UBC Sustainability Scholars
PROGRAM

Summer 2024 Internship Opportunities

Below is a list of Sustainability Scholars projects available for the summer 2024 program. The program runs May 1 through August 15, and these are paid positions. Please check the program website for detailed descriptions of each project and for more information about the program.
Applications close Sunday, January 28.

If you have questions contact sustainability.scholars@ubc.ca

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2024-001 Exploring legal mechanisms for the transfer of land to Indigenous governing bodies in BC

Assessment of potential frameworks for the distribution of lands to Indigenous governing bodies (IGBs) in situations where land would otherwise escheat to the provincial government due to a lapse in fee simple title. It will involve gathering information about and reviewing approaches within the current BC Crown legal framework for the escheat of land and looking at practices and protocols for the distribution of property and monies to First Nations in other contexts. The objective will be to evaluate and summarize potential mechanisms for the transfer of property to IGBs and the recognition of Indigenous property rights in a way that supports sustainable relationships between Indigenous and state governments and affirms the authority of Indigenous Peoples to self-govern. *British Columbia Law Institute (BCLI) – 250 Hours*

2024-002 Accessible transportation for newcomers: Research to understand barriers and opportunities

The project aims to enhance the accessibility and sustainability of public transportation in Vancouver, with a focus on addressing the challenges faced by newcomers, particularly those from Mandarin, Latin, and Persian communities. The overarching goal is to empower newcomers to confidently use diverse multi-modal and sustainable transportation options, fostering their integration into the broader community. The project aligns with the city's climate action and sustainability objectives while addressing social equity and community engagement. *Better Environmentally Sound Transportation – 250 hours*

2024-003 Best practices for mapping water scarcity hazard, risk, and adaptation

As British Columbia grapples with intensifying climate change impacts, including hotter temperatures, insufficient snow accumulation, faster spring snowmelt, glacier loss, and reduced precipitation, water scarcity has become a pressing concern (ClimateReadyBC). This project, led by the Fraser Basin Council with support from the Ministry of Emergency Management and Climate Readiness, addresses the urgent need for effective water resource management tools, specifically focusing on water scarcity hazard, risk, and adaptation mapping. This project involves conducting comprehensive research on local and global best practice case studies, creating a valuable repository of knowledge to inform the development of the mapping guidance framework. *Fraser Basin Council Society – 250 hours*

2024-004 Assessing the environmental and social impact of Herschel Supply's supply chain

We want to be a leader in social impact, ready for what our creatives and communities will expect from us tomorrow. To do this, we are looking for a Scholar to help Herschel Supply's Impact Team assess and improve social impact in our supply chain, by strengthening our social compliance policies and developing a social compliance roadmap. This roadmap will help us prioritise which areas of social impact we want to focus on over the next few years, define what standard of working conditions we expect factories that assemble our products to provide, and set targets for and lay out how we will improve worker wellbeing. Some of the topics the Scholar would be researching include how living wage varies by region, what current industry best practice for health and safety and worker wellbeing looks like, which organisations Herschel Supply could join and which standard we could adopt in support of our social impact targets, and what supplier evaluation criteria and responsible purchase practices would be most effective at driving positive change. *Herschel Supply – 480 hours*

2024-005 Universal Basic Mobility: Case study research and options analysis

Universal Basic Mobility (UBM) is the concept of providing a foundational level of mobility to all members of society, regardless of factors such as geographic location or income level, through partnerships and policies. We seek a summer student to conduct case study research on UBM pilots and programs around the world, including design, eligibility criteria, technology, funding, transportation modes, impacts and outcomes, etc., and using the learnings from that research, develop a set of design options for a potential UBM initiative in Metro Vancouver. These options will be evaluated against regional transportation objectives outlined in Transport 2050, as well as more specific equity objectives and sub-objectives, to be developed as part of the project. The focus on this initiative is on equity and inclusiveness, with a secondary emphasis on access to various sustainable transportation modes and choices. This work will feed into future considerations that TransLink will make on UBM-type programs. *TransLink – 250 hours*

2024-006 Quantifying the Benefits of Transit Oriented Communities (TOCs) in Metro Vancouver

Transit-Oriented Communities (TOCs), where development is centered around transit and active travel, are an important tool connecting land use and transportation. This project seeks to classify and quantify the benefits of TOC development. By putting quantifiable outcomes to the different types of communities, policy makers and political leaders will be better able to communicate and understand the trade-offs involved with differing development types. For this, a driven and capable researcher is needed to design the research program with guidance from a mentor and carry out a rigorous process resulting in defensible outcomes. Ideally this work will also serve as a springboard for future research at the nexus of transportation and land use in Vancouver and across Canada. *TransLink – 250 hours*

2024-007 Examination and gap analysis of sustainability educational opportunities in health-care

The primary objective of this research project is to assess the current landscape of educational and learning opportunities in sustainability, in the health-care sector in Canada. With an increasing focus on environmental responsibility and resource efficiency, this research aims to identify gaps in existing educational materials and resources, paving the way for the development of targeted initiatives to enhance sustainability in the health-care sector. The selected student will be tasked with conducting a thorough scan of existing educational materials and resources relevant to sustainability in health care. *Vancouver Coastal Health – 250 hours*

2024-008 Inventory of the Provincial Health Service Authority fleet vehicles to support transition to an electric fleet

The Energy and Environmental Sustainability (EES) team is a regional collaboration team that provides a service to Fraser Health, Providence Health Care, Provincial Health Services Authority (PHSA) and Vancouver Coastal Health. The EES team collaborates with clinical and non-clinical departments and staff to implement a regional approach to low-carbon, climate-resilient and environmentally sustainable health systems through planning, design, procurement, construction and operations.

