



TLEF Project – Final Report

Report Completion Date: (YYYY/MM/DD)

1. PROJECT OVERVIEW

1.1. General Information

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|---------------------------------|---|---------------------------------|---------------|
| Project Title: | Incorporating traditional Indigenous knowledge in ISCI 360, ISCI 361 and ISCI 461 | | |
| Principal Investigator: | Denise Gabriel | | |
| Report Submitted By: | Denise Gabriel | | |
| Project Initiation Date: | April 1, 2022 | Project Completion Date: | April 1, 2024 |
| Project Type: | <input type="checkbox"/> Large Transformation <input checked="" type="checkbox"/> Small Innovation <input type="checkbox"/> UDL Fellows Program <input type="checkbox"/> Hybrid and Multi-access Course Redesign Project <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 – *What did you do/change with this project? Explain how the project contributed toward the enhancement of teaching and learning for UBC students.*

What we did/changed with this project?

The project aimed to incorporate traditional Indigenous knowledge into ISCI 360 (UBC-V), ISCI 361/461 (Hawaii and Iceland). While Indigenous communities play a significant role in sustainability issues affecting the regions studied in these courses, their contributions had not been a focus of the curriculum prior to this project. This funding was provided to strengthen and expand the course curricula by enhancing engagement with Indigenous community leaders and incorporating an Indigenous perspective on sustainability.

The outputs include:

- **Development of Course Modules:** Each course now includes a module that investigates pre-colonial settlement of the study regions, explores early land and resource use practices, and examines the role of beliefs and stories in fostering sustainable land stewardship.
- **Learning Objectives and Activities:** New objectives and activities promote consideration of positionality, intersectionality, and stakeholder inclusivity in sustainable systems frameworks, particularly in relation to Indigenous rights and traditional knowledge.
- **Experiential Learning Activities and Assessments:** Students have the opportunity to engage with Indigenous partners through community or case study formats. This includes invited guest speakers, visits to significant sites (e.g., Place of Refuge and Hawaii Volcanoes National Park in Hawaii; Tin Can Factory in Iceland; Museum of Anthropology in BC), critical reflections, and community-focused projects applying a systems and sustainability framework.

Each course now intentionally considers the roles of traditional land stewardship and Indigenous knowledge in addressing past, present, and future sustainability challenges. This perspective is now deeply integrated into the competencies required for practicing sustainability science in an inclusive manner. Beyond individual activities and resources, this lens is central to our teaching approach and our intentions in place-based learning.

How the project contributed toward the enhancement of teaching and learning for UBC students

This project has directly benefited students by providing experiential learning opportunities where they can investigate how regional sustainability challenges impact the traditions and livelihoods of Indigenous peoples. Students engage with these issues firsthand in the visited regions, allowing them to critically consider the contributions and experiences of local traditional or Indigenous communities regarding elements of regional sustainability (e.g., water access, resource use, land rights, tourism). Through this process, students develop the ability to describe, explain, and compare, with examples, how Indigenous practices interact with the three sustainability pillars—environment, society, and economy—within these systems.



We have observed that enhancing the focus on inclusive perspectives and elevating the voices of traditional and Indigenous populations in our study regions has led to critical reflection by our students. There is a noticeable desire to engage with these perspectives on a deeper level, demonstrated through group debriefs following site visits and guest speakers, written reflections, and group projects emphasizing traditional knowledge holders and just practices for regional resource and land use.

Embracing the discourse of traditional land stewardship has transformed student participation in these courses. Students report an increased awareness of Indigenous histories, land and resource use, and their central role in sustainable systems after engaging with this curriculum. They frequently state that activities focusing on Indigenous traditions and contemporary challenges due to the transformation of traditional spaces are among the most impactful elements of the course. Additionally, they exhibit a critical reflection on how they will engage more intentionally in visits to spaces where they are visitors in the future.

This approach is complemented by the teaching teams' dedication to ongoing professional development through workshops and deepening our understanding of these knowledge spaces. By engaging in meaningful dialogues that nurture relationships without imposing expectations, and by being mindful and purposeful about the learning environments we choose, we strive to set a standard for our students to emulate. This holistic educational model not only broadens their perspective on sustainability but also instills a greater appreciation for Indigenous contributions and ethical engagement with diverse knowledge systems.



