NWT Environmental Monitoring

Results Workshop

Summary Report

Yellowknife, NT

January 14-15th, 2025

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Summary

The *NWT Environmental Monitoring Results Workshop* was held in Yellowknife, NT January 14-15th, 2025. The event was co-hosted by the Yellowknives Dene First Nation (YKDFN), North Slave Métis Alliance (NSMA), and the Government of the Northwest Territories Department of Environment and Climate Change (GNWT-ECC)'s NWT Cumulative Impact Monitoring Program (NWT CIMP).

The objectives of the workshop were to:

- Bring together researchers, community members, and NWT decision-makers to share results of environmental monitoring related to caribou, water, and fish.
- Provide a forum for discussion between researchers, communities and northern decision-makers. Feedback from these discussions can improve related projects and programs.
- Get feedback for NWT CIMP to help outline the program's work over the next five-years (2026-2030).

The workshop provided the opportunity to present results and updates on current NWT CIMP-supported monitoring and research conducted throughout the NWT. These projects focused primarily on current NWT CIMP priorities of **caribou**, **water**, and **fish**.

Eleven presentations were given by researchers and resource staff. Small, interactive breakout groups (Talking Circles) were held to generate discussion and information. Key topics included: changes, stressors, priorities and research questions for water, fish and caribou, along with ways for NWT CIMP to improve communication, data availability and collaboration among funded projects.

Seventy-six people (Appendix B) participated in the workshop, including community members, researchers and northern decision-makers.

Background

The *NWT Environmental Monitoring Results* was held in Yellowknife, NT January 14-15th, 2025. The event was co-hosted by the Yellowknives Dene First Nation (YKDFN), North Slave Métis Alliance (NSMA), and the Government of the Northwest Territories Department of Environment and Climate Change (GNWT-ECC)'s NWT Cumulative Impact Monitoring Program (NWT CIMP). This was the twelfth annual results workshop supported by NWT CIMP.

NWT CIMP-funded results workshops are held annually in the NWT to provide environmental monitoring results to key audiences (Indigenous governments, community members, co-management boards, government departments and academia). These workshops provide opportunities to network, strengthen ties between communities, discuss program results and to understand cumulative impacts in the NWT.

Current NWT CIMP-supported monitoring and research projects conducted throughout the NWT shared results and updates. These projects focused primarily on current NWT CIMP priorities of caribou, water, and fish. The objectives of the workshop were to:

- Bring together researchers, community members, and NWT decision-makers to share results of environmental monitoring related to caribou, water, and fish.
- Provide a forum for discussion between researchers, communities and northern decision-makers. Feedback from these discussions can improve related projects and programs.
- Get feedback for NWT CIMP to help outline the program's work for the next five-years (2026-2030).

Eleven presentations were given by researchers and resource staff. Small, interactive breakout groups (Talking Circles) were held to generate discussion and information. The first two Talking Circles provided an opportunity for participants to discuss changes and stressors of concern, and to identify research priorities and questions for water, fish and caribou. The final Talking Circle provided an opportunity to help shape the program's work over the next five-years (2026-2030) and provide specific feedback to NWT CIMP to help improve communication, data availability and collaboration among funded projects.

Seventy-six people (Appendix B) participated in the workshop including community members, researchers and northern decision-makers. NWT CIMP provided funding for NWT regional community representatives to attend the workshop as a way to promote information sharing among community members and decision-makers. Each invited Indigenous

Government/Indigenous Organization identified attendees and administered their travel arrangements.

As has been the practice for several years, participants were asked to fill out a short evaluation form each day to provide feedback on each of the presentations, as well as the balance between presentations, questions and discussion, and how well the objectives were fulfilled. On the final day, participants are also asked to provide feedback on the overall quality and relevance of the workshop and its presenters. This year, the feedback received was generally very positive and participants indicated that expectations for the workshop were met. Feedback is also shared with presenters to help improve their future communications with communities and decision-makers.

Opening Prayer drumming song by the Yellowknives Dene First Nation

Opening Remarks by: (L-R) Chief Fred Sangris (YKDFN), President Mark Whitford (NSMA) and Deputy Minister Robert Jenkins (GNWT-ECC)

Presentations

A total of eleven (11) presentations were given over the two-day workshop. The following section provides the title of each presentation, a link to its location on the NWT Discovery Portal, and a summary of the discussion that followed the presentation, if applicable.

Day 1: Tuesday January 14th, 2025

Presentation #1 - *About the NWT Cumulative Impact Monitoring Program (NWT CIMP) & Results Information* - Lorraine Brekke, NWT CIMP (GNWT-Environment and Climate Change)

Available at: https://nwtdiscoveryportal.enr.gov.nt.ca/geoportaldocuments/1%20-%20Brekke%20-%20CIMP%20overview%20-%20results%20workshop%20-%20NWT%20wide%20-%20jan%202025.pdf

Summary of Discussion

- No questions or comments.

Presentation #2 - *Unravelling the cumulative effects of climate change and permafrost thaw on streamflow in the southern Taiga Plains (CIMP226)* - Stephanie Wright (Queen's University)

Available at: https://nwtdiscoveryportal.enr.gov.nt.ca/geoportaldocuments/2-CIMP%20Final%20Results%20Workshop_Wright_2025_V2.pdf

Summary of Discussion

- Q: How thick or deep was the permafrost? How does that compare to the past?
    - At the Scotty Creek area, it is relatively thin between 10-20 meters at most.
    - At the Whatí area, it is much thicker and we couldn't drill through the permafrost. We are able to drill up to 30 meters, so it is more than that for this region. We are now using the temperature data and geophysics to figure out how deep it is.
    - Overall, it is not nearly as thick as further north.
- Q: Why is the permafrost melting? In Great Bear Lake area, the active layer hasn't changed but now it is melting and other things are changing. It's melting fast. What's the timeline? We need to be seriously looking at how to deal with this. Land and Water Board regulations may need to adapt to protect the permafrost.

- Scotty Creek work is at the southern edge of permafrost—understanding this area will help provide information as an indicator of what will happen further north.
- The active layer that freezes and thaws is staying the same, but now there is a zone that doesn't re-freeze over the winter. A zone of unfrozen ground prevents the lower layer from getting really cold over the winter and the thaw accelerates. That unfrozen zone is happening in the Whatí area.

Participants listen intently to Stephanie Wright, Queen's University

Presentation #3 - *Fish mercury in Dehcho Lakes (CIMP154)* - Mike Low (Dehcho AAROM) & Heidi Swanson (University of Waterloo)

Available at: https://nwtdiscoveryportal.enr.gov.nt.ca/geoportaldocuments/3-CIMP154_Jan%202025_ML_HKS.pdf

Summary of Discussion

- Q: How does smoking or drying fish impact the mercury in it? How does it affect our health?
  - This is still pilot study, but there is a lot of available information marine systems.
  - Mercury binds to protein (not fat), so when you cook them, the proteins denature. When the protein changes shapes, it affects how mercury can bind.
  - Smoking, drying and pan-frying fish all reduce the amount of mercury that is bio accessible in the fish.
  - Drinking tea and tomato juice can also reduce the mercury that is bioavailable by binding to the mercury itself.