The purpose of the project is to unify PHSA fleet information into a single inventory that will support PHSA's Clean Fleet planning. The work will support PHSA in meeting climate action requirements (e.g., CleanBC requirements for Clean Fleet plans) and decrease carbon emissions. It will support positioning PHSA to purchase only zero emissions vehicles by 2035, in alignment with CleanBC objectives. *Provincial Health Services Authority – 250 hours*

2024-009 Guidelines for sustainable construction and operation of leased health care facilities

About 16% of health care facilities are leased sites that include Urgent Clinical Care Centres, office space, physician clinics and some long-term care facilities. We have guidelines for new construction of owned sites, but these guidelines are not directly applicable to leased sites, including ones that have been specifically designed and built for the use of the health authority. We wish to identify which new construction guidelines are most applicable to non-owned sites, and what barriers exist and how they can be addressed. The Scholar working on this project will develop a set of practical guidelines to support VCH Planning and Real Estate Department staff, to influence specifications such that newly constructed or newly acquired leased sites meet the highest standard for low carbon, climate resilient and environmentally sustainable design and operation. *Vancouver Coastal Health – 250 hours*

2024-010 Research to support a natural environment and biodiversity plan for Fraser Health

Fraser Health recently approved its first Planetary Health strategy recognizing the degradation of the natural environment/loss of biodiversity as a direct risk to health and also a negative impact on the wider determinants of health. Fraser Health is committed to using nature regeneration as an opportunity to improve our services and our commitment as an anchor institution. With estates across the Fraser region, we envision following progressive health systems around the world who have committed to protecting and promoting nature on health care estate grounds and securing the benefits around wellbeing and resiliency. The purpose of this project is to document a baseline understanding of natural assets and current management practices at Fraser Health facilities and identify opportunities. *Fraser Health – 250 hours*

2024-011 Research to inform the development of a zero emissions maritime fuel collaborative

Shipping is powered almost entirely by fossil fuels, with the industry accounting for 2–3% of global CO2 emissions; this figure could rise to 17% by 2050 if left unregulated. Furthermore, the maritime industry is in competition with other sectors seeking zero emissions fuels - these may gain priority if policymakers deem them to have the greatest need from a policy perspective (e.g. housing, transportation). So, it is important to communicate the demand and need to prioritize these fuels for large vessels (e.g., no alternatives like heat pumps for buildings or batteries for vehicles). This project will complete research and lay the groundwork for the establishment of a West Coast Zero Emissions

Maritime Fuel Collaborative in BC, which can become that single point of entry for producers to speak to all the off-takers in BC seeking zero emissions fuels. *C40 Cities Climate Leadership Group – 250 hours*

2024-012 Identifying "essential" food supplies for climate resilience

The purpose of the project is to provide an initial review of the foods that governmental agencies, regions and cultural communities outside of the lower mainland in BC identify as “essential” for continued access during climate-driven emergency events; develop one or more case studies of communities that examines the approach of one or more public institutions with local retail provisioning; and provide recommendations for policy, practice and further research. The results of this study would inform the initiative for Emergency Preparedness for Food Security by the Ministry of Agriculture and Food, emergency management practices by the Ministry of Emergency Management and Climate Readiness, and related activities across ministries, such as the Ministry of Health and the Ministry of Education. *Ministry of Agriculture and Food – 250 hours*

2024-013 Statistical & spatial analysis to inform a future shared e-scooter program in Vernon

In 2021, the City of Vernon joined a provincial pilot exploring the use of e-scooters for personal transportation, aligning with the City Council's vision for an active transportation-focused community as outlined in the City’s Climate Action Plan. Research shows that people used e-scooters to reach important destinations, like work, and found them especially helpful for those with a car or driver's license. However, the City would like to better understand and accelerate efforts to reduce barriers for different user groups and neighborhoods, extending the reach and impact of the e-scooter share program and further improving equity considerations. In addition to a literature review, focusing on policy recommendations for subsidized transportation programs the Scholar will analyze statistical and spatial data to understand the relationship between socioeconomic variables and e-scooter use. *City of Vernon – 250 hours*

2024-014 Developing a building energy retrofit toolkit for homeowners in the City of Vernon

The purpose of the project is to research and recommend how best to increase the uptake of energy retrofits in homes in the City of Vernon. The overarching, long-term goal is to create a strong, local culture where citizens understand and believe in the value of building energy retrofits. This project will include researching provincial and local policy and the current financial incentives that support energy retrofits (e.g., rebates and grants). It will also include investigating how other municipalities are influencing residents to retrofit their homes, beyond the policy and financial incentives (e.g., communication materials, website resources, toolkits, or guidelines). *City of Vernon – 250 hours*

2024-015 Framework to assess the effectiveness and impact of a residential community building model

Minivillage, a Vancouver-based social purpose company committed to revolutionizing Canadian housing The purpose of this project is to identify clear measures, both quantitative and qualitative, to assess the effectiveness and impact of our hybrid community building model. The outcome will be a well-structured framework for regular evaluations, considering both short-term and long-term perspectives, to understand how the model influences the resilience and well-being of community residents. Additionally, we seek to explore the benefits for various stakeholders, including property managers, local businesses, and healthcare services, focusing on aspects like financial viability, return

on investment, and the potential for scalability. Ultimately, our plan is to use this framework to confirm and broaden the effectiveness of our community building model, applying it across different geographical scales, from the provincial and national levels to a global context. *MiniVillage – 250 hours*

2024-016 Policy and Best Practice Research to Inform Climate Resilient Development in Kamloops

This project will provide foundational research to inform and prioritize future updates of the City of Kamloops's landscape guidelines, development permit guidelines, tree protection bylaw, and KAMPLAN: the City's Official Community Plan (OCP) (among others) to comply with new government regulations, particularly the housing targets set by the Government of BC. To support these efforts, the Scholar will leverage their research skills to assess how existing City policies and practices align with these goals, including pinpointing gaps, barriers, and potential opportunities to propel climate-resilient development in Kamloops. *City of Kamloops – 250 hours*

2024-017 Creating an analytical tool to inform decarbonization of public buildings (Musqueam First Nation)

As part of their plan to move towards a sustainable emission-free community, Musqueam First Nation is looking for ways to reduce GHG emissions from public buildings. In particular, the Musqueam Public Works Department is looking to assess the cost and environmental impact of public building decarbonization on Musqueam Reserve. The primary objective of this project is to develop a tool to assess the cost and environmental impacts of implementing various heating technologies, including heat pumps, renewable natural gas, and more efficient natural gas systems.

