Health Canada Santé Canada



Your Health and a Changing Climate Newsletter

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The Social Impacts of Climate Change on Canadians and their Communities

In support of the Canadian Climate Change and Health Vulnerability Assessment 2006, being led by Health Canada, researchers at the University of Toronto have joined the Health Sector of the Canadian Climate Impacts and Adaptation Research Network (C-CIARN) to identify research gaps and to develop a conceptual framework for investigating the socio-economic impacts of climate change on health and well-being. This framework will take into consideration the impacts of climate change and climate variability (such as increased frequency and severity of extreme weather events, changes in patterns of diseases transmitted by insects and animals, and influences on air and water quality) on the social and economic determinants of health within a population health context.

To date, much of the climate change impacts and adaptation research has been focussed on specific regions and sectors. In the Health Sector, the recent publication by the World Health Organization - *Climate Change and Human Health: Risks and Responses* (McMichael et al., 2003 http://www.who.int/globalchange/publications/cchhbook/en/) - brings together the current knowledge on climate change and health into a single volume. It is comprehensive in nature, but provides little information on the socio-economic impacts affecting the climate change/health relationship. Despite the fact that there is "widespread recognition that climate can affect ecologic and sociologic processes and factors" (Chan et al., 1999:334), few studies have been conducted specifically on the social impacts of climate change. Social impacts of climate change are typically covered with economics under an umbrella of 'socio-economics.' Discussion of the economic impacts of climate change has been primarily resource based and has stopped short of linking these economic impacts with the simultaneous and ensuing social and health impacts.

University of Toronto

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In this issue:

Understanding the Nexus of Health, Social, and Economic Impacts of Climate Change on Canadians

A Workshop for Professionals and Academics
Novotel Hotel,
33 Nicholas Street, Ottawa,
Nov. 30 - Dec. 1, 2004

This workshop is being organized by Health Canada (Climate Change and Health Office), C-CIARN Health Sector, and the University of Toronto (Division of Environment, Institute for Environmental Studies and Innis College Environmental Studies Program).

The starting point for discussion at this workshop will be a paper by Dr. Marcy Erskine of the University of Toronto entitled "A Conceptual Framework for Research on Socio-economic Impacts Associated with Climate Change Health Impacts". The paper is available upon request at socioec.climate@utoronto.ca or by visiting: http://www.utoronto.ca/envstudy/socioeconomic

Researchers, practioners, and policy makers intersted in attending should contact Doug Macdonald, Director, Innis College Environmental Studies Program, University of Toronto, to register at douglas.macdonald@utoronto.ca

Registration is limited

C-CIARN

Canada

Modeling the Relationship of Foodborne Illness and Temperature in Canada

Authors: Manon D. Fleury[1], Dominique Charron[1], John D. Holt[2], O. Brian Allen[2] and Abdel Maarouf[3]

[1]Foodborne, Waterborne and Zoonotic Infections Division, Health Canada, Guelph, Ontario

[2]Department of Mathematics and Statistics, University of Guelph, Guelph, Ontario

[3]Meteorological Service, Environment Canada, Downsview, Ontario

Project Collaborators: R. Sari Kovats and Sally Edwards of the London School of Hygiene and Tropical Medicine; Rennie M. D'Souza of the National Centre for Epidemiology and Population Health, The Australian National University

The incidence of enteric infections such as Salmonella and Escherichia coli (E-Coli) in the Canadian population varies seasonally, and will therefore be expected to change in response to climate change. In order to explore this possibility further, this study investigated the potential shift in the seasonal patterns of infections caused by selected enteric pathogens in Canada.

Data associated with three common enteric pathogens — Salmonella,

Escherichia coli and Campylobacter — were obtained from the National Notifiable Disease registry for two Canadian provinces, Alberta and Newfoundland-Labrador, for the years 1992 to 2000. The project looks at the relationship between weekly occurrence of enteric illness and environmental temperature, with particular attention to the effect of seasonal adjustments on the estimated models. This paper also explores different methodologies for time series analysis, the most widely used method in environmental health research.

Analysis of the data suggests that an increase in temperature in Canada, which seems to be consistent with climate change, could lead to a subsequent increased risk of enteric illness.

