

Strategic Research Plan

2022-2024





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Executive Summary

The University of Northern British Columbia (UNBC) is a research-intensive 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. UNBC is also research-integrative in that research is integrated within our teaching and our service to the communities in our region. A commitment to our region also requires a commitment to the national and global reach of our research – both in sharing the research findings and lessons from northern BC, but also through engaging and drawing upon leading-edge global research to bring that knowledge to bear on issues facing our region.

UNBC researchers and students have a positive impact on local to global communities and environments. Their commitment to engaging with challenging questions that have meaningful outcomes contributes to a healthy research culture which attracts and engages diverse undergraduate and graduate students, postdoctoral fellows, and other research personnel. Research funding is growing, and our research benefits from a wide range of perspectives and approaches. UNBC research is enriched by its collaborations with community, government and industrial partners. This motivating and inclusive research milieu feeds the imaginations and creativity of (still) more highly qualified student researchers and partners—research at UNBC is flourishing.

UNBC has new opportunities before it as we move into a post-pandemic period; look forward to continued implementation of the academic restructuring into five new faculties; work towards our equity, diversity, and inclusion goals; and welcome a strong leadership team, including a new Vice-President Research and Innovation. This Strategic Research Plan is an interim plan, providing a platform for the development of a new five-year plan, following consultations and planning led by the new VP Research and Innovation, anticipated to occur in 2023.

The previous strategic research priorities will continue to be supported as we endeavour to meet the needs of rural, remote, northern and Indigenous communities and local to global partners through research. These research priorities are to:

1. Strengthen UNBC's Research Capacity
2. Enhance UNBC's Contribution to Training of Highly Skilled Personnel
3. Manage and Enhance Research Resources
4. Enhance Partnerships and Community Engagement
5. Mobilize Knowledge
6. Attract and Retain Outstanding Diverse Faculty





Purpose

Massive environmental transformations will have far-reaching social, cultural and economic impacts in the next decades. 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 environmental degradation, energy and food security, combined with important discussion and actions called for under the Truth and Reconciliation Commission, and issues of broader human rights, all present a need for interdisciplinary and collaborative research. Created at the demand of our region's population to provide access to university education and research in the northern half of British Columbia, UNBC acknowledges a special responsibility to contribute to the wellbeing of this region's communities, and to the sustainability of the biophysical, social and cultural environments that support them.

UNBC has gained national recognition for research performance, especially in key areas of 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 refreshed strategic research plan reaffirms UNBC's founding principles through its commitment to four interdisciplinary and interconnected areas of scholarly inquiry:

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

These areas of inquiry are of critical importance to our location, as well as to Canada and globally. This plan elaborates on the values, vision and mission put forth in UNBC's University Plan, including fostering research that is internationally recognized for its quality and impact, and for its orientation to the needs of its communities.

This strategic research plan builds on UNBC's research success while enabling rapid response to emerging needs. The plan describes UNBC's Strategic Research Areas but also recognizes the importance of scholarly excellence at UNBC in all disciplines, as vital to the breadth and diversity that UNBC offers its students and communities. The plan outlines UNBC's achievements and commitments to research, the growing infrastructure available to support research, and outlines objectives to address each of the priorities aimed at enhancing research and research culture at UNBC.

Research at UNBC

UNBC is strongly connected to communities locally to globally. Connection with community has instilled a strong sense of ownership and purpose among our students, faculty and staff. Located in the spectacular landscape of Northern British Columbia, UNBC aims to transform lives and communities in the North and around the world. UNBC strives to provide an inclusive, safe and challenging learning environment where students gain leadership skills, challenge their perceptions, and stretch their limits through opportunities to work closely with faculty and staff on research projects and a wide range of initiatives that improve life or contribute to a need in the community, the region or far beyond.

As part of our commitment to safe and inclusive research environments, UNBC has endorsed the Tri-Council Dimensions: Equity, Diversity and Inclusion Canada Charter and the Universities Canada Inclusive Excellence Principles. We are also signatories to the Scarborough Charter on anti-Black racism and Black inclusion in Canadian higher education. We invested in a new Associate VP-EDI who will provide guidance on EDI in relation to research.

