

Summer 2024 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. These opportunities are paid. The pay rate for the summer 2024 program is \$27.50/hour or \$6,875 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 midnight on Sunday January 28, 2024.

Project title: Research and GIS analysis of urban tree canopy and green rainwater infrastructure to inform design and construction practices

Project Background & Overview:

The Vancouver Urban Forest Strategy (UFS) illuminates the disparities in greenspace distribution and urban tree canopy across the city, emphasizing the need for greater equity. With a target of achieving 30% canopy cover city-wide by 2050, the UFS aims to address pressing issues such as the urban heat island effect, heightened energy consumption for air conditioning, air pollution, and the vulnerability of individuals to extreme heat. The City has also adopted the Rain City Strategy (RCS) with a target of managing rainwater runoff from 40% of the City's impervious areas by 2050. This will be achieved through increased use of nature-based solutions such as green rainwater infrastructure (GRI) to collect and treat rainwater runoff while providing more water and soil for trees. Projects in support of both strategies are also important to supporting the objectives of the City's Climate Change Adaptation Strategy.

However, accommodating trees in heavily urbanized zones has long been a global challenge for municipalities. Traditional public realm construction methods often leave insufficient soil space for tree roots. Over the past two decades, emerging construction methodologies like structural soil and soil cells have offered solutions by providing suitable soil conditions for urban trees. However, due to the slow growth of trees and the relative novelty of these methods, there is limited information on their efficacy. Vancouver, being an early adopter of these methodologies, possesses comprehensive data sets that present an opportunity to assess the effects of canopy growth in engineered specialized soils compared to regular tree pits. This work will build on the 2023 Sustainability Scholar project by Elliot Bellis that focused on improving the health of street trees surrounded by hardscape in urban environments.

Using this assessment to understand how trees grow in GRI soil treatments versus non-GRI treatments, the Scholar can help staff make design and construction decisions that consider effects to the overall tree canopy and rainwater management objectives, thus optimizing the outcomes for both. Additionally, the information generated will be instrumental for engineers

and urban foresters in comprehending the cost and benefit dynamics associated with investments in GRI and engineered specialized soils. This knowledge is essential for informed decision-making and sustainable urban planning, aligning with broader climate action goals and promoting equitable access to green spaces.

Project description

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.

The project objectives include:

1. Analyze growth rates for Vancouver trees planted in structural soils or soil cells compared to those planted in standard tree pits.
2. Document best practices for installing GRI to support new trees, including suggesting high performing or suitable tree species for structural soils or soil cells.
3. Document best practices, strategies, and methods for installing GRI near existing urban trees, and make recommendations on applicable practices for the Vancouver context.
4. Understand the risks and benefits for designing new GRI assets with engineered specialized soil adjacent to or incorporating existing mature tree roots, with a focus on areas of low canopy cover and species-specific needs.

Project scope

The Scholar will undertake analysis of City data and a scan of practices in other jurisdictions to understand how we can optimize our efforts to reduce urban heat and mitigate climate change effects with a healthy urban forest:

- Review of COV tree canopy inventory (2013, 2015, 2018) GIS datasets cross-referenced with GRI asset inventory to analyze canopy area growth rates versus tree pit characteristics for trees of the same species. Sidewalk condition data can also be reviewed, time permitting.
- Select site visits to audit GIS analysis and assess the current state of trees, GRI and nearby street assets, and collect relevant tree size measurements, time permitting.
- Interviews with 5-10 City staff involved in urban tree health and GRI implementation to document current design considerations and mitigating strategies for projects involving trees and GRI.
- Development of 3-5 case studies from a scan of other North American jurisdictions to understand the impact on tree health when installing GRI and determine best practices, mitigation strategies, and methods employed.

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Deliverables

- A final report containing a summary of the work completed
- A final report for the online public-facing [Scholars Project Library](#).
- Sections of the report to include:
 - A table of the GIS analysis noting tree growth performance for Vancouver's commonly planted urban tree species by summarizing the canopy area growth rate when planted in structural soil or soil cell versus when planted in a standard tree pit.
 - A preferred urban tree species list for GRI, to inform the City's GRI planting guide.
 - Summary of impacts and best mitigation practices for installing GRI near existing trees.
 - A list of recommendations for the City based on the findings of this research, including how to implement the findings with an equity lens.

Time Commitment

- This project will take 250 hours to complete
- This project must be completed between May 1 to August 15, 2024
- The Scholar is to complete 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
- Excellent public speaking and presentation skills
- Strong analytical skills
- Ability to work independently
- Deadline oriented
- Project management and organizational skills
- Strong technical and drafting skills
- Demonstrated experience in urban forestry or landscape architecture
- GIS training or experience
- Familiarity with benchmarking methods and tools
- Knowledge of green infrastructure typologies and design principles
- Experience working with large, complex data sets

Applications close **midnight Sunday January 28, 2024**

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 23, 2024. [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>