The Scholar will analyze different aspects of building decarbonization, considering capital and operational costs, utility bills, and GHG emission reduction potential. This involves comparing the costs of alternative heating systems against a baseline scenario where natural gas is currently used. The research will also provide a timeline for suggested replacements, costs, and estimated operational and utility expenses for existing mechanical equipment in public buildings. *Musqueam Indian Band – 250 hours*

2024-018 Information and resource toolkit on climate resilient buildings for Indigenous housing and service providers

The Aboriginal Housing Management Association (AHMA) wants to better support its members (Indigenous housing and service providers) in building capacity to develop resiliency to the impacts of climate change. BC's urban Indigenous housing providers lack guidance to develop climate change-resilient housing. AHMA's Asset Care Program (ACP) provides valuable resources that empower our members to steward their housing assets (i.e., buildings). The ACP currently includes best practice resources for asset management, building assessments, inventory and maintenance, and training to develop our member's capacity to manage their buildings. This project aims to incorporate climate resiliency planning, low carbon resiliency and demand-side energy management into the broader ACP. The Scholar will compile new resources (best practices, planning guidance, policy templates, hazard identification sources and other tools) to ensure our members have more equitable access to leading risk mitigation and emergency response management practices *Aboriginal Housing Management Association – 250 hours*

2024-019 Developing a covered buildings list to inform an energy reporting bylaw in the Resort Municipality of Whistler (RMOW)

In Whistler, natural gas consumption in commercial buildings is the second largest contributor to GHG emissions. Big Move 5 of Whistler's Big Moves Strategy is to make existing buildings better, with the goal of reducing emissions from residential buildings by 20% and from large commercial buildings by 40% by 2030. To reduce operational emissions from existing commercial buildings, Whistler aims to develop an energy reporting bylaw. This bylaw would outline the requirements for building owners to report on energy consumption annually to the municipality.

One of the first steps in implementing an energy reporting bylaw is identifying the buildings to which it will apply. This requires the development of what is often called a covered buildings list. The goal of this project will be to develop this list. From there, the RMOW will use this list to draft the energy reporting bylaw. *Resort Municipality of Whistler – 250 hours.*

2024-020 Neighbourhood scale nature-based urban design solutions to address urban heat islands

There is a growing urgency to respond to increasing intensity and frequency of climate change induced heat waves in British Columbia. In addition, urban areas are prone to heat island effects due to the heat absorbing nature of typical urban design, and heat produced by increasing use of air conditioning in urban areas. This project will investigate nature-based and other neighbourhood scale design options for mitigating urban heat island impacts, providing outdoor shade in the public realm and explore the feasibility for tree shading on buildings to reduce cooling demand in buildings. The results of the project will support UBC in meeting Campus Vision 2050 restorative and resilient landscape objectives and NCAP adaptation goals. *University of British Columbia – 250 hours*

2024-021 Residential Retrofits: Analyzing Energuide evaluations and creating emission reduction scenarios

The goal of this project is to explore correlations between housing archetypes and different retrofit factors such as the types of retrofits completed, the cost, and reductions in air changes per hour and energy/GHGs. It will provide valuable insights into estimating impacts of retrofit programs, which can lead to a variety of benefits such as support for funding applications, providing rationale for municipalities to pursue retrofit programs, and creating a better understanding of high-impact archetypes to target. The scholar will complete two primary tasks: analyze pre- and post-Energuide evaluations to identify correlations between housing archetypes and various retrofit factors and develop a basic retrofit emissions tool to estimate emission reduction potential at a community level. *Community Energy Association (CEA) – 250 hours*

2024-022 Research to inform a workforce attraction strategy for residential retrofit excellence

The purpose of this project is to support the development of a workforce attraction strategy that includes both short- and long-term insights to ensure that both the immediate needs of industry are supported, while also future-proofing the workforce. The Scholar will be designing a strategy and conducting research to help guide the Hope Performance Stakeholder Council's (HPSC) steps toward workforce attraction; this will include a literature review, identifying and interviewing stakeholders in the retrofit and workforce development sectors, and report writing. The strategy will serve as the

cornerstone of the HPSCs workforce development plans for the next several years and beyond. *Home Performance Stakeholder Council Association (HPSC) – 250 hours*

2024-023 Identification and analysis of potential solar photovoltaic sites for the Capital Regional District (CRD)

The purpose of this project is to identify and prioritize CRD facilities for potential solar photovoltaic (PV) opportunities and understand the impact to the BC Hydro grid if these installations are pursued. In particular, we aim to understand what sites are feasible for renewable power based on their physical location in the region, and what corporate sites are nearing maximum electrical capacity and may be an opportunity for a solar-battery storage solution. The project will include: a best practice review of modeling PV solar installations using solar potential maps, weather data, and satellite imagery; ranking of CRD corporate sites based on amount of solar insolation, from highest to lowest.; estimate solar generation (kW) capacity using high-level engineering estimates; analysis of impact to the BC Hydro grid. *Capital Regional District – 250 hours*

2024-024 Case study: In-river gravel mining as a flood mitigation tool & impact on fish habitat (Chilliwack/Vedder River)

Gravel mining has long been viewed as a flood mitigation solution; however, it is also known to impact watercourse hydrology and fish habitat. We want to understand the extent of such damage and look at solutions and alternatives. This project will involve a literature review of in-river gravel mining and its usefulness as a flood mitigation tool; research on alternative flood mitigation methods in waterways with a rich gravel bed; and, an analysis of the potential impacts of gravel mining on fish (salmon) and fish habitat. The final result will be a case study of the Chilliwack/Vedder River system and answering the questions: is gravel extraction the only way to manage for floods in this river system? Assuming it is not, what are the other options? And what are the impacts of gravel extraction on fish and fish habitat in this river system from gravel mining? *Watershed Watch Salmon Society – 250 hours.* This is a Fraser Estuary Research Collaborative (FERC) project.