Mission

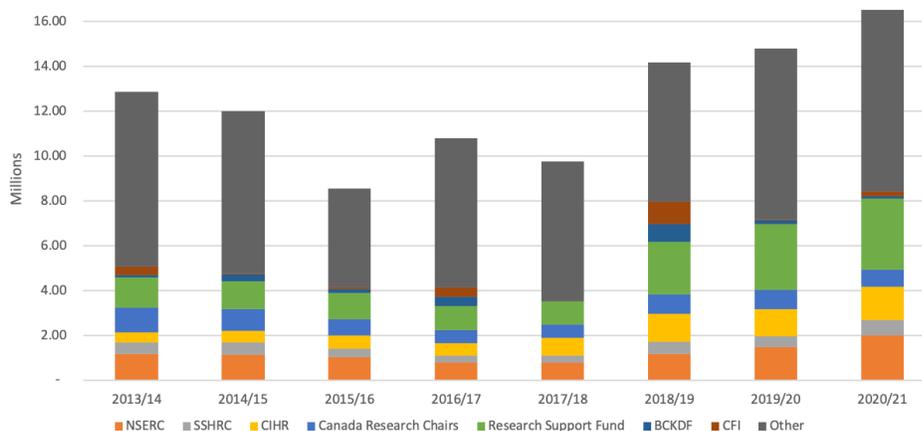
To grow capacity and opportunities for research and creative activities at UNBC by engaging our people and partners, leading to the discovery of new knowledge that has transformative academic, economic or social benefit for the region, province, nation, and beyond.

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.

Research funding and other indicators of excellence

UNBC has had a significant increase in funding over the past three years, with growth particularly in industry-sponsored, and not-for-profit sponsored funding. Funding from the federal Tri-Agencies has also increased across all three of the Natural Sciences and Engineering (NSERC), Social Sciences and Humanities (SSHRC), and the Canadian Institutes of Health Research (CIHR).



**Research funding at UNBC from 2013 to 2021. Other category includes research contracts and grants from industry, governments, non-governmental organizations.*

UNBC has consistently ranked among the best small research-intensive universities in Canada. In 2021 Canada Research Infocource ranked UNBC 5th among “research universities of the year”. Within our category we ranked 2nd in research intensity (\$/ faculty and \$/student). UNBC was ranked by MacLean’s magazine as Canada’s Best Primarily Undergraduate University in 2022, and placed 3rd in the research dollars metric. UNBC has consistently ranked in the top three of MacLean’s rankings for over a decade.

UNBC is the smallest Canadian university to be included in the Times Higher Education World University rankings, with particularly strong showing in the “citations” metric indicating that research at UNBC is having impact.

UNBC currently has six Canada Research Chairs plus one open chair, six Endowed/Leadership chairs (one currently being filled), one Knowledge Mobilization Chair and one Industrial Research Chair. The faculty members in these roles are exemplars and major contributors to UNBC’s research outputs.

Distribution of UNBC Research Chairs by Strategic Research Area (2022)

Chair Name	Chair Type	UNBC Strategic Research Area*	Funder	Tenure/Expiry
Integrative Physiology of Diabetes	Tier II, Canada Research Chair	IV	CIHR	Apr. 30/23
Rural and Small Town Studies	Tier I, Canada Research Chair	I, II, III, IV	SSHRC	June 30/25
Glacial Change	Tier II, Canada Research Chair	II	NSERC	June 30/23
Humanities and Health Inequities	Tier II, Canada Research Chair	I, IV	CIHR	Apr. 30/23 Renewal in progress
Cumulative Impacts of Environmental Change	Tier II, Canada Research Chair	I, II, III, IV	SSHRC	June 30/24 Can be renewed
Tall Wood and Hybrid Structures Engineering	Tier II, Canada Research Chair and BC Leadership Chair	II, III	NSERC BC Innovation Council	Mar. 31/27
TBD	Tier II, Canada Research Chair	TBD	NSERC	Currently vacant
Climate Change and Water Security	Industrial Research Chair	II	NSERC RioTinto	2024
Indigenous Environmental Health	BC Leadership Chair	I, II, IV	Dr. Donald B. Rix and BC Innovation Council	Currently vacant
Mixed-Wood Ecology and Management	Endowed Chair	II, III	FRBC-Slocan	No expiry
Conservation Solutions**	Endowed Chair	II	FRBC-West Fraser	No expiry
Landscape Ecology	Endowed Chair	I, II, III, IV	FRBC	No expiry
Muskwa Kechika	Endowed Research Professor	II	Muskwa Kechika	No expiry
Northern Health-UNBC Knowledge Mobilization	Research Chair	IV	Northern Health UNBC	June 2022

*I = First Nations and Indigenous Peoples, II= Environment and Natural Resources, III= Community Development, IV= Northern, Rural and Environmental Health
 **Formerly FRBC-West Fraser Endowed Chair in Forest Growth and Yield



Research Facilities

Over the past decade UNBC has been able to develop significant physical infrastructure to support research due in part to consistent financial support from the Canada Foundation for Innovation and the British Columbia Knowledge Development Fund. These federal and provincial investments in physical research capacity not only improve and enrich UNBC's research environment, but also contribute to the increased research competitiveness of British Columbia and Canada. As researcher numbers grow, we will maintain 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 provide world-class training opportunities for UNBC students that enhance their research experience and technical skills and knowledge, leading to the development of the next generation of research leaders.

