



Pacific Institute
for Climate Solutions
Knowledge. Insight. Action.

ANNUAL REPORT 2011/12



Mission

To partner with governments, the private sector, other researchers and civil society, in order to undertake research on, monitor, and assess the potential impacts of climate change and to assess, develop and promote viable mitigation and adaptation options to better inform climate change policies and actions.

The Pacific Institute for Climate Solutions gratefully acknowledges the generous endowment provided by the Province of British Columbia through the Ministry of Environment in 2008. This funding is enabling ongoing independent research aimed at developing innovative climate change solutions, opportunities for adaptation, and steps toward achieving a vibrant low carbon economy.

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Cover photo: View of Okanagan Lake by Paul Shepherd.

MESSAGE FROM THE EXECUTIVE DIRECTOR



As I write in the waning days of August, sea-ice extent over the Arctic ocean has reached a record minimum, and the persistent drought across so much of the US Midwest has caused the price of corn to rocket beyond \$8 US per bushel—a new record on the world commodity markets. While the two records appear as different as chalk and cheese, they might in fact be related. Arctic sea ice is like a mirror at the top of the world; it reflects back into space four-fifths of the summer sunlight that lands on it. But a darker, ice-free ocean absorbs solar radiation and warms.

The latest science suggests that the subsequent release of that stored warmth to the atmosphere in fall has weakened the equator-to-pole temperature gradient and slowed the eastward movement of high and low pressure ridges in the Northern Hemisphere. That observation can explain not just the increasing frequency of persistent summer heat waves like those over Europe in 2003 and 2006, Russia in 2010, and central North America in 2006 and now 2012, but also persistent winter cold spells as well as the low-pressure troughs that for weeks dumped rain on the US Midwest in the spring of 2011 and northern Europe this year, prior to the London Olympics.

While relating retreating Arctic sea ice to the world price for corn might seem a stretch, evidence continues to mount that the line connecting the two phenomena is not an abstraction. And in a nutshell, that connection is why the work of PICS is so important: physical changes in the climate realm have real consequences—economic, social, political, environmental and philosophical—that can be global in scale. Our job is a challenging one: to help provide navigational insights that will assist society in dealing with such complexity.

This report summarizes our approach to this challenge as we continue at full stride. There have been many pluses in the past year: our Climate Insights 101 short course has taken flight with lessons being taken by thousands of participants in tens of countries; some three dozen research projects—many interdisciplinary in nature—are humming along across the four PICS universities with most now being in a position to publish results in the year to come; our white paper series has seen thousands of downloads; and the institute now has a national profile that is being reinforced as many of our initial cohort of graduate fellows have moved into the workforce. We have established a very good relationship with the media in BC and Alberta, and we are called upon frequently to provide comment on climate policy issues.

But much remains to be done. Over the next year, we will work to redouble our focus on the primary keyword that guides our work: ‘solutions’. At the same time, we will work to increase our interactions with bodies politic in both BC and Ottawa, for as we noted in our last annual report—and as Arctic sea ice is reminding us—Earth’s climate is not standing still.

Let me end on a personal note. One of the most satisfying aspects of my job is being able to work with such exceptional colleagues at ‘PICS Central’, as we call the Victoria office. That the institute functions so effectively is very largely a reflection of their efforts and it has been an honour to work with them over the last year: Dr. Lawrence Pitt, associate director; Megan Jameson, administrative officer; our communications experts Robyn Meyer, Julie Gordon and Jessica Worsley; Wendy Phelan, executive assistant to the director; Coralie Breen, our short course executive producer, and part-timers Pauline Shepherd and Stephanie Inman. And on the continent, the institute continues to be aptly represented by our campus coordinators, Kyle Aben (UNBC), Nastenka Calle (SFU) and Sara Muir-Owen (UBC), each of whom works diligently to promote the PICS mission. I am grateful to them all.

A handwritten signature in black ink that reads "Tom Pedersen". The signature is written in a cursive, flowing style.

Dr. Tom Pedersen

The Year at a Glance

32 graduate and 5 postdoctoral fellows supported

13 new graduate fellowships awarded

2 new postdoctoral fellowships awarded

12 internship placements supported

35 research projects underway

26 seminars and lectures hosted

3 white papers published

4 briefing notes produced

Climate Insights: **bite size** released in February 2012

new website launched in June 2012

ABOUT PICS

The Pacific Institute for Climate Solutions (PICS) is a dynamic knowledge network that brings together leading researchers from British Columbia (BC) and around the world to study the impacts of climate change and to develop positive approaches to mitigation and adaptation.

Created in 2008 with a major endowment from the BC Ministry of the Environment, PICS is hosted and led by the University of Victoria (UVic) in collaboration with BC's three other research-intensive universities —Simon Fraser University (SFU), the University of British Columbia (UBC) and the University of Northern British Columbia (UNBC).

As such, PICS pulls together the intellectual capital of the province in applying a multi-disciplinary approach to climate change research. In partnership with all levels of government, the private and the non-profit sector, we strive to develop innovative climate change solutions that will help lead the way to a vibrant, low carbon economy.

The institute's main objectives are:

- ◇ understanding the magnitude and patterns of climate change and its impacts
- ◇ evaluating the physical, economic and social implications

- ◇ assessing mitigation and adaptation options and developing policy and business solutions
- ◇ evaluating and strengthening educational and capacity-building strategies to address climate change
- ◇ communicating climate change issues to government, industry and the general public

Governance

The institute is governed by:

- ◇ a program committee consisting of researchers from the four partner universities as well as representatives from the provincial Climate Action Secretariat (CAS) and Environment Canada's Canadian Centre for Climate Modelling and Analysis (CCCMA)
- ◇ an executive committee appointed by the University of Victoria
- ◇ an external advisory board comprising representatives from across the public, private and non-profit sector

More information about the PICS governance structure is included as Appendix 1.

RESEARCH

Research Themes

Collaborative and interdisciplinary research dedicated to meeting the multi-faceted climate change challenge is at the core of the PICS mandate.

Within this framework, we support a wide range of research endeavors that focus on solutions and relevance to BC under five broad themes:

- ◇ the low carbon emissions economy
- ◇ social mobilization
- ◇ sustainable communities
- ◇ resilient ecosystems
- ◇ carbon management in BC forests

Initial calls for applied research applications under each of these themes were issued in 2010/11 and a total of \$2.7 million over two years has been allocated to 32 projects, now at various stages of completion.

See pages 10 to 12 for a full listing of research currently underway. Detailed project information is available online at pics.uvic.ca/research-intro

The Low Carbon Emissions Economy

PICS envisions a future in which BC has developed a vibrant and diverse economy that allows for dramatic reduction in the emission of carbon dioxide (CO₂) and other greenhouse gases. This theme engages research that capitalizes on the opportunities and policy initiatives required to build such an economy.

Research priorities include:

- ◇ improving and sustaining BC's carbon pricing initiative
- ◇ ensuring environmentally sound development of renewable electricity generation
- ◇ reducing greenhouse gas (GHG) emissions from BC's transportation system
- ◇ reducing GHG emissions from BC's buildings
- ◇ managing BC's solid waste in ways that reduce GHG emissions
- ◇ accelerating the energy efficiency trend in BC

REDUCING GHG EMISSIONS IN THE BC ECONOMY

BC has ambitious policies to move towards a low carbon economy. This project is carried out in collaboration with a variety of stakeholders to accelerate GHG reductions in BC's economy. Researchers at UBC's Institute for Resources, Environment and Sustainability are partnering with the Climate Action Secretariat and two other public sector organizations to examine the effect of BC's carbon neutral government mandate on GHG reductions and core service delivery. They are also collaborating with the City of Surrey's engineering team to explore options for increasing green infrastructure funding, and working with Translink's strategic planning team towards lowering exposure to air pollutants associated with public transit. With the Tsay Keh Dene, they are proposing a new biomass-based community energy system to serve the needs of remote communities, and with the Musqueam Band, they are exploring the impact of using market mechanisms to shape energy and climate policy.

"The biggest challenge in meeting BC's GHG reduction targets is to find new solutions that meet the existing needs of various stakeholders. Our many partnerships afford us an opportunity to make sure the climate solutions we develop will be readily adopted in real world implementations."

