



THE UNIVERSITY OF BRITISH COLUMBIA

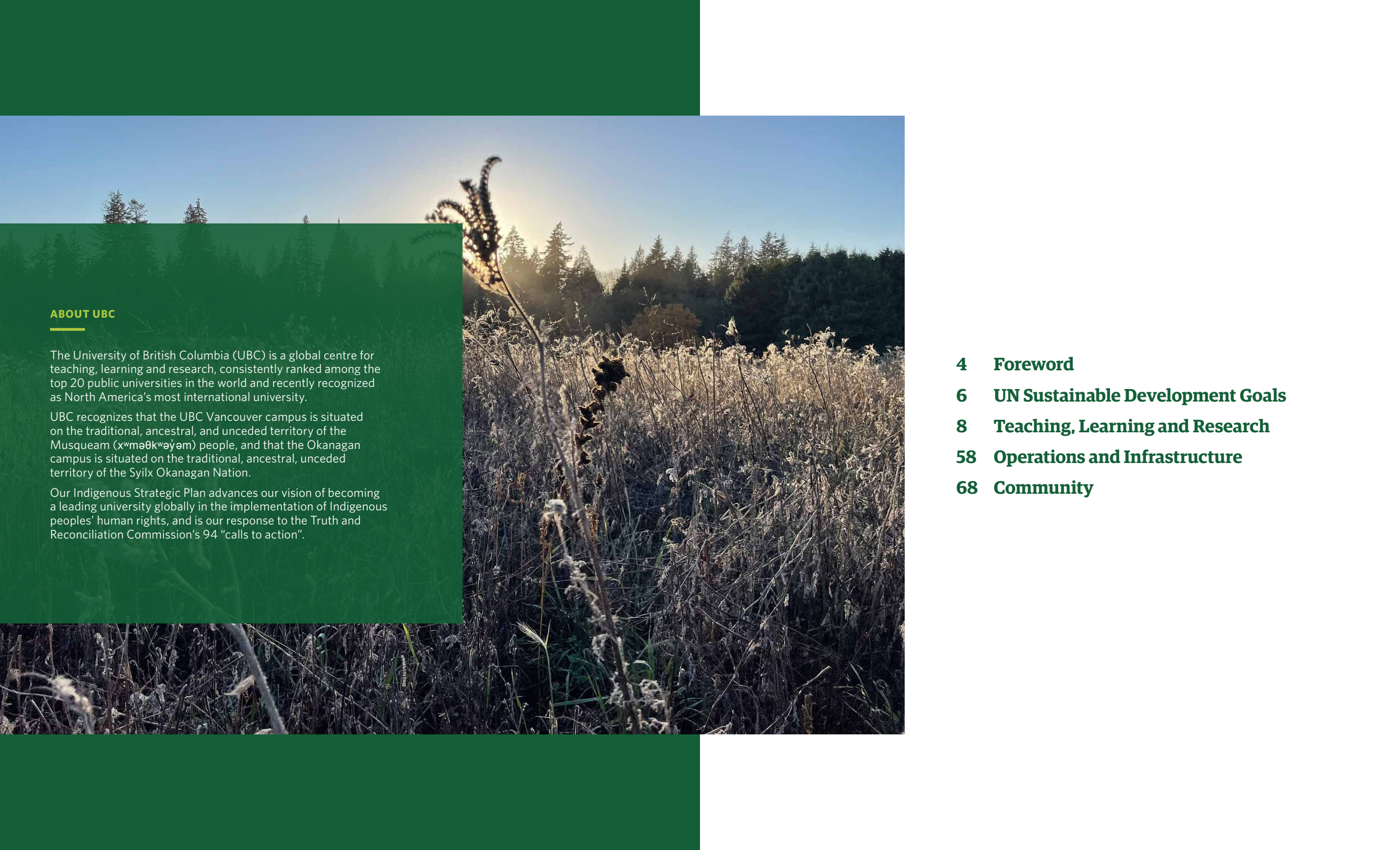
sustainability

2022/23

# Annual Sustainability Report







## ABOUT UBC

The University of British Columbia (UBC) is a global centre for teaching, learning and research, consistently ranked among the top 20 public universities in the world and recently recognized as North America's most international university.

UBC recognizes that the UBC Vancouver campus is situated on the traditional, ancestral, and unceded territory of the Musqueam (xʷməθkʷəy̓əm) people, and that the Okanagan campus is situated on the traditional, ancestral, unceded territory of the Syilx Okanagan Nation.

Our Indigenous Strategic Plan advances our vision of becoming a leading university globally in the implementation of Indigenous peoples' human rights, and is our response to the Truth and Reconciliation Commission's 94 "calls to action".

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## FOREWORD

A simple bold promise lies at the heart of the United Nations Sustainable Development Goals (SDGs): to end poverty and leave no one behind. At UBC, our teaching, learning and research, operations, and community engagement activities contribute to Canada's commitment to achieving these goals. This Annual Sustainability Report links our activities to one or more of the 17 SDGs, demonstrating the interdependencies between them.

First, take UBC's core academic purpose: excellence in research and learning. Imagine a university where sustainability isn't a buzzword, but instead a living, breathing philosophy, embedded into the very essence of how we educate and inspire students. Next year marks the halfway point of UBC's 20 Year Sustainability Strategy. Our first target is to, "provide each student, regardless of their degree program, with access to sustainability education." We're making good progress. A new Climate Studies and Action Certificate at UBC Vancouver, and UBC Okanagan's new Bachelor of Sustainability are just two examples launched this year.

UBC also recognizes the need to take practical steps to prepare students to tackle the challenges that lie ahead in a rapidly changing and precarious world. Bolstered by the Climate Emergency Task Force report's emphasis on diversifying climate education, and powered by the enthusiasm of faculty, students and staff, the range of experiential, co-curricular learning opportunities and community research partnerships continues to grow. See the Centre for Climate Justice's diverse efforts and the expanded Sustainability Scholars program for inspiration.

Second, let's consider operations and infrastructure. UBC continues to implement its sustainability action plans to advance energy efficiency, zero waste and high-performance buildings across both campuses. Campus Vision 2050 sets the stage for a new long-range vision and land use plan for UBC Vancouver, alongside the implementation of Climate Action Plan 2030 which puts the campus on a path to achieving its ambitious emission reduction targets. Implementation of UBC Okanagan's Climate Action Plan 2030 provides a roadmap for integrating climate and sustainability considerations into all aspects of the campus's growth, infrastructure and operations, and will inform the 2023-24 Campus Plan update and future investments.

And finally, community, the heart of UBC's activities. Post-pandemic we're back in person and on campus, enjoying the vibrancy of university life. Cultural celebrations, sports, student socials, family festivities, performing arts — there's a wealth of things to do every day on both campuses where everyone in our communities can be involved in making a difference.

The SDGs are a blueprint for a just and sustainable world. And while the challenges remain significant, UBC is striving harder than ever to achieve our goals.

### LINDA NOWLAN

Senior Director, Sustainability Hub

### MICHAEL WHITE

Associate Vice-President, Campus+Community Planning

### ROB EINARSON

Associate Vice-President, Finance & Operations (UBC Okanagan)



# United Nations Sustainable Development Goals

**History of the Goals »** The Sustainable Development Goals were developed by a United Nations Open Working Group with representatives from 70 countries, followed by a three-year civic participation process including 88 national consultations, six dialogues on implementation, an online survey, and door-to-door surveys.

The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries — developed and developing — in a global partnership.

## THE 17 GOALS



## THE GOALS IN ACTION AT UBC

Advancing the SDGs is a priority embedded within UBC’s academic and operational activities, and throughout our Annual Sustainability Report.

We are leveraging UBC’s institutional and intellectual capacities to address global challenges through teaching, learning and research, and implementing leading practices across our operational and infrastructure systems to demonstrate sustainable models of transformative change.

On each page of this report, you will notice a banner of small SDG ‘icons’ (example below) as a visual reference to the connections between UBC’s work, and one or more of the global goals.





# Teaching, Learning and Research

Across UBC, faculty and students are teaching, learning and exploring sustainability through hundreds of courses, programs, and research projects. UBC's ambitious goals include for all students to have access to sustainability learning alongside their chosen degree program; to create diverse learning and co-curricular engagement opportunities for students; and to be global leaders in applied research on sustainable behaviour, infrastructure, and communities.





## Teaching and Learning

Each year, thousands of students learn about human and ecological health, social justice, secure livelihoods, and a better world. The Sustainability Hub promotes a wide range of sustainability learning opportunities through course listings, programs and events and catalyzes interdisciplinary teaching and curriculum innovation through grants, a fellowship program, and other resources.

### UBC VANCOUVER

#### New courses in development by interdisciplinary Sustainability Fellows »

- These include:
- Sustainability in Global Health: Developing an Interdisciplinary Course on Global Health Policy and Systems
  - Forest-Fire Weather and Climate: An Element of Applied Meteorology and Sustainability
  - Climate Hacks in the Community: Developing an Interdisciplinary Field Course on Engaging Citizens in Local Climate Solutions
  - Climate Communications: Developing a Transdisciplinary Approach to Understanding and Engaging the Social Complexity of Climate Action
  - Climate Change Education Through Immersive Media: Educating for Sustainability in Multimodal Ways

#### Climate action curriculum projects in seven faculties supported by Climate Education Grants »

- New efforts to enhance learning opportunities on topics including:
- The Anthropology of Electronic Waste
  - Sustainability in the Agri-food Sector
  - Witchcraft and Ecological Events
  - Climate Analysis in Chemical, Biological and Environmental Engineering Capstone Design Courses
  - Climate Change Education in the Occupational Therapy Program
  - Climate Variables in Forestry Models and Climate-Focused ESG Reporting and Analysis

**New Climate Studies and Action Certificate »** The departments of Earth, Ocean and Atmospheric Sciences (Faculty of Science) and Geography (Faculty of Arts) collaborated to launch a new 18-credit credential, featuring new courses including:

- The Climate Emergency
- Climate Justice

- Climate Action Labs (three in total)
- Climate Action Capstone

This new credential is a response to UBC’s Climate Emergency Task Force Report recommendation to increase climate education. It is accessible to all undergraduates, regardless of their discipline or Faculty.

**Growing number of climate and sustainability-related micro-credentials »** UBC now offers more micro-credentials that provide opportunities to learn about sustainability outside traditional degree programs. These include programs from the Faculties of Forestry, Land and Food Systems, Science, the Allard School of Law, and Sauder School of Business. The Sustainability Hub, the Institute for Resources, Environment and Sustainability, and Campus+Community Planning are currently developing a new Climate Action Planning Micro-Certificate to commence in fall 2023.

### UBC OKANAGAN

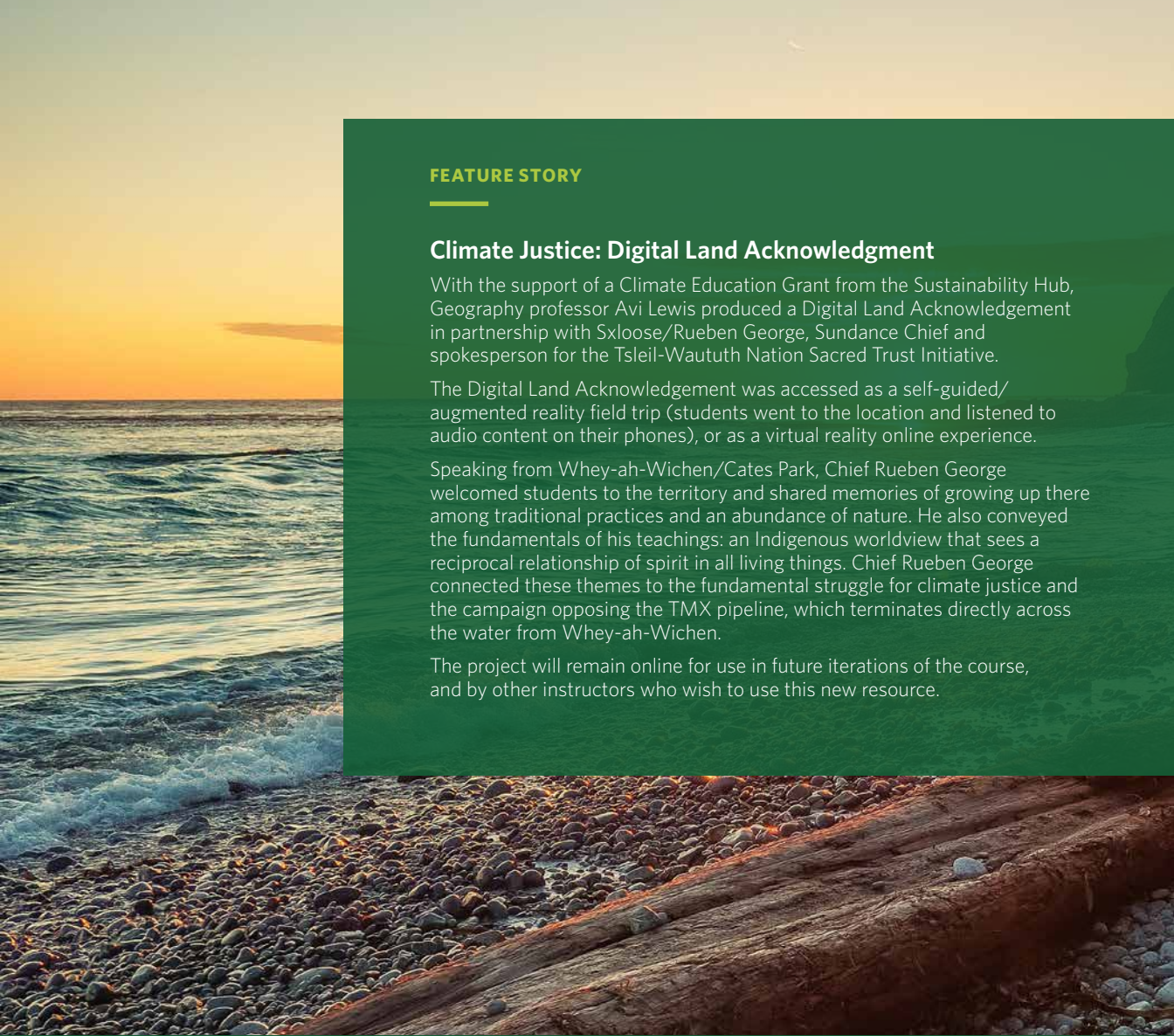
**New field course: Environmental Humanities Field Methods — Accessibility and Inclusion in Place-Based Pedagogies »** Supported by the Aspire Learnings Transformations - 2040 Fund, this new state-of-the-art pilot course is drawing on emergent practices to address equity, diversity, and access as key dimensions of sustainability.

**Three new sustainability-related micro-credentials »** Providing learners with the knowledge and skills needed to increase awareness and action on sustainability in the workforce, these include:

- Circular Economy: Principles and Applied Methods
- Wetland Delineation and Assessment
- Wildland Fire Ecology and Management

**Second Teach-In on Climate and Justice »** Educational forum attended by faculty, students and staff to share ideas and inspiration for researching climate solutions and engaging in community climate action. UBC Okanagan faculty members and graduate students from a variety of disciplines gave short presentations on how they are tackling interconnected climate and justice issues and solutions.

**Indigenous Micro-Forest »** A self-sustainable, biodiverse micro-forest on campus, created in collaboration with the Syilx community, environmentalists, engineers, forestry, soil scientists, and campus planning staff. Will provide new educational and research opportunities, and give UBC Okanagan students the opportunity to learn about Indigenous knowledge systems and languages, in the context of environmental stewardship.



### FEATURE STORY

#### Climate Justice: Digital Land Acknowledgment

With the support of a Climate Education Grant from the Sustainability Hub, Geography professor Avi Lewis produced a Digital Land Acknowledgement in partnership with Sxloose/Rueben George, Sundance Chief and spokesperson for the Tsleil-Waututh Nation Sacred Trust Initiative.

The Digital Land Acknowledgement was accessed as a self-guided/ augmented reality field trip (students went to the location and listened to audio content on their phones), or as a virtual reality online experience.

Speaking from Whey-ah-Wichen/Cates Park, Chief Rueben George welcomed students to the territory and shared memories of growing up there among traditional practices and an abundance of nature. He also conveyed the fundamentals of his teachings: an Indigenous worldview that sees a reciprocal relationship of spirit in all living things. Chief Rueben George connected these themes to the fundamental struggle for climate justice and the campaign opposing the TMX pipeline, which terminates directly across the water from Whey-ah-Wichen.

The project will remain online for use in future iterations of the course, and by other instructors who wish to use this new resource.

#### VANCOUVER

\$86k

in funding to support new climate and sustainability education

#### VANCOUVER

10

climate change courses open to all students with no entry restrictions

#### VANCOUVER

812

sustainability-related courses

#### OKANAGAN

238

sustainability-related courses





## FEATURE STORY

### Engineering Economics: Accounting for Environmental and Social Costs

Dr. Tamara Etmannski (Civil Engineering) and Dr. Gabriel Potvin (Chemical and Biological Engineering) collaborated via the Sustainability Fellows program to develop four self-contained content modules on the sustainability-related aspects of project costing.

The four modules developed included:

- Ecological and Value-Based Accounting
- Assessment of Social Impacts of Engineering Projects
- Circular Economy Models for Costing and Project Planning
- Social and Cultural Capital Considerations

Delivered via a course called Engineering Economics (for Civil Engineering) during the 2022 winter term, students completed feedback surveys and the findings were published in a national conference paper.

The modules are now ready to be used in more engineering courses and programs at UBC, and demonstrate how sustainability can be integrated into engineering economics courses across the country.

## SPOTLIGHT

### Sustainability at the Sauder School of Business

UBC's Sauder School of Business is putting sustainability, climate, and responsible business at the core of the school's identity through new directions in teaching, research, innovation labs, and operations.

**New MBA Climate Career Track »** Featuring climate-focused courses and career-development opportunities, UBC Sauder's new MBA Climate Career Track provides students with new tools to drive the kind of change they want to see in the world.

New and updated courses include:

- Climate and ESG Accounting and Reporting
- Climate Economics and Markets
- Climate and ESG Communications
- Indigenous Relations & Climate Economy

**Under development: Centre for Climate and Business Solutions »** Supported by funding from the UBC Academic Excellence Fund, the goal of the new centre is to accelerate the energy transition with scale and urgency using business solutions.

**Revamped: Undergraduate Concentration in Sustainability and Social Impact »** A 12-credit concentration based on completing sustainability-related courses from a selection including:

- Strategies for Responsible Business
- Climate Literacy for Business
- Innovation and Sustainability
- Impact Investing: Social Finance in the 21<sup>st</sup> Century
- Indigenous Peoples and Economic Development
- Social and Non-Profit Marketing
- Sustainability Marketing
- Climate-Focused ESG Reporting and Analysis
- Environmental Management

**Creative Destruction Lab hosts climate start-ups »** An innovation lab that aims to help high-calibre technology start-ups scale and activate their potential and benefit to society. The Creative Destruction Lab includes a Climate Stream that hosts approximately 20 science

and technology start-ups that are advancing carbon sequestration, advanced materials, the future of food, alternative energy, and the circular economy.

