

Indigenous Conditions for Cultural Continuity:
Designing Local Climate Change Adaptations in the Pluriverse

by

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ABSTRACT

This dissertation project builds on the hope expressed by United Nations Secretary-General Guterres that a new world is taking shape as young people push their elders to do what is right in response to climate change. The goal of this research is to contribute new knowledge to facilitating literacy for climate change adaptations. Modernity's failure to prepare for climate change adaptation is entangled with Modernity's problems of domination, climate illiteracy, necropolitics, intolerance, and greed. Loss of literacy, a marker of degeneration in the climate cycle, now manifests in Modernity as climate change disavowal, disinformation, conspiracy theories, and anti-science sentiments.

This critical transdisciplinary study integrates Indigenous Knowledges, ecofeminist philosophy, Decolonial Theory, Critical Ecopedagogy as well as published research by critical anthropologists. Key assumptions are that without coloniality, there would be no Modernity and that without coloniality, there would be no Anthropogenic Climate Change. I use two research methodologies: Bacchi's critical policy analysis approach and Kovach's Indigenous methodology of re-storying.

In seeking adaptation solutions, I look to Indigenous cultures whose unparalleled longevity indicates adaptive capacity. I work with the following Indigenous conditions for cultural continuity that contribute to their cultural longevity: caring relationality with Land and interspecies kin, living the cosmology of the Land, regenerating, sharing, welcoming difference, and intentional remembering of cultural memories.

In a review of Senior Years Social Studies curricula, I found that curricula are silent on Indigenous conditions for cultural continuity, adaptations to past climate change events, and

adaptations to local climate risks. I refer to these exclusions as *dropped threads*. Curricular silence on climate change adaptation has serious implications. If curricula do not name and expose anthropocentrism as a system of dominating Land, it cannot be interrogated and remains hidden in the curriculum. If curricula do not deconstruct the link between anthropocentrism, capitalism, and climate change, then sustainability education is a greenwash for business-as-usual. If curricula remain silent on adaptations to past climate events, then youth are unprepared to design adaptations based on what was possible in the past.

Concluding that climate illiteracy is embedded in hegemonic curricula that reproduce Modernity/ coloniality, I turned to Critical Ecopedagogy as an approach to facilitate literacy for local climate change adaptations in the pluriverse. The principles of Critical Ecopedagogy are congruent with Indigenous conditions for cultural continuity in that they include earth-centeredness, affective relationality with Land, respect for regenerative forces, and learning from the past. Critical Ecopedagogy responds to the climate crisis by preparing learners to engage in collective agency for long-term, large-scale systems change in cyclical time.

Applying the principles of Critical Ecopedagogy, I created a primer for informal learning about designing local climate change adaptations. The primer methodically weaves in the 30 *dropped threads*, suppressed knowledge of past climate events, and subjugated knowledges of sharing economies, matricultures, and earth-centered philosophies. The primer is designed for youth, climate activists, transgressive educators, climate change coordinators in public institutions, and concerned grandparents like me. It critiques Modernity/coloniality's systems of domination, particularly anthropocentrism, and facilitates *deModernizing*, which disinvests from Modernity/coloniality by becoming ecocentric and becoming agentic in the pluriverse.

Learning about adaptations to past climate change events expands imagination for designing adaptations based on what was possible in the past. The primer prepares learners to participate in the large-scale changes already underway: a cosmological shift, economic plurality, and regenerative cultures.

This study is significant for contributing to literacy for local climate change adaptations. It is unique for its ecocentric perspective, for drawing on Indigenous Knowledges, and for exposing anthropocentrism as the crux of the problem of Anthropogenic Climate Change.

Keywords: climate change adaptations, cultural continuity, ecocentric, climate literacy, deModernizing, regeneration.

Dedication

to my grandchildren,

Devin Hohler, Emerson Hohler, and Theodore Falk

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TABLE OF CONTENTS

ABSTRACT	ii
ACKNOWLEDGEMENTS	vi
TABLE OF CONTENTS	vii
List of Tables	x
List of Images	xi
Abbreviations and Acronyms	xii
INTRODUCTION	1
I am Standing in this TimePlaceSpace	1
The Research Questions	5
Working with Words and Images	5
Contextualizing the Climate Crisis	9
Focusing the Research Problems	11
Limitations and Delimitations	13
Organizing this Document	14
PART ONE - FRAMEWORKS	17
Chapter 1 – Philosophical Framework	19
Indigenous Knowledges in the Transdisciplinary Philosophical Framework	24
Ecofeminism in the Transdisciplinary Philosophical Framework	29
Decolonial Theory in the Transdisciplinary Philosophical Framework	33
Critical Anthropologists in the Transdisciplinary Philosophical Framework	37
Critical Ecopedagogy in the Transdisciplinary Philosophical Framework	41
Strategy for Creating New Knowledge	47
Chapter 2 – Conceptual Framework	51
Chapter 3 – Methodological Framework	57
Kovach’s Re-storying Methodology	58
Bacchi’s Critical Policy Analysis	64
Listening for Silences	65
Chapter 4 – Ecopedagogy: Findings and Discussion	69
The Problem of Climate illiteracy	69
Gaps in Climate Education: Listening for Silences	74
Critical Ecopedagogy and Literacy for Climate Change Adaptation	80

Synthesis of Findings on Ecopedagogy	85
PART TWO – FINDINGS AND DISCUSSION:	87
LEARNING ROOTS FOR RADICAL LITERACY FOR CLIMATE CHANGE ADAPTATION	87
Principles of Ecopedagogy	88
Weaving Keywords and Concepts	89
Learning Roots 1 - Regenerating: Indigenous Conditions for Cultural Continuity	93
Living the Cosmology of the Land	94
Relating with Land and Kin	98
Regenerating	101
Sharing	105
ReMembering	107
Welcoming Difference	109
Survivance	110
Preparing to Survive Climate Change	114
Synthesis of Findings on Indigenous Conditions for Cultural Continuity	115
Learning Roots 2 - ReMembering Past Climate Events	119
Past Climate Change Events	121
ReMembering Adaptations in Past Climate Events	131
Maladaptation and Culture Collapse: Lack of Agency and Courage	136
Synthesis of Findings on Past Climate Events	139
Learning Roots 3 - Recognizing the Darkness of the Modern Age	143
Climate Change Events in The Modern Age	146
Transitioning to The Modern Age	147
Modernity/coloniality and the power of Domination	151
Anthropocentrism's Methods of Erasure	153
Heteropatriarchy's Methods of Erasure	155
White Supremacy's Methods of Erasure	158
Christian Theocracy's Methods of Erasure	160
The Great Dithering: Maladaptations in Late Modernity	161
Synthesis of Findings on Recognizing the Darkness of Modernity	168
Learning Roots 4 - DeModernizing: ReInhabiting Land Differently	171
Problematizing Cosmological Destitution	172
Recovery: Re-Inhabiting Land Differently	176

Becoming Ecocentric	177
Preparing for Change	183
Cosmological Transition: Preparing for Large-Scale, Long-Term Change	184
Synthesis of Findings on DeModernizing: ReInhabiting Land Differently	190
Learning Roots 5 - Sharing the Generosity of the Land	193
Problematizing Greed	194
ReStorying Sharing Economies	199
Economic Transitions: Preparing for Long-Term, Large-Scale Change	206
Preparing for Change: Designing Adaptations to Climate Risks	208
Synthesis of Findings on Sharing the Generosity of the Land	211
Learning Roots 6 - Respecting Regenerative Forces	215
ReStorying Respect for Regenerative Forces	217
The Cycle of Life	218
Mothering	220
Climate	222
Water	224
Land	226
ReMembering Matricultures	230
Methods of Erasing Matricultures and Regeneration	235
Problematizing Intolerance of Difference	236
Cultural Transitions: Preparing for Large-scale, Long-term Change	241
Tying Together End Threads	242
Synthesis of Findings on Respecting Regenerative forces	244
CONCLUSION	247
Evaluating the Research Process	247
Outcomes: A Radical Literacy for Local Climate Change Adaptations	252
Calls for New Research	254
Significance	255
Closing thoughts	256
REFERENCES	257
APPENDICES	298
Appendix A—Lexicon for DeModernizing in the Pluriverse	298
Appendix B: Listening for Silences: Curricular Sources	320

List of Tables

Table 1. Knowledge Construction in the Pluriverse and the University	23
Table 2. Reading across Language Families	62
Table 3. Dropped Threads-Results of Curricular Keyword Searches	79
Table 4. Continuum of Philosophies about Relating with Land	177
Table 5. Continuum of Responding to Difference	236

List of Images

Image 1. Earth-centered cultures/Power of Regeneration-Concept Map 1	55
Image 2. Modernity/coloniality/Power of Domination-Concept Map 2	55
Image 3. Problematizing Modernity-Concept Map 1 excerpt	71
Image 4. Earth-centered cultures/Power of regeneration-Concept Map 1 excerpt	90
Image 5. Modernity/coloniality/Power of Domination-Concept Map 2 excerpt	90
Image 6. Indigenous Conditions for Cultural Continuity-Concept Map 1 excerpt	93
Image 7. The Spiraling Story of Climate and Culture-Concept Map 3	119
Image 8. The Spiraling Story of Climate and Culture-Concept Map 3 excerpt	143
Image 9. Four Square Structure of Domination-Concept Map 2 excerpt	153
Image 10. Chevron-Concept Map 1 excerpt	171
Image 11. Sharing Community	193
Image 12. Problematizing Modernity-Concept Map 1 excerpt	195
Image 13. The Five Elements-Concept Map 1 excerpt	215
Image 14. Regeneration-The Spiraling Story of Climate and Culture-Concept Map 3	241

Abbreviations and Acronyms

ACC Anthropogenic Climate Change event

CCA Climate change adaptation

EE Environmental Education

IPCC The International Panel on Climate Change

LIA The Little Ice Age climate event

SE Sustainability Education (SDS Sustainable Development Education in US)

Land Acknowledgement

I respectfully acknowledge that by living in Treaty 1 territory, I have a treaty relationship with the Anishinaabeg, Anishinewuk, Dakota Oyate, Denesuline and Nehethowuk nations. I acknowledge that the Homeland of the Red River Métis is located in Manitoba and that northern Manitoba includes Lands that were settled by the Inuit.

INTRODUCTION

I am Standing in this TimePlaceSpace

I begin by introducing my Self and my standpoint in this Time, Land, and Space. I am the daughter of Louise Friesen and the granddaughter of Helena Wiens, who emigrated to Canada from Omsk, Siberia in 1926. As a second generation Canadian, I am grounded in my cultural ancestry and speak two dialects of German, although not fluently. My pre-Christian ancestors in the Dutch Lowlands would have practiced dendrolatry and recognized Nerthus as Earth Mother and now I follow their tradition by cultivating a deep listening kinship with Oaks. During the Reformation, my Christianized ancestors in the Lowlands joined the Protestant group known as Mennonites, who moved in mass migrations from the Lowlands to the Vistula delta, then to Russia, and then to Manitoba in the 1920s. I was raised in Mennonite traditions, but now identify as a syncretist of ecocentric philosophies. Some close relatives have moved in a different direction toward Christian Fundamentalism, and this creates relational tensions that tend to creep into my work. A hybrid cosmology allows me to set down roots with the Oaks venerated by my ancestors, to enjoy the Mennonite practice of singing in four-part harmony, and to respect the Ojibwe cosmology of the Land of my belonging.

I come to this work as a settler woman rooted in a cosmology of spiraling time, Land¹ across times, and Space as Void. I commit to participating in Earth's sentient aliveness in a symbiotic nondual relationality of listening with Her and respecting her regenerative power. I

¹ I use *Land* (upper case) and *Earth* (upper case) to refer to sacred Earth-home shared with interspecies kin and elemental life forces. I use *land* (lower case) to refer to the Modern notion of property. In quotations, I follow the usage of the author I am quoting.

experience spaciousness in living a simple life in my round home located in a forest community on the mighty Winnipeg River in the Canadian Shield. Living in a round home has changed me; I don't fit into boxes anymore.

Pre-Ojibwe ancestors of this Land left signs of their cosmology on the rock outcrop where I live. A snake petroform of sixteen rocks marks a seasonal snake den next to The Great Mother Rock, which looks like a pregnant woman lying on her back. At the heart of the Great Mother is Young Mother carved into a basalt vein. When the snakes shed their skins, I am reminded that all Beings experience transformative change. Being in love with the Land where I belong, where I am at home, awakens imagination to participate with Its continual becoming in spiraling time.

As a treaty person, I build relationships with the Ojibwe people in whose traditional territory I reside by attending ceremonies at Turtle Lodge in Sagkeeng First Nation and by participating in Lighting the Fire gatherings when Elders from across Turtle Island meet at Manito Api to discuss preparations for climate change. The Eighth Fire teachings touch me at a soul level and strengthen my commitment to prepare settler Sojourners to partner with our Indigenous hosts in caring for the Land they agreed to share in Treaty 1.

Out of heartfelt concern for the impact of climate change on the world that I leave to my grandchildren and future generations, I focus this research project on climate change adaptation. As a mother and grandmother, I am response-able and responsible to contribute to the capacity of current and future generations to adapt to the climate emergency. As a climate activist, I have contributed to the Transition Network by writing a column in the local newspaper and organizing local learning events.

I draw on professional experience as an educator in secondary education and as a facilitator of adult learning. My work in public service includes solving complex problems and managing multi-year change projects using a toolbox that included organizational design, adult education, policy development, staffing, and information technology. My experience in change management prepared me to write this dissertation. In retirement, I worked at what I loved--pottery, gardening, counseling, and facilitating holistic learning. An accident in 2012 left me with mobility impairments that compelled major life-changes. While recovering from the accident, I began a master's degree via distance education with Athabasca University in interdisciplinary studies with culture studies as my focus area. It was a revitalizing undertaking with opportunities to inquire into climate change, matricultures, and Hannah Arendt's political philosophy of natality. I entered doctoral studies at University of Alberta with the intent to study Indigenous matricultures in Canada and climate change adaptation and was awarded a Bombardier scholarship based on my proposal on this topic; however, when the topic was unsupported, I pivoted to my current topic mid-way through my program.

Goal. My goals for this dissertation project are to contribute new knowledge to the design of local² climate change adaptations in the pluriverse and to develop an approach for facilitating literacy related to climate change adaptations. For this purpose, I present my findings in non-traditional format as a learning resource that can be disseminated rapidly in response to the urgency of the climate crisis. I explore ecopedagogy as a mode of informal learning about local climate change adaptations and design the learning resource for an

² **Local** (*adj.* localization (n.) an adaptive strategy involving decentralization to support self-sufficiency, cultural and ecological well-being, and social connectedness.

audience that includes youth, climate activists, transgressive educators, climate change coordinators in public institutions (e.g., municipalities, hospitals), and concerned grandparents like me.

My goal is embedded in the dissertation title, where *Indigenous Conditions for Cultural Continuity* communicates that my starting point for adaptation knowledge is Indigenous Knowledges; thus, this study aligns with the International Panel on Climate Change (IPCC) recommendation that transformative climate change adaptations are planned locally or bioregionally and draw on Indigenous Knowledges (IPCC, 2014, p. 842). The term *cultural continuity* refers to long-term, multi-generational ongoingness of a culture. The subtitle includes the words *designing and pluriverse* to communicate my pluriversal and creative perspectives. *Pluriverse* refers to the Earth world made up of a plurality of mutually entangled and co-constituting but distinct worlds, in contrast with the Modern monocultural world.

As a feminist researcher, I situate my embodied Self in the research by introducing my place of inhabitation, my culture, and my perspective. I engage my whole Self in the work by writing in the first person and drawing on embodied, affective, and transpersonal insights as well as cognition and creativity to construct “situated knowledges” informed and limited by my context (Haraway, 1988) and my “standpoint” as a woman, solo mom of three children, and activist for social justice and ecojustice (Harding, 1993). Accordingly, I recognize that knowledge construction is always subjective and partial.

I position myself in relation to the climate crisis, knowing that the mind-set for solving climate-related problems must be a different mind-set than the mind-set that produced the wicked anomalous problem that we know as Anthropogenic Climate Change. A critical

perspective enables me to deconstruct the Modern mind-set and to begin deModernizing myself. Following George Sefa Dei (2009), I recognize that Indigenous peoples and people of colour do not share complicity because they too are subjugated by the power of domination. Viewing the climate crisis not as “a management issue” (p. 17) but an issue of ecojustice and social justice, I problematize Western Eurocentric politics of power and interpret the prefix *anthropos*- (Greek) of anthropocentrism to mean white humans.

The Research Questions

I begin by focusing on Indigenous cultures, which have the greatest longevity of all cultures and demonstrate adaptive capacity by having endured past climate change events and by surviving coloniality. Indigenous conditions for cultural continuity are Land-based and enable regeneration. In contrast, Modern culture holds to an ideology of continual progress and resists mitigating Anthropogenic Climate Change³ if it impedes economic growth. The research questions that guide this research project are:

- What do designers of local climate change adaptations need to know about Indigenous conditions for cultural continuity that enabled Indigenous and ancient cultures to endure past climate change events?
- In what ways can Critical Ecopedagogy facilitate literacy for local climate change adaptations in the pluriverse?

Working with Words and Images

³ Anthropogenic Climate Change (ACC) is capitalized as a proper noun for an event, like The Little Ice Age, the previous climate change event.

The research approach needs to identify Indigenous conditions for cultural continuity, past climate change events and cultures that survived them, as well as adaptive practices that animate the conditions for cultural continuity.

In this section, I talk about how words and images are used in building an ecocentric lexicon for adapting to climate change. According to Daniel Heath Justice (2012), creative use of language helps to *imagine otherwise* (p. 108), so I engage with language creatively because the English language has a shortage of words for imagining ecocentric ways of being in the pluriverse. In Appendix A, I provide a lexicon of words for discussing radical literacy for climate change adaptation. In this section, I explain my usage of words.

Following Mary Daly, I practice Verbing as a way of participating in becoming; thus, I disrupt Modernity's habit of nouning that institutionalizes things into static states (Daly 1978, 1984; Berry, 1988). Following Daly, I use uppercase for Being (n.) to recognize the personhood of species and agential matter (e.g., Oak).

To communicate the nondual interconnectedness of all Beings, I use *Land* (upper case) and *Earth* (upper case) to refer to sacred Earth-home shared with interspecies kin and elemental life forces and I use *land* (lower case) to refer to the Modern notion of property. I avoid the terms *nature and wilderness* because they are dualistic abstractions that romanticize certain landscapes and infer separation from culture and humans. The category of *nature* is not useful because it collects plants, animals, rivers, and mountains into a single abstraction (Harvester and Blenkinsop, 2010, p. 124). *Wild* is often juxtaposed with *civilized* (Blenkinsop and Fettes, 2021, p. 3), which is problematic. The term *environment* excludes humans (Oreskes and Conway, 2014, p. 55), thereby reinforcing dualism and human exceptionalism. Ecology as a

synonym for *nature* or *environment* has become a confusing term because its Greek root *oikos* also forms *economy*, yet the two words are viewed as oppositional, not interdependent, in a Modern worldview. Words with the *-ology* suffix privilege Eurocentric knowledges and exclude interspecies knowledges, so I use *-ology* nouns sparingly to refer to academic disciplines.

How do I use language to decenter humans? I use *anthropocentrism* to refer to Western Eurocentric domination over Earth and other species. Let me interpret anthropocentrism. I interpret the Greek root *anthropos*- to mean Western Eurocentric humans, in recognition that Indigenous peoples and people of colour do not share complicity because they too are subjugated by the power of domination (Dei, 2009, p. 17). The secular ideology of anthropocentrism traces to European humanist philosophy. The religious belief in anthropocentrism traces to Abrahamic religions (i.e., Judaism, Christianity, and Islam), in which the origin story includes a deity's instruction to humans to dominate the Earth.

I do not problematize *centrism* but reclaim the circle as a symbol of egalitarianism and nondomination. For this reason, I am comfortable with the term *ecocentric*. Some scholars problematize *centrism*, for example, Rebecca Martusewicz (2013) avoids centric language in the practice of ecojustice (p. 262) and Ruyu Hung (2021) uses “ecological worldview” instead of *ecocentric* (p. 15), whereas I avoid *worldview*⁴. In using *ecocentric*, I decentre *anthropos* (humans) and centre Earth as the core value with the assumption that there are no man-made hierarchies when Earth is at the centre.

⁴ According to Oyěwùmí (1997), *worldview*, translated from *Weltanschauung* (German), is a Eurocentric concept that privileges sight, particularly text, to summarize the beliefs and logic of a person or society. She suggests *worldsense* as an inclusive alternative (p. 3).

I invite readers to join me in reTurning to spiraling time, where the prefix *re-* means again and again. Taking another revolution on the spiral of time opens a dynamic style of thinking and being that disrupts linearity by using research practices with creative repetitions such as revisiting times, reStorying knowledges, reMembering, and reTurning as a way of learning and learning again, but differently in each revolution (Braidotti, 2011, p. 230).

Images. As a visual learner, I think in images and build concept maps before I begin writing. Concept maps help me clarify interconnections and juxtapositions of concepts. Concept Maps 1 and 2 represent the core concepts of this work. On first usage of a core concept, I define it briefly in text or in a footnote and hyperlink to a longer working definition in [Appendix A - Lexicon](#). Hyperlinking is a strategy for web-based writing that saves paper, reduces errors, and enables rapid dissemination.

Symbols and graphics contribute to meaning making in this dissertation. The spiral symbolizes the power of regeneration in the pluriverse (see Concept Map 1). The square symbolizes Modernity's structure of power of domination (see Concept Map 2). The chevron or zigzag, an ancient symbol of Water, represents change.

Ecocentric is a core concept. Ecocentrism and anthropocentrism are not a binary pair; they anchor a continuum of philosophical standpoints about relationality with Land.

- [Ecocentrism](#) refers to an egalitarian, [nondual](#) philosophy that decentres humans and engages in mutual caring and empathic [relationality with Land and kin](#).
- [Anthropocentrism](#) refers to a hierarchical, [dualistic](#) philosophy and system of [domination](#) that ranks humans (*anthropos*) as the most superior species with the right to dominate all other species and land for human benefit.

The continuum of ecocentrism <> anthropocentrism is discussed in Learning Roots 4, but throughout this study, I deconstruct anthropocentrism in its entanglements with capitalism, coloniality, and Anthropogenic Climate Change.

Words, images, textboxes, and hyperlinks are tools for communication in this dissertation. Next, we turn to the problems that call for our attention.

Contextualizing the Climate Crisis

On November 30, 2020, United Nations Secretary-General António Guterres declared that COVID-19 and climate change “have brought us to a threshold. We cannot go back to the old normal of inequality, injustice, and heedless domination over the Earth.” He finds hope that a new world is taking shape as young people push their elders to do what is right (United Nations Climate Action, 2020). In January 2021, a group of international scientists issued a dire warning:

We have summarized predictions of a ghastly future of mass extinction, declining health, and climate-disruption upheavals (including looming massive migrations) and resource conflicts [in] this century. Yet, our goal is not to present a fatalist perspective, because there are many examples of successful interventions . . . at both local and regional scales. Instead, we contend that only a realistic appreciation of the colossal challenges facing the international community might allow it to chart a less-ravaged future. (Bradshaw et al., 2021, p. 6)

In April 2021, *The Scientific American*, on behalf of 13,000 scientists, called on the media to use stronger language for “the biggest environmental emergency to beset the earth in millennia” (Fischetti, 2021).

Scientists have been warning governments about the risks of climate change caused by human activity for 35 years since James Hansen (1988), Director of NASA Goddard Institute for Space Studies, warned the US Congress of the risks presented by global warming (p. 1). The period since 1988 is known as The Great Dithering⁵ when governments failed to act in response to scientists' warnings. According to The Keeling Curve,⁶ CO2 levels continue to rise, indicating that mitigation efforts have been inadequate to bend the curve. When the Canadian government subsidizes the oil industry that fuels climate change (Gray and Sandborn, 2019), it denies that climate change is an emergency, "an existential risk" (Spratt and Dunlop, 2018, p. 2) and broadcasts the message that fossil fuel profits are more valuable than a viable future for next generations, even as the death toll attributed to climate change increases each year. The World Health Organization (2022, Nov. 7) reports that the death toll attributed to the effects of climate change rose dramatically in 2022 due to heat-related deaths and massive flooding in Pakistan. Anthropogenic Climate Change presents existential risks.

Not being a scientist, I rely on the scientific consensus produced by The International Panel on Climate Change (IPCC), as well as on research by climate research institutes, particularly Potsdam Institute for Climate Impact Research (PIK) and Club of Rome.

Contextualizing Climate Change Adaptations. A decade ago, IPCC reports called for incremental and transformational adaptations; however, since 2018, IPCC Reports call for

⁵ The Great Dithering, coined by science fiction writer Kim Stanley Robinson, refers to the period after 1988 when scientists warned governments that Anthropogenic Climate Change was becoming a global crisis, but government failed to act rapidly or decisively enough to avert catastrophic climate change (Haraway, 2016). Oreskes and Conway (2014) refer to this time as the Period of the Penumbra (p. 59).

⁶ The Keeling Curve is a graph of the accumulation of carbon dioxide in Earth's atmosphere based on continuous measurements taken at the Mauna Loa Observatory from 1958 to the present day.
<https://keelingcurve.ucsd.edu/2019/06/04/animation-of-keeling-curve-history-updated-to-include-2019-milestone/>.

transformative changes in cultural and ecological systems. [Transformational change](#) refers to “adaptation that changes the fundamental attributes of a social-ecological system in anticipation of climate change and its impacts” (IPCC-AR6-Glossary, 2022, p. 2899).

Transformative adaptations involve long-term, large-scale changes across more than one system by critically interrogating existing systems for effectiveness, injustice, and power imbalances. In human systems, climate change adaptation is the process of adjusting to actual or expected climate change and its effects in order to moderate harm and protect life. IPCC recommends that transformative [climate change adaptations](#) are planned locally or bio-regionally, are ecosystem-based, and draw on Indigenous Knowledges⁷ (IPCC-AR6-SPM, 2022, p. 2898).

Recent IPCC reports utilize the language of [Limits to Growth](#) (LTG) theory developed by Club of Rome, with the late Donella Meadows (1974) as lead author. Adaptation is feasible only if the Land has not yet reached its peak [carrying capacity](#). Species inhabitants of Land, including humans, cannot stay in place if food, water, and secure shelter are not available. IPCC-AR6-SPM (2022) warns:

[Hard limits to adaptation](#) have been reached in some ecosystems (*high confidence*). With increasing global warming, losses and damages will increase and additional human and natural systems will reach adaptation limits (*high confidence*). (C.3.3)

Focusing the Research Problems

⁷ As a session reporter at the IPCC Cities and Climate Change Conference in Edmonton in 2018, I witnessed some thoughtful beginnings of including Indigenous voices in climate change discussions, but also some tears.

Studying a problem as big as climate change adaptation requires divergent thinking to consider the big picture of the problem. To manage the scope of the project, I examined the complex, wicked problems related to climate change adaptation and narrowed my focus to only six interrelated problems.

The macro problem is Modernity's hegemony or structure of power that operates with systems of domination that include [anthropocentrism](#), [heteropatriarchy](#), [white supremacy](#), and [Christian theocracy](#). These four systems of domination are mutually-reinforcing; thus, they are resistant to change and external influences. Hierarchy is the organizing principle of each system, which uses methods of erasure to eliminate or enslave marginalized Others and to subjugate their knowledges. The hegemonic structure of Modernity determines which knowledges are allowed in hegemonic education.

The overarching problem is [climate illiteracy](#), which manifests as tactics of intentional forgetting: disavowal, delusions, disinformation, and suppression of scientific knowledge related to past climate change events and adaptations. Climate illiteracy is not an information deficit that can be solved with cognitive learning; it is a "manufactured ignorance" that presents as a crisis of agency, memory and thinking (Giroux, 2014; 2021; 2020, p. 200-201). I problematize climate illiteracy in Chapter 4 and Learning Roots 3. Domination and climate illiteracy are entangled with four related problems, specifically cosmological destitution, intolerance of difference, necropolitics, and greed.

- [Cosmological destitution](#), a term coined by Freya Mathews (1991), refers to settlers who have forgotten the [cosmology](#) of their ancestral homeland, have not bonded with the Land they settled, and neglected to adopt the cosmology of the Land they settled.

The resulting loss of cosmology is indicated by settlers living nomadic lives chasing jobs and not settling in a place long enough to become acquainted with the Land and its cosmology. Cosmological destitution is problematized in Learning Roots 4.

- [Intolerance of difference](#) is inherent to Modernity's structure of power that privileges whiteness, maleness, and heterosexuality; thus, marginalizing people of difference and subjugating their knowledges. Intolerance is problematized in Learning Roots 6.
- [Necropolitics](#) is a Modern strategy of governance that embeds intolerance in policies and practices that determine who gets to live and who to let die. Failure to protect and failure to investigate missing and murdered Indigenous women and girls is an example of necropolitics in Canada. Necropolitics is problematized in Learning Roots 6.
- [Greed](#) is inherent in Modernity's capitalist economic system, which drives anthropocentric domination over Land and subjugates knowledges of egalitarian and sharing economies. Greed is problematized in Learning Roots 5.

I pay attention to these problems of Modernity/coloniality because they tend to contribute to stuckness and reduce agency, thus reducing adaptive capacity.

Limitations and Delimitations

Limiting the Topic. This study is not about climate change mitigation or about adaptations that involve engineered infrastructure, e.g., the Red River floodway. It is about the cultural or human dimensions of climate change adaptations as a caring response to climate and a

commitment to [regenerate](#) and [endure](#) Anthropogenic Climate Change together in caring communities.

Limiting the Research Problems. There are many cultural issues that constitute the complex problem of climate change adaptation, but I limit this inquiry to the six problems identified in the previous section and place the remainder out of scope for this project. A problem that calls for urgent attention is the mental health of youth who are experiencing an epidemic of despair for their future and traumatic grief for losses of species and landscapes. Scholars in the emerging field of Climate Psychology are working on this urgent problem. Educational scholars like Cathryn van Kessel (2020, 2022) and Alysha Farrell (2022) are preparing pre-service teachers for the affective aspects of climate change. Zembylas and Bekerman (2008) weigh in on the politics of memory and forgetting trauma in pedagogy.

Limiting the Research Solutions. In applying Critical Ecopedagogy principles to Part Two, I narrow the broad scope of Critical Ecopedagogy to focus on literacy related to climate change adaptations. I intentionally exclude Disaster Risk Reduction (DRR), a United Nations program for guiding disaster risk management because it does not sufficiently address the risks of domination and climate illiteracy.

Personal Limitations. As a settler, my understanding of Indigenous Knowledges is limited because I do not have lived experience as an Indigenous person. I am aware that my rural bias impedes my ability to imagine climate futurities in urban environments.

Organizing this Document

This dissertation is organized in two parts. In Part One, I develop the frameworks that guide my research and begin discussion of findings. Chapter 1 builds a transdisciplinary

philosophical framework and reviews literature related to the research questions in five knowledges and disciplines. Chapter 2 provides a conceptual framework with core concepts and concept maps. Chapter 3 describes the methodological approach for conducting the research. Chapter 4 discusses findings related to the research question: *In what ways can Critical Ecopedagogy facilitate literacy for local climate change adaptations in the pluriverse?* Chapter 4 sets up Part Two.

Part Two is functional and answers the question: *What do designers of local climate change adaptations need to know about Indigenous conditions for cultural continuity that enabled Indigenous and ancient cultures to endure past climate change events?* Findings and discussion are written in non-traditional format as six learning modules, called Learning Roots, which include learning objectives, keywords, concept maps, questions, and additional resources. At the end of each Learning Root is a synopsis of findings related to the research question. The learning modules are:

- Learning Roots 1 identifies and discusses Indigenous [conditions for cultural continuity](#).
- Learning Roots 2 discusses [past climate change events](#) and inquires if Indigenous conditions for cultural continuity are relevant to understanding the adaptive capacity of ancient cultures that survived a full climate cycle.
- Learning Roots 3 unmasks [Modernity](#), deconstructs four systems of domination and their [methods of erasure](#), and problematizes illiteracy.
- Learning Roots 4 deepens the exploration of two conditions for cultural continuity: relating with Land and living the [cosmology of the Land](#). It problematizes cosmological destitution and a broken relationship with Land and discusses deModernizing.

- Learning Roots 5 deepens the exploration of [sharing](#) as a condition for cultural continuity. It problematizes greed, discusses sharing economies, and becomes agentic in preparing for climate risks and for economic transitions in the pluriverse.
- Learning Roots 6 deepens the exploration of regenerating and [welcoming difference](#) as conditions for cultural continuity. It problematizes necropolitics and intolerance. It prepares for long-term change by learning practices for [regeneraphilia](#) or [respecting forces of regeneration](#), including the cycle of life, Land, Climate, Water, and mothering.

While Part Two can be used by learners of all ages, places, and occupations, it is designed with youth in mind because I feel burdened with responsibility about the climate crisis that youth and future generations will endure. Climate activism by youth around the world convinces me that I dare not minimize the challenges of ecological and cultural decline that they will witness in their lifetimes. A focus on adaptation has the potential to generate hope in a time of despair and to keep hope alive by participating in transition movements. Hope is not a guarantee for a future, but a power that generates action.

PART ONE - FRAMEWORKS

I invite you to read Part One with the mind-set of a construction manager reading a set of blueprints for building a round research centre. The Philosophical Framework (Chapter 1) is the design of the foundation, which requires a solid footing that will stand the test of time and the weightiness of my topic. The Conceptual Framework (Chapter 2) is the design of the building envelope with doors and windows that provide a diversity of perspectives on the pluriversal worlds in which the centre is located. The Methodological Framework (Chapter 3) is the mechanical design and has been kept quite simple. There are no interior walls (except for the washroom, of course) so that knowledges can mingle and intra-act without getting stuck in corners. The research centre provides functional space for the purpose of inquiring into two questions:

- What do designers of local climate change adaptations need to know about Indigenous conditions for cultural continuity that enabled Indigenous and ancient cultures to endure past climate change events?
- In what ways can Critical Ecopedagogy facilitate literacy for local climate change adaptations in the pluriverse?

My inquiry into these questions recognizes six problems related to climate change adaptation: domination, climate illiteracy, cosmological destitution, necropolitics, intolerance, and greed.

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Chapter 1 – Philosophical Framework

The intent of this chapter is to build a firm foundation by creating a transdisciplinary *philosophical framework* of five sets of knowledge that are necessary for my inquiry. By using the phrase *philosophical framework* instead of *theoretical framework*, I signal my commitment to [nondual](#) scholarship in which philosophy is an [onto-ethico-epistemology](#), an ethical way of being and thinking in the world that regards ontology, ethics, epistemology, and cosmology as inseparable (Barad, 2007). In contrast, theoretical frameworks tend to focus on epistemology. I am committed to nondual scholarship because, as an ecocentric, I interrogate the dualistic foundation of anthropocentrism as an unethical ideology that drives the co-occurring existential crises of Anthropogenic Climate Change and Sixth Mass Extinction Event.

Organization. In this chapter, I begin by justifying my transdisciplinary approach for studying climate change adaptation. Then there are five sections that introduce the five sets of knowledges and the literature that is relevant to my topic. The five sets of knowledges are:

- Indigenous Knowledges,
- ecofeminist philosophy,
- Decolonial Theory,
- critical anthropologists from the academic discipline of Anthropology, and
- Critical Ecopedagogy, a field of Critical Pedagogy in the academic discipline of Education.

These five critical knowledges may not be viewed as equal in the academy; however, in pluriversal scholarship, this is not a concern. Each knowledge contributes a useful way of thinking about climate change adaptation. You may ask if I really need all five knowledges. I am

convinced that the depth and breadth of insights into my topic would be diminished if I dropped any one of these knowledges. I am concerned that the philosophical framework does not include the emerging field of Climate Psychology or Hannah Arendt's political philosophy of natality, but I will bring those knowledges into the discussion when they are relevant. In the Conclusion, I will apply the Szostak Test (p. 421) to evaluate the effectiveness of my transdisciplinary philosophical approach for exploring the research questions and problems.

Each section in this chapter includes:

- an overview (origins, classic texts, relevant debates),
- principles (axioms, assumptions, core beliefs)
- scholarly literature related to cultural continuity,
- scholarly literature related to climate change adaptations,
- common ground with other knowledges and disciplines.

I close Chapter 1 with a strategy for integrating five sets of knowledge in the research, analysis, findings, and problem-solving of this dissertation project.

This dissertation is a problem-solving study. In the Introduction, I narrowed my focus to climate change adaptations and the entangled problems of domination, climate illiteracy, cosmological destitution, necropolitics, intolerance, and greed. As a problem-solving study, this chapter digresses from a traditional literature review, which looks for weaknesses or gaps that can be plugged by constructing new knowledge. Instead, I look for principles that illuminate the problem of climate illiteracy, the design of climate change adaptations, and an ecocentric pedagogical approach for facilitating literacy.

My dissertation title signals that I plan to look for knowledge about climate change adaptations in Indigenous Knowledges about Indigenous conditions for cultural continuity. I regard Indigenous conditions for cultural continuity as a subjugated knowledge, and my task is to bring that knowledge forward so that it can be applied to designing climate change adaptations. In the literature reviews, I continually ask if there are other subjugated knowledges that need to be brought forward for the purpose of designing climate change adaptations.

Justifying a Transdisciplinary Approach. According to Allen Repko (2008), interdisciplinary and transdisciplinary research allows scholars to draw on multiple knowledges to explore complex problems where no single discipline has sufficient knowledge to analyze the entanglements of the problem. Transdisciplinarity concerns that which is “between the disciplines, across different disciplines, and beyond all disciplines.” It enables researchers to synthesize multiple disciplinary and stakeholder knowledges based on an overarching theory or philosophy (p. 21).

Repko (2008) calls for holistic thinking, which he characterizes as reasoning, intuition, inclusiveness, and creativity. He encourages scholars to generate symbols and metaphors that express the integration of knowledges (p. 63). Accordingly, I use the metaphor of weaving a tapestry.

The wicked problem of climate change adaptation affects all species, all cultures, all youth, and all facilitators of learning. According to Rittel and Webber (1973), a wicked problem occurs in contexts with great diversity among stakeholders and calls for an interdisciplinary approach. Transdisciplinarity enables me to approach the wicked problem of climate change

adaptation from multiple perspectives and to synthesize the knowledges of pluriversal stakeholders. I narrowed the scope of the study by focusing on the following sub-problems: domination, climate illiteracy, cosmological destitution, intolerance, necropolitics and greed. As sub-problems, they are not discreet but deeply entangled with each other.

Thinking by itself can't solve problems. Problem solving requires thinking and action. By using an onto-ethico-epistemological approach, I can select actions based on ethics. If I use only epistemology, I may get stuck in theory and inductive thinking to peer down a gopher hole to analyze what's changed. Onto-ethico-epistemology is more holistic and calls for divergent thinking that is continually looking up, out, and across to get a big picture perspective.

Table 1-Knowledge Construction in the Pluriverse and the University contextualizes the five knowledges that comprise this philosophical framework. Indigenous Knowledges, ecofeminist philosophy, and Decolonial Theory are in Column 1 as pluriversal knowledges delinked from Modernity/coloniality. Column 2 lists social theory paradigms of the Western Eurocentric academy in chronological order, juxtaposed with Column 3—a chronology of The Modern Age shaped by two climate change events. The paradigm of Critical Theory has the most affinities with the pluriverse and may become an academic path to joining the pluriverse.

Table 1. Knowledge Construction in the Pluriverse and the University

	Modern Social Theory Research Paradigms of the Western Eurocentric Academy		Climate Change Chronology In the Modern Age	
	European Romanticism and Enlightenment Reductionism (Bacon) Dualism (Descartes) Atomism (Newton) Humanism		LITTLE ICE AGE 1300-1850 Early Modernity_1500–1788 Capitalism / Colonization	
	Positivist Research Paradigm assumes there are objective and knowable realities/truths, as well as separation of subjects and objects.		ANTHROPOGENIC CLIMATE CHANGE 1830- Mid Modernity 1789–1900 1 st Industrial Period	
	Interpretivist Research Paradigm assumes truth is variable, socially constructed, and ever-changing.		Late Modernity 1900–1987 2 nd Industrial Period	
	Critical Theory Research Paradigm assumes that oppression and inequality are caused by practices that limit freedom. <ul style="list-style-type: none"> Postcolonial: Mbembé, Césaire Critical Anthropology: Haarmann Feminist theory: Haraway Material Feminism: Braidotti, Barad Anti-racist education: Dei Critical pedagogy: Freire, Giroux Critical Ecopedagogy: Kahn, Hung 		High Modernity 1988 – Scientists warn of ACC 1988 The Great Dithering Climate Emergency 2016	

THE PLURIVERSE**Indigenous Philosophy**

- Little Bear
- Arnakak
- Simpson
- Armstrong

Indigenous Feminism

- Wilson
- Hill
- Kuokkanen
- Anderson

Ecofeminism

- Shiva
- Salleh
- Mathews

Decolonial Theory

- Lugones
- Escobar
- Mignolo
- Andreotti

Pluriversal Learning

- Ecopedagogy for Climate Change Adaptation

- Postmodernism

Indigenous Knowledges in the Transdisciplinary Philosophical Framework

Overview. Indigenous Knowledges are my primary source for knowledges about Indigenous conditions for cultural continuity. I access this knowledge through the literature of Indigenous Feminisms, primarily from Canada, and expand to other genres as needed. Indigenous Knowledges, including Indigenous feminisms, belong to Indigenous cultures and are not controlled by the academy; thus, I locate Indigenous Knowledges in the pluriverse. Indigenous Knowledges contribute to problematizing dominance, intolerance, and greed.

Principles of Indigenous Knowledges (IK). Regeneration is a complex concept that refers to an over-arching philosophy, a condition for cultural continuity, and an Earth-centered mode of power that co-exists with Modernity/coloniality's mode of power by domination. The politic of resurgence asserts sovereignty that is not subject to the colonizer's definitions. From my reading, I have come to understand that Indigenous conditions for cultural continuity include, but are not limited to:

- a) relationality with Land and kin,
- b) living the cosmology of the Land,
- c) regenerating,
- d) sharing,
- e) reMembering cultural memories, and
- f) welcoming difference.

A great deal has been written about cultural continuity. In the paragraphs below, I briefly discuss my sources for knowledge about these conditions. The literature is discussed fully in Learning Roots 1, and frequently referenced in Learning Roots 2 to 6.

Leanne Betasamosake Simpson (Anishinaabekwe) is a key source. Simpson (2017) locates herself outside the Western academy as a way of “refusing colonial domination, refusing heteropatriarchy, and refusing to be tamed by whiteness or the academy” (p. 33). Simpson’s *As We Have Always Done* (2017) is like a manual on cultural continuity with chapters on regeneration (Chapter 3), sharing economies (Chapter 5), and welcoming difference, queerness, and plurality (Chapter 8). Resurgence is the struggle of Indigenous peoples to emancipate their Land, bodies, and knowledges from colonial oppression.

Indigenous Literature on Cultural Continuity. The following paragraphs follow the sequence of conditions for cultural continuity listed above.

On [regenerating](#), Simpson is my primary source because her brilliant philosophy of regeneration is about the collective responsibility to make more life (Simpson, 2011, p. 142-8). Regeneration is symbolized by a spiral that represents ongoingness, relationality and disrupts Modern linearity (p. 144) by bringing the old into the new (Simpson, 2017, p. 193). Simpson (2011) interprets *mino bimaadiziwin* as continuous rebirth to promote life and to live it, thus inferring the sacredness of mothering and birthing.

A rich body of literature on Indigenous mothering and cultural regeneration was catalyzed by “*Until our Hearts are on the Ground*” *Aboriginal Mothering, Oppression, Resistance and Rebirth* (2006), edited by Dawn Lavell-Harvard and Jeanette Corbiere Lavell. In response to readers, Lavell-Harvard partnered with Kim Anderson to write *Mothers of the Nations: Indigenous Mothering as Global Resistance, Reclaiming and Recovery* (2014). Hannah Tait Neufeld and Jaime Cidro published *Indigenous Experiences of Pregnancy and Birth* (2017), an edited volume that documents the leadership of Indigenous women in restoring birthing as

ceremony and training Indigenous midwives and doulas. Fittingly, all three books are published by Demeter Press, which specializes in mothering. Read together, these books are integral to the story of Indigenous [matricultures](#) and [rematriation](#).

On [relating with Land](#), Sherry Pictou (2017) uses “interspecies” to translate the “Mi’kmaq concept of *M’sit No’kmaq* (All of my relations)” that acknowledges kinship and wisdom of all species as ancestors (p. 114). Simpson’s (2017) notion of dispossession critiques coloniality’s systems of domination by focusing on the “dispossession forces of capitalism, [heteropatriarchy](#), and [white supremacy](#)” (p. 34). She defines *dispossession* as the genocide of removing Indigenous bodies from the Land in order to possess it (p. 51-4), thus expanding the notion of colonial anthropocentrism to include theft of Land as well as exploitation.

On [reMembering cultural memories](#), my primary sources are Emma LaRocque (Métis) and Blair Metallic (Mi’gmaq). Metallic (2015) understands that the Mi’gmaq sense of cultural continuity is “made up of three aspects--traditions, consciousness or identity, and language” and that “continuity” is the “forward-motion” of culture that enables the continued existence of Mi’gmaq values, knowledge, and stories, which are in a “constant state of renewal” (p. 4)⁸. LaRocque (2011) explores the cultural agency of Indigenous writers whose literary works are influencing the way settler Canadians know Indigenous stories. ReMembering is often juxtaposed with forgetting. Paula Gunn Allen (Laguna) (1986), the first Indigenous scholar to insist that Turtle Island was [matricultural](#), explains the colonizer’s erasure of knowledges about Indigenous matricultures as intentional forgetting, another colonial method of erasure (p. 209-

⁸ Both Mi’gmaq and Mi’kmaq are acceptable spellings. I use the spelling used by the scholar I am citing.

13). I bring the subjugated knowledge of matricultures forward in Learning Roots 6 because it is relevant to regeneration, as a condition for cultural continuity.

On [welcoming difference](#), I draw on Alex Wilson (Cree) whose body of work contributes to welcoming gender plurality. Wilson (2015) uses the term *queer* to disrupt coloniality imposition of European gender and sexual binaries and hierarchies.

On [sharing](#) and gifting economies, my key sources are Susan Hill (Haudenosaunee) (2017) and Pansy Collison (Haida) (2010) for their respective cultures. Rauna Kuokkanen (Sami) studies circumpolar Indigenous peoples and specializes in Indigenous gifting economies. Reciprocity is a complex principle enacted in place-based practices for gifting, engaging in relationality with Land, and [respect for regenerative forces](#) (Simpson, 2017, p. 180-5). I bring the subjugated knowledge of sharing and gifting economies forward in Learning Roots 5 because it is relevant to designing economic climate change adaptations.

Indigenous Literature on Climate Change Adaptations. Simpson critiques the Western notion of sustainability as regeneration turned upside down because it enables [extractivism](#) and pollution that destroy the capacity of Land and her culture to regenerate (Simpson, 2011, p. 141; 2017, p. 67-70, 159). In an interview with Naomi Klein (2013) about climate change, [ecocide](#) and [decolonization](#), Simpson links colonialism to the current [Anthropogenic Climate Change](#) event. “Colonial thought brought us climate change. We need a new approach.” She talks about the need for transformative change and a new way of thinking.

Our elders have been warning us about this for generations now--they saw the unsustainability of settler society immediately. Societies based on conquest cannot be sustained, so yes, I do think we’re getting close to that breaking point for sure. We are

running out of time. We're losing the opportunity to turn this thing around. We don't have time for this massive slow transformation into something that's sustainable and alternative. I do feel like I'm getting pushed up against the wall. (Simpson, quote by Klein, 2013, np)

The Inuit are witnessing the ecological devastation of climate change and have already experienced a 2.2C increase in average annual temperature,⁹ causing loss of Arctic sea ice and thawing permafrost. Inuk leader Sheila Watt-Cloutier is distinguished for her leadership as International Chair for the Inuit Circumpolar Council and is an expert source on pollution in the Arctic; however, she is not as grounded in Inuit cosmology as Inuit philosopher Arnakak who declares that Canada, the colonizer, transgressed the duty of [reciprocal](#) relationality with the Arctic by treating it as a wasteland and this transgression manifests as climate change involving species extinctions and cultural disruption. He urges Canada to enter a reconciliation process to heal its broken relationship with the Arctic (Leduc, 2010, p. 198).

Heather Davis and Zoe Todd (Métis) (2017) enter the debate on the Anthropocene by arguing for dating the Anthropocene to 1500 CE to coincide with colonization and its practices of environmental degradation. They call us to think beyond fossil fuels as the cause of climate change and to examine the long-term impact of 500 years of broken relationship with Land (p. 776) since colonial invasions caused environmental changes by terraforming the landscape to benefit forestry, agriculture, transportation, and other industries. Similarly, Kyle Whyte (Anishinaabe-Potawatomi) (2017) argues that colonialism and capitalism laid the groundwork

⁹ *National Inuit Climate Change Strategy* (2019). https://www.itk.ca/wp-content/uploads/2019/06/ITK_Climate-Change-Strategy_English_lowres.pdf

for the carbon-intensive economy that is driving Anthropogenic Climate Change. Terraforming altered the ecosystems that support Indigenous peoples' cultures, health, economies, and governance. Indigenous cultures have long histories of adapting to change, but colonialism caused change so rapidly that Indigenous peoples became vulnerable to harms of diseases and pollution (p. 154). Whyte argues that the terms Anthropogenic Climate Change and the Anthropocene are not precise because *anthropogenic* infers that “all humans are implicated in and affected by colonialism, capitalism and industrialization in the same ways” (p. 160). These scholars use *terraforming* to refer to environmental degradation that tears apart and reconstructs the flesh of Mother Earth to make it more amenable to European industrialists. They lament the loss of ecologically unique places and the displacement of Indigenous communities that compelled them to adapt to new ecosystems with plants and animal species who are not part of their stories. Displacement is an outcome of climate change (p. 771) and settlers of European origin are only now experiencing the violence of involuntary displacement due to climate change (p. 772). The concept of *terraforming* is an innovative contribution to climate change discussions. Davis, Todd, and Whyte could strengthen the relevance of their ideas about climate change by contextualizing colonization in The Little Ice Age climate event.

Common ground. Indigenous feminisms share common ground with ecofeminism in the intersectional analysis of oppressions by anthropocentrism and heteropatriarchy. Indigenous Knowledges share common ground with Decolonial Theory in deconstructing coloniality by delinking and decolonizing in political movements. Indigenous Feminism has produced a rich body of literature that supports the political movement of resurgence.

Ecofeminism in the Transdisciplinary Philosophical Framework

Overview. I need ecofeminist philosophy in my philosophical framework for several reasons. First, ecofeminism informs my philosophical standpoint. Second, ecofeminist philosophy interrogates the problems of [dominance](#), [cosmological destitution](#), [necropolitics](#), [intolerance](#) and [greed](#). Third, ecofeminist philosophy is engaged in [ecojustice](#) and praxis to emancipate Land and women from domination.

Origins. Ecofeminism, coined by French feminist Françoise d'Eaubonne in 1974, began as an academic philosophy but does not claim to be a theory or to fit into a social research paradigm. In the 1990s, ecofeminism grew into a transnational political movement with considerable strength in the Global South and Latin America. In North America, ecofeminists are primarily located in the academy. The European school known as the Bielefeld Group is led by academics Maria Mies, Veronika Bennholdt-Thomsen, and Claudia von Werlhof. They critique Marx for excluding gender and Land from his vision of emancipation. Mies (2014) coined the term *housewifization* and links it to capitalism's stake in the witch hunts during the so-called Renaissance. Ecofeminism is anti-capitalist. The classic texts are Carolyn Merchant's *The Death of Nature* (1980), Maria Mies and Vandana Shiva's *Ecofeminism* (1993), and Ariel Salleh's *Ecofeminism as Politics* (2017). Each of these books interrogates power and asks who benefits from [anthropocentrism](#).

Ecofeminist Principles. Ecofeminism is [ecocentric](#) and grounded in affective, [nondual](#), egalitarian relationality with Land and interspecies kin. Ecofeminism claims the adjective *radical* meaning rooted in Earth. Using intersectional analysis, ecofeminists trace the roots of the oppressions of women and Land to the philosophies of the Scientific Revolution including Cartesian dualism, Baconian reductionism, and Newtonian atomism (Merchant, 1980);

however, ecofeminist theologian Rosemary Radford Ruether (2008) argues that the roots of oppression are embedded in the origin stories of the Abrahamic religions that authorize human domination over Land and denigrate women (p. 39). Ruether also observes the post-Christian movement and finds that a cosmological shift is underway. In *Learning Roots 4*, we pick up Ruether's suggestion regarding a cosmological transition.

Ecofeminism links women, Land and food, and traces women's work as farmers from the Neolithic to the present. Mies and Shiva (1993) analyze impacts on women and world food systems when capitalism pushed women out of farming and into unpaid domestic work and controlled women's reproductive bodies as another method of exploiting so-called natural resources. Feeding families and communities is feeding the world. Ecofeminism recognizes that subsistence economies respect Earth's carrying capacity.

