THE UNIVERSITY OF BRITISH COLUMBIA
Sustainability Hub

Fraser Estuary Research Collaborative

2024 Research Highlights

UBC Sustainability Scholars Program
sustain.ubc.ca/ferc

Photo credit: European Space Agency (Flickr)

Thank you to the Sitka Foundation for their generous support of the third year of the Fraser River Estuary Research Collaborative.

Year 3 Projects

From the Director

I am pleased to share with you the significant contributions made by the Fraser Estuary Research Collaborative, a group of graduate students from diverse academic backgrounds and a special stream of the Sustainability Scholars Program.

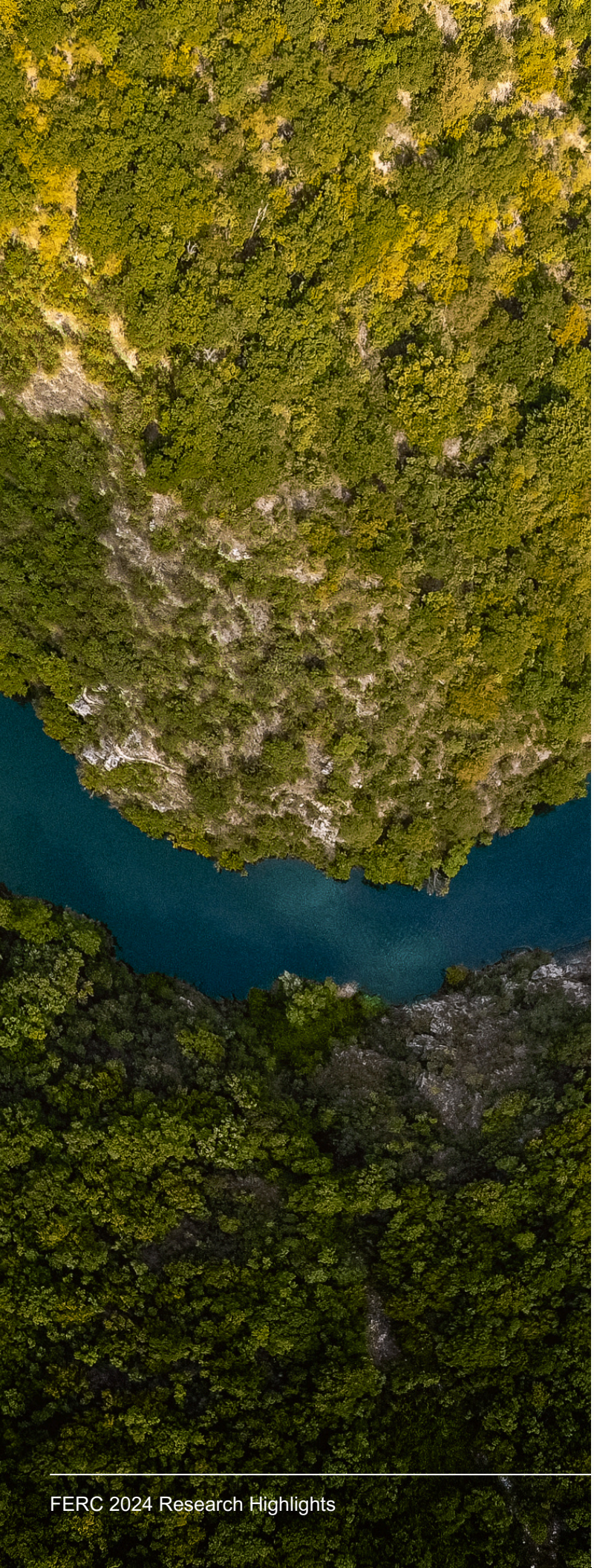
This summer, 10 students once again focused their efforts on the Fraser River Estuary—a region of ecological significance which continues to face widespread ecological threats from development, pollution, habitat alteration, and climate change.

Research projects encompassed a range of topics, including advancing flood resilience and mitigation, identifying opportunities for salmon habitat restoration, development of a public program of events centered on the estuary, designing a citizen science protocol for monitoring mini forests, and science communication of values-based approaches in coastal adaption. The academic rigour and practical insights derived from these projects underline the inherent value of work-integrated learning.

