

Strategic Research Action Plan

2017-2021



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 Northern B.C. 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; rural, remote, and northern health; and sustainable communities. UNBC researchers and scholars are committed to preserving, sustaining, and enhancing the future of the Canadian North. 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.

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.

UNBC Strategic Research Action Plan 2017-2021

Context And Purpose

Massive transformations will characterize the Earth's northern regions in the next few generations. Climate change, differentially experienced in northern regions, and the growing demands of an ever-rising global population for the North's rich resources will contribute to environmental alterations and changing resource availability. Challenges of energy and food security, Indigenous and broader human rights, and environmental degradation all have distinctly northern expressions. Created at the demand of our region's population to provide access to university education and research in the North of British Columbia, UNBC acknowledges a special responsibility to contribute to the wellbeing of the North's communities, and to the sustainability of the environments that support them.

UNBC has gained national recognition for excellent research performance, especially in key areas of strategic importance to the wellbeing of northerners. We value and encourage research and scholarly activity that is locally motivated and relevant, yet has global effect and recognition. This renewed strategic research action plan reaffirms UNBC's founding principles through commitment to four interdisciplinary and interconnected areas of scholarly inquiry of critical importance to our location, as well as to Canada and to the Circumpolar North. In doing

so, it elaborates on the values, vision and mission put forth in UNBC's (2010) University Plan, including fostering research that is internationally recognized for its quality and impact, and for its orientation to communities' needs. A strength of UNBC is the interdisciplinary research conducted at the institution in which all faculty and students play an integral role to the success of research at UNBC.

A strategic research action plan provides a road map for decisions about the direction of institutional initiatives and the selective allocation of institutional resources. While identifying specific strategic research areas, we recognize the importance of foundational areas of research that underlie the strategic theme. We also underscore that we deeply value scholarly excellence at UNBC outside of the strategic and associated foundational areas, as vital to the breadth and diversity that UNBC offers its students and communities. UNBC recognizes that central to our success in achieving our research goals and objectives is our community of faculty members, students, post-doctoral fellows, and support personnel. We laud all of our researchers' creativity and continue to develop an environment that inspires imagination, ingenuity and productivity in research and scholarly activity in all areas of inquiry.

Major Objectives Of The Plan

- 1)** To strengthen research at UNBC that is of outstanding quality and pioneering in its innovation, especially in strategic interdisciplinary research areas that are of marked importance to our region and similar areas;
- 2)** To enhance the training of researchers, by increasing the number of graduate students and by providing a highly stimulating research environment focused on research excellence for all our students (undergraduate and graduate) that establishes UNBC as a leader in the integration of research and teaching;
- 3)** To provide our researchers access to superior research resources and infrastructure, and to manage these to ensure their effective and efficient use;
- 4)** To develop new research relationships with communities, businesses, industries, other academic institutions and other partners, regionally, nationally and internationally;
- 5)** To enhance access to the results of our research, through improved knowledge translation, transfer and application, in order to maximize their benefits to society in Northern British Columbia and beyond; and,
- 6)** To maximize the potential for research to enhance faculty recruitment to UNBC, by promoting research dissemination and by the strategic allocation of Research Chairs.

Strategic Research Areas

UNBC's four interdisciplinary strategic research areas are:

- I. Environment and Natural Resources**
- II. Community Development**
- III. Northern, Rural and Environmental Health**
- IV. First Nations and Indigenous Studies**

These areas are informed by, and take advantage of, our location and the unique opportunities they provide for research. They reflect current strengths of UNBC researchers, who have created foci of excellence, often in response to the needs of our region. As well, they suggest emerging strategic themes for development that are priorities for Northern British Columbia and cognate areas. These priority areas offer opportunities for productive partnerships with our communities, their governments, and the industries and not-for-profit organizations that support these communities.

The strategic areas themselves are inter-related. Resources deployed for one thematic area often increase the capacity of others. Indeed, most of our Research Chairs contribute to more than one focus area (Table 1).

Table 1:

Distribution of UNBC Research Chairs by Strategic Research Area (2016)

Chair Name	Chair Type	UNBC Strategic Research Area	Funder	Tenure/ Expiry
Integrative Physiology of Diabetes	Tier II, Canada Research Chair	(III)	CIHR	Term 1 / 2017
Rural and Small Town Studies	Tier I, Canada Research Chair	(I, II, III, IV)	SSHRC	Term 2 / 2018
Aboriginal Governance and Law	Tier II, Canada Research Chair	(IV)	SSHRC	Term 1 / 2018
Glacial Change	Tier II, Canada Research Chair	(I)	NSERC	Term 1 / 2018
Health, Ecosystems, and Society	Tier II, Canada Research Chair	(III)	CIHR	Term 2 / 2019
Mixed-Wood Ecology	Endowed Chair	(I, II)	FRBC-Slocan	No expiry
Growth & Yield	Endowed Chair	(I)	FRBC-West Fraser	No expiry
Muskwa Kechika	Endowed Chair	(I)	Muskwa Kechika	No expiry
Landscape Ecology	Endowed Chair	(I, II, III, IV)	FRBC	No expiry
Landscape Ecology	Endowed Chair	(I, III)	FRBC	No expiry
Aboriginal Environmental Health	BC Leadership Chair	(I, IV)	Dr. Donald B. Rix and BC Innovation Council	No expiry
Tall Wood and Hybrid Structures Engineering	BC Leadership Chair	(I, II)	BCIC	No expiry
NH-UNBC Knowledge Mobilization Research Chair	Knowledge Mobilization Chair	(III)	Northern Health/ UNBC	Term 1/ 2020

UNBC is an advocate for equity and is committed to ensuring representation of underrepresented groups within the Canada Research Chairs Program.

A brief description of each of the strategic research areas follows.

