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SPECIAL ISSUE: INDIGENOUS RESEARCH SOVEREIGNTY

**GUEST EDITORS: Jay T Johnson, Joseph P Brewer II, Melissa K Nelson,
Mark H Palmer and Renee Pualani Louis**

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Indigenous research sovereignities: Sparking the deeper conversations we need

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Abstract

This editors' introduction seeks to spark a conversation and further debate through the 14 papers and 3 commentaries comprising this special issue entitled "Indigenous Research Sovereignty." By inviting the authors to publish in this special edition and address Indigenous Research Sovereignty from a variety of viewpoints, we have brought together a collection that inspires, transforms, and expands on the ways in which Indigenous and non-Indigenous researchers are engaging with Indigenous communities to address the research agendas of communities across the globe. Through our work together over the past 8 years, the editorial team have identified eight themes within this broad concept of Indigenous Research Sovereignty. This article provides an introduction to those eight themes in the broadest strokes, while the papers and commentaries explore and refine them with significant depth. We seek to spark a conversation, we do not intend to provide answers to any of the dilemma facing Indigenous communities as they engage, or choose not to engage, in research. Our primary goal is to express an all-encompassing concern for the protection of Indigenous Communities' inherent rights and knowledges.

Keywords

Indigenous methods, indigenous research, indigenous geographies

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Over the past 8 years, a diverse group of Indigenous scholars have been working on a variety of topics related to research needs of Indigenous communities facing rapid environmental change. This research and network development has been supported by three US National Science Foundation grants, most recently a Research Coordination Network grant entitled, Facilitating Indigenous Research, Science, and Technology (FIRST). The work of the FIRST Network has been to engage Indigenous environmental scholars from a variety of fields, building connections through intentional listening, learning, and by sharing the stories of communities in order to find “common ground” upon which to bridge Western and Indigenous sciences. The underlying goal of the Network is to move forward an agenda of stewarding resilient communities and landscapes.

In her germinal work, *Decolonizing Methodologies*, Linda Tuhiwai Smith (1999: 1) describes the problematic relationship many Indigenous communities have with research: “the word itself, ‘research,’ is probably one of the dirtiest . . . in the Indigenous . . . vocabulary. When mentioned in many Indigenous contexts, it stirs . . . silence, it conjures up bad memories, it raises a smile that is knowing and distrustful.” Overcoming this long-standing distrust of “research” has been the effort not only of Smith, but of a long list of Indigenous and non-Indigenous academics who endeavor to decolonize not only the associated principles, protocols, and practices of science, but the ontological frame that policies academic research (Chilisa, 2019; Kovach, 2010; Wilson, 2008). Increasingly, Indigenous environmentalists and geographers are calling for Indigenous leadership in research activity to meet the environmental, social, and health research needs of communities (Coombes et al., 2014; Hunt, 2014; Louis, 2007). However, taking leadership in the research enterprise requires more than merely addressing research methods. It means asserting Indigenous sovereignty over *all* aspects of the process. We have identified eight areas related to asserting sovereignty over the research process: setting the agenda, relationship building, cultural protocols, research permitting, practices and methods, data sovereignty, and evaluation and dissemination. Through this double special issue of *Environmental & Planning: F*, we are initiating a dialogue with scholars from across the globe who have joined us in articulating how Indigenous communities can take a greater role in governing research in order to perpetuate our shared responsibilities to steward landscapes and communities toward balance and resilience.

For this reason, we begin by describing the eight areas of Indigenous Research Sovereignty we have identified through our work together. Whether or not these eight areas, or our descriptions, resonate with others only time and subsequent publications will tell. Some of the papers submitted for this theme issue of *Environment and Planning F* have already redefined our initial understandings and, undoubtedly, readers will seek to explore and expand them further. As we describe the areas around which we are defining Indigenous Research Sovereignty, we weave in brief introductions to the papers, placed within their context. At the end of this themed issue, you’ll also find three commentaries that seek to highlight an area within our work, or that connects this work to previous publications and those within the special edition. These commentaries explore aspects of research sovereignty from unique angles, furthering our understanding and expanding the ways in which we pursue an honorable research engagement and harvest of data (see Nelson, 2023).

Setting the agenda

Asserting Indigenous sovereignty over research must begin with communities identifying and setting the agenda for themselves. Agenda setting often develops from clearly identified needs related to environmental and community health. It’s important to remember that, “Indigenous peoples have been employing systematic methods for learning and teaching about the natural world for thousands of years, sometimes utilizing techniques familiar to us today and sometimes not,” (Johnson et al., 2014: 13). Whether or not we call this systematic engagement with the natural world “science,” it was consistently guided by a desire to achieve balance between humans and our non-human relations. This reciprocal appropriation guided every protocol and practice (Brewer and

Johnson, 2023). Research was predicated upon understanding the relationships between relatives and perceiving the place-based struggles of co-existence (Larsen and Johnson, 2017). By setting the agenda, we seek to explore how tribal lifeways assist in establishing research foci based upon a contemporary desire to achieve a relational balance with the world around us. Reestablishing this balance may center around a community's desire to protect its members' mental and physical health, guarding the well-being of our treasured relatives, or protecting the freshwater necessary to carry all life.

Establishing an Indigenous and community-based research agenda is not a new concept. It's been articulated by authors in various forms over the past two decades (Hikuroa, 2017; Smith, 1999; Wilson, 2008). Any effort by Indigenous communities to control research within their communities, or that impacts their treasured relatives, first requires stating and establishing an agenda. What is important to our community? What is it that we want to learn and how do we envision that research proceeding? In keeping with previous work from Aotearoa/New Zealand, Te Kahuratai Painting et al. (2023) outline how Kaupapa Māori Science is being utilized in setting the research agenda in order to engage Māori environmental knowledge within geographic information systems. Lorinda Riley et al. (2023) outlines how the tenure process impacts Indigenous scholars in the North American system, documenting how this dated and racist system forces Indigenous academics to frequently choose between community engaged scholarship and an academic career.

Relationship building

Relationship building for researchers working with Indigenous peoples means developing thoughtful dialogue and trust between the community and the researcher(s). Māori scholar Russell Bishop (1995) refers to relationship building as a process of becoming aware and familiar with Indigenous community values, protocols, and visions. Likewise, it's important for communities to become familiar with a researcher's intent, goals, objectives, and knowledge. In association with the researcher's intent is the researchers predisposition to research in general and their preparation to conduct research alongside Indigenous peoples and communities. Relationship building takes time, a commodity not readily available in the contemporary academic environment (Castleden et al., 2012). Varying cultural conceptions of time, as may be found within Indigenous communities, is not typically a part of the training afforded researchers in Western institutions. Perhaps the most important linkage connecting researchers with a community is trust building. Trust building is place-based, requiring both researchers and communities to come together with good intentions, investing themselves into the messy coexistence of "being together in place" (Larsen and Johnson, 2017). While emotionally taxing on both sides, trust building can lead to the formation of close friendship bonds, long-lasting research collaborations, and the co-construction of knowledge. Within this on-going research relationship, the community and researcher may develop the trust required for knowledge production and reciprocity.

Two articles in this special edition specifically address the importance of relationship building for research ventures to serve as a "multi-vocal initiative" that brings together multiple viewpoints. Smith et al. (2023), identify the importance of relationship building to enable "two-eyed seeing" in order to restore environmental harms. Nicole Latulippe et al. (2023), remind us of the importance of building relationships not only with the human community, but primarily with and through Place and Ambtman-Smith et al. (2023) describe their efforts for relationship building through Indigenous-led training environments.

Cultural protocols

Indigenous peoples have their own worldviews and lifeways that are expressed and governed through different types of cultural protocols born from prolonged experiences and observations in their homelands (Cajete, 2000). These ethical principles guide and regulate behavior in different contexts. Often

referred to as customs, practices, values, beliefs, or behaviors, it is intended to demonstrate the way to create and maintain positive inclusive relationships within the human community and with our non-human relatives. As Johnson et al. (2014) observe, “Protocols cannot just satisfy a purely intellectual argument of sustaining resiliency for prolonged human consumption; it must also uphold ethical principles with a biocentric perspective” (p. 19). Whenever the topic of research comes up in Indigenous communities, one of the first questions to arise is “will the researcher respect our cultural protocols?” This is an essential question in Indigenous research and must be addressed early in the relationship building process. Understanding and respecting different Indigenous protocols is vital to productive and reciprocal research processes and is intimately linked to relationship building and engendering trust. This can seem to some researchers trained in a Western ideology like an additional burden in an already burdensome process. Western institutions already take steps to protect human subjects, and engaging with Indigenous community protocols may seem like an unnecessary added step. Frankly, it is an additional step, it can be time consuming, but Western institutions’ human subjects permitting primarily protects the liability of the institution, not Indigenous knowledge or knowledge holders.

While no articles in this special edition address this topic predominantly, many of them address the need for establishing, understanding, and respecting cultural protocols in order for successful research relationships to be developed.

Research permitting

Since World War II, concerns over the protection of human subjects in research have been increasingly codified through international instruments such as the Nuremberg Code (1947), and by national statutes such as the US Common Rule, last revised in 2018. Crucially, these codes are geared toward ensuring the protection of human subjects in medical and social research through the work of institutional review boards. Increasingly, tribal communities are instituting their own review boards to ensure not only the protection of community members in the research process, but also that community interests and protocols are incorporated into approved research projects (Brugge and Missaghian, 2006; Kuhn et al., 2020). Beyond approvals and protocols, important questions are being asked by communities and Elders councils that force us to think about the life span of the research and collected data after the research is completed. That is, can the data that’s been “harvested” and the research that has been written come back to harm the community, in any way? While not every Indigenous community has developed a research permitting process, some of those that have, incorporate elders into their review boards to bring tribal representation to the forefront (Louis, 2020).

Two articles within this special edition provide a detailed description of the process their team utilized in developing a research project with tribal partners. Murveit et al. (2023), describe how multiple university partners work with the Karuk Tribe to produce cultural fire-based research that is led by, permitted, and utilizes the protocols of the tribal partner. Dunaway et al. (2023) describe and this process with an international team conducting research with partners the Penan.

Practices and methods

Since time immemorial, Indigenous peoples have employed a variety of practices and methods for learning and gaining knowledge from the world, whether that be from individual elders and knowledge keepers, particular clans or societies, or non-human relatives and landscapes. Indigenous peoples have also used trans-rational ways of knowing such as dreaming, singing, art-making, or other forms of embodied observation and participation, to gain knowledge or “conduct research.” As Cree ethicist Willie Ermine (1995) notes, Indigenous peoples look not just to outer space, or the physical

world, but to inner space, the metaphysical, as an important realm of knowledge. The oppression of Indigenous ways of knowing and the hegemony of Western “objective” forms of knowledge have created devastating consequences for Indigenous peoples, other marginalized peoples, and most importantly, the Earth. Scholars, students, and community researchers today often weave together Indigenous and Western methods that are agile or inclusive enough to seek knowledge through innovative practices that highlight Indigenous values and knowledge systems.

Since the publication of *Decolonizing Methodologies*, a significant focus within Indigenous research circles has been centered on methodological aspects of the research venture (Chilisa, 2019; Kovach, 2010; Wilson, 2008). More recently though, the focus has shifted toward identifying and evaluating the efficacy of specific research methods within Indigenous led and partnered research (Drawson et al., 2017; Windchief and San Pedro, 2019). Within this thematic issue, four articles and one of the commentaries seek to address the practices and methods aspect of research sovereignty (Arnold et al., 2023; Awasis, 2023; Forster, 2023; Lee et al., 2023; Louis, 2023). We encourage more researchers to write about and report on the implementation of specific methods within their research projects with Indigenous communities.

Data sovereignty

As the US Indigenous Data Sovereignty Network (Rainie Carroll et al., 2017) asserts, “Indigenous data sovereignty is the right of Native nations to govern the collection, ownership, and application of its own data.” As data are collected on and about Indigenous communities without their consent or oversight, a troubling amount of sensitive information is being published by researchers. Unfortunately, as geographers we frequently see examples of private data from tribal communities being mapped in journal publications, sometimes naïvely and sometimes even knowingly. Today, the ancestral remains of countless Indigenous Peoples and their cultural hegemony remain housed in numerous US museums over 30 years after the Native American Graves and Protection Act was passed into law in 1990. Unfortunately, it’s not uncommon to read in a published document the latitude and longitudinal locations of Indigenous People’s graves and sacred sites. We wonder though why this unethical and illegal breach of Indigenous data is still allowed by academic institutions and publishers? As Melissa Nelson (2023) outlines in her commentary, data from and about Indigenous communities are frequently taken in a less than honorable harvest by researchers, who then share their data in ways that harm the community. There are numerous illustrative examples with some clearly demonstrating malice while others are thoughtless or reckless. This dishonorable harvest of data from Indigenous communities, along with restricting access to data that references or might benefit a community, has been a driving force behind Indigenous research sovereignty. The right to control data collected about Indigenous communities is founded within the inherent rights to govern their lands, resources, and people. These rights are not given, nor are they earned, in fact the fundamental underpinnings of “inherent” means these rights are of a metaphysical nature, not subject to human law. As Brewer et al. (2023) describe in their commentary, access to and control over sensitive data is critical in the management of Indigenous lands and resources.

In addition to the two commentaries by Nelson (2023) and Brewer et al. (2023), three original articles also engage with the importance of Indigenous data sovereignty, particularly in the area of environmental research (Nakhwotsii et al., 2023; Williamson et al., 2023) and agricultural systems (Paul et al., 2023).

Evaluation

Finally, we come to a frequently overlooked or undervalued aspect of the research endeavor, evaluation. Evaluating research involves in-depth critiques of the techniques used as well as the conditions

and contexts of the research process(es). Like many of the topics in this special edition, Indigenous evaluation does not occur only once in a research project. It is ever present from the moment you step foot on Indigenous territory and/or approach an Indigenous community. As Shawn Wilson observed, when you take part in the evaluation of research, from the inception of an idea and throughout to the conclusion and beyond, research is ceremony and like most Indigenous ceremony it is cyclical and on-going (Wilson, 2008). Alongside Indigenous peoples, research demands respect and reverence, it demands that the researcher and the research itself be void of bias. Not the bias we learn about in our Western institutional training in pursuit of validity, but the internal bias of the researchers' disposition in order to call into question their moral judgment that can shape bias in a way that harms, or even potentially harms, Indigenous peoples. For, by the time you believe you're done with your research project, both you and your project will have been "evaluated" several times by the community and through a reflexive monitoring of this work by the research team. Indigenous evaluation is culturally rooted, contextually responsive, and coexists with project implementation. (LaFrance and Nichols, 2009: 20). Including Indigenous perspectives in the evaluation process may ensure cultural integrity as subtleties and cultural mores are less likely to be misrepresented or overlooked as insignificant. However, "making our (Indigenous) values the central drivers for evaluation practices, rather than assuming we have to accept only Western values," is a goal that still resonates today (LaFrance and Nichols, 2009: 41). While none of the articles in this special edition address evaluation as their primary focus, a number do address the importance of on-going reflection and evaluation, particularly among cross-cultural research groups.

Dissemination

The dissemination of research findings is a foundational element of scientific practice. Dissemination, as a component of the scientific process, requires the sharing of data resources, methods, results, and peer-review. In some cases, researchers are required to sign the copyright of their work over to publishers or government agencies. The idea of scientific dissemination often runs counter to conservative Indigenous research protocols that closely guard information and knowledge. In some cases, Indigenous communities may require researchers to get permission from a nation's Internal Review Board (IRB) to publish sensitive data in journals or books. What is the appropriate level of reciprocity to be achieved between researchers and the community through their research and publications? What are the terms of data sovereignty agreements between researchers and nations? What are the knowledge co-production agreement terms between researchers and nations? When does it make sense for someone from the community, or the community itself, to appear as a coauthor on the work? Do nations have copyright procedures in place? All of these questions are continually being asked and answered in a shifting landscape of research publication and dissemination.

To be clear, we're not saying that this special edition is the "answer" to any of the dilemmas or current approaches we and the authors have outlined here. This is merely intended as an attempt to move this discussion forward and to envision Indigenous communities as research leaders, and full agents in setting the agenda. We end this introduction much as we started it, by reflecting on the number of questions that remain unanswered as we begin to consolidate these various aspects of the research process under an all-encompassing concern for the rights and knowledges of Indigenous communities.

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(Re)emergence of Pūtaiao: Conceptualising Kaupapa Māori science

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Abstract

Overcoming the long-standing distrust of ‘research’ is especially challenging within the colonial structures of Western science. This article aspires to rise to this challenge by conceptualising Pūtaiao as a form of Indigenous research sovereignty. Grounded in Kaupapa Māori Theory, Pūtaiao is envisioned as a Kaupapa Māori way of doing science in which Indigenous leadership is imperative. It incorporates Māori ways of knowing, being, and doing when undertaking scientific research. An essential element of Pūtaiao is setting a decolonising agenda, drawing from both Kaupapa Māori Theory and Indigenous methodologies. Accordingly, this centres the epistemology, ontology, axiology and positionality of researchers in all research, which informs their research standpoint. This approach speaks back to ontological framings of Western scientific research that restrict Indigenous ways of researching in the scientific academy. Furthermore, Pūtaiao offers tools and language to critique the academic disciplines of Western science which are a colonial construct within the global colonising agenda. As such, the theoretical search for Indigenous science(s) and Indigenising agendas explore the dialogical relationship between both knowledge systems – Kaupapa Māori science and Western science. This relationship necessitates setting a decolonising agenda before an Indigenising agenda can be realised, whereby they are mutually beneficial rather than mutually exclusive. This article is an affirmation of the work and discourse of Indigenous scientists. In this way, Pūtaiao becomes a pathway for asserting Indigenous sovereignty over and redefining scientific research for future generations of Māori and Indigenous researchers.

Keywords

Pūtaiao, Kaupapa Māori theory, Kaupapa Māori research, Kaupapa Māori methodologies, transforming science

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Introduction

Pūtaiao is used in the education sector to mean both science taught in Māori medium schools, including mātauranga (Māori body of knowledge, epistemology, and worldview) and more broadly in the New Zealand curriculum, as science. This article critically discusses Pūtaiao by conceptualising Kaupapa Māori Science. Drawing on Kaupapa Māori Theory, we describe some considerations for Indigenous research methodologies and discuss our experiences of attempting to do this work within the Western scientific paradigm and institutions. We weave theory, methodology, and our experiences together to imagine the way forward to decolonise, indigenise, and transform science. First, we describe the cultural and theoretical foundations for Pūtaiao, beginning with Kaupapa Māori Theory. This will focus on structuralist and culturalist decolonising agendas as expressions of Indigenous research sovereignty. Through Kaupapa Māori theory, Kaupapa Māori and Indigenous methodologies are then explored as the epistemological, ontological and axiological basis for understanding Pūtaiao in relation to scientific research. Critically, these methodologies demand centring of the researchers' positionality within the research standpoint and inform the theoretical framing of research. As researchers, we then reflect on our experiences of researching within the science academy. This theoretical foundation, methodological standpoint and reflective practice lead our collective and radical imagining of a re-emergence of Pūtaiao, transforming science through Graham Smith's Transformative Praxis of conscientisation, resistance and transformation.

Theoretical understanding of Pūtaiao

Conceptualising Pūtaiao as Kaupapa Māori science (drawing from Stewart's (2007) Pūtaiao as Kaupapa Māori Science Education) is a political speaking back, researching back and writing back for the inclusion of Te Ao Māori (the Māori world). It also critiques the use and misuse of te reo (the Māori language) in science – specifically languaging, translating, and translanguaging Indigenous languages (hooks, 1994). Pūtaiao is more than a Māori word for science. It is an exploration of the natural world from a Te Ao Māori tirohanga (Māori worldview) that is scientific and informs science. Encompassed by systems of intergenerational knowledge, it is important to understand that Pūtaiao exists and thrives outside of the academy. Pūtaiao is embedded in place and in the people of those places. Grounded in Kaupapa Māori Theory, this article expands the theoretical foundation of Pūtaiao to be a way of being, knowing and doing as Māori in scientific research, 'undertaken by a Māori researcher, not a researcher who happens to be Māori . . . being Māori, identifying as Māori and as a Māori researcher, is a critical element of Kaupapa Māori research' (Smith, 2012: 243). Pūtaiao, as a contemporary construct, describes the pū – the origins, rhythms and relationships, of the taiao – the life-giving waters that animate the Māori world of light, broadly understood as the environment and natural world, including humans. Here, Pūtaiao centres, prioritises and critically affirms Māori identity in the context of scientific research and science identity.

Pūtaiao, as Kaupapa Māori science, is firmly positioned in a Māori worldview, and informed by te reo, mātauranga, and tikanga (a value system that underpins Māori culture) holistically interwoven by whakapapa (a way of knowing about the world through intergenerational relationships) and expressed through whanaungatanga (relationships, being in relation through whakapapa) as a way of approaching science. While science asserts that the scientist is the creator of knowledge, Māori ontology, and thus Pūtaiao, asserts that knowledges are held by and within te taiao, to be revealed through whanaungatanga, the relationships grounded in whakapapa.

The use of the terms mātauranga Māori, te reo Māori and tikanga Māori in research unintentionally marginalises the knowledge and epistemology from the Māori worldview by assuming a universal application of these concepts. Informed by the principles of Kaupapa Māori Theory we emphasise the understanding that the use of te reo centres the Māori worldview by default, rather than generalising

for all worldviews. Conscious of this positioning, the terms *te reo*, *mātauranga* and *tikanga* will be utilised in this body of work in preference to *te reo Māori*, *mātauranga Māori* and *tikanga Māori*. In other words, *mātauranga* refers to knowledge already qualified as Māori, rendering the addition of the descriptor ‘Māori’ redundant.

A similar reclaiming of the word *Pūtaiao* is implicit in the conceptualisation in this article, where Western science more generally would be considered *Pūtaiao o te Pākehā*. In summary, *Pūtaiao* reframes the current scientific discourse around the inclusion of *mātauranga Māori* in science to consider the relationship between *Te Ao Māori*, and science through *Kaupapa Māori Theory* and methodologies. Importantly, science is not conceptualised simply as scientific knowledge but understood as a knowledge system. The case for the scientific knowledge system of *mātauranga* has been made previously (see Hikuroa, 2017). Knowledge systems have been described by Ngata (2021):

When I refer to knowledge systems I mean research, education, academia, scientific practice and publications, the evaluation and funding of science, the access to science and the legitimacy of science and its relationship to policy and government. It is a complex structure, the history of which is rooted in a period called The Enlightenment. The Enlightenment period, as the foundation of modern intellectual theory, was overseen by scientists and philosophers who were investors and clients of the slave trade and Imperial dispossession of Indigenous territories the world over, and their work supported those practices.

Kaupapa Māori theory

Kaupapa Māori stems from Māori identity, philosophies, values and principles. It is both a theory and a collective movement that carves out the theoretical space for *te reo*, *mātauranga*, and *tikanga* to be actualised in research, and knowledge more generally. With *Kaupapa Māori*, the validity and legitimacy of Māori ways of being, knowing and doing is assumed with the significance of *te reo*. Given this, *Kaupapa Māori* is concerned with the struggles for *tino rangatiratanga*, and collective efforts for autonomy and sovereignty to be realised for *whānau* (extended family), *Hapū* (a collection of *whānau* descended from a shared ancestor), *Iwi* (a collection of *Hapū* descended from a shared ancestor) and individual researchers across multiple spheres.

Kaupapa Māori Theory, as articulated by Graham Hingangaroa Smith, requires two simultaneous approaches to decolonisation – structuralist and culturalist (Smith, 2005). Culturalist approaches to decolonisation make theoretical space for, centre and amplify *te reo*, *mātauranga* and *tikanga*, and more broadly, Māori language, knowledge and culture. These can then become the foundations of scientific research. A structuralist approach asks how structures, systems and institutions act as barriers to hinder, oppress and ultimately deny culturalist approaches in research. Importantly, culturalist approaches alone are not sufficient to disrupt, decolonise and transform knowledge systems, such as science. This is illustrated by a critical examination of the colonial origins of science and the consistent use of science as both a justification for, and a tool of, colonial violence and oppression against Māori and Indigenous peoples. Culturalist approaches are distinguished from structuralist approaches by their focus on aligning space, structures and systems with Māori and Indigenous ways of being, knowing and doing. Structuralist approaches focus on acknowledging and addressing settler-colonial power, an essential element of *Pūtaiao*. Furthermore, this can manifest as intentional processes cognisant of settler-colonial foundations to directly address the core inequities and injustices of institutions that impact the opportunities and success of Indigenous researchers in science and Indigenous science itself.

Structuralist decolonisation of science – An essential element of Pūtaiao

Māori working within the discipline of science, including practitioners of *Pūtaiao*, are in relation and reflexive dialogue with coloniality in the scientific approach to knowledge. The separation of nature from culture which underpins science is mirrored in coloniality, which attempts to separate

knowledge from language, culture, and most importantly, people, to *'achieve' objectivity*. This demands that the scientist distance, and further, remove themselves from the object of study. Such an approach to mātauranga leads science to 'reject the people that create and develop these knowledges and deny the validity of Indigenous peoples, autonomy, language, natural resources and cultural knowledges' (Smith, 2021: 1). This is a stark contrast to Māori approaches to the relationality of knowledge, where 'Māori hold relational ontology (whakapapa) that assume material communication with humans. Kaupapa Māori treats non-human beings and materials as speaking subjects that act independently . . .' (Hoskins and Jones, 2017: 53). Reflexivity within science asks the researcher to understand their relationship with the disciplines within science and their field of study. This informs what researchers choose to study, the study methodology and methods, the outcomes of research that are disseminated and how they are disseminated. When framed in this way, even the most valiant and honest attempts at objectivity are still subjective:

No research is 'objective' if by objective one means standing outside of social power. For if research is truly impartial, how can we explain why we prioritise some social research projects over others or why some questions are asked, but not others? And how is it that different researchers interpret the same data so differently? (Walter and Andersen, 2013: 43–44)

In undertaking science (in the modern world), we are still in relation with these colonial approaches to knowledge. Even when critically amplifying te reo, mātauranga and tikanga, we are still in relation with science as a colonial construct. We cannot ignore, nor completely remove science in search of a Kaupapa Māori Science. Thus, Pūtaiao explores the dialogical relationship between science, the coloniality of science, and Te Ao Māori, inclusive of Māori worldview, language, knowledge and culture.

Science is often conceptualised through claims of universality and empirical experimentation consistent with the scientific method as a fallible, testable, assessable 'best' account of the current knowledge globally. This approach is based on key scientific theories and philosophical commitments to advance human knowledge and has become globally dominant. A community of scientific peers accept this foundation as the most appropriate for the search for an 'ultimate truth'. The fundamental assumption made here is that science is acultural. Science understood in this way has been critiqued extensively by Indigenous scientists and educators, and increasingly more widely among scientists (Baptista and De Carvalho, 2015; Iaccarino, 2003; Seifert, 2021). Iaccarino (2003) argues,

Moreover, although the language of science is often specialized, and thus inaccessible to nonspecialists, science and culture are not different entities: science is part of culture, and how science is done largely depends on the culture in which it is practiced. (p. 221)

Importantly, these conceptualisations focus on science as scientific knowledge and scientific method, while ignoring the context of science as a knowledge system as described by Ngata above. The fundamental acultural assumption is disproven if science is described as a science system. If culture is acknowledged within the science knowledge system, Western science, in this context, approaches scientific knowledge and methods from a Western worldview, based on Western ways of being, knowing and doing. In contrast, Pūtaiao as Kaupapa Māori science centres Māori ways of being, knowing and doing. Both approaches are equally rigorous and create reliable knowledge. The participation of Māori within the science knowledge system, however, is not a choice to subscribe or assimilate to Western science or Western worldviews. Scientific knowledge and methods, when applied cognisant with colonial history can be used to advance and enhance mātauranga. As articulated by Hal Hovell (quoted in Ngata, 2018: 25), 'Mātauranga Māori may at times be enhanced by Western science but must never be dictated by it'. Similar sentiments were shared by Will Ngakuru,

in a workshop exploring how to address kauri dieback, stating ‘science needs to learn to be on tap, not on top’ (Will Ngakuru, 2014, personal communication).

The first step in conceptualising Pūtaiao is then to set a decolonising agenda. Based on decolonising methodologies, this calls for an understanding and addressing the colonial violence, harm and oppression that has been perpetrated by science (Smith, 1999). Te Rangi Hiroa (1924) reported in the *Transactions and Proceedings of the New Zealand Institute* (the predecessor of the Royal Society of New Zealand, the apex organisation of science in Aotearoa New Zealand, henceforth Aotearoa), that in 1856 physician and politician Dr Isaac Featherston infamously stated ‘The Māoris [sic] are dying out, and nothing can save them. Our plain duty, as good compassionate colonists, is to smooth down their dying pillow’. This often quoted callous imagery is used to illustrate scientific racism, where the investigation came to these conclusions based on facts, statistics and evidence. Science including eugenics, genetics, genomics, epidemiology have been, and in many cases continue to be, used to scientifically justify racism and colonial violence in the form of ‘genocidal violence (killing of peoples), linguicide (death of languages), epistemicide (destruction of knowledge systems), cultural genocide (destruction of cultures) and ecocide (destruction of eco-systems)’ (Havemann, 2016: 49). Scientific racism is often morally distanced from the current science knowledge system, through claims of pseudoscience. However, as Roberts (2011) warns,

Scientists today can then claim that it was pseudoscience that fell victim to racial prejudice, not real science, which studies racial difference objectively. But what we call racial pseudoscience today was considered the vanguard of scientific progress at the time it was practised, and those who practised it were admired by the scientific community and the public as pioneering geniuses. (pp. 27–28)

The colonial history and ongoing impacts of science need to be addressed before a culturalist decolonisation of science can be realised.

Kimmerer (2013) challenges Indigenous researchers to also acknowledge why we continue to undertake scientific research and the potential benefits to our people, while simultaneously cognisant of its limitations:

I did learn another language in science, though, one of careful observation and intimate vocabulary that names each little part. To name and describe you must first see and science polishes the gift of seeing. I honour the strength of the language that has become a second tongue to me but beneath the richness of this vocabulary and it’s descriptive power something is missing the same something that’s why I was around you and in you when you listen to the world. Science can be a language of distance which reduces a being to its working parts; it is the language of objects. The language scientists speak, however precise, is based on a profound area and grammar, an omission, a grave loss and translation from the native languages of these Shores. (pp. 48–49)

As Māori researchers of science, this is just as true for us. Decolonising science then requires us to hold these two truths simultaneously: the colonial violences of science and the potential contributions of science. To hold both truths in our work requires humility, acknowledging the limitations of science and our knowledge as scientists. It should not be our role to defend science or its systems, when colonial violences justified by scientific racism are indefensible. The lack of acknowledgement of the colonial harm and potential Indigenous benefit of science, simultaneously, contributes to the low participation of Māori in sciences. The lack of acknowledgement of colonial, scientific racism erodes the trust Māori have in the sciences. Due to this lack of acknowledgement, the potential scientific benefits in our mātauranga past, present and future are lessened, while predominantly focusing on science rooted in colonial racism. This also ignores the fact that as Māori, while centring our Māori identity, believe in the potential of science and scientific research to be beneficial to our whānau, Hapū and Iwi. As Smith (2021) concludes,

. . . critique is not enough. We have to continue to act, to use our own imaginations, to enhance our own institutions and forge our own pathways. Decolonization is a practice of hopefulness, a belief that there is a future . . . (p. 285)

Culturalist decolonisation of science – Māori-led and Māori-centred

To give context to culturalist approaches to decolonisation of research in Aotearoa it is important to start with descriptions of Māori language, knowledge and culture in terms grounded in the Māori worldview – te reo, mātauranga and tikanga. In Aotearoa, Te Ao Māori has taonga (treasured gifts) protected under Article 2 of Te Tiriti o Waitangi (The treaty of Waitangi). Article 2 states ‘ngā taonga katoa’ (every treasured gift) which includes te reo, mātauranga, and tikanga. As an institution in Aotearoa, this means science education and research in the academy must carefully and respectfully embed Te Ao Māori, where appropriate, to meet obligations to Te Tiriti o Waitangi as an institution of the Crown.

Te Reo. Translating colonial concepts to te reo, but understanding the word only as its translation into English fails to meet obligations to Te Tiriti o Waitangi. This approach is common throughout the science system and demonstrates a genuine attempt to include te reo, and by extension, Te Ao Māori in science. The appropriate use of te reo Māori calls for an intimate understanding of te reo Māori terms when used, from a Te Ao Māori tirohanga to give words context and meaning. This is significantly different to a simple, one word translation of terms into English. As illustrated by the whakatauaikī of the kaumatua Sir James Henare,

Ko te reo te mauri o te mana Māori.

Ko te reo te kākahu o te whakaaro,

te huarahi ki Te Ao Tūroa.

Here, te reo is central to the spirit and self-determination of Māori. More than a mere translation of words, te reo ‘is like a cloak which clothes, envelops, and adorns the myriad of one’s thoughts’ (Smith, 2012: 244), and is the pathway to understanding the enduring natural world. Indigenous words and Indigenous languages offer an intergenerational wealth of knowledge that can inform, educate, reframe, illustrate, inspire and create a deeper understanding and relationality with the many worlds we walk in. This framing of te reo is referred to as translanguaging, grounding the process in the Māori worldview and addressing ‘the incommensurability inherent in this translation process’ (Roberts et al., 1995: 12).

Mātauranga. Reclaiming the meaning of words in Te Ao Māori encourages us to understand Pūtaiao differently. Distinct from Western science, Kaupapa Māori Science defines mātauranga as a superset of scientific knowledge. As articulated in Hikuroa (2017),

Clearly there are significant similarities between mātauranga Māori and science. Specifically, pūrākau and maramataka comprise knowledge generated consistent with the scientific method . . . Both mātauranga Māori and science are bodies of knowledge methodically created, contextualised within a world view. As demonstrated herein, some mātauranga Māori has been generated according to the scientific method, and can therefore be considered as science. (pp. 8–9)

That is, there is a subset of Mātauranga that because of the method used to generate it, can be considered science. The number of Māori scientists and the capacity of scientific knowledge in whānau,

Hapū and Iwi is growing and mātauranga Māori is a living, dynamic knowledge system. With that, this subset of mātauranga continues to grow. However, mātauranga is a culmination of knowledge held by Māori intergenerationally, descended from an intellectual genealogy shared across Te Moananui a Kiwa (The Pacific Ocean) and contributed to, articulated by and reiterated for each generation. It contains all that has emerged from Te Ao Māori – te reo, tikanga, and whakapapa. Therefore, much of Mātauranga is beyond the discipline of Western science and can enrich our experience of science when led by Māori and engaged with appropriately.

Mātauranga is central to Kaupapa Māori. Mātauranga is both a body of knowledge, and an epistemology – a way of knowing and worldview. Royal (2009) states that,

The purpose of indigenous knowledge is not merely to describe the world (acquire facts about phenomena) but ultimately to understand how one may live well in it. Indigenous knowledge is thus value-laden and value-driven. It seeks mutually enhancing relationships between the human community and the natural world. (p. 114)

Here, whanaungatanga, relationships, are a critical element of Kaupapa Māori, mediating research at every stage. Extending on this, Hoskins and Jones (2017) express that,

The identity of ‘things’ in the world is not understood as discrete or independent, but emerges through and relates to everything else. It is the relation, or connection, not the thing itself, that is ontologically privileged in Indigenous and Māori thought. (p. 51)

This is the nature of how we come to know as Māori. Literature, both academic and the literature shared through whakapapa kōrero (ancestral narratives, histories), waiata (songs), whakataukī (proverb, aphorism), whakairo (to carve), and many more ways are key to expressions of mātauranga within Pūtaiao. The environment is central to understanding mātauranga, as Durie (2005) explains,

The relationship between people and the environment . . . forms an important foundation for the organisation of indigenous knowledge, the categorisation of life experiences, and the shaping of attitudes and patterns of thinking. Because human identity is regarded as an extension of the environment, there is an inseparability between people and the natural world. (p. 137)

In turn, this exploration of Pūtaiao is naturally and necessarily about our human and more-than-human relationships, with and within the natural world.

Tikanga. Relationships are mediated by tikanga. In short, knowledge of te reo is essential to the communication of tikanga codified and informed by mātauranga. Tikanga is an essential part of mātauranga, neither can be understood independently. Te reo and mātauranga are a part of the understanding of tikanga, and vice versa. Through tikanga, knowledge is translated into practice in the form of ritual and general correctness of actions. Moana Jackson (2020) states that

In simple terms, tikanga is a values system about what ‘ought to be’ that helped us sustain relationships and whaka-tika or restore them when they were damaged. It is a relational law based on an ethic of restoration that seeks balance in all relationships. (p. 140)

In this way, the practice of tikanga can then be an empowering process, ‘People then see tikanga in action, and they do it, feel it, understand it, accept it and feel empowered through experience’ (Mead, 2016: 19). Therefore, tikanga guides all actions and interactions while simultaneously affirming Māori identity. As such, adhering to tikanga as an ethical framework is an essential element to Pūtaiao, and Kaupapa Māori Theory more generally. From this description of Kaupapa Māori Theory, te reo,

mātauranga and tikanga, Kaupapa Māori methodologies, drawing on Indigenous methodologies, can explore how these principles and concepts are expressed within scientific research and practice.

Kaupapa Māori methodologies and research

In this section, we shift from Kaupapa Māori as theory to considering Kaupapa Māori research and the implications for methodologies. Before considering Kaupapa Māori methodologies, methodology should be more broadly considered:

Methodology can be viewed as the theory and study of the methods used in research to produce knowledge and make meaning in a given field or discipline of knowledge . . . methodology is what forms the interpretative link between the ways in which knowledge is defined and understood and the practices of inquiry that are used by those who research and conduct scholarship. (Smith et al., 2016: 140)

Kaupapa Māori theory provides the overarching theoretical lens to inform Kaupapa Māori methodologies and therefore Pūtaiao, guiding how research is understood, designed and practised. Here, it may be beneficial to consider the reframing of methodologies by Smith et al. (2016), ‘in its simplest form, methodology explains the pathways between knowledge creation and knowledge production – the formation of knowledge’ (p. 140). Kaupapa Māori methodologies can then be understood as the study of Kaupapa Māori theories and principles that guide the formation of knowledge to inform research practice and methods.

This inherently prioritises a Māori worldview, inclusive of epistemology (Paul-Burke et al., 2020), ontology (Hoskins and Jones, 2017), axiology (Mead, 2016) and positionality (Walter and Andersen, 2013). Wilson (2008) states ‘The ontology and epistemology are based upon a process of relationships that form a mutual reality. The axiology and methodology are based upon maintaining accountability to these relationships’ (pp. 70–71). This construction of Indigenous methodologies provides,

. . . an overarching definition of what a methodology is – a starting point that underpins all methodologies not just Indigenous or just traditional Western methodologies . . . Who we are, the values that underpin our concept of self, our perspectives on the world and our own position within it, our realities, and our understandings of how knowledge is construed and constructed are each part of the complex puzzle involved in exploring the underpinnings of methodology. (Walter and Andersen, 2013: 44–45)

Drawing on the work of Smith (1999), Wilson (2008) and Walter and Andersen (2013), the following theoretical and methodological framework is suggested, relating overarching Te Ao Māori constructs to research paradigms. Indigenous research paradigms are inherently interconnected, relational (Wilson, 2008) and, in this case, considered from the theoretical foundations of Kaupapa Māori theory. This is inclusive of both structuralist and culturalist approaches to decolonising methodologies described above. In the next section, the interconnected components of Kaupapa Māori methodologies are conceptualised.

Whakapapa informs researcher’s epistemology

Epistemology explores what is defined as knowledge, which knowledges are valid, legitimate and valuable, what are the foundational assumptions for what can be known, what constitutes knowledge, and who are knowledge holders – both human and more-than-human (Smith, 2012; Walter and Andersen, 2013). Indigenous epistemology includes entire knowledge systems of Indigenous ‘cultures, worldviews, times, languages, histories, spiritualities and places in the cosmos’ (Wilson, 2008: 74) that results from relationships. Therefore, epistemology is more than a way of knowing (Meyer, 2001).

Kaupapa Māori as critical theory (Smith, 2012) and social constructionism (Le Grice, 2014) inquires into contexts, experiences, coloniality, and intersectionality to explore social and scientific issues of pertinence to Māori. A social constructionist epistemology (Gough et al., 2013) aligns with decolonising agendas by understanding cultural, historical, political and social contexts surrounding a given phenomenon. Exploring the function of knowledges to justify our epistemic marginalisation enables us to disrupt, decolonise and transform these processes (Denzin and Lincoln, 2008). This aligns with Moewaka Barnes' (2010) approach to Kaupapa Māori research that centres Māori people, culture, and constructs in analysis, rather than accepting an uncritical positioning as 'other'.

From Kaupapa Māori critical theories and social constructionist approaches we explore how whakapapa 'provides the theoretical or epistemological basis for a Maori "way of knowing" about the world' (Roberts, 2013: 93) where 'whakapapa maps epistemologies (including tribal concepts, principles, ideas, and related practices) and locates them within a particular context' (Bean et al., 2012). As described by Burgess and Painting (2020),

The concept of whakapapa explains the origins, positioning, and futures of all things. Whakapapa derives from the root 'papa', meaning a base or foundation. Whakapapa denotes a layering, adding to that foundation. Rooted in creation, generations layer upon each other, creating a reality of intergenerational relationships. Everything has whakapapa, all phenomena, spiritual and physical, from celestial bodies, days and nights, through to the winds, lands, waters, and all that transpires throughout. (p. 208)

Whakapapa, is not only a body of knowledge but a way of understanding the universe, and all its complexities, by weaving existence together within genealogical constructs as the foundation of Māori ways of being, knowing and doing.

Mātauranga. From this epistemic foundation, the research context for mātauranga can be further explored. However, mātauranga must not be analysed with deconstructive, generalising or universalising intent, as this runs counter to the epistemological assumptions of Pūtaiao – the validity and legitimacy of holistic, interconnected, whakapapa-based knowledge (Le Grice, 2014). Such intent will only continue to suppress cultural knowledge through colonising objectives and practices. Mātauranga is dynamic; connected to the bearer and receiver; in relation to whanau, Hapū and Iwi; includes reading the stars, the moon, environmental patterns and landscapes; includes narratives of colonial resistance and Māori excellence; includes intuitive approaches to relational encounters and meaning making (Smith et al., 2016). Critically, mātauranga reframes what counts as knowledge in the context of science research, in what Jackson (2013) describes as an ethic of prior thought,

That is, that if we are to do research, if we are to make sense of who we are, or what is happening to us, then we must have the confidence to reach back to the prior thought that has been left for us by our old people . . . In a very real way that tradition should be, if you like, the literature review of any research that we do. (p. 61)

This mātauranga could include Toi whakairo (*carving*) (see Mead, 1986), Raranga (*weaving*) (see Mead, 1968), Kapa haka (*contemporary performance*) (see Whitinui, 2007), Whaikōrero (*oratory*) (see Rewi, 2013), Karanga (*oratory*) (see Houpapa, 2021), Maramataka (*astronomy, fishing and gardening calendars*) (Matamua, 2017; Roberts et al., 2006; Tāwhai, 2013), Pūrākau (*narratives*) (see Roberts, 2013), waiata, mōteatea (*songs*), oriori (*genealogies and invested hopes sung to babies*) (see Ngata, 2004), intergenerational wisdom, memory and practice (as referenced in Smith et al., 2016). Whakapapa demonstrates how to weave together diverse sets of practices and knowledges to understand Māori epistemology, and can further include conventional scientific literature, academic accounts of mātauranga, and cultural narratives.

Whanaungatanga informs researcher's ontology

Ontology considers the nature of reality, how it is observed and investigated (Hathcoat et al., 2019). Indigenous ontologies have multiple realities, as such, relationships hold profound importance within and between these realities (Hoskins and Jones, 2017; Wilson, 2008). For Indigenous peoples, these relationships do not merely shape reality, they are reality; therefore, 'reality is not an object but a process of relationships' (Wilson, 2008: 73). As articulated by Hoskins and Jones (2017),

The identity of 'things' in the world is not understood as discrete or independent, but emerges through and relates to everything else. It is the relation, or connection, not the thing itself, that is ontologically privileged in Indigenous and Māori thought. (p. 52)

Thus, Indigenous research is relational in its approach, perception and execution of research (Walter and Andersen, 2013). This implies that Indigenous ontology is deeply relational and holistic in a way that overlaps with and, at times, can be considered the same as, an Indigenous epistemology (Wilson, 2008).

Māori experiences of the world that constitute our lived realities are internally diverse, complex and shaped by different proximities to Māori language, knowledge, culture and people, rendering further ontological questions salient (Le Grice, 2014). In a colonial context, where our knowledges and experiences are routinely undermined in academic discourse, an ontologically realist orientation is useful. Here, when conducting research with whānau, Hapū, Iwi and Māori communities – shared experiences, beliefs, ideals and behaviour are interpreted as real and valid to be legitimated in academic discourse. Simultaneously, we might also recognise the internal diversity of Māori experiences and local knowledges, such that there may not be one 'true' or comprehensively singular perspective shared by all Māori. Here, a relativist ontology might be useful in situating intersections of age, race, gender, class, sexuality, rural and urban positionalities in a sociocultural context configured by matrices of power relations, *and* multiple perspectives within and between Iwi, Hapū and whānau. In this way, a Māori ontology is inclusive of specific ontologies of diverse whānau, Hapū and Iwi, based on shared understandings and experiences through whakapapa.

Māori ontology positions all of existence in whanaungatanga, ontologically privileging intergenerational relationships through whakapapa, fundamentally the 'essential nature of all reality' (Burgess and Painting, 2020; Hoskins and Jones, 2017). The nature of being is to be in relation, where relationships constitute not only our reality, but who we are. 'Everything in existence is infinitely and complexly in relation all the time. This shapes a reality of interdependency, where the well-being of the whole is dependent on the well-being of its closely related components, and vice versa' (Burgess and Painting, 2020: 210). We are intimately connected to innumerable generations into the past, across the present, and equally as important, into the future. The nature of these relationships can be genealogical, social, environmental, astronomical and cosmological in nature (Roberts, 2013).

Whanaungatanga positions people within dynamic relationships between atua (ancestors of continuing influence) and whenua (land) (Tate, 2010), interactive relationships with environmental kin (Jahnke, 2002), as well as the socio-political interactions with and between peoples (Walker, 2004), defining a 'symbiotic relationship between humans and nature in which the health of each depends upon that of the other, which in turn places responsibilities upon communities and individuals' (Henwood and Henwood, 2011: 221). It is through whanaungatanga to aspects of whakapapa that mātauranga is gained (Royal, 2009), intimately linking Māori epistemology to Māori ontology. Science asserts that the scientist is the creator of knowledge, Māori ontology, and thus Pūtaiao asserts that knowledges are held by and within te taiao, to be revealed through whanaungatanga, the relationships grounded in whakapapa.

This Māori ontology argues that establishing and maintaining whānau (extended family) relationships with all components of research is fundamental, extensive and ongoing. This must precede and contextualise all other research activities (Le Grice and Braun, 2016). In research, a Māori ontology challenges our conceptualisation of research relationships to expand, in the form of peoples, more-than-human kin, landscapes and environments based on the shared understanding that no interaction is neutral or objective and no land is empty – without connection through whakapapa. A relationship with more-than-human kin, landscapes and environments necessitates two things; one, a relationship with peoples, whānau, Hapū and Iwi, who hold intergenerational relationships within those environments, and two, an acknowledgement that more-than-human kin, landscapes and environments are more than research objects, or even subjects, and are instead research partners. This reorders what constitutes research relationships based on whanaungatanga to reaffirm the importance of relationships in the research process.

Te reo Māori. Fundamental to a Māori ontology is *te reo*, the means through which we describe the nature of being. Embedded in *te reo*, and in Indigenous languages more generally, is the grammar and vocabulary that explicitly acknowledges whanaungatanga. Kimmerer (2013) describes this characteristic of Indigenous languages as the grammar of animacy:

In English, we never refer to a member of our family, or indeed any person as *it*. That would be a profound act of disrespect. *It* robs a person of selfhood and kinship, reducing a person to a mere thing. So it is that in Potawatomi and most other indigenous languages, we use the same words to address the living world as we use for our family. Because they are our family. (p. 55)

Te reo and the grammar of animacy changes language from ‘it’ to ‘who’, an acknowledgement of whanaungatanga and shared whakapapa. This comes with a set of responsibilities, obligations and customary practices in interacting with our kin that differ significantly from current scientific practice. Kimmerer (2013) continues,

To whom does our language extend the grammar of animacy? Naturally, plants and animals are animate . . . rocks are animate, as are mountains and water and fire and places. Beings that are imbued with spirit, our sacred medicines, our songs, drums, and even stories, are all animate. (p. 56)

In this way *te reo* and Indigenous languages ‘[remind] us, in every sentence, of our kinship with all the animate world’ by redefining who is animate and aiming for bilingualism ‘between the lexicon of science and the grammar of animacy’ (Kimmerer, 2013: 56).

Implicit to *te reo* is the knowledge of how to live in and care for *te taiao*. Culture, language and environmental well-being are interconnected (Maffi, 2005) where the cherishing and uplifting of one independent of others is impossible. Therefore, revitalisation of *te reo* is mutually beneficial to maintaining, enhancing and advancing mātauranga of the taiao (McAllister et al., 2019) and the enabling of the customary practices of tikanga (Mead, 2016). That is to say, a Māori ontology and Māori epistemology interrelate with a Māori axiology – a Māori way of doing.

Tikanga informs researcher’s axiology

Axiology is informed by intrinsic and extrinsic values, the value systems that guide research practice (Walter and Andersen, 2013), ethics and morals that underpin how research gains knowledge and what knowledge is used for (Cram, 2019; Curtis, 2016). An Indigenous axiology emerges from the relational accountability implicit in Indigenous epistemology and ontology (Wilson, 2008). This refocuses research on the fulfilment of roles, responsibilities and obligations to research relationships – being

accountable to whanaunga. ‘The knowledge that the researcher interprets must be respectful of and help to build the relationships that have been established through the process of finding out information’ (Wilson, 2008: 77). Indigenous research must therefore be of direct benefit to Indigenous peoples. This acknowledges that

all researchers make choices within their research, and these choices not only have an integral values base, they also influence how the data are interpreted and presented . . . Gaining insight into our axiological frame . . . allows us to read our own research and that of others reflexively, with an eye to the values informing it. (Walter and Andersen, 2013: 51)

The ‘responsibility to ensure respectful and reciprocal relationships becomes the axiology of the person who is making these connections’ (Wilson, 2008: 79) and is underpinned by whanaungatanga.

Kaupapa Māori research considers the cultural protocols of tikanga to ensure respect and reciprocity within research relationships, specifically the tikanga of communities research engages. This describes and achieves the axiology of Kaupapa Māori methodologies (Cram, 2019) where an attempt is made to translate tikanga into research methodology, methods and the research process. This axiological framing of Kaupapa Māori methodology ensures that methods are culturally responsive and pursue meaningful outcomes for Māori whānau, Hapū and Iwi (Curtis, 2016; Paul-Burke et al., 2020). Mead (2016) states that, ‘Tikanga are tools of thought and understanding. They are packages of ideas which help to organise behaviour and provide some predictability in how certain activities are carried out. They provide templates and frameworks to guide our actions’ (p. 25). As tools of thought and providing templates and frameworks, tikanga can guide all aspects of research. Tikanga is a particularly important foundation for all research relationships with whānau, Hapū, Iwi and Māori communities. Jackson (2020) described that tikanga is what ‘ought to be’ also gives insight into how to restore relationships when they are not maintained or damaged through the research process, for ‘in whakapapa no relationship is ever beyond repair’ (p. 140).

Scientific research creates many cultural nuanced situations where tikanga needs to be considered in new and complex ways. For example, tikanga in scientific laboratory spaces creates new contexts that test Kaupapa Māori axiology. When interacting with more-than-human kin in research, how do we practise relational accountability? Tikanga may become increasingly complex in more technological contexts. In laboratories, what would be the tikanga for relationships with human tissue, such as blood samples, tissue biopsies, cells, molecules, and genetic profiles from commercial, pathological or research sources (Reid et al., 2017)? Furthermore, how do we practise tikanga that includes the data generated from human tissue in that research context? Tikanga does ‘help us to differentiate between right and wrong in everything we do and in all of the activities that we engage in. There is a right and proper way to conduct one’s self’ (Mead, 2016: 25), especially in laboratory settings where tikanga ‘consider human tissue to be tapu, meaning it comes with a set of restrictions’ (Reid et al., 2017: 100).

In centring tikanga, considerations must be taken in terms of ethical approval, informed consent, and the sharing of formal information surrounding parameters of research; storage, management and governance over future decision-making in respect to samples and data generated; the process for returning or destroying samples; and feedback to research partners of findings from their tissues (Reid et al., 2017). Further considerations must be given to collective consent with respect to Māori axiology as data generated could provide information of the wider whānau, Hapū or even Iwi of the donor. Importantly, relational accountability in this Māori axiology extends from the research partner who donated human tissues, to the tissue itself, and even extends to data generated. The same respect and responsibilities to human research partners must also be shown to tissues and to data. The influential work of Indigenous data sovereignty and Māori data sovereignty has made significant contributions to this facet of Māori axiology in research.

Māori Data Sovereignty. Māori Data Sovereignty explores the intersection of tikanga, Māori axiology and Māori data in research. In the academy, Māori Data Sovereignty upholds the Kaupapa Māori principle that Māori research should be governed by Māori (Kukutai et al., 2020), including any data that is about Māori, for Māori, and with Māori. Here, it may be useful to consider the definition of Māori data as information or knowledge from te ao Māori, this includes our people, language, resources, pūrākau, and taiao (Kukutai et al., 2020). Similar to te reo and mātauranga, Māori data are a living taonga and as such, under Te Tiriti o Waitangi, is to be lawfully protected nationally in Aotearoa. Internationally, Article 31 of the United Nations Declaration of the Rights of Indigenous Peoples (UNDRIP) (United Nations General Assembly (UNGA), 2007) outlines the right of Māori ‘to maintain, control, protect and develop’ this definition of Māori data, in short, the right to Māori governance.

For a Māori axiology, data ethics acts as a beginning, a process to create axiological space in research and recognise that in order for Māori Data Sovereignty to be realised, Māori data must be subject to tikanga and Māori governance. Here, Māori Data Governance refers to tikanga, policies, laws, and structures through which Māori exercise control and autonomy over Māori data (Kukutai and Cormack, 2020). Te Mana Raraunga – the Māori Data Sovereignty network – have published a charter outlining tikanga for data, and a Mana Mahi (Governance-Operations) framework to support the inherent rights of Māori with regards to Māori data. In Pūtaiao, this is based on whakapapa in terms of a deep intergenerational relationship with people and the natural world.

Kukutai and Taylor (2016) have identified six key ways to advance Māori Data Sovereignty:

1. Asserting Māori rights and interests in relation to data.
2. Ensuring data for and about Māori can be safeguarded and protected.
3. Requiring the quality and integrity of Māori data and their collection.
4. Advocating for Māori involvement in the governance of data repositories Indigenous Data Sovereignty.
5. Supporting the development of Māori data infrastructure and security systems.
6. Supporting the development of sustainable Māori digital businesses and innovations.

Ethically, the permissions of who should have access to Māori data are complex, nuanced and are usually determined by whānau, Hapū and Iwi. Navigating permissions on data can be further complicated by colonial ownership, colonial structures, multiple Iwi involvement, and finding the right person to speak to. It is pivotal that the right people are asked and that there is a collective consensus on the use, dissemination and publication of Māori data. Important consideration must be given to access to and benefits of, Māori data. Here, the creation of access and benefit sharing (ABS) arrangements is a useful research tool (Lai et al., 2019).

Of particular interest to scientific research are the implications of Māori Data Sovereignty and access and benefit sharing on the environmental data of native species, ecosystems, environments and places. By recognising that data are a living taonga within Pūtaiao, we begin to shift from colonial ownership of environmental data to collective Māori governance of environmental data. The relationship of Māori with taiao is intrinsic, relational and sacred. This is similar for many Indigenous peoples. Thus, research involving Indigenous environmental data more broadly, needs to be Indigenous-led and Indigenous-centred based on this environmental relationship and Indigenous Data Sovereignty.

To fully realise Māori Data Sovereignty and Māori axiologies in research requires institution and government level policy shifts. While policies, such as Vision Mātauranga, focus on unlocking the science and innovation potential of mātauranga they fail to acknowledge the centrality of tikanga, Māori axiology and Māori Data Sovereignty in any interactions with mātauranga (Rauika Māngai, 2020). Having Māori Data Sovereignty, and by extension Pūtaiao, underpin policies regarding mātauranga will ensure the rights of Māori to maintain, control, protect and develop Māori data in

research such that it is culturally safe. This will guide institutional and governmental policy shifts to ensure they align with Māori ways of knowing, being and doing, Te Tiriti o Waitangi and UNDRIP.

Whakapapa and Whanaungatanga informs researcher's positionality

Positionality in research methodology critically reflects on the social, economic, cultural and racial influences of the researcher and on the research. 'It underpins the research questions we see, the answers we seek, the way we go about seeking those answers, the interpretations we make, and the theoretical paradigms that make sense to us' (Walter and Andersen, 2013: 46). Importantly, for Indigenous positionality in first world settler nations, there are familiar patterns of racial hierarchy reflected in colonisation and its processes of possession and dispossession; privilege and disadvantage; and entitlement and marginalisation. The outcome of said colonial violence is a pattern of positioning Indigenous peoples towards the bottom of the social hierarchies of those nations. Critical analysis of the social, cultural, economic and racial aspects of individual, collective and national identity are fundamental aspects of framing Indigenous methodologies to navigate the complexities of Indigenous research. 'Social position is, thus, a verb rather than a noun: we do, live, and embody social position, and as researchers, it covertly, overtly, actively, and continuously shapes how we do, live, and embody research practice' (Walter and Andersen, 2013: 47).

Indigenous positionality considers how the researcher is located relative to research partners. Māori positionality centres on Māori identity and thus whakapapa Māori is essential for Pūtaiao. This positionality is cognisant of the spectrum and complexity of Māori identity, how we position ourselves as Māori and how others position us. As Māori researchers, our positionality as Māori is at the forefront of Pūtaiao, and is deeply woven into research. In positioning te reo, mātauranga, and tikanga at the centre, and being guided by whakapapa and whanaungatanga through the research, reflexivity and nuance is favoured over a systematic or generalisable approach. It seeks to be relational. Importantly, such relational positioning is considered a strength in Kaupapa Maori Methodologies.

Relational positionality seeks to answer two questions between research partners: Who are we to each other and why do we matter to each other? To honestly answer these questions requires Māori researchers to explore the collective positionality of their whānau, Hapū and Iwi; their positionality to the whakapapa of their whenua, awa (river) and moana (ocean, large body of water); while simultaneously acknowledging their individual positionality within whānau, Hapū and Iwi and the intersections of age, race, gender, class, sexuality, rural and urban (and further nuanced) positionalities. Kaupapa Māori positionality of Māori identity does not seek to be essentialist. Reflection on the knowledge of te reo, mātauranga and tikanga, and the connection to whānau, Hapū and Iwi of Māori researchers are, however, essential. This, of course, is understood in the context of colonial violence and assimilationist agendas. Māori researchers can also conduct research appropriately outside of their whānau, Hapū and Iwi, and environments, requiring the researchers to position the whānau, Hapū or Iwi, and the whenua, awa and moana of research partners. In these instances, the appropriate engagement with cultural narratives is essential.

Wairua. Engaging a relationally contextualised and deeply situated approach to Kaupapa Māori research may activate, reinvigorate, or enhance an awareness of wairua (spirit, spirituality). This may be experienced through thoughts and visceral responses in the context of research, the ebb and flow of knowledge between the researcher and research partners, and may inform an approach to dialogue and reflection that gives shape and form to Indigenous theoretical development (Le Grice, 2017). The Māori concept of pā whakawairua refers to the thoughts and visceral responses when interacting with people and places. Positioning as Māori in collectives of people, whānau, Hapū and Iwi, and in relation to ancestral places not only validates, but also necessitates, experiencing and acknowledging pā whakawairua before undertaking research with people and places.

Moewaka Barnes et al. (2017) have argued that engaging with wairua is an important process for dialogical engagement with communities in research. Further, a wairua approach can challenge the marginalisation of Indigenous worldviews, and enable connections between the ‘seen’ and ‘unseen’ that permeate Indigenous ways of knowing and being. Wairua interweaves Māori epistemology and ontology in our embodied reality, and intimately positions Māori researchers within whānau, Hapū, Iwi, and with whenua, awa, moana, maunga (mountain) and atua (Pihama, 2001). This positional interconnection influences everything we do (Hutchings, 2002), and also informs Māori axiology. Positionality that acknowledges the interconnection of wairua, ecological features, whakapapa and cultural narratives is a distinctively Kaupapa Māori methodology (Evans, 1994).

Kaupapa Māori methodologies in the context of scientific research

Science assumes that researchers employ methodologies that are grounded in their scientific disciplines to decide research methods. Such methodologies are specifically crucial to scientific research as there are ‘expectations that knowledge can be replicated and validated by following the exact same pathways to produce the exact same results’ (Smith et al., 2016: 141). Kaupapa Māori Theory challenges this assumption by providing an alternative theoretical lens to inform Pūtaiao, guiding how scientific research is understood, designed and practised. In reference to Figure 1 below, Kaupapa Māori methodologies, when grounded in Māori ways of knowing, being and doing, can then inform the theoretical framing of the scientific research such that the methods used are not only scientifically robust, but also culturally responsive.

This may be seen as tension between Kaupapa Māori research and science methodologies, however, Kaupapa Māori theory and Kaupapa Māori methodologies, as conceptualised here, are not prescriptive or essentialising. Specific scientific methods are not explicitly included or excluded. Instead, Kaupapa Māori methodologies act as provocations, encouraging researchers to explore the relationship between culture, theories, methodologies and methods. This provocation acknowledges and aims to embed structuralist and culturalist approaches to decolonising science when designing scientific methodologies and methods in research. As articulated by Smith (2017),

‘Kaupapa Māori theory is not so much a set of principles but a space where Māori can work in ways free of dominant cultural pressures and constraints. It is a space where Māori can grow their self-development and transforming ideas and actions’. (p. 75)

This is particularly important in disciplines that are culturally and socio-politically fraught or problematic. Kaupapa Māori research ‘encourages Māori researchers to take being Māori as a given, to think critically and address structural relations of power, to build upon cultural values and systems and contribute research back to communities that are transformative’ (Smith, 2021: 269). In this way, Kaupapa Māori methodologies, and Indigenous and decolonising methodologies more broadly, enable the co-existence of Māori and Indigenous ways of being, knowing and doing, and scientific knowledge (Smith, 2012).

Reflections on experiences, disciplines and praxis to transform science

Māori experiences within science

There is an ongoing and long-standing history of Māori being excluded and marginalised in science (McAllister et al., 2022; McKinley, 2005). This exclusion and marginalisation is pernicious, occurring from the beginning of tertiary study and reflected in the experiences of Māori students across Science programmes from undergraduate through to postgraduate studies (Theodore et al., 2017;

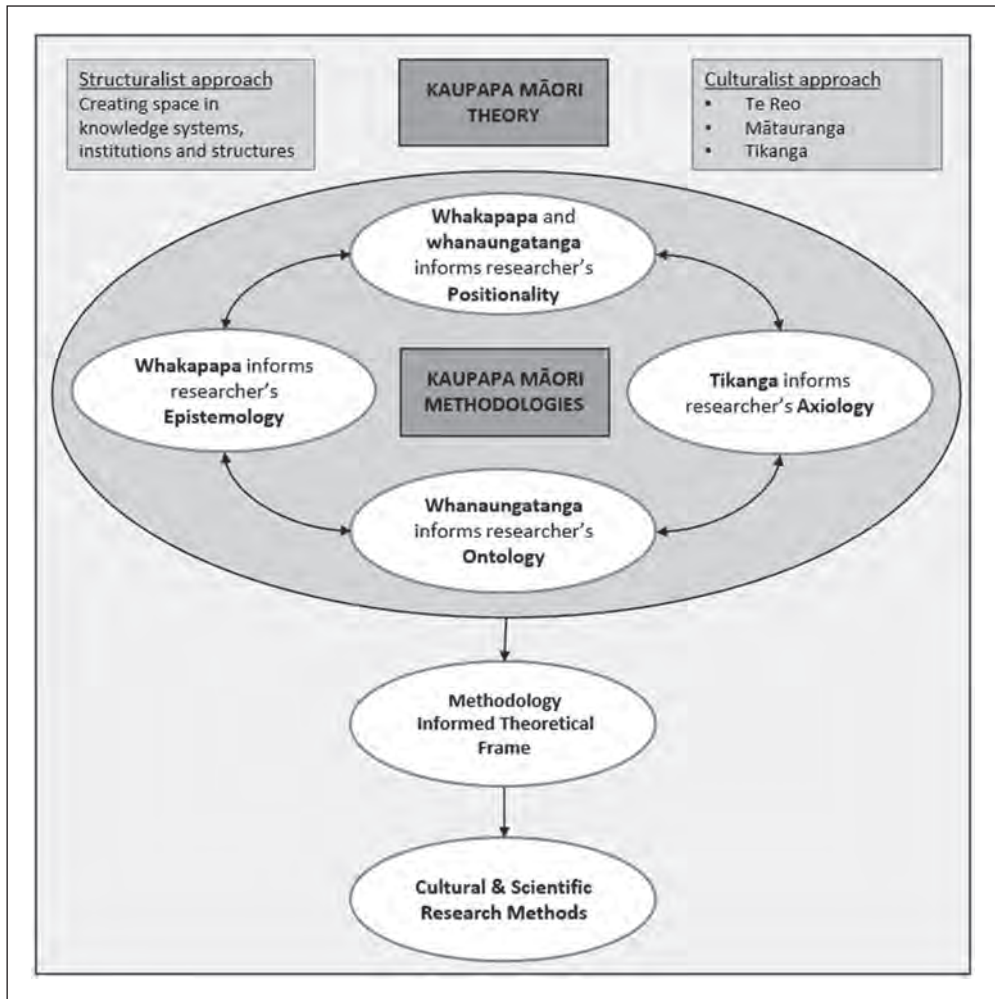


Figure 1. Conceptualisation of a Pūtaiao research methodology.

Source: Adapted from Walter and Andersen (2013).

Waiari et al., 2021). These experiences are further amplified as Māori progress through disciplines within Science and in turn constrain the ability for Māori communities to engage with and benefit from Science. Māori researchers face many challenges existing in science including excess labour, racism, appropriate supervision, publication opportunities, and lack of career progression (Haar and Martin, 2021; McAllister et al., 2020; Mayeda et al., 2014). Yet, alongside these broad structural and institutional forms of scientific racism there exist more nuanced forms of oppression within the science system that intentionally limit opportunities. The academy prioritises academic qualification over other Indigenous measures of expertise and experience. This, in turn, is tokenistic and misappropriates Indigenous science. Our ability to use and practice mātauranga within the academy is limited through the fixation on specific methodologies, methods, and outputs that do not account for mātauranga. Ruru and Nikora (2021) offer insight into the experiences of Māori scholars working at the interface of mātauranga and science, some of which mimic our own experiences. For example, Simmonds (2021) speaks of having to divorce her discipline and how,

. . . any attempts at decolonising or transforming the discipline in any real way were always going to be challenged, minimised, diluted and undervalued: not by individuals . . . but rather by the systems of power within which the department and the discipline were firmly entrenched. (p. 130)

Here, Pūtaiao offers a unique opportunity whereby Māori researchers do not have to distance themselves from their culture to fit into a discipline made to discipline us, and instead Pūtaiao supports Māori ways of knowing, being and doing.

