

Murray, J., Ferland, N., & McKenzie, M. (2023). Climate change education and land-based learning. In S. Priest, S. Ritchie & H. Ghadery (Eds). *Outdoor Learning in Canada*. Open Resource Textbook. Retrieved from <http://olic.ca>

Climate Change Education and Land-based Learning

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I could not wrap my head around [tides] in class. But now that I'm sitting on the rocks, listening to the waves, and paddling through the water, actually watching the tide and feeling the ebb and flow, I get it. – Student, College of the Rockies

Learning in context is integral for many people; it helps to connect to content in different ways, bringing abstract ideas into concrete teachings. In the above quote, a student in British Columbia was expressing how they were challenged in the classroom when learning the mathematics of tides, yet once on the water and next to what they were studying, the light bulb finally clicked on for them. This was a recurring theme for students throughout a recent course offering, where they were connecting to content in real

life, seeing the ebb and flow of tides, feeling the push of the wind on their kayaks, and watching the wildlife interact with their presence in ways that they had not had the privilege of experiencing before. Students also often shared that through the course they had new or strengthened personal connections to land, particularly after completing a nature solo.

In this course, the nature solo was a planned outing, where each student was spaced out along the coastline and provided with a tarp and emergency equipment to contact trip leaders in the event of an emergency. They had food, water, and supplies for their 8 hour solo adventure. Trip leaders patrolled the coastline from a distance to ensure safety, while maintaining silence and avoiding visual intrusion as much as possible.

After setting up their day camp, students had a series of guided questions they could answer to help them reflect on their place within the human-nature relationship, as well as guided observations that they could complete to spend their time. Otherwise, they could fill their time doing whatever they felt interested in doing.

After spending 8 hours alone with the land they were visiting, uninterrupted by technology or other people, students shared their thoughts about the impact that sitting quietly with the land had on them. In particular, one student shared about the presence they felt. Even though they were not with other humans, they did not feel alone. Many talked about the awe that they had experienced as well as the newfound respect that they had gained for the land they were on and their interactions with it. These examples highlighted the connection that learners often build with the land, when they have the opportunity to be immersed in their natural environment and connect. In these examples, students reported feeling responsible for their actions, seeing how they impacted the land in a new light, and feeling motivated to protect wild spaces. The content students shared in their reflections aligned with the goals of land-based climate change education (CCE) programs that support students in developing relational accountability with land.

The power of outdoor learning has long been studied (see other chapters in this textbook) and as humans navigate an ongoing climate emergency, we are all reminded of the need for education that pushes beyond cognitive learning and into the socio-emotional and spiritual realms. Such education will better equip learners to address the complexity of the climate emergency and disconnection from land. While the impacts of learning on the land vary across students, examples like the above demonstrate that learning on and with the land can be powerful interventions to climate change. Learning *on* the land allows students to learn in context to better understand concepts, while learning *with* the land allows students to enter into a relationship with the spaces they are in, co-developing an emotional relationship with the land and wider life

networks. These types of learning are integral when teaching about climate change so that students may develop authentic emotional, spiritual, and physical connections to the environment and communities they live in in order to address the present climate emergency.

In this chapter, we are centering our discussion of outdoor learning within the context of CCE with the inclusion of Indigenous ecological knowledges and practices. Through this chapter, we will highlight the importance of teaching this content across all levels of Canadian education institutions. We begin with an overview of CCE and then draw connections to the role land-based learning plays within that using an example from an Indigenous land-based climate change course in the University of Saskatchewan's Master of Education program (EFDT 817).

Educating for climate change is a growing focus across Canadian educational institutions (Martinez & Alsop, 2019). Global calls for increased climate change literacy focus specifically on the need for climate focused education so that our society may address the ongoing and increasingly urgent climate emergency (IPCC, 2018; UNESCO, 2014; UNFCCC, 2016). Climate scientists agree that humans are contributing to climate change and that responses must include elements of education, training, and public awareness, referred to as climate change education (Hargis & McKenzie, 2020). Teaching climate change science, while important to increase climate literacy, has historically not translated into action to address climate change challenges (Monroe, et al., 2019). Climate change educators contend that effective CCE must contain elements that build on students' climate literacy knowledge, pushing them to make connections across topic areas, and enabling students to move beyond cognitive learning and into socio-emotional and action-oriented learning (Hargis & McKenzie, 2020; Monroe et al., 2017). These types of learning allow students to challenge their thinking and behaviour patterns.

A major component of CCE is the integration of climate justice. Considering that those who face

considerable climate consequences are often not the ones who are contributing the most to the problem (Monroe et al., 2017; Whyte, 2019), CCE must take elements of equity into consideration. Research shows that environmental and climate injustices occur disproportionately along racial and class lines (Whyte, 2019), significantly impacting Indigenous communities across Canada. Climate change as a whole is an equity challenge (Perkins, 2018), therefore education for climate change must embed climate justice in order to effectively empower learners to create change. In Canada, this specifically means approaches that are rooted within justice frameworks that honour Indigenous worldviews.

Indigenous peoples have been the stewards of the land since time immemorial, living in relationship with all beings, thus offer much guidance (M's-it No'kmaq, et al., 2020). While CCE can be taught in various ways, when we are aiming for learning that changes how we feel, think, and behave within our environments, outdoor learning and critical place-based learning approaches are particularly effective. Considering that the various elements of outdoor learning highlight the importance of feeling, thinking, and behaving (Priest & Gass, 2018), its use in CCE approaches is ideal. Similarly, effective CCE must be rooted in critical place-based pedagogies that acknowledge place as Indigenous land, using justice frameworks to teach and take action for climate change.