Environment and Natural Resources

The University of Northern British Columbia is surrounded by abundant natural resources, and resource extraction and exploitation have traditionally been the foundation of the region's economy. However, environmental degradation and the disturbance of ecosystems which provide key ecosystem services to Canadians' are of increasing concern. These worries are especially acute in northern BC communities many of which are reliant on resource-based economies. Responsible stewardship of resources and the natural environment requires an advanced understanding of our rich natural heritage. UNBC is committed to training researchers in the social and ecological aspects of natural and man-made environmental complexities who can inform the mitigation of impacts on the environment when functions and processes are disrupted. Moreover, the transformation of extraction-based economies to innovative, global, knowledge-based economies requires advances in many areas, including:

- A highly developed understanding of the fundamental workings of natural systems: their complexity, resilience, adaptive capacity and sustainability;
- Mapping human pressures and conservation at the planetary scale as a result of natural resource development;
- Well-balanced and integrated assessment of multiple and often competing values associated with natural resources;
- Identification and integration of sound social, economic and ecosystems principles for resource management and environmental protection;
- Design and application of new technologies for management, extraction, processing, remediation, and many other issues related to the resource base.

Advancing research within these topics is of profound importance to Canada and to other areas of the world with similar ecosystems and resource dependencies. UNBC has developed an international reputation for research that examines both the human and natural dimensions of natural resources and environmental sustainability, engaging scholars from across the spectrum of natural, physical and social sciences and humanities,

and research that extends from the molecular to the landscape and global scales. We have emphasized multi-disciplinary and inter-disciplinary approaches to research as well as the training of highly qualified personnel (HQP), as evidenced in our innovative Natural Resource and Environmental Studies graduate degree programs (MA, MNRES, MSc, PhD). Furthermore, our research facilities provide the necessary infrastructure to advance environmental and natural resource-related research.

The Aleza Lake Research Forest (co-managed with UBC), the John Prince Research Forest (co-managed with Tl'azt'en Nation), and the Max Blouw Quesnel River Research Centre provide exceptional opportunities for research on the environment and natural resources, as well as in our other strategic research areas of Community Development, Environmental Health, and First Nations Peoples.

As a steward of the environment, and to further expand on this and other research areas, UNBC implemented the Energy Initiative, which is a recent initiative in this research direction. In May 2009, UNBC installed Canada's first university-owned wood pellet heating system to heat the Enhanced Forestry Laboratory. The Pellet Plant was a demonstration project initiated by the Wood Pellet Producers Association that showcased domestic use of wood pellets, and examined the commercial and environmental benefits of utilizing biomass for energy production at UNBC. Following the success of the Pellet System, Phase 2 of the UNBC Energy Initiative saw the expansion of bioenergy at UNBC with the start-up of the Bioenergy Plant on the Prince George campus in May 2011. The Bioenergy Plant uses gasification to convert sawmill residue into usable 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% of fossil fuels previously used to heat the core campus buildings. This reduction has helped UNBC work towards its energy policy goals of reducing fossil fuel consumption for space heating of all UNBC campuses by 80%. Phase 3 of the Energy Initiative is the Sustainable Communities Demonstration Project (SCDP). The SCDP is building on UNBC's award-winning Energy Initiative and further demonstrating to the North the potential for sustainable energy. The project consists of a low-temperature, hot water district energy system that connects the student residences, campus daycare, and I.K. Barber Enhanced

Forestry Lab to the Bioenergy Plant and the wood pellet system. The SDCP will expand UNBC's renewable energy production, reduce greenhouse gas emissions and fuel purchase costs, and expand capacity for research, education, and demonstration. As such, it will serve as a model of energy security for Canada's off-grid communities, many of which are located in British Columbia. It will also provide opportunities for research to explore ways to enhance the communities we serve. UNBC also participates in a Northern Bioenergy Partnership, an industry-led coalition.

UNBC is committed to providing researchers with the resources needed to develop their research programs, including providing support for the research institutes. The Natural Resources & Environmental Studies Institute (NRESi) builds connections among university researchers and communities or external experts to advance understanding of natural resources and the environment. NRESi facilitates collaborative projects that address complex issues involving ecological processes, social values, and Earth's physical systems. With over 70 members, the NRESi fosters collaborative opportunities among UNBC researchers and governmental agencies, resource managers, communities, non-governmental organizations, and industry.

Under this strategic research area, and capitalizing on its geographical location, UNBC will continue to enhance the capacity of Northern British Columbia, the province, and the Canadian and Circumpolar North in developing an understanding of environmental systems and in the sustainable development of its resource sectors. Expanding on our programming and aligning with the Province's Wood First! Initiative, UNBC opened the Wood Innovation and Design Centre (WIDC), one of the tallest contemporary wood buildings in North America, further positioning BC as a leader in wood innovation and design. The WIDC houses the Master of Wood Engineering Program – a program rooted in the specific needs of the British Columbian and North American wood construction industry. This program adds value to the institution because of its impacts on the sawmill through to the building site, and is well aligned with UNBC's educational and research priorities that lead to sustainable construction, with multiple environmental benefits.

Emerging Themes

In the coming years, UNBC envisions research growth in the following sub-areas (and in the disciplinary areas that support these):

- Bioenergy and other clean energy
- Wood innovation (including engineering, design, product diversification & marketing)
- Climate change and environment and human adaptation
- Contamination and human impacts on air, land, water and biota
- Environmental remediation
- Assessment of cumulative impacts of development on natural and social systems
- Ecosystem function and services
- Environmental history
- Fisheries
- Integrated watershed and airshed research



Community Development

Communities across Northern British Columbia are faced with planning for the future in the face of a range of complex, nuanced, and interconnected social, economic, and environmental pressures. Frequently dependent on natural resource-based industries, and subject to the vulnerability this engenders in an increasingly globalized economy, our communities have struggled to remain viable and are actively searching for opportunities to enhance both stability and resilience. While expected to engage in “bottom-up” development, the foundations upon which community stability and resilience are built: the supporting human, social, and built capital have suffered from a lack of re-investment for decades. Furthermore, in an increasingly complex world, communities often lack access to the information and tools that would enable them to identify, prioritize, and take positive action on emerging opportunities. These issues are not unique to Northern BC; they are found across rural and northern Canada and in rural and resource-based regions around the globe.