Te Taura Here Pūtaiao

At the end of 2020, Te Taura Here Pūtaiao – the kinship binding threads of Pūtaiao – comprising a network of Māori staff within the Faculty of Science at Waipapa Taumata Rau (The University of Auckland) spontaneously formed. This network has created a Kaupapa Māori space envisioned by this group as a space by Māori, for Māori and with Māori. Intentionally, this has centred Māori ways of knowing, being and doing. Aligned with Pūtaiao, the main focus of Te Taura Here Pūtaiao is whanaungatanga among kaimahi Māori (Māori staff). In centring Pūtaiao, academic staff, professional staff, and students – from undergraduate through to Professor – and kaimahi Māori who work with but are not positioned within the Faculty of Science, are included in this network. Establishment of Te Taura Here Pūtaiao is intended to overcome the isolation in theory, education and research caused by the disciplinary bounded departmental and faculty structure of the university.

The work of this network is deliberate and focuses on decolonising, disrupting and transforming the Faculty of Science through the priorities of kaimahi Māori. Impacts of Te Taura Here Pūtaiao rapidly affected kaimahi Māori. For some it became a space that fulfilled a desperate need of cultural safety, whanaungatanga and empowerment. Others reflected the network to be ‘the kind of place I didn’t know I needed until I went’. Te Taura Here Pūtaiao positions itself in parallel with existing faculty governance with collective accountability to Māori kaupapa (approach, topic, purpose). As such it is a structuralist form of resistance that provides a space for the privileging of Māori aspirations and cultural well-being in academia.

Collectivising in this way naturally created collaborative space for Te Taura Here Pūtaiao to contribute extensively to priorities within the Faculty of Science. Collaborative space that would otherwise be difficult, if not impossible to achieve without collectivising. This included navigating cultural safety and cultural double-shift of kaimahi Māori; professional mentoring; empowering student voice; dismantling hegemonic and hierarchical structures by involving undergraduates, postgraduates, academic staff (Professional Teaching Fellows, Lecturers to Professors) and professional staff across the university who are involved in science; discussions to develop a shared understanding of the Faculty of Science context of mātauranga, Kaupapa Māori and Te Tiriti o Waitangi; conceptualising Te Ao Māori Curriculum and Pedagogy development through involvement with the process of the Curriculum Framework Transformation Taskforce, specifically the Pūtoi Ako: Kaupapa Māori pedagogies working group; submissions on university policies and guidelines; collaborating on publications; leading te reo revitalisation initiatives; and influencing university-wide Māori research governance and development.

Although much transformative work has been accomplished since the establishment of Te Taura Here Pūtaiao, structural changes to staffing, resourcing, and funding must continue that encourages, incentivises and acknowledges the important contributions of kaimahi Māori without further increasing the cultural double-shift. Collectivising and creating a Māori community in science is an important step to actualising the transformative praxis of Pūtaiao and addressing structuralist and culturalist barriers within the academy and Western science system.

Pūtaiao: Moving beyond the discipline

In considering the relationship between Pūtaiao and disciplines it is useful to consider how we can be employed and positioned within disciplines of science within the academy, while simultaneously practising Pūtaiao. All disciplines within science are bound by the Western scientific approach. An approach founded upon Cartesian ideals of oppositional binaries: mind being separate from matter, people separate from nature, nature from culture, and subject from object. It prioritises individual rights and classification to focus primarily on the ‘what’. Termed the Order of Things by Michel Foucault, it formed the foundation stone upon which the Enlightenment was established, and from which Western science grew. Given that history, the preference for disciplines is a natural outcome. In practice, discipline has become an invisible, but highly effective structural barrier in scientific research.

For Pūtaiao, founded in Te Ao Māori, and its foundation on relationality, connection and responsibility, the focus is primarily on the ‘why’, with the ‘what’ and ‘how’ following, hence trying to frame it in disciplinary terms makes no sense. At times Pūtaiao might draw from a single scientific discipline, other times it may have people from different disciplines working together, each drawing on different disciplinary knowledge (multidisciplinary), or integrate and synthesise knowledge and methods from different disciplines (interdisciplinary) or create a unity of intellectual frameworks beyond the disciplinary perspective (transdisciplinary) (definitions after Awan, 2022). Fundamentally, when undertaking Pūtaiao, such framings are irrelevant – instead we ask – why should we do this? This informs what we need to do, and how. Indeed, building a team with the required skills is necessary, but, whether the team is uni-, multi-, inter- or transdisciplinary is not important. The ‘why’ is often framed in terms of kaupapa that is what is the kaupapa? In this way, identifying scientific research as Pūtaiao is not a statement of discipline. Undertaking Pūtaiao is a political statement of the centrality of Māori identity in undertaking research that can draw from both knowledge systems and uses the scientific method to realise the goals and aspirations of, and address challenges faced by, Māori communities.

Here, it is important to position Pūtaiao relative to mātauranga and Western science. The intention of Pūtaiao is not to develop mātauranga experts or Indigenous knowledge holders through the academy. Intergenerational knowledge systems already exist outside of the academy to that end. Pūtaiao aims to transform scientific research such that engagement with mātauranga experts is no longer exploitative and extractive, but appropriate, meaningful and beneficial for Māori. This can include engaging Western science and scientists, if and where appropriate. However, humility is required to acknowledge the mātauranga and scientific expertise beyond our scientific training of those we engage with. Partnership in this way requires a tuakana-teina relationship (a relationship between older and younger siblings that shapes the responsibilities and obligations of each person), where we must humble our own scientific knowledge as the teina to the mātauranga experts as our tuakana. This framing the need to transform science as a knowledge system to enable access for whānau, Hapū and Iwi.

Transforming science through transformative praxis

In this article, we lay out many assumptions, obstacles, barriers, structures, institutions, and systems that need to be transformed by Pūtaiao. Kaupapa Māori theory as transforming praxis (Smith, 2017) is explored here to connect theory to practice and transform science to further enable expressions of Pūtaiao that are more complete, complex and nuanced. Smith describes Freire’s (1972) notion of transformative praxis, which highlights conscientisation, resistance, and transformation as a cycle, where ‘Māori experience suggests that the elements of conscientisation, resistance, and transformative action may occur in any order and, indeed, may all occur simultaneously’ (Smith, 2017: 78). Conscientisation, or consciousness raising, has been vital to the development of Kaupapa Māori theory and critiques the continual failure of the existing systems that create structural impediments to

Māori education and research aspirations (Smith, 2005). The same rationale necessitates a structuralist decolonising agenda for Pūtaiao to flourish as a research space in Aotearoa. Active resistance against the cultural oppression, misappropriation and exploitation within scientific research continues to be necessary of Kaupapa Māori theory as transforming praxis. Here, Pūtaiao becomes a call to Kaupapa Māori theory to resist the misappropriation of te reo, the exploitation of mātauranga and the oppression of tikanga in scientific research.

Having been denied research sovereignty within the academy, the culturalist decolonising agenda is a fundamental part of resistance. It addresses the need for Māori to have increased autonomy, self-determination and control when engaging with scientific research. Kaupapa Māori theory engages with conscientisation, resistance and transformative action simultaneously, which this conceptualisation of Pūtaiao also requires. Combining a structuralist and culturalist approach to achieve the decolonising agenda of Pūtaiao engages with both raising consciousness of, and resistance against, the oppressive elements of current Western science systems. Within the theoretical space created by Pūtaiao as transformative praxis, physical space must also be created for Māori to come together and collectively transform science. With the theoretical, methodological, practical and collaborative foundations of Pūtaiao explored within this article, we now ask – how do we transform scientific research?

How do we transform scientific research?

It is important to acknowledge here that the ability to ask this question in the academic context of this article already affirms the transformative work previously undertaken by Māori and Indigenous scientists and researchers. Through conscientisation and resistance, theoretical space has been created for Pūtaiao to be undertaken within the current scientific academy. The call to transform scientific research here, then requires that space continues to be made for research of this nature within and beyond the many disciplines of science. Simultaneously, the theoretical foundations of Pūtaiao should be tested, challenged, adapted and expanded upon. Here, centring Indigeneity, Māori identity and Māori science leadership is essential.

Important to the dialogical relationship between Te Ao Māori and science is the power and position of Indigeneity. Often Māori ways of knowing, being and doing are considered optional, as add-ons, a theoretical ‘othering’ by science. As Ngata (2019) notes, ‘Indigenous participation on the margin is vital to the centring of the coloniser’ (p. 45). Culturalist decolonising attempts to include Indigeneity in science on the margins can further centre Western approaches to science. Centring Indigeneity, Māori identity and Māori science leadership can lead to transformative change, whereas theoretical ‘othering’ and participation on the margins further perpetuates the colonising agenda systemic within the current science system. Then, implicit in the question – how do we transform scientific research? – is the question – how do we centre Indigeneity, Māori identity and Māori science leadership in order to transform scientific research?

One way to think about Māori science leadership is through Māori understandings of the growth of trees, as exemplified in the whakataukī below:

E kore te Tōtara e tū noa i te pārae ēngari me tū i roto i te wao-nui-a-Tane

(The Tōtara [Podocarpus totara]¹ does not stand alone in the field, but stands within the great forest of Tane).

This expands the metaphor beyond the growth of individual trees to growing forests. Tree metaphors for Māori leadership are common. Mead and Grove (2004) compared a good leader to a Tōtara tree in a forest: a leader with substance; that stands tall and presents as a leader; works with people rather than alone; is a source of pride; and puts others first. Mead et al. (2006) continue the metaphor to describe Māori leadership conceptualising ‘Rātā whakaruruhau’ (the sheltering Rātā [Metrosideros robusta]) as a model of Māori leadership that emphasises a strong dedication to others; ensuring

stability for, and genuinely caring about people under your leadership; highlighting confidence and standing tall in the face of the challenge; and instilling confidence for the future in their people. Mather (2014) explores the following whakataukī,

Kia uru Kahikātea te tū.

(To stand as a grove of Kahikātea [Dacrycarpus dacrydioides].)

Here, the words of Māori leader Tariana Turia (2005) adds clarity to the Māori leadership qualities associated with Kahikātea:

The Kahikātea is our tallest tree, stretching up to over thirty metres to the first branch. With shallow roots, isolated and on their own they are vulnerable. The Kahikātea are commonly found in groves with their roots interlocked, giving each other mutual support – providing a vital foundation, a whakapapa of connections. (p. 48)

Kahikātea as a model for Māori leadership describes a collectivist approach where the collaboration of each individual Kahikātea contributes, and is indeed essential, to success. Here, interdependence of intertwining roots represents the contribution of whanaungatanga to both strength and resilience. Kahikātea are typically the tallest tree in the forest, therefore Kahikātea is a model of Māori leadership that can be utilised to ascend to greater heights. Māori science leadership within Pūtaiao can also be thought of in a similar way. An ecosystem of trees with diverse skills and competencies enveloping a forest. As we raise our canopy together, we are conscious of who is sheltering us and who we should be sheltering as the next generations of trees enter the forest.

To further our forest metaphor, we begin with Pūtaiao as the theoretical foundation, the forest floor that interweaves and connects the diversity of trees in the forest, the diversity of Māori leaders in scientific research. The structuralist and culturalist decolonising agendas of Pūtaiao (discussed above) are exemplified through the diversity of trees within the forest and their subsequent roles. The structuralist decolonising agenda is led by trees that border the forest. Much like māhuri Tōtara, young saplings of Tōtara as young leaders who stand proud and tall. These trees break new ground to expand the borders of the forest creating space for new sites of struggle, conscientisation, resistance and transformation through Pūtaiao. Specifically, Tōtara address the structures, systems and institutions that act as barriers to hinder, oppress and ultimately deny Māori ways of knowing, being and doing in scientific research. The culturalist decolonising agenda can be thought of as both Rātā and Kahikātea. Rātā, those Māori leaders who have climbed high within the scientific academy, make space for experienced and emerging Pūtaiao practitioners under their leadership. With a strong dedication to, and genuine care for others, Rātā provide stability during challenges and confidence in the future for others to practise Pūtaiao. When critical mass has been reached Kahikātea as practitioners of Pūtaiao collectivise and interweave their roots to grow the canopy, providing strength and resilience for each other to collaboratively achieve successful outcomes. Through collaboration, Kahikātea collectively enable te reo, mātauranga and tikanga to be embedded in scientific research, while simultaneously entering into leadership positions within structures, systems, and institutions.

It is important to note that Tōtara, Rātā and Kahikātea models of Māori leadership all require that Māori leaders do not stand alone in the field, but stand together within the great forest of Tane. Pūtaiao offers a theoretical, methodological and practical foundation to connect Māori science leaders with the aim of transforming science. The outcomes of transformational change led by Pūtaiao, whether it be new university courses, academic programmes, research centres, science departments, institutions, or regional and community hubs remain to be seen. It is certain, however, that Pūtaiao conceptualised

as Kaupapa Māori science offers many avenues for Māori scientists and researchers to continue to decolonise, transform and ultimately, redefine science into the future.

Glossary

Aotearoa: New Zealand.

Atua: ancestors of continuing influence.

Awa: river.

Hapū: a collection of whānau descended from a shared ancestor.

Iwi: a collection of Hapū descended from a shared ancestor.

Kahikātea: *Dacrycarpus dacrydioides*, white pine, large forest trees.

kaimahi Māori: Māori staff.

Kapa haka: contemporary performance.

Karanga: oratory.

Kaupapa: approach, topic, purpose.

Kaupapa Māori: Māori approaches, principles and vision.

Māhuri: young tree, sapling.

Mana mahi: Governance-Operations.

Maramataka: astronomy, fishing and gardening calendars.

Mātauranga: a body of knowledge, epistemology.

Maunga: mountain.

Moana: ocean, large body of water.

Mōteatea: songs.

Ngā taonga katoa: every treasured gift.

Orioi: genealogies and invested hopes sung to babies.

Pā whakawairua: the thoughts and visceral responses when interacting with people and places.

Pū: origins.

Pūrākau: narratives.

Pūtaiao: Kaupapa Māori Science.

Pūtoi Ako: Kaupapa Māori pedagogies working group within the Faculty of Science.

Raranga: weaving.

Rātā: *Metrosideros robusta* and *Metrosideros umbellata*, large forest trees.

Rātā whakaruruhau: the sheltering Rātā.

Taiao: the environment and natural world.

Taonga: treasured gifts

Te Ao Māori: the Māori world.

Te Ao Māori tirohanga: Māori worldview.

Te Mana Raraunga: The Māori Data Sovereignty network.

Te Moananui a Kiwa: The Pacific Ocean.

Te reo: the Māori language.

Te Taura Here Pūtaiao: the kinship binding threads of Pūtaiao, a network of Māori staff within the Faculty of Science at Waipapa Taumata Rau.

Te Tiriti o Waitangi: Te reo Māori version of the Treaty of Waitangi.

Tikanga: a value system that underpins Māori culture

Tōtara: *Podocarpus totara*, *Podocarpus cunninghamii*, large forest trees.

Toi whakairo: carving.

Tuākana-teina: tuakana-teina relationship (a relationship between older and younger siblings that shapes the responsibilities and obligations of each person).

Waiata: songs.

Waipapa Taumata Rau: The University of Auckland.

Wairua: spirit, spirituality.

Whaikōrero: oratory.

Whakairo: to carve.

Whakapapa: a way of knowing about the world through intergenerational relationships.

Whakapapa kōrero: ancestral narratives, histories.

Whakataukī: proverb, aphorism.

Whānau: extended family.

Whanaungatanga: relationships, being in relation through whakapapa.

Whenua: land (also placenta).

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Note

1. The intention of capitalising the names of Tōtara, Rātā and Kahikātea here is linked to the language of animacy. By capitalising the names of native species we change the grammar from a common noun to a proper noun, from 'it' to 'them' to acknowledge our shared whakapapa.

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Wrangling the system: How tenure impacts Indigenous research

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Abstract

Faculty research agendas are informed by and intertwined with the evaluation process. One's research agenda influences productivity, choice in methodology, and dissemination decisions. Indigenous researchers often undergo a dual evaluation process—one with their academic institution and another with their Indigenous communities. Indigenous researchers, situated in the liminal space between these two spheres, need control over the research process in order to conduct the type of research their communities desire, while meeting the standards of their institution. Using a series of talk stories with Indigenous faculty, this article explores how the tenure process often is a barrier to Indigenous research sovereignty. Indigenous faculty, in this study, articulated feeling lonely and, at times, ill-prepared due to a lack of mentors, prior traumatic academic experiences, and the weight of the many facets of a faculty position. They also noted a disconnect between their institutional processes and Indigenous methods and felt that administration needed to make changes, especially in terms of faculty evaluation through the tenure criteria. Improving the tenure process for Indigenous faculty could have rippling effects beyond individual faculty, expanding into Indigenous communities by providing space for Indigenous faculty to conduct important research that is relevant to their communities.

Keywords

Indigenous research sovereignty, Indigenous faculty, tenure, research agenda

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Introduction

Faculty research agendas are informed by and intertwined with the evaluation process. One's research agenda influences productivity, choice in methodology, and dissemination decisions. Indigenous researchers often undergo a dual evaluation processes—one with their academic institution and another with their Indigenous communities. Indigenous researchers, situated in the liminal space between these two spheres, need control over the research process in order to conduct the type of research their communities desire, while meeting the standards of their institution. Improving the tenure process for Indigenous faculty could have rippling effects beyond individual faculty, expanding into Indigenous communities by providing space for Indigenous faculty to conduct important research that is relevant to their communities. Thus, the tenure system plays a key role in Indigenous research sovereignty.

Tenure or the right to a permanent position is the “gold standard” of academia (Gavazzi and Gee, 2018). In 1940, the American Association of University Professors (AAUP) issued a Statement on the Principles of Academic Freedom and Tenure. The preamble notes that “Institutions of higher education are conducted for the public good . . . The common good depends upon the free search for truth and its free expression,” which rests upon academic freedom (AAUP, 1940). With the number of tenure-track position decreasing more faculty are competing for less tenure-track positions, and faculty who are offered a tenure-track position immediately building their tenure dossier.

Although the requirements to obtain tenure vary based on the type of institution as well as the discipline, the tenure system places pressure on faculty to achieve and maintain a certain level of performance with the promise of full control over their pedagogy and research pursuits in the future (Pfeifferberger et al., 2014). Most tenure procedures require three elements: research productivity judged by peer-reviewed publications, teaching excellence, and service (Park and Riggs, 1993). The degree of focus on each of these three elements varies by institution. Research institutions, for example, place a significant focus on faculty publishing multiple peer-reviewed publications in their pre-tenure or probationary period to prove their research trajectory will continue (Hardin and Hodges, 2006). In contrast, teaching institutions place the emphasis on teaching, while still requiring faculty to publish in peer-reviewed journals. The lower publication requirements are still challenging, however, when accounting for the heavy teaching loads.

Societal inequities are mirrored in the tenure system. The tenure process itself is vague and rife with ambiguities, which disadvantages minorities, women, and faculty from lower socioeconomic backgrounds who may not know unwritten rules of academia (Cate et al., 2022). Minority faculty also endure being racialized by students, colleagues, and administrators in ways that negatively impact their tenure dossier (Endo, 2020). Women, especially those expanding their families, have increased caregiving burden that can make the tenure process challenging (Perna, 2005; Ylijoki, 2013). Some women faculty opt to stop their tenure clock in order to give birth, recover, and caregive, which increases the length of their pre-tenure appointment (Cardel et al., 2020; Stewart et al., 2009). Their male counterparts also have the option of stopping their tenure clock with one study finding that this inequitably benefited them during the tenure process (Antecol et al., 2016). Finally, faculty engaged in community-based participatory research are often confronted with balancing the additional time requirements of this type of research methodology (Holkup et al., 2004) while still completely the myriad of other requirements imposed on faculty.

Indigenous faculty face these same issues as well as unique challenges such as ontological differences, balancing community expectations, and honoring Indigenous ways of knowing. Indigenous faculty are often called upon in an array of situations to represent the Indigenous perspective, yet with the numbers of faculty being so low it creates even more of a strain on this population (Henry, 2012). Institutions of higher education have been the slow to recruit certain sub-specializations, which could open space for Indigenous faculty whose “research areas relate to their own history, traditions, and

social problems,” however, the devaluing of community work compared to peer-reviewed publications in Western academic journals disadvantage community focused Indigenous scholars (Henry, 2012). Finally, Indigenous faculty have also expressed fear of losing their Indigenous identity while teaching and researching in oppressive settings as well as being racialized by students in teacher evaluations (Council of Ontario Universities, 2020; Fiarcloth, 2017; Mohamed and Beagan, 2019).

Although more Indigenous people are receiving doctoral degrees than ever, they remain a clear minority in academia. Only 2% of respondents identified themselves as Indigenous in a 2019 Survey of Postsecondary Faculty and Researchers in Canada (Statistics Canada, 2020). Similar statistics exist in the United States where, in 2018, less than 1% of full-time faculty identified as American Indian and Alaska Native (US Department of Education, 2020). In the face of junior faculty concerns across ethnicities and genders regarding the lack of support and resultant stress of the tenure process (Eddy and Gaston-Gayles, 2008), several programs that support Indigenous faculty achievement have been implemented and show promise (Brodt et al., 2019; Windchief et al., 2018). Nonetheless, these efforts seek to tackle the issue of tenure at an individual level and fail to address the communal impact of Indigenous tenure.

Indigenous research sovereignty is linked to and builds upon the movement around Indigenous data sovereignty, which promotes Indigenous control of Indigenous data including its collection, ownership, and use (Williams et al., 2020). While there is no clear consensus on the definition of Indigenous research sovereignty, there are key elements considered in the literature. Indigenous research sovereignty is an extension of the right to self-determination (Díaz Ríos et al., 2020; Sabzalian, 2019) and can be seen as a response to inflexible Western research paradigms. Western research along with neoliberal models of research often involves the dehumanization and colonization of Indigenous peoples through the marginalization and exploitation of Indigenous knowledge (Kennedy et al., 2020; Williams et al., 2020). Within Indigenous research sovereignty, Indigenous peoples, therefore, decide and control the process as well as the aspirations of the research (Williams et al., 2020). The process itself highlights the importance of relationality and reciprocity between the research, researcher, place, knowledge keepers, and Indigenous communities. The acknowledgment of Indigenous methodologies and epistemologies as well as the protection of Indigenous knowledge, worldviews, and intellectual property is paramount. Research itself should be framed within the sovereignty of Indigenous nations, countries, and lands and in doing so, confronts present colonization that is otherwise upheld within Western research (Alderson, 2020; Muller et al., 2019; Williams et al., 2020).

The implementation of Indigenous research sovereignty requires substantial shifts within the academy. Expanding the capacity of Indigenous communities to control Indigenous research, establish ethical regulations, and protect intellectual property are crucial starting points. Integration of Indigenous values into research policies guides research and researchers toward Indigenous principles, but without control or authority by Indigenous peoples it does not inherently challenge current power structures (Díaz Ríos et al., 2020; Kennedy et al., 2020; Muller et al., 2019). Indigenous research sovereignty, therefore, is not only an aspiration but a right for Indigenous people that challenges the harms that Western research has perpetuated against Indigenous peoples.

The tenure system creates subversive incentives to increase research productivity (Park, 2011), which poses unique challenges for Indigenous faculty regardless of the type of institution. With the stakes of tenure being so high, Indigenous faculty face choices that challenge their axiology, question their methodological choices, and stifle their ability to express themselves (Council of Ontario Universities, 2020). At first glance these seemingly individual challenges work in unison to subvert collective Indigenous research sovereignty (Castleden et al., 2015; Freeman et al., 2009). The desire for tenure may lead Indigenous faculty to pursue topics or methods that may not align with their desired research area or bifurcate their research agenda into pre-and-post-tenure tracks. Yet, because Indigenous faculty feel a responsibility to Indigenous communities, these choices not only impact them, but also

impact the availability of qualified researchers committed to working with Indigenous communities in ways that honor Indigenous research sovereignty (Barney, 2018; Galloway et al., 2020).

This article shares the experiences of Indigenous faculty and higher education administrators across the United States and Canada with the tenure system. Faculty discussed how the tenure system presented challenges to conducting research on the topics and in the ways that they hoped. Faculty expressed difficulty aligning their work with the desires of the community in ways that would be mutually beneficial. Similarly, faculty disagreed with the focus on research over students indicating that Indigenous faculty held differing understandings of what constituted success. Faculty also expressed frustration with the misalignment of the service requirements for tenure. Due to a lack of Indigenous faculty, they faced a high service load to the institution, yet also felt a responsibility to be of service to their own community, which resulted in an even heavier service load. Finally, faculty believed that mentorship played a key role in their ability to find their voice, that administration needed to play a role in creating a space of Indigenous research, and that the tenure system needed to acknowledge a different definition of success by valuing research for community. The tenure system, therefore, plays a role in shaping or mis-shaping Indigenous research sovereignty.

Methods

Position statement

We believe in the importance of disclosing our positionality and acknowledge that the researchers' worldview and experiences influence the inquiry and interpretation of findings. All the researchers in this study are Indigenous. Although we are either working at or attending an institution of higher education with a particular focus on serving Indigenous students, we also reside in a discipline where Indigenous voices are underrepresented. As junior and prospective Indigenous faculty, we reflect deeply on our place in the academy while representing our respective communities. At the same time, we acknowledge our position of privilege having benefited from higher education and reached a certain socioeconomic status. This privilege motivates our desire to do this work in support of an academy that better reflects our Indigenous values.

Indigenous qualitative research methods

We adopted Indigenous methods to approach this topic. Using the talk story method, the lead author remotely interviewed 10 Indigenous faculty and Indigenous administrators across the United States and Canada. Talk story interviews align with Indigenous values by building relationships between the participant and researcher while honoring the participants' stories (Sing et al., 1999). Originally, we focused solely on current Indigenous faculty; however, after interviewing a faculty member who later became an administrator, we opened the dialogue to Indigenous administrators as well. We used purposeful sampling to identify six Indigenous faculty and then used snowball sampling to recruit an additional four Indigenous faculty members. Participants spanned the United States and Canada from Toronto to Hawai'i. Care was taken to ensure that participants varied in terms of the types of institutions, the disciplines, and where they were on their tenure journey. Only one participant was currently in Indigenous Studies and none of the faculty was from Tribal Colleges. This was intentional as we hoped to understand how the tenure process impacted one's research agenda at institutions and in disciplines that were not already infused with Indigenous ideas and values.

Once we conducted the 1-hour talk story sessions, two researchers independently coded the recorded interview on Atlas-ti using inductive thematic coding. Inductive coding was used because it allows the voices of the participants to be expressed without necessarily fitting into a preset list of codes. To better align with Indigenous axiology, we used a rigorous consensus coding scheme meeting and discussing the talk stories and codes throughout the coding process until consensus was

Table 1. Interviewees' demographics ($n=10$).

Geographic region at time of interview	
US	7
Canada	3
Faculty position	
Pre-tenure	4
Tenured	3
Administration	3
Academic disciplines	
Administration	1
Education	1
Mathematics	1
Physics	1
Law	2
Indigenous Studies	1
Public Health	1
Languages	1
Sociology	1

reached in the themes (Olson et al., 2016; Raskind et al., 2019). Theoretical saturation was achieved and resulted in 7 themes and 10 sub-themes. Several recommendations, refined from the talk story interviews and research team discussions, were included for institutions of higher education to consider supporting the creation of a space for Indigenous faculty to, not only thrive in the institution, but also continue to work on issues that are important to their communities. Finally, we applied the COREQ (COnsolidated criteria for REporting Qualitative research) Checklist as a check to ensure rigor and transparency.

Results

Ten Indigenous administrators and faculty members who identified as Indigenous from either present-day United States or Canada representing a variety of disciplines from law to mathematics were engaged in a talk story session. The faculty varied in terms of experience, with some in their first year on tenure track while others had transitioned to administration or left academia altogether. See demographic table for full description (Table 1).

Themes

All participants expressed some degree of difficulty having sovereignty over their research agenda at some point in their academic journey. While some participants experienced this conflict during their graduate education, others experienced this challenge more profoundly while on the tenure track. Table 2 identifies the 7 themes and 10 sub-themes (see Table 2).

Theme 1: Being the only is lonely

Many Indigenous faculty participants experienced feeling as if they were alone. The first theme of Being the Only Is Lonely formed regardless of the location, type of institution, or discipline. Even at institutions where there were other Indigenous faculty, the Indigenous faculty were rarely in the same department. Two sub-themes were identified: Need for a critical mass of Indigenous faculty and Support faculty, but not decolonized Indigenous research.

Table 2. Themes.

Themes	Sub-themes
Theme 1: Being the Only Is Lonely	Need for a critical mass of Indigenous faculty Support faculty, but not decolonized Indigenized research
Theme 2: The Trauma of Academia	Glass cliff So many -isms
Theme 3: Many Hats—Tenure Track Does Not Allow for Balance	Differing definitions of success Burnout
Theme 4: There Are No Handbooks, so Mentors Are Critical	Having a good mentor is like having a superpower Lack of adequate mentors equates to lack of preparation for publication
Theme 5: Disconnect Between Indigenous Methods and Institution	IRB requirements do not align with co-creation Community-based work takes longer
Theme 6: Administration Needs to Own Their Role in Creating Space for Growth	
Theme 7: Change the Metric for Evaluation	

Sub-theme: Need for a critical mass of Indigenous faculty. Having a critical mass of Indigenous faculty was brought up by every participant. Even in Indigenous focused institutions, faculty felt that having more full-time Indigenous faculty would be beneficial not only in strengthening the focus on Indigenous issues, but also to spread the workload across a larger number of faculty. Many faculty expressed that they disliked how they were frequently called upon to provide the “Indigenous” perspective on topics and committees. These faculty also believed that if there were more Indigenous faculty it would be easier for them to focus on their dossier since the service burden would be shared across more faculty members.

The absence of similarly situated faculty meant that Indigenous faculty lacked adequate camaraderie in their departments and across the campus. Some wanted other Indigenous faculty so that they could collaborate on projects, while others simply wanted to share experiences and gain perspectives. This feeling was further enhanced during the COVID-19 pandemic where faculty did not return to campus and so were further isolated. One fairly new faculty member noted, “Here I’m in my second year of my tenure track position, and I haven’t even been to campus once, except to get my ID and meet with my Dean.” Since starting, only one person reached out to welcome them and help them adjust. They suspected that if there had been other faculty with similar research agendas they may have received more interest and compassion. Another faculty member who started around the same time noted that only two faculty members reached out when they started—the other Indigenous faculty member and a faculty member who worked on Indigenous issues. They recalled how difficult it was to adjust and that they were “stressed out” about not having enough publications for their first contract renewal, but they didn’t know how to meet people who they could collaborate with in their new institution.

On the contrary, a current administrator recalled that as a new faculty member they were seen as “an exotic” and often were overly engaged by curious faculty colleagues. Similarly, a mid-career faculty member bemoaned the “tokenism” that they experienced at their most recent institution. He recalled being recruited and paraded around, but when he tried to speak up about concerns at faculty meetings, the Chair began canceling the meetings, which he interpreted as an attempt to limit his voice. Several faculty said that they were sometimes kindly and sometimes aggressively told that they should limit their advocacy for Indigenous issues as it was “hurting them” or that they would be labeled “the angry Indian.” They felt that these things were experienced, in part, because they were the only Indigenous faculty and so were the only ones bringing up these issues. Several faculty noted

that they had to regroup and “find wholeness in [their] family.” Yet another faculty stated after their third year they realized that the “only way I was going to survive this was to lean in on my Indigenous values.”

One administrator summarized by stating that “it’s all about getting those [Indigenous faculty] numbers up.” To that end, they tried to use their authority to increase the number of Indigenous faculty by sitting on hiring committees and “paying attention to the details” such as writing position descriptions to include community engagement. Another administrator attempted to use their position to have “high level discussions” with other administrators educating them on the importance of having Indigenous perspectives represented in their departments.

Sub-theme: Support faculty, but not decolonized indigenized research. While some faculty experienced behavior that suggested that their presence was not desired, it was more common for faculty to be supported in their growth, but not their research. For example, some faculty experienced mentors pressuring them to change elements of their dissertation topic arguing that their topic would not be well received by general academia, such as one faculty member who shared that during their PhD candidacy a mentor “didn’t think my topic [] had any merit.” The mentor went on to say if she “want[ed] to be a star” she needed to study a different topic. In another instance, a faculty member was told as a PhD candidate that they were not doing “real science” because they were researching Indigenous ways of knowing. Another Indigenous faculty member was told by one of her colleagues that she was not teaching “real law” because she focused on Indigenous legal topics.

One faculty member who received significant support throughout their academic journey, admitted that they “did not know [Indigenous topics] were an option” for their dissertation. Instead, they worked on topics that their non-Indigenous mentors worked on. While they reflected that they did not believe they were pushed into the topics in any nefarious way, they also acknowledged that being educated in a highly Western context meant that their advisors were not well-versed in decolonized research.

Several Indigenous faculty received verbal encouragement and even funding to support their academic growth, but their specific research agenda was questioned. One faculty member said that people always seemed to want to fund Indigenous topics, but colleagues and administration often suggested or required that elements of these projects change. For example, specific interview questions were removed during the review process. In many instances colleagues, deans, and mentors were well-intentioned, but their advice served to disenfranchise their colleague and call their work into question.

Theme 2: The trauma of academia

The second theme, The Trauma of Academia, included two major sub-themes: Glass cliff and So many -isms. Although academia is already challenging, Indigenous faculty often face a compounding layer of trauma that they must endure and overcome. Whether explicit or implicit, many Indigenous faculty experience bias, racism, sexism, and lack of respect for their culture.

Sub-theme: Glass cliff. Glass cliff was a term that one Indigenous faculty member used to describe the tendency to place women and minorities in positions when conditions make it unlikely that they will be successful. He stated, the institution puts “Indigenous people, or minorities, or highly underrepresented individuals” into a position where it is “impossible for even [a] white person to do [the job] . . . they put ‘them’ there because they are gonna fail and drop off the cliff.” Other faculty members described the same phenomenon when discussing the unrealistic expectations in teaching, service, and publications. Others noted working through their off-duty period because that was the only time they could engage in research and writing.

Several faculty were hired into tenure-track positions in disciplines other than the area of their academic degree. In most cases, the disciplines were minimally related, but nonetheless created additional and unique challenges that, when coupled with a lack of appropriate mentors in that discipline, made the glass cliff terrifying. These Indigenous faculty members lacked support and guidance to understand the many unwritten rules of the new discipline. Unfortunately, in the end, the glass cliff may be too much for some Indigenous faculty members to overcome.

Sub-theme: So many -isms. Several faculty discussed struggling with intersectionality. These faculty felt impacted not just by a bias against Indigenous-focused topics, but also experienced sexism, racism, and discrimination based on sexual orientation. In one situation, financial and mentorship support was made available to female Indigenous students, but not to male students. This faculty member understood that when viewed through the lens of the White world women are underrepresented compared with men, but felt that Indigenous men in higher education needed additional support, too.

Another faculty member recounted some student evaluations appeared motivated by sexism as well as political outrage for a mandatory Indigenous focused course. For example, students wrote that the faculty member was “incompetent as a professor [and] as a person,” “hostile,” “mean,” and “not kind at all” without providing any details. She said that she didn’t want to be an “aunty” to these students. She attributed the “vitriol that is student evaluations” to the mandatory nature of the Indigenous course. As part of the course, the students learned about Indigenous ceremonies and several students were incensed with one commenting, “We shouldn’t be subjected to other people’s religions,” even though alternative assignments were provided for those who did not wish to engage. The result was that the faculty members’ contract renewal process was contentious. They later learned that other faculty were “concerned about my student evaluations and [] they wanted to put conditions on my renewal.” Having anticipated the evaluations being an issue, the faculty member spent a significant amount of time taking appropriate steps to not only improve their teaching, but also providing context and interpretation in her dossier for the renewal committee. The “emotional energy” expended led this individual to consider alternative professions.

Faculty members who have experienced trauma from their academic journey often need to find their own healing journey. When reflecting on their student evaluations, one faculty member decided they had to lean into their culture. They now

view those evaluations as more of a [] microcosm of the intersectionality that happens—like racism, sexism, things like that—and not as any sort of personal attack upon myself or as a failure to being able to teach.

Another faculty member shared that it took years of therapy for them to be able to read peer-review articles in their discipline without taking them back to the trauma they experienced in their PhD journey.

Unfortunately, some faculty experience a “toxic” environment in their Departments. These faculty were dismayed to find that “people are just in it for themselves” and that they wanted “clout and attention.” “I don’t like talking like that about my own people,” but some Indigenous faculty become “automatic experts” for the media. When speaking about non-Indigenous faculty, this faculty member said that “everyone wants to be Dances with Wolves,” yet “not everyone was cut out” to be an academic. Another Indigenous faculty noted that some “talented Indigenous scholars didn’t make it” and the one’s that did gain “control of a lot. [] They’re in control of programs. In control of publications. In control of knowledge.” He expressed concern that some Indigenous faculty were allowed to struggle by senior faculty while others had “everything handed to them,” leading him to question whether the tenure process was bias. With tenure comes a significant amount of power making an equitable process important.

Theme 3: Many hats—Tenure track does not allow for balance

The third theme, Many Hats—Tenure Track Does Not Allow For Balance, included two significant sub-themes: Differing definitions of success and burnout. Being in academia requires faculty to multi-task, function within multiple roles, and wear many hats, professionally and personally. All faculty are expected to meet specific research, teaching, and service quotas at their institutions, however, Indigenous faculty are often faced with the unique challenge of having a responsibility to their community as well. In these talk stories, most Indigenous scholars disclosed they struggled to balance their research with teaching and service to community.

Sub-theme: Differing definitions of success. Success is subjective and takes on many forms. One Indigenous faculty member stated, “The people who are the gatekeepers are selling and marketing a version of what success is . . . but I’m hearing a systematic story come along.” The gatekeepers in academia are typically non-Indigenous faculty and administrators who have manufactured a standard of what success looks like, which does not always match the Indigenous version. One faculty member explained that the

most recent [] Director was on a tenure track, but they weren’t counting a lot of what she did. They’re like, you have to publish in a peer-reviewed journal. It doesn’t matter that you’ve done some technical books and that you’ve done a lot of stuff with the communities, etc., so she left.

In academia, publications and peer-reviewed articles are measures of a successful faculty member. However, this form of measurement is largely a Western construct of success:

I don’t know if being peer-reviewed is valuable, it can be a very valuable experience, but the way that it’s done in such an impersonal manner, I don’t find it very useful at all, [] it’s not growth-oriented. Whenever I look at the promotion and tenure system, I’m just like, you know, there is no growth objective here.

For several Indigenous scholars, the need and desire to learn and grow was ever-present.

Indigenous faculty seem to agree on one key element of what constitutes a successful faculty member. As one faculty member shared, “All my greater emphasis is on making an impact at the community level, versus making an impact at the university level.” This faculty member said that if they “don’t want to promote me to tenure in the end, then, you know, I’m fine with that because I think my greater concern is for the community than it is for the university.” This is a prime example of the difference between Indigenous and non-Indigenous Western views of success. Indigenous views, values, beliefs, teachings, and practices are not individualistic; Indigenous values focus on the collective.

On the contrary, many Indigenous faculty felt a deep responsibility to students, as well. Many participants reported a desire to teach and pass down their knowledge to their students. Indigenous faculty members stated they wanted to focus and prioritize Indigenous pedagogy and practices for their students. For example, one Indigenous faculty member stated,

I try to show them that participation isn’t just what you say in class. Participation in the topic is immersive and it [] feeds more into what I believe is Indigenous pedagogy.” This faculty noted that their focus on teaching “definitely detracts from my ability to have time for research.

Indigenous faculty are often forced to teach specific classes. For example, for several they were the only Indigenous faculty in their department and taught all of the “Indigenous” courses. Another Indigenous faculty member said, “There’s only four tenure track math faculty for 3,000 students, [and] I’m the only one that’s ever taught the upper-level classes.” At the same time, Indigenous

faculty members are also starting new and groundbreaking Indigenous courses, which are the first of their kind. These faculty are responsible for not only teaching the course, but developing the curriculum as well. Indigenous faculty, then, become role models to Indigenous students especially in disciplines that have few Indigenous faculty leading one faculty member to say, “I’m like the face of Indigenous mathematicians, [] so I’m being asked in the mathematical community to be [] a representative of Indigenous people,” and it’s “kinda hard to turn down because this could really impact [] students.”

Indigenous faculty members recognize the importance of mentorship to doctoral students. For example, one Indigenous administrator said,

I actually always have a dissertation student that I’m working with, so I’m working with two right now because that’s the core of what we do, that whole learning and discovery and exploration, and then watching someone that you care so much about just blow the roof up. You know and just go and do really good work. [] That’s what fighting to stay in the institution has meant to me.

Indigenous faculty see the importance of supporting other Indigenous students and how supportive mentorship can shape the future of Indigenous research and teachings.

Sub-theme: Burnout. Positions in academia involve wearing many hats from teaching to research to mentorship to administration. Handling this unrealistic expectation on a daily basis leads Indigenous faculty members to burnout. One Indigenous administrator expressed, “[Indigenous] faculty [] were really just overwhelmed and didn’t have the support they needed [] to be successful.” In addition, Indigenous faculty members feel pressure from their institutions and indirect pressure from the Indigenous community. Because there are limited Indigenous faculty members in academia, they field numerous requests to present and participate in projects. Understanding the privilege that they hold, these requests are difficult to decline, however, this type of “community service is not rewarded in the tenure process.”

Depending on whether the faculty hold positions at research-focused or teaching-focused institutions, the percentage of time a faculty member devotes to research versus teaching differs. While the number of publications required to be granted tenure varies, each type of academic institution requires faculty to publish in peer-reviewed journals to achieve tenure. One Indigenous faculty member stated,

I think the bar, of that glass ceiling, is too high . . . it is unrealistic. We only have 24 hours in a day, so many hours in a week, so many hours in a year. Really one publication a year is all you need to do, [but] we do not have that much time when we teach so much.

Some Indigenous faculty members may also be expected to provide formal or informal administrative support. For example, one Indigenous faculty member reported a high turnover rate at their institution because of the unmanageable workload and unrealistic expectations. When discussing her positions she stated, “it’s an academic appointment, so you are supposed to run a center and go through the tenure process, and teach, and do all that other stuff.” Another faculty shared that at their institution they were expected to do all of their grant management and administration like accounting and human resources paperwork, which meant that faculty were expected to learn all of those policies on top of the research and teaching policies.

The compounding layers of pressure weighed heavily on these Indigenous faculty members and resulted in physical and emotional drain. This led one Indigenous faculty member to disclose to her Chair that, “I’m too burnt out to apply for another job, so I’m gonna stay here for the rest of the semester, but I hate this.” This type of pressure can also lead to resignation. This same faculty member noted that the pressures were so immense at her institution that many Indigenous faculty were leaving

feeling that they lacked support, especially in the face of systemic racism. She noted that “It feels like I’m in a forest fire and all the smarter animals have already left.” Without support from their institution and sufficient mentorship, this pressure can quickly lead to burnout, decreased productivity, and ultimately leaving academia altogether. Wearing many hats creates an imbalance and an insurmountable pressure, which can lead to stress and burnout.

Theme 4: There are no handbooks, so mentors are critical

Mentorship was a strong theme that all participants discussed. Mentorship played a critical role in the success of Indigenous faculty, however, even those with strong mentors felt underprepared when entering academia. Having a good mentor was perceived as having a superpower, while lacking good mentorship was often equated to being ill-prepared for tenure, especially in relation to the publishing requirements.

Sub-theme: Having a good mentor is like having a superpower. Whether or not an Indigenous faculty member had access to a strong mentor played a critical role in their career trajectory. One faculty member noted that it was their mentor that “walked me back from the ledge” when they were in graduate school and thought they “weren’t cut out for this” and were “admitted by error.” Especially in the sciences, students gain critical research experience through mentorship by faculty in labs and other clinical settings. Students who are unable to meet the criteria to participate due to minimum grade point average requirements or because of family obligations leave their programs with an abridged understanding of the research process. Whereas another faculty member recounted that, all of their publications prior to being hired in a tenure-track position were because their mentor invited them to join in on projects.

Mentors also played a critical role in the ability of junior faculty to navigate the tenure process. In one instance, an administrator provided significant mentorship on how to navigate the politics of the institution highlighting the value of diverse mentorship. That same administrator noted, however, that it is critical for faculty to have at least one champion in their department since they are the ones that review the tenure application. Having “some type of coaching system embedded in the process” would be beneficial. This individual expressed the idea that coaching was “our [Indigenous] competitive advantage. We had thousands of years of history . . . that pre-date Western civilization” and coaching should be everywhere. “It is an Indigenous system.” When mentors were not available, some Indigenous faculty gained experiences in minority focused graduate research programs.

Finally, a strong mentor helps Indigenous faculty “find their voice.” Most Indigenous faculty expressed frustration early in their careers not being able to do the research that they wanted. One faculty recalled being afraid to tell his research mentor that he wanted to shift from being more research focused to teaching more, but “it was something he realized in me before I realized it.” Another faculty member said that their mentor told them, “You are going to make a difference in this field, but you have to stop being us; and you need to start being you.” This type of individual-focused mentoring is important for Indigenous faculty and must start early on one’s academic journey.

Sub-theme: Lack of adequate mentors equates to lack of preparation for publication. The last sub-theme identified was that lack of adequate mentors equates to lack of preparation for publication. “I wasn’t properly mentored,” “I need a mentor,” and similar phrases appeared through many of the talk story sessions. These Indigenous faculty members felt lost, confused, and ill-prepared for academia. This was especially noticeable as early faculty began independently conducting their own research for publication. “I need a mentor that’s above me—that I can talk to. I still can’t publish. My barriers: I can’t publish because I don’t know what my research field is,” stated one Indigenous faculty member who was teaching in a discipline related to his degree.

Indigenous faculty members also highlighted the need for collaboration among all Indigenous researchers and scholars. For example, one faculty member stated, “I think we need to come together and not have these cliques. And, like, why are only certain people asked to write.” This same Indigenous faculty member stated further how research is privileged, even for him. He says, “I don’t know where I can publish, and I’m trying to find where I can publish.” Another faculty member noted that there were “two groups of Indigenous faculty” at their campus and they worried about upsetting one of the groups to the detriment of their tenure application. They did not want to “burn bridges” by engaging in certain research topics or making certain conclusions, which may anger one of the groups. Implicit in these comments is a desire for a supportive near peer research community that is not always present due to internal conflicts.

Even Indigenous faculty who receive grant funding with an assigned mentor, sometimes still experience challenges. For example, one Indigenous faculty member stated, “I was supposed to have a mentor as part of this national grant that I’m part of, but that other person is just too busy.” This scholar said that they spent a lot of time “trying to get some research support, and trying to find out, like how do I do this? What do I do?” Another faculty echoed this by stating that their grant supported mentor does a good job of explaining things to me, but felt that they “need[ed] a mentor who will walk alongside me.” Even Indigenous faculty that appear to be successful and are getting funded still desire stronger mentorship.

Theme 5: Disconnect between Indigenous methods and institution

Another strong theme that emerged related to the unique challenges of conducting community engaged research using Indigenous methods. Specifically, Indigenous epistemology calls for the co-creation of a research project from the development of the initial research questions to the dissemination of research with the Indigenous community. To varying degrees the faculty that engaged in this type of work experienced challenges navigating the Western research focused bureaucracies.

Sub-theme: IRB requirements do not align with co-creation. One troubling sub-theme was that many Indigenous faculty encountered seemingly unnecessary bureaucratic challenges to conducting their research. A recurrent topic of discussion was the Institutional Review Board (IRB) or Research Ethics Office policies. Although these faculty suggested that the processes did not align with their chosen methodology, none suggested that these checks should not exist. Rather, participants shared the sentiment that the IRB process was overly cumbersome for those who wanted to engage the community in research. At one institution, anyone who engages with research participants or reviews the collected data must receive two multi-hour long online ethics training, which poses a substantial burden to the community collaborators and often delays the research timeline. No trainings were offered that were geared toward collaborators rather than principal investigators.

One faculty shared that their university had “done some not-so-good things in the past and [] now the Research office was incredibly stringent.” The Indigenous faculty member described the process of drafting an autobiographical reflective article where the Research Office determined that she, as author, was a vulnerable participant, triggering the need for additional steps, including an advisory committee, to ensure there was no coercion. The same faculty member expressed discontent that Indigenous elders and participants were automatically considered “vulnerable.” They noted that as an Indigenous researcher “elders, ceremonial keepers, and current and former leaders hold more of the power vis-a-vis ‘me,’ the institution, than anyone else.” Nonetheless, the past actions of other researchers with Indigenous communities have created systems that erect barriers for faculty.

Several faculty noted the timing of IRB approval for grants did not always align with the flow of Indigenous research. One stated that “when we put our grants forward, we have to have our research questions ready,” but what “if I wanted to work with [the Indigenous community] to find [the] research

questions.” This participant noted that the requirement to have a fully formed research project in place to apply for grant funding proved challenging. Another faculty member agreed, adding that community partners are often not invested in the details until funding is secured. As a result, the faculty member had to create a “strawman protocol” and then go through multiple modifications once funding was secured.

Finally, faculty noted that IRBs push for a structured list of interview questions, which is off-putting to many Indigenous participants who prefer to let the conversation “just flow.” The expectation of using structured or semi-structured methods also impedes the use of more Indigenous “conversational” or “talk story” method of inquiry. Similarly, faculty felt as if they were being asked to unnaturally remove their voice from their work. As one faculty member put it, “we cannot remove ourselves from our work . . . and why would we want to” highlighting how the IRB process conflicted with Indigenous understandings of what constituted good research. These types of challenges feed into the second connected sub-theme that community engaged research takes longer.

Sub-theme: Community-based work takes longer. Most of the Indigenous faculty we talked with collaborated with the Indigenous community as part of their research, however, many noted that community engaged research models take longer to execute. One faculty, when describing the additional steps to conduct community engaged research, noted that “the same hands-on process happens at every stage of the research project, including getting approval to publish.” As a result, another faculty mentioned that during the tenure review process they spent a significant amount of time explaining to potential reviewers that their methodology was time intensive in order to justify the relatively few publications they had. In many cases, it takes years of steady work to build the relationships needed to engage in truly collaborative projects.

Several faculty members who are also cultural practitioners reinforced the belief that working with Indigenous communities means that we need to honor their values. One faculty member summed this up by saying that you have to ask “is it your place to do [the work]?” especially when it comes to “decisions on research topics and whether to publish.” Another stated that they hoped to work in cultural revitalization and learn their community’s traditional speeches for special events and ceremonies, yet they also acknowledged that they needed to consult tribal leaders to determine “whether it’s appropriate or not for the greater audience of academia or wherever.” Clearly, these types of internal discussions have an impact on a pre-tenure faculty member’s decision as to what research projects to engage in. As one faculty member put it, “I have my pre-tenure research agenda and then I have my post-tenure research agenda. My pre-tenure research agenda will, hopefully, get me tenure, but my post-tenure agenda is what sets my soul on fire.” This sentiment was echoed by many.

The challenge of creating a research agenda that is tenurable was noted by other faculty who said they “still don’t really know how to [create a research agenda].” Despite feeling overwhelmed with all the requirements of tenure-track positions, another faculty member felt obliged to agree to co-author certain articles to meet their annual publication requirements. As a result, they felt pulled in many different directions, some of which “they really weren’t that interested in.” Those other projects “took time away from what they wanted to work on,” but they needed a safety net of sorts for their dossier.

Theme 6: Administration needs to own their role in creating space for growth

One theme that more seasoned faculty and administrators noted was the important role that administrators play in creating an environment that supports Indigenous faculty and Indigenous students. When commenting on the role of administration in creating a supportive environment for all faculty, one administrator noted, “the administration needs to own it. They are part of the problem if

they are not tackling it head on.” While they suggested that it was important to have Indigenous administrators, they also noted that it was equally important to nurture allies at the administrative level. One administrator suggested that all Indigenous faculty should attempt to “develop a relationship with [non-Indigenous] faculty” in order to “demystify” the Indigenous issues and values.

Few Indigenous faculty reach the level of an administrator, and those that do, often face a difficult and lonely battle. Indigenous faculty expect a lot from Indigenous administrators. Several administrators and faculty recounted Indigenous administrators faltering under the weight of pressure. Some administrators entered into these positions hoping to make change, but found that the institutions were firm and change could only be incremental. While Indigenous faculty noted how important it is to see Indigenous faculty farther along in their careers providing a pathway and goal to aspire to, they were also quick to criticize those same people. Without releasing the high expectations, several faculty and administrators suggested that more support was needed for these emerging leaders.

Theme 7: Change the metric for evaluation

A final recurrent theme that Indigenous faculty members shared is the desire to reform the tenure process to include additional metrics for evaluating an Indigenous faculty member’s true potential. One administrator suggested that “the whole publish or perish perspective has been somewhat skewed.” They suggested that those who created the definitions used in tenure may “not be progressive enough to really understand what scholarship and research can be and the usefulness of it.” They bemoaned the rule bound tenure process’ attempt to create an “objective measurement process,” which they saw as “hinder[ing] your capacity to do imaginative work” and “wonder in public.” In attempting to be even-handed, tenure has turned impersonal and not “growth oriented.”

Other faculty members focused on what counted toward publications in the tenure process. Several faculty took issue with the requirement that publications be peer-reviewed where the peer was another PhD. The Western concept of peer-review does not encompass publications for the community. However, these faculty saw the Indigenous community as their peers and felt that scholarly work done for them such as creating language curriculum, reports, or analyses should count as peer-reviewed. Another faculty suggested that Indigenous honors such as “blanketing” should receive the same level of recognition as more traditional academic rewards. On the contrary, one faculty opined that even if the criteria changed the tenure process still consists of largely “non-Indigenous faculty judging Indigenous faculty and interpreting what counts for tenure.” The interrelated nature of these themes can be seen when imaging potential solutions.

Specific improvements

Participants were asked whether and how they would like the tenure process to be reformed to allow for greater Indigenous research sovereignty. All of the participants expressed gratitude for their positions recognizing that tenure-track positions are increasingly rare. Most expressly stated that they feel privileged to be able to do this work at their institutions. Nonetheless, room for improvement was identified. One faculty member when reflecting on their journey, said

it was not easy [] for Indigenous faculty to get promoted and to get time tenure . . . and one of the reasons it was not easy was that no one really took the time to map it out.

Although many other faculty also discussed the importance of clarity in the tenure process, what constituted clarity varied. One faculty expressed pleasure that their institution clearly listed the number of peer-reviewed publications required to obtain tenure while another wanted written confirmation that certain research activities, which were orally supported by the department would also be supported by

the tenure review committee. These suggestions grew out of concerns related to the uncertainty surrounding whether that faculty member's research agenda aligned with the tenure criteria.

Several participants suggested that mentorship programs be continued and expanded, especially faculty mentorship programs for new and junior faculty. One faculty member stated that they would like to see mentorship programs that pair junior and senior faculty to conduct research together in order to gain "publication experience." They felt that this type of partnership would support junior faculty who may not have had strong mentors or were unable to take advantage of research opportunities in graduate programs due to family obligations. Other faculty members simply suggested that federal funds continue to be placed into programs that provide opportunities for underrepresented students.

Finally, quite a few faculty members suggested that academic institutions should reconsider peer-review as the "gold standard" of publication. The concept of peer-review is to ensure a certain quality of work, yet many Indigenous faculty find themselves torn between meeting Western standards as well as the standards of their Indigenous community. Several faculty members suggested that they "choose to focus on community" indicating that their loyalties were toward using their positions to support the community. This suggests that these faculty members held a different concept of who they considered a "peer," and leads to the conclusion that the narrow definition of peer-reviewed applied in the tenure process is misaligned with Indigenous values.

Discussion

Although we are seeing more Indigenous scholars being hired into tenure track positions, they still face unique challenges. Our findings are consistent with other studies that have queried Indigenous faculty regarding the challenges they experience (Galloway et al., 2020; Henry, 2012; Kennedy et al., 2020; Mohamed and Beagan, 2019). Issues related to the emotional burden of being the representative of their community, having to take on additional service, and struggling with the competing interests of service and teaching in relation to time for research and publication. Most notably, the inflexible tenure process hampers the ability of Indigenous faculty to engage in the type of research that they want to engage in. This not only impacts Indigenous faculty, but also Indigenous communities as Indigenous faculty make conscious decisions not to take on as many projects that rely on community engaged methods due to tenure pressures.

Although we anticipated that faculty would make the connection between service to community and publication, we did not anticipate that so many faculty would experience institutional barriers in conducting community engaged research and the impact it would have on their tenure timeline. It is widely accepted that community engaged work takes more time. To do this work correctly requires the building of relationships over time that often occurs outside of official work hours. However, overly complicated institutional policies meant to be protective have also served to hinder Indigenous faculty from engaging with the community, especially their own communities, in the ways that they hoped. This created a chilling effect on some junior faculty who recognize that if they are to achieve tenure, they cannot rest their entire dossier on this type of work. Alternatively, other junior faculty have decided that their principles are more important and acknowledge that this may put them in a more vulnerable position when it comes time to go up for tenure.

Another important finding was the different axiology that Indigenous faculty tended to express in relation to students. Well-intentioned senior faculty seem to acknowledge that to be excellent in teaching, service, and research is nearly impossible and suggest that junior faculty focus on research, which is critical to one's dossier. However, this seems to create an ethical dilemma for many Indigenous faculty who felt it was inappropriate to focus on research at the expense of teaching and mentoring students. Regardless of the reason, even Indigenous faculty who acknowledge that one cannot focus on all three elements have difficulty letting teaching fall to the wayside.

The overarching takeaway from this work is that Indigenous values diverge from the traditional tenure process. Because of the relationality that is embedded in conducting research with Indigenous communities, Indigenous faculty are caught trying to balance the opposing forces of publishing and community engagement. While individual Indigenous faculty deal with this conflict in different ways, they all discussed needing to navigate between these opposing forces. Academic institutions, in turn, need to understand the unique challenges that Indigenous faculty face and adjust to policies, procedures, and values to create truly open institutions. In particular, academic institutions need to continue to fund and encourage the expansion of mentorship programs that support underrepresented minorities, especially Indigenous students and junior faculty. These programs were instrumental in the pathways of many of the participants. Creating ways to incentivize shared research should be encouraged.

Ultimately, Indigenous communities are suffering from the narrow view that academic institutions are taking toward what constitutes “peer-reviewed publication.” When Indigenous faculty must choose between doing needed community work and getting the right number of publications, they either do less community work or they run the risk of not getting tenure and, thus, not being able to continue the work in the future. Thus, the issue of tenure in the academy impacts more than just individual Indigenous faculty, it diminishes the amount of support that Indigenous faculty can provide to Indigenous communities.

Academic institutions should do more than merely state their desire to hire more Indigenous faculty and take meaningful steps to accomplish this goal. From promoting policies that require Indigenous representation on hiring committees to adding community relationships as a desirable qualification, these steps honor the commitment that Indigenous candidates have to not only the institution, but also the larger community. Once a critical mass of Indigenous faculty are present there will be more opportunities to expand the concept of “peer” to include community and acknowledge community work as a criteria for tenure. If the goal is to create an academy that honors all, the institution must make modifications to the conceptualization of research and create space for new ways of engaging in and creating knowledge.

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You can't just bring people here and then not feed them: A case in support of Indigenous-led training environments

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Abstract

By and large, academic research in geography has advanced the colonial project, and been synonymous with extractive and reductionist research practices that subjugate Indigenous people. To counteract these harmful impacts and produce research that supports the needs of communities, advancing Indigenous sovereignty over research is vital. By presenting a case study of an Indigenous research space at a Canadian University, we argue that Indigenous training environments are more than a shared, physical space; they provide essential emotive and relational spaces of collaborative learning, wherein trainees practice relationship-building, reciprocity, and accountability. This article argues that decolonizing academic spaces dedicated to Indigenous geographic research will be essential to meeting the ethical imperative of Indigenous control over knowledge production. There is a current deficit of culturally appropriate spaces that support both the whole person and their learning. We highlight the impact of Indigenous training environments in nurturing respectful, long-standing relationships with peers, community, and research partners; a critical element of Indigenous geographies, yet one of the most challenging aspects of upholding meaningful and decolonizing research. By drawing on our diverse perspectives and research projects, we reflect on how an Indigenous-led training environment, rooted in Indigenous ways of knowing, can contribute to relational accountability both within and outside of these spaces. As more communities assert their authority over these processes, the need for respectful research grows, and it is anticipated that this article will provide a useful guide and support for emerging Indigenous training environments.

Keywords

Indigenous health, training environments, decolonizing, relational, Indigenous health geographies

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The things that I really think are important about bringing people together, offering space for people to come in and do the things that they have to do and be together—it's critical. And if you can share food and laugh about stuff and have a place of belonging, those are really important things. (Chantelle Richmond, 8 February 2022)

Introduction

The buzz to write this article started in the fall of 2021, at a regular meeting of the Indigenous Health Lab (Lab), where meeting face-to-face, albeit socially distanced, had come to be an exciting and rare occurrence as we navigated through the restrictions with each wave of COVID-19. Because we were meeting in person, lunch had been ordered, and we had arranged our chairs to be 2 meters apart, centered around our meeting table, with a laptop to zoom-in students who lived remotely. It was common to have shared food or drink when we met in person, as it served to nourish our physical bodies, as much as the gathering together served to nourish us socially, emotionally, mentally, and spiritually. In relation to the title of this article, a cultural understanding of bringing people together “in a good way” has roots across many worldviews and cultures and in this article, it serves as a metaphor for the Lab itself, and how the levels of support go beyond meeting academic goals, and mirror those needs that must be nourished to create this type of specialized training environment. These gatherings also helped to break through the isolation of graduate studies, and the stress of balancing coursework, TA-ship, thesis work, and research requirements. At our meeting, the energy was high, and despite our physical distance from one another, and the barrier created through our masks, we rejoiced at the fact that we were together once again, after what had felt like an eternity of isolation. Our graduate experiences over the past 2 years had been relegated to working remotely, from our homes, and meeting virtually through digital platforms. At this meeting, we heard there was to be a Special Issue in the geography publication *Environment and Planning F*, and that the focus was to be on Indigenous Research Sovereignty, centering relational approaches to research! This was exciting news because it felt so aligned with the work of the Lab, and as we started to talk about ideas for articles, the Lab's Director started to write down ideas on the white board. There were ideas coming from individual scholars related to their research efforts, and then there were a couple of ideas for collaborative pieces—including this piece, which grew out of a collective desire to document our experiences in the Lab. We felt inspired to write this piece because we felt grateful to be part of this Lab, and noticed a sizable gap in literature around Indigenous health training environments, at least from the perspectives of graduate students. From this initial discussion, five trainees from the Lab came together to present a case study of an Indigenous-led training environment at a Canadian University.

Our reflections center the collective view that Indigenous training environments are more than a shared, physical space; these environments center Indigenous worldviews, Ways of Knowing and Doing, values, and priorities in both the work taking place and in building capacity for trainees within the academy. In this article, we describe how the Lab is an essential emotive and relational space of collaborative learning, wherein trainees practice relationship-building, reciprocity, and responsibility for decolonizing research practices required to meet the ethical imperative of Indigenous research sovereignty over knowledge production. Through our individual and shared experiences, we highlight the impact of Indigenous training environments in nurturing respectful, long-standing relationships with peers, community, and research partners.

Who we are

In the geographies of Indigenous health, it has become common practice to describe oneself and their relationship to the research they are undertaking as one's positionality. From a research perspective,

there is often mention of one's epistemology, ontology, and axiology, as they impact chosen methods and influence the research relationships themselves. We believe it is critical to position oneself as it authenticates the perspectives drawn on in authoring this article, and also articulates *why* we must position ourselves. To position oneself is to enact a relational accountability, to oneself, to community, to the Ancestors before us, and to future generations who will come after us. Reflecting on positionality is a cognition of one's human, environmental and spiritual relationships, values, ethics, history, culture, biases, relationships, strengths, weaknesses, and so on, and is not static; by taking the time to locate ourselves, we invite you, as the reader, to enter into a respectful relationship with us (Kovach, 2021; Wilson, 2008).

As five co-authors, hereafter referred to as "we," the content and perspectives for this publication are both personal and practical. Though we come with diverse and varied life experiences, we have come to co-locate ourselves within the Lab. Collectively connected through decolonial approaches, our research projects span across varied, spatially-oriented Indigenous health geographies, connected through concepts of Indigenous health, the environment and well-being, emphasizing Indigenous community self-determination. In meeting weekly and bi-weekly for 3 months, we self-identified our own roles and responsibilities in this writing process. The first author self-identifies as an Indigenous woman (she/her) of mixed Nehiyaw–Métis and European ancestry, an Indigenous adoptee and Sixties Scoop survivor raised in large, urban areas. She has reclaimed identity through teachings, education, ceremony, and learning from Elders. As a former Indigenous health leader, she draws from her own observations and experiences within healthcare systems. The first author is in her final year of training as a PhD Candidate.

The second author is a settler woman (she/her) of Hungarian, Ukrainian, English, and Scottish ancestry. She is grounded within her roles as a daughter, granddaughter, sister, fiancé, and aunt. Her deep love for the environment, experience working in the field of environmental restoration, and education in regenerative ways of organizing have drawn her to pursue a graduate doctoral degree in Geography and Environment under the supervision of Dr. Chantelle Richmond. She is in her first year of the PhD program.

The third author (she/her) is Kanyen'kehá:ka—Yakohskaré:wake né:ne Ohswekén':en (Mohawk—Bear Clan from Six Nations of the Grand River). She is a second-year master's student and one of the newer members to the Lab. She describes her positionality as rooted in Haudenosaunee worldview and teachings. Her scholarship is shaped through growing up on reserve and witnessing the myriad of social injustices experienced and persevered by her nation. Her role in this article has been in contributing reflections, and as an editor.

The fourth author is a settler of Polish ancestry (she/her), and is a daughter, sister, sister-in-law, niece, dog-mom, and aunt. She is a second-year MA student who describes herself as naturally curious, open minded, and willing to learn. She has contributed as a writer, reviewer, transcript editor, and figure developer. The fifth author (she/her) is a Jewish settler scholar in the final year of her PhD program. As a new mother, her role in this publication has been to support the team as a sounding board throughout the process.

In co-authoring this piece, we share our perspectives on the Lab as a way of honoring our gratitude in belonging to this unique training environment; we believe it has propelled significant personal and professional growth in us all, and has enabled us to engage in respectful research and relationships. The reflections shared by the co-authors have been voluntary and are not meant to be inclusive of all voices within the Indigenous Health Lab (IHL), past and present. Rather, this article offers a snapshot of current experiences, observations, and questions on how a training environment helps to shape us as critical, Indigenous and allied scholars within the discipline of geography. We would like to recognize the immense and generous support and leadership of Dr. Chantelle Richmond, IHL Director, and Katie Big-Canoe, IHL Coordinator, who make the Lab the supportive environment that it is.

