



Climate Change IMPACTS and ADAPTATION Program

Coastal Zones

Canada's coastal zones are vast and dynamic. They are home to many diverse and productive environments. The impacts of climate change will vary across Canada's coastal zones owing to regional differences in climate and water level changes, the nature of the coasts themselves and their use. Changes in sea and lake level, air and water temperature; variations in storms, precipitation and seasonal ice extent and thickness are some of the impacts that will affect both the physical and biological elements of the coastal zone as well as a wide range of human activities. The potential impacts of climate change on the ocean coasts include increased levels of flooding, accelerated coastal erosion and damage to coastal infrastructure. Lower water levels on the Great Lakes could lead to the need for dredging of ports and harbours, reduction in hydro-electrical generation and loss of wetlands.



Oliphant, Lake Huron, Ontario

Adaptations to address the impacts of climate change on the coastal zone, taken proactively, can help to minimize damages and allow us to take advantage of potential opportunities that climate change may present. The vulnerability of our coastal zones to climate change can

only be determined by examining both the impacts of a changing climate on biophysical and social systems and the capacity of these systems to adapt to the impacts.

New Directions

The overarching goal of the Climate Change Impacts and Adaptation Program is to reduce Canada's vulnerability to climate change. Through a competitive proposal process, the research program supports cost shared research to address gaps in our knowledge of Canada's vulnerability to climate change and to provide information for adaptation decision-making. Additional emphasis will be placed on research that examines processes, barriers, and drivers for adaptation.



Prince Edward Island

The program also supports the Canadian Climate Impacts and Adaptation Research Network (C-CIARN). This network facilitates linkages between stakeholders and researchers, promotes new research techniques and methodologies, disseminates information, and provides a voice for an emerging impacts and adaptation research community.

adaptation.nrcan.gc.ca

Between 1998 and 2001, the Impacts and Adaptation component of the Government of Canada's Climate Change Action Fund supported over 75 projects to examine the impacts of climate change on Canadians and the processes by which we adapt. Five of these projects addressed coastal zone issues. Here are some brief highlights of the projects funded.

1. The Fate of Salt Marshes in Atlantic Canada

By comparing past rates of accumulation of marsh sediments with tide gauge records, researchers determined to what degree four salt marshes in Atlantic Canada would be threatened by increases in sea level associated with climate change. The sedimentation rates for each marsh, the estimated reduction in deposits over time, and the degree of variability within and among regions were established.

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2. Climate Change Impacts and Adaptation in Newfoundland Coastal Communities

Using a checklist of geoindicators that they had developed, researchers examined the vulnerability of the Conception Bay South-Holyrood coastline to shoreline erosion and other potential hazards. They suggested approaches to adaptation involving community outreach and land use planning.

Principal Investigator: Norm Catto
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3. Evaluation of Risk of Erosion and Flooding in British Columbia

Researchers studied the role of winds, storms and tide levels to analyse the risks of coastal flooding in British Columbia and identified steps that could be taken to improve warnings of extreme sea levels.

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4. Sea Level Rise and Climate Change: Impacts and Adaptation Needs, Prince Edward Island — A Case Study

The twenty three-member research team undertook a comprehensive analysis of the risk posed by sea level rise to Charlottetown and a section of the north coast of PEI. The work produced high-resolution topographic maps of the study areas and climatological analysis of sea level, storm surges, winds, waves and ice cover in the Gulf of St. Lawrence. It also contributed to the development of a storm surge model, which was used to analyse the flood potential for Charlottetown at three critical water levels. Socio-economic analysis estimated the number and value of properties in Charlottetown at risk from these three flooding scenarios. For the north shore, an assessment was carried out on the effects of increased erosion on real property loss for cottage and non-cottage properties, and on non-market values for wetlands, forested land, beaches and dunes. A review of adaptation measures was also undertaken.

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5. Climate Change and Sea-level Hazards on the Canadian Beaufort Sea Coast

This project focussed on the low-lying, ice-rich Western Arctic coast where, under current conditions, erosion rates can exceed 20 metres per year. More than 100 metres of coastal retreat has occurred at Tuktoyaktuk since 1947. Researchers refined and calibrated storm-surge models for the Beaufort Sea; developed scenarios of the impact of climate change on storm frequency, intensity, direction, and ice conditions, and mapped areas of sensitivity to flooding and potential erosion under present and future storm-surge scenarios.

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Further information on the program and funding opportunities can be found on the web site: adaptation.nrcan.gc.ca,
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