- Q: Are you actively documenting Traditional Knowledge when you're out collecting this information? What's your approach to data management?
    - Our expertise isn't in managing Traditional Knowledge, but we communicate and use the Guardians' advice to do the work itself - it's very informal.
    - We're using cloud-based services developed for us to do data management, with community-specific portals for them to access.
    - Traditional Knowledge studies have very different answers when the setting is in meetings versus on the land. Informal approach is what communities are more comfortable with.

Presentation #4 - ***Is Our Water Good to Drink? (CIMP230)*** - Diane Giroux (Akaitcho AAROM) & Corrine Schuster-Wallace (University of Saskatchewan)

Available at: https://nwtdiscoveryportal.enr.gov.nt.ca/geoportaldocuments/4-CIMP%20Report%20Back%20Jan%202025%20Is%20Our%20Water%20Good%20to%20Drink%20USB.pdf

Summary of Discussion

- Q: How are you getting this information out to the general public, not just back to the First Nation? We need to educate non-Indigenous people on these issues as well.
    - We will be providing a report to NWT CIMP which is shared publicly.
    - We were approached by UNESCO to present on a global scale (not yet confirmed).
    - Traditional Knowledge and science need to be promoted on equal footing and collectively used to provide guidance. All information and results must be reported back to the Chiefs first before release.

Diane Giroux (Akaitcho AAROM) shares project results with support from Corrine Schuster-Wallace of the University of Saskatchewan

Presentation #5 - *Understanding the cumulative impacts of beaver activity on stream health in the Inuvialuit Settlement Region (CIMP231)* - Jordan Musetta-Lambert (Environment and Climate Change Canada)

Available at: https://nwtdiscoveryportal.enr.gov.nt.ca/geoportaldocuments/5-Musetta-Lambert%20CIMP%20Results%20Forum%20Jan%2014_25.pdf

Summary of Discussion

- Q: How many beavers are there in the area, especially compared to 10-20 years ago? What about muskrats? There were thousands in the 1970s, so I'm curious how this has impacted the muskrats.
    - My expertise is not in beavers, but rather on freshwater ecosystems. Historical aerial photos are helping to detect how the range of beavers moved into this area. The best information about this will come from the community. Ongoing research led by Dr. Helen Wheeler at Anglia Ruskin University to conduct interviews with community members in the region (specifically Inuvik, Aklavik, and Tuktoyaktuk) may help address this question.
    - Primary drivers of range expansion are complicated, but increased shrub cover (alder and willow especially), longer ice-free sessions, and decreased ice thickness are all predicted to facilitate northward movement of boreal species such as the beaver.
    - Regarding muskrats, the Inuvialuit Joint Secretariat and the Imaryuk Monitoring Program are beginning a camera trap and eDNA monitoring program that may help see what other activity is happening around beaver dams. The GNWT, Helen Wheeler (Anglia Ruskin University), and I (ECCC) will be collaborators.

- Q: Will you expand work into the Gwich'in region as well?
    - No plans to expand at this time but would be interesting. It depends a lot on community priorities, capacity and funding availability.
    - Most of my research in the Gwich'in Settlement Area has been related to permafrost slumping as another major driver of change in freshwater ecosystems and their biodiversity. This work was also part of a CIMP project I co-led with Dr. Joseph Culp at Wilfrid Laurier University. My colleague, Dr. Helen Wheeler, has conducted some research in the Gwich'in Settlement Area associated with using aerial imagery to detect beaver habitat

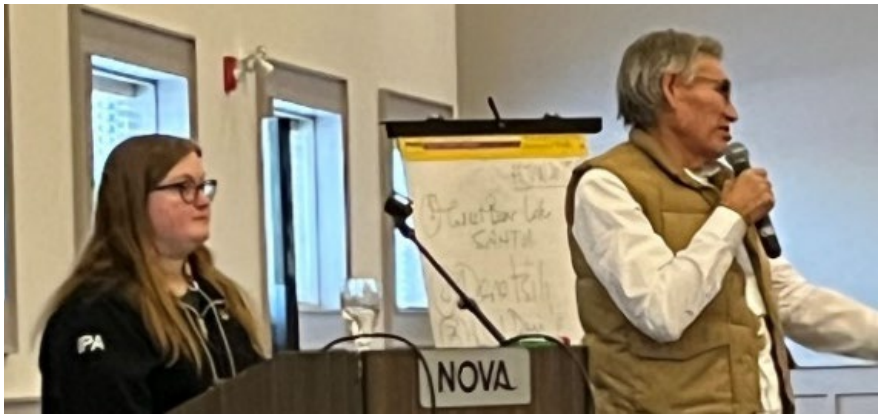
- Q: In the Sahtu region, there are a lot of beavers too. How does this compare to your study area? What's the lifespan of a beaver? Is the population growing?
    - Again, my expertise is not in beavers so cannot confidently comment on changes in population size. Management strategies such as trapping incentives have periodically been in place to help maintain numbers and dams are frequently managed in areas like along the Inuvik-Tuktoyaktuk Highway, where many streams are important fish habitat draining into the Husky Lakes.
    - In more southern boreal habitats, there have been studies showing that beaver dams can impact fish passage, especially if the fish stock is already stressed due to other factors. In the ISR, many of the dams in cobble streams do not seem to hold up well from year to year, so they are less likely to impact fish passage.

Presentation #6 - ***Understanding Cumulative Impacts on Dene Ts'įlį and relationships to fish through knowledge mapping in Déljnę (CIMP229)*** - Walter Bezha (Déljnę Renewable Resources Council) & Kahlea Wells – (Carleton University)

Available at: https://nwtdiscoveryportal.enr.gov.nt.ca/geoportaldocuments/6-CIMP%20Presentation.pdf

Summary of Discussion

- No questions or comments.



Walter Bezha (Déljnę Renewable Resources Council) and Kahlea Wells (Carleton University) share CIMP229 project results.

Meet your NWT CIMP Steering Committee*:*

Your NWT CIMP Steering Committee (L-R): Simon Toogood (MVEIRB), Orna Phelan (NSMA), Sally Wong (DFO), Dakota Erutse (SSI), Lorne Napier (NWTMN), Mike Low (DFN), Tyanna Steinwand (TG), Lorraine Brekke (GNWT). *Missing – Heather Scott (MVLWB), Garfield Giff (ARI), IGC, ATG.*

Following introductions, the key functions of the Steering Committee were described:

1. Provide overall program guidance and strategic advice to NWT CIMP staff;
2. Ensure program is relevant to key decision-makers, such as Indigenous governments and various boards;
3. Ensure an ongoing balance of Traditional Knowledge and science; and
4. Promote and ensure effective cumulative impact monitoring results over the long-term.