>>> For more information, contact Dominique Charron at dominique_charron@hc-sc.gc.ca

Climate Change, Extreme Weather Events and Health-Effects in Alberta

This project, led by Dr. Colin Soskolne at the University of Alberta, examined impacts of the effects of natural disasters on human health as reflected in almost 1000 newspaper reports about various weather-related natural disasters and extreme weather events from 1960 to 2003. Findings included the following health impacts:

- droughts result in financial losses which often causes stress and depression in farmers and their families.
- flooding and the resultant water quality problems, property damage, service interruption and displacement cause personal anxiety and stress
- extreme winter weather causes deaths and injury from exposure during prolonged cold waves, motor vehicle crashes during winter storms, and heart attacks from shovelling snow.
- forest fires and the resultant poor air quality lead to increased respiratory ailments and mental health problems associated with the stress of dislocation, property damage and service interruption

In addition, climate shifts at five Alberta meteorological stations were investigated over the past 100 years. The detailed report can be found at *www.phs.ualberta.ca/climatechange/index.html*

The Social Impacts of Climate Change

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One of the key findings of an expert panel workshop examining the implications of climate change for health and well-being in Canada, held at the University of Ottawa in 2002, was that "climate change will place greater demands on the social infrastructure (including emergency services and social support systems) supporting public health and well-being. These health and social impacts will result in significant costs to Canadian society, including increased health care costs, loss of productivity, and broader damages to the well-being of Canadians."

In November 2004, the University of Toronto will be organizing a workshop on how to develop an integrated understanding of the web of factors affecting human health, how climate change disturbs this web, and what research is required to further our understanding of this relationship.

>>> For more information, contact Dr. Doug Macdonald at douglas.macdonald@utoronto.ca

The Possible Role of High Impact Weather Events in Waterborne Disease Outbreaks in Canada, 1975-2001

M. Kate Thomas[1], Dominique Charron[2], David Waltner-Toews1, Corinne Schuster[3], Abdel R. Maarouf[4], and John D. Holt[5]

[1]University of Guelph, Department of Population Medicine, Guelph, Ontario, Canada

[2]Foodborne, Waterborne and Zoonotic Infections Division, Centre for Infectious Disease Prevention and Control, Population and Public Health Branch, Health Canada, Ontario, Canada

[3]HPRP Project, Climate change effects on waterborne disease risk in Canada, University of Guelph

[4]Meteorological Service of Canada, Environment Canada, Toronto, Ontario Canada

[5]University of Guelph, Department of Mathematics and Statistics, Guelph, Ontario, Canada

An adequate supply of safe water is essential to the health and well-being of Canadians. Recent disease outbreaks caused by Escherichia coli O157:H7, Campylobacter, and

Cryptosporidium have heightened the awareness of Canadians about the risks associated with contaminated drinking water. The main objectives of this research were to describe the incidence and distribution of waterborne disease outbreaks in Canada in relation to preceding weather conditions, and to explore the association between extremes in weather and waterborne disease outbreaks.

The study examined extreme rainfall and spring snowmelt in association with 168 Canadian waterborne disease outbreaks from 1975 to 2001, using case-crossover methodology. Explanatory variables including daily rainfall amount, temperature, and peak stream flow were used to determine the relationship between these environmental factors and the occurrence of waterborne disease outbreaks.

The results of the study suggest that weather contributes to waterborne disease outbreaks in Canada. This could have implications for water management and public health initiatives in communities across the country.

>>> *For more information, contact Dr. David Waltner-Toews at dwaltner@ovc.uoguelph.ca*

Cognitive and Linguistic Functioning in Children of Mothers Exposed to High and Low Levels of Objective Stress During Pregnancy as a Result of a Natural Disaster.

Laplante, D.P., Barr, R. G., Brunet, A., Galbaud du Fort, G., Meaney, M., Saucier, J-F., Zelazo, P. R., and King, S.

Prenatal maternal stress (PNMS) has been shown to impair functioning in nonhuman primate offspring. Little is known about the effects of prenatal stress on intellectual and language development in humans because it is difficult to identify sufficiently large samples of pregnant women who have been exposed to an environmental stressor. This study took advantage of a natural disaster (January 1998 ice storm in Québec and Eastern Ontario, Canada) to determine the effect of the exposure to stress during a woman's pregnancy on the general intellectual and language development of children who were born shortly after the ice storm. Bayley Mental Development Index (MDI) scores and parent-reported language abilities of 58 toddlers of mothers who were exposed to varying levels of prenatal stress were obtained at 2 years of age. The hierarchical multiple regression analyses indicated that the toddlers' birth weight and age at testing accounted for 12.0% and 14.8% of the variance in the Bayley MDI scores and in productive language abilities, respectively. The level of prenatal stress exposure accounted for an -additional 11.4% and 12.1% of the variance in the toddlers' Bayley MDI and productive language abilities, and uniquely accounted for 17.3% in the variance of their receptive language abilities. The more severe the level of prenatal stress exposure, the poorer the toddlers' abilities. The results of the study may indicate that high levels of prenatal stress exposure, particularly early in the pregnancy, may negatively affect the brain development of the fetuses, and may be related to a lower level of general intellectual and language abilities in the toddlers.