Hadi Downtabadi,
Principal Investigator

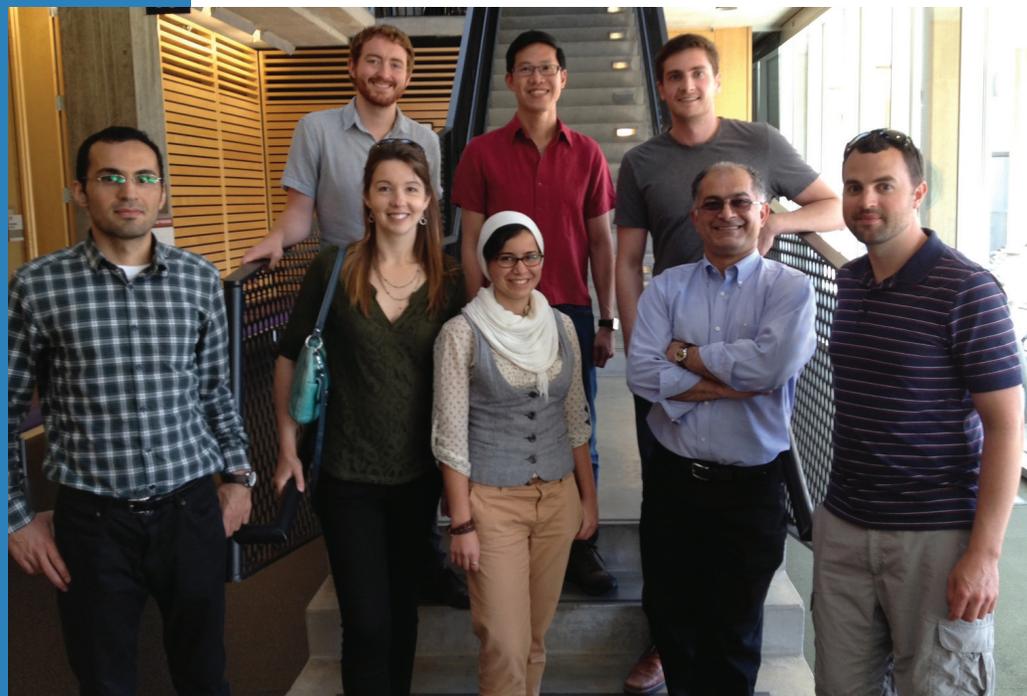
Photo: The research team at UBC.

Social Mobilization

Real and lasting changes in the ways we live, work and think are a crucial part of the equation in mitigating and adapting to climate change. This theme focuses on finding ways to mobilize British Columbians to think about and act on climate solutions.

Research priorities include:

- ◇ engaging British Columbians in developing and implementing climate change solutions
- ◇ changing collective behaviour toward a reduced carbon footprint
- ◇ building public support for policies and actions that support a green economy, ecological resilience, and sustainable communities, and meet GHG reduction targets
- ◇ creating planning and response capacity for climate change adaptation and mitigation



Sustainable Communities

A society's networks of built structures, institutions and organizations, as well as the beliefs and behaviours of its leaders and citizens, have a powerful influence on the collective use of energy and materials and, in turn, how communities both influence and respond to climate change. This theme promotes research designed to foster sustainable communities in BC.

Research priorities include:

- ◇ exploring, from a BC perspective, the elements of a sustainable community, including densification, mixed land use, a net-zero energy system and a diverse local economy, and determining how to get there through planning and policy development
- ◇ addressing the underlying drivers of unsustainable practices in our communities

PANDO | SUSTAINABLE COMMUNITIES

Pando | Sustainable Communities, a multilingual online network designed by SFU's Centre for Sustainable Community Development, facilitates collaboration and knowledge-sharing among researchers, practitioners and decision-makers. Designed for planners, local government staff, elected officials, consultants, developers, professors, and students, Pando allows members to create profiles, engage in forum discussions, share resources and learning, post events, make new professional connections, organize meetings, and receive customized content. The network promises to stimulate interdisciplinary thinking, more relevant community-based sustainability research, and speedier dissemination of good ideas. It was officially unveiled to a global researcher/practitioner community at the 2012 ICLEI World Summit in Brazil, an event associated with the Rio+20 Earth Summit.

"Pando provides a way to maintain momentum that is often lost between major conferences. We are encouraged that for many participants at Rio+20, Pando was one of the more tangible outcomes of the summit."

Mark Roseland,
Principal Investigator

Photo: Mark Roseland presenting PANDO at the ICLEI World Summit, May 2012.



Resilient Ecosystems

The scale, pace and range of climate change has far-reaching impacts on BC's ecosystems. Research under the resilient ecosystems theme seeks to understand these impacts and to develop management solutions that will maintain the viability of ecosystems in the province. Given that many such ecosystems are now under threat from climate change, the emphasis is on risk and adaptive management.

Research priorities include:

- ◇ understanding existing rates of change to BC ecosystems
- ◇ predicting future ecosystem change and the vulnerability of ecosystem services
- ◇ promoting adaptive management and governance in the stewardship of natural resources

Carbon Management in BC Forests

Forests play a major role in the planetary carbon cycle via the constant uptake and release of greenhouse gases such as CO₂ and methane. Moreover, they store a large amount of carbon in standing biomass and soils. These forest-based carbon stocks are being affected by pests, fire, drought and other disturbances associated with climate change, as well as by human activities such as land use changes and harvesting practices.

This theme seeks to understand and address the impacts of climate change on BC's forest ecosystems as well as the related socio-economic implications.

Research priorities include:

- ◇ developing quantitative carbon and carbon-offset accounting methods
- ◇ exploring the bio-energy potential of BC's forests, and the associated environmental concerns
- ◇ understanding the soil carbon pool and its future behaviour
- ◇ developing sustainable forest management policies in the face of a changing climate

The Low Carbon Emissions Economy		
Project Title	Grant Holder, Organization	Project Partners
Accelerating GHG reductions in BC's economy	Hadi Dowlatabadi, University of British Columbia	BC Climate Action Secretariat
Closing the loop: opportunities to reduce GHG emissions and create green jobs through zero waste policies	William Rees, University of British Columbia	Canadian Centre for Policy Alternatives (CCPA); Wilderness Committee; CUPE
Development of novel nano-structured photo catalysts for highly efficient solar reduction of carbon dioxide to clean energy fuels	David Wilkinson, University of British Columbia	
Experimental validation of the performance of wave energy converters of the point-absorber class	Brad Buckham, University of Victoria	
Flogging a dead policy: estimating the environmental impact of the luxury vehicle surtax in BC	Sumeet Gulati, University of British Columbia	
Just transition in BC: a framework for dealing with the employment impacts of the shift to a low-carbon economy	Kenneth Carlaw, University of British Columbia – Okanagan	CCPA; Communication, Energy and Paperworkers Union
Next steps on BC's carbon tax: assessing alternatives and searching for common ground	Mark Jaccard, Simon Fraser University	Pembina Institute
Wind turbine design and siting for unsteady conditions	Curran Crawford, University of Victoria	
Social Mobilization		
A day in my carbon neutral life: imagining transformative change, overcoming barriers	Shannon Daub, Canadian Centre for Policy Alternatives	SFU; CCPA; David Suzuki Foundation; Pembina Institute; SAP Canada; BC Healthy Communities; VanCity
From communities of interest to communities of practice: digital media as catalysts for climate action campaigns	Maged Senbel, University of British Columbia	goBEYOND Campus Climate Network
Greenest City Conversations	John Robinson, University of British Columbia	SFU; City of Vancouver

Social Mobilization cont'd		
Project Title	Grant Holder, University	Project Partners
Measured visualizations as catalysts for mobilization: a prototype for public engagement in municipal planning for climate change	Ronald Kellett, University of British Columbia	City of Revelstoke
Understanding the public uptake and acceptance of a municipal green energy incentive program	Chris Ling, Royal Roads University	City of Colwood
Sustainable Communities		
A community energy and emissions simulation model	Michael Wolinet, Simon Fraser University	Nanaimo and Sunshine Coast Regional Districts
Integrated community sustainability planning: implications for rural BC	Maureen Lebourdais, Fraser Basin Council	Regional District of Fraser Fort George
Meeting the climate change challenge: community responses to BC climate policy	Ann Dale, Royal Roads University	UBC; SFU
Pando Sustainable Communities	Mark Roseland, Simon Fraser University	BC Climate Action Secretariat
<i>Towards Sustainable Communities: Solutions for Citizens and Their Governments</i>	Mark Roseland, Simon Fraser University	BC Climate Action Secretariat; Union of BC Municipalities
Resilient Ecosystems		
Assessing the potential aquatic habitat value of streams responding to a changing climate	Brett Eaton, University of British Columbia	SFU; Fisheries and Oceans Canada; BC Ministry of Forests
Climate and ecosystem dynamics on southern Vancouver Island and the Gulf Islands: a historical perspective on strategies for restoration, management, and population recovery	Marlow Pellat, Simon Fraser University	UVic; UBC; University of Guelph; University of Sherbrooke; Parks Canada
Climate change and the decline of yellow cedar along the north coast of BC	Lori Daniels, University of British Columbia	University of Guelph; BC Ministry of Forests
Combining historical datasets, ecological modeling & sampling, and cutting-edge visualization techniques for adaptive management of mountain biodiversity	Brian Starzomski, University of Victoria	BC Parks; Alberta Parks; Alberta Innovates

