Climate Change and Atmospheric Research: Funded Projects

Network on Climate and Aerosols (NETCARE): Addressing Key Uncertainties in Remote Canadian Environments

Principal Investigator: Jonathan Abbatt

Host Institution: University of Toronto

Funding: $4,798,900

The impact of aerosols on remote environments is poorly understood, hindering the ability of climate models to make accurate forecasts. NETCARE brings together academic and government scientists to tackle climate issues related to aerosols. The network will use comprehensive measurements and modelling to identify the sources and impacts of aerosols, especially black carbon. It will also explore the role the ocean plays as a biogenic aerosol source and assess the formation of ice clouds and their impact on the atmosphere. It is expected that the work of NETCARE will result in improved climate models to be used for years to come.

Research Related to the Polar Environment Atmospheric Research Laboratory (PEARL): Probing the Atmosphere of the High Arctic

Principal Investigator: James Drummond

Host Institution: Dalhousie University

Funding: $5,000,000

Climate in the High Arctic is changing at a significant rate. In some regions the temperature is rising about five times faster than it has increased on the rest of the planet. These changes are important, both within the region and in lower latitudes, as the influence of northern temperature reaches to where many Canadians live. Combining measurements from the Polar Environment Atmospheric Research Laboratory (PEARL) at Eureka, Nunavut, and from other sites around the Arctic and the rest of the globe, this project will probe the atmosphere of the Canadian High Arctic and analyze the causes of the changes to the climate. With an understanding of the causes of atmospheric changes in the Arctic, this team will ensure we have the tools needed to predict the progress of these changes in the future.

Canadian Arctic-GEOTRACES Program: Biogeochemical and Tracer Study of a Rapidly Changing Arctic Ocean

Principal Investigator: Roger Francois

Host Institution: University of British Columbia

Funding: $4,833,355

The Arctic marine system is undergoing rapid change as a result of climate-driven changes in sea ice cover and surface ocean circulation. These changes can strongly influence the biological productivity of climate-active gases (e.g., carbon dioxide) and the distribution of contaminants such as mercury and lead. At present, our ability to fully understand the impacts of these changes and predict their future is limited by a poor understanding of the interacting chemical, physical and biological processes that shape the Arctic marine system and influence its resilience. To bridge this critical knowledge gap, the Arctic-GEOTRACES program will measure a suite of chemical tracers that will provide information on these key processes in the Arctic Ocean and the Canadian Arctic Archipelago.

Canadian Sea Ice and Snow Evolution (CanSISE) Network

Principal Investigator: Paul Kushner

Host Institution: University of Toronto

Funding: $3,595,000

The sea ice and seasonal snow cover in the Northern Hemisphere are retreating at an unexpectedly rapid rate, presenting a range of impacts and challenges to Canada and the world. This has created an urgent need to improve and exploit scientifically grounded predictions of seasonal snow cover, sea ice and the climate elements with which they are linked. The Canadian Sea Ice and Snow Evolution (CanSISE) Network brings together leading Canadian and international experts who will use state-of-the-art analysis and computer models to improve climate predictions. It aims to advance prediction of snow and sea ice in the Arctic, sub-Arctic, alpine and seasonally snow-covered regions, with a primary focus on the Canadian Arctic and the Western Canadian Cordillera.

Ventilation, Interactions and Transports Across the Labrador Sea (VITALS)

Principal Investigator: Paul Myers

Host Institution: University of Alberta

Funding: $4,999,930

The Ventilation, Interactions and Transports Across the Labrador Sea (VITALS) Research Network will answer fundamental questions about how the deep ocean exchanges carbon dioxide, oxygen and heat with the atmosphere in the Labrador Sea. New observations and modelling will determine what controls these exchanges and how they interact with varying climates, helping us to understand the role of specific regions in the carbon cycle and Earth system.

Canadian Network for Regional Climate and Weather Processes

Principal Investigator: Laxmi Sushama

Host Institution: Université du Québec à Montréal

Funding: $4,078,255

Canada's northern and Arctic regions offer unique challenges to numerical weather prediction (NWP), in which computer models of atmosphere and oceans are used to predict weather, as well as to climate projection, due to complex processes and relationships among various components of the climate system. This Network will use high-resolution models of climate and weather simulations, particularly those representing weather extremes, provided through a regional Earth system model approach. This team's research will lead to important developments in models used by Environment Canada and will ultimately contribute to reducing uncertainties in both weather prediction and climate change projections.

Changing Cold Regions Network (CCRN)
Principal Investigator: Howard Wheater
Host Institution: University of Saskatchewan
Funding: $5,000,000

The cold interior of Western and Northern Canada east of the Continental Divide has one of the world's most extreme and variable climates and is experiencing rapid environmental change. In a region that holds a variety of globally important natural resources and sustains 80 per cent of Canada's agricultural production, changing climate is affecting the land, vegetation and water. There is an urgent need to understand the nature of these changes and to develop the improved modelling tools needed to manage uncertain futures. This Changing Cold Region Network (CCRN) will combine existing and new experimental data with modelling and remote sensing products to better understand and predict changes to land, water and climate.