>>> *For more information, contact Dr. Suzanne King at suzanne.king@douglas.mcgill.ca. For a copy of the article, visit Pediatric Research at www.pedresearch.org*

Health Vulnerability Assessment 2006 — Progress to Date

In June 2003, the Climate Change and Health Office at Health Canada launched the *Canadian Climate Change and Health Vulnerability Assessment 2006*. The Assessment is a key component of the *National Climate Change Impact Assessment 2006* led by Natural Resources Canada. Regular national assessments are part of the Government of Canada's international obligations to report on impacts and adaptation efforts. A multi-stakeholder Steering Committee, co-chaired by the McLaughlin Centre for Population Health Risk Assessment at the University of Ottawa and by Health Canada, draws upon the expert knowledge of a wide range of partners from all levels of government, academia, non-governmental organizations, and public health practitioners and officials to provide direction and advice for the Assessment.

The Health Assessment 2006 will involve projects associated with the following key areas — air quality, natural hazards, adaptive capacity and a cumulative impacts study being undertaken in Quebec. Based on expert advice generated from a series of workshops on these themes of the Assessment, a number of important research initiatives will be undertaken.

Examples include:

1. **Baseline data** of health impacts associated with natural hazards and air pollution.
2. **Future scenarios** of the health effects of climate change related to natural hazard events and air pollution.
3. Mortality and morbidity related to **heat stress** associated with climate change.
4. **Public perception** of climate change health impacts and the need for adaptation actions and measures.
5. **Psychosocial impacts** of natural hazards events related to climate change.
6. **An adaptive capacity framework** for the health sector to help assess the ability of communities to address these impacts.

The research networks comprising the Health Sector of the Canadian Climate Impacts and Adaptation Research Networks (C-CIARN Health) will play an important role in the Assessment, studying problems related to climate change and health.

In 2003, the Climate Change and Health Office, together with the World Health Organization and other international partners, released a document for guiding the conduct of climate change and health vulnerability assessments. The document, entitled *Methods of Assessing Human Health Vulnerability and Public Health Adaptation to Climate Change* (www.euro.who.int/globalchange), provides practical information to governments, health agencies, and environmental and meteorological institutions in both developed and developing countries on how to assess the potential health impacts of climate change at regional, national and local levels. The Health Assessment 2006 will be guided by this document and lessons from it will be useful to future assessments.

>>> *For more information, contact Melanie Itzkovitch at melanie_itzkovitch@hc-sc.gc.ca*

C-CIARN Health Sector Research Networks

Extreme Weather Events
www.iclr.org/research/research network.htm

Air Pollution
www.climateairhealth.ca

Water and Food-borne Contamination
www.eccho.ca/networks.asp

Vector-borne and Zoonotic Diseases
www.eccho.ca/networks.asp

Population Vulnerabilities in Rural and Urban Communities
www.chuq.qc.ca/oms/cc

Socio-economic Impacts
socioec.climate@utoronto.ca

ArcticNet Project 4.5 — Surveillance and Management of Climate Change Impacts in the North: Implications for Northern Public Health Policy and Infrastructure.

Led by principal investigators Dr. Pierre Gosselin, MD, MPH at Laval University and Dr. Donald Wigle at the University of Ottawa, this project will assess several aspects of the ability of northern health and environmental organizations and departments to identify, monitor, manage and adapt to the various impacts of climate change and accelerated economic development on the health and lifestyles of Northerners. Specifically this project will:

- Assess the adequacy of present surveillance tools to support northern managers' ability to identify and monitor acute and chronic diseases, exposures, and other health determinants related to climate change, and the health impacts associated with economic development.
- Assess the applicability and use among northern managers of current risk management frameworks and knowledge transfer processes, as well as their treatment of potential impacts of climate change in the North, and make recommendations to improve comprehension, use and applicability of relevant tools.
- Identify policy implications for surveillance infrastructure, risk management frameworks and tools, and sustainable development policies for sound interdepartmental and intergovernmental cooperation at national and international levels.

- Propose, through regular interaction with stakeholders, options and recommendations on the above-mentioned topics to develop capacity-building initiatives.
- Initiate and propose pilot projects for upgrading the public health infrastructure in the areas of chronic diseases, infectious diseases, environmental and occupational health, and injuries and disaster preparedness as they relate to potential climate changes.

