

**UNBC** UNIVERSITY OF  
NORTHERN BRITISH COLUMBIA

# UNBC Annual Research Report

**2016**



# About UNBC

**Located in the spectacular landscape of Northern British Columbia, UNBC is Canada's best small university according to Maclean's magazine. We have a passion for teaching, discovery, people, the environment, and the North.**

UNBC provides exceptional undergraduate and graduate learning and research opportunities. In addition to fostering and celebrating academic excellence, UNBC is a welcoming place, with a learning environment that is friendly, inclusive and supportive.

UNBC is a University both in and for the North. This mission has instilled a strong sense of ownership, purpose and adventure among our students, alumni, faculty, staff and the communities we serve.

We are also Canada's Green University leading the way to a more sustainable future for all through teaching, research and University operations.

## Vice President's Message

It is my pleasure to provide a brief overview of UNBC Research. We are proud to be located in the North and are committed to working with our regions, community and industrial partners to continue to build a strong and prosperous Northern B.C. UNBC is a young and emerging University, well aligned with the mandate of our province that is to provide skills to our learners so that they become drivers of the economy in the regions and in the nation. UNBC has world-class research clusters in natural resources and the environment; Indigenous and First Nations studies; rural, remote, and northern health; and sustainable communities. By creating local solutions that are globally relevant, UNBC researchers and scholars are committed to preserving, sustaining and enhancing the future of the Canadian North, and beyond. I welcome you to connect with us. Through partnership and collective investment we can generate prosperity, knowledge, and wisdom benefiting our society and our future generations.

**Dr. Geoffrey W. Payne**  
**Interim Vice President Research and  
Graduate Programs**

# Mission

**To grow capacity and opportunities for research and creative activities at UNBC by engaging our people and partners, leading to the discovery of new knowledge that has transformative academic, economic or social benefit for the region, province, nation, and beyond.**

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# Vision

**To build a flourishing research culture facilitated by state-of-the-art infrastructure and efficient support services, enabling UNBC scholars to undertake leading-edge local, national, and international research with respect for humanity and nature.**



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# Introduction

The past year has been one of many achievements for UNBC. On the heels of the institution's 25th anniversary as one of four major research-intensive universities in British Columbia, Maclean's Magazine ranked UNBC first among small universities in Canada for the second year in a row. The research activity of UNBC faculty, graduate and undergraduate students has been paramount in achieving this important milestone.

UNBC is committed to interdisciplinary and interconnected areas of scholarly inquiry of critical importance, as well as to Canada and the Circumpolar North, a commitment reflected in the collection of research stories presented throughout this report. UNBC's four strategic research areas, (i) Environment and Natural Resources, (ii) Community Development, (iii) Northern, Rural and Environmental Health, and (iv) First Nations and Indigenous Studies align with our values, vision and mission, including fostering research that is internationally recognized for its quality and impact, and for its orientation to communities' needs. UNBC's six Canada Research Chairs and eight endowed research chairs drive innovative research programs that are recognized at the national and international level.

Our four research institutes foster research collaboration among UNBC researchers and getting valuable research outcomes to communities of practice. These include:

- Natural Resources and Environmental Studies Institute (NRESi)
- Community Development Institute (CDI)
- Health Research Institute (HRI)
- Cumulative Impacts Research Consortium (CIRC)

UNBC has developed significant physical infrastructure for research, in part due to generous support from Canada Foundation for Innovation in partnership with the British Columbia Knowledge Development Fund, Western Economic Diversification Canada (WD), and other government funding initiatives. The UNBC Northern Analytical Laboratory Service (NALS) provides an extensive suite of analytical science instrumentation that enables a broad spectrum of biological, chemical and physical analyses.

Two research forests provide research and education facilities and opportunities to UNBC, other universities, government agencies, private sector research, and educational groups with an interest in ecosystem and resource management studies. The Dr. Max Blouw Quesnel River Research Centre is Western Canada's first field station established to support research and education in landscape ecology. The High Performance Computing (HPC) lab at UNBC enables research on projects such as weather hindcasting, regional climate model dynamic downscaling, simulation of shocks, fluid dynamics, computational chemistry and distributed transaction processing.