Key areas of research and scholarly activity include:

- A understanding of the interwoven factors that contribute to communities remaining resilient in the face of change and challenges;
- Identification and formulation of place-based sustainable options for economic diversification;
- Analysis of globalization processes that affect the societies, cultures, economies and environments of northern British Columbia and like regions;
- Exploration and development of the culture and cultural economy of small cities and rural communities and their contribution to quality of life;
- Assessing and planning for appropriate services provision (e.g. community, social, health, cultural, education, housing, planning, child development, family supports, seniors supports, etc.) in northern and rural environments;
- An assessment of how perceptions and behaviors are related to the challenges and opportunities for social integration of different racial, ethnic, religious or other groups into northern communities.

Such areas of inquiry relate to overarching issues of the politics of identity, engaged citizenship, social justice and the cultural and social definitions of quality of life, as well as economic development.

UNBC has provided leadership in the area of research on community development in Northern British Columbia that has wide application beyond our region. Work on a range of community development topics has focused especially on comparable regions across Canada and internationally.

UNBC has also been a leader in creating a richer arts and culture environment on and off its campuses through scholarly activities and creative performances. UNBC's Community Development Institute (CDI) has partnered with numerous communities at their request to address cultural, social and economic development challenges.

The CDI was established in 2004 with a broad mandate in community and economic development. The CDI provides programs and services in four broad areas: community transformation and renewal, research, education, and dialogues and policy discussions. Working in partnership with communities, industry, business, non-profit and community organizations, First Nations, and all levels of government, the CDI develops and implements strategies for economic diversification and community resilience. The CDI focuses on the non-metropolitan communities across British Columbia's northern and central regions – communities where more than 80% of the province's export wealth is generated from natural resources. An invaluable resource for UNBC researchers, Resilience and sustainability of rural and small town the CDI facilitates communities and economies access to practical information, insights, and knowledge to assist communities, government, industry, business, and the changing relationships between the non-profit sector.

Under this strategic in an increasingly urbanized world research area, UNBC will improve its understanding of the evolving needs of northern communities from a range of disciplinary perspectives, in or divided to inform public policy and practice, and community decision-making. The emerging communications and technology UNBC will foster experiences and relationships in The impact of demographic shifts and the need for the arts and cultural sectors in an effort to cultivate a better quality of life, stronger community identities, investments that will enhance and expand social and human capital and healthier cultural economies. We will contribute to the sustainability of communities through research, community collaboration, and partnerships research methodologies on the complex and nuanced intersections between social, economic, cultural, demographic, Creative cultural expression and sense of place considers impacts of climate change and growing global demands and other community development and planning issues.

Emerging Themes

- Sustainable agriculture and food production that
- 'Green' entrepreneurship
- Water resource issues, including impact on community and regional sustainability from both internal and external factors
- Role of energy and energy use in community and economic sustainability
- Place-based tourism
- Changing relationships between industry and communities, including impacts associated with mobile labour, population and workforce aging and transition, and needed community infrastructure investments
- Rural and cross-cultural education
- Sustainable Aboriginal economies

Northern, Rural and Environmental Health

Canadians who live in rural and northern regions have a reduced health status and health outcomes that are markedly worse than those of their urban and southern fellow citizens. Factors that contribute to these disparities include long distances to full-range health care services and providers, life-styles, socio-economic status and environmental sustainability. Such disparities are even greater for First Nations populations, who experience much higher than average morbidity and mortality rates. The health determinants that produce these disparities include individual, community, population and environmental factors, necessitating a broadly comprehensive approach to the study of health.

Key research areas include:

- Identification of the determinants of health status in rural and northern communities;
- Understanding of health services and health human resources, and the development of enhanced models of service delivery and health professional education;
- Improvements in the accessibility and effectiveness of health promotion programs across space and across diverse populations;
- Identification and evaluation of cultural issues affecting health and health care delivery, especially in First Nations communities;
- The relationship between health of individuals and populations and the natural, and built environments in which they live.

UNBC has taken advantage of its location to advance multi-disciplinary research on the social, cultural, psychological, and environmental determinants of health in rural communities, including First Nations communities, and on planning and provision of health care services and preventative health programs that address the challenges of rural location and cultural suitability. Basic research on the biological-based pathways for the treatment of diseases complement these foci. UNBC's biomedical research is providing critical training opportunities for future health professionals, as well as contributing to attracting and retaining researcher-practitioners. Work on linking social and environmental determinants of health to reduce health disparities has received national recognition. Building on this work and to further strengthen its health research portfolio and respond to the increasing demands placed on the northern health care system, UNBC now also offers an interdisciplinary PhD in Health Sciences.

To synthesize and exchange new knowledge, and also foster research linkages to develop UNBC's health research capacity, the Health Research Institute (HRI) has been established in partnership with the Northern Health Authority in order to enhance capacity in this strategic area. The HRI's mission is to facilitate the creation and translation of knowledge that will enhance the health and well-being of individuals, families and communities.

With the opening of the BC Cancer Agency – Centre for the North in 2012, new and exciting opportunities for research collaborations are possible through the engagement of northern patients in national and international research initiatives, and the development of novel technologies targeted at small or mobile treatment facilities.

Emerging Themes

UNBC envisages research growth in the following sub-areas. While these are of broad importance across Canada and globally, UNBC researchers will often distinguish their research by focusing specifically on the often-neglected rural and northern dimensions of such themes:

- Air quality and health
- Health and related social services provision policy and best practices
- Impact on diseases of cellular mechanisms
- Improving access to health care and health information
- Linking social and environmental determinants of health to reduce health disparities
- Mental health and addictions
- Northern food security and diet-related health issues
- Preventative health care and disabilities management

First Nations and Indigenous Peoples

UNBC is located on the traditional territory of the Lheidli T'enneh and northern British Columbia is homeland to a rich diversity of First Nations, including 20 major linguistic groupings, the territories of 16 Tribal Councils and 77 bands, and four Métis organizations. First Nations and Indigenous students comprise over 10% of our student body, and UNBC is actively working towards growing its Indigenous student community. The university acknowledges a special responsibility to the First Nations of its service area in terms of education and research, as well as in supporting Indigenous communities in their self-governance, and creating meaningful opportunities for knowledge exchange between Indigenous and non-Indigenous peoples. We recognize the potency a comparative perspective brings to many research questions, and thus include research focusing on broader Indigenous studies.

