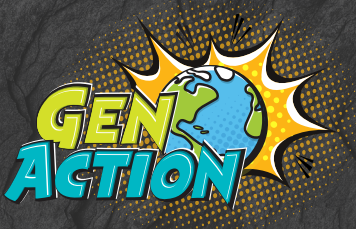


SCIENCE **SPOTLIGHT**



NORTHWEST TERRITORIES: HOW CLIMATE CHANGE IS IMPACTING NORTHERN FOOD SYSTEMS

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Northwest Territories: How Climate Change Is Impacting Northern Food Systems

Déjıne Community

Spanning deep into the Canadian Arctic, the Northwest Territories is covered with both tundra and boreal forest and is home to many First Nations communities. The community of Déjıne is one of them, where the Sahtú Dene or more specifically, Sahtúgot'ıne e (meaning Bear Lake People) have lived, governed, and stewarded the Déjıne District region for millennia, including Tsá Tué (or Great Bear Lake), the largest lake wholly contained within the borders of Canada.

This Indigenous community is home to about six hundred people whose culture, laws, language, and spirituality are all inherently connected to the lake and surrounding land which they rely upon. The Déjıne community is the only settlement on Great Bear Lake and is only accessible by air, boat, or winter roads (seasonal roads that run over frozen land and frozen water). When winter roads are not in operation, the remote community gets its supplies delivered by cargo flights.

Northern Canadian ecosystems are changing at a rapid pace. Making up almost 55 percent of Canada's landmass, this region is warming at nearly four times faster than the average global rate. A changing ecosystem means that food sources for people are changing too. Around Great Bear Lake, the Sahtúgot'ıne have noticed these impacts, and now are in need to prepare and adapt their food system to these changing conditions.

Adapting Food System

As with many other Indigenous communities, the Sahtúgot'ıne rely greatly on the land and water for their well-being. For this reason, the health of the people is directly linked to the health of the ecosystem that they live in. Because of this deep interconnected relationship, the Sahtúgot'ıne have undertaken monumental efforts to protect their rights to the land and stewardship practices.

The establishment of the Tsá Tué UNESCO Biosphere Reserve in 2016 is part of this historical and ongoing work by the Sahtúgot'ıne to protect the Great Bear Lake Watershed for all time. To help fulfill this mandate, a team of researchers from Wilfrid Laurier University came together to work with community members and local organizations to study the impacts of climate change and build a community response plan. The plan demonstrates that changes to land and water impact food sovereignty, where it relies on traditionally harvested foods in accordance with cultural laws and ways of knowing and is less dependent on food shipments from the south, thus ensuring all community members - at all times - have sufficient access to safe and nutritious food, and cultural continuity, the preservation of traditional knowledge across generations. The plan also offers measures that need to be prioritized to mitigate and adapt to a changing climate.

A few changes were observed within the lake itself and the surrounding rivers. The temperatures are becoming warmer, and the weather conditions are harder to predict. These changes impact many activities, including fishing. There were concerns that populations of traditional fish species have decreased, their habitats are shifting, and the overall fish health is declining. With the warming winters, the fish that the community catches spoil quicker which means that they had to adapt and check on their fishing nets more often. This involves more time and resources of harvesters in the community.

Hunting practices have been affected as well. Changing temperatures mean that the community members need to travel farther to hunt caribou, and they have noticed that there are less caribou available. To protect the caribou population, the community created a plan based on Sahtúgot'ıne knowledge to manage the herd. This is an example of how the community is coming together to determine their food system for future generations. The decision to limit hunting caribou was not easy – caribou is an important cultural and environmental “resource” that many people, including the Sahtúgot'ıne, rely on. This decision ties into their long-term outlook; this short-term lack of caribou will protect their future generations.

Weather is also impacting travel on and around Tsá Tué. Winds are changing quickly, causing unpredictable and even dangerous conditions. This makes planning travel much more difficult and often means that travelling needs to be delayed. To adapt to the changing weather, some members of the community have started travelling with extra supplies and more people to help with their safety. Having these additional safety measures means that more resources are required from the community.

The research showed that there is a strong need for multiple approaches to best support adaptation plans in the context of climate change. The Déjıne community wants to continue to support themselves by being on the land and rely less on food shipments into the community. Sharing Sahtúgot'ıne skills and knowledge within the community from one generation to another, as well as using knowledge from outside the community (i.e., Mi'kmaq Elder Albert Marshall's principles of [Etuaptmuk or Two-Eyed Seeing](#)) are key to growing community capacity.