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 |
|-----------------|--|--|
| Denise Gabriel | Lecturer/Integrated Sciences | Co-lead correspondent, curriculum developer, field course lead |
| Lee Groat | Director/Integrated Sciences | Co-lead correspondent, curriculum developer, field course lead |
| Steve Quane | Sessional Lecturer/Integrated Sciences | Curriculum developer, field course lead |
| Mary Anne Lyons | Program Manager and Academic Advisor/Integrated Sciences | Financial and administrative coordinator, project coordinator, student and alumni outreach facilitator |
| Mary Macquistan | MSc and Graduate Academic Assistant/EOAS | Curriculum developer, field course assistant |

1.5. Courses Reached – Please fill in the following table with **past** and **current** courses (e.g., HIST 101, 2017/2018) that have been 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 | Academic Year |
|--------------|-------------------|
| ISCI 360 201 | 2022W1 and 2023W1 |
| ISCI 361 201 | 2022W2 and 2023W2 |
| ISCI 361 101 | 2023S1 and 2023S2 |
| ISCI 461 201 | 2022W2 and 2023W2 |
| ISCI 461 101 | 2023S1 and 2024S1 |
| ISCI 361 102 | 2023S1 and 2024S1 |



2. OUTPUTS AND/OR PRODUCTS

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

| Output(s)/Product(s): | URL (if applicable): |
|---|---|
| One module in ISCI 361/461 201: Hawaii that explores the settlement of Hawaii by Polynesian explorers; the beliefs, cultures, and traditional land practices of Native Hawaiians; and the later colonization of Hawaii and conversion to a US State. | https://canvas.ubc.ca/courses/131464/modules |
| One module in ISCI 361/461 101 and 102: Iceland that explores the settlement of Iceland, Greenland, and Vinland (Newfoundland) by Norse explorers; the early settlers traditional land practices, resource exchange, and sustainability assessments; and the historical theories for the lack of sustained presence of settlers in Greenland and Vinland. | https://canvas.ubc.ca/courses/140945/modules |
| A set of learning objectives for each course for students to consider sustainability through an Indigenous lens | |
| Learning activities in ISCI 360 that focus on positionality, intersectionality, and a consideration of inclusive stakeholder participation in sustainable systems | |
| Experiential learning activities/assessments for students to engage with Indigenous partners in a community or case study format (see impact areas below) | |

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

| Item(s) Not Met: | Reason: |
|--|---|
| A list of Indigenous partners with expertise in sustainability issues as they relate to the Indigenous | While we have succeeded in establishing relationships with Indigenous partners in British Columbia and Hawaii, as well as experts on Icelandic folklore and the environmental impact of settlement throughout the Medieval period, we would like to respect the time investment of our partners to date and remain uncertain as to the longevity of these partnerships. We have, however, identified locations and narratives of importance for each of our courses in alignment with our intended project goals and learning outcomes. |



| | |
|--|---|
| A manual for new instructors teaching the ISCI 360/361/461 curricula in future iterations of the courses | We are in the process of developing a Course Workbook for systems and sustainability that can be implemented alongside a wide range of UBC courses that aim to incorporate a systems thinking approach to the curriculum. This workbook includes considerations of positionality, intersectionality, and inclusive stakeholder practices that have been significant learning outcomes from this TLEF project for those of us involved in teaching ISCI 360/361/461. We have also developed online modules in each of the courses (outlined in Outputs/Products above) to preserve the content and narratives that have resulted from this project in future iterations of the courses |
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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-satisfaction
- Teaching practices
- Student wellbeing, social inclusion
- Awareness and capacity around strategic areas (Indigenous, equity and diversity)
- Unit operations and processes
- Other: [please specify]

3.2. Please provide details on each of the impact areas you selected in 3.1. – For example, explain in which ways your teaching practices changed; how student wellbeing was impacted; how students wellbeing benefited from your project, etc.

Student Learning and Knowledge

Through our assessments, we found that students often lacked familiarity with the Indigenous history of our curricular regional areas of study and how we might apply Indigenous ways of knowing to regional sustainability challenges.

For example,



- Prior to engaging with the developed online module for ISCI 361/461 201: Hawaii, the majority of students (10/11 survey respondents) indicated that they were either slightly familiar or not familiar at all with the Indigenous history and culture of Hawaii, and that the information shared in the newly developed online module was new to them.
- Prior to taking ISCI 361/461 – Iceland, student perception of sustainability in Iceland emphasized contemporary, often technological solutions to energy challenges.

By intentionally engaging with the historical context of pre-colonial settlers, discussing traditional relationships to the land, and hearing from Indigenous knowledge holders (in the form of guest lectures, guided on-site visits, course modules/materials, and independent research projects), we observed that our students' knowledge and consideration of inclusive land rights, stewardship, and climate justice became a focal point in our course discussions surrounding sustainability.