UNBC's Geoffrey R. Weller Library plays a key role in enhancing research intensity at UNBC, underlined by the development of the branch Research Data Centre at UNBC (RDC@UNBC) is affiliated with the British Columbia Inter-University Research Data Centre (BCIRDC), which is a member of the Canadian Research Data Centre Network (CRDCN). It provides Northern B.C. researchers with the opportunity to access and analyze detailed microdata from an increasing array of survey, census and administrative data.

The UNBC Bioenergy Plan on the Prince George campus is key component of UNBC's work as Canada's Green University. The Bioenergy Plant uses gasification to convert sawmill residue into useable heat in the form of hot water. The hot water is distributed through the existing hot water district heating system and has offset roughly 85 per cent of the fossil fuels previously used to heat the core campus buildings. While reducing the fossil fuel consumption for space heating of all UNBC campuses by 80 per cent, the bioenergy plant has also expanded our capacity for research and education on bioenergy.

We value and encourage research and scholarly activity that is locally motivated and relevant, yet has global effect and recognition. The Annual Research Report provides an overview of what we have achieved over the last year and offers a look at the impact of the diverse research pursued by our researchers.



**12,410**  
**UNBC Alumni**  
 25 Post-Doctoral Fellows

**6 Canada Research Chairs**  
**5 Endowed Chairs**  
**2 BC Leadership Chairs**  
**1 Knowledge Mobilization Chair**



**Total of research funding**  
**\$8,563,010.66**

Funding Agency	\$ Amount (2016)
NSERC	\$1,005,563.59
SSHRC	\$392,865.00
CIHR	\$569,521.16

**366 faculty members**  
 190 Full-time faculty (tenure & tenure-track)  
**176 Part-time faculty**  
**760 total employees**

(2013/14 numbers)



**3,793 Total Students**  
**3,089 Undergrad**  
**704 Graduate**  
 (2014/2015)

**11.2%**  
 International  
 Students

**745 Credentials conferred**  
**599 Undergraduate**  
**146 Graduate**  
 (2016)



# **Environment & Natural Resources**

# Population growth outpaces human ecological footprint

The global impact of human activities on the natural environment is extensive, but those impacts are expanding slower than the rate of economic and population growth according an international research project led by UNBC Associate Professor Dr. Oscar Venter.

The results, published in the journal Nature Communications, reveal a complex story of how humans are altering natural habitats at the planetary scale. The study finds that while the global population grew 23 per cent and the global economy grew 153 per cent between 1993 and 2009, the global human footprint grew only nine per cent.

“Seeing that our impacts have expanded at a rate that is slower than the rate of economic and population growth is encouraging,” said Venter, “it means we are becoming more efficient in how we use natural resources.”

While environmental impacts may not be tracking the exact growth rate of economies, they are already frighteningly extensive.

The publication includes high resolution and comprehensive maps of humanity’s changing impact on the terrestrial environment.

A team of researchers from UNBC, the University of Queensland, the Wildlife Conservation Society (WCS), and six other universities collaborated on the project.



West Fraser Growth and Yield Chair Dr. Oscar Venter.



Environmental Science Professor Dr. Stephen Déry.

# UNBC study details impact of declining mountain snowpack on Fraser River Basin

A new study by UNBC researchers details the impacts of a rapidly declining mountain snowpack on streamflow timing of the Fraser River Basin.

The study, a collaboration between UNBC Environmental Science Professor Dr. Stephen Déry and UNBC post-doctoral fellow Siraj ul Islam, was published by the Nature Publishing Group in their journal Scientific Reports. The paper is available at: <http://www.nature.com/articles/srep19299>

They found that although the total amount of annual precipitation in the Fraser River Basin has remained nearly stable between 1949 and 2006, changes in the type of precipitation and the timing of it, coupled with warmer air temperatures, have led to a significant decline in peak seasonal snowpack accumulation.

“Over our study period of 1949 to 2006, the contribution of snow to Fraser River flows declined 19 per cent,” said Dr. Déry. “This large decrease has led to an average 10-day advance of recent spring snowmelt pulses in the river. It also has resulted in a more rapid transition to lower flows during the summer. This can lead to warmer water temperatures that are possibly unfavorable to migrating salmon.”