Most First Nations in UNBC's service area are highly dependent on the natural resources of the area, including forests and fisheries. First Nations are challenged by health, education, and economic inequalities.

Key areas of research include:

- Design and application of Indigenous-informed resource management strategies;
- Understanding definitions of, and causal factors to, Indigenous health and wellness, and contributing to their enhancement;
- Formulation of culturally-appropriate models for education curricula and delivery;
- Assessments and recommendations of self-governance models;
- Preservation and revitalization of Aboriginal languages and cultures.

UNBC houses the National Collaborating Centre for Aboriginal Health, the mandate of which is health knowledge synthesis, translation and exchange, in order to empower Aboriginal communities. Through a formalized partnership with the Northern Health Authority of British Columbia, UNBC is developing joint initiatives to use innovation to improve access, enhance quality and reduce costs in health care. UNBC brings a strong focus to research relevant to people living in rural and northern communities, to Aboriginal peoples, and to the determinants of health. For its part, the NCCAH has drawn funding to the university from multiple sources to support

a variety of Aboriginal health initiatives. UNBC and the NCCAH are committed to moving the agenda forward in support of the health and well-being of First Nations, Inuit, and Métis (FNIM) peoples in Canada.

UNBC is committed to research that involves Indigenous partners at all stages of planning and execution. Our governance system incorporates Aboriginal representation. We are proud of our long-standing cooperative relationship with Wilp Wilxo'oskwhl Nisga'a (Nisga'a House of Learning) and our co-management with Tl'azt'en Nation of the John Prince Research Forest. We have pursued a number of community-based research initiatives with various First Nations, and have worked with communities to develop formal protocol agreements relating to joint research activities. Research on First Nations community development, Aboriginal history, Aboriginal resource management, and Aboriginal tourism has flowed from First Nation community-initiated projects, and has provided concrete products and outcomes valued by both researchers and First Nations. As noted above, UNBC also has provided national and international research leadership on Aboriginal health.

Emerging Themes

- First Nations epistemologies and education
- First Nations health and healing
- Indigenous governance and law
- Indigenous research methods
- Orality and connections with literary traditions
- Traditional land use studies
- Reconciliation





Objective 1:

Strengthening UNBC's Research Capacity

Developing the Strategic Research Areas Through Allocation and Support of Research Chairs: Future Research Chair Allocations

UNBC is committed to increasing the number of externally-funded Research Chairs in the strategic research themes, to further enhance our capacity for research and graduate training in these areas. We will pursue other opportunities for endowed Research Chairs at the federal and provincial levels, as well as through private sponsorship. UNBC is committed to increasing the number of industrial research chairs at the institution. These chairs would help drive the industry-sponsored research programs here at UNBC and would help ensure we continue to support our partners by addressing industry challenges through research.

Gender representation

UNBC is committed to gender equity in employment and in training the next generation of researchers. Women account for 45% of UNBC faculty (national average=34%), as well as 70% of our graduate students. UNBC ensures that gender considerations are a fundamental component of all faculty searches. Fifty percent of UNBC's Canada Research Chairs and 40% of UNBC's endowed Chairs are female. We acknowledge responsibility to allocate Research Chairs in a way that ensures gender equity and recognizes the diversity of Canada's population.

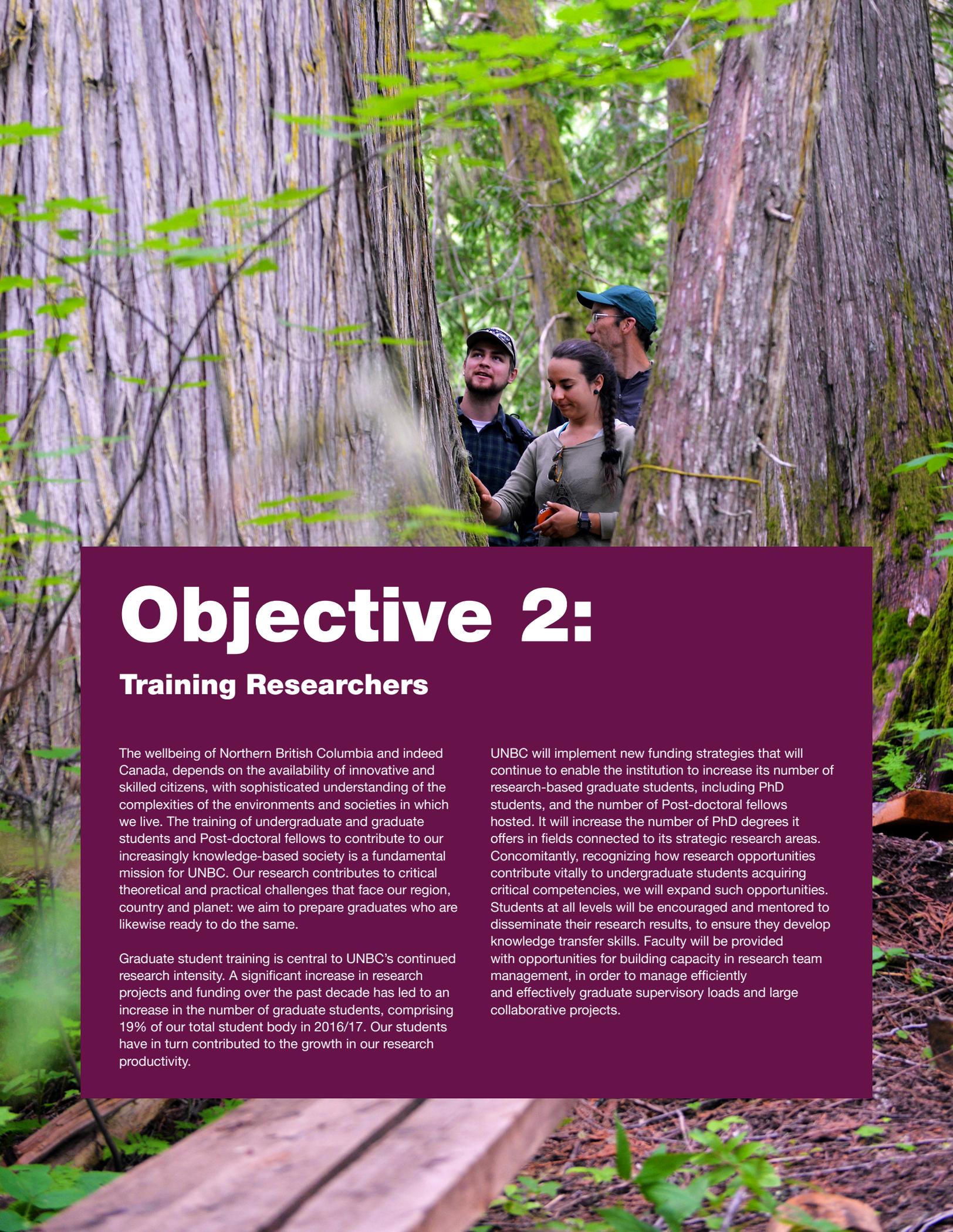
Other Strategies for Strengthening Research Capacity