The Panel was asked various questions:

What changes and evolutions have you seen in NWT CIMP in response to the feedback you've been getting over the years?

- NWT CIMP is open to new ideas and always collecting feedback. Staff do a great job of summarizing that feedback and bringing it to all partners.
- NWT CIMP reviews a variety of information and conducts quality control.
- The Traditional Knowledge Project Funding Guide is a relatively new initiative. There is an increasing focus on keeping more funds in the north, with more funds for northern participation and students. Prioritizing northern students and capacity building is important.
- Community concerns are increasingly being addressed through our funding proposal process. This helps ensure that funded work is as relevant as possible.
- Having broad representation makes sure everyone's community concerns are represented.

- The Committee is diverse and includes representation from different regions, boards, and governments. Its membership is quite stable, which speaks to the commitment people feel to cumulative impacts research. This is appreciated.
- Bringing such a group together to work on these monitoring projects is meaningful and helps build capacity and knowledge within our own programs.

Where do you see NWT CIMP going in the next five years? What are the new opportunities to make more good change or address important issues?

- The NWT Environmental Audit is an opportunity for feedback, concerns, and issues being put forward and shaping the NWT's five-year vision.
- How do we move forward with balancing Traditional Knowledge and science and the two ways of knowing?
- The 2020 Environmental Audit identified NWT CIMP more as a funding program than a monitoring program. We need to really make the program more relevant to decision-making by making the quality of the monitoring program more influential.
- Building for the future, there is more and more emphasis on southern researchers building capacity in the north. Looking to the future, there should be more work on the cumulative impacts of development. There are many challenges in doing that when the whole environment is changing so dramatically, such as extreme events from climate change.
- A key challenge is that funding is tight, and there are many great and deserving project applicants. The needs and concerns are there, but the funding cannot cover everything.

How do we manage the unlimited need, but limited funding issue? What are the priorities?

- There are finite resources, but NWT CIMP is currently funding 31 projects. Prioritization is key! In the next five-year Action Plan, our monitoring priorities (Blueprints) will be revised to further prioritize the funding.
- Water levels is a priority – access is a big issue for remote communities.
- Limited access caused by low water greatly impacts community-based work. Also, fish aren't showing up where they used to. Need to look at why these changes are happening?
- Upcoming environmental assessments are forward-looking and broad. We should be focusing on areas that will experience future environmental assessments to directly feed into decision-making (e.g. Slave Geological Province).
- Cumulative impacts of wildfires and droughts are a priority.

Recently, NWT CIMP has been funding northern youth to help with monitoring and research. Do you feel that the GNWT is supporting that to happen?

- The Committee has been prioritizing proposals that have northern students because it helps builds capacity, but there are limited numbers of students. Building northern capacity is a key factor in the funding decisions.
- Youth involvement is important and varies among communities. Youth-focused budgets aren't always spent, so there's work to improve their inclusion. It's hard to find people to continue their studies, so the students often aren't northern.
- You can't force interest from the youth. You can only make opportunities available and easy to access, which NWT CIMP promotes.
- Partnerships and data-sharing agreements are an opportunity to incorporate training and teaching so that once a project is over, the tools are in place when the researchers/students are gone.

Group stretch!

Day 2: Wednesday January 15th, 2025

Presentation #7 - ***Recovery of the mining-impacted landscape in the Yellowknife region (CIMP227)*** -Heather Jamieson (Queen's University)

Available at: https://nwtdiscoveryportal.enr.gov.nt.ca/geoportaldocuments/7-Jamieson_CIMP227%20presentation_Jan2025.pdf

Summary of Discussion

- Q: Is there any follow-up on how these soil and water arsenic levels impact concentrations in vegetation and wildlife?
    - There is territorial data on the vegetation and wildlife on the Giant Mine site, and some beyond. Vegetation and wildlife within the broader Yellowknife region is safe for traditional use, though not in the immediate vicinity of Giant Mine (signage on site only).
- *(Participant comment):* It's important to look at the cumulative impacts on the natural environment, and not only impacted areas.

Heather Jamieson (Queen's University) sharing project results from CIMP227

Presentation #8 - *Boreal caribou habitat enhancement – lichen habitat restoration on disturbed sites (CIMP234)* - Marc d'Entremont (LGL Consultants for Deninu K'ue First Nation)

Available at: https://nwtdiscoveryportal.enr.gov.nt.ca/geoportaldocuments/8-DKFN%20(dEntremont)%20-%20CIMP234%20Boreal%20caribou%20habitat%20enhancement%20Jan2025.pdf

Summary of Discussion

- Q: What is your favorite lichen?
    - There are 20-30 fruticose lichen species, of which we are focusing on three *Cladonia* species (*Cladonia mitis, Cladonia stellaris & Clandonia rangiferina*), which would be my favorite.

- Q: Is the lichen being transplanted similar to the lichen found on the barrenlands? Would this method work there too?
    - Yes, it's the same species group, all of which thrive in bare areas, with little nutrients available. Transplanting may be an option once we develop protocols that can be scaled up to larger areas.
- Q: What if there are catastrophic events (fire, flood) in a year you aren't monitoring?
    - Gap years are included in the monitoring program for two mains reasons. First is mostly due to cost, second, the growth of lichen is slow, and there would be very little added benefit or notable changes expected by monitoring every year.
- Q: Do boreal and barren ground caribou start using remediated lichen at the same time?
    - Currently, there is no information on this. The patches we are remediating are also too small to expect any results on this.

Presentation #9 - ***Environmental and human factors that best predict boreal caribou survival and population trends in the NWT (CIMP247)*** - James Hodson (GNWT, Environment & Climate Change)

Available at: https://nwtdiscoveryportal.enr.gov.nt.ca/geoportaldocuments/9-Boreal_caribou_survival_project_CIMP_results_workshop_presentation_Jan2025_v4.1.pdf

Summary of Discussion

- Q: Were you surprised by any of these results?
    - Yes, the positive impact of younger burns was surprising, but after comparing to the habitat selection models, we believe the younger burns are providing high quality food as the burn regrows. Slightly older burn sites are still avoided.
- Q: The Bluenose East herd has had a couple of good years, with lower insect abundance and harassment. Are boreal caribou also affected by insect harassment and could this explain any of these surprises?
    - It might, with hot dry summers likely being beneficial for reduced insect harassment. We are hoping to test this by using insect harassment indices that combine temperature, precipitation, and wind as a next step.
- Q: BC and AB boreal caribou come up into NWT and vice versa. Are you working with the areas impacted by coal mines in Alberta? Does that impact NWT caribou?

