Fact

The Dehcho is one of the most rapidly warming regions on Earth. This has led to unprecedented environmental changes and to new uncertainties about the Dehcho's water resources.

How is Scotty Creek Helping?

Scotty Creek provides a space where knowledge producers, mobilisers and end-users from Indigenous communities, universities, government and industry can collaborate to improve their understanding of and ability to mitigate the impacts of warming on their shared water resources.
By providing a forum for sharing ideas and knowledge, Scotty Creek helps to develop new perspectives and respect for different ways of knowing.

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COLD REGIONS RESEARCH CENTRE

SCOTTY CREEK
Research Station

UNDERSTANDING ENVIRONMENTAL CHANGE

The Scotty Creek Research Station is located in the Northwest Territories, Canada, approximately 50 km south of Fort Simpson. The station was founded in 1999 and operates each year between mid-March and early September. Scotty Creek drains a 152 km2 area of high Boreal forest containing discontinuous, permafrost, and a high concentration of wetlands.

BUILDING PARTNERSHIPS IN THE DEHCHO

The learning environment at Scotty Creek is enriched by making research programmes visible and available for local community participation.
By collaborating on research and monitoring, local communities and researchers become “partners in learning”.
Such “collaborative learning” is empowering to local communities as it gives them a voice in creating knowledge.







Researchers at Scotty Creek examine and monitor the impacts of warming on water resources

Permafrost Thaw

The rate and pattern of permafrost thaw is being monitored from historical aerial photographs and satellite images, and from the ground using geophysics and other methods. Scotty researchers develop new tools to predict the rates and patterns of permafrost thaw, and new methods to reduce permafrost thaw and mitigate its environmental impacts

Landcover Change

Permafrost thaw causes the ground to subside and become flooded, causing forests to transition into wetlands. We are examining the mechanisms, rates and patterns of this change so we can better understand the trajectory of land cover and water resource changes in the Dehcho.

Stream Flows

We monitor stream flows from Scotty Creek as well as other gauged rivers in the Dehcho. We also work in the headwaters of Scotty Creek so we can better understand how stream flow is produced. From this work, we develop and mobilise new knowledge on the hydrological and water resource impacts of climate warming and environmental change.

Human Disturbance

Linear disturbances (winter roads, seismic lines) are the most common form of disturbance at Scotty Creek. Our monitoring has found that the ground below the lines does not completely freeze during winter and that underlying permafrost has degraded allowing seismic lines to conduct water below the ground throughout the year. We are developing new ground freezing systems for application to infrastructure vulnerable to permafrost thaw.

Forest Fire

Climate warming is known to increase the number of extreme events, including forest fires. There was a forest fire at Scotty Creek in June 2014. Since that time, we have monitored the impact of this fire on ground temperatures and moisture contents, snow depth, snowmelt, and on the quality and quantity of the water draining from the burn into Scotty Creek.

Greenhouse Gasses

Scotty Creek like much of the wetland-dominated areas of the Dehcho contain vast amounts of carbon. Scotty researchers are learning about how this stored carbon will interact with the atmosphere as the climate continues to warm. Scotty Creek was designated a “Super Site” NASA for their Arctic Boreal Vulnerability Experiment (ABoVE).