The research team also included Do Hyuk “DK” Kang, a former post-doctoral fellow at UNBC who is now a post-doctoral fellow at the NASA Goddard Space Flight Centre; Huilin Gao, Assistant Professor, Texas A&M University; and Xiaogang Shi, Research Scientist at the Commonwealth Scientific and Industrial Research Organisation (CSIRO) Land and Water.

# Federal Funds Supporting Quesnel Lake Research

UNBC professors Dr. Ellen Petticrew and Dr. Phil Owens secured nearly \$800,000 in funding from the Government of Canada's Environmental Damages Fund (EDF) to continue their research into the impacts on the Quesnel Lake ecosystem after the breach of the Mount Polley Mine tailings storage facility in 2014.

The research team conducted a detailed monitoring program around the zone of initial deposition and in a halo around it extending out several kilometres. They also monitored the quality of sediment below the lake in the Quesnel River.

With the use of EDF funds, the research team brought in a specialized corer on loan from the Bedford Institute of Oceanography (Fisheries and Oceans Canada) in Halifax to collect samples of tailings and sediment at the bottom of the lake. The researchers are examining whether tailings deposited at the bottom of Quesnel Lake are loose and if they can re-enter the water column when the lake turns over seasonally.

This project was undertaken with the financial support of the Government of Canada.



Endowed Research Chairs in Landscape Ecology Dr. Ellen Petticrew and Dr. Phil Owen.



Researchers deploy a specialized corer to take samples from the bottom of Quesnel Lake.



**Community**

**Development**

# UNBC Launches Cash and Bioenergy Crop Feasibility Study

A UNBC team of researchers is studying whether crops such as specialty plants and vegetable, medicinal and natural health products, traditional First Nations crops and those for seed, grasses and hemp could be successfully grown in and around Vanderhoof, Fort St. James and the Bulkley-Nechako Regional District (BNRD).

The Bioenergy and Cash Crop Feasibility Study began in September 2016 and is factoring in anticipated changes in climate conditions in the region.

A list of possible crops will be developed from the study that will allow producers in the BNRD and Northern B.C. to better understand the potential and suitability for growing these types of crops and to create a solid foundation of information on how these crops could be put into a production rotation in Northern B.C.

“This project highlights UNBC’s commitment to the sustainability of the communities of Northern B.C. through their development of viable agricultural crops,” said Dr. Geoff Payne, UNBC Interim Vice President Research.

Some crops being studied include lavender, gourmet garlic, herbs, ginseng, Echinacea and other medicinal

plants, including motherwort, calendula, camelina, hops, quinoa, spelt, amaranth, seed and bioenergy crops, such as grasses and hemp. Innovative potential new crops may be added to this list of potential crops.

The Governments of Canada and British Columbia through the Canada-BC Agri-Innovation Program under Growing Forward 2, a federal-provincial-territorial initiative, have provided funding for this project. The program is delivered by the Investment Agriculture Foundation of BC.

Nak’azdli Whut’en First Nation and Chan Sisters Foundation are also funding the project.

UNBC Environmental Engineering Professor Dr. Steve Helle is the principal investigator on the study. He’s joined by Dr. Bill Deen from the University of Guelph, Erica Nitche from the Government of British Columbia, Matt Dickson with Hallbar Consulting, and Geoff De Ruiter and Serena Black. De Ruiter is currently a UNBC PhD candidate, while Black is a UNBC Master of Science Natural Resources and Environmental Studies graduate who focused on agricultural research.



A UNBC-led team of researchers is partnering with Nak’azdli Whut’en First Nation, Little Valley Farms in Vanderhoof and Bulkley-Nechako Regional District on a bioenergy and cash crop feasibility study.

# Community Development Institute

In 2016, the Community Development Institute (CDI) continued to provide research knowledge and leadership on issues communities face as they adapt to a changing global economy. The CDI is working extensively in the City of Prince Rupert and with communities in the Cariboo to develop and implement strategies for economic diversification and community resilience. These projects have brought people and organizations in these communities together to identify and realize opportunities that will help them build economic and social capacity.

