

BC SHOWS FASTEST GROWTH ATTRACTING RESEARCH DOLLARS, NEW FIGURES SHOW BC University research grants grow by 148 per cent, double Canadian average

VICTORIA – British Columbia is outpacing the country attracting research dollars from Canadian granting agencies according to new figures released today by the Research Universities' Council of British Columbia (RUCBC).

Since 2000, BC's research universities have increased their per capita share of federal research grants by 148 per cent – almost double the Canadian average and faster than any other province.

"Today's new figures show us that BC's research universities are leading the way attracting research dollars and talent to British Columbia," said RUCBC Chair and Simon Fraser University President, Andrew Petter. "That success is translating into new jobs and a stronger, more diverse economy for all British Columbians."

University of British Columbia President, Arvind Gupta pointed to the provincial government's British Columbia Knowledge Development Fund (BCKDF) as a key reason for BC's success.

"Since its inception, the BCKDF has helped the province secure almost \$1 billion in research infrastructure funding from the federal government and industry," said Gupta. "And BC's share of new funding from the Canadian Institute for Health Research has grown by 343% since 2001, more than double the national average."

"In 2012 alone, BC's research universities leveraged \$700 million from sources outside the province," said University of Victoria President, Jamie Cassels. "Starting from a platform of excellence supported by the province, BC's universities have been successful in attracting substantial additional funding from federal, private and non-profit partners, fueling innovation and discovery, jobs for our graduates and a strong provincial economy."

"Competition for this funding is intense," said Royal Roads University President, Allan Cahoon. "Federal research funds could have gone elsewhere in Canada, but they are coming to BC because of the high quality of our research, our faculty and our students."

"As a result of these investments, BC's universities are working with industry to pull research to where it will have the most impact and university graduates are bringing new ideas into the marketplace. That's driving innovation and creating new jobs in industries in all areas of the province," said University of Northern British Columbia President, Daniel Weeks.

"Research and innovation are fundamental building blocks for economic success. And that's not just for emerging sectors but for all of BC's industries, including the natural resource sector, such as forestry and mining," said Thompson Rivers University President, Alan Shaver. "BC's success attracting federal research dollars will help our province compete and win in today's economy."

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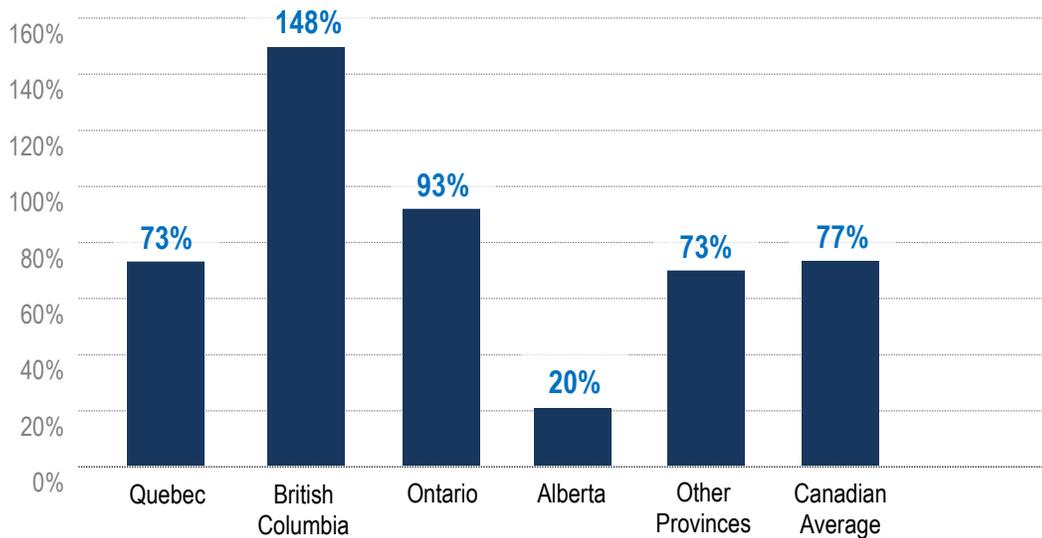
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Backgrounder: British Columbia Emerging as Canadian Research Engine

