



FALL 2011



From the Executive Director

For a country once highly regarded internationally for taking progressive positions on global issues it is disappointing to finish 2011 with Canada's federal government withdrawing from the Kyoto Protocol. As limited in scope and effectiveness as it was, it was still the only accord that legally required its signatories to take action on climate change. To rub salt into the wound, Canada's carbon emissions are now almost 30 percent higher than where they would have been had we met our Kyoto obligations. As a developed nation, we have failed.

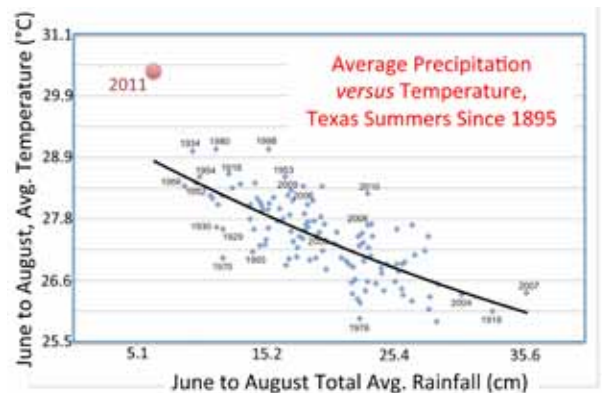
Both the US and Canada are now complicit in abdicating responsibility on the climate change file. Western economies have largely created extant global warming, and although some insist that the rapid growth of developing countries such as China make them equally responsible, the truth is that current global warming has been driven by us. China and India have come late to the parade. On a per capita basis, Canadians still emit at least three times as much CO₂ as a resident of China and 12 times as much as a resident of India.

Our national unwillingness to take serious action on global warming is all the more ironic given that Canada is on the front lines of witnessing impacts of climate change. Thawing permafrost in the North is buckling the foundations of buildings and damaging roads. And worse, according to an article in *Nature* magazine published this fall, the retreat of the permafrost may in coming decades lead to large, previously unanticipated releases of carbon dioxide and methane from thawing, carbon-rich soils. Head south, east or west and you can see other impacts, in particular related to extreme weather events, some of which are now believed to have been made worse by global warming.

Some of those impacts are hitting us in our lunchboxes. Kraft Foods, for example, raised the price of its peanut butter by 40% on 31 October—a jump directly attributable to a 270% increase in the market price of bulk runner-peanuts over the last year. Why did this happen? A major contributor was extreme weather. This past spring and summer, drought and scorching temperatures afflicted both Texas and Georgia, the two main runner-peanut producing

regions in North America. Temperature records were shattered from May through August, with Dallas seeing 70 straight days with temperatures at or above 37.7 °C (100 °F). Other towns had 100 days straight with 100+ °F heat. The peanut crop was decimated as the plants shriveled in the cracked, dry soil.

The dry, hot weather went well beyond normal experience, as can be seen in the accompanying chart compiled by Dr. John Nielsen-Gammon, Texas State Climatologist and Professor of Atmospheric Sciences at Texas A&M University. What's worse, the 2011 event might not be the end of it: Nielsen-Gammon is now suggesting that Texas might be in the initial stages of a much longer drought, an effect that appears to be related to the strong La Niña event of early 2011—superimposed on the global warming trend—that has rebuilt and is set to influence weather globally through at least the first half of 2012.



Based on original chart prepared by Dr. John Nielsen-Gammon, Texas State Climatologist. Units converted from Fahrenheit and inches.

Other food staple prices are also on the rise. Between June 2010 and today, the world wheat price doubled to about US\$300 a ton, and once again, extreme weather events played a role. Summer 2010 saw a heat wave in Eastern Europe that decimated a third of Russia's wheat crop and led to the country closing its borders to wheat exports. Exceptional rains on our prairies in the 2010 spring reduced the Canadian wheat harvest last year by 20%. This fall, record monsoon rains and flooding destroyed more than a tenth of the rice crop in Thailand, the world's largest exporter of that grain. Supply and demand being the force it is, the price of rice has jumped by 20% since May.

These examples remind us that our food supply is vulnerable. Climate change will necessitate adaptive responses if agricultural production is to be maintained at the level needed to feed seven billion human beings.

This fall, PICS released a white paper on food security; another will appear early in 2012 based on discussions with farmers and commodity producers associations held across the province. Both papers recommend how BC can best face a changing climatic landscape. Pest infestations, droughts and floods happen, and when they do in future, some will likely be more severe than regional historical experience would predict. The challenge in western Canada will be to have domestic policies and adaptations in place that will blunt their impact, for weather-related crop disasters and sharp jumps in agricultural commodity prices benefit neither farmers nor consumers.

On the international policy front, the only silver lining to come out of the dark clouds of this month's UN climate conference in Durban is that 194 countries agreed to keep talking. The "Durban Platform" puts the world on a course to negotiate a legally binding agreement to limit emissions from both developed and developing countries. Getting there will not be easy, but PICS will do its part to persuade Canadians to step up and construct, rather than reject.