As a political movement, ecofeminism focuses on regenerative farming, regenerative economies, and regenerative cultures. Shiva leads the movement to ban the genetic engineering of seeds that destroys their self-generating attributes, thus causing loss of plant biodiversity and contributing to the extinction crisis. Shiva (1993) writes that a [monoculture](#) of seeds begins with breeding a "monoculture of the mind."

Ecofeminist philosopher Freya Mathews (1991) identifies cosmological deprivation as a condition affecting settlers who have forgotten the [cosmology](#) of their ancestral homeland, have not bonded with the Land they settled, and neglected to learn the cosmology of the Land that they inhabit. (p. 9, 47). Mathews (2005) envisions recovery from [cosmological destitution](#) as reinhabiting Land in loving and reverent ways by becoming ecocentric and adopting the

cosmology of the Land, not to become Indigenous, but to become grounded with the Land we inhabit.

Debates. Critics attempted to silence ecofeminism with the charge of essentialism for linking the oppression of women's bodies with the oppression of Land (Salleh, 2017, p. 299); however, that debate ended after ecofeminists exposed the essentialism of universal patriarchy's belief that males are hard-wired to dominate. In another debate, Deep Ecology attempted to subsume ecofeminism; however, ecofeminists critique Deep Ecology for lacking a political praxis and for failing to interrogate anthropocentrism, heteropatriarchy, and white supremacy in the domination of Land (Salleh, 1984; Plumwood, 2009). While I concur with these critiques, I view Deep Ecology as an important transitional zone, not a destination, on the journey from anthropocentrism to becoming ecocentric.

Common Ground. There is common ground between ecofeminism and Indigenous feminisms in that both take [intersectional](#) and pluriversal approaches to interrogating the layered oppressions of women in relation to Land in Modernity/coloniality. As Marxian feminists, ecofeminist Ana Isla (2019) describes her standpoint as "materialist ecofeminism" (p. 19) and ecofeminist Ariel Salleh (2017) takes an embodied materialist approach to ecofeminism. Ecofeminism and Indigenous feminism have never been humanist or anthropocentric, while material feminism evolved into an anti-humanist, post-anthropocentric standpoint, but has been slow to interrogate coloniality and to explore affective relationality with Land. There is common ground between ecofeminisms and material feminisms. Ecofeminism's strength is its political praxis, while Material Feminisms' strength is applying quantum theories to the social sciences.

Ecofeminism on Cultural Continuity. Ecofeminists emphasize that continuity depends on regeneration, and that interfering with regeneration is anti-life. Ecofeminists view Anthropogenic Climate Change and Sixth Mass Extinction as the outcome of anthropocentric exploitation of Earth, driven by greed. Greed and industrialized farming are reducing the biodiversity of plants. Monoculture, as intolerance of difference, reduces the viability of Modernity. Salleh takes an embodied approach to growing regenerative cultures and regenerative economies by resacralizing Life, birthing, and women's bodies in the world system (Salleh, 2016, 2017, p. 10, 161, 247).

Ecofeminism on Climate Change Adaptations. Ana Isla, in *Climate Chaos: Ecofeminism and the Land Problem* (2019), grounds herself in the Andean cosmology of Pachamama and critiques the greening policies of the United Nations that are putting subsistence livelihoods and ecosystems at risk (p. 199). She calls for labouring through the climate crisis by loving the Land we inhabit, reducing consumption to a subsistence way of life, and respecting Earth as Mother (p. 29). In the context of subsistence, ecofeminists are engaged in climate change adaptations that strengthen food and water security (Shiva, 2015, 2016; Isla, 2019). Shiva, in *Soil not Oil* (2015) and *Who really feeds the world?* (2016), proposes climate adaptations that focus on food sovereignty, biodiversity, and regeneration. She works with Indigenous mountainous peoples of the Global South to adapt to water shortages as their glacier-fed rivers dry up.

Decolonial Theory in the Transdisciplinary Philosophical Framework

Overview. Decolonial Theory is relevant to deconstructing Modernity and coloniality. I need Decolonial Theory to problematize domination and intolerance. My dissertation title includes the terms *pluriverse* and *design* derived from Decolonial Theory.

Origins. Decolonial Theory (DT) is generated by The Modernity/coloniality Group, a research collective in the Global South that formed in 2008. DT does not align with any academic discipline because it exists in the [pluriverse](#), defined as a world where many worlds fit. DT builds on the postcolonial theories of Césaire and Fanon, and on Arendt's theory of race and violence. Decolonial Theorists apply Wallerstein's (2007) world-systems analysis and its assumption that all systems are human constructs with begin dates and end dates. From this perspective, the collapse of Modernity and its globalized systems is inevitable and the agentic design of new systems in the pluriverse is underway.

Principles of Decolonial Theory. Without coloniality, there is no Modernity (Quijano, 2007, p. 176). Modernity/coloniality is a structure of power with four systems of domination: [anthropocentrism](#), [white supremacy](#), [religion](#) (Quijano, 2007, and [heteropatriarchy](#) (Lugones, 2007). As Andreotti argues, "Violence and unsustainability are necessary for Modernity to exist" (Andreotti, 2021, p. 179). Stein (2019) posits that "without coloniality, there would be no Anthropogenic Climate Change." Decolonial theorists interpret world as plurality and acknowledge that many worlds within the world have their own economic, cosmological, and cultural systems. Decolonial theorists expose colonial [epistemicide](#), the subjugation of the knowledges of colonized cultures. Decoloniality is delinking from European knowledge systems so that decolonizing cultures can reMember when they were not dominated (Mignolo, 2011). Decoloniality means delinking from Modernity's systems of domination, [reMembering](#) ancestral

knowledges, recovery, and building a future without domination. Economic transitions underway in the Global South use terms such as [sharing](#) economies, communality, communing, *communalidad*, and The Communal (Escobar, 2018, p. 177, 219). Ecocivilization, an emerging movement in the Global South, is more than an economic transition; it is a cosmological and cultural transition. Some Indigenous cultures, however, view their cultures as ecocivilizations.

Gender debate. Quijano's omission of gender from his discussion of Modernity's systems of power is aggravated by his use of *matrix* to describe the colonial structure of domination because the etymology of *matrix* derives from the regenerative Maternal. María Lugones (2008) complicates Quijano by adding gender, a fourth system in Modernity/coloniality's structure of power. Naming heteropatriarchy makes it unavoidably visible and signals that gender is a key debate in Decolonial Theory (Lugones, 2010, p. 1). Lugones (2008) argues that Modern Europe was only possible via the dehumanization of women and people of color and the exploitation of Land. According to Lugones, colonialism did not impose the European gender system on colonized peoples but rather created a new gender system for colonized women that intersects with race and class; thus, colonized women were treated as a class lower than colonized men and European women.

Decolonial Theory on Cultural Continuity. Decolonial theorists emphasize that Modernity/coloniality's effort to establish a global monocultural civilization has failed. They find optimism in studying decolonizing cultures in the Andes that are delinking from Modernity/coloniality, recovering from the oppressions of Modernity/coloniality, reclaiming their cosmology of Pachamama, and reclaiming their ancestral system of sharing communality.

With optimism for cultural continuity, Mignolo (2021) rejects The Social as a construct of the Western European academy (p. 518) and creates language for The Communal.

Decolonial Theory on Climate Change Adaptation. Escobar (2018) contributes [design](#) thinking to climate change adaptations. He assumes that Modernity has degraded Earth to the point of a “civilizational conjuncture” where many systems need to change, and he calls attention to large-scale, long-term transitions that are already occurring in the pluriverse, where people are practicing alterity and [nondomination](#) out of deep concern for the “radical equality of all Beings” (p. xvi). Hybridity and syncretism are options because the pluriverse does not fear difference (p. 4-7, 68).

Gesturing Towards Decolonial Futures (GTDF) is an arts/research collective that builds on Decolonial Theory by making it relevant to climate change and settler coloniality, as well as to decolonial contexts. It was founded by Vanessa Andreotti, author of *Hospicing Modernity* (2021), who exposes Modernity’s disavowal of its systemic violence and unsustainability and its disavowal of the magnitude and complexity of the climate crisis it is causing (p. 23). She argues that Modernity’s disavowal of Anthropogenic Climate Change severely restricts its capacity to perceive, prepare and adapt to climate change. She calls for “disinvesting” from the future of Modernity and taking up the responsibilities of death doulas (p. 238) by sitting with Modernity in hospice as it slowly dies a self-inflicted death. According to Andreotti, hospicing involves “intellectual accountability” by facing the truth of our own complicity in harming Earth and climate (p. 238). Sharon Stein (2019), also from University of British Columbia (UBC) Faculty of Education and a member of GTDF, links climate change and coloniality and calls for decolonizing climate change in the academy. Her insights on decolonizing climate change

compelled me to explore the links between decolonizing education and literacy for climate change adaptations because both must name and deconstruct anthropocentrism as a driver of coloniality, climate change, and species extinction.

Common ground. The common ground between Decolonial Theory (DT) and Indigenous Knowledges (IK) is the interrogation of coloniality¹⁰. DT writes from the perspective of recovery after Spanish and Portuguese colonizers left South America, while Indigenous scholars in Canada write from the perspective of resurgence and recovery despite the ongoingness of settler coloniality. Both Indigenous and DT scholars would concur with Escobar that “the care of communal territories/worlds is the fundamental political task of our times” (p. 220). Ecofeminism in the Global South shares common ground with Decolonial Theory, as illustrated by ecofeminists Shiva and Salleh who contribute to *Pluriverse: A Post-development Dictionary* (Kothari, Salleh, Escobar et al., 2021).

Critical Anthropologists in the Transdisciplinary Philosophical Framework

Overview. Critical anthropologists contribute to understanding [culture](#), cultural knowledge construction, [cultural memory](#), and cultural forgetting. In Canada and the United States, the discipline of Anthropology has not yet developed a critical field, so I distinguish between conventional anthropology and critical anthropologists. Conventional anthropologists are not yet studying past [climate change events](#) and the human causes of the current climate change event (Jobson, 2020, p. 259); however, critical anthropologists are filling that gap. Knowledge of past climate change events is science-based and therefore not a subjugated

¹⁰ Scholars of Decolonial Theory ingeniously use the suffix *-ity* to infer ongoingness, e.g., decoloniality.

knowledge; however, it appears to be a suppressed knowledge because it is excluded from curricula (see Chapter 4) and public discourse.

Among critical anthropologists, I include linguist and culture scientist Harald Haarmann, who is not well known in the Canadian academy; however, his deep theories integrate [cosmology](#), [cultural memory](#), cyclical time, [shamanism](#), gender, climate change events, ecology, and symbiotic relationality with Land. He is German, lives in Finland, has authored 40 books in eight languages, and serves as European Director of [The Institute of Archaeomythology](#),¹¹ which advances the multidisciplinary theories and methodology of Maria Gimbutas. Haarmann is a rare scholar whose brilliant theories of cultural knowledge construction and cultural memory guide my inquiry into conditions for cultural continuity. I follow Haarmann (2020) in defining culture as a collective way of making sense of the world using a set of shared values and memories that are reflected in people's thinking, practices, and ethics and that give order and meaning to their cosmology, arts and aesthetics, and social structures (p. 1-2). Cultural knowledge construction is collective knowledge that is not confined to text but is interwoven with storytelling, art, symbol, and ritual to communicate cultural memories across generations (Haarmann, 2007).

Environmental sociologist Sing C. Chew is a transdisciplinary scholar, who explores ecological and social crises in a horizon of five millennia using world-systems analysis. He critiques [anthropocentrism](#) and calls for healing the relationship of communities with the Land they inhabit. Chew's trilogy is a valuable resource to designers of climate change adaptation; he analyzes adaptations to past climate events, imagines possible futures, and proposes

¹¹ Disclosure. I am a member of the Institute of Archaeomythology.

transformative system transitions such as economic [decentralization](#), simplifying information technologies, and thinking local for meeting basic needs. In *The Recurring Dark Ages* (2007), Chew identifies patterns of ecological degradation and culture collapse in three Dark Ages: Bronze Age Collapse, Greek Dark Age, and Roman (Medieval) Dark Age. In *Ecological Futures* (2008), Chew explores the phenomena of [mass migration](#) and socioeconomic chaos that occur in climate change events. His fascinating case study of monastic communities portrays them as a highly adaptive sub-culture during The Little Ice Age that shared a subsistence living with local communities, sharing food and herbal medicines during a climate change event of recurring crop failures and pandemics. Chew contributes to imagining possible adaptations.

Baer and Singer (2018) are critical medical anthropologists whose comprehensive overview expands the way we understand the social dimensions of Anthropogenic Climate Change. Their critical perspective draws on ecofeminist philosophy to argue that climate change illustrates the unsustainability of the capitalist system. Crate and Nutall (2016) are critical anthropologists who compile case studies of extant cultures at risk in the current climate event.

Common Ground. The transdisciplinary school of archaeomythology integrates comparative religion and mythology, folklore, linguistics, anthropology, and archaeology. Chew's transdisciplinary scholarship integrates sociology and environmental studies.

Debates. Of the many debates in anthropology, I focus on the civilization debate and the gender debate. The civilization debate is ongoing. Haarmann (2020) critiques conventional anthropology for defining civilizations using criteria based on a European model: hierarchically stratified, militarized, centralized statehood, urban, resource development, and a written script

(p. 100). These criteria exclude advanced cultures that are oral, egalitarian, peaceful, decentralized, and live in harmony and balance with the Land to which they belong. Thus, despite their longevity, conventional Anthropology excludes pre-patriarchal, egalitarian, and Indigenous cultures from the category of civilization.

The gender debate is linked to tracing the roots of [patriarchy](#). When theorists of cultural evolution J. J. Bachofen (1861), L. H. Morgan (1871), and E. B. Tylor (1871) generated new words like *mother right*, *matrilineal*, and *matriarchy*, they touched a nerve in Boas and Malinowski, the so-called fathers of American anthropology, who preferred Henry Maine's theory that patriarchy is primeval and universal. Gimbutas touched that nerve again when she hypothesized that patriarchy in Europe was imposed by an invading patriarchal culture from the Pontic steppes; thus, a human construct, not the outcome of primeval and inherent traits (Gimbutas 1989, 1991; Marler, 2006). Gimbutas states that Western Eurocentric cultures are still "living under the sway of that aggressive male invasion" from the Pontic region beginning ~4300 BCE and only beginning to discover their long alienation from their European heritage of matristic, non-violent, Earth-centered cultures (Gimbutas, 1989, p. xxi).

Conventional Anthropology repudiated the study of matriarchal cultures after Rosaldo (1974), defining matriarchy as the reverse opposite of patriarchy, found no evidence of matriarchies. Nevertheless, critical anthropologists and independent scholars continue to construct knowledge of ancient and extant [matricultures](#).

Principles-Critical Anthropologists on Cultural Continuity. The literature of critical anthropologists matters because it is the primary source for knowledge related to surviving past climate change events. Haarmann (2007) explains the connections between culture,

cultural continuity, climate, and [cultural memory](#). If a culture inhabits a territory uninterrupted over many generations, then its body of ancestral knowledge about living in harmony with Land has proved useful to sustain cultural life (p.224). If a culture inhabits a territory with an extreme climate that limits resources, then the body of ancestral knowledge about living in harmony with Land is likely to retain its usefulness indefinitely, thus guaranteeing the longevity of cultural patterns (p.230). Haarmann provides case studies to support this theory of continuity. Baer and Singer (2018) as well as Chew (2006, 2007, 2008) provide additional case studies.

Principles-Critical Anthropologists on Climate Change Adaptations. The literature of critical anthropologists matters because it is the primary source of knowledge of adaptations of ancient cultures to past climate events. Haarmann (2007) finds that complete restructuring of a culture, including its cosmology, may occur *only if* the Land becomes degraded or destroyed beyond Earth's [carrying capacity](#) and can no longer sustain the community (p.260).

Furthermore, Haarmann finds that a culture in end-stage decline does not have capacity to perpetuate its body of ancestral knowledge; however, that knowledge forms a substratum in a subsequent culture (p.270). This finding is relevant to [climate illiteracy](#) in settler colonial nations that lack a body of ancestral Land-based knowledge about the Land they colonized.

Haarmann (2020) expands these principles with case studies.

Critical Ecopedagogy in the Transdisciplinary Philosophical Framework

Overview. This section is organized slightly differently. I begin by discussing the problem of [climate illiteracy](#) and critiquing climate change education in hegemonic education. After summarizing gaps identified by scholars in the discipline of Education, I integrate Critical Ecopedagogy into my transdisciplinary philosophical framework. My reason for this variation is

to explore the problem of climate illiteracy in hegemonic curricula before exploring Critical Ecopedagogy as a more effective way to facilitate climate literacy in the [pluriverse](#).

The Problem of Climate illiteracy is entangled with the intransigency of intentional forgetting and the refusal to learn. Critical Pedagogist Henry Giroux (2020) attributes “the new form of illiteracy” to “willful practice” with the intent to “actively depoliticize people and make them complicit with the forces that impose misery and suffering upon their lives” (p. 201). The new illiteracy is not caused by the absence of knowledge. Climate illiteracy is a “manufactured illiteracy that has become a form of political repression” that discourages questioning, agency, memory, and thinking by restaging the power of domination (p. 201). Building on Freire’s theory of pedagogy, Giroux advocates the integration of affect, emotion, and desire in the learning process (p. 96) to open up space for systemic thinking (p. 246).

Three studies of climate change education in Canada identified gaps in hegemonic education. I briefly summarize the findings of those scholarly reviews. First, a study by Kagawa and Selby (2012) found that educators are not trained to facilitate affective learning about the emotional impacts of disasters (p. 215). This study did not inquire into anthropocentrism.

Second, the Monitoring and Evaluation of Climate Change Education (MECCE) project, directed by Marcia McKenzie at University of Saskatchewan, studied climate change education across Canadian provinces and territories and found major gaps. Bieler, McKenzie et al. (2017) conclude that curricula across all provinces are “woefully lacking in preparing an engaged citizenry to help mitigate and adapt to climate change” (p.79) and that “educational research has largely failed to confront global climate change” (p. 65). They did not inquire into anthropocentrism.

Third, Blenkinsop and Fettes (2021) of Simon Fraser University studied educational practices to prepare for “large-scale” systems change through formal and informal education (p. 1). Their recommendations include a) reckoning with Western Eurocentric bias in hegemonic curricula, b) improving climate change education to prepare for large-scale transformative change (p. 16), c) defining [ecojustice](#) as egalitarian sharing of Earth’s carrying capacity (p. 43), and d) reckoning “with anthropocentrism and human species elitism” (p. 48). Of the three studies, this is the only one that interrogates [anthropocentrism](#).

In the following paragraphs, I discuss three other scholars of Education who are concerned about climate change education. Among curriculum scholars, Dwayne Donald (Cree-Papachase) is a rare critic of anthropocentrism. Donald (2013) critiques the Modern world’s “love affair with market capitalism” and declares that making love to oil is slowly killing us (p. 16). He calls for transforming curricula from a tool to reproduce capitalism to a process of receiving “organic knowledge” and allowing it to make a claim on us that facilitates transformation (p. 17). Donald (2019) is concerned that “myopically anthropocentric understandings” embedded in curricula (p. 104) require “deep forgetting” (p. 104), which prevents learners from imagining possibilities (p. 107). He names [white superiority](#) (p. 123, n.8), but is silent on heteropatriarchy. Similarly, curriculum theorist Nicholas Ng-A-Fook (2010) calls on educators to interrogate the greenwashing of anthropocentric curricula.

Anti-racism educator George Sefa Dei (2009) recognizes that the study of “climate change is not independent of a body and its politics” but is linked “with questions of power, social difference, equity, and justice” (p. 17). He problematizes the hegemonic view that the

environment is “a management issue” and confronts Western Eurocentric¹² [anthropocentrism](#) for producing the current climate crisis. He argues that people of colour and Indigenous peoples do not share complicity because they too are subjugated by the power of [domination](#) (p. 17). Dei (2010) critiques hegemonic education for [colonial epistemic violence](#) that subjugates the land-based knowledges of Indigenous peoples. He calls for a transgressive pedagogy, insisting that learning is not critical or transgressive if it does not lead to actions that resist domination.

Alysha Farrell critiques educators’ [disavowal](#) of the climate emergency. Disavowal manifests as silence on acknowledging “climate precarity and the consequences of living beyond Earth’s [carrying capacity](#)” (Farrell, 2021, p. 87). She is concerned that young people’s climate grief and existential fears will be a source of intergenerational trauma. In *Teaching in the Anthropocene* (2022), Farrell with co-editors Skyhar and Tam reject anthropocentric curricular practices and present ecocentric pedagogies that attend to climate grief and fear.

The urgency of the climate emergency calls for a rapid response to addressing the climate illiteracy problem, and this precludes curricular revisions that could take decades given that curricula is entangled with hegemonic anthropocentrism and conservative provincial governments that support extractivist industries. A rapid response to addressing the climate illiteracy problem requires an [ecocentric](#) mind-set committed to [ecojustice](#), and this implies a response external to hegemonic education.

Critical Ecopedagogy Overview. Critical Ecopedagogy originated in Brazil with Paolo Freire and was promoted by Antunnes and Gadotti (2006), associates of the Freirean Institute in

¹² Following George Sefa Dei (2010), I use *Western Eurocentrism* to refer to nations that follow the language, law, religion, and social organization of its European colonizer.

Brazil, who define it as a way of re-educating people to speak of Earth as home and to become centered on life (p. 135-7). Critical Ecopedagogy, now a transnational field of study, includes formal and [informal learning](#). The classic text is Richard Kahn's *Critical Pedagogy, Ecoliteracy, & Planetary Crisis* (2010), the first book in the English language on Critical Ecopedagogy. I also draw extensively on Ruyu Hung, Distinguished Professor of Education at National Chiayi University in Taiwan, who has produced many insightful articles on ecopedagogy. Her approach is relevant to designing climate change adaptations because it integrates affective [relations with Land](#), [respect for regenerative forces](#), and [nondual Daoist](#) philosophy.

Critical Ecopedagogy critiques environmental education (EE) as ineffective. Kahn (2010) rejects Sustainable Education (SE) as “an educational sham” and panacea (p. 153) that perpetuates [anthropocentrism](#) in a “pedagogical seduction” that enables business-as-usual” (p. 17). He critiques the Brundtland Commission for replacing the [ecocentric](#) Earth Charter with an aspirational and unenforceable sustainability statement that serves the interests of [extractivist](#) industries (p. 13). I concur with Kahn's critique that Sustainable Education fails to expose and deconstruct anthropocentrism and thus is complicit with the hidden curriculum that reproduces Modernity. SE distorts the original intent of sustaining life into a strategy for sustaining wealth. If the effectiveness of Sustainability Education is measured by its capacity to generate action to mitigate climate change, then it has failed and a new approach to climate education is required.

Stein, Andreotti, Ahenakew et al. (2022) call for a shift from “education for sustainable development” to “education for the end of the world as we know it” that involves growing up, showing up, and living responsibly on planet Earth so that it can continue to provide sustenance such as clean air, clean water, and fertile soil. Hung (2021) critiques environmental education

for being more anthropocentric than ecocentric and for failing to interrogate the social, political, and economic factors that contribute to the degradation of climate and Earth (p. 2).

I reviewed the literature on ecopedagogy published by Greg Misiasek (2019, 2020), a Freirean scholar who teaches at Beijing Normal University. His perspective on sustainability is grounded in *The Earth Charter* and he is seemingly unaware that Sustainability Education in the Global North has been high jacked to align with corporate interests. Misiasek does not discuss Kahn and Hung, and Kahn and Hung do not cite Misiasek. Rodrigues and Lowan-Trudeau (2021) inquire into Ecopedagogy via Misiasek.

Principles of Critical Ecopedagogy. The goal of Critical Ecopedagogy is [ecojustice](#)-emancipating Land from [domination](#) by humans. Critical Ecopedagogy facilitates ecoliteracy for affective and embodied [relationality with Land](#) (Kahn, 2010, 2011; Hung, 2017a, 2017b) and with interspecies kin. It emphasizes love and [respect for regenerative forces](#) (Hung, 2017a; 2017b).

Ecopedagogy and Cultural Continuity. The principles of Critical Ecopedagogy cohere with several Indigenous conditions for cultural continuity. Kahn (2010) generates a Critical Ecopedagogy in which ecoliteracy includes

- 1) cultural literacy interwoven with [cosmology](#) and an ethic of care that nurtures emotional intelligence and affective practices for loving Earth as home, respecting the intrinsic value of all species, and living in a culture of harmony by listening with the Land,
- 2) a praxis based on [intersectional](#) analysis of oppressions that motivates literates to take political action to emancipate Land from human domination (p. 19, 21, 152), and

3) survival skills.

Ecopedagogy and Climate Change Adaptations. Hung (2020) insists that learning related to climate change must prepare communities for large-scale and long-term changes (p. 1361) and draw on [cultural memory](#) to learn from past ecological catastrophes to avoid repeating mistakes (Hung, p. 1360).

Common Ground. Hung (2021) elevates ecosophy or Deep Ecology, as theorized by Arne Naess (1973). Earlier, in the Ecofeminism section, I indicated that Deep Ecology cannot be conflated with Earth-centered philosophies, including Daoism and Indigenous philosophies, which have ancient, shamanic origins and are more complex than ecofeminism or ecosocialism that emerged in the last century. I regard Deep Ecology (i.e., ecosophy) as an important ecophilosophical standpoint in the transition from anthropocentrism to ecocentrism, but not as a destination. While I do not concur with Hung's distinction between ecopedagogy and ecosophy, I value her emphasis on learning for a future that is different from the present. Critical Ecopedagogy is more radically ecocentric than Environmental Education, which includes Chet Bowers' (2006) commons-based environmental education and David Gruenewald's (2003, 2008) place-based environmental pedagogy. Critical Ecopedagogy shares common ground with Indigenous land-based environmental education (Wilson, A., Murray, J., Loutit, S., & Scott, R. N. S., 2021; Lowan-Trudeau, 2013; Tuck, McKenzie, and McCoy, 2014; Rodrigues and Lowan-Trudeau, 2021).

Strategy for Creating New Knowledge

Standing on the foundation of my transdisciplinary philosophical framework, I strategize an approach for reaching my goal to contribute new knowledge related to literacy for designing

local climate change adaptations in the pluriverse. My approach is not to plug gaps in each of the five knowledges in my philosophical framework, but to address the gaping hole of climate illiteracy, with a specific focus on local climate change adaptations. For this purpose, I present my findings on Research Question 1 (*What do designers of local climate change adaptations need to know about Indigenous conditions for cultural continuity that enabled Indigenous and ancient cultures to endure past climate change events?*) in non-traditional format as a learning resource in Part Two, organized as six Learning Roots. Findings on Research Question 2 (*In what ways can Critical Ecopedagogy facilitate literacy for local climate change adaptations in the pluriverse?*) are discussed in Chapter 4 and applied in the process of writing Part Two. Each Learning Root draws on one or more knowledges in the philosophical framework, as follows:

- 1) Learning Roots 1-Regenerating: Indigenous Conditions for Cultural Continuity draws on Indigenous Knowledges.
- 2) Learning Roots 2-ReMembering Past Climate Change Events is informed by the work of critical anthropologists who study the impacts of climate on ancient cultures.
- 3) Learning Roots 3-Recognizing the Darkness of the Modern Age is informed by the critical and intersectional analysis of Modernity/coloniality in the literature of Indigenous Studies, ecofeminist philosophy, Decolonial Theory, Critical Pedagogy, and Critical Ecopedagogy.
- 4) Learning Roots 4-DeModernizing: Reinhabiting Land Differently brings forward the subjugated knowledges of earth-centred philosophies by drawing on Indigenous Knowledges, ecofeminism, Decolonial Theory, and critical anthropologists.

- 5) Learning Roots 5-Sharing the Generosity of the Land brings forward the subjugated knowledges of sharing economies by drawing on Indigenous Knowledges, ecofeminist philosophy, Decolonial Theory, and critical anthropologists.
- 6) Learning Roots 6-Respecting Regenerative Forces brings forward the subjugated knowledges of respecting regenerative forces and matricultures by drawing on the knowledges of Indigenous Knowledges. Ecofeminism, and critical anthropologists.

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Chapter 2 – Conceptual Framework

The conceptual framework derives from the philosophical framework. Grant and Osanloo (2014) define conceptual framework as a logical structure of connected concepts that are used to explore the research questions. It frames core concepts embedded in the title, research questions, and research problems, as well as concepts from the philosophical framework into a cohesive whole.¹³ Concept mapping is a way to visualize relationships between concepts and critically map power. The relative size of Concept Map 1 and Concept Map 2 expresses my belief that regeneration, as a mode of power, is greater than domination, as a mode of power.

I imagine the concepts as threads that I am weaving into two tapestries. On the left, I mend an ancient tapestry of the [pluriverse](#) that is textured with wool yarns dyed in rich earth tones. It has endured millennia. It takes a long time to learn the many stories woven into this ancient tapestry. On the right, I deconstruct a newer tapestry, begun only 500 years ago, by tearing apart its gaudy plastic overlay to expose the violence and unsustainability lurking behind the delusion of continual progress. They were two disconnected tapestries, but I am designing a zigzagging pattern between them, coarse enough that it won't enmesh Sojourners who transgress Modernity/coloniality to the [Space Between](#). The zigzag is an ancient symbol of flowing water and change (Gimbutas, 1989, p. xxii).

Concept Map 1 – The Power of Regeneration. The following [conditions for cultural continuity](#) are articulated as verbs:

- a) [living the cosmology of the Land](#),
- b) [regenerating](#),

¹³ In subsequent chapters, concepts are hyperlinked to working definitions in the [Appendix A-Lexicon](#).

- c) [sharing](#),
- d) [relating with Land](#),
- e) [reMembering cultural memories](#), and
- f) [welcoming difference](#).

There are more conditions for cultural continuity, but these are the focus of this study. The spiral represents ongoingness in cyclical time. Simpson's philosophy of regeneration is used to name the mode of power (Simpson, 2011, p. 142). Regeneration is a complex concept that means a condition for continuity, a philosophy, and a mode of power. *Earth-centered cultures* refers to Indigenous cultures, ancient cultures, decolonizing cultures, and regenerative communities that are located in the pluriverse. The philosophies of Earth-centered cultures value [reciprocal](#) relationality with Earth and her Beings as kin. Earth is venerated as sacred, sentient, and alive. Life is sacred.

Concept Map 2 – The Power of Domination. Modernity/coloniality's system of power is represented by the fortified Four-Square structure that includes the following systems of [domination](#):

- a) [heteropatriarchy](#),
- b) [anthropocentrism](#),
- c) [white supremacy](#), and
- d) [Christian theocracy](#).

Each system deploys unique [methods of erasure](#) to marginalize those it deems Other and subjugate their knowledges. There may be additional systems of domination, e.g., classism. All four systems are essential for capitalism and coloniality to work; however, anthropocentrism is

a system of dominating Land, Air, Fire, Water and Climate that drives the co-occurring crises of [Anthropogenic Climate Change](#) event and the [Sixth Mass Extinction Event](#). Modernity/coloniality holds to an ideology of continual progress in linear time. Of the many cultural problems that contribute to the complex problem of Anthropogenic Climate Change, I focus on:

- [climate illiteracy](#),
- [cosmological destitution](#),
- [intolerance of difference](#),
- [necropolitics](#), and
- [greed](#).

These problems of Modernity may cause trauma that requires healing in the Space Between.

The [Space Between](#) is a political transition zone for Sojourners (my term) who transgress the thick border of Modernity/coloniality and zigzag toward Earth-centered cultures in the pluriverse. Sojourners are not homogenous, but they have a common goal of becoming [ecocentric](#) and agentic for [ecojustice](#). The notion of an in-between space between has been taken up by several scholars using diverse metaphors, like Aoki's bridge (Lee, 2017, pp. 21-23) and Anzaldúa's (1999) borderland. Margaret A. Somerville (2008) introduced me to the Space Between as a zone where learners engage in the work of [decolonizing](#) from a place-based perspective (p. 338). Lessard, Caine, and Clandinin (2015) draw on Maria Lugones' (1987) experience of living in and between worlds to reflect on urban youth who negotiate connections between their urban setting and their home community.

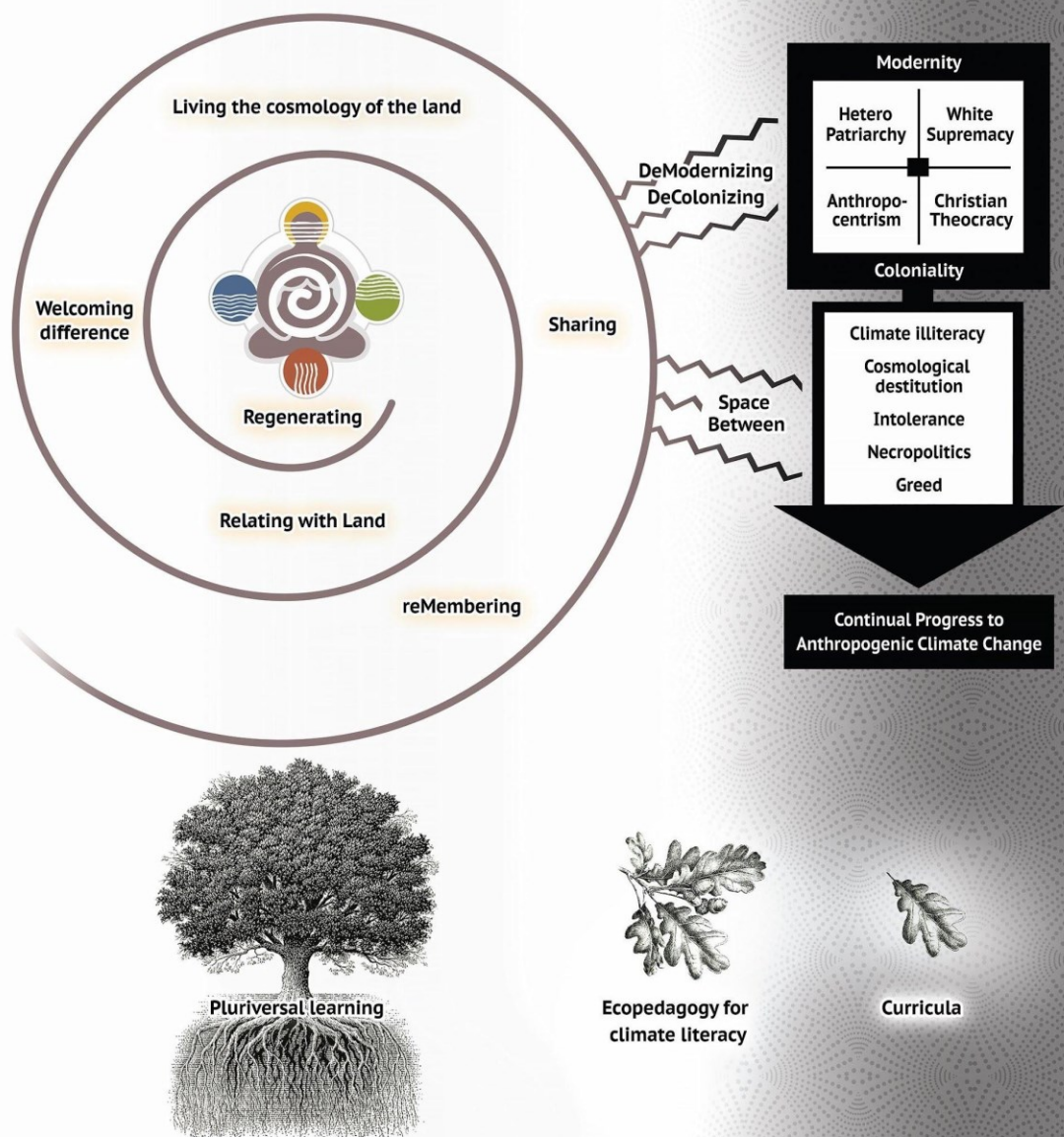
In The Space Between, transgressive Sojourners engage in the work of [deModernizing](#), a process of disinvesting from Modernity/coloniality's systems of domination. The process of

deModernizing includes recovering from Modernity's oppressions, becoming ecocentric, becoming [agentic](#), and reTurning in [spiraling time](#) to regenerative cultures. Like decolonizing, deModernizing is committed to restructuring to relations of [nondomination](#).

Learning Layer. The Oak images at the bottom of Concept Maps 1 and 2 represent ways of learning about climate change adaptations.

- The curricula leaf represents curricular guidelines on climate change adaptation authorized by provincial governments for educating children and youth.
- The acorns on the Critical Ecopedagogy twig represent the principles of Critical Ecopedagogy that guide literacy for climate change [adaptations](#) in the pluriversal Space Between.
- The oak tree of pluriversal learning exists in my imagination as the transformed learning institutions in decolonizing and deModernizing places of ecocentric and organic learning about a) listening and loving with Land, b) respecting regenerative forces, and c) reciprocating the bounty of the Land.

**CONDITIONS FOR CULTURAL CONTINUITY:
pluriversal design
of local Climate Change Adaptations**



*Image 1. Earth-centered cultures in the pluriverse
and the Power of Regeneration
©Wolfstone.
Design: S. Thompson Designs Inc.*

Space Between

*Image 2,
Modernity/coloniality
and the Power of
Domination-Concept Map 2
©Wolfstone. Design:
S. Thompson Designs Inc.*

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Chapter 3 – Methodological Framework

This qualitative research project is theoretical because the constraints of the COVID-19 pandemic compelled me to select research methods that do not involve primary research with people participants. The transdisciplinary philosophical framework (Chapter 1) guides my exploration of the research questions and problems. My intent is not to solve Modernity's problems, but to address these Modern problems if they spill over into the [Space Between](#) where transgressive Sojourners are learning to become [ecocentric](#) and to adapt to climate change.

This chapter describes the methodological framework for exploring my research questions and writing up findings. The first question asks: *What do designers of local climate change adaptations need to know about Indigenous conditions for cultural continuity that enabled Indigenous and ancient cultures to endure past climate change events?* To explore this question, I need a methodology for telling the story of past climate change events, the cultures that survived them, and the adaptations that contributed to their survival. The question also challenges me to transform knowledge of the past into design for the future.

The second question asks: *In what ways can Critical Ecopedagogy facilitate literacy for local climate change adaptations in the pluriverse?* This question calls for identifying the principles of Critical Ecopedagogy and applying them as praxis to writing up the stories related to Question 1. The question does not seek to evaluate ecopedagogy. It is a practical question about ways of applying Critical Ecopedagogy principles to develop *literacy* for local climate change adaptations.

According to Szostak (2006), transdisciplinary research must be theoretically diverse and methodologically flexible to work with complex problems. Accordingly, I seek methodologies that are flexible enough to work in a transdisciplinary context. I need an Indigenous research methodology for inquiring into Indigenous knowledges about conditions for cultural continuity, and I need a critical approach for analysis. After considering the research methodologies related to the pluriversal knowledges and academic disciplines integrated in the philosophical framework, I selected Margaret Kovach's Indigenous research methodology of re-storying¹⁴ and Bacchi's critical methodology for policy analysis. Kovach (2009) cautions that methodological inconsistencies can arise when mixing Indigenous methodologies with Western Eurocentric methodologies (p. 43), so I balance this caution with Szostak's advice for methodological flexibility.

Ecofeminism, Decolonial Theory, critical anthropology, and critical pedagogy do not have proprietary research methodologies and rely on critical research methodologies. Bacchi's critical policy analysis approach is a good fit with Kovach's re-storying because both are committed to bringing subjugated knowledges to light. Both focus on who and what is silent.

Kovach's Re-storying Methodology

Margaret Kovach (Nêhiyaw and Saulteaux) is a specialist in Indigenous research methodologies. Her re-storying methodology is located in the larger context of Indigenous research methodologies that understand ethical knowledge as relationality that maintains harmony and balance with Land and all Beings in the community. According to Michael Hart

¹⁴ When referring to Kovach's methodology, I use her punctuation, i.e., re-storying, and when referring to my adaptation of Kovach's methodology, I capitalize the S: i.e., reStorying.

(Cree) (2010), Indigenous research differs from social theory research paradigms in at least three ways:

- Indigenous Knowledges are relational and integrate emotional intelligence shaped by the ethic of care, whereas social theory research paradigms emphasize reasoning and logic as ways of knowing;
- Indigenous Knowledges are Land-based and integrate cosmology from millennia-long relationality with Land and the ancestors, whereas social theory research paradigms are detached from place and the deep past; and
- Indigenous Knowledges are collective knowledges that belong to the culture and benefit the community, whereas the Western Eurocentric academy rewards individual scholars who make knowledge claims in text-based products published with by-lines.

Hart's emphasis on relationality as a core principle of Indigenous research is reiterated by well-known Indigenous research scholars Shawn Wilson (Opaskwayak Cree) (2008), Linda Tuhawai Smith (Māori) (2012), and Margaret Kovach (2009, 2010, 2017).

In *Indigenous Methodologies: Characteristics, Conversations and Contexts* (2009), Kovach discusses story as methodology in decolonizing research (p. 103). She regards decolonizing as the collective responsibility of reMembering and re-storying to collective memory the stories that were subjugated, thus facilitating healing of the community (Kovach, 2017, p. 226). Kovach (2017) models her conversational methodology and expands her re-storying methodology by emphasizing that Indigenous Knowledge creation “arises from multi and multidimensional sources and through holistic nonfragmented processes” that invite interpretations and representations through re-storying (p. 227). She defines holism as integrating the cosmological

and sacred with the mundane. Kovach recognizes that, since Descartes, Western Eurocentric philosophies have struggled with mind-body dualism and fragmentation, in contrast to Indigenous research methodologies that do not fragment knowledges into disciplines, fields, and categories. Indigenous research integrates epistemology, ontology, and axiology in cyclical time (p. 219).

Kovach uses the term “re-storying” to refer to the transformative process of meaning making where *re-* means again and again and *storying* refers to dancing through a series of hoops to remember, research, represent, and re-story.

- The first hoop grounds the dancer by reMembering Indigenous philosophies. I danced the first hoop by grounding myself in Indigenous [conditions for cultural continuity](#) and in Indigenous philosophy of [regeneration](#) (see Learning Roots 1).
- The second hoop grounds the dancer in Indigenous principles in researching subjugated knowledges. Kovach, like George Sefa Dei, is concerned about epistemic colonialism that refuses to acknowledge the knowledges of colonized peoples (Dei, 2010, p. 93; 2011, p. 4). I danced the second hoop to search for [subjugated knowledges](#) about earth-centred philosophies and practices (see Learning Roots 4), [sharing](#) economies (see Learning Roots 5), and Indigenous [matricultures](#) (see Learning Roots 6).
- The third hoop grounds the dancer in relational re-storying methodology that represents Indigenous teachings accurately, respectfully, and ethically. I dance the third hoop by representing Indigenous teachings in long quotes with minimal interpretations. I recognize the cultural affiliation(s) of Indigenous scholars and use

names and spellings used by the cultures. Indigenous words are *italicized* and used only if they are translated and defined by an Indigenous writer.

- The fourth hoop grounds the dancer in re-storying for healing, enabling the community to become whole again. Repetition, like ritual, evokes fresh insights so that each revolution serves the political goal of resurgence. I danced the fourth hoop by focusing on recovery from the oppressions of Modernity (see Learning Roots 4) and using repetition by spiraling writing techniques.

Kovach advises that there are no short-cuts to re-storying.

My relationality with Indigenous Knowledges is through texts written in the English language. To avoid homogenizing Indigenous cultures, I choose to *read across* cultures in order to become familiar with the diversity of cosmologies and cultural practices. Assuming that cultural cosmologies within a language family share common ground, I access cultural distinctions by *reading across* Indigenous language families. I privilege writers who have lived experience in their cultural homeland and who are speakers of their cultural language. *Table 2-Reading across Language Families* lists my key sources by Indigenous language family (Cook and Flynn, 2004, p. 320; Indigenous Peoples Atlas of Canada, 2018, p. 103). I began the practice of *reading across* while researching Indigenous [matricultures](#) in Canada and found that it is not only effective but interesting beyond words.

Grounding in my Settler Culture. Kovach (2017) urges allied settlers who research Indigenous Knowledges to use grounding practices. First, she encourages us to follow protocol. Accordingly, in Learning Roots 1, I introduce myself by my name, cultural identity, and affiliations. I state my intent at the outset of each Learning Roots. This practice clarifies my

motivation and my situatedness in relation to the Indigenous cultures and to my cultural ancestry. I clearly reMember the workshop in which I first used the protocol of introducing myself by my names and maternal lineage and how it evoked nods and smiles as though I was welcome there.

Table 2- Reading across Indigenous Language Families								
Language Families	Cultures in political and kinship relations	Key Sources	Pt1	Part 2 Learning Roots				
				1	3	4	5	6
Iroquoian	Mohawk, Oneida, and Cayuga of the Haudenosaunee Confederacy	Susan Hill		√			√	√
Algonquian	Nehiyaw (Cree) includes Woods, Swampy, Plains, Naskapi, Innu	Alex Wilson	√	√	√			
	Anishinaabemowin includes Ojibwe, Algonquin, Odawa, Michi-Sagig	Leanne Simpson	√	√	√	√	√	√
	Mi'gmaq and Malecite of the Wahbanaki confederacy	Blair Metallic		√	√			
	Siksika (Blackfoot), Kainai (Blood), Piikani (Peigan) of the Siksikaitsitapi (Blackfoot) Confederacy	Betty Bastien	√	√				√
Siouan	Oceti Sakowin (Dakota, Nakota, Lakota, Stoney)	Kim TallBear		√			√	
Salish	Syilx	Jeannette Armstrong		√			√	
Wakashan	includes Kwak'wala, Nuuchahnulth (Nootka), Haisla, Heiltsuk	Jody Wilson Raybould		√				√
Haida	Haida	Pansy Collison		√				√
Tsimshian	Gitksan	Cindy Blackstock		√				√
Athabaskan (Dene)	includes Wet'suwet'en (Babine), Denesuliné (Chipewyan), Gwich'in, Tlicho (Dogrib), Tutchone, ...	Betty Patrick Leslie Dawson		√			√	√
Inuit	Inuktitut, Inuvialuktun, Inuinnaqtun	S Watt-Cloutier Arnakak (Leduc)		√			√	
Michif	Métis	Kim Anderson Emma LaRocque		√	√		√	

Second, Kovach encourages us to be grounded in our own culture. Elder Florence Paynter also encouraged me to apply my learnings about Indigenous cultures to better understand my own culture. This practice helps me to hybridize past, present, and future by grounding in the

ancient (pre-Christian) cosmology of my ancestors in the Netherlands, with Mennonite peace teachings, and in the process of becoming friends with Ojibwe neighbours whose territory I inhabit. As a settler scholar, I value my learnings about Indigenous conditions for cultural continuity, but I also experience worry and grief when I turn my gaze to settler culture and find scant evidence of those conditions. It's like juxtaposing a regenerative culture with a necrophilic culture.

Third, Kovach encourages settler researchers to unsettle our “Western gaze” by questioning our assumptions:

Amid contradictions and complicities, attempts at reconciliation and well-trodden retreats behind a Western gaze that propels a ruthless materialism, we find the possibilities of contemporary Indigenous research. Indigenous research has the potential to shake things up, to provoke an unsettling that arises from piercing the gaze. If Indigenous research is to have decolonizing aspirations, it must make one think deeply, feel strongly. It ought to unsettle. If this happens it means you are doing something right. (p. 217)

To further unsettle my gaze, I meet monthly for unsettling conversations with a group of Sojourners. We are educators, writers, and artists seeking to understand our privilege and our complicity in colonialism and climate change.

Kovach encourages me to ground in Place by sharing experiences of insight or connectedness with Land and to story my life in deep connection with Land and all that is sacred. Kovach urges researchers to write from embodied experience and inward knowing:

Inward knowledges are equally important within Indigenous inquiry and so there need to be methods to record these types of knowing so that they become a formal part of the meaning-making aspect of research . . . Knowledge can emerge through fasts, ceremonies, and dreams. (Kovach, 2009, p. 126-127)

Kovach's advice challenges me because I have erected a thick wall to protect my soulwork from the academy. I may share insights from my dreamwork and transpersonal relationships with Oaks, but I do not acknowledge the source of this wisdom to protect it from interrogation using rational argument and logic. How do you justify a dream? Or account for Oak logic?

Bacchi's Critical Policy Analysis

Carol Bacchi's critical approach to policy analysis focuses on what is excluded from policy. Bacchi, a feminist policy specialist at University of Adelaide, developed a critical approach to policy analysis known as "What's the Problem Represented to be?" (WPR). Bacchi (1999) insists that the absence of discourse around a social problem is an indicator that it has been rendered invisible. She asserts that social problems that are invisible have not been problematized and thus cannot be interrogated, and that comprehensive policy work is required to detect who and what has been excluded and silenced (p. 59). The WPR process asks questions about the origins and assumptions that underpin the problem, as well as the silences that left it unproblematized. Bacchi urges researchers to delineate and situate the problem so that its origins and mentifacts shed light on its entanglements (Bacchi 1999, p. 13; 2012, p. 21-24).

Bacchi's approach has been applied to education policy and curricula. Lynette Shultz and Melody Viczko (2021) apply Bacchi's policy approach to analyze educational policy related to

on-line learning during COVID-19. Barrero Jaramillo (2018) applies the Bacchi approach to study racism in curricula. Jacinta Maxwell et al. (2018) applies it to study decolonizing curricula.

I first used Bacchi's approach in 2017 to problematize Canada's policies and practices for disrupting Indigenous women's capacity to reproduce their culture. I also used it in a study to analyze curricular silences that call for reStorying matricultures (Wolfstone, 2023). I apply Bacchi's approach to listen for the hidden curriculum, the intentional forgetting of the violence and unsustainability of Modernity/coloniality. Dwayne Donald (2019) refers to this silence created by "deep forgetting" as a "forgetful curriculum" (p. 104).

In Part Two, I problematize [domination](#) (the macro problem), [climate illiteracy](#) (the overarching problem), as well as [cosmological destitution](#), [intolerance of difference](#), [necropolitics](#), and [greed](#). Problematizing is the analytical process of digging deep into the underpinnings of a problem by naming, exposing, and deconstructing it so that it can be interrogated. The objective of problematizing is not to develop a do-able solution, but to engage in continuous critique of implications and contexts (Bacchi, 2015).

Listening for Silences

I use the Listening for Silences method to identify two types of silences: a) the silence of [subjugated knowledges](#) of marginalized peoples and b) the silence of suppressed knowledge that hegemony does not want us to know. Both are forms of intentional forgetting.

Data set. I limited my investigation to Grade 11-12 Social Studies curricula because my focus is on the human or social dimensions of climate change adaptation, not on climate science. For this reason, I did not include Science curricula in my data set. I limited my data set to the Social Studies curricula of only two provinces (see [Appendix B-Listening for Silence](#)).

choosing to work with the Manitoba and Ontario curricula based on Bieler, McKenzie et al. (2017), who rated Manitoba high and rated Ontario slightly lower for climate change education policies.

British Columbia and Manitoba rated a level three engagement with climate education for both climate and education policies as a result of identifying specific energy efficiency objectives for school infrastructure which are referenced in both document types. Both Ontario and Québec rated a level three engagement within climate policies as a result of identifying school energy efficiency goals but show lower levels of engagement within education policies. (p. 70).

I chose not to use British Columbia's curriculum despite its high rating because it is thin on detail and thus yields limited results using my Listening for Silences method. The data set includes curricula for the following Grade 11 and 12 Social Studies courses approved as of April 1, 2021: Canadian Studies; World Studies; World Religions; and First Nations, Métis, and Inuit Studies.

Rating Method. Adapting Sharon Stein's (2017) rating rubric for assessing decolonizing in higher education, I assessed literacy for climate change adaptation in curricula.

- *Flat.* Business-as-usual. Silence on knowledge necessary for designing climate change adaptations. Normalizes anthropocentric sustainable development.
- *Shallow.* Leaves hegemonic narratives intact (p. S32) and suggests slow incremental change. Climate risks are under-stated. Includes marginalized voices.

- *Thick*. Transformative change. Deconstructs anthropocentrism as systemic domination over Land. Introduces ecocentrism and affective relationality with the Land. Poses questions about who produces knowledge (S34). Applies intersectional analysis.

Analysis Method. My intent is to examine curricula for included and excluded knowledges. The method is similar to keyword analysis, a computer-assisted method of textual analysis that scans large volumes of textual material for keywords (Seale & Tonkiss, 2012, p. 467). I downloaded the PDF curricular documents of my dataset (Appendix A) to a Province Manitoba folder and a Province Ontario folder. There are four analytical steps:

- 1) Listening for Silences. In the first rotation, using Microsoft Explorer, I scanned one Province folder for a keyword. If the keyword was not found, I noted the exclusion and rated the keyword as *0-flat*. If the keyword was found, I noted the relevant document.
- 2) Listening for Location. In the second rotation, using Adobe Acrobat search function, I scanned a PDF curricular document for the keyword. If the keyword was not found, I noted the exclusion and rated the keyword as 0-flat. If the keyword was found, I highlighted all instances, noting page numbers.
- 3) Listening for Context. In the third rotation, I returned to highlighted keywords in the PDF document and read for context, making notes on the unit(s) in which the keyword is found. I checked in-text and curricular glossary definitions for Western Eurocentric bias and accuracy. Using the rubric, I assessed the inclusion as *0-Flat* or *1-Shallow*.
- 4) Listening for Meaning. In the fourth rotation, I returned to the highlighted sections for a close reading and listened for implicit constructions of knowledge. I listened for voices from the margins including pre-patriarchal voices, Indigenous voices, mother's

voices, pagan voices, and the voices of endangered species. I listened for emotive language, symbols, and stories that added meaning. Using discretion, I adjusted the rating to *2-Thick*.