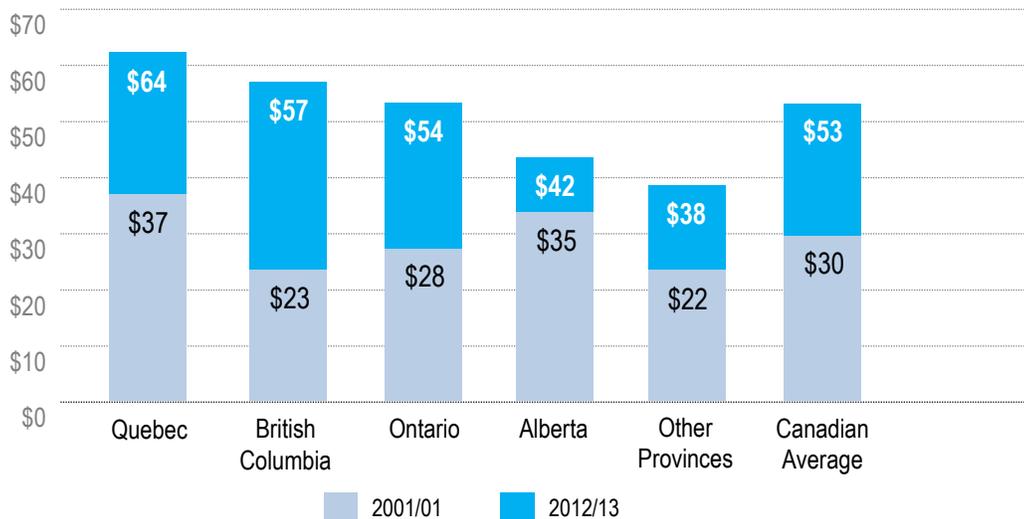
British Columbia has emerged as a hub for world-leading research. The province's success is driven by its research intensive universities, which are attracting hundreds of millions of dollars in research funding every year. In 2013 alone, research universities attracted more than \$700 million in research funding from outside the province.

Since 2000, British Columbia's per capita share of federal government research funding has risen by 148%, almost double the Canadian average. British Columbia now ranks second in Canada for federal per capita research funding, ahead of Ontario and Alberta.