>>> *For more information, contact Dr. Pierre Gosselin at Pierre-L.Gosselin@crchul.ulaval.ca*

Links between Climate, Water and Waterborne Illness, and Projected Impacts of Climate Change

Led by Dr. David Waltner-Toews at the University of Guelph, this three phase study was funded by the Health Policy Research Program at Health Canada. It used statistical models to explore the links between water quality, weather, and gastrointestinal illness in selected communities (see completed research section of this newsletter). The final phase of the project, led by Abdel Maarouf of Environment Canada, has just begun, and is focussing on climate change modelling and scenarios which may be helpful for exploring the impacts of climate change on rates of gastrointestinal illness in Canada. This work is due to be completed in April 2005. Individual case studies forming part of this project are outlined on pages 6 and 7.

>>> *For more information, visit www.eccho.ca*

A Forensic Analysis of Meteorological Thresholds Associated with Increased Risk of Waterborne Disease in Canada

(C.J. Schuster, D. Charron, A. Maarouf, H. Auld, D. MacIver, J. Klaassen)

Public Health Officers and water users would like to better assess potential risks to drinking water supplies and when to issue boil water advisories and other warnings in a timely and accurate manner. Research undertaken in the U.S. has demonstrated a link between high precipitation events and waterborne disease outbreaks. This study uses a forensic analysis of weather events which preceded confirmed waterborne disease outbreaks in Canada in an attempt to identify climate thresholds for potential water source contamination and therefore increased risk for waterborne disease. These thresholds can be combined with an indication of a water system's susceptibility (history of waterborne disease outbreaks; inadequate water treatment practices; treatment failures, maintenance and malfunctions) in order to assess vulnerability more comprehensively. Given this type of information, water users can increase monitoring, alter treatment practices, issue alerts or, in extremely high risk areas, stop water intake temporarily, in order to protect the population.

>>> *For more information, contact Dr. Corinne Schuster at Corinne@eccho.ca*

Impact of Climate and Agriculture on Enteric Illness in Atlantic Canada: Toward a Climate Change Adaptation Strategy

This case study, focussing on the Atlantic provinces, will help identify geographic areas and populations vulnerable to an increased risk of enteric illness. Climate change scenarios will be used to gain a better understanding of whether communities in Atlantic Canada may become more vulnerable to this type of illness in the future as a result of climate change. The study results will allow Canadian policy makers to better understand and manage the risks of waterborne enteric illness, in an uncertain climatic future which may bring more frequent extreme weather events.

Hospitalization discharge data from the Canadian Institute for Health Information (CIHI) have been obtained for years 1992–2000. Data for 2001 and 2002 are pending. Access to the notifiable disease records for each Atlantic province is being negotiated with the provincial epidemiologists for the pathogens Escherichia coli, Salmonella, Campylobacter, Giardia and Cryptosporidium. Data on weather parameters have been secured from Environment Canada. Weather stations have been identified for Prince Edward Island and New Brunswick, and stations in the other Atlantic provinces are currently being identified. Agriculture data from the Census of Agriculture are in hand for years 1991, 1996 and for 2001 through the TriUniversity Data Resource Centre (TDR). Appropriate methods are currently being investigated. Water quality/quantity data will be derived from several sources. The National Water Research Institute and Environment Canada are advising on this issue.

By late 2004, analysis of relationships between weather parameters, agricultural indicators, water quality and quantity variables and health outcomes will be completed.

>>> *For more information, contact J. Valcour at valcour@eccho.ca*

CCIAP HEALTH CALL — Update

Submission of Letters of Interest for research on climate change and health issues funded by the Climate Change Impacts and Adaptations Program closed on February 18, 2004. In total, 46 letters of interest were received. This is an increase of almost 150% over submissions received for the first health call in May 2002. This is indicative of the increasing interest in this field of research in Canada. The present call is now in phase 2 where about one third of the applicants have been selected to make a formal submission for funding. For more information, contact Beth Lavender at blavende@nrcan.gc.ca

A Study of Potential Climate Risk Factors of Enteric Waterborne Disease in Southern Alberta (1992–1998)

This study will analyse a medical/environmental database to determine if certain climatic variables are potential risk factors for enteric gastrointestinal disease. The study focuses on data from 18 specific Canada Census Subdivisions in southern Alberta from 1992 to 1998 that have been cross-referenced with climatic variables obtained from Environment Canada. The initial part of this investigation focuses on case/control logistic regression to identify climatic risk factors. Other potential explanatory variables such as sex, age, location, and livestock density will be included. Further investigation will try to assess clustering effects within the data in order to better represent the risk level associated with climate variables. Work continues on daily interpolated weather data for Southern Alberta. The Ontario work (described below) will serve to validate, compare and contrast findings from Alberta.