Lab Facilities

The Genetics Lab at UNBC performs DNA Sequencing and Fragment Analysis with the Applied Biosystems 3130xL. The lab also has an Applied Biosystems QuantStudio3, and a BioRad Droplet Digital PCR System for qPCR and eDNA detection. A Nanodrop and Qubit fluorometer are also available for use.

GIS and Remote Sensing Lab at UNBC provides a collaborative environment for projects utilizing geospatial data, and remote sensing techniques. The GIS Lab includes a variety of software platforms such as ESRI Software, PCI Geomatica, QGIS, PostGIS and Agisoft Metashape. This software is supported by a hyper-converged server cluster providing 800TB of storage, along with ample computation for modern remote sensing workloads. The Senior Lab instructors facilitate researchers developing the tools to process geospatial data including geometries, imagery, lidar, and drone data, spatial statistics and cartography. The lab also provides access to equipment and certified pilots for RPAS (drone) surveys of research sites, and distributed systems for environmental monitoring in remote areas.

The IK Barber Enhanced Forestry Lab (EFL) supports controlled environment research and teaching activities. It has four greenhouse compartments with independent temperature, lighting and venting control. The header house provides sample and plant preparation facilities, and the EFL is also home to the UNBC Tree Ring Laboratory.

Northern Analytical Services Lab (NALS). 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 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 facility recently received a substantial contribution from PacifiCan which has enhanced and upgraded available equipment and has enabled the creation of the Environmental Solutions Innovation Hub. 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 research and development in their future careers. The facility's Analytical Support Specialists regularly participate in research activities to develop and validate new analytical methods. Training services are also available for faculty, students and clients who may wish to improve their knowledge and skills for use in their own labs.

The Research Computing (RC) Lab at UNBC provides a collaborative environment for computationally and data intensive projects of all types. The RC is equipped with a 596-core Intel Xeon cluster for parallel computing and four 20-core independent nodes for serial calculations, supported by a 650 TB storage and several workstations. It is supported by a Senior Lab Instructor who facilitates access, provides training and assists with infrastructure maintenance. UNBC researchers requiring more storage or compute power can access Digital Research Alliance of Canada grid resources. This lab supports a diverse array of projects including weather hindcasting, regional climate model dynamic downscaling, simulation of shocks, fluid dynamics, computational chemistry, geospatial analysis, and distributed transaction processing.

Wood Innovation Research Lab provides the ability for researchers to build and test large-scale integrated wood structures using engineered wood products such as Cross-Laminated Timber, Glued Laminated Timber and Laminated Veneer Lumber. The over-height, single-storey structure features a high-head lab for tall projects and a portion of the building consists of a strong floor and wall to support testing equipment and a crane.

Research Forests and Centres

The Aleza Lake Research Forest (ALRF) is a 9000ha research and working forest located 60 km east of Prince George, BC. The mandate of the ALRF is to provide research and education facilities and opportunities to UNBC and other institutions, agencies and educational groups, with regard to ecosystem and resource management within the wet sub-boreal spruce biogeoclimatic zone. The Aleza Field Education Centre, located within the ALRF, is a two-story building designed to enhance education, training and research at the forest.

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 and is co-managed by UNBC and the Tl'azt'en and Binche Whut'en First Nations. 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 focused on developing innovative approaches to natural resource conservation and management that combines First Nations' traditional and western scientific approaches to understanding the natural world. This land also provides the setting and focus for a series of experiential learning and research programs that have brought greater understanding around the local natural resource systems and their stewardship.

The Dr Max Blouw Quesnel River Research Centre (QRRC) is Western Canada's only field station established to support research and education in the interdisciplinary domain of landscape ecology. The QRRC is located on the banks of the Quesnel River at the outlet of Quesnel Lake which is surrounded by the Cariboo mountains and diverse forest types. This unique location fosters interdisciplinary research and education in terrestrial, freshwater and atmospheric environmental science, spanning interactions between and among hydrology, ecology, geology and climatology. Current research at the QRRC includes studies on fluvial sedimentology and geomorphology, limnology, and a variety of topics relating to terrestrial and freshwater ecology and fisheries science. The QRRC also hosts a diverse community of scientists studying the environmental impacts of the Mt. Polley tailings pond breach.