I discuss the findings of my curricular research in Chapter 4. This critical method can be used to identify gaps where curricula or policy are silent.

In summary, Chapter 3 justifies the selection of Kovach's re-storying methodology and Bacchi's critical analysis approach. Both support my objectives to reStory subjugated and suppressed knowledges that are needed to design local climate change adaptations.

Chapter 4 – Ecopedagogy: Findings and Discussion

In this chapter, I discuss findings related to my research question: *In what ways can Critical Ecopedagogy facilitate literacy for local climate change adaptations in the pluriverse?*

This chapter is organized in three sections. The first section discusses the problem of climate illiteracy. The second section identifies gaps related to literacy for climate change adaptation in curricula. The third section explores Critical Ecopedagogy as a way to address the identified gaps. This chapter draws on scholars of Critical Ecopedagogy and Critical Pedagogy.

The Problem of Climate illiteracy

Climate illiteracy reduces [adaptive capacity](#) and that is why it merits close attention. Climate illiteracy is a complex problem because it involves intentionality and mind tricks. Climate activist Greta Thunberg (2019, Feb. 21) accused Western world leaders of setting our house on fire and then pretending that there is no fire. Her words illustrate the mind trick of [disavowal](#), a perverse form of denialism that involves simultaneously knowing and not knowing. In this section I discuss the relevance of Giroux's (2020) assertion that Modern illiteracy is not a lack of information, but a "manufactured illiteracy" that infers intent (p. 200). Giroux, leading scholar of Critical Pedagogy, has been developing his ideas about manufactured illiteracy for ten years and his insights are relevant to climate illiteracy and cohere with Sally Weintrobe's study of climate change denialisms. Let's examine tactics of intentional forgetting:

- **Suppression of knowledge** refers to hegemonic actions to conceal knowledge about Modernity/coloniality so that it cannot be interrogated, thus maintaining the delusions that Modernity is civilized and benevolent (e.g., the hidden curriculum). According to Paula Gunn Allen (1986), loss of memory is the root of colonial oppression because

forgetting the past renders the Land meaningless and allows colonizers to rape the Land and degrade landscapes that have no sacred significance to them (p. 210).

Intentional forgetting is at the root of climate change denialisms.

- **Epistemicide** is a method of subjugating or erasing the knowledges of peoples marginalized by Modernity/coloniality, including women, Indigenous peoples, and people of colour. Epistemicide can involve omitting and/or distorting their knowledges and identities (Wilson and Laing, 2018, p. 133; Mignolo, 2011). Epistemicide is also known as epistemic violence (Dei, 2010, p. 91; Dei, 2011, p. 4) and cognitive imperialism (Simpson, 2017, p. 72), In Learning Roots 4 to 6, I reStory the subjugated knowledges of earth-centred philosophies, sharing economies, matricultures, and practices for respecting regenerative forces.
- **Disavowal** involves a range of strategies that ensure that reality can be seen and not seen at one and the same time. It is often called turning a blind eye and is part of a more organized and enduring defensive structure when our narcissistic part comes under the sway of entrenched arrogance (Weintrobe, 2014, p.38).
- **Delusions** are a type of intentional forgetting that involve unshakable beliefs that are not true and/or not based on reality (Weintrobe, 2014). Delusions can become conspiracy theories and common cause for violent action. David Smith (2012) views curricular delusions as masks for a “form of denial based on a deep fear of the truth” (p. 340).

These tactics of intentional forgetting complicate the problem of climate illiteracy, as an overarching problem that is entangled with the problems of domination, cosmological destitution, intolerance, and greed.

Climate Illiteracy is entangled with Domination. [Anthropocentric](#) humans, believing that humans are separate from and superior to Land and all other species, disrespect the integrity of Land and other species by dominating the materiality and personhood of Land and other species through activities like extractivism, polluting, garbage, and consumerism. Domination breaks the relationship because it prevents egalitarian, affective relationality. Domination disrespects the integrity of Other Beings, thus indicating that dominators lack moral integrity because they are unable to empathize with the Beings that they dominate (Kuokkanen, 2019, pp. 40-59). Anthropocentric domination, entangled with Modernity/coloniality's economic system, is driving the co-occurring existential crises of [Anthropogenic Climate Change Event](#) and the [Sixth Mass Extinction Event](#).

Similarly, [heteropatriarchal](#) humans, by disrespecting the bodies and personhood of women and queer persons, lose moral integrity in gendered relationships because they cannot enter egalitarian relations except with persons of their own gender. The loss of moral integrity linked with loss of capacity to empathize produces a serious Modern condition for which there is a dearth of treatments. There is a need for therapies to restore integrity as a way of healing from the disordered thinking of being a dominator. I suggest that recovery involves developing



*Image 3. Problematizing
Modernity-
Concept Map 2 excerpt*

emotional intelligence by expanding the capacity for empathy and affective relations with Beings that are different from oneself.

Climate Illiteracy is entangled with Cosmological Destitution. [Cosmological destitution](#) is a settler condition that describes those who have forgotten the [cosmology](#) of their ancestral homeland, have not bonded with the Land they settled, and neglected to learn the [cosmology of the Land](#) that they inhabit (Mathews, 1991, p. 9, 47). Symptoms of cosmological destitution include apathy (i.e., loss of [agency](#)) as well as loss of big picture thinking and loss of imagination. If cosmology is a culture's collective way of making sense of the world (Haarmann, 2020), then loss of cosmology is like losing one's culture in a world that makes no sense. Critical educator Edmund O'Sullivan (2002) suggests that hegemonic education suffers from a loss of cosmology (p. 62) because it is locked in a [dualistic](#) world where everything is categorized in finite distinctions, making it difficult to see the world as a whole. Cosmological destitution is problematized in Learning Roots 4, with a focus on recovery by learning to become [ecocentric](#) in loving, listening relationality with the Land and living the cosmology of the Land to which we belong. In the recovery process of learning the cosmology of the Land we inhabit, we expand literacy by developing transpersonal ways of knowing the Land.

Climate Illiteracy is entangled with Intolerance. [Intolerance](#) as socialized fear of difference is linked to fear of rapid or large-scale change, which requires openness to different circumstances. When intolerance of difference becomes extreme, it attempts to eliminate those whose differences are intolerable using violent methods, including [necropolitics](#), genocide, [ecocide](#), [epistemicide](#), and extinctions. Each of these erasures contributes to illiteracy because it results in loss of knowledge. Recovering from this type of illiteracy requires courage-

courage to [welcome differences](#) so that all Lands, landscapes, cultures, genders, species, and religions can regenerate and flourish. Courage is the mental and moral strength to venture and persevere despite fear, danger, and challenge. Courage increases the capacity for empathy, which moves the mind outward, imagining positions outside the self and participating vicariously in the experience of those who have been othered. In contrast, fear of difference and fear of change decrease adaptive capacity because they are preoccupied with safety of the self and the mind resorts to binary thinking to construct a scapegoat. In Learning Roots 6, I introduce a continuum of responses to difference.

Climate Illiteracy is entangled with Greed. Weintrobe (2020), leading scholar in the emerging field of Climate Psychology, views climate change [disavowal](#) as immoral because it is the refusal to know, the refusal to take responsibility, and the refusal to be present in a crisis. According to Weintrobe, greed-driven Modernity is a “care-less culture” in which uncaring people participate in the immoral project of living lifestyles without regard for Earth’s [carrying capacity](#) (p. 352). She calls for “divesting” from the “culture of uncare” by recognizing disavowal, working through grief and remorse, taking responsibility, and showing up (p. 359).

Giroux (2020) is concerned that the decay of collective memory and the manufacture of ignorance is producing a crisis of [agency](#), [memory](#), and critical thinking that enables “neoliberal fascism” to foreclose the political and to normalize rule by the rich in which economics dominates over everyday life and corporations override the will of the people (p. 196-197). When literacy decreases due to fear, so does the practice of learning political skills that are foundational to agency. When a culture loses its collective agency, it becomes apathetic, a condition that can degenerate to anomie--the inability to perceive risk, resulting in deviant

behaviour, excessive conformity, and dependency on the state to provide caretaking. A culture that has lost collective agency has already lost its courage. Giroux challenges “the anti-intellectual, anti-democratic worldviews of the new extremists” who declare war on science and critical thinking, producing a “moral coma” in which thinking is dangerous and citizens acquiesce unconsciously to Modern systems of authoritarianism (Giroux, 2016, np). Giroux (2021) is concerned that “the cult of manufactured ignorance now works through schools and other disimagination machines engaged in a politics of falsehoods and erasure” (np) that serve the interests of neoliberalism.

Giroux’s analysis of manufactured ignorance leads me to conclude that climate illiteracy is not caused by an information deficit; but by [maladaptation](#) to climate change using the tactics of intentional forgetting. I invoke Arendt’s (2006) phrase “the banality of evil” to refer to climate change deniers not as monstrous villains who intentionally set the collective house on fire, but as care-less humans who are instruments of a system and thoughtlessly comply because they have lost the capacity to empathize with those made homeless by their actions. When a culture loses its capacity to empathize, it loses its ability to imagine.

Gaps in Climate Education: Listening for Silences

In Chapter 1, I discussed three scholarly reviews of climate education that identified general gaps in hegemonic education. They are:

- Kagawa and Selby (2012) find a gap in teacher preparation for facilitating affective learning about the emotional impacts of climate change (p. 215);

- Bieler, McKenzie et al. (2017) find a lack of preparation for change and critique the hegemonic education system as “woefully inadequate” for preparing learners to develop climate adaptation strategies; and
- Blenkinsop and Fettes (2021) find a lack of preparation for large-scale transformative change, as well as gaps in considering Earth’s carrying capacity (p. 16-17). They call for reckoning with anthropocentrism and human exceptionalism.

In this section, I explore curricular gaps related to climate change adaptations with greater specificity.

Listening for Silences. Using the Listening for Silence methods (see Chapter 3), I drilled down into curricular documents to search for concepts or keywords relevant to designing climate change adaptations and documented if the concepts were included or excluded, and then rated any inclusions as flat, shallow, or thick, using a rubric adapted from Stein (2017) (see Chapter 3). The following paragraphs provide a narrative description of specific silences and the implications for literacy related to climate change adaptation. My results are summarized in *Table 3: Dropped Threads-Curricular Keyword Searches*. I find that *no* concepts rated thick (3) or transformative (4). Some concepts were mentioned but not explained fully, clearly, or accurately, so they are noted as mentioned and rated flat (1).

Gap: Silence on Cultural Continuity. Using keywords related to Indigenous [conditions for cultural continuity](#), I find that curricula randomly mentioned up to three Indigenous conditions for cultural continuity but did not connect them to cultural continuity or [adaptive capacity](#). I interpret the silence as a [subjugated knowledge](#). The implication is that if curricula are silent on Indigenous conditions for cultural continuity, then youth are unprepared to design climate

change adaptations based on factors that enable the longevity of Indigenous cultures. I reweave these dropped threads into Learning Roots 1.

Gap: Silence on past climate events. Using keywords related to adaptations in past climate events, I find that curricula are profoundly silent on past [climate change events](#), including The Little Ice Age. I interpret the silence as a suppressed knowledge. The implication is that if curricula are silent on past climate change events, then youth do not have knowledge to design climate change adaptations based on the past adaptations that were effective. I reweave these dropped threads into Learning Roots 2.

Gap: Silence on anthropocentrism as the crux of the climate problem. Using keywords related to Modern systems of [domination](#), I find that curricula are silent on [anthropocentrism](#) and [Christian theocracy](#) as systems of domination. This silence is the crux of the climate literacy problem and there are many implications. If curricula fail to name and expose anthropocentrism and Christian Theocracy as systems of domination in Modernity/coloniality, then learners cannot deconstruct and interrogate these systems of domination and the intersectionality of their oppressions. Until curricula link anthropocentrism to climate change, it cannot advance [ecojustice](#) by emancipating Land and Climate from the injustice of white domination. Sustainability Education is a greenwash that hides anthropocentrism. The silences on anthropocentrism and Christian Theocracy imply they are part of the hidden curriculum. If educators engaged in decolonizing curricula do not interrogate anthropocentrism, abetted by Christian Theocracy, then they have not interrogated the root cause of coloniality and climate change. These dropped threads are woven into Learning Roots 3.

Gap: Silence on Earth-centered philosophies. Using keywords related [to relationality with Land](#) (a condition for cultural continuity) and the problem of [cosmological destitution](#), I find that curricula are silent on affective relationality with Land and [ecocentrism](#). This gap is related to the silence on Christian Theocracy as a system of domination. If curricula present only anthropocentric ideas, albeit un-named, then learners will perceive anthropocentrism as normative and not explore ecocentric and earth-centered philosophies. I find that World Religions curricula are silent on Earth-centered philosophies and cosmologies of the Land. If curricula are silent on ancient, pre-patriarchal, and extant Earth-centered philosophies, then learners are unprepared to perceive and participate in the resurgence of Earth-centered practices in the current cosmological transition. I reweave these dropped threads into Learning Roots 4.

Gap: Silence on sharing economies. Using keywords related to [sharing](#) economies and [Limits to Growth Theory](#), I find that curricula are silent on ancient and extant egalitarian economic systems. There are shallow references to subsistence economies in impoverished cultures, but no references to sharing economies. This implies that if curricula are silent on sharing and egalitarian economies, then learners cannot imagine future economies that are different from the capitalist economy based on domination. I find that curricula do not present climate change as a risk with the potential to cause mass deaths and homelessness. If curricula do not present climate change as a risk, then youth cannot design and prepare adaptations with appropriate sense of urgency. I reweave these threads in Learning Roots 5.

Gap: Silence on regeneration. Using keywords related to [regeneration](#) (a condition for cultural continuity) and [respect for regenerative forces](#), I find that curricula are profoundly

silent on regeneration as a condition for cultural continuity, a system of power, and a philosophy. I also find profound silence about ancient and extant [matricultures](#). Profound silence on regeneration indicates that a heteropatriarchal [method of erasure](#) has not been exposed for interrogation. The implication is that learners, lacking knowledge of ancient and extant regenerative cultures, cannot imagine building regenerative cultures as a local climate change adaptation. They cannot respect [mothering](#) as a basic human need and as a critical factor for cultural survival. I reweave these threads into Learning Roots 6.

These curricular silences are deeply troubling because they indicate that climate illiteracy is embedded in curricula and that anthropocentrism is concealed in the hidden curriculum. To expedite literacy for climate change adaptation, I must turn my attention to Critical Ecopedagogy as an alternative approach to facilitating literacy for climate change adaptations.

Table 3-Dropped threads- Results of Curricular Keyword Searches	Ontario Inclusions	Ontario Rating	Manitoba Inclusions	Manitoba Rating
Group 1- Indigenous Conditions for Cultural Continuity				
1. Conditions for cultural continuity	Mention	Shallow	Mention	Shallow
2. Living the cosmology of the Land	Mention	Flat	Silence	Flat
3. Relating with Land & kin (caring, affective, nondual)	Mention	Shallow	Mention	Shallow
4. Regeneration, Respect for regenerative forces	Silence	Flat	Silence	Flat
5. Sharing (reciprocity, balhats, potlatch, give-aways)	Mention	Shallow	Mention	Shallow
6. ReMembering, cultural memory	Mention	Shallow	Mention	Shallow
7. Welcoming difference	Silence	Flat	Silence	Flat
Group 2 ReMembering Past Climate Events				
8. Climate cycle (regenerative, degeneration),	Silence	Flat	Silence	Flat
9. Climate change events (5.9 KY, 4.2 KY, GM, LIA).	Silence	Flat	Silence	Flat
10. Adaptations and maladaptations	Mention	Flat	Mention	Flat
Group 3 The “Dark Age” of Modernity/coloniality				
11. The Modern Age. Modernity, coloniality, capitalism	Mention	Flat	Mention	Flat
12. Heteropatriarchy and its system of domination	Mention	Shallow	Mention	Shallow
13. White supremacy and its system of domination	Mention	Shallow	Mention	Shallow
14. Anthropocentrism and its system of domination	Mention	Flat	Mention	Flat
15. Christian Theocracy and its system of domination	Silence	Flat	Silence	Flat
16. Methods of erasure (ceremonial ban, extractivism)	Silence	Flat	Silence	Flat
17. Problem: Climate illiteracy	Silence	Flat	Silence	Flat
Group 4 Loving and Listening with the Land. Cosmology				
18. Cosmology (origin stories, ceremony, symbols)	Mention	Flat	Mention	Flat
19. Problem: cosmological destitution	Silence	Flat	Silence	Flat
20. Problem: Intolerance of difference	Mention	Shallow	Mention	Shallow
21. Nondomination, ecojustice	Mention	Shallow	Mention	Flat
22. Adaptation: Ecocentric / Earth-based philosophies	Mention	Flat	Silence	Flat
Group 5 Sharing Economies. Reciprocity				
23. Caring economies (regenerative, gifting, community)	Mention	Shallow	Mention	Shallow
24. Problem of Greed	Silence	Flat	Silence	Flat
25. Limits to Growth (adaptation limits, carrying capacity)	Silence	Flat	Introduce concept	Shallow
36. Preparing for climate risks (tipping points, 2C, food and water shortages, climate refugees)	Silence	Flat	Silence	Flat
Group 6 Respect for Regenerative Forces				
27. Problem of Necropolitics	Silence	Flat	Silence	Flat
28. Sixth Mass Extinction Event	Silence	Flat	Silence	Flat
29. Mothering (midwifery, birthing) puberty rites	Silence	Flat	Silence	Flat
30. Matricultures, rematriation, Maternal in cosmology	Mention	Flat	Silence	Flat
Stein’s Rubric adapted for rating curricular inclusions and exclusions: 0-Flat. Normalizes Modernity/ coloniality; 1-Shallow. Suggests slow change and minimizes climate change risks; 2-Thick. Prepares for systems transitions and advocates egalitarian and ecojustice values. 3-Transformative, radical change.				

Critical Ecopedagogy and Literacy for Climate Change Adaptation

In this section, I discuss Critical Ecopedagogy as a way to address the serious gaps in climate literacy identified in the previous section. I begin by emphasizing that the political goal of Critical Ecopedagogy is [ecojustice](#) (Hung, 2021, p. 10), defined as the emancipation of Earth (including Air, Water, Land, Climate) from human domination. Critical Ecopedagogy is committed to an ecocentric philosophy of relationality with Land as an [onto-ethico-epistemology](#) and [cosmology](#). To analyze the fit between Critical Ecopedagogy and the work of facilitating literacy for climate change adaptation in the [pluriverse](#), I identified the principles of Critical Ecopedagogy, drawn from Ecopedagogy Association International (Kahn, 2008, p. iii) and from the literature produced by Richard Kahn and by Ruyu Hung. The principles of Critical Ecopedagogy are:

- 1) listening and loving in caring relationality with Earth and kin,
- 2) respecting forces of regeneration,
- 3) learning from the past,
- 4) becoming agentic,
- 5) preparing for long-term, large-scale change in spiraling time, and
- 6) learning holistically.

I discuss each of these principles below.

Principle 1-Listening and Loving in Caring Relationality with Earth and Kin. The primary learning principle aligns with [relationality with Land](#)-an Indigenous condition for cultural continuity. In contrast, my curricular review found that curricula are silent on affective relationality with Land. It guides the [deModernizing](#) process of recovering and becoming

ecocentric. The ethic of care extends to interspecies kin and to persons who are traumatized by grief and losses due to climate change. Learning Roots 4 engages in deep listening in relationality with Land. Becoming ecocentric is the movement towards a relationship with Land guided by an Earth-centered or ecocentric philosophy.

Kahn (2011) builds on Freire to generate a “radical ecoliteracy” defined as a loving relationship to Earth that builds awareness of intersectional oppressions, thus motivating new literates to take political action. Kahn calls for learning that nurtures a “many-armed monstrous love,” symbolized by Kali-Ma, to sustain the labours of giving birth to “a new humanity” (p.111). This love is like that of the Navi of Pandora who are rooted in a relational onto-ethico-epistemology that views “life as an unending series of dialogue and common bonding of the past with the present or the self with another” (p.119). Leonardo Boff (2014) describes Critical Ecopedagogy as a “revolution of tenderness” in which people relate with Land by offering deep listening that accepts and tenderly loves the otherness of Land and feels empathy for Earth and Climate in their current struggle with human domination. Hung (2019) builds on the cosmology of [Daoism](#) and holds up symbiosis as a model for learning: “the symbionts are different from but dependent on each other. They reciprocally live, develop and evolve together” (p. 1075).

Principle 2-Respecting Forces of Regeneration. The second learning principle aligns with [regeneration](#) as a condition for cultural continuity. In contrast, my curricular review found that curricula are silent on the power of regenerating life. Regenerating involves intentional participation, using imagination, in creating the future through the organic cycle of living and dying (Hung, 2017a, 2017b). Both Kahn and Hung commit to maintaining harmony and balance with regenerative forces. Hung brings Daoist practice to this commitment. Building on Hung, I

explore cultural practices for respecting regenerative forces in Learning Roots 6 and emphasize respect for Climate as a regenerative force.

Principle 3-Learning from the Past. The third learning principle aligns with [reMembering cultural memory](#) as an Indigenous condition for cultural continuity. In contrast, my curricular review found that curricula are silent on past climate change events and adaptations. Learning from the past draws on the knowledge of the ancestors. Kahn (2010) views the past as dynamic and continually influencing the present (p. 37). Studying the stories of the past is a way of understanding the present. Ruyu Hung (2020) draws on China's experience of enduring catastrophic earthquakes to emphasize the importance of learning from past catastrophes and learning from past mistakes by developing adaptations to correct, compensate, and do justice (p. 1358). Elders and ancestral wisdom are treasured in Daoism and Indigenous cultures, in contrast to Modernity that tends to sideline seniors and ignore the past as backward and unevolved. Building on Hung, I emphasize the study of past climate events in [spiraling time](#) to enable thinking across and thinking through past events to reMember adaptations that are relevant to the present crisis. In Learning Roots 4, 5 and 6, I bring forward subjugated knowledges of Earth-centered philosophies and practices for [respecting regenerative forces](#) and for [sharing](#) the gifts of Mother Earth.

Principle 4-Becoming Agentic. Political praxis begins with a critical, [intersectional](#) analysis of Modern systems of power by domination. Critical Ecopedagogy engages in emancipatory action using individual and collective [agency](#) (Kahn, 2010, p. 152; Escobar p. 203). For many climate activists, collective action provokes rethinking community as a way of inhabiting the world together (Escobar, p. 176). Arendt (1977) asserts that revolutionary learners bring

enthusiasm for what is new (p. 175). Informal learning, not formal education, plays a key role in revolutionary movements because learners engaged in creating a new world are thirsty to learn. Revolutionaries do not seek educators who will “act as their guardian and prevent them from political activity” (p. 173). They turn to [informal learning](#) with other revolutionaries to deepen their understanding and coherence, aware that their revolution requires the strength of persuasion to succeed.

Principle 5-Preparing for Long-Term, Large-Scale Systems Change in Spiraling Time. The fifth principle responds to the magnitude and pervasiveness of [climate risks](#). Hung (2020) recommends a “change approach” that agentially prepares for “long-term, large-scale changes in cyclical time,” in contrast to Modernity’s perception of climate change as a temporary disruption to continual progress in linear time (p. 1361). Hung asserts that preparing for change can prevent loss of life and prepare communities for the unpredictability, randomness, and discontinuity of disasters. In contrast to High Modernity’s resistance to change and fear of difference, Critical Ecopedagogy emphasizes getting to know our fears so that we can welcome difference. Pluriversal communities, recognizing that diversity is life, include queer voices and diverse beliefs (Russell, 2013; McGarry et al., 2021; Gough, 2021).

Principle 6-Learning Holistically. Learning for climate change adaptation is facilitated using holistic methods to develop the whole person. In contrast, I found that Social Studies curricula privilege cognitive ways of learning. Based on an [elemental philosophy](#) of continuous change, I integrate five ways of learning and knowing:

- embodied ways of learning and knowing process experiences that are sensory, felt, or enacted;

- affective ways of learning and knowing engage in emotions, feelings, and relationships and do not bury the negative feelings of grief and fear, which contribute to developing emotional intelligence for caring and empathizing;
- transpersonal ways of learning and knowing engage in unitive experiences with Land, Beings, and the Cosmos that expand the Self through imagination and intentional ways to access knowledges in the collective unconscious;
- inspired ways of learning and knowing are expressed in agency, political initiatives, art, and design; and
- cognitive ways of learning and knowing process information using reasoning and intentional reMembering (memory) to research the past, learn from mistakes, analyze intersectionality, and interrogate Modern systems of dominance (O’Sullivan, 2002; Wolfstone, 2018a).

Transpersonal learning may be greeted with skepticism in hegemonic education; however, my previous studies demonstrate that transpersonal experience is often a catalyst for becoming ecocentric, developing affective relationality with Land, and transpersonal learning¹⁵ (Wolfstone, 2016; Sojourners Collective, 2021). I concur with cultural anthropologist Michael Winkelman (2011) who states that all humans have the capacity to experience altered states of consciousness, which has potential to deepen human connectedness to animated Land (p. 273). Transpersonal knowing is understudied. There is a need to inquire if cosmological destitution is

¹⁵ In a delightful illustration of transpersonal learning, Leslie Wakeman asks a group of Early Years learners, “What will the trees teach us today?” (Sojourner Collective, 2022, p. 248-251).

a factor in Modernity's loss of transpersonal knowing. In Critical Ecopedagogy, transpersonal relations with Land and interspecies kin deepens respect for the sacredness of climate and Life.

Principle 7-Design. The [design](#) principle is not found in the literature of Critical Ecopedagogy, but it is important to Decolonial Theory, so I add it as a seventh principle because it is needed for systems thinking. Design uses systems thinking and divergent thinking to imagine new systems that protect life and build capacity to [endure](#) (Escobar, p. 4). Escobar promotes Transition Design, defined as long-term, Land-based, local scale system propositions that incorporate a shift in values (p. 137-164).

With these seven principles, I am confident that Critical Ecopedagogy can guide literacy for local climate change adaptations in the pluriverse.

Synthesis of Findings on Ecopedagogy

Climate illiteracy is not caused by information deficits but by a manufactured ignorance involving intentional forgetting. Through a curricular review, I find that curricula are silent on climate change adaptation and on Indigenous conditions for cultural continuity, and that curricula do not interrogate anthropocentrism, capitalism, and coloniality as drivers of Anthropogenic Climate Change. Sustainability education is complicit in the silence on anthropocentrism. Learners engaged in climate activism cannot rely on formal education for knowledge related to climate change adaptations in the pluriverse and turn to [informal learning](#) to develop a coherent understanding about ecojustice and local climate change adaptations. Concluding that climate illiteracy is embedded in hegemonic curricula, I do not make recommendations for curricular revisions. Instead, I invest in Critical Ecopedagogy as a political fit for facilitating ecocentric climate change adaptations for the following reasons:

- 1) the goal of Critical Ecopedagogy is [ecojustice](#);
- 2) Critical Ecopedagogy addresses the identified gaps in hegemonic education by weaving in the 30 dropped threads as “need-to-know” concepts for designers of local climate change adaptations;
- 3) three principles of Critical Ecopedagogy are directly related to Indigenous conditions for cultural continuity, i.e., affective relationality with Land, respect for regenerative forces, and learning from the past;
- 4) Critical Ecopedagogy’s ecocentric standpoint and [agency](#) are congruent with the pluriversal praxes of ecofeminism, Indigenous Knowledges, and Decolonial Theory;
- 5) Critical Ecopedagogy has capacity to restore knowledges that are subjugated in hegemonic curricula, e.g., sharing economies, matricultures, and earth-centered philosophies;
- 6) Critical Ecopedagogy interrogates power and exposes and deconstructs anthropocentrism in its intersectionality with Christian theocracy, heteropatriarchy, and white supremacy;
- 7) Critical Ecopedagogy is holistic in that as it welcomes affective, embodied, and transpersonal ways of learning, as well as cognition and creativity.

With these findings, I move to Part Two where I apply the Critical Ecopedagogy principles to facilitating literacy for local climate change adaptation in the pluriverse. In keeping with my ecofeminist roots, I refer to this as a radical literacy for climate change adaptations, where *radical* means rooted in Earth.

PART TWO – FINDINGS AND DISCUSSION:

LEARNING ROOTS FOR RADICAL LITERACY FOR CLIMATE CHANGE ADAPTATION

What do designers of local climate change adaptations need to know about Indigenous conditions for cultural continuity that enabled Indigenous and ancient cultures to endure past climate change events? This is the question that guides me as I think about facilitating literacy for adapting to Anthropogenic Climate Change.

Part Two is organized in six Learning Roots¹⁶ and each root discusses knowledges needed by designers of local climate change adaptations. Each Learning Root opens with learning objectives, an overview, and threads (concepts), and closes with questions for reflection and action, as well as additional resources. My goal is to write a primer for radical literacy on climate change adaptation, where *radical* means rooted in Earth, and thus emphasizes that humans are organic Beings living earthy lives on an organic planet that is our only home.

The Learning Roots are written for youth, climate activists, climate change coordinators in institutions and First Nations, ecofeminists, transgressive educators, and for grandparents who share a deep concern for adapting to a future with climate change. The Learning Roots are designed for [informal learning](#), defined as self-directed and beyond institutions and curricula. Informal learning is often the first learning mode for persons engaged in eco-social justice movements. Transgressive educators can adapt Learning Roots to formal learning. I hope that

¹⁶ Part Two is written in non-traditional format as learning modules called Learning Roots, as approved by the Examiners at my Candidacy Exam. I aimed to write to a Grade 12 reading level but the outcome is Grade 14.

readers of this primer will build on it and expand knowledge for designing local climate change adaptations.

Principles of Ecopedagogy

The goal of Critical Ecopedagogy is [ecojustice](#)-the liberation of Land from human domination. I apply the principles of Critical Ecopedagogy to facilitate radical literacy:

- ***Listening and Loving in Caring Relationality with Earth and Kin.*** This learning principle aligns with affective relationality with Land-a condition for cultural continuity.
- ***Respecting Forces of Regeneration.*** This learning principle aligns with regenerating-a condition for cultural continuity that intentionally participates in creating the future.
- ***Learning from the Past.*** This learning principle aligns with reMembering cultural memories-an Indigenous condition for cultural continuity.
- ***Becoming Agentic.*** This learning principle supports learners acting for ecojustice through individual and collective agency. Collective action may provoke rethinking community as a way of inhabiting the world together
- ***Preparing for Long-Term, Large-Scale Systems Change in Spiraling Time.*** This learning principle responds to climate risks by preparing communities for the unpredictability, randomness, and discontinuity of disasters.
- ***Learning and Recovering Holistically.*** Ecopedagogy pays attention to the emotional impacts of climate change and Land degradation. Holistic methods facilitate affective, embodied, and transpersonal ways of learning, as well as cognition and creativity.
- ***Design.*** This principle is critical to creating adaptive solutions and imagining new systems. (Kahn, 2010; Hung, 2017a & b; Escobar, 2018; Hung, 2020).

These are the principles of Critical Ecopedagogy that inform my approach to radical literacy for climate change adaptation.

Weaving Keywords and Concepts

I imagine this work as an art project in which I am weaving a huge tapestry that began as two distinct tapestries. The ancient tapestry (Concept Map 1) represents the [pluriverse](#) where local [climate change adaptations](#) are underway in many Earth-centered cultures. The second tapestry (Concept Map 2) represents 5 centuries of [Modernity](#) with its Four-Square systems of [dominations](#) concealed by plastic overlays. Each word on these two concept maps is a thread or core concept that is woven in and out, throughout this artistic project.

In the [Space Between](#) I weave *dropped threads* into a chevron or zigzagging pattern. The chevron is an ancient symbol for flowing water and for continual change. Dropped threads are concepts that are excluded or under-represented in curricula. In Learning Roots, I reStory these 30 dropped threads by weaving them back into the tapestry in ways that create a zigzag in the Space Between to enable Modern humans to make a leap and transgress the thick borders of Modernity to the Space Between, a transition zone for learning. Learning Roots 1 to 6 are designed to prepare Sojourners to become [ecocentric](#), become [agentic](#), and then to reTurn in [spiraling time](#) to regenerative cultures where [climate change adaptations](#) are not only possible, but already underway.

A transdisciplinary philosophical framework guides this work. It integrates three pluriversal knowledges, specifically Indigenous Knowledges, ecofeminist philosophy, and Decolonial Theory, with two academic disciplines, specifically, Critical Ecopedagogy and the work of critical anthropologists who study past climate change events. The core concepts derive

from this framework and are defined in [Appendix A-Lexicon](#). I may hyperlink concepts to the Lexicon for quick reference to definitions.

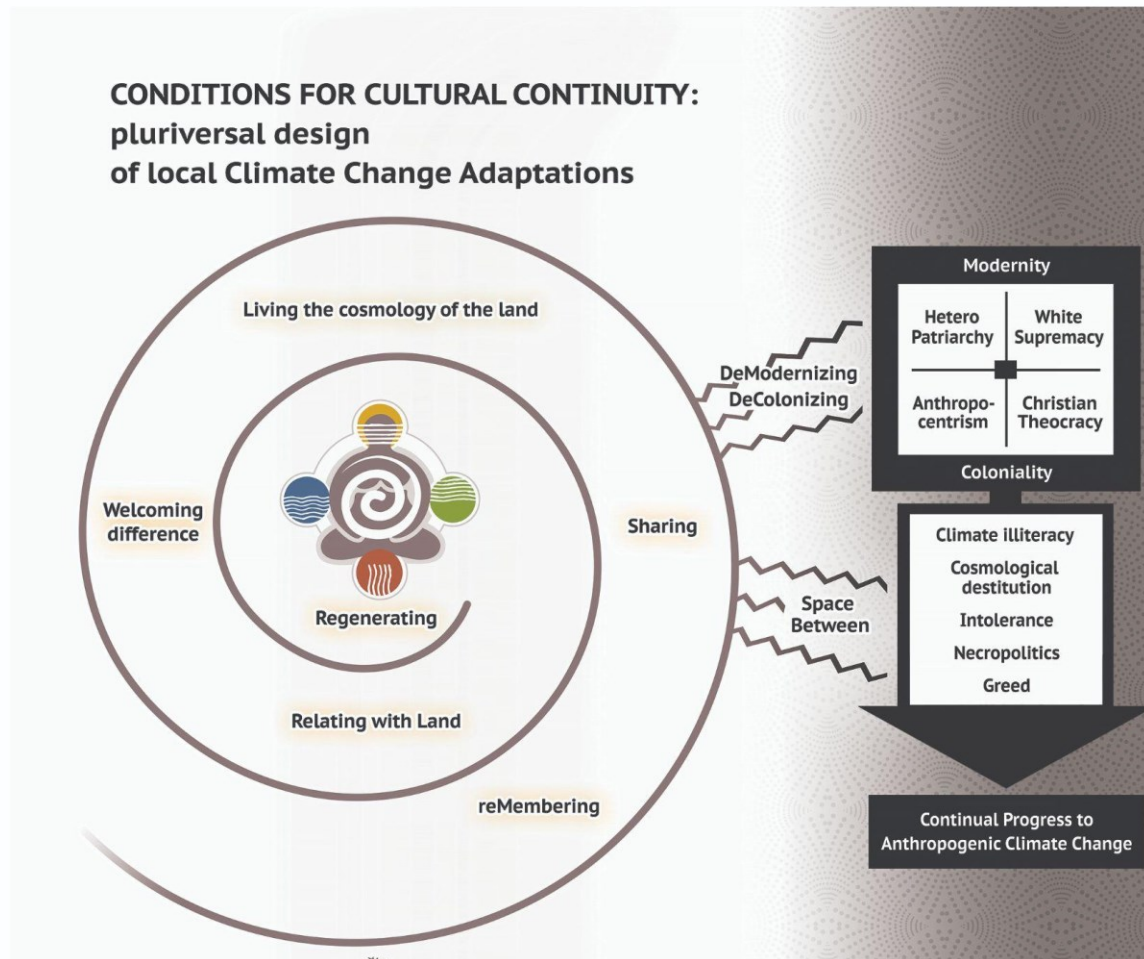


Image 4. Earth-centered cultures/Power of regeneration-
Concept Map 1 excerpt

Image 5. Modernity/
coloniality- Concept Map 2
excerpt

My philosophical framework informs the assumptions I bring to this work. They are:

- [Modernity/coloniality's](#) structure of power includes these systems of domination-
[anthropocentrism](#), [heteropatriarchy](#), [white supremacy](#), and [Christian theocracy](#).
- Ecofeminist philosophy deconstructs the [intersectional](#) oppression of women, Land,
and regenerative forces by anthropocentrism and heteropatriarchy.

- Without coloniality, there would be no modernity (Quijano, 2007).
- Without coloniality, there would be no [Anthropogenic Climate Change](#) (Stein, 2019).
- Modernity/coloniality is inherently violent and unsustainable (Andreotti, 2021).
- The power that sustains Indigenous cultures is the power of [regeneration](#), embedded in a philosophy of regeneration about making more life (Simpson, 2011).
- Decolonizing is restructuring relations to [nondomination](#) (Kuokkanen, 2019).
- A complete restructuring of a culture, including its cosmology, may occur *only if* the Land becomes degraded or destroyed beyond its [carrying capacity](#) and can no longer sustain the community (Haarmann, 2007, p.260)
- A culture in end-stage decline does not have capacity to perpetuate its body of ancestral knowledge or [cultural memories](#) (p.270).

These assumptions reflect my understanding that the political task of our time is [deModernizing](#), which involves recovering from Modernity, becoming ecocentric by loving the Land we inhabit as Home, becoming agentic for ecojustice, and reTurning in spiraling time to regenerative cultures.

Let me provide a brief overview of the questions we explore in Learning Roots:

- Learning Roots 1 explores the question: what conditions for cultural continuity enable Indigenous cultures, the cultures with greatest longevity, to endure? Learning Roots 1 is foundational to Learning Roots 2 to 6.
- Learning Roots 2 explores the question: are Indigenous conditions for cultural continuity relevant to understanding the adaptive capacity of ancient cultures that survived past climate events?

- Learning Roots 3 explores the question: how have The Little Ice Age and Anthropogenic Climate Change shaped Modernity?
- Learning Roots 4 explores the question: what are some ancient and Indigenous practices for living the cosmology of the Land-a condition for cultural continuity?
- Learning Roots 5 explores the question: given that sharing is a condition for cultural continuity, what are some systems of sharing economies practised by ancient, Indigenous, and decolonizing cultures?
- Learning Roots 6 explores the question: what are some ancient and Indigenous practices for respecting regenerative forces-a condition for cultural continuity?

Let's begin regenerating by growing our Roots.

Learning Roots 1 - Regenerating: Indigenous Conditions for Cultural Continuity

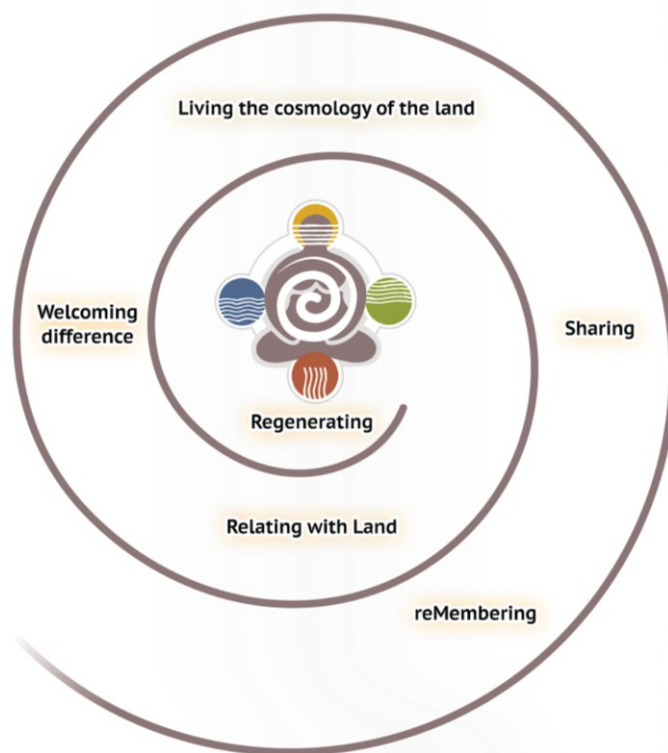


Image 6: Indigenous Conditions for Cultural Continuity-Concept Map 1 excerpt
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Learning objectives

- to explore conditions for cultural continuity that enable the longevity of Indigenous cultures;
- to understand regeneration as a power, a philosophy, and a condition for cultural continuity; and
- to recognize Indigenous preparations to survive climate change as adaptations.

Overview

We explore the question: What conditions for cultural continuity enable Indigenous cultures, the cultures with greatest longevity, to endure? Learning Roots 1 is organized in six sections based on six conditions for continuity: living the cosmology of the Land, relating with Land and kin, regenerating, sharing, reMembering cultural memories, and welcoming difference. The last two sections discuss how Indigenous cultures demonstrate survivance in enduring colonization and are now agentially preparing to survive climate change.

Weaving Dropped Threads into Radical Literacy for Climate Change Adaptations

conditions for cultural continuity, living the cosmology of the Land, regenerating, relating with Land and kin, reMembering (cultural memory), resurgence, sharing (reciprocity, *balhats*, potlatch, give-aways), welcoming difference.

Introduction. Let me introduce myself and my relations by telling you the story of my name. I am Irene Wiens Friesen Wolfstone, daughter of Louise Friesen and granddaughter of Helena Wiens, who emigrated to Canada in 1926 from Siberia but whose Mennonite ancestors originate in the Netherlands. The name Friesen represents my paternal ancestors who emigrated from the Dnieper region of Ukraine to Canada in 1924 and their ancestors also originate in the Netherlands. My parents named me Irene because it means peace. I was raised in Mennonite culture and faith, but now follow syncretic beliefs. My surname, Wolfstone, is a spirit name gifted to me over 25 years ago and with permission, it is now my chosen surname. I live in Plnawa, Manitoba, located on the mighty Winnipeg River and in the Whiteshell Forest. This Land is the traditional territory of the Ojibwe peoples, who agreed to share the Land in Treaty 1.

My intent is to focus on Indigenous [conditions for cultural continuity](#), which are foundational to each Learning Root and to the design of local climate change adaptations. These conditions are not discrete but deeply interconnected with other conditions and embedded in a diversity of practices. In approaching this topic, I draw on the literature of Indigenous Knowledges, particularly Indigenous feminism, and pay attention to the diversity of Indigenous cultures across Canada.



Living the Cosmology of the Land

[Living the cosmology of the Land](#) is a complex condition for cultural continuity that weaves the concepts of Life and Land, cosmology, and philosophy. Most cosmologies are land-based and thus are as varied as bioregional landscapes. As the oldest cultures in the world, Indigenous cultures have evolved complex beliefs which, like Daoism, are nondual philosophies¹⁷ that integrate cosmology and metaphysics (Little Bear, 2011; Simpson, 2017; Leduc, 2010, p. 182).

Cultural Cosmology. Let's begin by defining cultural [cosmology](#) as a culture's theory of its origins in timespaceplace, derived from long-term inhabitation of a place. It survives for millennia once it is established in the stories, ceremonies, rituals, signs, songs, and symbols of a culture. It is deep knowledge that is believed and lived. It shapes a culture's symbols, contributes to meaning making, and unifies a culture around a common philosophy. Origin stories often include First Instructions—a code of ethics for maintaining balance and harmony with the Land by respecting life forces and Land as a gift from Mother Earth, the Creator, or First Ancestor, according to the cosmology of the Land. Origin stories are narrated in songs and stories and transmitted from generation to generation. Knowing the origin story of one's culture(s) carries responsibility for demonstrating respect for the knowledge and enacting the knowledge in ethical lifeways (Bastien, 2004, p. 65; Courchene, Bone, Paynter et al., 2021).

Time, Place, and Space. The cosmologies of Indigenous cultures articulate a [cyclical or spiraling concept of time](#). Cyclical time unifies the phases of life: birth, be/coming, death and contextualizes Indigenous claims that they have inhabited the Land where they live since time

¹⁷ Recognizing that belief in spirit is a part, but not the whole, of most religions and many belief traditions, I refer to Indigenous beliefs as philosophies, not as [spiritualities](#).

immemorial. Time and place exist in space and are experienced internally and externally. The schedule of ceremonies follows the cyclical patterns of the cosmos. Participating in ceremony is an act of [regeneration](#) for it renews the collective peoples' continued existence in the cosmos.

Indigenous philosophers speak about their cultural cosmologies in ways that tell the story of the Land and the ancestors in the Cosmos. According to Anishinaabekwe philosopher, Leanne Simpson (2017),

Our Indigenous bodies exist only in relation to Indigenous complex, nonlinear constructions of time, space, and place that are continually rebirthed through the practice and often coded recognition of obligations and responsibilities with a nest of diversity, freedom, consent, noninterference, and a generated proportional, emergent [reciprocity](#). Reciprocal recognition is a core Nishnaabeg practice. We greet and speak to medicinal plants before we pick medicines. We recognize animals' spirits before we engage in hunting them. (p. 182)

In this philosophy, the ancestors are always present in the spirits that cohabit the Land and death is only the end of one embodied existence. The ancestors are not stuck in the past but are ever-present Beings and, as Simpson explains, "it is my responsibility with them and those yet unborn to continuously give birth to my Indigenous present" (p. 193).

Jeannette Armstrong (Syilx), writing about the cosmology and philosophy of her people, refers to *captikwl* as a winding rope of continuous knowledge bound to the origins of Life and Land. At the core of the word *Syilx* is the image of *-yil-* that refers to many strands continuously woven together to make one strong rope that coils year after year into the future. *Captikwl* is a distinctly Indigenous adaptive response within Earth systems that continually creates the *Syilx*.

This distinctly oral knowledge depends on an egalitarian governance system that builds its laws on *naw'qinwixw*, the First Instructions (Armstrong, 2007, p. 7-10, 44).

Indigenous philosopher Leroy Little Bear (Niitsitapi-Kainai) recognizes mutuality in the relationship between cosmos, Land, and persons. Earth is honoured as Mother-the giver of life-and inseparable from the identity of Being an embodied Blackfoot. “In Blackfoot cosmology of place and space, we know the balance of relationships in our traditional territory. Maintaining those relationships allows continuity” (Little Bear, 2018). Existence consists of energy that animates a world always in flux:

The idea of all Beings in constant motion or flux leads to a holistic and cyclical view of the world. If everything is constantly moving and changing, then one has to look at the whole to begin to see the patterns. For instance, the cosmic cycles are in constant motion, but they have regular patterns that result in recurrences such as the seasons of the year, the migration of the animals, renewal ceremonies, songs, and stories. Constant motion, as manifested in cyclical or repetitive patterns, emphasizes process as opposed to product. It results in a concept of time that is dynamic but without motion. Time is part of the constant flux but goes nowhere. Time just is. (Little Bear, 2011, p. 78)

The Maternal in Cosmology. Women are represented in [cosmological](#) narratives as Ancestral Mother who gives birth to the world and sustains all her children with the bounty of the world's [immanent](#) regenerative forces. Land is sacred because it is the body of the mother. Water is sacred because it is the birth fluids of the mother. Plants are sacred because they provide food for the mother's children. In Cree/Saulteaux cosmology, the love of a woman was so great and so powerful that it caused creation to take place, and for that reason, “the

foundation of our people is the heart of a woman. When they are strong, we are strong”

(Anderson, 2011, p. 131). Susan Hill (Mohawk-Haudenosaunee) writes that The Haudenosaunee Thanksgiving Address reminds the people of their origins and responsibilities:

The earth is our mother and that she supports all life as we know it. This echoes the Haudenosaunee Creation Story, which teaches that the first person born on this earth was buried under the ground, and from her body the plants that sustain life grew and continue to grow to this day. The Four Ceremonies recall the gifts of creation and remind us of our dependence upon the earth. (Hill, 2017, p. 15)

Sky Woman’s First Instructions to the Haudenosaunee people include assigning women with the responsibility of feeding the people by growing plants and working with Land because Land is the basis for life. According to Hill, the ancestors and future generations cohabit the Land with the living: “The faces of the future generations are below the ground and the dead are returned to the earth just as the Creator’s mother had been at the beginning of the world” (p. 52).

Living the cosmology of the Land, as a condition for cultural continuity, is discussed again in Learning Roots 4 from the perspective of designing climate change adaptations.



Relating with Land and Kin

[Relationality with Land](#) is not an abstraction but grounded in deep relational networks experienced by an Indigenous culture living in a particular place for millennia. Relationality refers to a philosophy of interconnectedness or [nonduality](#) between and among all living things and the Earth. In Oceti-Sakowin (Sioux) culture, the ethic of care is enacted in relationality and

expressed in collective practices of caregiving and making relations with human relatives, Land relatives, and Land itself (TallBear, 2017). In this context, [decolonizing](#) is the process of expanding “critical relationalities” in multi-species communities (TallBear and Willey, 2019, p. 13).

Simpson (2014) refers to relationality as an “intelligence” conducted with respect, responsibility, and generosity (p. 13):

a web of connections to each other, to the plant nations, the animal nations, the rivers and lakes, the cosmos, and our neighbouring Indigenous nations. *Kini Gchi Nishanaabegtogamig* is an ecology of intimacy. It is an ecology of relationships in the absence of coercion, hierarchy, or authoritarian power. (Simpson, 2017, p. 8)

Intense love of Land, family, and nationhood is the “spine of Indigenous resistance” that motivates profound caring for surviving by “working together toward a radical alternative” (p. 9). Intentional caring relationality, respect and reciprocity are vital to maintaining harmony and balance in a network of relationships with Land and the interspecies kin who share the Land (Courchene, Bone, Paynter et al., 2021). Reciprocity is a way of being responsible in one’s network by enacting ethical protocols that demonstrate gratitude, caring, and respect for Life, and the teachings of the Elders (Johnston et al., 2018, p. 15).

Denise Nadeau and Alannah Young, two Indigenous researchers, use protocol to honour their relations and to introduce themselves to a group:

We acknowledge our place in Creation and remember the Ancestors who have gone before and the teachings they left with us for the benefit of the future generations. We acknowledge the sacred gifts of the earth, the air, the fire, and the water that give life

and sustain us. We acknowledge the minerals, plants, animals, and the humans as our relatives. We acknowledge the traditional ancestral territories in which we visit, work, live, and we honour where our original Ancestors' lineages come from and the gifts they offer in our lives as they continue to direct our intention to reflect our spiritual teachings in practice. (Nadeau and Young, 2006, p. 87)

Jody Wilson-Raybould writes that among her people, the Kwak'waka speaking peoples in the North Pacific, leadership is viewed as caring for relations. Leadership responsibilities for facilitating consensus decisions are exercised by diverse roles that maintain balance and harmony in relations among the people. A clan's Hereditary Chief is *Hamatsa*. *Hiligatxste* refers to a role held by women as one "who corrects the Chief's path" (Wilson-Raybould, 2019, p. 5, 214).

Several Indigenous expressions for relationality are difficult to interpret because the English language lacks words to adequately explain their complex philosophical meanings. In Cree, *miyowicehtowin* refers to having good relations and *wahkohtowin* refers to interconnectedness or kinship in relations with the living world. In Anishinaabemowin, the expression *mino bimaadiziwin* refers to good living. The Mi'gmaq term *netukulimk* refers to living well. These expressions are similar to the Andean philosophy of *sumak kawsay*, meaning living life in harmony and plenitude, and expressed in Spanish as *buen vivir*. The Haudenosaunee philosophy of *skennen'kowa* (carrying peace between peoples) also refers to a quality of relationship (Battiste, 2013, p. 183). These philosophies have a collective meaning of living in harmony and balance together and cannot be interpreted in the English way of offering well-wishes to an individual, e.g., have a good day.



Regenerating

[Regenerating](#) is participating with life forces in the cycle of life that connects all Beings in beginnings, flourishings, and endings. Simpson interprets *mino bimaadiziwin* as a philosophy of continuous rebirth wherein the purpose of life and culture is regeneration-to create more life (Simpson, 2011, p. 142). She insists that a philosophy of regeneration in cyclical spacetime is critical to [resurgence](#):

My Ancestors are not in the past. The spiritual world does not exist in some mystical realm. These forces and Beings are right here beside me-inspiring , loving, and caring for me in each moment and compelling me to do the same. It is my responsibility with them and those yet unborn to continuously give birth to my Indigenous present ... the present, then, is a colliding of the past and the future. Everyday embodiment is therefore a mechanism for ancient beginnings. Engagement in these practices unlocks their theoretical potentialities and generates intelligence. (Simpson, 2017. pp. 192-3)

Simpson links regeneration to collective agential actions in Indigenous systems that ensure the continuation of future generations. In an interview with Naomi Klein (2013), she talks about regeneration as process:

In Anishinaabeg society, our economic systems, our education systems, our systems of governance, and our political systems were designed with that basic [regenerative] tenet at their core ... In Anishinaabeg philosophy, if you have a dream, if you have a vision, you share that with your community, and then you have a responsibility for bringing that

dream forth, or that vision forth into a reality. That is the process of regeneration. That is the process of bringing forth more life—getting the seed and planting and nurturing it. It can be a physical seed, it can be a child, or it can be an idea. But if you are not continually engaged in that process then it doesn't happen. (Simpson, interviewed by Klein, 2013, np)

Seeds represent the wisdom of the ancestors (Simpson, 2011, p. 38); they also carry the potential of resurgence when the time is right (p. 66). [Resurgency](#) refers to the Indigenous movement to strengthen sovereignty in order to endure, not as decolonization, because resurgency is moving forward even if the colonizer fails to decolonize (p. 18-9).