2024-026 Advancing Flood Resilience Best Practices for the Lower Mainland

With the flooding events of November 2021, it has become well understood that BC and the Lower Mainland are suffering from a lack of attention to thoughtful and proactive flood resilience techniques. Resilient Waters has been engaging a cross sector audience across the Lower Mainland on the issue of flood resilience since 2020. As part of an ongoing project called Designing for Flood Resilience, we will be hosting a series of workshops to encourage information sharing and innovation around place-based flood infrastructure best practices, which will run spring and summer of 2024. We are seeking a student that would help to capture and translate workshop results and do additional desktop research to support best practices proliferation. *Resilient Waters – 350 hours.* This is a Fraser Estuary Research Collaborative (FERC) project.

2024-027 Using a landscape analysis approach to identifying opportunities for salmon habitat restoration projects in the Lower Fraser River

This project proposes to use a landscape framework to identify key locations where developed shoreline, or remaining natural shoreline, could be restored/enhanced to provide tidal transition areas and refugia for outmigrating juvenile salmon. The landscape framework used in this project will be modeled after the framework implemented in the Columbia River Estuary (see Hood et al. 2021), which uses a 'stepping-stone model' to provide site-specific evaluation for each restoration site. Project work includes a literature review, scoping a landscape framework specific to the Lower Fraser using the stepping stone modal, creation on a map and identification of potential habitat patch locations for juvenile salmon (among other related activities). *Raincoast Conservation Foundation – 250 hours.* This is a Fraser Estuary Research Collaborative (FERC) project.

2024-028 Policy & Regulatory Review of Passive Flood Water Storage to Mitigate Flood Risk

The Emergency Planning Secretariat (EPS) is seeking to understanding the existing landscape around passive storage as a means to reduce flood risk in the Lower Fraser Region. Flooding is already a risk in this region, as seen by the 2021 atmospheric river that caused billions in damage, destroyed homes and roads, and loss of human life. Flood risk is expected to increase, unpredictably so, into the future as climate change impacts such as storms may increase in size and frequency. Passive storage, or storage of floodwaters in non-waterways during high water events, is a means to mitigate this risk, but the regional context is still unclear. For this project, the Scholar will produce a report examining case studies of passive storage in other parts of the world, summarize existing policies that enable or inhibit the use of passive storage on this landscape, and evaluate potential funding mechanisms that can be used to incentivize the use of passive storage by landowners. *Lower Fraser Fisheries Alliance (Emergency Planning Secretariat) – 250 hours.* This is a Fraser Estuary Research Collaborative (FERC) project.

2024-029 Literature & policy review to inform a framework integrating nature-based solutions and restoration work on the Fraser Estuary

In order to meet the overall objectives of the Convention on Biological Diversity countries from around the world met in December of 2022 to set a new set of targets. Among these targets was one to ensure that by 2030 at least 30 per cent of areas of degraded terrestrial, inland water, and marine and coastal ecosystems are under effective restoration. As a significant step toward implementing conservation plans Canada entered a Tripartite Framework Agreement on Nature Conservation between Canada, British Columbia, and the First Nations Leadership Council and agreed to work together on habitat enhancement and restoration initiatives (including grasslands, wetlands, forests, riparian areas, and estuaries). WWF-Canada is seeking a Scholar to help refine our understanding of how restoration is being implemented across the Fraser River Estuary through a policy and literature review complemented by interviews with subject experts. *World Wildlife Fund Canada – 250 hours.* This is a Fraser Estuary Research Collaborative (FERC) project.

2024-030 Regulatory Barriers to Nature-Based Solutions along the South Coast of B.C.

Two important Nature-based Solutions (NBS) in the Fraser Estuary have begun implementation: the Boundary Bay Living Dike Project and the Sturgeon Banks Sediment Enhancement Project. Because these are novel projects that are highly place-based, there are a lot of unknowns concerning how they

should be designed, regulated, implemented, and monitored. For projects within the intertidal area, the sheer number of regulations and policies becomes very complex and difficult to navigate. It requires substantial capacity and additional budgets from First Nations communities and local municipalities to support the implementation of NBS, which may be a deterrent to pursuing these projects.

This research will focus on documenting these regulatory processes, including which rights- and stakeholders need to be involved and what barriers, and enablers are present. By systematically identifying and analyzing these regulatory factors, we can develop a comprehensive understanding of the challenges and opportunities associated with implementing nature-based solutions. *University of British Columbia (Living with Water) – 360 hours.* This is a Fraser Estuary Research Collaborative (FERC) project.

2024-031 Science Communication of Values-Based Approaches in Coastal Adaptation

There is a growing body of literature and practice that integrates values-based approaches to climate change and coastal adaptation planning, but there is a lack of communication around the potentials and importance of such an approach for coastal and flood management. As such, this project aims to use science communication practices to convey scientific information, concepts, and methods related to values-based approaches to a non-expert audience. Based on a best practice review of values-based approaches to coastal adaptation, this project aims to create various outputs (blog posts, videos, infographics, science communication, etc.) that will enhance the public understanding of values-based approaches to climate change, build trust between the scientific community and the public, encourage informed decision-making, and foster interest in scientific fields working on coastal adaptation. *University of British Columbia (Living with Water) – 250 hours.* This is a Fraser Estuary Research Collaborative (FERC) project.