### Research: Responsible Consumption and Production, on Climate Action and Affordable Clean Energy »

UBC Sauder is a member of the UN Principles of Responsible Business Education (PRME) network. This includes a commitment to engaging in research that advances our understanding of the role, dynamics, and impact of corporations in the creation of sustainable social, environmental, and economic value.

### UBC Decision Insights for Business and Society (DIBS) »

A behavioural research and policy solutions initiative to improve outcomes across major social and planetary challenges by improving our understanding of decision-making and helping people make better choices for themselves and for the world.

Current research projects include:

- A SHIFT to Green: Using Behavioural Insights to Encourage Sustainable Consumer Behaviours. *Faculty team: Dr. Katherine White, Dr. Rishad Habib, & Dr. David Hardisty*
- Focusing on the Forest vs. the Trees: Making Eco-Friendly Products More Attractive. *Faculty team: Dr. Rebecca Walker-Reczek, Dr. Remi Trudel, & Dr. Katherine White*
- A Picture is Worth a Thousand Words: Comparing Interventions to Reduce Plastic Waste. *Faculty team: Dr. Jeremy Douglas, Dr. Yu Luo, & Dr. Jiaying Zhao*

**Scope 3 operations emissions offset »** The Sauder School of Business has selected two BC-based projects to offset Scope 3 carbon emissions associated with its operations.

The Great Bear Rainforest Project, in partnership with nine different First Nations groups, and Merom Farms — a local farm investing in different types of biomass fuel to replace fossil fuel use.





FEATURE STORY

**New Bachelor of Sustainability allows students to pursue interdisciplinary solutions to climate issues**

As the world increasingly faces climate-related disasters, UBC Okanagan’s inaugural cohort of Bachelor of Sustainability students are gaining the knowledge and training needed to find sustainable solutions to the environmental threats facing our planet and its people.

The program, launched in fall 2022, is the first of its kind in Canada. It draws on insights and methods from several academic fields, including science, arts, engineering, and management, in order to prepare students to address complex environmental issues using a multi-disciplinary lens.

In the first year, students were deeply engaged across a range of interdisciplinary focus areas — including concentrations in Environmental Analytics, Environmental Humanities, Green Chemistry, and Environmental Conservation and Management — that demonstrate the need to incorporate multiple perspectives into addressing multifaceted issues like climate change and biodiversity loss. Each concentration will provide students with specialized courses and training that enable them to take action and solve local and global problems.

In addition, the program features an Indigenous Studies course that introduces concepts of Indigenous knowledge, furthering student’s understanding of sustainability through Indigenous voices and perspectives. An example of support for UBC Okanagan’s commitments to the Truth and Reconciliation Commission’s Calls to Action.

“Our students are here for a reason — they are very concerned about the world and its direction, and they want to change things and make a difference. University educators have a profound responsibility to create spaces where students can develop these skill sets,” says Dr. Kevin Hanna, the program’s inaugural director and associate professor of earth sciences. “So when I work with my colleagues on implementing this degree, we have many conversations focused on creating spaces where students will define their future and create a role in sustainability.”

Students learn to integrate and apply this knowledge to real-world problems through experiential and community-based learning opportunities, such as fieldwork, labs, projects, and placements.

While this program is one of only a few sustainability degrees in Canada, and the first dedicated exclusively to sustainability, the growing demand for sustainability-related courses and programs is a positive sign of the vital importance of this work. By supporting sustainability-related courses and programs, UBC Okanagan is at the forefront of building capacity and growth in climate resilience, and supporting our students to become the environmental leaders of tomorrow.

For more information, visit: [sustainability.ok.ubc.ca](https://sustainability.ok.ubc.ca).



## Climate Emergency Response

In response to the urgency of the global climate crisis and years of student-led advocacy, UBC declared a Climate Emergency in 2019 and the UBC Board of Governors endorsed in principle the Climate Emergency Task Force (CETF) report and recommendations in 2021. While implementing the report is a shared responsibility across UBC, the Sustainability Hub is responsible for coordinating and convening this work, collaborating with climate action leaders across UBC, and with external partners and communities.

**Wall Scholars Catalyst program initiates new collaborations »** A new program from the Peter Wall Institute for Advanced Studies supported inter-and-transdisciplinary collaborations to address the urgency, scale and complexity of the climate crisis, climate justice, and biodiversity loss.

Six cohorts, including scholars (faculty), undergraduate students, postgraduate students, Emeritus College, artists, and staff working in the Climate and Nature Emergency stream sought to expand ways of knowing and acting in this challenging socio-ecological moment.

**Indigenous Rights and Climate Justice Circles »** The global community is awakening to the reality that has long been expressed by Indigenous leaders: colonialism is harming our planet and exacerbating the effects of climate change. In response, the Sustainability Hub hosted Indigenous Rights and Climate Justice Circles at the UBC Farm to explore the leadership needed to mobilize action for a climate-just world. Sessions included ‘Abundance of Light’ with Dr. Tabitha Robin, Dr. Shandin Pete, and Kasey Stirling, and ‘Harvest of Abundance’ with Dr. Bernard Perley, Dr. Shandin Pete, and Victor Guerin.

**Representing UBC at COP27 »** UBC held an open and transparent selection process for observer badges to the UN Framework Convention on Climate Change



Conference of the Parties, held in Sharm el-Sheikh, Egypt. A group of 10 faculty, staff, and student delegates were selected to travel to the conference, and participated in a COP27 Live! webinar and post-event panel co-hosted by the Sustainability Hub, SFU Sustainability, and the Pacific Institute for Climate Solutions.

**New departmental climate emergency committees »** New committees formed in Forestry, Educational Studies, and Sociology, in addition to the existing committees in Geography, Library, Earth, Ocean, and Atmospheric Science, and Asian Studies. All joined the Interdepartmental Climate Emergency Committee, an informal group that meets regularly to share best practices, inspire each other, and work collectively to prioritize climate action.

VANCOUVER

10

UBC delegates attended COP27 climate negotiations in Egypt

VANCOUVER

29

partners convened to take part in Climate Emergency Week

VANCOUVER

12

climate and nature emergency scholars working on collaborations



### FEATURE STORY

#### Peter Wall Institute for Advanced Studies: Climate and Nature Emergency theme

In recognition of the fact that human-induced climate destabilization and destruction of biodiversity are arguably setting humanity on a course of premature extinction, in 2022/2023 PWIAS adopted the Climate and Nature Emergency as the focal theme of all its activities.

Over the course of the year, 12 UBC scholars worked together to build connections, cultivate relationships and initiate collaborations that engage with the urgency, scale and complexity of the Climate and Nature Emergency (CNE). The Scholars were invited into a collective inquiry aimed at building connections, cultivating relationships, and initiating inter- and transdisciplinary collaborations that engaged with the urgency, scale and complexity of the CNE.

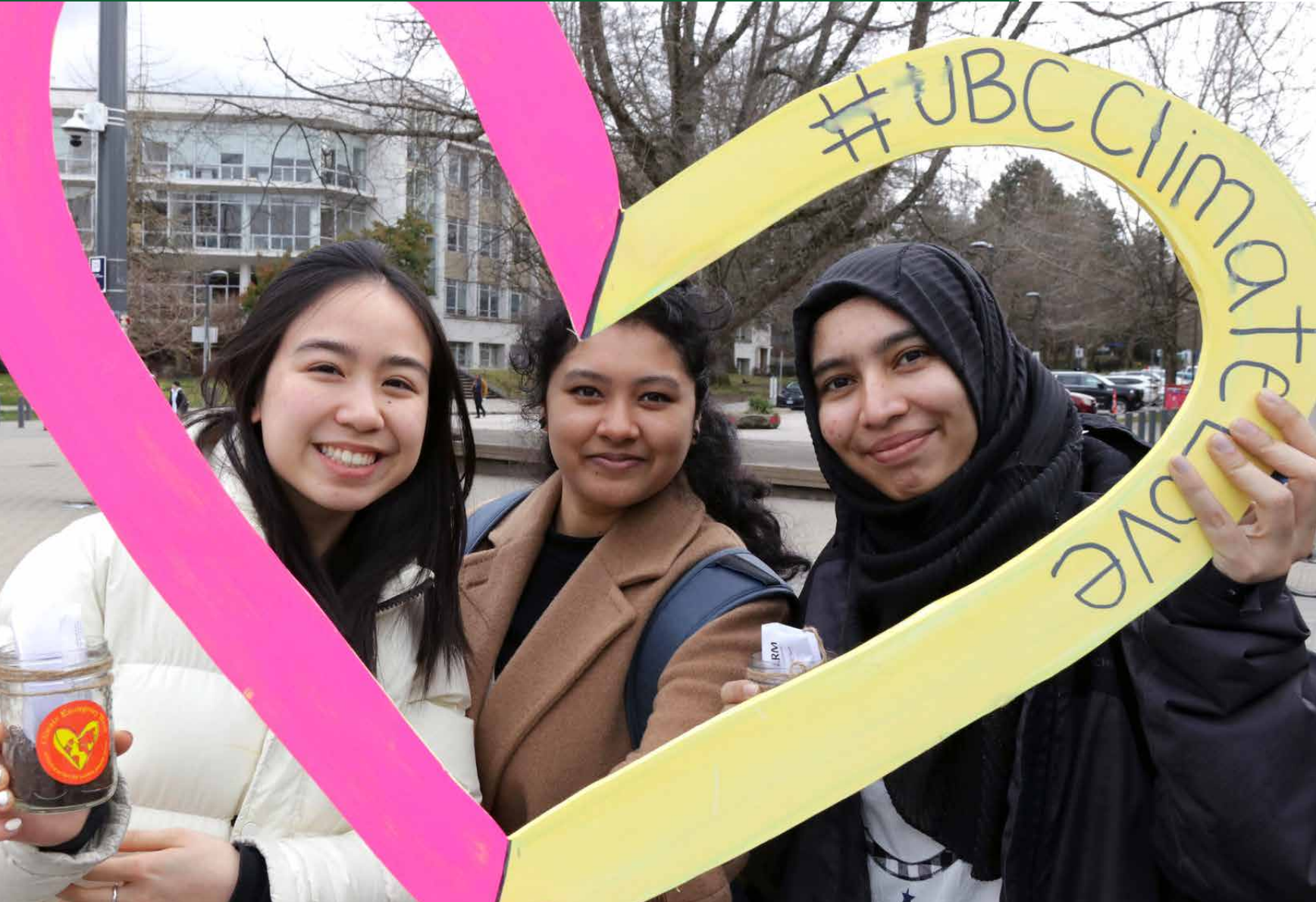
Throughout the program, participants were invited to consider how unsustainable economic growth, overconsumption, land occupation, cultural subjugation, labour exploitation, racial discrimination, as well as other forms of historical, systemic and ongoing social and ecological violence have brought us to where we are today, but they were not required to adopt any particular view or approach.

This ambitious remit was supported through a \$45,000 research award for each scholar and access to an additional Catalyst seed funding pool for scholar-initiated projects to address issues from advancing anticolonial methods in laboratory research to reimagining global climate science.

The CNE Catalyst Collaboration Fund offered seed funding for relevant, rigorous, and responsible collaborative research and knowledge translation and mobilization about the CNE. Support through the Catalyst Collaboration Fund “Stream 1” provided seed or match funding for research projects related to climate and nature emergency, while “Stream 2” funded events focused on scholarly, artistic and research collaborations and knowledge translation and mobilization.

“Engaging deeply with the Catalyst community of thinkers has helped me ground my scholarship in new ways beyond traditional scientific, colonial approaches, and unlearn the disciplinary, scholarly, and relational practice that pervade the academy and that have largely created the intertwined ecological and societal crises we find ourselves in.” - Dr. Michele Koppes, CNE Catalyst Scholars Cohort.





FEATURE STORY

Climate Emergency Week convened 29 partners

The Sustainability Hub and Climate Hub, together with the AMS and other campus partners, hosted the second UBC Climate Emergency Week in February. Seeking to convene and energize communities of climate action, 32 activities in partnership with 29 groups from UBC and beyond were held over a span of more than two weeks. Through a diversity of spaces and offerings, over 450 people attended events, workshops and creative activities focused on the need for collective action for justice, people, and our planet.

Highlights included: “Tea in the Garden” at the Morris and Helen Belkin Art Gallery and an “Ask-Me-Anything” with TikTok’s Global Sustainability Lead. The PuShFestival’s climate theatre production held a “talk-back” with students. Pulitzer Prize-winning journalist Elizabeth Kolbert spoke about her latest work, “Under a White Sky”. Municipal experts answered questions on, “How Local Governments Create Climate Policy and How You Can Help”, and ancestral ocean voyagers from across Pacific islands spoke about Indigenous knowledge and seafaring. Dr. Jiaying Zhao previewed her TED talk on ‘Happy Climate’. Students learned how to grow dorm-to-table microgreens. An AMS waste audit highlighted ways to reach a zero-waste community. And a Climate Emergency Sustainability Fair offered the campus community an opportunity to meet local organizations from Vancouver, student clubs, and UBC units focused on climate action.

**Spotlight event: Climate Slamposium »** To mark the official start of Climate Emergency Week, the Climate Hub and Sustainability Hub hosted a Climate Slamposium and were honoured to hear x̱məθḵwəy̱əm Elder Martin Sparrow open the gathering through story and song.

Deconstructing the traditional research symposium format, the Climate Slamposium was a cozy and intimate forum, much like a slam poetry event, for students to share their research, initiatives, artwork, and stories of climate grief, as well as dreams and visions of just and thriving futures.

**Spotlight event: Verbatim Theatre »** Climate Emergency Week concluded with a unique collaboration between community members and acclaimed theatre artist, journalist, and founding director of Sum Theatre, Joel Bernbaum — presented in partnership by the Sustainability Hub, Department of Language & Literacy Education, and Department of Theatre & Film.

Beginning with a two-day workshop, participants learned about the art of verbatim theatre and participated in recorded interviews. Transcripts of each interview became the basis for a brand new play called When You Have a Fire in Your Community, performed after just one rehearsal by five actors in an emotional reading before a live audience at the Chan Centre. This exceptional feat served as an example of new ideas for bringing attention to diverse community voices responding to the climate emergency.





FEATURE STORY

Climate Action Mobilizers, social and climate justice issues

The Climate Action Mobilizers program, led by the Centre for Community Engaged Learning (CCEL), aims to empower UBC students to tackle social and climate justice issues associated with the climate emergency.

Supported by the UBC Climate Emergency Fund, the program combines CCEL’s Social Impact Lab methodology for creating social change and ethical engagement, with UBC Collaborative for Advanced Landscape Planning (CALP) tools to catalyze local climate action.

In their first year, the Climate Action Mobilizers delivered 18 events and engaged a total of 425 participants.

**Microgreens event: Dorm to Table »** As part of UBC’s Climate Emergency Week, the Climate Action Mobilizers hosted a microgreen growing workshop for students.

In this workshop participants:

- Learnt how to grow microgreens (the seedlings of edible vegetables and herbs) in their dorm rooms, or at home
- Developed a skill that can contribute to self-sufficiency
- Increased their understanding of food literacy
- Expanded knowledge of campus and community organizations involved in sustainable food systems and food literacy-related work
- Developed connections to build a community centred around sustainable food practices

The workshop integrated speakers and live activities from partners on-and-off campus including City Beet Farm, Andrea Carlson, (Michelin star Chef and Restaurant Owner), UBC Farm, UBC Food Hub, Campus+Community Planning, Roots on the Roof, Orchard Garden, and UBC Sprouts.

Over 70 participants benefited from learning about how local food systems contribute to climate resilience, the benefits of sustainable food practices, and the power of community-focused climate action.



## Sustainability Scholars Program

An innovative paid internship program that matches graduate students with on-and-off campus partners to work on applied research projects that advance sustainability and climate action. Projects explore topics such as emissions reduction, food security, sustainable transportation, green buildings, biodiversity, climate change, circular economy, and social sustainability.

**100: Largest cohort of participants in the history of the program »** Thanks to UBC Climate Emergency Funding and a grant from the Sitka Foundation, 41 additional positions were created, resulting in a total of 100 UBC graduate students participating in applied research projects on sustainability and climate action for local and regional organizations.

**New Sustainability Scholars program stream — FERC »** The Fraser Estuary Research Collaborative (FERC) — funded by a Sitka Foundation Grant for three years — commenced with 14 Scholars working on projects for NGOs and other partner organizations to support efforts to protect and restore the vital watershed of the Fraser Estuary.

Projects ranged from developing an Indigenous-centric cumulative effects framework to protect the Fraser River estuary; identifying and assessing climate change indicators; exploring flood management opportunities for climate, salmon, and community resilience; creating a strategic plan to manage species at risk; and producing a graphic rendering of a restored estuary.

**Unique cohort supports climate & sustainability goals »** In summer 2022, 19 Sustainability Scholars worked in clusters on complex projects for a First Nation Government and five NGOs.

The projects included:

- Planning for Future Food Systems
- Virtual Community Engagement on Climate Impacts and Preparedness in Northeast BC
- Foreshore Integrated Management Planning: Local Indigenous Knowledge & Values Framework Overview
- Research to develop toolkits and resources to enable the creation of circular innovation districts in other jurisdictions
- Regional plan for climate change adaptation and biodiversity
- Foundational literature reviews to support land, water and resource management in T̓silhqot'in Territory



### FEATURE STORY

#### Habitat creation using biorock as a “living breakwater” for Metro Vancouver

This Scholar’s project explored the potential opportunities associated with using Biorock to create a living breakwater that provides shoreline erosion protection and biodiversity enhancement.

Core design principles for promoting biodiversity in hard marine structures include augmenting structural heterogeneity and complexity, surface rugosity, porosity and edge-area ratios, providing diverse microclimate conditions, and mimicking natural forms.