For example,

- Following the ISCI 361/461 201: Hawaii field course, all students indicated that their knowledge of the Indigenous history and culture of Hawaii had improved, ranging from moderately familiar (5/9 survey respondents) to very or extremely familiar (4/9 survey respondents).
- Following the ISCI 361/461 201: Hawaii field course, all students indicated that engagement in the course modules and activities increased their knowledge of Indigenous Hawaiian culture and ways of knowing (9/9 survey respondents).
- Increased awareness of the role of Icelandic folklore in land stewardship in ISCI 361/461: Iceland field course, resulted in rich discussions of the importance of elevating traditional place-based knowledge

Student Engagement and Attitudes

Throughout the duration of this TLEF project and the curricular developments to enhance Indigenous and traditional knowledge pertaining to land stewardship and sustainability, we have observed that our students express a significant desire and deep-seeded connection to this discourse. Though they may have had little exposure or lack a pre-developed knowledge base surrounding Indigenous histories and practices prior to taking ISCI 360/361/461, the students consistently expressed the desire to have this content included in the curriculum and respond with overwhelming positivity when reflecting on the discussions and experiences that pertained to Indigenous and traditional perspectives with respect to our contemporary sustainability lens.

For example,

- All of the students registered in ISCI 361/461 201: Hawaii (11/11 survey respondents) indicated that including Indigenous Hawaiian history and culture in the field course is very important to extremely important.



- All of the students registered in ISCI 361/461 201: Hawaii (9/9 survey respondents) indicated that the site visit to the Place of Refuge and engagement with Indigenous Hawaiian ranger, Kanani, had a strong positive impact on their understanding of Indigenous Hawaiian culture and ways of knowing.

Student testimonials:

“[Visiting the Place of Refuge] gave me perspective on cultural management of the land. [It was] one of the most memorable experiences of my life.”

“I had a really wonderful time at the Place of Refuge. It was an opportunity to learn and appreciate the vast knowledge of Indigenous Hawaii Culture, and the guided tour was extremely informational and deeply spiritual.”

Awareness and Capacity Around Strategic Areas (Indigenous, equity and diversity)

Our observations throughout this project are that students recognize the importance of including Indigenous voices and traditional land stewardship when practicing sustainability science, and that this is emphasized when participating in place-based learning (field courses).

Students registered in ISCI 360/361/461 have demonstrated the desire to critically consider the contribution and experience of the local Indigenous community on one or more elements of a regional system’s sustainability and/or on the system as a whole. In many instances, these considerations have had profound impacts on our students’ evaluation of their experiences in the courses.

For example,

- Prior to the start of ISCI 360, the majority of students indicated that they believed Indigenous ways of knowing are somewhat to very relevant to addressing the climate crisis (17/24 survey respondents)
- Following ISCI 360, all students indicated that they believed Indigenous ways of knowing are relevant to addressing the climate crisis, with the majority thinking this strategic area was very important to this discussion (11/13 survey respondents)
- Several group projects at the conclusion of ISCI 360 have featured systems and sustainability challenges as they pertain to Indigenous groups in British Columbia. Project titles include:
 - Impacts of coal mining on water accessibility of rural Indigenous reserves
 - Food insecurity in Indigenous communities
 - Healthcare accessibility in rural Indigenous communities of BC
 - Water management in BC Indigenous communities



- Several group projects at the conclusion of the ISCI 361/461: Iceland field course have incorporated a traditional practices and storytelling lens in guiding both past and future sustainability practices in Iceland.

“I hear the Icelandic winds are wailing
Hidden choirs are softly singing
Be my shadow, my ancient guide
My guardians hid in the mountainside
They showed us how to treat the land
And reap nature’s fields with a helping hand
But now their stories wane
Forgotten keepers, losing their name”

- Student composition, Iceland 2023S1

Student testimonials:

“I think the most impactful moments were the ones that touched my heart and made me re-examine my ideas of tourism and sustainability. [...] Moving forward I’m now going to be a much more thoughtful traveler who is more aware of my actions.”

3.3. How do you know that the impacts listed in 3.1/3.2 occurred? – *Describe how you evaluated changes/impacts (e.g., collected survey data, conducted focus groups/interviews, learning analytics, etc.) and what was learned about your project from the evaluation. You are encouraged to include graphical representations of data and/or scenarios or quotes to represent and illustrate key themes.*

Evaluation of the project’s impact was measured via pre- and post-course surveys aimed at assessing the learning experience and knowledge gained from the course modules and experiential learning opportunities.