These approaches ensure that learners have the opportunity to connect to the land, fostering relationships with land and our more-than-human relations, thus developing a sense of responsibility to protecting those lands and beings. In a climate change meeting at Vancouver Island University, our local elders explained that in order for society to mitigate climate change, there are certain required cultural shifts (Geraldine Manson C'tasi:a of the Snuneymuxw First Nation, Nanaimo, B.C., personal communication, December 13, 2022). Primarily, CCE must be rooted in a climate justice framework that provides the opportunity for individuals to re-connect to the earth, to listen to the water, the plants and the animals,

in order to recognize land as sacred. Land-based CCE embodies these connections, teaching learners how to care for the food, forests, and rivers to combat the impacts of climate change and protect the future of future generations.

In this way, we are reminded that climate change is an issue of equity (Perkins, 2018), as noted earlier. Equity should span beyond the borders of mainstream institutions, policies, and laws and reach into the depths of relationships between humans and more-than-human relations. It seems evident then, that climate justice and CCE in Canada would primarily draw on Indigenous worldviews and practices. We are not proposing that Indigenous ways of being and knowing be appropriated by non-Indigenous learners, but rather that any good climate change education be rooted to place and land, including through land-based learning supported by local Indigenous communities whose knowledge, if shared through reciprocal relationships, can shed light on approaches that have sustained the land for millennia before the present climate emergency.

Below, we share our experiences as land-based CCE students and teachers in post-secondary contexts to show approaches to teaching and learning about climate change that cultivate land and climate change literacy and action-oriented interventions grounded in Indigenous ecological knowledges and practices. Land-based CCE has a pedagogical focus on relationships. Relationship-building requires a lot of time and space. Students have to learn (how to learn) on and from the land, with a lot of help interpreting and translating knowledge from elders and educators. CCE provides immersive opportunities for learners to be on the land and nurture their relationships with the natural world.

This world includes cities, where many students live, study, work, or play. In order to cultivate a land ethic that includes cities (and not only the wilderness or the bush), we must help students build relationships with their own neighbourhoods and with whole cities, and not only the urban forests, green spaces, and other patches of grass that we tend towards (Greunewald, 2003).

We want learners to see their concrete-covered communities as land and ecosystems that are also worthy of cultivating relationships with, of protecting, and caring for. These budding relationships inspire relational accountability; when learners love the land, they are likely to want to protect and care for it. When learners love the land, climate change comes to matter (Wilson et al., 2021).

Land-based CCE combines experiential learning with traditional ecological knowledge to build land and climate literacy. During the land-based CCE course, taught in the Northwest Territories, local elders took students on a boat ride and told them about the dropping water levels, the shrinking and disappearing waterways, and the ensuing impacts on wildlife and Indigenous harvesters. Students inquired about the best fishing spots and ended up learning about the relational structures among the land and between the land and Indigenous ways of knowing, being, and doing (Sangries, Dene, Chief Drygeese Territory of the Yellowknives Dene, Lives in Yellowknife, personal communication, 25 July 2020). They came to understand what was at stake. Climate change impacts entire ecosystems, resulting in the loss of Indigenous land and knowledge systems.

On another occasion, on a hike with a Cree trapper through the boreal forest, students learned about the impacts of climate change on caribou migrations, and how the melting permafrost brings invasive parasites northward, impacting old growth forests and wildlife (Keith Anderson, Rocky Cree, Nisichawayasihk Cree Nation, Treaty 5, Lives in Leaf Rapids, MB, personal communication, 12 May 2018). The parasites burrow into the caribou, making it impossible for subsistence harvesters to sell their hides, impacting the few traditional economies that still exist in the north. For this harvester, what was at stake was the loss of ways of living that have supported Indigenous communities for countless generations.

Land-based CCE is intentionally designed to illicit an emotional connection with the land and an emotional response to climate change. When climate change comes to matter, learners feel

things. Indigenous students may find land-based CCE cathartic or traumatic; they may see climate change as another oppressive force imposed on Indigenous people and Indigenous land, further severing land-based knowledges, that they are now expected to fix. In Chief Drygeese territory, the predominantly Indigenous class took part in sharing circles and ceremonies to reflect on the highs and lows of their land-based CCE experiences and process their emotions, ranging from joy to anger and grief. Emotional responses can fuel interventions to climate change when CCE intentionally helps students follow through from literacy and relationship to action and change, from thinking and feeling to behaving and responding.

While CCE can be taught through a variety of approaches, one that is absent of land would fall short of what is required. CCE must reconnect learners to land to achieve the socio-emotional and spiritual un-learning and re-learning required for climate action. It is not enough to teach *about* the land, nor is it enough to just move the classroom outside where students are learning *on* the land. Effective CCE connects students *with* the land, emotionally and spiritually. Educating for climate change requires a justice oriented land-based component where students connect to land in their own authentic ways, entering into personal relationships to develop emotional and spiritual responses to the climate emergency. Providing students with the technical knowledge to communicate about climate change while also providing space for them to enter into relationship with the land, builds relational accountability that fosters action-oriented responses to the climate crisis. Learning *with* the land emphasizes Indigenous knowledges and practices as viable interventions to the climate crisis; at the same time, this works to dismantle colonial practices and policies that aim to disrupt Indigenous knowledge systems. Climate change education that will equip learners with the skills to create authentic and lasting change, is one that is rooted in relational accountability, reciprocity, and the commitment to re-connect with all of our relations.

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