

## Summer 2025 Sustainability Scholars Program Internship Opportunity

The UBC Sustainability Hub is pleased to offer current UBC graduate students the opportunity to work on sustainability internship projects. Successful candidates work under the guidance of a mentor from the partner organization, and are immersed in real world learning where they can apply their research skills and contribute to advancing sustainability across the region. The pay rate for the summer 2025 program is \$31.25/hour or \$7,812.50 for a 250-hour project.

- Visit the [Sustainability Scholars Program website](#) to learn [how the program works](#) and to [apply](#).
- Be sure to review the application guide on the Apply page to confirm your eligibility before applying.

**Applications close at 11:59 pm on Sunday January 26, 2025.**

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### **Project title: Enhancing Metro Vancouver's Emissions Inventory for Non-Road Engines: A Bottom-Up Approach**

#### **Project Background & Overview:**

Non-road engines are a diverse group of engines and equipment used in construction, industry, commercial, lawn and garden care, recreation, and a variety of other applications that are typically not intended for use on a public road. Non-road engines also vary in size, from construction cranes to lawnmowers and other small handheld equipment. The large majority of these engines run on fossil fuels. Electric equipment is currently limited mostly to smaller handheld equipment, but more electric options are becoming available across the sector. Non-road engines are also significant contributors of emissions at a regional scale, as well in local environments, as they emit large quantities of greenhouse gases, particulate matter, nitrogen oxides, and other air pollutants. Developing more accurate emissions inventories aligns with Metro Vancouver's continuous improvement principles, and improves tracking of progress towards meeting regional reduction targets.

Metro Vancouver's *Clean Air Plan* includes 2030 targets to reduce emissions from non-road engines and equipment, as follows:

- 35% reduction in greenhouse gas emissions, from 2010 levels
- 50% reduction in diesel particulate matter emissions, from 2020 levels.

To track air pollutant emissions in the region, Metro Vancouver prepares emissions inventories, which are used to measure performance, track progress towards goals and targets, and guide policy and regulatory development. The existing regional emissions inventory for the non-road sector is based on provincial estimates and allocated to the Metro Vancouver region using a method similar to that used by Environment and Climate Change Canada (ECCC) for scaling the emissions from a national level to the provincial level. Metro Vancouver seeks to improve and update the inventory by using bottom-up local and regional data, where possible.

This project will build on work completed by a previous UBC Sustainability Scholar in August 2024.

## **Project description**

This project aims to create a more precise and actionable emissions inventory for non-road engines (NREs) in Metro Vancouver, addressing a critical gap in regional air quality and climate data. By employing a bottom-up approach using locally-sourced data—such as census information and industry statistics—the Scholar will generate refined estimates of emissions that better reflect Metro Vancouver’s unique engine and equipment use patterns. This tailored methodology aims to empower Metro Vancouver to track emissions reductions more accurately, align with Clean Air Plan targets, and enhance policies aimed at lowering greenhouse gases and particulate matter. With the results, Metro Vancouver will be better positioned to lead effective, data-driven initiatives to improve air quality and protect public health.

The Scholar would connect with other jurisdictions that have completed non-road emission inventories to better understand the data sources and determine relevance to Metro Vancouver. Locally sourced engine population data could include census information, trade association data, and other sources identified by the Scholar. This work would also involve identifying other related information that could be used as surrogates to develop engine population estimates in the region, in order to estimate emission from this sector. Depending on findings, the work could focus on the largest sectors responsible for non-road emissions.

With the results, Metro Vancouver will be better positioned to lead effective, data-driven initiatives to improve air quality and protect public health. Specifically, the findings will support Metro Vancouver’s ongoing improvement of its emissions inventory procedures, and will help inform progress toward meeting regional clean air and climate goals.

The outcomes would be valuable in informing progress toward meeting regional clean air and climate goals, and would support ongoing improvement of regional emissions inventory procedures.

- Environmental: provides potential insights into emissions from the non-road sector, one of the larger sources of regional GHG emissions
- Economic: helps identify non-road sectors with potential for emissions reduction and potential future growth and support for low-carbon technology.
- Social: would enhance Metro Vancouver’s information in engaging with residents and businesses that use non-road engines, by supporting a data-driven approach to policy development.

## **Project scope**

Project tasks may include:

- Identify any best practices or sources of data for developing estimates of population of the different categories of non-road engines and equipment. Metro Vancouver currently has population estimates that are disaggregated from provincial estimates (i.e., top-down estimates), and wishes to update and replace these with bottom-up data. The

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work could consider approaches used by other jurisdictions in Canada and the US, and academia, as applicable

- Based on the best practices research, develop a replicable methodology for updating population estimates / counts on an annual basis for the Metro Vancouver region and its member jurisdictions, based on using locally sourced data, including but not limited to census information, trade association data, and other sources identified by the Scholar
- Identify any remaining gaps or barriers to accurately report / estimate population data for the non-road sector, and make recommendations for improvement
- Apply the population data to non-road engine emissions data (data set will be provided by the project mentor) to update estimates of emissions for the Metro Vancouver region and member municipalities

## Deliverables

- A final report containing a summary of the work completed
- A final report for the online public-facing [Scholars Project Library](#).
- A 15-minute presentation to MV departments that have an interest in this work
- Optional: a 5-minute presentation to Metro Vancouver's Corporate Planning Committee (consists of senior managers from across the departments at Metro Vancouver)

## Time Commitment

- This project will take 250 hours to complete
- This project must be completed between May 1 to August 15, 2025
- The Scholars is to complete their hours between 9 am and 5 pm, Monday to Friday, approximately 17 to 20 hours per week.

## Required/preferred Skills and Background

- Excellent research and writing skills
- Demonstrated interest in sustainability
- Familiarity with research methodologies and survey techniques
- Statistical analysis
- Strong analytical skills
- Ability to work independently
- Deadline oriented
- Project management and organizational skills
- Demonstrated experience in data science (R or Python, Git), understanding of sources of air emissions, creative problem solving with data
- Interest/experience in technical areas (air quality, emissions) and data analysis an asset

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Apply here: [Click here to apply](#)

Contact Karen Taylor at [sustainability.scholars@ubc.ca](mailto:sustainability.scholars@ubc.ca) if you have questions

## Useful Resources

We are holding a special **resume preparation workshop for prospective Scholars** on January 21, 2025. [Click here for details and to register.](#)

Below are some links to useful resources to help you with your resume and cover letter (there are many more online). Some of these resources also provide information on preparing for your interview.

<https://students.ubc.ca/career/career-resources/resumes-cover-letters-curricula-vitae>

<https://www.grad.ubc.ca/current-students/graduate-pathways-success>

<https://www.grad.ubc.ca/cover-letter-cv-resume-templates-ubc-career-services>