Summer 2021 Sustainability Scholars Program Internship Opportunity

The UBC Sustainability Initiative (USI) is pleased to offer current UBC graduate students the opportunity to work on funded sustainability internship projects. Successful candidates work under the mentorship of a partner organization, and are immersed in real world learning where they can apply their research skills and contribute to advancing sustainability across the region.

- Visit the Sustainability Scholars Program website to learn how the program works and to apply.
- Be sure to review the application guide to confirm your eligibility before applying.

Applications close at midnight on Sunday January 31, 2021.

Research project title

Examination of biosolids and drinking water treatment residuals as effective filter media for stormwater source control in Green Infrastructure / Low-Impact Development

Project description

Overview

In urban areas, stormwater is collected by storm sewers and discharged into nearby water bodies. Stormwater carries pollutants from the urban landscape. Grey infrastructure (i.e., sewer pipes) is designed to move stormwater away from the built environment and can create high flows in receiving streams, which can cause erosion or flooding. In contrast, green infrastructure (GI), also called Low Impact Development (LID), uses vegetation, soils, and other elements that mimic natural landscapes to absorb, store, and filter the water.

Using GI/LID provides important services for communities by protecting them against flooding or excessive heat, or helping to improve air, soil and water quality. Stormwater management is one of the GI services that provides significant environmental benefits to the community. The use of Metro Vancouver residuals (biosolids or drinking water treatment residuals (DWTR)) in GI also promotes the beneficial use of the residuals, rather than going to disposal in a landfill.

The purpose of the project is:

GI/LID systems include rain gardens and bioretention facilities to manage stormwater and/or remediate runoff. Bioretention facilities (e.g., cells, swales, or planters) are engineered to treat and infiltrate a specific volume of stormwater. Rain gardens are typically smaller systems that do not need to be engineered. This project will investigate the potential to use residuals from Metro Vancouver's wastewater and water treatment facilities as an ingredient in the filter media soils in GI/LID systems. As part of the Integrated Liquid Waste and Resource Management Plan, Metro Vancouver is mandated to beneficially use residuals generated at its wastewater treatment plants (WWTPs). Metro Vancouver's Annacis Island WWTP produces Class A biosolids that are beneficially used to fabricate landscaping soil for use in the region, as well as creating soil to rehabilitate degraded lands elsewhere in the province. Metro Vancouver's Seymour-Capilano Filtration Plant generates drinking water treatment residuals (DWTR) that currently are beneficially used as a raw material in cement manufacturing.

Metro Vancouver would like to explore whether biosolids, DWTR, and mixtures thereof, can be used effectively as components in filter media to enhance and optimize the performance of GI/LID systems locally. Because of their high organic matter content, biosolids have been anecdotally inferred to increase the water holding capacity of soils. DWTR are known to have properties that bind phosphorus and adsorb a wide variety of pollutants. Since biosolids are high in phosphorus, a combination of biosolids and DWTR may help balance the nutrients carried by stormwater that passes through GI/LID systems.

Metro Vancouver would like to gather information on current GI/LID practices to:

- determine whether others have used filter media mixes that include biosolids or DWTR;
- assess the efficacy of existing LID practices and various filter media for removing pollutants from stormwater;
- assess how biosolids affect the water holding capacity of soils in general and GI/LID systems in particular;
- evaluate potential environmental effects of using biosolids in the filter media in GI/LID systems; and
- evaluate potential environmental effects of using DWTR in the filter media of GI/LID systems.

The Scholar's work will be used to conduct a local field scale trial to test different filter media mixes that include biosolids and/or DWTR. Going forward, working in conjunction with local member municipalities, Metro Vancouver would like to use this work to develop reliable information to potentially incorporate the use of residuals into the Metro Vancouver and municipal specifications for GI/LID landscape filter media. Ultimately this will provide a stormwater management tool for municipalities and Metro Vancouver that also beneficially uses resources recovered from wastewater and drinking water treatment plants.

Deliverables

- Draft final report summarizing the literature review and interviews, for review by Metro Vancouver.
- Draft design criteria for bench-scale filter media trial (if time allows)
- Final report for Metro Vancouver's internal use.
- Create a PowerPoint presentation summarizing the findings, and deliver presentation to Metro Vancouver staff (if time allows).
- Executive Summary for the UBC Sustainability Scholars online project library.

Time Commitment

- This project will take **250** hours to complete.
- This project must be completed between **May 3 and August 13.**
- The scholar is to complete hours between **8 and 4:30 pm, Monday to Friday**, approximately **20** hours per week.
- The Scholar will present their work at a Utility Residuals Management Group meeting in August at the close of the project.

- Mandatory meetings: Kick off meeting, preliminary Table of Contents, weekly progress and draft report meetings, and final presentation. All meetings to take place via Zoom.

Required/preferred Skills and Background

☒ Excellent research and writing skills
☒ Demonstrated interest in sustainability
☒ Familiarity with research methodologies and survey techniques
☒ Excellent public speaking and presentation skills
☒ Strong analytical skills
☒ Ability to work independently
☒ Deadline oriented
☒ Project management and organizational skills
☒ Familiarity with benchmarking methods and tools
☒ Comfortable interacting with strangers to conduct public/in person surveys
☒ Familiarity with stormwater and green infrastructure

Applications close **midnight Sunday January 31, 2021**
Apply here: Click here to apply
Contact Karen Taylor at sustainability.scholars@ubc.ca if you have questions

Useful Resources

We are holding a special **resume preparation workshop for prospective Scholars** on January 19. 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