The concept of [regenerative force](#) as immanent life force or inwardness is woven into several Indigenous cosmologies. Philosopher Willie Ermine (1995) describes the Cree concept of life force as *mamatowisowin* translated as “being in connection with happenings” that fluctuate between past, present, and future. He refers to “a mysterious force that connects the totality of existence – the forms, energies, or concepts that constitute the outer and inner worlds” (p. 103). *Mamatowisowin* describes the capability of tapping into the life force as a means of procreation; it assumes that constant flux can be tapped by practising inwardness (p. 104). Inuit philosopher Arnakak speaks of *Sila* as a “living, breathing immanence” that actively participates in all Beings as the ungendered animate and sentient life-force of the Arctic. *Silatunig* refers to the practical intelligence of living with this immanent force. Observations about climate change are based on *silatunig* and how climate, weather, and air are changing temporally and spatially (Leduc, 2010, p. 19-32). Inuit people respect Sedna, Mother of the Sea, who is the ethic of harvesting only as much as is needed. The Inuit cosmology of Sedna teaches ethical relationship with kin and the consequences to climate if people cause imbalance to cosmic relationships (p.

179-211). Rituals and ceremonies to honour Sedna are not propitiatory but performative modes of participating in the regeneration of the world.

Traditional foods are sacred, a gift from Mother Earth that is reciprocated by community feasting. Before contact, Indigenous peoples enjoyed [food sovereignty](#) and unlimited clean water. Indigenous communities are traumatized when their traditional food sources are no longer available or safe to eat. Seeds are sacred as food and as symbols of regeneration. Knowledge of plant medicine is not a possession; it is an ethical relationship.

Laura Hall (2008) reMembers the Haudenosaunee cosmology of Sky Woman who fell from the sky with three types of seeds under her fingernails from the roots of the Life Tree. Corn, beans, and squash-the plants known as the Three Sisters-are sacred gifts to Haudenosaunee women who learned the spirit knowledge of seeds and became proficient in plant breeding. After relocating her home to Haudenosaunee territory and relearning women's traditional responsibilities for farming and care of the Land, Hall experienced "the degree to which Land loss and environmental degradation have undermined the agricultural tradition of Haudenosaunee women" (p. 151). Her first experience of growing corn reconnected her with her ancestors, her cosmology, and the power of Haudenosaunee women (p. 152); it opened her mind to "re-vision" new possibilities (p. 157) for reclaiming Haudenosaunee ways of knowing and of living. Inuk leader Sheila Watt-Cloutier (2015) speaks of the loss of country foods due to pollution and climate change as a cultural and a spiritual loss: "Country foods connect us to the water and the land, to the source of our life... The preparation of this food... links us to our forebears, to our families, to our community." Sharing country food is a deeply ingrained Inuit tradition and losing this food is devastating (p. 138). "Food that nourished us in our cold

environment, that we cherished, that had held families and communities together for generations, has turned out to be toxic” (p. 137).

Mothers regenerate life, thereby ensuring the continuity of the culture. Mothers are respected as sacred as a force of regeneration because they bring new life into the world (Courchene, Bone, Paynter et al., 2021, page 87-94). Birthing new life participates in the self-renewing, regenerative process of Mother Earth. Mothers are elevated as carriers of culture and the unbroken continuity of regenerative power (Bedard, 2006; Simpson, 2011, p. 28; Carrière and Thomas, 2014; Simpson, 2014, p. 13; Anderson, 2011). As carriers of culture, mothers are first teachers of language, stories, and songs, and thus of Indigenous Knowledges and identity.

Water, as a regenerative life-force that sustains life, is a sacred, living Being that is interconnected with all Beings. Josephine Mandamin, founder of the Water Walker movement, demonstrated how to reciprocate relationality with Water by supporting and protecting Water in fulfilling its responsibilities for sustaining Life. Water governance takes a long-term approach for sustaining future generations. In Anishinaabeg tradition, women have a special role to speak for Water (Bedard, 2008; McGregor, 2012; Craft, 2013, 2016). Despite boil water advisories in many Indigenous communities, women continue to lead political movements to protect water from pipeline construction, e.g., #tinyhousewarriors, #NoDAPL, #waterislife (*Mní Wičóni*).

Regeneration is the catalyst for Indigenous resurgence movements that engage in political actions to create more life, promote life, and defend life. Regenerative practices involve intelligence and relationality:

We cannot carry out the kind of decolonization our Ancestors set in motion if we don't create a generation of land-based, community-based intellectuals and cultural producers who are accountable to our nations and whose life work is concerned with the regeneration of these systems. (Simpson, 2017, p. 159)

Simpson compares decolonizing to the time when the Hoofed Nation withdrew to illustrate the principle of “generative refusal,” by disengaging from a violent relationship with another culture or species. By turning inward, the Hoofed Nation recovered from grief and trauma (p. 243). The Indigenous culture entered a reconciliatory process to rebuild its relationship with the Hoofed Nation. Generative refusal changed not only the actors involved, but the power dynamics between the Hoofed Nation and the Nishnaabeg. Similarly, when the Nishnaabeg culture practices generative refusal by disengaging from the settler state, it asserts its independence as a sovereign Nations and generates new conditions for Indigenous futures (p. 245).



Sharing

[Sharing](#), as a condition for cultural continuity, applies the ethic of care to distributing resources so that no Being is left behind. Indigenous peoples [reciprocate](#) the Land's bounty by practising generosity through [gifting economies](#), including the potlatch, balhats, and ceremonial give-aways, not out of obligation or exchange, but out of gratitude (Collison, 2010, p. 198; Robertson, 2012; Anderson, 2016, p. 34-38; Simpson, 2017, p. 50, 77; Hill, 2017). Generosity is affective because it involves caring and empathy. Cosmological narratives frequently provide ethical instructions for expressing thankfulness and taboos for [greed](#). Inuk leader Sheila Watt-

Cloutier (2015) describes *Tukkussueq*, the Inuit value of generosity, which is embodied by the community sharing of the hunt (p. 293). The ethical relationship with relatives who are hunted for food is a delicate balance. Betty Bastien (Piikani-Siksikaitsitapi) (2004) laments that the consequences of her people's participation in the fur trade was a broken relationship with fur-bearing animals that breached the principle of the sacredness of life and altered the interdependent relationships that maintained cosmic balance in the Siksikaitsitapi world. The most obvious broken relationship is with the bison, which had been a staple source for food, clothing, and shelter for Siksikaitsitapi and Cree. When the relationship with bison shifted to a commodity, the ceremonial and subsistence relationship was broken, violating natural laws to respect interrelatedness of all Beings, and causing imbalance. The bison was taken from the people (p. 18). To restore cosmic balance in the Siksikaitsitapi world, the people have renewed their traditional practices of sharing and generosity. Giving gifts is a way of participating in natural laws; it restores the fabric of the culture (p. 145).

Leanne Simpson (2017) critiques capitalism for driving dispossession and loss of habitats for relations including salmon, caribou, bison, and wild rice:

We have thousands and thousands of years experience building and living in societies outside global capitalism. We have hundreds of years of direct experience with the absolute destruction of capitalism. We have seen its apocalyptic devastation of our lands and plant and animal relations. (p. 73)

She notes the intensification of “colonial pillage” or “hyper-extraction of Indigenous lands” (p. 73). Elders warned that settler societies built on conquest are unsustainable. Colonialism and capitalism are based on [extractivism](#). Capitalism views land as a resource to be commodified

through extractivist development that is stealing: “it is taking without consent, without thought, care, or even knowledge of the impacts ... on other living things” (p. 75). The Indigenous alternative to extractivism is “deep reciprocity” that is a responsibility enacted locally in societies “where consent, empathy, caring, sharing ... are centered” and harvests are distributed to the most vulnerable first (p. 77). We return to the concepts of sharing economies, gifting economies, and reciprocity in Learning Roots 5.



ReMembering

ReMembering as a condition for cultural continuity refers to agentic [cultural memory](#) transmitted across generations in intentional ways. Cultural knowledge is transmitted through various media, including stories, songs, and ceremonies that use shared gifts of language and symbols, which contribute to a collective identity (LaRocque, 2011; Anderson, 2011; Metallic, 2015; Simpson, 2017). With digital media offering creative opportunities for design, Indigenous teachings, music, and art is transmitted to keep the vision alive.

Blair Metallic (Mi'gmaw) (2015) asserts that Indigenous stories “assure culture continuity by creating and keeping a collective memory” that is repeated in telling stories. She defines *continuity* as “forward-motion,” meaning a constant state of renewal. Mi'gmaw practices of cultural continuity include traditions, consciousness, and language that respect cultural memory in ways that transmit the collective past as cultural knowledge (p. 4). Collective [agency](#) maintains the oral tradition that transmits collective knowledge and practices it through collective living. Narratives of the past carry onward a vision of a future defined by the place and identity of the present (p. 154).

Emma LaRocque (Métis) (2011) explores “cultural agency” by examining the body of literary work produced by Indigenous women (p. 149) whose agentic action of sharing knowledge continues despite the collective transgenerational trauma of colonization: “The act of writing is an act of agency, and agency is cultural continuity in its articulation of our histories ...and our cultural values” (p. 163). Larocque views culture as collective memory in which both oral and written forms of communication serve to renew and sustain cultural continuity as a “cultural fluidity” that contradicts anthropology’s perspective of Indigenous cultures as static and unable to adapt (p. 162). Respect for Elders is a critical part of collective sharing knowledge in oral traditions (Collison, p. 207) and that respect is integrated in the three phases of Elderhood: community leadership, ceremonial leader, and Earth Elders who know the philosophies required for in-depth learning (Anderson, 2011, p. 128-9).

The Haudenosaunee and the Anishinaabe have prophetic teachings that guide their preparations for the future. Prophecies are an important part of cultural memory. Susan Hill (Mohawk) recounts the prophecies of *Karihwiyo* that address cultural continuity in the face of extreme land loss “that would ensure the survival of the people and the perpetuation of their Original Instructions” (p. 48), which emphasized the ethic of thankfulness. A prophesy related to Land use came with a warning that colonial land use would result in degradation of Land and water. In a vision, Handsome Lake was shown water in Haudenosaunee territory that was not drinkable and a river on fire (p. 51). Haudenosaunee today recognize that many prophecies have become their reality due to harmful actions of those who do not have gratitude for the bounty of the Land and consequently endanger the entire world (Hill, 2017, p. 46-51).

The Anishinaabeg Eight Fires Prophecy suggests that there is a great deal of work to do before the Eighth Fire can be lit (Simpson, 2008, p. 13-28; 2011, p. 18, 38-40):

The Seventh Fire foretold of a time when the most oppressive parts of the colonial regime would loosen and Nishnaabeg people would be able to pick up the pieces of their language, culture and thought-ways and begin to build, in essence, a resurgence... It is the responsibility of the new people, the *Oshkimaadiziig*, to pick up the pieces of our lifeways, collectivize them and build a political and cultural renaissance and resurgence. It is foretold that if this is done in a good way, it has the power to transform settler society generating political relationships based on the Indigenous principles of peace, justice and righteousness as embodied in *mino bimaadiziwin*. (Simpson, 2011, p. 66-7)

Knowledges hidden underground during the Fifth and Sixth Fires are now brought forward by the Midewin to guide the people in imagining “an Indigenous future radically decoupled from the domination of colonialisms and where Indigenous freedom is centered” (Simpson, 2017, p. 192).



Welcoming Difference

[Welcoming difference](#), as a condition for cultural continuity, refers to intentional relationality that respects uniqueness and draws on difference to strengthen the pluralistic fabric of the community, in contrast to coloniality's fear and intolerance of difference, which Dwayne Donald (Cree-Papachase) (2009) refers to as “fort logic.” Indigenous practices for integrating differences include adoptions, which are negotiated with diplomacy (Hill, p. 63, 93). Many Indigenous cultures have a nonbinary conceptualization of gender and sexuality. The

Swampy Cree dialect of Alex Wilson's community of Opaskwayak Cree Nation has no word for homosexual and no gendered pronouns that divide the world into female/male, or make linguistic distinctions based on sexual characteristics or anatomy. Cree cosmology recognizes and accepts gender and sexual plurality (Wilson and Laing, 2018, p. 139). Wilson (1996) cautions against romanticizing Two Spiritedness by treating queer persons as special (p. 305). Using *queer*¹⁸ is a way of disrupting coloniality that punishes deviance and imposes European gender and sexual binaries and hierarchies through colonial policies (Wilson, 2015). Simpson (2017) notes that the English language has a limited vocabulary for intimate relationships outside [heteropatriarchy](#), which "places the relationship of cisgendered, married, monogamous men and women at the top, and de-emphasizes or erases all other relationships" (p. 134). She calls for disrupting colonial hierarchies and restoring sovereignty to all Indigenous bodies.

Survivance

In the Introduction to this chapter, I wrote that longevity of Indigenous cultures indicates an [adaptive capacity](#) that may be unparalleled. Indigenous adaptive capacity was challenged during The Little Ice Age climate event when French and English invaders entered their territory without nation-to-nation protocol and brought [mass migrations](#) of European humans, plants, animals, and diseases to this continent. In this section, I discuss how colonial Canada attempted to erode Indigenous' peoples' adaptive capacity in each of the conditions for continuity discussed in previous sections.

¹⁸ *Queer* is an inclusive term for the plurality of gender identities and sexual preferences. It avoids *bisexual* and *Two Spirit*, where *bi-* and *Two* imply binary gender.

First, Indigenous capacity to live the [cosmology of the Land](#) was attacked when Canada introduced The Indian Act (1876), which prohibited Indigenous ceremonies. The ban was lifted when The Indian Act was amended in 1951. Subsequently, Indigenous cultures renewed their ceremonial practices, demonstrating survivance. Pow-wows are now public events. The Midewiwin strategy of going underground preserved their knowledge during the ban. Indigenous women are resuming their traditional role as ceremonial leaders and Knowledge Keepers (Anderson, 2011). However, to date, Canada has not introduced policies to regulate missionization and other methods for imposing Christian religion.

Second, Indigenous capacity to maintain [relationality with Land and kin](#) was disrupted by colonial imposition of patriarchal social organization and municipal-style governance, which put Indigenous men in charge as chief and band councillors, a role for which they were ill-prepared, making First Nations vulnerable to manipulation by colonial politicians who were not willing to negotiate with women as political leaders (Lawrence and Anderson, 2005). The ceremonial ban was enforced by Indian Agents who organized an unauthorized pass system to prevent cultural gatherings and to restrict parents from visiting their children at residential schools (Carter, 1990; Daschuk, 2019). Relationality with Land and kin was disrupted when the government relocated reservations to marginal land and exterminated the bison. Indigenous resurgence, as a political movement, indicates survivance; however, ongoing coloniality manifests as oppressive surveillance of the Idle No More movement, compelling the movement to go underground.

Third, Indigenous capacity to [regenerate](#) their cultures was attacked by the colonizer targeting the power of Indigenous women as life-givers by reducing them to lowest status,

stealing their children, criminalizing midwifery, and sterilizing women without informed consent. Indigenous cultures demonstrate survivance by [rematriating](#), reclaiming [food sovereignty](#) and traditional birthing and child rearing practices. They are Idle No More, leading their communities in reclaiming traditional forms of governance that prioritize caring.

Fourth, Indigenous capacity to practice [sharing economies](#) and [gifting economies](#) was attacked by the ceremonial ban that prohibited potlatch, *balhats* and give-aways. These economic practices applied the principles of caring, reciprocity, and egalitarianism so that the entire community received care. The principle of egalitarian sharing undergirds Jordan's Principle, an Indigenous-led policy to hold governments accountable for leaving no child behind. In 2007, Indigenous child advocate Cindy Blackstock filed a complaint against The Human Rights Act regarding government underfunding of Indigenous children's services despite greater needs than non-Indigenous children. In January 2016, after nearly a decade of delays by the federal government, the Canadian Human Rights Tribunal (2016, January 2016) decided in *First Nations Child and Family Caring Society of Canada v. Canada (Attorney General)* that the federal government's funding model resulted in denials of services and created adverse impacts for many First Nations children and families living on reserves (p. 161). The state placed Cindy Blackstock, advocate for Indigenous children, under such aggressive surveillance that it drew a reprimand from the Canadian Human Rights Tribunal and attention from the media (Diebel, 2013; Blackstock, 2016).

Fifth, Indigenous capacity to [reMember their cultural memories](#) was attacked by forcing children to attend residential schools. By separating Indigenous children from their families, stories, and language, the colonizers removed them from Indigenous collective memory and the

teachings of the ancestors (Metallic, p. 110). The outcome was intergenerational trauma due to loss of connection with Land, language, tradition, and the security of family. Survivance is manifest despite the “attack on Indigenous memory” in practices of cultural genocide at residential schools (TRC, 2015, p. 267).

Sixth, Indigenous capacity to [welcome difference](#) was attacked by federal laws that criminalized homosexual behaviours and imposed European binary concepts of gender and sexuality on First Nations. Survivance manifests as reclamation of Indigenous pluralistic concepts of gender and sexuality and exposes the violence of the colonizer’s binary ideology. The *Final Report of the MMIWG Inquiry* (MMIWG, 2019) found gendered and racialized genocide against Indigenous women, girls, and queer persons and it exposed misogyny, transphobia, and homophobia.

Survivance, coined by Vizenor, differs from basic survival in the face of the colonizer’s power of dominance. It means surviving settler colonial genocide by outwitting the colonizer and recreating sovereign spaces of renewal and resistance. It refuses victimry and resists colonial [methods of erasure](#) by continuing to tell Indigenous stories of regeneration and resurgence that assert ongoing presence (Vizenor, 2008), despite polite Canada’s attempts to erase Indigenous peoples using policy and practice. Simon Lambert (Maori) (2023) refuses *resilience* thinking “as an admirable callus [sic] on our collective lives—built up over generations of oppression” because it reifies the stereotype of vulnerability and diverts attention from survivance through sovereignty—an Indigenous approach to surviving disaster. Like Lambert, I do not use the term resilience, and prefer the terms adaptive capacity and enduring.

Preparing to Survive Climate Change

Survivance is indicated in the capacity of Indigenous cultures to change as they agentically prepare for Anthropogenic Climate Change by:

- reclaiming their languages in which Indigenous ecological knowledge is embedded,
- reclaiming Indigenous food sovereignty,
- protecting water and renewing traditional knowledge of Water Laws,
- renewing practices of their sharing traditions,
- rematriating,
- creating Land-based learning camps, and
- ensuring no child is left behind (e.g., Jordan's Principle).

These [adaptation strategies](#) may not be perceptible to settlers for several reasons. First, they are cultural adaptations, unlike engineered infrastructure adaptations of settler Canadians trying to protect their material assets by terraforming land and bodies of water. Second, settlers tend to forget how much Indigenous cultures lost due to colonization. I believe that Land-based survival knowledge is one of the most valuable assets for climate change adaptations, and for that reason, I focus on designing local or land-based [climate change adaptations](#) based on values and practices that enabled Indigenous cultures to endure past climate events.

At annual Igniting the Fire Gatherings, Indigenous Elders and Knowledge-Keepers from across the Americas gather to discuss preparations for climate change and to exchange the gift of seeds.

Prepare for hard times. Do not waste time in trying to fight a system that will not change.

Rebuild yourselves. A treaty is a covenant – it is a commitment... our identity and relationship. That relationship has also included the newcomers. We would share not only the Land, we would share the values, the teachings, the protocols in taking care of the Land. It is never too late for them to change – to join us in taking care of the Land.

(Courchene, 2017)

I had the privilege of attending several Igniting the Fire Gatherings. The Knowledge-Keepers associated with Turtle Lodge International Centre for Indigenous Education and Wellness published a book to call Indigenous peoples to participate in the future by returning to traditional ways. *Wahbanang: The resurgence of a people, Clearing a path for our survival* (2021) is co-authored by Knowledge-Keepers David Courchene, Jr., Harry Bone (Anishinaabe), Florence Paynter (Anishinaabe-Ojibwe), Philip Paynter (Cree), Katherine Whitecloud (Dakota), Robert Maytwayashing (Ojibwe), Mary Maytwayashing (Ojibwe), and Gordon Walker (Cree), with contributions by the late Orianna Courchene (Anishinaabe). *Wahbanang Call to Action 9* calls for making "our survival in times of climate change a priority and focus on preparing our communities and families for our spiritual, emotional, physical, and mental survival" (p. 284).

Synthesis of Findings on Indigenous Conditions for Cultural Continuity

What do designers of local climate change adaptations need to know about Indigenous conditions for cultural continuity that enabled Indigenous and ancient cultures to endure past climate change events? With the goal of facilitating radical literacy for climate change adaptations, I synthesize the knowledges about climate change adaptations discussed in

Learning Roots 1. These findings are based on reading across Indigenous cultures in the Land now called Canada.

- Indigenous cultures, having the greatest longevity of all cultures, demonstrate adaptive capacity by having endured past climate change events and by surviving coloniality.

Their adaptive capacity can be attributed to Indigenous conditions for cultural continuity, which include but are not limited to:

- living the cosmology of the Land,
- relationality with Land and kin
- regenerating,
- sharing,
- reMembering cultural memories, and
- welcoming difference.

These conditions can be regarded as principles for climate change adaptations because they have proven their effectiveness over time and provide ethical guidance.

- Regeneration is a power, a principle, and a condition for cultural continuity. The six conditions for cultural continuity are not discrete categories but are tightly interwoven as a regenerative way of being in the world, a philosophy of regeneration with guiding principles enacted in practices. As a power, it co-exists with Modernity's power of domination but may not be perceptible to Modern humans. It is the power of ongoingness that sustains Earth-centered cultures. As a philosophy, it is a way of life, an onto-ethico-epistemology, cosmology, and metaphysic. Regeneration occurs in a cosmology of spiraling time.

- Indigenous resurgence manifests as communities agentially preparing to survive Anthropogenic Climate Change by reclaiming their languages, refreshing Land-based knowledges, living their Land-based cosmologies, reclaiming food sovereignty, rematriating, and strengthening support for children and mothers. These preparations rely on agentic cultural memory.

Learning Roots 1 provoked my curiosity about the lack of agency in settler culture in preparing for Anthropogenic Climate Change.

Questions for Reflection and Discussion

1. How is your silatunig?
2. What is the place of your belonging?
3. Imagine designing climate change adaptations for your community that are based on the principles embedded in the six conditions for cultural continuity explored in this module.

Praxis. Each morning, greet the sun and express gratitude for a new day. Ground yourself in Mother Earth.

Suggested readings

- Eighth Fire Prophecy, pp. 37-39 in Simpson, L. B. (2011). *Dancing on our Turtle's back: Stories of Nishnaabeg re-creation, resurgence, and a new emergence*. ARP
- Chapter 1 in Hill, S. M. (2017). *The clay we are made of: Haudenosaunee land tenure on the Grand River*. University of Manitoba Press.
- Little Bear, L. (2011). Jagged worldviews colliding. In M. Battiste (Ed.), *Reclaiming Indigenous voice and vision* (pp. 77-85). UBC Press.

Resources for Arts-based Learning

- "Song for Nibi-the Water." The Turtle Lodge shares this original song by Anishinaabe-kwe Strong Standing Golden Eagle Woman (Mary Maytwayashing), who received the song in a dream. It is for all to learn. YouTube.
<https://youtu.be/K3yHiJqZXFc>
- "Umingmak" by Tanya Tagaq, Inuk throat-singer. You Tube.
<https://www.youtube.com/watch?v=O9-HuHhm5fs>
- Terry-Lynn Williams-Davidson (2017). *Out of concealment: Female supernatural Beings of Haida Gwaii*. Heritage House.

Learning Roots 2 - ReMembering Past Climate Events

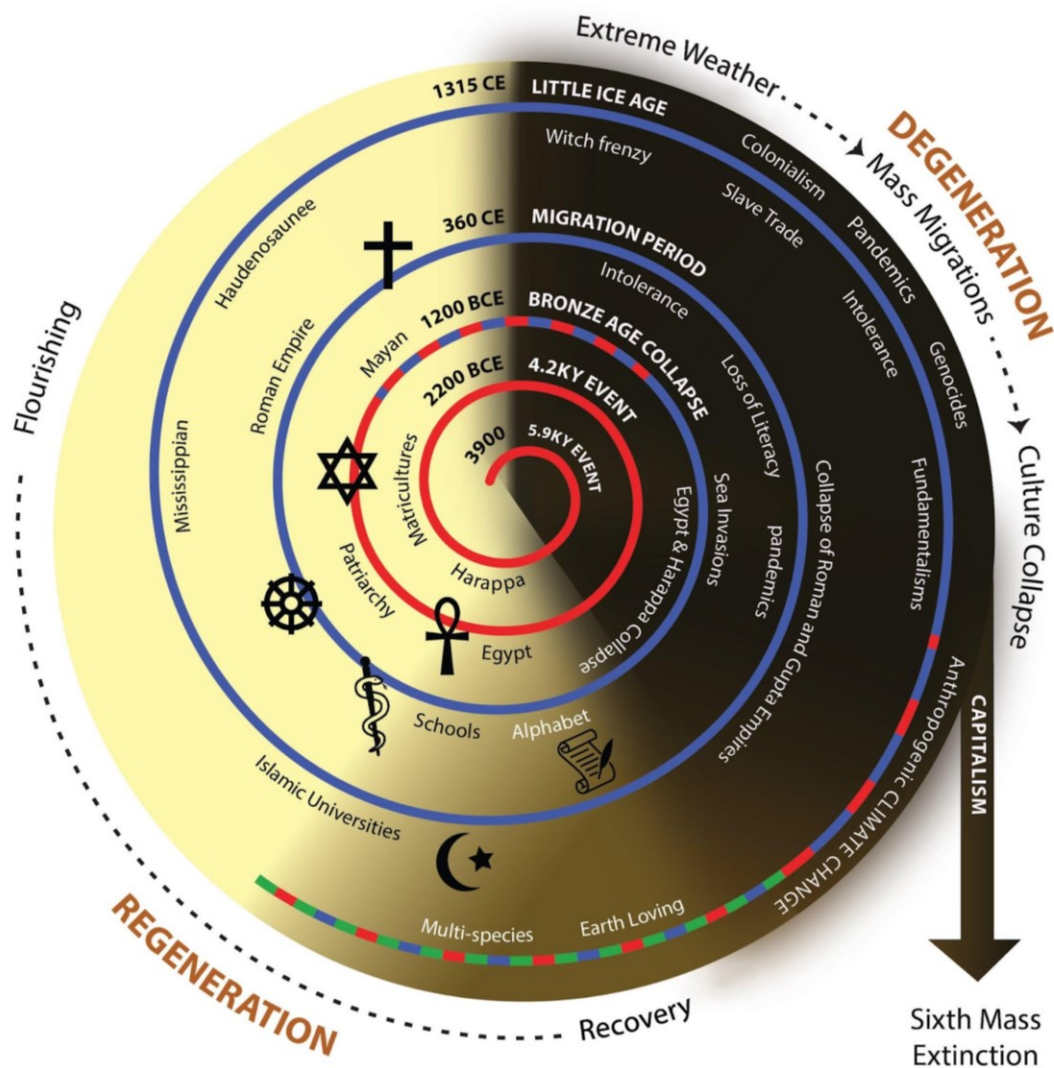


Image 7. The Spiraling Story of Climate and Culture Concept Map 3
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Learning objectives

- to explore past climate change events
- to identify adaptations that enabled ancient cultures to endure the impacts of past climate events.

Overview

We explore the question: Are the Indigenous conditions for cultural continuity identified in Learning Roots 1 relevant to understanding the adaptive capacity of ancient cultures that survived past climate events? Learning Roots 2 is organized into three sections. First, we learn about past climate change events, their causes, and impacts. Second, we explore the adaptive capacity of four ancient cultures that endured an entire climate cycle

and discuss how their adaptations reflect the Indigenous conditions for cultural continuity. The last section briefly discusses maladaptations that contributed to culture collapse in past climate change events. Learning from the past expands possibilities for designing climate change adaptations to endure the current climate crisis.

Weaving Dropped Threads into Radical Literacy for Climate Change Adaptations

Climate change events (5.9 KY, 4.2 KY, Bronze Age Collapse, Migration Period, The Little Ice Age, Anthropogenic Climate Change), climate cycle, climate change adaptations (adaptive capacity, mass migration, decentralization, de-urbanization, hybridity, syncretism), maladaptation (diaspora, invasion), period of degeneration (Egyptian Intermediate periods, Greek Dark Age, Roman/Medieval Dark Age), period of regeneration, pre-patriarchal, Proto-Indo-European.

Introduction. Let me begin by explaining my curiosity about past climate events. While studying climate change denialism, I found that deniers tend to take the first step toward accepting climate change when they learn that climate change events have occurred in the past (Wolfstone, 2014). This finding surprised me and continues to remind me that unprecedented change evokes greater fear than repetitive change; it also motivated me to learn the names and stories of past climate change events and their impacts on ancient cultures, with the hope that fear of climate change will be reduced by learning adaptive strategies of ancient cultures. In school, we learn the names of empires, but not the names of the climate change event that caused their collapse; thus, the present climate crisis disconnects the future from the past, causing fear and anxiety, particularly for those who believe the Modern ideology of continual progress (Chakrabarty, 2009, p. 197).

Learning Roots 2 leans on the work of critical anthropologists who study the impacts of past climate change events on ancient cultures. I relied on their work to build the case studies of Danube, Harappan, Egyptian, and Mayan cultures, enabling me to learn across continents

and avoid a Eurocentric approach. I acknowledge that the case study on Mayan culture is a work in progress; however, new research will thicken that case study.

Past Climate Change Events

Historical climatologists have used several methods to produce a chronology of past climate change events.¹⁹ The Bond chronology is based on the study of North Atlantic ice rafting data (Bond et al., 1997). The Heinrich chronology, also based on ice rafting data, is applicable to studying the northern hemisphere. The Dansgaard–Oeschger chronology is based on Greenland ice core data.²⁰ The interval between climate change events is approximately 1000 years.

Using the Bond chronology, I created a linear timeline of climate events and drawing on the scholarship of critical anthropologists Haarmann (2007, 2020), Chew (2001, 2006, 2007, 2008), and Baer and Singer (2018), I mapped the rise and decline of ancient cultures to the chronology of climate events. These scholars describe cultural decline during climate events. I reconfigured the climate events by plotting them onto a spiral (Concept Map 3), aligning the approximated onset of climate events with the top vertical axis of the spiral. Each revolution of the spiral represents a climate change event. This configuration enabled me to study the patterns by *thinking across* the spiral. The pattern of decline can be seen more vividly. And I was also able to see the gradual recovery and then regeneration. Based on the spiral

¹⁹ Ice-rafting data refers to sediments and debris deposited on/in icebergs.

²⁰ The methods are debated; however, the chronology of climate events during the Holocene Epoch is well established and used by critical anthropologists who study the impact of past climate events on cultures.

configuration, I refer to spontaneously-occurring climate events as a [climate cycle](#) in a pattern of degeneration, recovery, and regeneration in the interplay between climate and culture.

- [Period of degeneration](#), signified by the grey shading on Concept Map 3, refers to the period of ecological and cultural crisis during a climate event. The period of degeneration may last up to 400 years and may be named a “dark age²¹” (Chew, 2007, 2008); it is marked by pandemics, famines, reduced prosperity, [mass migrations](#), invasions, intolerance, and loss of literacy (Chew, 2007, p. 65; Chew 2008, p. 2, Chapter 1; Haarmann, 2007, Chapter 6). If the decline in a culture’s cultural systems is irreversible and its ancestral knowledge is no longer effective for survival in their territory, then the culture may collapse (Haarmann, 2020, p. 19).
- [Period of regeneration](#), signified by the yellow shading on Concept Map 3, refers to the regenerative period after the degenerative period of a climate event. Cultures may begin to recover after the Land has recovered from the impacts of ecological trauma of the climate event. Adaptive cultures renew their [relationship with Land](#) and revitalize. An innovation or new knowledge may provide a catalyst for cultural revitalization or a paradigm shift²². [Hybrid cultures](#) may emerge after mass migrations. Some cultures reach a stage of flourishing in which basic needs are readily met, allowing the culture to invest in innovation and design, for example, grand architecture.

²¹ “Dark Age” is a contested term so I enclose it in quotation marks.

²² My curiosity about innovations in learning during Periods of Regeneration is reflected in Concept Map 3 by including symbols and words for the alphabet and first universities. As a person with different curiosities, you can research related breakthroughs that occurred during the Period of regeneration in past climate cycles.

My synopses of eight climate change events include probable cause, duration, and cultural impacts. There is a great deal we don't know about these climate events. Each climate change event is unique in its causation and its challenges to cultural continuity. The synopses do not rewrite cultural stories, but they add a climate layer to the stories we already know. I begin with the 9.4 kiloyear (KY) event because it links to the geological features of eastern Manitoba where I live and illustrates that climate change events have global impacts.



The 9.4 KY climate event involved massive amounts of water. Melting ice sheets in North America formed glacial lakes Agassiz and Ojibwa, which drained suddenly into the Atlantic, causing a rise in global sea levels. In West Asia, Euxine Lake rapidly flooded with salt water from the Mediterranean Sea and formed the Black Sea. This catastrophic event is remembered as The Great Flood in mythic narratives, including the Epic of Gilgamesh and the biblical flood story (Ryan & Pitman, 1997). The narrative impact of the ancient flood in myth can be associated “with the long-lasting aftereffects of a traumatic experience that shaped the cultural memory of people” (Haarmann, 2013, p. 87).



The 8.2 KY climate event was an abrupt climate event that began ~6200 BCE. The [period of degeneration](#) was marked by aridity and severe droughts. In Anatolia, Çatalhöyük and Hacilar were abandoned (Ryan & Pitman, 1997). Desertification of the Sahara compelled mass migrations to North Africa's great river valleys.

In the [period of regeneration](#), Neolithic agriculture expanded. In eastern Europe, the matrilineal and peaceful Danube culture developed sacred architecture and craft specializations

in pottery and weaving decorated with signs and symbols (Gimbutas, 1982, p. 8; Gimbutas, 1991, p. 211, 342). Its Vinča script predates the Egyptian script (Haarmann, 2020, p. 24, 159). This egalitarian culture was based on the [oecumene system](#) (p. 101), an egalitarian socio-economic governance model, and predates Athenian democracy. In North Africa, the Nabta Playa megalithic calendar in the Nubian desert indicates advanced astronomical knowledge and a flourishing agricultural community with domesticated cattle (Wendorf & Malville, 2001, p. 489).

6

The 5.9 KY climate event began ~3900 BCE and was an intense aridification event. The Danube culture was over-run by kurgan²³ invaders from the Pontic region in three mass migrations from 3500 BCE to 2200 BCE. The invaders, using weapons, domesticated horses, and chariots, imposed their Proto-Indo-European, language, patriarchal social organization and [cosmology](#) with a male sky God *Dyeus* on the Danube culture. The invasions resulted in the “abrupt cessation” of the Danube culture’s production of painted pottery and sculptures. The Vinča script fell out of use. The impact was devastating (Gimbutas, 1982, p. 1; 1997, p. 250, 309). In North Africa, the Neolithic Subpluvial ended the alternating humid/arid periods and the Sahara Desert reformed. Due to aridification, Nabta Playa in the Nubian Desert was abandoned; however, the astronomical cultural knowledge of its people reappeared later in the Nile region.

In the [period of regeneration](#), a cosmological shift in Europe and West Asia introduced the [Great Mother](#) coupled with a male god who is her son/lover according to the season, reflecting

²³ *Kurgan culture* is an informal term that refers to the invaders from the Pontic region, more specifically the Samara and Yamna (also spelled Yamnaya) pastoral cultures that buried their dead in kurgan mounds.

the seasonal consciousness of Neolithic agrarian cultures and the emergence of the masculine in cultural cosmologies (Baring & Cashford, 1991, Chapter 4). Egyptian culture emerged in the Nile region. The Egyptian Old Kingdom built pyramids that integrated astronomical knowledge found earlier at Nabta Playa (Malville & Wendorf, 1998; Wendorf & Malville, 2001, p. 489). Cultural memories of Sahara's intermittent wet and dry periods spurred innovations in grain storage to improve capacity to feed people during dry periods (Baer & Singer, 2018, p. 54). In Asia, the Harappan culture thrived in the Indus Valley, building the planned cities of Mohenjo-Daro and Harappa, and designing irrigation systems to support agriculture in village communities. The Harappan culture flourished as an egalitarian *oecumene* system (Maisels, 1999).

6

The 4.2 KY climate event began abruptly ~2200 BCE and may have been triggered by massive volcanic eruptions. Lakes and rivers dried up in a prolonged cold drought that lasted 100 years and up to 300 years in some regions, compelling mass migrations. In Eastern Europe, Pontic invasions of the Danube culture resulted in a cosmological transition reflected in Greek mythology. According to classicist Jane E. Harrison (1912), the earlier Titan pantheon was overwritten by the Olympian pantheon, which assimilated and demoted the earlier layer and elevated Zeus (Dyeus), who murdered his pregnant lover by swallowing her and birthed their daughter Athena from his head (Cavarero, p. 108), symbolizing the attempt by emerging patriarchy to steal the power of regeneration²⁴. Robert Graves (1955) analyzes myths of

²⁴ The notion of a male god giving birth from the head may be a precursor to the Hebrew creation myths where a male god creates the world with words, not with gestation. Mythologies compel us to dig deep into the stories of who we 'think' we are.

matricide, rape, abduction, and murder in Olympian mythology to reveal the older [matricultural](#) layer of Titan mythology that was violently destroyed. In his view, “the political and social confusion of these last 3000 years has been entirely due to man’s revolt against woman” (p. 1). Egypt’s Old Kingdom collapsed and entered the first Egyptian Intermediate Period, marked by drought, social degradation, plundering, squalor, epidemics, and mass death (Weiss and Courty et al., 1993; Weiss, 1997; Diamond, 2005, p. 174, Baer & Singer, p. 51; Chew, 2007). In Asia, a prolonged drought contributed to sudden decline in the cities of Harappa and Mohenjo-Daro. The Harappan culture adapted to the climate event by [de-urbanizing](#) and moving its city populations to rural food production areas. Eventually climate conditions weakened its irrigation systems and reduced its capacity to supply food and water, compelling a mass migration to another river valley (Maisels, 1999, p. 184; Diamond, 2005, p. 174; Haarmann, 2007, p. 171; Chew, 2007, p. 63; Baer & Singer, p. 51).

In the [period of regeneration](#), Egyptians reinvented their culture as the Middle Kingdom. After a Second Intermediate Period, Egypt revitalized its culture as the New Kingdom. Against the advice of his mother, Pharaoh Akhenaten introduced Atenism, a monotheistic religion with a male sky god that lasted only fifteen years. After his death, his mother restored the ancestral cosmology and Earth-centered philosophy. His successors completely erased Akhenaten’s temple-city at Amarna (Haarmann, 2020, p. 90-6).

6

The Bronze Age Collapse climate event (also known as Bond Event 2) began abruptly ~1200 BCE. The [period of degeneration](#), commonly known as the Greek “Dark Age” despite its global scope, lasted 400 years. Prolonged drought is indicated by depopulation, de-

urbanization, and mass migrations. Egyptian records indicate violent invasions by Sea Peoples whose origin and identity has not yet been confirmed. The sea invaders destabilized the Levant, plundering most Mediterranean cities between Troy and Gaza. The Hittite, Akkadian, and Mycenaean cultures collapsed. The Egyptian New Kingdom was destabilized. The islands of Malta and Sardinia escaped devastation by the invaders. When the Mycenaean culture collapsed, its Linear B writing system fell out of use, palaces were destroyed, and monumental architecture ceased (Chew, 2006, p. 153; Chew, 2007, p. 80).

In the regeneration period, the invention of the Proto-Canaanite²⁵ alphabet introduced a mode of literacy that catalyzed knowledge construction and was adapted by other cultures, including the Greeks. The fields of philosophy, medicine and science emerged, and academies of learning were established from Asia to Europe. Canaanite merchants based in Lebanon developed trade networks in the Mediterranean using innovations in shipbuilding and sea navigation. The Roman republic expanded to become the Roman Empire with a centralized system of governance that distributed food from the provinces to the cities. After Rome conquered Egypt, the worship of Isis spread throughout the Roman empire, reflecting religious [syncretism](#)²⁶-one of the Roman Empire's strategies for keeping peace between neighbouring provinces. In Asia, Buddhism and Confucianism formalized as non-theistic philosophical

²⁵ I use Canaanite instead of Phoenician, which was an epithet ascribed by the Greeks, similar to the epithet Berber ascribed to Amazigh Indigenous peoples of North Africa by Roman invaders and the epithet Indian.

²⁶ You can experience ancient Rome's religious [syncretism](#) by visiting Campus Martius where The Pantheon still stands-originally designed as a temple dedicated to all gods. Nearby Basilica Santa Maria *sopra* Minerva is built on top of a Roman temple to the Roman deity Minerva and the Iseum where Isis' rites were practiced.

religions with roots in shamanism. In West Asia, Christianity emerged as a second [Abrahamic](#) monotheism.

6

The Migration Period climate event had two periods. In Europe, the onset is ~300 CE when warming resulted in soil erosion and mass migrations (Chew, 2006, p. 166), often referred to as invasions of the Roman Empire by Huns, Goths, and Visigoths (Chew, 2008). The warm, dry period was followed by a global cool period from 536 to 660 CE that is generally attributed to volcanic eruptions. The end date of this climate event is debated and ranges from 660 and 1200 CE (Chew, 2006, p. 171).

The period of degeneration, known in Eurocentric history as the Medieval or Roman Dark Age, was marked by mass migrations, invasions, famines, social chaos, trade route disruption, loss of literacy, pandemics, economic decline, and system collapse (Chew, 2006, 2008). Due to prolonged drought, Roman authorities were unable to provide the guaranteed distribution of food that had maintained domestic stability. Greek and Roman scholars fled to Persia. The Roman Empire was dissolved in 476. In the Americas, the classic Mayan culture and the Moche civilization of northern Peru also suffered political collapse (Chew, 2006).

Religious intolerance contributed to the decline of the Roman Empire after Christianity became the official religion of the Roman Empire. Emperor Theodosius authorized persecution of [pagans](#), ending the practice of religious syncretism. Many Romans resisted the imposed change in cosmology and the destruction of the temples where they had venerated their gods. In 431 CE, the Catholic Church restored a limited worship of the Maternal by elevating Mary, a strategy that somewhat appeased Roman citizens and accommodated the Eastern veneration

of Mary as *Theotokos*, mother of God; however, the loss of their ancient deities and practices reduced Roman citizens' loyalty to the Roman emperor (Baring & Cashford, 1991, p. 549-72).

The period of regeneration may have been catalyzed by the emergence of Islam, a third Abrahamic monotheistic religion that evolved rapidly into the Islamic Golden Age, generating new knowledges in mathematics, chemistry, and medicine at intellectual centres in Persia. Europe slowly transitioned to decentralized governance and an economic system of feudalism (Wolff, 2020). According to Chew (2008), monasteries and convents were important to the survival of rural populations during times of drought. They introduced adaptations that retained literacy, provided healthcare using herbal medicines²⁷, and shared a subsistence livelihood with the local communities (see Learning Roots 5). In the Americas, the Mississippian culture of mound-builders flourished, developing urban settlements from the Great Lakes to lower Mississippi Valley, with a ceremonial centre located at Cahokia. Five nations separated from the Mississippian culture, forming the Haudenosaunee confederacy that negotiated a joint constitution known as *The Great Binding Law of Peace* (Hall, 2017).

6

The Little Ice Age (LIA) climate event began gradually and impacted regions differently. The start date is contested. Baer & Singer (2018) suggest a start date of 1250 based on the decline of Norse communities in Greenland and Newfoundland (p. 6, 56), while Chew (2008) suggests a start date of 1590 (p. 15). I use a start date of 1315 to correspond with the Great Famine. The northern hemisphere experienced two cold periods. The first cold period was from

²⁷ Hildegard of Bingen published a book on herbal medicine circa 1150 CE. The Benedictine monks at Reichenau Monastery published books on herbal medicine and gardening.

1300 to 1400 and an even colder period lasted from 1560 to 1850 when the average temperature was 2C lower than normal and “glaciers advanced, overrunning towns and farms” (Oosthoek, 2015). The end date of 1850 is based on evidence of glacial retreat and is not disputed. The cause of LIA is not confirmed but consensus is accruing for the Maunder Minimum explanation of reduced sunspot activity. In Europe, the period of degeneration was marked by mass deaths due to the Great Famine, pandemics of bubonic plague and cholera, religious conflict, homelessness due to the privatization of Land, the Inquisition, and executions of thousands of women on trumped-up charges of [witchcraft](#). On Concept Map 3, the thick vertical line veering off the right side of the spiral represents the emergence of capitalism, an economic system entangled with linear time. Colonization, as a project of capitalism, involved mass migrations of European humans, plants, animals, and diseases to other continents, which caused mass deaths of Indigenous peoples due to violence and communicable diseases. I find no period of regeneration as there was no interval between the end of The Little Ice Age and the beginning of Anthropogenic Climate Change.



Anthropogenic Climate Change (ACC) Event evokes debate about its start date. Scientists Abram et al. (2016) argue for an 1830 start date, based on their findings that production of greenhouse gases began in the First Industrial Revolution and was accelerated in the shift to carbon-emitting combustion engines in the Second Industrial Revolution. Other scholars argue that the conditions for ACC began with colonization’s land degradation and deforestation, which reduced carbon sinks and caused atmospheric imbalance (Davis and Todd, 2017). ACC is anomalous for three reasons: it is the first climate change event categorized as anthropogenic,

it overlaps with LIA, and it is co-occurring with anthropogenic [Sixth Mass Extinction Event](#).

Learning Roots 3 focuses on the entanglement of ACC, Modernity, and coloniality.

This brief overview of the archaeology of culture and climate in the Holocene illustrates the spiraling pattern of degeneration and regeneration.

ReMembering Adaptations in Past Climate Events

In Learning Roots 1, we learned about six conditions for cultural continuity that enabled the longevity of Indigenous cultures in the Land now called Canada. In this section, we ask if those same conditions for cultural continuity are relevant to explaining the adaptive capacity of four ancient cultures that endured a full [climate cycle](#): Danube, Harappa, ancient Egypt, and Mayan. If I find that the conditions are relevant, then this finding strengthens my proposal that Indigenous conditions for cultural continuity provide a firm foundation for designing climate change adaptations in the current climate emergency. Learning from the past has potential to expand our imaginations about designing adaptations for the future.

Cultural Memory as a Condition for Cultural Continuity. Harald Haarmann (2009) invites us to think about [cultural memory](#) in three dimensions. The *past* contains the instructions of previous generations about the functioning of community life. Knowledge of cultural heritage is activated for the purpose of making culture operate in the *present*, and this knowledge, in turn, cultivates [agency](#) to plan for the *future* (p. 212). Cultural memory is stored in artifacts (e.g., sculptures) and mentifacts (e.g., traditions) that represent ecological knowledge and cosmological beliefs. When ancestral knowledge about living in harmony with the Land remains effective for surviving an ecological catastrophe, it reinforces traditional cultural patterns (Haarmann, 2007, p. 230). If it becomes ineffective for survival, a culture may attempt to adjust

its ancestral knowledge. Haarmann insists that a culture abandons its ancestral knowledge “only under the condition that the natural environment is destroyed or deprived of its potential to serve as sustenance for the community” (p. 260). During periods of degeneration, scripts or writing systems fell into disuse, resulting in loss of literacy and loss of memory, i.e., Vinča script and Linear B.

Living the Cosmology of the Land as a Condition for Cultural Continuity. Changes to cosmology and religion occurred during past climate change events. Cosmology is cultural knowledge that is preserved and transmitted using narrative, ceremony, ritual, sign, and symbol; it is essential for identity formation and for maintaining a relationship of harmony with the Land. Pontic invaders disrupted the cosmology of the Danube culture by imposing their patriarchal cosmology (Gimbutas, 1997, p. 250, 309). Gimbutas (1991) explicitly describes the Danube culture as “matristic” and “egalitarian” and describes its cosmology as veneration of an Ancestral Mother, progenitor of the culture linked to Earth, Sky, and agricultural cycles (p. 324). Recognizing the problem inherent in the terms *god* and *goddess*, she uses *Genetrix* for the Maternal creator of Life or First Ancestor, and *Regeneratrix* to refer to the life force that mediated the powers of Giver of Life and Wielder of Death (Gimbutas, 1989, p. xix). [Respect for regenerative forces](#) assured ongoingness in the cycle of life and death.

Egypt’s cosmology provided effective knowledge for cultural continuity through two Intermediate periods. Their elemental philosophy aligned male and female deities with life forces: Water and fluidity, Air and infinity, Fire and darkness, and Earth and hiddenness (Abdou and Zervas, 2023, p. 45). Akhenaten’s brief flirtation with Atenism was so offensive that his

name and his temple-city were intentionally erased from cultural memory²⁸. The influx of Saharan migrants during long droughts did not introduce a competing cosmology, as there is a loose syncretism between North African cosmologies, for example, Tamazight Tanit is known in Libya as Neith and in Egypt as Nut. After Egypt became part of the Roman Empire, Isis was syncretized with other deities in the Roman Empire. The adaptive capacity of ancient Egyptians may be attributable to a stable cosmology shared with their kin across North Africa and to long cultural memories of dealing with extreme climate variations when the Sahara alternated between desert and savannah. Africa is matricultural and ancient Egypt honoured those traditions in their cosmology up to the Roman period (Diop, 1989; Amadiume, 1997; Alameen, 2013).

Relationality with Land as a Condition for Cultural Continuity. Adaptation is feasible only if the Land has not reached its peak carrying capacity. Species inhabitants of Land cannot stay in place if food and water are not available. When adaptation limits have been reached, species make mass migrations or die. Mass migrations are usually driven by hunger and thirst because the Land no longer has carrying capacity, but some mass migrations are also driven by violence of war or genocide. Mass migrations re-configure a culture's relationship with Land and kin, often causing transgenerational trauma.

Gimbutas' Kurgan Hypothesis, introduced in 1956, is based on evidence of cultural upheaval when kurgan invaders from the Pontic region disrupted the Danube culture in

²⁸ German Egyptologist Jan Assmann (2010) theorizes that Atenism, not Moses, was the proto monotheism in the cosmological shift from polytheisms; however, Assmann neglects to consider the introduction of Dyeus, chief sky god by Pontic invaders, which predates Atenism and the Abrahamic religions. Assmann does not mention the Danube culture.

multiple mass invasions and imposed their language, cosmology, and social organization on the Danube culture. The invasions resulted in the “abrupt cessation” of the Danube culture, indicated by the sudden stop to production of painted pottery and sculptures. Eventually the Danube culture collapsed. Over decades, interdisciplinary scholars expanded Gimbutas’ Kurgan Hypothesis, which was irrevocably validated by an archaeogenetic study (Haak et al., 2015) and is now known as the Kurgan Theory. In describing evidence of the invasions, Gimbutas was reminded of another invasion when European invaders seized Indigenous lands and imposed European languages, cosmology, and patriarchal social organization on Indigenous peoples (Gimbutas, 1997, p. 250, 309; Gimbutas, 1982, p. 1).

Several successful adaptation strategies are noteworthy. Decentralizing governance is illustrated by the Mayan culture’s decentralization to local communities, which enabled local self-sufficiency by anticipating the break-down of trade and supply networks in a prolonged ecological crisis. De-urbanizing is illustrated by the Harappan culture, which moved urban populations to agricultural areas (Haarmann, 2007, p. 171) as a planned mass migration and resettlement to address food security. Relationality with Land and living the cosmology of the Land as conditions for cultural continuity are further explored in Learning Roots 4.

Welcoming difference as a Condition for Cultural Continuity. [Welcoming difference](#) is a condition for cultural continuity that is illustrated by diverse strategies for receiving mass migrants:

- Hosting relatives refers to a hospitable reception of migrants who are treated as kin.

Ancient Egyptians viewed the peoples of the North Sahara as kin and hosted them during long droughts.

- Hybridization occurs when two cultures coexist for generations and intentionally blend elements of both cultures, forming a unique culture, with a unique dialect, and a hybrid cosmology that unifies the new culture.

Gimbutas (1989) insists that no culture disappears because remnants remain in the substratum of the succeeding culture and those remnants can be found in myths, songs, legends, and symbols of the succeeding culture.

Sharing as a Condition for Cultural Continuity. Egalitarian socio-economic systems are illustrated by the Danube and Harappan cultures. Maisels (1999) coined *oecumene* to refer to the egalitarian socio-economic governance system in Harappa. Haarmann, building on Maisels, identified the Danube culture as another *oecumene*, interpreting the word as “commonwealth” to refer to community settlements of shared Land (Haarmann, 2007, p. 167-77; 2020, p. 100-108). Sharing as a condition for cultural continuity is explored again in Learning Roots 5.