Situating the IHL: Room 3107, a room for the “whole-self”

At first glance, the IHL may look similar to other academic workspaces—dedicated desks for graduate students, a computer, printer, and various office supplies. However, once inside the Lab, you are welcomed by the comforting fragrance of Wiingashk (Sweetgrass—one of four sacred medicines), photos from students’ community-based research projects and retreats, and a multitude of Indigenous art. The placement of a large table in the center of the room invites collaboration, creativity, and conversation. Lab trainees and mentor gather around this table for weekly meetings to discuss individual and shared research work but also to share meals and crafting sessions, often inviting peers from beyond our research team to take part in these social activities. The Lab is an intentional training environment nourishing the social, mental, emotional, spiritual, and cultural needs of our students.

The mission of the Lab was derived from a desire to cultivate and contribute to Indigenous knowledge production in the areas of Indigenous health, well-being and the environment. Over time, the values of Lab have evolved through experience in knowing “how to do the work” respectfully and responsibly, honoring community self-determination, practicing reciprocity, and drawing on traditional teachings and Anishinabe principles of being a good relative. As a research lab and training environment, the purpose of the Lab is not only to fulfill the social need for belonging, it also bring Indigenous critical scholarship methodologies into focus, propelling students to learn deeply about the geographies of Indigenous health, with a deliberate focus on how to conduct Indigenous health research “in community-centered approaches [and] led by ethically responsive methods” (Richmond, 2016: 153).

Methodology

It is through the application of this Vision Wheel approach (see Figure 1), that we have been able to draw out connections of our individual and collective roles, responsibilities, and values enshrined in our “reality” as trainees and scholars within the Lab context. Given the focus on Indigenous research sovereignty, it is necessary to center Indigenous voice in this article; therefore, we note the lead author of this article is an Indigenous scholar, and it is through this location and lens that the methodology was derived, building on her identification as a Cree–Métis woman, who has adapted teachings through her cultural lens. The Vision Wheel exemplifies these teachings, building on the wholistic, interconnected facets of the Medicine Wheel (Elder Mary Lee, Nehiyawak) (Lee, 2012).

This article privileges Indigenous Ways of Knowing through the relational practices and values in how knowing, learning, and research is referenced. Explicitly, an Indigenous framework (the Vision Wheel) and Indigenous methods (storytelling and a sharing circle) were used to draw out and organize the reflections and storytelling from the students’ perspectives, and in establishing the flow and format for this article.

The four main sections comprising the body of this article are organized based on the architecture of the four quadrants of the Vision Wheel: Vision—how we “see it;” Relationship—how we “relate to it;” Knowledge—how we “figure it out;” and Action—how we “do it.” While we have found a sense of unity in voice, we also recognize the value and need to distinguish among the Indigenous and allied scholars’ voices in this article and have noted this where applicable.

In applying the Vision Wheel to frame the article, we are honoring the context in which knowledge was shared during the Sharing Circle, serving to support the order and content of the questions (see Figure 2). Sharing Circles are classified as a qualitative method as they do not require the collection of numerical data and are often related to the Western concept of focus groups. However, Sharing Circles differ from the focus group approach as the process goes beyond gaining knowledge through

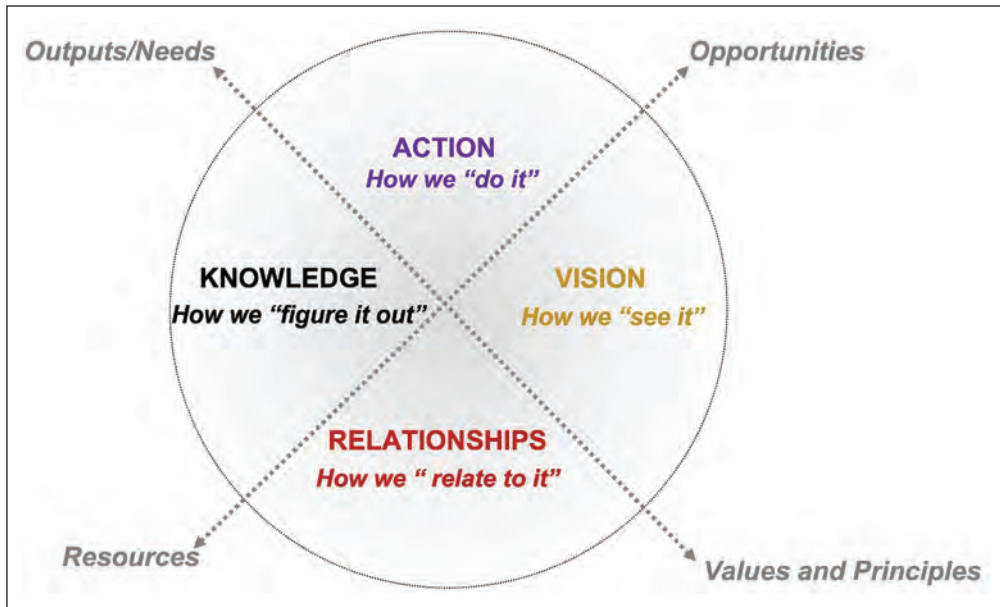


Figure 1. Vision Wheel process.

discussion and relates to the relationships that are formed during this process of ceremony (Graham and Martin, 2016; Hunt and Young, 2021). In this mode of inquiry, participants are engaged in “the gathering of stories, exploring lived experiences and in existential phenomenological inquiry or narrative research, which consists of a range of methods, including ethno-biography, analyzing biographies, and narrative interviewing” (Lavallée, 2009: 28). A Sharing Circle involves situating the group itself in a circle, even virtually, and carries sacred significance within many Indigenous worldviews (Archibald, 2008; Wilson, 2008).

In addition, within this circle, the knowledges that surface are done so using a “healing method” that draws from a spiritual base, and it is through this process of connection that the facilitator is given permission to report on the discussions. The concept of maintaining unity of information, regardless of placement, is central to this methodology, with the inherent desire to demonstrate a connected derivation of knowledge without hierarchy. There is an important rationale for employing an Indigenous conceptual framework for research as it upholds an Indigenous positioning in the research itself, beyond the specific methodologies.

Our reflections are shared following the design and movement of Figure 1, starting with the first quadrant “Vision,” located in the eastern direction. Based on our methodology, we have organized the body of the article in keeping with the following sections, as depicted through the Vision Wheel:

1. Our “Vision” of how we view our roles and responsibilities as Indigenous and allied scholars located within the IHL and how this relates to our purpose in advancing Indigenous research sovereignty efforts;
 - The origins of the Indigenous Health Lab;
 - The values and principles we have learned and practice through the Lab and how this influences our research relationships both within and outside of the training environment;
 - Learning and practicing decolonizing, geographic health research: why this matters.

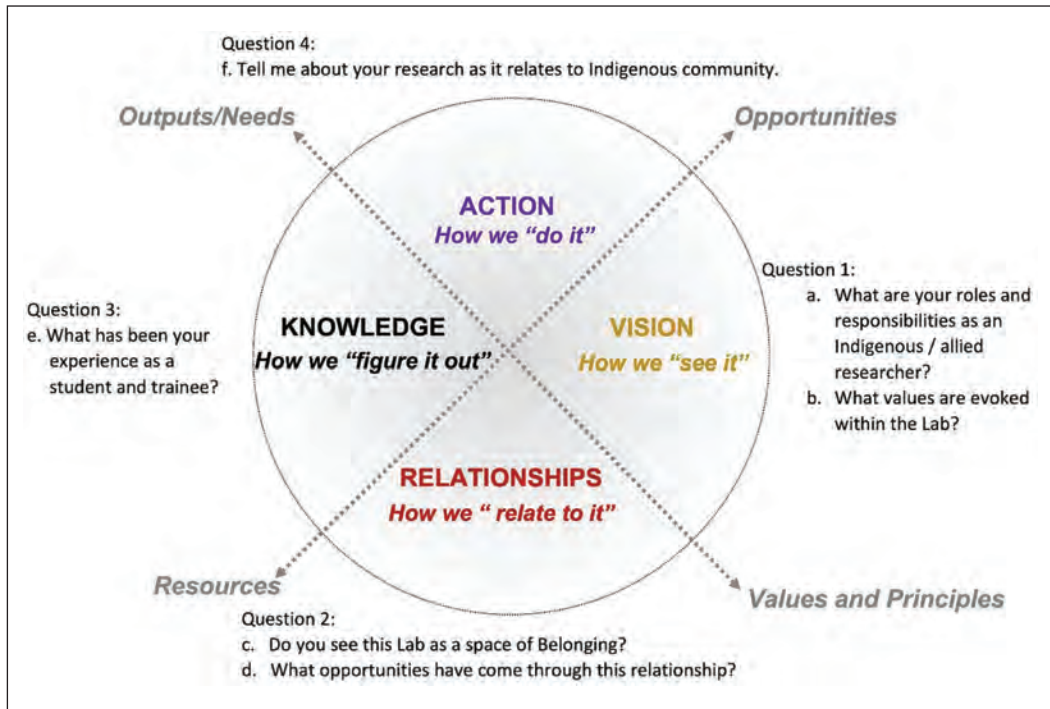


Figure 2. Vision Wheel process including guiding questions of the Sharing Circle.

2. The “Relationships” that we have cultivated through the Lab, and how these relationships serve to support relational approaches and relational accountability;
 - How we navigate through colonial tensions.
3. We share the “Knowledge” of how we “figure it out” by offering examples from our own research projects, centering Indigenous and community knowledge and reflecting on how we have come to practice research “in a good way.”
 - Examples of Knowledge—our research;
 - Enacting Indigenous knowledges and worldviews;
 - Opportunities and Challenges.
4. In the Discussion, we spotlight key learnings, questions, and recommend future opportunities for “Action”—how we “do it,” resulting from our own analysis of these tensions and opportunities.

As students, we recognize the challenges inherent in collaborating, being vulnerable, and sharing about our own journeys and experiences with the Lab, while in the midst of this journey. We believe our ability to share and work positively together was strengthened through this Indigenous, relational framework. Relational work is complex and brings out both opportunities resulting from “unity of environment,” as well as tensions associated with carrying out decolonizing work within colonial environments.

The origins of the Indigenous Health Lab

In discussion with Dr. Richmond, we realized the roots of the Lab extend much deeper than its physical manifestation; this space was purposeful, rooted in principles of relationality and designed

with a desire to redress the shortcomings experienced in their own pathway to becoming an Indigenous health scholar. Access to appropriate spaces was a central theme throughout Dr. Richmond's training, where they recognized how fulfilling it was to have space that was Indigenous-led, nurtured belonging and celebrated Indigenous identity. Though social and cultural connections were important, an additional rigor in training was needed to redress struggles encountered "when attempting to bridge these powerful practices within the wider university context, where the same openness to Indigenized ways of learning and doing has not been similarly embraced" (Richmond, 2020).

Vision: How we "see it"

Indigenous Ways of Knowing and Doing are central to the mission of the IHL and mirror the relational values so crucial in meeting the moral and ethical imperatives of Indigenous sovereignty in research. Drawing from the Vision Wheel framework and asserting both our individual views on how we "see ourselves" (as Indigenous and allied researchers and scholars) within the Lab, we present our narrative of what we are calling "Vision:" why we do what we do, what problem it addresses. Specific views on individual roles and responsibilities between the Indigenous and allied scholars across this vision are defined here.

All scholars' vision

1. Be critical scholars and "good contributors" through respectful research: all authors' articulated the goal to enhance Indigenous research sovereignty by examining the role of decolonizing research environments that will prepare us to do research 'in a good way', meaning that we can attend to community needs in ways that are helpful, not harmful.
2. Interrogation as a relational practice: Russell-Mundine (2012) argues that to support a decolonizing approach to research, reflexivity is not enough; we must also intentionally interrogate Western colonial systems, environments, and practices. There is a duality in this—the work you do on the "inside" must also be done, and related to, the work on the "outside." In our sharing circle we discussed at length our values, which have been shaped by our cultures, relationships, and past experiences. We also agreed that outside of our lab space, in the greater contexts of health geography and colonial institutions, even the idea of having values is not always welcomed, reflecting the hierarchal, paternalistic, empirical and extractive roots of contemporary Western geography (Livingstone, 1992).

Indigenous scholars' vision

3. Indigenize institutional practices and space:

In the lab space . . . it does create a level of safety that allows me to enact my own full role and responsibility, which is to contribute towards decolonizing the discipline (of geography) and looking at reworking the research process as a whole, so that it honors and centers the communities who are being impacted by the decisions, the structures, the environments . . . through colonial society. It will never take away from the fact that I, as an Indigenous person, as a researcher, have a lot of value to offer because I am coming from a place of knowledge and learning that has been cultivated throughout my whole life. And I think it's so critical, to be located in a place [Lab] that values that experience, and that knowledge, and also recognizes that I don't need to try to create a "separation" from "who I am" and, and "how I do this work"; it's all valid. (*Author 1, Sharing Circle*)

Allied scholars' vision

4. Support and Advocacy: To support advancements of community knowledge and well-being; this commitment has also been described as “being held accountable” to being a responsible researcher who will “advance community knowledge and agency.”
5. Challenge Mindsets and Education: One allied scholar described the need to “use privilege to advocate from the inside-out.” An example of this advocacy is related to “using voice to speak out about harms of colonial violence,” and “seeking to be a good ally through ongoing efforts aligned with decolonizing academic infrastructure,” amplifying Indigenous voice, and educating/challenging mindsets when appropriate.

These goals align with a purposeful vision—meeting and attending to community needs through self-determination and seeking to support helpful and hopeful research. Articulating “Values” is important as we seek to critically examine our own motives and positionality (Ball and Janyst, 2008). This reflexivity is a precursor in building ethical research relationships and enacting our moral imperative as responsible and respectful scholars. Within the Sharing Circle, students were asked to “describe what values were evoked within the Lab”; here is a sample of how these values have been articulated:

Scholars' shared values

1. Relational: Central in the discussion was many descriptions of and examples of the value of “relationality,” which, while described more within a scholarly context in the next section of this article, through the sharing circle was described in specific terms and connected to the notions of “belonging,” “cultural safety,” “unity of environment,” “connections to others,” “love/emotion,” “patience,” “community,” and “listening.” Relationality, as described by one participant:

requires more regrowth and more learning and more relationships . . . so, I guess those are the values . . . it's a lot of reflecting, it's a lot of hard work, it's a lot of learning how to communicate and being patient too, and a lot of listening (Author 4, Sharing Circle).

Indigenous scholars' values

2. Responsible:

My commitment is first and foremost to my community. I know that anything that I do I'll be held accountable back at [my home community]. And so, a lot of that drives the work that I do and it drives who I am in the Academy as well. So, when I hear something that is offensive or puts my community down, I feel a responsibility to speak up. Or puts down Indigenous Knowledges as a whole, I feel like I can't sit in a conversation that erases [us] or doesn't acknowledge the ability and the truth in our knowledges. (Author 3, Sharing Circle)

3. Gratitude and Cultural Safety:

I can see very honestly that I came into this place not feeling safe and being very concerned that there wouldn't be a place for me, and I am really grateful and honored to be surrounded by people like you all, who I learn from everyday. And . . . we have a mentor and a leader that works their butt off to make it [LAB] available for us, because without her, the space wouldn't be here and I wouldn't have come to [university]. (Author 1, Sharing Circle)

4. Protective:

So, I feel a bit protective, and responsible that I'm not just here to get a degree or to get my masters. I'm here to advance our communities and our Knowledges in ways that are responsible, and then, of course, whatever I do, doing it in a way that it matters to our communities, that can be used by our communities. That's why I'm engaged in a campus and community-based research that's really connected with our community, our campus and Indigenous leadership. (*Author 3, Sharing Circle*)

5. Self-expression: The value for self-expression and community-driven research means the research conducted in the lab spans many sub-disciplines, and relationships in the IHL build the types of connections necessary to conduct transdisciplinary and wholistic research. "[The lab is] a way of organizing ourselves and building relationships across the sub-disciplines" (*Author 1, Sharing Circle*).

Allied scholars' values

6. Compassion and reconciliation:

And so, I think also speaking about the harm of colonized spaces and doing the reflective work to really understand those honestly, and then being a settler scholar I think I have more capacity to look at colonized and neoliberal patterns of relating with a compassionate lens as well because those are absolutely part of me, to be able to find a reconciling middle ground for those. (*Author 2, Sharing Circle*)

7. Personal agency:

And then as far as the values in the lab, they're challenging for me because it's new to be in a space that value things like "personal agency," "self-expression" and "supporting one another," but it's challenging in a really good way because I know that there are values that are good; good things worth working toward. (*Author 2, Sharing Circle*)

8. Honesty and Humility:

In my professional role I work in land restoration climate change work, and in that role, for four years, I was seeing very extractive ways of relating with Indigenous peoples, who would come to meetings to share and would always come so open[ly]. And that was part of my motivation for becoming an "allied scholar" and learning how to relate in ways that are regenerative and don't have that extractive pattern. And so, I think as an ally, I'm learning that my role is to continue to be honest with myself about the things in my own way of being and patterns of relating that cause barriers to me being able to be a good ally and noticing when I'm starting to relate in those extractive ways. (*Author 2, Sharing Circle*)

The values identified here serve as common points of connection that guide relationships among Lab members, and in meeting their vision to do research "in a good way." Achieving this "Vision" calls for new ways of working and enhanced capacity that can be developed through relational and decolonial learning and training. A perceived value-free epistemology and learning environment is incompatible and harmful to Indigenous research sovereignty and capacity building. Interrogation of self and place provides a practice in which allies can critically address the potential power imbalances and epistemic violence that occur in these settings.

To be relational, we *must* first gain consciousness of ourselves and the privilege, energy, and responsibility we have. After all, relationships are not one-sided—and non-Indigenous peoples have created a legacy of mistrust and harm through research “relationships.” As described above, there is a strong foundation of relational and decolonial values that underscore the ways that both Indigenous and allied scholars view their roles and responsibilities both within and beyond the Lab.

Learning and practicing decolonizing, geographic health research: Why this matters. In the recent past, the field of geography as a whole, has been responsible for producing research results wherein “a mere 20 years earlier, when individuals and communities were depicted as data points in large surveys” (Richmond and Big-Canoe, 2018: 185). Prompted by a small group of Indigenous and allied scholars in the field, an active movement away from its colonizing project has taken hold, within the emerging sub-discipline of Indigenous geographies, yielding “new cultural geographies [through] a process of re-engagement with issues of Indigeneity through careful, sensitive, inclusive, representative and emancipatory research projects” (Shaw et al., 2006: 267). Within the scope of health geography, is the ability to examine health and relationships from a spatial perspective, seeking to interpret and understand how environments (natural or human built) shape and influence health and well-being.

“Every issue has been approached by indigenous peoples with a view to rewriting and righing our positions in history.” (Smith, 2012: p. 29) especially when taking leadership roles in research on matters of direct relevance to their health and well-being. Efforts to respond to this call to action have included establishing deliberate training on Indigenous research sovereignty, globally; prompting scholars to respond, stating “we were urged to do research on our own matters, in our own places, on our own time, and often with our families and communities” (Richmond, 2020: 71).

Relationship—How we “relate to it”

Indigenous training environments provide essential, emotive and relational spaces of collaborative learning, wherein trainees practice relationship-building, reciprocity, and accountability. When examining the authors’ conceptions of, and experiences with, processes of gathering, learning, and applying lessons to one’s own research projects, the connections between “relationality” and knowledge production become clear. This shift in relational dynamic has been described as “relational accountability” (Reich et al., 2017; Wilson, 2008), and has become a widely accepted ethical imperative and precursor to research, in generating results that help to improve the reality of the research participant (Wilson, 2008: 37).

As discussed in the origins of the IHL, the values and principles carried through the Director, are interwoven and fundamental in understanding how the training environment mirrors the relational framework on which scholars are building their approaches to and within Indigenous communities. As described in Figures 1 and 2, the Vision Wheel, members of the Lab were asked “Do you see the lab as a place of belonging? And if so, what opportunities have come through your relationships, in your research?” As described by the Indigenous scholars, the Lab is an important factor in recruitment and retention of Indigenous health scholars, and the reputation of this space as a research lab matters in fostering community relationship and trust.

I’ve observed that other environments might value “metrics” that are held to a high standard within the Academy, like the number of publications. Whereas I think that we have an opportunity to question whether that’s really valid in terms of saying “that is a measure of success”. I think the things that we’re talking about today are “measures of success,” we’re talking about the opportunity to navigate through tensions when we know we’re coming from a position of limited power within a very hierarchical structure. (Author 1, Sharing Circle)

One way to “measure” whether a space is meeting the needs of scholars is to review feelings of trust or being within a safe and inclusive environment, which we can interpret as descriptions synonymous

with the term “belonging.” These are descriptors which are most often referenced, when students’ discuss their “relationships” both in the academy, and more broadly with Indigenous communities.

So, in terms of whether I see this place as the lab as a place of “belonging” and what opportunities have come through those relationships, and how that’s impacted my research, I think being part of a relational environment is part of the learning; so, if we’re learning to do “decolonized research” to move forward in a relational [way] and breakdown hierarchies, in terms of reducing, and minimizing power between the researchers and the communities, I think learning, by being part of a group that values and puts forward “relational approaches” in everything we do is . . . that’s how I’ve have been able to continue to stay in more of a “decolonized” mindset. (Author 1, Sharing Circle)

“Relational” in essence refers to the realization of both context and analysis that will bring about a deeper understanding of the content. “Relational Accountability” refers to processes of how information is surfaced and created in a relational way (through a methodology based within an Indigenous community context), while demonstrating the three “R’s”: Respect, Responsibility, and Reciprocity (to be accountable as it is put into action) (Kirkness and Barnhardt, 1991; Wilson, 2008).

The lab is certainly a place of belonging for me and the research that I engage in; it [is] critical to be a part of a research team that has a strong history of working with [Indigenous] community in ways that have supported . . . [community] interests and desires—their research needs. And so, to be a part of a team that already has that history, that community reputation, has been critical to my research that is examining some “personal experiences” of Indigenous students. So, to come from the Lab and represent the Lab . . . I think has been helpful in people/participants trusting my research. That it’s “not going to sit on a shelf” afterwards; that it’s “a part of community” that’s been created in collaboration with community and . . . the findings will support the community needs [and] campus community needs. So, relationships have been integral in developing the research and executing the research and it’s certainly going to be integral in advancing the study findings and aligning them with the community needs. (Author 3, Sharing Circle)

Senior students (those who have been in the lab for 3 or more years) show a high level of awareness of their role and the value of relationship in supporting community-led research, as well as their own identities and positionality in relation to Indigenous health. That Indigenous training environments provide space for scholars to explore concepts and experiences from a wholistic perspective. The ways relationships are held within the Lab among its members holds the students accountable to be responsible for conducting research with communities in a good way.

Building on my relationship with the [hospital research partner], we are able to create our own understanding of an “Indigenous community” so that we could carry out this research with a group of Indigenous leaders from within the hospital itself, [who] came together to direct me, and they have helped to shape and inform the research goals and objectives, so that it’s not just about what I want to see in terms of research that I think is meaningful within a hospital, because I do come from some place of information, because I’ve had such an extensive career in health care, but I also know that the whole point about Indigenous research sovereignty is really taking the time to listen, and work with the community, in this case with the Indigenous Research Circle within [the hospital] to understand what is going to make a difference for them. (Author 1, Sharing Circle)

Our discussion has been focused on Indigenous health training environments, and the implications that relationality has for supporting Indigenous research sovereignty in our extended web of relations. As identified in the values section, self-reflection and relationality at the intersection of identity are critical components of responsible, decolonial work. This is one example of how this process of reflection can enhance accountability in decolonial work:

Throughout this process I have been reflecting on my future—likely because I face uncertainty on what comes “after” my graduate program. Without a specific destination in mind (i.e., PhD, career, researcher,

professional school), my thoughts have circling around positionality, and interrogating colonial spaces—practices that should transcend these academic borders and training environments. I ask myself, “who am I,” and “how do I honour myself and the relationships I have created here as my relations transform?”—I believe are important questions to consider as we move both physically and temporally in our human experience. As a non-Indigenous person especially, it is paramount for me not to replicate or perpetuate colonial harms in relationships. (Author 4, Sharing Circle)

A motivating factor of joining the Lab was seeing and feeling the potential of relationships: across sub-disciplines and sectors, in geographic research, relationship to place, or practitioner settings with relationships to healing spaces, or collaborative relationships between settler and Indigenous peoples.

It’s the fact that I am immersed in this, we’ve created our own “community” within the Lab, so you guys hold me accountable to the work that I do and to the standard of the work that I do. And then also having an Indigenous mentor . . . making space for and time to value the principles, and the practices that are critical in doing community-based research with Indigenous communities and I can reflect on what I see coming from other Labs, in contrast, and I think some of the things that are apparent to me are that there is a different perception on “why” we’re doing this work -the “end goal” is different in some ways. (Author 1, Sharing Circle)

Knowledge—How we “figure it out”

The IHL is a graduate training environment that supports community-based research and projects that “enable Indigenous communities to address their environment and health concerns” (Indigenous Health Lab, 2022). Research topics include: health and social equity, housing security, environmental dispossession and repossession, food security, Indigenous health geographies, and Indigenous geographies. Currently, the Lab hosts 11 full-time graduate and undergraduate students, including one Indigenous medical student.

Examples of knowledge—Our research

IHL members shared about their role in community-based research in the “how we ‘figure it out’ context of the Sharing Circle. Specifically, they were asked ‘what has been your experience as a student and trainee?’” We also reflected on the types of knowledge, and specifically of Indigenous knowledge production and methodologies enacted within the lab training environment. In geography, spatial perspectives are fundamental—students’ research projects often reflect their own diverse personal experiences of places, spaces, and systems where Indigenous health and well-being must be improved. One student described coming into their research as a direct result of assisting with the Director’s research, and then pivoting as the impacts of the COVID-19 pandemic started to surface:

My research started off as an extension of my undergraduate thesis on relational accountability and Indigenous health training environments . . . but then the world changed with the pandemic, and so did my research, and we took on this other research project in the summer, going into my Master’s, that interviewed Indigenous physicians and health and social care providers . . . my research now has transformed to “looking at how Indigenous people are connecting across Turtle Island, through social media, to help promote and support mental health during the pandemic-whether it’s through advocacy, resource sharing information, amplifying voices, or just being heard and seen. So, it’s exciting work. It’s definitely new, very inductive, and I’m learning as we go.” (Author 4, Sharing Circle)

My big research problem is addressing an issue that I have experienced and witnessed within Indigenous health care environments. Not because I love hospitals, [but] because they have become places where there has been a lot of harmful treatment mistreatment or lack of treatment towards Indigenous people. [My research addresses how] hospitals are not considered to be safe places, that’s a pretty big paradox considering most people would say that they enter into a hospital for care. (Author 1, Sharing Circle)

Enacting Indigenous knowledges and worldviews

One allied student describes coming from a western scientific background where her education and professional pathways were often “linear, extractive, reductive and disconnected.” This resonated with other students, who reflected on how, upon encountering Indigenous worldviews, their understandings of the possibilities in terms of how to think about knowledge and approach research were “blown wide open.” To these students, Indigenous Ways of Knowing and Doing seemed more grounded, connected and relevant to “making a difference” in supporting Indigenous sovereignty in research:

My research is taking shape from working professionally in land restoration over four years. A lot of the grants get granted to settler institutions, even though they have explicit deliverables to collaborate with Indigenous communities and Indigenous leaders really are the ones leading good stewardship and what it means to be in good relationship with the land. So [that the funding continues to go to settler institutions] is frustrating to me, [and] that the relationships and collaborations with Indigenous people when they do happen [don't happen with] a lot of listening or hearing and realigning priorities so that we are adding value to Indigenous health and Indigenous well-being. I recognize [from these experiences] that [in some cases] there wasn't capacity to have those kinds of conversations and bring in the spiritual, emotional values [and ways of relating to land], yet. (Author 2, Sharing Circle)

Author 1 described how she has experienced coming into a research Lab that values Indigenous worldviews, and how this influenced her research and knowledge practices:

I grew up in a non-Indigenous family. And I've had to work really hard to establish relationships and connections back with [Indigenous] community, to feel like I'm “part of.” And I think that that has shaped the way that “I see the world” and “how” and “what I want to know about the world” and I know the Lab has offered me opportunities to draw from “yes,” my Indigeneity—it is valued, my worldview is valued and it's validated. But I also am learning how to be successful in an academic environment, knowing that it's only through that combination of the Western processes and really good training in high quality research that we're [Indigenous scholars] going to be able to get the results that we need, that are going to have an impact on [Indigenous] community. (Author 1, Sharing Circle)

Common threads noted in “Knowledge” identified by students are within the context of relationships with Indigenous mentors, community and peers, recognizing that this network facilitated knowledge transmission, and served as a key support in determining a student's approach to research. This network of resources extends beyond the Lab, and includes connections with Indigenous mentors from other institutions, communities, and networks. One example is from Author 3, who shares about the process of research project co-creation with community partners:

I received encouragement from my Indigenous mentors at [university] to apply for research funding, I received my first research grant to examine Indigenous student housing needs in London. And from there you know it's certainly been connecting with the Indigenous campus communities and reaching out for support and giving back. [Then] I made these connections here at [university] and working with Dr. Richmond, we wanted to look at how we can make sure that the research isn't just “a thesis” that I do and complete on my own . . . how we can connect it with community, how can we make it relevant to our needs here at [university]. We presented the research and I continue to provide updates to the ORGANIZATION NAME and the ORGANIZATION NAME, to make sure that the research is aligned with their needs, and the conversations that they've had with students over the many years. (Author 3, Sharing Circle)

From these reflections it is clear students in the Lab conduct research that seeks to build knowledge and capacity, and inform policies which improve Indigenous community health, well-being, and sovereignty. Much of the contemporary research being developed within the Lab is expanding the understanding of the value of relationality and how connections are created within and among community through storytelling methodologies.

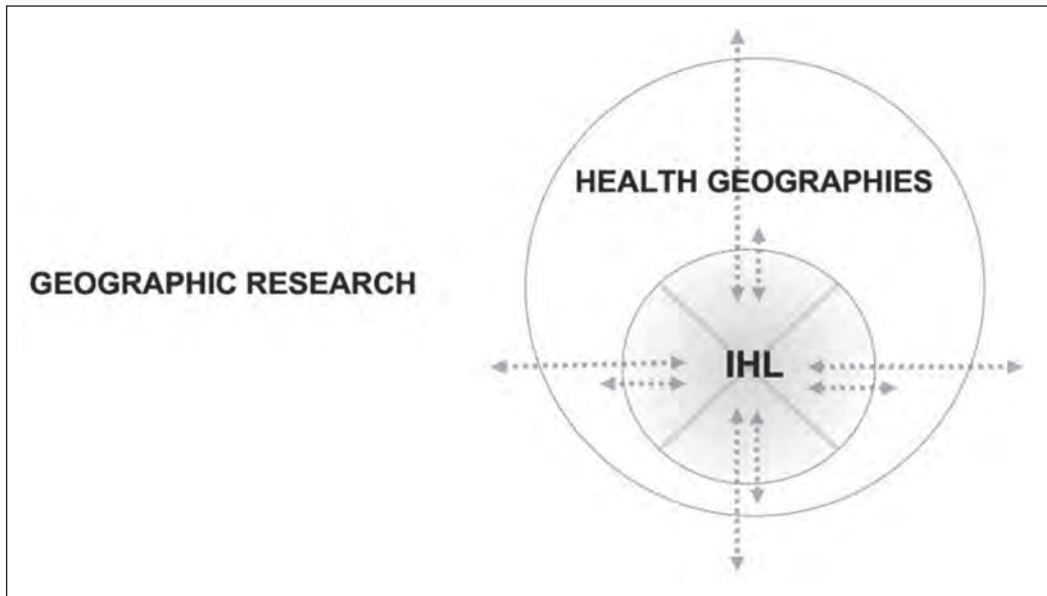


Figure 3. Conceptual positioning of the Lab (IHL) within the broader conceptual fields or “wholes” of Health Geographies and geographic research. The greater and proximal conceptual fields have clearly identifiable influence on the Lab, and vice versa.

The main motivation for my research and the community that [it’s] serving is kind of holding, honoring and being accountable to [the] stories that have been shared with me and finding a way to, builds from the strength [of] these communities and find a way to further support them. (Author 4, Sharing Circle)

Discussion: Action—How we “do it”

We need to build community amongst peers in training environments to support conducting community-based research. (Richmond, 8 February 2022, Interview by Vanessa Ambtman-Smith, Koral Wysocki, E. Victoria Bomberry, Elana Nightingale, and Veronica Reitmeier [Zoom]).

The space and time to do research in a good way with communities allows students the opportunity to develop high-quality research contributions and influence the broader conceptual fields of Health geographies and Geographical research more broadly, as describe below in Figure 3:

Although the Lab is a place and space where students can “think, do and know” in Indigenized ways, it is not a closed system, impervious to the colonial context of the department within which it is situated (as described in Figure 4). Challenges are often surfaced as a result of these contrasting identities and values between the Lab and the department. Outside of the Lab, students experience the erasure and devaluing of Indigenous ways of knowing in classes and administrative spaces. Within the Lab, colonial patterns and insecurities in relationship are surfaced and can show up as resistance to Indigenous worldviews.

At some point conceptually and physically, the identity and values of the Lab come into relationship with the dominant structures, systems, and values of western society. Indigenous students within the Lab noted that have been explicitly encouraged to create healthy boundaries as a method of empowerment to safely navigate harmful tensions and added demands requested of Indigenous students.

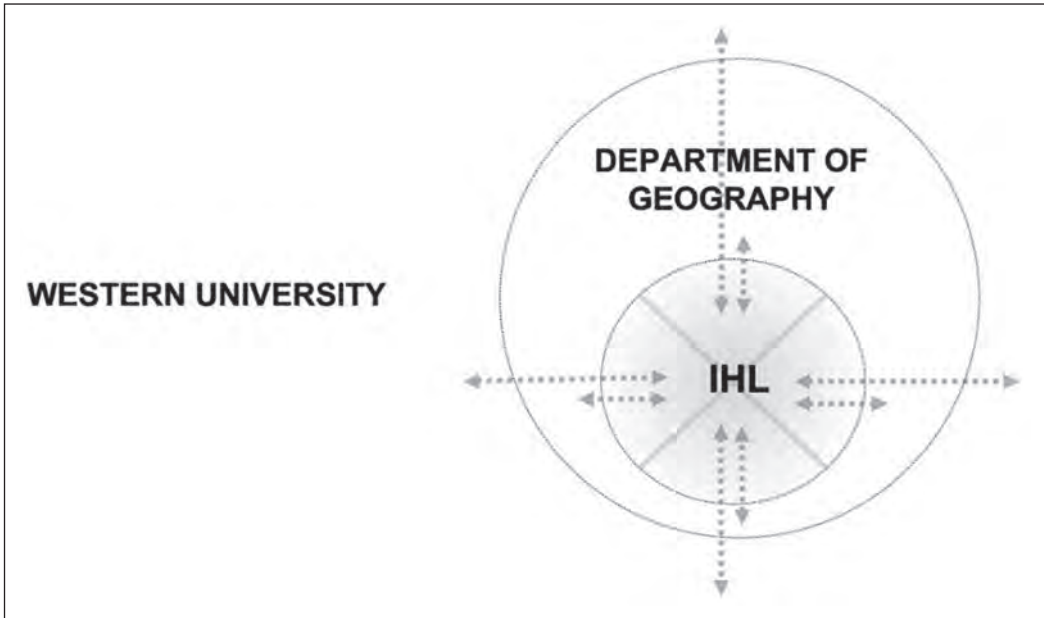


Figure 4. Physical positioning of the LAB (IHL) within the broader physical contexts of the Department of Geography and Environment and Western University. The Department of Geography as an immediate sphere of exchange, with colonial power dynamics limiting the influences of the Lab.

And I know that my experience has been enhanced because I have people who can not only help me navigate and talk through options and relate to those tensions, but also just be there for me “emotionally, physically, spiritually, mentally,” and I think that my experience as a student has been very positive . . . I have the capacity to be a “student” here, I have a capacity to be a “learner,” and to know that I am valued as a student and I am going to have the opportunity to learn and grow in that way, without other “expectations” necessarily resting on my shoulders. As an Indigenous scholar, often we get centered out, and we are expected to do things that go above and beyond the role of “student” and I think I’ve had the opportunity to create boundaries that I don’t think would have been as obvious. (Author 1, Sharing Circle)

A common understanding between Lab members is the awareness that relationships are a powerful way to engage an assemblage of people toward realizing a common vision. They are powerful in the sense of the potential for knowledge sharing and the ability for people to help develop each other, in relationship. A lot of our research and work centers relationships among people and between people and place. Relationality of the Lab allows for creative and reciprocally beneficial relationships that bring together scholars as community, and as co-creators, moving them individually and collectively up to a higher expression of their potential.

Implications within geographic health research and the academy

In making recommendations based on our case study and the information gleaned through sharing, we see three types of implications emerging, which are substantiated through literature, and relevant for both our field of study, as well as colonial institutions: theoretical, methodological, and practical implications. In highlighting these themes, we present a useful synthesis that can be discussed in more environments moving forward.

Theoretical implications	Quotes	Recommendation
<p>It is through embodied learning, trust, and encouragement that scholars feel that the Lab, as a shared learning environment, cultivates opportunity, brings people in, and advances the type of respectful, and meaningful research critical within the field of Indigenous health geographies. Academic institutions can be bewildering places for many, and for some, can be places of violence, where scholars encounter resistance and racism embedded throughout colonial structures, programs and people.</p>	<p>The Indigenous students describe how in many ways their own research has been inspired through lived experience and shaped through a desire to contribute to meaningful opportunities to redress inequity:</p> <p>“So, my research is bringing forward the Indigenous student housing experiences and needs. I came to the research from my own personal experience in trying to find housing when I wanted to move to the city of Hamilton, to complete my undergrad, and the housing search experience was incredibly demoralizing. I experienced so much discrimination and racism. You know as an Indigenous person you kind of just keep moving because if you know you can’t let it get you too down because there’s going to be more [discrimination and racism] tomorrow” (<i>Author 3, Sharing Circle</i>).</p>	<p>The Lab, as a training environment, functions with firsthand understanding of the challenges associated with being “Indigenous in the academy” as well as the rigorous and unique training required to enact decolonial and relationally accountable research practices. It is within these complex and challenging environments that Indigenous and allied scholars often find themselves wholly unprepared to tackle the power differential between students, faculty and institutional structures. Therefore, strong leadership, demonstrating commitment to Indigenous health, well-being and advancing decolonial research through modeling, training, visibility and in supporting students with the appropriate resources needed to do this work, is a critical component for success in navigating through the colonial research environment.</p>
<p>Our deliberate application of an Indigenous framework (Vision Wheel) serves to reinforce why our efforts are both necessary and important. It has been only recently that limitations within the scope of the natural and social sciences have been documented from an Indigenous perspective, where it is noted that researchers have historically been outsiders who seek to “study” Indigenous problems using the widely supported scientific approach (Smith, 1999). Through our choices in collecting reflections and presenting back information in this way, we have created a paper that models our learnings, centering an Indigenous epistemology and methodology (Wilson, 2001), and thereby creating a narrative that we believe will resonate with Indigenous and allied scholars alike.</p>	<p>What has been recognized is that with this “Western, outsider approach”, the researcher themselves, coupled with the methodology(s) employed will carry biases, whether implicit or explicit, shaping the type of knowledge produced, and offering a “Eurocentric definition of reality upon the rest of the world” (Wilson, 2008: 16). It is through this version of reality that we have seen the growth and “proliferation of negative stereotypes about Indigenous communities” (Wilson, 2008: 17).</p>	<p>The Lab was created as a training environment to support Indigenous health research. The Lab draws in graduate scholars looking to engage their whole selves in research that supports communities, research that requires scholars to learn with their heart and mind (Richmond, 2020). Although it is notably challenging for students to undertake research in this way with relatively short degree timelines (2–4 years), a commitment to research grounded in a space and place that honors whole, self-expression, cultivates belonging and allows a relational approach to knowledge co-creation, the Lab is guided by values that strengthen the relationships we work hard to cultivate. Research sovereignty and community governance require space and time to develop.</p>

Theoretical implications	Quotes	Recommendation
<p>When reflecting on the growth of their own perspectives and capacity to engage in relational approaches, there was a depth and contrast in what the authors' shared about their experiences within and outside the Lab. Indigenous students identified that their encounters within academia and professional workplaces were often marginalizing at best, and at worst, violent, harmful and isolating. Often, "identity" was reduced to "one thing" or only provided space and value for "one narrative." The authors recounted feelings of not belonging, and a desire to flee academia prior to finding their place of belonging within academia through the Lab.</p>	<p>"As a training environment as a 'place' where I can say, 'I'm part of this group', we have a valid and legitimate connection in the Academy, that's respected. We have that track record that [other student] speaks of and people know 'yeah, okay we trust you, we know that this is going to be good work' because of Chantelle's leadership and her training; she's not going to let me just get away with work that's not a high quality, and I think that it's a reflection on her commitment to community, that our group is cultivating a high quality level of research and excellence that is not only going to be important in informing our department here but also we're putting it out back out into the world and showing others that they can do the same" (<i>Author 1, Sharing Circle</i>).</p>	<p>The Lab runs in contrast to the status quo, and thus, having the support of leadership, space and time to do research in a good way with communities is imperative in redressing power dynamics that could hinder such efforts otherwise, allowing students the opportunity to develop high quality research contributions and influence the broader conceptual fields of Health geographies and geographical research more broadly, through this safe working space.</p>

How we navigate through colonial tensions

The Lab is an active place of learning, which includes learning how to thrive within a colonial environment, where connections extend through individual identities, living experiences, and within an institution that privileges the colonial project.

[After an] offensive experience [in a graduate-level class], that [made me] feel like I [didn't belong] in graduate school or at UNIVERSITY, the support I received from NAME and the team made me see that I have valuable contributions even if course instructors didn't realise it and that part of what my role is here as an Indigenous scholar is to disrupt conventional ways of seeing and thinking about the world that have intentionally erased Indigenous knowledge and worldviews. I certainly wouldn't have felt as welcomed or as valuable as an Indigenous scholar on campus if it weren't for the lab. (*Author 3, Sharing Circle*)

Elements of racism, sexism, eurocentrism, colonialism, and neo-liberalism continue to dominate, manifesting real and violent tensions that can impact and derail efforts that unsettle these patterns. There is power in community. Creating a place where Indigenous voices are valued, and scholars are encouraged to "come in and think about the big questions, and be helpful," (Richmond, 2020) is fundamental to creating a safe space for learning and forming relationships across the Lab. In this way, the Lab can be described as an extension of this relational philosophy, wherein people are welcomed in, encouraged to identify and use their natural gifts in shaping and forming their own unique and courageous paths forward.

One of the fundamental [realizations] that has shaped [me] as an ally, [is the need to] constantly be aware [and reflexive] with your perspectives [to realize how] they [shift and] transform over time. And a lot of [those

shifts in perspective come] from relationships and teachings and [those are] things that you carry with you. And so, I guess this comes back to what I said about “learning with your heart.” (Author 4, Sharing Circle)

The work of negotiating and cultivating a respectful research relationship is iterative. There is no one way to go about enacting relational accountabilities. Therefore, appropriate mentorship, training, and listening must be part of the learning process. “Having good intentions about my research relationships is not sufficient. Even in instances when researchers have every intention of honouring and valuing Indigenous collaborators, good intentions do not always lead to respectful actions” (Reo, 2019: 5). As exemplified in the following quote, an Indigenous scholar notes:

The lab has helped me to know and understand that who I am and what I do matters, and that it is no coincidence that I am able to bring my “whole-self” into this environment and into this research because, as Shawn Wilson shares with us “we are the relationships in research”; these things are not disconnected and it really validated the way that I see myself in the world. (Author 1, Sharing Circle)

It is through this collective model that scholars are trained to engage in Indigenous Ways of Knowing and Doing, and the application of decolonizing approaches to research and practice, building competency and capacity to shift mindsets and attitudes around the value of relational accountabilities in geographic research (Castleden et al., 2017). This knowledge framework includes “placing Indigenous peoples at the centre of the research environment and is cognizant of Indigenous values, beliefs, paradigms, social practices, ethical protocols, and pedagogies” (Denzin et al., 2008: 92).

Conclusion

We end this article by sharing about our mentor and their experience establishing the Lab. The establishment of the IHL, as a space that attracts and nurtures Indigenous and allied scholars, did not happen by chance: the Lab came to be through the difficult negotiations, leveraging external awards and grants to build a undeniable rationale for why a space for Indigenous and allied scholars engaged in Indigenous research was needed. In fact, this institution was selected specifically “because the things that I care about, and the mission that I’m on does not exist [here]” (Richmond, 8 February 2022, Interview by Vanessa Ambtman-Smith, Koral Wysocki, E. Victoria Bomberry, Elana Nightingale, and Veronica Reitmeier [Zoom]). This mission, to provide a welcoming space where students can embrace who they are and feel good about where they come from, centering Indigenous Ways of Knowing led to an environment created to prepare emerging scholars and trainees in how to practice relationality in research. We believe the Lab has created a culturally-safe space and “unity of environment” to address the “trickiness” of settler-colonial tensions and relationships, navigating and confronting barriers to relationality that are important skillsets in supporting Indigenous self-determination and research sovereignty beyond the academy. Indigenized and decolonizing spaces have the potential to nurture many dimensions of growth and identity, culturally, emotionally, spiritually, and mentally, wherein scholars describe “be[ing] valued as a researcher and as a person,” connecting their “whole selves” into academic training that is designed to redress and transform former harmful research practices. As described by Dr. Richmond, there is a mission and purpose for the Lab that is relational:

At the heart of this research training environment is something different, something more human, guided by dimensions, principles and values that mirror the ones that guide relationships in life, because you don’t become a different person because you enter a different environment . . . you can’t just bring people here and then not feed them. (Richmond, 8 February 2022, Interview by Vanessa Ambtman-Smith, Koral Wysocki, E. Victoria Bomberry, Elana Nightingale, and Veronica Reitmeier [Zoom])

We have now embarked upon a “new culture of Indigenous research,” facilitated through intentional Indigenous research infrastructure. This movement has been sparked by the development and dissemination of Indigenous health training resources by national leaders such as the Canadian Institutes of Health Research. Through leaders like Dr. Richmond, Indigenous scholars have created, or are seeking to create, opportunities to build on an Indigenous community health agenda which “privileges the voices at the ground-level,” employing both Indigenous and decolonizing methodologies. These are emergent practices, with the first generation of Indigenous health network funding emerging in the mid-2000s. We recommend further study to understand how these training environments (at the national, regional, and institutional levels) can provide opportunity for Indigenous and allied students to gather, learn, grow, and build a community of practice that celebrates and prioritizes Indigenous contributions to research. These research philosophies and practices have been widely adopted as a minimum standard for ethical research with Indigenous communities, and are requirements underscoring most institutional ethics reviews, and tri-council funding agencies in Canada (Canadian Institutes of Health Research et al., 2018). There is a deficit of literature and learnings based on the student-perspective, which we know is foundational in understanding what these training spaces look like, how they are used, and what they mean for Indigenous and allied health scholars embarking on their academic journeys.

It is no accident that many of the sentiments expressed by current scholars in this publication reflect the transformative potential related to larger networks of Indigenous scholarship (e.g. ACADRE, NEAHR, and IMN), knowing that these models themselves influenced the Lab’s Director in her own pathway forward from Indigenous trainee to an independent Indigenous health scholar (Richmond, 8 February 2022, Interview by Vanessa Ambtman-Smith, Koral Wysocki, E. Victoria Bomberry, Elana Nightingale, and Veronica Reitmeier [Zoom], p. 5). Drawing on results presented through ACADRE and NEAHR participant experiences, there is good evidence to support the value and benefit of programs that create “the time, space and resources [students] need to learn, see and personally experience research through Indigenous ways of knowing” (Richmond et al., 2013.)

As we are near the end of the third generation of Indigenous health network funding, we view our Lab as a generative environment that is connected to the work and legacy of these larger training networks. It is through these networks that we may access a larger knowledge base on student and trainee experiences by examining the platforms that create capacity to engage in hopeful and helpful research.

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A pragmatic approach to ethical research collaboration with Indigenous communities: A case study with the Penan people of Long Lamai, Malaysia

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Abstract

It is paramount that research relevant to Indigenous communities be conducted in partnership with them through free and prior informed consent. Historically, much research was extractive in nature, performed without Indigenous community consent, and often applied a deficit-framing. Some academic professional societies have developed guidelines for ethically conducting research with Indigenous communities to avoid these unethical practices. However, missing from these ethical research declarations are the specifics on research implementation or how research can be enriched through an ethical research approach. In 2010, the Association of American Geographers' (AAG, now known as the American Association of Geographers) Indigenous Peoples Specialty Group (IPSG) wrote a Declaration of Key Questions About Research Ethics with Indigenous Communities outlining several questions that researchers should ask themselves when collaborating with Indigenous communities. We selected the AAG's ethical principles for this study as it was one of the first environmentally oriented professional societies to make such a declaration. It is also among the world's largest professional societies with over 10,000 members across 100 countries, with nearly upward of 7000 in attendance at its annual conference. The IPSG's Declaration organizes their key questions around several elements: (1) Formulating the Project, (2) Identities of the Researchers, (3) Partnerships, (4) Benefits, (5) Findings, and (6) Deepening Relationships. This article discusses how each of the elements in the IPSG's

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Declaration can be addressed for a wide range of research projects, providing specific examples from the Global Citizenship and Sustainability (GCS) program, a community-based partnership between Cornell University, the Institute of Social Informatics and Technological Innovations at the Universiti Malaysia Sarawak, and Penan village leaders in Long Lamai, Malaysia. This article argues that GCS' research was enhanced through a non-extractive, community-based, and collaborative research mindset and further describes questions based on the IPSG's Declaration that researchers can ask themselves throughout their research processes. This article serves as a foundation for researchers collaborating with Indigenous communities to think about their research to give agency to those communities while conducting innovative research. This article has been written in consultation with a community-chosen representative of Long Lamai, Borneo.

Keywords

Indigenous methodologies, service-learning, community-based research, participatory action research, research ethics, Indigenous issues

Introduction

Indigenous communities have long experienced the negative consequences of extractive research practices (Smith, 2021). To this end, several professional societies have committed themselves to conducting ethical research, for example, the American Geophysical Union (2017), the Society for Conservation Biology (2004), and the International Association for Society and Natural Resources (2021). However, there is an opportunity for further growth within academia to work with Indigenous communities in an ethical manner by engaging in Indigenous methodologies that produce robust and co-created research that empowers communities. Our stance in this article is that ethical research is not a hindrance to the research process; on the contrary, it enriches the research experience and establishes the ability for long-term, in-depth, mutually beneficial research where researchers and Indigenous community members work in ethical relationships with one another. This creates a condition whereby academic organizations and researchers can create more robust research by utilizing Indigenous methodologies when working with Indigenous communities. To this end, this article focuses on the 2010 Declaration of Key Questions About Research Ethics with Indigenous Communities of Indigenous Peoples Specialty Group (IPSG) of the American Association of Geographers (AAG, formerly known as the Association of American Geographers) (Grossman et al., 2010) as a lens to evaluate an Indigenous research project undertaken by our team in partnership with the Penan community. The AAG's IPSG comprises Indigenous and non-Indigenous geographers who work closely with Indigenous communities. The IPSG's memberships saw that as academics, they had a moral obligation to formulate academically rigorous research and benefit Indigenous communities. A decade later, the Black Lives Matter movement highlights much work that societies still need to do to create justice beyond equality or equity (Nummi et al., 2019). Research science, institutions, and projects tend to impact Indigenous communities and, as such, are in a position to encourage research that happens "with and for" those communities and should evolve beyond being something imposed "on" them (Wilson, 2008).

The IPSG's declaration focused on geographers' academic research with Indigenous communities, but researchers from a range of disciplines and vocations can adapt the key questions to their research, institutions, and non-academic projects. To that end, this article argues that researchers must enter more collaborative and mutually beneficial processes when working with Indigenous communities. This article will address how each of the six elements of the IPSG's Declaration, as described above, can be a valuable framework for researchers to build stronger research collaborations with Indigenous communities. This article is a pragmatic examination of a research project conducted with the Penan people of Borneo and how the research process aligned with the IPSG's declaration.

Cornell's Global Citizenship and Sustainability (GCS) program was founded in 2012 to provide place-based research experiences for undergraduates and communities using community-based research principles, reciprocal learning, and trusting relationships (Allred and Somchanhmvong, 2015). In 2016, the GCS began a community-based research partnership with the Penan people of Long Lamai in Malaysian Borneo. The program's focus was to offer a community-based field experience based on reciprocity and Indigenous cultural resilience (Allred et al., 2016, 2017).

The Long Lamai community is located in the Sarawak region of Malaysia on the island of Borneo near the border of Indonesia. There is no direct access by road, so the GCS group traveled by twin otter planes and small boats on the Sungai Balong River to arrive at the village of Long Lamai. According to Village Headman, Wilson Bian Belaré (Jengan, 2016), the history of the founding of Long Lamai is as follows:

The reason is that during (that time), they settled in that area, many diseases they experienced at the time. So, while the villagers built their village there, my father traveled to the jungle looking for suitable land. After that, he found the flat ground and also a suitable area to make a new settlement for the new village. So, he called all the villages to move to that place for making and build a new village it's called Ba'Akep before and Long Lamai right now. In 1950, or something like that, there was a missionary who came to that area. They asked my father to find the other people who were still nomadic in the forest. So, my father traveled to the forest and found the nomadic brought them together from being nomadic. There were a few people in different groups from the downstream river, they met, and my father explained the living conditions here. Their lifestyle included hope in religion. So that nomadic people from downstream rotated to enter our village and met my grandfather, Jabu, as you know my generation starts from Batan down to Jaleng, then down to Muai, after that down to Sawen, and to Jabu, down to my father Belaré and lastly me.

In 2015, Universiti Malaysia in Sarawak (UNIMAS) and Cornell University established a formal partnership to host the GCS program. Given the long-standing relationship that UNIMAS has with the Long Lamai community, they agreed to partner with the GCS to engage with the Long Lamai community. UNIMAS first approached the Long Lamai community for their consent to expand the existing partnership to include another higher education institution, Cornell's GCS program.

Formulating the project

One of the critical elements of the IPSPG's declaration is that building connections with communities begins even before the project begins. There are two fundamental elements that this article will discuss concerning formulating research projects. First, to what extent are the researchers devoting time to building community capacity before the project begins? Building community capacity requires that researchers spend time in Indigenous communities building relationships, and this process should start even before the project is implemented. Building community capacity at a fundamental level forges multiple types of connections between the researcher(s) and the Indigenous community. It extends to fostering relationships between Indigenous community members as a means to engage in collective work and strengthen the overall community (McDonald and Raderschall, 2019). Building community capacity enables researchers to better understand what is important to the Indigenous community and, as a result, prioritize the community's goals equally with their research goals. The power dynamic is rebalanced by prioritizing what is essential to the people, which forges a stronger research partnership. Strong partnerships reduce the chance that the Indigenous community members will feel exploited by the researchers and shows how research projects can be conducted with the community's needs in mind.

The second key question focuses on how much of a role the Indigenous community has in shaping the research framework. One way to address this question is to establish a community advisory board for the project while building community capacity. Community advisers can be political leaders,

Table 1. A few questions from the IPSG Declaration of Key Questions About Research Ethics with Indigenous Communities were adapted for researchers concerning formulating their research projects.

Areas of concern	A few key questions
Formulating the Project	<p>How much time is being given to review, implement, and complete the project?</p> <p>How much time is being invested in building relationships with the Indigenous community and its leadership, and is enough patience being invested in learning what they care about?</p> <p>How much of a role does the community have in shaping the research framework?</p> <p>To what extent has the process of gaining Free, Prior, and Informed Consent been taken into account?</p> <p>How is the project plan addressing the stated goals and intentions of the research project and the inadvertent or unanticipated consequences of the project?</p> <p>How does the project align with both academic and community timelines?</p>

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elders, or any trusted and respected community member. Community advisers collaborate with researchers to establish a research agenda that meets the community's and research project's goals, can help resolve misunderstandings between the researchers and the community and assist in validating how goals are being met throughout the research process (Kassam and The Wainwright Traditional Council, 2001; Robinson et al., 1998). Table 1 has several other questions adapted from the IPSG's declaration that researchers can ask to ensure the agency of the Indigenous communities during the formulation of the research projects.

In formulating the project, it was vital to operate from a principle of reciprocity. The community of Long Lamai's learning from the experience of working with UNIMAS and their collaborative development of cultural and research protocol were paramount (Zaman et al., 2016). Cornell University became an opportunity to serve as a "test case" (Zaman et al., 2016). Long Lamai was interested in how this process of engaging outsiders from a Western university might work for them as a community. The people of Long Lamai developed an agenda for the type of research that they would like to have conducted and thus expected to have a voice in the types of questions that were being explored by researchers. To that end, the community appointed Long Lamai elder, Mr Garen Jengan, as the liaison to the universities. His role is critical to the communication, administrative and logistical needs of both the universities and the Long Lamai community. As Cornell University and UNIMAS built their own capacity, the Long Lamai community was also building their capacities such as the infrastructure, homestays, food, electricity, and so forth, to host university students, faculty, and staff members. Simultaneously, they reworked their schedules and everyday routines to accommodate the group.

For Indigenous communities partnering with institutions of higher education, there are several key factors to consider. Findings from a service-learning workshop conducted by the authors at the 2015 eBorneo Knowledge Fair in Ba'kelalan, Malaysia, revealed that Indigenous communities from the Borneo highlands perceive benefits from university-community partnerships, including how external partners can bring the community together and sometimes suspend local politics (Harris, 2017). Factors that they stated are important are deciding on the project's scope and considering the timing of projects, particularly because many are farmers and rely on agriculture for their livelihoods. When asked what success looks like, "sustainable relationships" were paramount. They expressed wanting to avoid a "one-night stand" with regard to the university-community relationship and emphasized the importance of "coming back to the community." The process of returning creates excitement, rewards, and outcomes as long as both parties are coming together. Even if a technical issue is not solved through the partnership, "that does not mean that the partnership failed because there is still learning on both sides."

Projects like the Ngerabit eLamai have connected Long Lamai to the world, creating cultural and linguistic preservation, economic development, and education opportunities. However, opening their community to outsiders like students, researchers, developers, and government agencies also created tensions in engaging with external groups (Winschiers-Theophilus et al., 2015). The community responded by appointing a well-respected member, Garen Jengan, to liaison between the community and UNIMAS. He is a fluent speaker of local languages and English and has extensive experience working with government agencies (Winschiers-Theophilus et al., 2015). The community research liaison tasks include facilitating researchers and their field activities during their visits to the community (Zaman et al., 2016). The community also designated five researchers as facilitators, including Franklin George, a Penan and a student at UNIMAS, and asked that one of the facilitators must join and lead any research team who wanted to visit Long Lamai (Zaman et al., 2016). The GCS was facilitated by a research team from UNIMAS, including Franklin George, who joined the GCS team as a student facilitator and translator during their time in Long Lamai.

Garen also built the capacity to handle small groups of visitors, but it did not happen all at once. Prior to the GCS research visit in 2013, the community hosted a group of 20 researchers (with different ethnic and cultural backgrounds) for the first time. It was the first time visiting a Penan community for many of them. As a result, the community started feeling pressure related to “engagement,” “facilitation,” and “communication,” and the need to “follow certain protocols” with the UNIMAS research team (Winschiers-Theophilus et al., 2015). A written cultural protocol was co-developed with the community based on this feedback. The first stage involved two focus groups in the community (with 15 participants), exploring the tacit and implicit values and practices (Zaman et al., 2016). This finding established a text-based, written cultural protocol with 17 fundamental themes (Winschiers-Theophilus et al., 2015). The guidelines were presented and approved by the community council of elders. Then the community reached a consensus on providing the guidelines to each researcher for endorsement during their visit to Long Lamai (Zaman et al., 2016). However, there was a disconnection between the written protocols that the researchers were given and the community’s expectations of how the researchers would conduct themselves. UNIMAS representatives listened to the community’s different engagement experiences with the researchers and held a workshop to raise awareness among guest researchers (Winschiers-Theophilus et al., 2015). The workshop comprised a series of presentations, discussions, conflicting scenarios, and reflections. Guest researchers’ responses were recorded and evaluated to prepare better researchers to interact with the Long Lamai community. In addition, the community designed cultural protocols based on the critical incidents they experienced working with researchers (Zaman et al., 2016). Furthermore, Franklin George transformed the guidelines and important community concerns into a sketchbook for their cultural training, as described in more detail in the Partnerships section.

The GCS program leaders understood that they also needed to build community capacity for the students as a community. To that end, they created a 3-credit class, Community-Based Research Methods in Southeast Asia, where they could discuss the issues, they learned about in Long Lamai with the students. They also modeled the decolonial methodologies that would later be used in the field, including a visual charting exercise (Allred et al., 2016). The class also included a language and culture component where the students learned basic Bahasa phrases to gain basic proficiency in communicating with the community in the national language in Malaysia. Finally, the class required an in-depth examination of Decolonizing Methodologies (Smith, 1999) so the students could understand the specific issues concerning Indigenous communities and research projects. In addition to the content, the class was designed to build a community of learners and community-based researchers. Instructors used multiple pedagogies to cultivate a safe and welcoming space for students and instructors to practice critical reflection, articulate their talents, assets, and biases, and form a supportive community leading up to the trip. It was meaningful when students took up the courage to express their frustration with the “unknown.” The year 2015 was a pilot year; all partners involved explored

the possibility of a long-term collaboration. As instructors, we were learning simultaneously with students to be patient and open to the unknown and unexpected. Reading and analyzing course texts is much more straightforward, but personally experiencing them is a much fuller learning experience. The GCS leadership learned how to best navigate between students' desires for structured and packaged projects and UNIMAS and the Long Lamai's community's approach of relationship building. The students eventually valued the knowledge exchange process rather than simply providing an output for the community.

The pre-departure course was designed to provide students with an introductory knowledge of the geographic location of the Long Lamai, the projects they might be conducting, community-based research methods, and so forth. More importantly, it was about being part of a community, using the classroom as the site of experiential learning. The class conducted several activities designed to change students' perspectives throughout the semester. For example, they learned from the Borneo visit that people must remove shoes before entering the house before entering hosts' homes. A sign was posted stating, "please remove your shoes before entering" on the first day of class. Some students took off their shoes at the door, and others took them off after entering the room. One or two students were reluctant to do so but saw others had done so. They then followed suit. As the semester progressed, the sign about taking off the shoes was removed, but the students continued to remove their shoes at the door, having established a social norm. The activity introduced students to the cultural etiquette of entering folks' homes in Borneo, Malaysia. It was an activity that required students to reflect on their cultural upbringing and their day-to-day activities. One of the hopes was to have students recognize the importance of respecting cultural practices. Also, the conversation went further in talking about how to manage and unpack the "discomfort" if someone is not comfortable taking off their shoes before entering. However, once in Long Lamai, the students took their shoes off without being asked, which showed the community members that the GCS researchers were taking steps to respect their culture while reducing the impact of culture shock on the students.

Identities of the researchers

When working with Indigenous communities, researchers need to confront their own experiences with systemic racism and colonization and recognize that the process of institutionalized education may have created biases that have gone unnoticed (Rose, 2002). Researchers must be willing to self-reflect on their interactions on multiple levels. An example of multiple layered reflections would be transparently reflecting on oneself, their close relationships within the community, and how their actions impact the community in a larger context (Nicholls, 2009). Discussing the researchers' identities can include sharing their family lineage, places they have lived, and why they went into their field. Researchers should not be limited to discussing their academic credentials with communities (Robinson et al., 1994). In addition, by working within the community, the researchers refine their own identity and worldview (Nicholls, 2009). The benefits of this are threefold. First, a more complex worldview can drive the research projects in unanticipated directions. Second, the researchers constantly refine their identities, which will be shared with new communities. Third, as the research project evolves, so do the researchers' identities.

Another key element of the researchers' identities focuses on the institutions supporting their research. It is important to recognize institutional goals for research and share that with community members to determine where there is synergy with community aspirations. Researchers need to discuss what is important to their associated institutions and their fundamental principles. Discussing one's research institutions with Indigenous community members creates the opportunity for researchers to find ways beyond the thinking in their own projects and expands the conversation both within the community and within the institutions (Denzin et al., 2008). Including communities in that discussion can enrich research project priorities in the future and create a greater understanding between

Table 2. A few questions from the IPSG Declaration of Key Questions About Research Ethics with Indigenous Communities were adapted for researchers concerning their identities.

Areas of concern	A few key questions
Identities of Researchers	<p>To what extent has the researcher thought about their relationship of power and positionality in relation to the communities they want to collaborate with?</p> <p>In what ways can non-local researchers be trained in cultural respect and sensitivity in their dealings with Indigenous communities and individuals, both in their research work and other social settings?</p> <p>How can the project methodologies go beyond research methodologies and incorporate other methodologies—exploring ways that the community itself would implement or manage a project?</p> <p>To what extent are researchers prepared to share life experiences or skills that can provide tools or opportunities to the community, aside from the research project itself?</p> <p>To what extent is the research organization leadership fully aware of the dynamics and complexities of working with Indigenous communities?</p>

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researchers and the community. In addition, the community leaders may want to check the researchers' credentials and their institutions by scrutinizing their record of work with other communities (Kassam and The Wainwright Traditional Council, 2001). Discussing the research institution's interests also provides a means for community members to contact other members of that institution to advocate for their research agendas or to assess the researchers' reputations (Chambers, 1997). By being transparent with the ideals of their research institutions, the community can address any potential issues that may arise from the research process.

The source of a researchers' funding is the final element that needs to be discussed with the community. In having this discussion, the community members can address any potential conflicts of interest. For example, if the researchers' funding comes from an organization that has caused harm to the community in the past, the community members may feel betrayed if that funding source is not disclosed upfront (Bryan and Wood, 2015). Even if researchers adhere to all the other elements in this article but do not disclose their funding source, it can damage their reputation, trust, and relationships with the community. Indigenous communities do not exist in a vacuum; the researchers' funding source will most likely be discovered. The community's reaction to that betrayal of trust makes the research process more difficult for subsequent researchers and research projects. There is a greater benefit to being honest with the community and addressing their concerns that far outweighs the cost of not being transparent and losing a research partnership. Sustainable research means that the research projects are continuously viable and foster an inclusive environment where other researchers may be invited in to conduct future projects. Table 2 has several other questions adapted from the IPSG's declaration that researchers can ask as a means to create space for the Indigenous community members to have a voice by discussing their identities with the community members.

However, discussing identity is a two-way process. Researchers need to engage with community members to understand their issues and histories better. The Penan have a tradition of trading with outside communities. Often the Penan have been described as "meek," "inoffensive," "peaceful," and "politically irrelevant." This perspective of the Penan meant that outsiders often took advantage of them and exploited trading with the Penan to create exorbitant profits. For example, in 1927, one Brooke official (Ermen, 1927: 304) noted that traders could make 600% to 1000% profits from trading with the Penan (Ermen, 1927: 304). Brooke officials were concerned about the Penan to protect them from economic exploitation (Ermen, 1927: 305). In 1906, the Brooke regime began supervising

Table 3. A few questions from the IPSG Declaration of Key Questions About Research Ethics with Indigenous Communities were adapted for researchers concerning establishing community partnerships.

