



TLEF Project – Final Report

Report Completion Date: (2023/04/30)

1. PROJECT OVERVIEW

1.1. General Information

Project Title:	Co-producing Aquatic Science Curriculum Through University–Indigenous Community Partnerships		
Principal Investigator:	Dr. Margot Hessing-Lewis		
Report Submitted By:	Dr. Andrea Reid		
Project Initiation Date:	2019/07/01	Project Completion Date:	2023/03/31
Project Type:	<input type="checkbox"/> Large Transformation <input checked="" type="checkbox"/> Small Innovation <input type="checkbox"/> Flexible Learning <input type="checkbox"/> Other: [please specify]		

1.2. Project Focus Areas – Please select all the areas that describe your project.

- Resource development (e.g. learning materials, media)
- Infrastructure development (e.g. management tools, repositories, learning spaces)
- Pedagogies for student learning and/or engagement (e.g. active learning)
- Innovative assessments (e.g. two-stage exams, student peer-assessment)
- Teaching roles and training (e.g. teaching practice development, TA roles)
- Curriculum (e.g. program development/implementation, learning communities)
- Student experience outside the classroom (e.g. wellbeing, social inclusion)
- Experiential and work-integrated learning (e.g. co-op, community service learning)
- Indigenous-focused curricula and ways of knowing
- Diversity and inclusion in teaching and learning contexts
- Open educational resources
- Other: [please specify]

1.3. Final Project Summary

A new mandate for science in Canada emphasizes partnerships between university researchers and Indigenous communities. Yet, Canadian science students receive limited formal training in effective modes of partnering with Indigenous communities and in research co-production. This need is broadly recognized within UBC’s Indigenous Strategic Plan, which emphasizes “collaboration and equal partnerships” between the university and communities, as well as within the Truth and Reconciliation Commission of Canada: Calls to Action (e.g., 10.iii, 62.ii, 63.iii, and 63.iv). UBC Science and the Student Diversity Initiative (SDI) share a goal to “build capacity within departments to sustain ongoing action addressing diversity, equity, and inclusion in science education.” It is in line with the SDI and guided by the above mandates that we proposed a transformative curriculum co-development program that culminated in a new UBC Science graduate-level course on effective research co-production with Indigenous communities.

We focused our efforts within the aquatic sciences, including both marine and freshwater systems, for several reasons. Importantly, water bodies are sites of long-standing convergence between Indigenous Peoples and place, where rich knowledge systems have arisen that inform present-day practices, perceptions, and strategies. Furthermore, aquatic systems and resources figure very centrally in the identities, cultures, and economies of many Indigenous Peoples – these relationships reflect tremendous concern for the future state of aquatic ecosystems. Additionally, UBC is an epicenter of both marine and freshwater research in British Columbia and hosts an interdisciplinary community of researchers with broad expertise. As such, the Institute for the Oceans and Fisheries (IOF) is well positioned to build university–community bridges as it trains the next generation of science leadership in British Columbia.

We carried out curriculum co-development for a new graduate course on “Co-producing Aquatic Science” at UBC, the Haida Gwaii Institute (HGI), and with members of the Haida Nation, culminating in workshops with university and community partners. The course was taught for the first time in January–April 2023. Eventually, the course will expand the breadth of its reach by working with additional Indigenous communities. Community and university engagement, as well as co-production workshops, were central to establishing the reciprocal foundations of this new course.

1.4. Team Members – Please fill in the following table and include **students**, undergraduate and/or graduate, who participated in your project.

Name	Title/Affiliation	Responsibilities/Roles
Margot Helsing-Lewis	Adjunct Professor, Institute for the Oceans and Fisheries, UBC	Co-produced activities including curriculum development
Sarah Harper	Postdoctoral Fellow (Marine Social Science), University of Victoria	Co-produced activities including curriculum development
Andrea Reid	Assistant Professor, Centre for Indigenous Fisheries, Institute for the Ocean and Fisheries, UBC	Co-led activities including curriculum development and course delivery
Colette Wabnitz	Research Associate, Institute for the Oceans and Fisheries (UBC) and Center for Ocean Solutions (Stanford University)	Co-produced activities including curriculum development