    - Those mines are too far away for the NWT boreal caribou to be impacted, but yes, we are working with transboundary partners for mines closer to the border. The proposed Pine Point mine is likely of greater interest as there is already a high density of linear disturbances in that area, and caribou avoid linear disturbances.
- Q: How will these results impact range planning and policy? It seems like uncontrollable factors (fire, snow depth) are the largest impact.
    - We aren't going to do anything differently. Right now, we must work with Critical Habitat under the definitions set by ECCC for boreal caribou.
    - The next step is to pitch these model improvements to ECCC. We will want to forecast the future, and make sure that our range plans incorporate the best available future climate and fire predictions.

Presentation #10 - *North Slave Métis Alliance's Guardianship program, a two-eyed seeing approach to northern conservation* - Orna Phelan (North Slave Métis Alliance)

Available at: https://nwtdiscoveryportal.enr.gov.nt.ca/geoportaldocuments/10-NWT%20CIMP%20results%20workshop%20Jan%2015%202024.pdf

Summary of Discussion

- Q: How much of the heavy traffic flow is personal vs transport trucks from the mines?
    - Great question but is hard to answer. Last year, the condensed winter road season meant that haul traffic frequency was increased as the mine had to get all their loads completed in a shorter time frame.
    - The mines do track their own traffic, but previously no one has tracked personal vehicles.
    - This year will be the first year with traffic counters.
- Q: Is there data to compare to Ekati on site and road crossings there?
    - Yes - this is a next step for the Fate of the Caribou team that we are working with. They are starting to look at permeability of the road.
    - From our observations, it seems caribou avoid crossing the road during times of heavy traffic but we have seen them cross the road when there is no traffic.
- *(Participant comment):* Concern about the word "integrating" in relation to Traditional Knowledge and science. Would prefer to think of it as "assisting" – one science assisting another science.

- *(Participant comment):* Wonderful to see this project as wanting to help the caribou. It makes us all happy to hear these positive stories, and to see multiple organizations working together. With regard to meat wastage, we have a good idea who is wasting caribou and we want to help them do better. It requires more knowledge of traditional practices.

NSMA's Orna Phelan (at microphone), Wayne Mercredi and Shirley Coumont share project results and experiences

Introduction to the NWT CIMP Action Plan – Lorraine Brekke, NWT CIMP (GNWT-ECC)

Available at: https://nwtdiscoveryportal.enr.gov.nt.ca/geoportaldocuments/NWT%20CIMP%20-%20Informing%20the%20Action%20Plan%20(2026-30)%20-%20Jan%202025.pdf

Summary of Discussion

- No questions or comments.

Video Presentation:

Workshop participants enjoyed a NWT CIMP project results video titled CIMP216 – K'ahsho Got'ine Foundation Guardians – Water Monitoring (Environment and Climate Change Canada). It was one of several short videos highlighting various NWT environmental monitoring and research initiatives. All NWT CIMP videos are available at www.nwtcimp.ca.

Talking Circles - Breakout Group Discussions

Throughout the workshop, interactive and smaller-group discussions (Talking Circles) were held to promote dialogue and gather feedback and observations based on presented projects. The final Talking Circle focused on gathering input into the NWT CIMP Action Plan for the next five years. The following section summarizes these discussions. The Talking Circles are idea generating exercises and did not focus on building consensus. The ideas shared in this summary represent the contributions of all participants, and do not necessarily reflect the opinions of GNWT and NWT CIMP. Feedback on projects was taken by researchers who were present at the workshop and will be used to inform their future monitoring and research efforts.

Day 1: Talking Circle #1:

- **Q1: What changes in water and fish are you most concerned about?**
- **Q2: What stressors are you most concerned about related to water and fish?**
- **Q3: What priorities and research questions would assist decision-making?**

Q1: What changes in water and fish are you most concerned about?

Concerns about changes in fish populations, habitat and health

- Changing fish migrations, spawning times, availability, and predictability
- Changing fish species and range expansion
- Fish health and quality is worse (poor taste, soft tissue, more and different parasites)
- Fish eggs in Lac de Gras are smaller
- Food security: salmon, inconnu, suckers, grayling are unpredictable, not where and when they used to be
- Commercial fish – concern about soft flesh, contaminants, need to meet guidelines to sell fish
- Over-fishing due to visitors/tourism
- Having to check nets more frequently due to warmer waters (increase in time = decrease in interest in fishing)
- Orange floaters (Peel River and elsewhere)

Water temperature and flow

- Changing water temperature
- Increased water temperatures (mainly lakes) are impacting fish and their habitat
- Warming surface water in rivers over the last 20 years; drought is exposing sediment and reducing/changing access
- Lower flow levels affect fish spawning, migration, and transportation
- Long-term projections for water flow for the Slave and Mackenzie rivers
- Wildly changing water levels in rivers, streams, and lakes
- Ice thickness is worse (not as thick on rivers, lakes & ocean)
- Change in length of time for freeze-up and break-up

Water quality and contaminants

- Contaminants and microplastics uptake in ecosystems
- Increased bacteria (bloom, algal, cyanobacteria) changing from climate
- Water quality – drinking water is affected since 2023 ash deposits and added fire retardant and algal blooms – is the water safe for wildlife to drink?
- Permafrost thaw slumps/erosion into waterways that impact fish
- Drilling fluids into water in the Sahtu
- Concern with treated tailings release, oil sands, pulp mills, oil and gas, dams (Bennett and Site C)
- Release of arsenic into aquatic systems

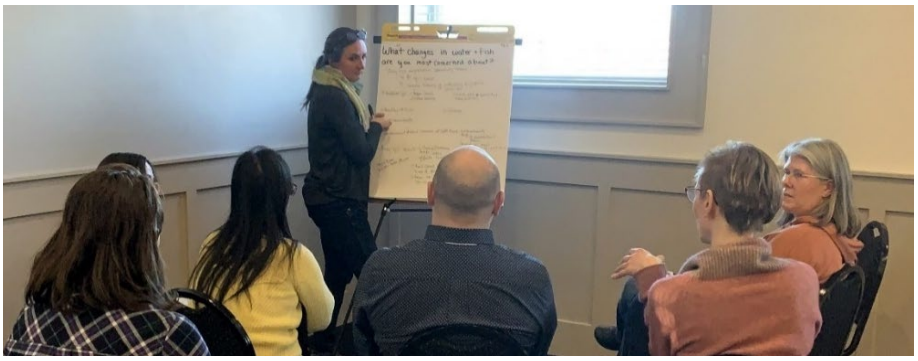
Climate change and ecosystem impacts

- Impacts from climate change (ecosystem, animals, birds, fishes, pathogens)
- Changing relationship between drought, fire, and wetlands (impacts on aquatic systems)
- Effect of fires on fish habitat (e.g., debris/ash falling into spawning areas)
- How permafrost thaw impacts groundwater quality and quantity – things are changing fast

Policy, Management, and Data Gaps

- Is our legislation enough to ensure good water quality and quantity? Everything is less predictable – fishing, boating, safety, ice safety – seasonal changes
- Transboundary issues/challenges (disparity of research between Alberta and NWT)
- Lack of groundwater information in general
- Lack of relevant baseline data – harder to understand how to use baseline when things are changing so rapidly

- Respectful and sustainable use; management should recognize “personhood,” spiritual, and cultural aspects



Q2: What stressors are you most concerned about related to water and fish?

