

## 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: Data analysis and modelling to understand the impact of gravel extraction on salmon habitat and flood risks, and evaluate mitigation strategies**

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

In-river gravel mining, also known as in-stream or channel mining, involves the extraction of gravel from the bed and banks of rivers or streams. This process typically occurs directly within the watercourse and can have various environmental impacts. The removal of gravel has been cited as a flood mitigation technique. Gravel is an important natural resource with many uses in city building and for infrastructure such as roads.

The Chilliwack/Vedder River between Abbotsford and Chilliwack is an area that's rich in quality gravel that comes down from the Chilliwack River Valley. The Chilliwack/Vedder River is renowned for its significance as habitat for various salmon species and provides crucial spawning ground for several species of including Chinook, Coho, Chum, and Pink salmon. The Chilliwack/Vedder River also provides cold, well-oxygenated water that helps keep salmon redds well aerated and ensures sediments do not build up and smother eggs.

Generally, gravel mining is understood to destroy spawning habitat, impact egg mortality, alter river flows, increase turbidity, impact temperature, and create habitat fragmentation. All of these impacts combined can significantly affect the Pink salmon population, making it harder for them to survive, reproduce, and maintain healthy numbers.

The Chilliwack River flows into the Vedder River which flows through the Vedder Canal before meeting the Fraser River. This reach of the Fraser is commonly known as the Heart of the Fraser River. It is primarily made up of gravel, and every 'odd year,' Fraser Pinks spawn in the millions in the mainstem, side channels and tributaries of the Fraser, including the Chilliwack/Vedder River system.

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In addition to being a good source of gravel for construction, the Chilliwack/Vedder River is also a very popular fishing and recreational area, and for agricultural irrigation. Economically, socially and ecologically, the area supports a number of vital needs.

The issues around gravel mining have been divisive and we want to bring clarity to the situation.

Over the past few years, Watershed Watch has been working in the Fraser Valley with others to move towards a place of flood resilience. Gravel mining is a part of this conversation to which there is no clear solution. Our work in the region looks at governance, nature-based solutions to flooding and reconnecting waterways impacted by ageing flood infrastructure, to name a few. In the Chilliwack/Vedder especially, gravel extraction is touted as a solution to flooding but with very mixed reviews.

In 2023, we helped stop the extraction of a massive load of gravel from the Chilliwack/Vedder. This action greatly concerned us because this was an 'odd year' and large populations of Pink salmon were expected to return. More information can be found on our blog about this issue: <https://watershedwatch.ca/Chilliwack/Vedder-gravel-mining-cancelled/>

Gravel mining in the Fraser River and its tributaries can have various impacts downstream throughout the Fraser Estuary, an ecologically significant area. Potential impacts of gravel mining include sedimentation and turbidity, impacts on fish habitat, erosion and channel morphology, impacts on bird habitats and navigation and the need for more channel dredging in addition to other cumulative impacts. If we are able to add clarity to decision-making around gravel mining impacts, we can move towards more sustainable ways of conducting flood mitigation that also promotes healthier salmon habitats.

Over the summer of 2024, a UBC Sustainability Scholar looked at the impacts of in-river gravel mining on salmon and salmon habitat, provided a number of natural flood mitigation options and conducted a case study of the Chilliwack/Vedder river with alternative flood mitigation solutions. [Link here.](#)

## **Project description**

The Chilliwack/Vedder River is a waterway impacted by flooding. It has high-value fish habitat and high inputs of gravel. It's been significantly changed over time to accommodate colonial land settling and development. In Phase 1 of this project, we answered 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?

While Phase 1 allowed us to answer many questions and created a basic understanding of the issue there is still more to learn. We realized the need for an initial scenario analysis would help us understand what impacts the river faced and better formulate solutions to tackle habitat degradation.

As such, moving into Phase 2, the purpose of this work is to understand the impact of gravel extraction on salmon habitat and flood risks, and evaluate mitigation strategies in the Chilliwack/Vedder as the case study. We want to take our exploration of this waterway further by modelling this system using appropriate indicators of river health and climate change projections. As we look at building out the knowledge foundation on this issue further, and based on identified next steps and feedback from the 2024 UBC Scholar, we want to model or create a series of scenarios of the Chilliwack/Vedder river system for flood mitigation solutions using a number of indicators such as: climate change projections, river health and cost effectiveness.

We'd like to create 2 – 3 scenarios based on different warming levels and different levels of loss and damage and then showcase 1 – 2 flood mitigation or adaptation solutions.

## Project scope

1. Identify and list all data sets and sources needed for the scenario analysis
2. Gather and analyze baseline data (including: physical characteristics, biological, gravel extraction data, flood data, regulatory and socioeconomic context)
3. Identify the modelling tool to be used
4. Develop the hydrological and hydraulic models
5. Develop the scenarios (such as: baseline, gravel extraction, flood mitigation, ecological, climate change)
6. Simulate the scenarios
7. Assess and compare scenario outcomes
8. Recommend and prioritize solutions

## Deliverables

- 2 to 3 simulated scenarios
- A report summarizing the work completed including recommendations and prioritized solutions
- A final report for the online public-facing [Scholars Project Library](#).

## Time Commitment

- This project will take 250 hours to complete
- This project must be completed between May 1 to August 15.
- 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

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- ☒ Ability to work independently
- ☒ Deadline oriented
- ☒ Demonstrated experience working with and analysing data to generate scenarios
- ☒ Ability to access the needed data for analysis
- ☒ Experience with GIS and geospatial analysis
- ☒ Familiarity with benchmarking methods and tools
- ☒ Experience with modelling and analysis of geotechnical and geospatial data
- ☒ Proficient in hydrological and hydraulic modelling
- ☒ Data analysis

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

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>