2024-032 Research on and development of a public program of events centred on the significance of the Fraser Estuary

The Intertidal Kinning (working title) event series will address the significance of the Fraser River Estuary in a dynamic and multi-faceted way. The program can contain a large array of types of engagements: protest marches, letter writing campaigns, debates, talks and lectures, foreshore walks, performances on the water, workshops on salmon tanning and charting migratory bird paths, podcasts on pollution and so much more. The Scholar is invited to take an intersectional approach to programming integrating science, art, Indigenous knowledge, music, environment, non-human voices – all of which will speak to the expansive and ever evolving estuary. But more importantly, we look forward to the Sustainability Scholar enriching the program with a range of perspectives and ideas that connect to the Fraser Estuary. Building context awareness on critical sustainable and ecological research is just as important as the science and innovation underway. *Other Sights for Artists' Projects Association – 250 hours.* This is a Fraser Estuary Research Collaborative (FERC) project.

2024-033 Designing a Citizen Science Protocol for Monitoring Mini Forests in the Fraser Estuary

Mini forests, also called Miyawaki forests, are an afforestation method that has been used internationally to increase local canopy cover, biodiversity, and stormwater absorption. This planting technique involves amending the soil with fungal mycorrhizae, and densely planting trees representing

the canopy, sub-canopy, understory, and groundcovers of a mature forest. The technique is relatively new in Canada, and 15 new mini forests have been planted in 2023 through the National Mini Forest Pilot and Living Cities Canada Fund including one at Terra Nova Rural Park in the City of Richmond, BC. The purpose of this project is to develop a citizen science monitoring protocol for the mini forests in Richmond, BC. Specifically, it will include techniques that citizen scientists (minimum 6th grade comprehension level) can utilize to measure tree growth, wildlife species observations, infiltration rate, and soil type within the mini forest will be useful for measuring how the mini forest is affecting the local environment and contributing to the health of the Fraser Estuary. *Green Garden City Conservation Society – 250 hours.* This is a Fraser Estuary Research Collaborative (FERC) project.

2024-034 Best practices research to inform municipal water utility decarbonisation

This research project endeavors to conduct a comprehensive examination of strategies and implementation approaches employed by municipalities worldwide that have successfully transitioned towards decarbonizing their water utilities. By scrutinizing case studies, policy frameworks, and technology adoption trends, this study aims to discern the key drivers, challenges, and best practices that enabled these municipalities to achieve significant reductions in greenhouse gas emissions within their water supply and treatment systems. Through a comparative analysis of diverse geographical, infrastructural, and regulatory contexts, this research will identify actionable recommendations tailored to the unique circumstances of Metro Vancouver, providing drinking water to the lower mainland region. *Metro Vancouver – 250 hours*

2024-035 Inventory of emerging technologies and innovations to reduce GHG emissions in drinking water services

This research project addresses the critical need to reduce greenhouse gas (GHG) emissions associated with regional drinking water services. The project focuses on the Metro Vancouver area, where water utility operations contribute to the region's carbon footprint. Project work includes assembly of an inventory of activities required to manage drinking water in the regional water utility. These activities broadly include planning, procurement, construction, operation and maintenance. Based on a subset of the identified activities, conduct a literature review to identify alternative technologies and approaches. By exploring cutting-edge technologies and sustainable practices, the project aims to provide actionable insights for mitigating emissions across all scopes. *Metro Vancouver – 250 hours*

2024-036 Best practices for visualizing and communicating air quality data

As our climate changes, it is important that residents can quickly access reliable, timely, and accurate air quality and weather data so they can take action to protect their health during periods of poor air quality. This project aims to identify how Metro Vancouver's AirMap webpage can be updated and made more user-friendly to allow regional residents to view data from Metro Vancouver's air quality monitoring network. The scholar will conduct research into best practices for visualizing or communicating air quality data and recommend improvements to AirMap to enhance its usability. Metro Vancouver staff make regular updates to AirMap, and anticipate integrating the scholar's recommendations into future updates. *Metro Vancouver – 250 hours*

2024-037 Evaluation of current and projected agricultural water demands within the Metro Vancouver Region

A sizable portion of the water used by the agricultural sector comes from other sources, such as the Fraser, Alouette and Pitt Rivers, or private wells. Climate change is expected to impact the quality of water from these other sources as summers become hotter and drier with an increased risk of droughts, causing impacts to local water sources and increased salinity of the Fraser River. Given these anticipated changes the agricultural sector may look to Metro Vancouver's water supply as an alternative. The purpose of the project is collect and analyse information about current water sources, other than from the treated drinking water supply used for agricultural purposes. This project will focus on desktop work, utilizing existing information to determine an estimate of water use within the agricultural sector for two jurisdictions. *Metro Vancouver – 250 hours*

2024-038 Estimating emissions from non-road engines in the Metro Vancouver region

This project seeks to review methods for disaggregation of emissions, and to prepare updated estimates of emissions from non-road engines for the Metro Vancouver region. The Scholar will conduct research into best practices for disaggregating emissions data and develop a repeatable methodology that will be applied to estimate emissions. A key element of this project is to access local equipment populations and engine types. This may require working with industrial organizations such as the port and industry associations. The outcome would be valuable in supporting Metro Vancouver's ongoing improvement of its emissions inventory procedures, and will help inform progress toward meeting regional clean air and climate goals. *Metro Vancouver – 250 hours*

2024-039 Case studies and policy guidelines for reusable food service ware at events and in cafeterias

Metro Vancouver is working to make reusable food service ware the default in the region to combat 1.3 billion of single-use items disposed annually. We are also working with our head office cafeteria to implement a reusable cup and container program. Within this project, the Scholar will investigate optimal methods and insights to guide the expansion and promotion of reusable food service items on a broader scale. Additionally, they will craft case studies and procurement templates for implementing reusables in event settings, catering services, and takeaway container and cup programs. *Metro Vancouver – 250 hours*

2024-040 Exploring the potential for a holistic indicator of social sustainability and quality of life in Vancouver

Is Vancouver becoming a healthier city? Our best answer to date is "it depends on the indicator." We are interested in exploring if there is potential for a holistic metric of social sustainability, and we think that the concept of health- or life-satisfaction-adjusted life expectancy is a promising lead. We're curious if indicators like these are feasible with existing social and health datasets in Canada, and also want to make sure that they keep our attention on the systems that create health inequities rather than people who experience them. The Scholar will research potential indicators through a conceptual, technical, and practical lens, and make recommendations that can be incorporated directly into the renewal process for the Healthy City Strategy. *City of Vancouver – 250 hours*

2024-041 Environment Scan and Literature Review of Urban Indigenous Service Delivery Infrastructure and Program

There has not been consistent means by which Indigenous communities have had service delivery and space asset information catered towards City informed decision-making. By reviewing models used in other agencies, Vancouver will develop a path forward for urban Indigenous communities to have more power and voice in shaping how the City serves these communities. This project will complement and inform related City-led initiatives, including engagement with Urban Indigenous communities and organizations throughout 2024; and regular meetings of a working group of City staff working in Urban Indigenous relations from cities across Canada.