Food security on the table

This fall, PICS generated public debate over an issue close to British Columbians' hearts, and stomachs—food security under a changing climate. Talk-back radio lines ran hot with callers keen to discuss the findings of a new PICS white paper—Climate Change and Food Security in British Columbia—co-authored by Canada Research Chair Aleck Ostry and Rachelle Beveridge from the University of Victoria (UVic) and Dr. Christiana Miewald from Simon Fraser University. The report found that British Columbia—which sources half its food from outside the province—should not assume that food supplies will continue to be easily accessible in future. The report noted that local growing conditions will change and outlined steps to improve food security. Lead author Ostry has been invited to give talks around the province as a result.

UNBC campus co-ordinator Kyle Aben also tackled the question of climate change impacts on BC agriculture and the development of local carbon offset markets during his invitational address at the BC Institute of Agrologists 2011 professional development workshop. Offset projects relevant to agrologists' daily work include improving



A piece of biochar. Photo credit: Jessica Dennis, UBC.

greenhouse energy efficiency, no-till farming, anaerobic digestion systems for dairy farms, forestry initiatives, and the use of biochar.

Using biochar to boost agriculture

Biochar's potential benefit for small-scale agriculture was also one of the projects supported by the PICS internship program this year. PICS intern Jessica Dennis from UBC—one of 17 students supported in 2011—spent the summer working with a joint UBC-SFU research team led by Hannah Wittman, SFU Sociology and Centre for Sustainable Community Development. Biochar is charcoal, produced through heating biomass at high temperature in the absence of oxygen, and intended for use as a soil amendment. In order to test the impact of biochar on beet production, the team conducted field trials at the Fraser Commons Farm Cooperative in Aldergrove, BC between June and October. They found that the biochar supplement significantly increased crop yield compared to untreated soil. An added benefit of biochar is that a portion of the carbon contained within it is resistant to decay and expected to remain sequestered for a long period of time.

Other PICS intern projects

Meanwhile, Nigel Whitehead (UNBC Environmental Planning) assisted the City of Williams Lake, BC with its carbon neutrality activities by conducting research as well as educating city staff and council about provincial greenhouse gas (GHG) emission reduction targets. He helped develop a 2010 Corporate GHG Inventory and Green Fleet Strategy, worked on a corporate emissions reduction plan and partially completed a 2011 emissions inventory.

Other student projects this year included research on low carbon transportation and ecosystem management strategies for the Province of BC; sustainability planning for the District of Saanich; research on water management, crops and food at SFU; and climate impacts on mountain biodiversity at UVic.

Research underway on carbon management in BC forests

This fall, PICS awarded \$450,000 to five inter-university research teams to study the impact of climate change on the province's forest ecosystems and find more sustainable forest management practices. Forests play a critical role in the planet's carbon cycle and are worth billions of dollars annually to the BC economy. But they are under threat from deforestation, global warming, increasing fire frequency, and pests. The projects funded under

the institute's carbon management in BC forests theme include the following topics:

- Developing advanced forest growth and yield models to improve predictions of carbon storage capacity
- Modelling of mountain pine beetle impacts on carbon fluxes
- Using biomass as an energy source

All projects are headed by one of the four PICS universities and include other university, government or not-for-profit partners. PICS is also supporting 27 additional projects under its four other research themes—the low carbon emissions economy, sustainable communities, social mobilization, and resilient ecosystems.

Debunking climate myths in the age of new media

A last minute opportunity to host a public lecture by John Cook—University of Queensland Climate Change Fellow, author and creator of the influential award-winning Skeptical Science website—didn't dampen audience turnout with around 170 people attending the November 30th event at UVic. The website analyses climate change skeptics' arguments against actual peer-reviewed scientific findings, and has attracted a team of worldwide scientific contributors and an online monthly audience of 500,000 visitors. Part of its outreach success has involved releasing smartphone apps for the iPhone and Android phones.



John Cook speaking at UVic.

Cook spoke about the psychology of misinformation and the most effective way to debunk myths, plus using social

media to communicate science. PICS can testify first-hand to the effectiveness of his site —page views of our website rose from 5,000 to 20,000 a day after Skeptical Science praised the PICS *Climate Insights 101* online courses.

New international PhD program in renewable energy

November 2011 saw the launch of a new Canada-Germany PhD training program in renewable energy led by the University of Victoria (UVic) and Carl von Ossietzky University in Oldenburg. Members of the founding board for the three-year program include PICS Associate Director Lawrence Pitt and members of UVic's Institute for Integrated Energy Systems. Funded by the German Academic Exchange Service and the European Union,

the program aims to foster collaboration and exchange between German and Canadian researchers in the following core areas:

- Conversion and storage of renewable energy sources
- System integration and management; and
- Societal acceptance and the political-economic framework

The program will also emphasize strong industry partnerships as well as interdisciplinary cooperation. Students will have the opportunity to complete half their training at each university and be jointly supervised by a faculty member from each country.