Regenerating as a Condition for Cultural Continuity. [Pre-patriarchal](#) belief traditions were not theistic in the sense of a supreme god who created the world, as in monotheisms. The cosmologies of pre-patriarchal Earth-centered cultures tend to emphasize [respect for regenerative forces](#) that sustain life. Gimbutas finds a [matristic cosmology](#) in Neolithic Europe based on evidence from mobiliary artefacts of female sculptures, with no corresponding artefacts of male sculptures. In *Language of the Goddess* (1989), Gimbutas interprets sculptures and pottery designs from the Paleolithic Age and the Neolithic Age to theorize that the cosmology focused on regeneration, symbolized by water, eggs, breasts, and birth-giving Mother.

The red rotations on Concept Map 3 indicate a period when [matricultures](#) were the most common form of cultural organization and the blue rotations represent Europe's [patriarchal period](#). The transition from the matricultural period to the patriarchal period involved violent social upheaval. Conventional Anthropology, holding to the ideology of universal patriarchy, rejects the notion that matriarchies exist or have ever existed. Critical anthropologists, on the other hand, research matricultures. In Learning Roots 6, we return to the disputed topic of matricultures.

In summary, I have demonstrated that the [conditions for cultural continuity](#) that enabled Indigenous cultures to endure past climate change events are relevant to explaining the adaptive strategies and practices of ancient cultures that endured a full climate cycle. Indigenous conditions for cultural continuity not only have stood the test of time for Indigenous cultures in Canada, but they have also stood the test of time for other cultures. This finding strengthens my proposal that the Indigenous conditions for cultural continuity provide a firm foundation for designing climate change adaptations in the present climate change event; however, more study is needed to confirm this finding by developing additional case studies of adaptive cultures that endured a full climate cycle.

Maladaptation and Culture Collapse: Lack of Agency and Courage

My focus is on cultural continuity in past climate change events; however, I would be remiss if I did not learn from the significant body of literature on culture collapse. The factors of cultural decline are complex and the end of a culture's life cycle is rarely attributed to climate change alone; for example, the decline of the Roman Empire cannot be attributed solely to the Migration Period climate event.

[Maladaptation](#) is defined by IPCC as “action that may lead to increased risk of adverse climate-related outcomes, including via increased greenhouse gas (GHG) emissions, increased or shifted vulnerability to climate change, more inequitable outcomes, or diminished welfare, now or in the future” (IPCC-AR6-Glossary, 2022). I illustrate maladaptation with some examples.

- [Diaspora](#) refers to a rapid, disorganized dispersion of a population when the threat to life is immediate and extreme. The threat could be war, ecological catastrophe, and/or genocide. When refugees disperse to many places, the outcome may be loss of cultural knowledge and cultural identity, aggravated by the trauma of involuntary separation from kin, the homeland, and the burial places of the ancestors. During the Great Famine of Ireland during LIA, one million people died and 1.5 million migrated in a diaspora.
- Invasions create collective fear, particularly if the enemy is unknown. The Pontic invasions of the Danube culture changed Europe by causing (a) a cosmological transition from Earth-centered philosophy to patriarchal sky-god cosmologies, (b) a social transition from matricultures to patriarchy, (c) a linguistic transition that imposed Proto-Indo European language-the antecedent of English, and (d) loss of the Vinča script, Europe’s oldest known writing system. In the Bronze Age climate event, invasions by the sea peoples destroyed cities from the Black Sea to the Nile delta and to date, the identity of the sea peoples remains uncertain.
- Deforestation undercuts the resilience of ancient cultures (Chew, 2001).

- Maladaptations driven by intolerance of difference include a) invasion and colonization where the colonizer imposes its language, laws, and cultural norms on the cultures it colonizes, b) assimilation, c) apartheid systems, and d) genocide.

Anthropologist Joseph Tainter (1988) was skeptical that contemporary complex nations would collapse due to failure to manage their environment; however, historian Jared Diamond (2005), in *Collapse: How societies choose to fail or succeed*, answered Tainter's skepticism by developing case studies of complex cultures that collapsed after experiencing ecological disasters. Diamond attributed culture collapse to lack of agency and identified four types of maladaptations that cause a complex culture to collapse in an ecological disaster:

- failure to anticipate and plan for a problem;
- failure to perceive the problem when the problem arrived;
- failure to attempt to solve problem even if they perceived it; and/or
- attempted solution to the problem did not succeed (p. 421).

Diamond concludes that cultural survival requires agency, perception, problem-solving, and courage to change core values in an ecological disaster. Tainter (2000) revised his viewpoint, acknowledging that while complexity has short-term benefits, it is detrimental to sustainability because institutional problem-solving capacity declines. Simplifying may be the best adaptation because the magnitude, speed, and population impacts of climate change present complex problems without precedents.

James Kunstler, in *The Long Emergency* (2005), predicts that when Anthropogenic Climate Change reaches a tipping point, a crisis will follow in which powerful nations collapse and globalized systems fail. Michael Greer, in *Dark Age America* (2016), building on Tainter and

Kunstler, argues that the United States is already collapsing due to climate change in “a slow and uneven process” of harsh and terrible losses (p. 224); he recommends community-based adaptations by living simply and using one’s own labour to meet basic needs (p. 100).

Synthesis of Findings on Past Climate Events

What do designers of local climate change adaptations need to know about Indigenous conditions for cultural continuity that enabled Indigenous and ancient cultures to endure past climate change events? With the goal of facilitating radical literacy for climate change adaptations, I synthesize the knowledges about past climate change adaptations discussed in this chapter.

- Climate events that changed cultural stories and compelled long-term, large-scale systems changes in the Holocene include:
 - 5.9 KY Climate event,
 - 4.2 KY Climate event,
 - Bronze Age Collapse,
 - Migration Period, and
 - The Little Ice Age.
- Scientists find that spontaneously-occurring climate events occur at 1000-year intervals. I propose the terms climate cycle, period of degeneration, and period of regeneration to refer to the recurring pattern of climate change events, and welcome debate on the accuracy and usefulness of these new terms.
 - Periods of Degeneration include Egyptian Intermediate Periods, Greek Dark Age, and Medieval/ Roman Dark Age. Markers of Periods of Degeneration include

pandemics, food and water shortages, reduced literacy, reduced prosperity, invasions, and social chaos.

- A period of regeneration is not a return-to-normal because the old normal disappeared in the period of degeneration. After Land has recovered from the trauma of climate change, cultures can recover and regenerate. New knowledge or a technology may provide a catalyst for cultural regeneration.
- I find that the [conditions for cultural continuity](#) that enabled Indigenous cultures to endure past climate change events (see Learning Roots 1) are relevant to explaining the adaptive capacity of Danube, Harappan, Egyptian, and Mayan ancient cultures, which endured a full [climate cycle](#). This finding strengthens my confidence in recommending Indigenous conditions for cultural continuity as foundational knowledge for designing local [climate change adaptations](#).
- Adaptation strategies include:
 - embedding cosmology and cultural memory in script and art, (e.g., Danube, Egypt),
 - egalitarian economies (e.g., *oecumene* in Harappa and Danube),
 - respect for regenerative forces (e.g., Danube, Egypt),
 - internal mass migration by de-urbanizing (e.g., Harappa),
 - hosting mass migrations of relatives from the bioregion (e.g., Egypt),
 - irrigation systems (e.g., Mayan, Harappa),
 - long-term food storage facilities (e.g., Egypt).
 - decentralization,

- hybridity, and
- syncretism.
- Learning from the mistakes and maladaptations of cultures that collapsed in past climate change events is important. Lack of courage and loss of agency are factors in maladaptations.
- Knowledge of past climate change events has the potential to reduce fear about climate change and to expand imagination for designing adaptations in the current climate crisis. Failure to learn from the past contributes to climate illiteracy.

Looking forward, I call for more case studies of adaptive cultures, with attention to cosmologies and the transmission of ancestral Land-based knowledge. I call for case studies of pre-patriarchal, egalitarian and ecocentric cultures to disrupt the Eurocentric motion of civilization.

Questions for Reflection and Discussion

1. What strategy would you add to the list of adaptation options related to mass migrations?
2. In what ways did The Little Ice Age impact your ancestral culture(s)?
3. Imagine designing a de-urbanizing adaptation strategy to address inflated food prices due to a pervasive breakdown in the globalized food supply chain?
4. In your opinion, why is knowledge of past climate change events excluded from curricula?

Praxis. Modify your diet to reduce food miles.

Suggested readings

- Haarmann, H. (2020). *Advancement in ancient civilizations: Life, culture, science and thought*. McFarland.
- S. C. Chew (2006). *Recurring Dark Ages*. Alta Mira.
- Baer, H. A. & Singer, M. (2018). *The anthropology of climate change: An integrated critical perspective*. Routledge.

Resources for arts-based Learning

- Anne McAffrey's Pern series (fiction) can be read as a study in adaptation.
- Gimbutas, Maria (1989). *The Language of the Goddess*, Chapter 15 focuses on symbolic art representations of regeneration.

Learning Roots 3 - Recognizing the Darkness of the Modern Age

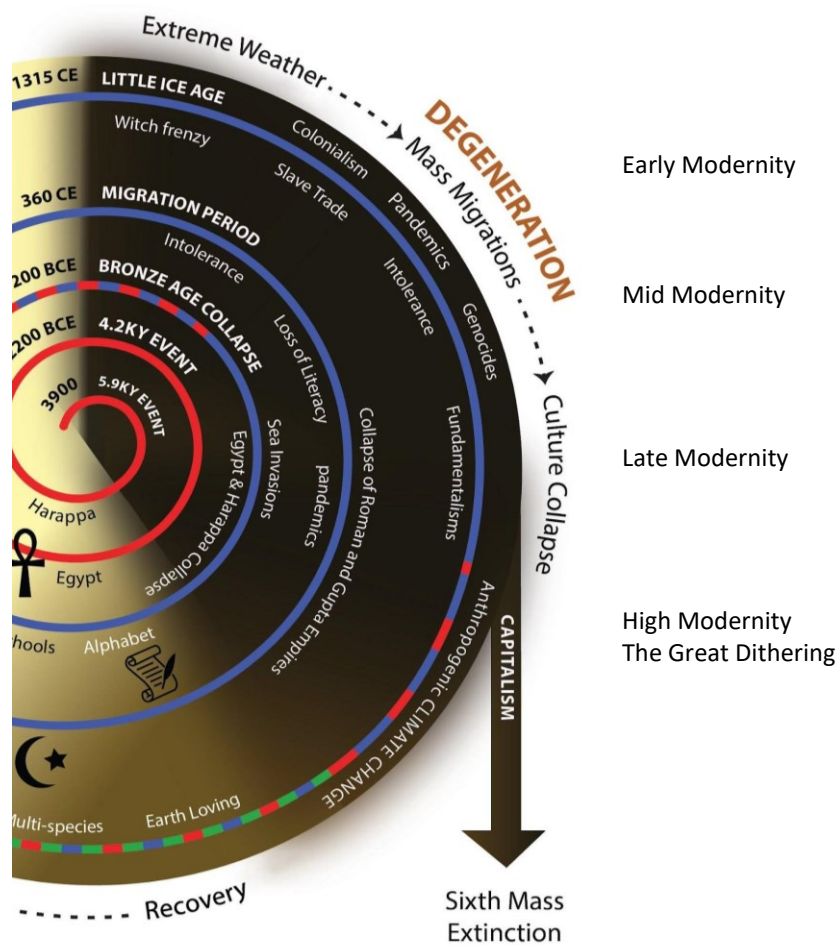


Image 8: The Spiraling Story of Climate and Culture-
Concept Map 3 excerpt

Learning objectives

- to recognize The Modern Age in the context of two climate change events,
- to recognize Modernity's systems of domination,
- to recognize the link between anthropocentrism and Anthropogenic Climate Change, and
- to recognize climate illiteracy as a maladaptation.

Overview

Building on knowledge of past climate change events from Learning Roots 2, we continue to explore The Little Ice Age climate event and Anthropogenic Climate Change to understand how they shape Modernity. Learning Roots 3 is organized in eight sections. First, we locate the Modern Age in two climate change events and discuss some system transitions from the Medieval Age that preceded it. In four sections, we deconstruct Modernity's

systems of power by domination: anthropocentrism, heteropatriarchy, white supremacy, and Christian theocracy. In the last section, we focus on maladaptive responses to Anthropogenic Climate Change and problematize climate illiteracy. By deconstructing the Modern mind-set that created the problem of Anthropogenic Climate Change, we can begin to deModernize and acquire a different mind-set for solving the problems related to climate change adaptation.

Weaving Dropped Threads into Radical Literacy for Climate Change Adaptations

The Modern Age, Modernity/coloniality, settler coloniality, domination, anthropocentrism (speciesism, humanism, Sixth Mass Extinction Event), Christian theocracy (missionizing, monotheism), heteropatriarchy (systemic sexism, misogyny, transphobia, homophobia), white supremacy (systemic racism, genocide), climate illiteracy problem (disinformation, denialism), intersectionality.

Introduction. I have grappled with the question: How did we get into this climate mess anyway? After mulling over this question for months, I concluded that [anthropocentrism](#) was the crux of the problem because it breaks the relationship between humans and Earth. My optimism in the future is kept alive by the many people I have met who are transitioning from being anthropocentric to becoming ecocentric.

In Learning Roots 3, my intent is to expose anthropocentrism as a driver of [Anthropogenic Climate Change Event](#) (ACC) and to analyze its [intersectionality](#) with other Modern²⁹ systems of domination: heteropatriarchy, white supremacy, and Christian theocracy. My approach is to draw on Indigenous Knowledges, ecofeminist philosophy, and Decolonial Theory to problematize domination. The word *problematize* signals my intent to get to the root of a problem by approaching it from different perspectives. I must caution readers that Learning Roots 3 is disturbing because it turns upside down the benign stories we learn in hegemonic

²⁹ Modernity (n.) and Modern (adj) are capitalized as is standard for ages, i.e., Neolithic, Bronze Age.

education and exposes the dark underside of Modernity. Some critical educators refer to this dark underside as the hidden curriculum.

Let's begin with *Image 6: Excerpt of Concept Map 3* to orient ourselves to the chronology of climate change events. Because Anthropogenic Climate Change (ACC) is not a spontaneously occurring event, I located it in the period of degeneration that followed the Little Ice Age (LIA) because it would be inaccurate to align it on the vertical axis with other spontaneously occurring climate change events in intervals of approximately 1000 years. LIA was a prolonged climate event and ACC is prolonging its period of degeneration. On the right side of the spiral, the vertical line represents capitalism's emergence during the Little Ice Age and its dependence on linear time.

I invite you to look closely at the outside revolution of the spiral, where the colour changes from blue, representing patriarchy, to intermittent red/blue representing the influence of feminism in achieving limited gender fairness. The line becomes green/blue/red in the early stages of the period of regeneration and is associated with the word Recovery. The green/blue/red line represents my vision for an interspecies future and my optimism that some humans are already transitioning to an ecocentric and loving relationship with Earth. My optimism is based on the model of Indigenous cultures who are living the philosophy and power of regeneration as they agentially prepare to survive climate change (see Learning Roots 1). I must face the reality that the window for transition is small but do-able if we make a rapid, large-scale, long-term transition in economic, political, and cultural systems, and that is my intent for Learning Roots 4 to 6. I invite you to join the revolution toward an interspecies future in an earth-loving pluriverse.

Climate Change Events in The Modern Age

Let's return to discussing how we got into this climate event that is out of pattern with other climate events. The science on climate change is clear, but there is a great deal that we don't know about the intra-action of climate and culture. The Little Ice Age (LIA) was a prolonged climate event marked by pandemics, famines, [mass migrations](#), loss of prosperity, loss of literacy, and intolerance (Behringer, 1999; Oster, 2004; Alfani et al., 2016; Camenisch and Rohr, 2018). The story of The Little Ice Age involves collective trauma from mass deaths due to famines, pandemics, witch-hunts, and religious conflicts. There is general agreement that the story of LIA ended in 1850 based on glacial retreat. Past climate change events occurred in intervals of approximately 1000 years, with a 600-year [period of regeneration](#) when Land recovered and then cultures recovered from the effects of a climate event; however, the overlap between LIA and ACC implies that Land and culture could not recover after LIA and that culture has not had time to recover from the collective traumas of LIA.

There is general agreement that The Modern Age began circa 1500 and we will discuss the transition to The Modern Age in the next section. According to a scientific study, Anthropogenic Climate Change began in 1830 based on warming trends in the First Industrial Period (Abram et al., 2016, p. 411). Carbon emissions and warming accelerated during the Second Industrial Period with the transition to fossil fuels. Deforestation and agriculture reduced carbon sinks (IPCC-AR6-SPM, 2022, p. 20). The anomalous overlap between LIA and ACC climate events is approximately 20 years.

Kyle Whyte (Anishinaabe-Potawatomi), scholar of Indigenous climate change studies, argues that colonialism laid the groundwork for the carbon-intensive economy that is driving

Anthropogenic Climate Change. Whyte (2017), following Davis and Todd (2017), uses the term terraforming to describe the colonial practice of tearing apart and reconstructing the flesh of Mother Earth, destroying that which makes a place ecologically unique in terms of human and nonhuman relations and displacing Indigenous communities. Settlers of European origin are only now experiencing the violence of involuntary displacement due to climate change (p. 772) that Indigenous cultures have experienced for 500 years.

Transitioning to The Modern Age

Let's discuss the system changes that occurred in the transition from the Medieval Age to the Modern Age, with a focus on economic, philosophical, and political systems transitions.

Economic transition. In early Modernity, Europe made two economic transitions. First it transitioned from a feudal economic system to mercantilism, and then it transitioned to a capitalist economic system. Capitalism emerged during the LIA when mass deaths resulted in a labour shortage (Federici, 2014). The economic change required a strong concept of linear time and a transition from decentralized governance of feudalism to centralized governance by monarchs, who took on the totalitarian powers of emperors and expanded their empires through coloniality.

Philosophical transition. The philosophical transition involves the Renaissance, the Scientific Revolution, and later the Enlightenment period. The Scientific Revolution provided ideas that supported the development of capitalism.

- Francis Bacon (1561-1626) produced the science of reductionism that reduced land into constituent parts that had value only as a commodity to be reassembled in man's mechanized inventions. He viewed land and nonhuman species as lacking inherent

value and described Earth not as a venerated mother, but as a wanton female to be conquered by male aggression: “nature” must be “bound into service” and made a “slave,” put “in constraint,” and “molded” and shaped by miners and smiths (Bacon cited by Merchant, 2005, p. 45). Bacon’s misogynistic language is contextualized by his role as Attorney General for King James VI with responsibility for overseeing England’s witch-trials (Berke, 2017, p. 52).

- René Descartes (1596-1650) produced a dualistic philosophy of separated phenomena in ranked hierarchies. He claimed that men can master their bodies to reside in purely rational states (p. 32).
- Isaac Newton (1642-1727) produced the science of atomism, which influenced social atomism, resulting in an individualistic society (Mathews, 1991, p. 24). His metaphor for the universe is a clock, no more than the sum of its parts, meaningless and subject to control by human persons (Suzuki, 1997, p. 15).

Earlier [nondual](#) philosophies were replaced with a [dualistic](#) belief system or [cosmology](#) that fragmented personhood and broke relationship with Land (Apffel-Marglin, 2011, p. 28). Secular [Humanism](#) elevated white male humans to the apex of a hierarchy of species and as the centre of the world, thus delinking secular [anthropocentrism](#) from Judeo/Christian theology in the Scientific Revolution. Humanism claims that Universal Man is inherently free and equal; however, in practice, freedom and equality were not universal because they excluded women and racialized Others who were not viewed as persons in law (p. 137). These philosophies reinforce Western European alienation from Land and denigrate Life, creating the delusion that men can rationally control forces of [regeneration](#) (Salleh, 2017, p. 221). According to

Frederique Apffel-Marglin (2011), the philosophical change in early Modernity erased a sense of sacred:

Nature as an agency-less, amoral entity could only emerge once people bypassed the spiritual dimension and treated the Land and the rest of the landscape not as a source of gifts from God and/or the spirits, but as purely material entities to be used for one's own material advantage. The material and the spiritual were cut asunder. (p. 41)

The loss of the sacred had long term implications and continues to manifest as a loss of cosmology, a problem of Modernity/coloniality that we explore in Learning Roots 4.

Political Transitions. The political systems of Europe transitioned from the feudal system to monarchies and colonial empires with authoritarian rules. In late 18th century, revolutions created a movement toward republics and democracies in nation-states.

Postcolonial scholar Achille Mbembé developed the concept of [necropolitics](#) to refer to colonial methods of erasure that treat some human bodies as material that can be discarded as waste or allowed to live. Necropolitics, embedded in colonial policy and practice, selects who gets to live and who to let die; it limits which species and cultures are allowed to regenerate, according to the state's hierarchy of the degrees of value (Mbembé, 2003, Braidotti, 2007; 2011, p. 335-6; Mbembé, 2016, p. 66). Mbembé (2016) critiques humanism as a failed Enlightenment philosophy of "unreason" coupled with the politics of "unfreedom" in an economy of death. In his view, humanism is a philosophy that condemned Black slaves to die working (p. 161). Africans stolen into slavery were forced to lose their faces and their names, so that "the useful" could be separated from "the waste."

As a result, any critique of humanism in the context of Black life must take as its point of departure not so much what some have called “social death” as this matter of waste, as how to retrieve the human from a history of waste. (p. 158)

He demystifies the universalist pretensions of European humanism by critiquing it as a mythology that is “indifferent to the falsity of its own contents” in dehumanizing the African continent (p. 161). Slaves were “the product of man hunts - a type of “predation” that enabled capitalism to operate by stealing and “consuming what could be called a biostock” (p. 165). He poignantly describes how African slaves remembered the conditions for cultural continuity and cared for each other by “producing symbols and rituals, languages, memory and meaning-and therefore the substance necessary to *sustain Life*” (p. 159, emphasis mine), thereby resisting being turned into waste and slowly shaping their cultural story from “captured subject” to human. By surviving, they exposed European humanism as a “death drive” (p. 160). Mbembé’s concept of necropolitics is relevant to the study of [settler colonialism](#) where the colonizer makes the laws and policies that inflict slow death, e.g., multi-decade boil water advisories in First Nations communities.

I propose that the Modern Age is a period of degeneration that began with LIA and has not yet ended, because Modernity has plunged the world into a human-induced climate event that is unpredictable and that is co-occurring with the white anthropogenic Sixth Mass Extinction (6ME). According to Giddens (1990), few scholars anticipated “how extensive the darker side of Modernity would turn out to be,” particularly ecological degradation, the slide from democracy to totalitarianism, and militarization using weapons of mass destruction (p. 7). Modernity, like capitalism, is a human construct that has a begin date and pending end date. It

is unclear if Modern humans can make a rapid, large-scale, long-term transition to ecocentric cultures, but I have confidence that many decolonizing people have already prepared to endure climate change in regenerative cultures in the pluriverse. In Learning Roots 1 to 6, I facilitate radical literacy for climate change adaptations in the pluriverse, not in Modernity. The next section will discuss how to disinvest from Modernity.

Modernity/coloniality and the power of Domination

Modernity/coloniality is a term coined by Peruvian sociologist Anibal Quijano (2007) to refer to his theory that *without coloniality, there is no Modernity* (p. 176). Quijano theorizes that modernity and coloniality are entangled with three systems of [domination](#): [anthropocentrism](#), [white supremacy](#), and [religious domination](#). María Lugones (2008) complicates Quijano by adding gender and naming [heteropatriarchy](#) as the fourth system of domination.

Walter Mignolo (2011) defines [decoloniality](#) as agentic delinking from the power of domination, recovering, and returning to ancestral ways of structuring cultural, economic and governance systems. Delinking from European knowledge systems that pretend to be universalisms is necessary for imagining and building futures that are not driven by wealth accumulation. Delinking does not seek sameness. The concept of the pluriverse refers to “a world where many worlds fit” and where people are practicing alterity and nondomination out of deep concern for the “radical equality of all Beings” (Escobar, 2018, p. xvi). It rejects the Eurocentric universe of [monotheism](#), [monoculture](#), and globalized economics.

Decolonial theory originated with Latin American scholars but is now spreading throughout the Global South (Kothari, Salleh, Escobar et al., 2021, p. 208). Canadian scholars

are integrating decolonial concepts with the Indigenous politics of [resurgence](#). Educator Sharon Stein (2017) contributes her theory that *without coloniality, there would be no Anthropogenic Climate Change*. She calls for decolonizing climate change in the academy and influences me to explore the common ground between climate literacy and decolonizing education: both begin by exposing and deconstructing Modernity/coloniality's systems of domination, particularly anthropocentrism.

Educator Vanessa Andreotti, in *Hospicing Modernity* (2021), declares that Modernity is dying: it cannot regenerate because it is inherently violent and unsustainable. She calls for death doulas to sit with Modernity in palliative care as it dies a self-inflicted death. Sitting with Modernity in palliative care does not seek to prolong the life of Modernity but disinvests from Modernity as a “hegemonic form of power that organizes bodies, time, knowledge, relationships, labour, and space according to economic parameters (e.g., exchange value) and to the benefit of particular groups of people” (p. 19). In this way, Andreotti conceptualizes disinvesting from entangled Modernity, coloniality, and capitalism. Disinvesting is an agentic, courageous action of transitioning to the next Age that values regeneration and loves the Land; it takes responsibility and shows up for climate change.

I propose [deModernizing](#) as a companion term for delinking, disinvesting, and decolonizing in the [Space Between](#), a transition zone in the pluriverse where ecocentrics learn together about designing climate change adaptations in the pluriverse as they zigzag their way back to regenerative cultures. In Concept Maps 1 and 2, I intentionally imagine the power of regeneration as greater and more enduring than Modernity's power of domination. These ideas are discussed in Learning Roots 4 to 6.

Modernity/coloniality's structure of power deploys multiple systems of domination; however, I focus on only four: anthropocentrism, heteropatriarchy, white supremacy, and Christian theocracy (Starhawk, 1982; Apffel-Marglin, 2011, p. 27; Donald, 2019, p. 123; Federici, 2014; Klein, 2015; Salleh, 2017, p. 234; Simpson, 2017, Chapter 6; Federici, 2019, p. 156; Mbembé, 2016). Concept Map 2 represents these systems as a Four-Square, a metaphor appropriated from Christian Fundamentalism's four-square gospel. The four systems of dominance are mutually-reinforcing, thus resistant to change. The thick border defends against external influences and excludes knowledges of alternatives that contradict hegemony. In each square, hierarchy is the organizing principle.

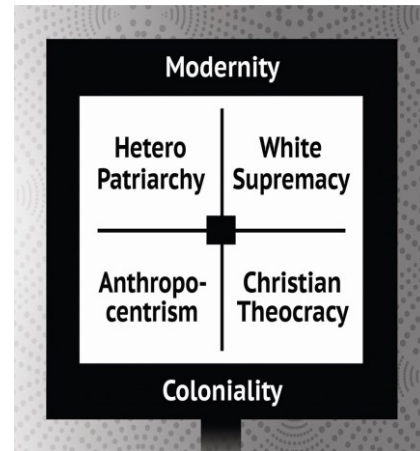


Image 9. Four-Square Structure of Domination-Concept Map 2 excerpt

Activist Angela Davis (1990) insists that if we wish to be radical in our quest for change, we must get to the root of our oppression (p. 14). To get to the root of our oppressions, I name and deconstruct four systems of domination and expose their [methods of erasure](#). I invite readers to write margin notes about methods of erasure they have experienced, witnessed, and/or studied.

Anthropocentrism's Methods of Erasure

Anthropocentrism is a hierarchical, dualistic system of domination that ranks the human species (*anthropos*) at the most superior species, giving humans sole authority to dominate over Land and other species for human benefit and to steal Land from those humans that Eurocentric Modernity deems inferior (e.g., women, people of colour, heathens).

Anthropocentrism is [speciesism](#) and assumes the right of humans, particularly white humans, to extract, develop, and commodify Land as a so-called natural resource for the benefit of humans and their corporations, which have status as persons in law. Naomi Klein coined the term [extractivism](#) to refer to anthropocentrism as “a nonreciprocal, dominance-based relationship with the earth, one of profound taking” (Klein, 2015, p. 169). Ecofeminist Val Plumwood (2009) asserts that the secular basis for anthropocentrism derives from [humanism](#) and requires “hyper/separation” of humans as a special species, producing the Modern delusions that humans are beyond animality and beyond the reach of the [Sixth Mass Extinction Event](#) (p. 114).

The religious authority for anthropocentrism is Judeo/Christian cosmology in which a male sky deity instructed first humans to exercise dominion over Land, Air, Fire, and Water and the creatures of those domains (*New English Bible*, 1970, Gen. 1:28). This instruction implies that Land and Water are no longer sacred, as they were in pre-patriarchal cosmologies. Ecofeminist philosopher Ariel Salleh (2017) argues that “the positioning of humanity [read man] over nature marks Eurocentric knowledge-making from religion to philosophy to science, and the same convention is complicit in the breakdown of Earth life-support systems.” She argues climate change is a gendered domination over Earth that is “complicit in the breakdown of Earth’s life-support system.” The masculinist domination over Earth minimizes the regenerative powers of Earth, including mothering, to a resource. “The massive theft of women’s reproductive labour, a theft that is the very foundation of capitalism” is a geopolitical problem that stunts Modernity’s capacity to take responsibility for the intersectional oppressions of anthropocentrism and heteropatriarchy (p. 292). Christianity’s global reach contributes to the

globalized problem of anthropocentrism and disconnection from Land (Ruether, 2005, 2006; Mignolo, 2011, Mbembé, 2016).

Anthropocentrism's methods of erasure range from intolerance of difference (e.g., monocropping) to elimination (e.g., speciesism, agricultural use of neonicotinoids that are killing bee population). Let me provide a short example of anthropocentrism. In mid-Modernity, the enclosure of the commons in Britain evicted peasants from Land that had enabled them to make a subsistence living. Homeless, they migrated to city slums and to the British colonies. The displacement of subsistence populations by greedy landowners, developers, and colonizers is a recurring Modern story of refusal to share the Earth (Federici, 2014, pp. 61-91; Mathews, 2005, p. 151).



Heteropatriarchy's Methods of Erasure

Heteropatriarchy refers to a hierarchical, dualistic system of domination using ranked human organization based on a binary conceptualization of gender and sexuality to privilege heterosexual males. It ranks cisgendered, married, monogamous men and women at the top, and attempts to erase all other relationships (Simpson, 2017, p. 134). Heteropatriarchy holds the opinion that hetero male humans are superior to female humans and to persons who identify as LGBTQ2S. This opinion is socially constructed and based on binary concepts of gender and sexuality that drive systemic violence against women and gender plurality in governance, capitalist economics, and knowledge construction (Lugones, 2008). Homophobia is a colonial prejudice imposed by European colonizers on Indigenous peoples through policy and practice (Wilson, 2015; Simpson, 2017).

As a system of domination, heteropatriarchy assigns privilege to heterosexual males, imposes gender-stereotyped roles in social organization, and controls women's reproductive bodies. Femicide is not simply the murder of females but rather the intentional killing of females by males because they are female (Federici et al., 2021, p. 4). Matricide is the killing of females because they have reproductive bodies. The virulence of transphobia in recent years may indicate that the heteropatriarchal ideology that males are hard-wired is under threat.

Secular heteropatriarchy derives authority from the belief in universal patriarchy based on the essentialist notion that men are hard-wired to dominate, following British historian Henry Maine's definition of patriarchy: "The eldest male parent is absolutely supreme in his household. His dominion extends to life and death and is as unqualified over his children and their houses as over his slaves" (Maine, 1861, p. 122, as cited by Millet, 1970, p.34). Religious heteropatriarchy derives its authority from the Abrahamic monotheisms in which a male deity creates the world using words, not gestation (*New English Bible*, 1970, Gen. 1:26). Ecofeminists expose the intersectionality of anthropocentrism, heteropatriarchy, white supremacy, and Christian theocracy in the oppression of women and Land. Heteropatriarchy's methods of erasure range from intolerance of difference (e.g., homophobia) to elimination (e.g., murdered Indigenous women, girls, and queer persons).

The following illustration of heteropatriarchy from Early Modernity indicates intersectionality of heteropatriarchy, anthropocentrism, and Christian theocracy:

During The Little Ice Age, the witch hunts, a campaign of domestic terror targeting women, was fueled by conspiracy theories about witchcraft. Psychological, religious, and economic factors drove the witch-hunts. The psychological driver of the witch-hunts was

fear that produced delusions and irrational actions. Local mobs scapegoated women for casting spells that caused crop failures and epidemics (Oster, 2004, p. 216).

Disinformation was disseminated using the recent technology of the printing press (Federici, 2014, p. 165-185).

The religious driver of the witch hunts was patriarchal Christianity's attempt to erase remnants of Europe's pagan cultures that had survived Europe's transition from [paganism](#) to Christianity in the Roman era (Apffel-Marglin, 2011, p. 28-33). Both Catholics and Protestants participated in the public torture, burning, drowning, and hanging of so-called witches (p. 169). Executions decreased dramatically after 1648 when the Treaty of Westphalia ended decades of religious wars and created new rules for religious plurality in a community (Leeson and Russ, 2018). The witch-hunts finally ended in the mid-eighteenth century after European courts banned witch-trials on the grounds that witchcraft was a delusion; it was not based on reason or fact.

The economic driver of the witch-hunts was capitalism's labour shortage due to mass deaths from famines and plagues. Ecofeminist Maria Mies (1998) coined the term [housewifization](#) to refer to the domestic enslavement of women to reproduce the workforce. Building on Mies, Silvia Federici (2014) argues that the witch-hunts served the interests of the emerging capitalist economy by confining women to the domestic sphere to perform unpaid domestic labour and to reproduce the workforce. Laws were introduced to control women's sexual and reproductive bodies by criminalizing miscarriage and abortion and by decriminalizing rape (Merchant, 1980, p. 168; Starhawk, 1982, p. 214; Mies & Shiva, 1993, p. 144). Women healers were targeted in the witch-

hunts so that the new male-only profession of medicine could appropriate women's specialized role in diagnosing and treating illness (Ehrenreich & English, 1973; Starhawk, 1982, p. 199; Apffel-Marglin, 2011, p. 142; Federici, 2014, p.89). In this period, women were viewed as less than human and prohibited from owning land. The impacts of this transgenerational trauma still linger. The 200-year witch-hunt is one of the most understudied genocides (Federici, 2014, p. 163).



White Supremacy's Methods of Erasure

White supremacy is a system of domination in Modernity/coloniality that uses ranked social organization to assign superiority to persons with light skin colour, particularly persons of European origin. Privileges afforded to persons of light skin are not available to persons of dark skin colour. Using the term *white supremacy* instead of *race* shifts the focus to the perpetrator. "Systemic racism conveys the pervasiveness of racial oppression, but white supremacy goes further by indicating that there is a rigid nexus of power that protects and enforces it" (Smith, 2020). White supremacy imposes socially constructed racialized identities on persons of non-white skin colour while assigning privilege to persons of white skin colour (Reardon & TallBear, 2012). According to Mbembé (2016), white supremacy was the primary ideological weapon in Europe's imperialist politics of coloniality and papal decrees granted monarchs the "sovereign right to kill" (p. 78). White supremacy intersects with anthropocentrism, heteropatriarchy, and Christian theocracy in the oppression of colonized peoples. White Supremacist methods of erasure range from intolerance of difference (e.g., racialized insults) to elimination (e.g.,

genocide). Let me provide two examples: the first is from Mid Modernity on the theme of homelessness, and the second is from High Modernity on environmental racism.

In the 20th century, war and conflict became more barbaric with multiple genocides and wars in which civilian deaths out-numbered military deaths. In World War Two, the kind of violence previously reserved for Indigenous peoples was unleashed by Europeans on Europeans, creating the new problem of statelessness (Arendt,³⁰ 1958). Millions of stateless persons have been made homeless by their governments, which refuse to share the Earth. The problem, seemingly unsolvable by democracies, is becoming acute with the increase in necropolitics and mass migrations related to ACC. According to the United Nations High Commission for Refugees, there are 29.3M refugees and 5.1M stateless persons in 134 countries in 2023³¹.

The next illustration relates to environmental racism. During The Great Dithering, extractivist industries became neocolonizers, invading Indigenous territories without consent of Hereditary Chiefs and matriarchs practising their traditional governance. In 2021, Coastal GasLinks, a pipeline corporation, called on the RCMP to defend their interests as they transected unceded Wet'suwet'en territory without the consent of the Hereditary Chiefs. RCMP arrested Wet'suwet'en Matriarch Freda Huson and other women who were sitting in ceremony to protect the Land and Water of their unceded territory.



³⁰ Hannah Arendt was a stateless refugee for eighteen years from the time she fled Nazi Germany until she became a US citizen.

³¹ Source: <https://reporting.unhcr.org/globalappeal2023>.

Christian Theocracy's Methods of Erasure

Christian Theocracy is an authoritarian system of domination in Modernity/coloniality that holds the opinion that the Christian deity is the only deity and the supreme ruling authority of the state. European emperors relied on papal decrees to provide divine authority to use violence to impose Christian monotheism on the peoples of the colonies (Mbembé, 2003), imposing not only a belief system, but also laws, institutions, and socially constructed identities. Christian theocracy, as a dominating force in coloniality, imposed Christian religion by attempting to break the cosmological relationship between colonized cultures and the Land they inhabit. Secularism reduced the power of this system of domination to create law but contracted Christian institutions to administer policies such as the residential school system.

Due to secularism, Christian theocracy may be the first of the four systems of domination to develop a crack in Modernity's foundation. Secularists turn to humanism, not the Abrahamic religions, to rationalize heteropatriarchy and anthropocentrism. Christian theocracy is understudied as a system of domination. Christian theocracy's methods of erasure range from intolerance of difference (e.g., [missionizing](#)) to elimination (e.g., disposing of Indigenous children's bodies in unmarked graves at residential schools).

In 1894, The Dominion of Canada amended *The Indian Act* to ban Indigenous ceremonies, including potlatch, powwows, sun dances, sweat lodges, and dancing. Around the same time, Canada contracted with Christian institutions to operate residential schools to meet the government goal of assimilation. Indian agents organized an unauthorized pass system to enforce the ceremonial ban and to prevent groups of parents from visiting their children at residential schools (Carter, 1990; Daschuk, 2019). Many parents whose children never returned

home from residential school were not informed of their child's death or burial place.

Indigenous children suffered sexual, physical, and emotional abuse at residential schools (TRC, 2015). In 1968, the federal government ended its partnership with churches and assumed sole control of residential schools. The last residential school closed in 1998. In 2021, researchers identified the first unmarked graves of children on the site of a former residential school (NCTR, 2023).

The Great Dithering: Maladaptations in Late Modernity

In this section, I discuss the rapid degeneration of Modernity during The Great Dithering, a term for the period after James Hansen (1988), Director of NASA Goddard Institute for Space Studies (1988), warned the US Congress that “the earth is warmer in 1988 than at any time in the history of instrumental measurements” (p. 1). His testimony raised awareness of the implications of global warming, and in response, the International Panel on Climate Change (IPCC) was established. However, before nations could act on IPCC recommendations, there was a backlash from capitalists. Three maladaptations that characterize The Great Dithering are a) free-market fundamentalism, b) religious fundamentalisms, and c) climate illiteracy.

In their meticulously researched *Merchants of Doubt* (2011), scholars of science Naomi Oreskes and Eric Conway expose the contrarian scientists who joined right-wing think-tanks to abet [disinformation](#) campaigns funded by Big Oil with the intent to seed uncertainty about climate science and to foster an anti-science sentiment. By the turn of the millennium, climate change [denialism](#) was widespread. Oreskes and Conway (2014) refer to the darkness of High Modernity as the Period of the Penumbra: the “shadow of ignorance and denial had fallen over people who considered themselves children of the Enlightenment” (p. 9, 60). During three

decades of dithering, Big Oil lobbied governments for subsidies and accelerated extractivism. In 2022, UN Secretary General Guterres rebuked the carbon industry for its “scandalous greed” even as the human toll of ACC rose sharply (Quenneville, 2022).

Disinformation funded by Big Oil has exacerbated [climate illiteracy](#). In 2023, three oil companies (i.e., ExxonMobil Corporation, Suncor Energy, and Chevron Corporation) are facing lawsuits by the state of Rhode Island and municipalities in Colorado, Maryland, California, and Hawaii for deceiving and failing to warn consumers about the danger of fossil fuels even as their profits rose sharply. The cases are similar to the tobacco lawsuits in the 1990s that resulted in settlements exceeding \$200 billion (Beaumont, 2023).

Free-market Fundamentalism: A Maladaptation to Climate Change. The “capitalist sorcerers” (Stengers, 2015, p. 35) of free-market fundamentalism are manufacturing ignorance and marketing delusions such as:

- The market has always existed and will always exist;
- There Is No Alternative;
- The free market is guided by an invisible hand that is wise and infallible, so we should trust markets and distrust governments for interfering with the wisdom of the market;
- The free-market system is the only economic system that does not threaten individual liberty;
- Capitalism and economic freedom are bulwarks against totalitarianism;
- Trickle-down economics creates more jobs;
- A free market can solve social problems; and
- Capitalism can go green.

These delusions are still used to justify capitalism as the only economic system capable of solving the climate crisis it caused. These delusions stifle imagination for developing new economic models as we transition from Modernity to the next age (Oreskes and Conway, 2011, 2014; Stengers, 2015; Klein, 2015; Aratani, 2023 interview with Oreskes and Conway).

Religious Fundamentalisms: A Maladaptation to Climate Change. Three Abrahamic religions have fundamentalist sects with similar attributes (Armstrong, 2000). Christian Fundamentalism refers to a quasi-religious movement that aims to restore heteropatriarchy and to replace democracy with [Christian theocracy](#). To avoid association with Islamic extremists after 9/11, Christian Fundamentalists attempted to appropriate the identity of evangelicals; however, most evangelical denominations are grounded in theology, in contrast to Christian Fundamentalisms that are anti-theology because they take a literal approach to religious texts.

Pulitzer Prize-winning journalist and Presbyterian seminarian Chris Hedges (2006) refers to Christian Fundamentalism as “American fascism” (p. 10) and as a domestic terrorist group driven not by religious principles, but by Dominionist and Reconstructionist ideologies (pp. 10-14). Fundamentalists, suffering the destitution of homelessness on Earth, live to die by valorizing death (p. 183). Christian Fundamentalists read Genesis 1:28 literally as a directive to dominate over Earth and regard environmentalists as enemies who “lack faith in God’s providence” (p. 180). Hedges cautions that well-monied think-tanks like The Cornwall Alliance are bolstering the Christian Right’s defense of free-market policies that oppose public ownership of parks and utilities and oppose the collective rights of Indigenous peoples.

Chris Lehmann, in *The Money Cult* (2016), locates Christian Fundamentalism squarely with free-market fundamentalism. He critiques the billionaire megapastors of the Prosperity Gospel

who adapt capitalism for personal gain, while disparaging persons living in poverty for failing to earn God's blessing (p.312).

Karen Armstrong, in *The Battle for God: a History of Fundamentalism* (2000), finds that Fundamentalist movements in the Abrahamic religions are not theologically coherent and tend toward militancy and alliances with anti-knowledge factions (p. 61). Armstrong cautions that suppressing Fundamentalism tends to make it more extreme and recommends a compassionate strategy that attends to the fear that permeates these movements (p. ix). In her view, Fundamentalisms are a product of Modernity's intolerance of difference and fear of change; they are not a reaction to Modernity.

Climate Illiteracy: a Maladaptation to Climate Change. As a life-long learner, I treasure literacy and I confess that climate illiteracy gets under my skin. My intent is to problematize climate illiteracy by asking the questions that get under my skin; thus, illustrating how good questions propel us deeper into a problem until we reach a synthesizing insight.

Climate illiteracy involves intentional forgetting, so let's begin with a few theoretical perspectives on memory and forgetting. Haarmann (2009) invites us to think about cultural memory as the instructions of previous generations that are activated to make culture operate in the present, and this knowledge, in turn, nurtures agency to plan for the future (p. 212). Paula Gunn Allen (Laguna) (1986) states that loss of memory is the root of colonial oppression because forgetting the past renders the Land meaningless and allows industries to rape the Land and degrade Landscapes that have no sacred significance to colonizers (p. 210). Aleida Assmann (2011) studies intentional forgetting of the Holocaust genocide and concludes that while cultural memory is always constructed, it is also profiled by "the edges of forgetting" and

inevitably includes intentional forgetting (p. 396). Cindy Minarova-Banjac (2018), building on Assmann's theory, argues that policymakers (e.g., curriculum developers) may use forgetting tactics (p.25). These theoretical perspectives provoke a question about power: Who benefits when citizens and consumers intentionally forget that our planetary home is on fire?

I argue that climate illiteracy is intentional illiteracy that involves at least four tactics of intentional forgetting: disavowal, delusion, disinformation, and the suppression of knowledge. First, let's listen to climate psychologist Sally Weintrobe (2013) explain climate change

[disavowal](#):

To deny reality in an outright way (negation) can seem a more serious evasion than seeing it, but with one eye only (disavowal). However, when one looks beneath the surface and studies the underlying structure of the defences in each case, disavowal is a more serious and intractable form of denial. While negation says no to the truth, it does not distort the truth. Disavowal, by contrast, can be highly organized at an unconscious level and can become entrenched. It distorts the truth in a variety of artful ways. Disavowal can lead us further and further away from accepting reality ... This is because the more reality is systematically avoided through making it insignificant or through distortion, the more anxiety builds up unconsciously, and the greater is the need to defend with further disavowal. (p. 7)

Disavowal blocks mourning at the stage before sadness, grieving and reconciliation; it cleverly bends, reverses, and warps the truth with delusions (p.39). Weintrobe (2020) describes how Big Oil seeded "a culture of uncare":

Oil executives and the political establishment knew in the 1980s that burning fossil fuels leads to global warming. They also knew that to continue burning fossil fuels they must seed and grow a climate bubble. They did so by putting in place a culture of uncare that by promoting denialism (largely industry-funded) aimed to encourage people to minimise conscious awareness that burning fossil fuels leads to global warming. (p. 356)

Second, delusion is a form of intentional forgetting that involves an unshakable belief in something that is not based on reality, even when presented with conflicting evidence.

Delusion can become conspiracy theory and common cause for violent action (e.g., witch-hunts, trucker convoy to Ottawa). Dwayne Donald (2019) is concerned about the curricular fictions of progress, anthropocentrism (p. 108) and white superiority (p. 123, n.8). Curriculum scholar David Smith (2012) views delusions in the curriculum as masks for a “form of denial based on a deep fear of the truth” (p. 340). This provokes another question: Are all tactics of intentional forgetting driven by fear?

Third, disinformation refers to false information that is weaponized and spread with intent to mislead, in contrast to misinformation that is spread without malicious intent. With the rise of populism, there is an increase in disinformation designed to appeal to disaffected citizens and to demonize opponents. Linguist Ruth Wodak (2015) is a global expert on populism; she argues that populism deliberately spreads fear of the future, thereby contributing to intentional illiteracy and lack of courage. When fear dominates, people fall into binary thinking, which makes it easier to scapegoat the Other and claim victimry. Wodak’s insights provoke a question about fear: What does Big Oil fear so much that it would throw

gasoline on the fire that is burning our planetary Home and spread lies that the fire is a hoax by scientists.

Fourth, knowledge suppression occurs when hegemony does not want the general population to know certain scientific facts and excludes that information from curricula and public communications. For example, scientific knowledge of past climate change events in the Holocene summarized in Learning Roots 2 is excluded from curricula, but it is accessible via Wikipedia and academic publications. We must ask who benefits by suppressing this knowledge?

The implications of climate change illiteracy are serious. Following Giroux (2020), I argue that climate illiteracy is a manufactured ignorance involving complex tactics of intentional forgetting. It is not a knowledge deficit. Climate illiteracy is maladaptive because it is intentional in not knowing and not taking responsibility. Following Diamond (2005), I attribute climate illiteracy to loss of [agency](#) and lack of courage. When a culture loses agency, it has already lost its courage. Like Diamond, Chris Hedges (2009) warns that intentional illiteracy indicates a dying culture that fears the future:

The worse reality becomes, the less a beleaguered population wants to hear about it, and the more it distracts itself with squalid pseudo-events. More than the divides of race, class, or gender, more than rural or urban, believer or nonbeliever ... our culture has been carved up into radically distinct, unbridgeable, and antagonistic entities that no longer speak the same language and cannot communicate. This is the divide between a literate, marginalized minority and those who have been consumed by an illiterate mass culture.

(p. 190)

From a compassionate perspective, listening to fears and anxieties about climate change may support a first step toward accepting climate change as an existential threat, and then a second step toward accepting that this current climate change even is caused by human behaviours.

During the Great Dithering, Modernity/coloniality is responding to climate change in three maladaptive ways: free-market fundamentalism, religious fundamentalism, and climate illiteracy. Climate illiteracy is complex and entangled with manufactured ignorance. In Learning Roots 4 to 6, we continue exploring a political literacy for designing climate change adaptations with agency and courage together with other courageous Sojourners who have transgressed the thick boundaries of Modernity/coloniality to the Space Between. I call on readers to think critically even if it is dangerous. Particularly when it is dangerous.

Synthesis of Findings on Recognizing the Darkness of Modernity

With the goal of facilitating radical literacy for climate change adaptations, I synthesize Learning Roots 3 with its focus on problematizing domination and climate illiteracy.

- I propose that The Modern Age is a prolonged [period of degeneration](#) related to two overlapping climate change events: The Little Ice Age and Anthropogenic Climate Change. Like Periods of Degeneration from past climate change events, the Modern Age is marked by famines, reduced prosperity, mass migrations, invasion, intolerance, loss of literacy, and a pandemic.
- Modernity/coloniality's structure of power relies on systems of domination that reflect Eurocentric hierarchies:
 - [anthropocentrism](#) (includes speciesism),

- [heteropatriarchy](#) (includes systemic sexism, transphobia, homophobia, misogyny),
- [white supremacy](#) (includes systemic racism), and
- [Christian theocracy](#).
- Intersectionality is a critical tool for analyzing layered oppressions and erasures.
- Decolonial Theory analyzes the structure of power and its global impacts:
 - without coloniality, there would be no Modernity (Quijano, 2007),
 - without coloniality, there would be no Anthropogenic Climate Change (Stein, 2019), and
 - Modernity is inherently violent and unsustainable (Andreotti, 2021).
- Decoloniality, resurgence, and decolonizing are pluriversal ways to delink from Modernity/coloniality and reclaim pluralities, languages, cosmologies, and economies that were subjugated by Modernity's [monoculture](#) and globalized economy. I propose [deModernizing](#) as another way of delinking from Modernity.
- Anthropocentrism is entangled with coloniality and capitalism as a driver of Anthropogenic Climate Change Event and Sixth Mass Extinction Event.
- During The Great Dithering, Modernity's maladaptive responses to climate change include free-market fundamentalism, religious fundamentalisms, and [climate illiteracy](#). Climate illiteracy is a manufactured ignorance involving intentional forgetting (e.g., disavowal, delusions, disinformation, and suppression of scientific knowledge). These maladaptations indicate refusal to take responsibility, failure to prepare for climate change, loss of agency, and lack of courage.

- The economic transition to capitalism in early Modernity appears to be a [maladaptation](#) to the Little Ice Age for the following reasons:
 - it is causing massive harm to Earth systems through extractivism, carbon-emitting industrialization, and colonization;
 - it threatens continuity of life by driving Anthropogenic Climate Change and the Sixth Mass Extinction; and
 - it is immoral in that it depends on theft of bodies (Black slavery and women's domestic slavery), theft of land (coloniality), and the normalization of [greed](#).

Looking forward, I call for the emerging field of Climate Psychology to develop therapies for recovering courage and agency and for attending compassionately to fear.

Questions for Reflection and Discussion

1. What grieves you most about the unsustainability of Modernity?
2. What steps can you take to build courage and agency?
3. Identify at least two cultures that are not anthropocentric.
4. Reflect on the commons in your community. Consider sidewalks and roads, public institutions, recreation and arts facilities, energy, and emergency services. How does your community value the commons?

Praxis. When you observe aggression, ask: “what is the fear here?”

Resources for Arts-based Learning

- Pete Seeger, *Little Boxes* by <https://www.youtube.com/watch?v=n-sQSp5jbSQ>
- Kent Monkman, *The Scream* (2017). <https://www.wag.ca/event/kent-monkman/>.

Learning Roots 4 - DeModernizing: ReInhabiting Land Differently



Image 10. Chevron- Concept Map 1 excerpt

Learning objectives

- to begin the process of deModernizing in the Space Between,
- to link loss of cosmology with a broken relationship with Land,
- to understand the continuum of relationships with Land, and
- to understand ecojustice as emancipation of Earth from human domination.