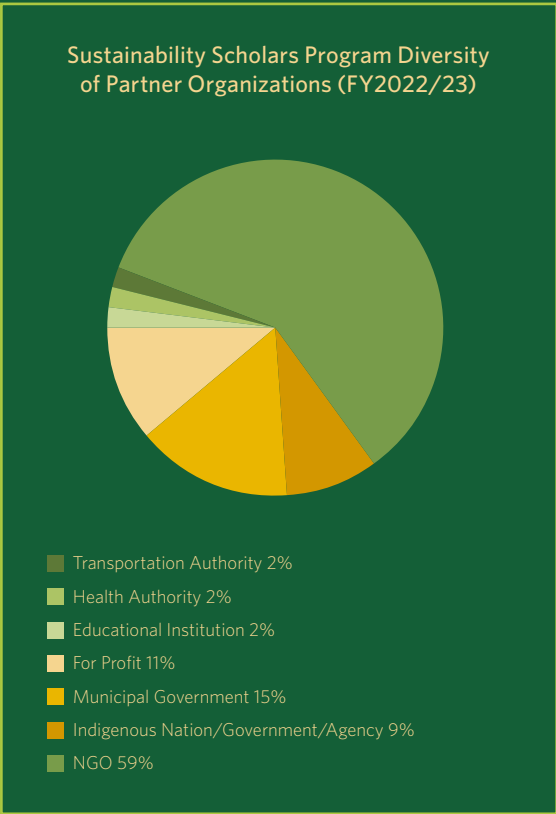
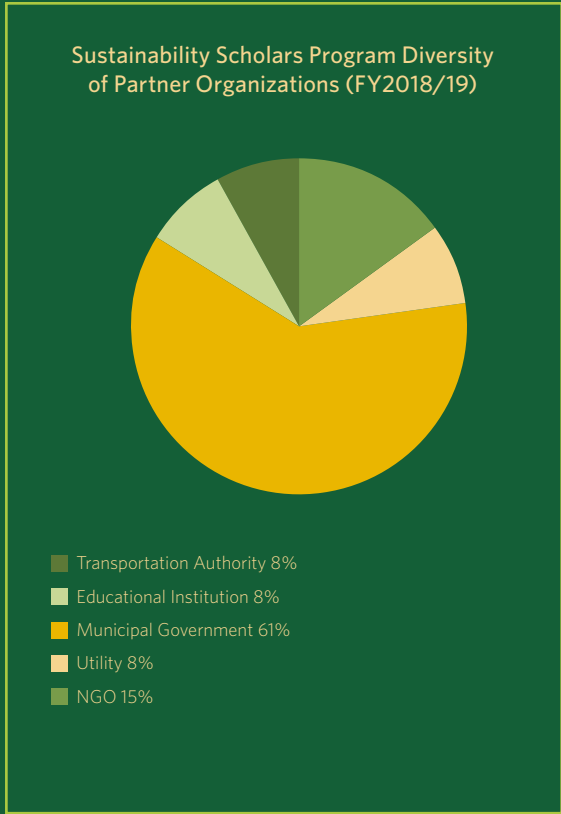
There are multiple ways Biorock can be used as habitat; as a refuge, as substrate to attach to, or as a source of calcium carbonate for shell formation. Biorock appears to be a suitable material for creating diverse habitat types since it can be made into any customized shape and offers a large range of design possibilities that could increase the number of ecological niches. This means that different techniques for habitat creation can be used ranging from regenerative aquaculture, artificial reef design, ecological engineering, and ecological restoration.

Piloting the transplantation of bull kelp, sugar kelp, Pacific oysters and bay mussels onto Biorock as well as the transplantation of eelgrass adjacent to Biorock structures could also offer valuable feeding and rearing habitat for several local species of juvenile fish.

The analysis and design recommendations of this study indicate that Biorock presents a potential opportunity to meet both Metro Vancouver’s goals of protecting the Iona Island foreshore from coastal erosion, and creating habitat. Future steps in the breakwater project could include engagement with Musqueam First Nation on decisions about species, restoration techniques and technologies, and identification of opportunities for cultural continuity and future harvesting of marine food sources.

## Growth and diversification of partnerships

The Sustainability Hub is focused on increasing the diversity of regional organizations served by the Sustainability Scholars program. Since 2018, the number of projects per summer cohort has increased from 67 to 100, with 54 new partner organizations now advancing their climate and sustainability goals with support from Scholars. During this period, the proportion of NGO partners has grown from 15% in 2018/19, to 59% in 2022/23.



VANCOUVER

100

graduate student internships

VANCOUVER

40+

off campus partners, incl. governments, regional organizations and NGOs

VANCOUVER

41

graduate degree programs with participating students



## SEEDS Sustainability Program

SEEDS helps advance UBC’s sustainability and wellbeing commitments by creating applied student research opportunities and interdisciplinary partnerships between students, faculty, staff and community. An internationally recognized Campus as a Living Laboratory initiative, SEEDS focuses on five research priorities — Climate Action, Urban Biodiversity, Circular Economies, Food Systems Transformation, and Community Wellbeing and Inclusion — to address interconnected societal issues while providing enriching student research and professional experiences.

### Harnessing urban forests for climate adaptation »

Analyzing data from recent heat waves, student researchers mapped land surface temperatures and evaluated the impact of tree stand compositions on UBC’s Vancouver Campus. Results emphasized the significance of strategically planting uncultivated spaces, and that deciduous trees are most effective at lowering surrounding temperatures due to their transpiration processes and denser canopies.

The findings will help inform UBC’s climate mitigation and adaptation goals, highlighting urban forests as critical for a cooler and more climate resilient campus.

### Putting food systems at the centre of climate action »

This year UBC’s innovative Climate-Friendly Food Labels were tested in all residence dining halls on the Vancouver campus. Students quantified the environmental impact of 800 menu items, expanding beyond Greenhouse Gas (GHG) emissions to include water use and nitrogen, and identified alternative products for the most GHG-intensive items purchased by UBC Food Services.

A future SEEDS research cluster will develop Climate-Friendly Food System Procurement Guidelines to prioritize GHG emissions reduction, promote biodiverse food systems, and foster support for just, sovereign, and resilient communities.

**New! SEEDS biodiversity data hub »** In partnership with the UBC Botanical Garden and Campus Biodiversity Initiative: Research and Demonstration, SEEDS launched a biodiversity data hub; an open access repository for geospatial biodiversity data related to UBC’s Vancouver Campus.

The data hub showcases SEEDS projects including student research that has contributed to a campus natural asset baseline, tree and soil inventories, estimates of ecological and socio-cultural services, such as carbon sequestration, as well as novel campus ecological connectivity analysis.

**Climate-Ready Food Gardens launch »** SEEDS students produced the first UBC Climate-Ready Food Garden Management Plan and Climate-Ready Food Plant List, based on the projected climate conditions for UBC’s Vancouver campus in 2050.

These resources will help inform UBC’s new Community Garden application, and can be scaled to support other gardeners in the Vancouver region to create food gardens that are resilient and adaptable to future climate conditions. The project was a collaboration between students in the Faculty of Land and Food Systems, Campus+Community Planning, and the UBC Botanical Garden.

**Addressing climate risks and vulnerabilities »** The winter storm event of 2022 was a notable climate event that disrupted transportation to-and-from campus, and led to feelings of stress and anxiety for many students. In response, Geography students collaborated on a SEEDS research project with Campus+Community Planning to elicit feedback on the experiences of students during the storm.

Key recommendations included significant changes to UBC’s notifications system to improve communications between students and campus during extreme weather events, changes to snow weather update procedures, and details of emergency refuges.

VANCOUVER	VANCOUVER	VANCOUVER	VANCOUVER
16	510	88	63
UBC sustainability plans and policies advanced	students, faculty, staff and community partners engaged	applied research reports developed	SEEDS projects supported

*\*SEEDS reporting data represents the academic year September 2022 to August 2023, not fiscal year 2022-23.*



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FEATURE STORY

UBC’s tree inventory provides biodiversity baseline and social connections

Over five years the SEEDS Program, in partnership with the Faculty of Forestry and Campus+Community Planning, has successfully completed an initial Tree Inventory of UBC Vancouver’s academic land.

This ambitious project began in 2018 when Urban Forestry students joined a multi-year SEEDS initiative intended to develop a vast dataset that includes every living tree on campus. In September 2022, students finally accomplished the monumental task of completing an initial inventory, which will be further analyzed for accuracy and completeness.

The Tree Inventory has already proven to be an invaluable resource by serving as a baseline measurement that empowers UBC researchers, practitioners and planners to make informed decisions regarding biodiversity. It acts as the foundation for a variety of other projects, including several studies that have contributed to our understanding of the crucial role urban forests play in mitigating climate risks and vulnerabilities on campus. In particular, new insights will help us combat the urban heat island effect, prepare us for future heat waves, and bolster UBC’s climate resilience.

In addition to ecological benefits, the Tree Inventory has been used in numerous projects that foster community wellbeing by forging meaningful connections between humans and nature. For example, SEEDS and the UBC Botanical Garden have organized tree walks as part of UBC’s “Biodiversity Days” to celebrate the stories behind notable campus trees, shedding light on their ecological significance, as well as their historical, cultural, and social importance.

While the initial inventory is actively being used by researchers and practitioners to conduct research that will inform UBC’s sustainability policies and plans, the project will continue to expand in future years to include additional data that supports more comprehensive analyses of tree and ecosystem health over the long-term.

Future SEEDS projects will build upon the initial success of the Tree Inventory initiative to further inform biodiversity baselining, monitoring, and campus planning decisions.



Student Engagement

Student engagement is at the heart of sustainability learning at UBC. Through immersive, transformative, and experiential learning, student engagement programs provide opportunities to build leadership skills and professional competencies. Whether it's collaboration, connections, or peer mentoring, UBC offers diverse opportunities to meet a variety of student needs and interests.

**Integrated sustainability and climate action into UBC orientations »** The Sustainability Hub partnered with Campus+Community Planning to incorporate new sustainability and climate education materials into UBC's student orientation programming. This included developing a comprehensive Canvas self-study course – 'Introduction to Climate Action at UBC' – for students, and training for orientation leaders to facilitate sustainability-focused workshop sessions.

**Doubled capacity of Sustainability Ambassadors program »** This year the Sustainability Ambassadors program doubled in size from 25 to 50 participants. Five students in peer leadership positions were trained by staff to mentor a cohort of 10 students. Each cohort focused on a different key strategic theme, including climate, resilient communities, justice, ethical civic engagement and biodiversity. Throughout the year, the program partnered with 12 organizations and directly engaged over 1,200 individuals, including students, staff, faculty and community members through workshops and events.

**New! Catalyst Certification program »** The Sustainability Hub launched a new certification program to offer recognition for students' participation in existing and new sustainability-related leadership experiences on-and-off campus. So far, more than 115 students have enrolled in the first year of the program under three streams: Engage – where students participate at their own pace, Amplify – where students work with directed groups, and Lead – where students offer sustainability guidance and leadership to other students.

VANCOUVER

100+

educational workshops developed and delivered to on and off campus groups

VANCOUVER

1,286

attendees at Ambassador events

VANCOUVER

15

student groups participated in the Student Sustainability Council

VANCOUVER

115

students joined the new Catalyst program

**Global Virtual Classroom Pilot Program: Climate Justice »** A pilot program focused on climate justice and student leadership. Bringing together universities from the global north and the global south, participants explored the linkages between climate change and inequity through a justice lens, local activism for global impact, and cross-cultural perspectives on climate justice. Delivered through partnership between UBC's VP International, the UBC Sustainability Hub, Deakin University, Manipal Academy of Higher Education, Monash University, Nanyang Technological University, and Pontificia Universidad Católica de Chile.

**Re-envisioned Sustainable Clubs Program »** The Sustainable Clubs Program was relaunched to support student clubs and groups with the knowledge, guidance, and resources to create and implement sustainability-informed decisions into their networks at UBC and beyond. In its first year, the re-envisioned program guided 12 student clubs to make climate action commitments, and supported individual students within the clubs to become leaders in sustainability.

**Student Sustainability Council »** The Student Sustainability Council provides input on emerging UBC plans. This year, leaders from 15 student groups gave input on seven staff and student projects, including UBC's evolving land use plan, and Campus Vision 2050.

FEATURE STORY

Sustainability Hub co-hosts first ever SDG Week Canada

Modelled after the United Nations' Global Goals Week, SDG Week Canada brought together 57 academic institutions across Canada to showcase and accelerate action on the UN's Sustainable Development Goals (SDGs). The SDGs are a blueprint for collaboration to create positive change.

Throughout the week of March 6-10, over 100 independently organized workshops, panels, and other activities took place on participating campuses across the country to raise awareness and engagement with all 17 SDGs. Each event enabled post-secondary institutions to collaborate across disciplines to advance the SDGs, to learn from each other about how to better integrate the guiding values of the SDGs across programming, and to build long-term momentum for SDG action across the sector.

SDG Week Canada was presented by UBC's Sustainability Hub in partnership with Sustainable Development Solutions Network (SDSN) Canada, and Colleges & institutes Canada (CICan). (SDSN) Canada and Colleges & institutes Canada (CICan).



FEATURE STORY

Dunbar Resident Association turns to Sustainability Ambassadors for Five-Year Youth Engagement Strategy

As a result of the pandemic, youth engagement in the Dunbar community has declined over the last few years.

To help address this, the Ethical Civic Engagement cohort of the Sustainability Ambassadors conducted community consultations to better understand the needs of the community and its members' perspectives on community engagement. Focus issues included food insecurity, social isolation, and diminished intergenerational relationships,

Based on this research, the Ambassadors compiled a strategic plan that proposes recommendations under three broad areas: community food security, combating social isolation, and fostering intergenerational relationships.

The recommendations included a centralized page on the Dunbar Resident Association's website for youth to access resources, events, and volunteer opportunities; a sponsored Food Bank and associated events; and a youth association — a new program providing youth with the opportunity to provide their perspective on community issues, and a platform to help foster intergenerational relationships in their community.





Student Leadership

UBC students are leading change across our campus, and in our communities. By self-organizing and speaking out, student groups are taking the initiative to spark meaningful conversations — often about what UBC itself can do differently. Addressing issues like the climate crisis, social and racial justice, student wellness and more, student leaders at UBC are making a positive contribution to sustainability.

UBC VANCOUVER

**UBC Climate Hub »** In its fifth year, the Climate Hub hired over 20 student staff to deliver student led-programming, worked with over 45 partners, hosted over 90 workshops and events reaching over 2,000 local youth, students, staff and faculty, and partnered with the International Institute for Sustainable Development to issue 12 sustainability certificates.

The Climate Hub’s Climate Wellbeing Engagement Network also released new resources, including extreme heat and cold coping resources, and translated five climate wellbeing resources into four languages.

Further highlights this year include mobilizing a new community garden with local partner Home Grown Justice, hosting the Climate Slamposium, and partnering with the AMS and the Sustainability Hub to deliver Climate Emergency Week at UBC.

**Student Energy at UBC »** Student Energy at UBC is a student-led group whose mission is to create a sustainable future by educating, inspiring, and empowering young people to become leaders in the global energy transition.

This year, the group established themselves as an official chapter of Student Energy Global, held their first information session to build their team, and held a student energy symposium with industry speakers and four professors as panelists.

Upcoming activities include networking events, interactive workshops, and new clean energy projects on campus.

VANCOUVER

1,700

undergraduate students received education through Climate Teaching Connector

VANCOUVER

900

school-age children taught by student Climate Ambassadors

**AMS Sustainability »** This year the AMS Sustainability Team has been working on reviewing and updating the current AMS Sustainable Action Plan.

Originally published in 2020, the plan is set to be renewed every 3 years to track progress and refine goals. The team aims to complete the latest edition of the plan by the end of October 2023.

In addition, the AMS is currently working on the Plant-Based September Campaign, creating Sustainability Guidelines for club event planning, hosting AMS Sustainability Week, and continuing to support student projects through the Sustainability Projects Fund.

**UBC Surf Club »** Passionate about the waves and protecting the environment, UBC Surf Club members organized numerous educational and hands-on events throughout the year to highlight and take action on climate and sustainability issues.

In particular, the group engaged in advocacy to protect the ocean from the threats posed by deep sea mining, joining a demonstration beginning outside the Vancouver Convention Center, aimed at industry and government decision makers.

Other notable activities included a presentation of award-winning documentary film ‘Coextinction’ – about the final attempt to protect the last 73 Southern Resident orcas from extinction, featuring panel discussion moderated by Bodhi Patil (student-activist) and featuring Will George (Tsleil-Waututh water protector), plus special guests.

UBC OKANAGAN

**Community Service Learning Program »** Offers students opportunities to connect classroom learning with real-life experiences in the community. The focus is on service and the beneficiary is both the student and the organization served. The goal is to educate students about their roles as engaged citizens and leaders in their communities.

**Student-led plogging »** In spring 2023, student staff from across two campus areas co-created a series of three plogging (pick up litter and jog) events to remove waste from campus grounds.

**Climate action film series »** Film screening and discussion sessions featuring prominent documentaries focused on the climate crisis aimed to raise collective consciousness and mobilize student action.



FEATURE STORY

UBC students design modern, carbon-minimal campus space

Designed and built by Third Quadrant Design, a 60-member student team with members drawn from a wide variety of disciplines, virtually every material, construction technique and design element of the building was chosen for its ability to lower or capture carbon emissions.

One of the key features of the building — its thermal insulation — is made entirely of hempcrete, a mixture of natural hemp fibres and lime that captures carbon from the atmosphere as it sets. Sections of the interior walls will be left exposed to display the hempcrete for teaching and learning purposes.

In recognition of the team’s achievement in emitting nearly-zero carbon emissions during construction, Third Space Commons received the inaugural 2023 B.C. Embodied Carbon Award for Small Building Construction by the BC Carbon Leadership Forum. The build project was also a finalist in the U.S. Department of Energy Solar Decathlon Build Challenge, an international, biannual competition held to celebrate innovative and high performance housing design.

“Third Space Commons is a student-designed and constructed building. It needs to be acknowledged and reported just how unique this project was, in that everything you are seeing has been designed and project managed by students — far more than any other trade or professional contractor.” - Dr. Adam Rysanek, assistant professor of Environmental Systems at UBC’s School of Architecture and Landscape Architecture, and faculty advisor for the Third Quadrant Design team.



FEATURE STORY

UBC medical students write climate change into the curriculum

To advocate for the inclusion of climate change curriculum in medical school, and to highlight the crucial role health-care professionals play in treating the effects of climate change on health, a student group collaborated to develop climate action learning modules that are now part of the curriculum at UBC’s Faculty of Medicine.

The learning modules were created by students Montana Blum, Lise Van Amerom, Keiko Patterson, and Sarah Poteryko, and they cover topics ranging from infectious diseases to heat stroke to mental health, all of which are impacted by climate change. The group aims to educate medical professionals about the effects of climate change on health, and to promote advocacy and action within the health-care industry.

“We all had different backgrounds that had situated us in a space of being curious about climate change in health [on] entering medical school,” said Montana Blum. Some of us have different rural experiences, some of us have had to pay closer attention to the wildfires, or some of us have traveled to places and seen extreme air pollution and how that impacted health before coming to medicine,” explained Blum.

“We focused on four modules,” explained Sarah Poteryko, “...each of us took on a research question, [for example] looking at the patient populations that are most impacted by climate change, what sort of diseases are likely to be seen at an increased frequency because of climate change, and then [thinking about] the health-care system itself and its contributions to climate change.”

“[The faculty response] has been really positive. Just this January, it was given the go-ahead to put these modules into the UBC curriculum starting next year,” noted Sarah.



## Campus Engagement

Engagement programs for students, staff, and faculty support the implementation of UBC’s climate action and sustainability plans, and help advance a culture of sustainability. Our goal is to inspire and mobilize campus community members in order to build a resilient, interconnected community that is empowered to take climate action and create a more sustainable campus and world.

### UBC VANCOUVER

**Sustainability Coordinator program supported 82 coordinators »** The Sustainability Coordinator program ended its 21<sup>st</sup> year with a network of 82 coordinators throughout offices and laboratories across the UBC Vancouver campus. The program provides volunteers with resources to promote and implement sustainable practices related to energy, waste and purchasing, commuting and air travel, food, education and engagement, as well as training and networking opportunities.

**Workplace Sustainability Fund grants awarded to four departments »** Grants were awarded to four departments to support projects such as a circular loop lab plastic recycling project, a department-wide sustainability shoreline cleanup, the pilot of a sustainable events project, and a project addressing student educational travel and the climate crisis. Recipients included the Centre for Blood Research/Oral Biological Medical Sciences, Go Global and Office of the Vice Provost International, School of Information, and the University Neighbourhoods Association.