Collections and Data Centres

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 Research Data Centre and the Northern BC Archives and Special Collections at UNBC demonstrates the library's commitment as a research library. Equitable access to information resources and services, facilities, and systems for all individuals in physical and virtual environments is a core value that the library strives to meet.

The Northern BC Archives & Special Collections acquires, preserves, and provides access to materials of permanent value that relate to the institutional history of UNBC, and the culture and history of Northern British Columbia. The Archives serves research and scholarship by making these records available to researchers, students, faculty, and the general public. Archive holdings contain materials from 1697 to the present and include the following:

- 2,719+ Linear metres of archival materials
- 9,795+ Rare books
- 33,000+ Photographic images
- 3,000+ Cartographic materials
- 1,000+ Sound and moving image recordings
- 500+ Artworks from the University Art Collection

The 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 BC researchers with the opportunity to access and analyze detailed microdata from an increasing array of survey, census and administrative data.

Institutes and Centres

UNBC has several research institutes and centres:

- Centre of Excellence in Data Privacy, Security and Integrity
- CIHR Institute of Indigenous People's Health
- Community Development Institute
- Health Research Institute
- Institute for Social Research
- National Collaborating Centre for Indigenous Health
- Natural Resources & Environmental Studies Institute
- Pacific Institute for Climate Solutions
- Women North Network/Northern Feminist Institute for Research and Evaluation (FIRE)

These institutes and centres play a critical role in connecting researchers and stakeholders, knowledge exchange, and outreach. Several of these are described further in the sections below on strategic research areas.



Undergraduate research experience, graduate students and post-docs

The opportunity for both undergraduate and graduate students, as well as Post-doctoral Fellows (PDF), to engage in research is a critical component of the education process at UNBC. Each of these have distinct but connected needs and roles and require distinct but connected strategies to support their educational pathway. We implemented a highly successful Research Ambassadors program that has enhanced awareness of, and interest in, research among undergraduate students at UNBC. Faculty members can apply for Undergraduate Research Experience Awards (URE) that provide funding for undergraduate students to engage and be mentored in the faculty member's research. UNBC also provides Graduate Scholarships, graduate Research Project Awards, and travel funding for graduate students to attend conferences to present their work. We are working on approaches to enhance support for the student-supervisor relationship which is a key element of graduate student success. We have a growing cadre of Post-doctoral Fellows (PDF) at UNBC who are supported in several ways, including grant-writing workshops that are open to PDFs. More information on engaging students and PDFs in research is in section 4.



Strategic Research Areas

First Nations and Indigenous Peoples

Northern British Columbia is homeland to many First Nations, including 20 major linguistic groupings, the territories of 16 Tribal Councils and 77 bands, and four Métis organizations. UNBC's main campus is located on the traditional territory of the Lheidli T'enneh, with regional campuses located in the traditional territories of Lhtako Dene Nation, Nazko First Nation, Lhoosk'uz Dené Nation, Esdilagh First Nation, Dane-zaa peoples of the Doig River First Nation, Blueberry River First Nation, Halfway River First Nation, traditional Ts'msyen territory of the Kitsumkalum and Kitselas First Nation, Lax Kw'alaams Band, and Metlakatla First Nation. UNBC has a federated agreement with the Wilp Wilxo'oskwhl (House of Wisdom) Nisga'a Institute (WWNI). Established by the Nisga'a Lisims Government in 1993 and located in the Village of Gitwinksihlkw, WWNI is a fully accredited university-college serving all people in northwestern British Columbia.

First Nations and Indigenous students compose 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 in 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 value that multiple perspectives and ways of knowing bring to research in many different areas.

Most First Nations in UNBC's service area are highly dependent on the natural resources of the area, including forests and waters, and are therefore significantly impacted by environmental degradation and disaster. Indigenous peoples are also challenged by health, education, and economic inequalities.

Key areas of research include:

- Design and application of Indigenous-informed resource management strategies
- Understanding definitions and drivers of Indigenous health and wellness, and how to improve them
- Methods to enhance cultural safety and reduce anti-Indigenous racism
- Integration of Indigenous knowledge and teaching methods
- 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 Indigenous Health, the mandate of which is health knowledge synthesis, translation and exchange, in order to empower Indigenous 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 healthcare. UNBC brings a strong focus to research relevant to people living in rural and northern communities, to Indigenous peoples, and to the determinants of health. For its part, the NCCIH has drawn funding to the university from multiple sources to support a variety of Indigenous health initiatives. UNBC and the NCCIH 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 Indigenous 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 of the John Prince Research Forest with Tl'azt'en Nation. 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, Indigenous history, resource management, and 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 Indigenous health.

