CFCAS News—Special Issue

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CFCAS *Special Issue*

Canadian Foundation for Climate and Atmospheric Sciences

Climate change has been called the most serious environmental and economic problem of this century. Federal investments are helping to address this through a number of programs, and agencies. The Canadian Foundation for Climate and Atmospheric Sciences (CFCAS) is a leader in stimulating and supporting research in strategic areas of benefit to Canadians.

CFCAS is an autonomous, non-profit agency. It operates in a focused, flexible and responsive manner. CFCAS funds university-based research on topics such as climate change and the production and absorption of 'greenhouse gases', climate modelling and weather prediction, air quality, extreme weather, conditions at the air–ocean interface, marine weather hazards and sea surges.

Established in 2000 for a six-year period, the Foundation has invested $35 M: over half its total ($60 million) budget, to support top research networks and projects. It uses competitive procedures and experts from Canada and abroad to ensure its funds go to only the best initiatives.

Dawn Conway, Executive Director

CFCAS Strengths

- History of supporting quality research geared to national need
- Over $22M towards training the next generation of research staff, to meet future needs and fill positions left vacant by retirements
- Emphasis on partnerships, sharing of facilities, pooling of expertise and transfer of information
- Focus on new research opportunities and areas requiring greater attention, including Arctic climate, extreme weather and air quality
- Investment of $35 million in scientifically sound answers to environmental questions.
- Enhancement of Canada's international profile, through supporting the Canadian components of international environmental consortia
- Input to federal policy discussions on climate issues

Economic Impact of Weather

Canada's economy is dominated by weather-dependent industries. An estimated $150 billion in economic activity is directly or indirectly affected by weather. Weather disasters impact heavily on the insurance industry. Weather damages paid by governments around the world have doubled every 5 to 7 years since the 1960s. Three of Canada's most costly weather events have occurred since 1996: the Ice Storm, the Red River Flood and the Saguenay Flood. The cost of the 2002 prairie drought is not yet known.

The air we breathe

Fine air particles and ozone are the two major components of smog, which is carried by the wind and is a growing problem in Canada, particularly among people with heart or lung disease, and children. The Foundation is funding projects that will help move Canada from managing air pollution, to preventing it.

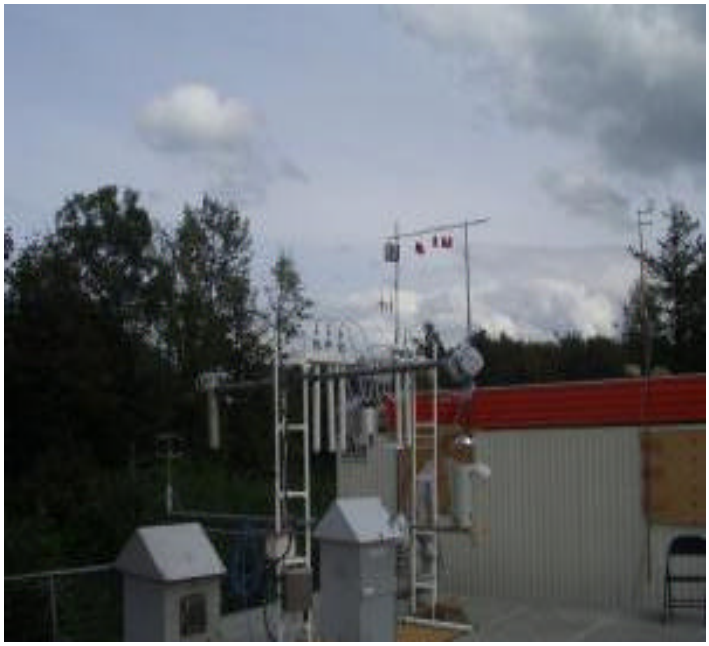
Our oceans

The world's oceans buffer climate through their huge capacity to store and transport heat. Canada borders on three oceans. Knowledge of ecological, chemical and physical processes at the interface of the ocean and the atmosphere is essential for understanding and predicting the global impact of future climate change.

Pacific 2001

CFCAS has invested over $670,000 in 'Pacific 2001'. This has enabled university researchers and students to work with federal partners to sample and study smog in the Lower Fraser Valley of British Columbia. The project is generating knowledge of the interactions of particulate matter and ozone and will help pinpoint the sources, formation and distribution of smog. The work is helping provide a sound scientific basis for government and industry policy on air quality.