We also conducted an impact assessment survey for ISCI 361/461: Hawaii field course for the 2023W2 session to assess student experience with respect to place-based learning and modifications that we made to the course to facilitate observations and reflections of the sites we visited. Though we did not directly ask about the students’ observations related to site visits/speakers that emphasized Native Hawaiian knowledge and practices, many of the responses that we received reflected on this content (as detailed in impacts 3.2 of this document)

At the initiation of this project, we identified the following key Indicators of the project’s success/performance:

- A significant improvement in acquired Indigenous knowledge as it relates to sustainability as measured via pre- and post-module student surveys



- Demonstrable achievement of module learning objectives as assessed through course learning assessments (exams, poster projects, logbooks)
- Student evaluations of the courses and instruction

Through our evaluations of the revised curriculum in each of ISCI 360/361/461, we have observed that each of these key indicators were achieved. In addition, we find that when selecting topics for course research projects/learning assessments, many students choose to explore how traditional land use narratives and practices can be used to inform solutions to contemporary sustainability challenges, or how we can apply a systems thinking approach to address sustainability issues that disproportionately impact Indigenous communities in our study regions. We believe that this shift in focus exemplifies a positive impact of the curricular changes made through this project and an overall increased awareness of the role of traditional land stewardship and Indigenous inclusion in addressing contemporary sustainability challenges in the ISCI curriculum.

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?*

Going through this TLEF process, we started with the intention to “incorporate Indigenous knowledge into our specialization’s curriculum”. By developing modules pertaining to pre-colonial settler histories and traditional land stewardship, inviting Indigenous speakers with expertise in sustainable systems management, and visiting sites of relevance in our field courses, we aimed to benefit students by providing experiential learning opportunities where students can observe the ways in which regional sustainability challenges are impacting the traditions and livelihoods of Indigenous peoples and interact with these issues first hand in the visited regions (Vancouver, Hawaii, and Iceland).

Reflecting on this approach, it became clear that this process was more complex and requires ongoing community building, awareness, and commitment to entering spaces with intentionality and openness. Our observations are that students have a strong desire to enhance traditional and Indigenous perspectives, voices, and experiences as they relate to sustainability challenges in our study regions. Bringing awareness to this lens resulted in rich discussions, focused research, and critical reflections by our students with respect to both what we can learn from traditional knowledge holders about land stewardship and why it is critical to elevate Indigenous voices and experiences in attempting to achieve sustainable systems. However, as non-Indigenous colonial settlers guiding our students through these discussions, we have found that awareness is only the first step to truly engaging with this discourse, and that our teaching practices need to commit to ongoing learning, intentionality in entering spaces that are unknown to us, and building relationships and respect with those that are stewards of the land.

Though by the proposed metrics of success of this project, we feel that we made significant positive changes to our curriculum and students have demonstrated the intended impact, we acknowledge that we have only scratched the surface when it comes to enhancing the role of traditional and Indigenous knowledge and perspectives both in our courses and in real-world applications.



We will continue to explore ways to intentionally and respectfully balance and integrate traditional ways of knowing and land stewardship with more contemporary approaches to sustainability. This will be met with the commitment to continue to attend workshops, deepen our learning, engage in conversations that build relationships without expectation, and be aware and intentional about the spaces that we enter for our learning, and we will encourage our students to do the same.

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 project sustainment?*

The online modules that we have created for each course operate as a repository and initial dialogue for future iterations of our sustainability courses. These will remain as part of the learning goals/activities for these courses for the foreseeable future.

The courses included in this curriculum are structured to provide students with the competencies of evaluating sustainability through the 3-dimensional model: social, economic, and environmental. The central narrative of the courses now incorporates an important emphasis on positionality, intersectionality, and equitable stakeholder consideration, specifically as they relate to Indigenous land rights, knowledge, and practices. While the project initially aimed to add components to incorporate Indigenous knowledge into the curriculum, rather than simply including independent modules and activities, our observation is that this perspective is now interwoven into the theoretical discourse of the courses and place-based learning model. As the teaching team for these courses is small and made up of the same instructors annually, it is expected that this emphasis will continue to expand over time.

It is more difficult to predict the sustainment of the relationships that we have built with experts and partners in our study regions. Continued participation of these partners in the curriculum is dependent on other commitments, employment roles/responsibilities, and associated costs and may fluctuate annually. We also want to respect that regular participation by our partners in the courses is optional and may not align with their individual priorities. The instructor team will continue to actively build upon the relationships that we have made and explore how we may be able to enhance reciprocal contributions to the communities visited (e.g., through community projects, learning opportunities etc.).



- 6. DISSEMINATION** – *Please provide a list of 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). These will be included on the TLEF scholarly output page.*

Gabriel D, Macquistan M, Quane S, Lyons MA, Groat L, Welsh A. (2024) Reflecting on place-based learning and the role of land stewardship and Indigenous knowledge in Integrated Sciences sustainability courses. TLEF and ALT-2040 Virtual Showcase, Celebrate Learning Week, University of British Columbia

Gabriel D, Macquistan M, Lyons MA, Groat L, Edzereza A, Welsh A, Quane S. (2023) Incorporating traditional Indigenous knowledge in Integrated Sciences sustainability courses. TLEF and ALT-2040 Virtual Showcase, Celebrate Learning Week, University of British Columbia