>>> *For more information, contact D. Gillis at* gillis@eccho.ca

Spatial and Temporal Patterns of Endemic Gastrointestinal Illness, Water Source and Quality, and Climate in Ontario

The purpose of this study is to determine the relationship between certain climatic variables, water quality and water quantity, and hospitalizations for acute gastrointestinal disease in Ontario. Explanatory variables will include water quality indices, source water type, livestock density, soil types, and demographic data. The Ontario data will be used to validate, compare and contrast findings from the Alberta analysis.

Weekly interpolated weather data have been obtained and further data sources are being researched and collected, including Reportable Disease data, Water Turbidity (HYDAT), etc. Spatial interpolation techniques are being researched for use within these studies.

>>> *For more information, contact D. Gillis at* gillis@eccho.ca

The Prevalence of West Nile Virus, Avian Influenza Virus, and Newcastle Disease Virus Infections in Ring-billed Gulls (Larus delawarensis) in Toronto and Hamilton on Western Lake Ontario

With respect to West Nile Virus, one of the objectives of this study, undertaken by Dr. Sharon Calvin at the University of Guelph, is to assess how local weather parameters might influence the prevalence of infected mosquitoes and birds. This will be done by collecting weather data from nearby meteorological stations and analysing it in relation to data obtained from the testing of mosquitoes and birds for West Nile virus.

>>> *For more information contact Sharon Calvin, at* calvin@eccho.ca

Submit information about your research on climate change and health issues for a future newsletter.

Climatinfo@hc-sc.gc.ca
indicating in subject line
For Newsletter

Community Adaptation to Outbreaks of Ciguatera Fish Poisoning

The research project, being undertaken by Karen Morrison at the University of Guelph and funded by the Social Sciences and Humanities Research Council (SSHRC), the International Development Research Centre EcoHealth Training Award, and the Pan-American Health Organization, uses a case study approach to understanding the public health and sustainable livelihood implications of ciguatera fish poisoning in Cuba. According to Lehane (1999) ciguatera poisoning is the most common illness caused by eating fish that contain toxins produced by a species of marine microalgae (Gambierdiscus toxicus). The illness is increasing in incidence, prevalence and distribution.

Interested and affected communities will be asked to help develop a better understanding of the linkages between coral reefs, climate change, near-shore reef fisheries, human infrastructure, public health, sustainable livelihoods, ecosystem management, tourism and other topics, in order to determine what adaptive, coping and mitigative measures might be necessary for affected communities to respond to the presence of this natural toxin.

This is a case study which will involve the collection of both qualitative and quantitative data, and will rely heavily on community involvement in both the information gathering and analysis stages.

According to Berke (2003) "fisheries are always complex systems of humans and nature". Alternatives to conventional management will be sought as part of this study. They are:

1. consideration of uncertainty and complexity;
2. fisheries as social-ecological systems and complex adaptive systems;
3. use of fishers' knowledge;
4. management objectives that incorporate livelihood issues; and
5. participatory management with community-based institutions and cross-scale governance.

This study will emphasize the adaptive, coping and mitigative strategies that are available to communities facing the threat of ciguatera fish poisoning. The research proposal has been developed at the request of the Cuban Ministry of Health which perceives ciguatera to be a growing problem in their country and which is interested in the ecosystem health approach.

>>> *For more information contact K. Morrison at morrison@eccho.ca*

Large Scale Air Quality Study Launched

The New Brunswick Lung Association and C-CIARN Health Air Pollution Network member Dr. Cameron Wake will track health effects as part of this large air quality study. Led by NASA, the US National Oceanic and Atmospheric Administration and involving hundreds of academic and government scientists from the United States, Canada, France, Germany and the United Kingdom, the collaboration will use 12 airplanes, one 274-foot research ship at sea, dozens of balloons equipped with sensors, satellite imaging and a network of ground-based stations for measuring air quality. Dubbed the International Consortium for Atmospheric Research on Transport and Transformation (ICARTT), it will be the most extensive study of air quality ever conducted, providing valuable data about the origins and content of pollution as it moves across North America and the Atlantic Ocean. Results should improve the ability to forecast poor air quality and to better understand how pollution produced in one region affects air quality in other places.

Related experiments, coordinated by Dr. Wake, will measure the public health effects of days in which pollution levels are high.