We sincerely appreciate the generous funding from the Sitka Foundation, whose support allowed us to carry out this program over the past three years and contributed to the educational and practical experiences of these aspiring researchers.

We'd like to express our gratitude to the students and mentor organizations for their contribution to making this important initiative possible. We'd also like to extend a special thank you to graduate student Clarence Lau, an academic assistant on the FERC program this summer, whose organizational skills helped the program flourish in year two and three.

Sincerely,
Linda Nowlan
Senior Director, UBC Sustainability Hub



About

The Fraser Estuary Research Collaborative (FERC) is a three-year applied research project that brings together UBC graduate students and non-governmental organizations to restore and protect the endangered Fraser River Estuary.

Students come from a range of disciplines, including landscape architecture, law, geography, planning, and civil engineering and are matched with a mentor from a local NGO or Indigenous association that is working in fields such as environmental law, advocacy, mapping, Indigenous-led conservation, or habitat restoration projects in and around the estuary.

By connecting local knowledge and scholarship, FERC Scholars continue work undertaken over the past two years to contribute to the development of an array of solutions to challenges faced by this vital watershed.

Photo credit: Memaxmarz (Flickr)

Territorial Acknowledgement

The Sustainability Hub office is located at the UBC Point Grey campus situated on the traditional, ancestral, and unceded territory of the xʷməθkʷəy̓əm (Musqueam). As part of the larger UBC community, we are guests and settlers on the traditional, ancestral, and unceded territories of the xʷməθkʷəy̓əm (Musqueam), Sḵwx̱wú7mesh (Squamish), Sel̓íl̓witulh (TsleilWaututh), and Syilx (Okanagan) Nations.

In our pursuit of sustainability, climate action and climate justice, we understand that protecting human rights is indelibly woven into the fabric of environmental protection and sustainability. As guests and settlers on Indigenous lands, we share an important responsibility for learning about host Nations and strengthening these relationships.

Partners

FERC Scholars in year 3 received guidance from NGO partners with expertise on flood management, estuary protection, environmental legal governance frameworks, community wellbeing, policy and ecosystem health.

2024 Partners

- Emergency Planning Secretariat
- Green Communities Canada
- Living with Water (UBC)
- Resilient Waters
- Other Sights for Artists' Projects Association
- Raincoast Conservation Foundation
- Watershed Watch Salmon Society
- World Wildlife Fund Canada

Photo credit: Suman Bhattacharyya

In-River Gravel Mining as a Flood Mitigation Tool: Impacts on Pacific Salmon and Alternative Solutions

Prepared by Suman Bhattacharyya

for the Watershed Watch Salmon Society

The project examines the impact of in-river gravel mining on flood control and Pacific salmon habitat by assessing how gravel extraction changes riverbed conditions and affects salmon habitat. Based on a literature review, the study aims to enhance flood resilience and sediment management in the Chilliwack/Vedder River while addressing ecological challenges. It examines nature-based solutions, like floodplain rehabilitation, to improve flood resilience and salmon habitat.

Full report at:

https://sustain.ubc.ca/about/resources/river-gravel-mining-flood-mitigation-tool-impacts-pacific-salmon-and-alternative

Photo credit: Joe Thomissen (Flickr)

Bank Stabilization for Flood Resilience and Healthier Habitats in British Columbia

This project summarises bank erosion issues, along with the different techniques used to stabilize riverbanks in British Columbia. The problems with an over-reliance upon "hard engineering" techniques are outlined, along with the importance of alternative methods (e.g., revegetation and bioengineering) that reduce erosion and floods, while also supporting healthy river habitats. Included are management recommendations based upon both the academic literature and a practitioner workshop.