Resilient Communities cont'd		
Project Title	Grant Holder, University	Project Partners
Evaluating the resilience of northern interior cedar-hemlock forests to western hemlock looper outbreaks	Philip Burton, University of Northern British Columbia	Canadian Forest Service (CFS)
Impacts of climate change on natural disturbance regimes in BC: planning for adaptive forest management solutions	Dan Smith, University of Victoria	CFS; BC Ministry of Forests
Operationalizing resilience over the long-term: learning from ecosystem baselines	Sara Gergel, University of British Columbia	University of Toronto; BC Ministry of Forests
Place-based policy-making and community resilience-building for climate change	Michael Howlett, Simon Fraser University	University of Saskatchewan; Carleton University; Natural Resources Canada
The Alouette River Basin: the developing urban fringe at the interface with protected landscapes in coastal BC and consequences for ecosystem resilience	John Richardson, University of British Columbia	SFU
Understanding ecosystem responses to climate change in southwestern BC forests: a paleoecological perspective on resilient ecosystems	Terry Lacourse, University of Victoria	Parks Canada
Carbon Management in BC Forests		
Community fire-interface biomass utilization for heating fuel	Juan Blanco, University of British Columbia	Community Energy Association; Green Heat Initiative
Developing environmental-response functions of growth and mortality to forecast forest carbon stocks in BC	Nicholas Coops, University of British Columbia	CFS
Estimating the carbon storage and emissions from harvested wood products from BC	Paul McFarlane, University of British Columbia	BC Ministry of Forests
Predicting carbon storage for BC on seasonal to decadal timescales	Vivek Arora, University of Victoria	CFS; Environment Canada; Pacific Climate Impacts Consortium (PCIC)
Striking the right bioenergy balance: promoting healthier carbon stores in our forests and forest product streams	Art Fredeen, University of Northern British Columbia	UBC; CCPA

STRIKING THE RIGHT BIOENERGY BALANCE

This project, entitled “Striking the right bioenergy balance: promoting healthier carbon stores in our forests and forest product streams”, is examining the best ways to manage forest carbon in pine-dominated forests affected by the mountain pine beetle (MPB), particularly in central and northern BC. MPB-affected forests can be logged, unlogged, clearcut, or partially cut. Using empirical data and modeling results, this project will suggest how to minimize site-level carbon emissions. Researchers are also modeling the impact of forest end-use, such as bioenergy combustion versus lumber production, and the resulting net carbon emissions when substituting bio-energy for fossil fuels and wood for concrete. Finally, the project will examine which policy instruments would best conserve forest carbon stocks in BC, while also considering the interests of the province’s forest resource and associated industries.

“This project will help inform policy aimed at striking the right balance between the environment, energy generation and the economy.

**Art Fredeen,
Principal Investigator**

Photo: Art Fredeen, professor of ecosystem science and management at UNBC, measuring carbon uptake by pine trees. Credit: UNBC.

Affiliated Projects

PICS occasionally supports climate-related research that falls outside our five core themes. The three projects supported over the past year were:

- ◇ the *BC Agriculture Climate Change Risk and Opportunity Assessment* conducted by the BC Agriculture and Food Climate Action Initiative
- ◇ a province-wide *Climate Analysis and Monitoring (CAM) project* led by PCIC in partnership with PICS and the BC Ministry of Environment
- ◇ an energy systems analysis of energy grids in BC and beyond, a collaboration between PICS, IESVic, BC Hydro and BCIT



Fellowship Programs

PICS fellowships support graduate students and postdoctoral fellows from the four partner universities as well as established visiting scholars from around the world. Drawing on a continuous flow of talent and expertise from BC and beyond, our fellowship programs produce a diverse array of research outcomes related to climate change issues that are closely aligned with the institute's research agenda.



IMPACTS OF CLIMATE CHANGE ON NATURAL DISTURBANCE REGIMES IN BC

Climate change is causing increased forest disturbance through fire, drought, insects and disease. This project, led by the University of Victoria, explores the response of BC interior Douglas-fir forests to western spruce budworm (WSB) outbreaks, BC's most damaging pest after the mountain pine beetle. In collaboration with the Canadian Forest Service and the BC Ministry of Forests, Land and Natural Resource Operations, researchers are collecting and analyzing data to better understand the historical role of WSB outbreaks in interior forests, and to determine the current impact of insect disturbance. One of the goals of this research is to develop recommendations for adaptive management strategies that will maintain and enhance forest resilience in the face of a changing climate.

"Tree-ring records show us how interior Douglas-fir forests have been affected by WSB outbreaks for centuries, which suggests that these ecosystems have been resilient to past disturbances. The trick for us, and one of the central objectives of our research, is to unravel the complex dynamics of climate change, forest management and natural disturbances to determine if this resiliency will persist into the future."

**Jodi Axelson,
Co-investigator**

Photo: Taking notes in a forest that had previously been defoliated by the western spruce budworm.

PICS fellowships are valued at \$12,000/year over two years for masters, \$18,000/year over three years for PhD students and \$50,000/year over two years for postdoctoral fellows. Visiting fellowships are awarded on a periodic, short-term basis throughout the year.

To date, PICS has awarded more than 70 fellowships totaling approximately \$2 million and, over the past twelve months, has supported a total of 32 graduate students and five post-doctoral fellows at its collaborating universities.

For a complete list of 2011/12 fellowship holders, see Appendix 2.

Internship Program

Through its internship program, PICS provides funding for public sector and non-profit organizations to hire students from collaborating universities to work on climate change research and policy projects across BC.

Now in its third year, the program supports 10 or more internships each year, providing a valuable opportunity for students to gain hands-on learning experiences and for employers to benefit from student expertise.

To date, 32 students have completed work terms with local and provincial governments, academia and non-profit organizations.

For a list of projects supported in 2011/12, see Appendix 3.

Publications

PICS research generates a growing body of knowledge in the form of white papers, briefing notes and other publications on issues related broadly to climate change mitigation and adaptation. All publications are solutions-focused and can be used to inform and guide anyone from policy-makers to educators, researchers and the interested public.

White Papers

Our white paper series consists of independent, peer-reviewed reports authored by leading researchers and policy experts commissioned by PICS. White papers contain in-depth analysis and recommendations on a range of climate-related topics of key interest to BC.

Over the past year, PICS has published white papers on:

- ◇ climate change and food security
- ◇ renewable electricity development
- ◇ district energy systems

Briefing Notes

PICS briefing notes offer succinct analysis and solutions-oriented policy recommendations based on a range of climate-change related topics. They provide quality background and are a useful tool for the media, decision-makers, industry leaders and the interested public.

Briefing notes published in 2011/12 covered:

- ◇ BC's ocean energy policy
- ◇ the possibility for a Western Climate Initiative (WCI) offset gateway including non-WCI partner offsets
- ◇ managing the increase of tourism-driven GHG emissions in BC's aviation sector
- ◇ the conservation of BC's leading-edge species at risk

Other Publications

Additional resources include journal articles, book chapters, conference proceedings and theses produced by the institute's fellowship holders, as well as special reports commissioned or supported by PICS.

Over the past year, these have included the following reports:

- ◇ the *BC Agriculture and Climate Change Risk and Opportunity Assessment Report* (see *Affiliated Projects*)
- ◇ a *BC Energy and GHG Emissions Inventory for 1990 to 2010* produced by SFU's Canadian Industrial Energy End-use Data and Analysis Centre (CIEDAC)

All publications are available for download from the institute's website at pics.uvic.ca/research/publications.

OUTREACH & EDUCATION

Advancing public awareness and understanding of climate change is a key component of the PICS mandate. Drawing on our vast knowledge base, we engage in a variety of outreach activities and create educational tools to inform audiences at all levels.

Lectures & Seminars

Pacific Climate Seminar Series

The Pacific Climate Seminar Series is jointly hosted by PICS and its sister organization, the Pacific Climate Impacts Consortium (PCIC) at the University of Victoria. Launched in September 2009, the monthly seminar series covers a range of topics related to climate science, regional impacts and potential solutions. Speakers often include local researchers or PICS fellowship holders.