**Green Labs program »** The program promotes sustainability by reducing the environmental impact of campus laboratory operations including:

- **International Freezer Challenge** – to encourage cold storage best management practices.
- **Chill up Challenge** – UBC Pharmaceutical Sciences researchers changed the temperature in freezers from -80°C to -70°C, saving an estimated 30,440 kWh in annual electricity — the equivalent of 142 standard chest freezers.
- **Ultra Low Temperature Freezer Rebates** – six research groups were awarded funds to purchase ultra efficient freezers.
- **Shut the Sash Competition** – saved an estimated 47,100 kWh via increasing efficiency in participating fume hoods, including the prize winning MacLachlan and Wolf Labs.

- **Lab Sustainability Course** – a free course launched on Canvas open to UBC staff, students and faculty to improve the sustainability of lab operations.
- **Lab Plastics Recycling Program** – between 240 and 500 kg of plastic waste diverted this year from landfill as a result of this program.
- **Amber Glass Recycling Program** – in total, 7,450 kg of campus lab glass was diverted from landfill in 2022.
- **Ice Pack Donation Program** – over 3,075 ice packs were donated this year through the program.
- **Green Labs Fund** – made an award to the UBC Vancouver School of Biomedical Engineering.

### UBC OKANAGAN

**The Power of You »** UBC Okanagan’s behaviour change program offered virtual and on-campus initiatives with a focus on energy conservation and sustainable, active modes of transportation, including:

- **Shut the Sash Challenge** – a six-week challenge taken by over 50 students in participating labs saved 2,909 kWh and 32 GJ of energy, and reduced emissions by 1,630 kgCO<sub>2</sub>e.
- **Choose to Reuse** – campaign event engaged over 400 community members, provided attendees with material sorting education, and distributed 250 reusable travel mugs.
- **Cozy and Closed** – featured nightly energy reduction audits during which staff turned off or powered down over 2,903 lights, 83 projectors/screens, and closed 93 windows.
- **Green Labs Fund** – made awards to the UBC Okanagan School of Engineering, and Department of Chemistry.



### FEATURE STORY

#### The Pacific Museum of Earth: Climate Hero

It is the year 2063. Earth’s climate is noticeably changed. Extreme temperatures and precipitation bring intense heat waves, devastating floods, and worrisome droughts, threatening food supplies and the livelihood of local communities.

Climate Hero is a new online Escape Room developed by the Pacific Museum of Earth that combines AI technology and climate education. This contemporary immersive game synthesizes knowledge learned throughout the experience and tasks groups to “escape” from Earth’s climate crisis.

Players enter this world, 40 years in the future, and are given the opportunity to go back in time and make commitments to climate action. They use critical thinking and collaboration skills to solve interactive challenges that bring basic concepts of climate science and climate action to life.

Climate Hero aims to educate and inspire the next generation of scientists, policymakers, and global citizens to engage in conversation and take action to tackle climate change. The game is one example of how the Pacific Museum of Earth showcases the wonders of our dynamic planet through participatory programming, engaging exhibits, and connecting the public with UBC research and learning.

#### VANCOUVER

4

projects funded through  
Workplace Sustainability  
Fund Grants

#### VANCOUVER

82

Sustainability  
Coordinators in offices  
and labs

#### OKANAGAN

2,909 kWh

of energy savings via Shut  
The Sash Competition

#### OKANAGAN

35,314

‘Lights Off’ during  
campaign since 2015





FEATURE STORY

Climate adaptation, resilience and biodiversity at UBC Okanagan

In alignment with existing UBCO policies and plans that prepare the campus for climate change, UBCO recently completed a Multi-Hazard Risk Assessment to identify and evaluate risks to campus infrastructure, systems, and buildings. Outcomes of the assessment include a risk register that identifies the highest risks for each infrastructure system, and potential actions to investigate as part of a future Phase 2 Resiliency Plan.

In parallel, the development of a UBCO Climate Adaptation, Resilience and Biodiversity Strategy is underway in partnership with UBC’s School of Community and Regional Planning. The strategy will identify best practices in climate adaptation and prepare the campus for regulatory climate resiliency planning reporting requirements. The strategy is anticipated to identify how the campus’s resilience and adaptive capacity to climate change can be optimized; demonstrate best practices in climate adaptation, resilience and biodiversity within operational and land use planning and policies; and make recommendations for policy updates and actions to further prepare the campus and its ecological assets against climate risks.

In addition, the strategy is expected to identify opportunities for integrating Indigenous knowledge systems, while identifying the co-benefits of adaption actions with mitigation strategies identified in UBCO’s Climate Action Plan 2030.



## Research

UBC plays a leadership role among global post-secondary institutions that focus on researching, developing, and demonstrating sustainable practices. With over 400 faculty across two main campuses investigating sustainability, our goal is to excel across the spectrum of fundamental and applied research. The following pages include some examples of new groups and projects — just a small selection from an incredible breadth of work across the university.

## Featured Research Groups

### UBC VANCOUVER

**Climate Change Health Effects, Adaptation, and Resilience (HEAL) »** A new research cluster that aims to understand the compounding health effects of extreme weather events caused by climate change, co-led by Dr. Lorien Nesbitt (Faculty of Forestry) and Dr. Chris Carlsten (Faculty of Medicine), funded by UBC’s Academic Excellence Funds. Research partners include the Ministry of Health, the City of Vancouver, the Regional District of Metro Vancouver, and local non-profit Farmers on 57<sup>th</sup>.

Current projects include:

#### Tackling Wildfire Smoke through HEPA Filter Intervention Programs | Amin Adibi, PhD student

Evaluating the cost-effectiveness of High-Efficiency Particulate Air (HEPA) filter interventions in reducing wildfire smoke exposure and associated health risks in patients diagnosed with asthma.

#### Multi-dimensional Urban Environmental Justice Analysis | Shuoqi Ren, MSc student

Characterizing patterns of multi-dimensional environmental quality and related injustice that consider interactions, synergies, and trade-offs between multiple environmental factors that impact human health.

#### Disaster Resilience Research Network (DRRN) »

The network aims to advance multi-hazard assessment and mitigation in support of inclusive and equitable disaster risk management, with a focus on BC informed by international perspectives. Composed of faculty, post graduate students and practitioners committed to transdisciplinary research, four multidisciplinary working groups are conducting research and outreach activities related to disasters in BC.

Working groups include:

#### Research seminars on shared interests and goals

Activity co-leads: Dr. Carlos Molina Hutt (Department of Civil Engineering) and Dr. Sara Shneiderman (Department of Anthropology; School of Public Policy & Global Affairs)

#### Pre-disaster coordination / Rapid Response Network

Activity co-leads: Dr. Jocelyn Stacey (Peter A. Allard School of Law) and Dr. Amy Kim (Department of Civil Engineering)

#### Course mapping / building an interdisciplinary graduate curriculum

Activity co-leads: Dr. Stephanie Chang (School of Community and Regional Planning; Institute for Resources, Environment, and Sustainability) & Dr. Trevor Carey (Department of Civil Engineering)

#### Analysis and assessment of the 2021 events (wildfires, heat wave, flooding, landslides, etc.) in BC

Activity co-leads: Dr. David Edgington (Department of Geography) & Dr. Dwayne Tannant (Department of Civil Engineering)

**Centre for Climate Justice: community engaged research »** The Centre’s 32 faculty affiliates and 16 graduate student affiliates across both campuses have so far secured over \$5M to support research across several streams, including climate just housing, transport and infrastructure; just transitions; and Indigenous-led climate action and research.

In one example of community engaged research, the first cohort of a ‘Climate Justice Study Collective’, in collaboration with SFU’s Community-Engaged Research Initiative (CERi), included faculty, Indigenous elders, IBPOC youth activists and artists, a local elected leader, a lawyer, local union and community organizers, and highlighted how climate impacts intersect with the housing crisis, poverty, toxic drugs and colonization.

### VANCOUVER

506

faculty researching sustainability-related topics

### VANCOUVER

40

research institutes and clusters exploring sustainability-related issues

### UBC OKANAGAN

#### Materials and Manufacturing Research Institute »

A multidisciplinary, interdepartmental research hub with more than 100 participating researchers. Linking basic and applied science, the institute strives to intelligently integrate emerging materials with manufacturing technologies to help create value-added products that are lighter, stronger, smarter, more durable, and energy efficient.

**Green Infrastructure Research Cluster »** Through innovative technologies, researchers are working to create civil infrastructure that is safe, durable, energy-efficient and affordable. With an expanded focus on resilient urban infrastructure, the cluster is designing an interdisciplinary program to help BC withstand natural disasters like flood, fire and earthquakes, predicted to increase with climate change. Members are also exploring reuse and recycling of local materials and feasible low-emission technologies for a circular economy.

**Indigenous-led impact assessment »** This interdisciplinary group aims to work with Indigenous organizations to help outline information management requirements, define best practices for impact assessment, and develop case studies to help communities design new approaches to conducting impact assessments. The cluster hopes to support Indigenous people across Canada as they manage resources while protecting the values that define their lands and cultural relationships.

**Watershed ecosystems »** An interdisciplinary research team developing and testing a watershed ecosystem approach that assesses and manages critical linkages and interactions in a changing environment. Research topics include forest disturbance and cumulative hydrological effects, trade-offs and resilience, inclusion of Indigenous values in watershed governance, and climate change adaptation.

#### West Campus lands to support future research »

Situated 45 hectares west of UBCO’s main campus, the West Campus lands are part of BC’s Agricultural Land Reserve (ALR). As UBCO continues to grow, the Conceptual Structure Plan (published in 2023) provides an overall vision for future uses of this land, with an emphasis on land-based research activities and conservation initiatives to support innovation, protect the unique saline ecosystem around Robert Lake, preserve wildlife movement within the lands, and seek Syilx engagement and partnership for research and use of the lands.

### OKANAGAN

149

faculty researching sustainability-related topics

### OKANAGAN

17

research institutes and clusters exploring sustainability-related issues





SPOTLIGHT

Campus as a Living Lab

As a public university, UBC has both a commitment and responsibility to leverage our academic and operational capabilities to respond to global challenges, like climate change and the biodiversity crises. The Campus as a Living Lab (CLL) program provides a collaborative framework for researchers, students, staff and external partners to use our campuses to explore, develop and test new ideas, and share the knowledge and learning gained from these experiences.

**\$250K in seed funding distributed in Vancouver »** In 2022, the Sustainability Hub managed UBC Vancouver’s third annual CLL Fund Competition to provide seed funding for collaborative applied ‘living lab’ projects that are developing and piloting innovative solutions to global sustainability challenges. The Vancouver competition awarded up to \$250,000 in total funding.

Teams are composed of interdisciplinary collaborations between academic faculty and operational staff, and must demonstrate both research excellence and operational benefits for the university. Projects are meant to have immediate impact on campus, but also be applicable to environmental and social challenges in the region and beyond.

**Okanagan funding launch »** In 2022, UBC Okanagan launched its first Campus as a Living Lab competition, awarding \$100,000 in seed funding to incubate, test and demonstrate innovative research ideas at our Kelowna campus and in local communities. UBC Okanagan has also established a CLL Steering Committee to provide campus-specific guidance and direction to the future development of living lab opportunities and initiatives in the Okanagan.

**Health and wellbeing expansion »** Campus as a Living Lab partnered with UBC Wellbeing in 2022 to expand the scope of the UBCV competition by providing additional seed funding of up to \$50,000 for projects specifically focused on promoting health and wellbeing.

In addition to illustrating research excellence and operational benefits, these projects also demonstrated innovation in the following five priority areas: promoting and enhancing student and employee mental health; food security; active transportation; inclusive and connected communities; and Indigenous perspectives on wellbeing.

Funded Projects

UBC VANCOUVER

- **MycoToilet.** Demonstration of a Mycelium Based Composting Toilet. Led by Dr. Joseph Dahmen, School of Architecture + Landscape Architecture; Dr. Steven Hallam, Department of Microbiology and Immunology; Daniel Mosquin, Research Manager, UBC Botanical Garden.
- **Creating an inclusive, climate and COVID-resilient outdoor learning space @ UBC.** Led by Dr. Blair Satterfield School of Architecture + Landscape Architecture(SALA) and Graham Entwistle, Workshop + Digital Fabrication Supervisor, SALA; Carole Jolly, Director of Community Development and Engagement, Campus+Community Planning.
- **Leak detection for UBC building using autonomous robots.** Led by Zhengbo Zou, Department of Civil Engineering; Bryan Archibald, Manager of Maintenance Planning in Facilities, Building Operations.
- **Mind in Motion.** Developing a exercise referral pathway for students seeking help for depression. Led by Dr. Guy Faulkner, School of Kinesiology; Dr. Lauren McBride, Ed.D., Associate Director, Clinical Services; Dr. Madelaine Gierc, Postdoctoral Fellow, School of Kinesiology.
- **Indigenous Campus Living Laboratory at x̓w̓ičəsəm Garden.** Led by Dr. Eduardo Jovel and Dr. Tabitha Martens, Faculty of Land and Food Systems; Dr. Margaret Moss, Director, First Nations House of Learning.
- **Campus Trees, Microbes and Insects (CTMAIN).** A database for understanding how tree traits mitigate climate change and enhance biodiversity. Led by Dr. Michelle Tseng, Department of Botany; Dr. Tara Moreau, Associate Director of Sustainability and Community Programs, UBC Botanical Garden.

UBC OKANAGAN

- **Integrating mental/behavioural health services with the UBCO Student Health Clinic.** A collaborative effort that aims to improve mental health care for students, where supervised student clinicians provide clinical psychology services. Led by Lesley Lutes, Department of Psychology; Dale Mullings, Associate Vice-President Students.
- **Addressing the sustainability of concrete structures.** A project to extract cores from aging structures for analysis and for use in developing rehabilitation techniques to extend the concrete’s life. Led by Shahria Alam and Lisa Tobber, School of Engineering; Andrew Lawson and Andi Zahedi, Construction Management Office.





### Addressing the impacts of Canadian mining on communities in Africa

Mining provides mineral resources that are essential for the transition to a green economy. But how do we reach a balance between respect for community rights — especially Indigenous communities with ancestral links to the land — and the economic push for greater extraction of the minerals needed to support clean technology?

Dr. Sara Ghebremusse, Assistant Professor, Peter A Allard School of Law, focuses on the impacts of Canadian mining interests on communities in Africa.



“My parents are from East Africa. I was born and raised in Canada, but having those strong familial ties to East Africa always made me very interested in understanding the social, political, and economic conditions — not just in my parent’s homeland Eritrea, but across Sub-Saharan Africa because there are a lot of similarities,” explains Dr. Ghebremusse.

Members of local communities whose interests intersect with mining because they reside on resource-rich lands are often placed at a disadvantage in decision-making processes. “But if mining is going to proceed sustainably in Africa, it really cannot be done without the voices and concerns of local communities, regardless of how challenging that process can be to orchestrate,” says Dr. Ghebremusse.

Previous research by Dr. Ghebremusse focused on the issue of transparency in mining; particularly Canadian mining company payments to governments, and other elements of governance and regulation. Now Ghebremusse is investigating social sustainability issues, such as human rights violations arising from mining activities (e.g., violence against members of the community), and the displacement of local people.

“We have similar issues in Canada when we think about resource extraction especially in Indigenous territories, with very little to no consideration of the interests of the Indigenous peoples whose territories this extraction is going to take place in. And that is something that has very much shaped Crown and Indigenous relations in B.C.,” she added.

Future research by Dr. Ghebremusse and others will inform the development of consistent governance norms to ensure that the presence and activities of Canadian mining companies are meeting their own sustainability objectives.





### Micropollutants transformed into bioenergy products

In response to the Province’s CleanBC energy plan for reducing greenhouse emissions and meeting renewable energy requirements, industries and municipalities are seeking new waste-to-energy solutions.

Dr. Cigdem Eskicioglu, Professor and Natural Sciences and Engineering Research Council of Canada/Metro Vancouver Industrial Research Chair in the School of Engineering, is supporting this transition through research that focuses on anaerobic digestion, utilizing microorganisms to turn organic waste and human-created pollutants into renewable bioenergy products like methane and organic fertilizer. Dr. Eskicioglu also works to identify and remove emerging micropollutants like hormones, pharmaceuticals, and pesticides.

“Since most of the conventional wastewater treatment plans are not able to efficiently remove micropollutants, I believe that advanced treatment processes designed to target these micropollutants are urgently needed,” says Eskicioglu. To meet this demand, her research group operates three facilities: the Advanced Anaerobic Digestion Facility; the Particle Sizing, Zeta Potential and Imaging Facility; and the Micropollutant Detection Facility.

To date, Dr. Eskicioglu’s research group have conducted extensive bench-scale anaerobic digester testing programs for conversion of the City of Kelowna and Regional District of Central Okanagan’s municipal biosolids to biogas and fertilizer.

Results so far demonstrate the potential for transforming wastewater facilities into product factories, minimizing waste, creating carbon credits, and leading a new circular economy.



### Transboundary Water Governance in the Columbia River Basin

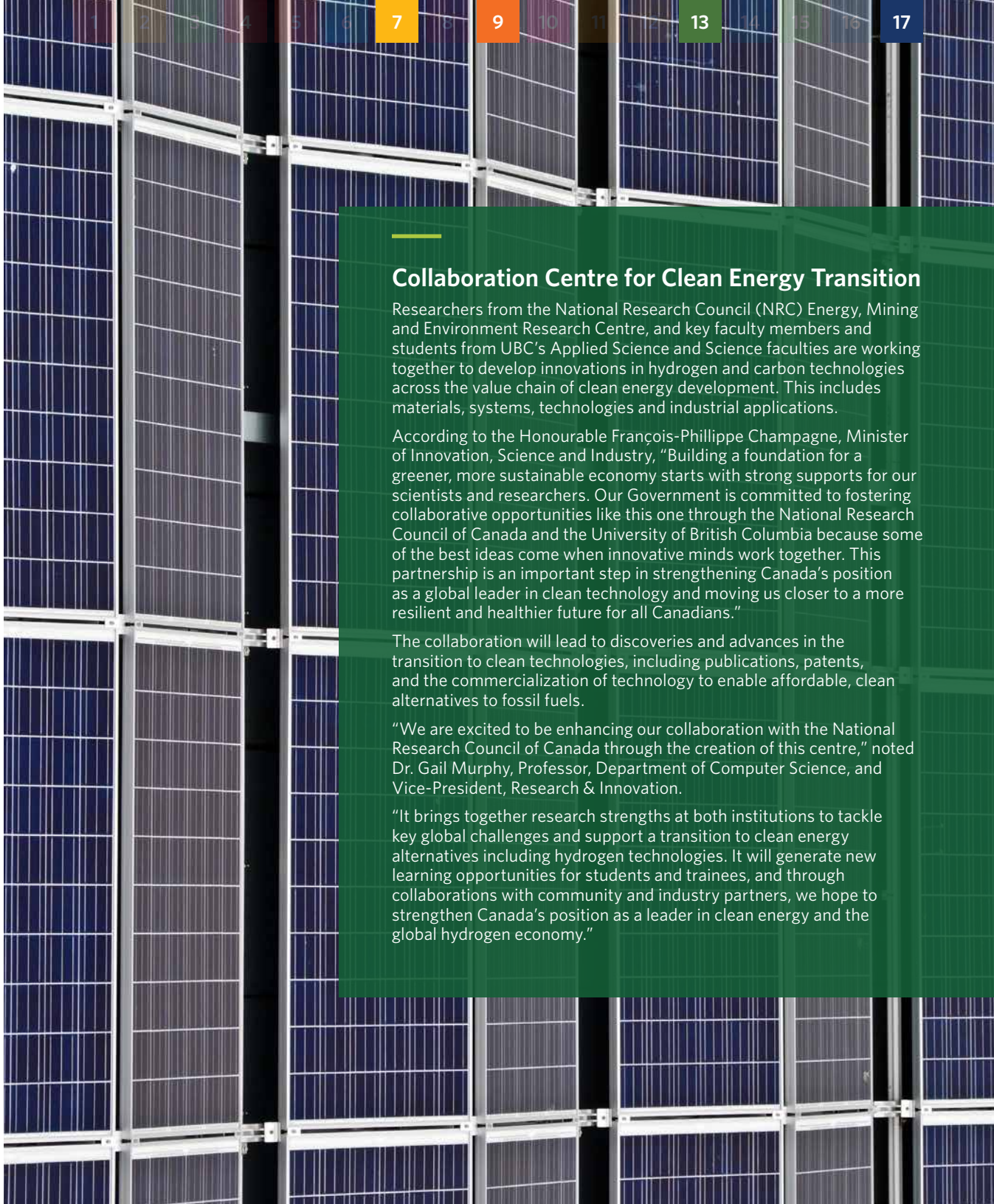
Canada and the United States are currently in the process of renegotiating the Columbia River Treaty, an agreement implemented in 1964 that led to the construction of three dams in British Columbia.

