



## Message from the Executive Director

### Tackling climate change in Canada

2016 is a pivotal year for climate action in British Columbia, with the provincial government set to write the next chapter in its evolving strategy to tackle climate change. It has been eight years since former BC Premier Gordon Campbell released the first Climate Action Plan, a road map for meeting the province's greenhouse gas (GHG) reduction goals while creating a low carbon economy.

Among the many firsts introduced at that time was a revenue-neutral carbon tax—a first for North America—that has proven the naysayers wrong by reducing fuel consumption without harming the economy. British Columbians also have the lowest income and corporate taxes in the country, thanks to this tax.

BC's climate leadership has carved a path that many jurisdictions have since followed, and against this backdrop, many are now asking, what next?

In January 2016, the BC government launched a [public consultation](#) to ask residents 'what are the most important actions we can take as a province to lower our greenhouse emissions, and to take advantage of the low carbon economy of the future'. Information from this consultation will be used to help shape the province's Climate Leadership Plan, due out later this year.

This plan will affect many aspects of our lives including future 'clean transport' options, whether the carbon tax will start ramping up again, how energy efficient our buildings are, decisions around natural gas, and the level of support for BC's emerging clean tech sector and 'green jobs' creation. In short, this plan needs to keep us on that path towards developing a vibrant and sustainable low-carbon economy.

To help drum up awareness and participation in this important consultation process, this winter PICS hosted three public panel discussions in Vancouver featuring climate experts from within industry, academia and the municipal sector. Several hundred British Columbians attended these events, either in person or via the web, to ask questions of our panelists, as part of a lively discussion on what are the essential elements for effective future climate action.

Comments made during these events, however, suggest that the vast majority of British Columbians are not aware that the next steps for BC's climate

action are being decided right now, nor that their chance to influence those decisions finishes Friday April 8. The pending next chapter in the province's climate strategy is crucial for many reasons. A fast changing climate is no longer in the distant future. It is here today, and the evidence is all around us.



Dr. Sybil Seitzinger

In British Columbia, for example, we are seeing the impact of warmer winters, and the numbers are staggering. Statistics calculated by PICS's sister organization, the Pacific Climate Impacts Consortium, shows that BC's glaciers lost 10.8% of their land coverage between 1985 and 2005. As reported in the latest [PCIC Science Brief](#), fast forward 84 years to 2100, and climate models project BC glaciers will lose  $70\% \pm 10\%$  of their volume and  $75\% \pm 10\%$  of their area relative to 2005—the range being dependent on the climate actions we take, or don't take, to drastically reduce global GHG emissions.

While the average global surface temperature has risen 1 degree Celsius since the 1880's, parts of this province are now nearly 2.5 degrees warmer than in 1948, according to Environment and Climate Change Canada data. In 2015, Earth's surface temperatures were the warmest since record keeping began. And with Canada's rate of warming being about twice the global rate, clearly there is much at stake.

While BC grapples with its next move, Canada too, is also entering a new era, with the prime minister along with provincial and territorial leaders meeting this winter to start developing the country's first national strategy on climate change.

Meeting these challenges will require the collaboration of the best minds across industry, government, academia, the scientific community, First Nations, and wider society. This winter I have had the privilege of meeting such stakeholders within PICS's four universities and executive committee, as well as within the provincial and federal governments. I have also been inspired by "our future", when talking with graduate students and PICS fellows who will be picking up the legacy we are creating today. Their research, supported by PICS, will help deliver the solutions we need.

Canada is at the forefront of global warming. The time to act is now. PICS will be doing its part to assist decision-makers in BC and Ottawa in taking the right path forward.

WINTER 2016



Nancy Olewiler,  
SFU



Emanuel Machado,  
Town of Gibsons



Merran Smith,  
Clean Energy Canada,  
SFU



Matt Horne,  
Pembina Institute



Jonathan Rhone,  
Axine Water  
Technologies



Shauna Sylvester,  
SFU Public Square

## Had your say on BC's climate future?

Several hundred people attended the three PICS public events in March aimed at encouraging British Columbians to participate in the government's public consultation for developing its next [Climate Leadership Plan](#).

The consultation period started on January 25, 2016 and runs until April 8, 2016.

The largest of the PICS events was an evening public panel discussion in downtown Vancouver on [March 8](#), involving climate, industry and municipal leaders from around BC. More than 250 people turned up in person or tuned into the webcast of the two-hour discussion that was opened by PICS executive director Sybil Seitzinger and moderated by the executive director of SFU Public Square, Shauna Sylvester.

The conversation between the audience and the five panelists—Nancy Olewiler from SFU School of Public Policy, Matt Horne from Pembina, Emanuel Machado CAO from the Town of Gibsons, Merran Smith from SFU's Clean Energy Canada, and PICS Advisory Board member Jonathon Rhone who heads Axine Water Technologies—covered a wide range of topics including raising the carbon tax, the viability and impact of an LNG industry, mobilizing communities to climate action, land-use planning and adaptation, the potential for renewable energy exports, improving buildings' energy efficiency, and how to best support BC's clean tech sector.