UBC-SFU Public Lecture Series

This monthly lecture series is a joint effort between the two Vancouver-based PICS universities, typically featuring at least one speaker from each campus at either UBC Robson Square or SFU Harbour Centre in downtown Vancouver. Launched in September 2010, the series has brought together dozens of UBC and SFU experts to discuss such core climate change issues as sustainable urban planning, public health impacts, sustainability education, climate policy, and technological innovations for a carbon-free future.

Invited Speakers

In addition to our regular seminar and lecture series, we periodically host special public events with key climate change authorities from across North America and internationally. Invited speakers and topics over the past year have included:

- ◇ John Cook, author and creator of the award-winning Skeptical Science website on communicating climate change in the age of new media
- ◇ Mike Hulme, scientist, author and founding director of the Tyndall Centre at the University of East Anglia on why we disagree about climate change
- ◇ Michael Mann, renowned US scientist, author and co-creator of the famous 'hockey stick' chart on global temperature rise
- ◇ Randy Olson, scientist turned writer and film-maker on communicating science through storytelling
- ◇ environmental policy expert Nancy Olewiler from SFU
- ◇ fusion expert Alan Offenberger
- ◇ Ian Mason from the University of Christchurch, New Zealand
- ◇ Environment Canada's Stewart Cohen

PICS Lecture Tour

Launched in March 2010, the PICS Lecture Tour aims to increase public awareness of the challenges and opportunities presented by climate change, primarily across BC but also on a national and international scale.

Last year, as the 2011 national speaker of the Canadian Meteorological and Oceanographic Society, PICS Executive Director Tom Pedersen took his message about the urgent need for action from coast to coast in more than 20 public talks across nine provinces, attracting extensive media coverage.

In 2012, he spoke at a number of conferences and to multiple civic groups, specifically targeting the engineering and business communities with a special talk through the Prince George Chamber of Commerce, and plans to visit other BC communities during the coming year.

PICS Annual Forum

The PICS Annual Forum brings together researchers and decision-makers from across the public, private and non-profit sectors to discuss key climate change issues of relevance to the province. Held in June of each year, the forum also provides a valuable opportunity for the PICS community to meet, network and share ideas. The fourth annual forum in June 2012 took the form of a two-day retrospective and planning session.

Under the theme “Climate Change Solutions: The Road Ahead”, the core PICS team, including fellows, researchers and committee members, were invited to take stock of the past three years of supported research and to consider the institute’s direction for the coming years.

In addition, all PICS fellows and principal investigators had an opportunity to share their research activities and outcomes by displaying a poster during the event.



TIMOTHY SHAH

Climate Action Stories Intern
Pembina Institute

A recent graduate of UBC's School of Community and Regional Planning, Timothy spent the summer working as Climate Action Stories Intern with the Pembina Institute, to help the organization with its ongoing review of the BC carbon tax. He conducted a literature review on carbon taxes and their impacts in various jurisdictions around the world, and interviewed local governments across BC to learn about their recent energy efficiency projects, why they implemented them, and whether the carbon tax had any economic impact. He also supported Pembina's work on electric vehicle (EV) planning and charging station deployment by conducting research and consulting with individuals from Oregon and Washington about their EV planning experiences.

"Working at Pembina has been an extraordinary experience. It has given me a chance to apply my knowledge of environmental planning and policy through understanding the impacts of the carbon tax on local government decision-making, and how public policy choices more generally work in practice."

Timothy Shah

Weekly News Scan

Launched in August 2009 and produced in partnership with the ISIS research centre at UBC's Sauder School of Business, the PICS Climate News Scan is a weekly summary of the major climate change related science, technology, and policy advances from around the world that are of direct relevance to BC.

The scan is organized around the institute's five core research themes and distributed collectively to over 3,000 recipients in the public, private and non-profit sectors. A novel feature of the scan is the analysis of the implications for British Columbia inherent in the topics described in the publication, and feedback indicates that readers particularly value such BC-specific analysis.

Short Courses

Climate Insights 101

Climate Insights 101 is a series of short, animated interactive courses designed to provide an in-depth understanding of the science behind, and issues related to, climate change. The courses are being developed in sequence and will ultimately comprise four distinct modules, each containing a number of animated 30-minute lessons.

Module 1, Climate Science Basics, was launched in August 2011. Three additional modules are currently in development and will be completed in late 2012 and early-mid 2013. They cover the topics of regional climate change and its impacts, adaptation and mitigation.

Originally intended for civil servants, the short courses have proven to be popular amongst educators at the secondary and post-secondary levels. They are also useful tools for a variety of audiences, including special interest groups and members of the general public interested in having a comprehensive understanding of climate change. The courses combine animation, interactive quizzes, and interviews for a truly engaging experience.

YouTube Videos

In addition to Climate Insights 101, PICS has developed two complementary products that make climate change education accessible via shorter animated videos, available on YouTube and the PICS website.

- ◇ **Climate Insights: bite size**
Whereas Climate Insights 101 features comprehensive, in-depth lessons, the 'bite size' videos, released in February 2012, are shorter, more accessible, animated videos that cover the 'highlights' of the same material, providing a more basic educational overview of climate change related science and issues. The 10 bite size videos, mostly under 10 minutes in length, cover the same topics as the first module of Climate Insights 101, thus providing an overview of climate science basics for audiences wishing to have a basic understanding.
- ◇ **Clear the Air**
These six animated short videos refute common climate change myths in less than two minutes each. Topics include the greenhouse effect; the Sun's influence; Mother Nature; human influence; is the Earth cooling?; and climate change consensus.

Following the launch of Climate Insights: bite size in February, the videos were showcased during Family Science Days at the 2012 AAAS Annual Meeting and the GLOBE 2012 Conference & Trade Fair, both in Vancouver. PICS also displayed a poster on its short course initiative at UVIC's first annual "How to Talk about Science" Conference in May. Additional outreach activities, specifically focusing on high school students, are planned for the coming year.

Media Coverage

Building on its success in attracting media coverage during 2010/11, PICS continues to feature in news outlets across BC and beyond. The more prominent items over the past year included the launch of the Climate Insights 101 short course series in 2011 and Climate Insights: bite size in 2012; new research on climate change and food security, clean energy, and carbon management in BC forests; three op-eds by PICS Executive Director Tom Pedersen; as well as prominent guest speakers John Cook, Alan Offenberger, Mike Hulme, and Michael Mann.

In 2011/12, PICS appeared in the following print and broadcast media:

- ◇ **Print:** Vancouver Sun; Edmonton Journal; The Province; Georgia Straight; Business in Vancouver; Prince George Citizen; Times

Colonist; Victoria News; North Shore News; Salmon Arm Observer; Eagle Valley News; and 100 Mile House Free Press

- ◇ **Radio:** CBC Radio (BC Almanac, All Points West and On the Island); CFX 1070 (Straight Talk); Opinion 250 News Radio and 93.1 CFIS-FM (Prince George); and AM 1150 News (Kelowna)
- ◇ **Television:** CTV News (Vancouver and Victoria); and Studio Four TV (Vancouver)

Website & Social Media

The PICS website houses a wealth of information on the institute's research activities and outcomes, news, events, publications and other climate change related resources. Originally launched in September 2009, the site was redesigned in 2012 for a more user-friendly interface and easy navigation. It is organized in seven main sections:

- ◇ **About PICS:** the institute's mission, mandate and history, information about governance, and staff bios
- ◇ **Research:** the largest section of the site, includes information about the five research themes, fellowships and internships with a separate, dedicated page for each research project and fellowship. The research section also hosts the institute's

publications database, with all listings searchable by author, title or keyword.

- ◇ **Education:** a portal to the PICS short courses (Climate Insights 101) and YouTube videos
- ◇ **Events:** includes an events calendar, event archive and webcast recordings
- ◇ **Newsroom:** PICS media releases, newsletters, news scans, and a selection of PICS in the news
- ◇ **Resources:** a list of relevant and useful links, and a portal to the Climate Solutions Network database of climate change experts
- ◇ **Contact:** PICS contact information



SHANNON JONES

Program Assistant, Transportation
Fraser Basin Council

During her summer internship with the Fraser Basin Council (FBC), Shannon, a graduate student in SFU's School of Resource and Environmental Management, worked with the Climate Change and Air Quality team on the E3 Fleet program — a Canada-wide initiative designed to help public and private sector organizations green their vehicle fleets. Her work involved conducting research to update a database on low-emission vehicles, composing a monthly client newsletter, writing case studies on E3 members and developing a survey to determine how the FBC can continue to help organizations green their fleet. Through these projects, Shannon established strong relationships with her colleagues and E3 member, and gained valuable communication and technical skills. The internship, she says, has been a valuable learning experience and provided her with the necessary tools to pursue her passion for planning sustainable communities.