Through his research, Dr. John Wagner, Professor of anthropology in the Department of Community, Culture and Global Studies, is challenging conventional wisdom — that the treaty is only concerned with hydropower and flood control — and focusing instead on the irrigation benefits of the treaty for Washington State agriculture.

Wagner has proposed a “reframing” of our understanding of the treaty so that its history as an instrument of settler colonialism and agricultural development can be more fully understood. The implications of this reframing are enormous, since treaty waters are being used to support forms of industrial agriculture in the US that are now understood to be among the most impactful drivers of climate change in the region.

Wagner is also focusing his attention on both Indigenous and settler food sovereignty movements on both sides of the border, in order to assess the extent to which such movements provide a more sustainable food system model for the region as a whole.

Ideally, greater recognition of the food system and climate change implications of the treaty by negotiators and the general public, will lead to a more comprehensive and sustainable agreement, and one that is supportive of the calls to action of the Truth and Reconciliation Commission of Canada, and the United Nations Declaration on the Rights of Indigenous Peoples.



### Collaboration Centre for Clean Energy Transition

Researchers from the National Research Council (NRC) Energy, Mining and Environment Research Centre, and key faculty members and students from UBC’s Applied Science and Science faculties are working together to develop innovations in hydrogen and carbon technologies across the value chain of clean energy development. This includes materials, systems, technologies and industrial applications.

According to the Honourable François-Phillippe Champagne, Minister of Innovation, Science and Industry, “Building a foundation for a greener, more sustainable economy starts with strong supports for our scientists and researchers. Our Government is committed to fostering collaborative opportunities like this one through the National Research Council of Canada and the University of British Columbia because some of the best ideas come when innovative minds work together. This partnership is an important step in strengthening Canada’s position as a global leader in clean technology and moving us closer to a more resilient and healthier future for all Canadians.”

The collaboration will lead to discoveries and advances in the transition to clean technologies, including publications, patents, and the commercialization of technology to enable affordable, clean alternatives to fossil fuels.

“We are excited to be enhancing our collaboration with the National Research Council of Canada through the creation of this centre,” noted Dr. Gail Murphy, Professor, Department of Computer Science, and Vice-President, Research & Innovation.

“It brings together research strengths at both institutions to tackle key global challenges and support a transition to clean energy alternatives including hydrogen technologies. It will generate new learning opportunities for students and trainees, and through collaborations with community and industry partners, we hope to strengthen Canada’s position as a leader in clean energy and the global hydrogen economy.”





## Urban Climate Justice from Below

Climate change is causing extreme weather events worldwide, but market-oriented solutions often fail to support the communities most impacted. As a result, historically marginalized communities — already grappling with vulnerabilities and lack of basic services — bear the brunt of climate impacts. In particular, urban areas in the Global South are becoming hotspots where the climate crisis is exacerbating existing inequalities in urban social, political, and economic dimensions.

The collaborative research group, ‘Urban Climate Justice from Below’, led by Dr. Paroma Wagle, Postdoctoral Research Fellow, Department of Geography, is gathering and amplifying insights from grassroots and city-level activists across the Global South. This research seeks to add an important historical and social justice component to existing discussions on climate change, while supporting actions that build more just urban living conditions for all.

Social justice movements in cities across the Global South have already begun to develop frameworks and models to address urban inequalities and shape the vision of more just cities. By studying current social justice movements, Urban Climate Justice from Below aims to learn more about the links between urban inequalities and the effects of climate change. These insights will help inform greater understanding of the origins, persistence, and underlying power dynamics of these inequalities.

By working directly with climate activists in a variety of cities in the Global South, researchers are learning more about their common demands, agendas, and actions towards ensuring equity and justice in the face of imminent climate change impacts. And critically, more about what contributions activists expect from the academic community to help create just and inclusive cities.

Negros Occidental, Philippines by Amber Heckelman

## UBC Sociology Environment and Community Research Stream

A central concern with land use often involves both environmental issues and notions of community.

Members of the Environment & Community cluster contribute to an understanding of the relationships between built and human communities within natural environments. While the cluster maintains a core focus on environment and community, scholars in this area use their expertise to study a range of subjects including civic engagement in climate action and other social movements, the relationship between land use, community, and policymaking in urban centres, and the nature of human-environment relationships.

In one example, Dr. David Tindall studies contention over environmental issues, including topics such as forestry, wilderness preservation, fisheries, and climate change. A major focus of his research has been the environmental movement in British Columbia, and Canada, and in this context, the interrelationships between social networks, movement identification, and participation. His research has focused on various aspects of environmentalism including, values, attitudes, opinions, activism and conservation behavior, media coverage of environmental issues, gender issues, and social networks and environmentalism.

Dr. Tindall’s current research, funded by the Social Sciences and Humanities Research Council of Canada, focuses on sociological aspects of contention over climate change in Canada, including perceptions about climate change, views about climate justice, and social processes affecting policies for dealing with climate change, and media coverage of climate change issues.



## Zoology professor awarded Royal Swedish Academy of Sciences’ Crafoord Prize

Professor Dolph Schluter’s research focuses on stickleback species pairs — two closely related but distinct species living in the same lake. These pairs consist of benthic (lake bottom) and limnetic (water column) species, and they are found only in the coastal lakes of southwestern British Columbia. The three-spine sticklebacks exhibit remarkable diversity due to their evolution from marine fish to freshwater species after the last ice age, making them among the youngest species on Earth.



Dr. Schluter conducts his research in a unique research facility on UBC Vancouver’s south campus, consisting of 20 outdoor ponds where he experiments on sticklebacks imported from Texada Island, BC.

Together with his team, Dr. Schluter investigates traits and genetic variations that contribute to sticklebacks’ survival and reproductive success. They study how natural selection influences the development of advantageous traits in response to predators and changing environments. They also examine the origin and persistence of species, focusing on ecological selection and reinforcement in different environments. Additionally, they collaborate with international researchers to explore the genetic basis of species differences.

Dr. Schluter is deeply concerned about the rapid extinction of species, including the stickleback species pairs he studies. Several of these species are listed under the federal Species at Risk Act, with two pairs already extinct due to competition from introduced species. Climate change poses an additional threat, as rising lake temperatures may further impact the fish, although much remains unknown.

Looking ahead, Dr. Schluter plans to conduct more research in Enos Lake on Vancouver Island, where he will study the stickleback population prior to the invasion of crayfish. By extracting sediment cores containing 10,000-year-old stickleback spines, he aims to gain insights into their evolutionary history and adaptation from saltwater to freshwater environments.

This year Dr. Schluter was awarded the Royal Swedish Academy of Sciences’ Crafoord Prize for his work on adaptive radiation and ecological speciation. His research on sticklebacks contributes to our understanding of evolutionary biology and the ecological mechanisms driving evolution. While revolutionizing the field, he also finds joy in his career, describing it as “pretty marvelous.”



### Examining wildlife conservation in South Africa

Launched in early 2023, the Faculty of Forestry’s new field school program in Africa takes students into the heart of the savanna biome to work with, and learn from, rural community members — offering insights into innovative forms of community-based natural resource management emerging in South Africa.

The field program, led by Dr. David Bunn, Professor, and Dr. Melissa McHale, Associate Professor, Department of Forest Resources Management, offers a unique opportunity for students to experience firsthand a variety of decolonized conservation management models.



Throughout the program, students engage in a community-conservation project on tribal land returned via post-apartheid land claims processes; assist a community-managed ecotourism and research base; and work alongside anti-poaching teams comprised of unarmed black women in private reserves. A highlight of the program is a week of fieldwork in the villages of Hamakuya, where students collaborate with a dedicated team of African environmentalists associated with the Tshulu Trust, helping to support their resource management and ecotourism program.

Field school activities focus on the social-ecological issues facing communities living on the outskirts of Kruger National Park, one of the world’s most renowned game reserves. Flying into a research base in the southern part of the park, students spend time interacting with community leaders in Kruger’s southern border villages, exploring topics related to land use, land cover change, rewilding in the Greater Kruger National Park region, post-apartheid land restitution, rural resource harvesting, and human wildlife conflict.

Travelling in open safari vehicles, students are accompanied by South African National Parks scientists to examine some of the current challenges in wildlife management within Kruger, and develop a deeper understanding of the racial and economic complexities surrounding rhino poaching.

By engaging with local communities and fostering long-term partnerships, the field program aims to provide students with a holistic understanding of historical and modern wildlife conservation, while supporting and contributing to more inclusive and sustainable community-based natural resource management in Africa.





### Integrating a collaborative design approach into community forest management

In this interdisciplinary studio project, UBC School of Architecture and Landscape Architecture and Faculty of Forestry students collaborated with the remote coastal community of Bamfield, BC, to design, develop and construct new public infrastructure using timber harvested from a local community forest.

Located on the west coast of Vancouver Island, Bamfield is a small coastal community originally inhabited by Huu-ay-aht First Nations, who remain an integral presence in the community. Student teams used collaborative design methods integrated with sustainable forest management ideas to develop a design vision for new kayak and canoe storage facilities, and an elevated boardwalk through a fragile bog ecosystem.

The proposed trails and boat storage facilities will improve access for local community members and visitors alike to the unique ecosystems of the coastal fog zone, including the Broken Group Islands, a popular sea kayaking destination, and the West Coast Trail, whose northern terminus is in Bamfield.

The boathouse and elevated boardwalk were constructed from timber sustainably harvested from the Bamfield Huu-ay-aht Community Forest, a 365 hectare preserve located adjacent to the town.

The innovative hands-on pedagogical approach created reciprocal relationships between forestry practices and design of a local project, reframing the relationship of architectural materials to the forest ecologies from which they are harvested, while training architects and foresters to use sustainably harvested resources to build social and environmental equity.



### Nun ke’ Daahwéhsats (Dancing with the Land)

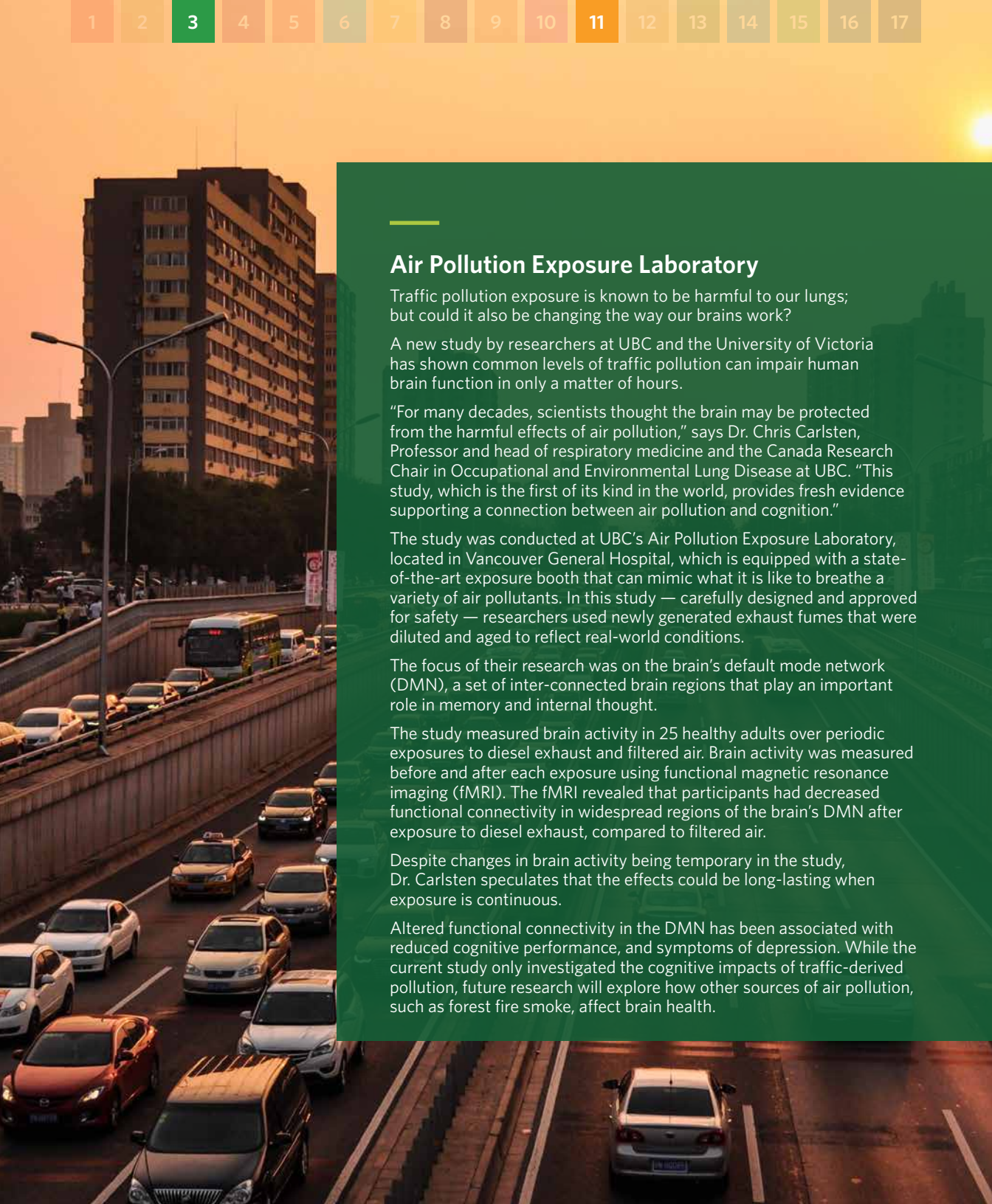
Dunne-za (Beaver people), the ancestors of West Moberly First Nations (WMFN), have successfully navigated climatic and ecosystem changes for the past 15,000 years. But colonial systems have significantly increased the pace and scale of change and WMFN are now confronted with rapid, human-driven climate change that may result in further losses to their Indigenous way of life.

Dancing with the Land is a research partnership between WMFN, Geography Professor Dr. Jessica Dempsey, and PhD student Audrey Irvine-Broque, to advance meaningful and consequential relationship-building, knowledge exchange and research planning around climate change impacts and policies.

In January 2023, the Centre for Climate Justice and WMFN held a workshop that brought together 14 faculty members with WMFN Chief Roland Willson and two members of the WMFN Lands Department in order to begin the process of creating a cooperative climate research agenda (CCRA). The workshop was supported by a CUES grant and a Chapman grant.

The workshop took steps towards addressing key knowledge gaps that have prevented WMFN from factoring climate impacts into decision-making, environmental planning and land management, and in government-to-government consultation processes pertaining to land uses and activities that contribute to, or intensify, the impacts of climate change.

Through ongoing community feedback and revision, the CCRA will inform the establishment of collaborative climate and ecosystem research in WMFN territories.



### Air Pollution Exposure Laboratory

Traffic pollution exposure is known to be harmful to our lungs; but could it also be changing the way our brains work?

A new study by researchers at UBC and the University of Victoria has shown common levels of traffic pollution can impair human brain function in only a matter of hours.

“For many decades, scientists thought the brain may be protected from the harmful effects of air pollution,” says Dr. Chris Carlsten, Professor and head of respiratory medicine and the Canada Research Chair in Occupational and Environmental Lung Disease at UBC. “This study, which is the first of its kind in the world, provides fresh evidence supporting a connection between air pollution and cognition.”

The study was conducted at UBC’s Air Pollution Exposure Laboratory, located in Vancouver General Hospital, which is equipped with a state-of-the-art exposure booth that can mimic what it is like to breathe a variety of air pollutants. In this study — carefully designed and approved for safety — researchers used newly generated exhaust fumes that were diluted and aged to reflect real-world conditions.

The focus of their research was on the brain’s default mode network (DMN), a set of inter-connected brain regions that play an important role in memory and internal thought.

The study measured brain activity in 25 healthy adults over periodic exposures to diesel exhaust and filtered air. Brain activity was measured before and after each exposure using functional magnetic resonance imaging (fMRI). The fMRI revealed that participants had decreased functional connectivity in widespread regions of the brain’s DMN after exposure to diesel exhaust, compared to filtered air.

Despite changes in brain activity being temporary in the study, Dr. Carlsten speculates that the effects could be long-lasting when exposure is continuous.

Altered functional connectivity in the DMN has been associated with reduced cognitive performance, and symptoms of depression. While the current study only investigated the cognitive impacts of traffic-derived pollution, future research will explore how other sources of air pollution, such as forest fire smoke, affect brain health.





## Interdisciplinary research cluster tackles plastic pollution

In Canada, 79% of plastics are dumped in landfills or natural settings, creating huge social and environmental problems. It's a problem UBC Okanagan's Dr. Mohammad Arjmand wants to help address with the help of varied expertise and state-of-the-art plastic processing equipment available at UBC.

"I've been working with mostly virgin plastic in my research for almost 15 years," explains the School of Engineering Assistant Professor and Canada Research Chair (Tier 2) in Advanced Materials and Polymer Engineering. "I wondered, could I do the same research with recycled plastic?"

UBC Okanagan's Plastics Recycling Research Cluster brings together a multi-disciplinary team of researchers from the Materials and Manufacturing Research Institute (MMRI) with industry partners and government authorities to better understand and address the issue of plastic waste from different aspects. For example, while Dr. Arjmand's engineering team is working to give plastics a second life by melting, reshaping and repurposing them, Dr. Aleksandra Dulic, Faculty of Creative and Critical Studies, is designing exhibitions to highlight the challenge of plastic waste and the initiatives UBC is taking to address the issue. At the same time, Dr. Grace Fan, Faculty of Management, is working with provincial and federal governments to hold plastic producers responsible for lifecycle plastic pollution.