Areas of concern	A few key questions
Partnerships	<p>How involved is the Indigenous community (and its legal representatives) in formulating the research plan?</p> <p>To what extent are the community and its legal representatives receiving full information on the research project's process, methods, funders, and sponsors?</p> <p>Have you provided a written description of the project, written in accessible prose, that explains the project to Indigenous community members in terms that they can understand?</p> <p>In situations of disputes within and between Indigenous communities, how will you deal with questions of divided leadership and direction?</p> <p>Has the project set up an advisory group of representatives from the Indigenous community?</p>

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the barter-trade meetings between the Penan and outside traders in a system called Tamu. Although the Balui area came under Brooke control in 1861 and the Baram basin in 1882, Tamu meetings only occurred in the Baram District (Ermen, 1927: 331). As government officials did not supervise trade meetings between the Penan and outside communities in the upper Rejang, there is very little information on these transactions. Johannes Nicolaisen, a Danish anthropologist who worked among the Penan in the upper Rejang in the 1970s, witnessed some of these forms of exploitation (Nicolaisen, 1976: 58). This history has caused the Penan to be both open to working with researchers but also concerned about exploitation. Hence, they sought to create cultural protocols when working with researchers that dictated expectations, communication, relationships, and data ownership.

Partnerships

Ethical research with Indigenous communities depends on creating strong partnerships with the community members. Creating and sustaining partnerships requires researchers to communicate with their community advisers about the research continuously. Collaborating with community advisers provides an avenue to discuss strategies for developing the research project's goals with the Indigenous community. While co-creating the research project's goals with the Indigenous community members, it is important to discuss the issues that the community is facing and find ways for the research project's goals to align with the community's goals (Kassam and The Wainwright Traditional Council, 2001; Robinson et al., 1998). Respecting the community's agenda can include community action projects or creating spaces within research institutions to hear the community's voice (Smith, 1999). Research that is practical for the community is central to ethical research projects; there is little use in partnering with Indigenous communities if all parties are not working toward shared goals. In addition, creating spaces in research institutions for Indigenous community members allows them to build a cohort of researchers and establish their own research projects. Another element of forging strong partnerships with community members is that researchers work with community members to formulate the research project's methods. Researchers' methods need to be diverse and pluralistic to adapt to different contexts (Chambers, 2008). Thus, researchers should be flexible regarding their methods because community members may not be receptive to certain methods. By working with the Indigenous community members, researchers can avoid creating negative experiences in the communities they work with and foster the trust that is the basis for effective research projects. Table 3 has several other questions adapted from the IPSG's declaration that researchers can ask to co-create knowledge with the Indigenous communities they work with through forging strong community partnerships.

The first full day after the GCS arrived at Long Lamai, the Penan conducted their cultural training protocol with the GCS participants to discuss the expected behaviors of the researchers while in Long Lamai. A Penan community member sat with two or three researchers and showed them hand drawings of researchers interacting with community members. The Penan community members asked students to describe what they thought was depicted in the images, which served as a foundation for the Penan community members to discuss concerns about researchers in their community (Zaman et al., 2020). The researchers also engaged in multilayered reflexivity (Nicholls, 2009). First, they reflected on themselves by journaling daily and thinking about the events and how they informed their worldviews. Second, the researchers reflected on the research group by setting aside time once or twice a day to check in with each other and as a group, do group building exercises and support each other through the research process. Finally, the GCS met regularly with Penan community members to reflect on how the researchers impacted the community and prevented any conflicts before they started.

After a few days of interacting with the community, the researchers met with respected community members to conduct a visual charting exercise (Allred et al., 2016). The researchers and the community members separated, drawing how they saw Long Lamai and the issues it faced. Both groups examined the other's representations, which facilitated a discussion over the important elements of the Long Lamai community and issues, both those that the researchers understood and those of which they were unaware. Based on that exercise, the researchers determined that issues of energy, tourism, clean water, and Internet access were significant to the Penan community members and were issues that the researchers could address (Allred et al., 2016). As Long Lamai community elder Garen Jengan stated, "We are trying to find our way to help ourselves before we seek help from others." Thus, the right to self-determination was instrumental. Our ability to include the community in co-developing the research plan gave agency to the community in the process and respected their self-determination.

Benefits

It is vital for researchers to honestly examine the benefits they will receive from working on a research project and attempt to reciprocate those benefits for the community. It is optimal if researchers and the community discuss how the research project can benefit the community. In addition, the researchers need to find opportunities for those benefits to align with the community priorities. Ethical research needs to be sustainable, much like development in Indigenous communities needs to be sustainable and "indigenized"—bottom-up (Allred et al., 2022). Therefore, research projects prioritizing research goals over community goals are just as damaging as resource extraction prioritizing finances above the environment. The research project itself needs to benefit the Indigenous community by respecting its culture and reaching shared goals (Denzin et al., 2008). Research projects can negatively impact Indigenous communities, and those communities need to be adequately compensated for those impacts (Louis, 2007). The researchers can compensate the community monetarily; however, there are several ways to give back to the community with longer-lasting benefits as well.

Reciprocity of the community's generosity is foremost. Reciprocity can include honor gifts that are culturally appropriate for a community member hosting researchers in their homes or sharing a story about a researcher's life after a community member has shared one of theirs. It can also include more things, such as performing good works around the community and establishing programs that will have long-term impacts, like a peer tutoring program for high school students. The concept of reciprocity is vital regarding research projects and sharing the benefits of the projects with the Indigenous communities.

Research projects can address the community's needs in many ways, including working with community members to manage the projects using culturally appropriate methods and taking the time to

Table 4. A few questions from the IPSG Declaration of Key Questions About Research Ethics with Indigenous Communities were adapted for researchers concerning benefits to the community.

Areas of concern	A few key questions
Benefits	<p>How is Traditional Ecological Knowledge included in the project?</p> <p>How are Indigenous partners acknowledged or recognized for their contributions when they wish to be or not acknowledged if their identity is protected?</p> <p>In situations of government oppression or hostility from the dominant population, how does the researcher collaborate with the communities in a safe way to confront researchers with these circumstances and intervene for their rights?</p> <p>What does the researcher leave behind service or material benefit, whether intrinsic to the research project or not?</p> <p>What plan do the researchers have to highlight Indigenous expertise on Indigenous issues—establishing Indigenous as experts on themselves and their local environment?</p>

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learn about traditional community-based research management techniques. In addition, researchers should find creative ways to benefit the communities in addition to the research. For example, researchers can advocate on behalf of the community's goals to other stakeholders, work with community members to provide new skills, and support the academic goals of younger community members (Chambers et al., 2004). Furthermore, researchers need to engage with Indigenous communities to integrate Traditional Ecological Knowledge (TEK) into their research projects and give equal credit to the community members when TEK is used as an adaptive research management technique (Allred et al., 2022; Berkes et al., 2000). Table 4 has several other questions adapted from the IPSG's declaration. Researchers can ask the Indigenous communities they are working with how they would like to see them give back and their perspectives on the community's benefits.

In Borneo, one of the main focal areas in addition to conducting research was cultural exchange. One of the GCS students, who is a member of the Choctaw Native American Nation, Michael Dunaway, engaged with the community members and shared experiences, stories, traditional dance, and gifts that were in line with his cultural values, which opened up opportunities for the Penan community members to do the same with him. In addition, the researchers engaged with sharing their own cultures and worldviews with the Penan, which included a shared dinner where Penan community members were able to share traditional songs, dances, and artwork. Even small exchanges where the Penan community members could practice speaking English were valued.

Traveling from the United States to Malaysia was the first time traveling outside of the United States for some students in the GCS program. This experience has impacted their outlook on society. One student, Rachel Whalen, who grew up in Upstate New York, decided to return to Sarawak, Malaysia, interning in UNIMAS in the summer following her participation in the GCS program. She researched community-based service-learning and was invited to facilitate community-based service-learning workshops for Pusat Internets, which led to the publication of a Service-Learning Toolkit (Whalen et al., 2022).

Another student, Komathi Wasudawan, who was a doctoral student, now a professor, mentioned how her involvement with the GCS sparked her doctoral dissertation:

Like for me, I was at the beginning of the Ph.D. [and] was suffering. I mean, I don't know how to start my research. I said, "What?" Because I'm not from here. So, by joining this program, by me going to Long Lamai, I could actually see where to start and how to structure my questionnaire because I did my private study there. So that was very helpful. And in order for me to think there are several types of tourism and I could only focus on what is the relevant like for example, I present on tourism results. (Wasudawan, 2018).

Evvia, a graduate student from UNIMAS, commented that she came on the trip with no expectations since this was her first experience with a formal global service-learning program. However, the trip made the difference for her and connected her not only with the Cornell students but the Long Lamai community as well while also gaining fieldwork experience. In a post-program reflection, she discussed what she learned and how she adapted during the process of working with Long Lamai and the larger research team:

I'm working with a different group of people which comes from a different part of the world and culturally. We are different and the way we work is different also, but then it's fun that they, they actually follow people. So, and they laugh a lot, which is good. I learned so much from them in so many ways . . . They really work, but at the same time, you don't be so serious about it, but try to put some fun in it. Because I'm the kind that, like, know you have to be serious the hundred percent. They do it, you know, fun. So, at the same time you learn. That's what I want. So, you gotta have some flexibility. (Interview with Evvia Veno, 2018).

Franklin George added from his experiences with our research project, “previously, if we done it [interviews] in class, our teachers only ask to do the interview and that's it . . . and student need to do it alone. But now we interview them together with Dr. [Allred] and the students.” So, the UNIMAS students were exposed to collaborative and community-based approaches for research that helped them to apply what they had learned in the classroom.

A key aspect of finding mutual benefits is spending time together to understand each other's perspectives. Our research group had to learn about how the Penan saw the world so we could find ways to benefit their community and deal with challenges in a way that aligned with the community's values. Like other egalitarian communities, for Penans, unity is the most important aspect of their culture, which keeps the community together (Allred et al., 2022; Zaman et al., 2016). Penans are very deliberative in their approach to conflict, both internally and with outsiders. Therefore, they invest time in discussion and planning before embarking on a project or coming to an informed decision. In our partnerships, we faced frictions in the implementation phase, usually solved with mutual consultation between the community members and researchers. As reported by Needham and Beidelman (1971), Penans are shy in nature. In the early stage of UNIMAS engagement with Long Lamai, the researchers experienced isolated conflicts that arose from not being attentive to indirect forms of communication. As reported earlier, the community elders and researchers co-designed interaction protocols for guiding and preventing conflicting situations and how to handle them when they do arise (Zaman et al., 2016). In addition, to understand the explicit norms of a community at the outset of a partnership, it is also important to learn the community's non-verbal cues and expressions of agreement and disagreement. For example, if the Penans want to avoid a situation or have no clear answer, they will request for a “break or pause” in the discussion instead of saying “no” outright (Zaman et al., 2020).

In our project, we had an intensive process of engagement and planning with the community elders before bringing a new idea or group of researchers, and if things needed to change—we adapted the research to the cadence of the community's day. However, one incident happened where the local organizer (community members) had an error and miscalculation in the arrangements of the boats, which meant an increase in expenses beyond the allocated budget. In response, the community elders called for a meeting of the boat operators and also invited the researchers. They asked the researchers to explain the situation to the community. Once researchers explained the situation, they were excused from the meeting, and community members settled the arrangements within themselves instead of deviating from the allocated budget. There are other occasions where misunderstandings occurred due to cultural interaction and communication differences. Some of those tension points have been utilized as examples of conflicting scenarios to use later in training programs for the students and guest researchers, as reported by Winschiers-Theophilus et al. (2015). In each example of the points of friction that we experienced with the Penan, it was important to work with the community members and create the opportunity for them to exercise their agency in finding solutions.

We needed to be attentive to other types of benefits in our project. One of those areas was funding. We secured funding through the Office of Engagement Initiatives at Cornell University, which was much more flexible than most funding sources regarding working with Indigenous communities and supporting community partners. We were able to fund compensation for our Research Liaison, Garen Jengan, to coordinate the research with us, and the funds also covered the costs of homestays and meals and translation in Long Lamai for student community-based researchers from Cornell and UNIMAS. We spoke with the community about the level of compensation. The community met and agreed that compensation should be linked to the required time commitments. This aligned with the Penan cultural protocol training, where one sketch showed a researcher asking for a Penan community member to take time away from their work to partner with the researcher. The expectation is that community members should be compensated for the work they are contributing as it translates to time away from other activities such as tending agricultural fields. In addition, the Penan community members who were providing our meals had to learn to cook foods that met the various food requirements of the researchers (e.g. vegan, gluten-free), which was also a component we needed to negotiate.

One communication challenge arose when we requested a jungle trek to a Durian gathering area, a common trek for the community members. The community members could reach the area within 45 minutes to an hour from the village. However, it was a much more challenging trek for our research group and the trek took most of the day, and we found ourselves ill-prepared for a long hike. In retrospect, the community members did not want to tell us “No” but kept asking us to think about the trek. The Penan checked our footwear and placed guides at the front, back, and middle of our group. If we had been more attentive to the cultural norms of the Penan, we would have understood that they were trying to tell us that it was not a good idea to make that trek at that time. An elder joked that our pace for the hike was “city time” versus “kampung (village) time” as something to keep in mind for future hikes. In research with Indigenous communities, it is common to have areas of friction, but open communication with the community advisors and giving agency to the community to resolve issues in their own ways helped our project to be more successful.

Findings (publications and sharing results)

One of the main goals of research projects in Indigenous communities should be for the research project to be useful to the community. Thus, the research findings need to be shared with the community. The findings should not just be shared at the end of the research process, but the research needs to be validated throughout the research process (Kassam and The Wainwright Traditional Council, 2001; Robinson et al., 1998). Validating the data throughout the research process allows the community to give feedback and reduces the likelihood that the researcher misinterprets the data. The community advisers are indispensable to the validation process and should be consulted throughout the entire data collection and interpretation process. The final findings should be presented to the community. An example of this is hosting several community dinners where the research can be presented. This creates a space for the community to see the research, to give final feedback, and is a way that they can give back to the community.

In addition to sharing the findings with the community, researchers need to discuss who owns the data. The community and the researchers need to agree on ethical practices, safe data management, data ownership, and authorship of publications (De Crespigny et al., 2004; Robinson et al., 1998). Examples include discussing data storage, such as where data will be housed (at the home institution, with the community) and in what format (digital, paper, or both), with what levels of access (password protected, public), and who will have access to the data? Some researchers choose to co-publish with the community or community members as co-authors as an important contributor to the research findings. Examples include Dr Karim-Aly Kassam’s work with the Indigenous North Americans (Kassam and The Soaring Eagle Friendship Centre, 2001; Kassam and The Wainwright Traditional Council, 2001;

Table 5. A few questions from the IPSG Declaration of Key Questions About Research Ethics with Indigenous Communities were adapted for researchers concerning sharing the results of research projects with the community.

Areas of concern	A few key questions
Sharing Results	<p>How are the voices and direct viewpoints of Indigenous community members—in written and oral form—presented in the publications and reports by researchers?</p> <p>Are subjective or experiential Indigenous values presented as their perspectives or set aside in favor of purely “objective” knowledge?</p> <p>Does the Indigenous community affected by the project have the option to revise or block information in publications and reports by researchers if they feel it violates their security or rights?</p> <p>What measures are being taken so that information is not being made available (purposely or inadvertently) to third parties that might use the information to harm the Indigenous community’s security or rights?</p> <p>To what extent do Indigenous community leaders have control over the information included in or excluded from the researcher’s publications and reports?</p> <p>To what extent is Traditional Ecological Knowledge given equal value to Western knowledge in research reports and publications?</p>

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Robinson et al., 1998), Dr Tariq Zaman’s research with the Indigenous Communities in Malaysia and Namibia (Winschiers-Theophilus et al., 2015, 2022), and Dr Shorna Allred’s community-based research with the Penan (Allred et al., 2016, 2022). This also acknowledges that the knowledge gained from the community belongs to the community as much as it does the researchers. It also rebalances the power dynamics between the researchers and the community.

Furthermore, co-publishing with the community effectively establishes co-ownership of the research data and the findings. The knowledge arises from the community, and researchers must find ways to ensure that the knowledge stays tied to the community. Table 5 has several other questions adapted from the IPSG’s declaration that researchers can ask as a means to engage with the Indigenous communities that they work with through sharing results with the community.

At the conclusion of the research project, the teams comprising student researchers and Penan community leaders presented their initial findings to the larger Penan community during a community meeting to which the village was invited. Each group discussed what they had learned about energy, tourism, clean water, and Internet connectivity issues with the community. Each presentation was accompanied by a visual representation and a community member who could translate the presentation into Penan. This process gave the Penan the agency to provide input on the findings, validate them, and discuss any parts of the findings they may not want to be shared. In addition, a community member had been a part of all the research teams, providing valuable local perspectives and knowledge. Upon returning to Cornell, the researchers continued their research and compiled a written report for the Penan on ways they could move forward on those issues if they so choose. The reports had several options so that the Penan could move forward on those issues in the ways that aligned best with their values. In addition, the reports were intended to serve as a foundation, so that when outsiders would come in with solutions for those issues, the Penan had the means to explain how they would like those issues worked on and why. Furthermore, the researchers completed “Story of Self” videos that showcased their experiences, which were also shared with the Penan community (CALs, 2022).

One of the unexpected outcomes was the participation of the Long Lamai youths. We were fortunate to have Penan youths join us. During the reflection sessions, they shared how the program impacted them in learning about their own culture, the village, the history, the forest, the cuisine, music, traditions, and more.

I grew up and went up to UNIMAS for my degree, and I took the Social Sciences program and continued to my internship in ISITI, where I became involved with all the projects; also, one of them is the service-learning program. This very good opportunity for me, and I can bring you back to my own community, and I can learn about my community where, when I was still young cannot manage to learn about my own culture, my own community, but when I was involved with this, with the SL, I was very lucky, I can learn back what I can't learn in the early stage. I learned a lot about my community, about my traditions through this program, and I am very happy about that. And right now, I am involved with an NGO that is also working with the communities in the Baram Miri area, and I applied all what I learned from the service-learning program, how to engage with the community, how I approach the community in that area. So, it is really benefited for me, very beneficial. -Franklin George, formal Master student at UNIMAS. (CALs, 2021)

Chris Jengan, a Penan youth who joined us on the first and the most recent trip, commented how the interaction helped him to learn more about the community and how the program impacted the community.

He also shared that in the reflection, the community appreciated the compensation that was provided to them as part of the project. It was not just the money which was helpful but most importantly was recognition of People were also being paid to help in this project. The money has helped the local people a lot with many things. Although it was just a normal thing to do, but it helped make people's day better. It had also made the people feel appreciated and grateful to be of any help to them. All the cultural exchange that took place during the project had also helped other people and me to adapt to the outside world. This will help prevent us from experiencing culture shocks. In conclusion, we hope that this kind of project will continue to make its way to the international level so the outside world can also learn about our local culture. —Chris Jengan. (CALs, 2021)

This article was published in consultation with Garen Jengan, Research Liaison and a community appointed elder, as well as, Ezra Uda, who is from Long Lamai and currently works with Penan matters in the Economic Planning Unit in the Chief Minister Department of Sarawak. Both are trusted by the community to represent the Penan with regard to academic publications. However, we recognize the difficulty with being able to do this, especially with the impacts of COVID-19. We made sure to allot the time for the consultation from the community before moving forward to publish. We were able to have one of the co-authors travel to Long Lamai for Garen's consultation as well as used electronic copies and phone conversations for Ezra's consultation. These types of consultations may require innovative solutions for communities that are isolated and have few options for communication outside of their community. One way to help to mitigate these issues is to discuss having the community appoint someone that they trust to represent them when it comes time to publish one's findings. It is important that Indigenous communities have a voice in how they are represented in academia, and it is incumbent on researchers to create the space for those voices to be heard.

Deepening relationships

The researchers' obligations to conduct ethical research projects do not end when the research projects are concluded. The mutual trust and respect initiated by the research project forged through strong alliances reinforce a sense of movement toward a positive future for the research project and the community (Smith, 1999). Maintaining these relationships provides the opportunity for future and continuing research projects with the community. In addition, by building lasting relationships with communities, the researchers can open the door for other research partners. Furthermore, the community can consult past researchers concerning future researchers and research opportunities. Staying connected with the community allows the researcher to be held accountable and find ways to mitigate the harm if there are negative impacts due to the research project. Strong research projects and social change are not mutually exclusive, but when done well, research projects that promote social change

Table 6. A few questions from the IPSG Declaration of Key Questions About Research Ethics with Indigenous Communities were adapted for researchers concerning deepening their relationships with the community.

Areas of concern	A few key questions
Deepening Relationships	<p>To what extent are you prepared to discuss your deeper personal motivations, not only the goals or methods of the project?</p> <p>What long-term relationship is being built with the Indigenous community, even after the project funding and career interests are no longer in play?</p> <p>How can activism, investigative journalism, lobbying advocacy, a witness presence, or service labor be more valuable to the community than a research project?</p> <p>How are local Indigenous cultural frameworks and protocols being incorporated into the project methods?</p> <p>What are the proper channels to follow in approaching Indigenous elders and leaders? For example, is gift-giving or the transfer of sacred materials expected as part of making requests?</p> <p>In the final analysis, is the primary goal of the research project to build a relationship with the Indigenous community and further its larger interests or to serve the interests of researcher careers or institutions?</p>

IPSG: Indigenous Peoples Specialty Group.

create more viable research projects in the future. Researchers that build strong alliances create lasting research projects and provide a mechanism that promotes positive changes for the Indigenous community (Kassam and The Wainwright Traditional Council, 2001; Robinson et al., 1998). Researchers need to create a positive research experience for the good of their own research project and create a foundation for those who follow. By being an example of how researchers can positively impact the community, the community will hold future researchers to that same mark and recognize when a research project has the potential to cause harm to the community. If each researcher tries to leave the communities better off than they found them, Indigenous communities will continue to be partners in research projects and will be more likely to build positive collaborations with researchers. Table 6 has several other questions adapted from the IPSG's declaration that researchers can ask to reexamine ways to deepen their relationships with the Indigenous communities.

After the research project was concluded, the research team also presented their initial findings to academics at the University of Malaysia, Sarawak, and to government officials from the Sarawak Development Institute. Each group discussed the issues of energy, tourism, clean water, and Internet access, highlighting why those things were important to the Penan. The goal was to share some of the issues the Penan faced with local academics, hoping to synergize future partnerships with the Penan to find solutions. After the winter session, students were required to take post-trip classes to reflect on the experience and finalize the research conducted in the winter. The research product was then shared with the Penan community with feedback and comments that allowed us to continue the conversation on the direction of the collaboration and the invitation to return to continue the collaborative research. In addition, the GCS created space for Penan voices to be heard at Cornell by inviting community members to the campus to discuss the issues that their community faced. With Mr Jengan, co-authors also presented at international conferences to share the work, the approach, and the Long Lamai community. Furthermore, Allred, Somchanhmvong, Zaman, along with other academics, hosted an academic conference in 2021 about service-learning projects in Borneo where Penan community members had equal space and time as academics to highlight their experiences with research projects in their community (CALs, 2021). Finally, the annual return with a new group of university students led to the documentation of the history of Long Lamai, oral stories of people, and recently the sound-scape project of the forest. Recently, the COVID-19 global pandemics prohibited travel have made it

a challenge; however, the group pivoted in hosting a conference inviting past students. Each year the GCS returned with a new group of university students that led to the documentation of the history of Long Lamai, oral stories of people, and recently the soundscape project of the forest. Recently, the COVID-19 global pandemics prohibited travel have made it a challenge; however, the group pivoted in hosting a conference inviting past students. The conference was held over several days with equal time given to the community in Malaysia and the contributors in the United States (International Conference on Community-Based Service Learning in Borneo 2021). Furthermore, several of the conference sessions are cited in the previous section of this article, thus creating another opportunity for the Penans' voices to be heard in academic spaces.

Conclusion

This article and these questions are not designed to be exhaustive or a final blueprint of how researchers should work with Indigenous communities. However, this article is designed to be a foundation for researchers to reexamine how they can be more inclusive of Indigenous communities when conducting research.

The GCS project serves as a pragmatic approach to implementing an Indigenous methodology that enriches the research experience for both the researchers and the community members. It is important to note that the GCS did not use the IPSG's Declaration as a foundation for their methodology, but this article examines a research project through its lens. By spending time in the community, the GCS learned about the issues the Penan faced and educated the students before they arrived. Without the insights from the community, the researchers may have explored issues that were unimportant to the Penan, thus doing research that had little impact and reducing the community's willingness to participate in the research. In addition, the GCS students expanded their worldview by participating in the Penan's cultural training and through the constant reflexivity of the project. The community had the agency to comment and provide input on research findings because there was a forum to do so (the researchers presented their initial findings before leaving the community). Finally, the GCS created the opportunity for more research projects by presenting the results to other academics and government officials and giving the Penan a chance to advocate for their issues in both academic and government spaces.

This type of methodology aims not to fix past errors but as Somchanhmvong aptly described, "to heal forward." Many have seen conducting research with Indigenous communities ethically as a hindrance to the research process. This case and others like it demonstrate that ethical research can enrich the research process. The paradigm shift can seem radical, but it may be as simple as Allred once stated: The ultimate goal of our research project is "to be invited back." So much can be gained if researchers think about their research, not just in terms of collecting data but building relationships. This perspective ensures that the community wants them to return and provides opportunities for the community to move forward in the ways that align best with their interests while enriching the research. One of the Penan cultural training images showed a Penan community member and a researcher helping each other walk up a set of stairs. Each progressed up the stairs to reach two different rewards at the top. While the goals may differ, both are on the journey together. By aligning a researcher's interests with the community's interests, both can help each other reach their individual goals for collective benefit.

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Maanjiwe Nendamowinan (The Gathering of Minds): Connecting Indigenous placemakers and caring for place through co-creative research with the Toronto Islands

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Abstract

Connecting Indigenous Placemakers was a week-long practitioners' retreat and public symposium held on Menecing, the Toronto Island (Treaty 13a). The collaborative project was supported by the Mississaugas of the Credit First Nation (MCFN), Ngā Aho Māori Designers' Network, and other institutional partners. Based on the success in Aotearoa New Zealand of supporting Indigenous placemaking practitioners and shaping opportunities through a network, the 2019 gathering created a supportive space for Indigenous creatives to be on the land, work on collective and individual projects, build relationship with one another, share knowledge and shape broader

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discourse on Indigenous placemaking in Toronto. As retreat participants integrated the teachings of Menacing, the Treaty Lands and Territory of the MCFN and a gathering place of many nations, the group began referring to the project as Maanjiwe Nendamowinan, the Gathering of Minds. This co-creative experience made clear the primacy of Place. That is, 'we don't make place – Place makes us'. Grounded in Menacing, and in dialogue with many voices, we demonstrate the more-than-ontological significance of Indigenous conceptualizations of and relational practices in (uppercase-P) Place, an entity with a specific identity. We conclude with key considerations that keep Place and placekeeping at the heart of research: respect for the sacred, living well with all our relations, relationship with the peoples of Place, and rethinking research.

Keywords

Indigenous placemaking, placekeeping, Indigenous research, Toronto Islands, Māori Design, sacred

Introduction

How many times must something be repeated to preserve the words? What are we not talking about enough? What symbols need to be on the ground, in Toronto, to remind us to keep talking these ideas through with others? What metaphors of authority are needed to back up our act? (Loft, 2021)

In the book, *Indigenous Toronto: Stories that Carry this Place*, Loft (2021) invites readers to consider who should be involved in conversations about sharing space and what is needed to generate meaningful and ongoing dialogue about collectivity and connectivity to Indigenous place. Thinking with Loft (2021) and the Talking Treaties Collective (2022), a multi-year art-based research initiative to share and reflect Indigenous presence and knowledge in the place now called Toronto, we suggest that land activations, including artistic, cultural, architectural, design and planning practice, have the potential to deepen our sense of interrelatedness in particular places and our understanding of the responsibilities that these relationships entail.

In 2019, an international gathering of Indigenous placemaking practitioners considered these and related themes during a 1-week programmed residency (retreat) on Menacing, the Toronto Islands (Treaty 13-a). In partnership with the Mississaugas of the Credit First Nation (MCFN) and Ngā Aho Māori Designers' Network, the *Connecting Indigenous Placemakers* project welcomed 25 placemaking practitioners based in Toronto, Mississauga territory and Aotearoa New Zealand. The project team conceptualized Indigenous 'placemaking' as the grassroots work of Elders, knowledge holders and community members in sharing narratives about place, as well as the work of practitioners such as artists, architects, planners and designers who create physical spaces. While Indigenous peoples have 'made place' for thousands of years, settler-colonialism works to erase visible Indigenous identities and cultural representations, political relationalities and legal traditions from places and urban spaces. Indigenous placemaking has been generating conversation in recent years in urban public policy, governance and academic spheres. For example, the City of Toronto has established an evolving inventory which records a list of Indigenous placemaking interventions within the city, numbering 37 at the time of the gathering (see also COT, 2017, 2020a, 2020b). However, despite growing opportunities, challenges facing Indigenous placemaking persist across both Turtle Island (North America) and Aotearoa New Zealand (Fawcett et al., 2015; Livesey, 2017; Loewen, 2016; Nejad and Walker, 2018; Newhouse, 2004; Porter, 2017).

Experience in Aotearoa illustrates the importance of networks and shared tools to ensure Indigenous practitioners can support each other and engage critically with and shape opportunities in urban design and placemaking. In Aotearoa, Indigenous placemaking interventions have been supported by a group of Māori practitioners under the cloak of the Ngā Aho Māori Designers' Network.¹ Building on this success, *Connecting Indigenous Placemakers* arose out of new and existing relationships between team members and collaborators. The concept for the 2019 gathering was to support the work of Indigenous placemaking practitioners in their creative practice, and, by forming a network of

Indigenous practitioners, to facilitate dialogue and mobilize existing knowledge around challenges and best practices to re-assert Indigenous placemaking in urban areas.

What emerged from this process is the centrality of Place (an entity with a specific identity) in both Indigenous ‘placekeeping’ and research practice.² Menecing, the Toronto Islands, has always been a site of healing and gathering of many nations. As the group integrated the teachings of Menecing during the gathering, participants increasingly referred to the project not as Connecting Indigenous Placemakers, but Maanjiwe Nendamowinan, the Gathering of Minds. The co-creative experience made clear that ‘placemaking’ is inadequate as a descriptive term: in a statement that resonated deeply with participants, Lucy Tukua observed, ‘As Indigenous peoples, we don’t make place – Place makes us’ (ELMNT FM, 2019). ‘Place Makes Us’ hinges on a more-than-ontological distinction between Indigenous understandings of the Earth as a sacred, animate and sentient being, and Western conceptualizations of abstract space, geographical place, surface landscape and material land – a distinction that we signify in English using uppercase-*L* Land and uppercase-*P* Place (Lambert, 2014; Lister et al., 2022; McGregor, 2018; Styres, 2017; Watts, 2013). Even where the affective, particular and storied, experiential, or agentic qualities of lowercase-*l* land and lowercase-*p* place are recognized within Western paradigms, the abundance, spirit, animacy, kinship and intentionality of Land/Place tend not to be (Chung-Tiam-Fook, 2020; Styres, 2017; Watts, 2013).

The centrality or primacy of ‘Place’ that we discuss below is nothing new to Indigenous peoples, but stands out against the dominant system of research procedures, ethics, operations and norms, a system that is also called to support Indigenous research sovereignty and to ‘make room and move over’ (Latulippe and Klenk, 2020). It stands out against a relational turn in the humanities and social and sustainability sciences that tends not to give due effect to Indigenous thought leadership and histories (Watts, 2013; West et al., 2020). We also acknowledge that knowledge and spiritual power from an Indigenous view are Place-based, but not place-bound. In addition to place specificity, in this article we speak to movement and circularity, relational practice and protocol, and what Larsen and Johnson (2017) call the vitalities of Indigenous coexistence, or ‘being together in place’, and Country et al. (2016) call, co-becoming.

Canada and Aotearoa New Zealand are countries with a shared reality of settler colonialism, history of Treaty/Te Tiriti o Waitangi and enduring Indigenous presence. Situated in a Canadian and Toronto context but drawing on insights, lessons and voices arising from connections with Aotearoa New Zealand and other territories, this article weaves together many voices. We begin with a review of approaches to Indigenous knowledge and research sovereignty and discuss the significance of Place-Thought as a physical embodiment of an Indigenous theoretical understanding of the Earth (Watts, 2013). We then journey to Menecing by sharing the background and context of our project, including a bi-cultural framework and network approach to research. On the substantive topic of Indigenous placemaking and supporting practitioners, we draw from the project’s many knowledge sharing activities to synthesize three themes: connecting with and caring for Place, nourishment and healing, and gathering strength. Conceived of as a project to support those who ‘make place’, Place as we describe below emerged as central to both research process and outcomes. From here, we share key considerations for keeping Place central in research and Indigenous research sovereignty: respect for the sacred, living well with all our relations, holding strong relationship and working with the peoples and languages of Place, and rethinking research.

Literature review: ‘Place’ and Indigenous research sovereignty

Indigenous peoples have been generating and sharing knowledge about the Earth for thousands of years. Relationship and engagement with all aspects of Creation inform infinite ways of knowing and doing Indigenous research methodologies (Simpson and Maniwabi, 2013). In response to the harms to Indigenous peoples, knowledges and territories caused by Western science and academic research practice, Indigenous peoples and organizations are codifying their own research principles, practices

and protocols (Smith, 1999; TRC, 2015; Whyte, 2018). Indigenous research and ethics protocols are designed to protect community knowledge and stories and allow for respectful engagement by non-Indigenous researchers who wish to learn from Indigenous people in a non-extractive way (Maracle, 2017). Numerous models are shared in the public domain (Hayward et al., 2021; Maar et al., 2007; McGregor, 2013; McGregor, 2018b; Morton Ninomiya et al., 2020).

Across the globe, Indigenous peoples have been articulating principles of Indigenous knowledge, research and data sovereignty. Williams et al. (2020) discuss Indigenous research sovereignty, 'Indigenous control of Indigenous research', as a guiding principle for decolonizing research administration in Canada and beyond (2):

Indigenous research sovereignty – an equitable governance arrangement based on Indigenous principles and intellectual traditions that is accountable to community and responsive to the contemporary needs and aspirations of Indigenous Peoples – is a better model for research with, and by, Indigenous Peoples in pluralist nations or nations aspiring to pluralism. (Williams et al., 2020: 4)

Indigenous research sovereignty requires both fundamentally changing mainstream research funding programmes and forming distinct 'in-community' research models developed by Indigenous people for specific cultural contexts (Williams et al., 2020). This two-pronged strategy mirrors the concept of Indigenous knowledge sovereignty, which similarly involves practices to strengthen *internal* Indigenous knowledge systems and the transmission of knowledge according to Indigenous governance structures, and the removal of *external* barriers (policy, jurisdictional, legal, etc.) to the expression of Indigenous knowledge on ancestral lands (Karuk Tribe in Noorgard, 2014; Whyte, 2018). Likewsie, Sandra Styres writes that Indigenous intellectual sovereignty relates 'directly back' to the principles of the Guswentha (Two-Row Wampum treaty), one of many nation-to-nation agreements (in this case, between the Haudenosaunee Confederacy and the Dutch) that embody an ethic of non-interference and respect for difference, which are essential for successful coexistence between knowledge systems and peoples (Porter and Barry, 2016; Styres, 2017: 138). In Aotearoa New Zealand, the Māori Data Sovereignty Network, Te Mana Raraunga (2018), and Te Kāhui Rauranga (n.d.) have developed policy language and principles to protect Māori data sovereignty, which includes the rights of Indigenous peoples to collect, own and apply data about them, their lifeways, and territories (GIDA 2018; Kukutai and Taylor 2016; Walter et al. 2020). Indigenous self-determination grounds these different articulations of research/knowledge/intellectual/data sovereignty, which promote collective wellbeing through the protection of Indigenous knowledge, knowledge keepers and related values and practices.

Our contribution to Indigenous research sovereignty is to emphasize the centrality of Place (an entity with a specific identity). 'Place makes us' is not an essentialist or environmentally deterministic statement, nor is it limited to an 'ontological' distinction from Western paradigms. Our assertion is premised on the reality that language is key to accessing worldview and consciousness: 'Te Ao Māori values, concepts, and constructs only gain full relevance and meaning within that language. English terms may not necessarily have direct translation to Te Reo Māori [the first human language of Aotearoa], and vice versa' (Lister et al., 2022: 55).³ For example, in the Te Tangi a te Manu, Aotearoa New Zealand Landscape Assessment Guidelines:

4.07 'Landscape' is a Western concept brought to New Zealand. It has evolved as a concept and will continue to evolve in an Aotearoa context.

4.08 There is no term for 'landscape' in Te Reo Māori. Whenua is the nearest term, although the words are not directly interchangeable because whenua derives specifically from Te Ao Māori perspectives and tikanga [customary values and practices].

4.09 'Whenua' means the land but also contains layers of meaning relating to peoples' relationship with the land. 'Tāngata whenua' indicates people with a deep connection with a territory, with rights and obligations. (p. 72)

In a Haudenosaunee and Anishinaabe context, Watts (2013) uses the English term Place-Thought to signify ‘the non-distinctive space where place and thought were never separated because they never could or can be separated’ (p. 21). Drawing on Haudenosaunee and Anishinaabe Creation histories, the land is literally an extension of the bodies of Sky Woman and Turtle, and First Woman (Earth) is literally the place where the thoughts of Gizhe-Mnidoo (Creator) could root and grow. Creation histories describe a theoretical understanding of the world through a physical embodiment, Place-Thought: land is alive and thinking and humans and non-humans derive agency through the extensions of these thoughts (Watts, 2013: 21). Place-Thought is ‘non-distinctive space’ because ontology (place) is not separate from epistemology (thought). First Woman and her teachings, ontologies and actions are not interpreted as lore, fable, or ‘theoretical jump-off’ (Watts, 2013: 31). To operationalize the distinction between ontology and epistemology is to undermine Indigenous governance systems and legal principles, as they depend on Indigenous peoples’ ability to access, communicate with and care for Place-Thought. Watts’ non-distinctive space is signified by Styres (2017) as uppercase-*L* Land. Within this frame, Indigenous ways of ‘being-knowing-doing-accounting’ (ontology–epistemology–methodology–axiology) form an undifferentiated whole (Cameron, 2015: 19), and research and education are relational practices grounded in the principle of self-in-relationship: many layers of relationships and an expression of Creation itself (Styres, 2017; Wilson, 2008). To recognize the Indigenous philosophical and (more-than) ontological underpinnings of Land/Place is to recognize learning and knowledge as relational, reciprocal and culturally located (Styres, 2017).

Place and Land signified as proper nouns helps to convey Indigenous philosophies, relationalities and practices outside their socio-cultural and political contexts and to counter harmful abstractions. Watts (2013: 28) discusses Haraway, Latour and other progressive Western thinkers who want to avoid ‘essentialist notions of the earth as mother’ and natural determinations of social relations and material conditions in their consideration of more-than-human agency. However, they end up abstracting Indigenous histories as myth or legend, eroding Indigenous understandings of being and becoming, and they miss the sacred, relational, intentional and intelligent qualities of ‘non-human’ agency. This abstraction undermines Indigenous agency and governance, which depend on access to and communication with the animals and other beings of the Earth.

Indigenous and Western philosophies and related practices are certainly distinct, but they are not consigned to mutual exclusion or isolation. Bridging Indigenous and non-Indigenous knowledge systems may not always be an explicit priority for Indigenous peoples but weaving different knowledge systems is inherent and embedded in the concepts and practices of many Indigenous knowledge holders, practitioners and researchers (Alexander et al., 2021). For example, Styres demonstrates shared pathways for remembering and recognizing Iethi’nihstenha Ohwentsia’kekha (Land) in education across different cultural contexts; namely, Aotearoa New Zealand, Haudenosaunee and Anishinaabe territories. Another example is a bi-cultural model for bridging Western and Māori cultural constructs of Landscape and Whenua (Hatton and Paul, 2021; Lister et al., 2022: 72). Indigenous practitioners routinely engage with Western knowledge systems and institutions. Indigenous worldviews have a place for non-Indigenous peoples and their knowledge whereas non-Indigenous peoples have yet to fully understand, respect or apply that lens to Indigenous peoples or knowledge systems (McGregor et al., 2023). Key is that Indigenous peoples determine when Western knowledge is appropriate and engage with professionals and institutions as required (Cajete, 1995; Johnson et al., 2016; Kimmerer, 2012; Whyte et al., 2016). The choice is essential to Indigenous intellectual and research sovereignty.

Finally, Place and the power of Place are not new concepts to Indigenous peoples. In 1973, Deloria (2003) first published his seminal work on spatially determinative Indigenous cosmology and the spiritual power available in places (Colorado, 1988). Outside the academy, knowledge keepers, Elders and Land itself continue to tell very old stories about the Earth, about a world populated by powerful beings, entities and forces (Murdoch, 2020, 2022; Nahwegahbow, 2017). But these

ideas and relational practices are not necessarily taught or taken up in respectful and appropriate ways within non-Indigenous research contexts or acknowledged in theoretical conversations about more-than-human agency. While Western thought increasingly engages relational ontologies, multiple worlds and the agency of non-humans, the Cartesian split does not readily enable the recognition of non-humans as kin relations possessing thought or agency as being tied to spirit (Watts, 2013). Land-based methods are gaining momentum across many fields, including education, environmental studies and geography, but practitioners are not always critical of colonial relations, nor (ethically or meaningfully) engaged in relationship with Indigenous ways of being, knowing and doing (Tuck and McKenzie, 2015).

Indigenous placemaking: Background and context

Indigenous placemaking includes interventions that strengthen the visibility of Indigenous identities in the built environment (such as design, architecture, art and planning) and exercise Indigenous socio-political authority, engage and contest broader decision-making structures and activate Indigenous-Land relations, which includes the fulfilment of obligations to other-than-human kin (Jojola et al., 2013; Kiddle et al., 2018; McGregor, 2015; Recollet, 2015; Stuart and Thompson-Fawcett, 2010). These practices connect people to Place in urban spaces by highlighting practices of relationality and life-making (Dorries, 2022).

In Aotearoa, physical and conceptual interventions in urban spaces have been supported by a group of Indigenous Māori practitioners under the cloak of Ngā Aho Māori Designers Network. Since 2008, this Network has been involved in developing a Māori Cultural Landscapes Strategy, the Te Aranga Māori Design Principles, and has provided a critical forum for connection and collaboration between Indigenous placemaking practitioners including youth and Elders. Ngā Aho has built relationships with key professional institutes in Aotearoa and has generated debate around transforming the planning system. This work is inherently interdisciplinary, with practitioners from a range of professions working together with grassroots knowledge holders towards self-determination.

Indigenous placemaking practitioners and initiatives are active across Canada as well, including in the Toronto region. The City of Toronto has established an evolving inventory which records a growing list of Indigenous placemaking interventions within the city. Major institutions such as the City of Toronto and University of Toronto are actively working to build Indigenous spaces, render Indigenous identities visible in places, enhance Indigenous programming, engagement and representation, and build their capacity to meaningfully contribute to reconciliation (COT, 2017, 2020a, 2020b, 2022, 2022–2023; UoT, 2017). Speaking recently about Indigenous placemaking, former leadership of the MCFN, Bryan Laforme and Carolyn King, discuss the recognition, respect and relationship that come from effective placemaking interventions within Mississauga Treaty and Traditional Territory (Polishing the Chain, 2022).

The literature also identifies significant barriers and challenges to Indigenous placemaking in urban spaces. Colonialism situates Indigenous peoples outside of urban spaces, in ‘nature’, and erases Indigenous histories and ongoing presence in cities, while Indigenous placemaking interventions tend to be ad hoc and tokenistic as opposed to holistic and Indigenous led (Nejad and Walker, 2018; Nejad et al., 2019, 2020). Within urban planning and design, Indigenous peoples are viewed as stakeholders or cultural communities as opposed to rights-bearing and self-determining peoples, there is a failure to co-produce design and planning policy, and public policy and planning literature tend to focus on socio-economic deficit while further entrenching colonial displacement and dispossession (Akama et al., 2019; Barry and Agyeman, 2020; Dorries, 2022:3; Fawcett et al., 2015; Livesey, 2017; Loewen, 2016; Newhouse, 2004; Porter, 2017).⁴

Similar opportunities and challenges are experienced across countries with shared Indigenous-colonial histories. Practitioners can learn from each other and collaborate across international borders (Jojola et al., 2013). At the same time, vital differences exist between the context for Indigenous

placemaking in Canada and Aotearoa, including the recognition of Indigenous rights, values and interests in regulation and legislation, and the number of Indigenous practitioners working in each country (Kiddle et al., 2018). In both countries, Indigenous placemaking practitioners creating opportunities for Indigenous-led projects and events are often challenged with simultaneously responding to externally led initiatives and requests. In light of these considerations, this project set out to create an immersive space for Indigenous practitioners to explore the similarities and differences in how Indigenous placemaking emerges in various disciplines and geographies. In so doing, it also addresses ongoing conversations about the ‘Indigenization’ of urban areas and universities as sites and arbiters of knowledge production (Gaudry and Lorenz, 2018).

Research methodology

A network approach

Indigenous placemaking involves multiple disciplines and communities, including but not limited to urban planning and policy, art and design, environmental management, architecture and landscape architecture, newly emerging digital sectors and practices such as augmented reality (Devlin, 2017) and locative media (First Story Toronto, 2018; Sustainable Seas, 2021). With a wide range of Indigenous placemaking practitioners and organizations working in Toronto, experience from Aotearoa illustrates the importance of developing networks and tools to ensure Indigenous practitioners can support each other to engage critically with and shape emerging opportunities (Whaanga-Schollum, 2018). To build support in the Toronto context, our project modelled a network approach.

The project emerged from, and contributes to, increasing interaction between Indigenous and allied practitioners and researchers in Canada, Aotearoa, and around the world (Kiddle et al., 2018; Ngā Aho Māori Design Network, 2018; RAIC, 2017). *Connecting Indigenous Placemakers* was initiated by Desna Whaanga-Schollum, the co-Chair of Ngā Aho Māori Designers Network, after a visit to Toronto and Artscape Gibraltar Point on the Toronto Islands in May 2018. Ngā Aho are growing their international connections and view the project as a chance to share their journey and strengthen their ways of doing and being Indigenous, also as an opportunity to share their successes and acknowledge the challenges faced by Indigenous practitioners. The project was developed with the support of members of Ngā Aho, two of whom (Livesey and Clark) were based in Toronto at the time, and a University of Toronto Scarborough (UTSC) faculty member (Latulippe) through a connection first made at the 2014 International Indigenous Research Conference hosted by Ngā Pae o te Māramatanga in Aotearoa.

Ngā Aho together with the MCFN are the Indigenous project partners. MCFN are the Treaty partners and rights-holders for lands currently occupied by the City of Toronto, including the Toronto Islands, Treaty 13a (MCFN, n.d.).⁵ The MCFN has settled several specific land claims with the Crown for past injustices related to treaties; however, outstanding land and treaty claims remain. The MCFN claim unextinguished Aboriginal title to the Rouge River Valley Tract and submitted a claim in 2015 seeking the return of those lands (MCFN, 2022; Talking Treaties Collective, 2022). The Rouge River Valley Tract includes unsurrendered MCFN lands currently occupied by the UTSC campus. The MCFN also assert unextinguished Aboriginal title to all water, beds of water, and floodplains contained in their 3.9 million acres of treaty lands and traditional territory and filed an Aboriginal Title Claim to Waters in 2016 (MCFN, 2017, 2022; Wybenga and Hottinger, n.d.). The MCFN (2022) state,

As stewards of the lands and waters, we advocate for a healthy environment for the people and wildlife that live within our treaty lands and territory. The Mississaugas of the Credit First Nation remains committed, as we have been for generations, to utilizing, protecting and caring for the waters in a holistic way that promotes continued sustainability. We want to maintain and strengthen positive relationships with the people who share our treaty lands and territory.

The lands and waters that form and flow through the City of Toronto, UTSC campus, and surround the Toronto Islands are subject to ongoing obligations and relationship involving the MCFN, making partnership integral to the integrity and success of the project. Toronto-based members of the project team and MCFN developed a relationship over time and eventually the project received formal endorsement and support from MCFN leadership, with accomplished Anishinaabe artist and former elected leader Cathie Jamieson supporting the project as a collaborator. A community-based recruitment process was established to invite members of the MCFN and the Mississauga Nation to participate in the retreat. The project also acknowledges the ongoing cultural importance of the Toronto Islands to other peoples. The Haudenosaunee, Huron-Wendat, Anishinaabek and other peoples carry stories about this place, which have been shared lands and an important inter-national gathering site for thousands of years, and efforts were made to include these perspectives and voices (Devine, 2018; Johnson, 2013; Loft, 2021).

Project collaborators also recognized the importance of engaging local partner and affiliate institutions to participate in an Indigenous-led forum. A public symposium held on Day 6 of the retreat saw engagement from all four universities based in Toronto, private design firms, the Toronto and Region Conservation Authority, Toronto Island and Mississaugas of the Credit Friendship Group, ENGOs, members of grassroots Indigenous-led urban land-based initiatives and restoration sites in the city, Canada's first national urban park, and arts and cultural groups. A total of 70 participants came together at the symposium to listen to Indigenous creatives, share knowledge, participate in open studios, build networks, and strategize longer-term initiatives.

Knowledge sharing activities

Early in the gathering, Cathie Jamieson of MCFN provided the concept in Anishinaabemowin that would ground our activities in Place: Maanjiwe nendamowinan, the gathering of minds. Cathie explained that Menecing, the Toronto Islands, has always been a place of healing and a gathering place of many nations. The name 'Ngā Aho' refers to a parallel concept in Te Reo Māori, weaving together the strands of many disciplines. The following bi-cultural framework guided our activities:

Maanjiwe nendamowinan
The gathering of minds

Mā te rongo, ka mōhio;
Mā te mōhio, ka mārama;
Mā te mārama, ka mātau;
Mā te mātau, ka ora
Through resonance comes cognisance;
Through cognisance comes understanding;
Through understanding comes knowledge;
Through knowledge comes life and well-being.

Working with this framework, knowledge was shared through many experiences over the week-long gathering. We began with spirit and an acknowledgement of Place and the ancestors through ceremony. To ground participants in Place, speakers from MCFN as the territorial hosts, Cathie Jamieson and Waawaashkeshii Nini Henry, shared knowledge about the MCFN and their connections to Menecing, including the movement of the people and connections with other groups within the Anishinaabek Nation. Throughout the week, participants were offered opportunities to engage in sessions with knowledge holders, beginning with the speakers from MCFN. Retreat participants were also invited by host David Moses to share thoughts on the programme A Moment of Truth on ELMNT FM (2019), an Indigenous radio station based in Toronto. The recording has been produced

as a podcast and linked to the show's website. Knowledge also circulated and was reinforced by spending time with the Land and waters, through storytelling and listening, personal and group reflections, meal preparation and feasting, singing, visiting, creative practice, sharing circles, panel discussions, presentations, open studios, workshops, audio recordings, blogging, photography, videography and writing.

The public symposium allowed participants to share some of the information gathered with other practitioners, policy makers and community members. It consisted of a series of three panels and the opportunity to visit the studios of practitioners. Equal weight was given to knowledge offered through presentations, and knowledge offered through embodied practice. We also created opportunities for institutions to be involved by inviting Maydianne Andrade (UTSC) and Tanya Chung-Tiam-Fook (Environmental & Innovation Advisor and Educator) to participate as active listeners. The role of these two people was to reflect knowledge shared by synthesizing the presentations and open studios into themes of the day. These syntheses were powerful and offered immediate assurance to the presenters that they had been heard.

Thirteen presenters were grouped into three panels: 'Working in Place', 'Supporting Practitioners', and 'Strategic Conversations'. Panellists shared images of their past work, videos, and also presented work developed through the week as a way to share their thoughts and journey. The panels intentionally moved from local to global, to show the connections between individual, local actions and collective, global movements. The panels each had a mix of retreat participants from different territories and grouped together people with complementary experience. The first panel grounded the symposium in conversations about working locally – in a specific site, in Place. The second panel focussed on the heart of the project – how to support practitioners to work sustainably and respectfully in Indigenous places. The final panel of the day brought together three retreat participants with three respected practitioners from the wider community. These six panellists were tasked with framing the tools, strategies and approaches needed for next steps beyond the symposium.

Finally, six participants offered to open their studios to symposium attendees. Open studios were an important forum for practitioners to share their work in one-on-one or small group conversations, and for attendees to touch, smell and taste work, as well as participate in creating something themselves. As the panels represented the collaborative nature of the week, the open studios showed the work done by practitioners as part of their individual practice. Studios shared work in process, ranging from the intimate and affective, to socio-cultural and systemic.

Wānanga: To work and speak collectively (Findings)

In creating the retreat and symposium space, we drew on earlier work by Whaanga-Schollum et al. (2015) regarding wānanga as a 'container' for aligning purpose, co-evolving new knowledge, and intentionally regenerating mauri (the essential quality and vitality of a being or entity):

Historically, whare wānanga were schools of learning where highly valued oral traditions, lore and mauri were preserved and passed onto those rangatira [leaders] who were considered to have the aptitude to cope. As with many terms and understandings within Māori society, researchers and practitioners have re-interpreted the term to fit new applications within the contemporary context. The practice of contemporary wānanga is derived from tikanga Māori, the act of interpreting and practising Māori knowledge. Used to describe a space or forum for immersive learning, contemporary wānanga are Māori-led events based on core cultural values, with tāngata whenua worldviews central in the discussion.

In this case, the project created an opportunity for participants to wānanga (wānanga is both a noun and a verb), to work and speak collectively. Here, we share those voices.

To determine what could be shared, the group held internal sessions to weave a collective voice and determine what information could be shared broadly and what should be retained within the group, a

relational process of accountability and consent (Wilson, 2008). The weaving together of many voices has been documented in several publicly available outputs: a radio interview and podcast (ELMNT FM, 2019), compilation video (Connecting Indigenous Placemakers, 2021) and Highlights Report (Latulippe et al., 2022). Other interpretive works have also been developed by retreat participants concerning the gathering itself (see Hatton, 2019) and related to dialogue and relationships formed or strengthened as a result (see Hatton and Paul, 2021; Henry in Latulippe, 2022; Kake and Whaanga Schollum, 2020; Kiddle et al., 2021), demonstrating ongoing connection and conversation.⁶

The following interpretive themes reflect the concept of Maanjiwe nendamowin, which grounded our activities in Place, and continues to find resonance: Connecting with and caring for Place (an entity with a specific identity); Nourishment and healing the Land and people; and Gathering strength.⁷ Ultimately, the gathering of minds, fed in and by Place, created a space of nourishment and collective strength. Participants were reminded that it is not about creating Place but connecting to it. Design and other creative practices can strengthen our connection to Place so that we may listen and, ultimately, heal it.

Connecting with and caring for Place

In the radio broadcast (ELMNT FM, 2019), Nicole Latulippe talked of the origins of the gathering – Place (Menecing) is what brought the group together. Desna Whaanga-Schollum shared her earlier experience of visiting AGP during a visit to Toronto: the space resonated with the kinds of spaces where gatherings are held in Aotearoa New Zealand. Artscape is not an Indigenous space, but it enables gathering, to explore creative practices and a strong connection to the environment. Artscape felt like a place where we could meet to share knowledge with reciprocity. Desna continued,

There are also beautiful mahinga kai (gardens) to harvest from, with Indigenous foods, and a connection to the waters of Lake Ontario. The task of Indigenous designers is to work towards the healing of Place, and we see humans as part of the environment. We ask, how does our work contribute to this? We bring through the Mother Earth law in our practice. This is an initial meeting so that we can nurture and support practice between Indigenous peoples because we have the same struggles. The more that we can share, the more that we can support each other and heal the environment.

Building on this, Lucy Tukua explained that being present on this Land is always an honour (ELMNT FM, 2019). She continued,

When we come to Indigenous lands, we acknowledge the Creator, those who have passed on, and the people of this land. We acknowledge our DNA markers – my mountains bow to your mountains, my rivers bow to your rivers, my sites of significance bow to your sites of significance. We are no different – it is just our languages that separate us. Thinking about the waters which connect us globally, we are all one. This work will magnify the way in which we hold our genealogical connections to those DNA markers.

Lucy sees the work she does in Tāmaki Makaurau (Auckland) as helping Māori to ‘see our faces in our places’. When ‘we share these deep cultural expressions, it helps non-Māori, non-Indigenous people, to think about who they are, what their DNA markers are, and where their bones come from’. In a statement that resonated deeply with participants all week, Lucy observed: ‘As Indigenous peoples, we don’t make place – Place makes us’.

Lucy and our Māori colleagues emphasized that to understand what placemaking means, we must start with Land, with Creation and spirit. All of life has a pulse and is grounded in the Earth. Land communicates; it tells us what it needs and can take on. Through our senses and dreams, through signs and symbols, cultural narratives and practices, travel routes and traditional land-uses, ceremony, the ancestors, songs, plant medicines, our relations in the plant, animal, mineral and water worlds, the landscape itself, Place, will tell its stories. Ultimately, it is not about creating Place but connecting to it.

At the symposium, presenters spoke to how an Indigenous sense of being is intricately woven in our sense of belonging to Place/Land: Lisa Myers spoke to how food connects us to Place, how it can anchor people in places and also urge them to migrate; Caitlin Laforme and Lindsay Stephens of the Toronto Island and Mississaugas of the Credit Friendship Group spoke about their bonds to a healing place in Toronto (O'Rourke, 2018); Jacqueline Paul and Josephine Clarke discussed the youth who are taking up their role as land defenders alongside the Elders; Cathie Jamieson talked about the continual cycle of energy and Place.

The first panel, *Working in Place*, was about instigating change and serving our communities. Cathie Jamieson talked about the Toronto Islands as a place of healing for the physical body and for the body as a spiritual entity, with symbols encoded throughout the island, which she depicted through her painting. Presenters spoke to a range of responsibilities they hold as Indigenous practitioners, community members and leaders, including the responsibility to support protest and occupations, the responsibility to support young people and involve children in the work, and the responsibility to fulfil leadership positions according to the original teachings, not Western roles. Jacqueline Paul shared her experiences supporting the ongoing occupation of ancestral land threatened with destruction/development at Ihumatao in Tāmaki Makaurau. Panellists illustrated a recurring theme of building relationships through sharing food and exchanging knowledge in Place. Both Cathie and Jacqueline emphasized that this gathering is part of a movement, a global resurgence of Indigenous peoples to reclaim their rights, knowledge and ways of life.

These themes were embodied and articulated in the open studios during the public symposium. Waawaashkeshii Nini Henry's studio, *Stewards of the land and water*, at the public symposium, opened with the question: 'What does it mean to be stewards of the land and water?':

For the Mississaugas of the Credit, being stewards of the land and water is a sacred charge given to us by the Creator (Gchi Manidoo). It is more than a legal right to the land so much that [it] is our sacred duty to watch and care for the land, water and all that live there. To retell this connection of the Mississaugas of the Credit to Tkaronto and the importance of our duties to the land and water, I've chose a series of hard carved canoe cups and other carvings to recount this history.

In her studio, 'The land tells us what it can take on', Keri Whaitiri drew on comments made by Cathie Jamieson to consider the following:

Traditional creative practices are deeply embedded in the land. They challenge us to pay close attention to the natural resources that surround us, the dynamics at play within our environment and our relationship to Papatūānuku (Earth Mother) in all her abundance. Engaging in these practices, particularly in an inquisitive way, also leads us towards a better understanding of the collective wisdom of our elders. As a visitor to Toronto Islands, a place of healing and respite within the traditional lands and waters of the Mississauga, Keri has been engaging with this place through creative practice. Her studio project fuses traditional harvesting local natural resources for weaving with jewellery-making. In the process of remaking these into small wearable objects, she seeks to understand the qualities of these resources encouraging viewers to identify natural resources, elaborate on these through story or association, to pick their own resources and to make or take a piece of their choosing.

In these curated spaces, hosts and guests alike considered what it means to relate in respectful and ultimately life-affirming ways with Land (Latulippe, 2022). Participants agreed that design and other creative practices can strengthen our connections to Place so that we may listen and know what Place/Land needs.

Nourishment and healing

The gathering aligned with the traditional uses of the Land on which it was held, a gathering place of many nations and site of healing. Cathie Jamieson explained that the island has always been a place

of rest and respite, purging, healing and regeneration. Participants reflected that sustenance and nourishment were central to the retreat experience: good food together with good company, access to local plant medicines, being with the Land and waters, participation in ceremony, sharing stories and attending to creative practice. These activities enhance connection with Land and contribute to a sense of wellbeing. When designed with communities, Indigenous ‘placemaking’ practices have the power to connect us to our cultures and systems of regenerating Place.

The second panel was titled, Supporting Practitioners. Desna introduced the relationship which Māori have with their ancestral lands, which drove the formation of Ngā Aho. As a catalyst for developing innovation and resilience in land occupation, Indigenous knowledge and belief systems relating to the environment have great potential to enhance contemporary practices. Ngā Aho proposes that bringing the Indigenous to the fore means designing concepts, products, ways of doing and frameworks – such as the Te Aranga Māori Design Principles (ADM, 2016), which have long-term meaningful outcomes and impacts for our communities. George Woolford shared his experience using the Te Aranga Māori Design Principles as a ‘baseline’ which identifies cultural values. In his open studio, William Hatton shared another example:

William has been working with other landscape practitioners to develop and implement a stronger indigenous approach to the way we assess and work with cultural landscapes. In Aotearoa New Zealand, cultural landscapes have been assessed based on their biophysical, perceptual and associative values. Although cultural values are recognized, the approach lacks a deep understanding of Māori, whānau [family], hapū [clan] and iwi [tribe] values and identity of their landscape. An initial Māori approach has been developed exploring whakapapa [genealogy, layered knowledge], hīkoi [walks, site visits] and kōrero tuku iho [oral traditions] as a way to assess and understand cultural landscapes from a traditional and indigenous worldview.

The importance of Elders, youth and other community members spending time together in collective work and storytelling was emphasized. Panellists spoke of their work with people whose voices are often excluded, including people experiencing homelessness and Indigenous youth. Referring to her work with the Nikibii Dawadinnā Giigwag: Flooded Valley Healing Garden, Sheila Boudreau stated that Indigenous youth do not see themselves as valued in Toronto and that this results in trauma. Through learning about design, stories and mapping to develop a green infrastructure project, youth found a pathway to feeling connected, speaking up and having their voice heard. Panellists suggested that the role of practitioners is to ‘open the door’ to Indigenous voices, to form partnerships and work with the people of the Places they are engaging, and to work with communities. Frida Larios concluded by noting that artefacts are transient, but narrative lives forever. In 2004 Frida founded a cultural movement and methodology called New Maya Language; this unique graphic system re-codifies a small part of the Maya mythic narrative giving ancestral oral tradition a new graphic form. The methodology intends to speak from and with today’s Indigenous communities, by borrowing directly from the logo-graphic principles of ancestral precolonial scribes.

Elisapeta Hinemoa Heta channelled nourishment, support and healing through narrative praxis in her open studio, Kupu hou – words in process, with Jade Kake:

As the name suggests, these are new (hou) words (kupu), words/works in process. An indulgent, reflective, and somewhat vulnerable open studio, Elisapeta will invite you in, with tea and the opportunity to sit, and digest works she is currently producing as an expression of self, indigeneity, place, grief, life and love. During her stay at Artscape Gibraltar Point she has also produced small watercolours to accompany some of the words written before and/or during the residency. She asks that you join the workshop with an open mind, ready to listen, and if you have any feedback to write, or voice this feedback during the session.

Everyone is nourished by Mother Earth and to care for her enhances our wellbeing – critical in the context of ongoing settler-colonial violence and trauma. The gifts of ceremonial leaders, youth and

Elders, traditional knowledge keepers, language speakers and medicine people are paramount in this work, and should be adequately supported. While the special relationship and custodial role that Indigenous people have in relation to our territories is nourished through particular processes, activities and values that connect people to Place, significant barriers impinge on the ability to enact obligations, such as pollution and contamination. Tokie Laotan-Brown's talk asserted that access and resources, not 'empowerment', are needed to carry out responsibilities to Land/Place.

Gathering strength

The gathering built upon existing connections within and between Toronto and Aotearoa, across Turtle Island, and internationally. It intentionally fostered connection and an Indigenous space. The practice of connection was embodied in the round of introductions in which participants were invited to introduce themselves through naming the peoples and places to which they belong. The process was the same for each new participant, presenter or guest who joined events (the circle) during the week, enabling people to make connections across age, nation, mountain and river. Water as a connecting element between our peoples was also observed. The symposium space itself was claimed by the Indigenous partners through hanging the MCFN flag behind the lectern, and the Tino Rangatiratanga flag, which represents Māori sovereignty, behind the panellists.

In a session at the end of the week, participants reflected that power was generated from each other, from the collective of Indigenous voices, and from the act of 'placing yourself . . . the authority to place yourself' (Cathie Jamieson). The event was like a council fire of nations coming together, activating Place. As experts and cultural producers, the 'movers and shakers', practitioners reflected on being energized by collective experiences like the gathering. Practitioners bring this energy back to community, part of a 'trigger, then mobilize' process. What is more, inter-tribal gatherings demonstrate sovereignty, nationhood and governance to neighbouring communities, sending a strong message about Indigenous jurisdiction. There is strength in numbers, Waawaashkeshii Nini Henry reflected.

In the third and final panel of the symposium, Strategic Conversations, Tokie Laotan-Brown traced her roots and international journey to 'follow the flow' of the Yoruba language, concluding with the importance of developing long term strategies to connect a global network of custodians, Indigenous people and gatekeepers. Josephine Clarke reflected on her involvement in custodianship and earning the right and responsibility to 'sit in spaces' for local peoples; Selina Young shared stories from her lead role in the first Indigenous Affairs Office at the City of Toronto, including the observation that placemaking is happening but is very reactive without the support of a network that can thoughtfully, mindfully create that space in the city; Elder Wendy Phillips described the cultural and spiritual authority that is held by Elders and often sought in strategic conversations; and James K. Bird spoke of his work to make places and spaces in language, with language being of Land and embodying the connection. Lucy Tukua shared a regenerative framework called 'Te Whakarito' to enable Indigenous peoples to articulate how to give life, vitality, and essence to their cultural narratives in urban spaces. She described how her work as a cultural advisor has allowed Māori to develop their own policies and outcomes. Josephine considered the concept of 'legacy' within Māori worldview and translated it as the pure continuation of energy. In our creation story, she continued, from the nothingness came the potential of being, and the world of awakening. It's the potential in that darkness. Elder Wendy reiterated that deep and cyclical time, 'our ancestors, they have a connection to the space we live in today', while Selina spoke of the need to work for seven generations ahead so that future generations have (safe) space and see themselves as welcomed and celebrated. Legacy has to come from a place of Indigenous knowledge.