"I would like to thank both PICS and the FBC for providing me with this opportunity. I believe that this experience will help advance both my research and professional career in sustainable community planning."

Shannon Jones

The new website also includes e-mail sign-up options for the PICS news & events distribution list and the weekly news scan.

In addition to its website, PICS actively uses the social media platforms Twitter, Facebook and YouTube to share news, event notifications and other information about the institute.

CAMPUS UPDATES

University of Victoria

As the host institution, UVic houses the central PICS office, comprising the executive and associate directors, four full-time and two part-time staff. PICS at UVic is responsible for directing the institute's overall programming and outreach activities. This includes administering the PICS research, fellowship and internship programs; coordinating the news scan, briefing program, white paper series, PICS annual forum, lecture tour and other events; producing the Climate Insights 101 short courses; as well as managing the institute's promotional activities and media relations.

Research: Over the past year, PICS has collaborated with the Pacific Climate Impacts Consortium (PCIC) on a province-wide Climate analysis and monitoring (CAM) project and with UVic's Institute for Integrated Energy Systems (IESVIC) on an energy systems analysis of energy grids in

BC and beyond. More information on both initiatives is available on the PICS website under affiliated projects.

Fellowships & Interns: In 2011/12, PICS fellowships supported a total of nine UVic graduate students, including six PhD candidates, and one postdoctoral fellow in a wide range of disciplines (see Appendix 2 for details). Moreover, three UVic students completed PICS internship positions with the BC Ministry of Energy and Mines, the Bulkley Valley Research Centre and Climate Smart.

Publications: In addition to producing a weekly climate news scan in collaboration with the UBC Sauder School of Business, PICS also published three white papers, four briefing notes and two special reports during the past year. White papers included *Climate change and food security* by UVic's Aleck Ostry, *Scaling-up renewable electricity in BC* by SFU's Mark Jaccard, and *The regulation of district energy systems in BC* by Peter Ostergaard from the Fraser Basin Council. Briefing notes discussed BC's ocean energy policy, the WCI's offset program, the management of GHG emissions in BC's aviation sector, and the conservation of BC's leading-edge species at risk; special reports included the *BC Agriculture and Climate Change Risk and Opportunity Assessment Report* and the *BC Energy and GHG Emissions Inventory for 1990 to 2010*. The institute also published four editions of its quarterly newsletter.

PICS Annual Forum: The 2012 annual forum, entitled *The Road Ahead*, took place on June 13 and 14 in Victoria. Following the event, members of the program committee met *in camera* to discuss the institute's strategic direction.

Pacific Climate Seminar Series: In 2011/12, the UVic-based PICS-PCIC seminar series explored the topics of wind power integration; storm event monitoring; sustainability progress at UVic; BC's 2012 State of the Ocean Report; and weather data from PCIC's climate analysis and monitoring project. Speakers included PICS fellow Torsten Broeer from IESVic; a PCIC visiting researcher from Germany; UVic's director of campus planning and sustainability; a NEPTUNE Canada data specialist; Bill Crawford from DFO's Institute for Ocean Sciences; and PCIC climatologist Faron Anslow. Seminar recordings are available on the PICS website.

IdeaFest 2012: In March 2012, PICS participated in UVic's first annual IdeaFest, a weeklong celebration of research, scholarship and creativity, featuring a wide range of events and activities. The thematic focus for IdeaFest 2012 was interdisciplinarity and PICS was contributed to two events as part of a public lecture series hosted by the vice-president research; one focusing on the impacts of climate change and pollution on the world's oceans with PICS executive director

Tom Pedersen and Verena Tunnicliffe, director of the university's VENUS Coastal Network; the other on climate change and food security featuring PICS white paper author Alex Ostry and PCIC director Francis Zwiers.

Other Events: Further to the above events, PICS-UVIC hosted a series of guest speakers including John Cook, author and creator of the award-winning *Skeptical Science* website; Mike Hulme, founding director of the University of East Anglia's Tyndall Centre for Climate Change Research; Michael Mann, co-author of the famous 'hockey stick' chart on global temperature rise; Randy Olson, scientist turned writer and film-maker; environmental policy expert Nancy Olewiler from SFU; fusion expert Alan Offenberger; and Ian Mason from the University of Christchurch, New Zealand.

Climate Insights 101: Following the release of *Climate Insights: bite size* in February 2012, the remainder of the year focused on developing the next module of the short course series—*Mitigation*—scheduled for release in 2013.

Website & Social Media: Other milestones in 2011/12 included the redesign of the institute's website and the expansion of its social media presence. The website now includes an individual page for each research and fellowship project, and the YouTube Channel, in addition to the *Climate Insights: bite size* and *Clear the Air*

videos, features a selection of seminar recordings on a wide range of topics. As a result of this new feature, the number of YouTube followers and viewings has increased significantly. The number of Facebook and Twitter followers has also increased in response to more frequent posts by the PICS communications team.

Simon Fraser University

2011/12 at PICS-SFU saw the emergence of new partnerships, the founding of the SFU Sustainability Network, and the Science in Action program reaching many more children and families than anticipated; all helping to build a stronger sense of community both on and off campus by engaging the public through different programs. Key initiatives over the past year included:

UBC-SFU Public Lecture Series: Public interest in the joint lecture series has continued to grow, reaching an audience of close to 700 over the past year. In 2011/12, the series brought together a total of 10 professors from both universities to talk about a range of topics, including environmental education; climate policies; cleantech innovation and commercialization; climate change and health; sustainable development at the community level; and engaging citizens through visualization tools.

Brown Bag Lunch Dialogues: In September 2011, PICS partnered with SFU Carbon Talks to co-host the

monthly Brown Bag Lunch Dialogue series, reaching over 700 people to date. The goal of these public dialogues is to raise awareness of innovations and innovators in the low carbon economy and to profile key emerging issues related to climate change mitigation and adaptation, including greening gas stations; resilient cities; car sharing in Vancouver; the future of climate change negotiations; and an economic assessment of the Northern Gateway pipeline.

Science in Action Energy Workshops: Offered in partnership with SFU Science in Action, this program was launched in June 2011 to provide children in grades four to seven with a hands-on opportunity to explore different ways of generating “green” energy from wind, sun and water power, and to help them understand the greenhouse effect and its impacts using the Climate Insights: bite size videos as a learning



PICS-SFU program coordinator Nastenka Calle explains the greenhouse effect at one of the Science in Action Energy workshops.

and teaching tool. The program, run by PICS-SFU coordinator Nastenka Calle, is now open to grade eight students and has to date reached over 2500 children and families through workshops and special events, such as the AAAS Family Science Days and the Brighthouse Science Bash.

SFU Sustainability Network: Seeking to advance sustainability in key areas of the university, this network was launched in April 2012 with PICS-SFU as one of the founding partners along with Facilities Services, the Campus Sustainability Advisory Committee, Faculty of Environment and Sustainable SFU. PICS-SFU program coordinator Nastenka Calle is one of the committee members.

SFU Sustainability Festival: PICS-SFU co-hosted the fifth SFU Sustainability Festival in September 2011. This annual event aims to inspire the campus community to learn about sustainability issues and provide them with tools and resources to integrate solutions into their daily lives.

Climate Change Research Poster Competition: During this year's Sustainability Festival, SFU graduate students had the opportunity to showcase their innovative, climate change-related work at the first annual poster competition hosted by PICS-SFU. The prize for best poster went jointly to PhD candidates Hadi Hadizadeh from the School of Engineering Science and

MEASURED VISUALIZATIONS AS CATALYSTS FOR MOBILIZATION

This two-year project is developing and testing new participatory design tools to enhance community engagement in, and support of, municipal planning for climate change. Researchers in UBC's Schools of Architecture & Landscape Architecture (SALA) and Community & Regional Planning (SCARP), in partnership with the City of Revelstoke, are working with residents to envision how their communities might change over the next thirty years. Based on the characteristics of future scenarios, the research team will calculate their implications for energy efficiency and GHG reduction targets. Phase 1 of the project – the development of a prototype public engagement strategy – is now complete, and the first engagement workshop took place in June 2012. This work will help Revelstoke and other BC communities better plan for a more sustainable future.

"The goal of this project is to learn how 'measured visualizations' of possible futures could improve community engagement in, understanding of, and dialogue around carbon emissions challenges – and opportunities – in local planning."

**Ron Kellett,
Principal Investigator**

Photo: Screen caption of a Revelstoke neighbourhood design option as viewed by workshop participants on a touch table interface.