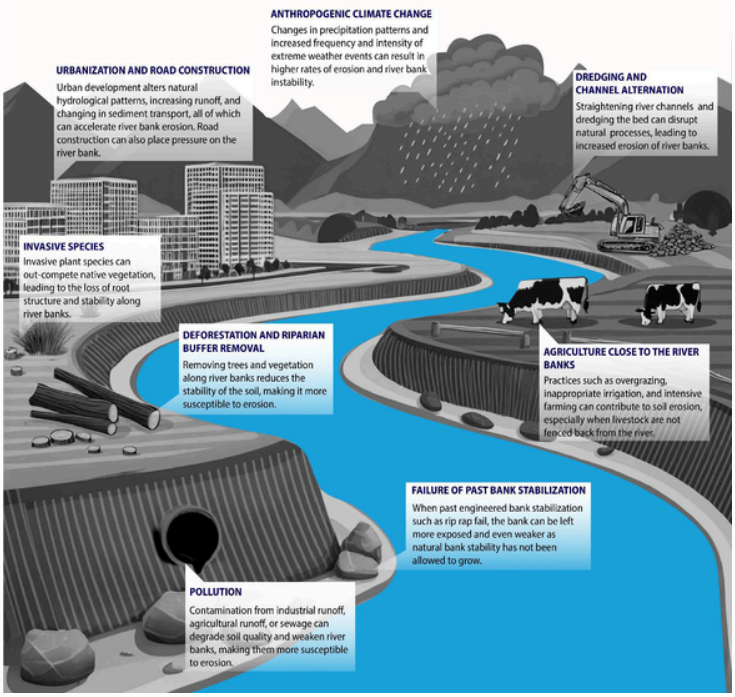


Illustration credit: Charlotte Milne

Full report at:

https://sustain.ubc.ca/about/resources/bank-stabilization-flood-resilience-and-healthier-habitats-british-columbia

Prepared by Charlotte Milne

for Resilient Waters and the Watershed Watch Salmon Society

Photo credit: Linda Nowlan (Flickr)

Salmon Habitat Analysis in the Lower Fraser River & Estuary

Prepared by Diego Lozano
for the Raincoast Conservation Foundation

This project aims to evaluate the condition of habitat availability for out migrating juvenile salmon in the Lower Fraser Estuary. Using a GIS methodology the project uses existing habitat, shoreline conditions, and land use as the base of the analysis. A final series of maps shows the results of habitat availability and accessibility. The results will hopefully support future habitat restoration projects to better support salmon in the Lower Fraser River and Estuary.

Full report at:

https://sustain.ubc.ca/about/resources/salmon-habitat-analysis-lower-fraser-river-estuary