Kii'iljuus Barbara Wilson	Co-Instructor	Provided input for curriculum design & co-led course delivery
Gidin Jaad Erica Reid	Community-based Teaching Assistant	Assisted with teaching and supporting the instructors
Alex Duncan	Current Ph.D. student, Centre for Indigenous Fisheries, Institute for the Oceans and Fisheries (UBC)	Supported co-leads with course content and delivery.
Sara Cannon	Postdoctoral Researcher, Centre for Indigenous Fisheries, Institute for the Oceans and Fisheries (UBC); formerly PhD Candidate, Department of Geography (UBC)	Supported co-leads with activities including workshop planning, survey planning and analysis, curriculum development, course content, and course delivery
Graham Brownlee	Former M.Sc. student, Zoology (UBC)	Supported co-leads with activities including workshop planning, survey planning and analysis.
Katy Davis	Former Ph.D. candidate, Zoology (UBC)	Supported co-leads with activities including workshop planning, survey planning and analysis.
Skil Jáada Vanessa Zahner	Current Marine Biologist/Planner, Council of the Haida Nation, Former M.Sc. student, Earth and Atmospheric sciences (UBC)	Supported co-leads with activities, including workshop planning, survey planning, curriculum development, and organizing/supporting events with the Haida Nation.
Ashley Welsh	Interim Director, Skylight (Science Centre for Learning & Teaching)	Supported co-leads with funding applications, workshop planning and curriculum development, advertisement and outreach
K'iinuwaas Carrie Anne Vanderhoop	Director, Haida Gwaii Institute (formerly, Indigenous and Community Initiatives Manager, Haida Gwaii Institute)	Supported and participated in the workshops and curriculum development, and supported events with the Haida Nation
Carlos Ormond	Director, Indigenous and Intercultural Initiatives, Faculty of Forestry, UBC (formerly Director, Haida Gwaii Institute)	Supported and participated in workshops and curriculum development and student enrolment

1.5. **Courses Reached** – Please fill in the following table with **past**, **current**, and **future** courses and sections (e.g. HIST 101, 002, 2017/2018, Sep) that have been/will be reached by your project, including courses not included in your original proposal (you may adapt this section to the context of your project as necessary).

Course	Section	Academic Year	Term (Summer/Fall/Winter)
FISH507 Ocean Leaders (co-development)	003	2020/2021	Fall
FISH507 Ocean Leaders (co-development)	003	2020/2021	Winter
FISH506I / EOSC 448 Co-creating Aquatic Science	001	2022/2023	Winter
FISH506I / EOSC 448 Co-creating Aquatic Science	001	2023/2024 (and every year moving forward)	Winter

2. OUTPUTS AND/OR PRODUCTS

2.1. Please **list** project outputs and/or products (e.g. resources, infrastructure, new courses/programs). Indicate the current location of such products and provide a URL if applicable.

Product(s)/Achievement(s):	Location:
Survey of UBC community members and subsequent summary report	Online. Survey was done using Qualtrics. The summary report is available for download here: https://drive.google.com/file/d/1kn7fvtAJIUKA26bg50IH4E0GsVGaENbu/view?usp=sharing
New graduate level course (FISH506I)	Online. Course website: http://cif.fish/fish506i
Workshops	Online.
Haida Scholar Speaker Series	Online. Videos are available from https://www.facebook.com/HaidaNation/videos/haida-scholar-speaker-series-october-28-2021/269731868399647/ and https://www.facebook.com/HaidaNation/videos/6902898616446849/

2.2. **Item(s) Not Met** – Please list intended project outputs and/or products that were not attained and the reason(s) for this.

Item(s) Not Met:	Reason:

3. PROJECT IMPACT

3.1. Project Impact Areas – Please select all the areas where your project made an impact.

- Student learning and knowledge
- Student engagement and attitudes
- Instructional team-teaching practice and satisfaction
- Student wellbeing, social inclusion
- Awareness and capacity around strategic areas (indigenous, equity and diversity)
- Unit operations and processes
- Other: [please specify]

3.2. What were you hoping to change or where were you hoping to see an impact with this project? – Please describe the intended benefits of the project for students, TAs, instructors and/or community members.