Overview

We explore three conditions for cultural continuity: relating with Land, living the cosmology of the Land, and welcoming difference. We begin by problematizing cosmological destitution. The next sections engage with the process of deModernizing. First, we focus on recovering from cosmological destitution in the Space Between. Second, we focus on becoming ecocentric by building a loving and listening relationship with Land. Third, we focus on becoming agentic in political action for ecojustice and welcoming difference. Last, we prepare for large-scale, long-term change, specifically a cosmological transition toward Earth-centered philosophies. Learning Roots 4 prepares us for designing climate change adaptations for interspecies communities in symbiotic and loving relationships.

Weaving Dropped Threads into Radical Literacy for Climate Change Adaptations

cosmology, cosmological destitution problem, Earth-centered philosophies (Daoism, hylozoism, Great Mother, dendrolatry, Medicine Wheel, animism paganism, shamanism, elementalism), ecocentric, ecojustice, nondomination, pluriverse, relating (caring, emotion, affect), symbiosis, transformative change.

Introduction. I approach the topics of cosmology and relationality with Land by drawing on insights from ecofeminist philosophy, Indigenous philosophy, Decolonial Theory, and critical anthropologists. I introduce the process of deModernizing, which begins by taking a courageous leap across the thick borders of Modernity/coloniality and transgressing to the [Space Between](#) (see Concept Map 1 and 2). The Space Between is a political transition zone for Sojourners (my term) who are zigzagging toward Earth-centered cultures in the pluriverse. I locate the Space Between in the [pluriverse](#) where transgressive Sojourners engage in the holistic work of [deModernizing](#), my temporary³² term for the process of disinvesting from Modernity/coloniality's systems of domination. The process of deModernizing includes:

- recovering from the oppressions of Modernity,
- becoming [ecocentric](#),
- becoming agentic for [ecojustice](#), and
- reTurning in [spiraling time](#) to regenerative cultures (Learning Roots 6).

Like decolonizing, deModernizing is the process of restructuring to relations of [nondomination](#) (Kuokkanen, 2019). In Learning Roots 4, our focus is on recovery and becoming ecocentric.

Problematizing Cosmological Destitution

I begin by defining cultural cosmology of time, place, and space so that we can learn the concepts for understanding the complex problem of cosmological destitution and its impacts on thinking and feeling.

³² DeModernizing is a temporary term until the next historical Age has been named. The naming of a historical age follows a different process than the naming of a geological age (i.e., Holocene). I use *postmodern* to refer to a theoretical paradigm, not to a historical period or age.

What is Cosmology? [Cosmology](#) is the branch of philosophy that theorizes a big-picture perspective of time, place, and space. Cultural cosmology, articulated through myth, ritual, sign, and symbol, is intertwined with and beneath culture. It is deep knowledge that is believed, lived, embodied, and articulated in non-linguistic and linguistic form. It answers a culture's existential questions: How did we get here? What is the place of humans in the cosmic scheme of time, place, and space? (Haarmann, 2007, p. 19-33). Cultural cosmology shapes a culture's Imaginary and Symbolology, contributes to meaning making, and unifies a culture's identity around a common philosophy and a theory of origins. Cultural cosmology is specific to Land and often provides instruction for ethical relationality with the Land. Cosmology has a wider horizon and deeper meaning than religion, mythology, [spirituality](#), or worldview (Mathews, 1991, p. 5-9; Little Bear, 2011, p. 2).

Time. Earth-centered philosophies conceptualize time as abundant, indefinite, and cyclical in that it repeats itself between not-yet here, already there, and been-here-before. I invite you to join me in [spiraling time](#), in contrast to the Modern concept of linear time, finitely measured, and the delusion that there is never enough time (Braidotti, 2011, p. 228; Mignolo, 2011, p. 169-177).

Place. Earth-centered philosophies conceptualize place as the sacred and animated Land with whom the community lives in a relationship of intimacy, an intense love and caring. In contrast, Modernity/coloniality views place as geographic location and as property that can be owned and developed. European colonizers, having severed their affective relationality with Land, view themselves as civilized and superior to Indigenous peoples, who believe that they belong to the Land (Arendt, 1966, p. 192; Mbembe, 2016, p. 77; Mignolo, 2011, p. 172). Settlers

seem homeless because they have a broken relationship with Land, while Fundamentalist Christians are intentionally homeless because they live to die so that they can return to a home in an unearthly place.

Space. Earth-centered philosophies conceptualize space as emptiness—a void in which to dream, imagine, create newness, and receive gifts of insight and future vision (Ermine, 1995). In contrast, Modernity/coloniality views space as full. I believe that the concept of Space as Void enhances one's capacity for transpersonal learning.

Cultural Memory and Cultural Continuity. Haarmann (2020) asserts that cosmological knowledge survives for millennia and is abandoned only if it proves ineffective in surviving disaster. Even after a transition from one cosmological belief system to another, remnants of old beliefs remain in the substrata of myths, rituals, sacred days, art, and sacred places (p. 19). Cosmological knowledge is adaptive and may integrate science. Earth-centered philosophies conceptualize interconnectedness to explain how all things are agentially in flux and interdependent, in contrast to the Modern dualistic view that all things are separate.

Haarmann (2007) writes that Land-based knowledges are often embedded in cosmological narratives and that the knowledge is used to keep a community functioning during an ecological crisis. He finds that a culture abandons its cosmological narratives and symbols *only if* its Land becomes destroyed by ecological disaster to the point that it no longer has capacity to carry the culture (p. 260). This insight helps us understand how and why oral cultures maintain their adaptive capacity and why they treasure their cosmological teachings. I return to cosmological narratives in each of the following Learning Roots.

Now that we know what cosmology is, let's explore the impacts of loss of cosmology. I encourage readers to keep a cosmological journal for reflecting on your own cosmology and the ways it is changing.

What is cosmological destitution? Some Sojourners arrive in the Space Between traumatized by the oppressions of Modernity, so the first step in deModernizing is healing. According to ecofeminist philosopher Freya Mathews (1991), [cosmological destitution](#) is a condition that affects settlers who have forgotten the cosmology of their ancestral Homeland, have not bonded with the Land that they settled, and failed to adopt the cosmology of the Land that they inhabit (p. 9). Cosmological destitution appears to be aggravated for settlers who live nomadic lives, chasing jobs and not settling in a place long enough to become acquainted with the cosmology of the Land where they dwell. The "symptoms of cosmological uncertainty [are] anxiety and insecurity, alienation, anomie, and a massive confusion over values' ' (p. 47).

The impacts of cosmological destitution are significant. First, loss of affective relationality with Land blocks empathy with Earth and with climate, with endangered species and with degraded Land, leaving self-interest as the only motivator for engaging in climate change adaptation. Second, loss of ethics related to Land contributes to resistance to environmental regulations that impinge on profits³³. Third, loss of imagination and big-picture thinking reduces the capacity to design local adaptation strategies based on ancestral knowledge, thus contributing to illiteracy (Mathews, 2005, p. 38). Fourth, loss of the sacred leaves Modern people disoriented and adrift. Without a cosmology of the Land, cultures lack

³³ According to Karen Armstrong (2000), Fundamentalists suffer from [loss of cosmology](#) and loss of an ethical framework for compassion and living with difference.

capacity to engage in life as an organic totality and to respect forces of regeneration (Mathews, 1991, p. 8). In short, Mathews is concerned that when a culture loses its cosmology, it loses its viability and enters a lengthy period of degeneration because it does not have the thinking capacity and the ethics for adapting to ecological crisis.

Recovery: Re-Inhabiting Land Differently

Sojourners arriving in the Space Between may need to recover from cosmological destitution so that they can better adapt to climate change in the pluriverse. Matthews (1991) states that “we stand radically in need of cosmological rehabilitation” (p. 47), a process of reinhabiting the Land differently, of living with Land with love and caring as though we belong to the Land (p. 156). Looking to Indigenous cultures for insight, she observes that Indigenous peoples perceive Land in its massive materiality as the ground of Being and participate with Land in an organic relationship that contributes to flourishing and cultural wellness, “richly fulfilled in emotional, imaginative, artistic, intellectual and spiritual life” (p. 156-8).

In *Reinhabiting Reality* (2005), Mathews turns her attention to living differently with the world in loving and reverent ways that respect Earth as alive, sentient, intelligent, self-regulating, communicative, and intrinsically dynamic. Mathews encourages us to think about cosmology as “locally specific ways of being at-home in the world” and as engaged in practices of “devotion” to place (p. 203).

In transitioning to an emotional relationship with Land, we begin to participate in the cosmic process of regeneration (p. 186) in the pluriverse. Reclaiming cosmology occurs at the intersection of imagination and tender loving relationality with Land. The love that we share in relationship with Land expands into love with interspecies kin that cohabit the Land, and thus

we are expanded. It is through deep connectedness, sometimes experienced transpersonally as One-ness or unitive experience that we participate in cosmic processes.

Becoming Ecocentric

Becoming ecocentric means growing into a deep loving relationship with Land and engaging in active listening with Land, Climate, and interspecies kin. It is a radical way of being because it roots deeply with Earth. Becoming ecocentric is deModernizing because it rejects Modernity's system of anthropocentrism and commits to ecojustice, the struggle to emancipate Earth from human domination by restructuring relations to nondomination.

Ecocentrism and anthropocentrism are not binaries, but anchors on a continuum of philosophical standpoints about relating with Land. *Table 4: Continuum of Philosophies about Land* describes five philosophical standpoints and their variations.³⁴ Each standpoint is a shift in philosophy—a [transformational](#) transition in [onto-ethico-epistemology](#). Moving toward ecocentrism is moving toward [nonduality](#). Hannah Arendt (1992) refers to a standpoint as a natal's perspective located in place and time and is subject to change as we expand our imaginations by visiting the perspectives of other natals (p. 43).

Table 4: Continuum of Philosophies about Relating with Land				
Ecocentric Relations with Land		Transition	Anthropocentric Domination over Land	
Belonging to the Land	Organic Rootedness	Deep Ecology	Conservation	Resource Development
<ul style="list-style-type: none"> ● reciprocating ● unities ● kinship love ● sharing 	<ul style="list-style-type: none"> ● respecting ● nondual ● regenerating ● caring ● political 	<ul style="list-style-type: none"> ● intrinsic value ● interdependent ● apolitical ● romantic nature 	<ul style="list-style-type: none"> ● ecosystems ● dualistic ● managerial ● steward 	<ul style="list-style-type: none"> ● commodity ● dualistic ● developer ● sustainability

³⁴ The continuum is based on my master's thesis and an early version is published in Wolfstone (2018).

Let's look at working definitions for each standpoint.

- **Resource Development** is an [anthropocentric](#) philosophy that assigns value to land and so-called natural resources only if they can be developed and commodified to create wealth in the market economy. Sustainable resource development is located here because it retains the intent to create wealth, albeit at a slower pace in consideration of the next generation.
- **Conservation** is another anthropocentric philosophy that may be found in environmental sciences and conservation work. It seeks to protect selected land for use as parks for recreation and as reserves to protect habitats of endangered species. Systems thinking may be applied to understand species in ecosystems.
- **Deep Ecology** is a transitional philosophy that holds that nature has intrinsic value irrespective of its usefulness to humans. It tends to romanticize nature, particularly wilderness. It is based on ecosophy developed by Arne Naess (1973).
- **Organic Rootedness** is an [ecocentric](#) group of philosophies characterized by [nondual](#), egalitarian, and embodied relationships of mutual caring and love with Land and interspecies Beings. Organic Rootedness is distinct from Deep Ecology in that it disinvests from Modernity, critiques anthropocentrism, and engages in political praxis for [ecojustice](#). Ecofeminist philosophy and ecosocialism are located at this standpoint.
- **Belonging to the Land** represents Indigenous Earth-centered philosophies of living in loving and caring kinship with the Land. This standpoint respects the ancient

cosmology of the Land and takes responsibility to maintain harmony and balance with the Land and other regenerative forces.

These definitions emerged from previous studies in which I found that adults tend to transition from anthropocentrism to ecocentrism through informal and nonformal learning by building networks with other ecocentrics for learning and activism. A transpersonal experience of unity with Land may provide a catalyst for transformation (Wolfstone, 2016; 2018a, p. 191-195). I have not yet met a person who moved from ecocentrism to anthropocentrism and interpret this phenomenon as affirmation that becoming ecocentric is expansive and healing because we are liberated from behaving like a dominator. The experience of listening to and learning with Sojourners who are transitioning from anthropocentrism to ecocentrism gives me hope in the viability of an ecocentric way of living.

There are many ways and perspectives for nurturing ecocentric relationality with Land, Climate, and interspecies kin. Let's focus on Glenn Albrecht's symbiotic approach and on my Deep Listening approach³⁵. An excellent resource for experiential learning is Joanna Macy's *Coming back to life: The guide to the work that reconnects* (2014), which is informed by Deep Ecology, systems thinking, and Buddhist teachings of nonduality.

Nurturing Symbiotic Relationships. Australian ecophilosopher Glenn Albrecht invites us to participate in symbiotic communities. As a wordsmith, he creates innovative words for relationality with Land to fill a gap in the English language. *Earth Emotions* (2019) is his dictionary of neologisms for transforming negative Earth emotions to positive Earth emotions.

³⁵ My ideas about deep listening and transpersonal learning have been previously published in Sojourner Collective (M.L. Chown, M. Korlak, L. Wakeman & I. F. Wolfstone). Deep listening. In A.J. Farrell, C. L. Skyhar, & M. Lam (Eds.), *Teaching in the Anthropocene*. Canadian Scholars Press.

He builds on the scientific concept of symbiosis, meaning organisms living together for mutual benefit. Albrecht believes that by forging emotional bonds, we can nurture a [symbiotic](#) relationship with Earth and with the Beings that share our place of habitation (p. 133), thus providing an antidote to living in Modern isolation. Here are a few examples of his creative neologisms:

- *solastalgia* refers to grieving with the Land as it suffers the effects of ACC (p. 200);
- *eutierria* refers to “a positive and good feeling of oneness with the Earth and its life forces where the boundaries between self and Earth are obliterated and a deep sense of peace and connectedness pervades consciousness” (p. 199);
- *sumbiophilia* refers to the love of living together (p. 119);
- *soliphilia* refers to the love of the totality of our place relationships and our willingness to accept political responsibility for protecting them at all scales (p. 121); and
- *symbiocene* is a meme for the geological epoch in Earth’s story that comes after the so-called Anthropocene. We will know that we have entered The Symbiocene when human activity leaves no trace of our impact on the planet except for the temporary remains of our teeth and bones (p. 201).

Albrecht is optimistic that the so-called Anthropocene will be short-lived because it is infused with negative emotions and a Symbiocene generation is bringing positive Earth emotions. He refers to Gen S as the youth movement that is leading the way to the Symbiocene because they, like Greta Thunberg, are frustrated with the adults who fail to react with urgency and common sense to the climate emergency. Entering the Symbiocene will be a deeply satisfying experience for ecocentric persons.

Unlike Albrecht, I resist the Anthropocene, the term proposed in 2000 by Paul Crutzen, atmosphere chemist, for the next geological epoch. I resist the popular term because a) it has not been approved by the International Union of Geological Sciences and b) it pessimistically extends Modernity's anthropocentrism into the future by assuming that "humanist Man and supremacist Anthropos" will continue to dominate (Braidotti, 2019, p. 52). I hold to the hope that the Modern Age, as a prolonged [period of degeneration](#), will be succeeded by a period of regeneration that demonstrates human capacity to make rapid transformations in response to Anthropogenic Climate Change. Like Donna Haraway (2016), I call for collective imagination to stay with the trouble of climate change by making kin in a multi-species future of earthbound relationships. This dissertation is my investment in a symbiotic future.

Deep Listening. Deep Listening is an ecotherapy that uses Focusing-oriented listening developed by Eugene Gendlin (1981)³⁶ and adapted to my practice of deep listening with Oaks. Befriending the felt sense of a tree or grove enables me to experience embodied learning and a full sensual and empathic connection with another species. My notion of self shifts from an enclosed-inside-this-body-skin sense to a transpersonal experience of body/self-in-symbiotic-community.

Deep Listening with a Tree
Approach a grove of trees. Ground yourself. Slow your breathing.
Broadcast a message that you have come to listen as a friend and ask if anyone would be willing to speak.

³⁶Gendlin's work at the Focusing Institute, University of Chicago, is informed by Merleau-Ponty's phenomenology. My application to ecotherapy borrows from Ted Toadvine's ecophenomenology. Adrian Harris (2013) has developed the technique into an ecotherapy. I am certified as a Focusing-oriented psychotherapist by the Focusing Institute, Chicago.

Listen for an affirmation that a tree has chosen you for conversation. Sense the tree with multiple senses and welcome the personhood of the tree to speak when it is ready.

On first listening, let the tree set the topic. When you have become better acquainted, you can come with the intention to ask a question, but on the first experience, please treat the tree as a Sage or Elder who speaks when the time is right. The conversation may involve sounds, sight, symbols, or multiple senses.

Listen for the feeling of the message and attend to the feeling with empathy and caring.

Listen for any instructions the tree may have for you. Ask if there is anything the tree needs from you.

The tree may invite you to transport yourself to its highest branches to get a big picture perspective of the world from the tree's perspective. Discuss your observations with the tree to make sure you are getting the meaning that the tree intended for you.

The tree may invite you to journey through its root system to learn from its underground big picture perspective. These conversations may get to the root of the matter.

When you are ready, return to your grounded reality. Feel your body in the place where you are. Thank the tree. If it feels right, you may wish to leave a gift.

Journal your conversation and insights. Communication is often cryptic so you may be short on words but rich in images or other sensory experience.

I encourage readers to use this technique to nurture a listening relationship with Climate by listening deeply to her active voice and empathizing with her distress. Recognizing Climate's [agency](#) is a way to respect Climate. Consider asking Climate what it needs from you to restore harmony and balance in your mutual relationship. Climate is not a threat to be confronted with fighting words; it is a planetary life force who makes cultural continuity possible.

Preparing for Change

In this section, I introduce change as an undulating process symbolized by the chevron, an ancient symbol of water. Designers of local climate change adaptations work with their communities to prepare for change, so let's focus on leadership and facilitating change. Preparing for change involves an attitude of hospitality.

Change is Undulating. In a world in flux, change is constant, like the undulating waves of a flowing stream. We ride the waves of change through crests and troughs. Changing an old way of thinking to a new way of being in the world can feel like a peak experience; however, after months or years in the trough of a new way of being, we are surprised to discover that we have not *arrived* yet. There is *More*. The learning journey continues as we climb another crest and adapt to yet another way of being on the continuum of change. When we are in a trough, we cannot see how many more crests are ahead and this may explain why change is an intense experience that gives us an elated sense of having arrived. Curiosity motivates us to ride the waves of change because, as learners, we yearn for more.

Change and Resistance. Change typically evokes resistance. Resistance may be related to the emotion of fear: fear of losing privilege, assets, and routines. Change facilitators listen to fear with respect and with openness to learn what is behind the fear and what it might take to

ease the fear. When fears are heard and respected, they can shift. It takes courage to change, and facilitators of change build collective courage to engage with change.

Cosmological Transition: Preparing for Large-Scale, Long-Term Change

This section explores cosmological transitions in past climate change events and asks if another cosmological transition is underway. Then we focus on some Earth-centered philosophies that are attracting renewed interest.

Cosmological Transitions in Past Climate Events. Building on Learning Roots 2, I reStory cosmological transitions that occurred in past [climate events](#).

- During the 5.9 KY and 4.2 KY climate events, Pontic invaders imposed their cosmology with chief sky god Dyeus on the Danube culture. The Danube culture's matristic cosmology was overwritten by a new patriarchal cosmology in a conflict that is immortalized in Greek mythology as Titanomachy and the transition from the ancient pantheon of the Titans to the pantheon of the Olympians (Gimbutas, 1989). The term deity derives from *Dyeus*, the Proto-Indo-European origin of Zeus and Latin *dei*.
- During the Migration Period climate event, the cosmology of the Roman Empire transitioned to Christianity, a monotheism that became the state religion in 380 CE, ending the syncretic practices of the Roman Empire. Christians persecuted adherents of pagan traditions, destroyed their temples, and appropriated the sites to build churches. Christians established a celibate priesthood and built a cathedral to St. Peter on Vatican Hill, where for centuries celibate priests had performed Taurobolium blood rituals in honour of Rome's protector deity Cybele.

- The Little Ice Age was marked by intense religious conflict. The Reformation was not a changing of the gods but a demand for plurality of Christian institutions and practices. The violent erasure of difference decreased after the Treaty of Westphalia set down rules for plurality (Leeson and Russ, 2018).

Did you notice the tension between plurality and intolerance of difference? These transitions prepare us for the next cosmological transition in the current climate event.

Is a Cosmological Transition underway? An increasing number of Canadians self-identify as *spiritual but not religious* (SBNR). According to an Angus Reid public opinion poll in 2015, 27% of Canadians viewed themselves as neither religious nor spiritual, while 39% viewed themselves as spiritual but not religious (Angus Reid Institute, 2015). Linda Mercadante (2020) finds that at least one third of the US population identifies as SBNR (p. 3). The SBNR movement defines spirituality as personal, heart-felt, and authentic; it views formal religion as external, structured, and non-essential. According to Mercadante, SBNRs are unlikely to form a new religion because they distrust institutions, lack organization, and have great diversity of beliefs.

Scholars of religion are studying the movement toward Earth-centered beliefs. Ecofeminist theologian Rosemary Radford Ruether (2008) finds that the post-Christian movement rejects anthropocentrism and cosmologies of a heavenly home that is superior to Earth. She studies the ways religions are responding to the climate crisis by greening their theologies and argues that the Abrahamic religions made minimal change because anthropocentrism is embedded in their Creation Story and regarded by some sects as divine law, not as a human construct open to fresh interpretations. Albrecht (2019) coined *ghedeist* to refer to the secular Earth-centered beliefs and practices that celebrate unity with Earth and the

community of Beings (p. 160). The current cosmological transition appears to be reflected in the Anishinaabe Eighth Fire teaching, which predicts that some settlers will join with Indigenous peoples in caring with the Land. Simpson (2008) tells the story of the Seventh Fire, which describes the present time, when a cosmological transition appears to be underway.

Eighth Fire – An Anishinaabeg Prophecy

After a long period of colonization and cultural loss, a new people, the *Oshkimaadziig*, emerge. It is the *Oshkimaadziig* whose responsibilities involve reviving our languages, philosophies, political and economic traditions, our ways of knowing, and our culture. The foremost responsibility of the “new people” is to pick up those things previous generations have left behind by nurturing relationships with Elders that have not “fallen asleep.”

Oshkimaadziig are responsible for decolonizing, for rebuilding our nation, and for forging new relationships with other nations by returning to original Nishnaabeg visions of peace and justice. According to the prophecy, the work of the *Oshkimaadziig* determines the outcome of the Eighth Fire, an external fire to be lit by all humans. It is an everlasting fire of peace, but its existence depends upon our actions and our choices today. For the Eighth Fire to be lit, settler society must also choose to change their ways, to decolonize their relationships with the Land and Indigenous Nations. (Simpson, 2008, p. 14)

Earth-Centered Philosophies. Many ancient practices for living the [cosmology of the Land](#) are still practised today. I refer to them as *philosophies* to avoid terms like spirituality, religion, wisdom traditions, or worldview, which may understate the complexity and significance of earth-centred philosophies, as [onto-ethico-epistemologies](#) and cosmologies. Many practices

have ancient origins in pre-patriarchal cultures and endure [in](#) contemporary practice. In [pluriversal](#) worlds, these philosophies are not mutually exclusive, e.g., a culture may be both animistic and elemental.

- ***Elemental philosophy*** is an ancient science in which the elements (i.e., Air, Earth, Fire, Water, Space) are life forces for regeneration and degeneration, are always in flux, and must be balanced to maintain harmony with the cosmos. Elemental philosophy informs eastern medicine systems, e.g., Traditional Chinese Medicine, Ayurveda, Unani, and Sowa-Rigpa. The Medicine Wheel teachings integrate elemental philosophy. For millennia, cultures have generated symbols to represent and transmit elemental beliefs and systems (Starhawk, 2005; Macauley, 2010).
- ***Shamanism***, an ancient and extant philosophy and practice, involves belief in soul and spirits. Death is a portal to other worlds and the soul is undying in a never-ending process of regeneration. The term *shaman* originates in Siberia where shamanist practice is linked to the cosmology of Tengrism and Umai, Mother of Souls. Many Indigenous cultures have shamanic practices that include healing, visionary, and ceremonial functions that seek the assistance of Ancestors as well as plant and animal spirits to maintain balance and harmony with the cosmos. Neo-shamanism is a contemporary movement often criticized as appropriation and a homogenization of diverse cultural traditions; however, it provides insight into the human capacity for transpersonal knowing (Balzer, 2016; Winkelman, 2011).
- ***Daoism*** originated in China's ancient shamanic traditions and holds beliefs about [immanent](#) life forces and respect for ancestors that extends to interspecies kin.

Practices for maintaining balance and harmony include Tai Chi, Qi Gong, and Feng Shui. Daoism is resurgent as an approach to climate change, which is viewed as human-caused imbalance and disharmony. A resurgent Daoist pedagogy prepares learners for ecological and social change in cyclical time in support of China's stated goal to become an ecological civilization (Hung, 2020, p. 1361).

- **Animism** is a nondual relational philosophy that is based on the cosmology of the Land, and thus unique to each bioregion. It is embedded in language, stories, songs, and symbols. Animism is open to the intentionality of the world as sentient, inventive, self-designing and self-regulating. Animism participates in the world through active listening in open-ended encounters with sentient Beings (Bird-David, 1999, 577; Plumwood, 2009; Harvey, 2017).
- **The Great Mother** was venerated by pre-patriarchal cultures that expressed their relationality with Land and chthonic life forces personified as immanent Sacred Beings, which evolved over millennia to deities, for example, Kybele, Anatolian Mother of the Mountain became Cybele, protector deity of Rome. Concept Map 3 uses red spirals to indicate the period when matricultures were the most common social organization and when veneration of the Great Mother was pervasive. The following Great Mothers are mentioned in this work: Sedna, Sky Woman, Maa-Durga, Demeter, Isis, Tanit, Pachamama, Serpent Mother, Gaia, Kali-Ma, Kybele, Mother Earth (Neumann, 1955; Diop, 1989; Gimbutas, 1989; Dexter, 1990; Baring and Cashford, 1991; Dashu, 2023).
- **Paganism**, derived from *paganus* (Latin) meaning country dweller, was used as a pejorative by Roman Christians for Romans who had not converted to Christianity and

continued to practice the old religions. In contemporary practice, paganism is a generalization that includes pre-patriarchal and non-Christian belief traditions that honour the [Great Mother](#) and Mother Earth. Some pagan traditions went underground during the period of religious violence in early Modernity, e.g., hylozoism. The contemporary resurgence of pagan traditions seems to follow the decline in adherents to the Christian religion and includes practices to honour both the lunar and solar cycles of time (Starhawk, 1982; Apffel-Marglin, 2011; Abdou and Zervas, 2023).

- **Ancestors.** Indigenous cultures pick medicines in the forest where their ancestors walked and fish in the rivers and lakes where their ancestors fished. They read traces of the ancestors, recall their memories, and experience the presence of the past.

Leanne Simpson links Anishinaabe cosmology with respect for ancestors:

Indigenous bodies exist only in relation to the Indigenous complex, nonlinear constructions of time, space, and place that are continually rebirthed through the practice of reciprocity. My Ancestors are not in the past. These forces and Beings are right here beside me—inspiring, loving, and caring for me in each moment and compelling me to do the same. It is my responsibility with them and those yet unborn to continuously give birth to my Indigenous present.

(Simpson, 2017, p. 182, p. 193)

I invite readers to add Earth-centered philosophies from their ancestral heritage. Settlers whose memories of their ancestral Land-based cosmology have grown dim may choose to hybridize their ancestral or chosen cosmology with the cosmology of the Land they now inhabit to become more deeply rooted in the Land—to live the cosmology of the Land.

In Learning Roots 4, we focussed on deModernizing by recovery from cosmological destitution, becoming ecocentric in a loving and listening relationship with Land, and preparing for a cosmological transition. Learning Roots 5 explores deModernizing by focusing on agency and Learning Roots 6 explores deModernizing by reTurning in spiraling time to regenerative cultures.

Synthesis of Findings on DeModernizing: ReInhabiting Land Differently

What do designers of local climate change adaptations need to know about Indigenous conditions for cultural continuity that enabled Indigenous and ancient cultures to endure past climate change events? With the goal of facilitating radical literacy for climate change adaptations, I synthesize knowledges about climate change adaptations discussed in Learning Roots 4, which focuses on the three conditions: living the cosmology of the Land, relating with Land, and welcoming difference.

- [DeModernizing](#) in the pluriverse, like decoloniality and resurgence, is engaged in restructuring relations to nondomination. The deModernizing process includes a) recovery, b) becoming ecocentric, c) becoming agentic, and d) reTurning in spiraling time to regenerative cultures.
- Recovery from cosmological destitution involves reinhabiting Land differently by relating with Land with caring and loving listening in an ecocentric relationship.
- Becoming agentic for ecojustice and climate justice is participating in collective actions with the goal of emancipating Land and climate from human domination by restructuring relations to nondomination.

- Climate change adaptation involves agentic preparations for long-term, large-scale transformative change at all scales: local, bioregional, national, and global; however, Learning Roots focus on [local](#) scale, a movement known as localization.
- Cosmological transitions occurred in past climate change events. The cosmological transition currently underway is a movement toward nondual Earth-centered practices & cosmologies (e.g., elementalism, paganism, animism, shamanism, the Great Mother, Daoism). This movement toward ecocentric beliefs and practices is a critique of Abrahamic religions that embed anthropocentrism.

Looking forward, I call on the emerging field of Climate Psychology to develop ecotherapies for recovering from Modernity as well as holistic learning tools for becoming ecocentric.

Questions for Reflection and Discussion

- 1) What is your cosmology of time, place, and space?
- 2) Do you imagine the next Age as the Anthropocene or as the Symbiocene?
- 3) What stands in the way between you and a symbiotic relationality with interspecies kin in your community?
- 4) What kind of adaptations would you design to facilitate the cosmological transition in your local community?
- 5) When you have a quiet moment, locate yourself on the continuum (Table 5). What experiences and learnings were catalysts to your movement along the continuum? Where are you moving to next?

Praxis. Each day, act for climate justice.

Additional Resources

- Escobar, A. (2018). *Designs for the Pluriverse*. Duke University Press.
- Albrecht, G. (2019). *Earth Emotions: New Words for a New World*. Cornell University Press. Albrecht's website is Psychoterratica.
<https://glennaalbrecht.wordpress.com/>
- Macy, J., & Brown, M. Y. (2014). *Coming back to life: The guide to the work that reconnects*. New Society.

Resources for Arts-based Learning

- *Earth Stories*: a planetary mythology to bring individuals back into relationship with humanity, the community of life and planet Earth. Website:
<https://theearthstoriescollection.org/en/tag/anthropocentrism-ecocentrism/>
- *The Travellers*. Sculptures by Bruno Catalano. *Le Grand Van Gogh* symbolizes the void created by leaving one's homeland and ancestors for life in another Land.
<https://www.dailyartmagazine.com/sculptures-of-bruno-catalano/>
- View *Avatar*, a movie by James Cameron. Use Table 4 to analyze any transitions along the continuum of philosophies of relating with Land.
- "Dido's Lament" by Annie Lennox and London City Voices. Music for grieving with Earth and climate. <https://www.youtube.com/watch?v=f3DFalovZxc>
- "Third Symphony: Symphony of Sorrowful Songs" by Henrik Gorecki. Music for grieving. <https://www.youtube.com/watch?v=-mEWIGLkjlw>
- The Greenfield Papyrus (the *Book of the Dead of Nesitanebtashru*). Art from ancient Egypt, photographed by the British Museum, original artist unknown. Public domain, via Wikimedia Commons. See also
https://www.britishmuseum.org/collection/object/Y_EA10554-87. How are the four elements represented? How is Egyptian matriculture represented?

Learning Roots 5 - Sharing the Generosity of the Land



Image 11: Sharing Community.
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Learning objectives

- to explore sharing economic systems based on the principles of care and ecojustice,
- to prepare for long-term, large-scale transitions in economic systems, and
- to prepare for climate risks in ways that respect the carrying capacity of local ecosystems.

Overview

We explore sharing as a condition for cultural continuity by asking the question: what are some sharing economies practised by ancient and extant cultures? Learning Roots 5 is organized in four sections. First, I problematize greed in its entanglement with capitalism and anthropocentrism. The second section explores practices of sharing economies. The third section focuses on deModernizing by preparing for long-term large-scale change in economic systems. The fourth section focuses on designing climate change adaptations to prepare for local impacts of climate risks.

Weaving Dropped Threads into Radical Literacy for Climate Change Adaptations

sharing economies (gifting economy, *oecumene*, regenerative economy, subsistence economy, communal economy), principles of care (egalitarian, enoughness, sufficiency, reciprocity, generosity); greed problem; Limits to Growth (carrying capacity, adaptation limits, overshoot), climate change risks (climate refugees, food insecurity).

Introduction. Ecofeminist scholar/activist Vandana Shiva (2008) calls for new ways of thinking and acting in small regenerative communities that disinvest from capitalist greed that is producing global poverty:

Climate chaos, brutal economic inequality, and social disintegration are jointly pushing human communities to the brink. We can either let the processes of destruction, disintegration, and extermination continue unchallenged or we can unleash our creative energies to make systemic change and reclaim our future as a species, as part of the earth family. We can either keep sleepwalking to extinction or wake up to the potential of the planet and ourselves. (p. 144)

Shiva's stark warning about extinction focuses our attention on designing economic adaptations that support the regeneration of life for all species. In Learning Roots 5, my intent is to explore [sharing](#) as a [condition for cultural continuity](#) and as a design principle for [local climate change adaptations](#) in the [pluriverse](#). I approach this topic by drawing on my informal learning experience as a visitor to intentional communities, as well as the literature of ecofeminism, Indigenous Knowledges, Decolonial Theory, critical anthropology, and Critical Ecopedagogy.

Problematizing Greed

[Greed](#) is the glue that keeps many humans stuck in the capitalist economy of Modernity/ coloniality. Greed, defined as desire to possess more than one needs, manifests in the Modern compulsion to get ahead, which infers ranking and competition. Greed is

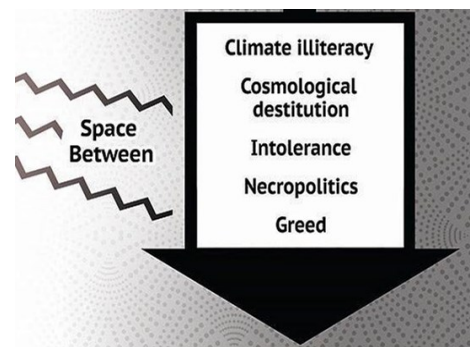


Image 12. Problematizing Modernity-Concept Map 2 excerpt

a harsh but honest word for a compulsion that feeds consumer demands for products that contribute to [overshoot](#) of Earth's [carrying capacity](#).

Critiques of Capitalism. Capitalism is perversely impervious to critique; however, my intent in critiquing capitalism is not to reform it, but to become clear-minded about designing future economies that contribute to ecojustice and regeneration. Let's listen to critiques of capitalism from the five knowledges that guide this work: ecofeminist philosophy, Indigenous Knowledges, Decolonial Theory, critical anthropologists, and Critical Ecopedagogy. But first, we listen to climate activist Greta Thunberg (2019, Feb. 21) who told the World Economic Forum at Davos: "I want you to act as if your house is on fire, because it is." In another speech titled, "You are acting like spoiled children," Greta Thunberg stated:

Once you have done your homework you realize that we need new politics, we need new economics where everything is based on a rapidly declining and extremely limited remaining carbon budget. But that is not enough. We need a whole new way of thinking. The political system that you have created is all about competition. You cheat when you can, because all that matters is to win, to get power. That must come to an end, we must stop competing with each other, we need to cooperate and work together and to share the resources of the planet in a fair way. We need to start living within the planetary boundaries, focus on equity and take a few steps back for the sake of all living species. We need to protect the biosphere, the air, the oceans, the soil, and the forests. (Thunberg, 2019, Feb 2)

Thunberg's agency and courage inspires youth who participate in School Strikes for Climate.

Ecofeminism. Ecofeminists critique capitalism for its inherent inequality built into Modernity's systems of [anthropocentrism](#), [heteropatriarchy](#), [white supremacy](#), and [Christian theocracy](#). Ecofeminists argue that capitalism is unsustainable because infinite growth is impossible on a planet with finite resources (Merchant, 1980; Mies and Shiva, 1993; Salleh, 2017). Shiva critiques capitalism for marketing consumption habits that feed greed and breed [monoculture](#), first a "monoculture of the mind" and then a monoculture of seeds that impoverish the regenerative capacity of life (Shiva, 1993, p. 4). Ecofeminist Maria Mies (2014) argues that "capitalist patriarchy" is a system that exploits and oppresses women using the mechanisms of "robbery, warfare, and conquest" (p. 38). In Europe's period of Enlightenment, women were confined to domestic slavery to reproduce the workforce, prohibited from owning land, and barred from higher learning. Ecofeminist Ariel Salleh (2017) exposes the oxymoron that only capitalism benefits while depleting Earth (p. 4). She critiques capitalism for driving climate change, and then profiting from mitigating technologies and bioengineering.

Indigenous Knowledges. Indigenous critique of capitalism is articulated in *Wahbanang: The resurgence of a people, Clearing a path for our survival* (Courchene, Bone, Paynter et al., 2021) in which the Knowledge-Keepers and Elders caution that promises of economic development have been empty promises for Indigenous people:

Unfortunately, for the most part, to succeed in a capitalistic world, one must become a capitalist. In the end, capitalism does not improve our way of life; it threatens our survival and the survival of all life on the planet. The challenge always is to live by our values, rather than the colonial ones. (p. 258)

Wahbanang urges Indigenous communities to make “our survival in times of climate change a priority and focus on preparing our communities and families for our spiritual, emotional, physical, and mental survival” (p. 284). Simpson (2017) critiques capitalism using the language of dispossession and theft. Creating a Nishnaabeg future is to “categorically refuse and reject dispossession and settler colonialism and the violence of capitalism, heteropatriarchy, white supremacy, and anti-Blackness that maintains them” (p. 10). She associates dispossession with “displacement, encroachment, and industrial extractivism” that took over Indigenous territories over time (p. 13). She accuses capitalism of greed-of “wanting all the land, whether or not it is legal” (p. 15). She refers to [extractivism](#) as stealing—as taking without consent, care, or consideration of impacts (p. 75).

Decolonial Theory. Decolonial theorists assert that the European project to globalize its capitalist economic system has failed. María Lugones (2007) criticizes Western science for being the servant of capitalism and distributing power that privileges European knowledges of men while hiding the methods of erasure that it uses to marginalize women and their traditional knowledges (Lugones, 2007; Gay Antaki, 2019). Building on Simpson, Mignolo (2021) argues that greedy European empires dispossessed Indigenous peoples in the Americas of their Land in the sixteenth century, in New Zealand, Australia, and South Africa in the nineteenth century, and in Africa after the 1884 Berlin Conference (p. 175). He predicts that Modern nation-states will collapse due to the failure of the globalization project as former colonies reclaim sovereignty over their ancestral Lands and communal economies that serve life (p. 179).

Critical anthropologists. Haarmann (2020) critiques self-regulating markets as a delusion and that “rapacious” market capitalism is driving disasters, while hiding the powerful

manipulators from public view (p. 208). He urges us to explore the notion of equality in ancient cultures that flourished using co-operative or communal social organization. Chew (2008) insists that all systems are human constructs with begin dates and end dates, and that the end of the historical capitalist world-economy system is at hand (p. 5). We are in transition.

Critical pedagogy. Henry Giroux (2013, 2020) critiques free-market fundamentalism as neoliberal fascism that is manufacturing illiteracy using the delusion that there is no alternative (p. 200). He is concerned that greed has become normalized. Avarice and narcissism are not new; however, an unprecedented social sanction of greed emerged during the Great Dithering. According to Giroux (2016), greed manifests as a selfie culture, competition, disposability, instant gratification, obsessive self-interest, dissatisfaction with one's face and body, and displaying possessions. He is concerned that "neoliberal public pedagogy" is creating a consumer culture that cannot distinguish between wants and the basic needs of survival. Richard Kahn (2010), scholar of Critical Ecopedagogy, critiques sustainable development policy as the systemic failure of economic and political institutions to respond to the climate emergency. He critiques scientists who endorse capitalist management of mitigation interventions despite understanding that capitalism is a driver of Anthropogenic Climate Change. He critiques sustainability education as a greenwash that masks anthropocentrism and neoliberal economics.

I propose that the economic transition to capitalism in early Modernity appears to be a [maladaptation](#) to the Little Ice Age for the following reasons:

- It causes massive harm to Earth and to cultures through extractivism, carbon-emitting industrialization, and colonization;

- It drives Anthropogenic Climate Change Event and the Sixth Mass Extinction Event; and
- It is immoral in that it depends on theft of bodies (Black slavery and women's domestic slavery), theft of land, and the normalization of greed.

In Learning Roots 5, I invite us to imagine a next economic system that is pro-Life. These critiques of capitalism call for imagining economies that are ecocentric, egalitarian, and just.

ReStorying Sharing Economies

In the [Space Between](#), I reStory the [subjugated knowledges](#) of sharing economies practised by Indigenous and decolonizing cultures. Knowledge of sharing economies enables designers of local climate change adaptations to imagine possible adaptations.

Principles. Before exploring systems of sharing economies, let's identify the caring principles that guide them.

- [Reciprocity](#) is an ethical responsibility enacted locally in response to the generosity of Land, Air, Fire, and Water in ways that demonstrate consent, empathy, caring, and sharing (Simpson, 2017, p. 77). According to Kuokkanen (2019), gifting is a way to reciprocate the Land's bounty, not out of obligation or self-interest, but as a way of living in harmony with the Land, often personified as Mother Earth. Apffel-Marglin (2020) believes that reciprocity is incongruent with Modernity's systems of domination and questions whether Modern settlers stuck in an anthropocentric and dualistic philosophy can perceive reciprocity (p. 81).
- *Egalitarianism* is a commitment to collective flourishing that respects all Beings. On Concept Map 3, *flourishing* is located after recovery has stabilized cultures, making it feasible to experience fullness, abundance, and plenitude (Matthews, 1991, p. 156-8;

Simpson, 2011, p. 16; Mignolo, 2021, p. 513). I invite readers to imagine an egalitarian economy as one of collective interspecies flourishing in which no Being is left behind because the notion of domination is abhorrent.

- *Generosity* is a principle enacted with kindness, hospitality, gifting, compassion, and voluntary service.

Keeping in mind the principles of reciprocity, egalitarianism, and generosity, let's explore sharing economies. The following forms of sharing economies are not discreet. There may be overlaps.

Indigenous Gifting Economies³⁷. Rauna Kuokkanen (Sami) (2006) states that the gifting economy in Indigenous philosophies is more complex than sharing economies and the exchange economy. In Indigenous philosophy, "the world as a whole is constituted of an infinite web of relationships extended to and incorporated into the entire social condition of the individual. Social ties apply to everybody and everything, including the land" (p. 258). Accordingly, the gift is the means for renewing and securing social order because it manifests reciprocity and recognizes the bond of dependence and respect toward Land. The bond places responsibilities on those who are dependent on Land, and that responsibility is observed through ceremonies. Gifts are expressions of gratitude to the ancestors in an affective gesture of wishing a good life for all kin (p. 266) because continuity depends on relationality with Land and all relations. Some cosmologies embed generosity and reciprocity in First Instructions. (Kuokkanen, 2007, p. 18; 2011, p. 219).

³⁷ The section on Indigenous Gifting Economies has been published in Wolfstone, I. F. (2020). Sharing economies and Indigenous matricultures in the Land now called Canada. *Canadian woman studies journal* (34)1-2.

Indigenous economies are complex systems that integrate ecological, cultural, governance, and cosmological systems, thus enriching communities in ways that promote cohesiveness, pride, and sharing. Simpson (2017) refers to gift giving as part of Indigenous diplomacy with the intent to build relationships (p. 77). The principle of gifting applies to gifts of knowledge as well as to aesthetic and material goods. Gifts of knowledge embedded in songs and stories are highly treasured. She critiques capitalism as extracting and assimilating. Gifting practices in Indigenous economies include the following.

- 1) *Aipommotsspistsi* is the Siksikaitsitapi practice of reciprocity and generosity that maintains balance by sharing Mother Earth's gifts to sustain all life. Societies flourish only when they mimic the generosity of Mother Earth in all their kinships. Elders give their best possessions as gifts to reflect the enormity of the gifts given by the Source of Life (Bastien, 2004, p.145).
- 2) Give-aways refers to an Anishinaabe and Cree gifting practice. Harvests are shared with the community's most vulnerable members. Many ceremonies include a giveaway (Simpson, 2017, p. 8, 73-7, 184-5).
- 3) Potlatch is practiced by Indigenous cultures of the North Pacific as a significant cultural ceremony involving the distribution of gifts to guests. Each culture has its own unique traditions for expressing joy in songs, dance, and art that enact and reciprocate their relationship with Land and Water. A song is the most treasured gift one can receive for it contains teachings and stories that are part of the oral tradition. Potlatch ceremonies mark milestones such as the naming of a child, marriage, adoption, mourning the dead, and raising a totem. The Tlingit and Haida claim the potlatch as a law since time

immemorial and the foundation of their sovereignty. The Tsimshian hold a ceremonial potlatch to officially transfer leadership and to assign rights to territory and hereditary names (Robertson, 2012; Collison, 2010).

- 4) *Balhats* refers to the Dene practice of feasting and gifting ceremonies to maintain an ancient social order that integrates customary law, gender roles, ceremonial functions, clan kinship system, hereditary chiefs, and kinship relations with the Land. Rituals of reciprocity are the responsibility of both men and women involved in the harvesting, cooking, distribution, and eating of foods; however, Dene matriarchs are responsible for distributing food in ways that respect both human kin as recipients and animal kin who are watching (Fiske & Patrick, 2000, p. 13).

Methods of Erasure. Canada amended The Indian Act from 1885 to 1951 to ban Indigenous ceremonies, specifically potlatch, Sundance, pow-wow, and give-aways. The ban was first applied in the North Pacific region where Christian missionaries condemned potlatches as excessive debauchery. The ban was later applied in other regions and enforced by Indian agents using an unauthorized pass system (Carter, 1990, p. 145-56; Daschuk, 2019). The ban on ceremonies was an attack on Indigenous economies as well as on Indigenous belief traditions.

Communal Economies. We turn to Arturo Escobar (2018), decolonial theorist, to define the *communal*. It does not mean *the commons* or *the commonwealth*, concepts that originate in England, or Marxism or communism. The *communal* in Latin America implies plurality—a collective *we* that exists in complementary relationships—an entanglement of humans and interspecies kin. Communal systems coexist with capitalism but expand communal enterprises. Communal economies are practised by urban and rural Indigenous groups. The political

dimension of the communal anchors power in the collective through shared responsibilities.

Escobar asks provocative questions for deModernizing in the Space Between:

How do we recommunalize our worlds? How do we develop forms of knowing that do not take words and Beings out of the flow of life—that is, forms of knowing and being that do not locate Land and Trees and Water as external to us, as insentient matter? ... How do we transform our locatedness between worlds into a hopeful praxis of living, a space for weaving ourselves back into the web of life with a pluriversal ethic? How can our thread of existence interweave relationality with other Beings in the communal tapestry made of interwoven threads (p. 200)

The goal of communal life is not accumulation or getting ahead but living in harmony. Mignolo (2021) contextualizes the *communal* in the living philosophy of *sumak kawsay*, where the priority is “living life in harmony and plenitude” unlike capitalism where people live to work, but only a few are privileged with wealth (p. 518).

Subsistence Economies. Economist E. F. Schumacher (1973) coined *enoughness* as the principle of rightsizing in his classic *Small Is Beautiful: A Study of Economics As If People Mattered*. His influence lives on at [Schumacher College](#) and in the [Transition Network](#), as well as the voluntary simplicity movement. Subsistence economies practice enoughness within a small informal community producing enough local goods to meet basic human needs. Many are built on the ecological knowledge of women as food producers and provisioners. Feeding the community is a way of reciprocating Mother Earth’s unconditional caring. Ecofeminists advocate for subsistence livelihoods that prioritize mothering and [food security](#) as ways to

adapt to climate change (Mies & Shiva, 1993; Shiva, 2016; Salleh, 2017; Isla, 2019, p. 30; Isla, 2019).

Regenerative economies. Earth-centred regenerative economies, also known as circular economies, respect forces of regeneration, including women's regenerative work. The principles of reciprocity and nondomination are reflected in practices. Ariel Salleh (2017) calls on women to care for Land, feed their communities, and set down roots for "a new civilization" built on a praxis of provisioning that respects regenerative labour (p. 8-9).

The Commons. According to Federici (2019), *the commons* refers to co-operation and mutual responsibility in relationships of caring that are practiced in a diversity of contexts (pp. 93-5). In the small forest town in which I live, all residents can enjoy *the commons* as shared spaces that belong to the entire community, e.g., playgrounds, marina, waterfront, trails, community centre, hockey arena, tennis courts, swimming pool, and beach. My neighbour led a community-based project to build an outdoor classroom. A friend in a neighbouring town leads a community-based project that invests in a community garden and outdoor classroom.

Co-operatives. Cooperatives are incorporated organizations owned by their members who use their services or purchase their products. During the Great Depression, Canadians demonstrated adaptive capacity by creating institutions that provided basic goods and services at fair prices, thereby reducing vulnerability to the economics of greed. During the Depression, Premier Tommy Douglas led the movement for a system of publicly funded healthcare in Canada. The People's Co-op tells a Winnipeg story about enduring the Dirty Thirties (Kardash and Mochoruk, 2000). The co-operative movement remains strong in Manitoba where co-ops

provide services in housing, food, agriculture, day-care, and financial sectors. Protecting the commons and organizing cooperatives are options for local climate change adaptations.

Intentional Communities. Monastic intentional communities provide a model for secular intentional communities. In this section, I draw on my experiences as a visitor to intentional communities, including Trappist Monastery in St. Norbert, Ivolginsky Datsan in Buryatia, Russia; Zuungon Darzhaling community of Buddhist nuns in Ulan-Ude, the Abbey of St. Hildegard in the Rhine Valley, and the Benedictine Monastery on Reichenau Island. Monastic communities are intentional communities in that individuals choose to join an organized social community that shares a commitment to voluntary poverty, generosity, and devotion to a religious practice. A life of voluntary simplicity and generosity usually involves service to a local community and hospitality to visitors.

A life of devotion engages in collective practices of ritual, meditation, and music. When I visited the Zuungon Darzhaling community of Buddhist nuns in Ulan-Ude, I participated in *sangha*, after which they conferred a ritual initiation, wrapped my neck with a turquoise scarf in the tradition of the Medicine Buddha, and invited me to share a meal. During my stay at the Abbey of St. Hildegard, I attended mass several times a day and was deeply moved by the Gregorian chants sung in mesmerizing layers of sounds that evoke transpersonal experience. My college choir sang with the monks at the Trappist Monastery in St. Norbert and afterwards, they shared a breakfast of bread and the special cheeses that they produce on their farm.

Monastic communities are usually self-sustaining. The nuns at the Abbey of St. Hildegard are self-sufficient farmers, selling wines, fruit preserves, and baking to sustain the abbey. The Trappist monks at St. Norbert operated a dairy farm and marketed fine cheeses. The

Benedictines on Reichenau Island were farmers and shared food with the neighbouring communities. The Benedictines on Reichenau Island and the Abbey of St. Hildegard maintained gardens of medicinal plants, treated illness, and kept medical literacy alive. The monastery on Reichenau Island had a scriptorium for copying and illustrating books before the invention of the printing press. Similarly, the monks at Ivolginsky Datsan produce Buddhist texts to replace those destroyed during the Soviet period.

Many secular intentional communities are similarly committed to subsistence living and organicism. Members of Northern Sun Co-op in southeastern Manitoba practice permaculture and generate renewable energy for their homes and farm operations. Yasodhara Ashram on Kootenay Lake in British Columbia models shared labour and permaculture.

Environmental sociologist S. C. Chew (2008) calls for self-sufficient, intentional communities as a local climate change adaptation that provides basic literacy and healthcare, practices voluntary simplicity, and restores social community after five centuries of atomism. In Learning Module 4, we learned about *reinhabiting Land differently* as a way of recovering from the condition of cosmological destitution. Chew promotes a similar idea. “Rehabilitation means learning to live-in-place” with Land that has been degraded and injured (p. 38) and participating in a recovery process so that both Land and its inhabitants become “fully alive again” in a symbiotic community (p. 39). Chew predicts that after the collapse of the global market economy, secular intentional communities will focus on local self-sufficiency using local materials and organizing around the principles of caring, enoughness, and generosity (p. 140-1).

Economic Transitions: Preparing for Long-Term, Large-Scale Change

In this section, we learn from past climate events and then focus on economic transitions in the current climate event. Cultures that endured past [climate change events](#) made long-term, large-scale economic transitions to adapt to changing ecological conditions.