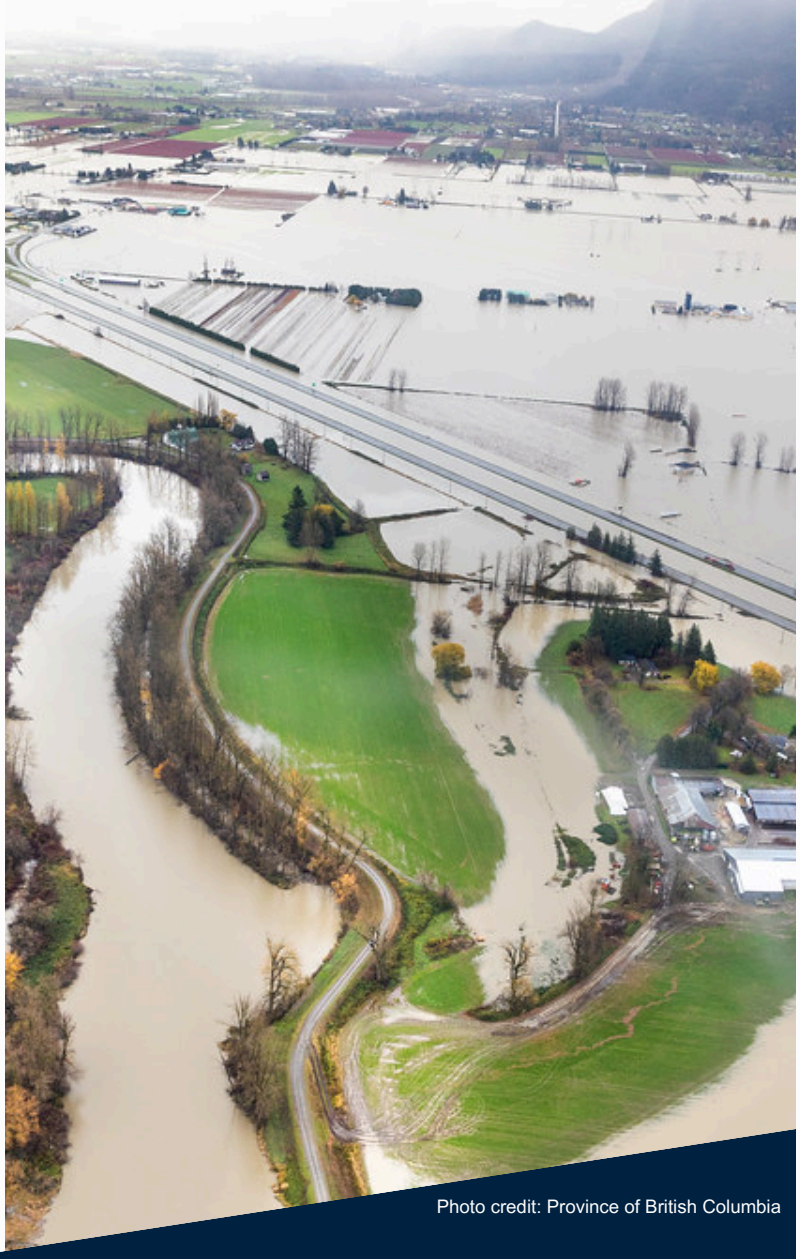


Photo credit: Province of British Columbia

Flood Mitigation in the Fraser Valley: An Exploration of Passive Water Storage on Agricultural Land

This project explores the feasibility of implementing passive water storage on agricultural land to mitigate flood risk in the context of climate change. It analyzes two examples of passive water storage tools, offering recommendations for further research to ensure their viability in the Fraser Valley. The report examines the governance frameworks and funding mechanisms that may support or hinder the integration of these strategies into British Columbia's floodplain management practices.

Full report at:

https://sustain.ubc.ca/about/resources/flood-mitigation-fraser-valley-exploration-passive-water-storage-agricultural-land

Prepared by Megan Parno
for the Emergency Planning Secretariat

Photo credit: Viktor Kirichenko (Unsplash)

Literature & Policy Review to Inform Opportunities to Integrate Nature-Based Solutions and Restoration Work on the Fraser Estuary

Prepared by Ilyas Kanybek
for World Wildlife Fund Canada

This report analyzes global and local restoration policies, identifying gaps in integrating nature-based solutions. The review examines the biodiversity-related policies of the Government of Canada and the Province of BC for alignment with the Convention on Biological Diversity, and Canada's commitments to halt and reverse biodiversity loss. The review highlights the need for better ecosystem mapping policies, steady funding, and communication of restoration benefits to property owners.

Full report at:

https://sustain.ubc.ca/about/resources/literature-policy-review-inform-opportunities-integrate-nature-based-solutions-and

Photo credit: Ivo Yordanov (Unsplash)

Good Governance and Regulation in Sea Level Rise Adaptation: Regulatory Barriers to Implementing Nature-Based Solutions Along the South Coast of B.C.

Prepared by Jessie Gomberg
for Living with Water (UBC)

The purpose of this project is to provide a high-level summary of laws governing sea level rise adaptation and nature-based solutions in B.C. This report explores the questions: What barriers exist within the current regulatory regime that hamper the implementation of nature-based solutions along the south coast of B.C.? What sort of conceptual framing of these issues can allow for policy change?

Full report at:

https://sustain.ubc.ca/about/resources/good-governance-and-regulation-sea-level-rise-adaptation-regulatory-barriers

Photo credit: Little Forests Kingston

Designing A Citizen Science Protocol for Monitoring Mini Forests in the Fraser Estuary

Photo credit: Little Forests Kingston

This project investigates citizen science, or community-based science, as a method for monitoring Canadian mini forests, including those planted in the Fraser Estuary. Monitoring mini forests is important for understanding the impacts of this novel approach to urban greening, including determining the benefits to urban biodiversity, water infiltration, and soil health. The report includes a citizen science monitoring guide, protocol instructions, and monitoring tracking sheets for volunteer use.

Full report at:

https://sustain.ubc.ca/about/resources/designing-citizen-science-protocol-monitoring-mini-forests-fraser-estuary

Prepared by Kylie Clark

for Green Communities Canada

Photo credit: Samuel Kohlmann

Mapping Ecological Zones and Species Habitats at Maplewood Flats

Prepared by Samuel Kohlmann
for Living with Water (UBC)

The Maplewood Flats Conservation Area is home to sixteen ecosystems in 256 acres. The site's ecosystems are at risk of being lost due to rising sea levels and flooding. This project mapped the ecosystems at Maplewood Flats and modeled inundation levels on site to better understand its impacts. Finally, the plants, topography, ecosystem zones, and inundation were graphically depicted in sections. Drawing on this information the reoprt suggests areas for coastal adaptation strategies and pilot projects.

