



# VACEA



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# Directors Message

This April marks the beginning of the 4th year of the five-year VACEA project. We have now completed much of the basic research on the natural science of exposure to climate extremes (Theme 2) and the social science of community vulnerability (Theme 2). The focus of the remaining two years will be efforts to integrate, compare and package the research so that we can share the results with communities and governance institutions, and engage them in an assessment of the risks and opportunities presented by a changing climate. A discussion of strategies to achieve this integrated risk assessment was the main item on the agenda of the VACEA project AGM held last December 11-15 in Puerto Varas in the Los Lagos (Lakes) Region of southern Chile. Vigorous discussion during three full days of meetings and during a 4th day on a boat on “Todos los Santos” produced a strategy that is feasible in all five countries.

An important part of this strategy is the Rural Adaptability to Climate Extremes (RACE) Index developed by Canadian researchers Greg Marchildon and Amber Fletcher (see page 5). The RACE index combines a set of quantitative indicators of vulnerability; this type of information directly informs policy making and has impact with the media. In addition to the RACE index, we need another mechanism for the integration of other mostly qualitative findings and key messages across disciplines and regions. Therefore, we are also in the process of identifying important insights and findings from the contributions of individual researchers, will a plan to explore these common issues and insights in small teams. This approach to integration will produce interdisciplinary and international analyses and publications.

VACEA researchers are currently preparing for meetings at Brock University (St. Catharines, ON) involving participants from all five projects funded under the International Research Initiative on Adaptation to Climate (IRIACC) program . A series of five panel sessions, each consisting of 4-5 presentations, will feature the IRIACC projects on May 27, during the annual meeting of the Canadian Association of Geographers. The following day, the Co-Directors of the five projects will meet with staff from IDRC for a mid-term evaluation and discussion of progress, successes and roadblocks.

Dave



# ! HOLA!

VACEA research continues at four sites in South America

Chinchina River Valley - COLOMBIA • Santa Catarina - BRASIL



Choapa Valley - CHILE • Mendoza Oasis - ARGENTINA



## Researcher Profile: Greg Marchildon



Gregory P. Marchildon is a Tier 1 Canada Research Chair and Professor at the Johnson-Shoyama Graduate School of Public Policy, an interdisciplinary centre for research, teaching, outreach and training with campuses at the University of Regina and the University of Saskatchewan. After receiving his PhD from the London School of Economics, he taught at Johns Hopkins University's School of Advanced International Studies in Washington, DC from 1989 until 1994. He then served in various policy and administrative positions including Deputy Minister of Intergovernmental Affairs, Deputy Minister to the Premier and Cabinet Secretary in the Government of Saskatchewan and Executive Director of the federal Royal Commission on the Future of Health Care in Canada. Shortly after returning to academic life in 2003, Marchildon began doing research on the policy history of adaptation to prolonged drought in the Great Plains of Canada.

## Student Profile: Santosh Poudel



Santosh is currently working towards his PhD in Agriculture Economics at the University of Saskatchewan. He received his Bachelor degree in Agriculture in 2003 and his Master degree in Agriculture Economics in 2005 from the Institute of Agriculture and Animal Sciences (IAAS), Tribhuvan University, Nepal. He also holds a Master degree in International Development Program (IDP) from the International University of Japan. He worked for more than 4 years as an Agriculture Economist in FORWARD Nepal.

Santosh grew up in an agrarian community in Nepal, which shaped his education and research interest in agriculture. He has a strong research interest in operation of rural farm communities, agriculture production, and their interaction with environment. For his Master degree in Nepal, he conducted research on the profitability of cash crop in Nepal and how they are affected

by scale of production. At the International University of Japan, he investigated how major food crops of Nepal are impacted by climate change and how those effects vary across type of crops, seasons and altitude.

His PhD research focuses on understanding the economic vulnerability of integrated Crop-Beef farm to climate change and extremes in the Canadian Prairies. He hopes that his PhD research would contribute significantly on better understanding of the impacts of climate change on Prairie agriculture. His study also investigates the impact of not only average climate change but also the impact of extreme climate events.