A number of Indigenous communities have also partnered with the researchers, providing bio-based materials from forests on their lands to help explore what happens when natural materials are added to plastic waste. The partnerships help explore the problem of plastic waste while finding a solution for biowaste in the wilderness at the same time. The project also involves hosting Indigenous high school and undergraduate students for one week in the lab to give hands-on experience to local youth.

Dr. Arjmand is confident that the research cluster's work will positively impact the world of plastic recycling.

"This is a niche area for UBC Okanagan. I know we can play a pivotal role in reducing plastic waste to our landfills through some creative thinking and teamwork. It's time to go beyond the boundaries of the university and impact British Columbia, Canada and the world."



## Eliminating toxic chemicals from our water supply

'Forever chemicals' — also known as per- and polyfluoroalkyl substances or PFAS for short — do not break down with time and remain as harmful toxins that can enter drinking water reservoirs. Industrial use of long chain PFAS (containing more than nine carbon atoms) stopped in 2015. However, short chain PFAS (containing less than eight carbons) are still detrimental to human health and difficult to remove from drinking water with conventional methods.

"In many cases, people throw [water filters] in the garbage and it finds its way into the landfill. Even in industry, they do that as well. So once the carbon is saturated, they often send it to the landfill. This way we don't eliminate the problem. So, the PFAS are taken out of the water but then put in the landfill and over time that also leaches out again back to the groundwater," explains Dr. Madjid Mohseni, Professor, Chemical and Biological Engineering in the Faculty of Applied Science.

To remove PFAS from the water supply, UBC researchers are using a new absorbant material that is capable of trapping PFAS, prior to removing and destroying them using electrochemical and photochemical techniques. This new technology will be used by municipalities in order to improve the quality of drinking water, and to ensure industry stops polluting the waterways with PFAS that can be also harmful to marine life.



## #WiRELab investigating white-tailed deer population affects on caribou

Doctoral student Melanie Dickie is exploring how human land use and climate intersect to influence the abundance of white-tailed deer, under the supervision of Dr. Adam Ford, Associate Professor, Department of Biology, in the Wildlife Restoration Ecology Lab (WiRE Lab).

White-tailed deer are expanding deeper into caribou range where they were previously less abundant, and now act as a food source that strengthens the population of caribou predators including wolves. Dickie's research explores questions of what management interventions are available, how effective they are, and how they might be prioritized across the landscape to make the biggest impact for caribou.

"Doing my PhD at UBC Okanagan has given me the room to push my research further," says Dickie. "I can research questions [based] in broader ecological theory that can be used by decision makers."

Dickie's passion for preserving and restoring ecosystems in Canada's north stemmed from fieldwork she undertook in Nunavut during her undergraduate degree, followed by a position at local non-profit Alberta Biodiversity Monitoring Institute (ABMI).

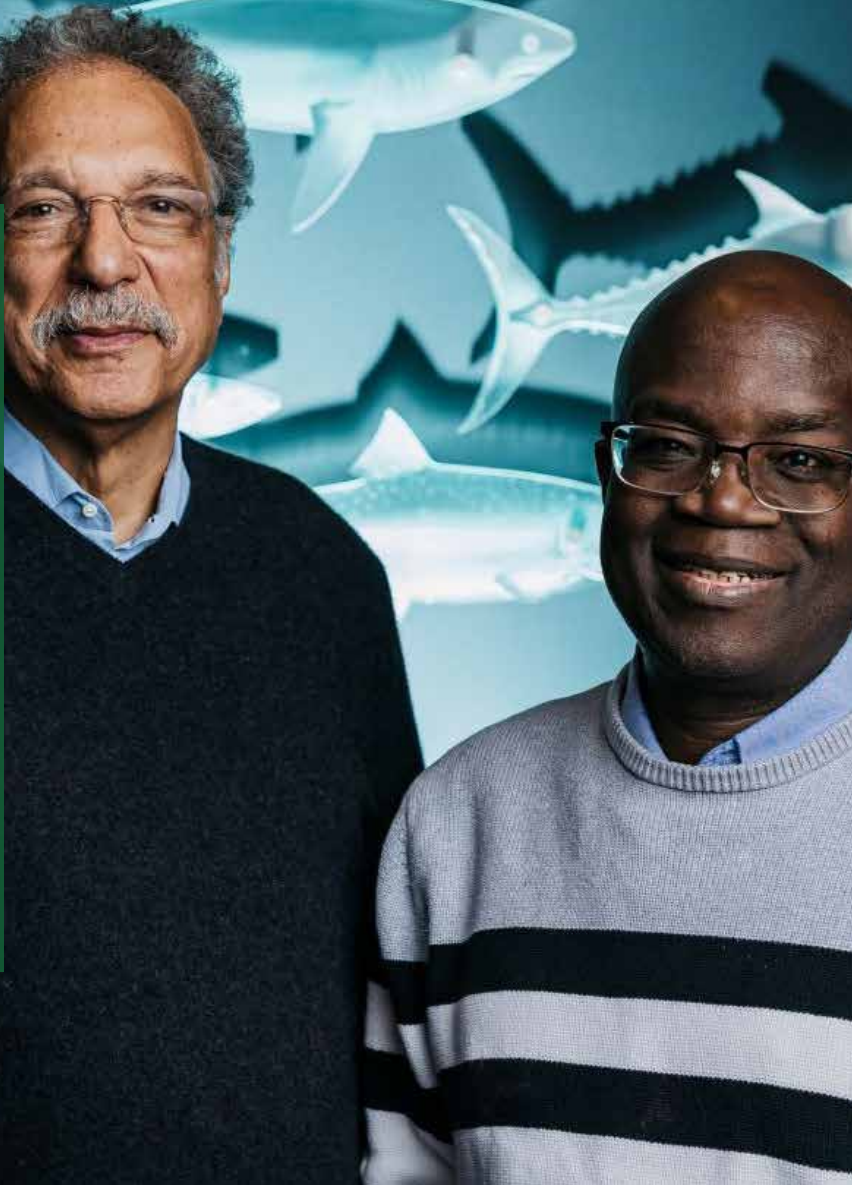
Following completion of her doctorate, Dickie plans to work alongside academics, government and Indigenous communities for decades to come, continuing to reduce society's effect on natural systems.



# Overfishing research wins 2023 Tyler Prize for Environmental Achievement

Two UBC ocean fisheries experts — marine biologist Dr. Daniel Pauly and fisheries economist Dr. Rashid Sumaila — have been awarded the 2023 Tyler Prize for Environmental Achievement, an award described as the ‘Nobel Prize for the Environment’.

Dr. Pauly and Dr. Sumaila are University Killam Professors and long-time colleagues at the UBC Institute for the Oceans and Fisheries. Winning this prize, they say, gives them an opportunity to spread an urgent and evidence-based message: all fishing on the high seas should be banned.



“Creating no-take marine reserves is something we must do. Banning fishing in the high seas, which is the area outside the 200-nautical-mile zones of maritime countries, will create a critically-needed ‘fish bank’ for the world,” said Sumaila, who is the Canada Research Chair in Interdisciplinary Ocean and Fisheries Economics, and holds a joint appointment at UBC’s School of Public Policy and Global Affairs.

“If we don’t stop overfishing, we will lose marine stocks essential for food security and biodiversity, and the ocean’s ability to effectively regulate global temperatures,” added Pauly, who is the Founder and Principal Investigator of the UBC research initiative Sea Around Us.

Dr. Pauly and Dr. Sumaila have published extensively on the ecological and economic effects of overfishing on the high seas, arguing that a high seas fishing ban is one of the most effective methods for reversing the damage caused by decades of unsustainable overfishing. Their modeling demonstrates that closing the high seas would result in no loss in total global catch, but rather more equitable distribution of fish resources. Pauly explains that most commercially fished species frequently move back and forth between the high seas and coastal areas, allowing for these fish to be caught in a country’s exclusive economic zone (EEZ) without the need to enter the high seas.

Dr. Pauly has also worked on helping the public visualize the decline of global fish stocks through The Sea Around Us research initiative and the global species database FishBase.

Support for a high seas fishing ban continues to grow; but Dr. Sumaila suggests we must move faster. “Overfishing increases global emergencies such as climate change, biodiversity loss and food insecurity — particularly for already vulnerable communities, such as Indigenous Peoples and populations in the Global South.”

By pioneering analytical approaches and knowledge platforms to assess the global state of world fisheries, Dr. Pauly and Dr. Sumaila are challenging traditional approaches to marine governance, and hope to catalyze action across the globe towards sustainable management of ocean fisheries.





### Learning to Coexist with Urban Wildlife

When campus activity came to a halt during the pandemic, UBC’s urban wildlife found greater freedom to move around campus. Now that students, faculty, and staff are back, research is helping establish safe and respectful boundaries with urban wildlife.

“Coyotes are naturally timid,” says Dr. Kristen Walker, Assistant Professor of Teaching, Faculty of Land and Food Systems. “But the human-coyote boundary gets blurred when we try to feed and interact with them.” Walker partners with organizations in Vancouver to produce collaborative research that aims to identify humane deterrents and reduce conflicts with urban coyotes.

On the UBC Vancouver campus, Dr. Walker monitors urban wildlife through a camera trap program. A focus of her team’s monitoring efforts has been on a young injured coyote nicknamed Kip. In November 2020, Kip was presumably injured from a car accident, suffering a back leg injury. Kip’s unique gait has sparked the interest of many curious onlookers on campus — unfortunately, this has included reports of individuals feeding Kip and approaching too closely to take pictures. These actions teach coyotes and other wildlife to be less fearful of humans, which can be dangerous for everyone involved.

Dr. Walker also works closely with the Stanley Park Ecology Society’s ‘Co-existing with Coyotes’ program to track coyotes in the Greater Vancouver area. With greater public awareness around coyotes and other urban wildlife, Dr. Walker is optimistic that we can learn to better co-exist and respect the animals in our shared city spaces.



### Enabling agency, efficacy, and self-regulated learning through virtual ecological inquiry

Dr. Jillianne Code, Assistant Professor, Department of Curriculum and Pedagogy, is a researcher and educator specializing in learner agency, online learning technologies, and the impact of social media on student success and wellbeing.

Facilitating authentic problem solving and scientific inquiry through environments similar to video games has shown considerable promise in the assessment literature. Something that environmental and climate change advocates are keen to understand and better harness.

Dr. Code’s Agency for Learning in Immersive and Virtual Environments (ALIVE) research project examines specifically how game-based assessments enable agency, self-efficacy, and self-regulated learning. Using evidence-centred game design, the ALIVE environment provides adaptable feedback, encouraging self-regulation as students engage in an ecological climate inquiry.

Outcomes from this research, funded by the Social Sciences and Humanities Research Council and the Canadian Institutes of Health Research, will provide further understanding of what game design conditions enable agency, and how different modes of agent-based gameplay impact learning.



### Research-based software advances net zero egg farming

Despite having relatively low greenhouse gas (GHG) emissions compared to other animal protein sources, egg production is among the fastest-growing livestock sectors, and hence faces mounting pressure to reduce potential climate impacts.

For Dr. Nathan Pelletier, Associate Professor of Biology, Faculty of Management at UBC Okanagan, this challenge is the focus of a renewed Canada Industrial Research Chair in Sustainability supported by the Natural Sciences and Engineering Research Council, and the Egg Farmers of Canada (EFC).

“The overarching theme of my collaborative research is the development of a strategy that will enable the Canadian egg industry to achieve net zero greenhouse gas emissions status by 2050,” notes Dr. Pelletier. “The key knowledge translation and transfer mechanism for research from my lab is the National Environmental Sustainability and Technology Tool (NESTT) that was collaboratively developed by my team, EFC, and the software company Mirego.”

NESTT is a farm-level sustainability assessment platform that enables Canadian egg farmers to benchmark their operations compared to national and regional average performance levels for a variety of resource efficiency and environmental metrics (including carbon footprints), and to assess the potential efficacy of adopting farm-appropriate green technologies in reducing their impacts.

The outlook is positive. A recent review of research by Dr. Pelletier’s team indicates that the widespread implementation of market-ready options promoted within NESTT could reduce Scope 1 and 2 emissions to zero in the short to medium term, while Scope 3 emissions could be reduced between 23 and 95% without offsetting. These represent potential GHG reductions that — if realized — mirror the urgent demands of the climate crisis.



## Exploring the public acceptability of direct air capture

What do people think about some of the new technologies that might be used to address climate change? What attributes might influence broad social, scientific and government support?

The focus of new research is ‘Solid Carbon’ — an ambitious project funded by the Pacific Institute for Climate Solutions, which aims to draw carbon from the atmosphere and inject it into sub-sea floor basalt, where it will ‘mineralize’ or turn to solid rock over time.

Dr. Terre Satterfield, Professor of Culture, Risk and the Environment at UBC’s Institute for Resources, Environment and Sustainability explains, “We really had no idea what kind of thinking or perceptual landscape existed for these technologies. Is the purpose [reduced atmospheric CO2] really key for people, or is the technology itself the focus in certain ways and what kind of ways? That’s the essence of our investigation.”

In their analyses of data from a representative survey of residents of B.C. and Washington state, Dr. Satterfield and her colleague Dr. Sara Nawaz dug into perceptions of carbon removal technologies as influenced by people’s sense of climate urgency, beliefs about the marine environment, and ideas about our responsibility for natural systems.

The researchers explored the relationship between these views and people’s comfort with various technologies, including Solid Carbon, which proposes offshore direct air carbon capture and storage, as well as coastal restoration and ocean fertilization (adding nutrients like iron to the ocean to increase photosynthetic activity and concomitantly remove carbon dioxide from the atmosphere).

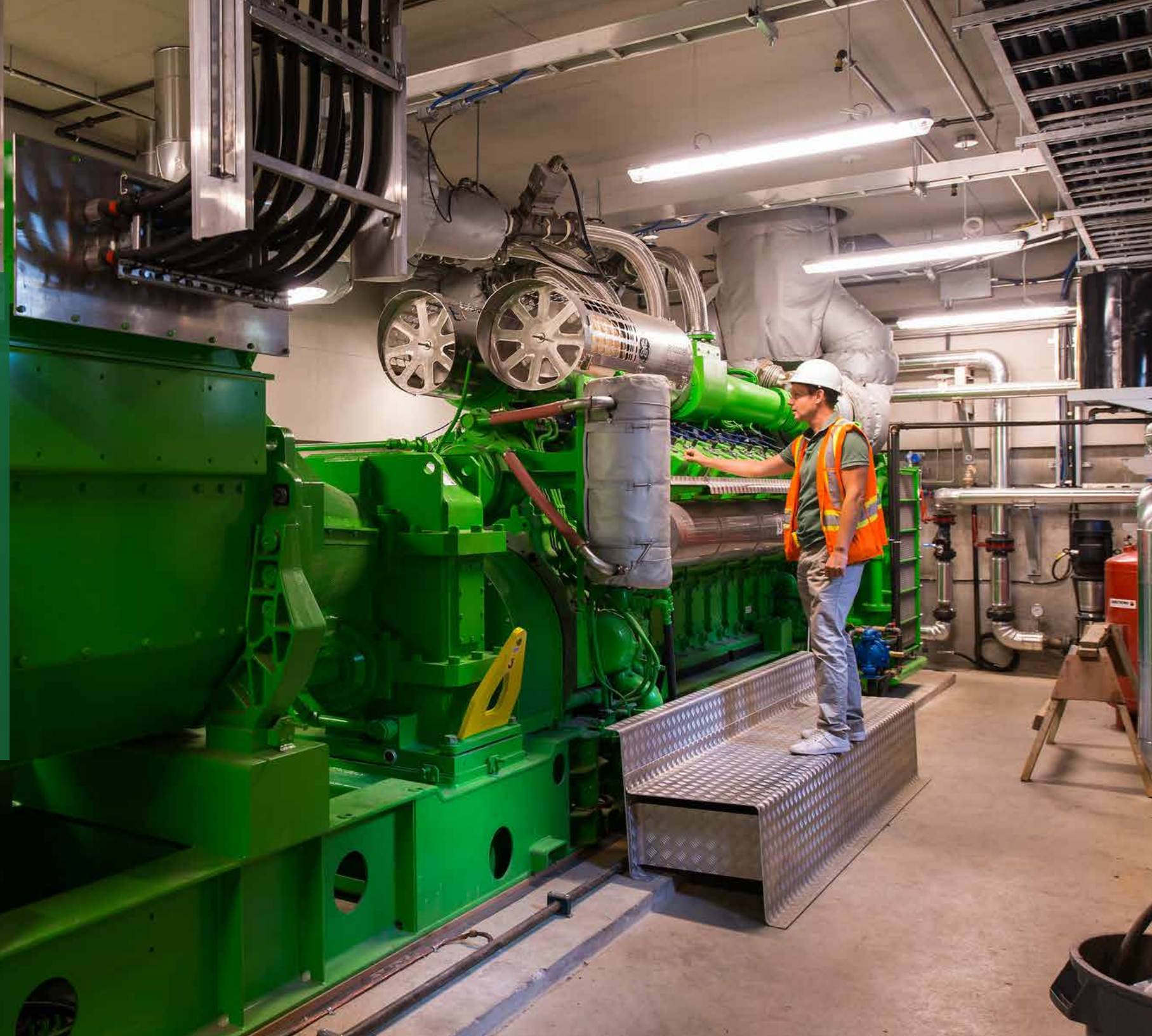
Dr. Satterfield concludes: “Things are shifting quickly as people continue to live with extreme weather events... We’re seeing in the [academic] literature in general an increased tolerance for getting on to trying new things that might not have been acceptable 10 years ago or five years ago.”

Research will continue on Vancouver Island with First Nations and environmental groups to explore more deeply people’s thinking about negative emissions technologies.



# Operations and Infrastructure

As a large, research-intensive university, with considerable land, assets and utilities in Vancouver and the Okanagan, UBC is in a unique position to use our campuses as test beds for sustainability. Our goals are to enhance the efficiency of our operations, improve environmental performance, and achieve cost savings, while leveraging our campus infrastructure and built environment to demonstrate innovative sustainability solutions at a municipal scale.





## Energy and Emissions

UBC’s Vancouver campus now produces 40% fewer GHG emissions than it did in 2007, while our institutional floorspace increased by 27% during the same period. At UBC’s Okanagan campus, a focus on sustainable buildings and low carbon energy supply has achieved a 15% reduction in absolute GHG emissions vs. 2013, simultaneous with a 23% rise in floorspace.

### UBC VANCOUVER

**Biomass energy expansion supports Climate Action Plan 2030 »** Accelerated goals to achieve an 85% reduction of operational emissions by 2030 mean UBC has expanded our Bioenergy Research and Demonstration Facility. Currently the first project of this scale in North America capable of generating both clean heat and power using biomass (clean wood waste from construction, pruning, and wood-based manufacturing).

The expansion features a new boiler, which once fully commissioned will triple the capacity of the biomass plant and will provide two-thirds of the thermal power to the Academic District Energy System. The result will be an additional reduction of approximately 13,000 to 15,000 tCO<sub>2</sub>e each year, accounting for approximately 20-30% of Scope 1 and 2 Operational GHG emissions.