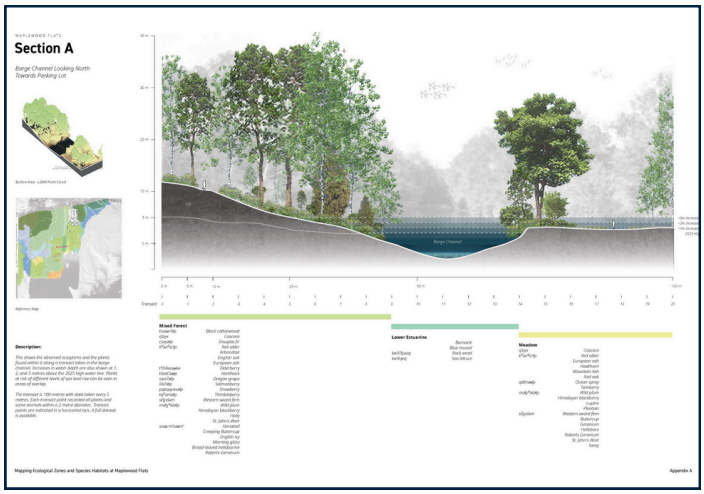


Illustration credit: Samuel Kohlmann

Full report at:

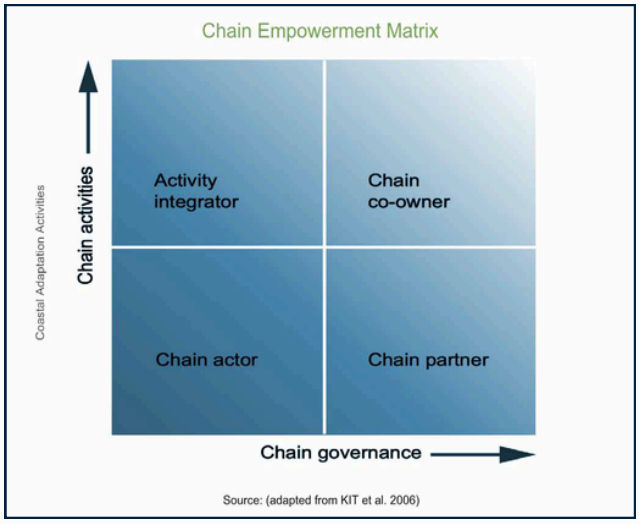
https://sustain.ubc.ca/about/resources/mapping-ecological-zones-and-species-habitats-maplewood-flats

Photo credit: Lauren Kan (Unsplash)

Bridging Knowledge and Practice: A Values-Based Approach to Coastal Adaptation

Prepared by Emily Rubooga
for Living with Water (UBC)

This project aimed to promote the intentional use of values-based approaches in coastal adaptation. The resulting literature review summarizes how values are conceptualized, operationalized, and integrated into coastal adaptation strategies. This report, intended for practitioners and program staff, highlights lessons learned, identifies entry points for integrating values-based approaches, and offers practical guidance to enhance the impact and sustainability of coastal adaptation efforts.



Full report at:

https://sustain.ubc.ca/about/resources/bridging-knowledge-and-practice-values-based-approach-coastal-adaptation

Photo credit: Ihomehe Agbebaku

Intertidal Kinning Festival 2024: Insights and Outcomes

This report details the planning, implementation, and outcomes of the Intertidal Kinning Festival, a series of events celebrating and raising awareness about the Fraser Estuary, an ecologically significant area facing numerous environmental challenges. The project was undertaken collaboration with the Blue Cabin and Other Sights for Artists. The events included workshops, symposiums, and community engagements, all aimed at fostering a deeper connection between local communities and the estuary through the lenses of arts and environmental stewardship. This report provides insights into the creative process, community involvement, and the impact of these events on participants and stakeholders. Additionally, it offers recommendations for future initiatives that seek to combine art, community engagement, and environmental stewardship.