## VACEA, Year 3: Integrating the Project Results

*By Greg Marchildon and Amber Fletcher*

The “Vulnerability and Adaptation to Climate Extremes in the Americas” (VACEA) project is now in its third year. The goal for Year 3 is to integrate and make sense of the information collected during the first two years of research. The VACEA project has brought together climate scientists, sociologists, legal experts, engineers, historians, policymakers and watershed managers from five countries and two continents. How to integrate the work of this multidisciplinary and international team raises two main integration challenges.

First, how do you integrate the qualitative evidence gained through interviews with people in the study areas with quantitative climate and economic data? Second, how do you best compare the results among the five countries? You do so by creating an index made up of a common set of indicators with an agreed upon methodology and approach to measurement.

Indexes are a well-known tool for comparing social and economic factors across countries. One example is the United Nations Human Development Index (HDI) that is now regularly used everywhere in the world. For VACEA, we created a new index for comparing climate vulnerability and adaptation called the Rural Adaptability to Climate Extremes (RACE) index.

The RACE index contains 36 individual indicators of climate vulnerability – 36 different factors that can make communities or countries more or less vulnerable to extreme climate events, such as flooding or drought. Each indicator provides information for at least one level of analysis, in the Canadian case from the community level (e.g., Pincher Creek, Rush Lake, Shaunavon, or Taber) or the watershed level, or from the provincial level to the national level – whichever is considered most appropriate for that particular indicator. The indicators were drawn from existing literature and the VACEA project findings. The indicators are categorized into three sections that cover both natural and social science:

- Environmental Exposure (future and baseline climate variability),
- Sensitivity (human/social factors causing sensitivity to climate events), and
- Adaptive Capacity (human and social methods for adapting to events).

Representatives from all five countries discussed a draft set of indicators, initially generated with the Canadian context in mind, at our meeting in Puerto Varas, Chile, in December 2013. The environmental, political and socio-economic differences among the countries required the ability to think beyond our individual country contexts in order to create a common index.

Among the 36 indicators are climate factors like precipitation intensity, crop yield, drought, and water supply. The VACEA climate scientists have produced a baseline average for each indicator over the past four decades. They have also produced future scenarios to understand how future levels will differ from the historical baseline. This information will be available for each watershed and each community in the study areas. By comparing how the future will differ from what people in each community have experienced in the past, we can better understand what kind of challenges they will face in a given climate scenario.

Social factors are also measured in the RACE index, including access to water resources, infrastructure to cope with climate stressors (e.g., irrigation or drainage), access to health care services, and income diversification. Many of our participants will recall answering these types of questions during their interviews with our student researchers in the Canadian study areas last year.

The final step is to convert all information – climatological and social – into a 9-point scale to compare communities and countries. This will help us understand each area’s strengths and limitations when it comes to possible climate extremes in the future based on the best climate scenario modeling available. Farmers, ranchers, local government councils, watershed managers, and other community members can use this information to create targeted plans for dealing with extreme climate events in the future.



## VACEA Team Meeting December 11-15, 2013 - Puerto Varas, Chile

During December 11-15, 2014 the VACEA project met in Puerto Varas, Chile for our annual comprehensive meeting. For three days we discussed how we will compile and integrate the research results across countries and disciplines. There were several very good proposals and all researchers committed to a process that will disseminate the outcomes of the VACEA project such that they can be used by community stakeholders and our external partners to achieve the ultimate goal of the project: to decrease vulnerability to climate extremes.

Get more information about the project on the VACEA website: [www.parc.ca/vacea](http://www.parc.ca/vacea)

and stay connected on the VACEA facebook page:  
[www.facebook.com/pages/Vulnerability-and-Adaptation-to-Climate-Extremes-in-the-Americas-VACEA/271211079611742](https://www.facebook.com/pages/Vulnerability-and-Adaptation-to-Climate-Extremes-in-the-Americas-VACEA/271211079611742)

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