Federal Granting Agency Funding per capita Increase, from 2000/01 and 2012/13

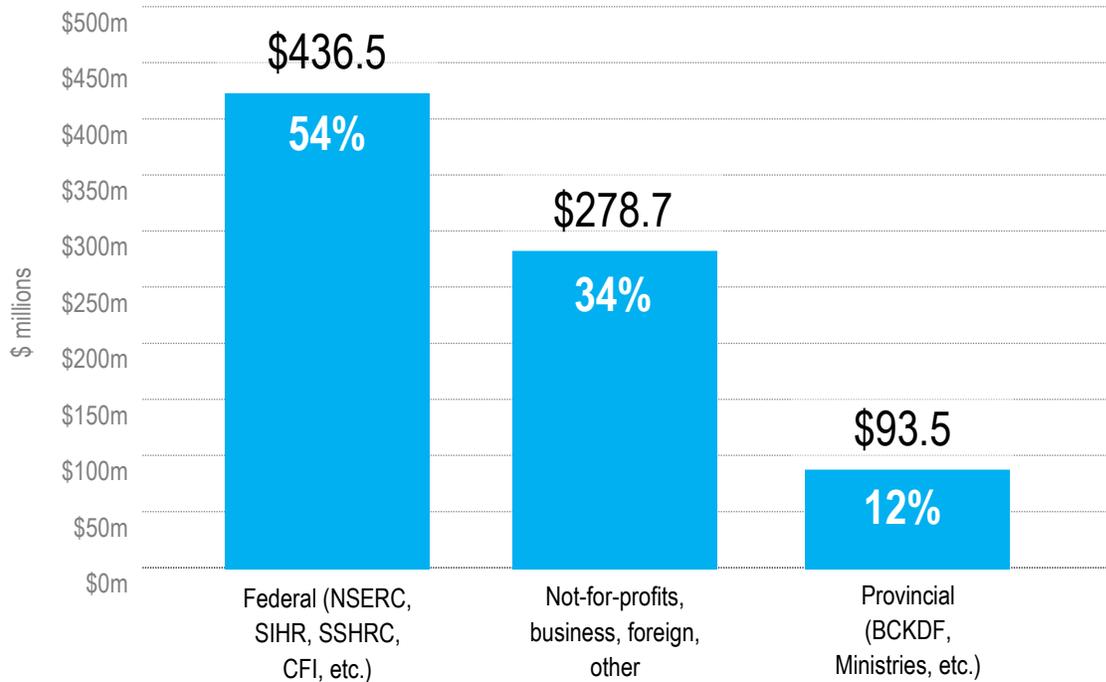


Federal Granting Agency Funding Per Capita – 2000/01 and 2012/13



In 2012/13 BC's research universities attracted almost \$809 million in research funding from federal, provincial, private and non-profit sources.

Total Sponsored Research = \$808.7 million



As a result of these investments, BC's research universities are helping to tackle important economic, social and health challenges, generating new jobs and economic opportunities in industries such as forestry and high-tech; advancing new technologies in health care and environmental protection; and attracting talent from around the globe to BC to work with students who take new ideas to the market place.

The success British Columbia is having in attracting and retaining world class research talent is one important reason why federal funding for research in BC is accelerating more quickly than in any other province. So too is the provincial government's commitment to research through the British Columbia Knowledge Development Fund (BCKDF).

British Columbia Knowledge Development Fund

Established in 1998, the British Columbia Knowledge Development Fund (BCKDF) has helped the province leverage almost \$1 billion in research infrastructure funding, largely from the federal government and industry, opening up tremendous opportunities for BC's research community.

The BCKDF has allowed research institutions in BC to attract and retain top talent from around the globe and allowed students to work with the best tools to gain the skills they need to succeed. It has been instrumental in driving innovation in resource industries such as mining and forestry and in new industries such as digital media and life sciences. It has contributed to advancing new technologies and treatments in health care and in environmental protection.

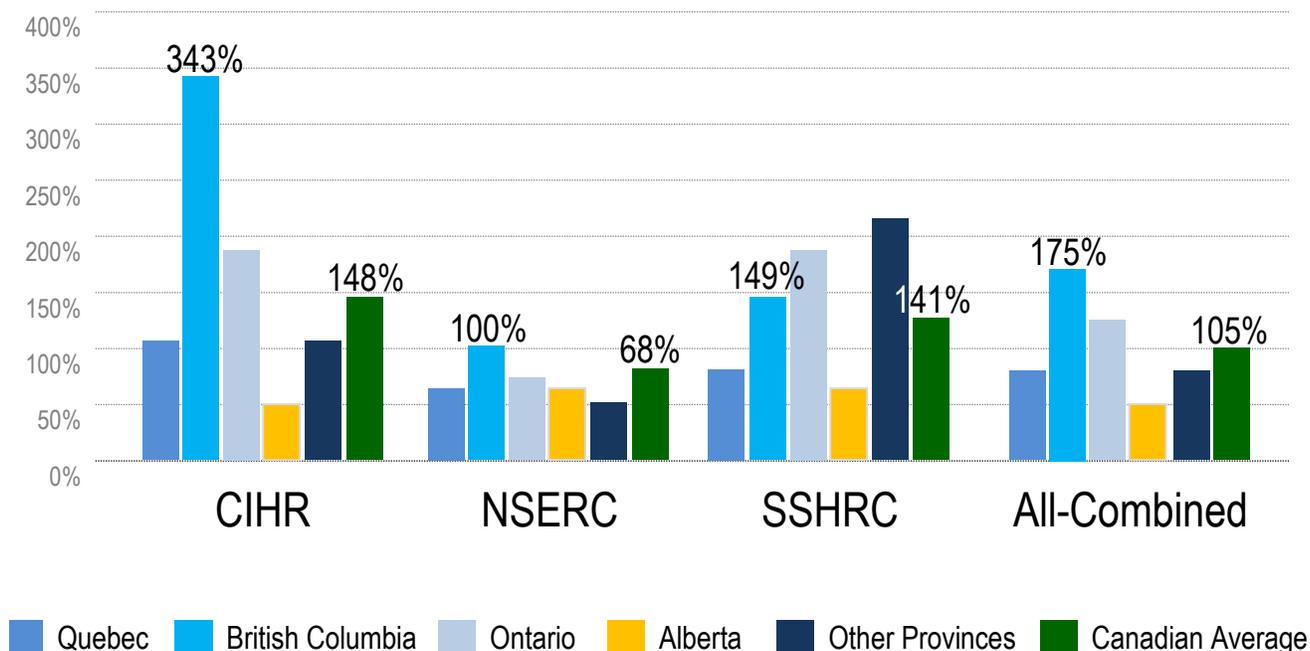
The **British Columbia Knowledge Development Fund** has been instrumental in driving innovation in resource industries such as mining and forestry and in new industries such as digital media and life sciences. It has contributed to new technologies and treatments in health care and in protecting our environment.