Britta Peters from the Department of Geography for their respective work on improving the image quality of low-energy digital displays and evaluating the use of mobile applications for environmental learning. PICS fellows Steve Conrad, Cedar Morton and Mary-Ann Middleton also participated in the competition showing their work on water allocation and adaptation policies; transboundary water governance in the Columbia River Basin; and an assessment of how climate change and water use can affect groundwater sensitive streams. PICS program committee member Tim Takaro served as one of the judges along with John Pierce, dean of the Faculty of Environment.

Student Research Day: In April of this year, PICS-SFU and the SFU Climate Change Impacts Research Consortium (CCIRC), led by PICS program committee member Diana Allen, hosted the second annual CCIRC Student Research Day, where graduate students presented their research on a range of climate change-related topics. Research topics included: water allocation and



PICS fellow Mary-Ann Middleton explains her work to the judges at SFU's Climate Change Poster Competition.

adaptation policies; planning for marine ecosystem resilience under climate change in BC; ambient, interactive displays and controls for sustainable living; the impacts of climate change on groundwater sensitive streams; wind patterns and forest fire risk; and management implications of Pineapple Express storms. PICS-SFU fellows Dionne Bunsha, Steve Conrad, Sabine Jessen, Mary-Ann Middleton and Rupananda Widanage were among the participants.

PICS-SFU also participated in the 2012 SFU Open House in Burnaby and Surrey, and sponsored the 2012 Sustainable Campuses Conference "Campus as a Living Lab" hosted by Sustainable SFU, two workshops on climate change impacts in coastal cities and agriculture hosted by the SFU Adaptation to Climate Change Team (ACT), as well as three GreenTech Exchange forums hosted by GTEx on food security; energy conservation; and employment opportunities in the green economy.



In addition, PICS-SFU provided bursaries for 13 SFU students to attend the 2011 International Student Energy Summit.

For more information, visit sfu.ca/climatechange/pics-sfu.html

University of British Columbia

The 2011/12 year was a productive one for the PICS-UBC contingent, including program committee members David Wilkinson and Paul Evans, program coordinator Sara Muir-Owen and Shirlene Cote, research coordinator with the social mobilization theme. At the start of the academic year, Sara and Shirlene moved office to the university's new Centre for Interactive Research in Sustainability (CIRS) to join a hub of sustainability initiatives at UBC. CIRS is recognized as one of the most innovative high-performance buildings in North America.

Celebrating CIRS | Accelerating Sustainability: The official opening ceremony for CIRS was held in November 2011 at a conference hosted by the UBC Sustainability Initiative (USI). Sara Muir-Owen, as well as assisting on the organizing committee, attended the event alongside Tom Pedersen, PICS-SFU coordinator Nastenka Calle and 300 other delegates from academia, government, industry and the NGO sector. The conference focused on three core themes: From Regenerative Buildings to Regenerative Communities; Community Engagement

and Social Action; Partnerships and Implementation. Highlights included keynote presentations by Steve Rayner, director of Oxford University's Institute for Science, Innovation and Society and Vancouver's own David Suzuki.

UBC-SFU Public Lecture Series:

Over the past year, PICS-SFU and UBC continued to collaborate on the Vancouver public lectures. The 2011/12 series launched on September 14, 2011 with a presentation by Dr. David Zandvliet, SFU Faculty of Education and Dr. Alejandro Rojas, UBC Faculty of Land and Food Systems.

Other speakers included:

- ◇ Mark Jaccard, SFU and Kathryn Harrison, UBC (October 2011)
- ◇ Elicia Maine, SFU and David Wilkinson, UBC (November 2011)
- ◇ Kirsten Zeflick, SFU and Erica Frank, UBC (January 2012)
- ◇ Mark Roseland, SFU and Ron Kellett, UBC (March 2012)

PICS-UBC Fellows: PICS-UBC fellows continued to meet in 2011/12 to provide research updates and receive feedback from colleagues: PhD candidate Jennie Moore with the School of Community and Regional Planning presented the findings of her project entitled "Getting serious about sustainability: exploring the potential for one planet living in Vancouver"; political science PhD

TARA MOREAU

Postdoctoral Fellow

University of British Columbia

Tara Moreau is nearing the end of her fellowship held jointly with UBC's School of Architecture and Landscape Architecture and the Institute for Sustainable Horticulture at Kwantlen Polytechnic University. Her postdoctoral research focused on agriculture and climate change, in particular the science, policy and planning for greenhouse gas mitigation in BC's agriculture and food supply chains. Through the support of PICS, Dr. Moreau has published three papers on climate-smart agriculture practices, specifically the role of local governments in enabling the transition to sustainable food systems. In addition to her academic work, she founded the SPEC/YWCA Urban Farmer Field School in Vancouver, which aims to teach new urban farmers about climate change while giving them hands-on skills.

"The PICS perspective of evaluating global climate change within the context of BC provided me with unique support and innovative resources to implement climate change solutions directly linking scientific research to community-based actions. I wish there were more agencies like this."

Tara Moreau

candidate Elizabeth Schwartz shared initial results from her interviews with City of Vancouver staff for "Local solutions to a global problem? A study of climate change policymaking in Vancouver"; and Laura Cornish from the School of Resource and Environmental Management posed the question: "Can 4D climate visioning foster local climate action?"

Bill McKibben: In November 2011, PICS-UBC partnered with the UBC Terry Project to host Bill McKibben of 350.org for a keynote address entitled "Notes on the climate front". Hailed as "the world's best green journalist" by Time magazine and the author of a dozen books about the environment, including his seminal *The End of Nature* (1989)—recognized as the first book on climate change for a general audience – McKibben works tirelessly to foster global grassroots activism in the struggle for climate justice. More than



1000 students and faculty attended his address at the Chan Centre and his visit spawned a new chapter of 350.org at UBC.

AAAS Annual Meeting: In addition to representing PICS at the AAAS Family Science Days in February 2012, PICS-UBC also worked with Stephen Sheppard and postdoctoral fellow Olaf Schroth to organize an interactive session entitled “Beyond climate models: rethinking how to envision the future with climate change”. The session brought together leading multi-disciplinary experts on climate change, including John Robinson as moderator, Stephen Sheppard from the Collaborative for Advanced Landscape Planning, Mike Hulme from the University of East Anglia and Richard Moss, senior scientist at the Joint Global Change Research Institute.

3-Minute-Thesis (3MT) Competition: In 2012, PICS-UBC sponsored the second annual UBC 3MT Competition, with Sara Muir-Owen participating as a semi-finals judge. The competition, organized through the UBC Faculty of Graduate Studies, aims to assist graduate students in achieving effective presentation and communication skills. Participants have just three minutes and a single power point slide to explain the scope and significance of their research to a non-specialist audience.

Other PICS-UBC Lectures: In addition to hosting the public lecture series and fellowship talks, PICS-UBC also

partnered with the UBC Institute for Asian Research to co-host “New perspectives on China’s energy security” by Claude Comtois, Visiting Chevalier Professor in Transportation and Development in China, and held a special lunchtime lecture titled “Climate change adaptation: reflections on experiences at UBC and a look ahead” with Dr. Stewart Cohen. This event provided an opportunity to offer a farewell to Dr. Cohen, who had been engaged in climate change adaptation research at UBC for close to 17 years.

GLOBE and Leading Change 2012: In March 2012, PICS-UBC attended the GLOBE Trade Fair at the Vancouver Convention Centre and Sara Muir-Owen served as a connection group theme leader for Leading Change 2012 — a one-day forum for 150 students and young professionals. The forum complemented GLOBE 2012 events by providing discussion groups, mentorship and networking opportunities for emerging environmental leaders from business, government and non-governmental organizations across Canada.

Scaling up Civic Engagement and Collective Action on Climate Change:

In March 2012, Shirlene Cote, research coordinator for the PICS social mobilization theme, collaborated with Voters Taking Action on Climate Change and the Canadian Centre for Policy Alternatives to organize a

one-day summit on how to motivate the civic engagement so urgently needed to respond to climate change. The event, supported by Vancity and the BC Climate Action Secretariat, brought together top researchers and social change leaders, including Tom Crompton, change strategist with WWF-UK and Susanne Moser, research associate at the University of California at Santa Cruz and Stanford University. The day also featured a panel discussion with regional leaders on how to build a broader, more inclusive movement for change, as well as a “campaign studio”, where groups pitched their campaign or initiative to a panel of “experts” and the audience for advice and mentoring.