>>> *For more information, contact Barbara MacKinnon at barb.mackinnon@nb.lung.ca*

Need a Speaker on Climate Change and Health Issues?

Contact climatinfo@hc-sc.gc.ca — we can put you in touch with the right person! with particular focus on the health sector.

Fourth European Ministerial Meeting on Health and the Environment – "The Future for our Children"

More than 40 ministers and 1,000 delegates from 52 European and central Asian countries, and observers from other continents met in Budapest June 23-25, 2004. Their discussions focussed on children's environmental health, and such related areas as the environmental burden of disease, climate change, and environmental health information and education. The Declaration at the end of the meeting recognized that:

- climate change poses increasing short and long-term hazards to human health
- the climate is already changing, and the intensity and frequency of extreme weather events may change in the future and
- recent extreme weather events have caused serious health and social problems in Europe.

The Ministers committed to take action to reduce the current burden of disease from extreme weather and climate events and will report on progress in 2007. The next meeting of the Ministers will take place in 2009. Implementation of these commitments is to be guided by the European Environment and Health Committee with the support of the WHO Regional Office for Europe.

>>> *For more information visit* http://www.euro.who.int/eprise/main/WHO/Progs/BUD/ *Or* http://193.231.189.110:8080/gsdl/cgi-bin/whoenv/library.fcgi *or contact* melanie_itzkovitch@hc-sc.gc.ca

Climate Change and Clean Air Linkages Roundtable

Organized by Environment Canada, a Clean Air - Climate Change Linkages roundtable was held on May 27, 2004 in Ottawa, Ontario. The objectives of the roundtable were to provide stakeholders with the opportunity to explore, from a long-term strategic perspective, a wide range of issues from a wide range of sectors, and to provide guidance on the linkages between policies that are related to climate change and air quality issues. Participants at the roundtable included representatives from federal and provincial government departments, from industry, and from non-governmental organizations.

One of the key messages from the roundtable discussions was that by

linking climate change and clean air initiatives, benefits from both a GHG emissions reduction and a climate change impacts perspective emerge, which can have implications on integrated policies that can save money, as well as help to improve human health.

>>> *For further information about the event contact Melanie Itzkovitch at* melanie_itzkovitch@hc-sc.gc.ca

Memoranda of Understanding (MOU) for Cooperation on Addressing Climate Change

There is growing recognition that climate change represents a threat to the quality of life of all Canadians through its impacts on human health, the environment and the economy. In 2002, the Government of Canada announced the *Climate Change Plan for Canada* to help meet it commitments under the Kyoto Protocol.

Earlier this year, the Government of Canada signed Memoranda of Understanding with the Territory of Nunavut (Oct 2003) and with the provinces of PEI (Nov 2003), Manitoba (March 2004) and Ontario (May 2004) to coordinate efforts in developing and implementing policies and measures that address climate change and the impacts that are expected to affect communities across Canada. The co-signatories agree to work together in important areas such as promoting energy efficiency, promoting development of new energy sources, environmental management, assessing climate change impacts, developing adaptation strategies and public awareness and education. Ontario has recognized its MOU with the Federal Government as an opportunity to improve the health of its citizens by highlighting the need to take advantage of the important co-benefits (e.g., cleaner air) that can be associated with initiatives to reduce greenhouse gas emissions.

>>> *For more information go to* http://www.climatechange.gc.ca/english/publications/mou_ontario/

>>> *To view the Climate Change Plan for Canada go to* http://www.climatechange.gc.ca/plan_for_canada/plan/

Health Canada Lecture Series

On March 17, Dr. Dominique Charron and Dr. Paul Sockett from Health Canada's Centre for Infectious Disease Prevention and Control made a joint presentation to colleagues from Health Canada and other federal government departments, sponsored by C-CIARN Health and the Climate Change and Health Office, on "Climate Change, Infectious Disease and the Public Health Response Challenge". Climate change is a new consideration in infectious disease response planning. Understanding how the climate will change, and how this change will affect disease ecology at various scales is a complex challenge. Canada, like all countries in temperate latitudes, may encounter climate-related changes in infectious disease ecology in the 21st century.

The audience heard that the public health challenge is to estimate potential risks, identify population vulnerabilities, and adapt to new threats by addressing gaps in our response capacity in a timely manner. As the Canadian public health community continues to develop responses to the emergence of West Nile virus. Avian influenza, and SARS, contingency planning for the impacts of climate change needs to advance. The scientific community needs to work with public health planners by identifying emerging or existing infectious disease threats vulnerable to the influence of climate variability or change, by deepening our understanding of these vulnerabilities through research on disease ecology, and by identifying priorities for surveillance (early warning) and adaptive response planning (policy).