Everyone has a role to play in the co-creation required to critically engage with and shape urban design and land-based work that ultimately benefits Indigenous communities, Land, and wider

society. Settlers and guests on Indigenous territories are challenged to know who they are, how they connect to the land, and to whom they are accountable. Questions were posed at the symposium: where are your bones, your stories? Are they being overlaid like ours are with your placemaking? Treaty contains principles to guide appropriate conduct on Land as human beings and as communities of many nations. Indigenous Place-based stories tell us about our relations and how to move forward. Rebecca Kiddle's open studio, *The Decolonizer*, engaged with these questions and a vision of decolonized urban spaces:

The Imagining Decolonised Cities (IDC) project led by Rebecca engaged the wider Aotearoa New Zealand public in an urban design competition which asked participants to think about what decolonisation looked, felt, smelt, tasted and sounded like. One of the contributions we received was a board game. This session tests a prototype of the game, seeking feedback from symposium participants.

Maydianne Andrade suggested that the interconnections between our diverse stories of Place and how we knit these stories together can help to build a common base of understanding, values and principles – a base that is needed to produce meaningful action for youth and future generations. The public symposium attracted representation from public, non-Indigenous and Indigenous agencies, organizations and grassroots and government initiatives. Non-Indigenous representatives listened while Indigenous voices led the discussion. The day was both a symbolic and material expression of Indigenous sovereignty and leadership with MCFN as the treaty holder acting as the host nation and Indigenous people, recognized as the landholders, stewards and leaders in urban design and placemaking. Reflections underscored that relationship-building and Indigenous leadership ought to guide institutional change. This work is not easy; Indigenous communities and non-Indigenous organizations often hold deeply opposing values, understandings, and priorities about our relations and what constitutes proper conduct. That said, with a focus on Land and stories of Land, there is something in common to develop.⁸ This is a strength.

Finally, Land was also observed to be gathering strength and speaking for itself. This is taking place, James K. Bird observed, 'whether we want to hear it or not'. Rematriating Indigenous knowledge back into our spaces is to give voice to Land and to the people. At the symposium, Desna reiterated that our narratives are there to remind us that we are part of the Earth's wider ecosystems. Stories connect us to where we live and help us determine how to support Place – this is part of strategic dialogue.

Discussion: Placekeeping and research sovereignty

Maydianne Andrade reflected that Indigenous placemaking is about stewardship and custodianship. Tanya Chung-Tiam-Fook emphasized that, as Indigenous people, 'our sense of being is intricately woven in our belonging to the land'. What does it mean, then, to reclaim and reimagine within the current system our sense of Place, belonging, regenerative governance, cultural continuity and land-based practices? Maanjiwe Nendamowin made clear that the task is to strengthen connections to Place through design and other creative practice. This resonates with recent observations from the Ontario Professional Planners Institute (OPPI) (2019: 12):

Land use – we need to term it differently. It's not there for our use. It should be 'land relationship planning'. Building a relationship with the land around us. Take into consideration what the land is telling us. Everything that is alive is our brothers and sisters.

It also resonates with the concept of Indigenous 'placekeeping', which 'conceives of place (and the land that provides a foundation for place) as having inherent being and agency' (Chung-Tiam-Fook in Engle et al., 2022: 27). Placekeeping is an approach to city building that prioritizes ecological,

historical and cultural relationships in the care of Place; it ‘is about how we respect our relations – the wind, the water, the land, the animals – and thinking about how we can build in a way that respects and enhances those (Hickey in Evergreen 2022). It emphasizes both social relations (which are not limited to human beings) and material conditions – that is, the need to support Place ‘as the setting and co-creator of our being in the world’, as well as those who keep Place (Engle et al., 2022: 51).

Participant feedback and looking ahead

Maanjiwe Nendamowin’s success can be attributed at least in part to methodology or research process. As a collaborative project, it drew from a community-based recruitment strategy, the First Nation treaty-holders for the Toronto Islands were engaged from the outset, Land consulted and tikanga (cultural protocol) followed. This process takes time, humārie (humility) as well as resources. Champions within our institutional partners ensured that adequate resources were made available. The COVID-19 pandemic has made subsequent travel and in-person assembly difficult, but the intention remains to stay connected and nurture our practices going forward.

Future opportunities for Indigenous placemaking/keeping events have been identified. A list of priorities for future initiatives can be found in Latulippe et al. (2022). However, ongoing challenges include pragmatic ones – time commitment and logistics – and emotional/spiritual concerns – the emotional labour and trauma that accompanies gatherings of Indigenous people in a ‘postcolonial’ world. Adequate time and space are needed and more Elders, ceremonial leaders and medicine people should be involved to support participants. It was also noted that Gano:nyok (The Words Before All Else) is a powerful way to begin such gatherings. Haudenosaunee people have a long tenure in the area and relationship with the Land and region. Related, language is welcomed by the Land and language and language speakers should be supported through these events.

‘Place’ and Indigenous research sovereignty

More broadly, we offer four considerations for keeping Place (an entity with a specific identity) and caring for Place central to research: (1) Respect for the sacred, (2) Living well with all our relations, (3) Relationship with the peoples of Place, and (4) Rethinking research (process, practice, evaluation, etc.). Again, Place and Land signified as proper nouns connote Indigenous conceptualizations of a fundamentally interconnected world where all our relations embody intelligence and will (Watts, 2013). In this manner, ‘all our relations’ signifies human and non-human kin, ‘including all living things and many entities not considered by Western society as living, such as water and Earth itself’ (McGregor, 2018: 7).

The *first* consideration is respect for the sacred. Spirit, prayer and ceremony are part of the everyday working lives and multiple responsibilities held by Indigenous placemaking practitioners, and likewise central to Indigenous research paradigms (Wilson, 2008).⁹ Non-Indigenous practitioners and institutions,

have to realize they are working within [an Indigenous] ‘system of knowledge’ that is totally different from their own. There is an explicit inclusion of spirit and spirituality in Indigenous knowledge system [yet] different conceptions of time for spiritual and value-based traditions are not considered [. . .] or factored into project timelines. Spirituality (e.g. prophecies and ceremony) is not recognized as relevant or as contemporary knowledge that informs approaches to describing environmental change, yet ‘spirit’ forms the foremost foundational aspect of TEK. (McGregor et al., 2023: 17)

In the context of building just and sustainable cities, Engle et al. (2022) address this gap in their recent collection, *Sacred Civics*. Contributors centre the sacred: the spiritual or divine force in all living beings, that which is ‘unique, intrinsically worthy of respect and dignity, relational, life-giving and

sustaining, and defiant of commodification' (p. 3). The authors acknowledge the Faith Keepers, Knowledge Keepers, Elders and community leaders from a myriad spiritual and cultural lineage 'whose ceremonial and cultural leadership and work are central to city building and placekeeping/placemaking' (p. 6). Their leadership teaches responsibilities and accountabilities to all peoples, future generations and the Earth, and they should be adequately supported.

Elder Wendy Phillips spoke at the *Connecting Indigenous Placemakers* symposium about the cultural authority of Elders:

we also have spiritual authority. This is a supernatural component that doesn't always get talked about when we talk about place [. . .] When we talk about space, and our ancestors, they have a connection to the space we live in.

Elder Wendy spoke of a universality to spiritual connection, 'no matter where we come from around the world', hinting at opportunity even in spaces that have not been welcoming to ceremony (New College, 2020; TRC, 2015). Indigenous cultural landscape strategies such as the Te Aranga Design Principles support local peoples, ceremonial leaders and practitioners to demonstrate cultural approaches and perspectives on how to manage and build on land. For Māori, this means spiritual connection and sense of belonging is preserved, among other outcomes, as well as benefits for Tauīwi, non-Māori (Paul, 2017).¹⁰ Supporting ceremonial spaces and their keepers is essential to Indigenous research sovereignty.

The *second* consideration that Place and placekeeping bring to research is respect for all our relations. From Desna Whaanga-Schollum's opening remarks at the symposium: 'We are not the most important things on this planet. We are the continuation of our ancestors and the seeds for what is to come'. Moving beyond human-centred planning and design, Indigenous methodology and practitioners reference 'an eco-system of actors' (Whaanga-Schollum, 2020). Several voices talked about the regeneration of Place through the embodiment of treaty principles that are rooted in precolonial relationships between different Indigenous nations and confederacies as well as relationships (bimaadizwin) with the Land and with animal nations (Simpson, 2008).¹¹ In a facilitated session during the retreat, Ange Loft and Jamie-Lee Oshkabewisens of Jumblies Theatre led a conversation and art-based response with the group. Participants created symbols and collective sounds to explore and consider the nature of treaty relationships, which are not just between settler and Indigenous peoples but have formed the foundation of relationships between Indigenous groups and with the living world.

McGregor (2018) writes that Mino-Mnaamodzawin, living well or the good life, means that well-being and justice pertain not only to human beings but to all our relations (2018). In a research context, Luby et al. (2021) challenge universities to respect not only the rights of Indigenous peoples to govern research within their territories, but also for non-human actors to figure meaningfully in ethics review processes. These interventions are part of a call to revitalize and reconcile our relationships as human beings with the Earth, an Indigenous law that could be applied more broadly (Elder Augustine in TRC, 2015: 18). To revitalize and strengthen relations through which all life may flourish includes making kin even with those 'polluted' areas and 'invasive' species (Hernández et al., 2021; Reo and Ogden, 2018). To strengthen relationships with Place, Indigenous peoples must have access to their lands. Access and relationship are protected by Article 25 of UNDRIP, the right of Indigenous peoples to maintain and strengthen their spiritual relationships to their lands and waters and uphold their responsibilities to future generations (Craft, 2018). This is something that research institutions have yet to meaningfully grapple with.

Third, is holding strong relationship and working with the rights-holders and stewards of Place, as well as local Indigenous practitioners, networks, language speakers and learners. Practitioners must bring their 'whole selves' to work with Indigenous communities, acknowledging their own identities, ancestors, and histories. 'Many times', Lucy shared at the symposium,

we've acknowledged the value of being here with the people of this land, to come into this space, be welcomed in a way that our ancestors speak to one another in strategic conversations, acknowledge those sacred sites people have talked about – they belong to all of us, we are all there to protect sacred sites across the globe.

Practitioners must also acknowledge that Indigenous knowledge is not 'transferable' and that their role is to reinvigorate Indigenous voices so that those voices are stronger and clearer.

The project team endeavoured to work in a respectful and appropriate way with the MCFN, the Mississauga Nation, and in acknowledgement of shared territory. On the first day, the welcome from MCFN was responded to by Ngā Aho, who offered acknowledgement and thanks in the form of a *whaikōrero* (formal speech) and *waiata* (song). This, and the subsequent exchange of gifts, offering of time from volunteers, visiting, and extending networks, express respect and reciprocity, fundamental values in Indigenous research. Respecting the rights of Indigenous peoples to govern research within their territories takes many forms and relies on relationship and reciprocity. The compilation video is a legacy piece that depicts collaboration and co-creation in the spirit of *maanjiwe nendamowinan*. It provides a record, reflecting the wishes of our community partner and territorial host nation, and shares the voices, languages, songs and faces in an Indigenous space.

Creating space for participants to exercise agency over how knowledge would be shared was key to the success and realization of research sovereignty at the symposium.¹² Panellists were encouraged to work together during the week to shape the focus of their panel and develop key messages or themes. They shared stories and learned from each other. This series of decisions meant that the symposium was not a collection of strangers talking on related but unconnected topics, but a coherent, cogent force of voices arguing for a single goal. Each speaker knew who they were, in relation to the other speakers. Each speaker knew how their perspective and story fitted with other perspectives and stories. Each speaker chose to introduce themselves in a way that makes sense to them. This experience demonstrated the value of building intentional time and space to relax, focus and connect. Many attendees expressed gratitude for the opportunity to listen and learn from Indigenous leadership that day.

To respect the diversity of Indigenous experiences and strengthen the weave of collective voices, hearts and minds requires well-considered supports to establish culturally grounded and productive spaces. The challenges – emotional, spiritual, physical, relational, that stem from settler-colonial violence and intergenerational trauma are real. Cultural safety and making supports available are key considerations for Indigenous research sovereignty.

Fourth, Place and Indigenous placekeeping demands a reconsideration of what constitutes research. A full discussion of this topic is beyond the scope of the article, but what can be highlighted is that the activities and outcomes shared here are not always legible or of value to mainstream research institutions, which can make it difficult to secure funding and other supports or achieve appropriate recognition for and appraisal of Indigenous research. Indigenous embodied research necessarily challenges dominant conceptualizations of 'research' (Whetung, 2019).

The project demonstrates one research pathway to what Styres (2017) calls (re)centering, (re)membering, (re)cognizing and (re)generating Indigenous philosophies and pedagogies of Land. She emphasizes the prefix *-re* to signify the circularity of coming to know 'again' the primacy of Land and the suffix *-ing* for fluidity, movement and progressive action. The project did not centre academics or prioritize peer-reviewed article outputs, an approach that the university system struggles to see, hear and meaningfully support (Kuokkanen, 2007). Rather, relationship, process, and embodied practice were paramount in our network-based approach to knowledge-sharing. Activities such as feasting, visiting and "gathering" itself are recognized as a culturally-appropriate methods for Indigenous knowledge sharing, and these activities should be adequately supported (Ermine et al. 2005; COO 2015; UOI 2015; Craft 2014, 2017; Heta 2016; Hernández et al. 2021).

Frameworks exist to support Indigenous researchers and research sovereignty (self-determination), such as the First Nations principles of ownership, control, access and possession (OCAP) (First Nations Information Governance Centre (FNIGC), n.d.), Global Indigenous Data Alliance

(GIDA, 2018), and others, but institutions and their representatives have work to do (Latulippe and Klenk, 2020). In the Canadian context, Senator Sinclair reminds us that virtually all aspects of Canadian society will need to be reconsidered to achieve truth and reconciliation (TRC, 2015) – and this certainly applies to research. Seeking truth before reconciliation, and developing institutional ‘trustworthiness’ before trust (Wilson et al., 2023), means that when challenges inevitably arise (i.e. unwanted and inappropriate developments on Indigenous land), relationships may be strong enough for non-Indigenous people, researchers, and institutions to forge collaborative and effective responses with Indigenous peoples.

Concluding remarks

Maanjiwe Nendamowin embodied a relationship and network-building approach to research that honoured long-standing stewardship and nourished connection with Place. The project prioritized the wellbeing and creative practice of participants and mobilized existing knowledge and expertise through peer-to-peer dialogue and collective, community-oriented outputs. Conceived of as a project to support those who ‘make place’, Place (re)emerged as primary relationship and first teacher (Styres, 2017) – as central to both research process and outcomes.

In this work, we shared priorities, principles and practices that (re)emerge when Place and place-keeping are central to research. This is not intended to bound Indigeneity or fix identities to certain spaces. Place and learning are interconnected and both are dynamic systems in constant flux (Moreton-Robinson, 2017; Styres, 2017). Knowledge, agency and spiritual power are available in Place, but not bound by it (Deloria, 2003). We emphasize movement and migration, cyclical time and ‘legacy’, and relational and life-making practices (Dorries, 2022; Whyte et al., 2016). Place (an entity with a specific identity) and placekeeping bring a diversity of human and more-than-human beings together into emergent processes of co-becoming (Larsen and Johnson, 2017; Styres, 2017).

The work ahead to (re)member the primacy of Land/Place is not for Indigenous peoples alone: ‘It is crucial that we all consider and take seriously how we want to be in relationship to this world now and in the future’ (Styres, 2017: 90, 61). Tuck and McKenzie (2015) argue for engagement with anti-colonial and Indigenous approaches to ‘place’ across all fields of research. On Menecing, reciprocal, relational and culturally grounded processes of learning and doing promoted connection to Place, care for Place, and support for Indigenous placemaking practitioners. Through a placekeeping lens, we consider the sacred, all our relations, the peoples of Place, and rethinking (re)search as paramount to the weaving of relationship and research practice from Toronto to Tāmaki Makaurau.

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As this paper goes to press, the authors reflect on the devastating impacts of Cyclone Gabrielle in Aotearoa. Clearly, Indigenous Placemaking is more than a decoration – it is survival. It continues to be more and more

pressing for us all to re-tune into the environment, revise the contemporary planning systems, and remember and revitalise our ancestor's knowledge of Place.

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Notes

1. See <https://ngaaho.maori.nz/>.
2. See Whaanga-Schollum (2018) for discussion of a Mātauranga Māori 'Sense of Place'.
3. A draft of the Aotearoa New Zealand Landscape Assessment Guidelines was crafted with Te Tau-a-Nuku, a technical group within Ngā Aho, the national collective of Māori design professionals (p. 8) and *Connecting Indigenous Placemakers* partner.
4. Bounded conceptualizations of Indigeneity as a fixed identity category in relation to colonialism and anti-theoretical to urbanity are reflected in urban policies, which 'further entrench colonial displacement and dispossession through processes of gentrification, policing and surveillance, and other forms of structural racism' (Dorries, 2022: 3).
5. The so-called Toronto Purchase of 1805 (Treaty 13) was an attempt to 'confirm' the contested terms of the Toronto Purchase of 1787 (Talking Treaties Collective, 2022; Wybenga, 2017). In 2010, the Government of Canada settled the Toronto Purchase Specific Claim and the Brant Tract Claim, which included compensation for lands unlawfully acquired (including the Toronto Islands) and for the Crown's failure to pay a reasonable price for land obtained in the 1805 agreement (MCFN, n.d.; Wybenga, 2017).
6. Retreat participant contributions to 'Our Voices II' (Kiddle et al., 2021) include Keri Whaitiri, Elisapeta Hinemoa Heta, Kristi Leora Gansworth, Desna Whaanga-Schollum, Jade Kake and Jacqueline Paul, and Josephine Clarke.
7. Direct and indirect quotations derive from public outputs such as the radio show, public symposium and Highlights Report, and from group reflections developed for the purpose of sharing. Other insights reflect ongoing dialogue between and interpretations by the authors, and every effort is made to be specific about attribution. In this section, the authors (who are not all Indigenous or belong to Indigenous collectives) use possessive language (i.e. "our") to reflect Indigenous project leadership, amplify participant voices, and in this context refuse to 'Other' Indigenous concepts, practices, peoples, and places. Where appropriate, we also discuss and differentiate the positionality, roles, and responsibilities of non-Indigenous practitioners and researchers.
8. When people lack an awareness of the fundamental being and agency of Land, recognizing Land can start with living in reflexive relationship to (lower case-*l*) land and requires critical self-location (Styres, 2017):

respectful acknowledgement of whose traditional lands one is on, a commitment to seeking out and coming to an understanding of the stories and knowledges embedded in those lands, a conscious choosing to live in intimate, sacred, and storied relationships with those lands, not the least of which is an acknowledgement of the ways one is implicated in and informed by the networks and relations of power that compose the tangled colonial history of the lands. (p. 55)

9. An example from broadcasting voices was William's opening with a formal mihi, acknowledging and greeting the Creator, the building, the Earth Mother and the ancestors.
10. Wairuatanga, the immutable spiritual connection between people and their environments, is a core principle that guides the application of the seven Te Aranga Māori Design Principles (ADM, 2016).
11. Indigenous versions of Treaty/Te Tiriti o Waitangi are 'constitutional associations', agreements or relationships codified through Indigenous diplomatic protocol and text, such as wampum belts and written language, which maintain Indigenous sovereignty and establish a foundation for Indigenous and non-Indigenous people to live together in place (Mills, 2017: 208; Livesey, 2017: 5; Krasowski, 2019).
12. This decision was inspired, in part, by a wānanga organized by Elisapeta Heta (2016) in 2015. Elisapeta facilitated the 2-day wānanga using the principles of Open Space Technology; she presented the topic, invited people to submit ideas and then asked participants to arrange conversations within the time and space available.

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Advancing Indigenous futures with two-eyed seeing: Strategies for restoration and repair through collaborative research

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Abstract

This article builds on the Indigenous research concept of two-eyed seeing, that is, learning from one eye with the strengths of Indigenous knowledges and ways of knowing, and from the other eye with the strengths of Western knowledges and ways of knowing. We do so by drawing on the authors' multiple standpoints (Karuk Tribal Member, Karuk Enrolled Descendent, and non-Indigenous ally) and experiences building longstanding research collaborations that apply biophysical science, ethnographic methods, and Karuk oral traditions to tribal lands protection. Using Kovach's conversational methodology, we discuss problems of health and well-being that arise from two-eyed seeing research collaborations affecting Indigenous lands, waters, and resources. We specifically examine interventions for advancing Indigenous leadership in research that intersect with the Karuk Tribe's ecocultural revitalization initiatives through (1) stewardship of baskets alongside basket-weaving communities (human and nonhuman); (2) family based management of ceremonial trails, and (3) allyship for tribal-academic collaborations. Our analysis emphasizes how the aliveness of Karuk knowledge resists ahistorical essentialism, for example, by engaging with the joy of human/nonhuman relations, ceremonial scale, and solidarity practices. Responding to ongoing challenges with knowledge hierarchies, this work recognizes the importance of mutual acknowledgment of persons across systems for advancing Indigenous research as a multi-vocal initiative with the capacity for restoration and repair.

Keywords

Indigenous methodologies, Indigenous research sovereignty, Indigenous knowledge systems, two-eyed seeing, Karuk Tribe

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Introduction

Two-eyed seeing has emerged as a powerful approach to engaging with complementary components of multiple knowledge systems that include Indigenous knowledge systems without assuming knowledge integration. In this context, two-eyed seeing can be understood to mean seeing as learning from one eye with the strengths of Indigenous knowledges and ways of knowing, and from the other eye with the strengths of Western knowledges and ways of knowing (e.g. Arsenault et al., 2018; Denny and Fanning, 2016; Reid et al., 2020). Yet, surface engagement with two-eyed seeing glosses over the complexity and ongoing struggles for advancing Indigenous leadership in negotiating research and land management decisions—a challenge that is rooted in longstanding conflict with settler-colonial systems.

Researchers have long engaged with the paradox of finding complementarity in Indigenous knowledge systems that may or may not fit with dominant approaches to scientific research and knowledge production (e.g. Agrawal, 1995; Barnhardt and Kawagley, 2005; Berkes, 2012; Berkes et al., 2000). While there may not be consensus over the compatibility of Indigenous and Western knowledge systems, even in part, management over Indigenous lands, waters, and natural resources that cross jurisdictional boundaries and authorities creates a particular need for knowledge translation. Concerted efforts to advance two-eyed seeing are conceived as one approach to supporting Indigenous self-determination in complex negotiations over knowledge and authority.

In practice, two-eyed seeing is a careful and selective process (e.g. Kimmerer, 2015) that starts from Indigenous knowledge systems, but also brings in Western scientific knowledge systems. This is especially the case when Indigenous knowledge systems are understood to be embedded in particular, place-based understandings of human and nonhuman relations. Thus, part of Indigenous research sovereignty includes advancing two-eyed seeing in a way that authentically centers Indigenous knowledge and place-based relationships. Knowledge translation processes that are required to maintain Indigenous research sovereignty are often rooted in Indigenous methodologies, which are now well established (e.g. Kovach, 2009; Smith, 1999; Wilson, 2008).

Two-eyed seeing is also bound up with longstanding challenges of land-based trauma and environmental justice related to the contested domains of land and water management on Indigenous lands, natural resource policies that are dominated by colonial institutions, and knowledge production that privileges elite academic institutions. Highly political contests between Indigenous nations and the state have often made the very idea of proposing two-eyed seeing an oppositional effort. Yet given growing interest in Indigenous knowledge systems as offering new perspectives for solving urgent environmental problems, there are also a growing number of research spaces where mutually interested parties are bringing the political will to engage across knowledge systems. This shift creates a need to go deeper into the practice of negotiating two-eyed seeing, and engaging with the underlying tensions involved in doing so.

In this article, we are specifically responding to the emotional tensions with two-eyed seeing, where we see the mental health toll on Indigenous scholars and cultural practitioners of working in elite spaces as a large factor determining the failure or success of many two-eyed seeing efforts (e.g. Diver, 2016b, 2017; Norgaard et al., 2011). Knowledge translation work that engages with elite academic institutions and dominant bureaucratic agencies can create a tremendous amount of turmoil for advocates of Indigenous methodologies. Given the many external barriers to advancing Indigenous knowledge within a dominant system that was not created by or for Indigenous peoples, two-eyed seeing involves a tremendous amount of work. The problem is not that people are incapable of doing this work. Rather, the problem lies in the intense labor of having to translate everything that cultural practitioners and Indigenous knowledge holders need to do—whether for agencies, funders, or the academy. Furthermore, engaging with dominant systems unfamiliar with Indigenous ways of knowing or being can reactivate historical trauma for Indigenous peoples. This work often involves working closely with institutions that have played distinct roles in the displacement of Indigenous communities

from their lands, the erasure of Indigenous knowledge, and suppression of Indigenous resistance movements. This leads us to the question, how do we do the work of two-eyed seeing without being angry all the time?

In this way, engaging with historical trauma involved in cross-cultural knowledge collaborations creates a significant emotional stumbling block for moving forward with the vision of two-eyed seeing. This article seeks to lift up the mental health and wellness outcomes of knowledge collaborations, and analyze how we can advance two-eyed seeing collaborations where all members feel they belong. We do so as a research collective engaging with Kovach's (2009) conversational method. We focus our contributions on understanding the trauma by engaging across knowledge systems, as well as by analyzing our own practices in building a collaboration linking western scientific knowledge and Indigenous knowledge that seeks healing, in part through the physical and spiritual work of land management.

Literature review

Philosophy of two-eyed seeing

Two-eyed seeing is an Indigenous research concept or philosophy around interweaving different ways of knowing (e.g. Arsenault et al., 2018; Denny and Fanning, 2016; Reid et al., 2020). While acknowledging complicated colonial histories, this approach recognizes the centrality of Indigenous knowledge systems to research, but does not reject Western scientific knowledge systems. The idea builds on the work of Indigenous scholars like Vine Deloria, Jr. who discuss “two ways of knowing” (Deloria et al., 1999: 67) and differentiate between Indigenous knowledge systems and more exclusionary Western scientific traditions. In contrast, two-eyed seeing emphasizes the possibility for coexistence of Indigenous knowledge systems and Western scientific knowledge systems for the benefit of all (e.g. Reid et al., 2020). An example of creating such a bridge or linkage between knowledge systems is Kimmerer's (2015), *Braiding Sweetgrass*, where she deftly and poetically weaves scientific knowledge of plants and algae with Indigenous knowledge that lifts up the interconnectedness of creation, immersed in experiential and sensorial learning that is predicated on reciprocal relationships.

Part of two-eyed seeing includes engaging with the edges and boundaries of knowledge systems, in order to work with multiple ways of knowing and transcend colonial systems that reinforce social hierarchies. As Larsen and Johnson (2017: 5-6) write:

To claim multiple ontologies is not to claim some ultimate reality or transcendental signifier. It is instead a way of understanding edges and boundaries, of looking into the eyes of others and seeing the world from the outside, and of developing this exteriority into a ‘border thinking aimed at decolonizing our relationship and forms of association. (citing Mignolo and Tlostanova, 2006)

Yet as Johnson (2008) writes, this is “tricky ground.” Even as collaborators strive toward a coexistence that forwards Indigenous self-determination, knowledge production occurs within a “political realm” that includes the ongoing displacement and dispossession of Indigenous peoples by settler-state governments (Larsen and Johnson, 2017).

While recognizing the coexistence of knowledge systems, the two-eyed seeing philosophy starts with Indigenous ways of knowing—engaging directly with cosmologies and epistemologies of Indigenous peoples (e.g. Deloria, 2001; Kimmerer, 2015; Kovach, 2010; McGregor, 2014; Smith, 1999; Wilson, 2008; Whyte, 2018). Knowledge is derived from everyday, lived experiences, individually and communally; through the observation and experience with the environment, and through intuition (Cajete, 2004; Deloria, 2006; Deloria and Wildcat, 2001; Deloria et al., 1999; Kovach, 2009; Stewart-Harawira, 2013; Weber-Pillwax, 2001). Indigenous epistemologies trace the ways in which learning and teaching developed in Indigenous communities, which is a cultural and life-sustaining

process that unfolds among peoples and the natural and spiritual worlds. Experiences and learning are tied to place, environmentally, socially, and spiritually and are interwoven in the fabric of daily life (Cajete, 2004: 71). Deloria (2001) further explains that Indigenous knowledge is relational, connecting to experiences and knowledges of humans and other-than-humans. He cautions researchers to keep this in mind, since “the reduction of knowledge of phenomena to a sterile, abstract concept, much is lost that cannot be retrieved” (Deloria, 2001: 6). Through these experiences, Indigenous ways of knowing are a way of seeing and living self-in-relation with the world (Graveline, 1998; Kimmerer, 2015).

Rooted in Indigenous methodologies

Importantly, two-eyed seeing employs more holistic research approaches used in Indigenous methodologies. Implementation of two-eyed seeing recognizes the importance of reciprocal relations (e.g. Arsenault et al., 2018; Diver et al., 2019; Kovach, 2009; McGregor, 2014; Tobias, 2009; Wilson, 2008) and encourages reciprocal learning through knowledge exchange—between Indigenous community members and academic researchers, as well as within Indigenous communities. This includes approaches that bring people together, such as Kovach’s (2010) conversational methodology emphasizing a two-way knowledge exchange process; Archibald’s storywork where the inclusion of stories within Indigenous research assists readers to personalize and internalize the events that are being discussed, making them “feel like a part of the story” (Archibald, 2008: 21); and Craft’s (2017) approach to organizing research gatherings that follow ceremonial protocol methods involving a Faculty of Elders; the Chiefs of Ontario approach to bringing knowledge holders together through an open process in a “knowledge sharing framework” among each other, rather than having the feeling of having knowledge extracted from individuals, or similar approaches that connect elders and youth in mutual learning conversations (Arsenault et al., 2018; Lavalley, 2006).

Furthermore, Indigenous research methodologies forge questions based on relations: “You are not answering questions of validity or reliability or making judgments of better or worse. Instead you should be fulfilling your relationships with the world around you” (Wilson, 2001: 177). Indeed, Indigenous methodologies consider ways of knowing as inherently relational; they are interconnected and intertwined and cannot be simply parsed out into discrete elements, as Western ways of knowing are (Cannon, 2011; Dei, 2011). The research endeavor does not belong solely to the researcher, extending beyond the individual and mutually influenced by family, community, tribe, and nation (Archibald, 2008: 11), with humans and nonhumans (Archibald, 2008; see also Kovach, 2009).

Indigenous research methods also “celebrate the pluralism in ‘truth,’ because Indigenous knowledge is dependent upon individual experiences and relationships with living and nonliving beings and entities” (Grincheva, 2013: 52). This approach helps mitigate the ahistorical voice in which many historical anthropological texts about Native peoples were written. For example, Coté (2010) forefronts Native voices in her research about Nuu-chah-nulth and Makah whaling practices, which ensures that multiple Native peoples and understandings are guiding the narrative. Writing in ways that are self-reflective within Indigenous research also honors the multiple ways of knowing about the world (Graveline, 1998; Kovach, 2009).

Personal experiences leading us to two-eyed seeing

While it is possible to engage in two-eyed seeing from a variety of perspectives, we are working from our own experiences. Specifically, we are coming to our analysis through the lens of basket weaving and ceremonial trails. We also draw on years of experience working through an allied approach to ecocultural revitalization in these domains, which includes using science and engaging in dominant systems. We use two-eyed seeing to bring a more open mind to our day-to-day collaborations—striving to engage across knowledge systems even if we are trained to think in one way, or are skeptical about approaches coming from dominant society. Here, we share how each of the authors came to a two-eyed approach.

The removal of Native children from their families and communities during the boarding school era and its aftereffects is keenly felt today by their descendants. For Smith, disconnection from community, culture, and homeland weighs heavily on her because her Karuk grandmother, who helped raise her, never returned home and hardly ever spoke about home and family after leaving Chemawa Indian School and Fort Lapwai Indian Sanitarium when she was just a teen. Growing up, Smith remembers that Karuk ways of knowing were in her grandmother's manner and lilt in which she spoke, but language, culture, and land were absent. The memory of her grandmother's influence on her, along with encouragement from other family members, led Smith to reconnect with her tribe. Learning to weave and gather brought her closer to her grandmother's memory, familiar lilt, and manner. Weaving baskets opened Smith's mind: seeing with both eyes and embodying different ways of knowing and understanding the world.

For Reed, going up to ceremonial areas at Inaam to make medicine is where two-eyed seeing took hold. This was a shift from his experience growing up in a lumber and mining town that was very conservative, where he was removed from a more encompassing cultural knowledge. For Reed, returning to ceremonial traditions as an adult occurred alongside starting a new job with the Karuk Department of Natural Resources. In that position, Reed became a tribal spokesperson, applying TEK and Karuk worldviews to shape federal dam removal negotiations. His experience included working with academics as a cultural practitioner to establish the links between dam construction, loss of traditional foods, and disproportionately high levels of diet-related disease in his community. After working from both Karuk TEK and Western science, Reed saw the utility of working in partnership with academia through a two-eyed seeing approach. This led him to engage with a new set of collaborators, and co-found the Karuk-UC Berkeley Collaborative in 2008—to foster synergistic collaborations for ecocultural revitalization of the people and landscapes within Karuk ancestral lands and territories.

For Diver, two-eyed seeing came from learning through research collaborations with Indigenous scholars, as well as personal friendships with community leaders. This included learning from Nancy Turner, an ethnobotanist, about her open-minded approach to accepting multiple truths as she worked with Western science and Indigenous cosmologies at the same time. For Diver, two-eyed seeing offered a productive pathway for moving out of a validation paradigm with TEK. It provided a model for holding multiple versions of reality in her mind, without feeling obligated to have everything match up perfectly. The two-eyed seeing approach further aligned with embracing multiple, situated knowledges to move toward a more complete understanding of the world (Haraway). Diver's appreciation of two-eyed seeing also came from conversations with Reed about his experience leveraging Western science and Karuk knowledge in dam removal negotiations. In this case, two-eyed seeing helped overcome uneven power dynamics in knowledge hierarchies, as an ongoing challenge for natural resource management negotiations with Indigenous peoples.

Experiences with two-eyed seeing are embodied—linked to stories, places, and people

By including our personal stories in this article and our analysis, our experiences are interwoven and their own histories, understandings, and personal integrity are implicated in the research (Archibald, 2008; Weber-Pillwax, 2001). Berryman et al. (2013: 5) state that both community members and researchers “are encouraged to bring their identities and ideologies to the research table so that these authentic selves inform the co-creation of new knowledge in a third space” (see Bhabha, 1994; Shor, 2009; Soja, 1996). This space bridges the gap between “self” and “other,” and reframes the researcher's stance from “expert” to “learner” (Berryman et al., 2013; see also Freire, 1998).

For our research team, place also feeds authentic connections between knowledge systems that can contribute to our two-eyed seeing, and knowledge collaborations between Indigenous and non-Indigenous peoples. Working on ceremonial trails or gathering materials for baskets involves reaching out to a place, and relearning what it means to be of that place. This follows the work of Larsen and

Johnson (2017), who emphasize the centrality of localized and particular place relations, writing “It is at the local scale that we see places compelling ontological dialogue and struggle over how to live together in ways that acknowledge our kinship and its inherent responsibilities” (p. 157). Place also supports Indigenous self-determination in political negotiations over knowledge production regarding Indigenous lands (e.g. Diver, 2017). As Larsen and Johnson (2017) describe it, “‘Border thinking’ is, at root, grounded in the agency of place to teach coexistence, an agency that also entangles corporations and states” (p. 186).

Engaging scientific and bureaucratic systems given historical trauma: A heavy lift

In addition to Indigenous ways of knowing, two-eyed seeing also seeks authentic knowledge collaboration with Western science. This is a heavy lift, considering the many cases in which dominant science engages with Indigenous knowledge in a techno-bureaucratic manner without respecting its embeddedness in place-based cultures (e.g. Norman, 2013). Yet, two-eyed seeing recognizes the contemporary and changing nature of Indigenous knowledges, cultures, and governance institutions, which multiple Indigenous peoples and nations are articulating for themselves (e.g. Clifford, 2001). To this point, TallBear (2016) writes that

part of the governance of science, and governing through science is to build Indigenous controlled institutions. Part of governance, if we choose to take it up, is to train our own peoples to do the science. . . . The hope is also that as we learn to participate in governing techno-science, we bring to the conversation a nuanced and radical positionality. (p. 79)

This speaks of the cases where Indigenous nations are choosing for themselves to leverage Western science in service of Indigenous values for restoration, revitalization, and repair (e.g. Diver, 2017). TallBear’s ideas of Indigenous governance in science connect with Todd’s (2014) “principled pragmatism,” that is, ensuring that Indigenous values are embedded in formal legal orders or informal norms regulating and guiding non-Indigenous resource users in respectful practices. Approached in this way, we see pathways by which two-eyed seeing could facilitate the radical transformation of knowledge production, and land management.

Yet such knowledge collaborations are embedded in longstanding histories of resistance against colonial legacies, uneven power relations, environmental injustice, and other forms of racialized violence. From the genocide and theft of lands and livelihoods through settler colonialism, to the children who were violently stolen from their families and placed in federal boarding schools, the centuries-long buildup of historical trauma in Native peoples is immense. The weight of these traumas continues to have socioeconomic, mental, and physical health impacts on individuals, families, and communities (e.g. Brave Heart et al., 2011; Evans-Campbell, 2008; Mohatt et al., 2014).

Such land-based historical traumas are often recapitulated when Indigenous peoples enter into contemporary, conflict-ridden environmental decision-making processes. Researchers have clearly established how problems of cultural differences and power asymmetries typify negotiations over environmental management and injustice with Indigenous peoples (Feit and Spaeder, 2005; Menzies and Butler, 2006; Nadasdy, 1999, 2003; Natcher et al., 2005; Spak, 2005; Taiepa et al., 1997; Tindall et al., 2013; Usher, 2003; Weir, 2009). Experiencing and responding to environmental injustices can provoke a sense of overwhelming outrage and despair for culture bearers (Norgaard and Reed, 2017). And Bacon and Norgaard (2021) point out how these emotions, including anger and shame, structure settler-Indigenous solidarity work and resistance movements.

In the Indigenous environmental management context, what is less discussed is the emotional toll that the complex process of crossing knowledge systems can take on the health and wellbeing of Indigenous community leaders, and what is needed to promote healing in research partnerships. There

have been important innovations in culturally informed therapy to provide healing of historical trauma that incorporate traditional knowledge (e.g. Archibald, 2008; Archibald and Dewar, 2010; Ellington, 2019; Galla and Goodwill, 2017; Hartmann et al., 2019; 5).

Moving forward: Collaborative care and reciprocal relations

Part of the solution has been discussed through reciprocal relations: doing research in deep connection with the communities we work with, as well as the land (Kovach, 2009; Wilson, 2008). This understanding of reciprocity grows from Indigenous worldviews centered on practices of embodied caretaking held between people and place (Craft, 2017; Littlebear, 2000, 2009; Vaughan, 2018), and through mutual caretaking between people and place that occurs when Indigenous communities can exercise their intrinsic responsibilities toward their lands and waters (Diver et al., 2019). Place-connections feed personal needs for kin-centric relations that connect human and non-human collaborators through ceremony, gathering, fishing, or other cultural practices that help to fulfill the intrinsic responsibilities people hold toward a particular place that are embedded in Indigenous belief systems (e.g. Deur and Turner, 2005; Kimmerer, 2015; Lake et al., 2010).

Reciprocal relations also reflect Wilson's (2008) discussion of relational accountability to ensure respectful relationships with other participants involved in research. Wilson's reflexive research approach intersects with a feminist ethic of care, and evokes TallBear's (2016) reflection on the need to care for our research subjects, even when taking on settler-colonial violence. As Whyte (2018) points out, however, relational accountability is severely lacking in the societal institutions that are available to work with Indigenous peoples. To avoid further perpetuating injustice, Whyte (2018: 1) calls for institutions with "relational qualities" based on reciprocity, trust, accountability, mutual responsibility, and consent and also notes the time and effort required to achieve such a relationship. We extend this ongoing conversation of reciprocal relations to our research collective, and our efforts at two-eyed seeing.

Method

Our analysis of two-eyed seeing arises from conversations between three scholars working from multiple standpoints: Karuk Tribal Member, Karuk Enrolled Descendent, and non-Indigenous ally. Through this conversational approach (Kovach, 2009), we draw on our experiences, individually and collectively, to identify challenges to researcher health and wellness that arise through two-eyed seeing processes, and share productive interventions we have employed to surmount these challenges.

The authors in our research collective, Smith, Diver, and Reed, first met through the Karuk-UC Berkeley Collaborative, a group made up of Karuk peoples, the scientific community, and others, that is, working toward "enhancing the eco-cultural revitalization of the people and landscapes within Karuk ancestral lands and territories" (www.nature.berkeley.edu/karuk-collaborative). In 2007, Reed initially connected with UC Berkeley scholars about his work on ecocultural restoration and supporting Indigenous youth. The following year, 2008, Diver started her PhD program in Environmental Science, Policy, and Management at UC Berkeley. Diver then met Smith, a 2010 incoming graduate student in the Department of Anthropology, and introduced her to the Karuk-UC Berkeley Collaborative. Notable projects, research and events that Smith, Diver, and Reed undertook as Collaborative members included building a 5-year partnership with the Karuk Tribe and Berkeley Law students to advance Karuk self-determination.

This article unfolded from our small collaborative's relationships through this web of meetings, research partnerships, and gatherings from 2010 onwards. What cemented the coauthors coming together for this particular project was a 2021 podcast recording for the @ Risk in the Climate Crisis

at Western Sydney University (www.westernsydney.edu.au/ics/events/@risk). After our podcast discussion of Indigenous leadership in the academy, we collectively felt we had so much more to say on these topics and others. In December 2021 through March 2022, we met virtually each week for conversations on each of our experiences with two-eyed seeing. Our methods of composing this article leveraged both written and oral contributions through a collaborative writing process. Smith and Diver who work primarily in academia often shared manuscript drafts by email. As our first agenda item at weekly research meetings, Reed who works primarily in the community would dictate additional text and edits. Notes that recorded our weekly conversation provided the backbone of our article, including the analysis and co-learning we did for envisioning Indigenous futures. The warp and weft of these conversations were dynamic, but wove together a more nuanced understanding of our encounters with two-eyed seeing through both the joy of land management and the mental toll of balancing Western science and Indigenous knowledge.

Results

Defining the problem: Engaging with “two-eyed seeing” from a weaver’s perspectives

When we are thinking about the environment, ceremonial trails, it is engaging different parts of our brain. We are going from unfixed, not-concretized ways of engaging with the world, and then we have to translate that into these fixed terms. And this is frustrating.

Because when we are out on the land, I am not thinking through the processes in a western science procedural way when I am coppicing a willow tree. It is part of a process where I know the tree will be healthy, but that is not the end point of it. I am gathering the materials so that it is going to be helpful.

It is working in conversation, constantly in rhythm and tempo in our environment. What we are doing in the moment is about where we are at with our stories, and a whole host of other things. (Carolyn Smith, Karuk scholar and weaver)

Drawing on her experiences as a Karuk basket-weaver, Smith shared with our collective that interweaving Indigenous science and Western science requires a careful process of selecting the threads you want, and then weaving them together in an intentional manner. There is a choosiness involved in preparing basket-weaving materials. Recalling the art of weaving, Smith is reminded of the work that is involved in scraping the roots to make sure they weave well together and choosing sticks that are the same thickness to ensure that the weave is tight and smooth. As Smith’s weaving teacher, Wilverna Reece, would tell her, do not try to throw everything into the basket, otherwise the basket will end up lumpy and holey, much like a bird’s nest. Weavers need to be choosy about their materials, for example, if materials are buggy or crooked, they need to be thrown out. If the roots are too thick, they need to be scraped down. Honing your ability to select the right materials is part of the artist’s skill, learned over a lifetime of experience. It is part of the joy and excitement, the labor, and the frustration of learning to weave.

The concept of two-eyed seeing, seeking to engage in multiple knowledge systems with the goal of finding complementarity and balance—a smooth weave—is inspiring. Yet, in practice, this work can lead to intense frustration. This is due to an imbalance in power hierarchies between Indigenous management systems and Western management systems. Many authors have written about these power dynamics that are a part of ongoing efforts to link Indigenous science and Western science (Diver, 2016a, 2017; Nadasdy, 1999; Notzke, 1995; Weir, 2009). These dynamics are replicated in current efforts by weavers striving to access materials they need on the land, a practice that is governed by regulations that favor Western policies, shaped by colonial legacies.

As Smith recounted in our conversations, this imbalance plays out through the harassment that weavers sometimes experience when gathering in their ancestral territories, areas that are now

under the jurisdiction of state or federal agencies, and the advocacy weavers have taken up to resist such harassment (Oberholzer Dent et al., 2023). Even in cases where state agencies and Indigenous governments have negotiated gathering policies, enforcement officers may be unaware that these policies exist. Repeatedly, state agents engage with Indigenous weavers as adversaries. The consequences of this means that the state and its enforcement officers are the deciders; gathering is not permitted; and if cultural practitioners choose to gather on these lands, they run the risk of having state agents confiscate the materials.

Harassment of Indigenous peoples engaging in subsistence use and the personal trauma these events can incite are not one-off events (Alliance for a Just Society, Council of Athabaskan Tribal Governments, n.d.). It speaks of the pattern of uneven power relations that prevent contemporary harvests of cultural materials necessary for the continuance of Indigenous knowledge. The threat of harassment and criminalization forces Indigenous knowledge practices into the shadows, where weavers must hide behind the trees if they wish to bring home the roots, sticks, ferns, and fibers from areas that remain their ancestral territory. The suppression of cultural practices has negative repercussions for both Indigenous and non-Indigenous peoples, both in preventing access of cultural practitioners from continuing subsistence harvests, and in preventing opportunities for two-eyed seeing that might flow from such cultural practices.

Such negative interactions between state agents and cultural practitioners also highlight the uneven power dynamics behind two-eyed seeing. Even if weavers negotiate the right to gather in a particular area, and the rules of this agreement are followed, and permits (where such agreements exist) are obtained, weavers must still function within a system that typically assumes the criminality of cultural practitioners as the starting point for regulation. Even if weavers tried to bypass or go around this system, the dominant system is still there as an organizing force.

What is at stake: Indigenous health and wellness

I can sit here and make everybody cry for the rest of the day, but we are trying to figure out the method to this madness. We need to bring a sense of happiness and well-being back to the conversation. (Ron Reed, Karuk culture bearer and cultural biologist)

Such on-the-ground experiences with two-eyed seeing—both the excitement of finding the right materials, and frustration of struggling against power hierarchies—condition the emotions underlying the leadership efforts of Indigenous scholars, cultural practitioners, and their allies in research and land management. As traditional dipnet fisherman, Reed shared with our collective, a key driver for working across knowledge systems includes the need to get the tribal community to be healthy again, and to accomplish this through a self-determination process. Indigenous research leadership is about healing Indigenous communities, and building a system that makes health and wellness for Indigenous communities just as good as for everybody else.

For Reed, this means finding a way to see the history for himself of what is behind tribal health and wellness challenges, and also supporting other community members and family members to do so (e.g. Diver, 2014; Diver et al., 2010). Reed also shared his vision for creating health and wellness that is rooted in cultural identity and place-based practices. In his experience, it is through centering culture that you can gain a sense of how everyone in the community is doing, and how you are connected to one another. Even as the community is working to rebuild Karuk knowledges, you can know that you are connected through ideology rooted in Karuk knowledge systems. For example, Reed noted how he connects with Smith, in part, because she is a basket-weaver, which dips down into the core of what it means to be a Karuk person.

As discussed by Bacon and Norgaard (2021), building health and wellness into environmental justice can be fraught—the emotions behind doing knowledge translation work in an environmental justice context can be immense. For cultural practitioners like Reed and Smith, there is a tension with

working in the academy and with agencies, particularly around dividing one's time, because there are more hours required under the fluorescent lights of sterile meeting rooms than on the trails. There are also deeper tensions around how to constantly negotiate between worldviews, which can deeply affect the mental health and well-being of individuals and the community, and in a research collaboration.

As Reed described to our group, the feeling he gets—when advocating with other tribal leaders and their allies for salmon protection and dam removal, the reintroduction of prescribed fire on Karuk ancestral territory, and Karuk leadership in the protection of sacred sites—is often one of incompatibility. He mentioned that, after a couple of meetings with an agency, the understanding that there is no space to be your own person can quickly unfold, and only the external vision of how agency leadership and staff choose to see you (Reed and Norgaard, 2010). Not only is there a mismatch with differing visions of work, but there are also complex emotions around restoring ceremony and ceremonial trails, particularly when it has to be done in collaboration with institutions in a Western bureaucratic world that separates church and state. As Reed shared with us, “It is a hard nut to crack when you have to go after federal funding to restore your religion, but that is what is at the crux of Indigenous land management.” For Reed, this raises the question, do you continue to stay in that space, or find a place that honors who you are as a full person, which includes your indigeneity, your religion, and your history?

Mental and physical consequences of advocacy for the cultural practitioner

Two-eyed seeing is being able to persist as an advocate and practitioner in the world of ceremony and community, and the world of agency and academy, even if there are mental and physical consequences to this work. Negotiating cultural knowledge and Western science ways of knowing can challenge one's sense of identity and one's confidence of their knowledge in both realms. Reed mentioned that to live the experience in both worlds can create a sense of inadequacy. For example, Reed shared that his grandparents were great leaders, while he felt that he had a fraction of that knowledge. He found that when he went to college, he felt he did not fit in there either. To be a Karuk person, to come from a ceremonial family, Reed holds an inherent responsibility to do what is right. But through his journey to restoring Karuk ceremonial trails and navigating the academy, he has found that there is a lack of reciprocity, which is central to Karuk ways of knowing. There is the sense of fighting against multiple systems and perspectives of how to manage the landscape.

To get the work done, two-eyed seeing from all collaborators is needed because each person brings unique understanding to the fore. Reed stated that the knowledge of Karuk World Renewal, Karuk ceremony was gifted to him, genetically encoded, so no matter what the pressures are, the work continues. All of the work is related to World Renewal, to ceremony, to creation stories, and to the ritualistic, annual, biannual, periodic knowledge that is required to continue Karuk culture. As Reed shared, this creates a sense of cultural integrity that is like the frame of a sweathouse, shared in the creation stories, and woven all together. Embedded throughout is responsibility: to restore balance and harmony, to heal historic trauma, and to help heal the land.

Reed described his vision for a collaboration process that engages with Western science to fill in knowledge that is missing due to colonial dispossession, knowledge that enables you to fill up your bag with the right things, in order to move past the story of the trauma. The progress needed to gather all the information needed, as well as to help each other get to a better state of mind—so that we can all gain the confidence we need to do our best work. Reed explained, “As my mom used to say, it's that extra bounce in your step.” This includes getting to a mental state where you feel you are good at something, and able to contribute to the community by fulfilling cultural responsibilities.

Interventions: Aliveness of knowledge-resisting ahistorical essentialism

Ethnographic research from the era of “salvage anthropology” sought to define and construct an image of Karuk culture that made sense to an academic, Western worldview, while at the same time

distorted and discounted Karuk social and cultural life (e.g. Stewart-Harawira, 2013). While anthropologists, who interviewed Karuk elders in the early 20th century, noted names and differing points of view in research notes, they aggregated data to create a fixed, ahistorical sketch of Karuk people. While archives and old publications can be useful if combed through carefully, the reliance on the claims made in the old anthropological project brings about unintended consequences, such as perpetuating a colonizing mindset about Karuk lands and practices, As Reed noted, anthropological information that often erased individuality, nuances of practices, and historical contextualization has been frequently relied upon by agencies and the academy to describe the Karuk Tribe, and also fed back to the Karuk community.

At the same time, archival research has become increasingly important in order to piece together Karuk elder oral histories, which can help with guiding “Cultural Management” that is both physical and spiritual in nature. There are many aspects of ceremonies, oral histories, and language, which have not been passed on due to forced assimilation. Responding to this loss, cultural leaders are reestablishing life-pathway ceremonies along with land management, and procuring, harvesting, and distributing traditional foods and materials helps to restore Karuk consciousness from working on the land, and from a place-based sense of being.

Given that Karuk knowledge is channeled through individual standpoints and lifetimes of experience, the question becomes, how can the polyphonic nature of Karuk knowledge from elders and individual experiences be conveyed to agencies and academics as tribal leaders move forward with ecocultural revitalization? How can these polyphonies of knowledge be honored in reports, publications, and “operationalized” in land management plans? Karuk people carry these voices and these perspectives, and express this knowledge to agencies and academics in order to gain support and access to steward the lands of life and livelihood. Yet all too often the multivocality that honors elders’ and individual’s knowledge is often drowned out, erased, flattened to a singular perspective.

Much of the knowledge that informs the restoration of ceremonial trails or gathering of weaving materials is the teachings from Karuk elders. Karuk elders and ancestors, who imparted these lessons, have shaped and informed what is shared. Yet while working with academics or working with agency personnel, the transactional experience of knowledge exchange is one-to-one. The elders and ancestors who taught the interconnection of prayer and stewardship are the forgotten ones in the knowledge transaction. Karuk cultural practitioners, like Reed and Smith, resist this transaction by honoring their elders, their contributions to the community, and the collective nature of knowledge production that includes ancestors and learning from place.

Relationships, joy, and liveliness: Sensory perception with ecocultural revitalization

Weaving is life—it is a way of life and a way of knowing. Through the act of weaving, one is both creating and recreating the past, present, and future. Each of these is intertwined in each basket—Karuk ecological responsibility, Karuk histories, including the legacy of genocide and erasure, Karuk language, illustrating the liveliness of our baskets, Karuk prayers for the world, breathed into each root and stick as they are twined together. (Carolyn Smith)

Whether gathering basket plant materials, or walking on ceremonial trails, Reed and Smith are engaging with all of the senses, existing in a land infused with the knowledge and experience of their elders and ancestors. When it comes to translating this knowledge into something understandable into Western science terms, there is an almost epistemic violence in the process that arises from shifting unfixed, cyclical knowledge to fixed, linear terms. Performing this balancing act, translating experience into Western science terms draws immense mental energy from both worlds.

The intervention with this simplification is to celebrate the world in which Karuk people live as a vital, living, breathing place infused with the knowledge and spirit of ancestors and beings, and materials gathered or harvested from their homelands. The work to restore ceremonial trails and the work

to gather and weave baskets are inextricably intertwined. Cultural practitioners are walking the land, breathing alongside it, in the rhythms and songs of the way things are and the ways things can be. Being connected to the land is a way to reconnect and rebuild the relationships with the environment and to heal from ongoing historical trauma.

Although there is restoration work to be done with agencies that have rights over Karuk lands, the academy that can amplify the meaning of the restoration work, and granting agencies that provide funding, the sensorial experience of gathering is at the center of the knowledge collaboration. The depth of weaving experience is felt within the songs and prayers, the stories of Karuk creation, and the muscle memory of the clipping, pruning, coppicing, digging, cleaning, and preparing weaving materials. This is what keeps the knowledge collaboration authentic and alive—not necessarily in the “translating” of sensorial, experiential knowledge of land stewardship for agency and academic purposes on top of residual trauma from colonization, which wears on a person’s health and wellbeing—but in creating space for the “doing” of cultural practices.

There are so many ways that we communicate with each other, with the world, and it is not just through words. In working toward two-eyed seeing, Smith remembers the space of weaving where the sense of animacy of the basket grows, and the encompassing awareness of the relationships to both human and other-than-human beings. While weaving a basket with materials so carefully harvested and prepared, a finely tuned conversation occurs between the weaver and the basket, like the gliding fingers over the sticks and scrapped roots or the waft of scent from the damp willow sticks that is reminiscent of a languidly warm spring day on the Klamath River. Each sensation is telling of a conversation between the weaver and the materials, with the baskets encompassing the thoughts and emotions of the weavers, and taking part in the knowledge collaboration.

Accountability to ceremonial scale: Doing the work in good spirit

Reciprocal relationships mean health and wellness when allowed to practice inherent responsibilities in regards to food and indigenous ritualistic landscape scale management processes. (Ron Reed)

Ceremonial trails are an important part of Karuk culture, as part of World Renewal ceremonies, named Pikyávis̄h in the Karuk language. Reed shared that ceremonial trails in the Inaam cultural area provide a spiritual and geographic center. Reed’s grandfather Francis Davis had been the Medicine Man at the Inaam Pikyávis̄h in the early 1920s, and became the ceremonial head man until his passing in 1977. These responsibilities have since been passed on to others in the family. Reed became Medicine Man at Inaam briefly from 1996 to 1998, then returned to a leadership role more recently in 2018.

In 1998, Reed shifted from ceremonial appointment into a job with the Karuk Tribe’s Department of Natural Resources, where he worked for over 20 years as a cultural biologist, identifying natural resource management impacts to Karuk culture. The experience was stressful and draining, so that he eventually left his position with the tribe to heal himself. Ceremonial and ritual-based management of trails, camps and associated resources has been one pathway for Reed to restore his health, as well as his family’s health. Becoming co-ceremonial leader at Inaam required managing ceremonial ritual and timelines; working closely with family members that includes his sister and brothers, sons and cousins, who also took on ceremonial roles as medicine men; and gathering traditional foods needed to provide sustenance during ceremony with the help of family.

There is a great stress and burden involved in site restoration for ceremonies. The physical labor involved in cleaning trails is challenging; the trail system includes steep, mountainous terrains that are now overgrown due to fire suppression. Over the past 4 years, the family has struggled to clear thick brush in order to allow the ceremonies to proceed. The magnitude of impacts of fire suppression to ceremonies has been catastrophic. Yet restoring trails is part of an inherent responsibility for Karuk people to care for the ceremonial grounds and associated places.

There is a broader spiritual and social obligation that arises from operating within a place-based religion. The physical practice of cleaning prepares the people for the ceremony, and holds the spirit of prayer. This is accomplished by cultivating responsibility through the family, which brings the people together around a shared place and purpose. And it is a land management practice that requires the family to lead; this land management cannot be done by others, if it is to have a strong social impact. Reed shared that it is a humbling experience to be out on the trails, which he sees as part of what it means to practice a place-based religion—connecting Karuk worldview and ceremonial ideology to this place.

Interventions in the current situation involve activating federal agencies to support ecocultural restoration, as a form of two-eyed seeing. Current talks with the District Ranger at the Klamath National Forest are encouraging. The meetings are proactive, sharing information and resources, as well as building trust through dialogue that will lead to action. Conversations have centered around Reed's inherent responsibility as a ceremonial leader and the health and wellness of Karuk place-based ceremonial community, both human and nonhuman. This means putting fire back on the landscape at a "ceremonial scale."

For Reed, working at a ceremonial scale is highly motivating, because it leads to cultural integrity. The joy coming from ceremony resides in connecting knowledge to spiritual action, which leads to clarity, competence, and feeling that you are in control of your life. It is about those relations that are embedded in you, all those relationships that are connected, creating a level of good. It gives a sense that at least you're trying, or on your way to being good. Reed goes on to state:

If you are going to have good medicine, you have to have that positive frame of mind. Finding that good feeling is something that can happen through ceremonies, as well as through the connections with non-human relations that come through them.

Reed shared that he never saw his grandmother cry until he was named Medicine Man. He remembers her having a sense of strength portrayed through her infectious smile and laughter, even though life was hard. He recalls that other community members, who also spent time with his grandma, remember that feeling too. To maintain that good feeling, Reed shared, is through "the good that we do every day." If you are going to do good things, you have to be thinking good. It becomes not a duty, as he explained, but a love for the lifestyle we have inherited. It is about finding your place in the world through cultural practices. As Reed stated, you do not have to be good at everything, but you do need to find something that is yours. It is about finding your place through the ceremony or practice of your choice.

Working at ceremonial scale is also part of the healing process needed in tribal community, with finding a path toward knowledge that is accessible to individual families, given their unique gifts and histories and futures. This is based on the inherent responsibility that is linked to place-based knowledge, and individual family ties to particular places. Community knowledge can function differently than the knowledge of tribal government, and finding ways to create space for multiple knowledges within the tribe is part of community healing. In this way managing at "ceremonial scale" has great teachings for the spirit, for community, and for two-eyed seeing.

Finding our allies: Mutual acknowledgment and solidarity across systems

Two-eyed seeing arises from working collectively in solidarity toward a common goal of Indigenous sovereignty. Intersections between lifepaths, expertise, and social movements enable us to make connections across systems and knowledge traditions, and sometimes to locate trusted allies. Many of the movement leaders have had to fight for a long time without being heard, and yet they still have the grace to share with people who are willing to listen. Reed often finds himself expressing his anger in

public talks, and in our conversations. Our group discussed how this has a use. Expressing outrage in such an open and personal way can allow you to find the people who can become your allies, people with a sense of mutual understanding and interests that you really want to work with in solidarity and learn from over the long term.

In our experience, this means working together to generate the energy we need to create a pillar of strength for Indigenous revitalization and sovereignty. Sometimes fear is the obstacle we seek to overcome. As Reed explained, the collaborations with researchers in the academy are part of what helps him to overcome this, to keep going. Working with trusted collaborators who have different experiences are sometimes able to help reflect back different points of view. As Reed stated, “you remind me of who I am.” This feeling comes out of friendship, connectivity, trust, and the acceptance we bring to our collaboration. The same kinds of relationships are needed within tribal community, which can be challenging to accomplish for many reasons. Ironically, it can sometimes help to seed a collaboration with friends and collaborators from outside the community—friends who do not share the same lived histories or traumas, and who may have been drawing on different lifepaths to contribute helpful reserves of empathy and support to solidarity efforts.

The real learning that we do is around being together as friends and family. As Diver recalled from her early experience as a graduate student beginning to work with Reed and Smith, we started working together through the Karuk-UC Berkeley Collaborative through friends, and in this way built our own friendships. We started by finding people who cared about each other, and who were willing to think about the needs of our friends and our collaborators as a first step toward anything else that we might build. It was about caring about each other, and finding ways to help each other in deep ways. This speaks strongly of Wilson’s (2008) understanding of research as relationships, where the knowledge sits in the personal connection created and held between particular people, their families, and life experiences.

Part of this relationship may go out into the world in collaborative writing, or restoration projects, but much of the knowledge is held internally, embedded in a friendship that endures over time and shapes your life path and behavior in new ways, as an individual, a community member, and a family member. This personal aspect of knowledge production through two-eyed seeing sheds light on what it means to conduct collaborative research in solidarity with Indigenous communities. While the academic project is there, much of the deep learning is around how to build toward wellness by engaging respectfully with one another as trusted friends and colleagues, appreciating and caring for one another and our families over time, even if we bring come from different standpoints and situated knowledge to the relationship.

Discussion

Seeing one another: Clearing the path for Indigenous leadership in research

Rebuilding that trust is about reconnecting the resources to family. It’s like a good fire, where you have to put fuel on it. That’s what I’m committed to doing to get out of this insanity part of my world. (Ron Reed)

As discussed above, engaging with two-eyed seeing requires grappling with power hierarchies. How do we weave together knowledges and what are the negotiations that go into decision-making processes? What does it mean to engage with two-eyed seeing as a flexible space for building solidarity for Indigenous sovereignty and self-determination, which benefits from all of our lifepaths and capacities? In seeking to overcome the challenges that are intrinsic to two-eyed seeing, we move in a three dimensional space, where we are open to all of the points of connection among us. Through building relational accountability, we move political relations into the field of personal and even spiritual relations, where we begin to negotiate our knowledges based on a sense of personal mutual responsibility to each other, and to particular places. Larsen and Johnson (2017: 157) describe the significance of this

shift in the following way: “With the call of place bringing Indigenous as well as non-Indigenous peoples into dialogue about our shared responsibilities to the more-than-human world, we are displacing the role of the state as arbiter of (economic, social, psychological, spiritual) value.”

To achieve Indigenous leadership in research and knowledge production the weaving process must be rooted in Indigenous sovereignty and freedom. At the same time, this does not mean that knowledge production for two-eyed seeing occurs as a singular effort, or that the knowledge production process is inherent to any one group of people. Building the freedom to lead despite colonial legacies requires strong relationships. This is difficult work that requires cooperation, and flexibility. It also involves advancing the understanding of Indigenous research as a multi-vocal initiative with the capacity for restoration and repair.

In many attempts at knowledge collaboration, Indigenous knowledge is often taken out of context, and out Indigenous peoples’ hands, but it does not need to be. With the Western scientific frame, knowledge becomes data, and connects to the erasure of our culture—and a lot of moral standards that rejected Karuk people. When an understanding of the medicine embedded in prayers and lifepaths is taken from Indigenous peoples, when this is vacated, it erases that spirit that connects basketry, hunting, fishing, gathering, and praying with the trails and everything that we do. When two-eyed seeing engages with questions of Indigenous lands and ceremonial trails, this is our cathedral. It is about protecting a community of faith, and yet the decision-making is dealt with in the context of “management,” not religion. Keeping Indigenous peoples, voices, and cultural practices in the knowledge collaboration, while protecting Indigenous knowledge sovereignty, is a vital part of our work.

In order for effective knowledge translation to occur across cultures and worldviews, one needs to feel welcome—before equitable knowledge exchange can occur. Yet feelings of belonging for Indigenous scholars and cultural practitioners are often elusive in the academy, or in bureaucratic government agencies. When academic institutions do not value Indigenous scholars for their intrinsic contributions, but instead engage with Indigenous scholars through a tokenistic approach, that is, “checking-the-box” on whether you have an Indigenous person on a review committee, grant proposal, or symposium panel, this reproduces colonial violence. The same goes for implicit or explicit expectations for Indigenous knowledge holders to provide performative demonstrations of vulnerability in talks of research collaborations. Collaborations such as the “So You Care About Indigenous Scholars?” research collective that Diver and Smith are a part of, are increasingly working to educate the broader academic community, in this case through comic art posters that challenge the academy to transcend extractive relationships with Indigenous peoples (Sullivan et al., 2020). A key message in the “So You Care?” poster series is “Pass the Ball,” a comic art storyline that envisions a win for the team when Indigenous scholars are valued and centered in knowledge production (Piatote et al., 2020).

Encouraging flexibility and multiplicity—For solidarity

The metaphor of weaving further expands our understanding of two-eyed seeing because it offers an understanding of the flexibility, as well as discernment that is involved with learning from multiple knowledges, choosing what materials work best for the situation at hand. We work toward creating a collaborative space that moves away from rigid connections that are prone to breaking. This kind of solidary work shifts away from having to find a single answer, or wrapping everything that is known into a neatly packaged theory. The act of “seeing” turns out differently based on the roots selected in a given session. As Wilson (2008) asserts, the search is grounded in relationships, and it is about seeing one another in a given moment. This is where our small research collective shines.

Baskets are not rigid, and neither are we. Weavers typically soak their roots and sticks in water to make them more pliable before they set themselves to the task of weaving fibers together. That is what

it feels like when we first get together to talk about our ideas, and loosen up—hearing about a family issue, challenges on the job, or celebrating a recent accomplishment. Whether we start with laughing or crying, we relax when we get together to talk about ideas, and that is what keeps us coming back to talk to one another. Like a dipnet, we flow into and through our conversations, building in flexibility and acknowledging one another as we go.