Climate change and environmental changes

- Climate Change!
- ‘Grasshopper effect’ – stressors continuing to increase and accumulate
- Extreme weather changes (timing of precipitation, winter fires, extreme storms, drought, flooding)
- Changes in freezing of lakes (transportation access), wildfire debris in lakes
- Increased air and water temperatures (impacts succession, pH, spawning, fish taste, etc.)
- Water levels (droughts, flooding, evaporation increase)
- Permafrost thaw and landslides, slumping (impacts water quality and groundwater, layering and stratification, etc.)
- Land use/cover - fire (increase in severity and frequency)

Water quality and contaminants

- Algal blooms (impacts to drinking water)
- Contaminants (mercury, arsenic, ash, phosphates, microplastics, industry pollutants)
- Long-term impacts of contaminants (stressors of pollutants and the interrelationships on humans and environmental health)

Industry and human stressors

- Water flow from hydropower and dams (existing and proposed)
- Industry (local and transboundary) – Crown authorized, artificial islands, oil sands/coal mines in Alberta, historic development without reclamation, rare earth elements without guidelines

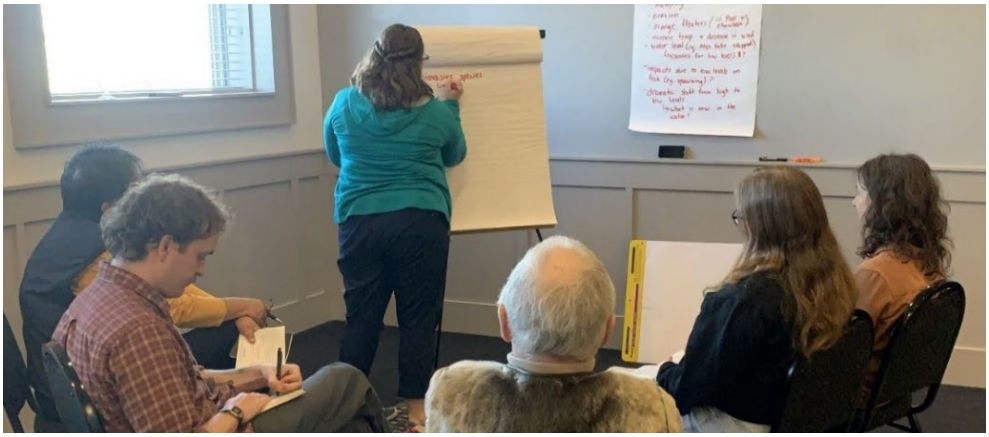
- Human disturbances (ocean tankers, roads, mines, more recreational vehicles, over-fishing/under-fishing, tourism, catch & release, noise, potential to contaminate, sewage, garbage, etc.)
- Poor communication

Ecological and biological stressors

- Invasive species are changing food webs/competition,
- More terrestrial inputs
- Impact water quality and aquatic ecosystems (lower fish habitat quality)

Other

- Lack of consultation and regulations/standards from First Nations perspectives
- Decrease in traditional use and traditional harvesting practices; losing connection to water and fish and less access. People are part of the ecosystem.



Q3: What priorities and research questions would assist decision-making?

Research approaches and data needs

- When is baseline relevant in a rapidly changing environment? (need more baseline data)
- Research and monitoring need to be community-driven (at local and regional scale) with local harvesters (builds trust)
- Need opportunities to research untouched lakes/waters
- Data standardization, management, and sharing
- Knowledge sharing is key; need to explain back to communities how their knowledge impacts decisions

- Decision-makers use best available information with forward-thinking (developing policies, open-mindedness)
- Understanding processes and stressor factors influencing the scale of a project (e.g., water levels, water quality)
- Knowing when information from one area can be transferable to another (Can we use information from one area to another, or does new data need to be collected?)
- Use all knowledge sources (Traditional Knowledge, local, scientific) to blend with science to co-develop research questions
- Look at how to use new technology to monitor and share information and support gaps
- More forecasting and back-casting - projects must respond and adapt
- Capacity: to go through the data and gather, monitor
- How good is the research behind a decision? (need long-term data)

Fish health and fisheries management

- What is the health of fish? (abundance/populations, contaminants, quality)
- Where are the fish going and how are movements changing?
- Predictions of fish species in warmer temperatures in freshwater
- Fishery monitoring of impacts from industry (need more enforcement)
- Connections to fisheries/environment

Water quality, safety, and availability

- What is the health of water? (is it safe to drink? Is it safe for fish?)
- Clean drinking water for fish and wildlife – data sharing and collection
- Being able to access clean drinking water while out on the land – critical for ability to travel long distances without having to pack water
- What is causing water level changes?
- What are drivers to lake water levels and how do we manage it?
- Algae blooms and source water protection
- Impacts of illegal dumping to water and land – could increase dump fees
- What impact does salt have on road runoff to water?
- Can mercury be magnetized (removed) from water?

Climate change and environmental changes

- How do we slow down climate change?
- Climate change modelling – changing fast; need information to help with project closure planning, air pollutants (transboundary and global)
- Could the Mackenzie River flow reverse with all the changes happening?

