*

Shifting climatic conditions are creating new opportunities for food production across the Northwest Territories, with warmer and extended growing seasons. To help plan future gardens or agroecosystems, information on local soil fertility and its changes following wildfires and cultivation is needed. Accordingly, MSc student Jane Mariotti from the University of Guelph aims to understand soil fertility variations in southern NWT and the effects of wildfire and short-term cultivation on nutrient availability and food production. She is hoping to work in areas around the Hay River and Fort Smith communities, collecting soils from approximately 50 sites that span different ecosystem types, drainage conditions, soil classes, and wildfire histories.

At each site the local environmental conditions will be carefully documented, and surface soil cores will be collected and processed to determine nutrient levels. Select soils will be used in a mesocosm experiment, potentially growing potatoes and strawberries. Nutrient changes will be monitored as the food grows, and results will show which soils are most productive and retain nutrients best. Jane is also hoping to provide soil fertility information on established food production sites as guided and requested by local growers. Combined, these results will help interested growers identify areas with more fertile soils and provide insights on the short-term sustainability of that food production in those areas.



*Map of different ecosystem types found in the areas surrounding Hay River and Fort Smith. Researchers are interested in understanding the variation in soil fertility across these different ecosystems to help northern food producers.*

## IMPACT OF WILDFIRE ON GARTER SNAKES

*Johanna Stewart, Thompson Rivers University*

Johanna Stewart was born and raised in Yellowknife, has several years of experience working for Environment and Climate Change, and is now a researcher based at Thompson Rivers University. Her research is focused on the red-sided garter snake, which was recently assessed as a species of special concern in the NWT.

Johanna is trying to understand the impacts that the 2023 wildfire season may have had on the red-sided garter snake population in the Fort Smith area. She will be based in Fort Smith from May to September and will be spending the summer weighing, measuring and tagging snakes to estimate the number and condition of snakes in the population.

She will have a second field season in 2025, which will include radio-tracking snakes through their summer habitat as well as assessing the snakes' prey populations (frogs) and investigating predation. If you're interested in getting involved, have information about snakes in the South Slave region or would like to learn more about Johanna's research, send an email to [fortsmithsnakes@gmail.com](mailto:fortsmithsnakes@gmail.com)



## WILDFIRE AND CARBON STOCKS

*Dr. Thea Whitman, University of Wisconsin*

Our research team from the University of Wisconsin is returning to Wood Buffalo National Park this summer to study how wildfire affects soil carbon stocks. Boreal soils hold globally-important stocks of carbon. When soil carbon is released to the atmosphere in the form of carbon dioxide or methane (through combustion or microbial activity), it acts as a greenhouse gas.

We will be comparing the amount of carbon that is released to the atmosphere during a fire to the amount of carbon that soil microbes release through respiration after a fire. We will be studying these in two different types of soils - sandy, jack-pine-dominated soils, and organic, spruce-dominated soils.

We collected soil samples from 30 sites in WBNP in 2019 and 2022, which, at the time, had not burned for at least 30 years. Last year, many of these sites were burned in wildfires. We will compare this year's samples to our past samples to determine how much carbon was lost during the fire. We will run laboratory incubations to measure soil microbial respiration.

If you see us out in the field or in town, please come say hi! We have some funds for additional student assistance, so if you are interested in helping out with some of the field or incubation work, please get in touch with Thea and Kelsey at [twhitman@wisc.edu](mailto:twhitman@wisc.edu) and [kmkruger2@wisc.edu](mailto:kmkruger2@wisc.edu).



## CARIBOU LICHEN AND CLIMATE CHANGE

*Katerina Coveny, Wilfrid Laurier University*

We are researchers from Wilfrid Laurier University in Waterloo, ON. We are studying how permafrost thaw and fire affect caribou lichen. Caribou lichens are a group of ground dwelling lichens with incredible diversity and resilience in harsh climates, they are found throughout the boreal forest and are an important food source for boreal caribou.

Unfortunately, caribou lichen is being affected by climate change through wildfire disturbances and increased rates of permafrost thaw. Our research aims to understand how caribou lichen biomass and abundance is being impacted by permafrost and fire disturbances.



This summer our team will be in Fort Smith, establishing long-term monitoring plots in forests near town that burned. These sites will eventually be revisited to see how the forest changes and recovers after fire. You may also see us at the ENRTP fall field camp, where we will assist students in establishing additional long-term monitoring plots!

Our team is made up of Katerina (Master's Student), Austin (Research Technician), Maya (Research Assistant) and Kyle (Research Assistant)

If you have any questions or want to connect you can contact Katerina at [cove3330@mylaurier.ca](mailto:cove3330@mylaurier.ca) or check out our lab website <https://forestecology.ca/>

## TRANSBOUNDARY WATER RESEARCH

*Allison Rubin, Dan Utting, Dan Palombi, Alberta Geological Survey*

The Alberta Geological Survey (AGS) is working in collaboration with the Government of Northwest Territories (GNWT) and the Government of Alberta to complete transboundary groundwater research in the South Slave region. Our study area spans the main watersheds across the provincial-territorial border with a focus on the Hay River sub-basin including regional landform features of interest such as the Cameron Hills and Caribou Mountains.



*Hay River water samples being collected by Government of Northwest Territories colleagues.*

Our project began in 2019 to support the Mackenzie River Basin Board Bilateral Water Management Agreement. The first objective was to resolve discrepancies in geological mapping of sediment thickness deposited above bedrock across our shared border. More recent work has built upon this mapping to create a unified model of bedrock geology and to study groundwater flow and quality by producing regional maps of aquifers within bedrock and surficial sediments.

Field-based objectives commenced in 2023 with our GNWT colleagues collecting water samples from the Hay River for geochemical laboratory analysis. With these results, the AGS will assess the interactions between groundwater and surface water in the Hay River watershed to add data and knowledge in understanding transboundary groundwater.

In 2024/25, we plan to visit field sites to view geological landforms pertinent to our mapping, collect water samples from groundwater wells in northern Alberta, and scan the landscape for springs via helicopter survey to aid in identifying groundwater discharge. We are also seeking opportunities for engagement with the community in data sharing and collection.



*Dan Utting, Allison Rubin, Dan Palombi*