Examples of BCKDF-funded research include:

- 4D Labs - **Simon Fraser University's** state-of-the-art materials science and engineering lab on Burnaby Mountain sets research goals based on information it receives from industry partners, directing research to areas where it will have a major impact.
- The Djavad Mowafaghian Centre for Brain Research at the **University of British Columbia** brings together experts in the fields of neuroscience, neurology, and psychiatry in a hub for training, research, and clinical care where researchers work in collaboration with clinicians, translating groundbreaking research into patient care and therapies.
- The nanoplasmonics research laboratory at the **University of Victoria** is working with Biomark Diagnostics Inc. on early detection of cancers.
- Cutting-edge research in the **University of Northern British Columbia** is helping the province combat mountain pine beetle infestation with improved predictive models tracking its spread.
- At **Royal Roads University**, marine geologists are making advances in fisheries and risk assessments of natural hazards.

The largest increase in federal research funding was from the Canadian Institute of Health Research – more than double the national average since 2000.

Percentage Increase in Federal Granting Agency Funding 2001/01 to 2012/13



Overall Economic Impact

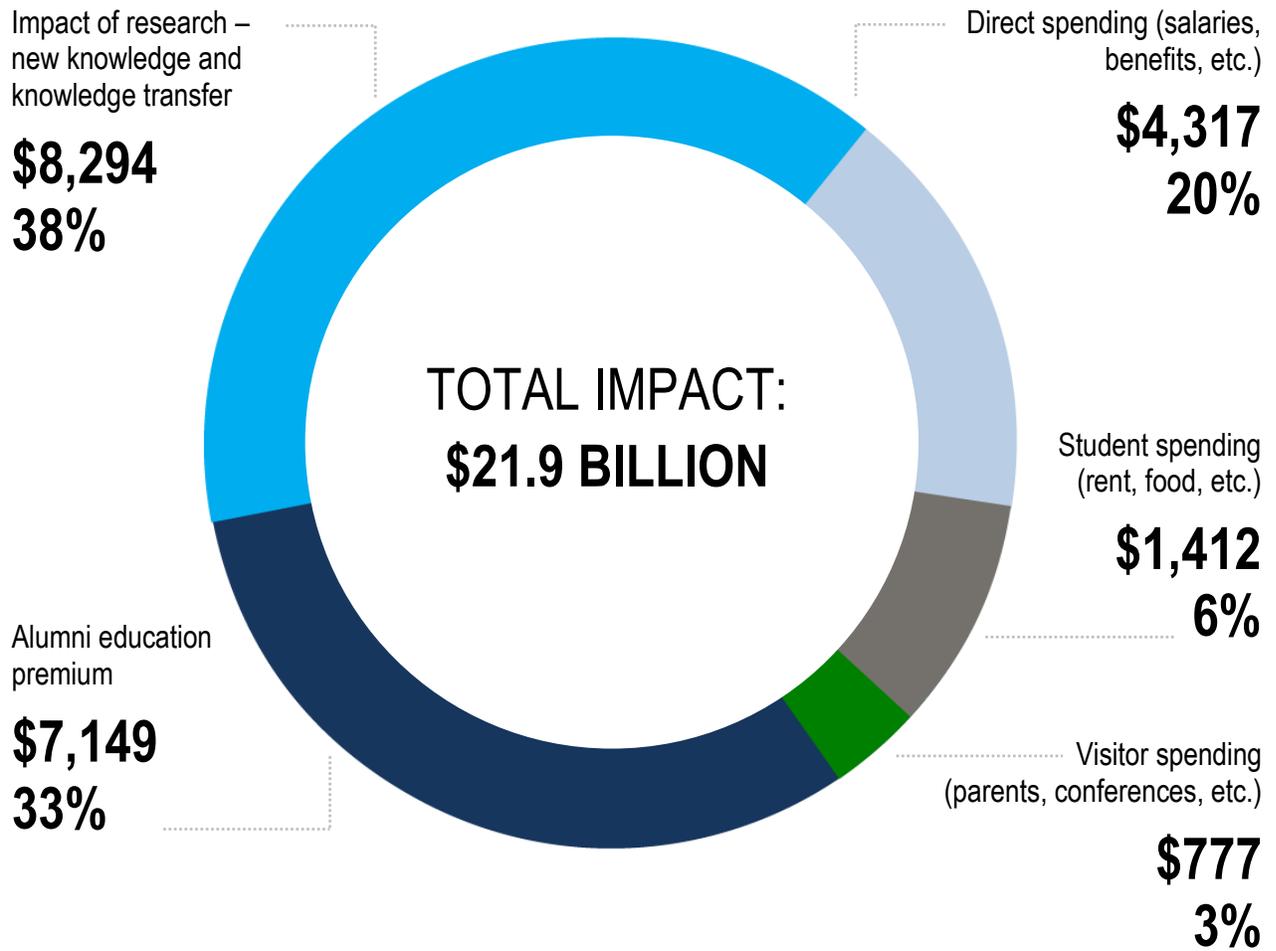
Overall, the economic impact of university research has grown to more than \$8 billion annually. This figure is derived from the increased productivity generated by both new knowledge and knowledge transfer and represents just one component of the research university sector's total contribution to the provincial economy.