**Energy conservation group to offset future campus growth »** UBC’s Energy and Water Services department has ambitious goals to offset future campus growth by targeting 4 GWh of electrical and 20,000 GJ of thermal savings each year. These goals are supported by the Energy Conservation group and the Building Management Systems technologists who are striving to make UBC Vancouver one of the most energy efficient campuses in the world.

**Internal carbon price introduced »** UBC is one of the first universities in Canada to introduce an internal carbon price (\$250/tCO<sub>2</sub>e) to help guide investment decisions to reach ambitious carbon reduction targets.

This provides a mechanism to assess the total financial life-cycle costs and risks of climate change associated with carbon pollution, and to support making investments that are aligned with UBC’s Climate Emergency and Climate Action Plan 2030 commitments.

### UBC OKANAGAN

**Climate Action Plan (CAP) 2030 implementation underway »** The UBCO CAP 2030 establishes ambitious targets to achieve a 65% reduction of operational emissions, and a 45% reduction of extended emissions (associated with commuting, air travel, food and waste) by 2030. The Plan provides a clear pathway to meet our GHG reduction targets that aligns with the Paris Agreement target to limit global warming to 1.5°C. The Plan further supports the longer-term goal of achieving a net-positive performance in operational energy and carbon by 2050, established by the UBCO Whole Systems Infrastructure Plan (2016).

**Multi-year project to address CAP 2030 calls for equity in participation »** Curricular and Teaching Innovation Grant funding for Dr. Natalie Forssman and Dr. Astrida Neimanis is supporting, “Social and Digital Infrastructures for Place-Based Pedagogical Collaboration”. This project supports the UBC Okanagan Climate Action Plan’s demand for attention to equity in participation in relation to sustainability initiatives.

**Low Carbon Energy Strategy and Strategic Energy Management Plan reduce consumption »** Key plans to advance UBCO’s CAP 2030 energy and emission reduction goals include the Low Carbon Energy Strategy, which guides future low carbon district energy system development and investments, and the Strategic Energy Management Plan (SEMP), which provides a suite of demand-side management approaches. Projects implemented through the SEMP in 2022 are projected to reduce energy and emissions by 942,000 kWh, 4,000 GJ, and 210 tCO<sub>2</sub>e per year.

### FEATURE STORY

#### Heat recovery project at bioenergy plant to further reduce emissions

While UBC has already seen major successes with the biomass plant, the Energy & Water team has continued to identify opportunities for improvements at the facility. In 2021, the department started an ambitious plan to install a heat recovery system at the Bioenergy Research and Demonstration Facility (BRDF) to extract as much energy as possible.

The first phase, now under construction, involves the installation of two economizers: one in the exhaust airstream of the gasification system, and the other in the exhaust of the cogeneration engine. These two economizers alone will reduce annual consumption of natural gas by 18,000 GJ, and biomass by 1,000 tonnes. This first phase alone will reduce GHG emissions by almost 1,000 tCO<sub>2</sub>e per year, and has received an incentive of \$1 million from FortisBC.

The second phase of the plan requires construction of a new building behind the BRDF to house heat pumps — the first of their kind in Western Canada — using a next-generation ultra-low GWP (global warming potential) refrigerant. This additional investment is supported by funding from BC Hydro and the provincial government’s CleanBC fund.

Stage 2 is projected to create further annual savings expected to reach 33,000 GJ of natural gas and nearly 2,000 tonnes of biomass, reducing GHG emissions by a further 1,700 tCO<sub>2</sub>e per year.

VANCOUVER

40%

reduction in absolute GHG emissions since 2007

OKANAGAN

29%

lower emissions intensity vs. 2021 BC Campus benchmark

VANCOUVER

57%

reduction in GHG emissions per student since 2007

OKANAGAN

40%

reduction in GHG emissions per student since 2013





## Water

Climate change impacts related to water resources at UBC include increasing drought periods, heavy rainfall events, and potential disruptions to water supply due to emergencies. Multiple departments across both campuses are collaborating to address these issues through interdisciplinary research, innovative and efficient buildings and infrastructure design, and developing a roadmap for climate adaptation and resilience.

### UBC VANCOUVER

**Identifying and implementing water conservation opportunities »** Using data provided by UBC’s water metering and monitoring systems, buildings with higher water use are undergoing audits to identify and implement measures to reduce water consumption. This includes projects administered by the Green Labs program to test potential water and cost savings associated with replacing water-cooled condensing units in fume hoods with waterless, passively cooled units. The Green Labs program is also supporting departments to invest in water conservation measures via the Green Labs Fund and Sustainability Revolving Fund.

In addition to conservation in existing buildings, new buildings target water-efficient designs, using LEED and UBC REAP green building rating systems.

**Developing a new Integrated Rainwater Management Plan »** This year, scoping work was initiated for an update to a comprehensive Integrated Rainwater Management Plan (IRMP) which will identify new targets, actions and design guidelines for rainwater and stormwater management on campus. The plan will address a range of issues including climate change impacts including more intense and frequent rain storm events.

The future IRMP will explore opportunities to introduce innovative rain water management features that help enhance biodiversity, improve water quality through bio-

swales, and create opportunities for water harvesting to minimize the use of potable water for irrigation and toilet flushing.

This project is being closely coordinated with Campus Vision 2050 to ensure alignment and support for anticipated campus changes and growth. It is anticipated the new IRMP will be completed in 2024.

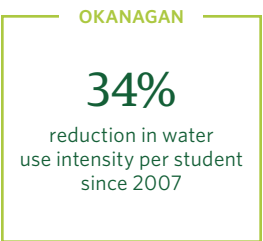
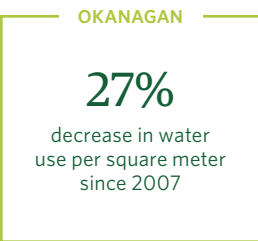
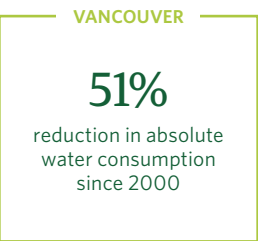
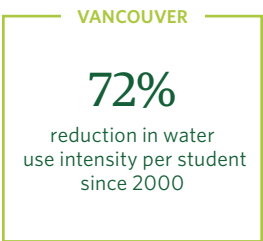
### UBC OKANAGAN

**Achieving 100% rainwater diversion »** Ongoing implementation of UBCO’s Integrated Rainwater Management Plan continues to divert 100% of the rainwater that falls on campus from municipal systems. The implementation of low impact development site strategies such as bioswales and raingardens, designed to account for climate change impacts up to 2070, enables the campus to effectively manage rainwater within the campus boundaries and prepare for climate change.

**Landscape and irrigation projects enhance water conservation and biodiversity »** UBC Okanagan continued to implement landscape and irrigation projects that enhance water conservation and ecological biodiversity.

These include the following ongoing projects:

- Leaf-mulching program in which autumn leaves are collected and shredded, then reapplied to landscape beds as a mulch to help hold moisture in the soil and suppress weeds
- Managing and removal of invasive species including the Siberian Elm and Myrtle Spurge
- Planting hardy, pest-resistant species of trees
- Initiating a “low mow” schedule for the greenspace by Reichwald Health Sciences Centre to reduce irrigation requirements, and to support pollinators by allowing vegetation to flower





## Waste and Materials

UBC Vancouver’s Climate Action Plan 2030 defined new targets — including a 50% reduction in waste disposal by 2030 vs. 2019. In the Okanagan, a closely aligned goal aims for a 50% reduction in waste (per capita) by 2030. Achieving these targets will require continued updating of infrastructure and operational processes, the commitment of the campus community, and collaboration with sustainable industry partners and government policymakers.

### UBC VANCOUVER

**Zero Waste Action Plan 2030 – towards a circular economy »** An updated Zero Waste Action Plan has been completed, with quick start actions already underway. The plan applies a circular economy lens to both reduce the waste and lifecycle GHG emissions associated with waste and materials in alignment with the Paris 1.5°C climate agreement.

**Weigh scale for waste data collection »** UBC Vancouver’s primary garbage collection truck was equipped with a weigh scale to measure the waste collected at each building, identifying the largest sources of waste generation on campus. A data management system currently in development will enable storage, analysis, and visualization, informing future actions to reduce and divert waste from landfill.

**Expansion of specialty waste recycling programs »** The Green Labs program continues to pilot and expand waste reduction and recycling opportunities, including specialty lab plastics, amber glass recycling, and disposable glove recycling. A new pilot project to test glove recycling for custodial workers is currently under development.

**Diverting washroom paper towels from landfill »** In a 10-month pilot project at the Life Sciences Centre, about 26,000 litres of washroom paper towels were successfully collected, diverted from landfill and sent for composting. Plans are currently underway to expand this approach to other buildings on campus.

**SEEDS student projects baseline food waste, enhance food security »** SEEDS projects targeted food waste including an assessment of pre-consumer food waste and emissions at Open Kitchen, as well as post-consumer food waste, establishing a baseline from which to measure future improvements in food waste diversion initiatives.

In addition, a pilot Campus Food Recovery Program — in partnership with UBC Food Services, UBC Sprouts Community Eats, and UBC Enactus (the SEEDER project) — diverted unused food from residence dining halls and redistributed it to promote food security. In total, 346 meals have been recovered since launch.

### UBC OKANAGAN

**Enhanced compost program expands into residences »** UBC Okanagan’s compost program successfully diverted 100 tonnes of organic material from landfill waste this year by expanding into traditional residence buildings, avoiding the release of 63 tCO<sub>2</sub>e emissions, and supporting a 13% improvement in waste diversion vs. 2010.

**PaperCutTM: Find-Me printing option reduces printing waste »** Ongoing use of the Find-Me printing option through the PaperCut™ software on all campus printers continues to reduce of unnecessary printing. In the last year 195,000 pages were submitted to be printed, but not released to print within the four-hour time period, saving GHG emissions of 877 kgCO<sub>2</sub>e.



### FEATURE STORY

#### New furniture program: reuse-it! UBC

UBC Vancouver has updated and relaunched a virtual online warehouse that allows employees to find and exchange low-value items (\$1,000 or less) between departments. Items can include furniture, office supplies, lab equipment, and more.

The reuse-it! program is designed to help departments save money, while helping UBC meet goals for zero waste and climate action.

Benefits include:

- Reduces unnecessary waste
- Lowers UBC’s GHG emissions
- Saves departments money
- Maximizes utilization of assets
- Reduces the number of items in storage

The program diverts surplus furniture from disposal, reducing waste-related emissions, and providing cost savings to departments.

This year, the program diverted 9,000 kg of surplus furniture, reducing associated life cycle greenhouse gas emissions by over 20 tonnes, and saving departments over \$150,000. Looking ahead, communications and marketing efforts are being prioritized to magnify the impact of the program. A pilot store is planned for 2023 on the Vancouver campus to sell low-cost furniture items.

reuse-it! is operated by UBC Financial Operations in collaboration with UBC Campus+Community Planning, Sustainability and Engineering unit, and Facilities Planning.



## Green Buildings

UBC buildings create an exceptional and sustainable environment for teaching, learning and research, and places to socialize, live and play. In Vancouver, our vision is that by 2035, our buildings will make net positive contributions to human and natural systems. In the Okanagan, our whole systems plan approach to energy efficiency, low carbon district energy, and climate adaptive design supports an equivalent goal to achieve a net positive performance in operational energy and carbon by 2050.

### UBC VANCOUVER

#### Reducing operational and embodied carbon »

Enhanced processes now require the calculation and reduction of embodied carbon — as well as operational emissions — for new academic buildings and major retrofits at UBC. For example, to meet reduction targets new projects are currently testing the use of a wood hybrid structure and low carbon concrete to reduce embodied carbon.

#### UBC Gateway targets Zero Carbon Building Standard »

In 2022, construction of the UBC Gateway building commenced. The project has four overall objectives: net zero carbon certification; creating a welcoming gateway to the campus; providing a focus on health; and wellbeing and collaboration with First Nations host. Construction has been designed to meet UBC's energy and emissions targets using a passive first approach, and the project is targeting both Zero Carbon Building Standard and LEED gold certification, including a 20% reduction in embodied carbon.

#### Jack Bell Building retrofit aiming for LEED Gold »

Design has started on a project to retrofit the four storey steel frame building with a seismic upgrade, envelope modernization, and building systems upgrades, while meeting requirements for office, classrooms, dry labs and lounge areas. In alignment with UBC's CAP2030, the project is targeting both Zero Carbon Building Standard certification as well as LEED gold certification.

**SEEDS students install bird strike sensors »** Extending on the success of UBC's Bird-Friendly Design Guidelines for Buildings, a group of SEEDS students from Electrical and Computer Engineering designed a multi-functional bird strike sensor. The first prototype installed monitors impacts on windows by caused by bird strikes, while also collecting valuable environmental data such as time, location, and temperature to promote energy efficiency and cost savings.

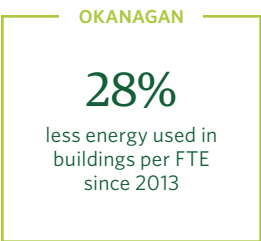
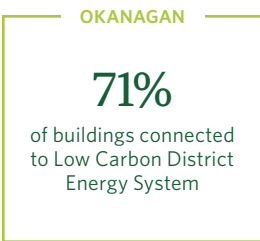
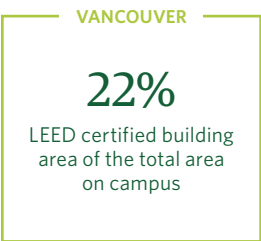
### UBC OKANAGAN

**ǂəl sic snpaǂnwiǂ\*tn »** The final building design integrates passive design principles with innovative measures to reduce operational energy and carbon emissions. Among its innovative design strategies, the project incorporates the longest earth tube system in Canada — one of the longest in the world to cool and heat air passively. It also incorporates a high-performance envelope, heat recovery chiller, and efficient lighting design. The building is projected to consume 63% less energy and emit 92% fewer emissions compared to a LEED® baseline facility.

**UBCO Downtown »** Project to expand UBC's presence in Kelowna, while actively working towards meeting LEED® Gold Certification and compliance with Step 3 of the BC Energy Step Code. Sustainability features integrated into the facility's final design include a solar wall system on the south façade, and an innovative "tanked" parkade design that minimizes impact on the surrounding soils and water table.

#### Plans and policies developed to support energy reduction »

- Initiated the development of a UBCO Green Building Plan to align with UBCO CAP 2030.
- Completed a Whole Building Lifecycle Analysis, including a 10% embodied carbon reduction target for ǂəl sic snpaǂnwiǂ\*tn.
- Added UBCO specific content to LEED v4.1 Implementation Guide.



### FEATURE STORY

#### Beaty Biodiversity Centre expansion features bird friendly design, pollinator garden

Since 2009, the museum has become an important landmark for the University and a one-of-a-kind natural sciences exhibition space. Now the Beaty Biodiversity Centre is rapidly expanding and hiring new faculty, launching new programs, and building new partnerships.

A proposed addition to the Beaty Biodiversity Centre, designed by Public Architecture, intends to expand on existing research capacity and add facilities that will increase the building's public appeal. The new project adds approximately 44,130 gross square feet to the existing floorspace — an academic facility designed by Patkau Architects — which in addition to administration and research functions, accommodates the Beaty Biodiversity Museum.

The design phase, completed in 2022, also included a special focus on exemplifying biodiversity design principles and enhancing biodiversity in the landscape, including features such as bird friendly building design, and a pollinator garden.

In addition to increased research space, the expansion will add a new museum storage facility that will enable the Beaty Biodiversity Centre to qualify as an official BC fossil repository — an authorized guardian of important heritage resources with scientific and educational value.



# Community

UBC is home to a growing community of people that live, work, learn and take part in everything that UBC has to offer. Each year, we design and deliver quality programming and events that leverage our world-class assets and public spaces. Our goal is to foster an inclusive and welcoming campus by sparking the imagination of our community members to join us.





# Campus Vision 2050: Shaping the future of UBC Vancouver

UBC has embarked on an ambitious, long-range plan for how the Vancouver campus will change and grow to support the needs of the university, its students, faculty, residents and staff, and Musqueam.

The plan is being developed as part of a comprehensive engagement process and will result in updates to key policies; UBC's Land Use Plan — which regulates campus development, and UBC's Housing Action Plan — to improve housing choice and affordability on campus, plus updates to the UBC Campus Plan and future Neighbourhood Plans.

## THE VISION

In 2050, UBC Vancouver is a unique combination of world class teaching, learning and research and thriving campus neighbourhoods — a resilient, climate-neutral, urban campus that embraces accessibility, inclusivity and meaningful reconciliation with Indigenous peoples, while celebrating and honouring its unique history and the land and ecosystem that support it.

The draft vision provides the capacity for the UBC Vancouver campus to change and grow in support of the needs and aspirations of the university, the community and Musqueam.

This includes:

- New academic spaces for teaching, learning, research and partnerships
- New and replacement student housing
- New neighbourhood housing, including rental and below-market rental for faculty and staff and for others who work on campus and support the community
- Comprehensive amenities, services and infrastructure to support the future population
- Green space and campus features that express the cultural values of Musqueam and enhance biodiversity and ecology, and infrastructure that supports climate resilience and adaptation

## COMMUNITY ENGAGEMENT

Over the past year and a half, students, faculty, residents and staff were deeply engaged in multiple stages of the visioning process — through more than 13,000 engagement touchpoints.

Input was gathered using a range of methods, including surveys and other interactive online tools, open houses, in-depth workshops, facilitated community conversations, pop-up information booths and discussions with various campus departments and groups. Feedback was also generated through targeted engagement with project advisory committees, faculty and technical experts, and key interest groups on campus.

The process included a tailored engagement process with Musqueam to understand needs and interests, and to build on the many Musqueam presence projects across campus.

Community input also helped shape the process itself, establish guiding principles, generate planning ideas and strategies, explore trade-offs and choices, and refine the final Vision.

## ENGAGEMENT HIGHLIGHTS

### How we reached people



Speaker Events



Pop-Up Booths



Surveys and Digital Tools



Workshops and Targeted Engagement<sup>1</sup>



Community Conversations



Roadshows



Walking Tours



Open Houses

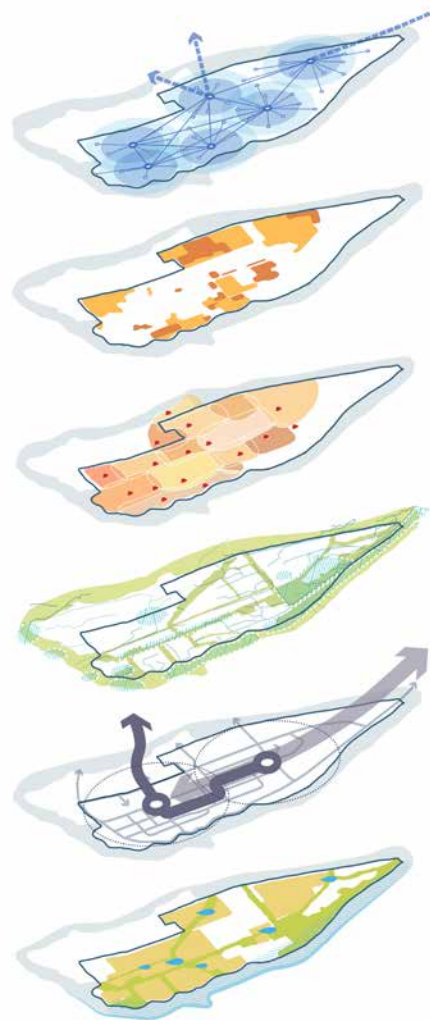
<sup>1</sup> Included Advisory Committee, Targeted Stakeholder and Technical Expert Meetings



# Six big ideas: A cross-cutting approach

The draft Vision is anchored around six big ideas. They are cross-cutting physical approaches to the campus that respond to university and community needs, advance the Campus Vision 2050 guiding principles, and reflect the unique qualities of UBC and its surrounding context.

