Government of
Northwest Territories

Research Bulletin

NWT Cumulative Impact Monitoring Program

New decision-support tools for understanding cumulative impacts on barren-ground caribou in the NWT

Summary

A better understanding of the future cumulative impacts on barren-ground caribou is necessary for wildlife management. We developed three decision-support tools in collaboration with the Gwich'in, Sahtú, Wek'èezhìı Renewable Resources Boards, and the Wildlife Management Advisory Council (RRBs). These tools help predict the cumulative impacts of climate change, project development, and management strategies on the habitat quality and population dynamics of the Cape Bathurst, Tuktoyaktuk Peninsula, Bluenose-West, and Bluenose-East herds of barren-ground caribou.

Why is This Important?

To make informed decisions and recommendations on barren-ground caribou, decision-makers, such as RRBs, need to understand the potential cumulative impacts of landscape changes, along with the impacts of different management strategies, on herd dynamics and habitat quality.

Bluenose-West caribou in Tuktut Nogait National Park. (Credit: Parks Canada).

What Did We Do?

We developed three decision-support tools to simulate and assess cumulative impacts on barren-ground caribou:

1. *Landscape change simulation model* – This model simulates habitat and vegetation changes by forecasting changes in climate, wildfires, shrub expansion, and human land-use.

2. *Population dynamics simulation models* – These models simulate how populations for each herd may respond to changes in climate, vegetation, land-use, harvest levels, and vital rates, such as recruitment and calf/adult female survival.

3. *Indigenous knowledge summaries* – Summaries of publicly-available Indigenous perspectives and observations on the trends and factors affecting caribou populations, habitat, and health.

What Did We Find?

All the decision-support tools provided useful insights. For example:

• Future climate change and land-use development is expected to lead to landscape changes, impacting caribou habitat quality.
• Conditions that contribute to reduced and highly variable populations include:
  ▪ High variation in climatic conditions and plant growth;
  ▪ Loss of caribou habitat (quality or area) associated with climate change; and
  ▪ High rates of harvest.
• There's a high level of consistency in harvester observations about caribou population, habitat, and health from the Inuvialuit, Gwich'in, Sahtú, and Tłı̨chǫ regions.

What Does This Mean?

These tools are available to decision-makers and will help them understand cumulative impacts on the four herds of barren-ground caribou. The models are informed by different ways that caribou are impacted, based on evidence. Scenarios are run to compare and assess the impacts of potential future landscape and climate change. The Indigenous knowledge summaries provide a first step towards braiding Indigenous knowledge into collaborative scenario analyses of cumulative impacts to caribou and their habitat.

What's Next?

We will expand the project to the Bathurst herd, continue to improve our models, and build capacity by training technical staff on using these decision-support tools.
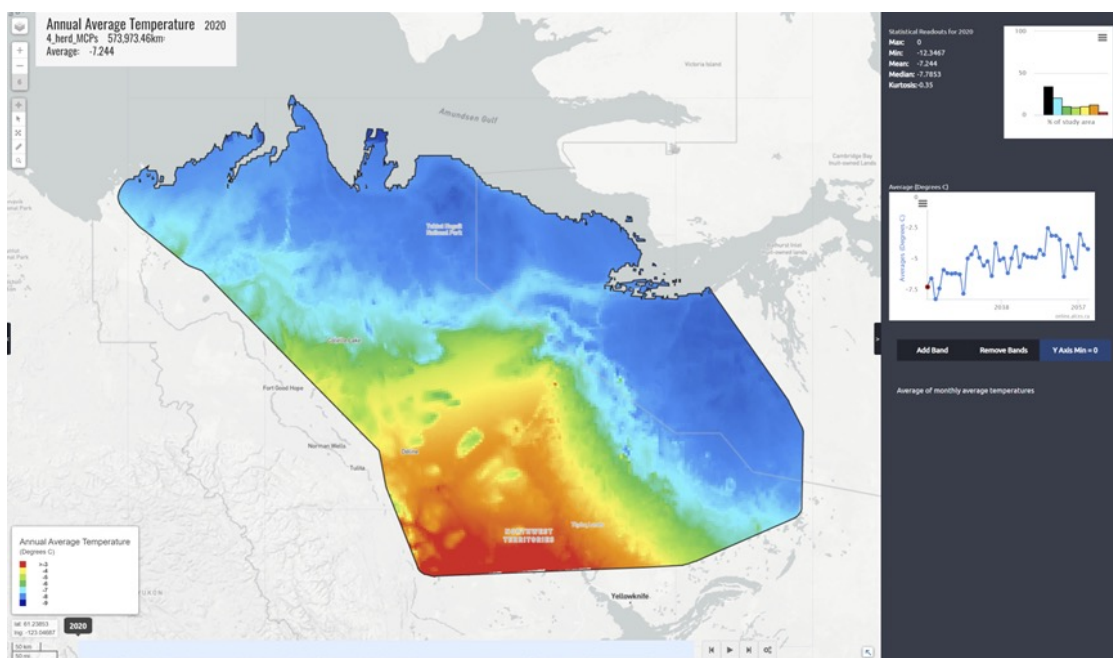
For More Information

Example of a simulation output of mean annual temperature from the landscape change simulation model. The map on the left is showing a snapshot of mean annual temperature in 2020 across the range of the four herds of barren-ground caribou. The line graph on the right shows the predicted changes in mean annual temperature with climate change from 2020 to 2060.

NWT CIMP is a source of environmental monitoring and research. The program coordinates, conducts and funds the collection, analysis and reporting of information related to NWT environmental conditions. If you're conducting environmental monitoring and research, consider sharing your information with northern residents and decision-makers in a Bulletin.