Photo credit: Ihomehe Agbebaku

Prepared by Ihomehe Agbebaku
for Other Sights for Artists' Projects Association

Full report at:

https://sustain.ubc.ca/about/resources/intertidal-kinning-festival-2024insights-and-outcomes

Events and Engagement

Coastal Waterbird Workshop & Walk

On May 3, 2024, the Coastal Waterbird Talk & Walk workshop took place at Tower Beach on the UBC Vancouver Campus. Led by Rémi Torrenta, the British Columbia Projects Coordinator at Birds Canada, this event aimed to introduce FERC Scholars to local coastal waterbird species and provide them with opportunities to practice their bird identification skills on a guided tour.

FERC Scholars had a unique opportunity to connect with nature and enhance their understanding of avian biodiversity and the coastal programs offered by Birds Canada. They enjoyed meeting one another while engaging in a hands-on learning experience.

Building Respectful Relationships in Indigenous Research

On May 30, 2024, a workshop titled “Fostering Relational Engagement Between Researchers and Indigenous Communities” took place at the Sty-Wet-Tan Great Hall, First Nations Longhouse, UBC Vancouver Campus. This event was a collaboration between the UBC Sustainability Scholars Program, the Pacific Institute for Climate Solutions (PICS), and the UBC Indigenous Research Support Initiative (IRSI).

The workshop aimed to deepen participants' understanding of building, maintaining, and expanding respectful relationships in Indigenous research. Participants explored the historical and current colonial contexts of research with Indigenous Peoples in Canada. They also learned the skills necessary to foster respectful and reciprocal relationships with Indigenous communities.

Attendees were invited to prepare for and continue to engage with their peers and the in-person workshop via an online Canvas course that incorporated group exercises, dialogue, case studies, and a take-home workbook to support the learning objectives. The workshop provided a valuable opportunity for participants to reflect on their roles as researchers and how to foster meaningful connections with Indigenous communities.

Photo credit: Andre Estevez (Pexels)

Radio Programming for Estuary Protection Drives Public Engagement

2023 FERC scholars Tirath Dave and Kim St-Pierre undertook research to address pressing environmental and social challenges in the Fraser Estuary. Tirath's work explored nature-based solutions to enhance flood resilience for Stó:lō communities in the Lower Fraser Valley while Kim focused on understanding the impact of small vessels on the Southern Resident Killer Whale population.[3,4]

Building on these efforts, the Fraser Estuary Radio was launched. It was a year-long broadcast project co-led by FERC scholar Viola Provost and Other Sights for Artists' Projects.[5] Running from May 1, 2023, to August 10, 2024, this initiative amplified Tirath's and Kim's research findings and drove public engagement through diverse, interdisciplinary content, including interviews, podcasts, and panel discussions.

The radio project is an innovative outcome of the Scholars' work, bridging the gap between research and community action to raise awareness, support Indigenous-led stewardship, and promote climate adaptation strategies in the estuary.

3 Dave.T (2023). Feasibility of nature-based solutions to enhance Stó:lō flood resiliency in the Lower Fraser Valley. UBC Sustainability Scholar Program. https://sustain.ubc.ca/about/resources/feasibility-nature-based-solutions-enhance-st%C3%B3l%C5%8D-flood-resiliency-lower-fraser

4 St-Pierre.K (2023). Assessing the Role of Small Vessels in Disrupting Killer Whale Habitat in the Fraser Estuary. UBC Sustainability Scholar Program. https://sustain.ubc.ca/about/resources/assessing-role-small-vessels-disrupting-killer-whale-habitat-fraser-estuary

5 Provost.V (2023). Listening to untold stories: Curation of a radio program on the Fraser River Estuary. UBC Sustainability Scholar Program. https://sustain.ubc.ca/about/resources/listening-untold-stories-curation-radio-program-fraser-river-estuary

Thank You

We are very grateful to the Sitka Foundation for their generous funding of this important initiative as well as the Foundation's broader support of UBC.

The mission of the Sustainability Hub is to inspire people to act upon the planet’s most urgent challenges through UBC’s academic and operational sustainability leadership. One of our goals is to build strong diverse supportive and reciprocal relationships with local and regional communities to mobilize for climate action and sustainability.

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