



INTEGRATED MODELLING FOR CLIMATE CHANGE IMPACT ASSESSMENT IN MACKENZIE BASIN

(Final Report)

(A Sub- Project for "Mackenzie Basin Impact Study")

prepared by:

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prepared for:

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Climate-Change Impact Assessment and Adaptation Planning

FOREWORD

This study is part of the integrated phase of the Mackenzie Basin Impact Study (MBIS) which is a multi-year and multi-disciplinary research project to examine regional impacts of projected global warming.

ABSTRACT

In this study, an integrated climate-change impact assessment for Mackenzie Basin, Canada, was conducted through development and application of an inexact multiobjective programming (IMOP) model. Many sectors, including agriculture, forest, wildlife habitat preservation, wetland preservation, hunting, recreation, soil conservation, nonpoint source pollution control and water resources development, as well as their interactive relationships, were considered and integrated within this study. The IMOP can reflect not only particular structure and entities of a complex system, but also processes, interactions and feedback mechanisms within the system that generate changes in its dynamics and structure. It also allows uncertainties to be effectively communicated into the optimization process and resulting solutions. The results indicate that, generally, temporal variations of land characteristics and thus land use activities exist due to changes in climatic, economic and environmental conditions. However, through effective systems analysis and assessment, the impacts of climate change could potentially be adapted and the desired land use patterns for compromising objectives from different stakeholders could thus be obtained.

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