Emerging Themes

- First Nations epistemologies and education
- First Nations health and healing, and anti-Indigenous racism in the healthcare system
- Indigenous governance and law
- Indigenous research methods
- Orality and connections with literary traditions
- Traditional land use studies
- Reconciliation



Environment and Natural Resources

The region served by UNBC has a long history of resource extraction and exploitation that has supported regional and provincial economies. Resource extraction combined with climate change have resulted in significant negative impacts on ecosystem function and ability to provide key ecosystem services including clean air and water, and productive soils. It has also had significant impact on human communities and infrastructure due to environmental disasters such as extreme heat, wildfires, floods, and landslides. These impacts are especially acute in Northern BC, where many communities rely on resource-based economies. Responsible stewardship of resources and the natural environment requires an advanced understanding of our rich natural heritage and drivers of environmental change. 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 and understanding human pressures and rapid environmental change at the local to global scales
- Well-balanced and integrated assessment of multiple and often competing values associated with natural resources
- Identification and integration of sound social, economic and ecosystem principles for resource management and environmental protection
- Design and application of new products and 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, and the Natural Resources and Environmental Studies Institute (NRESI) provide the necessary infrastructure to advance environmental and natural resource-related research. NRESI includes members internal to UNBC and external members and serves to connect university researchers with each other and with practitioners and community members.

The Aleza Lake Research Forest, the John Prince Research Forest, 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 Indigenous Peoples.

As a steward of the environment, UNBC implemented the Energy Initiative which involved three phases, all of which have been completed. Phase 1 was the installation of Canada's first university-owned wood pellet heating system to heat the Enhanced Forestry Laboratory. Phase 2 saw the expansion of bioenergy at UNBC with the start-up of the Bioenergy Plant on the Prince George campus. This 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 approximately 85 per cent of the fossil fuels previously used to heat the core campus buildings. Phase 3 of the Energy Initiative is the Sustainable Communities Demonstration Project (SCDP). The SCDP further demonstrates the potential for sustainable energy using a low-temperature, hot water district energy system that connects the student residences, campus daycare, and the I.K. Barber Enhanced Forestry Lab to the Bioenergy Plant and the wood pellet system. The SCDP has not only reduced greenhouse gas emissions and fuel purchase costs, but it has also expanded capacity for research, education, and demonstration.

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, rapid environmental change, and in the sustainable development of 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 was followed by the Wood Innovation Research Lab (WIRL). The WIRL provides students and faculty members with the ability to build and test large-scale integrated wood structures using engineered wood products such as Cross-Laminated Timber, Glue-Laminated Timber and Laminated Veneer Lumber.

Emerging areas of research in Natural Resources and Environment:

- Bioproducts and processes to reduce environmental impact through resource use
- Wood innovation (including engineering, design, product diversification & marketing)
- Climate change, rapid environmental change, and adaptation

Contamination and human impacts on air, land, water and biota

- Environmental remediation
- Human footprint and impacts on habitat
- Geospatial data acquisition and analysis
- Cryosphere monitoring and assessment
- Integrated watershed and airshed research



Community Development

Indigenous and Non-Indigenous 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:

- An understanding of the interwoven factors that contribute to communities remaining resilient in the face of change and challenges
- Research on implementation of the Calls to Action from the Truth and Reconciliation Commission, recommendations from the Missing and Murdered Indigenous Women and Girls National Inquiry, adoption of the UN Declaration of the Rights of Indigenous Peoples
- 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, community infrastructure, high-speed Internet connectivity) in northern and rural environments
- Identifying and assessing demographic trends impacting northern communities including population aging, workforce renewal, a growing Indigenous population, and increased international migration
- 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 also been a leader in creating a richer arts and culture environment on and off its campuses through scholarly activities, the UNBC Arts Council, 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 per cent of the province's export wealth is generated from natural resources. The CDI facilitates 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 area, UNBC strives to improve understanding of the evolving needs of northern communities from a range of disciplinary perspectives, to inform public policy and practice, and community decision-making.

Emerging Themes

- Housing research, particularly related to capacity within CDI
- Sustainable agriculture and food production
- 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 Indigenous 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 a full-range of healthcare services and providers, life-style, socio-economic status and environmental sustainability. Such disparities are even greater for Indigenous peoples who experience much higher-than-average morbidity and mortality rates, inequities in access to healthcare, and systemic racism. 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 healthcare delivery, especially in Indigenous communities
- Enhancing cultural safety/competency and reducing racism
- The relationship between health of individuals and populations and the natural, and built environments in which they live

UNBC researchers have focused on some key geographic disparities and attempted to address inequities in the region by advancing multi-disciplinary research on the social, cultural, psychological, and environmental determinants of health in rural communities, including Indigenous communities, and on planning and provision of healthcare 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 healthcare system, UNBC offers an interdisciplinary PhD in Health Sciences. To synthesize and exchange new knowledge, and foster research linkages to develop UNBC's health research capacity, the Health Research Institute (HRI) has been established 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.