Answering that question head-on, Jonathon Rhone said the province can do plenty, including putting pressure on the federal government to allow companies to import more high tech skilled workers, to support loan guarantees and venture capitalists, to build a clean tech capital market and to level the field with the oil,

gas and mining sectors by extending tax credits to clean tech. The [32 recommendations](#) put forward by the Climate Leadership Team were also discussed.

Two subsequent on-campus panel discussions were held—one at UBC on March 14 featuring UBC Professor Matt Horne, PICS Program Committee member Stephen Sheppard and UBC geological engineering student Julie Van de Valk, and the other at SFU's Burnaby Campus on March 16, featuring Matt Horne and SFU Assistant Professor Dr. John Axsen. UNBC students joined the event via webcast.

The events inspired more than 100 written submissions that PICS will be sending to the government. Visit [engage.gov.bc.ca/climateleadership/](http://engage.gov.bc.ca/climateleadership/) to have your say.

## PICS at GLOBE 2016

PICS continued its outreach work this winter with a booth in the PowerHaus Pavilion at the [GLOBE 2016 Conference and Innovation Expo](#). PICS featured its five major research projects, white papers related to energy efficiency, natural gas, biochar and the carbon

tax, and its educational outreach program. Nastenka Calle, PICS SFU Program Manager, along with PICS fellows Alex Jiang, Geoff de Ruiter and Vinu Rajus and Post Doc fellow Suzanne Goldberg from the Transportation Futures project had the opportunity to connect with many people from business and industry who showed great interest in PICS research and the opportunities for collaboration through our internship and fellowship programs. The

Pavilion hosted more than 25 emerging Canadian companies and organizations working on a diverse range of cleantech solutions and green innovations.



Suzanne Goldberg, Geoff de Ruiter and Nastenka Calle at the PICS booth at the Globe 2016 PowerHaus Pavilion

## Hazards caused by climate change

A PICS supported workshop aimed at identifying challenges that climate change poses for managing the impacts of natural hazards was held at Simon Fraser University on February 22. More than 80 professionals in the field of risk management planning and engineering attended the workshop hosted by the SFU Centre for Natural Hazard Research (CNHR), ACT SFU, the Geological Survey of Canada, and PICS.

Hazards such as sea level rise, wildfires, flooding, storm surges and droughts will likely increase in frequency and intensity due to climate change. The workshop focused on the challenge of reducing the risk to built and planned infrastructure. Increased support for cities (in particular, a more integrated risk-based regulatory framework, access to a larger portion of tax dollars, expanded cross-sector knowledge sharing and risk management strategies, creation of and better access to data and tools and capacity building) was recognized as a critical need for safer and more resilient urban infrastructure. A [video](#) of the presentations as well as an article with the highlights of the day, a slide deck and a proceedings volume, are available at the [CNHR website](#).

## Assessing groundwater & streams

Research conducted by PICS SFU fellow Mary Ann Middleton will be used to support integrated water management plans that aim to balance the needs of water users and the water requirements for aquatic habitat.

Using a combination of field and statistical methods, Mary Ann examined the relationships between streams and groundwater aquifers during summer when water flow is lowest. Understanding aquifer-stream connectivity during the summer months is important for BC because this is when groundwater makes the maximum relative contribution to stream flow given that other sources, such as rainfall and snowmelt, are lowest at this time. It

also coincides with periods of peak water demand and critical aquatic habitat needs. Streams fed primarily from groundwater may be more sensitive to changes in groundwater levels that result from pumping, climate change or land use changes.

Mary Ann's research evaluated a variety of methods to assess that connectivity and to identify factors influencing groundwater inflow at two streams in the Lower Fraser Valley. She has applied these findings in a vulnerability



Mary Ann Middleton measuring stream flow in Fishtrap Creek, Abbotsford, BC.

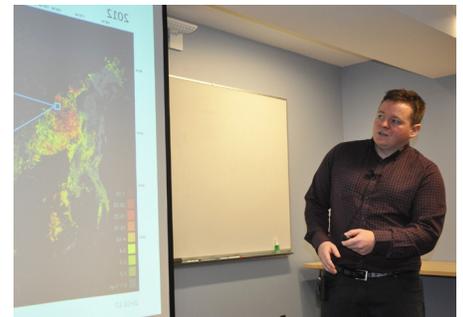
framework, which is an assessment method to evaluate potential impacts to stream flow from changes in groundwater.

PICS congratulates Mary Ann on defending her thesis, "Aquifer - Stream Connectivity at Various Scales: Application of Sediment - Water Interface Temperature and Vulnerability Assessments of Groundwater Dependent Streams" in February 2016.