- Adaptive management – solutions, urgency, ways to adapt, do something regarding uncertainty, flexibility to keep adjusting
- More forecasting and back-casting - projects must respond and adapt
- Understanding long-term trends despite recent climate extremes
- Understanding how different ecozones impact water levels
- Need holistic monitoring – on long-term pollution accumulated in NWT water systems and their interactions (especially in Sahtu)
- What are the impacts of change of precipitation on vegetation, landscape, muskeg? Berry productivity: amounts and patterns
- Need more precipitation data (lack of climate stations in the NWT)

Wildfire and fire impacts

- How does fire and firefighting impact fish and fish habitat?
- Management of forests, especially around communities – old forest close to a community

Contaminants, pollution and disease

- Diseases – impacts of transmission through the food chain
- fate and transport of chemicals
- Sumps – need new regulations, address sump destabilization and release of fluids
- Long-term impacts of contaminants (stressors of pollutants and the interrelationships on humans and environmental health)
- Shift our thinking to ensure environment comes first (zero-tolerance to pollution and limits)

Knowledge systems and Indigenous perspectives

- Indigenous Sovereignty and Dene Law! Think holistically!
- Link Traditional Knowledge (TK) to science (making licenses relevant to land users)
- Proper consultation and dialogue in the research planning
- Prioritize Traditional Knowledge
- Knowledge systems need to have respect and relationships – with fish, with water

Governance and regulatory

- “User pay” from transboundary projects impacting NWT
- More transparency in research, methods, and results is needed
- Set of principles for NWT CIMP researchers, regulators/GNWT
- Coordination/sharing with Department of Infrastructure and other decision-makers to share concerns/risks

- Enforce current regulations and agreements (e.g., spills, access, etc.)

Other

- What are the underground connections between lakes in Edehzhie area?
- Water reservoir design, location, and use (Jean Marie and Sambaa K'e: lake may be better because of wind)
- Engage with youth
- Do we really know what the impacts of a project will be?
- Food security/travel

Day 2: Talking Circle #2:

- **Q1: What changes and stressors to caribou are you most concerned about?**
- **Q2: What priorities and research questions would assist decision-making?**

Q1: What changes and stressors to caribou are you most concerned about?

Caribou health and population trends

- Decreased abundance and health is URGENT (caribou have less fat, insect harassment, changing feeding behaviours, population decline)
- Invasive species and diseases (increased deer and wild pigs)
- Insect harassment
    - Results in loss and injury
- Changes in migration patterns and herds
- Predators (e.g. grizzlies on calving grounds)
- Invasive vegetation (how will new plants impact caribou?)

Human Disturbances

- Road impacts (especially proposed Lockhart All Season Road)

    - Need weigh stations and better management and enforcement
    - Concern with road design, maintenance and impacts to waterways (hydrocarbons and spills)
    - Impact to calving grounds, eskers and migration routes
    - Increased harvesting access by people, tourism/outfitters
- Impacts from industry and linear development
    - Uranium effluent (overall increase and impacts to access, land and wildlife)
    - Noise, access by humans, induced development, mines, infrastructure, oil and gas operations
    - Changes and loss of habitat
- Overharvesting and management (including moose)
    - Habitat location is changing (safety concern when harvesting)
    - Easy access via roads
    - No limits per person – what is the rationale for the number of tags per community?
    - Limited traditional methods – increased use of firearms (safety concern)
    - Wastage and ability to process meat
    - Tourism/outfitters
    - Commercialization and poaching of meat (should be shared)
- Long-term and airborne contaminants
- Disconnect between ECC enforcement and Guardship capacity and observations. Need better enforcement and policies

Climate change

- Short and long-term impacts from droughts, fires, air quality, permafrost changes to vegetation/land stability, tundra fires, etc.
- Timing of seasons are shifting
    - Migratory birds are changing their routes
    - Movements of animals are changing
    - Community harvests are shifting (in January now)

Water

- Caribou can become stuck in overflow
- Timing and amounts of extreme conditions
- Lack of freshet (changes in when freeze-thaw occurs. Can caribou adapt to these changes?)
- Impacts of caribou water crossings during migration

Other

- Unknown stressors

- Lack of access to data
- Ask the caribou – listen, watch, understand

Q2: What priorities and research questions would assist decision-making?

Caribou health and population trends

- Boreal population trends and assessment (using respectful methods)
- Interactions between herds
- Are caribou adaptive to changing interseason patterns?
- What is the overall health?
    - Look at changes from stressors and impacts
    - Diseases (including Chronic Wasting Disease)
- What are the 1 or 2 key factors that are affecting populations?
- Need baseline and ongoing monitoring – WITH CONSULTATION
- Alternative methods for surveys (outside of collaring and that minimize impacts of aerial surveys) for population, health
- Predator-prey relationships and cycles (e.g. wolves)
- Impact of the presence of muskox on caribou (food access, added predators, migration patterns, changes to habitat due to muskox behaviour)
- What were the impacts/results of the wolf culling project on caribou and ecosystems?

Climate change impacts on caribou and habitat

- How does climate/weather influence insect harassment and diseases/parasites (especially in Boreal caribou)?
- How does logging after fire impact the effects of fire on caribou?
- Wildlife management in the boreal forest (alternatives to fire suppression to help caribou)
- Are proponent's mitigation strategies working – which ones are best?
- Caribou thresholds, resiliency, and recovery strategies
- Where and how can core calving ground habitat be protected for fire management?

Linear and other industrial disturbances

- Methods to minimize the effect of linear disturbances on the land through design solutions or development standards (co-developed with Indigenous communities)
- Mitigation for/from linear development
- What mitigations/changes would 'improve' how caribou behave around roads and development?

Traditional Knowledge, Indigenous participation and cultural impacts

- Impacts on culture, practices, traditional living, and teaching from Elders
- Decision-makers need to have a better understanding of the cultural importance of caribou (needed when deciding on significance)
- How can Dene law (and other Indigenous respectful practices/principles) go into harvest and natural resource management law? Should be included in NWT CIMP projects.
- Pass down Elder knowledge to current hunters (include how to use all parts of the animal) to help address wastage and disrespectful harvest
- ASK THE CARIBOU – what is their perspective, story, experience? What would they say from collected data?
- Report back in Indigenous language with visuals and infographics
- How are Indigenous people meaningfully participating in the research or shaping frameworks/methodology?
- Follow First Nation stewardship laws (e.g. Dene Conservation Caribou Plan in Deline)
- Education on respectful harvesting (using Guardians) and better protection policies and enforcement
- Indigenous-led reclamation planning (frameworks, effectiveness studies)

Research methods, collaboration, and data

- Need better transboundary and federal collaboration
- Funding research on stressors
- Multi-variable analysis (what are the biggest factors?)
- Research data sovereignty – need funding for communities, not researchers
- Need baseline and ongoing monitoring – WITH CONSULTATION
- Mapping and modelling

Other

- Holistic approach (nature is interconnected)
- Identifying core land areas as ‘values at risk’ (more specific than the full range)
- How to remediate with native lichen as good sources of food for caribou?

Day 2: Talking Circle #3:

- **Q1: How best may NWT CIMP provide communications and share information that is important to you?**
- **Q2: How can NWT CIMP help foster improved data availability?**
- **Q3: How can NWT CIMP foster more/better coordination and collaboration between funded projects in the NWT?**

Q1: How best may NWT CIMP provide communications and share information that is important to you?