UNBC has a strong relationship with the Northern Health Authority, documented in an MOU which has facilitated the integration of research, healthcare and education. A three-way partnership between UNBC, Northern Health and UBC (Division of Medical Sciences located at UNBC) has led to the new Northern Centre for Clinical Research which has opened the doors for new and exciting opportunities for research collaborations through the engagement of northern patients in national and international research initiatives.

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:

- Quality of life for seniors and support services for aging in place
- Cellular and molecular mechanisms that regulate myelin formation and neurological diseases
- Improving access to healthcare and health information
- Indigenous health and Indigenous ways of healing
- Linking social and environmental determinants of health to reduce health disparities, especially for Indigenous peoples
- Mental health and addictions
- Northern food security and diet-related health issues
- Preventative healthcare and disabilities management



Research Priorities

There are six inter-related objectives of this research plan targeted at enhancing UNBC’s ability to meet the needs of rural, remote, northern and Indigenous communities and local to global partners through research. Enhancing UNBC’s research capacity and continuing to attract faculty depends on increasing numbers of, and support for, students and PDFs engaged in research, improving access to resources and physical infrastructure, cultivating relationships with research partners and communities at multiple scales, and supporting effective means of knowledge transfer and application. Key to success will be consistent and deep attention to equity, diversity and inclusion across all these objectives.

Strengthen UNBC’s Research Capacity

Objective	Strategies
Develop the Strategic Research Areas through allocation and support of research chairs	<ul style="list-style-type: none"> • Increase the number of externally funded research chairs, including endowed chairs • Increase the number of Industrial Research Chairs
Enhance the diversity of research chairs and other research personnel	<ul style="list-style-type: none"> • Assist with development and use of self-identification processes and information to better understand diversity in the UNBC research context • Ensure selection processes enable a broad spectrum of applicants, and an inclusive definition of scholarship and scholarly outputs
Strengthen support for UNBC’s research institutes	<ul style="list-style-type: none"> • Seek stable means of funding support for staff • Provide Office of Research and Innovation liaisons for each institute
Enhance connections with UNBC’s research centres and forests	<ul style="list-style-type: none"> • Meet annually as a group with opportunities for faculty to connect with managers of research centres and forests • Facilitate opportunities to increase use of research centres and forests for experiential education
Enhance recruitment and support for graduate students and post-doctoral fellows	<ul style="list-style-type: none"> • Increase the number of scholarships available for domestic and international graduate students • Ensure supervisors and students are aware of funding opportunities • Enhance opportunities through Mitacs

Enhance UNBC's contribution to training of highly skilled personnel

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.

Objective

Strategies

Implement new funding strategies to support graduate students and postdoctoral fellows

- Monitor efficacy of revised internal funding programs to support leveraging of available funds
- Enhance fundraising for externally supported scholarships and bursaries

Implement new funding strategies to support engagement of undergraduate students in research

- Enhance Undergraduate Research Experience award funding and leverage with other sources (e.g. Mitacs)