>>> *For more information, contact Dominique Charron at dominique_charron@hc-sc.gc.ca*

C-CIARN Ontario Workshop

A workshop, organized by C-CIARN Ontario, entitled "Managing Risks from a Changing Climate: Making Adaptation Happen in Ontario" was held in Guelph, Ontario March 24–25, 2004. Dr. Dominique Charron made a presentation at this workshop entitled "Climate change and public health: Getting past go".

From a public health perspective, the keys to successfully adapting to climate change are to first understand existing sensitivities to climate conditions and the coping range of individuals and communities. Once known, we can then assess vulnerabilities to current and future climate conditions, and develop and implement practical, community-based solutions that reduce those vulnerabilities.

The public health sector needs to respond to climate change related risks by widening the spectrum of health determinants and injecting climate change into existing practices. By developing targeted surveillance programs, weather alert systems, effective communication systems and targeted disease control measures – all of which are existing public health functions – that integrate the new conditions anticipated under a warmer climate, we will better manage the health risks and impacts from climate change.

>>> *For more information contact Al Douglas at adouglas@mirarco.org*

Canadian Association of Geographers Annual Meeting

C-CIARN organized four sessions at the Annual Meeting of the Canadian Association of Geographers (CAG) held in Moncton, New Brunswick from May 25-29, 2004. Jacinthe Séguin, Manager, Climate Change and Health Office and of C-CIARN Health Sector, participated in a plenary panel discussion on how to integrate the natural, social, and medical sciences in climate change vulnerability assessments. In her remarks, she stressed the need, from a health perspective, for climate change research that embraces both the scenario and vulnerability approaches, that accommodates a range of scale, and that includes health considerations.

Dr. Chris Furgal of Laval University made a presentation at the C-CIARN Arctic and Coastal Session on his work on the impacts of climate change on public health in Arctic communities.

Climate change in Inuit regions poses health risks related to:

1. increased heat and cold stress,
2. increased exposure to UV-B radiation,
3. travelling or hunting and fishing activities due to changes in weather and storm events or stability and safety of ice and snow,
4. impacts on food security related to access and availability of important traditional food species,
5. the potential introduction of new vector-borne or water-borne diseases as well as
6. impacts on critical health infrastructure related to altered permafrost stability in communities.

Communities in the Canadian North have already started to adapt to changes occurring in their local area. Community workshops identified examples of current adaptation such as alteration of hunting and fishing patterns, significant investments in shoreline protection programs, changed water consumption habits. In many cases, further programs for adaptation are needed.

>>> *For more information, contact Christopher.Furgal@crchul.ulaval.ca*

The Natural City Symposium

The Climate Change and Health Office and the University of Toronto organized a session at the Natural City Symposium, held in Toronto June 23-25, 2004. The session focussed on the inter-relationships to be considered when studying the socio-economic impacts of climate change on community health and well-being. Chaired by Jacinthe Seguin, Manager of Climate Change and Health Office and C-CIARN Health, speakers included Lydia Dotto, author of "Storm Warning - Gambling with the Future of our Planet", Dr. David McKeown, Medical Officer of Health for Peel Region, and Dr. Marcy Erskine and Dr. Sarah Wakefield of the University of Toronto. Ms. Dotto opened the session by describing the health and social impacts associated with climate change. Dr. McKeown spoke about how the health system has responded to major public health issues in the past, and what this might tell us about the capacity to deal with the health impacts of climate change. He suggested some opportunities for synergy between our responses to climate change and our current and future responses to public health threats. Dr. Erskine outlined a potential framework for conducting research on this complicated topic and Dr. Wakefield commented on the three presentations and how they impact the development of sustainable communities in Canada.

>>> *For a copy of Dr. Erskine's paper, contact* socioec.climate@utoronto.ca

>>> *For a copy of Dr. McKeown's paper, contact* David.McKeown@peelregion.ca

NOAA Funding Cut

The US President's FY2005 budget includes a reduction of approximately US $9 million to the Climate and Global Change Program. The reduction eliminates three social science oriented programs including the Health and Climate Variability Program and encompasses all of NOAA's open competition social science application programs.

>>> *For further information, see* www.ogp.noaa.gov/mpe/csi/econhd/index.htm

Canadian and Chinese Governments Cooperate on Climate Change

On May 17 to 19, 2004, Canadian scientists attended an international conference in Li Jiang in eastern China, entitled "Climate Change — Building the Adaptive Capacity". It was co-sponsored by the Canadian and Chinese governments under the provisions of a binational cooperative agreement on building the adaptive capacity on climate change, which was signed in October 2003. The conference was held to share recent research results and developments in climate change impact and adaptation science, management, and policy in the two countries and in other parts of the world. The delegation was financed by the Climate Change Impacts and Adaptation Program of the Canadian government.