Accessible, timely and targeted sharing of information

- Must be timely and accessible (as it becomes available)
- More reporting on how NWT CIMP work is impacting/influencing decisions with examples (critical pathway)
- How is NWT CIMP measuring public access/use of information?
- Expand distribution list for the NERB's (contact person may not disseminate NERBs)
- Produce specific distribution/subscription lists (geographically? By topic?)
- Information needs to get to the right person
    - Knowing who the contact is in each community is needed (and kept current)
    - Update the list annually (perhaps through SC member?)
- Regional plain-language summaries (like NERBs) presented of NWT CIMP projects
- Report in all Indigenous languages
    - Use appropriate figures (images and pictures instead of graphs)
    - Use accessible font
    - Always include handouts with presentations
    - Re-think PowerPoint as the delivery format
    - Understand your audience!

    - Build relationships and trust
- Interpretation of results
    - Use of key messages in plain language in presentations or results
    - Use appropriate language
    - Plain language is key!

Communication channels & outreach

- Use multiple social media platforms to reach a wider audience
- Radio (Cabin, CBC, CKLB for community and researcher interviews)
- Videos for the community level (re-share past project videos and make searchable in the Portal)
- Handouts and printouts (including visuals, infographics & storyboards)
- Develop postcard to explain how NWT CIMP works (Coffee Talk News, inserts in mailbox)
- More promotion and information about NWT Discovery Portal and Mackenzie Datastream
- Include project list on NWT CIMP website in user-friendly format
- Themed NWT CIMP website by Valued Component (caribou, water, and fish)
- Development of new apps should be prioritized

In-person communication and relationship building

- NWT CIMP staff should attend and present at more in-person meetings (easier to understand than emails)
- Outreach to schools (all level grades) and show students real examples
    - Could researchers go to classrooms?
    - Could students get academic credits?
- Interview community members for their stories
- NWT CIMP staff could directly share project results to the Boards and/or coordinate meetings with researchers (set-up meetings, not just emails)
- Need regular and more in-person meetings with regulators and researchers (need to know what is feasible)
- Participate more actively and provide expertise in regulatory processes from a cumulative impacts perspective and put specific results/information forward
- NWT CIMP Steering Committee should share information with their organization

Support proposal development

- Provide and receive more constructive feedback on unsuccessful funding proposals

- Provide proposal writing workshops, more guideline documents, sample proposals as helpful examples (tips & tricks)
- Provide clear direction and feedback in request for proposal letter

Coordination, networks and capacity

- Distribute list of NWT CIMP projects to regions and leadership
- Boards and other decision-makers need information directly to their inbox based on specific interests (need specific outreach as it's inundating to have everything!)
- Land and Water Boards have limits to put information forward that other parties need (information isn't always being included)
- What products can regulators/co-management boards use?
- NWT CIMP functions as research and needs more staff
- Ensure Board priorities are included in NWT CIMP's priorities (Monitoring Blueprints)

Other

- Look at past projects and find examples of projects that took a holistic approach (current example with boreal caribou)
- Environmental Audit is an important tool - how can communities be more involved?
- Is identifying 'NWT CIMP' or 'NWT CIMP funded' projects important?
- Understanding reference conditions
    - How to build this into research questions?
    - Is this NWT CIMP's role? Need to assess CI
    - Is this GNWT's role? NWT CIMP could be better involved to meet and share what is happening

Q2: How can NWT CIMP help foster improved data availability?

Data accessibility and availability

- Make access to current data faster and easier
- Accessibility of raw data and metadata to all (including communities)
- Need a list of where to find NWT data sources (what exists and who owns it?)
- Finding data and information can be difficult on the Discovery Portal (improve search function)
- Monitor what groups are accessing Mackenzie Datastream

Data sharing and ownership

- Make it easy for direct communication to data holders/owners
- Data sharing protocols between organizations collecting data (platform management) and agreements between communities/IGIOs and researchers

- Must get permission from the community to use data (need ongoing communication)
- Help support funding with OCAP Principles
- Building policy around data-sharing

Data collection and standardization

- Develop guidelines for data collection and support projects that train community members
- Develop guidelines for collecting data and support projects to develop technicians that will help with sample collection
- Develop systematic standardized template (spreadsheet) to present and analyze data (minimal parameters to analyze when sampling, between eco-regions, etc.)
- Ensure that data and results are validated
- Mandate that a spatial data layer be developed

Technology and infrastructure support

- Holistic platform for all data and guidance on what platform options exist
- Explore and use Artificial Intelligence and other 'new' technologies
- Internet and technology access and bandwidth is an issue in communities (what are alternatives?)

Mapping and visualization

- Need a map of sampling areas for all NWT CIMP-funded projects
- Data sources and incentives (e.g. mines & weather data)

Collaboration and capacity building

- Encourage collaboration between funded projects to help involved organizations (e.g., YKDFN, TG, NSMA, and winter road tailgate meetings)
- Support toward Guardian programs working together (share skills, findings, and include researchers)

Q3: How can NWT CIMP foster more/better coordination and collaboration between funded projects in the NWT?

Strategic project coordination and support

- NWT CIMP should not only rely on people to propose projects – it should also spearhead funded projects that directly inform the decision-making process in a strategic manner
- Projects need to be determined based on:
    - The information required to understand the current state of VCs relied on for the practice of rights
    - The cumulative impacts affecting VCs
    - Measures to protect them
- Geographic/monitoring and research centers within specific areas prioritized

Help connect people and support relationships at the community level

- Connect researchers who are interested in similar questions (helps with capacity)
- Host workshops and gatherings such as online meetings about projects (e.g., lichen studies past and future)
- Researchers should follow Dene Laws and ways of the community to build relationships and trust in communities before/during/after work

Knowledge sharing and capacity building

- Knowledge-sharing transfer agreements and templates when staff/researchers leave
- Continue to encourage funded projects to engage with other researchers/projects at project development and inception level (need a list of contacts for all researchers)
- Offer employment opportunities for a community-based research coordinator by region/topic or management area

Improving and incentivizing collaborative processes

- Data standardizations – projects should use the same methods for collection and parameters analyzed
- Knowledge sharing must accommodate a variety of decision-makers; need for results to be shared in different ways
- Where there are overlapping interests/programs, look at 'where are the bottlenecks'
- Look at the Polar Research Projects Model
- Award recognition of good work (highlight innovative projects)

Guardian Programs

    - Standard methods/approaches

    - On-land camp/field manuals
    - Collaboration/assisting each other (foster a Contact List)
- High costs to do research and monitoring in the north are a challenge (NWT CIMP can help fund synergies between projects to pool funding)
- Collaboration funding for past and current projects to work together (NWT CIMP could help with logistics, not just topics)