Photo, right: Trace gas sampling inlets and particle samples, Sumas Mountain site, B.C. (credit to Rob McLaren, York University)



SOLAS

Research during the summer of 2002 put Canada ahead of the pack in climate studies related to the oceans. On July 29, 2002 NASA's 'Seawifs' satellite detected chlorophyll from plankton growth in a patch of ocean that a Canadian research team had fertilized with iron. The iron had stimulated the plankton to pull carbon dioxide, a major greenhouse gas, out of the air. During 2001, CFCAS and NSERC committed almost $9 million in the Surface Ocean Lower Atmosphere Study (SOLAS). Fisheries and Oceans Canada matched this with 90 days of ship time, the expertise of several scientists and research facilities and equipment. The Canadian SOLAS team is part of a major international initiative studying key interactions between the atmosphere and oceans and links to climate change.

CFCAS Investments by Theme (as of September 2002)

Climate Change; Greenhouse Gases	$20,676,578
Air Quality	$7,148,235
Extreme Weather	$4,664,622
Marine Environmental Prediction	$2,567,729
TOTAL	**$35,057,164**

Over half of CFCAS grant funds support graduate student training or enable postdoctoral fellows to gain advanced research expertise. This represents an investment in Canada's future, of $22 million.

(Photo, right: Ms. Elham Farahani, Graduate Student and Dr. Stella Melo, Postdoctoral Fellow, Eureka Astro Lab, Canadian Arctic - Research Project by Dr. K. Strong, University of Toronto)

Partners

Thanks to CFCAS, Canada now leads the world in some areas; however the critical mass and the facilities to meet current and future needs surpass the resources of any one group or sector. Partnerships have doubled the impact of the Foundation's investment by providing additional funds, intellectual resources, infrastructure and training opportunities.

Currently 270 researchers from 22 universities conduct CFCAS-sponsored research, in partnership with collaborators in 28 public and 11 private organizations in all regions of the country, and 9 international partners. Students benefit from exposure to career scientists from Fisheries and Oceans, the Meteorological Service of Canada, Natural Resources Canada, National Research Council, provincial and industrial research centres: the very people they will succeed as the senior scientists retire.

Building Canadian Expertise

Governments around the world need access to a pool of experts who can develop solutions to environmental problems. Canada's future prosperity depends heavily on the next generation of researchers, but it faces a shortfall in several areas. CFCAS is helping to address this.

Fluxnet-Canada

Scientists from across Canada are working together to understand how the cycling and storage of carbon by forests and peatlands relates to climate change, climate variability and activities such as commercial logging. Over 40 university, provincial and federal scientists are collaborating at 7 research sites stretching from Vancouver Island to New Brunswick. The initiative, known as Fluxnet-Canada, is addressing questions that will improve our understanding of carbon sinks and help in framing Canada's climate change policy. It is also providing Canadian leadership in international flux activities. Shared funding from CFCAS, NSERC and BIOCAP Canada exceeds $11.4 million.

(Photo, left: Fluxnet-Canada Tower, Campbell River, B.C.)

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Climate Change

Climate variability and change has touched us all; however over the last 150 years, it is humans that have changed the global carbon cycle the most. Consequences include persistent and rapid increases in the levels of greenhouse gases in the atmosphere, leading to global warming.

The Foundation has invested over $7 million in understanding how carbon dioxide and other greenhouse gases are produced or absorbed. Matching contributions have doubled this amount.

Current projects deal with topics such as the conditions contributing to greenhouse gas emission or absorption, changes in ice conditions in the north, smog and violent weather: tornados, severe storms, droughts, floods and adverse sea conditions.

Really Really Bad Weather

Weather disasters cause tremendous anguish, but also cost us dearly in social and economic terms. Climate change has accelerated the occurrence of severe weather events such as droughts, ice storms, floods and tornados.

The Foundation has invested $3.1 million to improve the detection and warning of local severe weather events, as well as predictions of when, where, how much and what type of precipitation will fall in an area over a given time period. Improved accuracy of short-term forecasting is a priority for the Canadian Weather Research Program. Information on extreme weather events is also very important for public safety and security and for planning measures to alleviate their effects.

Protecting the Investment

Research funded by CFCAS is generating knowledge, supporting policy, providing insights on environmental problems, and training the experts of tomorrow. CFCAS is a key partner in helping Canada meet its international environmental commitments. The mandate of CFCAS ends in 2006: the Foundation will need new support in order to continue its vital contribution to climate knowledge and policy, to national security and to training.

"Climate Change has been called the most serious environmental and economic problem of this century."

David Anderson, Minister of the Environment, April 2002