It is not so different from working within an Indigenous community in that it is not about sameness. For example, you get one weaver next to another, you're not going to see the same thing. There are tiffs and spats about how to do certain things. We all have different life experiences, and these influence the way we need to negotiate the world. Because we are not always going to see eye-to-eye, we find the work of two-eyed seeing wonderful and complex and unique. For example, while Karuk weavers may use the same materials, like hazel sticks and spruce roots, they often gather them from different places. We use these same materials to make watertight soup bowls, basket caps, and other baskets that take care of physical, spiritual, and emotional needs. How we weave and how we start baskets can be contested, though—but these differing knowledges were shared with us by teachers and elders. Families do things differently, and weavers add on their own touches, so while we weave together, we also weave differences into the warp and weft of the basket.

We can regain a healthy mindset from each other, even if we are walking different paths. It comes from working with a fundamental position of support and care, with people who have taken the time to get to know you as a person and who have a mutual understanding of the issues you are taking on. As Reed told our group, there is a relief in not having to start at the very beginning, not having to start from an adversarial relationship. There is healing that comes from being able to express emotions like grief and frustration, alongside the joy of being in good company. While we do not require sameness, we do need alignment. Through the concept of *solidary*, we emphasize that our knowledge collaboration works as long as we are aligned with similar goals, and what needs to be achieved to center Indigenous peoples in knowledge production. Negotiation comes into the picture, but this is woven into the fabric of our relationships. Through mutual recognition, intergenerational and learning, we are coming up with words and language and ideas that we want to write about together. In our case, two-eyed seeing is the way to go, the way to get things done if we are wishing for material changes to how we manage the lands and waters and resources that Indigenous peoples depend on for their subsistence and wellbeing and cultural continuance.

Sisseton-Wahpeton Oyate scholar Kim TallBear (2013: 203) describes the ethic of solidarity she desires when working across different knowledge traditions, stating:

I maintain my optimism by seeking out scientists with whom to speak and collaborate who love the revelations and insights their science produces but who also cherish democracy and connectivity. I seek those who are willing to battle within their fields to make space for respectful relations with others who are committed to different but equally moving ways of inhabiting this world.

An ethic of solidarity is required for two-eyed seeing because of the longstanding history of Indigenous peoples working under duress, in oppressive systems that have not yet succeeded in building a bridge across knowledge communities. As we seek to solve the problem of privileged spaces like the academy and federal agencies, excluding Indigenous peoples from decision-making and knowledge production, we need to look to Indigenous peoples themselves to understand the issue, without reproducing the tokenism or overburdening of Indigenous peoples in addressing long-standing disjunctures and concerns.

Still, the history of extractive engagement is ongoing, and this motivates us to make these problems visible in our collaborative writing and research to find a more inclusive path forward, in part by going beyond the academic project. When we work together on collaborative research, we do hope that the writing is useful to other scholars, but we also write for the youth who are just now coming

into leadership roles in the tribe, or finding their own path as scholars. We write for other Indigenous community leaders like Reed, who are exploring alternate leadership models that can extend beyond dominant bureaucratic structures. We write for Reed and his own family members, so that Reed's experiences advocating for Indigenous leadership for land protection and ecocultural revitalization on the Klamath can be documented in his own words, and passed along to his children and grandchildren, who will take up the work in their own way.

We also look for opportunities to extend the ideas and the language that we generate through our collaborations into material outcomes that benefit the Karuk people and the places they are connected to. Our research conversation easily transitions into practical steps for moving ecocultural revitalization forward on the ground. Because of the long-term nature of our relationships, it is not difficult for us to move into concrete actions that can generate substantive benefits ecocultural revitalization on the ground. For example, we discuss Smith's upcoming visit to see mentors to create an illustrated book documenting gathering practices and weaving methods for other basket weavers. We identify grant sources that can support Reed's efforts for revitalizing ceremonial trails in his family's management areas, and offer our respective skills toward outlining a proposal that can help direct policy decisions and resources needed to improve Karuk trail systems. We discuss approaches that support Diver on her collaborative research efforts working with the Karuk Tribe and allies on a community assessment of upcoming dam removal efforts, and make plans to meet on the river in a few weeks.

This is how we provide mutual support for one another for two-eyed seeing in solidarity. This is how we bring joy to the complex, sometimes adversarial work that is done with agencies and the academy. This mutual support is also a way in which we buoy each other, supporting mental health and wellness by acknowledging one another and the contributions we bring to the collaboration based on our respective knowledge and skills. This is where we "see" each other for all the things we are. While it is difficult to push back against academic, agency, and grant deadlines, taking time to get to know each other more completely, while creating an "extended family," is one way we fulfill our responsibility to one another. This is where we create the emotional health for ourselves that is so hard in this work.

Implications of two-eyed seeing for Indigenous futures

Building on our experiences, part of two-eyed seeing is that, by drawing on Western science and Indigenous knowledge, Reed's family is reclaiming Karuk ceremonies at Inaam and other lifepaths. It is also working to revitalize Karuk traditional foods, as part of ceremonial preparations and Karuk culture. Through our collective work, we have also seen how it can create links to allies and accomplices who support revitalization in solidarity with Indigenous leaders. So as we expand our gaze to other efforts of respectful knowledge collaborations, what does two-eyed seeing mean for Indigenous futures?

First, it recognizes that Native peoples use science. As Reed reminded us, "Don't say that I'm just Native, and I can't use the dominant science rules too." Native peoples have full political legitimacy in the dominant system. Noted Reed, "The times when people could talk about us not being part of the Constitution are over." The slogan, We Are Still Here, was a reminder to non-Indigenous peoples that we survived physical and cultural genocide, but it is time to move past this. Not only are Indigenous peoples still here, but we are also participants in the world, and members of sovereign Nations, working to breathe life back into the land, culture, water, and community. Two-eyed seeing in this way means employing the best tools that Western science can offer, alongside our own ways of knowing. And balance is created when it is community members that are implementing the framework of the two-eyed seeing, where tribal community is a full participant in knowledge production and land management processes that leverage both Western science and TEK.

Second, two-eyed seeing contributes to Indigenous futures by disrupting the knowledge hierarchy between Western science and Indigenous ways of knowing. As Smith shares, there is a difference when we choose to center Indigenous knowledge systems:

It comes down to our humanity, our embodied learning processes, our place in the world, our responsibility as Karuk people to bring balance to the world . . . With science, it is about the science, not about the human making the science, like Haraway's *god trick*, or like the anthropological project of old, excising snippets of complex, whole ways of life and rendering them into discrete sets of data to be shared and compared.

Interweaving knowledge systems allows us to maintain the integrity of Indigenous knowledges in a braid of interwoven strands that may include Western science. To transcend the challenges discussed in this article, we imagine an Indigenous future with two-eyed seeing where members of dominant society are able to accept Indigenous knowledge on its own terms within an inclusive knowledge production process. In this future world, Indigenous knowledge would not be rendered down to folklore or myth. Instead, the legitimacy of Indigenous knowledge would be a given, and where Indigenous knowledge systems, as represented by tribal community members, would be a central to research questions and processes.

Third, our hope is that two-eyed seeing can help facilitate a new approach to land management. In particular, two-eyed seeing might lead to Indigenous futures with active management, where the harvest of natural resources is guided by scientific monitoring and reciprocal responsibilities to place, and where humans are seen as a part of nature. Seeing with both eyes reveals the Klamath River as a cultural riverscape (King, 2004), both increasing awareness of cultural connections and land uses that extend across Karuk ancestral lands and territory, and also benefiting from scientific analysis of Klamath Basin watersheds, fireheds, and foodsheds (Sarna-Wojcicki et al., 2019). Furthermore, with its focus on coexistence, two-eyed seeing may create opportunities for identifying policy pivot points (Diver, 2016a), finding new ways to engage with government policy as a starting point for meaningful policy change to support Indigenous land management, for example, through cultural burning or land back.

These insights into Indigenous futures suggest an adaptive approach, where Indigenous peoples are continuing to engage with new technologies, now through Western scientific approaches. What is unchanging here, however, is the inherent responsibilities that Karuk people hold for past, present, and future to create balance in their community, in the Klamath Basin, and in the world. It is through honoring these responsibilities that Karuk people work to fix the world, repairing relations, and ensuring that future generations carry forward language, TEK, basket-weaving, and other cultural traditions. Recognizing ongoing inherent responsibilities is an important way that we steward the land and the river as people who are part of the world that we are inhabiting. It is through such embodied and adaptive practices that we maintain place-based relationships to our homelands, now and into the future.

Conclusion

Because of our respective experiences with land management conflicts involving Indigenous peoples, and working in the academy, we see this work as a highly political project. The real work of relationship building that authentically crosses multiple knowledge systems is a refusal of the dominant system of sameness, or the reductionism or totalization that often comes with engaging with Western scientific knowledge traditions. These political aspects of relationship building are not always discussed in the context of ecocultural revitalization. Perhaps this is where our contributions can build on the foundational writing of Wilson (2008), Kovach (2010), Smith (1999) and others, about the relational aspect of Indigenous research methodologies. We see part of our analysis as recognizing the history of why maintaining relationships in two-eyed seeing work is so difficult, and links back to the

lack of wellness in many Indigenous communities, and the need to create a sense of wellness and belong first, before we can do the hard work of conducting research between multiple knowledge systems.

This article adds to a growing conversation about the need for collective healing. As Reed shared, “It is wonderful to be doing something that is planning for the future. I have some bright spots on my horizon.” The conversation we have around this writing supports next steps with bridging the gaps with agencies, with figuring out what are the barriers, and with doing the cultural outreach. As Reed continued, “It’s about healing and wellness. That is what prayer is about. That is what ideology is about. . . . It is not only about being a survivor, but about future planning, hope, and family. There is a future.”

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Decolonial process tracing: Indigenous rights and pipeline resistance movements

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Abstract

This article explores how decolonial methodologies and Anishinaabe *gkendaasowin* (ways of knowing) can augment detailed narrative process tracing methodologies used to examine social and political processes. While detailed narrative is most frequently used as a tool of causal inference, focusing on the unfolding of a singular time, I see potential for it to be enriched by Indigenous legal traditions that emphasize epistemic diversity and multiple temporalities. Analyzing how Indigenous rights are leveraged in decision-making processes for the Line 9 and Line 3 pipelines, I show how a decolonial approach to process tracing (DPT) that centers Anishinaabe *gkendaasowin* can change both the actors and power relations involved. Recognizing that energy decision-making processes take place alongside, outside, and within colonial state institutions, and are embedded in the land as constellations of reciprocal kinship responsibilities, DPT opens space to examine two kinds of Indigenous rights: those acquired through struggle with state institutions, and those inherent to Indigenous communities' attachment to place. DPT addresses the shortcomings of a focus on linearity by privileging inherent rights that are often excluded from detailed narrative process tracing. To take inherent rights seriously, one must also take more-than-linearity and more-than-humans seriously—and DPT is uniquely positioned to do this. The key features I propose for decolonial process tracing are grounded constellations, multiversality, and multitemporalities. Decolonizing methodologies and Anishinaabeg studies provide direction for more expansive, decolonial process tracing techniques which can in turn help understand the relationship between temporalities, law, and energy governance.

Keywords

Process tracing, Indigenous rights, energy governance, decolonial theory, anishinaabe studies

Introduction

If you have ever watched a lake freeze for the winter, you may have noticed how nonlinear processes of ice formation are. Ice may form at the edges, melt, reform, crack, open in mosaic, freeze, weaken, refreeze, and eventually solidify into a foundation that can be traveled and fished upon. This process is different for each lake, each year, yet relies on the same complex network of interconnected processes: lake size, flow, precipitation, wind velocity, solar radiation, and snow cover, among others

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(Bengtsson, 2012a, 2012b). The body of water, sun, clouds, wind, and snow are all interrelated in inherent ways that contribute to the outcome of lake ice. Lakes have also acquired processes from human activity that impact ice formation, including industry, wastewater treatment, and climate change. Inherent and acquired processes often interact in ways that comprise an asymmetry of power. In the Great Lakes region, for instance, climate models predict reduced ice cover in a 30-year period due to human greenhouse gas emissions (Byun and Hamlet, 2018).

Social processes, including decolonial processes that seek to undo the ongoing impacts of settler colonialism, are also nonlinear—yet most research into decision-making relies on linear analysis. Hall (2003) notes a “growing misalignment of methodology and ontology in the social sciences” and “how we think the world actually works may not fit with the methods we use to study it.” Process-tracers aim to be sensitive to complex interactions, the specific institutional and historical contexts in which processes unfold, background factors that are often omitted, as well as the spatiotemporal scope of mechanisms and the theories underpinning them (Falleti and Lynch, 2009; Morgan, 2016; Trampusch and Palier, 2016). This calls for attention to nonlinear processes and systems theory, such as feedback loops, choice theory, social network analysis, missed opportunities, and critical junctures (Beach, 2016). However, this attention often does not go far enough in affirming the existence of multiple, distinct spatiotemporalities that provide for Indigenous self-determination, communities’ capabilities to choose their/our own decision-making, and governance structures.

Indigenous pipeline resistance movements, a widespread and growing form of decolonial action, involve several forms of nonlinearity, including constellations of place-based kinship networks across multiple spatiotemporalities (many past, present, and future (non)human worlds). Constellations of Indigenous people and nonhuman kin on the frontlines of antipipeline struggles interact with multiple legal orders, including two kinds of Indigenous rights that reflect asymmetrical power relations: those inherent to Indigenous communities’ attachment to place, and those acquired through struggles with colonial state institutions. Indigenous pipeline resistance movements are re-actualizing governance systems built around inherent rights and land-based responsibilities. Across *Mikinaak Minis* (Turtle Island or North America) there has been ongoing Indigenous-led opposition to pipeline projects since the Idle No More movement began in the winter 2012. Indigenous law and land-based knowledge systems feature strongly in these movements. Notably, the Unist’ot’en House of the Gilseyhu Clan, and the Gidimt’en and Laksamshu Clans of the Wet’suwet’en nation are challenging seven proposed oil and gas pipeline projects across Wet’suwet’en Yintah (territory) by establishing healing camps and checkpoints, as well as pursuing legal action through both their hereditary clan governance structures and colonial courts (Unist’ot’en Camp, 2017). Mass Lakota-led resistance refused the Keystone XL and the Dakota Access Pipelines (Estes, 2019). Along the proposed Trans Mountain pipeline route, the Secwepemec Tiny House Warriors (2020) have built 10 tiny homes to assert Secwepemec law and jurisdiction, and an alliance of Anna’s hummingbirds and Tsleil-Waututh community members halted construction for 4 months during the Summer 2021 nesting season (Judd, 2021). These examples point toward the shortcomings of process tracing and the need for more expansive, decolonial approaches. Constellations of humans and nonhumans are rebuilding mechanisms for shared decision-making in ways that amplify place-based relationships (Daigle and Ramírez, 2019; Simpson, 2017). Indigenous bodies on the frontlines of antipipeline struggles cogenerate interdependent theory, praxis, and processes of governance in interrelationship with the land (Simpson, 2011, 2017, 2021).

Yet, research documenting such Indigenous-led movements usually frames energy governance and energy justice in relation to colonial governments’ laws, institutions, and processes, and privileges linear interpretations of causality and time. Process tracing, my focus here, includes a variety of techniques used to examine how people and organizations make decisions. It is a laborious undertaking that demands the careful review of large volumes of documents in the form of proposals, institutional mandates, intervenor evidence, impact assessments, panel reports, council resolutions, constitutions, policies, interview transcripts, and other sources such as media reports. Process tracers also pay

attention to the actions of and interactions between people and organizations, as well as contextual factors, that shape social and political outcomes (Bengtsson and Ruonavaara, 2017). Process tracing can be used to carefully examine the context and contents of laws, assess areas of divergence between two legal systems, and go beyond “what” or “why” questions to better understand the “how” of law (Farrand, 2020). However, dominant process tracing methodologies are often marked by assumptions about the linearity of time, universality of knowledge, and the problematization of equifinality (the existence of multiple causal pathways that can lead to an outcome of interest).

In this paper, I propose ways to expand and enrich detailed narrative process tracing—to make it more decolonial—by engaging with insights from Anishinaabe *gkendaasowin* (ways of knowing). My aim is to provide process-focused theoretical interventions that could contribute to more just and sustainable energy decisions by decentering anthropogenic authority and reinforcing Indigenous legal systems as central to self-determination in energy decision-making. I focus on detailed narrative forms of process tracing due to their compatibility with Anishinaabe *gkendaasowin*. Anishinaabe *gkendaasowin* are embodied, dynamic, and complex knowledge systems specific to Anishinaabeg peoples and generated from “doing” in a direct relationship with the land (Pine, 2016). Anishinaabe *gkendaasowin* is also embedded in *Anishinaabemowin*, the Anishinaabe language, and provides meaning that cannot be translated into English (Corbiere, 2013).

These methodological reflections grew out of my work on Anishinaabeg pipeline resistance (Awâsis, 2020a, 2020b) which I contend is not merely a protest movement, but a conflict between divergent legal systems and ways of knowing. I draw examples from Anishinaabeg resistance to the expansion of Line 9 (Sarnia, Ontario to Montréal, Québec) and Line 3 (Hardisty, Alberta to Superior, Wisconsin). During the 2012-2017 Line 9 pipeline dispute, Deshkan Ziibiing Anishinaabeg (Chippewas of the Thames First Nation) challenged the Line 9 decision in the Supreme Court of Canada, citing the Crown’s failure to consult the nation. There has also been active and ongoing Anishinaabe-led resistance to Line 3 since the 2014 proposal. The Minnesota Chippewa Tribal Government (2017) conducted their own public hearings and cumulative impact assessment on Line 3 in response to inadequate consultation through the Public Utilities Commission (LaDuke, 2015). Consistent with decolonial and resurgence theory, I am less interested in why pipelines result from linear, colonial decision-making processes. Instead, I focus on how constellations of Anishinaabeg peoples decide to oppose pipeline projects within Anishinaabe legal systems.

Natural law resides in nature and is derived from the legislative power of the land (Ferreira da Cunha, 2013). Decolonial theory and Natural law are both deeply informed by what the land, as a system of reciprocal relationships and responsibilities, can teach us about living in the world in nonhierarchical and nondominating ways (Borrows, 2018; Coulthard, 2014). Colonialism is not experienced as a historical event that negatively impacts the present, but as hierarchical gender, racial, and class structures that are maintained by a series of complex and overlapping processes (including treaty making, law making, reconciliation, consultation, impact assessments, and court systems) (Mignolo and Walsh, 2018; Simpson, 2017). Processes of both settler colonialism and decolonization are complex and multifaceted, comprised of overlapping processes that require more expansive analytical approaches to understand.

To bridge the disciplinary boundaries between decolonizing and process tracing methodologies, I ask: (1) In what ways are dominant forms of process tracing limited when engaging with Indigenous rights? And (2) how can process tracing be more decolonial? I begin by briefly exploring how process tracing has thus far relied on theorizations of a linear temporality, universality, and equifinality. I bring process tracing methodologies into dialogue with key themes from decolonizing methodologies and Anishinaabeg studies, including constellations of nonhuman actors and multiple spatiotemporalities. Using examples from Lines 9 and 3, I explore how Anishinaabeg pipeline opponents decide which rights to leverage because this distinction between inherent and acquired rights makes explicit the interactions between linear and constellated temporal formations. Finally, I examine the

significance of decolonial process tracing techniques and propose future directions for decolonial process tracing scholarship. I conclude that decolonial process tracing has the potential to open further opportunities for Indigenous legal systems by centering inherent rights and nonhumans in decision-making.

Dominant forms of process tracing and their limitations

Process tracing aims to understand mechanisms of change by characterizing causal and temporal processes that led or lead to an outcome of interest (Trampusch and Palier, 2016). Process tracing techniques were first developed in cognitive psychology in the late 1970s to study individual decision-making. Political economy and international relations scholars have since applied process tracing techniques to identify intervening steps that influence organizational decision-making and the effects of institutional arrangements on processes and practices (Bennett and Checkel, 2014; George, 1979; George and Bennett, 2005; George and McKeown, 1985). Today, process tracing techniques are applied to a variety of issues across disciplines (Farrand, 2020). While analyzing mechanisms as theoretical processes is not unique to process tracing and many social scientists use variants of process tracing without referring to it as such, the terminology has become more common since the mid-2000s (Kittel and Kuehn, 2013; Morgan, 2016).

While all process tracing involves movement back and forth between empirical evidence and theory, its many forms can be grouped into two categories: those that are more inductive (aimed at theory building) versus deductive (aimed at theory testing) (Trampusch and Palier, 2016). Inductive approaches include detailed narrative process tracing, the focus of this article. Detailed narrative forms explore causal ideas embedded in a narrative along a timeline of events (Collier, 2011; George and Bennett, 2005). Detailed narrative process tracing is distinct from pure narrative because it focuses on specific aspects of a phenomenon, its structure is based on a theoretical framework, and it aims to explain a causal path leading to a specific outcome (Vennesson, 2008). While process tracing originated to analyze decision-making processes, it has become predominantly used to compensate for weaknesses in correlational analysis and improve causal identification and inference (Beach, 2016; Morgan, 2016).

However, correlations provide little insight into causal mechanisms, and correlational analysis is based on deeply held assumptions about linear temporality and unit homogeneity that are so central to explanation that many political scientists and sociologists simply take them for granted. For example, one could wrongly assume that all members of an Indigenous community have the same priorities and desire the same governance structure. While process tracers identify how factors or phenomena relate to each other, a persistent problem in process tracing literature is that many social, political, and ecological phenomena of concern such as power, rights, inequality, institutions, violence, and participation are embedded in dynamics that do not always make causal identification possible. Identifying and explaining processes can be especially difficult in social systems and require significant prior methodological reflections (Hay, 2016).

Trampusch and Palier (2016) offer a list of good process tracing practices that include clarifying research assumptions, selecting good theory, drawing on a variety of data sources, conducting thought experiments, and practicing transparency. They also suggest that process tracers who have a nondeterministic conceptualization of mechanisms and do not apply statistical analysis face a substantial challenge in further developing methodological concepts and standards. This article contributes to this methodological task using a decolonial lens. Process tracing is versatile enough to examine change among different legal systems, making it possible to describe energy decision-making in Anishinaabeg legal contexts. However, even when best practices are carefully followed, several limitations remain that diminish its applicability to Anishinaabeg contexts. I now explore three specific limitations of dominant process tracing methodologies: linearity, universality, and the problem of equifinality.

Linearity

As a tool of causal inference, dominant forms of process tracing focus on the unfolding of events over linear time and describe events at isolated points along this singular axis (Collier, 2011). This colonial temporality relies on homogeneous movement through empty time in “a successive series of presents, each becoming past in turn” (Rifkin, 2017: 17). A 7-day work week, 24-hour clock time, and the Gregorian calendar, as well as Canadian and American institutions are all based on assumptions about a linear temporality (Huebener, 2015). This temporality frames decision-making as a successive line of development and is central to capitalist modes of production and operation (Castree, 2009). Concepts such as progress, productivity, acceleration, instantaneity, and simultaneity underlying the linear temporal structure can be considered a form of timespace compression. Timespace compression is a set of processes through which the spread of technologies such as the Internet and smartphones effectively shorten spatiotemporal distances, or in some cases, eliminate their relevance altogether (Harvey, 1989). To increase profit and the speed at which commodities are produced and circulated, settler capitalism has a drive for timespace compression; this includes infrastructure such as pipelines that increase the speed at which fossil fuels reach markets (McCreary, 2020). The temporal qualities of settler capitalism require and normalize the dispossession of Indigenous peoples from ancestral lands, governance structures, and nonlinear temporalities to secure control of land and labor for exploitation.

The linearity of the colonial temporal logic limits Indigenous governance and reinforces colonial power relations in several ways (Huebener, 2015). Settler authorities are provided with the power to define the starting points, ending points, and duration of social processes. The present and shorter durations are prioritized over other timeframes. Finally, constraints are imposed on temporal modes based on race, age, gender, class, culture, sexuality, and nationality. Dominant forms of process tracing are both limited and limiting when they do not account for lived temporalities that exceed the linear formation. Along the linear temporality, Indigenous peoples get plotted in ways that deny temporal multiplicity and mobility that are inherent in Indigenous social and cultural life as well as political resurgence. In dominant pipeline reviews, for example, colonial decision-making authorities invalidate Indigenous self-determination and flatten Indigenous governance by excluding Indigenous place-based and nonhuman temporalities that serve as the background for Indigenous political and economic systems (McCreary, 2020; McCreary and Milligan, 2013). Against the linearity of the colonial, institutional background, Indigenous governance is treated as a difference within colonial nations, and Indigenous lands are required to remain open to capitalist expansion.

In colonial decision-making, Indigenous governance is flattened (dissociated from social, political, ecological, and economic claims) and frozen (fixed to the past) (Borrows, 2012; Coulthard, 2014). For instance, Indigenous rights are frozen when colonial authorities demand that Indigenous governance, land title, and land-based activities demonstrate linear continuity with practices that were happening at the time of contact or effective control to be formally recognized, through Section 35 of the 1982 Constitution Act in Canada and the 1831-1832 Marshall decisions in the United States (Borrows, 2002, 2012). The fixation on precontact practices ties Indigenous peoples to the past and severely restricts Indigenous legal systems (Huebener, 2015; Rifkin, 2017). Colonial courts maintain the power to violate Indigenous rights on grounds that they do not demonstrate linear continuity (Ogden, 2009). In colonial decision-making, “tradition” is only regarded as “authentic” when it emerges from the time of colonial contact/control and, with a linear progression of time, the distance between present-day Indigenous peoples and the past source of authenticity is steadily increasing (Richotte, 2013). By embracing a linear conception of time, process tracing reinforces the authority of settler institutions and precludes Indigenous ways of knowing and modes of governance. Decolonial process tracing can support Indigenous self-determination by accounting for a multiplicity of temporalities.

Universality

Dominant forms of process tracing assume epistemic universality (the singularity of the knowledge system) and universal synchrony (participation in a mutual now). The notion of a singular and all-encompassing time in which all events unfold relies on the naturalization of a shared present as if it were a neutral and self-evident medium. Conceiving of time as a universal line of development entails that it is possible to assign every event, person, place, and thing to a span on the continuous flow of a global timeline.

The assumed universal nature of time has several consequences. Insisting on epistemic universality is a way of reinforcing the dominant knowledge system and perpetuating ontological racism (Mignolo and Walsh, 2018: 205), stemming from colonial assumptions about Indigenous peoples holding a subontological position in academia, governance, and everyday life (Ciccariello-Maher, 2017; Sundberg, 2014). Indigenous systems of order have been dismissed, and Indigenous ways of knowing are viewed as not human, civilized, literate, or adequate (Smith, 2013). As a result, while dominant forms of process tracing emphasize methodological plurality, they do not give adequate attention to epistemological plurality. Despite their differences, positivism, constructivism, and critical theory—widely used in process tracing—all treat knowledge as singular in nature (Wilson, 2008). Process-tracers often make the multiculturalist assumption that we exist in a world with many different cultural understandings of a single nature, while Indigenous knowledge systems entail multinaturalist ontologies (Coombes et al., 2012) and the pluriversal (Mignolo and Walsh, 2018), recognizing the existence of many worlds.

The universality of the colonial temporal logic functions to normalize the temporality of the settler state and impose it on Indigenous communities. Temporal assimilation is integral to settler colonialism. In the 19th century, Indian legislation, such as the Indian Act (1876) in Canada and Indian policy (1810s–1890s) in the US, homogenized Indigenous nations into colonial forms of governance, fragmented Indigenous confederacies into reserve (Canada) and reservation (US) boundaries (Irwin, 1997; Simpson, 2017), criminalized gatherings and ceremonies, delineated Indian status on non-Native terms, facilitated large-scale dispossession, and enforced attendance at residential schools (Canada) and boarding schools (US). Colonialism violently disconnects Indigenous peoples from our histories, homelands, languages, social relations, and knowledge systems (Smith, 2013). The assumed universality of the normative temporal structure undermines and assimilates Indigenous ways of knowing and living, reinforcing colonial power. Settler time equates Indigeneity with backward relations to "real" time, framing Indigenous nations as in need of colonial institutions to make objective decisions on their behalf (Huebener, 2015; Rifkin, 2017). This colonial power relation is reflected in process tracing's overreliance on human-made law and acquired Indigenous rights. Decolonial process tracing can challenge colonial power when grounded in inherent Indigenous rights and Natural law.

Equifinality

Process tracing literature points to "the problem of equifinality"—sometimes also called "multiple causality"—when the possibility that there are multiple pathways that may lead to the same outcome is perceived as a problem (Farrand, 2020). Dominant forms of process tracing seek to account for equifinality by considering alternative explanations for a mechanism and determining which explanation is more likely to have resulted in the effect (Bennett and Checkel, 2014; George and Bennett, 2005). Alternatively, deciding to embrace equifinality rather than "resolve" it can shift how we understand causality and power. For example, Guzzini's (2017) interpretivist conception of causality sees relationality as characterized by equifinality: the same effect (if a, then b) can result from several different pathways from a to b. This is typical of social processes; a configuration of multiple paths

often contributes to an outcome. Mechanisms can be part of, but are not reducible to, a wider process that can help answer “how” questions (Guzzini, 2017). The challenge of a relational configuration is thinking of causation in terms that seem to be contradictory, like openness and indeterminacy.

A relational approach to understanding power undermines dominant process tracing’s problematization of equifinality. Power is a capability that exists in and through relation, not as an event nor possession of any agent prior to the relationship in which it is exercised. We cannot explain “power” without knowing the context of the relation and the people sharing it (Guzzini, 2017). There is no necessary causal line from Indigenous rights policy and discourse to a single understanding and action, yet process-tracers can demonstrate which possible capabilities were excluded. Without specific capabilities, certain pathways or processes, like self-determination, could not happen. Guzzini (2017) proposes using “social mechanisms” to frame a version of causation that addresses the open process, the mobilization of capacities/abilities, intersubjective mechanisms, and the reality of equifinality. In this sense, the causal reconstruction of mechanisms can be characterized by multicausality and nonlinear processes. The mechanism itself depends on its interaction with other mechanisms and the process in which it unfolds.

Similarly, the Minnesota Chippewa Tribe’s (2017) Cumulative Impact Assessment describes how, in traditional ecological knowledge systems:

there is a more holistic understanding of cause and effect. There is an understanding that cause A and effect B cannot be isolated from cause B and effect B in a system. This is known as “mutualistic logic” and “reciprocal causality.” In practical terms, this is the difference between examining the increase of GHG from a pipeline project (by direct emission, replacement increases, etc) and examining the impact increased investment in fossil fuel infrastructure will have on future generations.

Decolonial process tracing embraces relationality and reciprocal causality. With this conceptualization in mind, the next section details Anishinaabe *gkendaasowin* (ways of knowing) as a framework for understanding social processes. I use the critique just presented as motivation to develop a view of process tracing that does not rely on linearity and universality, nor problematize equifinality. The role of causality and the settler state move to the periphery. The questions informing the next section are: How can process tracing be more decolonial? How do Anishinaabe understandings of the relationality of place and power reroute process tracing? To begin, I will introduce the idea of mechanisms as communities’ capabilities. Then, I will illustrate how such a form of social mechanisms can be used in decolonial analysis, focusing on grounded constellations, multiversality, and multitemporalities.

Gkendaasowin

Indigenous self-determination in decision-making demands an expansive understanding of space-time that does not treat settler institutions as the baseline for Indigenous governance and does not treat multiplicity as weakness. I see possibilities to enrich process tracing by engaging with multiple (including nonhuman) spatiotemporalities and ontologies. Anishinaabe *gkendaasowin* provides a guiding framework for this decolonial project as a congenial approach outside the process tracing tradition. It is not possible to summarize the complexity of Anishinaabe knowledge systems here, nor do I have the authority to do so. Instead, I highlight the breadth of decolonizing methodologies that range from detailed family narratives (Daigle, 2018) to statistical associations demonstrating community support for kinship-based governance (Jewell, 2018). Anishinaabe *gkendaasowin* can provide explanations in ways that are both consistent with and contradict positivist and constructivist assumptions. My engagement with *gkendaasowin* and decoloniality is not meant to be comprehensive but focused on some of the processes and capabilities for Indigenous self-determination that are embedded in detailed narratives.

Biskaabiiyang is an Anishinaabe understanding of decolonization as individual and collective processes of embodying freedom and returning to ourselves and the land (Geniusz, 2009; Simpson and Manitowabi, 2013). In this sense, decolonial processes involve communities' capabilities to engage in deep and reciprocal land-based relationships and responsibilities (Corntassel, 2008; Kimmerer, 2015) that comprise the basis of Indigenous political systems, economies, and nations (Coulthard, 2014). Centering Anishinaabe *gkendaasowin*, *Chi Inaakonigewin* (Natural law) extends to *dodemiwan* (clan governance) (Jewell, 2018). *Dodemiwan* is a series of overlapping consensus-based decision-making structures comprised of extended kinship relations with animal nations, and less commonly plant and other nonhuman nations, that provide both social identity and function. *Dodemiwan* is grounded in land-based power, existing across distinct spatiotemporalities, in a decentralized system generated and maintained by Anishinaabe people in direct relationship with the land. The structural and material bases of pre/decolonial Indigenous life was/is process centered (Coulthard, 2014; Simpson, 2017). For Anishinaabe scholar Basil Johnston (1991), Anishinaabe is a verb and a noun; it is something we are and something we do at the same time. Anishinaabe ways of living and processes of governance are "both the instrument and the song" of self-determination—the goal as well as how we get there (Simpson, 2017: 19). Michi Saagiig Nishnaabeg scholar, Leanne Betasamosake Simpson (2017) considers diverse Indigenous ways of living on our homelands "the primary mechanism" for decoloniality (p. 21).

The compatibility of capabilities theory and critiques of colonial power relations make a communities' capabilities approach appropriate for framing mechanisms for Indigenous self-determination in decision-making. Sen (1999) and Nussbaum (2006)'s theory of justice concentrates on the capacities necessary for individuals to lead the kinds of lives that they freely choose for themselves and have reason to value. The focus of justice is not on the distribution of resources, but how goods are transformed into the capacity for human flourishing, and how injustices disrupt or limit what people can do or be. Schlosberg and Carruthers (2010) elucidate a pluralistic, community-centered capabilities approach to development based in Indigenous communities' diverse notions of environmental justice. Unlike liberal political thought, Indigenous environmental justice movements do not limit themselves to understanding injustice as individuals, and often situate their struggles in collective experiences of injustice that impact communities' ability to function (Schlosberg and Carruthers, 2010). Community-based definitions of capabilities that are central to Indigenous environmental justice struggles can be integrated into a concern for the basic functioning of ecosystems, intergenerational knowledge, and the cultural, political, and spiritual life of communities (Schlosberg and Carruthers, 2010). Indigenous demands for equity, recognition, and participation are incorporated into a larger concern for the basic functioning of socioecological communities. This is akin to promoting *mino bimaadiziwin*, or "a good way of life" in Anishinaabemowin, which can be understood as the mutual flourishing of natural and cultural communities (Doerfler et al., 2013. In discussion with Simpson (2011), Anishinaabe Elder Robin Greene roots environmental sustainability in the process of *mino bimaadiziwin* . . . "so that life can promote more life" (p. 141).

Indigenous communities' capabilities can be understood as real opportunities to choose how decisions are made. Sen (1999) makes an important distinction between functioning and real opportunities by drawing on an example of two people, one fasting and one starving. An affluent person who is fasting may function the same as a person living in poverty, in terms of not eating, but the affluent person has a different capability set of alternatives from which to choose, in this case, to access food to eat. We can attach importance to having real opportunities, even when they are not acted upon, in the same way, we can distinguish fasting from starving. Sen acknowledges that choosing itself is a valuable functioning, and the process through which outcomes are generated has its own significance. Indigenous communities' capabilities to choose their governance structures and the underlying temporalities make self-determination possible. Whether a community then decides to translate

these general capabilities “to choose” into more specific capabilities (e.g. clan governance, elected band council, or a hybrid), is up to the grassroots people. Capabilities theory does not dictate function: the evaluative focus is not on realized functionings (what someone actually does or what governance structure communities actually choose), but the capability set of alternatives (real opportunities for self-determination, or for communities to choose their own governance structures). Process tracing approaches encourage analysis of process(es) in which such capabilities do and do not exist (Guzzini, 2017). For example, when there is a violation of Indigenous law through the imposition of a pipeline project, are Indigenous communities capable of upholding legal decisions made through clan governance? In the case of Deshkan Ziibiing Anishinaabeg, Jewell (2018) provides statistical evidence that the majority of her community supports clan governance. What is of central importance to decolonial process tracing is whether Indigenous nations have community capabilities, real opportunities to deliberate and build consensus in traditional, hereditary, and grassroots councils (Manuel and Derrickson, 2017). Sen’s concept of capabilities provides for a deeper, more context-sensitive analysis of justice issues associated with energy decision-making (Bickerstaff et al., 2013).

What decolonization means and entails differs depending on where you are and can include layered understandings of decoloniality in the same place (Tuck and Yang, 2012). Decolonial process tracing demands that mechanisms are derived from multiple ontologies, open systems, and nonlinear processes. Many Indigenous people regard the starting and ending points of a sequence as less important than the ongoing process of relationship building. Reciprocal recognition can be considered an inherent Anishinaabeg place-based practice that promotes relationship building (Simpson, 2017). I do not use the term reciprocal recognition in a Hegelian sense. Instead, reciprocal refers to the act of recognizing and being recognized by a living, animate landscape. Reflecting recognition back to the land as a reciprocal political practice and affirmation of dignity can be understood as part of Natural law that promotes *mino bimaadiziwin* (Kimmerer, 2015; Simpson, 2011). Simpson (2017: 184–185) explains how Basil Johnson uses the term *maamaayawendamoowin* to describe the process of reciprocal recognition: the first *maa* meaning “it’s in my heart,” *maamaaya* meaning “fully understanding yourself or another being,” and *wendamoowin* meaning “your thought process as you move through life.” Simpson’s teacher, Doug Williams, distinguishes *maamaaya* from *baamaaya*, which refers to “searching for recognition,” presumptively from colonial authorities, which I interpret as more akin to the Hegelian notion of recognition.

Maamaayawendamoowin is a process of seeing another’s essence and amplifying reciprocity in place-based relationships. Anishinaabeg reciprocal recognition is embodied in our everyday lives when we ground ourselves in the web of land-based relationships that give us meaning. Indigenous self-recognition is about presence in our bodies and on the land; recognition that our bodies are created and sustained through shared relationships of deep reciprocity with and responsibilities to human and non-human collectives, communities, and nations (Simpson, 2017). Both terms for recognition, *maamaayawendamoowin* and *baamaayawendamoowin*, include the word, *wendamoowin*, which promotes remaining rooted in Anishinaabe thought processes as we move through life, and while we engage in both reciprocal and colonial forms of recognition. This is important because when Indigenous peoples engage with non-Indigenous institutions, it is often a struggle to retain connections with our relatives; it is common to start to feel removed from our grounded relationships and disconnected from intuitive ways of doing things in the community (Manuel and Derrickson, 2017; Wilson, 2008). It is important how recognition happens and whether communities have real opportunities to participate in the governance structures they choose and value. Self-determination is an ongoing process that relies on Indigenous communities’ direct relationship with the land, involves committed engagement between humans and nonhumans, and includes the communities’ capability for the everyday embodiment of inherent responsibilities (Corntassel, 2008; Kimmerer, 2015). To do this, Anishinaabe *gkendaasowin* transcends the colonial linear temporality, dissolves the problem of

equifinality, and emphasizes both methodological and epistemological diversity. Below I articulate related opportunities for decolonial approaches to process tracing: grounded constellations, multiversality, and multitemporalities.

Constellations

The basis of a constellation is the relationship, between humans and nonhuman beings across space-time (Simpson, 2017). Decoloniality is not a lineal point of arrival; in a constellation, there are many routes through spacetime and many ways to embody structures and relationships centered on relational accountability (Daigle and Ramírez, 2019). Recall how the formation of lake ice depends on the interrelationship between the unique body of water, sun, clouds, wind, snow, and human activity. We can trace how lake ice coverage is declining over time because of a shift in the constellation of relationships that privileges human industries over the inherent ways lake ice governs themselves. Constellations of small collectives' organizing rooted in *gkendaasowin* provide real opportunities to rebuild governance using Natural law and clan decision-making processes. Individuals with common goals come together to make decisions and act, then disperse or reform, and continue to develop relationships with other collectives (Simpson, 2017). Constellated formations are the embodied knowledge of Indigenous people in direct engagement with the land, including urban spaces, and other dispossessed and oppressed peoples. This is also how Indigenous pipeline resistance movements are built and operate: as constellations of human and nonhuman collectives creating mechanisms for communication, accountability, and shared decision-making.

McCreary (2020) argues that rather than focusing on the concentration and accumulation of wealth, the continual renewal of kinship relations in constellation with human and nonhuman kin through gift-giving promotes place-time extension. While commodity exchanges within capitalist systems disrupt Indigenous social relations, gift-giving generates community and social connection. This is also situated within Indigenous understandings of intergenerational responsibility, stretching reciprocal obligations into the past and future in ways that are open-ended and integral to one's identity. Kinship here includes shared responsibilities within and between clan families, and across species, it is not the same as biological descent or immediate family relationships (Whyte, 2021). These non-linear kinship relations are responsive and adjust when there are disruptions.

In Anishinaabeg resistance to Line 3, the White Earth Nation unanimously enacted the Rights of Manoomin ("the good seed" or wild rice) in December 2018, recognizing wild rice within the White Earth territory has the inherent right to exist and flourish (White Earth Band of Minnesota Chippewa Tribe, 2018). These rights are brought into action in the name of Manoomin themselves, as the real party of interest, and central actor in legal interventions to protect their rights from violations along the proposed pipeline corridor. The rights of Manoomin are far-reaching and include the right to freshwater habitat and the right to a healthy climate. This highlights the plurality of self-determining nonhuman persons in Anishinaabe pipeline resistance, as well as how national-level governance is embodied in constellations of local place-based relationships. Although decolonial process tracing engages with actors in institutional decision-making, relationships that exist beyond institutions are prioritized. Anishinaabe *gkendaasowin* instigates wide intellectual engagement that centers place-based ways of living (Simpson, 2017).

An integral component of decolonial process tracing is the consideration of the multiplicity of land-based relationships and how these are tied to specific sites and embodiments of self-determination. Constellations are in formation and emerging all around us every day, across struggles for self-determination, peoples rooted in different places are renewing relationships in their/our own communities. These unique histories and geographies that generate formations of constellations in co-resistance with each other and the land guide us toward decolonial futures (Daigle and Ramírez, 2019).

Multiversality

While universality is the logic of colonialism, multiversality is the basis of many different movements for decolonization (e.g. Indigenous Revolutionary Clandestine Committee-General Command of the Zapatista Army of National Liberation, 1996). “Where do you begin telling someone their world is not the only one?” (Maracle, 1993: 72). Multiversality (or pluriversality) describes the existence of many spatiotemporally distinct yet interconnected worlds (Cajete, 2000). Mignolo and Wash (2018) describe how pluriversal decoloniality “opens rather than closes the geographies and sphere of decolonial thinking and doing” (p. 3). It interweaves local histories, subjectivities, knowledge systems, narratives, and struggles against colonialism and for self-determination.

In the Minnesota Chippewa Tribe’s (2017) Cumulative Impact Assessment on the proposed Enbridge Line 3 Expansion and Abandonment Plan, the Anishinaabeg world is described as: “eight planes of existence, with an understanding of the deep relationship between the time of the ancestors and the time of the descendants.” Constellations seek to open up and advance radically distinct perspectives and positionalities that displace western scientific rationality as the only possible framework for analysis, encouraging a more relational way of living and inviting us to think with nonhuman peoples, struggles, and knowledge systems. A fundamental aim of decoloniality is the revitalization of epistemic diversity (Mignolo and Walsh, 2018). Decolonization is a process of refusing or delinking from the colonial matrix of power to regenerate pluriversality. Recalling Simpson’s (2017) queer normativity, knowledge is not a single set of ideas—it is the interaction between many different meanings, including discord, that make sense within Anishinaabe *gkendaasowin*. “You see, there are always worlds on top of worlds, worlds, underneath worlds, worlds intertwined with worlds. It’s a sort of Nishnaabeg String Theory” (Simpson, 2021: 30). Approaching knowledge as place-based is a decolonial necessity to relocate colonial universals in multiple forms of local emergence and restore them to their local scopes (Mignolo and Walsh, 2018: 205).

Multitemporalities

Indigenous narratives of time can exceed the dominant temporality in a variety of ways, including: prophecies, the presence of past ancestors and future descendants; land-based kinship political systems; queerness; memories; ancestral land-based knowledge including attunement to nonhuman and climatic temporalities; intergenerational knowledge and stories as a basis for engaging with people, places, and nonhumans; situating events within a much longer timeframe (generations, centuries, or millenia), and responsibilities to past and future generations (Rifkin, 2017). “[the pluriversal] opens up coexisting temporalities kept hostage by the Western idea of time and the belief that there is one single temporality” (Mignolo and Walsh, 2018: 3). Temporality is not a way to measure or calibrate processes; rather, the processes themselves involve multiple spatiotemporalities (Rifkin, 2017). Attending to temporal multiplicity means resisting broad static typologies, openness to internal forms of difference, and movement between categories in dynamic ways (Rifkin, 2017). Temporal multiplicity in decolonial process tracing means shifting from a shared now toward a deeper consideration of what constitutes distinct temporal formations and how these different formations engage and interact with each other.

Without being plotted on a singular timeline, Anishinaabe temporal multiplicity comes from direct engagement with the land as kin and is inherent in a natural flow of time—the creation of the multiverse, the rounds of the seasons, the lunar cycle, and the earth’s rotation. There are no abstract or universal concepts of “time” in Anishinaabemowin. Related terminology carries greater specificity: *aabiding* (at one time), *azhigwa* (at this time), or *gomaapii* (for some time) (Richotte, 2013). Simpson (2017) describes an Anishinaabe understanding of time coded in the etymology of the word *biidaaban* (dawn): the prefix “*bii*” refers to the coming future, the verb “*daa*” means being present in a specific

place, and the verb “ban” is used when someone no longer exists (p. 193). The past, present, and future coexist in Anishinaabe temporal understandings; not only does the past influence the present and future, but desired futures shape how we engage with the past and present. Similarly, *aanikoobi-jigan* refers to both ancestor and descendant, suggesting the existence of past and future relatives, as well as interaction with the actual and/or potential actions of our human and nonhuman ancestors and descendants (Whyte, 2021). Multitemporalities animated by Indigenous lands and not dissected in past, present, and future open immense possibilities for Indigenous self-determination.

Decolonial process tracing concentrates on the more-than-institutional temporal contexts within which communities build decision-making power. In the face of ongoing settler colonialism, expressions of Indigenous self-determination lie in the capability to participate in decision-making processes that do not take the colonial temporality and state as the implicit context. Constellated networks of relationship—stories, ceremonies, and the land itself—are procedures for decision-making (Simpson, 2017). It is critical not to assume here that Indigenous stories take place exclusively in ancient times. Traditional stories have the ability to apply to Anishinaabe peoples in multiple temporal settings, presume the present existence of past and future (non)humans, and maintain a deep sense of continuity that connects the past, present, and future (Nadasdy, 2008). Anishinaabe spatiotemporalities are not only cyclical in nature (same species, different individuals) but also circular (same individuals in the present, past, and future). This distinction is important for understanding how Anishinaabe people engage with temporal multiplicity; human and nonhuman nations exist in the present through our past and future inter-social relations. The past, present, and future societies of humans and nonhumans all exist in a continuous interrelationship.

There is both an opportunity and responsibility for decolonial process tracing to address power imbalances between settler and Indigenous societies, as well as human and nonhuman societies in our characterizations of energy decision-making processes by tracing constellations outside colonial institutions, in addition to Indigenous interactions with linear processes. Decolonial theory directs process tracers toward reciprocal responsibilities and relational accountability that are sustained through all stages of research, including topic selection, data collection, analysis, review, and dissemination. The next section applies insights from decolonizing methodologies and Anishinaabe *gkendaasowin* to detail methodological considerations that are integral to a decolonial approach to process tracing.

Biskaabiiyang and process tracing

Decolonial process tracing emphasizes personal relationship building and visiting with human and nonhuman communities at every stage of the research process. Topic selection that is guided by relational accountability and reciprocity directs us to responsibilities to the land and local community members. The proposed topic should be identified based on community need and support, strength-based, solution-focused, and sensitive to community history and how meaning is embedded in local landscapes (Louis, 2007). The research topic can offer a means of restoring humans’ relationships with more-than-human worlds. My relational accountability and responsibility to the land and community in topic selection extends from reclaiming Indigenous names and placenames, and honoring community protocols, to reframing my research approach based on feedback from community members that I should prioritize inherent rights.

To examine detailed narratives of how Anishinaabeg people understand Indigenous rights in pipeline decision-making, I offered tobacco to Anishinaabeg people who have been involved in resistance to the Line 9 and/or Line 3 pipelines and invited them to visit with me while we shared a meal or refreshments when possible. Sometimes this amounted to an interview one-on-one or in a small group that was open-ended and dialog based to provide for the mutual sharing of information through focused discussion (Wilson, 2008). Participants for both case studies live along the Line 9 or Line 3

pipeline routes but descend from communities across Anishinaabe Aki (territory), including from Ojibwe, Potawatomi, Odawa, Oji-Cree, Algonquin, Mississauga, Nipissing, Sauteaux, and Métis nations. Although decolonial process tracing prioritizes inherent rights and thus inherent rights holders who are from communities that are located along the pipeline route, Anishinaabeg pipeline resistance movements are comprised of the anikoobijigan of many (non)human nations. My decision to invite Anishinaabeg peoples from communities across the homelands to participate was to help challenge settler colonial divisions of Anishinaabe territories and bodies into Canada/US, reserve/urban, and status/non-status dichotomies, as well as to strengthen reserve-rural-urban and cross-border relationships. Decolonial process tracing that reflects these aims and considerations while centering the inherent rights and concerns of local communities can meaningfully contribute to nation-building efforts.

Dominant forms of process tracing implicitly encourage a focus on questions of what is or what ought to be Indigenous rights, comprising a normative approach to the study of Indigenous governance that predominantly focuses on colonial forms of recognition and colonial decision-making structures. Instead, decolonial approaches refocus attention on how rights are embodied in diverse ways in praxis and value communities' capabilities to choose inherent governance structures. Dominant forms of process tracing are often carried out in theory-informed, yet empirically open-ended ways and the techniques are considered most fruitful if stories are generated in terms and questions suggested by theory, but not limited to it (Bengtsson and Ruonavaara, 2017). Indigenous rights scholarship is often over-determined by theory focused on acquired rights. Centering colonial institutions and forms of recognition undermines Indigenous legal systems and limits community-based decision-making processes by positioning the state as the locus of legitimate decision-making power.

Indigenous rights discourses are embedded in Anishinaabe pipeline resistance movements and pipeline opponents' stories in which political focal points can be identified and analyzed. Focal points can be understood as key conjunctures where the restricting role of the colonial institution is made explicit. Focal points are good indicators of where linear processes can be expanded upon in a constellated form. For example, *Wiindmaagewin* (Consultation Protocol) *Deshkan Ziibiing* Anishinaabeg passed in November 2016 begins by stating that the purpose of the law is to protect their watersheds, relationships, and rights. Theories of energy justice and temporal justice, as well as ongoing personal relationships with participants, guided my analysis of in-depth interviews, evidence presented at hearings and in court challenges, and the constitutions, consultation protocols, and bylaws of Anishinaabeg nations. These complex configurations allowed for comparison and further examination using a holistic, systems approach. Shawn Wilson (2008), in conversation with Peter Hanohano, discusses

An analogy that Peter once used is that the data and analysis are like a circular fishing net. You could try to examine each of the knots in the net to see what holds it together, but it's the strings between the knots that have to work in conjunction in order for the net to function. So any analysis must examine all of the relationships or strings between particular events or knots of data as a whole before it will make any sense. (p. 120)

The relationships that connect distinct elements of the multiverse are important (Cajete, 2000). It's not enough to theoretically decenter humans or map out relationships, it is something you do through embodiment and living, building more relations, being active on the land and in community. Theorizing alone is not *gkendaasowin*; knowledge must be applied in praxis.

Anishinaabe people contextualize and embody energy governance practices through our respective communities' laws and political principles, and pipeline resistance movements are helping to regenerate these political and legal orders. The transformative potential of Anishinaabe pipeline resistance movements serves to influence both general understandings of law and specific approaches to energy justice. Resurgence "isn't just a recognition of the complexity and multidimensionality

that we might not fully understand at work. It is also a strategic, thoughtful process in the present as an agent of change” (Simpson, 2017: 20). Indigenous pipeline resistance movements emphasize structural transformation as pathways to deep decarbonization and Indigenous self-determination that are not apparent through dominant process tracing approaches.

For decolonial process tracing, the processes underlying how freedom is attained should be of central importance. In colonial contexts, injustice can work through freedom rather than exclusively against it, and *how* we attain capabilities determines whether real opportunities are present or not. Recalling Sen’s (1999) distinction between fasting and starving, or capacities and opportunities, Indigenous peoples and settlers may have the same functioning in terms of freedom to participate in an elected government; however, in colonial contexts, Indigenous peoples’ participation in electoral politics can also function as an “unfreedom” if there is not a real opportunity to choose a traditional form of governance. This is why Simpson (2017) calls for mobilizing around Indigenous systemic alternatives, because “how we live, how we organize, how we engage in the world—the process—not only frames the outcome, it is the transformation” (p. 19). Re-actualizing Indigenous systemic alternatives radically changes our ways of knowing and living, the actors involved, our modes of production, and how we embody governance.

Decolonial process tracing is concerned with whether Indigenous nations can determine the processes with which to pursue freedom. Building on Sen’s (1999) understanding that among different functionings, some are more effective at promoting freedom than others, I conclude this section by exploring a particular unfreedom, or contradictory functioning of freedom in colonial contexts. A concern brought up by multiple participants during the Line 9 interviews was the question of whether Indigenous nations should accept funding from the colonial government to participate in consultation. This directly relates to the Supreme Court ruling on Line 9, which noted as part of its decision to dismiss community objections to the consultation process that “Chippewas were granted funding to participate in the process” (Supreme Court of Canada, 2017). Community members expressed the worry that accepting government funds intended to enhance Indigenous communities’ capabilities to participate in energy decision-making signifies to colonial authorities that consultation has occurred, despite consultation processes that remain largely impartial or nonexistent. For Deshkan Ziiibiing Anishinaabeg, accepting state funding to ostensibly enhance freedom may have impacted their community’s capabilities to challenge the adequacy of consultation in court. The funding came with limits on what communities can do (Manuel and Derrickson, 2017). When situated in the ethical frameworks of Natural law, energy decision-making processes can improve environmental outcomes and promote Indigenous freedoms. However, when situated in market or colonial frameworks, there is a risk that outcomes will maintain injustice by undermining Indigenous social and environmental goals at a future date. Community capabilities that expand freedom at one time can limit it at another. This highlights that decolonial process tracing should be sensitive to unfreedoms, the contradictory role freedom can have over time in colonial contexts, and possible tradeoffs between present and future capabilities.

Decolonial process tracing insists that communities have the actual opportunity to shape their lives and energy decision-making processes, not just be passive recipients of ready-made state-centered development programs. The land and local Indigenous communities themselves should be the source of decision-making power for grassroots structures that provide real opportunities for community deliberation, mobilization, and embodiment of governance practices (Borrows, 2002; Manuel and Derrickson, 2017).

Conclusion

At the time of writing, it is Manidoo-Giizoons (Little Spirit Moon or December) in the Great Lakes. Recently, while walking along the Kagawong river on M’Chigeeng Anishinaabeg territory near

where I am living, I was visiting with the salmon migrating from Odaawawi Gichigami (Lake Huron) to spawn. With awe-inspiring strength, they hurl their bodies upstream against strong downward currents, flipping in the air, over obstacles, slapping against the surface, and chasing each other. I was startled when the path led me to one of the largest Salmon I have ever seen, struggling in the shallows beside me. It was a jarring sight, her jawbone was exposed, she had large sores down her sides, her tail was frayed, and her gills seemed to be slowly falling apart. The Salmon had put all her energy into the difficult trip upriver and reproducing, and as a result, was disintegrating in front of me.

I conclude with this story because several ideas within it are important to understanding decolonial process tracing. First, like swimming upstream to reproduce and decompose, it is largely difficult and unglamorous, what Simpson (2017) calls the “hard work of being present”; building lodges, cooking food, caring for elders and children, making mistakes, and organizing with our people, even when we disagree, are all practices that form the basis of Anishinaabeg political and economic systems. Second, decolonial process tracing is also concerned with temporal concepts such as communities’ intergenerational health, healing, and equity. Intergenerational health and healing relate to the biological, cultural, and social reproduction, and communities’ capabilities to heal from colonial violence, respectively. Intergenerational equity pertains to fairness between past, present, and future generations. Like other Salmon before her, the Salmon I saw is literally giving her body to provide nutrients for the next generation, as well as aquatic insects that can also be eaten by young Salmon. In both her life and death, the adult Salmon helps promote the flourishing of her species and the land and waters as a constellation of interrelationships. Third, there is a direct connection between the Salmon’s body and the surrounding environment. Decolonial process tracing engages with Indigenous governance and law that are embodied, embedded in the land, and more expansive than colonial law. Fourth, Indigeneity cannot easily be equated with local (Castree, 2004). Most of the salmon in the Great Lakes today are Pacific Salmon that were relocated from their ancestral territories and were introduced into the Great Lakes from 1966-1970, and they now outnumber the local Atlantic salmon (Parsons, 1973). Similarly, although Indigenous pipeline resistance movements center local communities’ rights and concerns, many Indigenous people today live in urban centers and/or do not live on their ancestral territories. In Indigenous-led pipeline resistance movements, decolonial process tracing is a useful tool to better understand ourselves and the lands on which we live from within local Indigenous governance systems. In brief, DPT seeks to make Indigenous ways of knowing more central to process tracing by providing context for a more expansive understanding of Indigenous law, governance, and rights. This demands an openness to constellations of decision-making processes, many human and nonhuman worlds, and multiple temporalities.

While this paper has laid a conceptual foundation for decolonial process tracing, it does not provide a template to apply concepts or a set of best practices. I invite others to share how they “use the fishing net,” build relationships, and “do” decolonial process tracing to help build rich, flexible, and collective understandings of DPT in praxis that prioritize local communities of inherent rights holders, challenge settler colonialism, and recenter land as the source of decision-making power.

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‘Often in between’: Thinking through research methods and Indigenous sovereignty with Yuin Country

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Abstract

Indigenous scholars have been calling for renewed attention to the theorisation and practice of sovereignty, including within research. Their scholarship has drawn attention to the sovereignty of people within research processes, as well as diverse expressions of sovereignty. In this article we bring these two dimensions into conversation to consider how research methods might enable and enliven understandings and practices of sovereignty within geography. Illustrating Yuin approaches to research through poetry, observation and dreaming, we show how Country is a living enactment of sovereignty. It dynamically contributes to research processes and enables nonhuman entities to communicate within and beyond their territory as sovereign subjects. In particular, Yuin research methods acknowledge the significant contribution of plants in the theorisation~storying and practice of sovereign Country. Through plants, we come to develop a knowledge of sovereign Country as often *in between* things, including places and knowledges, vulnerability and protection, and removal and persistence. Such insights are respectfully offered here in the spirit of broadening disciplinary perspectives and capacities in order to revitalise research that addresses the relationships between territory and its people.

Keywords

Indigenous people, sovereignty, research methods, Yuin Country, weeds

Introduction

Sovereignty does not exist with the concept and reality of oneness

Sovereignty however does exist with the concept and forced reality of colonisation

So I am living in a world in which sovereignty is non-existent and exists at the same time

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So where do I sit
 Often in between
 Often somewhere in the middle of being in between
 Oddly I am dammed if I do
 Oddly I am dammed if I don't
 Venturing into the middle of do and don't is don
 Venturing into don's meaning is master
 Everyone is entitled to respect
 Everyone is titled with respect
 Everyone should be able to have a tilt at respect
 Right now what does respect look like when sovereignty is a title
 Right now in the now I am Country
 Right later in the past we remain Country
 Eventually we are remains within Country and our authority of custodianship is the same
 Eventually sameness evolves from sovereignty of occupation
 Eventually the occupied are sovereign
 I cannot occupy rule over
 I can occupy rule over my behaviour of and in respect
 I am in and of you
 Got me tolerance
 Got me patience
 Got me you
 Nothing is something and I control something that is often missed by someone
 Nothing is missed when in connection to oneness, even when unknown or known
 Totally confused but in understanding
 Totally understand to be in confusion
 Yet Sovereignty is a ruler of power to itself
 Yet the only sovereignty I hold is me and me is Country
 Yet the word sovereignty is non-existent within existing.

This poem by Anthony McKnight.

This poem is an invitation to consider the sovereignty of Country. We (the authors) explain:

The layering of meaning in poems can allow for Aboriginal pedagogical approaches attached to our epistemology and ontology to occur in some form within research. The reader can make meaning from the story (Poem) as it is not just in the 'hands' of a sovereign researcher/writer. If no one person has ownership of the poem, then in this context Country does so – in relationship with all living things, including research. (Anthony, Awabakal, Gumaroi, Yuin man and academic)

It was not necessary to conceptualise the idea of sovereignty until colonisation began. Respect and understanding for every living thing and their Lore was always considered. There was no need to assert sovereignty. Today, power and Law is held within governments. Aboriginal people have had to conceptualise sovereignty to reassert their own sovereignty and likewise, that of the nonhuman. (Crystal, Gundungurra woman and academic)

I am not familiar with poetry in research. I am challenged by its form and function. I have questions about the place of poetry in geographical research and where it fits. But this poem pays no attention to my hesitations. The poem calls me into Country and the spaces in between what I know and what I don't. (Jenny, non-Indigenous woman and academic)

Can you see the poem, can you see Country? Our invitation is to you, reader, to consider this poem and other diverse methods as academic stepping-stones for geographical research *with* Country – as a knowledge holder and system. Methodological approaches that centre Country assist researchers to

step towards an understanding of Countries' sovereignty. The Sovereignty poem comes from McKnight's engagement with Country. He shares it here with you to recount what he saw from Yuin Country who speaks 'without voice' (Harrison and McConchie, 2009). The poem is McKnight's acknowledgement of the messages he receives from Country – messages which are produced in a format that will both induce thought and also limit his human intention to directly implement his meaning onto others. In the form of a poem, Country can still influence our conversation.

Sovereign Country sits in the spaces in between things – in between discomfort and learning, in between confusion and enlightenment, in between colonisation and oneness. We recognise however, that in order to explain this to you, we work within the structures of academia. To communicate to you, we need to elaborate some of our understanding and our intention. We do this through what we call theorisation~storying (McKnight, 2015), we are telling you our story of sovereign Country, and storying you into the process. An academic paper has to unpack its own knowledge system, processes, corruptions, biases and codes in order to learn (unlearn) and unpack (pack) meaning for its readers. Poetry, and the other methods we share in this article, contain teachings about sovereignty and Country that can be unpacked. We say *can* be unpacked, because not everything can be explained in words or will be clarified. Some meanings and interpretations have been reserved and some are left for you, reader, since you also have agency and responsibilities to Country. By starting our explanation about sovereignty with this poem, we are initiating a conversation with you. We are dancing between knowledge systems in order to do this. And we are inviting you in. As you read, we are showing you how the spirit of Country is recited, dreamt, danced and woven into the logical practices of research.

We recognise unapologetically, that what we share may challenge you. But that is a part of learning. Aboriginal academics are continually challenged to work in Western knowledge spaces and learn in a way that is foreign, or out of place, to them. The constrictions of Western knowledge conventions – those that 'do our head in', are the same ones that damage Country and its spirit. To undo such damage, we need to create a space for you to step out of a colonial mindset and step into Country. It won't happen without confusion and pain, but the methodologies of Country can be understood simply, when known. So respectfully, we acknowledge the knowledge shared here is partial, but that is how Sovereign Country is.

Questioning sovereignty

Sovereignty has been the subject of analysis and debate across many disciplines but particularly within geography where the relationship between territory and human authority are central concerns. Within conventional political discourse, sovereignty is inherently related to the authority of the state and how orders are given by an agent of state in accordance with claims to authority (Agnew, 1995). In such understandings, sovereignty is understood to be state-based and territorial. It requires the nation, kingship, government or authority (human) figures to control and operate effectively – first, through the exertion of power to arrange principal political institutions, and second, through the spatial division of territory where those institutions can utilise their power (Agnew, 1995). The historical development of the relationship between these two aspects has been explored by Johnson (2014) who understands the modern state system is built on the terms of Westphalia and conflict concerning the constitution of the Holy Roman Empire, religion and the state system of Europe. Fundamental to this conception of sovereignty is that it relates to a specific national territory occupied by a specific population with their own unique history, demonstrated in the shape of their lives and in their customs, institutions, laws and the entitlement to protect these systems.

Growing disciplinary interest in sovereignty challenges the orthodoxy of such conventions. Within international relations, sovereignty is central to the relationship between territorial states and their different procedures of authority (Agnew, 1995; Barkin, 1998). But geographers have shown how

more diverse form of power and articulations of territory are at play through focus on sovereign regimes, spatial metaphors, debates about power, the body and Indigenous sovereignty (Bauder and Mueller, 2021; Koerner and Pillay, 2020; Mountz, 2013; Shrinkhal, 2021; Wildcat and De Leon, 2020). A surge in interest in the concept of sovereignty has underscored that sovereignty and its relationship to territory has been and can be understood differently through culture and practice. As Bartelsson (2006) states:

What then became the subject of great interest was the question of why the meaning of this concept changes across time and space, and under what conditions these changes in turn spill over into institutional change on a grand scale. (p. 464)

Accordingly, recent work has addressed the transformational geographies of sovereignty, questioning how it is conceptualised and located (Mountz, 2013). For example, the Arctic is considered to be at a crisis point in only decades as climate change transforms marine and terrestrial landscapes (Gerhardt et al., 2010). A reduction in ice indicates less opportunities for resource use that will, in due course, escalate struggles over sovereignty among nation states, Indigenous peoples and corporations (Nicol, 2010). Likewise, analysis of conflict over marine resources illustrates how traditional legal and terrestrial notions of sovereignty are challenged by the shifting spaces and agency of the ocean (Campling and Colás, 2018; Havice, 2018).

For Indigenous people, the concept of sovereignty and related critique is particularly significant because of the historical and ongoing effects of colonisation. In Australia, ‘terra nullius’ was the false doctrine used to rationalise invasion (Porter, 2018) and which allowed for environmental and cultural genocide to occur. A treaty has never been made between Indigenous people in Australia and the state, and so it is argued by Indigenous people that sovereignty has never been ceded. Indigenous people are asserting their sovereignty in the face of ongoing harms and injustices, while also taking issue with its definition and the terms of engagement (Bauder and Mueller, 2021; Koerner and Pillay, 2020; Lee et al., 2020; Moreton-Robinson, 2020). For example, Sheryl Lightfoot (2016) argues that Indigenous definitions of sovereignty are different from those conventionally conceived because they do not necessarily include defined territories or states with authority. Likewise, McKenna and Wardle (2019) drawing on Watson of the Tanganekald, Meintang Boandik First Nations Peoples, illustrate a definition of law very different from European traditions of sovereignty, and which is all-embracing (p. 55). In a different vein, Wildcat, a Cree First Nations man from Canada (Wildcat and De Leon, 2020), argues that Indigenous sovereignty is inclusive of spiritual expressions, knowledge and practice:

This powwow belongs to the creator, you gotta remember, all these ceremonies that we have, they are from the creator. As individuals, as families when we want to do something, we ask the creator to borrow this lodge, it could be a round dance, powwow, Sundance. All these ceremonies they don’t belong to us, they belong to the creator. (Wildcat and De Leon, 2020: 3)

The point here is not only that there are differences between Indigenous and non-Indigenous conceptions of sovereignty, but that ‘expressions of sovereignty are multiplicitious’ (McKenna and Wardle, 2019: 41). Nonetheless, expressing or defining sovereignty differently creates serious dilemmas for Indigenous people, in that the process of full articulation risks undermining claims against ongoing occupation and control by colonial states.

