# Northern Water Futures

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## NWF Overview

Northern Water Futures (NWF) is a major multi-disciplinary, multi-institutional research project led by Wilfrid Laurier University. The multi-year project aims to take a leading role in sustainable development in the Northwest Territories (NWT) through science-based environmental prediction models, decision support tools and mitigation strategies that will lead to prudent decision-making and knowledge-based community adaptation.

### NWF Partners identified key concerns relating to environmental change, development and the health and well-being of NWT communities (Fig 1).

To address these user needs NWF focuses on 4 main research areas directly linked with Global Water Futures Priorities (i. Improved disaster warming; ii. Predicting Water Futures; iii. Adapting and Managing Risk):

1. Northern Water Resources and Security (GWF Priority i,ii)

Climate warming-induced changes challenge our ability to predict the future of northern water resources. Northern Water Futures will synthesize existing data; initiate innovative, targeted interdisciplinary studies; develop new monitoring capacity including new monitoring tools; and apply novel technologies for monitoring and predicting changes to ecosystems and water resources.

2. Integrated Ecosystem Change and Human Health (GWF Priority iii)

Partners have identified the need to better understanding how climate change will affect the safety and security of drinking water and traditional foods. Northern Water Futures will construct mechanisms of interaction and knowledge sharing that ensure communities can draw on scientific data in ways that support their own needs and decision-making processes to enhance community health and well-being.

3. Energy Security and Impacts of Industrial Development on Water Resources (GWF Priority ii, iii)

The development of energy resources within the Northwest Territories (i.e. oil, gas, biofuels) provides the simultaneous opportunities of enhancing economic prosperity and energy security. Northern Water Futures will address major challenges facing energy stakeholders and concerned communities pertaining to climate warming and the uncertainty concerning the ability of terrestrial and aquatic ecosystems to support these activities.

4. Impacts of Climate Warming on Infrastructure (GWF Priority i, ii, iii)

Climate warming directly challenges the functioning of existing and new infrastructure, including roads, buildings, pipelines and bridges. Northern Water Futures will develop the tools to improve regional climate change predictions such as extreme flows and terrain sensitivity in order to construct and maintain safe, reliable and cost-effective infrastructure for the 21st century.