The six big ideas provide cues as to the intention, general arrangement, amount and location of buildings, uses and spaces. Layered together, and supported by other foundational elements, they integrate and reinforce one another, and provide a campus-wide framework on which future, more detailed plans and policies will be developed.



## A Place of Learning

Flexible teaching, learning, research and partnership spaces that enhance and encourage creativity, collaboration and knowledge exchange, prioritizing Musqueam and Indigenous knowledge, and expanding Campus as a Living Lab.

## More Housing and Expanded Affordability for UBC

Significantly more on-campus and affordable housing options for the UBC community, prioritizing sustainability, livability, walkability and green space.

## A Community of Communities

A socially-connected, inclusive, accessible and sustainable campus comprised of distinct but connected communities that offer convenient access to daily needs and amenities.

## Restorative and Resilient Landscapes

An ecologically rich campus connected to its unique natural setting and reflecting a deep Musqueam presence and sense of welcome.

## Connected Campus

Drastically improved connectivity to the region through the extension of SkyTrain, and safe, convenient and efficient on-campus mobility.

## Climate Mitigation and Adaptation

A climate-resilient campus and a model for excellence and innovation in addressing the climate emergency, built on extensive student, faculty, staff and Musqueam expertise.



Cross-section illustrating sustainable land use strategies and transportation strategies



## Community Programs

UBC’s campuses and neighbourhoods are vibrant, sustainable, connected communities of students, faculty, staff, and residents — it is community members who help make UBC such an incredible place to live, work, and learn. Each year, we work with campus partners to design and deliver programs, events, and initiatives that leverage UBC’s world class cultural and recreational amenities and public spaces with the goal of sparking imagination, providing opportunities for community building, and fostering an inclusive and welcoming campus for all.

As community members returned to in-person learning and working this year, we continued to deliver programs, events, and other opportunities for connection, placemaking, and social vibrancy.

**Lee Square lights up the night for Climate Emergency Week »** A projection system that illuminates the campus around Money and Raymond M.C. Lee Square featured community-generated artwork to highlight a number of important campus priorities and initiatives, including Thrive, Sexual Assault Awareness Month, and Climate Emergency Week.

**Summer on the Mall »** Following two summers of remote work and study, community members were inspired to get out and celebrate summer with a series of pop-up events along Main Mall throughout July and August. From outdoor yoga sessions, to lunch hour concerts, a pop-up mini-golf course and more, Summer on the Mall was full of free festivities and fun for students, faculty, staff, and campus residents to enjoy.

**Kids Take Over UBC »** Over 1,000 kids and their grownups played across campus at this annual arts and culture festival during Family Day weekend. This year, 24 campus partners — including the Arts and Culture District, Pacific Museum of the Earth, UBC’s Indian Residential School History and Dialogue Centre, Nitobe Memorial Garden and more — provided an afternoon of family-friendly fun and educational programming.



**New community programs with the Chan Centre and MOA »** By collaborating with campus partners, we bring educational programs to the broader community. This year, new programs included a community concert series with the Chan Centre, and Culture Club: a family-friendly collaboration with the Museum of Anthropology, focused on intercultural understanding.

In addition, UBC’s Campus+Community Planning’s Community Development group supported long-running initiatives such as the Nature Club with Beaty Biodiversity Museum, the Peer Health Educator through the Wellness Centre, and a new moms support group at Acadia Park.

**Joint programming with the University Neighbourhood Association »** Over the past year, Campus + Community Planning and the UNA have partnered on a number of community programs. From Project 529 bike registrations, to pop-up programming, cycling skills workshops for kids, and the Youth Leadership Group, these programs—delivered through a joint staffing model—help support families in both the UNA and Acadia Park.

VANCOUVER

1,000+

kids and their grownups participated in Kids Take Over UBC

VANCOUVER

24

campus partners supported Kids Take Over UBC

VANCOUVER

\$10,000+

in Inspiring Community Grants awarded to 24 outstanding community-led projects

VANCOUVER

1,300+

community members took part in Summer on the Mall free pop-up events



FEATURE STORY

### Inspiring Community Grants

**Arducamp: inclusive access to STEM »** Led by five teens who are passionate about science, technology, engineering, and mathematics (STEM), this summer coding camp for kids 10-12 focused on teaching the fundamentals of Arduino, an open-source electronic prototyping platform. To help champion inclusive access to STEM, the youth grant recipients reserved spaces for female, gender-diverse, and IBPOC participants.

**UBC Mooncake Festival »** The recipient of this grant was inspired to share one of her favourite traditional celebrations — focused on reuniting, giving thanks, and making new connections — with a pop-up celebration booth that included trivia, luck fruit, green tea, and traditional Chinese mooncakes.

**Out on the Shelves Library »** Vancouver’s oldest LGBT2QIA+ library, Out on the Shelves, used community grant funding to expand its public outreach and in-person activities as community members sought connection and social interaction. Activities included film screenings and a skill-building workshop featuring a popular tabletop game.

**Diwali in the UNA »** University Neighbourhoods Association (UNA) community members came together to learn about and celebrate Diwali through the sharing of Indian art, dance, music, and food. Activities included Indian classical and modern dance performances, Bollywood dancing with audience participation, craft activities, henna artists, and traditional foods.



## Transportation

UBC's campuses in Vancouver and the Okanagan are a destination for students, faculty, staff, alumni and visitors from across the region, as well as home to many residents. This year on-campus activities resumed, but some remote work continued for eligible staff — allowing UBC to provide full services while continuing to focus on reducing commuting emissions.

**Go By Bike Weeks »** A week-long celebration of cycling. In total, 622 participants logged 42,599 km over 3,690 cycling trips as part of spring and fall 2022 Go By Bike Week Events across both campuses.

### UBC VANCOUVER

**Campus bike share sees record usage »** UBC's campus-wide bike share program continued to grow, recording more than 50,000 trips and covering over 55,000 km — the highest number since launch in 2018. With over 150 bikes available at approximately 80 designated bike share hubs, it's never been easier for people to get around UBC Vancouver's 400-hectare campus.

**New Travel Demand Management programs »** This year UBC invested in new programs to help reduce the greenhouse gas emissions associated with commuting. Dedicated staff carried out education and awareness sessions, including creating videos that highlight ways to get to and from campus via active and sustainable modes. In addition, a new tool provides individuals with more detailed commuting information to plan their trip.

**Pedestrian Priority Zones Engagement »** Campus + Community Planning engaged with community members to share information about multi-modal use, where individuals walk, bike, and roll through the same area. People in these public spaces were asked to be considerate, and to move slowly through the corridor to create a safe and inviting environment.

**SkyTrain to UBC »** Transit continues to be the primary mode of travel for the UBC Vancouver community — accounting for 49% of all trips (67,000 out of 137,000 daily trips). The Millennium Line UBC Extension took another step forward in 2022 as the Province initiated work on the project's business case. With full project funding secured by 2025, UBC could see a SkyTrain connection by the early 2030s, helping to reduce transit overcrowding and traffic congestion while achieving UBC's two-thirds sustainable mode share target for trips to and from campus.

### UBC OKANAGAN

**Establishing the UBCO Sustainable Transportation Office »** A new Sustainable Transportation Office will implement the UBCO Transportation Plan. The plan aims for a shift towards more sustainable modes of travel, and establishes a roadmap for meeting the transportation needs of the campus through 2040. Continued implementation will support UBCO to achieve CAP 2030 commuting-related GHG reduction targets.

**Transit passes discount now 50% for faculty and staff »** A key recommendation of the UBCO Transportation Plan, the ProPass program was developed in 2022 through a partnership between UBCO, the City of Kelowna, and BC Transit. Designed to provide better access to transit passes for UBCO faculty and staff, the program's discount rate increased from 15% to 50%, and has provided 511 four-month passes to faculty and staff so far.

**E-scooters added to e-bike program »** Getting to, from, and around UBC's Okanagan campus was made even easier this year through the addition of e-scooters to the e-bike program in late 2022. Ride reports indicated that over 8,930 trips originated on campus, and more than 8,240 trips ended at UBCO.

**UBCycles promotes sustainable rental fleet »** UBCycles opened in the Nechako Residence to provide improved accessibility to bike services on campus. The program conducted 62 bike repairs for community members, rented bikes to 62 users, and led or participated in sustainable transportation events including the Go By Bike Week Celebration Station, Mode-Shift, and UBCycles Open House.

#### VANCOUVER

50%

of all trips by sustainable modes of transport in 2022

#### OKANAGAN

40%

of all trips by sustainable modes of transport in 2021

#### VANCOUVER

49%

of all trips to and from campus by transit in 2022

#### OKANAGAN

19%

of all trips by cycling and walking in 2021

Sustainable modes of transport include walking, biking and transit.



#### FEATURE STORY

### Developing the full business case for SkyTrain to UBC

UBC is the largest post-secondary institution and employment centre in the region without a rapid transit connection. Bus service to the university along the Broadway-UBC corridor will be at full capacity during peak hours in 2026 when the Broadway Subway opens. In addition, significant population and employment growth is planned for the corridor — including on the Jericho lands via joint development by Musqueam, Squamish, and Tsleil-Waututh Nations.

The Millennium Line UBC Extension took another step forward in 2022 with its inclusion in TransLink's Transport 2050 10-Year Priorities. Now confirmed as a regional priority, the Province of BC has initiated a two-year process to develop the full project business case.

With full project funding secured by 2025, a SkyTrain connection to UBC could be operational by the early 2030s, reducing transit commute times by as much as 20-25 minutes each way and achieving UBC's two-thirds sustainable mode share target for trips to and from campus.



## Housing and Amenities

UBC is building a vibrant community by providing campus housing options for students, faculty, staff and residents, and by developing recreation facilities, community centres, parks, open spaces, and other community amenities within our neighbourhoods and academic spaces. Driven by UBC’s vision to be a world-class community of scholars and a global leader in sustainability, we are committed to increasing housing choices and growing amenities that support thriving climate resilient communities.

### UBC VANCOUVER

**Neighbourhood Climate Action Plan »** Work has started on UBC’s Neighbourhood Climate Action Plan (NCAP), with the objective of putting UBC’s neighbourhoods on an accelerated pathway to net zero emissions while increasing resilience in the university’s neighbourhoods.

**Evolve development adds 110 rental housing units for UBC faculty and staff, bringing the campus total to 951 units »** These new high-performance homes are targeting both REAP gold plus and Passive House certification, as well as aiming to be UBC’s first net zero energy buildings. The homes are built to minimize energy usage with triple glazed windows, movable sun shades, and heating recovery ventilation that continuously provides fresh filtered air.

**Brock Commons Phase 2: construction underway »** The addition of approximately 600 beds in phase 2 will help meet the significant demand for on-campus student housing, bringing the campus total to nearly 14,000 beds. The new residence will also support the wider campus community through child care, food service, and social spaces that value inclusion across cultures, ages and abilities.

**Child care centres up to 994 spaces »** The Child Care Expansion Plan provides the framework to deliver on UBC’s child care commitments and addresses both long range institutional needs for child care and projected neighbourhood demand. This year, child care centres in the UBC community and neighbourhood housing areas provided 994 spaces, including spaces for ages 0-5 and out of school care. The number of spaces will continue to increase over the next several years, with updated targets that take into account future projected population growth and child care demand.

### UBC OKANAGAN

**New child care facility to add 37 spaces »** UBCO has completed the design of a new child care facility to open during the 2023-24 academic year. To be co-located with the existing UBC Okanagan Child Care, the new facility will add 37 new childcare spaces to the current 57, a 66% increase.

#### OKANAGAN

2,120

beds in student residences

#### OKANAGAN

66%

planned increase in childcare spaces

#### VANCOUVER

12,795

beds in student residences

#### VANCOUVER

600

student beds under construction as part of Brock Commons Phase 2

#### VANCOUVER

951

faculty and staff rental units in operation

#### VANCOUVER

110

faculty and staff rental homes added in Wesbrook Place

### FEATURE STORY

#### Housing Action Plan update for UBC Vancouver

It has been more than 10 years since UBC last updated land use plans for the Vancouver campus. Today, there are 20% more students on campus, 25% more faculty and staff, and nearly double the number of neighbourhood residents. UBC’s daytime population has increased from 61,000 to an estimated 80,000 people. UBC has also added more than four million square feet of new institutional space, an increase of more than 25%.

As part of the Campus Vision 2050 planning process which recognizes affordable housing as a top concern and priority for the UBC community, UBC is reviewing the Housing Action Plan: a 30-year strategy for how UBC uses its land and financial resources to support student, faculty, and staff housing choice and affordability.

As part of the process, UBC commissioned a study of the housing needs of faculty and staff, to assess how well the current set of housing programs is meeting those needs. Campus Vision 2050 will incorporate these findings. The review also explores how growth can meet the Campus Vision 2050 guiding principle to ‘Confront the Affordability Crisis’ and an emerging ‘big idea’ to provide more housing and expanded affordability for UBC.

The resulting updated Housing Action Plan will accompany the final Campus Vision 2050 and updated Land Use Plan for the campus.





## Wellbeing

UBC Wellbeing is a collaborative effort to make the University a better place to live, work and learn through a systems-wide and settings-based approach to promoting health and wellbeing across our campuses. At UBC, we recognize the foundational importance of wellbeing to our success as individuals, as a university, and as a community. We aspire to support our people and community to achieve their full potential in teaching, learning, working and research by making wellbeing a priority that guides our daily interactions, decisions, policy planning, and program development.

**UBC receives Excellence Canada’s Gold for Mental Health at Work »** Excellence Canada awarded UBC Vancouver and UBC Okanagan a Gold certification for Mental Health at Work in November 2022. This outstanding achievement was based on Excellence Canada’s assessment of UBC’s approaches to mental health in the workplace, using their own Mental Health at Work Framework which aligns closely with the National Standard of Canada for Psychological Health and Safety.

**UBC Wellbeing Strategic Initiative Fund »** Available to departments and units at both Vancouver and Okanagan campuses, the fund aims to support the ongoing and collective efforts of university-wide teams supporting the health and wellbeing of people, places, and the planet. Selected projects advance wellbeing priority areas including Collaborative Leadership, Mental Health and Resilience, Food and Nutrition, Social Connection, Built and Natural Environments, and Physical Activity.

Preference is given to projects that showcase partnership, collaboration and innovation, and advance decolonization, equity, and sustainability in meaningful ways. This past fiscal year, the fund supported over 20 community initiatives and two Campus as a Living Lab research projects.

**International Health Promoting Campuses Symposium »** In May 2022, the virtual International Health Promoting Campuses Symposium brought together representatives from higher education campuses worldwide to discuss their efforts to activate the Okanagan Charter. The Charter is a globally recognized framework that aims to promote health and wellbeing in higher education, and serves as a guiding force for UBC Wellbeing.

The one-day gathering featured keynotes by Indigenous leaders, in addition to the “Wellbeing as a priority: Presidents and Vice-Chancellors in conversation” panel discussion with former UBC President Santa Ono. The Symposium attracted nearly 800 registrants, illustrating the growing interest in implementing and sharing wellbeing practices among local and global post-secondary communities.

### UBC VANCOUVER

**Food Hub Market »** UBC launched the Food Hub Market in spring 2022 as a pilot ‘at-cost grocery store’ to promote social connection, cultural diversity, and access to affordable food essentials.

Since opening, the initiative has evolved into a student-led not-for-profit community space with low-cost groceries, including a variety of plant-based options. The Food Hub Market has also established partnerships on and off campus to deliver events and workshops to build food literacy and support community connections.

**AMS and SEEDS identify barriers to food access »** Responding to an increasing need for emergency food services for the UBC community, the AMS Food Bank partnered with a group of SEEDS students to identify opportunities to reduce barriers to community food access.

Using surveys, focus groups, observational research and literature reviews, students proposed a set of recommendations to support the AMS Food Bank; these included strategies to increase efficiencies to reduce line up times, adjustments to food selection, recipes, signage, a feedback voting system, and enhancing volunteer interactions.

The recommendations and insight provided by the research will have tangible impact on the experiences of thousands of students who access the Food Bank each year.

### UBC OKANAGAN

**Picnic wellness space»** In January 2023, the Student Wellness team at UBC Okanagan launched ‘Picnic’ in the University Centre Building, a student-focused wellness space designed to enhance wellbeing, improve food skills, and build community on campus. This space will host a variety of free and low-cost programs and services to support students, including food skills workshops, the Students’ Union Okanagan Pantry, grab and go breakfast options, and tips on safe substance use from the Harm Reduction Team (HaRT).



### FEATURE STORY

## Activate Wellbeing Toolkit

In spring 2023, UBC launched the Activate Wellbeing Toolkit — an online resource designed to strengthen the health and wellbeing of teams across the university, with an emphasis on workplace settings.

The user-friendly Toolkit provides a structured five-step process and practical resources to help staff and faculty identify actionable and measurable steps to integrate health and wellbeing within their teams. The Toolkit also takes a strengths-based approach to recognize the positive efforts teams are already taking, and embed actions into unit and portfolio-level strategic planning processes.

Aligned with the strategic goals outlined in the University Strategic Plan, Focus on People 2025, and the Student Strategic Plan, the Activate Wellbeing Toolkit serves as one of several resources available to support units with addressing key university commitments to Indigenous human rights, equity, diversity and inclusion, anti-racism and climate action. Recognizing that supporting human and ecological wellbeing requires coordinated action across these intersecting priorities, the Toolkit acts as a catalyst for collective progress toward building a more inclusive and sustainable university community.

The Activate Wellbeing Toolkit was developed collaboratively by Health, Wellbeing and Benefits (UBC Vancouver), Workplace Health and Wellbeing (UBC Okanagan), and the Office of Wellbeing Strategy.

#### VANCOUVER OKANAGAN

140

participants at Research Roundtable on Anti-Racism and Lateral Allyship in Racism and Sport

#### VANCOUVER

466,419,312

collective steps walked by 750 participants from 197 teams during UBC Vancouver’s Walk for Joy

#### VANCOUVER OKANAGAN

12<sup>th</sup>

consecutive year UBC was recognized as one of Canada’s Greenest Employers in 2023

#### VANCOUVER

58,854

items were sold at the Food Hub Market in its pilot year



PERFORMANCE METRICS

Below is a snapshot of some of the metrics we use to measure performance against our sustainability goals. See more online at: <https://sustain.ubc.ca/dashboards>





