

Senior climate scientist shares presentation

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Compared to the tools available to researchers for the study of mountain and forest hydrology in the 1960s, today's researchers have the benefit of equipment Dr. James Bruce and his colleagues only dreamed of when they established the Marmot Creek basin research station in Kananaskis half a century ago.

Today's researchers, Bruce explained, have the advantage of using remote sensing and recording of meteorological and hydrologic factors in hard to reach areas. As well, they have the ability to digitize observations and analyse them by ever more powerful computers.

Now one of Canada's senior and most respected climate scientists, Bruce was superintendent of hydrometeorology in the Meteorological Service when concerns about water availability for growing populations and irrigation demands in the South Saskatchewan River system led to questions of whether more runoff could be obtained from the east slopes of the Rockies by altering forest management practices. The Marmot Creek site was chosen by Bruce's colleague, Walt Jaffrey, a forester with the Federal-Provincial Eastern Rockies Conservation Board.

An Officer of the Order of Canada among a lengthy list of accomplishments and awards, on Thursday (Feb. 21), Jim Bruce will share a presentation titled Global Climate Change and Canada's Water, taking place at the Canmore Civic Centre at 7:30 p.m. Admission is free.

Bruce's research involved selecting the initial observation site and planning a basin-wide observation system. The lessons he learned at Marmot Creek early in his career were valuable, Bruce said, teaching him about the difficulties of making reliable measurements in a mountainous, largely-forested region, and about the inherent value of understanding hydrologic processes in small research basins.

Research continues at Marmot Creek today, under the direction of Canmore's Dr. John Pomeroy, director of the University of Saskatchewan's Centre for Hydrology and Canada Research Chair in Water Resources and Climate Change, with a focus on how the changing climate is affecting snow and runoff.

As Canada prepared for its role in the United Nations' International Hydrologic Decade, which began in 1965, Bruce chaired the preparatory committee that instrumented half a dozen small research basins from Nova Scotia through to British Columbia as part of that program – decisions influenced by his Marmot Creek experience.

But, while some of the equipment of the era may have been primitive compared with today's high-tech sensing and measuring instrumentation, the level of political will and support enjoyed by Bruce and his colleagues was something Canadian hydrometric research scientists today can only dream of.

"The federal government was then very committed to science and scientific advice," Bruce said. "(Canada had) a science secretariat in the Privy Council Office and a high-powered advisory science council. I worked for the secretariat in the mid-'60s on hydrologic and water sciences. In all departments, interdisciplinary research and studies were encouraged."

This exemplary level of support stands in sharp contrast to Canada's current government's repressive attitude toward critical scientific research in the face of immediate and inescapable climate change effects and consequences. As a result, Canada has repeatedly been on the receiving end of the none-too-flattering Colossal Fossil of the Year Awards, presented to countries that deliberately block progress at United Nations climate talks.

"I am not surprised, but ashamed, that Canada deservedly has received many Fossil of the day, week, and year awards from the international community," Bruce said. "Not only have we failed in our obligations to reduce emissions, we have tried to

prevent international consensus on moving forward. This is shameful indeed, and has turned Canada from being recognized as environmental champions to being pariahs.”

During his time at Marmot Creek, climate change due to increasing greenhouse gas concentrations was a theoretical concern, Bruce said, but there was little observational data to back it up. The 1964 textbook, Introduction to Hydrometeorology, co-authored by Bruce and R.H. Clark, said, “It may be that part of the global temperature increases of the last 100 years are due to human activity in burning fossil fuels, such as coal and oil, releasing carbon dioxide into the atmosphere.”

Bruce’s later career included an assignment with the Ontario Conservation Authorities Branch, and appointment as Director of Canada Centre for Inland Waters in Burlington, Assistant Deputy Minister of Environmental Management, (Forests (CFS), Wildlife (CWS), Water, Land) and of Atmospheric Environment Service of Environment Canada.

After retiring from Environment Canada at the end of 1985, Bruce went to Geneva, Switzerland to work for the World Meteorological Organization (WMO) as Director of Technical Cooperation responsible for weather, climate and water, and as Acting Deputy Secretary General. It was in the latter role that he orchestrated, in 1988, the convening of the first meeting of the Intergovernmental Panel on Climate Change (IPCC).

Having been approved earlier that year by executive bodies of WMO and the UN Environment Program, there existed a sense of urgency to produce a first international assessment of the science of climate change, likely impacts and actions needed, which was crucial leading up to the second World Climate Conference – the Rio Earth Summit in 1992.

Since then, Bruce said he feels the IPCC has been successful in a credible, cautious way, in providing the basic scientific and economic foundation for international understanding of the issue, but unfortunately less successful in securing mitigation actions.

“IPCC’s scientific core is, by nature and design, not given to speculation, but only to well-proven and documented findings,” he said. “They leave to others expression of the horrendous implications for much of the world if no global reduction in greenhouse gas emissions is achieved.”

Having attended by invitation the Oslo, Norway presentation ceremony of the Nobel Peace Prize to Al Gore and IPCC chair Dr. R.K. Pachauri in 2007, Bruce said he felt the prize was well-awarded.

“Both Gore and IPCC undoubtedly deserved the Peace Prize for alerting the world to the great dangers,” he said.

Looking forward, he continued, Canada has its work cut out.

“The energy-climate-water nexus needs more detailed understanding to better estimate future problems to which we all must adapt,” Bruce said. “In addition, in Canada we need to put far more effort into improving efficiencies of energy and water use, and seeking low cost alternatives to fossil fuels. There is a huge global market for these technologies in which Canada is now only a bit player since we concentrate our energies and government support on digging the last bit of fossil fuel out of the ground for short-term gain. This policy orientation is both economically unsound and environmentally disastrous.”