CDI researchers published the Northern BC Housing Study. Recognizing that housing had become a pivotal issue in the ability of communities to attract and retain residents, the study profiled 10 communities across Northern B.C., looking at the factors that will drive housing need and demand. The study was launched at the Northern BC Housing Conference, Housing Solutions for Changing Communities, which was organized by the CDI. This study is now being used as a planning tool by local governments, the development industry and community groups.

CDI faculty published a number of books and journal articles. Greg Halseth, CDI Co-Director, Professor of Geography, and Canada Research Chair in Rural and Small Town Studies, published two books: *Doing Community Based Research, Perspectives from the Field* with Sean Markey, Don Manson, and Laura Ryser, and *The Integration Imperative: Cumulative Environmental, Community and Health Effects of Multiple Natural Resource Developments*, with Michael Gillingham, Chris Johnson, and Margo Parkes.



From left, Ecosystem Science and Management Professor Dr. Chris Johnson, Health Sciences Associate Professor Dr. Margot Parkes, Ecosystem Science and Management Dr. Michael Gillingham and Canada Research Chair in Rural and Small Town Studies Dr. Greg Halseth.

# Innovation focus

In November, the UNBC Office of Research collaborated with Innovation Central Society (ICS) to offer a Mini Tech Expo series at the Prince George campus.

Students, faculty and staff got an opportunity to check out virtual reality, 3D printing, and touchless controllers and see how they are used in Prince George.

Local innovators and technology entrepreneurs provided insights into the multitude of potential applications and exchanged interests in technology and innovation.



Virtual reality equipment was a popular attraction at the Mini Tech Expo.

**Northern, Rural  
and Environmental  
Health**

## Cutting-edge health care launches in the North

Northern B.C. is welcoming the first biobank of its kind in the province.

Led by Dr. Nadine Caron, affiliate UNBC faculty member, Northern Medical Program and Associate Professor, UBC Department of Surgery, the Northern Biobank Initiative Phase 2 will improve access for B.C.'s northern population to participate in, and reap the benefits of clinical research that will focus on community-specific disease prevention, diagnosis and treatment.

A biobank is a collection of biological samples, such as blood and tissue. These samples, along with associated health information, are collected with donor consent under stringent ethical guidelines.

“As we move forward with our comprehensive technology strategy, it’s clear that British Columbians continue to learn and benefit from research going on in their home communities,” said Health Minister Terry Lake. “And now, the North has an opportunity to learn from on-the-ground work being conducted to identify health impacts over the long term.”

The project is part of Genome British Columbia’s User Partner Program. UNBC is the lead academic institution for the \$1.25 million project, which is being funded in equal parts by Genome British Columbia, Northern Health, the First Nations Health Authority, Provincial Health Services Authority, and the BC Cancer Foundation. The BC Cancer Foundation fully funded the first phase of the biobank project.



Dr. Nadine Caron, affiliate UNBC faculty member with the Northern Medical Program and UBC Associate Professor of Surgery.

# UNBC researchers receive federal funding to further study of cancer-fighting properties in mushrooms

A team of UNBC interdisciplinary researchers has received a federal grant of nearly \$400,000 to further their study of local mushrooms as a potential cancer and diabetes prevention or treatment.

The \$389,908 provided by the federal government's Canada Foundation for Innovation's John R. Evans Leaders Fund is allowing UNBC Biochemistry Professor Dr. Chow Lee and his fellow researchers to expedite their search for new compounds derived from British Columbia's mushrooms which have bio-activities that are relevant to cancer and diabetes.

"The CFI infrastructure funding grants (equipment only) to be set up will significantly boost our quest to find new medicinal compounds that can be potentially used for the treatment or prevention of two chronic diseases – cancer and diabetes," said Dr. Lee who is the principal investigator of the research.

"The infrastructure includes equipment for chemical extraction of mushrooms, equipment for purifying and to help identify bio-active compounds, equipment for biological analysis (various types of microscopes and a cell sorter), and fridge/freezers for storing mushroom extracts and bio-active compounds."

Lee was joined by Dr. Sarah Gray, an associate professor in the Northern Medical Program and Dr. Ranjana Bird as co-investigators.

The project brings together researchers from UNBC's Chemistry and Biochemistry programs who have expertise in cancer and the Ecosystem Science and Management Program who have expertise in the biology and ecology of wild mushrooms and native trees.