These initiatives will provide starting points for the Scholar to conduct an environmental scan and literature review and will enable the findings of this research to inform action taken and the development of broader policy and practice. *City of Vancouver – 250 hours*

2024-042 Determining the Economic Impacts of the Community Benefits Agreement Policy

A Community Benefits Agreement (CBA) is a legal agreement signed by a Developer committing them to actions, targets and/or outcomes relating to employment and local or social procurement. Its purpose is to ensure that opportunities are connecting to local employment agencies, non-profits, social enterprises, and local and diverse-owned businesses. These kinds of agreements keep jobs and money local and support economic opportunities for equity-denied groups. Additionally, by keeping hiring and procurement local, carbon footprints of individuals and companies may be reduced. The scholar will help develop and present modelling that demonstrates how Community Benefits Agreements contribute to the local economy and support climate action. This will strengthen rationale for the policy and inform a report to council with policy revisions in September 2024. *City of Vancouver – 250 hours*

2024-043 Evaluating how Vancouver Business Improvement Associations incorporate diversity, equity, and inclusion into their practices

Cultural food assets (CFAs), such as restaurants, green grocers, food courts, and other food-related businesses significantly contribute to Vancouver's intangible cultural heritage; however, they are increasingly at risk of displacement. The purpose of this project is to identify how BIAs are incorporating diversity, equity, and inclusion (DEI) into their work with regards to protecting and promoting cultural businesses. To achieve this, the Scholar will conduct a jurisdictional scan of best practices and engage with select BIAs and businesses to identify how diversity, equity, and inclusion principles are incorporated into practices. Learnings will inform how the City can better engage with and support its CFAs, including through the actions identified in the City's Placekeeping Motion. *City of Vancouver – 250 hours*

2024-044 Improving Bicycle and Scooter Parking at Elementary and High Schools in Vancouver

Currently 64% of elementary school students take active transportation and transit to school and the City's Climate Emergency Action Plan has a target to increase this to 70% by 2030. Creating safe and convenient infrastructure is the key to getting more kids taking healthy and active transportation. This includes ensuring that bike and scooter parking at schools is secure, convenient and plentiful.

According to the 2022 Vancouver Travel Survey many parents feel that better bicycle parking facilities at schools could help get their children take active travel more often. While this data point is interesting, there is still a lack of local research about the actual situation at school sites across Vancouver. The purpose of this project is to understand how the City can partner with the Vancouver School Board to improve parking for bicycles and scooters at schools through an audit of existing end-of-trip facilities, a review of international examples and recommendations for next steps. The project will include a variety of research tactics/methods, including a mix of desktop research, in-person observations and data analysis. *City of Vancouver – 250 hours*

2024-045 Testing and Adapting an Evaluation Framework for Equity and Justice in Climate Action at the City of Vancouver

Evaluating equity in climate action is critical, as the findings can allow organizations to identify gaps and adapt patterns, practices, and policies to improve climate justice. Evaluation can act as a tool for systems change, however, methodologies for evaluating equity in climate work are not widely known or practiced at the City of Vancouver. An appropriate evaluation framework that incorporates the complexities of climate change, equity, justice, and decolonization is required. Building off work completed by a Scholar in 2024, this project will involve testing a prototype equity evaluation framework on real climate projects at the City. The scholar will evaluate projects, reflect on the process, and iterate new versions of the framework. The outputs from this project will directly inform the City's evaluation process for equity in climate action. *City of Vancouver – 250 hours*

2024-046 Improving accessibility at rapid transit stations and plazas

Aligning with the vision of a green transportation transition as outlined in the City's Greenest City 2020 Action Plan and the objective of developing fully accessible rapid transit infrastructure in the Vancouver Plan 2050 and Transportation 2040, the primary purpose of this project is to document the specific challenges faced by individuals accessing rapid transit stations and provide recommendations for improvements. This project aims to conduct an inventory of existing accessible designs at both pre-existing and planned rapid transit stations and plazas, identify outstanding challenges to be addressed, and provide actionable recommendations through case studies to enhance the current building code and design guidelines regarding accessibility. *City of Vancouver – 250 hours*

2024-047 Financial Analysis of Transitioning to Battery Electric Fire Service Vehicles

Vancouver Fire Rescue Services (VFRS) operates a fleet of over 130 vehicles ranging from small ATV's to large 100 ft.+ aerial platforms. As part of the City's climate emergency plan, transitioning these vehicles to electric where feasible is a priority. VFRS will be the first fire department in Canada to operate a battery-powered electric fire engine that is estimated to enter service in early 2024. As part of their commitment to allocate funding responsibly, a comprehensive review of the financial benefits and drawbacks of this electric transition are to be analyzed. Quantifying the financial benefits will be an important factor in future decision making for electrifying the VFRS fleet. *City of Vancouver – 250 hours*

2024-048 Research to quantify the carbon capture of street infrastructure assets

This project will explore how to quantify the benefits of sustainable street infrastructure assets on street right of ways, specifically street trees, sidewalks, transit lanes, bike lanes, zero-emission vehicle infrastructure. This will aid to better understand their role in addressing the overall impact and

footprint of constructing and maintaining our roads, which are carbon intensive assets. Project work includes: academic literature review of best practice sin carbon accounting; site visits to become familiar with typical types of sustainability street infrastructure assets and their various functions; right-of-way asset inventory and ranking; along with an analysis comparing carbon reduction capacities and the carbon caption efficiency of various assets. *City of Vancouver – 250 hours*