Within this context we are interested in emerging relationships between expressions of Indigenous sovereignty and contemporary geographical research methods. Indigenous ways of knowing and being, including methodologies for research, are as ancient as the earth herself. Constructed within the nonhuman world, they are principal in interpreting individual identity connected to nonhuman and human communities (Arnold et al., 2021). Knowledge flows like rivers and methodologies are ‘living

knowledge' passed on and through generations forever evolving and growing, never static (Kurtz, 2013; McKnight, 2017; Ryder et al., 2020). The negative colonising effects of Western research practices on Indigenous peoples have been widely reported (Moreton-Robinson, 2004; Nakata, 2010; Rigney, 2001; Saunders et al., 2010; Singh and Major, 2017; Smith, 1999; Toombs, 2011; Tur et al., 2010; Walter and Andersen, 2013), however, emerging research practices and collaborations provide more hopeful possibilities that Indigenous research methods and perspectives on sovereignty might be acknowledged and respected within geography.

For example, Indigenous researchers have asserted the sovereignty of nonhumans through their practices and methodologies including co-becoming (Bawaka Country et al., 2016), yarning/storytelling Dadirri (Datta, 2018; Geia et al., 2013; Ungunmerr, 2003) and Country as methodology (McKnight, 2017). Bawaka Country et al. (2016) is Country authoritatively writing itself – a collective of Indigenous and non-Indigenous authors, and all that is tangible and in-tangible which become together in an active, sentient, mutually caring and multidirectional manner in, with and as place (Bawaka Country et al., 2016). Bawaka Country et al.'s research is a co-becoming – where humans and nonhumans together contribute to research. Datta (2018) and Geia et al. (2013) utilise Indigenous methodologies of yarning and storytelling as a form of deep relational communication to build vital Indigenous methodologies based on collaborative and respectful partnerships. Miriam Rose Ungunmerr (2003) offers Dadirri – the process of being still and waiting to let research follow its course. These approaches recognise forms of nonhuman agency that others (Latour, 2007) have elevated, though for Indigenous people such ideas are not new.

Some of the examples noted above have addressed the relationship between research methods and the sovereignty of Indigenous people in the process of research. They are emblematic of necessary moves away from researching Indigenous people as subjects, towards collaborative and participatory processes led by Indigenous people on more ethical and equitable terms. Other examples have addressed the research process as a basis for illuminating Indigenous knowledge about what sovereignty is, in order that it be perceived and recognised (Robertson, 2017). We argue both aspects are important while also acknowledging that making such a claim is a necessary challenge to thinking about what methodologies are recognised as valid within the discipline. We invite discussion by sharing how Yuin methods enable the sovereignty of Country within the research process.

Methods for sovereign Country

Anthony's sovereignty poem demonstrates the complexities of current and historical interactions between Aboriginal and non-Aboriginal knowledge systems. These confusing, contradictory, divisive and intimate interactions are central to how Aboriginal people experience the ongoing effects of colonisation and the structures that have been imposed to govern how people think, act and behave. The poem also points to a middle ground in between knowledge systems – a space where Aboriginal and non-Aboriginal people might come together to heal and look after Country. Research practices and processes are part of Aboriginal people's experience of colonisation and so they are also part of how the collective of Aboriginal and non-Aboriginal people working as geographers may address the damage and destruction wrought by it. Country is a term used by Indigenous people in Australia to refer to all that is seen and unseen (Rose, 2004). In Yuin Country, the oneness of all that is (McKnight, 2015), is depicted through Mother Earth, Father Sky, Grandmother Moon and Grandfather Sun. Our focus in this article is Mother Earth. The poem cryptically informs the reader of the entity who can bring people and knowledge systems together: Mother Earth and all the Kin born of her, in which 'we' the humans were born last (Yuin Story of Creation: Uncle Max Harrison personal communication). Humans are understood to be the most destructive of all Mother Earths' children, something geographers have also noted (Kunstler, 1993). Mother Earth holds the solutions and the context to bring people together and heal by taking care of our nonhuman siblings.

Yuin knowledge about the world and how to act is derived from Country and takes the form of story. Country is our knowledge holder who seeks oneness with us through stories of chaotic connectivity (Arnold et al., 2021; Bawaka Country et al., 2015; McKnight, 2017; Milroy and Revell, 2013). Country can ‘see’ spirit and communicate without voice (Arnold et al., 2021; Birrell, 2006; Harrison and McConchie, 2009; McKnight, 2015) through our kin – plants, wind, sun, moon, animals, insects, people and so on – what we refer to as spiritual yarning. As Uncle Max says ‘I don’t use a computer but I receive emails from the land; they’re spiritual ones’ (Harrison and McConchie, 2009: 77). Country sends messages which provide knowledge. Messages may concern a nonhumans’ own experience as a sovereign being, or something for the human receiving it. To interpret messages into knowledge requires training and connection to the stories held in the Yuin tradition. In connection with Country, non-Yuin people also have the capacity to experience Country in this way. And, in connection, they may find solutions that contribute to the healing of Country, and its people (Birrell, 2006; Iwama et al., 2009; Nakata, 2007; Yunkaporta, 2009). Such healing can occur when academics learn from Country, her kin, and relevant Yuin people about how to weave in the body as knowing ‘research instruments’ together with the spiritual elements referred to as knowing, doing and behaving in oneness.

Yarning has been described by other researchers and Indigenous people in Australia as a form of deep communication:

Both the researcher and participant journey together visiting places and topics of interest relevant to the research study. Yarning is a process that requires the researcher to develop and build a relationship that is accountable to Indigenous people participating in the research. (Bessarab and Ng’andu, 2010: 38)

On Yuin Country, spiritual yarning is yarning that is inclusive of spirit. McKnight (2017) shares his understanding of approaching life and learning from the oneness concept:

The term spiritual for the context of this article is not intended in a religious manner. Spirituality from my current Yuin position is an appreciation of everything that is inherent of Country, a connecting energy that provides oneness of being. (p. 153)

Spiritual yarning then is the communication that takes place between the human and nonhuman world. Through the strength of yarning relationships, participants whether human or nonhuman contribute to a yarn. In a yarn that is part of a research process, Country contributes to the research decision making, the data and the analysis, gifting its messages and providing the basis for knowledge production and interpretation. For example, when a researcher yarns with plants, the plants might provide messages. A researcher may observe a plant and then write about how it grows. The plant may come to the researcher in their dreams, depending on the strength of the connection. These are messages shared with an individual that are then shared and interpreted in connection with other Yuin people who know the Yuin stories. This type of visual and spiritual communication is illustrative of the sovereign nature of plants – how they make a space for themselves in collaboration with and respect for others.

The validity of Yuin methods rely on the acknowledgement and maintenance of reciprocity and respect. Messages may be received as gifts for knowledge production but there is a dynamic element to the process that relies on the return action. Spiritual yarning, whether for research or otherwise, is a process of acknowledging human oneness with Yuin Country. The responsive action is the work we must do as people to look after and to heal Country. Yuin research methods therefore, are about responsibility and ethics. We are obligated to Country, not only because of the messages we might receive as gifts, but also because Country provides everything that we need to live, survive and work as academics – Country holds sovereignty. Academics working in other traditions may build respectful reciprocal relationships with Country and relevant Aboriginal people, and/or be invited in to develop their own methodology with Country, provided their behaviour is appropriate.

In addition to established protocols for reciprocity and respect, there is a methodological fluidity to Yuin research processes. This is because Yuin methods also respect the individuality of the researcher and their personal journey. An individual may receive messages, which require interpretation. Strength in interpretation develops through familiarity or proficiency with the relevant Yuin stories. Stories may be held in safe keeping by particular people. Interpretation or analysis therefore is always about who Country chooses to share its messages with and whether they are ready, able and supported to interpret them with integrity. Like methods elsewhere, Yuin methods recognise a researchers' positionality, but this is understood to be in a constant state of becoming. To illustrate these aspects further, we share Crystal's research journey. We trace some of the stepping-stones she has taken to place the physical, mental and spiritual aspects of her academic practice with sovereign Country through spiritual yarning.

Nonhuman knowledge: Messages received

Culturally, it is necessary for Country, including nonhumans and humans, to feel safe. In order for plants to share their thoughts and feelings or messages with people, they need safety to know that what they share will be respected. As articulated above, respect and reciprocity are integral to Yuin research methodologies. If plants or other elements of Country do not feel safe, they may not provide or send messages. In this way, the research process becomes blocked. Messages only flow if the conditions for cultural safety are met. Research that heals comes from a safe space where reciprocal relationships and respect are the foundations.

Crystal's and Anthony's Ancestors and Elders, as part of Country, hold them accountable to their actions and behaviours. When they make 'mistakes', in the sense of going on Country with inappropriate intent or trying to force knowledge attainment, Country and/or themselves and/or Elders provides discipline through varying forms of communications. Discipline is similar and different to blockage, or in between. For example, their car may break down to stop them from going further, a red-belly black snake may cross their paths sending them a respectful message to stop what they were about to do, or an Elder may respond to questions with silence or a 'growl'. Crystal and Anthony then have responsibility to self. Self as Country, Country as Self (McKnight, 2015): an example to look at (your)self in relationship with Country to decipher a feeling of understanding and possible meaning. These interventions from Country can sometimes seem harsh or gentle, but are a necessary part of cultural learning and a way for Country to keep us in line and ensure we are showing respect. As a non-Indigenous woman, Jenny is also accountable to her actions and behaviours, but she has to work at recognising when and how Country blocks and/or disciplines her. Like Crystal, Jenny has to work alongside Anthony, as an Awabakal, Gumaroi and Yuin man, in order to maintain the protocols of respect and reciprocity.

As a Gundungurra woman, Crystal interacts with humans, plants and other nonhumans from Yuin Country in a way that is particular to her personal, familial and community relationships. The Yuin ontology of oneness (Arnold et al., 2021; McKnight, 2015) helps to explain Crystal's developing relationship with Country and her research process. For example, as Crystal wrote this section, she gave close attention to the messages that were being sent from Country. In the moments she typed these words, a community of ants were walking their own stories in waves and flows across her desk. As she received their messages, they incorporated themselves into her spirit. Crystal sensed movement within her blood cells, within her breath and within her movements at the keyboard. In this moment Crystal and the ants are in oneness. They are weaving themselves together, linking up ideas, feelings, sights and sensations into the trail of words that became the text for this article. Each ant is individual, but they link up to form larger connections that aid interpretation or clarify overall meaning. Country inserts itself into the research process in surprising and unexpected ways.

Some of what is described above resonates with what geographers have described elsewhere as embodied, affective and sensory methods. For instance, Wright et al. (2012: 41) note how research methodologies can be situated within felt, sensed and emplaced storytelling:

Our research interactions are based on the ongoing telling of stories that are embodied, emotional, sensual, and placed. They are constituted by the agencies of the people directly involved, of other humans and nonhumans, and of places. Rather than an orchestrated discussion between designated people, our research interactions involve contrapuntal stories that are simultaneously told, heard, felt, sensed, and recorded by humans, nonhumans, and Country.

Wright et al.'s (2012) account notes the active and dynamic nature of research interactions between people and Bawaka Country and the way that the process and artefacts of research may be recognised.

Their accounts however, also challenge the foundations of conventional research processes, attuned to the lively positionality of the researcher. Bawaka Country et al. (2016) describe these interactions as a process of co-becoming, 'As the messages emerge, we emerge, we co-become' (p. 462). Co-becoming with the ocean attends to deep and emergent connections in the spaces and times of salt-water Country:

The ocean breathes in currents and swirls, catching the wind in its wake. It is reminding us that we are always co-becoming with ocean breathing. There are deep material and symbolic connections that enable cultures, beings, becomings, and places. (Bawaka Country et al., 2019: 1)

The concept of co-becoming helps to impart some of what research as a lived experience with Country can be. It is not a surrendering of the self to Country, but the colocation and ongoing development of the self *in place* (Arnold et al., 2021). Thus, co-becoming redirects attention away from the forces that separate people from territory, towards those that connect people and place *in Country*. Becoming researcher is a critical, thoughtful and rigorous process of engaging the self in place.

Yuin research on Country, follow Yuin protocols. It starts with showing respect to Mother Earth and spiritual yarnning through 'looking, listening and seeing' (Harrison and McConchie, 2009). Looking and listening are actions a researcher might do to identify and locate messages. These actions are intentional, directing of the self towards Country. Crystal approached nonhuman entities, in this case weeds, as participants and co-researchers. They may actively participate, and she may receive messages from them, provided she is not blocked. Messages come through all the senses and can take diverse forms. To 'see' the messages, Crystal is learning to interpret them. To see and understand them she uses her body, and she embodies their messages. In order to share these messages, she has had to develop respectful reciprocal relationships with Country, learning through discipline and spending long periods quietly observing plants and their kin, watching their behaviours and actions. Moreover, she has considered their needs and wants in life. Through these considerations, she has worked to understand a snapshot of their perspectives.

What we share below then, are Crystal's efforts to yarn with plants working within the Yuin ontology of oneness. Within this ontology, weeds are an important part of Country, not separate to it. We bring weeds to the fore, rather than separate them out, because they have something to share in terms of how they become a part of a new place and ecology. Like people, they are mobile. They can be benign, supportive and/or damaging. All of these aspects mean that they lend themselves to reflection on human centred concepts, as well as to human behaviours and practices with respect to Country. Yuin people are not the only people who seek to learn from weeds, as McKiernan et al. (2021) show, they are instructive in other contexts also. In this case, however, the interpretations we've made have required connections and yarns with Yuin people and the stories they hold to aid explanation. Only some of the messages Crystal has received can be shared with you.

Poetry: Sovereignty

Weeds are active participants in research. They engage readily in discussions about sovereignty, territory and place. They may stand out with a bright show of flowers, present prickles that puncture your skin, or insert seeds that stick onto your socks as you walk around. As plants understood to be 'out of place' they also make themselves at home. In becoming weedy they take up space or occupy the space of others. When Crystal was observing plants along the Shoalhaven River, a certain Scotch

Thistle called out – its bright purple flower contrasted against the surrounding dried grass. The Scotch Thistle grows readily along the Shoalhaven River, as it does elsewhere in riparian areas and in gardens, parks and among crops (Qaderi et al., 2005). Crystal was unsure what this plant had to offer and sought advice from Anthony who guided her to sit in silence, and observe the messages that came:

Scotch Thistle Missile

Listen to my silence, hear my presence, feel my flow,

Observe, understand, know,

My story begins in my birth country Scotland,

Here,

I am not foreign,

Here,

I am sovereign.

My Lore is to uphold

bravery,

courage

and loyalty,

All in the face

of treachery.

If I enter your body,

my medicine is anti-inflammatory,

I courageously put out the flames in your body.

But,

If I enter the soil on Yuin Country,

My actions are no remedy,

I am the bearer of treachery,

My behaviour can be wild and fiery,

I extinguish native plants like my enemy,

But like any battle, I long for serenity.

The sovereign Lore that I uphold,

Is not Yuin Country Lore

that my new home holds.

The Lore that is Country,

Is the only authority,

Here, on Yuin Country,

It is a guarantee,

That Country is

the very being of

Sovereignty.

The story of this plant and its knowledge was shared with Crystal in the form of a poem. Within academic writing poetry has been utilised as a valid form of representation in qualitative research (Acim, 2021; Baxley and Sealey-Ruiz, 2021; Carroll, 2005; Fitzpatrick, 2012). According to Fitzpatrick (2012) 'poetry can provide a rich, evocative, and aesthetic means of communication, which ultimately enhances ethnographic work' (p. 8). The shape of the Thistle is represented through the words on the page. The Thistle takes up space at the expense of other words. This shape is recognisable, perhaps already known or imprinted in your mind before you've read the words. However, poetry can be much more than a visual communication tool. According to Carroll (2005) poetry is based on voice and must be passed through ears. When poetry is read with spirit and meaning behind it, messages can be felt within. Taking the words of the poem into the mouth and passing them through the ears, produces feelings. Taking notice of these feelings and the auditory experience of poetry moves your mind. The Thistle is an entity that can take up space. Through poetry it can also occupy bodies elsewhere.

Acim (2021) asserts that through poetry, poets strived to build human connections with one another and establish a networked society governed by verse and rhythmical prose. Poems provide the means for reflection and for insights to be developed building connectivity across distance. In this case, the poem above is a means for allowing different understandings of sovereignty to be expressed and shared. Sometimes, those understandings or insights can be in tension, or *in between*. For instance, the Scotch Thistle is a sovereign plant. It has power through its own traditions and what it knows of the world. In its home country, this plant symbolises bravery and loyalty and can even be healing when consumed as it acts as an anti-inflammatory (Garsiya et al., 2019). But it also travels, and when it does so it actively colonises by spreading rapidly into disturbed native grasslands, open woodlands and conservation areas. A single plant can produce more than 20,000 seeds (Pettit et al., 1996). Thus, thistles remind us of two things; how knowledge from elsewhere can travel and spread, sometimes to the detriment of local knowledge and places, but also that in travelling and spreading, knowledge can bring hope and the promise or possibility of situations being otherwise.

While a thistles' message may travel in poetry, voicing ideas by writing poems can also connect a researcher to personal and political situations, acting as an outlet. Research that takes place across a wide range of different social conditions, cultures and diversity allows voices to be heard beyond socio-political boundaries (Bourdieu, 2004). It is commonly understood that having your voice heard, particularly in poetry, can be healing (Carroll, 2005) and poems are gifted to others when we are in need of comfort. Whether the words resonate, sooth or inspire, we have all been moved on some occasion by words. It is through finding the words to articulate experiences that poetry can bring relief. Through poetry, the voices of Indigenous people can be heard and can travel. The poems by Anthony and Crystal both invite readers to question their own understanding of sovereignty, where that knowledge comes from and how it sits in their place in the world.

Observation: The snake

Alongside poetry, observation is a key aspect of Yuin research methods. Yuin, Gundungurra and other Indigenous nations are connected to each other by the Shoalhaven River. The river is also a significant place for ecologists and other scientists who identify it as a place of high water and sediment movement, and full of aquatic life (Carvalho and Woodroffe, 2020). The river is constantly evolving and becoming anew as it responds to the rain, the ocean tides, the plants that grow along its banks and the humans and animals that live alongside and within it. Yuin people pay close attention to the river and how it changes. The presence and activity of plants and other entities are observed in relation to the seasons, and how people sense and feel in the moments they are on Country. Observations are required in order to identify feelings and meanings for connecting stories that may be needed for interpreting the messages that Country offers as knowledge.



Figure 1. The snake – as she feeds on her prey under a plant at the Shoalhaven River.

Crystal began data collection for her research in the late summer of 2020. During one visit she stepped into the vegetation by the river. The riverbank was somewhat overgrown, and Crystal was making observations of the weeds growing there. However, the first thing she saw was a graceful python eating her prey, Figure 1. Crystal felt honoured to witness this moment and watched the snake ingest a feed. She stood at a distance so as not to disturb her in this vulnerable state. In this moment, Crystal began questioning her own right to be in this particular place. In Yuin understandings, some snakes bar movement and present barriers that cannot be transgressed. Crystal did not venture further but continued to observe the snake's movements. The snake was nestled under a plant and Crystal saw that this plant grew in a way that allowed animals to take shelter underneath its branches. Careful observation provided the means for these plants to convey their role on Country – how they care for small birds and other animals by providing protection. Again, questions emerged in Crystal's mind in relation to how plants, which were also weeds, might care for and shelter others.

In Yuin Country, observation involves paying close attention through the senses to all entities within the environment through 'looking, listening and seeing' (Harrison and McConchie, 2009). It is a means to take in and know the world. Crystal made observations about the snake she encountered and what it was doing at the time she encountered it. She considered it within its relationship to the world around it and what it appeared to be doing. On one level, this observation provides a metaphor for thinking about sovereign Country. Nonhuman entities need to be free to practice and govern themselves and to be free from interference. But they are also vulnerable and need care. Sometimes the source or locality of care can be unexpected as in the case of weedy plants that shelter and protect others. Addressing the problems weeds present in terms of how they take over territory thus requires us as humans to hold their capacity for care in mind. It requires careful consideration for how much damage might be done within worlds of existing relations in the process of trying to make situations better.

On another level, it also provides the direction for thinking about the sovereignty and safety of Indigenous researchers. In addition to what can be seen or heard, observation involves paying close attention to how sensory responses during observations dwell within the observer – how they make the observer feel, and how the observer responds to those feelings. Those feelings – the emotions, affects, thoughts and questions that arise through observation are also the way that Yuin people come to know the world and how Country asserts itself and brings itself, into the spirit of the researcher. Attending to these feelings is vital since they are the conduit for Country’s messages which guide people in their actions. These feelings, and how they are interpreted, in turn contribute to the formation of identity. However, expressing these ideas, including as part of research processes, can make Indigenous people feel vulnerable, especially when they are evaluated in Western terms. Indigenous scholar Irene Watson notes that sovereignty is dependent upon Indigenous people being able to practice their Lore, respect and honour their territories and acknowledge their right to life (Watson, 2002). In relation to expressing sovereignty, there is thus always a tension for Indigenous researchers, who in order to assert their ideas, risk opening their worlds to the scrutiny and subjugation of others.

Dream: The weeds

For many Indigenous people understanding dreams or ‘spiritual emails’, as Uncle Max calls them, are vital for understanding the world. Dreams act as a catalyst for attaining access to inner spaces and are considered so invaluable that the external environment is often manipulated in order that dreams might happen (Ermine, 1995). Yuin Elder Uncle Max Harrison and Yuin cultural men including Anthony, taught Crystal that she needs to *go within* when connecting to Country and she has learnt how to incorporate spirit and her ‘inner knowings’ (Rowe, 2014) into all areas of her life.

Dreams have always been a big part of Crystal’s life and she has vivid memories of dreams she had as a child, but incorporating and understanding dreams as a research process has not been straightforward. Although they have always been directing and guiding her, she has often been confused about what her dreams meant. In the process of reconnecting with Country, Crystal began to talk about her dreams to Yuin cultural people. She received guidance from them which helped her to understand the meanings of her dreams. In turn she began to understand the value of listening to her dreams for guidance in her life. One dream about weeds is instructive:

I dreamt that weeds were growing out of my legs, pushing through my skin. . . . And when I tried to pull them out, they snapped at the stem and the roots remained in there. I couldn’t get them out and I was worried that the wound where the opening of the weeds coming out in my legs would get infected.

This was a frightening dream and through this dream, Crystal started paying attention to the fears that people have of weeds. Again, there are levels of interpretation to be made in relation to sovereignty. In the dream, weeds were growing and pushing through the surface of Crystal’s skin. They crossed boundaries and territories. People are fearful of weeds because they show us how the boundaries people create are flimsy or permeable. As other geographers have argued, they illustrate the tenuous nature of territory as something that can be separated, known and controlled. Furthermore, the weeds growing out of Crystal’s legs would not come out when Crystal tried to pull them, and she feared an infection. Weeds are difficult to remove. Often a lot of effort is expended on removing weeds, only for them to re-sprout or set seed. In this case, fear relates to a sense that weeds are or will become uncontrollable and provides the impetus for thinking about what needs to be done to care for Country in order to prevent weeds, when it is feasible.

On another level, this particular dream shifted Crystal’s perspective and focus from plants as entities who are separate from humans, to entities who are part of the self and so deeply connected that they metaphorically grow out of us. Thinking about weeds as part of Country, even as part of the self,

presents profound challenges to considerations of whether and how they should be addressed, managed or even removed. While Western knowledge about weeds and weed management practices often emphasise the differences and disconnections between people, places and plants, the Yuin ontology of oneness directs attention to the interconnectedness of all living things, including weeds, as part of Country. Acknowledging such interconnectedness therefore requires a shift from thinking about how we fight against weeds, to thinking about how we nurture the sovereignty of Country and work towards a balance between weed removal and their likely persistence.

Summary and conclusion

In this article we have sought to unpack and share with you Yuin research methods which enable and assert the sovereignty of Country. Poetry, observation and dreams are just some of the methods that Yuin people use to theorise~story Country. We say story because our theories bring entities into relation – researchers in relationship to Country, us as authors into relationship to you as reader. We know that these methods tip upside down, or turn inside out, conventional understandings of what constitutes geographic research, research methods and sovereignty itself. But we are unperturbed; there are already lively and vital discussions taking place in geography about Indigenous epistemologies and ontologies which strengthen the discipline and knowledge of the diverse relationships between people and place. What we have shared seeks to work alongside these efforts in tandem and build solidarity through dialogue and connection. In this final section, we offer three concluding insights in relation to the sovereignty of Country, geographical research methods and research collaborations for sovereign Country.

First, Yuin research methods highlight the sovereignty of Country. When we say the sovereignty of Country, or sovereign Country, we mean that Country is self-determining. As people, we do not hold sovereignty over Country, we are only sovereign in oneness with Country. Mother Earth is not the territory or the background to human control over space, but the authority and sphere of connection between people and place. Yuin expressions of sovereignty come through the Yuin ontology of oneness, a worldview which refocuses thinking away from what separates entities to that which binds or brings them together. Thus, within research, sovereign Country determines whether and how messages will be shared. Only when people are ready through discipline and training, and when they have behaved appropriately and with respect and reciprocity, will they be able to receive and interpret messages from Country. Interpreting messages requires collaboration with other Yuin people, as well as ethical relationships with Country. This is an ongoing ever-evolving process, involving obligations of mutual exchange and an openness to the diverse forms through which Country sends its messages. Our theorisation~storying of sovereignty goes beyond conventional conceptions of sovereignty because it emphasises how knowledge of the world comes into being in relation to Mother Earth.

In recognising Country as sovereign, we also recognise that our capacities as researchers to know and understand Country, and the world at large, are always partial. Country is not under our control, nor do we control when and where knowledge is shared. Country keeps its knowledge close, it is not always knowable, or definable. We know and sense this when our research does not progress, and when our data are not interpretable. As people, we cannot always put words to the messages that Country sends. Certain messages are also for particular people, reflecting always the positionality of an individual person and their relationships. We illustrated the partiality, or in betweenness of what we can know as researchers through the example of plants and their stories of sovereignty. Plants, and weeds in particular, are good collaborators with whom to think through questions of sovereignty. Plants are tied to and constitute places in ways that animals do not. They not only occupy space, they share and give shape to how places are felt. But plants such as weeds also move, and in some cases colonise space, reminding us that mobility and transgression are forces that undermine existing power

relations and remake places differently. Plants which come from elsewhere hold knowledge and power, both of which must be considered and interpreted in respect of Yuin Country. Thinking through these dynamics of relationality – between plants in relationship to sovereign Country, provides new scope for thinking through how we relate to, and also manage them as weeds.

Second, Indigenous research methods expand the ethical scope for geographical research in relationship to both people and place. We have illustrated how Yuin people and their collaborators receive and interpret messages from Country through spiritual yarning. The practice of spiritual yarning situates researchers in place and requires them to learn and follow the protocols for appropriate behaviour in place. It involves researchers engaging with the people, stories and traditions of places in order to learn about where they are, as well as how they conduct themselves. Respect and reciprocity, to people and Country, are foundational to this endeavour. While formal research ethics processes often prioritise ethical relationships with people, and we highlight the continued significance of attention to human research ethics, we also underscore that research ethics must engage with relationships to place. Spiritual yarning draws attention to researchers' ethical engagement with Country and all of the human and nonhuman entities through which it is constituted. Geographers in particular, attuned to questions of sustainability and justice, are encouraged to place themselves and their research practices in relation to Country with respect and reciprocity.

Finally, our axis of analysis has sought to go beyond the weary binary of Indigenous and non-Indigenous ways of knowing towards analysis of what happens when we pay attention to the spaces in between knowing and understanding. Indigenous epistemologies and ontologies inform distinctive approaches to understanding, knowing and being in the world. They also inspire more ethical foundations for reciprocal and respectful relationships between people and the nonhuman world highlighting Indigenous people's concern for the importance of nonhumans and their continued efforts to continue their cultural practices. But Indigenous people continue to endure and suffer the oppressive structures of colonial power which constrain thinking, as much as they also assert authority and control territory. These structures are damaging for Indigenous and non-Indigenous people alike. Undoing them requires new collaborations, new relationships and a shared sense of purpose, binding ourselves together towards healing Mother Earth. And so, we invite you, reader, to free yourself too and engage with us about how places move and inspire you to see and sense, know and understand the world through your research. Indigenous research methodologies and efforts by Indigenous scholars to be recognised within academia are connected to broader projects of recognition, decolonisation and the reclamation of sovereignty. We are making a space for you to be part of that conversation. We are calling you in through respect and reciprocity with sovereign Country.

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Stories as data: Indigenous research sovereignty and the “Intentional Fire” podcast

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Abstract

Natural resource management intertwines with cultural practices and health outcomes for Indigenous peoples. Indigenous communities have managed and contributed to knowledge on ecosystems and sustainability since time immemorial. However, Indigenous communities in California face significant institutional constraints when implementing practices such as cultural burning. Indigenous-led research projects, programs, and political action are crucial to overcoming such constraints. It is important for non-Indigenous researchers to support Indigenous research agendas. This article helps to meet this need by identifying research procedures that respect Indigenous sovereignty and by using methods informed by Indigenous knowledge systems. The authors, representing the Southwest Climate Adaptation Science Center and the Karuk Tribe Department of Natural Resources, present a collaborative approach that integrates Native American and Indigenous Studies scholarship, participatory research methods, and engagement in the sovereign research protocols established by the Karuk Tribe. We share a process of effective collaborative research that respects Karuk research sovereignty. This process resulted in the *Intentional Fire* podcast series, a co-produced data set that documents Karuk stories on fire suppression, social impacts of fire exclusion, and Karuk determinants of healthy, resilient homeland ecosystems. The authors did not analyze the data further because Indigenous people do not need outside academics to speak on their behalf. The process also developed relationships, amplified knowledge, and strengthened capacities. We share our process and lessons learned to provide a model that can inform other collaborations that aim to support Indigenous research sovereignty.

Keywords

Fire management, Indigenous research sovereignty, transdisciplinary research, cultural burning, podcast production

Introduction

Fire is an essential part of many ecosystems in the Western United States (US). However, in the last decade, wildfires have increased in frequency and intensity, leading to catastrophic events (Marks-Block et al., 2021; Mucioki et al., 2021; Williams et al., 2019). In the 20th century, federal and state agencies instituted fire suppression policies that excluded prescribed fires, including cultural burning by Indigenous communities (Clark et al., 2021; Goode et al., 2022; Marks-Block et al., 2021; Marks-Block and Tripp, 2021). These fire suppression policies and practices led to an accumulation of fuel and, consequently, more catastrophic events have occurred (Marks-Block et al., 2021; Mucioki et al., 2021; USGCRP, 2018). Anthropogenic climate change aggravates this situation, which has altered ecosystems and natural cycles, leading to an increase in burned areas (USGCRP, 2018).

Since time immemorial, Indigenous communities have used their knowledge to maintain healthy ecosystems (Austin, 2004; Kimmerer and Lake, 2001; Lake et al., 2017; Lightfoot and Parrish, 2009; Long et al., 2021; Mucioki et al., 2021). In the mid-Klamath River Basin of California, the Karuk and other Indigenous peoples have used low-intensity fires to minimize the risk of large wildfires, encourage desired plant communities, increase hunting successes, and maintain cultural resources, among other benefits (Anderson, 2006; Goode et al., 2022; Knight et al., 2020; Mucioki et al., 2021). However, since the onset of settler colonialism by the United States, people who are not familiar with the local dynamics of the region have carried out natural resource science and management (e.g. Austin, 2004) and suppressed Indigenous management to favor practices that have not effectively addressed site-specific needs (Goode et al., 2022). American scientific management and research, and policies that erase and ignore the presence of Indigenous livelihood and natural resource management, are the settler colonial practices and policies that suppress Indigenous fire management in Karuk territory (Meissner and Whyte, 2017; Norgaard, 2019; Wolfe, 1999). Many communities are currently experiencing the consequences of decisions made at a large scale by non-local people, including health risks due to air pollution from large wildfires (Austin, 2004; Clark et al., 2021; USGCRP, 2018). Many scholars have pointed to the problems that arise when researchers and resource

managers who lack understanding of local contexts attempt to impose their epistemologies and practices. Chief et al. (2016) and Latulippe and Klenk (2020) point to additional impacts, such as Indigenous knowledge being extracted or ignored by Western scientific management and research practices. Wilmer et al. (2021) describe the ethical gaps that too often harm Indigenous (and other) communities when they are engaged in collaborative environmental research.

Interdisciplinary approaches and collaborative research are important in natural resource management because landscapes are complex and include stakeholders with different interests and knowledge (Wilmer et al., 2021). Therefore, the integration of different knowledges—through ethical collaborations—is essential to tackling some of the most pressing management issues (Norström et al., 2020). Previous studies have discussed the mutual benefits that can result from collaborations between local communities and Western science practitioners when those collaborations are done ethically and with respect for Indigenous research sovereignty (Austin, 2004; Lake et al., 2017; Popkin, 2016; Wilmer et al., 2021). In these collaborations, Indigenous communities can set the research agenda, craft and influence research protocols, and amplify issues of concern, as well as contribute their knowledge. When Western science practitioners conduct ethical and responsible research that respects and builds on Indigenous knowledge, they can work on issues of great importance and apply a transdisciplinary approach, which is necessary to understand complex natural resource issues (Lomawaima, 2000; Popkin, 2016).

Even though practitioners of Western science are increasingly interested in embracing and integrating Indigenous knowledge, there is still a lot to learn about these collaborations, and a need for more guidance on collaborative methods that implement Indigenous research sovereignty (Austin, 2004; Tuhiwai Smith, 2021; Wilmer et al., 2021). Many Tribal Nations have developed internal review processes that include protocols for collaboration and research in their territories. Researchers must understand and implement these protocols to ensure responsible projects that respect Indigenous sovereignty (Fisher and Ball, 2003; Lomawaima, 2000). Ethical partnerships and collaborations are needed between Western scientists, managers, and Indigenous knowledge holders, based on sound foundations, to steward ecosystem conservation in the local cultural context and with ethical practices that uphold Indigenous research sovereignty.

We understand Indigenous Research Sovereignty to be research enacted and implemented by Indigenous people and upholding their tribally specific knowledge and knowledge frameworks. Linda Tuhiwai Smith's (2021) *Indigenous Research Agenda* guides researchers to understand that Indigenous people's research can be harbored by and for Indigenous people. We also considered tenants of Indigenous data sovereignty by Stephanie Russo Carroll et al. (2019) who declare that the control of data must be with the Indigenous people. A 2014 report by the Karuk Tribe explains why scientists and natural resource managers must take time to understand Karuk Culture: "knowledge is generated through an ongoing process that involves not only observations and actions over time, but moral and spiritual components as well as 'social license' of knowledge practitioners" (Norgaard, 2014: 3). Karuk knowledge on fire, for example, cannot be separated from Karuk culture and so cannot be extracted and appropriated in other contexts or by other actors (Norgaard, 2014).

We enacted an Indigenous Research Agenda and data sovereignty through regular communication between the Karuk Department of Natural Resources (Karuk DNR) and the Southwest Climate Adaptation Science Center (SW CASC), which allowed the latter to learn about Practicing Pickyav, the Karuk Tribe's research oversight process and code of research ethics. Indigenous research sovereignty can be enacted by outside collaborators when they learn about, reflect on, and enact Tribe-specific research protocols. We want to be clear: collaboration with outside researchers is not at all a requirement for Indigenous research sovereignty. However, our experience demonstrates how collaboration can uphold Indigenous research sovereignty. Further practices can be developed to bridge the gap between Indigenous knowledge and Western science, and the patterns and challenges that occurred in this partnership might be useful for other collaborations between the American academy and Indigenous communities.

This article describes a collaborative research process between the Karuk Tribe Department of Natural Resources and a cohort of graduate students and their advisors who represent the Southwest Climate Adaptation Science Center. The authors comprise these two groups. Together, we explored two essential questions: “How can we develop a collaborative process to guide ethical research on topics related to Indigenous knowledge?” and “How can we amplify the knowledge and culture of Karuk People?” Figure 1 illustrates our research process through the metaphor of a campfire and guides the reader through the major sections of this article. Section 2 sets the scene by providing key background. We present the foundation of our research in section 3, which integrates principles from Native American and Indigenous Studies scholarship (NAIS), participatory research methods, and engagement with research governance protocols. In section 4, we demonstrate how we built a collaborative research process that sought to respect Indigenous sovereignty by providing a description of our research methods and practices. In section 5, we discuss the outputs and outcomes of this research project, including a podcast series titled *Intentional Fire*, which records Karuk stories and perspectives on the use of fire in their homelands. These stories serve as important data on the ecological impacts of fire suppression, social impacts of fire exclusion, and Karuk determinants of healthy, resilient ecosystems in Karuk Aboriginal Territory. We believe these stories will contribute to a positive change in relationships among people and between fire and people. We offer conclusions in section 6 on the role of Storywork and podcasting in the research activities of Tribal Nations and their collaborators.

Background: The setting

Karuk Tribe

The homelands of the Karuk Tribe are located in the Siskiyou-Klamath Bioregion in California (Lake and Christianson, 2019) (Figure 2). The Karuk Aboriginal Territory is unceded land largely occupied by the US Forest Service (USFS). The Karuk Tribe has never given up their land through war or ratified treaty. In 1850, the United States authorized a treaty commissioner who negotiated treaties with Karuk and other peoples. However, Congress did not ratify these treaties, in part because gold was discovered in California Tribal lands (Raphael, 1993) and the creation of a reservation would have prevented Anglo settlement in these economically valuable lands (Baker, 2003; Heizer, 1972). Settlers expected to erase the Karuk from their homeland (Raphael, 1993), but the Karuk People continue to resist all attempts of removal and exile.

Karuk People have been impacted by the fire suppression policies of the USFS and California Department of Forestry and Fire Prevention (CALFIRE) (Marks-Block and Tripp, 2021). For example, the Week’s Act of 1911 authorized the purchase of millions of acres of land by the USFS, including Karuk Aboriginal Territory. This Act outlawed Karuk use of fire, while providing for and incentivizing cooperation on fire and forest management with state and private lands that vastly expanded the jurisdiction of the USFS with respect to fire suppression (Busenberg, 2004; Karuk Tribe, 2019a). Those who sought to maintain their cultural management of the land through fire stewardship faced law enforcement and violence. The Orleans District Ranger of the USFS wrote in a 1918 memo, “Every time you catch one [Karuk person] sneaking around in the bush like a coyote, take a shot at them.” Like the Karuk, many Indigenous communities around the world—from the western provinces of Canada, the Amazonian Bioregion, the northern territory of Australia—persist in practicing cultural burning in their ancestral lands, despite many obstacles (Lake and Christianson, 2019).

At the beginning of the 1970s, some land management agencies began to support prescribed burning to restore ecosystems. In the 1990s, the USFS integrated some prescribed burning into its forest management, but fire managers were constrained by permitting requirements, narrow windows of opportunity to implement prescribed fire, and limitations imposed by the scale of prescribed fire

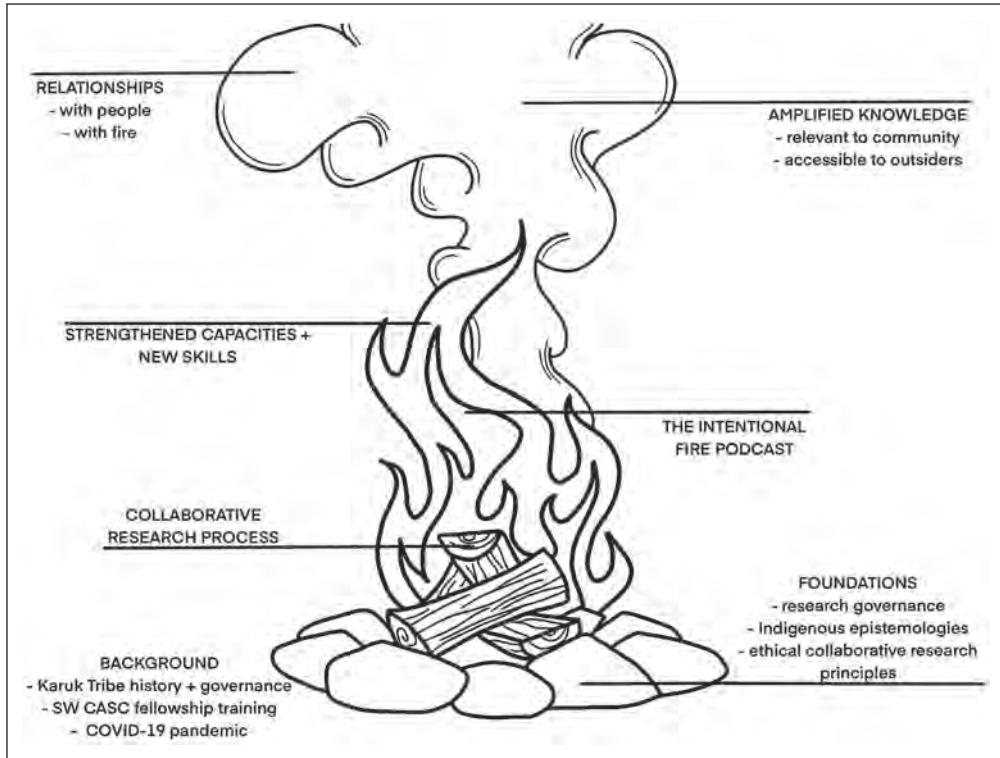


Figure 1. The foundations, outcomes, and outputs of our collaborative research process. This figure draws on the metaphor of a campfire to explain how we built the collaborative research process between Karuk DNR and SW CASC. The setting for the fire is the background described in section 2. Each stone in the fire ring is a foundation discussed in section 3. The fire ring supports the logs, or the collaborative research processes, which we built together. The built relationships can fuel future collaboration (section 4). The logs are potential energy; when built well, the logs slowly transform over time into good fire and smoke. The flames symbolize the Intentional Fire podcast series and the new and strengthened capacities of those involved in the project (section 5). As we keep our partnership strong through our relationships, the fire continues to glow. While fire can evoke fear, many communities have more complicated—and positive—relationships with fire (e.g. Kamakau, 1964; McGregor and Aluli, 2020; Marks-Block et al., 2021). The longer-term impacts of Karuk Storywork, in this case through podcasting, are less clear. These and cultural outcomes are represented by smoke (section 5). Although thick smoke can be dangerous to breathe, smoke can also be beneficial; it is used as an ecosystem management tool by Karuk People (David et al., 2018). The Karuk stories captured in the podcast have the potential to strengthen relationships among people and between people and fire. Through this project, partners examined their own relationships to fire and built a more positive relationship with fire on the land. From a warm campfire, built with community, the diffusion of ideas emerges as good smoke.

(Clark et al., 2021). In the 2000s, Tribal Nation and NGO advocacy for prescribed burning grew. Karuk and other Tribal Nations in the region promoted cultural burning through informal governance mechanisms, such as inter-institutional alliances (Marks-Block et al., 2021; Marks-Block and Tripp, 2021). Today, the Karuk Tribe Department of Natural Resources works to restore fire regimes and implements prescribed and cultural fire. The Karuk Tribe Climate Action Plan calls for continued cultural burning programs to address climate change vulnerabilities (Karuk Tribe, 2019b; USGCRP, 2018). The Karuk People are responsible for restoring cultural and natural resources and ecological processes in Karuk Aboriginal Territories. The Karuk DNR’s mission is to “protect, enhance and restore the cultural/natural resources and ecological processes upon which Karuk people depend,” and

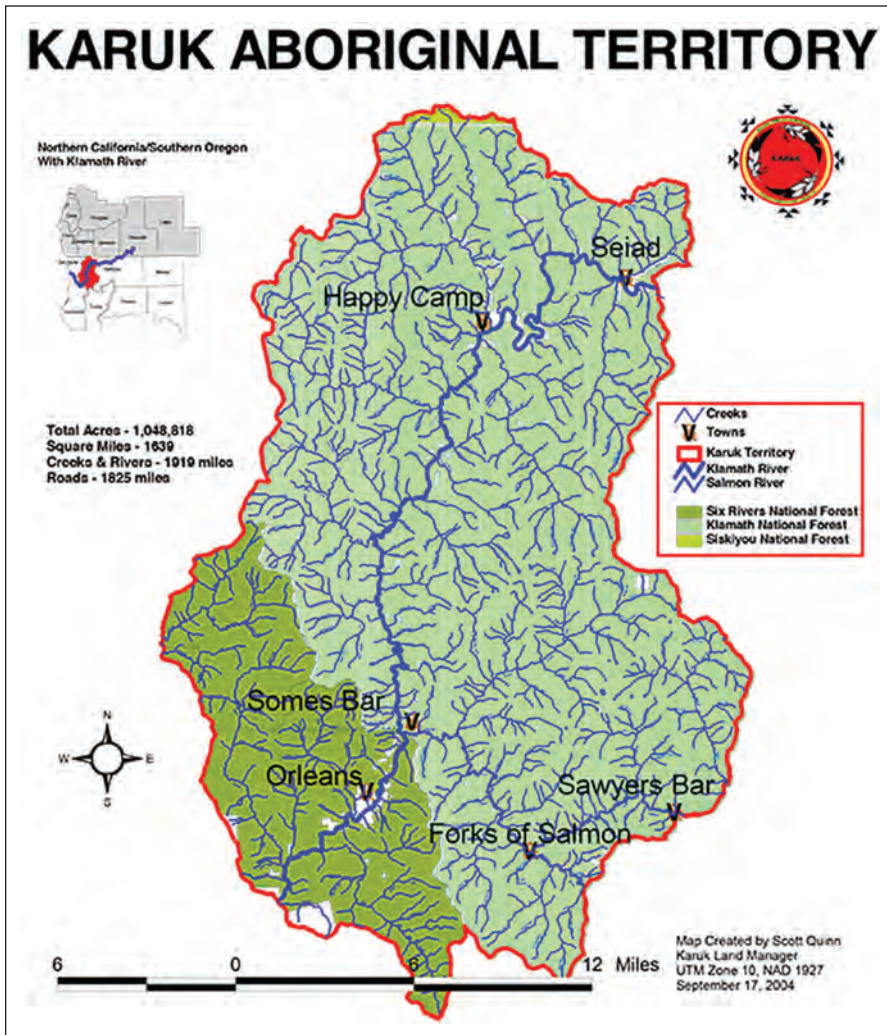


Figure 2. Map of Karuk Aboriginal Territory (Courtesy of the Karuk Tribe and Scott Quinn).

Karuk DNR staff “ensure the integrity of natural ecosystem processes and traditional values are integrated into natural resource management strategies” (Karuk Tribe, 2022). The Karuk Tribe provides leadership for and participates in the Western Klamath Restoration Partnership (WKRPP), an inter-institutional alliance with the USFS, non-profits, private landowners, and others in the Klamath region of California (Marks-Block et al., 2021). The partnership aims to “maintain resilient Klamath ecosystems, communities, and economies guided by cultural and contemporary knowledge,” through restoration of fire regimes (WKRPP, n.d.).

SW CASC

The SW CASC is a partnership between the federal government and universities from the US Southwest. Partners include the US Geological Survey (USGS), seven research institutions (University of California, Davis; University of California, Los Angeles; Desert Research Institute; University of

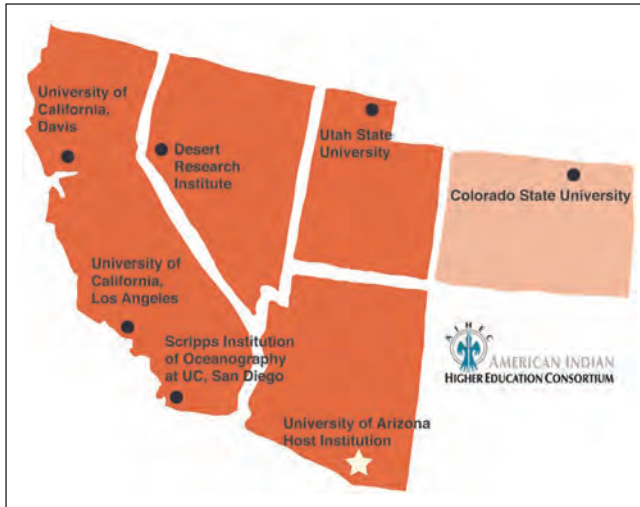


Figure 3. SW CASC Region (Courtesy of the Southwest Climate Adaptation Science Center).

Arizona; Utah State University; Colorado State University; and Scripps Institution of Oceanography at University of California, San Diego), and a tribal climate resilience liaison (American Indian Higher Education Consortium) (Figure 3). These institutions work together to develop actionable science and inform climate adaptation solutions in partnerships with natural and cultural resource managers, policymakers, Tribal Nations, and researchers across the southwestern states of Arizona, California, Colorado, Nevada, and Utah.

The SW CASC's goals include training young scholars and practitioners. Through its Natural Resources Workforce Development (NRWD) fellowship program, SW CASC mentors diverse cohorts of young scholars in use-inspired transdisciplinary team science. The collaborative research project described in this article took place over approximately one academic year through the NRWD fellowship program. The science theme for the 2020–2021 NRWD Fellowship was “management in the aftermath of landscape-scale disturbances.” The SW CASC fellows focused on fire suppression policies and the use of prescribed and cultural burning to reduce the occurrence and frequency of large wildfires (Williams et al., 2019).

The COVID-19 pandemic

Our collaborative research effort began during the first year of the COVID-19 pandemic, with its many personal, inter-personal, local, and institutional impacts and mitigations. This affected the partners in many ways, from losses of loved ones to increased childcare responsibilities to extra paperwork for approving travel. The pandemic impacted every aspect of the collaborative process, including relationship building, research protocols, and data collection.

Foundations for collaborative research: The fire ring

We constructed our collaborative process upon three foundational concepts: (1) principles of ethical, collaborative research, (2) the research governance of each institution involved in the partnership, and (3) Indigenous epistemologies. In Figure 1, we represent each foundation of our collaboration as a stone in the fire ring that surrounds and supports our collaborative research process. Table 1 summarizes the key contributions of the foundations of our research collaboration.

Table 1. Foundation for collaborative research between the Karuk Tribe and the SW CASC.

Ethical collaborative research principles with Tribal Nations	Research governance	Indigenous epistemologies
<ul style="list-style-type: none"> • Long-term relationships • Self-determination • Reciprocity • Deference • Representation • Belmont Principles 	<ul style="list-style-type: none"> • <i>Pikyav</i> • Individual and community consent • Understanding risks from Karuk perspectives • Indigenous research/data sovereignty 	<ul style="list-style-type: none"> • Storywork • Community building • Relatives, not resources

SW CASC: Southwest Climate Adaptation Science Center.

Principles of ethical collaborative research

The foundation for our partnership incorporates principles from various methods and frameworks of ethical collaborative academic research so as to do our best to uphold Indigenous research sovereignty (e.g. Archibald, 2008; Rainie et al., 2017; Tuhiwai Smith, 2021). Especially because of the legacy of academic research on Indigenous peoples, the preferred method of research in Indigenous communities is that it be initiated by and conducted by Indigenous people. With academia housing mostly non-Indigenous scholars, this is not the reality. Therefore, these principles aim to guide research that is as ethical as possible. “Research” retains a deeply negative connotation in many Indigenous communities around the world (Tuhiwai Smith, 2021). Since 1850 in the US, the most common form of research in Native communities has been salvage ethnography, the systematic collection of material culture and the looting of gravesites (Lomawaima, 2000). This extractive research lacks reciprocity and has allowed non-Indigenous researchers to claim expertise over Indigenous cultures (Lomawaima, 2000). In biomedical research, there have been cases where researchers have misused human biological samples from Native communities for research outside of the scope agreed upon by the Tribe and the individuals who granted their consent to participate in the study (e.g. Drabiak-Syed, 2010). The history of extractive and unethical research, and the power dynamic between academic researchers and local communities, must be understood and acknowledged to establish responsible research partnerships (Fisher and Ball, 2003; Lomawaima, 2000). Power dynamics among academic researchers and communities matter; the distribution of benefits between academic researchers, their non-academic Indigenous research partners, and communities should be scrutinized (Lomawaima, 2000). Also, the benefits to a Tribe may accrue slowly. An academic’s career may benefit in the short-term from publications and grants resulting from research collaborations with Tribes, but for Indigenous communities, these benefits may accrue more slowly and from the cumulative impact of the scholarship over time.

Ethical approaches to research with Tribal Nations and Indigenous people seek permission from, follow the leadership of, and meaningfully include the communities in every stage of the research process (Chief et al., 2016; Deloria, 1988). Wilmer et al. (2021) and Brittain et al. (2020) both discuss the necessity of careful considerations of ethical principles and actions when working with communities, particularly those who have been harmed by research in the past. Doyle and Buckley (2017) provide guidance on how standard research review boards within universities can more effectively manage the complexities of qualitative research. Tuhiwai Smith (2021) points out that Indigenous social movements since the 1960s, and multiple declarations by Indigenous people since 1993, document Indigenous people demanding ownership of their intellectual and cultural knowledge, despite Western laws that force private ownership of intellectual ideas. Indigenous people demand that they continue to be sole purveyors of their knowledge and that Indigenous descendants have access to Indigenous knowledge. Indigenous communities now maintain and produce their own

guidelines for ethical collaborations, which can be found online, in written documents, or directly from the partnering Tribe.

Lomawaima (2000) poses four simple rules for research with Native communities: First, “if a researcher wants to know the ethics of doing research in a particular Native community or reservation, they must first ask, then listen.” Second, “if the researcher does more talking than listening in the ensuing dialogue, something is wrong.” Third, “where tribes have established guidelines for conducting research, researchers must find out the rules and follow them. They should acquaint themselves with tribal history, past social and economic conditions, and the tribe’s prior experiences with academic researchers.” Fourth, “researchers must give something back.”

In addition to the rules discussed above, participatory research methods can guide ethical collaborative research between Indigenous communities and non-Indigenous researchers. Methods of participatory research intend to democratize research through community participation (Cvitanovic et al., 2019). Community-based participatory research is used in public health and health sciences and participatory action research is an approach commonly used in the social sciences (Hacker, 2013; Whyte et al., 1989). These are approaches to research that emphasize community strengths, empower communities, and build capacities in the process of producing meaningful and valid research (Austin, 2004; Mariella et al., 2009). Participatory research approaches emphasize long-term partnerships between communities and researchers that encourage collaboration throughout the research process (Austin, 2004). Tribal-driven Participatory Research impresses the importance of Tribal authority and leadership of the research (Mariella et al., 2009). Social change and community empowerment are important objectives, especially in recognition of the historical trauma experienced in Indigenous communities and by Tribal Nations (Fisher and Ball, 2003; Mariella et al., 2009). Therefore, participatory research methods are often evaluated first by their success in addressing issues of importance to the Indigenous community and identifying or implementing solutions. This type of science is rooted in advocacy, a departure from the norm of objectivity that Western science practitioners may claim to implement or strive for (Fisher and Ball, 2003).

Transdisciplinary science, another participatory research practice, recognizes the contributions of different forms of knowledge, particularly local and Indigenous knowledge. Like the other participatory research approaches, transdisciplinarity emphasizes action and engagement and incorporates multiple ways of knowing into research and practice. However, transdisciplinary research, which is often applied in environmental scholarship, also emphasizes the integration of multiple academic disciplines. Transdisciplinary research is “a democratic scientific practice” that emphasizes “ethical and mutually respectful partnership” throughout the entire research process (Wilmer et al., 2021). Transdisciplinarity can include co-production of knowledge, a collaborative research process that emphasizes the importance of diverse knowledge and skills across the spectrum of science, policy, and society to collectively generate usable science (Djenontin and Meadow, 2018; Lemos and Morehouse, 2005). The process of co-production relies on long-term relationships, open communication, and producing usable information for decision-makers, managers, stakeholders, and communities (Meadow et al., 2015).

Wilmer et al. (2021) provide a set of expanded principles for transdisciplinary research that include non-academic partners in project design, implementation, and reporting. To have successful partnerships or collaborations, researchers need to expand ethical understandings and practices beyond the Belmont Principles (Wilmer et al., 2021), which are the underpinnings for research ethics policy in the United States. The Belmont Principles include respect for persons, justice, and beneficence (United States, 1978). However, Wilmer and colleagues find these principles to be important but insufficient for research collaborations, especially in partnerships between academics and Indigenous communities. They include four additional principles: (1) “Appropriate representation” acknowledges the implications of how representation affects “people, places, species, ecosystems, and socio-ecological relationships” on ethical and real-world levels. (2) “Self-determination” represents that

Indigenous communities are sovereign peoples with the right to decide if and how research can occur, to require collective and individual consent for participation, and to control data related to their community, Indigenous knowledge, and ecological relationship. (3) “Reciprocity” refers to equitable sharing of benefits from research. (4) “Deference” means an understanding of and willingness to trust and defer to different ways of knowing and local expertise.

Research governance

The history of the relationship between the American academy and Indigenous communities provides some additional context underlying our approach to collaborative research. Both universities and Tribal Nations have established protocols that govern research, and both groups have institutional arrangements, specific parameters, and expectations that influence any collaboration. Crucial to the foundation of our collaborative work were the Karuk Tribe’s research protocol known as Practicing Pikyav (2017), the Arizona Board of Regents Tribal Consultation Policy (2016), University of Arizona (UA) Guidelines for Research and Engagement (2021), and the SW CASC use-inspired research practices.

Indigenous research sovereignty. Many Tribal Nations have established research protocols for oversight of scientific research conducted on their reservation lands or aboriginal territory, a trend that has been growing since the mid-1990s (Chief et al., 2016; Him et al., 2019). Common features of these protocols include the requirement for permission to conduct research, the Tribal Nation’s rights over data collected in research, collective rights and protections for the Tribal Nation in addition to the individual, direct benefit of the research to the Tribal Nation, requirements for non-Indigenous researchers to develop relationships and cultural fluency, and requirements for outside researchers to be sensitive to placing burdens on knowledge bearers (Chief et al., 2016; Rainie et al., 2017).

The Karuk Tribe’s research oversight process is called Practicing Pikyav. The Karuk Tribe established Practicing Pikyav to set “the terms for communication, informed consent, and expectations in collaborative research” with the Karuk Tribe and to prevent exploitation of the Karuk Tribe’s intellectual property (Karuk Tribe, 2017). Pikyav means “to fix or to repair” in the Karuk language and refers to the everlasting responsibility Karuk People hold to “repair and restore the complex socio-cultural and ecological systems,” including actions ranging from their sacred annual world renewal ceremony, their research programs, land management, and ecological restoration (Karuk Tribe, 2017). The Karuk Tribe found their research protocol to be necessary after the legacy of past researchers, including those who dug up interred human remains when they excavated gravesites (Platt, 2011).

Human subjects protection at universities in the United States. Universities also have institutional arrangements that govern research ethics. Under the Federal Policy for the Protection of Human Subjects, known as the “Common Rule,” universities are required to uphold a basic standard for ethical human subjects’ research (HHS Office of Human Research Protections, 2017). The Common Rule is based on the 1979 Belmont Report, which outlines three ethical principles: respect for persons, justice, and beneficence. The Common Rule, and the Institutional Review Boards (IRBs) that implement these policies on university campuses, are important but insufficient to ensure ethical research in collaboration with Tribes (e.g. Drabiak-Syed, 2010). Wilmer et al. (2021) lay out four fundamental problems with the Common Rule concerning transdisciplinary research: (1) the Common Rule focuses on protecting research “subjects” and does not explicitly provide guidance on transdisciplinary approaches to research. In transdisciplinary research, a non-academic research partner may be in charge of the research agenda and retain sovereignty over data, which was the case for the SW CASC and Karuk DNR collaboration. (2) The Common Rule only governs “human subject research” as defined in the legislation. This leaves a gap in oversight because not all research that involves people meets this federal definition, meaning that partners could be involved in a

project that does not provide sufficient legal protection for the experiences and knowledge they share within the research process. The upholding of ethical research standards relies on the awareness and actions of the academic researchers in such cases. (3) The Common Rule focuses on risks to individuals. Group harms are not considered, and yet group harms are essential considerations when working with Tribal Nations. Finally, (4) the Common Rule only requires *transparency around the availability of direct benefits*, if any, to participants without incentivizing direct benefits. Another historical weakness has been that only recently, the Common Rule was updated to state that federally recognized Tribal Nations regulate research conducted on Tribal lands (Tsosie et al., 2019). This is a step forward, but the gaps identified by Wilmer et al. (2021) remain.

Our collaborative project was subject to review by the UA's IRB, because UA is the administrative seat of the SW CASC. UA prescribes additional procedures beyond the Common Rule requirements for Tribal partnerships. The Arizona Board of Regents adopted a Tribal Consultation Policy in 2016, which acknowledges sovereignty of Tribal Nations and states that all research projects and initiatives that engage with Tribal Nations must document consultation and approval processes (Harper and Newberg, 2016). The policy acknowledges the need for collective consent and for collaboration on research design (Arizona Board of Regents, 2016). UA has Guidelines for Research and Institutional Engagement with Native Nations, which guide faculty, students, and staff in their responsibilities to consult with Tribal Nations. These includes the responsibility to gain "an understanding and recognition of tribal sovereignty, early and continuous consultation, determination of formal and informal authority, demonstration that free, prior, and informed consent has been obtained, and recognition of the potential for heightened community risk." Under these guidelines, UA Native Peoples Technical Assistance Office (NPTAO) reviews all IRB protocols and advises researchers on research collaborations with Tribal Nations not falling under human subjects research (University of Arizona, 2021).

SW CASC and use inspired research. The use-inspired approach of the Southwest CASC is another piece of the foundation. SW CASC conducts periodic stakeholder needs assessments, supplemented by annual consultations with natural resource managers in the region. The assessments and consultations inform their science themes and new programs. SW CASC researchers aspire to follow principles of translational ecology and other use-inspired research frameworks (e.g. Enquist et al., 2017; Parris et al., 2016); the research is conducted in collaboration with practitioners, to co-produce actionable science (Beier et al., 2017). While all scientific research depends on rigorous and transparent research methods, actionable science frameworks also emphasize the importance of understanding the context within which decision-makers operate, the need to develop strong researcher-practitioner relationships and trust, and the multi-directional communication of roles, responsibilities, and commitments to the collaborative research process, outputs, and outcomes (Ferguson et al., 2014; Meadow et al., 2015). The anticipated result of use-inspired actionable science is to inform environmental management practice and policy—to have real impact (Meadow and Owen, 2021).

Indigenous epistemologies

The last piece of our foundation is related to Indigenous Epistemologies. Native American and Indigenous Studies scholarship (NAIS) provides guidelines for ethical research with, by, for, and from Indigenous people, such as the Indigenous Research Agenda (IRA). Tuhiwai Smith writes that IRA can be carried out by Indigenous research programs (Tuhiwai Smith, 2021). NAIS provides theories and methodologies that recognize the validity of Indigenous scholarship, such as Indigenous Storywork (Archibald, 2008; Archibald et al., 2019), both within and beyond American academia. While the American biological and physical sciences considering the scientific method to be authoritative knowledge, Indigenous people have a generational pedagogical knowledge production system where specific people within the community are seen as knowledge keepers (Kimmerer, 2013). Academic writing is not the primary mode of knowledge production for Indigenous people; thus, the

foundation of our research included Indigenous epistemology documented in media and communication beyond academic writing.

NAIS methodology and scholarship acknowledges that epistemology in Indigenous communities exists within, outside of, and alongside American academic institutions. Indigenous people's knowledge and social production exists in Storywork, oral tradition, and storytelling; academic researchers may be able to integrate this knowledge using protocols and methodologies (Archibald, 2008; Archibald et al., 2019; Kimmerer, 2013; Wildcat, 2009). Indigenous people's words, stories, and oral testimony are as valid as quantitative scientific data in the American system (Archibald, 2008; Betasamosake Simpson, 2017; Goeman, 2013; Kimmerer, 2013; Miranda, 2016; Tuhiwai Smith, 2021). In *Indigenous Storywork*, Archibald (2008) builds on the theoretical disposition from Stó:lō, Coast Salish elders and writes that when using Storywork in pedagogical settings, researchers must also engage in respect, responsibility, reciprocity, reverence, holism, interrelatedness, and synergy. *Indigenous Storywork* documents Archibald and Stó:lō, Coast Salish elders implementing Storywork over many decades and with regular meetings for local public school curriculum (Archibald, 2008). In *Decolonizing Research: Indigenous Storywork as Methodology*, Archibald and colleagues (Allen, 1992; Archibald et al., 2019; Betasamosake Simpson, 2017; Tuhiwai Smith, 2021) bring together scholars' work in applying Storywork in various disciplinary contexts such as film, literature, mathematics, gender studies, and law. These scholars demonstrate the ways in which Indigenous communities practice Storywork to maintain their indispensable epistemology in stories.

Although Tribal communities and Indigenous people can engage in a conversation using the language of natural resource management, in Indigenous epistemologies, Indigenous knowledge producers discuss natural resources as relatives (Torres, 2019; Wildcat, 2009). For instance, the great Native American thinker and leader Vine Deloria (2000) once said "I think the primary difference is that Indians experience and relate to a living universe, whereas Western people—especially scientists—reduce all things, living or not, to objects." An understanding that Indigenous fire practitioners would perceive fire, animals, and water as relatives needs to be adopted so that the academic researchers can perceive this important and nuanced difference when planning for climate change and prescribed fire practices. One way that Indigenous people build sustainable relationships with entities in their local ecosystems is to ensure clean air, clean water, food, and resources so that all relatives—whether bears, birds, wolves, hawks, or eagles—have what they need to live healthfully. This differs from the Western natural resource management model where entities, such as water, timber, land, and salmon, convert into commodities with market value, as natural *resources* (Allen, 1992; Betasamosake Simpson, 2017; Kimmerer, 2013; Tuhiwai Smith, 2021). Furthermore, NAIS scholarship supports an individual's relationships, community, and personal experiences to inform research (Tuhiwai Smith, 2012).

Our collaborative research process: The logs

The SW CASC fellows and Karuk DNR aimed to collaborate in every stage of the research process (e.g. Austin, 2004; Wilmer et al., 2021), from November 2020 to February 2022, implementing our research to respect the research sovereignty of the Karuk Tribe throughout the process (Fisher and Ball, 2003; Wilmer et al., 2021). This partnership constructed the research process by drawing on the foundations, context, and lived experience of the co-authors. The process began with relationship building and culminated with planning for the dissemination of the podcast, although our relationships continue into the future.