UNBC is committed to developing a strategic approach for assisting faculty who need funding, get funding.

UNBC's Community Development, Natural Resources and Environmental Studies and Health Research Institutes play an important role as catalysts for the development of research in three of our strategic areas. Resources to employ support staff will be sought, to enable these institutes to serve more effectively and help drive the research mission at UNBC.

Strategic planning will be undertaken for UNBC's three research 'stations' (Aleza Lake Research Forest, John Prince Research Forest, and Max Blow Quesnel River Research Centre), that capitalizes on the interdisciplinary and cross-disciplinary opportunities offered by each and the complementarities among them (with respect for partner institutions' roles).

We will recruit more Post-doctoral fellows and visiting scholars to UNBC, and we are exploring opportunities for providing competitive financial incentives to do so.

A photograph of three people in a forest. A man in a dark plaid shirt and a baseball cap is looking up at a tree trunk. A woman in a light green long-sleeved shirt is looking down at something in her hands. A man in a blue cap and glasses is looking towards the woman. The forest has large, textured tree trunks and green foliage in the background.

Objective 2:

Training Researchers

The wellbeing of Northern British Columbia and indeed Canada, depends on the availability of innovative and skilled citizens, with sophisticated understanding of the complexities of the environments and societies in which we live. The training of undergraduate and graduate students and Post-doctoral fellows to contribute to our increasingly knowledge-based society is a fundamental mission for UNBC. Our research contributes to critical theoretical and practical challenges that face our region, country and planet: we aim to prepare graduates who are likewise ready to do the same.

Graduate student training is central to UNBC's continued research intensity. A significant increase in research projects and funding over the past decade has led to an increase in the number of graduate students, comprising 19% of our total student body in 2016/17. Our students have in turn contributed to the growth in our research productivity.

UNBC will implement new funding strategies that will continue to enable the institution to increase its number of research-based graduate students, including PhD students, and the number of Post-doctoral fellows hosted. It will increase the number of PhD degrees it offers in fields connected to its strategic research areas. Concomitantly, recognizing how research opportunities contribute vitally to undergraduate students acquiring critical competencies, we will expand such opportunities. Students at all levels will be encouraged and mentored to disseminate their research results, to ensure they develop knowledge transfer skills. Faculty will be provided with opportunities for building capacity in research team management, in order to manage efficiently and effectively graduate supervisory loads and large collaborative projects.

Objective 3:

Managing And Enhancing Research Resources

To sustain and promote research activity at UNBC, we must manage our support programs (e.g. administrative, financial), physical facilities, field operations and equipment in innovative ways that provide the best service and access for faculty and students, and the best value to our communities and partners, while also respecting our goal to be Canada's Green University™.

To account for the increasing number of UNBC faculty retiring and/or leaving UNBC over the next decade, UNBC will take a strategic approach to ensuring there are the human resources in place to continue to drive the research programs at UNBC. This will ensure alignment between the UNBC strategic planning process and the Strategic Research Action Plan when it comes to 'faculty renewals' and fulfilling the teaching needs of the institution.

Physical Resources

UNBC has been able to develop significant physical infrastructure for research over the past decade, in part, due to generous support from various government funding initiatives. Such resources not only improve the research environment of UNBC, but also contribute to the increased research competitiveness of British Columbia and Canada. As researcher numbers grow, UNBC will continue to establish transparent plans and procedures for reallocation of research space, replacement of major equipment, and acquisition of new equipment. The following physical resources are in place to support the research programs of UNBC researchers and also to provide world-class training opportunities for UNBC students in the development of the next generation of research leaders.

The University of Northern British Columbia is home to an extensive suite of analytical science instrumentation that enables a broad spectrum of biological, chemical and physical analyses. The UNBC Northern Analytical Laboratory Service (NALS) has a mission to contribute

to the development and application of sound, well-documented science-based knowledge to support faculty research and client based analytical services. The NALS is committed to providing analytical services, supporting the advancement of scientific knowledge, and the training of students aimed at creating highly qualified professionals capable of contributing to industry in their future careers. The facility's Analytical Support Specialists regularly participate in research activities to develop and validate new analytical methods. In addition to analytical services, the equipment and resources available through the Northern Analytical Laboratory Service will be used for academic and skills training for UNBC students. Training services are also available for clients who may wish to improve the knowledge and skills of their staff in their own labs.