The Tsá Tué Biosphere Reserve continues to facilitate ongoing community efforts to establish the Sahtú K'aowe Indigenous Protected and Conserved area and build the capacity of the Guardians program and Déjıne ʔek'onę Kə (Youth Council). Together, these initiatives strengthen Sahtúgot'ıne governance while creating a food-secure future for the community and maintaining their cultural identity in the context of new climate realities.

Try This at Home: **HANDPICKED PODCAST**



Try learning in a new and exciting way and hear stories from the experts themselves through Laurier's very own [Handpicked Podcast](#). Each episode explores the importance of food sustainability research, and how it can change our understanding of the food systems around us. The podcast always provides additional notes and material to help keep you on track, including a list of terms that you might not know! Start now and explore stories directly from the research field.

Climate Action: **PRESERVATION STATION**

Do you ever find that your food goes bad before you can eat it all? There are a few simple ways to preserve your food and help reduce your food waste.



1. Refrigerating and freezing

Refrigeration, also known as chilling your food, is one of the most common ways to preserve food. By using a refrigerator, the cold air will slow bacterial growth which makes your food last longer. Freezing does the same thing, but the sub-zero temperatures stop bacteria from growing at all. Freezing can help your food last for weeks or even months if done properly. Make sure that you write the date on the container when you put it in the freezer to avoid freezer burn.

2. Sugaring or salting

Sugaring your food is when you place it in a bunch of sugar to preserve your food. It sounds crazy, but this high-sugar environment can slow or even stop bacterial growth since it helps to remove water from the food. Salting works in a similar way! Sugaring can help use up old fruit or vegetables to give them a new life as a jam or relish, and salting is how pickles are made!



3. Canning and vacuum sealing

Canning food is when you put it into an air-tight container with a fluid that makes bacteria hard to grow (like a salty, sugary, or acidic environment). Canning properly is important, so make sure that you follow instructions on how to can your food items. Canning is usually done with another method, like salting or sugaring as seen above! Vacuum sealing is similar to canning since it takes the oxygen away from the food, but it does not need extra ingredients. It is a great way to preserve your food without changing it.

By preserving your food, you can help the planet reduce your food waste.



Climate Change

Past, Present, and Future

Earth is the only planet in the solar system known to support life. What makes our home so special? Earth has an atmosphere, a layer of gases between our planet and space. Some of these gases, like carbon dioxide, are called **greenhouse gases**. They are crucial parts of our atmosphere; they trap in the heat of the sun, similar to how heat is trapped in a greenhouse, or in a car on a hot day. This process, called the **greenhouse effect**, keeps Earth's temperature warm enough for living things to thrive.

The sun's rays hit our round, tilted planet unevenly. This uneven heating of Earth's surface leads to differences in temperature, which drives weather patterns. We call the patterns in temperature and weather over long periods of time **climate**. Different parts of the world have vastly different climates; it depends on how much heat they receive, as well as what landscape features are nearby. Water, mountains, ocean currents, and forests all impact our climate. In turn, living things around the world have adapted to the climate they live in.

Something, though, is changing. Over the past two hundred years, humans have been burning fossil fuels, such as coal and oil, to make energy to power our daily lives. Fossil fuels are made from decomposed plant matter and microscopic life millions of years old. This matter is full of carbon, and, burning it releases, or emits, billions of tonnes of **carbon dioxide** gas into the atmosphere every year. When too much carbon dioxide is emitted, the delicate balance of greenhouse gases maintaining

Earth's climate is upset. More and more heat is trapped, causing the planet to warm. Weather patterns change, water levels rise, storms get worse.

Climate has changed many times throughout Earth's history, from ice ages to periods much hotter than today. So why is this time any different? Scientists agree on two things. One, temperatures are rising faster than they ever have in documented climate history. Two, this climate change is driven by human activities, due primarily to greenhouse gas emissions.

Climate change is already impacting people's ways of life all over the world. Powerful storms, droughts, forest fires, and floods are threatening people's access to food, water, and safe homes.

The most important step we can take to prevent serious climate change is to reduce greenhouse gas emissions. Incredibly brave and caring people around the world are finding new ways to reduce emissions and make our communities climate resilient every single day. And you can join them! These Science Spotlights are here to help us learn more about climate change and how you can take action.

Our Commitment to the Decolonization of Science

Institutions of GenAction initiative respect and affirm the inherent and Treaty Rights of all Indigenous Peoples across what we now know as Canada. We give thanks to the Indigenous Peoples who care for this land since time immemorial and pay respect to their traditions and ways of knowing. We acknowledge their many contributions to innovations in Science, Technology, Engineering, and Mathematics, past and present, and are committed to deepening engagement and collaborating with Indigenous Peoples as partners in order to advance truth and reconciliation and the decolonization of science.