New knowledge (or knowledge creation) and knowledge transfer are closely linked. There are many examples of new knowledge created by BC's research universities which have directly affected the BC economy. Much of the impact comes from transmitting the extraordinary world-wide growth in new knowledge into the BC economy. Graduate students, through their involvement in research, are a key conduit for knowledge transmission, and it is through active research at the leading edge of knowledge discovery that this process takes place.

In addition to the economic impact of research, the direct, student and visitor spending combined with the premium associated with higher wages earned by university graduates means that the estimated annual economic contribution of BC's research university sector is now almost \$22 billion, or 9.5 per cent of BC's total GDP.

Overall, the economic impact of university research has topped \$8 billion every year, bringing the total annual economic impact of BC's research universities to \$21.9 billion, or 9.5 per cent of British Columbia's GDP.

Economic Impact of BC Research Universities (\$ millions)



RUCBC Research Examples



The University of British Columbia

UBC scientists step closer to stem-cell cure for diabetes

Scientists at the University of British Columbia are at the forefront of a global effort aimed at using stem cells to treat diabetes.

People with diabetes need their bodies to produce more insulin, the hormone that enables cells to metabolize glucose (sugar). In Type 1 diabetes, which usually begins in childhood, the insulin-producing cells are attacked by the body's own immune system. In Type 2 diabetes, which usually begins later in life but is much more common, the body loses its responsiveness to insulin, and the pancreas cannot produce enough of the hormone to compensate. In both cases, glucose accumulates to toxic levels.

Members of the UBC Diabetes Research Group, led by Dr. Timothy Kieffer, made two major discoveries in the past year that point toward stem cells as a more effective alternative to the standard treatment: constant monitoring of blood-sugar levels and frequent self-injections of insulin. Those discoveries made headlines, and were recognized by the journals *Nature Medicine* and *Science* as notable breakthroughs of 2014.

In September 2014, Dr. Kieffer published a laboratory method for converting stem cells into reliable, insulin-producing cells that are capable of reversing diabetes in a few weeks, far quicker than the four months it took using previous methods. The final step of the conversion takes place when the cells are implanted in the host.