Additional Comments Captured Throughout Workshop

- Three years for a NWT CIMP project is not enough time to get results
- NWT CIMP scope is narrow – one-off projects
- Knowledge holders are all generations!
- Inclusion of UNDRIP at all levels
- Research questions need to come from community priorities
- Research application should be going directly to the appropriate First Nation or IGIOs and they can approve it (not the GNWT approving which is not respectful of sovereignty)
- Investigate sewage smells in some lakes (i.e., Vee Lake)
- Need funding for smaller IGIOs for capacity-building
- Need better transparency of transboundary issues (BC/Alberta)
- Lack of community presence at this workshop
- We should have talked about the impacts of our communities on water and fish (road, garbage, water use, sewage, pollutants etc.)
- There is too much garbage in YK from Tim Horton's and McDonald's thrown out everywhere – what is anyone doing to reduce this?
- Junk is being discarded along the roadsides in all communities

Appendix A: Agenda

FINAL AGENDA

NWT ENVIRONMENTAL MONITORING RESULTS WORKSHOP

January 14-15th, 2025

Chateau Nova Hotel – Caribou Room

4571 – 48th Street, Yellowknife, NT

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The Government of the Northwest Territories Department of Environment and Climate Change (GNWT-ECC) ***NWT Cumulative Impact Monitoring Program*** *(NWT CIMP), the* ***Yellowknives Dene First Nation*** *(YKDFN), and the* ***North Slave Métis Alliance*** *(NSMA) and are co-hosting a workshop.*

OBJECTIVES:

The workshop objectives are to:

- Bring together researchers, community members, and NWT decision-makers to share results of environmental monitoring related to **caribou, water, and fish;**
- Provide a **forum for discussion** between researchers, communities and northern decision-makers. Feedback from these discussions can **improve related projects and programs;** and
- Get feedback for NWT CIMP to help develop the program's next five-year Action Plan (2026-2030).

INFORMATION:

Copies of presentation abstracts, presentations and a summary report will be available on the NWT Discovery Portal. For additional details, contact nwtcimp@gov.nt.ca or 867-767-9233 ext. 53084.

Tuesday, January 14th - DAY 1

Time	Activity	Lead
8:30 am	Arrival, Coffee and Connecting Registration	
9:00 – 9:45	Welcome, Opening Prayer, Drumming and Introductions • Opening remarks by YKDFN, NSMA & GNWT • Agenda review	Facilitator *(Roxane Poulin)*
9:45 – 10:05	• Presentation #1 - *About the NWT Cumulative Impact Monitoring Program (NWT CIMP) and Results Information*	Lorraine Brekke *(GNWT-ECC, NWT CIMP)*
10:10 – 10:30	**Water and Fish Related Projects:** • Presentation #2 - *Unravelling the cumulative effects of climate change and permafrost thaw on streamflow in the southern Taiga Plains (CIMP226)*	Stephanie Wright *(Queen's University)*
10:30 – 10:40	**BREAK**	
10:40 – 12:00	• Presentation #3 - *Fish mercury in Dehcho Lakes (CIMP154)* • Presentation #4 – *Is Our Water Good to Drink? (CIMP230)* • Presentation #5 – *Understanding the cumulative impacts of beaver activity on stream health in the Inuvialuit Settlement Region (CIMP231)*	Mike Low (*Dehcho AAROM)* & Heidi Swanson *(University of Waterloo)* Diane Giroux *(Akaitcho AAROM)* & Corrine Schuster-Wallace *(University of Saskatchewan)* Jordan Musetta-Lambert *(Environment Climate Change Canada)*
12:00 – 1:00	**LUNCH** (provided in meeting space)	
1:00 – 1:20	• Presentation #6 - *Understanding Cumulative Impacts on Dene Ts'įlį and relationships to Fish through knowledge mapping in Déljnę (CIMP229)*	Walter Bezha (*Deline Renewable Resources Council)* & Kahlea Wells (*Carleton University)*
1:20 – 3:00	**Talking Circle #1 – Related to Water & Fish:** **Guiding questions for discussion** • What changes in water and fish are you most concerned about?	Facilitator

	• What stressors are you most concerned about related to water and fish? • What priorities and research questions would assist decision-making?	
3:00 - 3:10	**BREAK**	
3:10 – 4:15	**Meet your NWT CIMP Steering Committee*:*** • Introductions and Perspectives	Facilitator (with NWT CIMP Steering Committee members & observers)
4:15 – 4:30	**Wrap-up and Summary of Day 1**	Facilitator

Wednesday, January 15th - DAY 2

8:30 am	Arrival, Coffee and Connecting	
9:00 – 9:15	Welcome and Opening Comments • Highlights from Day 1 • Review of Agenda	Facilitator
9:15 – 10:15	**Caribou & Land Use Projects*:*** • Presentation #7 - *Recovery of the mining-impacted landscape in the Yellowknife region (CIMP227)* • Presentation #8 **-** *Boreal caribou habitat enhancement – lichen habitat restoration on disturbed sites (CIMP234)*	Heather Jamieson *(Queen's University)* Marc d'Entremont *(LGL Consultants for Deninu K'ue First Nation)*
10:15 – 10:30	**BREAK**	
10:30 – 11:30	• Presentation #9 **–** *Environmental and human factors that best predict boreal caribou survival and population trends in the NWT (CIMP247)* • Presentation #10 – *North Slave Métis Alliance's Guardianship program, a Two-eyed seeing approach to northern conservation*	James Hodson *(GNWT-ECC)* Orna Phelan *(North Slave Métis Alliance)*
11:30 – 12:00	**Introduction to the NWT CIMP Action Plan** • Overview of current Action Plan • Expectations for afternoon session	Lorraine Brekke *(GNWT-ECC, NWT CIMP)*

12:00 – 1:00	**LUNCH** (provided in meeting space) • Video Presentation – Preview 1-2 short videos highlighting various NWT environmental monitoring More NWT CIMP videos are available at www.nwtcimp.ca	
1:00 – 2:00	**Talking Circle #2 – Related to Caribou:** **Guiding questions for discussion:** • What changes and stressors to caribou are you most concerned about? • What priorities and research questions would assist decision-making?	Facilitator
2:00 – 2:15	**BREAK**	
2:15 – 4:15	**Talking Circle #3 - The NWT CIMP Action Plan (2026-2030)** Discuss NWT CIMP plans for the next 5 years in breakout groups **Guiding questions for discussion:** • How best may NWT CIMP provide communications and share information that is important to you? • How can NWT CIMP help foster improved data availability? • How can NWT CIMP foster more/better coordination and collaboration between funded projects in the NWT?	Facilitator
4:15 – 4:30	**Wrap up, Closing Comments and Closing Prayer**	Facilitator
4:30	**Adjourn**	

Mahsi Cho - Thank you for participating!

Appendix B: Attendee List

Name	Email	Organization
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