The conference participants reported on development and use of climate change scenarios, on assessing climate trends and ecosystem responses to environmental changes, on assessing vulnerability to climate change, and on the development and use of regional and sectoral adaptation policies and strategies, including social responses.

Dr. Dieter Riedel of the Climate Change and Health Office of Health Canada was the only representative of a health agency invited to attend this conference. He gave a talk on public health considerations related to climate change, which was well received, and which is to be adapted by Chinese colleagues for presentations to decision makers.

The Adaptation and Impacts Research Group of the Meteorological Service of Canada is preparing a report on the conference, to be published in 2005.

>>> *For more information, contact Dr. Peter Berry at* peter_berry@hc-sc.gc.ca

1st National Climate Change Impacts and Adaptation Conference

Adapting to Climate Change in Canada 2005: Understanding Risks and Building Capacity

Watch for more details in upcoming newsletters

Climate and Health Summer Colloquium

This six day colloquium, hosted by the Advanced Study Program of the National Center for Atmospheric Research (NCAR), National Aeronautics and Space Administration (NASA) and the NCAR Weather and Climate Impacts Assessment Science Initiative, in partnership with the Center for Disease Control (CDC) and World Health Organization/Pan American Health Organization, was held July 21-28, 2004. Topics included:

1. tools available to health researchers for analysing extreme climate events and for downscaling climate change information;
2. demonstration of the utility of satellite remote sensing to study diseases that change with climate and/or land use;
3. integrated modelling (e.g. applied to climate/air pollution studies) and strategies for communicating scientific findings and uncertainties.

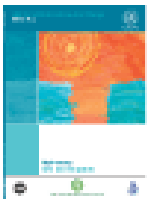
>>> *For more information and a copy of the presentations, visit the colloquium website at www.asp.ucar.edu/colloquium/2004/CH or contact Rebecca at rhaacker@ucar.edu*

Our mission is to help the people of Canada maintain and improve their health.

Health Canada

Heat-waves: risks and responses Health and Global Environmental Change Series, No. 2. World Health Organization 2004.

>>> *Available electronically at www.euro.who.int/globalchange*



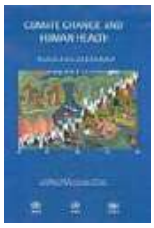
A changing climate is expected to increase average summer temperatures and the frequency and intensity of hot days.

Heat-waves in Europe are associated with significant increases in illnesses and deaths. A preliminary analysis of the 2003 heat-wave in Europe estimated that it caused 14 802 excess deaths in France, 2045 excess deaths in the United Kingdom, 2099 in Portugal.

This report addresses the health impact of heat as well as aspects of prevention and adaptation such as heat health warning systems, urban planning elements and aspects of building design.

Climate Change and Human Health — Risks and Responses

by A.J. McMichael, D.H. Campbell-Lendrum, C.F. CorvalÃin, K.L. Ebi, A. Githeko, J.D. Scheraga and A. Woodward



This book, published by the World Health Organization in collaboration with United Nations Environment Program and the World Meteorological Organization, describes the context and process of global climate change, its actual or likely impacts on health, and how human societies and their governments should respond

>>> *A summary of the book is available electronically at: http://www.who.int/globalchange/publications/cchhbook/en/*

Using Climate to Predict Disease Outbreaks: A Review. WHO 2004

This document evaluates the current and future potential of climate-based disease early warning as a means of improving preparedness for, and response to, epidemics. Based on the history of Early Warning System(EWS) development to date, the authors develop a conceptual framework for constructing and evaluating climate-based EWS. They identify the climate-sensitive diseases of major public health importance and review the current state of the art in climate-based modelling of these diseases, as well as future requirements and recommendations.

>>> *available electronically at www.who.int/globalchange/publications*

Climate Change Impacts and Adaptation: A Canadian Perspective

This document provides a review of the recent Canadian impacts and adaptation research (post-1997) and also highlights results from research funded by the Impacts and Adaptation component of the Climate Change Action Fund. The report provides information on various sectors such as water resources, agriculture, forestry, fisheries, coastal zone and health, as well as general information on impacts and adaptation, advances in research techniques and the remaining knowledge gaps.

>>> *For more information, visit www.adaptation.nrcan.gc.ca*