This project grew from identified needs in Indigenous communities and at Canadian universities to support future university and local leaders who are rooted in aquatic science and management in Indigenous communities. UBC's 2019 Indigenous Strategic Plan placed new emphasis on collaboration and equal partnerships as a "defining feature of Indigenous engagement at the university". Our project spoke directly to this focus, and to numerous Truth and Reconciliation Calls to Actions, by developing university programming for future leaders that aims to set a path forward for Indigenous engagement frameworks for aquatic science co-production.

We implemented this through the co-creation of a course on Indigenous research and community-centred learning and engagement, which will be the cornerstone of the new Center for Indigenous Fisheries led by Nisga'a fisheries scientist Dr. Andrea Reid. The course is housed UBC's Institute for the Oceans and Fisheries (IOF), and will provide a base for long-term Indigenous community relationships with university-based aquatic scientists. The project built on existing relationships with the Haida Nation, with the aim to expand partnerships with other Indigenous communities in the future. We included Elders, aquatic resource managers, local scientists and activists, and Indigenous students and emerging leaders in the co-creation process and also in delivering the pilot course. Guiding principles directed the course co-development process and created tangible course content reflecting these same values.

In this way, we aimed to achieve the following outcomes:

- Strengthened opportunities for research collaborations, dialogue, and networking between UBC research groups, graduate students in the aquatic sciences and Indigenous communities.
- Increased capacity for UBC Science graduate students as well as participating faculty members to effectively lead community-engaged aquatic research.
- Enhanced potential recruitment of Indigenous students into UBC Science.
- Development of a framework for Indigenous community-university research partnerships and serving as a model of academic bridging programming for other departments and institutions.

3.3. Were these changes/impacts achieved? How do you know they occurred? – *How did you measure changes/impacts? (e.g. collected survey data, conducted focus groups/interviews, learning analytics, etc.) Describe what was learned from this process. You are encouraged to include copies of data collection tools (e.g. surveys and interview protocols) as well as graphical representations of data and/or scenarios or quotes to represent and illustrate key themes.*

While it is too early to measure the success of all the above objectives, the course co-development project was successful in several aspects of these goals. First, the course co-development team is in the process of drafting a manuscript for submission to a peer-reviewed publication to present a framework for co-developing curriculum with Indigenous community partners. We have also built relationships and provided opportunities for research collaborations, dialogue, and networking between UBC research groups, graduate students, and Haida Gwaii community members, through the workshop series, the Haida speaker series and through the pilot course. While we hope that this course will enhance recruitment of Indigenous students into UBC Science, the course has only been offered once to date, and it is too early to tell. Anecdotally, the course instructors heard directly from several Indigenous students who took the pilot course that this was the first time they could centre and feel safe sharing their Indigenous identities and experiences in a classroom (for most, it was their first time having Indigenous instructors!). We hope this is an indication that the course will contribute to UBC's efforts to support Indigenous students who are interested in enrolling in a university program, by showing that UBC supports Indigenous-centred spaces for learning. While we do not yet have data collection tools to evaluate the course objectives, we have asked the students to complete an end-of-course survey (due the first week of May, 2023) that asks for their feedback and suggestions for future iterations of the course.

3.4. Dissemination – *Please provide a list of **past** and **upcoming** scholarly activities (e.g. publications, presentations, invited talks, etc.) in which you or anyone from your team have shared information regarding this project. Be sure to include author names, presentation title, date, and presentation forum (e.g., journal, conference name, event).*

- Past
 - In 2022, Graham Brownlee and Sarah Harper presented a poster about this project at the TLEF Open House.
 - Skil Jáada Vanessa Zahner and K'iinuwaas Carrie Anne Vanderhoop organized an online Haida Gwaii Speaker Series with public talks in 2021 and 2022. The first event, The Importance of Connection to Place for Native Youth in Science Education, was hosted by Kii'iljuus Barbara Wilson on October 28, 2021 and featured a conversation between Skil Jáada Vanessa Zahner and K'ah Skaahluwaa Wendy Smythe. The second event, Opportunities in Marine Science, was hosted by K'iinuwaas Carrie Anne Vanderhoop on February 15, 2022 and featured discussions with Kil Hltaanuwaay Tayler Brown and Dolly Garza.
 - In February 2023, Sara Cannon and K'iinuwaas Carrie Anne Vanderhoop led a presentation about this project at the Society of Canadian Aquatic Sciences conference in Montreal, Quebec. Five students who were enrolled in the course joined the presentation and shared what the course had meant to them.
 - In March 2023, the team submitted a short article in response to a call for submissions from the University of Manitoba, for inclusion in a guidebook on Indigenous-University research partnerships, led by Dr. Brittany Luby (University of Guelph).

