Summer 2020

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 February 2, 2020.

Research project title: Laying the groundwork for quantification of carbon sequestration and emissions for land-applied Metro Vancouver biosolids.

How will this project make a contribution to regional sustainability?

The work will facilitate better evaluation of greenhouse gas (GHG) sequestration and emissions due to current and future biosolids management options. This will allow GHG assessments to be included in future biosolids management decisions.

Project description

Metro Vancouver has committed to achieving carbon neutrality through the BC Climate Action Charter and its Climate 2050 strategy. Emissions from the biosolids program are a significant portion of Metro Vancouver’s carbon footprint. However, the emissions may be outweighed by GHG reductions resulting from land application of biosolids.

Metro Vancouver beneficially uses biosolids, the solid residual from wastewater treatment, as a soil conditioner and nutrient source for a variety of projects including mine reclamation, landscaping soil manufacturing, and grassland fertilization. These beneficial uses result in both GHG emissions and carbon sequestration, which vary widely between different types of projects. Metro Vancouver has historically quantified only the GHG emissions from the fuel use of trucks that haul biosolids to project sites and of heavy equipment used to apply biosolids at sites.

Metro Vancouver has not systematically quantified the GHG implications – both emissions and reductions – of the land application itself. These include nitrous oxide release from biosolids, carbon sequestration in soils, and avoided emissions from displacement of conventional fertilizers. Some piecemeal investigation has been completed to estimate GHG impacts for specific Metro Vancouver biosolids land application projects. Some of this work was completed with assumptions that may no longer be valid. The current assignment will synthesize and evaluate those historic investigations, as well as identify gaps that remain for Metro Vancouver to better understand and quantify emissions and sequestration from biosolids applied to land. The scholar may also conduct a literature search to assist in completing the assignment.
Biosolids land application and GHG evaluation are common activities for many large municipalities/water utilities. The scholar will also conduct phone interviews with contacts at municipalities/utilities to better understand how those organizations are addressing GHG evaluation and what tools they are using.

Once the research phase is completed, the scholar will develop a scope of work to (a) fill knowledge gaps in quantifying GHG emissions/reductions and (b) produce a GHG estimation tool specific to the Metro Vancouver biosolids land application program. Metro Vancouver will later seek a specialist consultant to complete this scope of work.

This work will ultimately help Metro Vancouver to more comprehensively quantify its carbon footprint. The future GHG estimation tool will help staff compare options for biosolids land application based on a triple-bottom-line business case that incorporates the value of carbon, as dictated by Metro Vancouver’s Carbon Price Policy.

The purpose of the project is:

1) To review, evaluate, and summarize the historic GHG evaluation work that Metro Vancouver has completed for land application of biosolids. A milestone deliverable for this project will be a memo that summarizes the historic work, comments on its technical defensibility, and identifies remaining gaps in understanding GHG emissions and reductions.

2) Review of best practices of other jurisdictions, including interviews with other municipalities/utilities (identified by Metro Vancouver), to gain an understanding of how they have developed GHG estimations for biosolids land application.

3) The overall goal of the project is to create a scope of work that can be used to later engage specialist consultants to conduct research that will fill gaps and update the historic work and develop GHG estimation tools specific to Metro Vancouver’s biosolids program.

Project Deliverables:

The Scholar will deliver a final report containing a summary of their completed work. The report should include:

- Synthesis and analysis of historic evaluations of GHG emissions/sequestration from biosolids application.
- Scope of work for filling gaps understanding biosolids GHG emissions/sequestration and developing a GHG quantification tool for biosolids land application.

Time Commitment

- This project will take 250 hours to complete.
- This project must be completed between May 4 and August 14, 2020.
- Any work conducted at Metro Vancouver’s offices must be completed between 8:30 am and 4:30 pm.

Hours per week are flexible and will be determined in consultation with the Scholar.
Required/preferred Skills and Background
☒ Excellent research and writing skills
☒ Demonstrated interest in sustainability
☒ Strong analytical skills
☒ Ability to work independently
☒ Experience in GHG quantification is preferred
☒ Academic background in one of the following areas would be an asset: Soil science; Plant science; Integrated studies in land and food systems; Botany; Resources, Environment, and Sustainability; Chemical and Biological Engineering.

- The historical research components of this work will need to be done at the Metro Vancouver head office in Burnaby where the Scholar can access our library and electronic filing system.
- The candidate will need their own laptop to complete the assignment.

Applications close **midnight Sunday February 2, 2020**.
Apply here: [http://sustain.ubc.ca/scholarsapply](http://sustain.ubc.ca/scholarsapply)
Contact Karen Taylor at sustainability.scholars@ubc.ca if you have questions

Useful Resources

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://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/current-students/graduate-pathways-success)

[https://www.grad.ubc.ca/cover-letter-cv-resume-templates-ubc-career-services](https://www.grad.ubc.ca/cover-letter-cv-resume-templates-ubc-career-services)

The Centre for Student Involvement & Careers will host a resume & cover letter webinar tailored for graduate students on Tuesday, January 21, 2020 from 12:00-1:30. Registration will open approximately two weeks before the webinar, and can be accessed at Careers Online.