Enhance the opportunities available to PhD students

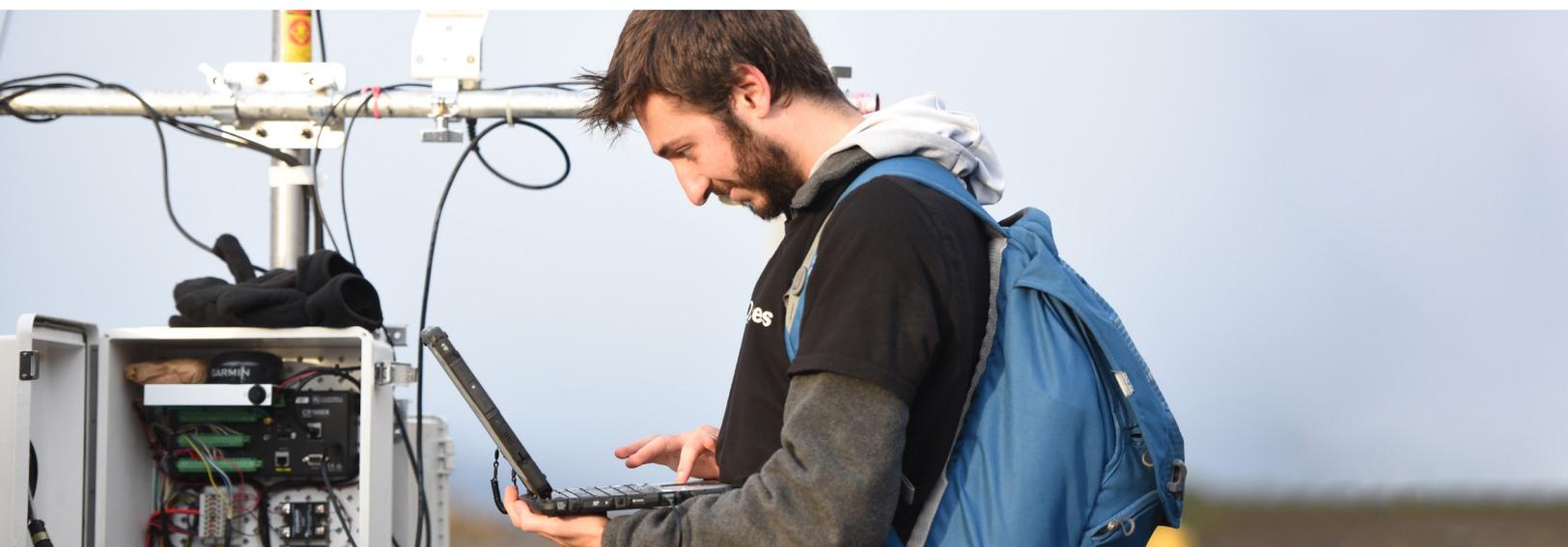
- Increase the number and availability of PhD programs

Enhance professional development opportunities for students and postdoctoral fellows

- Support development and implementation of professional development opportunities for graduate students
- Provide faculty with opportunities to build capacity in research team management
- Support development and implementation of opportunities for students to present and disseminate their work
- Provide equity, diversity and inclusion training opportunities for the next generation of professionals to ensure integration of equitable and inclusive practices

Enhance our competitiveness to attract top graduate students

- Work with Graduate Administration and Faculties to improve our ability to make early offers to prospective students, including funding packages



Manage and Enhance 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.

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.

Objective	Strategies
Clear and transparent policies and procedures for allocation of resources to researchers	<ul style="list-style-type: none"> • Monitor efficacy of revised internal funding programs to support leveraging of available funds • Enhance fundraising for externally supported scholarships and bursaries
Enhanced opportunities for the Northern Analytical Laboratory Services (NALS) facility to support faculty and student research	<ul style="list-style-type: none"> • Enhance Undergraduate Research Experience award funding and leverage with other sources (e.g. Mitacs)
Increased access to, and technical support for, the Research Computing facility at UNBC	<ul style="list-style-type: none"> • Increase the number and availability of PhD programs
Enhanced access to Library resources, including the Research Data Centre (RDC) and archives	<ul style="list-style-type: none"> • Support development and implementation of professional development opportunities for graduate students • Provide faculty with opportunities to build capacity in research team management • Support development and implementation of opportunities for students to present and disseminate their work • Provide equity, diversity and inclusion training opportunities for the next generation of professionals to ensure integration of equitable and inclusive practices
Efficient use of research overhead and indirect costs to support the UNBC research mission	<ul style="list-style-type: none"> • Work with Graduate Administration and Faculties to improve our ability to make early offers to prospective students, including funding packages
Efficient administrative processes	<ul style="list-style-type: none"> • Work with finance and purchasing departments to ensure efficient operations with respect to research • Enhance communication with researchers regarding changes in external regulations and requirements • Continue to improve use of, and operation of Romeo (online research administration software), including building research certification into Romeo
Consistent and complete regulatory compliance	<ul style="list-style-type: none"> • Continue to meet regularly with UNBC Research Ethics Board chair and vice-chair • Continue to support the UNBC Animal Care and Use Committee through engagement with certification and monitoring of compliance with policy • Continue to support a culture of safety at UNBC through ensuring compliance with existing policy and responding quickly to concerns
Increased visibility of UNBC research	<ul style="list-style-type: none"> • Continue to work with the Communications and Marketing Office on opportunities to showcase UNBC research • Support organization of workshops, symposia and other venues that highlight research and engage stakeholders



Enhance 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. Partnerships with various research organizations will also enhance our researchers' access to information, funding opportunities, and facilities. For example, UNBC is a member of the British Columbia Inter-University Research Data Centre, the Pacific Institute for Climate Solutions, the Royal Society of Canada, among others.