Clockwise from bottom, Chemistry Professor Dr. Chow Lee, Chemistry Professor Dr. Kerry Reimer, Ecosystem Science and Management Professor Dr. Hugues Massicotte and Ecosystem Science and Management Professor Dr. Keith Egger.

## New research highlights link between youth crime and legal drinking age

Dr. Russ Callaghan with the Northern Medical Program has found that minimum legal drinking age (MLDA) legislation in Canada can have a major effect on crimes committed by young adults.

“The number of police-reported criminal incidents involving both male and females who have just reached the legal drinking age rises dramatically, a pattern which illustrates the impact that alcohol-related legislation can have on crime,” says Dr. Callaghan.

Dr. Callaghan and his research team looked at Canadian police-reported crime statistics between 2009 - 2013. They found that release from drinking-age restrictions was associated with significant increases in national police-reported crime perpetration by 7.6% among males and by 10.4% among females.

The MLDA is 18 years of age in Alberta, Manitoba, and Québec, and 19 years in the rest of Canada. Recently, the Canadian Public Health Association and a national expert-panel working group not only recommended that the legal drinking age be raised to at least 19 years, but also identified 21 years as the ideal. The current findings provide support for the position that raising the drinking age would likely reduce crimes in the newly alcohol-restricted age groups.

This research was directly funded by the Canadian Institutes of Health Research (CIHR).



Northern Medical Program Associate Professor  
Dr. Russ Callaghan.



Knowledge Mobilization Chair Dr. Martha MacLeod.

## Funding Supports Knowledge Mobilization Research

UNBC Nursing Professor Dr. Martha MacLeod is exploring the best ways to mobilize the knowledge gained in scientific studies into real world situations.

Dr. MacLeod, the Northern Health – UNBC Knowledge Mobilization Research Chair, secured \$250,000 in matched funding through the federally and provincially funded British Columbia Support for People and Patient-Oriented Research and Trials Unit.

Dr. MacLeod will use the matched funding to further her work into exploring ways that research evidence can be useable and useful as well as finding ways to improve the uptake of research evidence and other knowledge into practice.

“As Knowledge Mobilization Research Chair, I will be working with researchers and students at UNBC and with clinicians and others at Northern Health to extend ways to develop responsive, relevant research evidence and finding ways to move it into action,” Dr. MacLeod says.

The BC SUPPORT Unit was developed under Canada’s Strategy for Patient-Oriented Research, with support from the Governments of Canada and British Columbia, and provincial partners.

**First Nations**

**Studies**

**& Indigenous**

# Preparing for the inevitable: ecological and social impacts of oil spill-related mortality in the Beaufort Sea marine ecosystem

Within Beaufort Sea coastal-marine ecosystem the United States (Alaskan) indigenous communities of Barrow, Nuiqsut, and Kaktovik, and the Canadian (Northwest Territories) indigenous communities of Aklavik, Inuvik, Tuktoyaktuk, Paulatuk, Ulukhaktok, and Sachs Harbour, subsist by harvesting marine mammals, fish, and invertebrates to provide the majority of their community foods. Many Beaufort Sea marine animals rely on seasonal sea-ice for foraging activities and denning (e.g., polar bears). Recent losses in sea-ice extent and concomitant increases sea surface temperature (SST) reduce animal habitat, alter predator-prey relationships, and impact indigenous community harvesting. In addition to these environmental changes, oil extraction activities are predicted to increase throughout the Beaufort Sea.

Dr. Paul Mark Suprenand is a UNBC Postdoctoral Research Fellow funded by the Fulbright Scholar Program and works under the supervision of UNBC's Dr. Gary Wilson and Dr. Chris Johnson. In addition, Dr. Suprenand's work is supported by the Mote Marine Laboratory & Aquarium. The researchers have developed a whole-ecosystem model to capture environmental impacts to the Beaufort Sea coastal-marine ecosystem from 1970 to 2014, and then identified historic changes to food-web structures and keystone species. After model validation,

the researchers are now working to couple hypothetical oil spill simulation data generated with the support of Ocean Conservancy and the World Wildlife Federation – Canada. Specifically, they aim to identify at-risk species, habitats, and communities. As a part of this work, the researchers visit indigenous communities to learn how they can better inform their model.