Six months later, Dr. Kieffer published research showing for the first time that Type 2 diabetes can be treated with a combination of those specially-cultured stem cells and low doses of conventional diabetes drugs. Mice that received a combination of the cells with one of three diabetes drugs were able to keep their blood sugar in check, even after ingesting a sugary meal. The combination therapy also produced an unexpected, but welcome result: the mice returned to a normal weight.

In both projects, Dr. Kieffer worked in collaboration with BetaLogics, part of Janssen Research and Development (JDRF).

From 1999 to 2009, the prevalence of diagnosed diabetes among Canadians increased by 70 per cent. It affects three million Canadians and hundreds of millions worldwide.

The UBC Diabetes Research Group is tackling the disease from multiple angles, with top researchers working on projects focused on the fundamental causes of diabetes as well as novel treatment strategies.

The group is supported by grants from the Canadian Institute for Health Research, the British Columbia Knowledge Development Fund, Canada Foundation for Innovation and other government grants in addition to numerous industry partners such as Johnson & Johnson and non-profit agencies such as Canadian Diabetes Association and JDRF.



Simon Fraser University

Engaged in Innovation: The Prometheus Project

British Columbia's materials scientists and engineers play well together, coordinating efforts and sharing research facilities to bridge the gap between university invention and industry innovation.

This advantageous relationship has been taken to the next level through the Prometheus Project, a \$20 million initiative funded by the Canada Foundation for Innovation and the BC Knowledge Development Fund (40% each), with the remaining 20% from its academic and industrial partners.

It is led by Neil Branda, a Canada Research Chair in Materials Science and SFU chemistry professor. Branda is co-founder of SFU's 4D LABS, a \$65-million materials science research institute known for nanotechnology innovation.

"Prometheus aims to turn the province's world-class materials science capability into new jobs, economic growth and social wellbeing for British Columbians," says Branda. "These benefits will be achieved faster and will reach further through our network of about 100 researchers from four BC institutions and our 30 partner companies."

Together, the partners are fabricating and testing advanced materials for real-world applications, such as solar materials and functional fabrics, biosensors for medical diagnostics and treatment, and computing devices. Some of these products, originally intended to meet a specific need of industry, could turn out to be incredibly useful for other devices that enhance energy, health, and communication.

It is this unbridled creativity of advanced materials research, combined with the needs-based drive of industry, which gives Prometheus its vast potential.

As well as the creation of new technologies that will benefit British Columbians, Prometheus also draws top-quality research talent here, and trains the next generation of researchers.



University of Victoria

UVic Proteomics Centre - MRM Proteomics Inc.

The UVic Proteomics Centre PC is a University of Victoria research laboratory that focuses on technology development for protein identification and characterization, quantitative proteomics for biomarker discovery and validation, and bioinformatics, using protein detection to identify early warning signs of diseases and conditions such as cancer and diabetes.

Through ongoing investment from Genome Canada from 2005-2015, the Centre has brought in \$14.6 million of platform funding into BC and has also received support from provincial, national and international sources (e.g. Genome BC, WED, Agilent, Bruker, ABSciex).

The PC employs a core staff of 24 employees, whose outstanding expertise has led them to publish more than 165 highly-cited papers and deliver over 280 presentations – many of which have been international in scope, putting BC on the map for Proteomics innovation.

In addition to its highly successful academic track record and a rich development of HQP, the PC has also been active on the commercial front. Since 2011, the UVic-PC has performed service contracts for over 300 research projects in health, agriculture, energy, environment and forestry with revenue exceeding \$3.6 million.

In 2010, UVic developed a spin-off company called MRM Proteomics Inc. (MRMP) to commercialize the technologies developed by the PC and to facilitate service delivery to industry. Since then, MRMP has attracted more than 30 contracts from industry clients across 4 continents. MRMP, which now has 4 employees, has been successful in negotiating commercial rights to a University of North Carolina technology called iMALDI, developed a line of Mass Spectrometer Standardization/Quality control kits, developed a line of biomarker assessment kits, and is currently in development of a new technology that will allow for testing on research mice without destruction of the animals. The Company recently entered into a distribution agreement with Cambridge Isotope Laboratories for distribution of the MRMP kits and has developed and agreement with Agilent for co-marketing.