UNBC has joined with Thompson Rivers University and UBC-Okanagan, to form the Interior Universities Research Coalition (IURC), a research partnership that is dedicated to collaboration and pooling of resources to address significant issues common to all three regions that the member institutions serve. This partnership has led to collaborative work on COVID-19 response, funded by the Ministry of Health, and emerging opportunities to work with municipalities on topics such as homelessness, food sustainability and security, and wildfire management.

Objective	Strategies
Supportive environment for researchers to build partnerships	<ul style="list-style-type: none"> • Fund a Business Development Officer through Mitacs • Support partnership development with staff and internal resources
Increased scope of membership in organizations that support strategic research areas and foundational research	<ul style="list-style-type: none"> • Consult with Faculties regarding high impact memberships
Enhanced relationship with foundations, not for profit institutions, and industry in support of collaborative research	<ul style="list-style-type: none"> • Build on existing partnerships • Ensure mutually beneficial relationship and appropriate recognition of partner contributions
Enhanced engagement of undergraduate students in research through partnerships	<ul style="list-style-type: none"> • Support classroom research opportunities • Increase partnerships that lead to undergraduate research experiences

Mobilizing Knowledge

The translation and transfer of knowledge is a critical role for researchers, and one that is increasingly important to ensure research findings get into the right hands. One of UNBC's key mandates is to promote knowledge mobilization. We aspire to not only be excellent in 'traditional' methods of dissemination, such as publishing books, articles and reports, and training students, but also in other forms of knowledge transfer and translation, such as workshops and advisory committees. UNBC has been a leader 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, developed a Knowledge Mobilization Research Chair who has worked with researchers and students at UNBC, and with clinicians and others at Northern Health, to extend ways to develop responsive, relevant research evidence and move it into action, further demonstrating UNBC's commitment to playing a crucial role in community outreach and public education of research results.

Objective	Strategies
Library serves as a conduit for research results and dissemination	<ul style="list-style-type: none">• Continue to support a digital institutional repository to increase the accessibility of research products• Work with library in establishment of a "research commons"• Work with library on open access initiatives
Faculty and students have resources needed to disseminate research findings	<ul style="list-style-type: none">• Monitor efficacy of revised internal funding program in support of knowledge transfer• Support the revision of the Intellectual Property policy and procedures and support development of up-to-date language around open access in the existing or a separate policy
Enhance range and recognition of knowledge dissemination methods	<ul style="list-style-type: none">• Work with Office of Indigenous Initiatives on recognition of Indigenous knowledge and ways of knowing• Engage end-users at the beginning of research projects and in development of the most useful methods of dissemination of findings
Facilitate evidence-based decision making in health services	<ul style="list-style-type: none">• Continue to support the Northern BC Knowledge Synthesis Centre (situated in HRI); developed in partnership between UNBC and NH)



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.

Objective	Strategies
Supportive institutional research culture	<ul style="list-style-type: none">• Work with other departments to ensure efficient administrative processes• Provide space and other resources needed to start and maintain productive research programs
Raise UNBC's research profile	<ul style="list-style-type: none">• Enhance communication of research activities and impacts• Encourage co-creation of research projects with end users to maximize benefit
Diverse and Inclusive research community	<ul style="list-style-type: none">• Work with Human Resources on ongoing development of self-identification forms and processes• Ensure position announcements are distributed widely and to diverse audiences/groups• Ensure staff and selection committees have up to date training on unconscious bias and principles of EDI

Planning, Approval, and Implementation

This fourth iteration of UNBC's Strategic Research Plan is based on the 2017-2021 Strategic Research Plan, which was developed after extensive community consultation across UNBC's service region. For that plan, a Research Taskforce Committee comprised of faculty from both former colleges, undergraduate and graduate students, and administrative staff, a draft document was created. Input and comment 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 Plan (2022-2024) is an interim plan with the same research themes and priorities as found in the 2017-2021 plan. Due to significant restructuring of both the academic and the administrative organizations at UNBC, as well as significant and ongoing change in senior leadership, and responses to the global pandemic, now is not the time for an extensive revision of the Strategic Research Plan. The Strategic Research Plan did need updating and reformatting to provide more clear direction for the Office of Research and Innovation staff over the next 2 years, and for more transparent communication of UNBC's priorities and objectives with respect to its research mission.

This interim plan has been reviewed by UNBC's Research Committee, and approved by the President.

The Office of Research and Innovation annually evaluates its progress toward meeting these objectives, and the Vice President Research and Innovation reports regularly to UNBC's Senate and Board of Governors on research activities and progress on the plan.



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