- In the 4.2. KY climate event, Harappa culture in the Indus River valley adapted to prolonged drought by [de-urbanizing](#), i.e., moving city populations to rural areas to support food production and irrigation projects. Harappa's egalitarian economic system of [oecumene](#) enabled this adaptation (Maisels, 1999, p. 249). When climate conditions caused the irrigation systems to collapse, the culture made a mass migration to another river valley (p. 184).
- In the Migration Period climate event, environmental degradation in combination with climate change compelled mass migrations by Central Asian peoples into the Roman Empire. Roman governors could not provide the guaranteed distribution of food that had maintained domestic stability (Chew, 2008, p. 59), causing social unrest. The Roman Empire's highly centralized economic system was unable to adapt and collapsed. In the [period of degeneration](#), Europe transitioned to a feudal system of [decentralized](#) economic and governance systems (Wolff, 2020). Monastic orders contributed to the [adaptive capacity](#) of local communities by sharing a subsistence living with them and keeping literacy alive after Latin fell into disuse (Chew, p. 27-44).
- During The Little Ice Age climate event, there were two economic transitions, first from feudalism to mercantilism, and then to the capitalist system under a centralized system of governance under monarchs. This occurred at a time of multiple crises: mass deaths due to famines and pandemics, loss of prosperity, and loss of literacy.

Colonization, as a project of capitalism, involved mass migrations of people, plants, and animals from Europe to the colonies. The capitalist economy involved theft in the forms of enclosure of the commons, theft of bodies into slavery, and theft of Land from Indigenous peoples (Federici, 2014; Apffel-Marglin, 2020, Simpson, 2017).

Preparing for Change: Designing Adaptations to Climate Risks

In this section, we dig into some practical aspects of planning climate change adaptations that prevent overshoot, transition design, and preparing for climate risks in our region.

Transition Design. Escobar (2018) assumes that Modernity has degraded Earth to the point of a “civilizational conjuncture” where everything needs to change. He calls attention to large-scale, long-term transitions that are already occurring in the pluriverse, where people are practicing alterity and non-hierarchy out of commitment to radical egalitarianism of all Beings (p. xvi). Hybridity and syncretism thrive in the pluriverse, which does not fear difference (p. 4-7, 68). He recommends Transition Design to facilitate system transitions that are not possible in Modernity/coloniality. Drawing from the Transition Movement and Transition Towns, he observes that Transition Design embraces affective relationality with Land and gives structure to economic transitions from greed-driven capitalism to sharing economies that support “convivial” and regenerative communities (p. 137-164). Transition Design is flexible enough to integrate other design principles, such as Albrecht’s *sybiomimicry* (Albrecht, p. 201), which mimics ecosystems in a cyclical, no-waste, mutually adaptive system.

Escobar believes that economic transitions are underway, although the outcomes are not guaranteed (p. 140). He recognizes that the transitions are complex, profoundly shaping and being shaped by culture and cosmology. He points to the movement toward ecological

civilizations. The People's Republic of China (2020) has enshrined its goal to become an ecological civilization in its constitution and developed a plan for national development toward this goal, including building on the Daoist principles and practices from its ancestral knowledge.

Designers of climate change adaptation need knowledge of Limits to Growth Theory to design local adaptations that respect Earth's limited carrying capacity. Limits To Growth theory (1972) was introduced by Club of Rome with lead author Donella Meadows. In *Limits to Growth: The 30-Year Update* (Meadows, Randers, Meadows, 2004), the authors conclude that humanity is in a dangerous state of overshoot. Key concepts of Limits to Growth Theory include:

- **Adaptation limit** is “the point at which an actor's objectives (or system needs) cannot be secured from intolerable risks through adaptive actions. Hard adaptation limit means “no adaptive actions are possible to avoid intolerable risks.” Soft adaptation limit means “options are currently not available to avoid intolerable risks through adaptive action” (IPCC, AR6-Glossary, 2022). IPCC cautions that adaptation limits have been reached in some ecosystems and that where there are no feasible adaptations, humans and other species must migrate or die.
- **Adaptive capacity** refers to “the ability of systems, institutions, humans and other organisms to prepare for climate risks, adjust to potential damage, or to respond to consequences” (IPCC, AR6-Glossary, 2022).
- **Overshoot** means that humanity is drawing on the world's resources faster than they can be restored, and we are releasing wastes and pollutants faster than the Earth can absorb them or render them harmless. In short, infinite growth is not possible with

finite resources and humanity's footprint is in overshoot of Earth's carrying capacity.

Earth Overshoot Day is the calculated illustrative calendar date on which humanity's resource consumption for the year exceeds Earth's capacity to regenerate those resources that year. In 2022, Earth Overshoot Day was July 28th.

- **Maladaptation** refers to “action that may lead to increased risk of adverse climate-related outcomes, including via increased greenhouse gas (GHG) emissions, increased or shifted vulnerability to climate change, more inequitable outcomes, or diminished welfare, now or in the future” (IPCC, AR6-Glossary, 2022). Maladaptations discussed in this study include [climate illiteracy](#), invasions, unplanned [diaspora](#), lack of preparation, accelerated [extractivism](#), and fundamentalisms.

The short-term focus of local climate change adaptations is to prepare for potential disasters associated with known climate risks. IPCC's Sixth Assessment Report identifies 130 key climate risks and groups them into eight representative risk areas:

- 1) Risks to low-lying coastal socio-ecological systems (e.g., sea level changes, extreme weather events, sea ice loss and permafrost thaw),
- 2) Risks to terrestrial and ocean ecosystems (e.g., invasive species, loss of biodiversity).
- 3) Risks associated with critical physical infrastructure, networks, and services, including healthcare and emergency response,
- 4) Risks to living standards (e.g., increased poverty, loss of literacy),
- 5) Risks to human health (e.g., pandemics, heat deaths, mental health),
- 6) Risks of [food insecurity](#) linked to droughts, floods, extreme weather, affordability, and breakdown of supply chains,

- 7) Risks to water security (e.g., floods, droughts, pollution), and
- 8) Risks to peace (e.g., war) and to settlement (e.g., involuntary mass migration).

Many provinces have research centres to forecast climate risks. In Canada, municipalities have taken the lead in preparing for climate change. *Local Climate Change Adaptation Planning in Manitoba* (Goertzen, 2019) analyzes the effectiveness of climate change plans and has many excellent ideas. For readers who are keen to dig into local climate change planning, I suggest obtaining a copy of your municipality's emergency plan and/or development plan to analyze its preparedness for known climate risks.

Risk #8-Climate Refugees. The climate refugee crisis is a daunting challenge. Preparing to host and resettle massive numbers of climate refugees has potential to draw on Canadian strengths. Some refugees may leave their homeland in a planned mass migration, but many climate refugees will flee in a diaspora, similar to the Syrian refugee crisis since 2011. Settler communities have an opportunity to reciprocate the generosity of First Nations in sharing this Land with European climate refugees who made mass migrations during the LIA climate event.

In Learning Roots 5, we learned that there are economic alternatives to capitalism. I hope the models briefly introduced here invite your curiosity to learn more and that the models expand your imagination for designing new economic systems based on the past and on economic transitions already underway.

Synthesis of Findings on Sharing the Generosity of the Land

What do designers of local climate change adaptations need to know about Indigenous conditions for cultural continuity that enabled Indigenous and ancient cultures to endure past

climate change events? With the goal of facilitating radical literacy for climate change adaptations, I synthesize knowledges about sharing economies discussed in Learning Roots 5.

- Sharing economies are based on the principles of reciprocity, generosity, sufficiency (enoughness), and egalitarianism. Reciprocity is a complex principle that sustains relationships within interspecies communities and maintains relationships of balance and harmony. It is intricately interwoven with regeneration.
- Models of sharing economic systems include:
 - *oecumene* in Danube and Harappa cultures,
 - Indigenous gifting practices, e.g., *balhats*, potlatch, and give-aways,
 - intentional communities such as monastic orders that share a subsistence living with local communities,
 - subsistence economies,
 - regenerative economies,
 - communal sharing, e.g., *communalidad*, a Latin American model, and
 - community commons and co-operatives.

When the design of climate change adaptations is informed by Limits to Growth Theory, adaptations will respect Earth's carrying capacity and avoid overshoot. Like past climate change events, adaptation to ACC requires long-term, large-scale economic transitions. Multiple models demonstrate that alternatives to capitalism exist, are possible, and are underway.

Looking forward, I call for case studies on diverse sharing economic systems that illustrate principles of reciprocity, generosity, and/or enoughness, particularly where these principles are embedded in cosmology, relational practices, and ceremonies. The

Land/Gender/Regeneration Question requires intersectional analysis to understand the Modern methods of erasure that severed women from agriculture and Land and that removed the ethical principle of regeneration from the Modern Imaginary.

Questions for Reflection

1. There are many greeds in the Modern world. Which one most outrages you?
2. What is your critique of capitalism as the economic system of Modernity/coloniality?
3. Imagine designing a regenerative economy that produces goods to fulfill needs and leaves no waste by producing only usable products in compostable or reusable containers. What would be some challenges?
4. Write a job posting for a climate change coordinator for your municipality, First Nation, or school.

Praxis. Each day, reciprocate the generosity of the Land in sustaining your life.

Suggested reading and viewing

- Vandana Shiva (2016). *Who Really Feeds the World?* Atlantic.
- Sing C. Chew (2008). *Ecological Futures: What history can teach us*. Altamira Press.
- *The Climate Atlas of Canada*. <https://climateatlas.ca/>. Prairie Climate Centre, University of Winnipeg
- Rob Hopkins (2008). *The Transition Handbook*. www.cs.toronto.edu/~sme/CSC2600/transition-handbook.pdf. Rob Hopkins is the founder of the Transition Movement.
- Sean Goertzen. (2019). *Local climate change adaptation planning in Manitoba*. International Institute for Sustainable Development. <https://www.iisd.org/system/files/publications/climate-change-adaptation-planning-manitoba.pdf>.
- “Tommy Douglas: Keeper of the Flame.” NFB film. 57 minutes. https://www.nfb.ca/film/tommy_douglas_keeper_of_the_flame/
- Donella H. Meadows, A Synopsis: Limits to Growth: The 30-Year Update <https://donellameadows.org/archives/a-synopsis-limits-to-growth-the-30-year-update/#:~:text=To%20overshoot%20means%20to%20go,growth%2C%20acceleration%2C%20rapid%20change>.

Resources for Arts-based Learning

- *The Origin of Fire*, Music, and Visions of Hildegard von Bingen. Performed by Anonymous4. www.youtube.com/playlist?list=OLAK5uy_kQzJ-IWjKk23RRrCu4i9hExsy20f-dNTw

Learning Roots 6 - Respecting Regenerative Forces



*Image 13. The Five Elements-Concept Map 1 excerpt
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Learning objectives

- to explore ancient and extant practices for respecting regenerative forces,
- to reMember Indigenous matricultures, and
- to link spiraling time with regenerative cultures.

Overview

We explore two conditions for cultural continuity: regenerating and welcoming difference and ask what knowledges designers of climate change adaptations need about respecting regenerative forces. The discussion has four sections. First, I reStory ancient and Indigenous practices for respecting regenerative forces. Second, I reStory matricultures. The third section problematizes intolerance and necropolitics for erasing knowledge of matricultures and regeneration from the Canadian Imaginary. In the last section, we prepare for long-term change by deModernizing and reTurning to regenerative cultures in spiraling time.

Weaving Dropped Threads into Radical Literacy for Climate Change Adaptations

Intolerance (marginalization, monoculture, monotheism, epistemicide, necropolitics), respect for climate as a regenerative force, matricultures (matrilineal, matriarch, clan mothers, rematriation, Maternal in cosmology), respect for mothering as a regenerative force (birthing, midwifery, puberty rites).

Introduction. In Learning Roots 6, I approach the exploration of regeneration, a condition for cultural continuity, by expanding my philosophical framework to include Hannah Arendt's political philosophy of natality.

Allow me to introduce Hannah Arendt, a Jewish scholar who fled the Nazis in Germany, and then had to flee her refuge in France when the Nazis invaded France. For thirteen years, she was a stateless person until the United States granted her citizenship. Her insights on totalitarianism, terrorism, and statelessness have influenced postcolonial and decolonial scholars. Like Arendt, I believe that violence breeds more violence and that violence tends to boomerang on perpetrators. Arendt theorizes a boomerang effect when centuries of colonial violence returned to European soil in World War II and European nations turned on each other using the methods of mass violence that had previously been reserved for the colonies, thus exposing the barbarity of European culture. In *Eichmann in Jerusalem: A report on the banality of evil* (2006), Arendt regards genocide as unwillingness to share the Earth, and argues that "evil comes from a failure to think ... That is the banality of evil" (p. xiv). She was committed to radical thinking:

Good can be radical; evil can never be radical, it can only be extreme, for it possesses neither depth nor any demonic dimension yet--and this is its horror--it can spread like a fungus over the surface of the Earth and lay waste the entire world. Evil comes from a failure to think. (p. xiv)

Arendt's (1958) political philosophy of natality invites us to think about natality and creativity in three layers. First, natality refers to the fact of birth. The activity of birth is linked with organic Beings, which are governed by cyclical time of life, death, and regeneration (p. 96). Every

human enters the world as a baby, born of a mother. Second, natality refers to belonging to a world characterized by plurality, where each ensouled and embodied natal is different from anyone else who ever lived, lives, or will live (p. 8). The acceptance of difference is necessary for harmonious communities. Our second natality occurs in the public realm where natals differentiate and take responsibility for their own creative initiatives. Third, natality is a political philosophy in that each revolution is a new beginning enacted through collective [agency](#) (p. 9). Initiative is the greatest political activity; thus, natality, not mortality, is central to Arendt's political thought. Arendt understands that agency is acting, meaning to take an initiative, to begin, and to lead by setting something into motion (p. 177).

Arendt's political philosophy of natality and Leanne's Simpson's philosophy of regeneration come together in Learning Roots 6. Let's think together about practices for respecting regenerative forces including the cycle of life, mothering, climate, water, and Land.

ReStorying Respect for Regenerative Forces

As designers of climate change adaptations, we need to know about practices that respect regeneration³⁸ as a condition for cultural continuity, so I collected stories about regenerative practices to help us to imagine possibilities. Arendt (1958) refers to natality as telling a story that begins with the "who" and then narrates their actions in the world. Through their agency, they engage in actions that change the world. Arendt (1992) suggests that thinking "with an enlarged mentality means that one trains one's imagination to go visiting" (p. 43), so I invite readers to join me in visiting diverse cultures, ancient and extant, to listen to their stories about

³⁸ A version of this section on ReStorying Respect for Regeneration section has been accepted for publication by Engaged Scholars Journal.

practicing respect for regenerative forces. I intentionally left out transition sentences between the stories so that they flow together and can be read aloud, like a reader's theatre. To improve the flow, I place citations at the end of paragraphs. I created the word [*regeneraphilia*](#) to express love for the process of regeneration and for creating more life. *Regeneraphilia* is an emotion that flourishes in the pluriverse and that is congruent with ecojustice and nondomination.

The Cycle of Life

Regeneraphilia recognizes that natals are embodied, organic Beings living in interspecies communities with whom we share the cycle of life.³⁹ We grieve when the cycle of life breaks down, causing extinctions in our interspecies community. In the spiraling cycle of birth and death, regeneration and degeneration, each generation has a stake in the flourishing of future generations. Performing ceremony and ritual participates in the life forces that are weaving the fabric of worlds.





Yolŋu Basket Weaving. In the Yolŋu homeland of Arnhem Country in northern Australia, songspirals, often called songlines, are rich and multilayered articulations passed down through the generations and sung and cried by Indigenous people to wake the Country (Land). This way of participating in co-becoming involves making and remaking the life-giving connections between people and place (Bawaka Country, 2022). Yolŋu means "person" and the concept of becoming a person is symbolized by weaving:

The spiral in a woven basket shows the life cycle – tells us how babies grow, their arteries and their selves, both in the womb and as growing children and on through the

³⁹ Learning Roots 4 requires Level 4 headings, instead of the APA guideline for indented boldface headings.

generations. As the basket grows, so a baby girl grows up until she's a young mother and she'll learn and have babies, and the knowledge and growth keep spiraling. The woman becomes a grandmother, and the cycle keeps going. There's no actual death, life keeps spiraling on through the generations. (Bawaka Country, 2017, p. 15)

 **Coiling Rope.** The Syilx Okanagan culture honours the laws of the *tmixw*—that which gives us life. In Syilx cosmology, life forces are mysterious and sacred. Life force is symbolized by a coiling rope with many strands that represent the unity of place and kinship with each species forming a strand. Humans are responsible to regenerate as one unified strand and to ensure that their strand enables the regeneration of other strands in an equality of species through spiraling time. Continuity is assured by practices that involve intelligence, knowledge, and acting in a “civilized way” with caring. Syilx knowledges of system regeneration are “underpinned by socially and individually institutionalized practices” of respect. Flourishing is achieved only when the Land and its inhabitant species are regenerating in a continuing motion of “story through time” and the continuity of knowledge is bound to its origins in the living things of the Land. The coiled rope represents belonging through common knowledge (Armstrong, 2010, p. 4, 44, 61, 159).

 **Harmony.** In Daoist philosophy, *tienr_en-h_e-yi* is a cardinal truth, usually translated as “the harmony between humanity and nature.” Ruyu Hung, an educator in Taiwan, states that Daoism can be integrated with Critical Ecopedagogy to facilitate embodied and emotive knowing about *tien* by “becoming aware of the transformation and motion of every living or nonliving Being in the world.” *Tien* is like symbiosis in which symbionts are different but

interdependent, live reciprocally and evolve together. Symbiotic relations exist between animate and inanimate Beings (Hung, 2019, p. 1073-5).

As designers of local climate change adaptations, we learn from regenerative cultures. Through radical literacy that welcomes holistic ways of learning, we restore suppressed knowledges of the extinction crisis. This is how we are deModernizing in the pluriverse-by standing for interspecies justice so that no species becomes extinct.

Mothering

Regeneraphilia values mothering by elevating the process of carrying, birthing, and nurturing new life as participating in the self-renewing, regenerative process of Mother Earth. We grieve that Modernity has lost the sacredness of birthing and has turned it into a medical intervention. Many mothers have experienced hardship because Modern society under-values mother's work as first teachers of language, stories, and songs, and thus of cultural knowledges and identity (Bedard, 2006; Simpson, 2011, p. 28).



Midwives of Ancient Rome. In ancient Rome, knowledge of midwifery was embedded in myths, rituals, and symbols. Mother and babe were protected at each stage of birthing. When a woman entered labour, she invoked Juno Lucina, deity of childbirth, for an easy delivery and a healthy child. A key was placed in her hand to invoke Janus, keeper of doorways, who guarded all passages including the birth canal. Carmenta, patron deity of midwives, arrived with Prosa who assisted in normal deliveries, Postverta who assisted when the baby presented breech, and Vaticanus who supported the baby's first cry. While the midwife swaddled and presented the child to the mother, Juno Februa delivered the woman of the placenta. At the Matronalia

festival on March 1st, Romans honoured motherhood by making a procession to the temple of Juno Lucina on Esquiline Hill (Turcan, 2001, p. 19; Dolansky, 2011).



Navajo Birthing Ceremony.

Offer cornmeal to the above-below-all-around: north, south, east, and west; east, west, north, south, centre; above, below, around...The threads have become tangled...The men start a fire and pray while Maria labors in my home. We laugh and eat *atole* with cacao for Life Force. The birth powers are called in, and I say words only to be said at this moment of life. Within four hours, she delivers her daughter. Her placenta is born in a pot, and we present this child to her other mother. We offer tobacco and corn tortillas, a *velita* to her tree of life. Her birth liquids on my sheets are washed with prayers...The movement between life and death has made its cycle. For days after Maria's labor, my house is filled with her birth energy, her life. As her womb opened and contracted, the birth power that moves bones, fluids, and child emerged from the deepest layers of the physical and spiritual cosmos. Her life remains in the air, near the ceilings, near the fireplace. Her life has been released in ceremony. In its own body-time, her energy reconstitutes in her body. This is the physical ceremonial energy of birth. (Gonzales, 2012, p. 229)



Mola Design. The people of Kuna Yala from Central America regard themselves as children of Mother Earth; they belong to her because she brought them forth. They live by an ethic of care to share the Mother's fruits with their interspecies brothers and sisters. Kuna mothers are treasured as bearers of the culture and when girls enter puberty, they are celebrated with ceremony. The *mola* (design) originated as women's body paintings with

geometrical designs; however, the designs are now ritually sewn into clothing to express the significance of each woman in relation to the biodiverse community. Creating *mola* is a puberty ritual of making visible the unique personhood of a young woman and her unique relationships with the cosmos. Kuna cosmology is reflected in its matricultural society. First Instructions for cultural continuity include an aggressive boundary around the perimeter of the community to protect the treasured Maternal principle at the centre. The boundary unifies the community and reduces vulnerability to external influences. Kuna recognize that the disease of reversed principles has already infected much of the world, causing great suffering and disrespect to Mother Earth (Olowaili, 2009; Fortis, 2013).




Women's Lodge. In traditional Syilx practice, puberty, menstruation, and birthing rituals took place in secluded female-built lodges where women's knowledges and skills were transmitted from one generation to the next; however, women's lodge practices declined when epidemics required women to nurse the sick. Syilx culture believes menstruating women are powerful, just as when they are pregnant, in contrast to colonizers who require women to be secretive about menstruation (Wright, 2006).


As designers of local climate change adaptations, we learn from regenerative cultures. Through radical literacy that welcomes learning through emotion, we experience empathy for Earth's suffering. We restore subjugated knowledges about matricultures and mothering as a regenerative force. This is how we are deModernizing in the pluriverse: by standing for Mothering.

Climate

Regeneraphilia respects Climate as a regenerative force that interconnects with the elemental forces of Air, Earth, Fire, and Water. We acknowledge our complicity in the human

behaviours that caused the elemental imbalance that resulted in Anthropogenic Climate Change. When Modern humans try to save the world from climate change by declaring war on climate change, they exhibit the same anthropocentric hubris that caused climate to change.

 **Silatuniq.** Inuit philosopher Jaypeetee Arnakak speaks of *sila* as an ever-moving and immanent force that surrounds and permeates Inuit life. Inuit philosopher Rachel Qitsualik speaks of *sila* as a raw ungendered life force that lays over the Land, is felt as air, seen as sky, and lived as breath. Silatuniq refers to the practical ancestral wisdom for living within this land—the Inuit intelligence (IQ) of living with *sila* as an immanent life force. Silatuniq requires a mature mind to take responsibility for living in balance with the cosmos by respecting *sila* as a regenerative force and living with the consequences if one causes imbalance to cosmic relationships. *Sila* is both giver and taker of life, and no individual or collective can claim control over *sila*.

 Cosmological narratives of *Sedna*, Mother of the Sea, include ethics for harvesting only as many animals as the community needs. According to Arnakak, *Sedna* is not a deity or god in the European sense; she is the Inuit concept of *inue*-(meaning Indweller, or immanent life force). If the relationship with *Sedna* becomes imbalanced due to unethical hunting, *Sedna* may withhold the animals. Shamans undergo great suffering to prepare for the journey to *Sedna* to ease her irritations and to negotiate reconciliation with *Sedna* on behalf of the community. The reconciled relationship is sealed with a feast of local foods, throat-singing, storytelling, and laughter, not as propitiation, but as performative participation in regenerating the Inuit world. Arnakak refers to the ritual feast as a communal confession to restore balance. He calls for Canada to make a communal confession as a way of beginning the reconciliation process to

restore balance with *sila*, an ever-moving and immanent force: “It will require empathy, humility, awareness, and sharing of a merciful hunt as the matured traits of a socialization process” that is diametrically opposed to a capitalist economy of individualized greed (Leduc, 2010, p. 19, 26-31, 179-211).




Maa-Durga. Maa-Durga is a Hindu deity so ancient that her name is written in the Rigveda. Mahishasura, an Evil Being, became so powerful and tyrannical that he could not be defeated by gods or men. Thinking he was invincible, he ruled the world in place of the gods. When he threatened to destroy the world, the male gods collaborated to prevent him from doing so, but the rules were clear that Mahishasura could not be defeated by man or god. The gods finally found a loophole. There was no rule to prohibit Mahishasura’s defeat by a woman. The male gods appealed to Maa-Durga for help. Maa-Durga took up the weapons of the male gods in her eight arms, transformed them into effective tools using her regenerative power and slayed Mahishasura. Afterwards, Durga danced, and her dance shook the worlds (Dexter, 1990, p.85; Singh, 2018).


As designers of local climate change adaptations, we learn from regenerative cultures. Through radical literacy that welcomes deep listening to climate’s agentic voice, we develop silatunig and restore the subjugated knowledge of maintaining harmony and balance with climate. This is how we are deModernizing in the pluriverse: by standing for climate justice.

Water

Regeneraphilia protects Water as a generative force and a sacred, living Being that is vital to natals and other Beings. We grieve Modernity’s loss of courage and lack of agency in

adapting to Anthropogenic Climate Change. We stand with Indigenous women who lead political movements to protect local Water from extractivist industries.

 **Water is Life.** Oceti Sakowin (Dakota) matriarch LaDonna Tamakawastewin Allard, leader of the Sacred Stone Camp at the Standing Rock resistance to the Dakota Access Pipeline, said “the Water is female; Water is life and so we as women must stand with the Water ... We stand in prayer and in civil disobedience. We stand because we must protect our children and grandchildren” (WPLC, 2021).

 **Water Protectors.** Anishinaabe women have a political responsibility to stand for water. Anishinaabe-kwe Josephine Mandamin, founder of the Water Walker movement, invited people to join her as she walked around each of the Great Lakes carrying a copper bucket of Water to build awareness of the sacredness of water. Her dignified activism inspired a new generation of Water Walkers. Anishinaabe-kwe Elder Mary Maytwayashing (2014) was invited to share “The Water Song” at the opening ceremony of an Indigenous Food Sovereignty conference in Winnipeg. As she sang the first notes, participants silently rose to their feet and stood for Water. It was a sacred moment. Law professor Aimee Craft (Anishinaabe-kwe-Métis) conducts community-based research at *Nibi* (Water) Gatherings to renew knowledge of Anishinaabe water laws. Winona LaDuke (Ojibwe-Anishinaabeg) and six other women were arrested while peacefully protesting Enbridge’s Line 3 pipeline construction at the Shell River. Enbridge designed the pipeline to cross Shell River in five places. An oil spill would impact wild rice, an Indigenous food staple and cultural symbol of the Ojibwe people (McGregor, 2013; Craft, 2016; Winter, 2021).



Wet'suwet'en Resistance. RCMP arrested Wet'suwet'en matriarch Freda Huson and other women while they were holding ceremony to remember the spirits of the murdered women, girls, and two-spirit people taken from them. The RCMP said they were enforcing a B.C. Supreme Court injunction obtained by Coastal GasLinks Pipeline. The Wet'suwet'en matriarchs and hereditary chiefs in the traditional governance structure have not given consent for the pipeline to cross their unceded lands. According to the matrilineal governance structure of the Wet'suwet'en, house and clan membership are passed through matrilineal lines to protect the interests of children in matters of land (Hosgood, 2020).

As designers of local climate change adaptations, we learn from regenerative cultures. We welcome emotion as a way of learning to be in relationship with Water. This is how we are deModernizing in the pluriverse: by standing for water justice.

Land

Regeneraphilia loves the Land as a regenerative force. We grieve Modernity's broken relationship with Land and the resulting problems of homelessness, addictions, and apathy. We grieve Modernity's decline into monoculture. Seeds are links between Land, species, and a land-based food chain. For millennia, farmers have selected and saved seeds in ways that enhance biodiversity. Many cultures view plants as kin and regard traditional foods as sacred gifts from Mother Earth. When food became a globalized industry, it exacerbated the climate risk of food insecurity. We grieve for climate refugees who are compelled to migrate because the Land has exceeded its carrying capacity and can no longer supply water and food to the people who belong to that Land.




Crianza. Quechua farmers of the Andes practice rituals when they work with seeds.


Their Earth Mother is known as *Pachamama* where *Pacha* means world and *mama* is the ancestral Mother who shares her self-sufficient power to regenerate new life for her people. Potatoes are inextricably linked to Quechua identity. The seed potato is a living Being and a member of the community with its own unique sensitivities. *Crianza* is a complex and intimate ritual, resembling courtship, with different songs, gestures, and festivals that are performed according to the rhythm of the seed, not according to a calendar. Farmers agentially regenerate and reproduce cosmic relationships by performing ancient rituals of singing and flute playing as musical offerings sent out through breath and life force, and when the spirit of the song has been received, the seed is able to reciprocate. The generosity of Pachamama evokes reciprocity—the agentic principle that those who nurture the streams and plants are themselves nurtured (Wissler, 2009, p. vi; Isla, 2019, p. 31).



Eleusinian Mysteries. In the archaic Greek mythology of the Titans, Demeter is the daughter of Cronus and Rhea, who are the children of the first parents, Gaia (Earth) and Uranus (Sky). When Demeter's beloved daughter Persephone is abducted by Hades to the Underworld, Demeter retreats to Eleusis in grief. Her sorrow is so great that she withdraws the life force from the Land. Plants wither and animals cease to give birth. Eventually Hades relents and allows Persephone to return to Demeter, but only for half of each year. When Demeter is reunited with Persephone, her rejoicing makes the Land flourish again. Thereafter, Persephone's descent marks the onset of winter and her return to Demeter marks the arrival of spring. Ancient peoples created ceremonial rites known as the Eleusinian Mysteries that were practised for millennia. Julian was the last emperor of Rome to be initiated into the Mysteries.

Christian emperors that succeeded Julian closed the temples and criminalized the Mysteries (Mathews, 2005, p. 201-2).

 ***Sky Woman's Gift of Seeds.*** In Haudenosaunee cosmology, Sky Woman fell to Earth with seeds in her hands and became Earth Mother of Turtle Island with its thirteen moons. She regenerates life for Earth Beings by planting seeds for the plants they would need to survive—corn, beans, squash, medicinal herbs, and strawberries. Sky Woman's First Instructions to the Haudenosaunee people assigned women with responsibility for feeding the people by growing plants and working with Land because Land is the basis for life. The women created varieties of corn, beans, and squash (known as the Three Sisters) that were adaptive to their climate. When colonizers removed Indigenous women from farming and governance, Haudenosaunee women almost lost their identity and power; however, as Haudenosaunee women recover from this transgenerational trauma, they are becoming whole again by relearning their language and reMembering Sky Woman's First Instructions to feed the people. Their cosmology gives them hope that the people will be fed and that women will once again lead their nation (Horn-Miller, 2009, 2016; Hill, 2017, p. 56-62).

 ***Navdanya.*** Vandana Shiva founded Navdanya (meaning nine seeds), an organization in Dehradun, India that advances biocultural diversity and preserves the commons of seed knowledge. It advocates the right to save and share seeds. Seeds are the first link in the land-based food chain and for seven thousand years, farmers have selected and saved seeds in ways that enhanced biodiversity. The false narratives of the Green Revolution disrupted this ancient practice by destroying the self-reproducing characteristic of seeds that are no longer a regenerative source of plant life. Farmers are going bankrupt because they are required to buy

new seed supplies every year. Shiva describes the root of this Modern problem as “a monoculture of the mind” (Shiva, 2016, p. vi, 120; Shiva, 1993, p. 4).



La Liberación de la Madre Tierra (*the Liberation of Mother Earth*). The Nasa people announce worlds to come:

But we say—as long as we continue to be Indigenous, in other words, children of the Earth—that our mother is not currently free for life, but she will be when she returns to being the soil and collective home of the peoples who take care of her, respect her, and live with her. As long as it is not this way, neither will we be free, her children. All peoples are slaves along with the animals and all Beings of life, as long as we do not achieve that our mother recovers her freedom. (cited by Escobar, 2018, p. 204)

As designers of local climate change adaptations, we learn from regenerative cultures. Through radical literacy that welcomes experiential, embodied learning, we restore forgotten knowledges of growing, harvesting, and storing food. This is how we are deModernizing in the pluriverse: by standing up for ecojustice.

We have gone visiting to learn from cultures in spiraling times and places to expand our perspectives for designing climate change adaptations that create more life. As a settler researcher who enjoys learning by experience, I yearn for a school of regeneration. I call for centres of learning where regeneration can be studied experientially in regenerative communities.

ReMembering Matricultures⁴⁰

Let's begin by defining *matricultures*, a [subjugated knowledge](#) that is interwoven with knowledges of regeneration. This section draws on the study of pre-patriarchal, transnational, and extant matricultures. In the following section, we shift our focus to the methods of erasure used to subjugate knowledge of matricultures.

Matricultures, coined by Tina Passman (1993), refers to egalitarian cultures founded on the maternal value of caring that serves as an ethical principle for all genders, for mothers and not-mothers. Matricultures embed mothering in cosmological narratives and elevate mothering as a regenerative force and a condition for cultural continuity. Matricultures typically practice governance by consensus and sharing economies. Matricultures includes the concepts of matrilineal, meaning lineage traced through the mother line, and matricentric, meaning mother-centred.

I use the term *matricultures* (plural) to avoid the problematics of the term *matriarchy*, derived from *-arche*, which has two conflicting definitions: 1) “from the beginning, or original” as in archaeology, or 2) “domination” as the reverse of patriarchy. Heidi Göttner-Abendroth (2012) uses the first definition (p. xxvi); however, conventional Anthropology uses the second definition and repudiated the study of matriarchies after Rosaldo (1974), using the second definition, concluded that matriarchies have never existed. “ReMembering matricultures: Historiography of subjugated knowledges” (Wolfstone, 2018b) is a detailed study of the

⁴⁰ ReMembering Matricultures section is part of my forthcoming chapter In E. D. Abdou & T. G. Zervas (Eds.), *Reconciling ancient and Indigenous belief systems: Textbooks and curricula in contention*. University of Toronto Press.

debates in the study of matriarchies and explores the courageous scholars who construct knowledge on matricultures.

Ancient Matricultures. Matricultures can be traced to the Paleolithic through cave art and sculptures. Many pre-patriarchal matricultures were earth-centred and venerated a Primordial Mother known by many names including Demeter, Inanna, and Kybele, Mistress of the Mountain. In Australia, she is known as Serpent Mother. In the Andes, she is revered as Pachamama. The Buryats know her as Umai. Tanit, Ancestral Mother of North Africa, is a powerful, parthenogenetic force known as Mother of all the Gods. In ancient Egypt, she was known as Nut, patron of childbirth and mother of Isis. She is sometimes portrayed as having undifferentiated gender. The Canaanites in Carthage syncretized Astarte with Tanit and the Romans romanized her to Juno Caelestis, dedicating a temple to her at Tas-Silġ on the island of Malta (Dexter, 1990, p. 23; Baring & Cashford, 1991; Stuckey, 2009).

Extant Matricultures. Transnationally, matricultures exist on all continents despite disruptions by colonization and missionization. Senegalese scholar and intellectual Cheikh Anta Diop (1978) attests that “African matriarchy existed on a continent-wide scale” (p. 70) from ancient to contemporary times, and that the paradigm shift to patriarchy is due to external “factors such as the religions of Islam and Christianity and the secular presence of Europe in Africa” (p. 125). Similarly, Igbo scholar Ifi Amadiume (1997) critiques Western universities for being blind to African matricultures. She asserts that “the traditional power of African women had an economic and an ideological basis, which derived from the importance accorded motherhood” as the continuation of the sacred creativity of the Primordial Mother (p. 112). The

British banned Indigenous African religions in the areas they colonized, and later Islam imposed patriarchal family and wifehood laws (p. 130).

Indigenous Matricultures in Canada. Paula Gunn Allen (Laguna) (1986) was one of the first Indigenous scholars to insist that Turtle Island was matricultural before colonization. She explains the colonizer's erasure of knowledges about Indigenous gynarchies (matricultures) as intentional forgetting, a colonial method of oppression (p. 209-213). In my research on Indigenous matricultures in Canada, I find that matricultures are pervasive and diverse. In Canada, Indigenous cultures use a variety of terms including matriarchs (Haida, Syilx, Tsimshian, Tlingit, Dene, Oceti Sakowin), matrilineal (Kwak'wala, Nuuchahnulth, Haisla, Heiltsuk, Dene), The Grandmothers (Ojibwe, Cree), and clan mother (Haudenosaunee). I continue to research the language of matricultures in the following cultures: Mi'gmaq, Malecite, Siksika, and Kainai.

Susan Hill (Haudenosaunee-Mohawk) (2017), citing The Great Law, describes the duties of Haudenosaunee female leaders as holders of the Land:

The lineal descent of the Five Iroquois Nations shall run on the female side and the women shall be considered as the progenitors of the Nation, and the title of ownership of the land or soil of the Nation's country shall be vested in the said women, and the descendants of these women shall follow the status of their mothers. (p. 60)

Canadian politician Jody Wilson-Raybould (Kwak'wala) (2019) locates her roots in a matriarchal society with Hereditary Chiefs where descent is traced through the mother line:

My grandmother's name was Pugladee—the highest-ranking name in our Clan—The Eagle Clan. Her name means “a good host”—a name that was given to my older sister, Kory, at the same time I was given my name Puglass [which] means “a woman born to noble

people.” These names were given in a naming Potlatch at Gilford Island when I was five...We are “potlatching” people. A Potlatch is a traditional institution of governance. (p. 5)

Wilson-Raybould recognizes that the matriarchal political and legal order of her culture that has existed “since time immemorial” is “incomprehensible” to the patriarchal system of governance that was imposed on her people (p. 182). The people of Haida Gwaii in the North Pacific declare that they are a matriarchal society and that Hereditary Chiefs and Matriarchs continue to lead their clans, families, and traditional territories:

We the Haida have lived on Haida Gwaii for millennia and have been living with and managing the land and water of the island for just as long...Our culture remains strong, and we are defined by our connection to the land and waters. We value our relationships to each other; we are a matriarchal society, governed by our Hereditary Chief and Matriarchal clan system. (Skidegate Community, 2011, p. 9)

Similarly, Leslie Dawson (2017) describes traditional matricultural practices in Tlicho (Dene) culture. Jeannette Armstrong (Sylix) (2007) declares, “In our society, we are egalitarian” meaning “what we can do for and with each other—how we consider each other” (p. 7-11).

Rematriation. Rematriation refers to the “restoration and reclaiming the political roles and authority of Indigenous women alongside traditional governance structures and political orders” (Kuokkanen, 2019, p.98). Rematriation reclaims Indigenous egalitarianism, which “foregrounds the dignity and integrity of all genders and is predicated on nondomination in all relations” (p. 123). It interrogates heteropatriarchy and the gendered structure of political

institutions that were imposed by colonizers (p. 124).). The study of Indigenous matricultures has potential to teach us a great deal about regenerative cultures and egalitarianism.

Rematriation is occurring as part of the Indigenous [resurgence](#) and in preparation for surviving Anthropogenic Climate Change. Rematriation is dynamic and multi-dimensional, so I will focus on only three aspects. First, rematriation is restoring dignity to Indigenous mothering by reclaiming birthing as ceremony. This movement has been supported by several publications. The edited volume *“Until our hearts are on the ground” Aboriginal mothering, oppression, resistance, and rebirth* (Lavell-Harvard and Lavell, 2006) celebrates the survivance of Indigenous women who continually mothered despite Canada’s war on Indigenous mothers. A second book, *Mothers of the Nations: Indigenous Mothering as Global Resistance, Reclaiming and Recovery* (Lavell-Harvard and Anderson, 2014) put heart and identity into Indigenous women who face an escalation in gendered violence. Hannah Tait Neufeld and Jaime Cidro’s *Indigenous Experiences of Pregnancy and Birth* (2017) illustrates the strengths of the movement to reclaim Indigenous birthing and midwifery practices. Each of these books is remarkable in its own way and a good read.

Second, rematriation is returning women to Indigenous governance, and this is shifting political priorities to health and social needs, particularly the needs of youth. Third, the movement to reclaim Indigenous [food sovereignty](#) is led by women from coast to coast (Settee and Shukla, 2020). Despite Canada’s attempts to erase Indigenous matricultures, Indigenous women are Idle No More.

There is a need for more research into the Land/Gender/Regeneration Question to understand a) the role of women as farmers from the Neolithic revolution to the present, b) the

displacement of women from Land and food production in the patriarchal period, c) the academy's subjugation of knowledge about ancient and Indigenous matricultures, and d) the path forward for women to reclaim responsibility for Land and food production to sustain regenerative cultures.

Methods of Erasing Matricultures and Regeneration

Italian feminist philosopher Adriana Cavarero (1990) expands birthing until it breaks free of men's fears that subjugated birthing to invisibility. Building on Arendt, she insists that birth comes from a mother and is the basis of every [natal](#)'s embodied existence that connects with other nats (p. 60). Cavarero tears apart the tapestry of the patriarchal record. First, she exposes Zeus' crime of matricide as symbolic of patriarchy's erasure of the Great Mother (p. 7). Then she unties the knots that confine mothers to domestic servitude and calls on Penelope, ancient Queen of Ithaca, to re-weave the threads into an open philosophy that draws attention to the connectedness of bodies and souls in worlds (p.29). Cavarero's intent is to create a "revolution in perspective where the symbolic axis transitions from death to birth" and compels "a global rethinking of the meaning of the world" (p.80). Like a midwife, Cavarero brings to light women's stories that were hidden from view. By shifting the gaze from death to birth, it is possible "to restore meaning both to Maternal power and to the reality of those who are born." In birth, we always find a woman who generates. In birth we also have the one who is generated (p. 83). The one who is born becomes an embodied Being in the world through the passage of birth and, in due time, takes its place in the *polis*.

Taking up Cavarero's call, I tease apart the threads of the patriarchal tapestry to reveal the subjugated knowledge of matricultures and regeneration and to expose patriarchy's

methods of erasure. The previous sections on regeneration and matricultures conveyed the assumption of plurality—that difference is welcomed because it contributes to regeneration.

[Welcoming difference](#) is a condition for cultural continuity because a pluralistic culture that treasures biocultural diversity has greater adaptive capacity than a Modern monoculture that is intolerant of difference.

Problematizing Intolerance of Difference

In this section, I problematize intolerance of difference, a problem of Modernity/coloniality by introducing *Table 5: Continuum of Responding to Difference* as a tool for thinking about including and excluding differences. The first column lists inclusive behaviours that are associated with the radical response of welcoming difference, behaviours that need to be embedded in the designs of local [climate change adaptations](#). The fifth column lists extreme behaviours associated with eliminating differences. The second, third, and fourth columns represent a continuum of responses from inclusion to elimination. As in *Table 4: Continuum of Philosophies about Relating with Land*, we move along the continuum in slow undulating change.

Table 5: Continuum of Responding to Difference				
Including	Pluriverse Accepting	Tolerating	Modernity/coloniality Intolerance	Elimination
Welcomes differences to strengthen the community: • egalitarian • syncretizing • plurality • hybridity • biodiversity	Receives differences even if they are uncomfortable: • accommodates	Puts up with differences even if they are disagreeable or inconvenient: • employment equity policy, • tokenism	Deliberately Insulates from difference using aggression: • excluding • marginalizing • subjugating • assimilating • missionizing	Deliberately erases difference using violence: • epistemicide • necropolitics • genocide • species extinction • rape culture

I expose the [methods of erasure](#) used by the Dominion of Canada to erase knowledges about Indigenous matricultures from the Canadian Imaginary. In the following discussion, I focus on three methods of elimination, specifically epistemicide, necropolitics, and extinction.

Each system of [domination](#) has methods for excluding differences that are deemed intolerable. [White supremacy](#) privileges whiteness and has methods of marginalizing people of colour. [Heteropatriarchy](#) privileges heterosexual males and has ways of marginalizing women and queer folks. [Marginalizing](#) (see column 4) or “othering” is a way of excluding by categorizing and treating a group of people as inferior based on opinion about perceived differences, such as ethnicity, skin colour, religion, ability, gender, and/or sexual orientation.

Epistemicide is a behaviour that silences the voices of marginalized Others by erasing their faces, names, and stories from hegemonic communications and by distorting, misrepresenting, or homogenizing their stories and identities, using stereotypes or slurs. Epistemicide is the [subjugation of knowledges](#) of marginalized others, in contrast to suppression of knowledge, which refers to hegemonic practices of intentionally concealing the violence and unsustainability of Modernity/coloniality.

Conventional anthropology, for example, repudiated the study of [matriarchies](#) after Rosaldo (1974), using a definition of matriarchy as the reverse opposite of patriarchy, concluded that matriarchies have never existed (p. 3). Scholars of matricultures were subsequently subjected to academic methods of suppression, as described by Dale Spender (1982). Renowned archaeologist Marija Gimbutas who identified the Danube culture as matristic and theorized European patriarchy as a social construct was vilified and expunged from syllabi in Canadian and American universities (Spretnak, 2011; Marler, 2006, Dashú, 2005).

After 30 years, Gimbutas' Kurgan Theory was unequivocally validated by archaeogenetics (Haak et al., 2015), compelling Colin Renfrew, her chief detractor, to concede that Gimbutas' Kurgan Theory had been "magnificently vindicated" (Renfrew, 2017), thus implicitly giving permission to conventional anthropologists to consider her theories (Christ, 2017). Many scholars of [matricultures](#) left the academy to work as independent scholars when the university environment became inhospitable, including Dr. Max Dashú, Dr. Heidi Goettner-Abendroth, and Dr. Carol Christ.

Necropolitics. In the following paragraphs, I problematize necropolitics. In Learning Roots 3, I introduced Mbembé's concept of [necropolitics](#) as colonial policies and practices that administer who gets to live and who to let die according to the state's hierarchy of value (Mbembé, 2003). Necropolitics reduces resistance to domination by creating terror. The state manages marginalized sub-populations whose lives are devalued as disposable using policies that permit "bare life" and defunding to levels below privileged populations. Mbembé (2016), building on Arendt, argues that colonial necropolitics is driven by racism in a slow "process of exiting from democracy" when nations refuse to share the Earth with people based on their skin colour. Mbembé calls for a politic of inclusion that recognizes Earth as held in-common in a relationship of co-belonging in an interspecies democracy (p. 40).

Canada's necropolitical policies and practices to eliminate Indigenous populations are cleverly hidden from view in hegemonic education. When necropolitics are hidden from view, they cannot be interrogated. Comprehensive inquiry is required to detect who and what has been subjugated and silenced (Bacchi, 1999, p. 59).

Indigenous women became vulnerable when the Canadian government used The Indian Act (1867) to reduce them to the lowest class, made their Indian status conditional on patrilineality via fathers and husbands, and excluded them from governance (Lawrence, 2003; Hill, 2017). The denigration and silencing of Indigenous women made it easier to subjugate public knowledge of Indigenous matricultures and to treat Indigenous women as disposable waste. Federal and provincial policies and practices for disrupting Indigenous women's capacity to regenerate their cultures include, but are not limited to:

- involuntary sterilizations and birth control experiments without informed consent (Stote, 2015, 2016; MacMahon and Steacy, 2021);
- criminalizing traditional midwifery and replacing it with medicalized birthing (Simpson, 2006; Burnett, 2011, p. 164);
- evacuating pregnant women to city hospitals to give birth alone (Cidro et al., 2017; Dawson, 2017, p. 145-153);
- removing children from their families, e.g., residential schools (TRC, 2015); the Sixties Scoop, child apprehensions (Denison et al., 2014), and birth alerts (Puxley, 2015; Sharma et al., 2016); and
- failure to protect and to investigate missing and murdered Indigenous women and girls (MMIWG, 2019).

Necropolitical policies and practices that reduce the life-expectancy of Indigenous populations include but are not limited to multi-decade boil water advisories, underfunding children's services (Blackstock, 2016), substandard housing, and pollution from extractivist industries (Simpson, Da Silva et al., 2009; Hoover et al., 2012). The distinction between necropolitics,

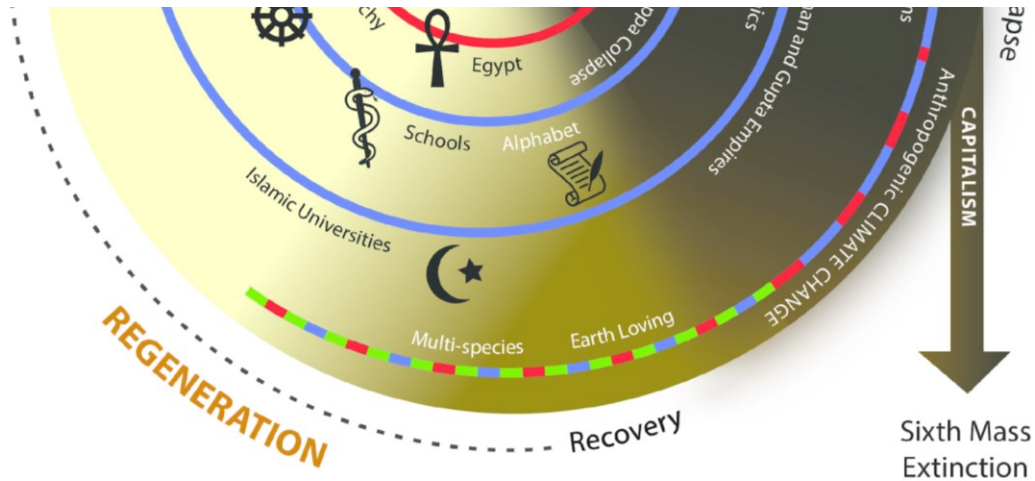
genocide, feminicide, and matricide becomes blurry when women and girls are eliminated because they have reproductive bodies (Federici et al., 2021, p. 4). Despite the MMIWG Inquiry (2019) finding of genocide, Canada has not yet responded meaningfully to the MMIWG calls for justice and curricula do not yet reflect Call for Justice 11 related to public education.

Extinction. On a global scale, Modernity's disrespect for forces of regeneration is contributing to white anthropogenic [Sixth Mass Extinction Event](#). E. O. Wilson, renowned biologist and author of *The Future of Life* (2002) calculated that half of Earth's plant and animal life forms will be extinct by 2100. He calls for global protection of biodiversity.

This discussion of methods of erasure is partial, but it illustrates the violence of Canada's necropolitics that target Indigenous women. Leanne Simpson (2017) synthesizes the colonial erasures in this way:

Indigenous bodies, particularly the bodies of 2SQ people, children, and women represented the lived alternative to heteronormative constructions of gender, political systems, and rules of descent ... They represent alternative Indigenous political systems that refuse to replicate capitalism, heteropatriarchy, and whiteness. They are the embodied representation in the eyes of the colonizers of land, reproduction, Indigenous governance, and political systems. They reproduce Indigenous governance, and political systems. They reproduce and amplify Indigeneity, and so it is these bodies that must be eradicated-disappeared and erased into Canadian society, outright murdered, or damaged to the point where we can no longer reproduce Indigeneity. (Simpson, 2017, p. 41)

Cultural Transitions: Preparing for Large-scale, Long-term Change



*Image 14. Recovery and Regeneration-Concept Map 3 excerpt.
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Regenerative cultures welcome difference. The adaptive capacity of regenerative cultures is linked to their commitment to biocultural diversity, which includes plant diversity, gender fluidity, and welcoming uniqueness. Acceptance of flux as constant change nurtures minds that welcome difference, a condition for cultural continuity. A regenerative culture does not seek sameness but cultivates difference.

Regenerative communities are symbiotic in that they are committed to the well-being and ongoingness of all species who cohabit the Land. In Image 13 (excerpt of Concept Map 3), I express this commitment by the red/blue/green line. The red revolutions begin at the centre of the spiral indicating a period when matricultures were a common form of cultural organization. They gradually became blue, representing Europe's patriarchal period. The influence of feminism is represented by alternating blue/red as an aspiration for equality. In the period of recovery that follows the current period of degeneration, the revolution is gradually becoming blue/red/green representing an interspecies future in earth-loving symbiotic cultures in which

the principle of egalitarianism is expanded to include all species. Perhaps the next colour will be purple or orange. The colours of the revolutions represent my vision for a deModernizing future and for designing inclusive climate change adaptations. I dare to imagine egalitarian worlds where species participate in relations of nondomination in spiraling time. We will know we have achieved the revolution when the term *deModernizing* is discarded because we will have a new word for the regenerative Age that follows the Modern Age.

ReTurning in Spiraling Time. Spiraling time generates hope that the current period of degeneration will end, that we will recover, and that future generations can flourish again. The future is no longer defined by Modern linearity and its dead-end ideology of continual progress on a finite planet. In the Space Between, we are eager to take up our responsibilities by respecting the cycle of life and participating in cyclical cosmic processes.

The spiral of life revolves in three dimensional ways. The verb *revolve* derives from *revolven*, meaning to change, change direction, bend around. Learning Roots 4 to 6 focus on preparing for large-scale, long-term revolutions as adaptations to climate change: a cosmological transition (Chapter 4), an economic transition (Chapter 5), and a cultural revolution (Chapter 6). Revolving in a three-dimensional spiral that is constantly expanding and contracting in response to change mimics the “seasonal round” of migrations. Constant change is a catalyst to imagine possibilities and an antidote to hopelessness (Whyte, 2018).

Tying Together End Threads

I thank my readers for considering what it means to prepare for a long-term, large-scale transitions to regenerative cultures in the pluriverse. Together, we have learned to think across the spiral of past climate change events. When I asked myself if a transition to regenerative

cultures is already underway, I soon realized I was asking the wrong question. Regenerative cultures already exist wherever Indigenous cultures are recovering from colonization and reTurning to their ancestral ways of regenerating Life. As a settler, I could not perceive regenerative cultures until I had perceived the power of regeneration. Now I see differently with both eyes wide open and I am aware that I have much more to learn about regenerative cultures. I take up my responsibility to learn, to perceive, and to act.