The High Performance Computing (HPC) lab at UNBC is a collaborative environment where compute intensive projects of all stripes are being developed. This lab features projects such as weather hindcasting, regional climate model dynamic downscaling, simulation of shocks, fluid dynamics, computational chemistry, and distributed transaction processing. The HPC has a 50 TB file-server and a 176-core Xeon infiniband cluster, as well as other servers and workstations. UNBC researchers requiring more storage or compute power can access ComputeCanada grid resources.

The Aleza Lake Research Forest is a 9000 ha university-based outdoor research facility and working forest 60 km east of Prince George, BC. The mandate of the Research Forest is to provide research and education facilities and opportunities to UNBC and other institutes, universities, government agencies, private sector research, schools and other educational groups with regards to ecosystem and resource management studies within the wet sub-boreal spruce biogeoclimatic zone.

The Dr Max Blouw Quesnel River Research Centre is Western Canada's only field station established to support research and education in landscape ecology. Its aim is to foster interdisciplinary research and education

in terrestrial, freshwater and atmospheric environmental science, spanning interactions between and among hydrology, ecology, geology and climatology. Currently active QRRRC researchers are investigating aspects of fluvial sedimentology and geomorphology, limnology, and a variety of topics relating to terrestrial and freshwater ecology and fisheries science.

The John Prince Research Forest (JPRF) encompasses 13 032 hectares of Crown land in North Central BC, 50 km north of Fort St. James. The forest is situated between Tezzeron (Chuzghun) and Pinchi (Tesgha) Lakes in the traditional territory of the Tl'azt'en First Nation. The research forest was established in 1999 as a result of many years of planning by the University of Northern British Columbia and the Tl'azt'en First Nation. The landscape exhibits diverse forest types and land management history and has a wide range of natural resource values and environmental conditions. This research forest is unique in North America in that it is the only research forest that is jointly managed by a University and a First Nation community. The purpose of the forest is to promote interdisciplinary research while providing education and employment opportunities for the local community.

The UNBC library plays a key role in enhancing research intensity at UNBC. Increased research intensity has allowed our library to be better resourced through allocation of federal indirect costs and research overhead funds to expand researcher access to data and publications. Furthermore, the development of the branch Research Data Centre at UNBC demonstrates the library's commitment to being a research library. The branch Research Data Centre at UNBC (RDC@UNBC) is affiliated with the British Columbia Inter-University Research Data Centre (BCIRD), which is a member of the Canadian Research Data Centre Network (CRDCN). It provides Northern BC researchers with the opportunity to access and analyze detailed microdata from an increasing array of survey, census and administrative data.

Financial Resources

Although research funds, including those from contracts, have grown dramatically over the last decade, UNBC has not enforced its own policy on overhead. This has diminished our ability to support researchers with critical support services in some departments (e.g., Human Resources, Purchasing). We will increase overhead capture, including through education of grant providers about indirect costs of research, and allocate the resultant revenue to expanding research services, in order to meet these pressing needs. We will improve processes for funding the repair and replacement of major equipment,

and work to secure funds for new equipment.

UNBC has mechanisms in place to offer bridge grants, seed grants, travel grants, and publication grants to our researchers. We will increase the amounts allocated to these funds, to keep pace with growing researcher numbers and intensity, and increasing costs of research. The Office of Research is now core-funding the Undergraduate Research Experience (URE) award, further demonstrating our commitment to training the next generation of researchers.