UNBC Postdoctoral Research Fellow Dr. Paul Mark Suprenand.



# Dr. Gail Fondahl returns to Russia to update Indigenous rights research

In the 1990s, UNBC Geography Professor Dr. Gail Fondahl studied the legal reforms guiding indigenous territorial rights at the federal and sub-federal (regional) level in the Russian Federation.

Indigenous communities continue to face increasing pressures from resource extraction and industrial development projects.

Dr. Fondahl has received a federal Social Sciences and Humanities Research Council Insight Grant worth \$273,880 over four years to update and expand on her earlier research.

“We intend our research to be of use to indigenous leaders and decision-makers and to community makers who may experience similar experiences in engaging with the law and would benefit from sharing and learning from each other’s understandings and practices,” said Dr. Fondahl.

“This research will make an important contribution to the academic literature on indigenous rights and territorialities,

about an area not extensively covered, especially outside of Russian-language literature.”

With Fondahl as the principal investigator, the SSHRC team involves researchers from Northeast Federal University (Russian Federation), University of Lapland (Finland), Vilnius University (Lithuania) and the Institute for Humanities Research and Indigenous Studies of the North (Russian Federation). At least two graduate students will be recruited to UNBC on this project.

A Norwegian colleague from the University of Tromsø (with which UNBC has an exchange agreement), has received an additional 4 million Norwegian kroner (approx. CAD\$617,000) from the Norwegian Research Council for this project, with an expanded examination of governance. The interdisciplinary team involves geographers, anthropologists, a legal studies expert, and international relations scholars.



Geography Professor Dr. Gail Fondahl (second from right) is collaborating with an international team of researchers for her study in small indigenous communities in Siberia.

## **UNBC researcher receives funding to pursue unique First Nations project at Northern Health**

Northern Medical Program and Geography Associate Professor Dr. Sarah de Leeuw will lead the development of a unique research project centred on First Nations employment within Northern Health. She received \$149,500 from the Social Sciences and Humanities Research Council and the Canadian Institutes of Health Research through a Healthy and Productive Work - Partnership Development Grant.

Initial work will focus on building stakeholder partnerships and knowledge sharing with an emphasis on enhancing cultural safety in northern health-care work environments. Key partners include Northern Health, the First Nations Health Authority (FNHA), UNBC, and the Northern Medical Program, as well as numerous Indigenous and non-Indigenous stakeholders across the North.

“We are interested in studying the workplace in relation to Indigenous employees at Northern Health, and how to bring more Indigenous workers into the organization,” explains de Leeuw. “We will look at how to best gather information in this area, including innovative approaches such as videos of individuals highlighting what an ideal healthy work climate could look like for Indigenous people.

The project is being further supported through in-kind contributions, valued at approximately \$145,000, from various organizations including Northern Health, FNHA, the Michael Smith Foundation for Health Research, the National Collaborating Centre for Aboriginal Health, the Health Arts Research Centre, Arts Health Network Canada, Two Rivers Gallery, and Carrier Sekani Family Services.



Northern Medical Program Associate Professor Dr. Sarah de Leeuw.

# **Students in Research**

## Undergraduate Research Experience

The Undergraduate Research Experience (URE) program provides opportunities for UNBC's undergraduate students to be involved in research and scholarly activities.

In 2016, Conan Veitch participated in the URE program under the mentorship of graduate student Rafael Roman-Otero in the Computer Science Program. Veitch proposed to develop a system for counting seeds using recognition software and ended up exploring the application of swarm robotics to agriculture.

"Very few undergraduate students in the computer science program are allowed this kind of academic freedom to explore the integration of hardware and software thoroughly," Veitch said. "None of this would have been possible without the Undergraduate Research Experience program."

Inspired by the URE experience, Veitch has decided to pursue a master's degree with UNBC Computer Science Professor Dr. Alex Aravind.

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## Wolf-caribou dynamics study by biologist and UNBC grad published in Journal of Wildlife Management

The Bathurst caribou herd, with calving ground approximately 500 km north of Yellowknife, Northwest Territories, has experienced a dramatic decline in distribution and abundance over the past 20 years. That population has decreased from more than 350,000 animals in the mid-1990s to approximately 15,000 animals in 2016.