I invite you to join me in becoming agentic in building networks of friendship and collaboration for learning to participate in regenerative cultures. Regeneration involves an entirely different mind-set than the Modern mind-set of dominating Land and othered Others. In the pluriverse, we nurture a caring ethic in relationality, motivated by the desire to flourish collectively. This is our task: to love and care *with* our Earth-community-world and to participate in its ongoingness by making more life.

The process of deModernizing is one of recovery, becoming ecocentric, and becoming agentic by taking up our responsibilities to participate in these transitions as a way of making more life. Agency is acting collectively by taking initiative, by designing climate change adaptations that build regenerative communities. *Regeneraphilia* moves us forward in the revolution toward regenerative cultures. When we learn to practice *regeneraphilia* for Climate, we can stop fighting climate as if it were an evil monster like Mahishasura, and respect Climate as a regenerative force like Maa-Durga, who reminds us that the power to adapt to climate change is a power different from the power of domination that caused climate to change. There is a quiet humility about the power of regeneration. It does not seek attention and may not be

perceptible to Modern humans who are conditioned to look for power at the apex of hierarchies. Regeneraphilia is the love of making more Life together.

Synthesis of Findings on Respecting Regenerative forces

What do designers of local climate change adaptations need to know about Indigenous conditions for cultural continuity that enabled Indigenous and ancient cultures to endure past climate change events? With the goal of facilitating radical literacy for climate change adaptations, I synthesize knowledges about adaptations related to two conditions for cultural continuity: regenerating and welcoming difference.

- Practices for respecting the forces of regeneration (i.e., cycle of Life, Climate, mothering, Water, and Land) are drawn from ancient and Indigenous cultures. There is a dearth of regenerative narratives from Modernity/coloniality.
- Regenerative cultures welcome difference because uniqueness is valued and biocultural diversity is necessary for life to continue.
- Indigenous matricultures are pervasive and diverse, but this knowledge is excluded from hegemonic education and is not part of the Canadian Imaginary.
- The egalitarian principle of matricultures can be expanded beyond gender to include interspecies kin living in symbiotic communities.
- The political task of our time is to love and care *with* our Earth-community-world and to regenerate life by participating in Earth flourishing and ongoingness.
- The deModernizing process is complete when we reTurn to regenerative cultures in the pluriverse in spiraling time and join the struggle to engage in relations of

nondomination. Women reclaim sovereignty over their reproductive bodies and grow food for their families and communities on Land to which they belong.

Modernity/coloniality's intolerance of difference manifests as excluding and eliminating differences using methods such as marginalizing, assimilating, epistemicide, necropolitics, genocide, ecocide, and species extinction. Epistemicide refers to subjugating knowledge to distort or erase representation of those deemed Other. Knowledge of pre-patriarchal and extant matricultures has been subjugated. Suppressing knowledge refers to Modernity's intentional hiding of its violence and unsustainability. Canada's necropolitical methods for disrupting Indigenous women's capacity to regenerate their cultures is a suppressed knowledge. According to Bacchi's (1999) critical policy analysis approach, knowledge that is hidden from view cannot be interrogated. Epistemicide and knowledge suppression, like intentional forgetting, contribute to illiteracy.

Looking forward, I reiterate my call for inquiry into the Land/Gender/Regeneration Question to interrogate the methods for severing women from Land and for subjugating knowledge of regeneration and of matricultures. I call for building pluriversal centres of learning where regeneration can be studied holistically and experientially in regenerative communities.

Questions for Reflection and Discussion

1. How did you come to matter in an organic body? What is your Maternal lineage?
2. Imagine planning a local feast to renew your community's relationship with Climate (Sila) and to commit to reciprocal relations with Climate in the future.
3. In a regenerative culture, how would caring work be valued?
4. Locate yourself on the continuum in Table 6. Where are you moving to next? What experiences and learnings will help you move in that direction?
5. Create a new word for the age that follows the Modern Age.

Praxis: Each day, practice composting, not only as a household practice, but metaphorically.

Suggested reading

- William Dumas (2020). *Pisim finds her Miskanaw*. Portage & Main Press.
- Vandana Shiva (2016). *Who really feeds the world? The failures of agribusiness and the promise of agroecology*. North Atlantic.
- Leanne B. Simpson (2017). *As We Have Always Done*. University of Minnesota Press.
- Schumacher College <https://campus.dartington.org/schumacher-college/>.

Resources for Arts-based Learning

- "Redemption Song" by Bob Marley.
- *Suppressed Histories* by Max Dashu. <https://www.suppressedhistories.net/>
- *Nuliajuk's Story*. <https://www.waq.ca/event/nuliajuk-story/>
- "Ever New" by Beverly Glenn-Copeland. <https://youtu.be/TbrJk92fQzQ>

CONCLUSION

In concluding this dissertation, I evaluate my transdisciplinary research process and synthesise the outcomes. Lastly, I call for further research and assert the contribution of this study to knowledge construction.

Evaluating the Research Process

This research project has generated new knowledge for designing climate change adaptations. By building on the foundation of Indigenous conditions for cultural continuity, this project facilitates radical literacy for local climate such adaptations in the pluriverse in response to the climate change emergency.

I narrowed the scope of the wicked climate change problem to focus on climate change adaptation at a local scale. I further narrowed the scope by focusing on Modern problems that are entangled with the problem of climate illiteracy: domination, cosmological destitution, intolerance, necropolitics, and greed. I framed two questions to guide my inquiry. *What do designers of local climate change adaptations need to know about Indigenous conditions for cultural continuity that enabled Indigenous and ancient cultures to endure past climate change events? In what ways can Critical Ecopedagogy facilitate literacy for local climate change adaptations in the pluriverse?*

To provide structure for my inquiry, I built a transdisciplinary philosophical framework (Chapter 1), a conceptual framework (Chapter 2), and a methodological framework (Chapter 3). Applying the Repko (2008) method of transdisciplinary research, I built a philosophical

framework that integrates relevant knowledges from Indigenous Knowledges, ecofeminist philosophy, Decolonial Theory, Critical Ecopedagogy, and the work of critical anthropologists. The common ground between the five knowledges is a critical perspective on Modernity/coloniality and its systems of domination that include anthropocentrism, heteropatriarchy, white supremacy, and Christian theocracy. I reviewed literature relevant to conditions for cultural continuity and to climate change adaptation in each knowledge. In hindsight, the field of Climate Psychology would have been an asset to the philosophical framework, but it would have expanded the project beyond my capacity to manage it. A non-disciplinary approach is appropriate for studies located in the pluriverse.

Applying the Szostak (2006) test for evaluating the effectiveness of transdisciplinarity in this research project, I find that transdisciplinarity provided multi-perspectival insights into climate change adaptations, adding depth and breadth of insight to the problems under study. Transdisciplinarity quickly brought to the foreground the causal relationship between anthropocentrism and Anthropogenic Climate Change, a relationship that became increasingly complex because it has been concealed in its entanglements with capitalism. Transdisciplinarity involving Indigenous Knowledges and ecofeminism enabled a holistic approach to learning. Indigenous Knowledges are relevant to all Learning Roots. Decolonial Theory shaped my critique of Modernity/coloniality. Critical anthropologists, as the primary source of knowledge about cultural adaptations to past climate change events, reiterated the principle of reMembering so that we can learn from the past. The pluriversal knowledges of ecofeminist philosophy, Indigenous Knowledges and Decolonial Theory were coherent with Critical Ecopedagogy and the work of critical anthropologists. Clearly, a problem as wicked as climate

change cannot be studied using only one discipline or field. Studying the human problems related to climate change requires a critical approach that interrogates Modernity's system of domination.

Climate illiteracy. In problematizing climate illiteracy, I began with Paula Gunn Allen's notion that coloniality relies on intentional forgetting. Intentional forgetting became a theme that integrated Giroux's (2020) concern about manufactured ignorance and Weintrobe's (2013) concern about climate change disavowal, leading me to conclude that climate illiteracy is not a knowledge deficit but a manufactured illiteracy involving intentional forgetting, disavowal, and delusions. Climate illiteracy is a Modern maladaptation that was exacerbated during The Great Dithering by disinformation funded by Big Oil. It is reflected in Western Eurocentric refusal to take responsibility for climate change mitigation, leading us to the bring of climate catastrophe. Intentional climate illiteracy is linked to lack of courage and loss of agency to prepare for climate change, an indicator of impending culture collapse according to Diamond (2005).

In my curricular review, I find 30 concepts related to climate change adaptation that are excluded or under-represented in curricula. I refer to these exclusions as *30 dropped threads*. This finding adds specificity to the general conclusions of earlier reviews on climate change education by Kagawa and Selby (2012), Bieler, McKenzie, et al. (2017), and Blenkinsop and Fettes (2020). This finding led me to conclude that Modernity's problem of climate illiteracy is embedded in curricula, which has serious implications for hegemonic education. Applying Bacchi's critical policy approach, I identified curricular silences. The implications of these silences include the following:

- If curricula do not name and expose anthropocentrism and Christian theocracy as systems of domination, these systems of domination cannot be interrogated and remain part of the hidden curriculum.
- If curricula related to sustainability education do not deconstruct the link between anthropocentrism and climate change, then sustainability education is a greenwash.
- If curricula remain silent on adaptations to past climate change events and Indigenous conditions for cultural continuity, then youth are unprepared to design climate change adaptations based on what was possible in the past.
- If curricula remain silent on the subjugated knowledges of sharing economies, practices for respecting regenerative forces, matricultures, cosmologies of the Land, and Earth-centered philosophies, then youth are unprepared to participate in the large-scale transitions that are already underway.

Assessing the Foundation in Indigenous Conditions for Cultural Continuity. Indigenous cultures, having the greatest longevity of all cultures, demonstrate adaptive capacity by having endured past climate change events and by surviving coloniality. I have come to understand through the literature that Indigenous conditions for cultural continuity are Land-based, complex, and intertwined with a philosophy of regeneration. By reading across Indigenous cultures in Canada, I was able to illustrate the prevalence and diversity of practices related to the following conditions for cultural continuity:

- caring relationality with Land and kin,
- living the cosmology of the Land,
- regenerating,

- sharing,
- reMembering cultural memories, and
- welcoming difference.

Learning Roots 2 found that these conditions for cultural continuity are relevant to explaining the adaptive capacity of four ancient cultures that endured a full climate cycle. This finding of relevance across millennia strengthens my conclusion that Indigenous conditions for cultural continuity provide a firm foundational for designing local climate change adaptations. They have stood the test of time.

What Designers Need to Know. My research question was too narrow because it asked for knowledge as a “need to know”; however, by Learning Roots 4, I became aware that designers also “need to know how” to be designers and leaders and that there is a skills and competencies factor missing in my research question. I leaned into the problem by returning to Mary Daly’s advice about Verbing. Verbing invites us to integrate thinking, being, and ethics in an onto-ethico-epistemological engagement with the world. As I worked through Learning Roots 4, 5, and 6, I sought to create a primer that served as a catalyst for critical thinking, intersectional analysis, divergent thinking, systems thinking, design thinking, and problem-solving, all of which depend on emotional intelligence and deep listening skills to attend to resistance, fear, trauma, and grief in the process of leading change.

Applying the principles of Critical Ecopedagogy, I created Learning Roots as a primer to facilitate radical literacy for climate change adaptations that builds on the foundation of Indigenous conditions for cultural continuity. Learning Roots are interwoven with the 30 dropped threads as well as core concepts from the Conceptual Framework. Learning Roots

evolved into a massive tapestry of learning across past revolutions of the spiral as we make the present revolutionary turn toward futurities.

Outcomes: A Radical Literacy for Local Climate Change Adaptations

This section creates the finishing edge on the tapestry by knotting the loose threads and cutting off loose ends. This final knotting step is organized by the principles of Critical Ecopedagogy, expressed as verbs.

Listening in loving, caring relationality with Earth. This principle aligns with three Indigenous conditions for cultural continuity: caring relationality with Land and kin, living the cosmology of the Land, and sharing. The principles of caring that guide sharing economies include reciprocity, egalitarianism, enoughness (sufficiency), and generosity. Reciprocity, like regeneration, is a complex principle because it maintains balance and harmony in relationships.

Respecting Regenerative Forces. This principle of Critical Ecopedagogy aligns with regenerating as a power, a principle, and a condition for cultural continuity. As a power, regeneration co-exists with Modernity's power of domination but may not be perceptible to Modern humans. It is the power of ongoingness that sustains Indigenous and other Earth-centered cultures. Regeneration occurs in a cosmology of spiraling time and is not commensurable with Modernity's linear time. *Regeneraphilia* expresses love for regenerative forces including climate, mothering, Land, and water. DeModernizing prepares us for the large-scale, long-term transition to regenerative cultures in the pluriverse.

Learning from the Past. This principle of Critical Ecopedagogy aligns with reMembering cultural memories, a condition for cultural continuity. Knowledge of past climate change events has the potential to reduce fear about climate change, so introduced learners to the names and

distinguishing features of climate events in the Holocene in the organic climate cycle of degeneration and regeneration (Wolfstone, 2014). According to Hung (2020), it is important to learn from past mistakes. Failure to learn from past climate change events contributes to climate illiteracy. I suggest that The Modern Age is a prolonged period of degeneration spanning two overlapping climate change events: LIA and ACC. Like periods of degeneration in past climate change events, LIA and ACC are marked by famines, pandemics, reduced prosperity, mass migrations, invasions, intolerance, and loss of literacy. This dark underside of The Modern Age is under-represented in hegemonic education about the so-called Renaissance and Enlightenment.

Becoming Agentic. This political principle of ecopedagogy is engaged in ecojustice. DeModernizing, like decoloniality and resurgence, is a pluriversal way of disinvesting from Modernity/coloniality's systems of domination. DeModernizing is a process of:

- recovery from cosmological destitution and other Modern dis-eases;
- becoming ecocentric by nurturing a loving relationship with Land and living in interspecies symbiotic community;
- becoming agentic for ecojustice by restructuring relations to nondomination; and
- reTurning in spiraling time to contribute to ongoingness in regenerative cultures.

DeModernizing embraces plurality and alterity.

Preparing for long-term, large-scale change in spiraling time. This principle of Critical Ecopedagogy aligns with welcoming difference, a condition for cultural continuity that also welcomes change. I found that Indigenous communities are agentially preparing for climate

change by reclaiming languages, Land-based learning, rematriating, reclaiming food sovereignty, and supporting children and mothers (see Learning Roots 1).

Learning holistically. Critical Ecopedagogy is holistic and welcomes affective, embodied, and transpersonal ways of learning and knowing, as well as cognition and creativity and political initiative.

Transition Design. The design principle applies planning local climate change adaptations that respect Earth's carrying capacity to prevent overshoot, prepare for climate risks, and integrate with systems transitions.

In summary, Critical Ecopedagogy has capacity for rapid change in response to the climate emergency, in contrast to hegemonic education, which supports incremental change. Learning Roots integrates the 30 dropped threads identified through curricular analysis as well as subjugated and suppressed knowledges. It provides informal learning, which is instrumental in revolutionary movements because learners engaged in creating new worlds are thirsty to learn what hegemonic education conceals (Arendt, 1977, p. 173). Critical Ecopedagogy has the capacity to rapidly disseminate Learning Roots using the internet and climate activist networks.

Calls for New Research

This study provokes new questions that require further inquiry. First, I call for case studies. I call on critical anthropologists to develop more case studies on adaptive cultures that survived previous climate change events, with a focus on egalitarian, peace-loving cultures. I also call for case studies on sharing economic systems that are embedded in cosmology.

Second, pluriversal learning needs knowledge centres where learners can engage in holistic and experiential learning in regenerative communities. These centres could build on

existing networks such as ecovillages, cooperative farms, permaculture centres, monastic communities, Waldorf schools, Indigenous land-based learning camps, and retreat centres (e.g., Yasodhara Ashram). Schumacher College in the UK is a model.

Third, I call for the emerging field of Climate Psychology to design holistic, ecocentric therapies for recovering from cosmological destitution, loss of agency, lack of courage, and fear of difference.

Fourth, I call for deep transdisciplinary inquiry into the Land/Gender/Regeneration Question to expose Modernity/coloniality's methods of erasure that a) subjugate knowledge of ancient and extant matricultures; b) subjugate knowledge of the Maternal in cosmology of earth-centred philosophies; c) sever women from Land, farming, and medicine; d) control reproduction; and e) make regeneration invisible in the Modern Imaginary. The inquiry would deconstruct anthropocentrism as a driver of climate change and build on the intersectional research by scholars of Indigenous feminisms, ecofeminism, and Decolonial Theory.

Significance

The significance of this study is its unique contribution to critical and radical literacy for local climate change adaptations. It takes a cultural perspective, not a social perspective, to articulate climate change as a human problem. It assumes that the mind-set for solving climate change problems is different from the Modern mind-set that created the problems. Youth, climate activists, artists, ecocentrics, organic farmers, the Transition movement, and transgressive educators will benefit from Learning Roots. The emerging occupation of climate change coordinators in municipalities, First Nations, and health institutions can also benefit from Learning Roots.

Closing thoughts

This dissertation is for my grandchildren and for current and future generations who are concerned about enduring a future with Anthropogenic Climate Change. I recognize that my generation has not shouldered its responsibility, leaving youth with the challenge of designing local climate change adaptations to endure the climate chaos that my generation is leaving to them. We are living in an existential crisis exacerbated by my generation's failure to act in response to the warnings of scientists since 1988. Writing this dissertation is my act of hope that futurities are possible.

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APPENDICES

Appendix A–Lexicon for DeModernizing in the Pluriverse

This lexicon describes knowledges embedded in specific words related to radical literacy for climate change adaptations, including core concepts from Concept Maps 1, 2, and 3, as well as the 30 *dropped threads* from Learning Roots 1 to 6. A lexicon differs from a glossary and a dictionary by including theoretical sources.

- **Abrahamic** (adj.): pertaining to the religions of Judaism, Christianity, and Islam that recognize Abraham as a common ancestor or patriarch and have similar origin stories.
- **Agency** (n.), **agentic** (adj.): having the integrity and autonomy to act with self-determination. Personal integrity refers to bodily integrity, freedom from domination, and the quality of having strong moral principles conveyed through contributions to collective goals. The integrity of Land refers to the collective interspecies cohesion of Beings that belong to a Land and act for collective survival (Kuokkanen, 2019). Related term: [nondomination](#).
- **Animism**: a nondual relational philosophy based on the cosmology of the Land, and thus unique to each bioregion. It is embedded in language, stories, songs, and symbols. Animism participates in the world through active listening in open-ended encounters with sentient Beings (Bird-David, 1999, 577; Plumwood, 2009; Harvey, 2017).
- **Anthropocentrism** (n.), **anthropocentric** (adj.): hierarchical, dualistic system of domination that ranks humans (*anthropos*) as the most superior species, giving them sole authority to dominate over land and other species for human benefit, and to steal land from those humans deemed inferior (e.g., women, people of colour, heathens). It diminishes human

capacity to empathize with other species and with Land (Merchant, 1980; Plumwood, 2019). Related term: human exceptionalism, *speciesism*. **Post-anthropocentric** refers to a philosophical transition that decenters humans, expands the concept of egalitarianism, and disrupts the “classical boundaries between humans and others, stressing the importance of becoming animal, becoming other” (Braidotti, 2011, p. 327; Sojourners’ Collective, p. 241). *Anthropogenic* is imprecise because the Greek root *anthropos*- infers all humans, but Indigenous peoples and people of colour do not share complicity in the causes of climate change because they too are subjugated (Dei, 2009, p. 17; Stein, 2019).

- **Anthropogenic Climate Change** (abbrev. ACC): **Climate change** is defined by IPCC-AR6 (2022) as “A change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer. Climate change may be due to spontaneous internal processes or external forcings such as modulations of the solar cycles, volcanic eruptions, and persistent white anthropogenic changes in the composition of the atmosphere or in land use. variability observed over comparable time periods. The United Nations Framework Convention on Climate Change (UNFCCC) defines ACC as “a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate” (cited by IPCC). UNFCCC distinguishes between climate change attributable to human activities altering the atmospheric composition and climate variability attributable to spontaneous causes. **Global warming** refers only to increased surface warming. **Anthropogenic** means “resulting from or produced by human activities” (IPCC, IPCC-AR6 (2022). The consensus

among research scientists on anthropogenic global warming is now 100%, based on peer-reviewed articles on climate change. The terms Anthropogenic Climate Change is imprecise because the Greek root *anthropos*- infers incorrectly that all humans share complicity in the causes of climate change; however, we do not yet have a term to recognize this reality, so I use the adjective “white” to locate accountability with Western Eurocentric cultures, based on my assumption that without coloniality, there would be no Anthropogenic Climate Change event (Dei, 2009, p. 17; Davis and Todd, 2017; Whyte, 2017; Stein, 2019).

- ***Christian theocracy***: an authoritarian system of domination in Modernity/coloniality that recognizes the European version of the Christian deity as the only deity and as the supreme ruling authority of the state. European emperors relied on papal decrees to provide divine authority to use violence to impose Christian ***monotheism*** on the peoples of the colonies (Mbembé, 2003). Methods of erasing other belief traditions and philosophies include ceremonial ban, [missionizing](#), proselytizing, residential schools, Inquisition, and genocide.
- ***Climate Change Adaptation (CCA): Climate Change Adaptation (CCA)***: In human systems, adaptation is the process of adjusting to actual or expected climate change and its effects in order to moderate harm. ***Adaptation strategies***: “the array of strategies and measures that are available and appropriate for addressing adaptation, including structural, institutional, ecological, or behavioural” change in response to **climate risks** (IPCC, AR6-Glossary, 2022). The following terms are related to ***Limits to Growth theory*** (Meadows et al., 1972).
 - ***Carrying capacity*** refers to the limits of planet Earth to carry human populations and economic systems before reaching overshoot.

- **Adaptation limit:** “the point at which an actor’s objectives (or system needs) cannot be secured from intolerable risks through adaptive actions.
- **Hard adaptation limit:** “no adaptive actions are possible to avoid intolerable risks.”
- **Soft adaptation limit** means “options are currently not available to avoid intolerable risks through adaptive action” (IPCC, AR6-Glossary, 2022).
- **Adaptive capacity:** “the ability of systems, *institutions*, humans and other organisms to prepare for climate risks, adjust to potential damage, or to respond to consequences” (IPCC, AR6-Glossary, 2022).
- **Overshoot:** drawing on Earth resources faster than those resources can regenerate and releasing wastes and pollutants faster than the Earth can absorb them or render them harmless.
- **Transformational adaptations** change the fundamental attributes of a system in anticipation of the impacts of climate change. Change may be rapid, long-term, and large-scale. Designing transformative change requires redressing social injustices and power imbalances (Park et al., 2012; IPCC, 2014, p. 1121; IPCC, 2019, p. 678).

Related terms: [maladaptations](#), [decentralization](#), [de-urbanization](#).

- **Climate change events:** In the Holocene, climate change events occur spontaneously in approximately 1000-year intervals and include 4.2 KY event, 5.9 KY event, Bronze Age Collapse, Migration Period, The Little Ice Age (LIA).
- **Climate cycle:** Climate change events due to spontaneous causes occur in approximately 1000-year intervals. The phases of a climate change event include [period of degeneration](#) (approximately 400 years) and [period of regeneration](#) of recovery and flourishing.

- **Climate illiteracy:** a [maladaptive](#) response to climate change during the Great Dithering (High Modernity); a manufactured ignorance that has implications for [agency](#), critical thinking, and [memory](#) (Giroux, 2020). Climate illiteracy is entangled with tactics of intentional forgetting including [disavowal](#), [denialism](#), disinformation, delusions, [epistemicide](#), and knowledge suppression.
- **Climate risks:** IPCC-6AR identified 130 key risks that could become severe and grouped them into eight representative key risks:
 1. Risks to low-lying coastal socio-ecological systems (e.g., sea level changes, extreme weather events, sea ice loss and permafrost thaw);
 2. Risks to terrestrial and ocean ecosystems (e.g., invasive species, loss of biodiversity);
 3. Risks associated with critical physical infrastructure, networks, and services, including healthcare and emergency response;
 4. Risks to living standards (e.g., increased poverty);
 5. Risks to human health (e.g., pandemics, heat deaths, mental health);
 6. Risks of food insecurity linked to droughts, floods, extreme weather, and affordability;
 7. Risks to water security (e.g., floods, droughts, pollution); and
 8. Risks to peace (e.g., war) and to human mobility (e.g., involuntary mass migration).
- **Coloniality:** see Modernity/coloniality and Settler coloniality.
- **Conditions for cultural continuity:** *Cultural continuity* is a temporal concept for a culture's ongoing existence in time and infers the transmission of cultural memories from one

generation to the next generation. *Conditions for cultural continuity* refers to principles that guide cultures to adapting to ecological and other catastrophes based on cultural memories.

- ***Cosmological destitution***: a condition experienced by many settlers who forgot the cosmology of their ancestral homeland, failed to bond with the Land in which they settled, and neglected to adopt the cosmology of the Land that they inhabit (Matthews, 1991). .
- ***Cosmology***: the branch of philosophy that theorizes a big-picture perspective of time, place, and space. Cultural cosmology survives for millennia once it is established in the myths, origin stories, First Instructions, rituals, ceremonies, signs, symbols, songs, and traditions of a culture. Cosmology is deep knowledge that is believed, lived, embodied, and often not articulated in linguistic form. It shapes a culture's Imaginary, contributes to meaning making, and unifies a culture around common philosophy and a theory of origins.

Cosmology has a wider horizon and deeper meaning than religion, spirituality, or worldview (Matthews, 1991, chapter 2; Haarmann, 2007; Haarmann, 2020, p. 109). ***Cosmology of the Land*** recognizes that culture is specific to Land and that cultural cosmologies tell the story of a Homeland, its origins, and its sacred places.

- ***Culture***: a collective way of making sense of the world using a set of shared values that reflects people's thinking, practices, and ethics and that give order to their cosmology, arts and aesthetics, and social structures (Haarmann, 2007, p. 1-2).
- ***Daoism***: an earth-centred philosophy that originated in China's ancient [shamanic](#) traditions. It holds beliefs about [immanent](#) life forces and practices respect for regenerative forces and ancestors that extends to interspecies kin.

- **Decentralization:** an adaptive strategy by which a centralized governance structure transitions to a decentralized governance model to enable [localization](#) and a faster response to [climate risks](#).
- **Decolonizing:** In [settler colonial](#) contexts (i.e., Canada, US, Australia, and NZ), where the colonizer stayed, the term refers to reconciliation between settlers and Indigenous peoples. Decolonizing is the struggle to restructure relations to relations of nondomination (Kuokkanen, 2019, p. 23, 59). Indigenous peoples use **resurgence** to refer to reclaiming sovereignty over Indigenous bodies, cultures, philosophies, languages, and Lands (Simpson, 2017; Wilson, 2018). **Decoloniality** is a term from Decolonial Theory to refer to ongoing recovery from Modernity/coloniality and reclaiming sovereignty, languages, belief traditions, and economies after the colonizer left.
- **DeModernizing** (v.): a process for disinvesting from Modernity/coloniality's systems of domination. DeModernizing commits to restructuring relations to nondomination and involves becoming [ecocentric](#), becoming agentic in collective praxis for [ecojustice](#), and reTurning in spiraling time to regenerative cultures (Wolfstone, 2022). We can discard this temporary term when the next age is named.
- **Dendrolatry:** an Earth-centered practice that venerates Trees as sacred Beings.
- **Denialism:** forms of negating information and/or reality include denial, [disavowal](#), delusion. All forms of climate change denialism contribute to [climate illiteracy](#). Related term: denier.
- **Design** (n.): the creative process of imagining solutions in the [pluriverse](#) (Escobar, 2018). Design principles include Transition, biomimicry, and symbiomimicry (Albrecht, 2019).

- **De-urbanization:** an adaptive strategy for organized mass migrations from cities to rural areas to address problems related to food security and/or water security.
- **Diaspora:** an unplanned and chaotic mass migration to an external territory driven by imminent threat to life, e.g., Syrian diaspora. It may result in statelessness.
- **Disavowal:** a complex form of intentional forgetting that ensures that “reality can be seen and not seen at one and the same time.” Disavowal is a more organized and enduring defense strategy than negation (Weintrobe, 2014, p.38). Disavowal can result in confusion and inability to think with a sense of proportion (p. 39).
- **Disinformation:** a falsehood created with the malicious intent to cause harm. It differs from misinformation, which is also false but created without the intent to deceive.
- **Domination:** Modernity/coloniality’s structure of power deploys multiple systems of domination including [anthropocentrism](#), [heteropatriarchy](#), [white supremacy](#), and [Christian theocracy](#). Hierarchy, the organizing principle in each system, ranks Beings in order of superiority/inferiority and accords highest ranked Beings with authority over beings in lower ranks. The secular authority for domination is [humanism](#) and its concept of human exceptionalism. The religious authority for domination in Abrahamic religions is the deity’s First Instruction to humans to dominate or rule.
- **Dualism:** Dualism separates phenomena into binary oppositions (i.e., man/woman, culture/nature) and values the binaries differently. One part of the binary is deemed superior and orderly, while the other part of the binary is inferior and chaotic, and therefore located outside the sphere of influence. Dualistic philosophy undergirds heteropatriarchy,

white supremacy, Christian theocracy, and anthropocentrism, which categorize and rank based on gender, skin colour, and utility to humans.

- **Ecocentrism (n.), ecocentric (adj.):** egalitarian philosophy that decentres humans, centres Earth, and engages in mutual caring and empathic relationality with Earth and interspecies kin. Earth is sentient and alive. Life is sacred. Concepts include interconnectedness, flux, symbiosis, spiraling time, and plurality. Practices include deep listening, reciprocity, and [respect for regenerative](#) forces. This philosophy is held by many Indigenous; however, they may prefer the terms *Earth-centered* and *Land-based* to avoid the eco-prefix. Related terms: post-anthropocentric, anti-humanist.
- **Ecocide:** “unlawful or wanton acts committed with knowledge that there is a substantial likelihood of severe and either widespread or long-term damage to the environment being caused by those acts.” (Independent Expert Panel for the Legal Definition of Ecocide, 2021).
- **Ecojustice:** the emancipation of Earth (including Climate) from human domination.
- **Egalitarian (adj.), egalitarianism (n.):** the outcome of restructuring relations to [nondomination](#). Non-hierarchical. Do not conflate the Modern concepts of equality and equity.
- **Elemental philosophy:** an earth-centred philosophy and an ancient science in which the elements (i.e., Air, Earth, Fire, Water, Space) are life forces for [regeneration](#) and degeneration, are always in flux, and must be balanced to maintain harmony and balance in the cosmos. This philosophy informs eastern medicine systems and the Medicine Wheel teachings (Starhawk, 2005; Macauley, 2010).

- **Enduring:** a life-affirming term to replace *sustainability*; refers to the “humble fact of endurance (as duration or continuity) that honours our obligation to the generations to come ... the shared collective imagining that is a continual process of becoming” despite capitalism’s habit of destroying a sustainable future (Braidotti, 2011, p. 296). Endurance is an embodied hope linked to memory, particularly traumatic memory, and carries ethical responsibility.
- **Epistemicide:** a colonial method of erasure that *subjugates* marginalized Others and their non-European knowledges (Grosfoguel, 2013; Wilson, 2018; Dei, 2010). In contrast, *suppression of knowledge* refers to intentional hegemonic practices to conceal the violence and unsustainability of Modernity/coloniality.
- **Extractivism:** an anthropocentric and capitalist practice that removes large quantities of raw materials from Earth, usually for export, often with government subsidies.
“Extractivism is a nonreciprocal , dominance-based relationship with the Earth, one purely of taking,” and at its core, it is “the absence of caring (Klein, 2014, p. 169)
- **Food Insecurity:** an urgent and dynamic climate risk that requires significant climate change adaptation planning so that all natals have sufficient, safe, and nutritious food (Wittman, Desmarais, and Wiebe, 2010). Related term: [food sovereignty](#).
- **Food Sovereignty:** a transnational political movement that asserts a nation’s sovereign right to establish its own agricultural, labour, fishing, food, and land use policies that are ecologically, economically, and culturally appropriate to the people who belong to the Land. Sovereign nations control their own seeds and trading practices (Shiva, 2016; [Nyleni Accord, 2007](#); Settee and Shukla, 2020). Indigenous Food Sovereignty expands the

transnational movement by emphasizing the sacredness of Land, plants, animals, and humans, as well as responsibility to produce, harvest and consume food in a sacred manner (Simpson, 1999).

- **Great Dithering:** refers to the period after 1988 when scientists warned governments that ACC was becoming a global crisis but Western Eurocentric nations failed to act rapidly or decisively enough to avert catastrophic climate change (Oreskes and Conway, 2014, p. 4; Haraway, 2016). Coined by science fiction writer Kim Stanley Robinson.
- **Great Mother:** cultural [cosmologies](#) involving veneration of The Maternal Principle in relationality with Land, Sky, and/or chthonic life forces personified as Sacred Beings or deities. Great Mothers mentioned in this work include Sedna, Sky Woman, Maa-Durga, Demeter, Isis, Tanit, Pachamama, Gaia, Kali-Ma, Kybele, Mother Earth (Neumann, 1955; Diop, 1989; Gimbutas, 1989; Dexter, 1990; Baring and Cashford, 1991; Dashu, 2023).
- **Greed:** a pervasive moral failure and maladaptation of Modernity/coloniality that involves taking more than you need, refusing to share the Earth, preoccupation with accumulating assets, and the drive to get ahead.
- **Heteropatriarchy:** a dualistic and hierarchical system of domination using ranked organization and binary gender and sexuality to privilege white hetero males. On sexuality, it ranks “the relationship of cisgendered, married, monogamous men and women at the top, and de-emphasizes or erases all other relationships” (Simpson, 2017, p. 134). On gender, it accords heterosexual males with authority to subjugate females, lesbian, gay, bisexual, transgender, queer, and two spirited (LGBTQ2S) persons, bodies, and sexual relations in ways that do not allow self-determination or individual body sovereignty

(Merchant, 1980, 2005; Simpson, 2017, p. 123). Anthropologist Henry Maine's classic definition of patriarchy states that dominion, not consanguinity, defines 'family': "The eldest male parent is absolutely supreme in his household. His dominion extends to life and death and is as unqualified over his children and their houses as over his slaves." The authority of the eldest male extends to wives, land, and goods as well as children (Maine, 1861, p. 122 as cited by Millett, 1970, p.34). Heteropatriarchy is a social construct and is not a universalism. The Neolithic is associated with the **pre-patriarchal period** which is under-studied. Heteropatriarchy's [methods of erasure](#) include systemic sexism, misogyny, housewifization (Mies, 2014), transphobia, homophobia, sex trafficking, rape culture, wife/partner abuse, incest, feminicide, and matricide. **Feminicide** refers to the killing of females by males because they are female (Federici et al., 2021, p. 4). Heteropatriarchy should not be conflated with paternalism.

- **Housewifization:** the domestication and privatization of women in the domestic sphere as part of the transition to capitalism in early Modernity (Mies, 1986, 2014).
- **Humanism:** a European philosophy introduced during The Little Ice Age that continues to shape Modern thinking. Humanism is inherently supremacist in that it elevates white heterosexual males as "universal man" and views women and people of colour as less than human and not persons in law. Secular anthropocentrism is grounded in humanism. *Anti-humanism* is a political standpoint that rejects the humanist ideal of *Man* as a Eurocentric universalism (Braidotti, 2011, p. 218-9). Related terms: anthropocentrism, heteropatriarchy, white supremacy, speciesism, human exceptionalism.

- ***Immanence***: the cosmological belief that regenerative forces are inherent in Earth’s living systems, in contrast to transcendental beliefs that locate them external to Earth.
- ***Informal learning***: intentional, but less organized, less structured, and more experiential than nonformal learning; it may include self-directed, learner-centred activities that occur at multiple sites in the family, workplace, and community (Wolfstone, 2016).
- ***Intersectionality***: a theory and method to interrogate the impact of layers of oppression by systems of domination, for example, heteropatriarchal and white supremacist oppression of Black women (Crenshaw, 1989; Carbado, Crenshaw et al., 2014).
- ***Intolerance of difference***: Intolerance is enacted using behaviours that exclude: [marginalizing](#), assimilating, sexism, racialization, antisemitism, speciesism, homophobia, Islamophobia, ableism, ageism, [monoculture](#). Extreme intolerance manifests as violent behaviours that eliminate Othered Beings using methods such as [epistemicide](#), [necropolitics](#), [ecocide](#), extinctions, genocide, [feminicide](#), and ethnocide.
- ***Land***: I use “Land” (upper case) to refer to the sacred place that we inhabit and “land” (lower case) to refer to the anthropocentric concept of property. I use Land instead of *nature*, which is an abstract romantic idealization of wilderness as untouched by humans and perpetuates the human/nature and culture/nature binaries (Sojourners’ Collective, 2022).
- ***Living the Cosmology of the Land***: See [Cosmology](#).
- ***Local*** (*adj.*), ***localism*** (*n.*), ***localizing*** (*v.*), ***localization*** (*n.*): an adaptive strategy involving decentralization to support self-sufficiency, cultural and ecological well-being, and social connectedness (Hopkins, 2014). IPCC recommends that climate change adaptations are

planned locally or bio-regionally and draw on Indigenous Knowledges (IPCC, 2014, p. 842).

In the scaling schema of household>local>bioregional > provincial>national>global, this study focuses on local. All scales require agency and courage. Escobar (2018) states that “the fundamental political task of our times” is “the care of communal territories/worlds” (p. 220).

- **Maladaptation:** “action that may lead to increased risk of adverse climate-related outcomes, including via increased greenhouse gas (GHG) emissions, increased or shifted vulnerability to climate change, more inequitable outcomes, or diminished welfare, now or in the future” (IPCC, AR6-Glossary, 2022). Modern maladaptations include [witch-hunts](#), [climate illiteracy](#), [colonization](#), resource wars, and weapons of mass destruction.
- **Marginalizing (v.):** a form of *intolerance* that denigrates and excludes Othered persons.
- **Mass migration:** a planned adaptive strategy when food and water scarcity or violence make it impossible to remain in the Homeland. In contrast, [diaspora](#) refers to an unplanned and chaotic exodus. Internal mass migrations include [decentralization](#) and [de-urbanization](#).
- **Matricultures:** egalitarian cultures founded on the Maternal ethic of caring that serves as a principle for all genders, for mothers and not-mothers. Matricultures elevate the Maternal in cosmological narratives and regard regeneration as a condition for cultural continuity. Matricultures typically practice governance by consensus and sharing economies (Wolfstone, 2022). The term *matricultures* was coined by Tina Passmann, 1993. Related concepts: matrilineal, matricentric, matriarchal, and [rematriation](#), [Great Mother](#).
- **Method of Erasure:** coined by Cavarero (1990) to inquire into patriarchy’s methods of erasing The Great Mother from cultural memory. I use the term broadly to refer to

methods of subjugating Others by making their bodies, knowledges, cosmologies, cultures, languages, and stories disappear. Related terms: [Intolerance of Difference](#), necropolitics, epistemicide, [disavowal](#), genocide, [femicide](#), [ecocide](#), statelessness, [monoculture](#).

- **Missionizing** (v.): method of erasing other religions and belief traditions based on the assumption that there is only one true religion and only one deity. Colonial missionizing methods include proselytizing, residential schools, and mission hospitals. Related: [Christian theocracy](#), monotheism, [intolerance of difference](#).
- **Modernity/coloniality**: The Modern Age is the historical Age that followed the Medieval Age. It spans two climate events: The Little Ice Age and Anthropogenic Climate Change. Modernity/coloniality, coined by Quijano (2007), postulates that without coloniality, there is no modernity. The -ity suffix indicates ongoingness. Modernity/coloniality is entangled with capitalism in interlocking systems of domination: *anthropocentrism*, *heteropatriarchy*, *white supremacy*, and *Christian theocracy*, which impose European economic, social, gender, and legal systems on colonized peoples, as well as European languages and Christian religion (Mignolo, 2011, 2021; Escobar, 2018; Lugones, 2008).
- **Monoculture**: the erasure of biocultural diversity. Methods for erasing biodiversity include terminator seeds, mono-cropping, and agrochemicals that contribute to cancer and species extinctions. Methods for erasing biocultural diversity include imposing European languages, religion, laws, and norms. Related terms: [intolerance of difference](#), assimilation.
- **Mothering**: a regenerative force in that mothers create more life. Cultural regeneration depends on it. Reproduction is a basic human need. Regenerative cultures regard women's regenerative functions of gestating, labouring, birthing, and breast-feeding as sacred

because they create life, distinct from caring for the basic needs of the young, a function that can be performed by mothers and not mothers. Related terms: [Great Mother](#), [natality](#), pregnancy, parturition, birthing, breast-feeding, midwifery, menstruation, puberty rites.

- **Natality:** Arendt's political philosophy of natality refers to natality in three ways. First, natality refers to the fact of birth in which a natal comes to matter by being born of a mother in an organic process governed by the cycle of life, death, and regeneration (Arendt, 1958, p. 96). Second, natality refers to belonging to a world characterized by plurality, where unique nats accept differences as an enrichment to harmonious communities. Third, natality is a political philosophy about revolutions and new initiatives enacted through collective agency (p. 9).
- **Necropolitics:** violent methods of erasure used by colonial governments that determine who gets to live and whom to let die and embeds these priorities in policy and practice. Necropolitics shifts "the boundaries between life and death" (Mbembé; 2003; Braidotti, 2007; 2011, p. 330-339). Methods of erasure include statelessness, [epistemicide](#), genocide, failure to investigate murdered Indigenous women and girls, birth alerts.
- **Nondomination:** "a process of restructuring relations of domination" (Kuokkanen, 2019, p. 24) by upholding the integrity of the body (material) and personhood of all Beings. Principles are noninterference (p. 24), self-determination (p. 25), nonviolence, and participation in decision-making (p. 58). Related terms: [ecojustice](#), [deModernizing](#).
- **Nonduality:** From an Indigenous perspective, nonduality is interconnectedness and flux. From an ecofeminist perspective, nonduality is accepting all Beings as autonomous subjects that exist in interdependent relationships, and radical nonduality is a "subtle, unitary field

of form, motion, space, and time” (Spretnak, 1997, p. 425) that integrates cosmological, ecological, and material unfolding of profound subjectivity, or interiority” (p. 434). From the perspective of Materialist Feminism, nonduality recognizes that all matter is agential and living; it “feels, converses, suffers, desires, yearns and remembers” (Barad, 2012, p. 59).

- **Oecumene:** Maisels (1999) coined *oecumene* to refer to the egalitarian socio-economic governance model in Harappa, defining it as a “civilization” that serves “the greatest good through advances in knowledge, civility and economic well-being shared by all” (p. 249).
- **Onto-ethico-epistemology:** coined by Karen Barad (2007) to assert that “practices of knowing and being are not isolatable; they are mutually implicated. We don’t obtain knowledge by standing outside the world; we know because we are of the world. We are part of the world in its differential becoming. The separation of epistemology from ontology is a reverberation of a metaphysics that assumes an inherent difference between human and nonhuman, subject and object, mind, and body. Onto-ethico-epistemology is the interweaving of knowing and being in the world ethically (p. 185, 381).
- **Paganism:** derived from *paganus* (Latin) meaning country dweller, it was a pejorative used for Romans who had not converted to Christianity and still practiced the old religions. In contemporary usage, paganism refers to non-Christian beliefs and practices that honour Mother Earth. (Starhawk, 1982; Apffel-Marglin, 2011; Abdou and Zervas, 2023).
- **Patriarchy.** See [Heteropatriarchy](#)
- **Period of degeneration:** the first part of the climate event when ecological and social crises occur. The period, lasting up to 400 years, is marked by pandemics, famines, reduced

prosperity, mass migrations, invasions, intolerance, and loss of literacy (Chew, 2007, p. 65; Chew 2008; Haarmann, 2007, Chapter 6). Some named periods of degeneration are Egyptian Intermediate Periods, Greek Dark Age, Medieval/Roman Dark Age.

- ***Period of regeneration***: the second part of the climate event when Land and cultures recover from a climate change event, stabilize, and flourish. (Wolfstone, 2022).
- ***Pluriverse (n.), pluriversality (n.), pluriversal (adj)***: the plurality of worlds within the world, in contrast with the Eurocentric monocultural world as a single, market-driven globalized civilization. The pluriverse welcomes plurality, hybridity, and syncretism because it does not fear difference (Escobar, 2018). It is not utopian, because it existed before colonization. It accepts conflict as inevitable and negotiable. See [Welcoming difference](#).
- ***Reciprocity (n.), reciprocating (v.)***: an agentic and principled response that expresses gratitude and respect for a great gift. In Indigenous philosophies, reciprocity is an ethical responsibility enacted locally in response to the generosity of Land in sustaining life. It demonstrates consent, empathy, caring, and sharing (Simpson, 2017, p. 77).
- ***Regeneraphilia***: coined by Irene Wolfstone to express loving (*philia*, Greek) [respect for regenerative forces](#) and the process of regeneration. Regeneraphilia is an emotion (Wolfstone, 2022) that contrasts with necrophilia (Wolfstone, 2019).
- ***Regenerating (v.), regeneration (n.), regenerative (adj)***: participating with life forces in the cycle of life that connects all Beings in beginnings, flourishings, and endings. This complex concept has layers of meaning, including a) a philosophy of regeneration (Simpson, 2011, p. 142), b) an Indigenous condition for cultural continuity, c) a mode of power expressed by and d) reproduction and [mothering](#) as a basic human need for survival. It assumes that

there will be future generations and agentially makes more life by participating in the organic cycle of life and death. Agentic regeneration protects biodiversity and biocultural diversity to prevent extinction. Related terms: [natality](#), menstruation, puberty rites, midwifery. (Simpson, 2011; Mathews, 2005; Armstrong, 2010).

- ***Relating with Land (v.), relationality (n.), relations, relationship:*** the affective and symbiotic bond with Earth and all Beings (i.e., interspecies kin) that cohabit the Earth, including ancestors. Affective relationality involves mutual loving and listening imbued with empathy and an ethic of care (TallBear, 2017). Relationality is an “intelligence” conducted with respect, responsibility, and generosity (Simpson, 2014, p. 13).
- ***ReMatriation:*** coined by Muthein (2011) and defined by Kuokkanen (2019) as “restoration and reclaiming the political roles and authority of Indigenous women alongside traditional governance structures and political orders” (p.98).
- ***ReMembering. Cultural Memory:*** the agentic storage of useful knowledge of the ancestors and the entire cultural symbolism that links a culture with the Land it inhabits. Societies ensure cultural continuity by linking cultural memories of the past and present in group narratives (Haarmann, 2007), rituals, ceremonies, songs, symbols, and text.
- ***Respecting regenerative forces:*** agential practices for showing deference to a force of [regeneration](#). Also participating in the cycle of life in ways that contribute to harmony and balance. Regenerative forces include Mothering, Land, Water, Air, Climate.
- ***Resurgency:*** See [Decolonizing](#).
- ***Settler Coloniality:*** institutionalizes in national governance the theft and exploitation of Indigenous peoples’ Land and cultural treasures. It exercises sovereignty over Indigenous

peoples by ruling over them (dominating, subjugating), redefining them, imposing laws, and statuses, and re-writing their story from the colonizer's point of view. Settler colonialism is an ongoing and evolving project of capitalism (Salleh, 2017, p. 234; Dei, 2010, p. xvii).

- **Shamanism:** an ancient and extant earth-centred philosophy and practice. Shamanism involves belief in soul, spirits, and transpersonal knowing. Elemental philosophy originates in shamanism (Balzer, 1997; Winkelman, 2011).
- **Sharing** (v.): practices for distributing resources based on the ethic of care and [reciprocity](#) for Earth's generosity, not out of obligation or exchange (Kuokkanen 2006; Kuokkanen, 2007, p. 18; Simpson, 2017, p. 50, 77). Models of sharing economies include regenerative economies (Salleh, 2017), subsistence economies (Mies & Shiva, 1993), and communal sharing (*communalidad*) (Mignolo, 2021; Escobar, 2018). Indigenous gifting economies include *balhats*, potlatch, and giveaways. Related terms: [oecumene](#), [egalitarian](#).
- **Sixth Mass Extinction Event, Holocene Extinction:** the ongoing extinction event during the Holocene epoch that span families of plants, mammals, birds, reptiles, amphibians, fish, invertebrates. This anthropogenic event represents Modernity's failure to value [regeneration](#).
- **Space Between:** a political transition zone for Sojourners who transgress the thick border of Modernity/coloniality and zigzag toward Earth-centeredness in the pluriverse.
- **Spiraling Time:** a [cosmology](#) of time and space as cyclical or spiraling is a way of thinking across past, present, and future with the expectation that stories repeat themselves in organic ways. There are cultural variations of spiraling time:

- In Māori cosmology, the double spiral represents the interconnectedness of past, present, and future, of time and space, of spirit and matter. It represents raw elemental energy, potentiality, emergence into wisdom (Stewart-Harawira, 2005, p. 34).
- Haudenosaunee concepts of self-determination and sovereignty use the spiral symbol to how relations begin with self and family, then spiral outward to our communities and our nations (Patricia Monture cited by Simpson, 2017)
- Spiraling time is the seasonal round of migratory concepts such as transformation and shapeshifting in adapting to an ever-changing world where survival requires constant change (Whyte, 2018, p. 132).

In contrast, Modernity has normalized linear time.

- ***Spirituality***: a contested term that implies belief in sacred Beings, ensouled Beings, or the sacred part of the Self. Most religions and belief traditions conceptualize spirit; however, it is rarely the only and defining belief. Similarly, in Indigenous philosophies, spirituality is a part but not the whole.
- ***Subjugating Knowledge***: a [method of erasure](#) by Modernity/coloniality, which assumes that Eurocentric knowledge is universal knowledge (Dei, 2010, p. 91; Dei, 2011, p. 4;) and erases or marginalizes the stories, sciences, and philosophies of Othered populations. imperialism (Simpson, 2017, p. 72). Related terms: [epistemicide](#), [intolerance of difference](#).
- ***Symbiosis* (n.), *symbiotic* (adj)**: a term from the biosciences that refers to organisms living together for mutual benefit. Albrecht (2019) interprets symbiosis as “living together in the lifeworld” with emotional bonds (p. x) with the Beings that share a Place of cohabitation (p.

133). Haarmann (2007) views symbiosis as a philosophy for a future grounded in reconciling cultural and economic interests as well as respect for all lifeforms (p. 276).

- **Welcoming difference:** the outcome of intentional relationality that includes, respects differences, and treasures uniqueness. Including difference strengthens the fabric of the community. Includes nonbinary gender and sexuality (Simpson, 2017, p. 86, 110; Anderson, 2016, p. 167-70; Wilson and Laing, 2018). Hybridity of cultures refers to the blending of at least two diverse cultures, e.g., Métis, often producing a distinct language or dialect.

Syncretism refers to the harmonious co-existence or blending of different beliefs. Related words: queer, plurality, pluriverse, biodiversity, and biocultural diversity.

- **White supremacy:** a system of domination in Modernity/coloniality that uses ranked social organization to privilege and assign superiority to persons with light skin colour, particularly persons of European origin. Related terms: systemic racism, genocide.
- **Witch hunt:** a genocide in Europe during early to mid Modernity driven by Protestants and Catholics, and to a lesser degree, the judiciary (Federici, 2014). It can be studied as a psychological and economic maladaptation to The Little Ice Age climate event.

Appendix B: Listening for Silences: Curricular Sources

Government of Manitoba (2011). *Grade 12 Current topics in First Nations, Métis, and Inuit Studies*. Manitoba Education and Training.

https://www.edu.gov.mb.ca/k12/abedu/foundation_gr12/index.html.

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https://www.edu.gov.mb.ca/k12/cur/socstud/history_gr11/document.pdf.

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Manitoba Education and Training.

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Government of Manitoba (2019). *Grade 12 World of Religions: A Canadian perspective*.

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https://www.edu.gov.mb.ca/k12/docs/support/world_religions/full_doc.pdf

Government of Manitoba (2019). *Grade 12 Western Civilization History*. Manitoba Education

and Training. <https://www.edu.gov.mb.ca/k12/cur/socstud/overviews/senior4-west.pdf>

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Ontario Government © Queen's Printer for Ontario (2013). *The Ontario curriculum, Grades 9 to 12: Social Sciences and Humanities*. Ontario Ministry of Education.

<http://www.edu.gov.on.ca/eng/curriculum/secondary/ssciences9to122013.pdf>. (Units

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<http://www.edu.gov.on.ca/eng/curriculum/secondary/2015cws11and12.pdf>.

Ontario Government © Queen's Printer for Ontario (2018). *The Ontario curriculum, Grades 9 and 10: Canadian and World Studies*. Ontario Ministry of Education.

<http://www.edu.gov.on.ca/eng/curriculum/secondary/canworld910curr2018.pdf>. For context only.

Ontario Government © Queen's Printer for Ontario (2019). *The Ontario curriculum, Grades 9 to 12: First Nations, Métis, and Inuit Studies* (298 pp). Ontario Ministry of Education.

<http://www.edu.gov.on.ca/eng/curriculum/secondary/First-nations-metis-inuit-studies-grades-9-12.pdf>.