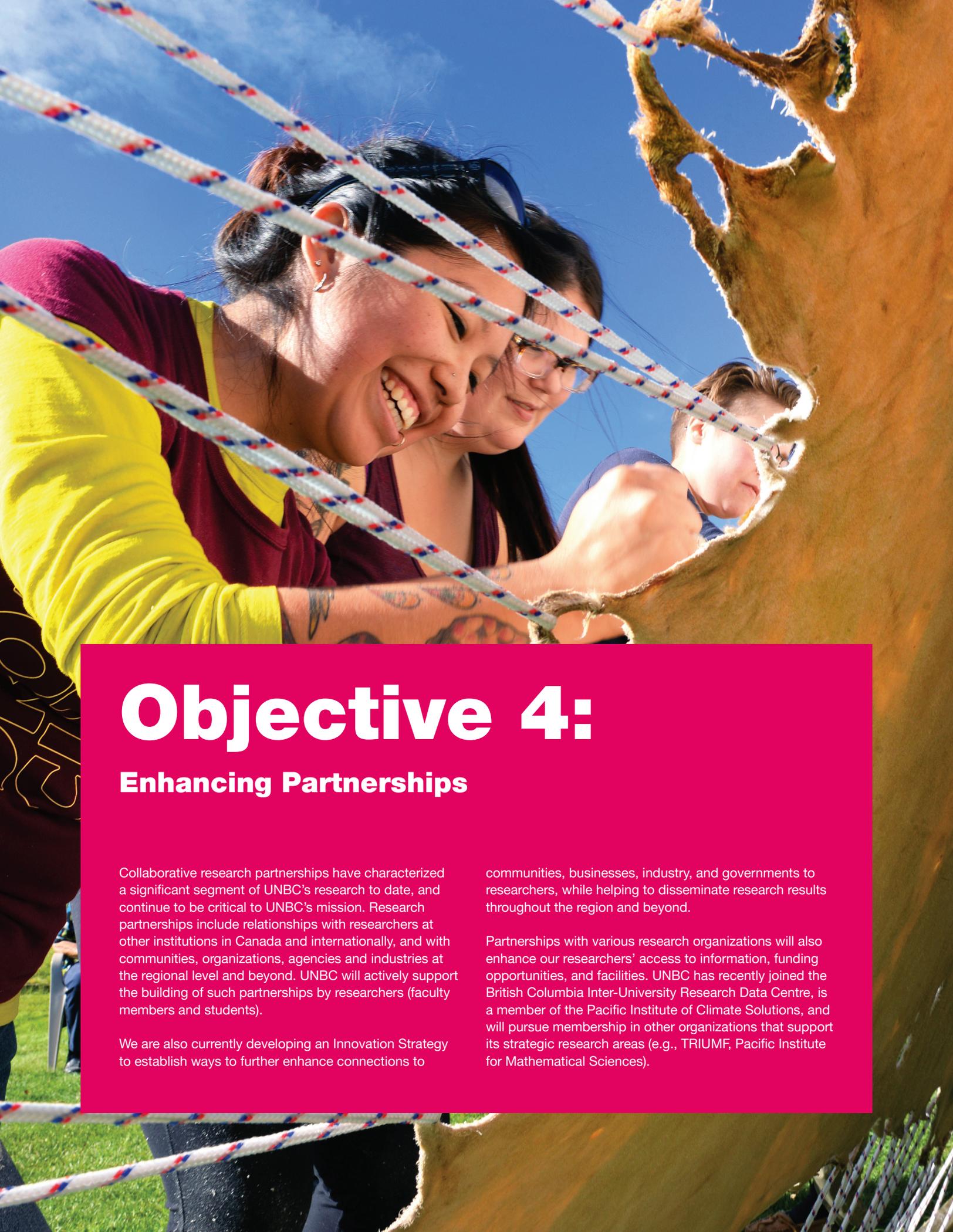
Administrative Resources

As research activity has dramatically increased, UNBC's administrative resources committed to research have expanded, but have not always kept pace. External demands on researchers, such as those regarding ethics approvals and other regulatory compliance, are increasing. Expansion of research into new areas also necessitates new services (e.g. ethics support for clinical trials). Research intensity can best be encouraged when researchers are well-supported with services that minimize the time they need to allot to administrative and reporting tasks.

UNBC will work to improve such services, and support the expansion of such services and development of new services as finances allow. The Research Office will attend to changing external regulations and requirements, inform researchers, and adjust policies and processes to comply with such developments.

UNBC has implemented Romeo, an online, database-driven research administration software to facilitate the management of grants, contracts and awards, as well as certifications (REB, animal care, and biohazardous materials) and reporting at UNBC. Romeo will lead to increased workflow productivity, as well as better communication and connectivity within and between the Office of Research and the research community. The software also features tracking and reporting capabilities guaranteeing accountability and compliance in today's highly regulated environment. This will free staff time to work more closely with researchers in the creative phase of the research process.

To increase the visibility of UNBC research and celebrate our successes, a research communications plan will be implemented that will enable the identification, recognition and dissemination of research and research successes at the University in collaboration with the Vice President Advancement and Communications team.



Objective 4:

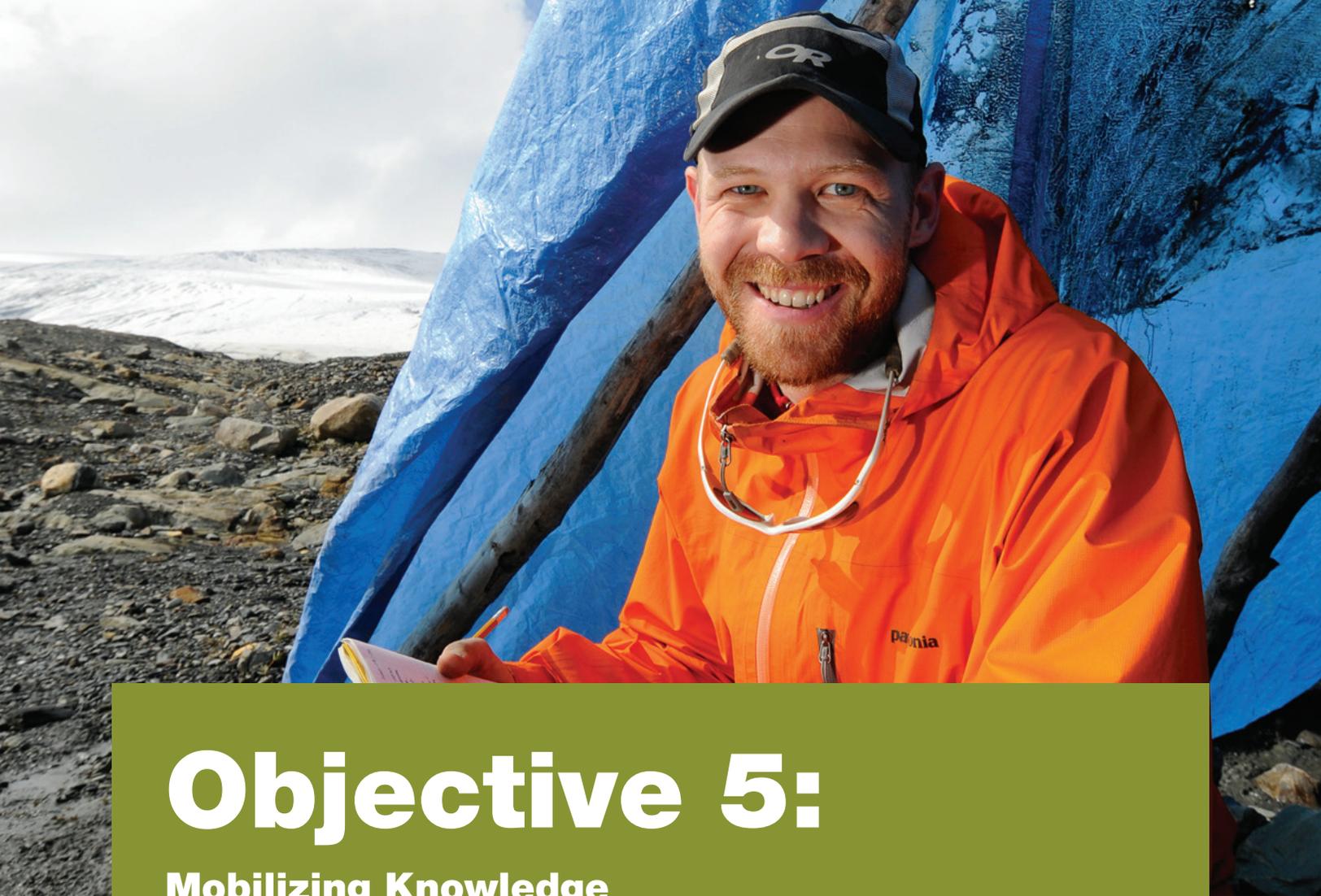
Enhancing Partnerships

Collaborative research partnerships have characterized a significant segment of UNBC's research to date, and continue to be critical to UNBC's mission. Research partnerships include relationships with researchers at other institutions in Canada and internationally, and with communities, organizations, agencies and industries at the regional level and beyond. UNBC will actively support the building of such partnerships by researchers (faculty members and students).