## Forests at risk from increasing drought

Droughts like the one British Columbia experienced this past summer suppress forestry growth and in extreme cases, can also kill off trees especially old growth and young stands, according to PICS researcher Dr. Robbie Hember—a research scientist with the PICS' Forest Carbon Management project.

During his February 17th lecture at UVic entitled "Drought-related tree mortality: Heading into a century of more frequent and severe forest dieback events", Dr. Hember said that his study of historical forest inventories from BC and the western United States show the mortality rates of most commercial tree species are significantly related to drought conditions. However, the exact impact of climate change on tree mortality and BC's forest sector is not yet well understood.



Dr. Robert Hember at his UVic seminar

With droughts likely to become much more common in BC, forest health and productivity will depend strongly on what current tree populations can tolerate. Mitigating factors for tree health include genetic variation and size. He said trees in early and late stages of development are especially vulnerable to impacts from drought, which has implications for the success of short-rotation harvesting and old-growth conservation plans.

Results from this research will provide future projections of forest productivity, and inform long-term climate change adaptation and mitigation strategies for the forestry sector, as well as provide mapping of catastrophic tree mortality. The recording of his talk is available on the [PICS website](#).

## This Green House

A new PICS supported report from the Columbia Institute details the minor legislative changes needed to open doors for scaling up residential energy efficiency retrofits across Canada. The report entitled 'This Green House II' provides a valuable summary of building energy efficiency policies and financing programs across the country, identifying what works and where the barriers are. PICS research is included in the analysis, which shows Ontario and Nova Scotia as leading the way. As much as 30% of community greenhouse gas emissions can come from buildings' energy use.

## Targeting transport's worst polluters

Living on three continents gave PICS UNBC fellow Alex Schare a unique perspective on global issues, especially climate change: "Having a fair bit of experience with how things are done in places other than Canada, it seemed worthwhile to me to study transportation in BC." Born in Germany, Alex moved to Williams Lake as a teenager and lived in Osaka, Japan as a student. He moved to Prince George to attend UNBC, where he completed degrees in International Studies, and has now earned his PhD from the Natural Resource and Environmental Studies program. "BC is an especially interesting place to study transportation because it's got unique challenges, like large size and low population density."

Alex's dissertation, which he defended in February, is titled "Off track to 2050?: A study of present and future interurban transportation emissions in British Columbia, Canada, relative to its greenhouse gas reduction targets act of 2007." It's the first study of its kind that uses emission factors based on actual fleets in BC. It shows emissions levels, where they are, by what modes they are emitted, and how they compare between modes. Alex's study will allow policymakers to identify 'the worst offenders', and areas that have the highest reduction potential in order to prioritize which issues we should be addressing first.

## Seeking public opinion on forests as a climate solution

This winter saw the launch of a major outreach effort by the PICS Forest Carbon Management Project to find out what British Columbians value about their forests and what they want to see incorporated in climate change mitigation strategies for this sector. Between February 10 and March 14, five workshops were held with stakeholders, First Nations, experts and the general public in four different



Participants in the March 14th Prince George workshop providing input on forestry solutions



PICS UNBC Fellow Alex Schare's research is the first to calculate emissions from actual BC vehicle fleets

regions of the province: the Southern Interior (Kamloops), the Northern Interior (Prince George), the Lower Mainland (Vancouver) and the Coast (Nanaimo).

The way forests are managed has a major impact on trees' ability to sequester greenhouse gases. The

purpose of this province-wide outreach effort is to tap into the local knowledge and ideas for climate change mitigation solutions within the forestry sector. The results of this engagement process will provide insights on the public acceptability of existing and prospective mitigation policies and alternatives being developed by this project. A second series of workshops will be organized during the Fall of 2016. For more information please contact [Guillaume Peterson St-Laurent](#).

## Visit highlights northern climate issues

The challenges facing northern communities in a changing climate took centre-stage during public discussions held at UNBC during PICS executive director Sybil Seitzinger's first visit to Prince George on January 13th.

PICS fellowship recipients, faculty, and staff at Canada's Green University welcomed Dr. Seitzinger and partook in lively discussions about the cumulative impacts of resource



PICS' Executive Director, Sybil Seitzinger, at a public lecture on the outcomes of the COP 21 meetings in Paris

developments that are facing their communities, and the potential impacts of a changing climate on northern BC agriculture. Sybil was interviewed by CFIS radio and the [Prince George Citizen](#), and held a well attended public lecture on the outcomes of the COP 21 meetings in Paris.

## Underway and coming up

- PICS is supporting a program of climate change-themed public events currently underway at the [Two Rivers Gallery](#) in Prince George. The program will engage citizens in Northern British Columbia through a mix of creative media.
- Check out the PICS 2060 Project's [blog posts](#) from this winter and our [calendar](#) for upcoming events.

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