

SUSTAINABILITY SCHOLARS PROGRAM

Fall 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.

Note: Projects must be completed remotely during the COVID-19 pandemic.

- 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 September 20, 2020.

Research Project Title: Develop living shoreline design options to restore coastal habitats and help coastal areas adapt to sea level rise in the Lower Mainland

Sustainability Goals

- Good Health and Wellbeing: Support the health and well-being of communities that depend on healthy coastal ecosystems in the Lower Mainland
- Sustainable Cities and Communities: Advance nature-based flood protection for coastal communities
- Climate Action: Help protect and restore coastal ecosystems (e.g. tidal wetlands) in an era of rapid sea level rise

Project description

Context

Conventional shoreline development in the Lower Mainland has, for over a century, resulted in widespread ecosystem degradation and loss of coastal marine habitats. Consequently, many coastal species have suffered dramatic declines and the ecosystem services provided by these areas have diminished. Climate change and sea level rise will further impact coastal ecosystems due to changes in temperature, pH, and the reduction in habitat area (“coastal squeeze”) where landward migration of ecosystems is not possible.

Living shoreline design and nature-based flood protection are general approaches to shoreline-related works; these approaches seek to protect and restore coastal habitats while helping them adapt to sea level rise. A living shoreline design approach forgoes hardened shoreline features (e.g. conventional bulkheads, seawalls, breakwaters) and chooses appropriate nature-based solutions instead; these may include living breakwaters, artificial reefs, engineered tidal wetlands, sediment augmentation, floating wetlands, or seawalls with integrated habitat elements, among others.

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Purpose

Space2place design is currently involved with several waterfront-oriented projects that aim to restore coastal ecosystems and help ecosystems adapt to sea level rise, while also creating safe and attractive waterfronts for people. Many coastal jurisdictions around the world are actively implementing strategies to achieve these goals, but this type of work is still in the early stages of development in our region (e.g. Green Shores program, Stewardship Centre of BC; “living dike” proposal, City of Surrey; living breakwater and other nature-based design proposals for reducing erosion on UBC cliffs, led by UBC Professor Kees Lokman). Through this project we are seeking to advance local design knowledge and establish successful precedents for living shoreline development work.

How the Scholar’s work will be used

The Scholar’s work will help advance the development of new strategies for living shoreline development and adaptation to sea level rise for the Lower Mainland, generally, and for two study areas in particular: Sturgeon Bank and False Creek.

Components of the work

- Literature review and precedent research on living shoreline design strategies from other jurisdictions. Identification of precedents that are most relevant to the geographic and hydrodynamic conditions of Sturgeon Bank and False Creek.
- Interviews with design professionals to better understand the performance of built precedents and lessons learned.
- Documentation of habitat requirements for key species that use the study areas (Sturgeon Bank and False Creek).
- Development of living shoreline design options that restore coastal habitats and support the habitat requirements of key species, and documentation of these options with drawings and visuals.
- Synthesis of the work in the form of a report and presentation.

Key research questions

- What types of living shoreline design options are appropriate for the two study areas?
- How can the shorelines be designed to directly provide habitat to marine species? (i.e. consider incorporation of habitat elements, material options, custom structural elements)
- How can the shorelines be designed to indirectly support the restoration of coastal ecosystems (e.g. consider potential role in restoring broader coastal ecosystem processes, improving water quality, sediment quality, etc.)
- How can these shorelines be designed to adapt to sea level rise?
- How can the shorelines be designed to allow public access, such as for recreation, education, and traditional uses?
- What are the opportunities for integrating ongoing research and adaptive management strategies into the design of the living shoreline features?

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Deliverables

- Interim report documenting
 - Precedents for living shoreline options
 - Interview notes with technical experts
 - Documentation of hydrodynamic conditions at the study sites
 - Identification of suitable focal species
 - Habitat requirements for focal species
- Set of drawings and visuals, documenting design development and design options for living shorelines
- Draft final report synthesizing the above deliverables and answering the key research questions
- Final report incorporating feedback and edits from mentor
- A final report for the UBC Sustainability Scholars online project library

Time Commitment

The project will take 250 hours to complete and will be completed between October 19, 2020 and March 12, 2021. The Scholar is to complete approximately 12 hours per week; work is to be remote and hours are flexible, but Scholar should be available for a 30-minute phone call every other week. There are no mandatory meetings but there may be an opportunity for the Scholar to participate in zoom-based or in-person meetings related to the project work. A detailed schedule for meetings and deliverables will be developed jointly once the Scholar is confirmed.

Required/preferred skills and background

Required skills:

- Excellent research and writing skills
- Demonstrated interest in marine biology, estuary ecology, coastal engineering, and/or nature-based solutions to coastal engineering challenges
- Ability to work independently

Preferred skills:

- Interest in design and design solutions to advance sustainability
- Comfortable interacting with strangers to conduct phone interviews
- Strong analytical skills
- Ability to translate ideas into drawings (specific design / graphics skills are not necessary)

Applications close **midnight Sunday September 20, 2020.**

Apply here: <http://sustain.ubc.ca/scholarsapply>

Contact Karen Taylor at sustainability.scholars@ubc.ca if you have questions

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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.

Resume workshop for prospective Sustainability Scholars: <https://www.eventbrite.ca/e/resume-workshop-for-prospective-sustainability-scholars-tickets-117422877989>

<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>