- Upcoming
 - The first cohort of FISH506I students have been in discussion about potentially creating outward-facing resources and/or preparing a manuscript for submission to a peer-reviewed journal, about their experiences in the course and their final projects, during which each student designed and tested a culturally-inclusive indicator of measuring the health of aquatic ecosystems where they live.
 - Dr. Andrea Reid is working with Kil Hltaanuwaay Tayler Brown to put the outcomes of the students' final projects onto a story map, as the indicators come from all over Canada and the northern United States. Future cohorts will continue to add their indicator projects to this map.
 - On Friday, April 28, the Institute for Oceans and Fisheries will host its first Open House. Alex Duncan, who was the teaching assistant for the pilot course, will be present on behalf of the Centre for Indigenous Fisheries, and will discuss the course with visitors.

4. **TEACHING PRACTICES** – Please indicate if **your** teaching practices or those of **others** have changed as a result of your project. If so, in what ways. Do you see these changes as sustainable over time? Why or why not?

Some of the students who are graduate students are teaching and/or will teach in the future. This course will influence their approach to teaching by demonstrating how it is possible to centre Indigenous ways of knowing in a graduate-level classroom.

In addition, much of how the pilot course was taught was informed through the collaborative planning process, which was supported by this TLEF grant. During the workshops, participants recommended that the course be taught in an online format to promote accessibility, which directly facilitated the involvement of Haida community members. For example, the course was taught collaboratively by two Indigenous instructors, one who is a member of the Haida Nation and a respected Elder (Kii'iljuus Barbara Wilson), while the second is a UBC faculty member and member of the Nisga'a Nation (Dr. Andrea Reid); both reside in their home communities and not on/near the UBC Vancouver Campus. It also had two Indigenous teaching assistants, one who is a Haida Gwaii community member, teacher, and Haida language speaker (Gidin Jaad Erica Reid), and the second who is a UBC PhD student (Alex Duncan, Chippewas of Nawash Unceded First Nation). Because half of the teaching team were Haida community members, the instructors were able to center Haida principles in the course delivery. At the same time, having a fully Indigenous teaching team allowed the instructors to center ceremony in the classroom and curriculum, for example by opening each class with song or with a lesson in the Haida language. Having the course online also supported a diverse group of learners from across Canada and the United States, most of whom were Indigenous (13 of 17 the students enrolled in the pilot course).

Moreover, not all of the people enrolled in FISH506I are currently attending university; five of the 17 students were working in professional positions outside of academia. The workshops enabled all of these developments and as a result, profoundly shaped how the course was delivered and who it reached - which will be continued in future iterations of this course.

5. **PROJECT SUSTAINMENT** – Please describe the sustainment strategy for the project components. How will this be sustained and potentially expanded (e.g. over the next five years). What challenges do you foresee for achieving the expected long-term impacts listed above?



In addition to the funding from the TLEF, the co-leads have also successfully secured funding from the Office of Indigenous Strategic Initiatives via the Indigenous Strategic Initiatives (ISI) Fund, which supports the implementation of UBC's Indigenous Strategic Plan. Given that the course contributes to meeting many of the objectives of the Indigenous Strategic Plan, we are hopeful that we will be successful in securing future funding from the ISI fund.

We will also apply for an NSERC CREATE grant in 2024, which would provide more long-term support and allow us to continue to recruit Indigenous students from across Canada and the United States.

Finally, we will utilize the support and connections we have built with the Haida Gwaii Institute and with Director K'iinuwaas Carrie Anne Vanderhoop, and with Ashley Welsh in the Faculty of Science to make sure we are taking advantage of any funding opportunities that come their way and may be a good fit to support this program.