



Natural Resources
Canada

Ressources naturelles
Canada



NATURAL RESOURCES CANADA
GENERAL INFORMATION PRODUCT 142e

**Dynamics of the Mackenzie
River project**

J. Galloway

2021

© Her Majesty the Queen in Right of Canada, as represented by the Minister
of Natural Resources, 2021

For information regarding reproduction rights, contact Natural Resources
Canada at nrcan.copyrightdroitdauteur.nrcan@canada.ca.

Permanent link: <https://doi.org/10.4095/329845>

Canada 



DYNAMICS OF THE MACKENZIE RIVER PROJECT



The Dynamics of the Mackenzie River project will study the long-term natural variability of baseline water quality and quantity of Canada's largest watershed, the Mackenzie River Basin (MRB). The MRB has experienced the highest temperature increase in Canada over the last half century.

The warming has increased the streamflow of the basin. It is also thawing the permafrost and ground ice, which is altering the transfer of particulates, elements and organic carbon among the land, fresh water and the ocean.

The MRB contains conventional and unconventional hydrocarbons, oil sands, natural gas, and minerals and is essential for supporting communities through sustenance, as a cultural resource, and for transportation of goods and services.

In this changing environment, it is important to have baseline data to determine the cumulative effects of climate change and natural resources development. Water quantity and quality monitoring of the MRB has been conducted since the early 1970s, but the brevity of this instrumental record makes it insufficient for understanding multi-decadal cycles and trends associated with climate phenomena.

EXPECTED OUTCOMES

The anticipated outcomes of this project are:

- sub-decadal to centennial-scale late Holocene quantitative and qualitative reconstructions of water quality and quantity of the MRB along a latitudinal gradient within the Gwich'in Settlement Area;

- new geoscience knowledge on drivers of natural climate variability;
- new hydrological models to predict future changes in water quality and quantity under 21st-century warming scenarios;
- knowledge sharing among the research team, community members, decision-makers and stakeholders to ensure that the research is co-designed to meet the needs of northerners and end-users throughout the life of the project;
- training opportunities, both university-based highly qualified personnel training and training opportunities designed for northerners.

PARTNERS

Environment and Climate Change Canada, Northwest Territories Geological Survey, Government of the Northwest Territories, McMaster University, University of Victoria, University of Alberta, University of Ottawa, Carleton University, Central Michigan University, University of Leeds, Queen's University Belfast (United Kingdom), Aarhus University, University of Lodz, Gwich'in Renewable Resources Board, Gwich'in Tribal Council, Western Arctic Research Centre, Aurora Research Institute, Manchester Metropolitan University, ArcticNet

CONTACT

For more information, contact

Jennifer Galloway
Project Leader
Geological Survey of Canada
Email: jennifer.galloway@canada.ca

Aussi disponible en français sous le titre :
Dynamique du fleuve Mackenzie

Cat. No. M34-53/2022E-PDF
ISBN 978-0-660-43732-3

For information regarding reproduction rights, contact Natural Resources Canada at nrcan.copyrightdroitdauteur.nrcan@Canada.ca.

© Her Majesty the Queen in Right of Canada,
as represented by the Minister of Natural Resources, 2021