2024-049 Cost, Performance, and Emissions Analysis of Sustainable Concrete Alternatives for Sidewalk Construction

The purpose of this project is to investigate the current environmental impact of the use of concrete in street infrastructure. Scholar will explore alternative materials that meet the performance requirements of a sidewalk and compare the cost with our standard, Portland Cement Concrete. The research will also include a review the City's existing sidewalk network, review the performance of assets using sub-standard materials and propose future projects that provide carbon pollution reduction. *City of Vancouver – 250 hours*

2024-050 Deep Retrofit & Fuel Switch Projects for Existing Commercial Buildings: Case Study Development

City staff are researching regulations that would effectively require the replacement of gas-powered mechanical equipment with high efficiency electric heat pumps or dual-fuel systems in commercial buildings. A small, but growing number of early adopters in the Lower Mainland have completed deep retrofit upgrades on commercial buildings, but the performance of these systems, including the user experience has not been documented and made publicly available

The purpose of this project is to identify commercial buildings in the Lower Mainland that have replaced gas-fired equipment with high-efficiency electric or dual-fuel equipment, and document both the retrofit process and performance of those systems in order to create a series of case studies. The case studies will serve as educational tools to support commercial buildings decarbonization regulations being developed by the City of Vancouver in 2024/2025. *City of Vancouver – 250 hours*

2024-051 Inventory of public spaces to inform public realm improvements in the City of Vancouver

A good public realm provides elements and public spaces that support community building through interaction, cultural expression, community stewardship, amenities for respite such as street furniture as well as shelter from rain or heat. This project will identify and locate existing public realm elements and public spaces in retail streets (e.g., sidewalks, plazas, etc.), land uses (e.g., retail, restaurants) and potential/existing stewardship (community groups, non-profit organizations, etc.), and existing amenities (benches, trees, washrooms, bike racks).

This inventory will inform innovative approaches and prioritization of new investments relating to space (lack of green canopy, heat island effect), people (equity-serving communities and uses), and stewardship (existing community use). *City of Vancouver – 250 hours*

2024-052 Standardizing methods for citizen science BioBlitzes to monitor and support urban ecology (focus on green rainwater infrastructure)

Having healthy, resilient urban ecosystems is critical for climate change adaptation and carbon sequestration, so it is important for cities to monitor the health of the ecological communities we steward and coexist with. Citizen science programs can make valuable contributions to conservation. Although staff have been facilitating BioBlitzes for decades, we have not been doing so with any consistent, standardized or replicable methodology across or within staff teams. As such, the resulting data from BioBlitzes (etc.) is limited in its usefulness. The purpose of this project is to develop a standardized methodology and recommendations that can be implemented by staff teams throughout the city who currently or potentially would use citizen science for their work. *City of Vancouver – 250 hours*

2024-053 Develop an Objective Index for Equitable Access to Public Drinking Water in the City of Vancouver

The focus of this project is to develop an objective index that establishes a total number of permanent freeze proof public drinking fountains that would achieve adequate and equitable access to drinking water in the public realm. As our climate continues to change, and the need for access to drinking water increases, we must consider the various demographics that call Vancouver home, and the diversity of ability within these demographics. Establishing an objective index will allow for a consistent, fair and equitable approach to increasing our level of service of providing access to drinking water for the public. *City of Vancouver – 250 hours*

2024-054 Quantifying food and culture garden attributes as spaces for equitable access, climate action and community resilience

Building on a 2023 UBC Sustainability Scholar report *Decolonizing Local Food Systems Policy,* this project will examine the ways community food and culture gardens on park and city managed lands are potential hubs for demonstrating shifts towards more decolonized, sustainable and climate-friendly relationships with the land. As staff begin to advance projects, policies and processes that support increasing equitable access to food systems and climate action in growing assets, we are seeking a Sustainability Scholar to develop definitions and a methodology for measuring land-use typologies within community gardens and then apply this framework to gardens on public land in Vancouver. The data sources for the framework may include GIS mapping and analysis, site visits, and existing metrics from annual surveys to establish baseline information. *City of Vancouver – 250 hours*

2024-055 Research on Initiatives that Utilize Green Rainwater Infrastructure (GRI) to Address Urban Heat Reduction and Biodiversity Enhancement

The City of Vancouver is facing a number of challenges with respect to climate adaptation. Population growth, urban development practices, and climate change are increasing urban heat, reducing biodiversity, raising sea levels, and increasing the frequency and intensity of rainfall, which is straining the city's aging sewer system and leading to chronic water quality impacts on receiving waters such as False Creek and the Fraser River.

The purpose of this project is to better understand the role that GRI can play in addressing urban heat reduction and biodiversity enhancement. Specifically, the project seeks to undertake best practices research, subject matter expert interviews, and case studies from other jurisdictions that currently use GRI to advance climate adaptation objectives, and provide recommendations for the City of Vancouver to better justify and utilize GRI in their own climate adaptation objectives. *City of Vancouver – 250 hours*

2024-056 Research and GIS analysis of urban tree canopy and green rainwater infrastructure to inform design and construction practices

The project aims to investigate a hypothesis suggesting that innovative construction techniques, designed to facilitate sufficient soil volumes for tree growth, result in larger, healthier, and faster-growing tree canopies, while minimizing damage to sidewalks. The Scholar will undertake the desktop task of using GIS datasets to identify sites meeting these conditions and making measurements from aerial imagery. The Scholar will also develop case studies from other municipalities to understand best practices and make recommendations for installing GRI near mature trees in the City of Vancouver. This information will fill in knowledge gaps and be used upon receipt by staff to develop cost/benefit analyses and evaluate design decisions around siting GRI, planting new trees, and preserving existing ones. *City of Vancouver – 250 hours*

2024-057 Research to update the City of Richmond's demolition bylaw

The City of Richmond has led the way in British Columbia by implementing a strong by-law for reducing and diverting waste from landfill in single family residence demolition. This reflects the City's dedication to sustainability and environmental responsibility. By prioritizing materials reuse, the City has met its downstream embodied carbon emissions reduction targets, and now it is expanding this policy to the broader built environment in Richmond. The purpose of this project is to inform an updated demolition bylaw for the City of Richmond with a particular focus reducing embodied carbon emissions from the construction industry. *City of Richmond – 250 hours.* This is a Pathways to Net Zero Embodied Carbon Project.