We are also currently developing an Innovation Strategy to establish ways to further enhance connections to

communities, businesses, industry, and governments to researchers, while helping to disseminate research results throughout the region and beyond.

Partnerships with various research organizations will also enhance our researchers' access to information, funding opportunities, and facilities. UNBC has recently joined the British Columbia Inter-University Research Data Centre, is a member of the Pacific Institute of Climate Solutions, and will pursue membership in other organizations that support its strategic research areas (e.g., TRIUMF, Pacific Institute for Mathematical Sciences).



Objective 5:

Mobilizing Knowledge

The translation and transfer of knowledge is a critical role of researchers, and one that is increasingly emphasized and demanded of them. One of UNBC's key mandates is to promote knowledge mobilization. We aspire to excellence in 'traditional' methods of dissemination, such as publishing books, articles and reports, and training students. We have been working with the Library to establish a digital institutional repository to increase the accessibility of our research products.

UNBC has also led the nation in integrated knowledge translation, a direct outcome of its community-driven and community-based research partnerships. Relationships formed with our region's communities (including First Nations), businesses, industrial partners, governmental and non-governmental agencies and others give rise to opportunities and demands for tangible and practical outputs and outcomes in non-academic formats (e.g. training workshops, community forums, industrial innovations). Furthermore, UNBC, in partnership with

Northern Health, has developed a Knowledge Mobilization Research Chair. The Northern Health – UNBC Knowledge Mobilization Research Chair will work 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, further demonstrating UNBC's commitment to playing a crucial role in community outreach and public education of research results.

Northern British Columbia has benefited from the influx of expertise and related services (e.g., business entrepreneurship, environmental planning, nursing, social work) that UNBC has brought to the communities which house its campuses. We will provide resources and mentoring to help faculty and students to translate knowledge products and skills, including into commercializable products and services, for the benefit of society.



Objective 6:

Attract And Retain Outstanding Faculty

UNBC recognizes the importance of attracting and retaining high-quality faculty to enable the university to continue to build on the extent and merit of its research portfolio. UNBC will strive to develop an institutional culture and specific resources to support the activities of existing and arriving faculty and graduate students. In accordance with Objective 5, UNBC will support the knowledge dissemination activities of its current faculty as well as disseminate research to continue to raise UNBC's national and international research profiles, enhancing our capacity to attract outstanding faculty. Research chairs represent a unique opportunity to recruit faculty members performing at the highest levels of research, and UNBC will strategically allocate research chairs in light of their recruitment potential and in alignment with UNBC's research strengths.

Measuring Success: Research Performance Indicators

To measure progress toward meeting the six objectives articulated above, we suggest a set of research performance indicators that will be tracked over time. These include both input measures, and output/outcome measures. Mechanisms are in place for collecting information on some of these indicators, but will need to be developed for others.

Input Measures

- Total research revenues
- Tri-Council grant revenues
- Percentage of faculty members with Tri-Council Grants
- Number of research support staff
- Number of Research Chairs (CRC and Endowed Chairs) - Percentage of female Research Chairs
- Number of graduate students enrolled in research degrees
- Number of Post-doctoral fellows
- Number of students employed as research assistants
- Number of student research volunteers
- Number and proportion of graduate students holding external scholarships/fellowships
- Growth in major equipment inventory

Output/Outcome Measures

- Number of refereed publications by UNBC researchers
- Number of publications with undergraduate students as co-author
- Number of publications with graduate students as co-author
- Number of graduate students completed
- Number of undergraduate and graduate recipients receiving national or international recognition for their scholarly activities
- Number of faculty members receiving recognition awards (national or international awards, honours, citations)
- Number of research conferences and workshops organized by UNBC researchers
- Number of journals edited by UNBC researchers
- Number of collaborative research projects with partners (other academic institutions, communities, First Nations, industrial partners, NGOs, etc.)
- Patents pending and registered
- Number of faculty and student owned research based companies initiated
- Number of research related community outreach events
- Number of policy briefs, Number of media stories that feature UNBC research expertise
- Number of UNBC researchers that serve on advisory committees for communities, service agencies, small business, industry, and various levels of government
- Number of Philanthropy-driven research projects

Planning And Approval Process

This third iteration of UNBC's Strategic Research Action Plan flows from UNBC's revised (2010) University Plan and previous Strategic Research Plan, which was developed after extensive community consultation across UNBC's service region. Starting with the input from a Research Taskforce Committee comprised of faculty from both colleges, undergraduate and graduate students, and administrative staff, a draft document was created. Input and critique was then solicited from the research community at large, at all UNBC campuses. Once revisions were made, it was brought back for approval, and to the President for endorsement.

This revised Strategic Research Action Plan will serve as a map for the Vice-President Research and Graduate Programs and the Office of Research staff over the next 5 years activities. An associated action plan will detail actions and timelines for meeting the Plan's objectives. The Office of Research will annually evaluate its progress toward meeting these objectives, and the Vice President Research and Graduate Programs will annually report to UNBC's Senate and Board of Governors on such progress. We recognize that the strategic planning process must also be flexible to accommodate unanticipated opportunities that may arise.



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