Greenest City Conversations (GCC): GCC, funded under the PICS social mobilization theme, is a two-year, multi-disciplinary public engagement program led jointly by UBC and SFU, and carried out in partnership with Metro Vancouver. The project team at UBC includes former PICS program committee member John Robinson, PICS social mobilization chair Stephen Sheppard and PICS fellow Susanna Haas Lyons. In 2011/12, the research team hosted workshops with Vancouver city staff and citizens from the Marpole and Grandview-Woodlands neighbourhoods, in which participants explored interactive visualization tools to evaluate Vancouver’s proposed Greenest City 2020 actions as they relate

to green buildings, climate leadership and transportation.

Climate Leadership Training: PICS-UBC coordinator Sara Muir-Owen was among 800 volunteers this August being trained by former US Vice-President Al Gore as part of the Climate Reality Project. The training allows Sara to deliver Gore’s free slide presentation on climate change starting October 1. She was one of 115 Canadians nominated to attend the event.

University of Northern British Columbia

2011/12 was an active year for PICS at UNBC, with program coordinator Kyle Aben lecturing in several university courses on topics such as climate change policy and how to measure one’s carbon footprint. In addition to classroom participation, PICS supported UNBC students in many other ways this past year, such as sponsoring four talented students to attend the 2011 International Student Energy Summit in Vancouver and three others to attend the PICS annual forum in June. PICS-UNBC also assisted fellowship recipient Matt Beedle with the launch of his website, GlacierChange.org.

The PICS-UNBC community has now grown to more than 50 members on campus and meets regularly. Program coordinator Kyle Aben serves as the chair of the UNBC Carbon Neutrality

Subcommittee and also sits as a steering committee member for the university's Natural Resource and Environmental Studies Institute (NRESI). The PICS-UNBC office is located in UNBC's Green University Centre, working closely with the university's sustainability coordinator and energy technician. This work includes the development of UNBC's annual Carbon Neutral Action Report and the Sustainability Tracking and Rating System (STARS).

In addition to its on-campus activities, PICS-UNBC continues to work with the historic site of Barkerville on measuring and reducing its carbon footprint. The PICS-UNBC team also developed a policy paper for the Regional District of Bulkley Nechako on the first two years of BC's carbon neutral public sector and the challenges the district may



IAN PICKETTS

PhD Candidate

University of Northern British Columbia

PICS graduate fellow Ian Picketts is studying community adaptation to climate change. His research involves working with the case study community of Prince George to identify and prioritize local climate-related impacts, and to help implement adaptation measures. Ian has been fortunate to collaborate with many groups, including the Pacific Climate Impacts Consortium, the Fraser Basin Council, Environment Canada, Natural Resources Canada, the BC Ministry of Environment and the University of Waterloo. Successes to date include the incorporation of adaptation considerations into local planning documents, the utilization of climate projections in the City's flood risk assessment, and an ongoing project exploring how changes in winter weather may affect road safety.

"I've been very lucky to have had the opportunity to work with great people from many different organizations on this research. I am consistently amazed by people's willingness to lend their knowledge and energy to this project."

Ian Picketts

Photo: Ian presenting his work at the PICS Resilient Communities Forum, June 2011.

face as a local government striving to become carbon neutral in 2012. Over the past year, PICS-UNBC has presented to the Prince George Chamber of Commerce, the Yellowhead Rotary Club and the Winston Business Group. These opportunities and several media interview requests throughout the year have highlighted the presence PICS has by now established in the northern community of Prince George.

One of the highlights of the PICS-UNBC year was the success of its electric car partnership with the City of Prince George, Northern Health and the Regional District of Fraser Fort George. The agreement to share an electric car was initiated earlier this year by the City of Prince George with the purpose of testing an electric car in a northern climate and meeting the carbon reduction goals of each partner. The PICS program coordinator took the UNBC lead in this partnership and is excited to report that the car charger has been installed and the Nissan Leaf will be on campus from September 1 to November 30 of 2012 and for the next four years.

SPONSORED INITIATIVES

Special initiatives supported by PICS funding in 2011/12 include:

- ◇ **Tides Canada Energy Initiative:** This initiative focuses on helping Canada become a leader in clean

and renewable energy. PICS funding enabled Tides Canada to host four focus groups to test language and messaging around using low-carbon goods and services in Canada's energy supply chain.

- ◇ **BC Carbon Tax Review:** PICS funding also supported the Pembina Institute's ongoing work on reviewing BC's carbon tax, including a series of interviews and opinion polls to gather perspectives on impacts to date as well as future carbon-pricing design options.

WORKING WITH THE BC GOVERNMENT

PICS continues to build and maintain strong relationships with the BC government, primarily through the Climate Action Secretariat (CAS), the broader Ministry of Environment and with the Official Opposition. The PICS executive committee includes a representative from CAS, and the PICS executive director communicates regularly with the head of CAS to keep the province up to date regarding ongoing PICS activities, as well as to ensure that PICS-supported research is addressing provincial government information needs in a timely manner. CAS and other government representatives frequently attend PICS lectures and meet with invited speakers to discuss a wide range of relevant topics.

FINANCIAL REPORT

PICS is funded through a \$90 million endowment received from the Province of British Columbia in 2008 and held by the University of Victoria Foundation. The 2010/11 yield and 2009/10 carry-over provided PICS with a budget of approximately \$5 million for the fiscal year of 2011/12. Budget expenditures for 2011/12 are summarized in Figure A.1 below.

Administration includes: UVic overhead, salaries and operational costs

Research includes: research theme and internship funding, white papers

Communications/outreach includes: PICS seminars and events, briefing note and news scan program, short courses, sponsorships and the annual forum

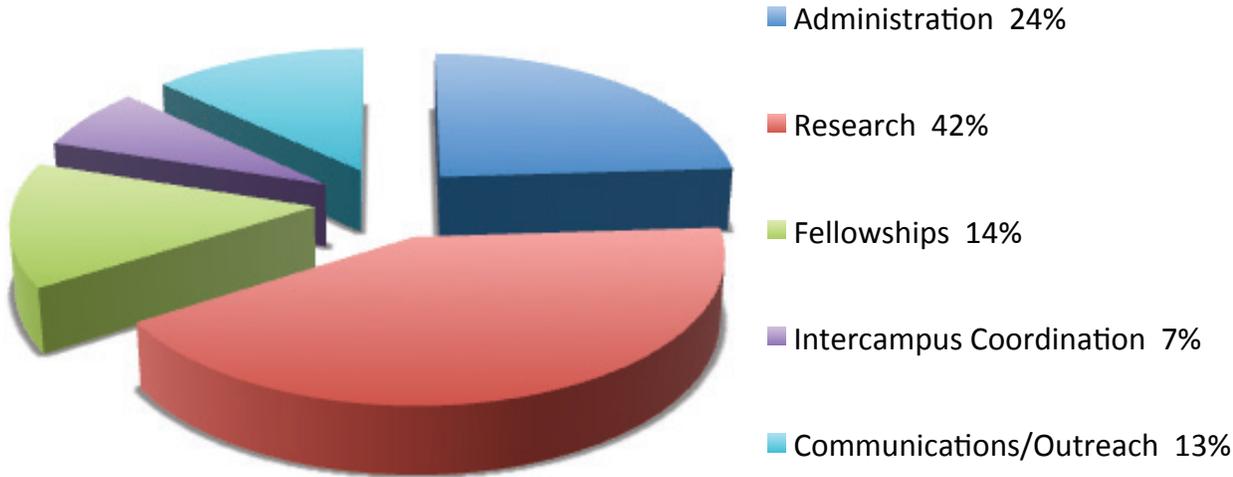


Figure A.1

APPENDIX 1: PICS GOVERNANCE

Program Committee

Tom Pedersen, Executive Director, Pacific Institute for Climate Solutions (Chair)

Paul Evans, Director, Centre for Asian Research, University of British Columbia

Art Fredeen, Professor, Ecosystem Science and Management,
University of Northern British Columbia

John Fyfe, Research Scientist, Canadian Centre for Climate Modelling and Analysis,
Environment Canada

Nancy Olewiler, Director, Public Policy Program, Simon Fraser University

Lawrence Pitt, Associate Director, Pacific Institute for Climate Solutions

Afzal Suleman, Professor, Department of Mechanical Engineering, University of Victoria

Tim Takaro, Associate Professor, Faculty of Health Sciences, Simon Fraser University

Thomas White, Manager, Science and Adaptation,
Climate Action Secretariat, BC Ministry of Environment Ken Wilkening, Chair,
International Studies, University of Northern British Columbia

David Wilkinson, Professor and Canada Research Chair, Department of Chemical and
Biological Engineering, University of British Columbia

Monika Winn, Associate Professor, School of Business, University of Victoria

Executive Committee

Howard Brunt, Vice-President Research, University of Victoria (Chair)

Ken Denman, Chief Scientist, Victoria Experimental Network Under the Sea (VENUS),
University of Victoria

Gail Fondahl, Vice-President Research, University of Northern British Columbia

Peter Keller, Dean of Social Sciences, University of Victoria

James Mack, Head, Climate Action Secretariat, BC Ministry of Environment

Michael Miller, Associate Vice-President Research, University of Victoria

Executive Committee cont'd

Tom Pedersen, Executive Director, Pacific Institute for Climate Solutions

Mario Pinto, Vice-President Research, Simon Fraser University

Brent Sauder, Director, Strategic Partnerships, University Sustainability Initiative,
University of British Columbia

Advisory Board

Michael Miller, Associate Vice-President Research, University of Victoria (Chair)

Lyn Brown, Vice-President, Catalyst Paper Corp.