PICS tour promotes national solutions for climate change

A Canada-wide speaking tour by PICS executive director Tom Pedersen wrapped up this fall with the final address in a 21-lecture series being held in Prince George on September 22. As the 2011 Canadian Meteorological and Oceanographic Society (CMOS) national speaker, Pedersen took the opportunity to spread the PICS message about the urgent need for climate action and finding solutions through collaboration, to audiences from eastern through to western Canada. The talks were held in 17 cities across nine provinces including St. John's, Halifax, Fredericton, Montreal, Saskatoon, Winnipeg, Toronto, Edmonton, Calgary, Lethbridge, Kelowna, Vancouver and Victoria.

The lectures—which attracted extensive media coverage—outlined the latest scientific findings and climate trends, highlighted the need for a collaborative effort to reduce greenhouse gas emissions and offered potential inter-provincial solutions for moving towards a clean renewable energy/low-carbon economy in Canada. In particular, Pedersen raised debate over the potential for a national electricity grid based on wind energy and hydro energy storage across provincial boundaries. "This tour was a wonderful opportunity to tell Canada about PICS, and it was gratifying to see how the institute's model of finding solutions through collaboration resonated with audiences. I believe the impetus for federal action on the climate change file in Canada will come from voters, so the value of this kind of outreach, and the public discussion it generates, cannot be underestimated."

Celebrating CIRS

More than 300 participants attended a PICS-sponsored conference hosted by UBC's Sustainability Initiative in early November, which included the official opening of the university's flagship sustainability project, the Centre for Interactive Research on Sustainability (CIRS). The "Celebrating CIRS



The CIRS building at UBC.

| Accelerating Sustainability" conference attracted representatives from academia, government, industry and non-governmental organizations to explore ways in which to support a sustainable future. Highlights included keynote presentations by Steve Rayner, Director of Oxford University's Said Business School Institute for Science, Innovation and Society, and leading, Vancouver-based environmentalist David Suzuki.

PICS events in Vancouver

PICS continues to reach Lower Mainland audiences with its joint public lecture series featuring UBC and SFU professors that takes place on the last Thursday of every month in downtown Vancouver. Recent topics included sustainability education in BC, climate policy, and innovative technologies for a carbon-free future. All talks are archived at www.pics.uvic.ca/events.php.

In addition, PICS partnered with the SFU Centre for Dialogue this fall to launch a new public lunch-time series focusing on the transition to a low-carbon economy. More information about this brown-bag series is available at www.carbontalks.ca.

PICS also partnered with the UBC Terry Project on hosting a talk by environmentalist, author and activist Bill McKibben. A recording of his talk is available at www.terry.ubc.ca/global-speaker-series/.

Also in Vancouver, the new PICS outreach program for children reached over 2,000 kids and parents at the "Brighthouse Science Bash" in the Richmond Public Library and "National Science and Technology Week" at Science World.

Regional Climate Services Workshop

PICS and its sister organization, the Pacific Climate Impacts Consortium, in partnership with the German Institute for Coastal Research, Helmholtz-Zentrum co-hosted the first-ever regional climate services workshop at the University of Victoria on Nov. 21-23. "Exploring Regional Climate Services: Meeting Stakeholder Needs for Practical Climate Information" brought together almost 100 climate scientists, climate service providers, communicators and regional stakeholders to share their thoughts

and experiences related to climate service delivery. The event was also co-sponsored by the University of Victoria and KlimaCampus Hamburg, Germany. For more information, visit <http://pacificclimate.org>.

Upcoming events

British Columbians will have the opportunity in the New Year to connect with leading UK climate change expert Mike Hulme, professor of climate change at the University of East Anglia and founding director of the Tyndall Centre. In February 2012, PICS is co-sponsoring a panel discussion with Dr. Hulme at the annual meeting of the American Association for the Advancement of Science (AAAS) in Vancouver. His visit will also include a public lecture on February 15 based on his 2009 book, *Why We Disagree about Climate Change*, in which he explores the idea of looking beyond science to connect with people's worldviews, beliefs and values in the quest for climate change solutions. Dr. Hulme is a frequent commentator on the politics of climate change, including the shifts seen in the environmental debate since the so-called "Climategate" story.



Mike Hulme will be speaking in Vancouver on Feb. 15, 2012.

Also watch for the PICS exhibit during free **Family Science Days** at the AAAS Meeting on February 18 and 19, 2012. PICS publications and products will be on display, including the popular *Climate Insights 101* series of animated online lessons on Climate Science Basics available at www.pics.uvic.ca/insights/index.php.

The **Pacific Climate Seminar Series** and the **PICS UBC-SFU Public Lecture Series** will also continue in the New Year. The January line-up includes a presentation by Neil Connelly, UVic Office of Campus and Sustainability Planning on the university's Reporting on Sustainability Progress from 2009-11, and a joint lecture by Kirsten Zeflick (SFU Geography) with Erica Frank (UBC School of Population and Public Health) on the implications of climate change for public health and the need for political action. More information on upcoming events is available at www.pics.uvic.ca/events.php.

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