Aside from the obvious economic effects that result from the service sales, product sales and employment detailed above, MRMP and the Proteomics Centre will play a role in the long-term health of Canadians and British Columbians. Their work involves being able to detect and quantify multiple diseases or conditions from a minute amount of blood in one multiplexed test. UVic has partnered with McGill University and UBC to validate these assays in a clinical setting moving us forward on the path to personalized medicine.



University of Northern British Columbia

Study Projects Drastic Reduction of Western Canadian Glaciers

UNBC Geography professor and Canada Research Chair in Glacier Change Brian Menounos co-authored a study released this year indicating that glaciers in Western Canada will lose 70 per cent of their volume relative to 2005 by the end of the century. Published along with researchers from UBC, the University of Iceland, and Pacific Climate Impacts Consortium, the paper in *Nature Geoscience* looked at glaciers in British Columbia and Alberta. The study found that surface runoff from Western Canadian glaciers will peak between 2020 and 2040, with reduced flows expected after that. Retreating mountain glaciers can lead to rises in sea levels and impact water availability and regional hydrology.

Federal funding for the project came from the Natural Sciences and Engineering Research Council of Canada (NSERC), including some of Dr. Menounos' NSERC funding. Other funding partners included the Canadian Foundation for Climate and Atmospheric Sciences, BC Hydro, the Columbia Basin Trust, UNBC, and UBC.

Media release: <http://www.unbc.ca/releases/36705/study-projects-drastic-reduction-western-canadian-glaciers>

Full paper: <http://www.nature.com/ngeo/journal/v8/n5/full/ngeo2407.html>



Royal Roads University

Paleoclimatic, paleoceanographic and paleoseismic history of the northern Pacific coast of British Columbia

Dr. Audrey Dallimore's Natural Sciences and Engineering Research Council of Canada (NSERC) funded paleo-seismic research on improving our understanding of the hazard potential for large earthquakes engages her team of graduate and undergraduate students, to provide clear environmental, economic and social/health benefits to the public, and embody the problem-solving research that RRU seeks to support.

This research is vital to economic and human security, and the ultimate sustainability of communities in the region. Most recently, Dallimore has expanded the reach of her research into the public sector, working with Parks Canada, the Gulf Island National Park Reserve, and First Nations communities studying and now restoring an ancient clam garden. Throughout her work, she provides opportunities for youth to engage in science in ways that would otherwise not be possible.



Thompson Rivers University

Rent Bank Research Lends Hope to the Homeless

This research project, supported with a Social Sciences and Humanities Research Council Aid to Small Universities Grant, evaluates the performance of the Kamloops Rent Bank in terms of its objective: preventing homelessness and improving housing stability.

Rent Banks provide small loans at a low interest rates to keep people in stable housing or to pay utilities that are in arrears.

This research aims to better understand the performance of the Kamloops Rent Bank, and to determine how best to tailor the rent bank concept for other small cities. The three-year project began with a series of structured interviews involving clients, landlords and officers and staff of the Kamloops Rent Bank. Researchers will also compare the cost per client for the rent bank to the cost of alternative homeless prevention approaches, such as emergency shelters.

In the first year of the research project, Dr. Latif completed an analysis of the Kamloops Rent Bank, conducting a series of interviews with clients, landlords, Kamloops Rent Bank officials and members of the advisory board, as well as evaluation reports from other regional rent banks. The study found high client satisfaction, and that all of the clients surveyed remained in their homes after receiving emergency loans from the KRB. The loan repayment rate of KRB clients was also very high — higher than rent banks in Prince George and Surrey — making the KRB a proven, cost-effective remedy to homelessness and housing stability. Dr. Latif's report was instrumental in encouraging the City of Kamloops to make a financial commitment to the KRB of \$15,000 per year for the next five years.

In the final two years of the grant, Dr. Latif's research will expand to include Kelowna, Nelson, Prince George, Nanaimo and Victoria. The Rent Bank study is a collaboration with community partners including the Kamloops Homelessness Action Plan, the Thompson Nicola Cariboo United Way and the Elizabeth Fry Society.

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