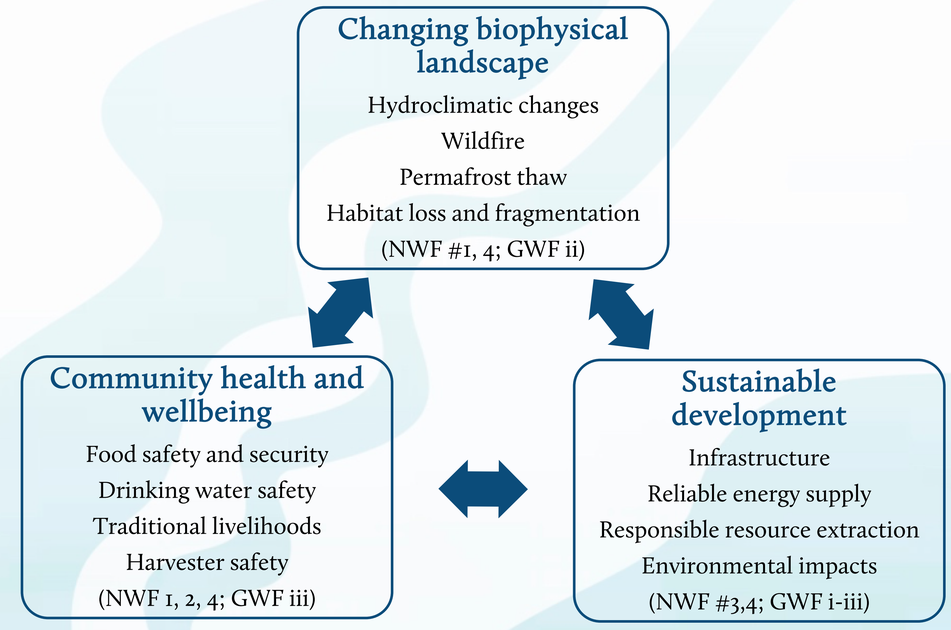
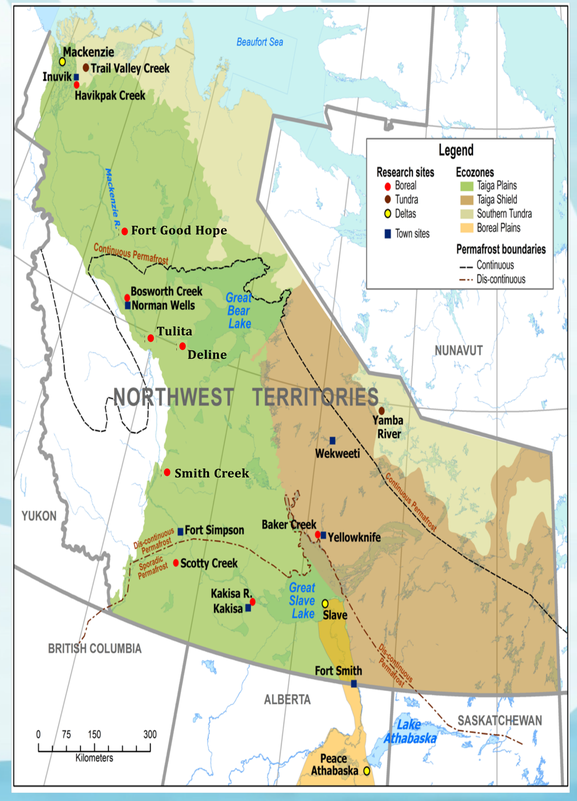



*Figure 1. User identified information needs and their interconnections. Links to NWF research themes and GWF priorities are indicated*

## NWF Research Sites




## NWF and the Sustainable Development Goals

**2 ZERO HUNGER**

| NWF Action: | Contribution to SDG Targets |
|---|---|
| N5: Improve country/local food security<br>N6: Understand the sustainability of fisheries<br>N7: Assess and predict food and drinking water safety<br>N8: Enhance harvester safety | 2.1: End hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round<br>2.3: Double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment<br>2.4 Ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality |

**6 CLEAN WATER AND SANITATION**

| NWF Action: | Contribution to SDG Targets |
|---|---|
| N1: Expand capacity for research in the NWT<br>N2: Improve the understanding of the long-term stability and resilience of ecosystems<br>N3: Develop tools for cumulative effect aquatic ecosystem monitoring<br>N4: Predict changes in hydrology and transboundary flows to the NWT<br>N7: Assess and predict food and drinking water safety<br>N9: Implement base monitoring to support environmentally sustainable non-renewable resource exploration and development | 6.3: Improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally<br>6.5: Implement integrated water resources management at all levels, including through transboundary cooperation as appropriate<br>6.6: Protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes<br>6.B Support and strengthen the participation of local communities in improving water and sanitation management |

**9 INDUSTRY, INNOVATION AND INFRASTRUCTURE**

| NWF Action: | Contribution to SDG Targets |
|---|---|
| N10: Improve regional mapping of thermokarst hot spots across the NWT<br>N11: Improve security of hydrologically sensitive infrastructure | 9.1 Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all.<br>9.5 Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending. |

## NWF Partners

GLOBAL WATER FUTURES
SOLUTIONS TO WATER THREATS IN AN ERA OF GLOBAL CHANGE

Government of Northwest Territories / Gouvernement des Territoires du Nord-Ouest
Tłı̨chǫ Government
Ducks Unlimited
FJMC
The Gordon Foundation
Ecology North
Environment and Climate Change Canada
NISAR NASA - ISRO SAR Mission
ABoVE Arctic – Boreal Vulnerability Experiment
Natural Resources Canada