Research by Mike Klaczek, a UNBC Master of Science (Biology) graduate in 2015, who was supervised by Ecosystem Science and Management professor Dr. Chris Johnson, focused on the interactions of the Bathurst caribou and their primary predator, tundra wolves.

He studied the distributional and population responses of wolves to the declining caribou population. He used location data from caribou with satellite collars and aerial surveys of the location of wolf dens to determine if wolves shifted their summer dens to be closer to caribou (that were contracting further north).

Wolves maintained a strong affinity to historical den sites, thus the dens were located at progressively greater distances from the caribou calving and summer ranges. This is bad news for the survival of wolf pups as there are few caribou near the den to feed the young.

Klaczek's analysis, published in *The Journal of Wildlife Management*, revealed that the decline in caribou numbers has resulted in poor survival of wolf pups and a decline in the wolf population. Without caribou, many of the pups didn't survive the summer. Klaczek's work suggests that the number of tundra wolves is regulated by the dynamics of caribou.



UNBC alumnus Mike Klaczek.

# RNA Splicing research could lead to better understanding of genetic diseases

Imagine being able to peer into the atomic structure of a protein, to understand how these tiny machines work, and to gain a better understanding of how to develop new treatments for genetic diseases that can occur when these proteins are damaged.

That's the work being done at UNBC as researchers have solved the first protein crystal structure at the university. This work allows them to see the location of every atom in a protein, which could help them learn more about the RNA splicing process in humans.

Corbin Black, a UNBC biochemistry graduate student, is the lead author on the research paper, published in the international journal *Protein Science*. He collaborated with a pair of University of Alberta researchers, Erin Garside, a PhD candidate, and Professor Andrew McMillan, and was supervised by UNBC Chemistry Professor Dr. Stephen Rader.

An algal protein was used since it has simpler splicing machinery – only 40 parts, compared to 250 in humans – making it an easier organism to work with. The concentrated protein was sent to the U of A, where a high quality crystal was grown. It was then frozen with liquid nitrogen and sent to Stanford University to be X-rayed.

“The similarity between our protein, which comes from an alga, and the human protein shows that what we learn about splicing from this alga is likely to be relevant to humans,” said Rader. “And it is a much easier organism to study, so this is a proof of principle for using this organism to determine what splicing proteins look like.”

RNA splicing occurs naturally in humans, but errors in the splicing process have been linked to numerous diseases ranging from cancer to cystic fibrosis to spinal muscular atrophy.



UNBC graduate student Corbin Black.

# Field Education Centre opens at UNBC Aleza Lake Research Forest

A unique log and timber building and classroom on a hilltop overlooking the Upper Fraser area and the McGregor Mountains has opened its doors..

The Field Education Centre at UNBC's Aleza Lake Research Forest, located 60 km east of Prince George, provides a great space for the university's faculty and students, for outdoor learning, field courses and research in forest ecology, forest and ecosystem management and environmental studies.

The Aleza Field Education Centre is a 1,200 square-foot interpretive centre of log and timber construction, designed to host field courses, meetings, retreats, training, and community events.

The Aleza Lake Research Forest Society is operating the Centre as an environmental learning centre, gathering place, and hub for events at the 9,000-hectare (22,250 acre) research forest. The Centre can also provide some

overnight accommodations for field researchers and crews, and community groups, from time to time.

The Centre is a valuable learning facility that's available for elementary and high school classes, community groups, the forest sector, and local industry for educational and training events, on a cost-recovery rental basis ([alf.unbc.ca](http://alf.unbc.ca)).

"The Field Education Centre will enhance the Aleza Lake Research Forest and make it even more relevant, rich and accessible to UNBC faculty, students and our community partners," said UNBC President Dr. Daniel Weeks. "Thank you to our donors Dunkley Lumber, Moss Rock Park Foundation, and Integris Credit Union for making this possible."



UNBC President Dr. Daniel Weeks is joined by donors, researchers, forestry professionals and local government officials at the grand opening of the Field Education Centre at the Aleza Lake Research Forest.



From left, Aleza Lake  
Research Forest interns  
Samantha Gonzalez, Hadyn  
Yeomans, Saskia Hart and  
Anna Tobiasz.