Michael Brown, Executive Director and Chairman, Chrysalix Energy Management Inc.

David Demers, Chief Executive Officer, Westport Innovations Inc.

Karen Dodds, Assistant Deputy Minister, Environment Canada

Mark Edwards, Director, Environment, Teck Cominco Ltd.

Richard Flury, former Chief Executive, Oil, Gas and Renewables, BP plc (retired)

Gordon Lambert, Vice-President, Sustainable Development, Suncor Energy

John MacDonald, Chairman and Chief Executive Officer, Day4 Energy Inc.

Jonathan Rhone, President and Chief Executive Officer, Nexterra Energy Corp.

Peter Robinson, Chief Executive Officer, The David Suzuki Foundation

James Tansey, Executive Director, ISIS Research Centre, Sauder School of Business,
University of British Columbia

Mossadiq Umedaly, Cleantech Entrepreneur and Business Executive

APPENDIX 2: PICS FELLOWSHIP HOLDERS

Graduate Fellowships

Simon Fraser University

Dionne Bunsha, PhD Candidate, Resource and Environmental Management
Community-based environmental monitoring networks: grassroots climate change detectives

Steven Conrad, PhD Candidate, Resource and Environmental Management
Improving water allocation adaptation policies and decision-making through an integrated hydrological-stated preference water demand model

Sabine Jessen, PhD Candidate, Geography/Resource and Environmental Management
Planning for marine ecosystem resilience under climate change in BC

Mary-Ann Middleton, PhD Candidate, Earth Sciences
Evaluating the impacts of climate change and water use on groundwater sensitive streams

Cedar Morton, PhD Candidate, Resource and Environmental Management
Enduring waters: building resilient international water institutions in a changing climate

Vinu Subashini Rajus, PhD Candidate, Interactive Arts and Technology
Ambient, interactive displays and controls for sustainable living

University of British Columbia

Maggie Baynham, MSc Candidate, Community and Regional Planning
Land-use tools for adaptation: opportunities for integration into official community plans

Laura Cornish, MA Candidate, Institute for Resources, Environment and Sustainability
Visioning to empower community action on climate change

Susanna Haas Lyons, MA Candidate, Institute for Resources, Environment and Sustainability
Greenest City Conversations

Kim Lau, PhD Candidate, Institute for Resources, Environment and Sustainability
British Columbia's "carbon-neutral" government: a critical evaluation

Jennie Moore, PhD Candidate, Community and Regional Planning
Getting serious about sustainability: exploring the potential for "one-planet" living in Vancouver

University of British Columbia cont'd

Polly Ng, MSc Candidate, Community and Regional Planning
Case studies of community responses to the BC Green Communities Act

Georgia Piggot, PhD Candidate, Sociology
Collaborative networks and climate change action: a British Columbia case study

Catalin Ristea, PhD Candidate, Forest Resource Management
Climate change mitigation potential and economic feasibility of producing bioenergy from woody biomass: a multi-objective analysis and life-cycle assessment approach

Elizabeth Schwartz, PhD Candidate, Political Science
Climate policy in Canadian cities: a comparative study

Gerald Singh, PhD Candidate, Institute for Resources, Environment and Sustainability
Cumulative impacts and resilience in social ecological systems

Paul Teehan, PhD Candidate, Resource Management and Environmental Studies
GHG implications of cloud computing: analyzing large data centre construction in the Columbia Basin

Lisa Westerhoff, PhD Candidate, Resource Management and Environmental Studies
Governance for climate change: local decision-making for low-carbon, resilient communities

Lilia Yumagulova, PhD Candidate, Resource Management and Environmental Studies
Resilient by design: the role of institutional adaptation to environmental risk in cities

Kevin Zhang, MSc Candidate, Community and Regional Planning
The effect of urban design on transit rider perceptions and ridership

University of Northern British Columbia

Matthew Beedle, PhD Candidate, Natural Resource and Environmental Studies
Communicating the implications of climate change through the study of glacier recession

Alana Clason, PhD Candidate, Natural Resources and Environmental Studies
The resilience of high-elevation ecosystems to cumulative disturbances across a climatic gradient

Ian Picketts, PhD Candidate, Natural Resources and Environmental Studies
Community adaptation to climate change in Prince George, BC

University of Victoria

Torsten Broeer, PhD Candidate, Institute for Integrated Energy Systems
Modeling of the existing conventional electricity generating system and the impacts of an increasing of wind energy to Canada's power generation system

Rod Davis, PhD Candidate, Environmental Studies/Geography
Conservation strategies for wildlife ecosystem resilience: an evaluation of land management policy alternatives to adapt to climate change

Anita Girvan, PhD Candidate, Social, Cultural and Political Thought
Tracing the mediations of the carbon footprint: a critical analysis of the central role of the metaphor in climate change solutions

Christine Kormos, PhD Candidate, Psychology
Social influences on the acceptance of new energy technologies: an investigation of the plug-in hybrid electric vehicle (PHEV)

Matthew Ooms, MSc Candidate, Mechanical Engineering
Sustainable solar fuel production: evanescent photo-bioreactor design and scale-up

Michael Shives, MASc Candidate, Mechanical Engineering
The efficiency of ducted tidal current turbine arrays

Amy Sopinka, PhD Candidate, Geography
Economic and environmental effects of wind energy integration in the Pacific North West

Jason Straka, MSc Candidate, Environmental Studies
Humming along or buzzing off? The resilience of pollination services to climate change in British Columbia

Trevor Williams, PhD Candidate, Institute for Integrated Energy Systems
Probabilistic power flow modeling (PLF) of renewable energy and PEV grid interactions

Postdoctoral Fellowships

Simon Fraser University

Syed Ahmed, Mechatronic Systems Engineering

Development of a customized lifecycle assessment (LCA) tool for low carbon emission vehicles

University of British Columbia

Sonja Klinsky, Institute for Resources, Environment and Sustainability

Justice in the negotiation and implementation of emission trading: leveraging lessons from the Western Climate Initiative

Tara Moreau, Architecture and Landscape Architecture

Sustainable agricultural systems for the 21st century: integrating urban and peri-urban agriculture with human settlements to minimize GHG production and maximize carbon sequestration

Olaf Schroth, Collaborative for Advanced Landscape Planning

Energy landscapes: social acceptance of different renewable energy options

University of Victoria

Dan Wang, Institute for Integrated Energy Systems

Modeling and comparative analysis of expanded power generation in BC: large-scale, centralized VS-distributed generation systems

APPENDIX 3: PICS INTERN PLACEMENTS

BC Ministry of Energy and Mines

Dian Ross (UVic Engineering), Community Clean Energy Project Assistant

BC Ministry of Environment

Raj Ghosh (UBC Engineering), Climate Policy Analyst

BC Ministry of Forests, Lands and Natural Resource Operations

Greg Greene (UBC Forest Sciences), Research Assistant,
Adapting Ecosystem Restoration to Achieve Forest Resilience

Adam Kamp (SFU Public Policy), Bioenergy and Bioeconomy Research Officer

Bulkley Valley Research Centre

Andrew Sheriff (UVic Geography), Research Assistant,
Climate Change Impacts and Adaptation

Canadian Parks and Wilderness Society

David Perez (UBC Forest Resource Management)

Erica Olson (SFU Resource and Environmental Management)

Climate Smart

Evan Pivnick (UVic Political Science), Client Advisor Intern

Fraser Basin Council

Shannon Jones (SFU Resource and Environmental Management),
Program Assistant, Transportation

Pembina Institute

Timothy Shah (UBC Urban Planning), Climate Action Stories Intern

WWF-Canada

Samantha Lewis (UNBC), Communication of Climate Adaptation



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