2024-058 Research to develop a contractor toolkit to reduce embodied carbon in new home construction

The purpose of this project is to develop a toolkit for contractors that highlights opportunities to reduce embodied carbon emissions in construction projects. The toolkit will feature options to reduce embodied carbon emissions of projects through optimization of building design and size, material selection and sourcing, and other factors relevant to new single-family home construction in Kamloops. *City of Kamloops – 250 hours.* This is a Pathways to Net Zero Embodied Carbon Project.

2024-059 Research to inform embodied carbon requirements in Squamish's Community Climate Action Plan (CCAP)

The purpose of this project is to support the integration of embodied carbon considerations into the next iteration of Squamish's CCAP. The current CCAP includes emissions and potential actions within the operational scope of the Squamish community, but excludes the embodied emissions associated with upstream and downstream activities. This project will focus on understanding key emissions

reductions mechanisms and levers for reducing the carbon footprint at the community level. Part of this project will include looking for ways to integrate actions with other CCAP initiatives (such as home retrofits and landfill waste reduction). It is not yet determined if embodied emissions will be incorporated into Squamish's inventory for the next CCAP iteration, but some quantification and modelling may also be required. *District of Squamish – 250 hours.* This is a Pathways to Net Zero Embodied Carbon Project.

2024-060 Researching opportunities to reduce embodied carbon in multi-unit residential building construction (City of Victoria)

The purpose of this project is to understand the city's current policy and program landscape project to inform the City's approach to new construction of multi-unit residential buildings to reduce embodied emissions. This project will align with the City's commitment to the reduction of GHG emissions level by 2025. Project work will include: a jurisdictional scan of municipal-scale policies and initiatives relevant to reducing embodied carbon in new construction of multi-unit residential buildings; interviews with subject experts to understand the successes and challenges of their embodied carbon policies and initiatives; analysis to identify best opportunities for the City to consider implementing. *City of Victoria – 250 hours.* This is a Pathways to Net Zero Embodied Carbon Project.

2024-061 Toolkit to integrate embodied carbon into municipal procurement strategies (City of Nelson)

The City of Nelson is committed to reducing GHG emissions from buildings and their materials at the local scale. In alignment with this commitment, the City is working to create a procurement policy and program to reduce embodied carbon emissions, which is derived from lessons learned from the City's multi-year project, the Low Carbon Homes Pilot. To further that work, the purpose of this project is to develop guidance and resources for municipalities and public sector organizations to support the reduction of embodied carbon in capital building projects (among other things) through procurement decisions. *City of Nelson – 250 hours.* This is a Pathways to Net Zero Embodied Carbon Project.

2024-062 Mapping ecological zones and species habitats at Maplewood Flats

Maplewood Flats is the only wild bird sanctuary on the north shore of Burrard Inlet. It is on the unceded lands and waters of the Tsleil-Waututh Nation (TWN) and Coast Salish Peoples adjacent to the TWN community and village site. Currently we know little about the ecological zones on the site and how flooding with brackish water will affect these areas. The Scholar will help create a long-term stewardship plan for area. Project work includes: 1) mapping the ecological zones and analysing them to assess how brackish floodwater will change soil, vegetation, and wildlife; 2) predictions on what the site could look like in 1, 15, 50 and 100 years; 3) a planting strategy based on the predicted conditions; and, 4) identification of areas for micro-pilot projects and testing. *University of British Columbia (Living with Waters) - 250 hours.* This is a Fraser Estuary Research Collaborative (FERC) project.

2024-063 Inventory UBC's climate research partnerships with Indigenous community and groups in the DTES

The purpose of the project is to research and catalogue the current state of climate change-related research partnerships between UBC and Indigenous community members, associations, and organizations in Vancouver's Downtown Eastside. The Scholar will be responsible for conducting exploratory interviews with established and emerging collaborators to understand the usefulness of such a database, how to assess the quality of research partnerships, and what climate change related topics are considered priorities. The Scholar will also be responsible for conduction semi-structured interviews to gather information on Indigenous - UBC partnerships within the DTES, as well as the quality of those partnerships. *University of British Columbia – 250 hours.*

2024-064 Research and test tools and methods for assessing carbon sequestration in parkland

The purpose of this project is to gain an understanding of the tools available for assessing carbon sequestration potential and how they could be applied to the planning and design of natural areas restoration and green infrastructure enhancement in Surrey's parkland. This project has three primary objectives 1) Identify and recommend available tools to quantify carbon sequestration potential of tree and plant species, and various types of greenspace; 2) Understand the methods used to quantify and enhance carbon sequestration being implemented by other municipalities, and 3) Identify opportunities to incorporate carbon sequestration potential within City policies and processes. *City of Surrey – 250 hours.*

2024-065 Research to inform drinking water & cooling station installment and placement in parks

The primary aim of this research is to inform a plan to enhance accessibility to drinking water and cooling stations within the public domain. The initial objective involves identifying equitable locations for the installation of 13 new hydration and cooling stations. This decision will be influenced by factors such as the complexities associated with integrating water utility systems, the proximity to existing drinking and cooling stations, and pedestrian traffic in specific areas. The emphasis will be on locations that often host community events and witness increased pedestrian activity. This project involves 1) field work to assess the condition of existing water stations in 5 to 6 parks, and 2) preparation of a GIS heat map to identify best locations for placement of new infrastructure. City of New Westminster – 250 hours.