Relationship building

The collaboration between SW CASC fellows and the Karuk DNR was initiated by the SW CASC fellows. As part of their research on landscape-scale ecological disturbance and climate change adaptation, the fellows wished to learn about Karuk cultural fire practices and produce a project that

would be useful to the Tribal Nation. As this outreach began, one of the SW CASC fellows (Chumach), who perceives her role as a member of the larger Indigenous communities to be central to her work, critiqued the use of the term “stakeholder engagement” and offered instead “community building.” From her approach, community building relates to existing and ongoing relationships, reciprocity, and an understanding that good relationships are built over time. This attunement to the importance of Indigenous community building resonated with the SW CASC fellows as an improved way to work with Karuk People.

The fellows relied on existing relationships of the SW CASC and Karuk Tribe to ensure that this collaborative relationship would not be limited to the one academic year of the fellowship. As stated above, participatory research emphasizes long-term relationships or partnerships (e.g. Austin, 2004). One of the SW CASC fellows had previously worked with the Karuk Tribe. The fellow was introduced to one of the Karuk Tribe representatives, who manages research collaborations with universities for Karuk DNR, and she began to ask about projects that might be of value. The partners communicated over 6 months (November 2020–May 2020) before developing a research proposal (e.g. Lomawaima, 2000). The Karuk Tribe representative introduced the SW CASC fellows to the future cultural liaison for this project (Karuk, Yurok, Paiute, Pit River), a technician for Karuk DNR and graduate student at Humboldt State University who was in the process of developing her own research proposal for her master’s project. Her collective knowledge of DNR, Karuk ecologies and practices, and the community were essential to furthering the work of the podcast. Karuk Practice is only navigable by a Karuk person because many principles are unwritten, created by living in a Karuk community, and not yet described in a Western-dominated setting. Thus, this project built on an emerging institutional relationship of the SW CASC and Karuk Tribe and on one researcher’s ongoing relationship with Karuk.

Setting the agenda: Co-production of research topic, methods, and products

After Karuk DNR confirmed their interest in the potential of a collaborative project, the two groups discussed ideas that were of mutual interest and were realistic, given the skills and time available. After several discussions, both partners confirmed their interest in producing a podcast on cultural and prescribed burning. The idea for the podcast was to build from an existing effort of Karuk DNR, the *Good Fire* report, which describes barriers to prescribed and cultural fire in Karuk Aboriginal Territory and identifies solutions (Clark et al., 2021). The goal for the podcast was to increase awareness of the report and make the issues described in the report more personal and salient by sharing stories and perspectives that communicate their impacts on Karuk People. The intended audience was the local community, non-Indigenous land managers, and the broader public, who, with better understanding, might reimagine their relationship with fire and support cultural and prescribed burning in Karuk Aboriginal Territory.

Storywork (Archibald, 2008; Archibald et al., 2019) justifies anchoring Karuk people’s stories as a data set for best practices and protocols, harbored by generations of experience with the implementation of burning and controlled fire practices. Storywork provided both ethical considerations and a model methodology for upholding Karuk knowledge in this research collaboration. Thus, when participating in the collaborative research project, SW CASC fellows could understand the value of Karuk stories and oral testimonies in any research carried out together. The co-produced *Intentional Fire* podcast would document stories of Karuk people as a data set and as generational knowledge about the use of burning and fire when tending Karuk ecosystems, culture, and landscape.

Cultural protocols and research permitting

The collaborative project required research permitting from both the Karuk Tribe and the UA IRB (Table 2). The Karuk Tribe is a sovereign nation with the right to regulate research activities and

Table 2. Research protocols and approvals process for collaborative projects with the Karuk Tribe.

Process	What is required
Karuk Resource Advisory Board (KRAB)	Project proposal (co-creation) Forming a review committee Presentation during the Karuk Resource Advisory Board meeting Approval of draft and final products
University of Arizona Institutional Review Board (IRB)	IRB Protocol including project description Letter of approval from the Karuk Tribe (free, prior, and informed consent) Review by UA IRB Coordinator Review and approval from the Director of Native Peoples Technical Assistance Office

UA: University of Arizona.

enforce Tribal laws, unlike other non-native communities engaged with academic researchers (Karuk Tribe, 2017). According to *Practicing Pikyav*, the policy document providing procedures and principles for collaborative projects and research initiatives, a project proposal needs to be reviewed and approved by the Karuk Resources Advisory Board (KRAB). The document clarifies that the Karuk Tribe retains the rights to all data and overall research products produced and provides procedures that protect Karuk knowledge and collective intellectual property. For example, *Practicing Pikyav* requires the formation of a Review Committee (RC) to provide guidance throughout the research process on matters including the protection of the Karuk Tribe's collective intellectual property and the review of research products to ensure culturally sensitive information is not published.

After KRAB approval in June 2021, UA was responsible for granting authorization through its IRB. The submitted IRB proposal included the letter of acceptance from KRAB. UA also requires an additional layer of approval, from the University's Native People's Technical Assistance Office, when working with Indigenous communities. In addition, UA required special permission to conduct in-person interviews to ensure participant' safety during the pandemic. The fellows received two trainings: Social and Behavioral Research Investigators and Native American Research through the Collaborative Institutional Training Initiative (CITI program). We obtained approval from the UA IRB in July 2021. These approval processes aim to ensure that all participants are protected, informed, and their rights upheld.

Data collection: Practices and methods

Data collection consisted of in-person semi-structured interviews in the Karuk Aboriginal Territory in August 2021, informed by *Storywork* (e.g. Archibald, 2008; Archibald et al., 2019). Many safeguards guided data collection. *Practicing Pikyav* and an associated intellectual property agreement provided a framework for understanding how to respect Karuk research sovereignty, navigate cultural sensitivities, and protect Karuk knowledge. RC members provided invaluable guidance on how to conduct podcast interviews in a way that would be comfortable and beneficial for participants. The cultural liaison from the Karuk Tribe acted as mentor and research partner during data collection.

The process of identifying interview participants began with brainstorming sessions where Karuk DNR identified potential interviewees with diverse relationships to fire. We also sought interviewees of a range of ages, to highlight the importance of engaging youth in learning from elders in the Karuk culture. We used purposive sampling rather than a random or representative sample (Patton, 2015: 264). The cultural liaison selected individuals with particular knowledge that she wanted to center and who would be appropriate to interview. She prioritized participants who are Karuk, familiar with being interviewed, female, and with whom she held strong relationships. We recorded four

interviews, with a DNR staff member, a grandmother, a forester, and a basket weaver. The cultural liaison led each interview, which increased the comfort of the participants, added her own knowledge into the conversations, and made Karuk voices central in the podcast episodes.

Responsible research collaboration between academic researchers and Tribal Nations must include informed consent, and informed consent by interview participants was part of the KRAB and UA IRB protocols. Each participant voluntarily granted consent before the recording, and one of the SW CASC fellows was responsible for carrying out and documenting the informed consent process. Free, prior, and informed consent is a first step in any project that includes Indigenous communities. Informed consent forms were co-developed to ensure Practicing Pikyav, and UA IRB requirements were considered. Practicing Pikyav always prevails over the UA IRB, because the project is conducted on Karuk Aboriginal Territory. We also provided each interviewee with the opportunity to review their interview in the draft podcast episode before publication.

Podcast production, data sovereignty, and dissemination of the research output

The podcast production process was a collaborative effort. We reviewed transcripts of the interviews and began to edit them into episodes, assisted by a graduate student who was a public radio science reporter intern and who had worked with Indigenous communities and natural resources. We were able to honor the individual stories of the participants in their near-original form by editing lightly for ease of listening. We did not qualitatively analyze or interpret the stories, in line with Storywork (Archibald, 2008). The objective was to provide a platform for Karuk people to share their perspectives on fire with their community, not to extract information from these stories for an academic publication. Both draft and final versions of each episode underwent a review process; episodes were not made public until final approval by the RC and Karuk DNR leadership.

Our objectives again were to practice reciprocity and provide benefits to the community (e.g. Lomawaima, 2000). The co-developed podcast project was designed to provide stories about cultural burning relevant to local audiences, but also accessible to outsiders including scientists, natural resource managers, and the general public. The Karuk DNR is a co-author of the podcast and retains the right to the raw data and creative control over the products. Karuk DNR will distribute the podcast and make it available to the local community.

Discussion on outcomes and outputs of the collaboration: The flames and smoke

This collaborative research project between the SW CASC fellows and the Karuk DNR was successful in building partnerships and capacities and in achieving project outcomes. The results of this collaboration went beyond our initial expectations, as we produced the podcast series and learned valuable lessons about research partnerships between academic institutions and Tribal Nations that support Indigenous research sovereignty. The partners gained new skills and strengthened their capacities in many areas, including the navigation of research protocols, project planning and implementation, and podcast production. As described in Figure 1, these outputs and outcomes are imagined as flames and good smoke that emerge from the campfire, supported by research foundations, and constructed from our research process. In this section, we discuss some of the critical outputs and outcomes of this research collaboration, including lessons learned.

The Intentional Fire podcast

One output from this collaborative research project was the four-episode *Intentional Fire* podcast (Karuk Tribe and SW CASC, 2022). *Intentional Fire* is a platform to share stories from Karuk people

about their relationship with fire and the importance of sovereignty over fire practices. The episodes discuss many fire-related topics, such as Tribal sovereignty, colonization, forest and fire management, changes in the land over time, traditional and medicinal plants, and experiences with cultural and prescribed burning. The episodes also include additional knowledge from the cultural liaison, whose unique life experiences allow her to bridge many perspectives presented in the podcast.

Collaborations and learning experiences

The collaborative approach is the cornerstone of our research because collaboration ensured we upheld the research sovereignty of the Karuk People. We attribute the success of this collaboration to the foundations used to implement this research. These foundations allowed us to practice principles of Pikyav, collective consent, Indigenous research sovereignty, Indigenous data sovereignty, representation, self-determination, reciprocity, and deference. It allowed us to practice Storywork and community building, while growing relationships with our partners and with fire, as a relative. Key to the success of this project was the definition of common goals and months of communication before data collection began. Frequent, early, and open conversation-built relationships and a partnership where all parties felt comfortable with the collaboration and could share benefits equitably (e.g. Lomawaima, 2000).

We defined a transparent process to produce our results, including frequent virtual meetings (e.g. Austin, 2004). We held these meetings once a week, and discussed a variety of topics, including progress toward project goals against our timeline, each member's progress report, challenges that came our way, and strategies to overcome them. These meetings helped us keep track of work and ensure that all were aware of the expected outcomes. Team members understood that building a partnership would require time and dedication to addressing challenges that were complicated by the COVID-19 pandemic. The partners committed to investing the time, effort, reflexivity, and good faith required to undertake this collaboration.

Ongoing collaboration

Collaborators expressed interest in working together beyond the project that had resulted in the initial *Intentional Fire* podcast, including writing this article. Ongoing researcher-practitioner collaborations, such as the institutional relationship between SW CASC and Karuk DNR and the production of this article, can bridge the gap between academia and Indigenous communities in an ethical manner. Such collaborations can lead to strengthened skills and research protocols that ensure that all voices are heard, and Tribal sovereignty is understood in the academy. In addition to continuing collaboration, the lessons learned from this shared research project will inform future collaborations that partners may pursue with others.

A further outcome is that the Karuk DNR is interested in producing a second season of the *Intentional Fire* podcast. We expect that the podcast episodes will fulfill their objective of disseminating cultural knowledge to younger generations, policymakers, and the broader public.

Working through challenges

Tribal-academic collaborations can address pressing environmental, social, political, and economic issues while upholding sovereignty of the Tribal Nation. It is important to convey the challenges of such partnerships to assure collaborators that persistence can resolve necessary challenges. We share several challenges we faced and worked through that may affect other research projects attuned to sovereignty of Tribal Nations:

1. **Integration of different protocols:** The Karuk Tribe's research protocol, Practicing Pikyav, always prevails over the UA's IRB, because the Karuk Tribe retains sovereignty over research activities in its ancestral territory and over Karuk knowledge and data. This is something that the UA's policies and training reinforce. However, the UA IRB initially requested that the Karuk Tribe sign an Institutional Collaboration Agreement (ICA). This document is typically required when staff from other institutions will be part of a research team without an additional IRB from that institution. However, in this case, we had already submitted documentation of approval by the KRAB, the Karuk Tribe's research oversight body. Karuk DNR viewed the request to sign an ICA as a request to cede its oversight of sovereign research activities to UA, an unacceptable action. After the partners discussed this request, the UA-based researchers contacted the IRB to discuss the nature of Tribal research sovereignty and the Karuk Tribe's research oversight body. Ultimately, the UA IRB did not require the ICA because it understood that the Karuk Tribe, as a sovereign nation, has its own IRB-equivalent, and tribal staff are under the jurisdiction of the Karuk Tribe. The strong relationships that we had built were critical to navigating this difficult situation, in which we learned that additional documentation or requirements can be negotiable and may not be required, so long as there is no risk to the research participants. Our project was the first collaboration between the Karuk Tribe and UA, so we were all learning about existing protocols and procedures. We learned how important it is to fully explain and understand all protocols to avoid unnecessary conflicts. The protection of the participants and the sovereignty of the Tribal Nation over the research are the most important elements in any collaboration.
2. **Collaborative teams take time:** A successful collaboration requires trust, which takes time to develop, particularly between an academic institution and a Tribal Nation. This would have been much more difficult for the SW CASC fellows without having a pre-existing contact and involving a Karuk person in every stage of the process. As outsiders, SW CASC fellows listened carefully to the Karuk DNR to understand what research would interest them (e.g. Lomawaima, 2000). A successful collaboration requires common goals, which take time to develop. We found that readiness to invest time was even more important in the context of the pandemic, which made face-to-face meetings impossible at the beginning of our research project. We learned that frequent meetings, excellent and clear communication, and good planning—all of which take substantial investments of time—help at the formative stage of a collaboration (Cvitanovic et al., 2019). We also learned to clarify and build a shared language to ensure that everyone was on the same page.
3. **Different agendas and unexpected events:** Collaborators have plans and demands outside of the shared research project, and unexpected events occur. At times, such factors challenged our ability to move the project forward. For example, we were producing podcasts in the middle of the fire season in California, so had to redistribute responsibilities within the team to complete the podcasts in a timely fashion. Flexibility, communication, and trust within the group were essential to overcoming such challenges.
4. **Artificial Timelines:** This research was part of a 1-year fellowship. We had delays, and we worked beyond 1 year. Still, thanks to the flexibility and commitment of Karuk DNR, the fellows were able to present preliminary podcast episodes at the close of the fellowship. In addition, several fellows remained involved in finalizing the podcast beyond the one-year fellowship program. This is one concrete example of how we practiced reciprocity and community building. We helped each other meet our different goals through good planning, teamwork, and communication. Because we focused on building toward long-lasting relationships with each other instead of insisting on a specific timeline, we will complete the project in its entirety when all partners are ready to do so.

Conclusion

This article describes the background, foundation, and process that formed a collaboration between the Karuk DNR and the SW CASC fellows, with special attention to supporting Indigenous research sovereignty by implementing *Practicing Pikyav*. The metaphor of a campfire (Figure 1) symbolizes each of the aspects of the project described in this article. We present the background (setting), the foundation of our collaboration (fire ring), the process that we constructed upon this foundation (logs), the podcast and capacity building that were outputs from the collaborative research process (flames), and the longer-term outcomes that emerged from this process and product, such as relationships and amplified knowledge (the smoke). This metaphor conveys community building with project partners and with fire as a relative.

Research on Indigenous knowledge requires the participation of Indigenous people throughout the process; in our case, the participation of Karuk DNR and the cultural liaison was essential. The Karuk Tribe shared its epistemology of cultural burning and its experience of the impacts of fire suppression policies on livelihoods. We developed an ethical framework for this specific collaboration. Then, we intentionally constructed a research process that reflected lessons from Indigenous Storywork, institutional research protocols, and principles of ethical and collaborative research. The output of this collaboration was the *Intentional Fire* podcast, which amplifies the voices of the Karuk people. The testimonies and stories, or Storywork, of Karuk people document their knowledge and understanding of fire suppression and fire exclusion. *Intentional Fire* podcast listeners learn directly from Karuk people about their Karuk-specific relationship to fire. In addition, during this process, the partners built skills in podcast production and received several training sessions, which may support the Karuk DNR in the production of future podcast episodes.

Each collaboration has its own context, protocols, and challenges. Nevertheless, we hope that sharing our research, the principles that guided the process, and the ways we navigated challenges will assist others to pursue ethical and meaningful research that supports Indigenous research sovereignty and uses Storywork and/or the stories of Indigenous people. We hope to contribute to knowledge about Indigenous research sovereignty by providing an example of how collaborative processes between universities and Tribal Nations can amplify knowledge production by Indigenous people in their own words. We also hope that our process contributes to reducing the gap between American academic researchers and Indigenous communities. Our research outlines how researchers can perceive stories as data with a theoretical foundation of Indigenous Storywork. The stories, the Indigenous Storywork, are necessary data to integrate Indigenous knowledge in climate adaptation planning. We anticipate that Storywork, as captured by podcasting, amplifies Indigenous peoples' voices to inform decision-making processes. Our research demonstrates how Indigenous people's knowledge and epistemology contribute to creating a sustainable and resilient future for everyone. Indigenous knowledge must be included to develop policy, planning, and management that affecting Indigenous homelands. Successful partnerships can form when researchers participate in and prioritize Indigenous knowledge production alongside of Western science.

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Note

1. F.W. Harley (Jan 30, 1918) Letter to Forest Supervisor Rider. Klamath National Forest, Orleans, CA.

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The Piikani Well-being Project: Indigenous-led metrics and mapping to improve human and agricultural system health within the Amskapi Piikani Blackfeet Nation

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Abstract

As the first stewards and scientists, Indigenous Peoples have collected data on land relationships across homelands since time immemorial. Settler-colonial experiences have associated data and maps as tools of dispossession, disparity, and disempowerment. Today, however, Indigenous-led statistics and mapping efforts yield powerful tools for Nations in addressing the interconnected wellness of Indigenous biosystems, lands, and people while honoring collectively held knowledge and community protocols. This article details both quantitative and qualitative Indigenous research, with geospatial methodologies of the Amskapi Piikani

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(Blackfeet Nation), in the creation of the Amskapi Piikani Nation's first well-being index. The Piikani Well-being Index (PWI), generated by this project, is grounded in cultural values and informed by traditional and current knowledge(s) defining 80 variables. The PWI encompasses areas of human health, agriculture and food sovereignty, cultural systems, social and educational lifeways, environmental stewardship, institutions and governance, economics, and land tenure to include traditional land use and Native land revitalization after centuries of systematic oppression, assimilation policies, structural inequities, and trauma. This project navigates data sovereignty challenges while mobilizing data generated by the Nation's first Indigenous land use census. Offering new insights for our Tribal leaders and organizations at nation, local, and watershed scales, the PWI represents an Indigenous system view to better build community research agendas and action. This article discusses the challenges incurred in data collection and use while identifying areas of future work determining metrics and tools to cover the environmental, social, economic, and health research needs of Indigenous communities through data sovereignty.

Keywords

Indigenous mapping, Indigenous well-being, Indigenous statistics, data sovereignty, Indigenous community planning, Indigenous governance

Introduction

The Piikani Well-being project is a community-based research project of the Piikani Lodge Health Institute, an Indigenous-led non-profit organization located within and serving the Blackfeet Nation with a focus on holistic development. The Piikani Well-being Index (PWI) is informed by traditional and current knowledge(s) and encompasses areas of human health, agriculture and food sovereignty, cultural systems, social and educational lifeways, environmental stewardship, institutions and governance, economics, and land tenure. This project navigates data sovereignty challenges while mobilizing data generated by the Nation's first locally led land use census. Offering new insights and maps for our Tribal leaders and organizations at Nation, local and watershed scales, the PWI represents an Indigenous system view to better build community research agendas and action.

This research project is rooted in and intended to serve the community in which the knowledge originates and is guided by seven core cultural values active in Amskapi Piikani community development, educational, and governance systems:

Tsi-ksi-ka-ta-pi-wa-tsin (Blackfeet Way of Knowing): Blackfeet culture/spirituality in philosophy, thought and action.

Nin-na-wa-tsin (Being a Leader): professionalism, integrity, and responsibility in human interaction

Ini-yimm (Respect): respect for oneself, all other people, all ideas and each thing in the natural world

Ni-ta-pi-pa-ta-pi-tsin (Living in a Good Way): honest in all thoughts and actions.

Ii-yi-kah-kii-ma-tsin (Trying Hard): commitment, dedication, sincerity in the pursuit of all our goals.

Aoh-kan-otah-tomo (Accepting Everyone): embracing the unique talents and contributions of each individual.

Ii-ta-mii-pa-ta-pi-yoip (Happy Living): humor, laughter and enjoyment of life.

This article details quantitative and qualitative Indigenous-led research, including geospatial methodologies of the Amskapi Piikani (Blackfeet Nation), in the creation of the Amskapi Piikani Nation's



Figure 1. Placenames of Amskapi Piikani and near homelands, 2021.

first well-being index. The context of the Blackfoot Nation is followed by a review of the academic literature on Indigenous well-being and research methodologies. An overview of the PWI describes its development in the context of a larger research project on Blackfoot food sovereignty, demonstrating the holistic nature of our work. A detailed description of the PWI methodology follows along with the results of the engagement and a discussion of their implications. Finally, we draw conclusions, insights, and next steps for future research.

The Blackfoot Nation

From time immemorial, Niitsitapi People of the Blackfoot Confederacy have governed and stewarded the health and well-being of the land and the people across vast homelands. These homelands stretch southward to what is now Yellowstone National Park, west to the continental divide, north to the North Saskatchewan River, and east to the East Saskatchewan and Missouri Rivers. Sharing a common language and traditional governance, the four Nations of the Siksikaitsitapi—the *Amskapi Piikani*, the *Kainai*, the *Piikani*, and the *Siksika*—make up a transboundary Indigenous confederacy. The Amskapi Piikani (Blackfoot Nation) is the southernmost Nation of this confederacy located south of the medicine line (US–Canada border). The current boundaries of the Blackfoot Nation encompass 1.5 million acres with 90% of the population living rurally across 5 watersheds and 11 major communities (Blackfoot Nation Agricultural Resource Management Planning Team, 2022; Luna and Bahls, 2017). Ecosystems range from alpine and subalpine in the Miistakis (Backbone of the World) and Ninaistako (Chief Mountain) at 9085 feet (2769 m) in the west, and roll through mixed forests, fen wetlands, prairie pothole lakes, temperate grasslands, and the lowlands along the Cut Bank Creek at 3400 ft (1000 m) in the east (see Figure 1) (Blackfoot Nation, 2018a, 2018b; Blackfoot Nation Agricultural Resource Management Planning Team, 2022; Luna and Bahls, 2017; State of Montana, 2021; US Department of Agriculture (USDA) National Agricultural Statistics Service (NASS), 2017). With its topographical and ecological diversity, this region represents more than 50% of the remaining

biodiversity and intact large landscapes in the region and state but only a remnant of the traditional homelands of the Amskapi Piikani (Luna and Bahls, 2017; Tatsey and BirdRattler, 2019).

The exterior boundaries of the current Blackfeet Reservation emerged from the 1855 Blackfeet (also known as *Lame Bull*) Treaty and, with these boundaries, new hardships to be borne by a Nation now limited in movement and food sources. In the intervening decades, the governance, environmental monitoring, and health systems of the Amskapi Piikani have undergone many changes, often to the detriment of the Blackfeet People. Beginning with the debt system imposed by Indian Agents, loss of land and community through Allotment, and the establishment of government-run health and educational systems, the collective form of observation that informed Blackfeet ways of being and well-being was severely constrained or else used to the advantage of the US federal government in the control of Native people.

With the passage of the Indian Self-Determination and Education Assistance Act in 1975, a new era in federal policy began to create a space for Tribal self-determination and the ability of Tribal Nations to run their own systems again. The reclamation of health delivery systems, access to culturally relevant care, and data and monitoring systems to inform decisions have been a living project to this day. Today, the Blackfeet Nation has one Indian Health Service (IHS) hospital located in the main population center and one rural clinic for outlying communities. The Tribal government operates its own health department, a Tribal Health Improvement Program, a diabetes clinic, two SAMHSA programs, in school health staff, and a suite of other programs aimed at improving the health of Native and local families (Blackfeet Tribal Health Department, 2017). While Western-style medical care exists in a limited fashion, many people access health on the land, with family and ceremony rather than through Western medical institutions where painful memories and abuses persist, and barriers to timely and culturally relevant care remain (Conaty, 2015; US Government Accountability Office, 1976).

Literature review

Defining and measuring Indigenous well-being

The concept of human “well-being” encompasses many fields of applied research and remains locally interpreted and subjective. As early as 1948, well-being was defined by the Constitution of the World Health Organization (WHO) as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.” It refers to a “positive rather than neutral state, framing health as a positive aspiration” (WHO, 1948). Globally, the well-being of Indigenous Peoples is reaffirmed in the United Nations Declaration of the Rights of Indigenous Peoples which honors rights that are “indispensable for their existence, well-being and integral development as peoples.” These are enshrined in Article 43 where Indigenous rights “constitute the minimum standards for the survival, dignity and well-being of the Indigenous peoples of the world” (Gómez Isa, 2019; United Nations Declaration on the Rights of Indigenous Peoples, 2007). Definitions and applications of the concept continue to develop, recognizing an increasingly complex and nuanced understanding (e.g. see Fudge et al., 2021; Sointu, 2012; Yaden-Antuñano, 2020).

To date, studies of the well-being of Indigenous peoples—globally, regionally and locally—illustrate substantial disparities often between members of the settler colonial state and the first people(s) of the region (Donatuto et al., 2016; Washington, 2016). Well-being in Indigenous communities is challenged in part by colonial histories. These histories have resulted in local conditions of very high social vulnerability and result in chronic illness, trauma, persistent poverty, inadequate housing, economic underdevelopment, and low levels of land tenure (Birkmann, 2006; Cardona et al., 2012; Cutter et al., 2003; Lee, 2014). Indigenous well-being studies and metrics must grapple with these historical and modern settler-colonial systems and their resulting trauma but also turn toward culturally relevant

approaches to individual and collective understandings of well-being (Beck, 2016; Rountree, 2016; Smith, 2013).

It is critical that measures of Indigenous well-being move beyond disparity study into appreciative inquiry, positive psychology, a focus on strengths, and the objectives of Indigenous families, citizens, and Nations (Kading et al., 2019). These measures, however forward facing, must also engage with the historical experiences and living legacies of settler colonialism, impacts of federal Indian law, policy, and the federal-Indian trust on land, land tenure, and economic development as well as access to quality education and healthcare (Brewer et al., 2016; Shoemaker, 2016). Indigenous well-being indicators represent complex relationships with place and the land and must rely on metrics that are both quantitative and qualitative. Indices are more relevant for use in local health improvement efforts when they focus on local values and honor traditional ways of governance along with cultural and socio-ecological relationships. Those that do so tend to produce high human development and health outcomes (Kant et al., 2014; Sterling et al., 2017).

Indigenous-led research and data sovereignty

Researchers are exploring the subjective and statistical well-being of First Nations, American Indian, and other Indigenous communities around the world through the development of well-being indexes. However, a vast majority of these efforts have been led by non-native researchers and external governmental and nongovernmental organizations that tend not to privilege locally specific or culturally relevant metrics, Indigenous research methodologies, local processes or protocols for research, or the community-based defining, determining, and resourcing of well-being indicators (Kant et al., 2014; Smith et al., 2014). A small but growing area of study by some Nations is the discussion of locally relevant metrics of well-being affording insights, analyses, and improved strategy and prioritization (Donatuto et al., 2016; Taylor and Kukutai, 2016; Walter and Andersen, 2013). This article adds to that body of work.

The creation of locally relevant metrics includes critical discussion around Indigenous data sovereignty and the strengthening of Indigenous research agendas. Equally important is increasing support for tribal institutional and cultural review boards (IRBs and CRBs) to protect collectively held knowledge, reduce harm, and end extractive methodologies of research that too often have come to define relationships between tribal communities and researchers (Around Him et al., 2019; Carroll et al., 2019; Hull and Wilson, 2017; Kelley et al., 2013).

In the discussion of historic misuse and harm created by data, concerns around both the protection and the use of data emerge, and discussions must deal with the sensitivity, intellectual property, personal safety, tribal sovereignty, and international rights of Indigenous peoples (Axelsson et al., 2016; Carroll et al., 2019; Kukutai, n.d.). Data-oriented and quantitative indicator research focusing on Indigenous well-being presents threats as well as opportunities for Tribal Nations. It is critical that Tribal Nations maintain Ownership, Control, Access and Possession (OCAP) of collectively held knowledge in order to mobilize new understandings to address pressing public policy and health issues (Armatas et al., 2016; Donatuto et al., 2020; First Nations Information Governance Centre, 2014; Sasakamoose et al., 2017).

Blackfeet understanding of well-being

Indigenous leadership has navigated challenges to community well-being by drawing on traditional and deliberative governance, mobilization of knowledge, and observation to inform decision-making (Bastien, 2004; Hungrywolf, 2006; Spoonhunter, 2014). One of the core concepts of Blackfeet's well-being involves community relations. In 1938, Abraham Maslow, one of the founders of humanistic psychology, visited the Blackfoot people in the Siksika Nation, participating in life and ceremony

during the summer months. When the book, “A Theory of Human Motivation” emerged in 1947 a “Hierarchy of Needs,” represented as a triangle, with “physiological needs” at the bottom, then moving upwardly to “Safety,” “Love and belonging,” “Esteem,” and finally “Self-actualization” at the top. We now understand these as fundamental concepts of Blackfoot people meeting their needs in the community, concepts that were liberally borrowed from the Niitsitapi but altered to refine mainstream and individualistic motivational theory (Feigenbaum and Smith, 2019).

Upon deeper study, we see this triangle of human development as reminiscent of a Blackfoot lodge, with the mushrooms and wetland plants rising along the bottom, to the celestial beings and world depicted at the lodge’s apex (Blackstock, 2011; Heavy Head, 2007). For the Niitsitapi, rather than a solo endeavor of pursuit of self-actualization there are active relations among all beings, protocols, and responsibilities that ensure members of a community elevate beyond basic needs to become cornerstone members of a band and a Nation toward cultural perpetuity, helping not just meet their own needs but those of others, as well, to achieve collective well-being—the continuation of a lifeway and a Nation. A Niitsitapi revision of Maslow’s Hierarchy of Needs is a reminder of how the Blackfoot lifeway situates Indigenous well-being, with the needs of the individual contextualized within the inherent responsibilities of and accountability to collective well-being. The core practices of Indigenous health, well-being, and perpetuation of a lifeway and culture across the Blackfoot Confederacy are, thus, understood as self-actualization’ *through* collective well-being. In this sense, Indigenous well-being indexes represent living relationships, community-based observation, and consciousness around health, a locally-informed way to maintain long-standing relationships while mobilizing tools such as data science and GIS mapping to monitor the health of the people and the land while informing action.

Currently, there is a gap in Indigenous well-being index development stemming from the lack of statistical methodological study and application led by Indigenous communities and Indigenous researchers. This offers an opportunity to identify pathways and methodologies and share experiences. Tribal Nations, Indigenous researchers, and community organizers can collaborate to define indexes that reflect the values, objectives, and governance of their respective Nations while modeling best practices (Kant et al., 2014; Washington, 2016). Indigenous methodologies can weave culturally grounded measures of well-being into locally relevant applications of statistical approaches. Locally informed indexes provide the power to influence governance and social services that are bound by the federal-Indian trust relationship (in the U.S. lower 48) and reserved rights to ensure Indigenous health and well-being (Murat and Gürsakal, 2015; Walter and Andersen, 2013).

The PWI project

The PWI is an opportunity to define what health means to Amskapi Piikani (Blackfeet People) people at the local level, to count what matters most to Amskapi Piikani, and use those measures to plan comprehensively about the health of Amskapi Piikani and the land from Blackfeet perspectives. The index approach, covering all systems, is a holistic approach to understanding a *Niitsitapi* way of well-being. The PWI encompasses areas of human health, agriculture and food sovereignty, cultural systems, social and educational lifeways, environmental stewardship, institutions and governance, economics, and land tenure. Eventually, the PWI will provide a “dashboard” to help community members, decision makers, and leaders understand three main things:

1. Where are we now? The current state of holistic health and well-being by watershed.
2. Where do we want to go? Illuminating strengths, weaknesses, and where concerted action is needed to improve the health of the people and land.
3. Have we arrived? Tracking changes in specific areas to build a stronger Blackfeet Nation (healthy families, food sovereignty, a strong local economy with decent jobs, a stewarded environment, language and cultural revitalization, etc.).

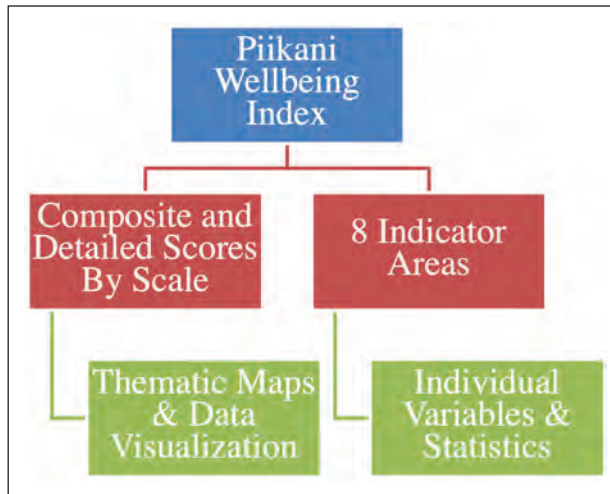


Figure 2. Piikani Well-being Index (PWI) in relation to data scales and decision support.

The PWI can be used in specific ways by users:

1. By Tribal decision makers, departments, and planners to better understand where they can allocate resources and infrastructure and create plans, initiatives, and interventions to ensure that the needs of Blackfeet people, non-human relations, water, and the land are met across watersheds.
2. By local Indigenous non-profit organizations to monitor the impacts of their environmental, social, and educational work and ease in their reporting and substantiating need.
3. By Blackfeet families to understand how the Blackfeet Nation is doing as a whole and within their own watersheds.
4. By individual allottees and other Tribal members to inform watershed groups, land and range management, human health, and other citizen-led planning efforts. Widespread community-based awareness of the health of our watersheds and land management also ensures transparency and accountability, securing good governance in the modern Tribal context.

The index is made up of indicator areas with individual aspects of Piikani health captured as variables. Figure 2 is a visual of how the data scales from low levels of detail (blue) to areas of analyses (red) to high levels of detail (green).

Individual variables help create a rough model of the state of Piikani well-being. From these indicators composite indexes are created by system. The overall composite of indicator areas and variable data insights comprise the PWI.

PWI methodology

Engaging the community

The “Ohkomi”(To Use One’s Voice) Survey, an agricultural resource based survey conducted by the Blackfeet Tribe in 2018, provided foundational dialogue and community action as well as core new baseline data to begin to create insights and composite scores across the Nation’s local areas and at the Nation level covering ongoing issues and vital themes of health, land and natural resources, culture and language, economic, agriculture, and institutional areas. Informed by these Ohkomi

Survey results, early phases of the Piikani Well-being Index began with a group of 20 knowledge holders from across a broad spectrum of backgrounds. This advisory group comprised Blackfeet planning practitioners, community organizers, thought leaders, traditional knowledge holders, and decision makers who would help define fundamentals and core measures of the PWI.

These advisors came from local non-profit, educational institutions including K–12 schools and the community college, Tribal programs and leadership, small businesses, ranches and farms as well as different communities within the Nation. They filled three roundtables and participated in a total of six sessions, each 2 hours long for a grand total of 12 hours of facilitated, intentional discussion. Another 20 hours of community engagement occurred in 2020 and 2021 at local events like Iinnii Days and Piikani Lodge Health Institute’s “culture camps” (partly supported by the same multi-year grant). Piikani Lodge Health Institute (PLHI) technicians were present for all roundtable sessions and events. Roundtable sessions were recorded via Zoom to ensure community transparency and accuracy in selecting the suite of indicators, and notes were made available to all participants.

Community concept mapping and index roundtables

Beginning in Winter and Spring 2021, PLHI, in step with the Blackfeet Nation Agriculture Resource Management and Food Sovereignty Plans and local partners, hosted three digital roundtable sessions. These roundtable sessions offered opportunities to connect with a core group of 20 advisors to understand what they most wanted to learn. The sessions covered the following:

- Roundtable 1: Introduction to the PWI, examples of mapping indicators and a draft selection of indicators for Blackfeet to identify what we’d like to learn, count, and what may be missing.
- Roundtable 2: Present integrated feedback, discuss revised suite of PWI indicators, and a sample map. Present Piikani WISE dashboard project with a demo of similar projects such as Hydrologic. Review indicators and index results and early maps by watershed. Discuss how we would like to use the index moving forward across our health, environmental, agriculture and food sovereignty, social, cultural, and educational efforts.
- Roundtable 3: Integrate all feedback, present final suite of indicators, and sample map. Work toward beta version of PWI maps and Piikani WISE dashboard. Discuss how the group would like to stay engaged moving forward.

Statistical method

A complete GIS inventory has been gathered and attribute tables of existing USDA NASS, US Census, County Health, and the Ohkomi Land Survey have been prepared. During Year 2 of the project, a suite of 80 variables was developed with focus group sessions (roundtables) with agricultural producers, health, cultural and community knowledge holders. This enabled community-based identification of the factors that influence human development more than others across watersheds at the Blackfeet Nation. From this, composite scores for the well-being of agriculture and human health systems at the Nation level were calculated using the following workflow.

Statistical / SPSS workflow. There are two steps to calculating the PWI:

1. Forming indices for each of the four metrics: Values of each of the four metrics are first normalized to an index value of 0 to 1. To do this, “goalposts” of the maximum and minimum limits on each metrics are set to establish aspirations of an agricultural system and human health that has high development outcomes. With the actual value for the Nation at a given year, the dimension (indices) value for each metric is calculated as a geometric median in

relation to a scale of 0 to 1. The dimension index is therefore 1 when Blackfeet Nation achieves the maximum value, and it is 0 for when the Nation is at the minimum value (United et al., 2016).

2. Aggregating the four metrics to produce the PWI: Once each of the individual indices have been calculated, they are aggregated to calculate the PWI. The PWI at a Nation scale is calculated as the geometric mean (equally weighted) of life expectancy, number of beginning Native agricultural producers, average age of Native agricultural producers, and per capita annual income of producers, as follows:

$$PWI = (I\ Health \times I\ Agriculture \times I\ Income)^{1/3}$$

The agriculture dimension is the arithmetic mean of the two age indices (number of beginning Native agricultural producers and average age of Native agricultural producers).

To ensure rigorous and robust geospatial statistics at smaller scales, the project sought to engage multivariate statistical analysis to dive deeper into the longitudinal data around the indicator areas of Human Health, Agriculture Production & Food Sovereignty, Cultural, Environmental & Non-human Relations, Land Tenure, and Institutional Capacity. In doing so, it became clear how individual factors—the 80 variables identified by community members—may influence overall human development by watershed at the Blackfeet Nation (Arteaga and Glewwe, 2019).

This methodology examines the correlation between individual variables as it pertains to an overall composite score or “index” of Piikani Human Development. Factor analysis methods examine the strength of the relationship between each individual variable and the underlying indicator areas or “capitals” through the estimation of a factor loading, or how much that variable influences human development, calculated using Pearson’s Coefficient and expressed through eigenvalues (Secolsky and Brian, 2017; C. C. Taylor, 1977). Studying the relationship between individual variables and how they impact overall scores helps us understand what correlates with human development at the Blackfeet Nation. The results can be visually communicated back to Blackfeet Nation technicians, producers, and decision makers using two- and three-dimensional data visualization and a complete set of maps projecting composite index results by watershed.

Data storage and protocol

All data collection and storage is guided by a Data Sharing Agreement with Blackfeet Nation IRB and Tribal Council (PLHI, 2021). The Agreement is based on increasingly widely accepted data sovereignty standards guided by international Indigenous intellectual property rights reflected in the OCAP™ Principles of Ownership, Control, Access, and Possession. These principles refer to the collective relationship of First Nations to their cultural knowledge, data, and information. That is, the community or group owns, controls, accesses, and possesses information collectively with the same rights as when an individual owns his or her personal information. To ensure data safety, PLHI uses REDcap (Research Electronic Data Capture) for sensitive geospatial information. This is a secure web application for building and managing online surveys, servers, and databases. Protocols for data collection, storage, and access are assigned according to the local Blackfeet protocol.

Results

From 2019 to 2021, community dialogues and discussions with advisors were synthesized in a singular large suite of indicators now known as the PWI. These indicators were organized via concept mapping sessions, or roundtables, and led to observations across eight Amskapi Piikani systems. Once consensus was reached, the chosen indicator areas were given names in the Blackfeet language. To observe

Sokinaápi /Saam				
Our Health				
Individual Variable	Rationale	Blackfeet Nation	Regional Tribal Median	Influential Factor On Long Healthy Life (significance level greater than 0.05)
Total diabetes prevalence rate of adults age 20+	Morbidity reduction is a core health objective towards tribal health outcomes, diabetes is consistently in the top cause of death on the Blackfeet Reservation the past decade (Blackfeet Nation, 2017).	17.67	8.8	YES
Cancer rate per 100,000 people	Morbidity reduction is a core health objective towards tribal health outcomes, cancer and heart disease is consistently in the top two causes of death on the Blackfeet Reservation for the past decade (Blackfeet Nation, 2017).	483.2	451	
% of Population with Broadband Internet Access	Increasing local area access to Internet affords access to telemedicine for mental health, educational opportunities and access to regional and global markets for informal and formal services and sales.	63%	75%	
% Housing on Reservation Trust Land 40 years or older (1999 or earlier)	Elder housing often poses risks to occupant health, risks and higher heating costs.	55%	48%	YES
Median age of death	Blackfeet live on average 20 years less than their non-native counterparts, shortening their ability participate in society, culture and be economically productive. Further, a lower median age of death indicates poor living conditions, environmental risks and traumas and the prevalence of chronic illness.	63.7	59	
% Suicidal Ideation in Our Youth 8th Grade Students	Measure of trauma and repetition in youth aged 13-24, 50% of youth exhibit ACEs scores greater than 2, 25% higher than 4, 6% of adults who participated in the survey had attempted suicide in the past year. According to the 2016 Preventive Needs Assessment, 33% of Browning Middle School students attempted suicide in the previous year along with 8% of Browning High School students (BP PNA 2016).	42%	20%	
Mean Household Food Security Raw Score	Score of access and availability of food	2.52	4.06	YES

Sources: Institute for Health Metrics and Evaluation (IHME), 2018 NIH U.S. Cancer Statistics Working Group U.S. Cancer Statistics Data Visualization Tool, based on 2020 submission data (1999-2018); U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute: www.seer.cancer.gov/statistics; released in June 2021. National Neighborhood Data Archive (NNDAA): Broadband Internet Access by ZIP Code, Publication Area, United States, 2014-2018. US CDC: Kansas Bureau (www.cdc.gov); 2018: ACS 5 Year Estimates: "MTD/FHHS Minnesota Preventive Needs Assessment (PNA) and Youth Risk Behavior Survey (YRBS) 2016" Blackfeet Native Community Food Security and Food Sovereignty Assessment.

Figure 4. Observed health indicators and correlation scores.

and monitor aspects of well-being in a detailed way within each area, advisors discussed and developed line-item variables, metrics specific to the qualities of the indicator area. These were variables observed in daily life in the community, historical experience and stories, and previous policy analyses as strongly correlated with the outcomes of the indicator area or system (e.g. mental health or rangeland condition). The development of these variables captures the spectrum of values-informed statistics including natural, constructed, and proxy attributes of how a multitude of factors are related to human well-being outcomes.

Indicator areas represent high-level focus areas, and variables represent very detailed, tactical, and source-able line-item observations closely related to indicator areas. Throughout the roundtable sessions, the team discussed why emerging variables resonated with them and how these variables are grounded in their work, personal experiences, and Traditional Ecological Knowledge in land-based systems. These insights are noted in the rationale column in Figure 3. While eight areas emerged based on discussions and concept mapping, *Sokinaapi* or *Saam* (human health) and *Awahsin* (food system production and sovereignty) remained central considerations. Additional connections and interdependencies are inherent across indicator areas, but these two are closely related and inseparable from the health of the people and the land. Furthermore, they are advisor-defined metrics that are useful both at the very local level of, for instance, neighborhood or village, and also at intermediate and national levels.

While the creation of a live test suite of indicators offered a structured approach to the observation of well-being at the Nation level and a common “umbrella” to gather data and collaborate, the team determined that it was not enough to simply have indicators and variables. To gain new insights from the PWI, technicians began creating thematic maps based on statistical findings in relation to landmarks and natural resources deemed important to advisors and elders as inherently interrelated with well-being.

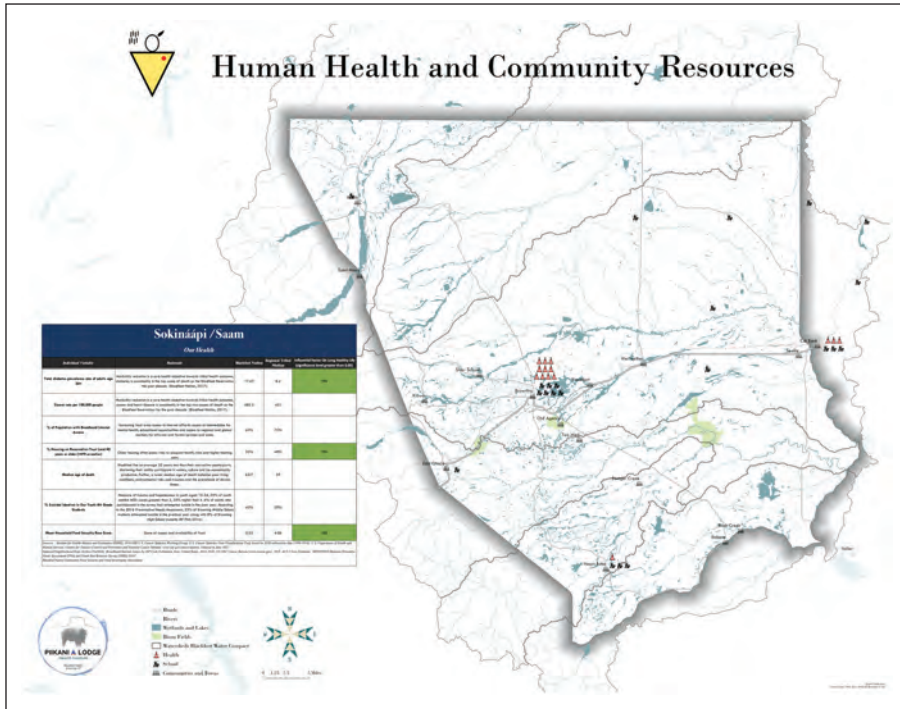


Figure 5. Human health and community resources map with statistics.

First, technicians and advisors scanned the first iteration of the PWI to ascertain what data was already available and then settled on a final suite of variables that could be sourced for data available at the same scale. In the case of health and food system indicators, variables would need to be scaled to the Nation level to be comparable to the available data. For purposes of descriptive statistics, a regional and tribal median was populated using publicly available information for the Rocky Mountain Region, and then a PCA factor analysis statistics package was run on available data in SPSS to understand which factors may correlate most strongly with overall composite scores. Variables with a high influential factor on an overall indicator area composite score, for example, health and a long healthy life with a level of significance greater than .05 were then noted in the right column. With this test suite of sourced variables and statistics, the team aimed to generate new insights on how the Tribe is doing and locate opportunities to focus resources.

Figure 4 shows the sourced seven health variables in the *Sokinaapi/Saam* (health) indicator area, descriptive statistics, regional Tribal median for reference, and then marked factors that were observed as influential on overall composite scores. It is important to note the small size of the data set used. The level of confidence will improve as additional datasets for the same variables are collected at local scales across the communities within the Nation and other Tribal Nations in the region to allow for a more robust data set and stronger study of correlating factors of variables to overall composite health indicators scores.

One area of focus was the creation of thematic maps for community planning and tribal decision-making in relation to place and cultural relationships on the land. Figure 5 illustrates the connection between human health resources defined traditionally, and land resources as well as modern schools and health clinics operated by the tribe and under treaty responsibility with the federal government. Given the strong connection between human health and water, water rights as allocated by watershed are also included as a polygon to show a relationship between a community's water rights and

<h2 style="text-align: center;">Awahsin</h2> <p style="text-align: center;">Where our food comes from, our food sovereignty</p>				
Individual Variable	Rationale	Blackfeet Nation	Regional Tribal Median	Influential Factor On Food Security (significance level greater than 0.05)
Average market value of agricultural products sold per farm / \$ Agriculture net per capita income	Increasing net agriculture production and rising incomes is an objective of the Blackfeet Nation (Blackfeet Nation ARMP, 2018).	\$ 60,526.00	\$ 54,989.00	
# of Native operations producing value-added products	Value added products increase the incomes of local agricultural producers and have higher multiplier principles in local agriculture economics. "Multiplier principles of LEI (Field to Market, 2012, Environmental and Socioeconomic Indicators for Measuring Outcomes of On-Farm Agricultural Production in the United States)".	9.0%	2.0%	YES
# of Native agriculture operators	Native agricultural operators earn higher year round incomes than other sectors (US Census and USDA NASS, 2012).	70#	21#	
Average age of agriculture producers	Higher average ages of US agricultural operators is a threat to the future of US production, up 1.2 years since 2007, and continuing a 30-year trend of steady increase. (USDA NASS, 2012).	52.6	58.3	
% population facing food insecurity in last 12 months	Food insecurity is an observed stressor to health and well-being as well as childhood development & educational outcomes (FAST, 2017).	56%	15%	YES
% of community members using federal food programs (FDPN)	The FDPN food package FY1-2010 score for Blackfeet Nation was notably higher than other federal food assistance and nutrition programs. Study findings highlight opportunities for the FDPN to modify its offerings to best support lifestyles towards prevention of diet-related chronic disease (Shanks et al, 2016).	2%	1%	
# of beginning agricultural operators/producers	A measure of intergenerational ranching and incoming Native agricultural operators, in 2012, the number of beginning farmers & ranchers – on their current operation less than 10 years – was down 20 percent from 2007 (USDA NASS, 2012).	145	10	
% of people using the land for traditional subsistence purposes who answered the O'kon Survey	Maintaining and expanding traditional land use and subsistence harvest improves Anakapi Pikani food sovereignty and foodways.	70%	81%	YES
Farms operated by an American Indian Reporting Internet Access	Increasing local area access to internet efforts access to telemedicine for mental health, educational opportunities and access to regional and global markets for internet and formal services and sales.	47%	83%	

Sources: USDA NASS 2017, USACS - Housing/Dakota Survey, 2018, Dutton ET, USDA NASS 2017 (Producers) Dakota Survey, 2016 (Waters), FAST Blackfeet PSA, 2017, Blackfeet Nation CH, 2018, USDA Food Atlas By County (Clatsop)

Figure 6. Observed food system indicators and correlation scores.

health infrastructure. At the guidance of advisors, International and National Park boundaries were intentionally removed to represent sociocultural and economic connectivity ensured in the Jay Treaty and International Indigenous rights to the Blackfoot Confederacy. Further bold gray lines note the six major water catchments to their heights of land, water rights secured by the Blackfeet Water Compact.

This same process of vetting and ground truthing datasets before conducting statistical analysis followed for *Awahsin* (the Blackfeet Nation’s food systems), offering observed conditions, regional tribal median, and the results of factor analysis statistics with variables observed to be influential to overall food sovereignty. These calculations from *Sokinaapi/Saam* and *Awahsin* would also later enable composite Piikani Human Development scores to offer high-level snapshots of human well-being at the Tribal Nation level. Figure 6 displays final approved variables, measures, rationale observations, comparisons, and factors found to be significant upon statistical analysis for the Nation’s food systems.

While these statistics drawn from available data offered a benchmark for where the Nation’s food sovereignty efforts stand, advisors noted the importance of showing the interdependencies of natural capital—the land, irrigation, and water rights—in relation to the Nation’s ability to feed itself and maintain a sustainable and culturally consonant agricultural system. The Nation’s current 1.5 million acres stretches from subalpine forests in the west to mixed forests, wetlands, and more temperate grasslands in the east, a vertical relief of 5000 feet over a mere 50 miles. The Nation’s geography and

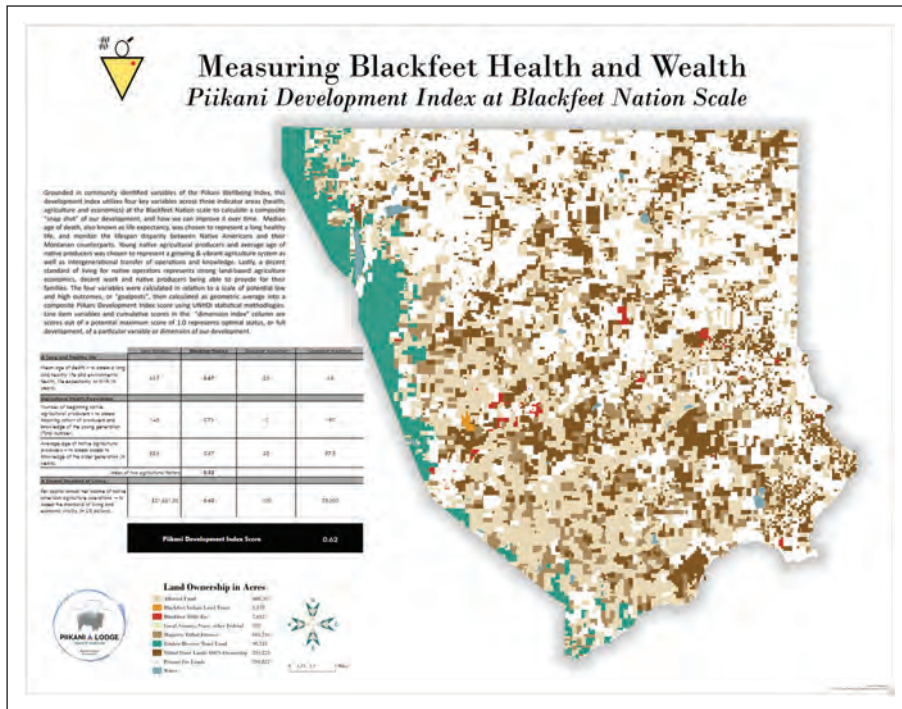


Figure 8. The Piikani Wellbeing Index (PWI)—Nation level score and land tenure.

level, the overall human development outcome represented in a composite development score, grounded in the PWI. This was only calculable at the national scale with available data, while up-to-date land tenure data were available down to the tract level. The intention for this map is to offer high-level insights on how people are doing, grounded in health, agriculture, and standard of living, and to explore how land tenure issues may be addressed by supporting allottees with decision-making tools, and targeted policies and programs to improve well-being conditions at a subnational level, namely by watershed or zip code. Figure 8 illustrates this grouping of statistics and composite score with land tenure by type across the Blackfeet Nation.

The PWI—Nation Level Score utilizes four key metrics at the Nation scale. (1) Health: With the variable of mean age of death (to assess a long and healthy life and environmental health); (2) Agriculture: With the number of beginning Native agricultural producers (to assess the incoming cohort of producers and knowledge of the younger generation) as well as the average age of Native agricultural producers (to assess access knowledge of the older generation), and; (3) Standard of Living: With the per capita annual income of agriculture producers (to assess the standard of living and economic vitality). Each of these three aspects of the composite score illustrates where the Nation is on a spectrum from low to high development in relation to possible outcomes, where 1.0 represents optimal status. Overall, the Blackfeet Nation has a nationwide well-being score of 0.62, a moderate score representing areas of strength and opportunities to improve Indigenous well-being. The mean age of death remains at 0.67 related to the development spectrum with the average Piikani living 63.7 years, 20 years younger than non-native cohorts in the State of Montana, and with a higher prevalence of disease and environmental health challenges (Blackfeet Tribal Health Department, 2017). Agricultural systems represent a true strength at the Blackfeet Nation where a relatively high number of beginning producers (145 in the last USDA NASS Census) are entering agriculture, and a younger median producer age (52.6 years old) leading to a 0.82 development score, the highest of any category

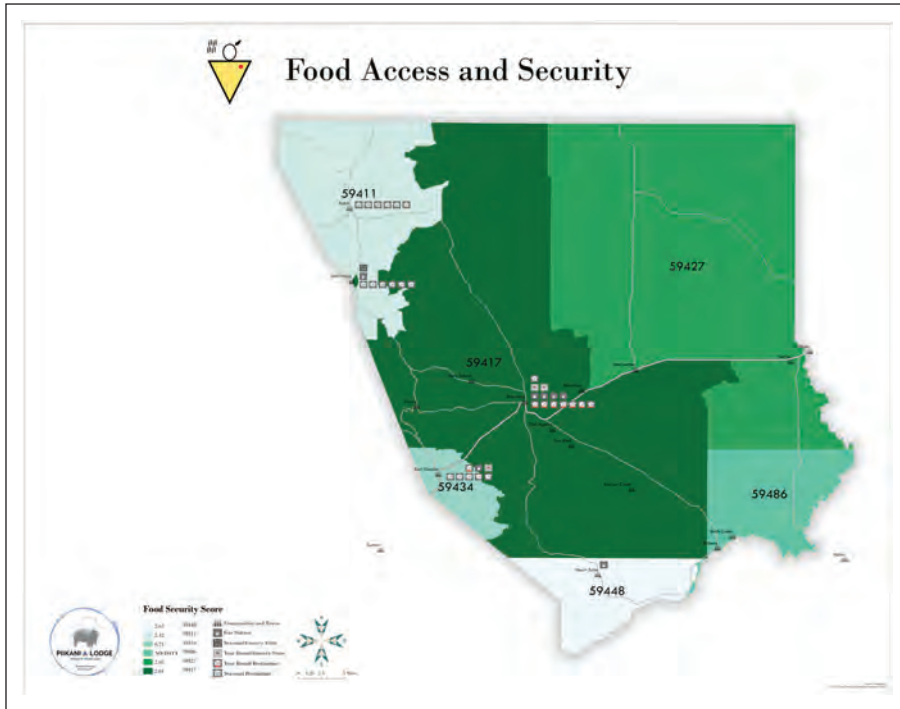


Figure 9. Food security by zip code.

observed at the Nation. Finally, a decent standard of living, represented by per capita net income of Native American agricultural producers, offers the highest area for improvement with a mere \$31,881 USD in net profit annually and a 0.42 development score in relation to potential outcomes. This need for economic and livelihood improvement through strategic local economic development is an active area for community organizing and is reflected in the Blackfoot Nation's Agriculture Resource Management Plan as well as other efforts to improve the production of value-added products (such as the proposed development of a multi-species processing plant).

In addition thematic maps, grounded in available data at a more local scale, were considered valuable by local Indigenous project advisors. These maps draw from ongoing data sovereignty efforts which address data gaps at the Nation specifically around food access and connection to the land, both of which have been identified by the community and advisors as vital aspects influencing Piikani well-being. Figure 9 builds upon a household survey completed as part of a Community Food Security Assessment completed in 2018. Households responded to questions regarding the availability of food and food stress across communities, the data being collected by zip code, and offering an actionable scale to address food access and security factors and variables influencing Piikani well-being.

Food insecurity within the Nation remains moderately high with all raw scores across communities in the 2.0–3.0 range. Lighter tones in the map represent higher food security scores. Community food infrastructure, any location where food can be purchased or received free of cost, is noted on the map. The most rural and difficult to reach communities within the Blackfoot Nation—particularly in the northwest and south—exhibit the highest levels of food insecurity.

However, remote communities within the Nation are also those that are closest to the land as revealed by the prevalence of traditional land use practices. The well-being project team noted this role and the importance of traditional land use and subsistence hunting as both a practical solution to food insecurity but also a vital family and individual activity leading to connectedness to the land and

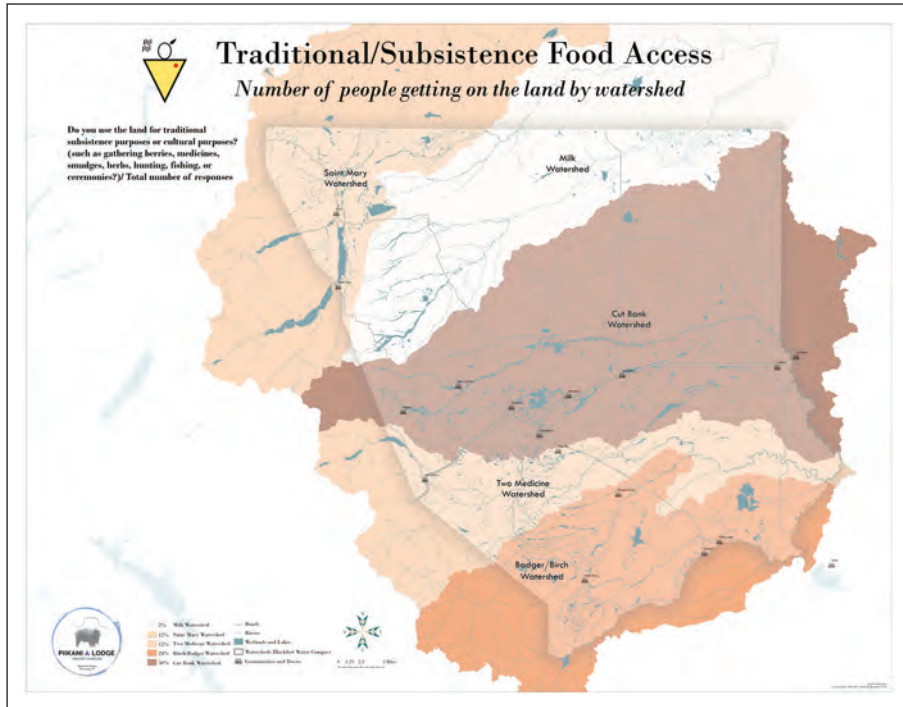


Figure 10. Traditional use / subsistence harvest by watershed.

culture and supportive of Piikani well-being. Drawing from this observation in community, the PWI, and data available from the Nation's own land use census, the team created a thematic map to explore this connection to the land for traditional and subsistence purposes by region within the Nation (Figure 10). This map offers the number of users by total responses for the watershed, or intensity of use by population, spatially across the Nation in relation to watersheds and natural resources. This map offers insight into what the Food Security map (Figure 9) may not be able to cover: that is, how much people are getting onto the land each year as well as access opportunities or barriers which may contribute to more Piikani getting on the land for cultural and subsistence purposes. In this case, the highest use remains the highest populated watershed; however, the two communities noted as the least food secure have the second and third highest traditional land use days per person per year.

Discussion

Central to any discussion of results from the Piikani Well-being project is the importance of values as the beginning, the destination, and an ongoing guide for research understandings: How they are created, interpreted, used, and how they may be engaged to improve the well-being of Amskapi Piikani people and lands. At the beginning of dialogues and project scoping in 2018, the research team with 20 advisors from across systems within the Blackfoot Nation discussed the need for efforts and research to be collaborative. It was clear that the team would be building on the work of many generations and centering the core values of Amskapi Piikani people and governance throughout. A set of seven community-generated values informed both creation and application of Indigenous Well-being Indicators, composite scores, maps, and other decision support materials. This set of values, reproduced in this article's introduction, is consistently referenced in the Nation's school district, community college, and Tribal Government settings. Piikani core values continue to drive

the application of new insights and research products in pursuit of Indigenous well-being within the Blackfeet Nation.

The Piikani Wellbeing Index offers holistic thinking and a common umbrella under which to organize data and improve collaboration toward common objectives of Indigenous well-being and Blackfeet tribal sovereignty. Granted the losses and continuing impacts of the COVID-19 pandemic on all systems, there are ongoing opportunities to apply parts or all the suite of indicators in the recovery phases of the pandemic to “build back better” with Piikani values and collective understanding of what constitutes Indigenous well-being at the core.

Statistical analysis composite scores and thematic maps help to reveal what was invisible. Being able to understand how a few factors are influencing an overall indicator area, for example, health or the economy, offers new insights that supplement intuitive knowledge as well as the collectively held knowledge of the community. The process of creating the index and maps furthered community dialogue around how well-being is defined locally and personally as well as how health is connected to the land. Preliminary analyses in maps offer new insights on local systems, as data, or composite scores, are projected onto the landscape in a new way and in relation to place and local infrastructure. For example, measures of traditional land user days by watershed and composite human well-being scores in relation to land tenure and infrastructure offer new and strategic insights that can be used by the Blackfeet Nation leaders and community organizers to reduce food insecurity by maintaining policies that improve land access and reduce barriers for allottees. While concerns around human health and poverty predate this project and remain central to discussions of how to improve the lives of Piikani people and families, this project offers new and nuanced observations of variables and specific factors that are contributing to human well-being and the health of food systems. Statistics and thematic maps generated by the Piikani Well-being Project offer “vital signs” of human health and food systems at the Nation scale grounded in recently collected data that can be updated as desired to track progression and change.

The creation of indicators that represent local values, worldview, and objectives is not new in the context of Native American Tribal Nations, First Nations, or Indigenous Peoples globally. However, this project established a baseline at the Blackfeet Nation and spurred community dialogue around what is important to observe and monitor when it comes to the well-being of Piikani people and the land and how common metrics may be used to inform decisions. The creation of the PWI, statistical analysis, and thematic maps brings exciting developments and opportunities for the Nation to continue to reclaim ways of planning and strong governance to achieve higher well-being outcomes, specifically in health and food systems. This process, in addition to preliminary maps and statistics, offers powerful new opportunities to reclaim old ways and improve governance capacity to meet the needs of people, from housing to food to social connection and cultural vitality and perpetuity. The PWI, early analyses, and mapping lay the groundwork for future data collection planning (e.g. what types of data do we collect? and at what common scale?). More advanced statistical analyses will explore correlations as more data becomes available at sub-Blackfeet Nation scale in order to strengthen self-governance, policy, planning, and effective programs.

This project actively addressed data gaps within the Blackfeet Nation, bringing up important conversations around data sovereignty as a protective measure and as an act of objective setting where tribes identify data that are vital to track in order to achieve higher human development and well-being outcomes for the Nation. Further, in the creation of the PWI and early decision support materials, there are opportunities to inform and monitor planning policies, programs, and the allocation of resources. Well-being-based budgeting, a concept now popular among progressive governments globally, is also possible at a scale where resource allocation can be grounded in metrics that local technicians and decision makers can track in policymaking, budgeting, programs, and partnerships.

While this project addressed data gaps in the creation of the index, it also identified other gaps and areas for future research to strengthen local capacity and knowledge around how well-being is influenced and monitored within the Nation. Where data are not available, the project team flagged variables that should be included in future surveys. Community advisors identified several indicators that are desired but are either not yet being monitored, or data about which are only available at too coarse of a scale to be useful (e.g. at county scale rather than Tribal Nation, or at Nation scale rather than at community level). What follows is a list of recommendations for future common survey work and research within the Blackfeet Nation to address these data gaps. Identifying a common scale of data and analysis was discussed and is strongly recommended for future research. Nineteen outstanding variables that community advisors would like to track and calculate are noted in Table 1; each is designed to elicit quantitative responses but can include open-ended follow-up questions to capture qualitative feedback, such as assessing the relative cultural significance of different types of land use or time spent on the land. These will be communicated back to advisors and to the Blackfeet Nation Institutional Review Board to support ongoing Tribal research agenda-setting and data sovereignty efforts.

Conclusion

Definitions of well-being which emerged in this project are inclusive and interrelated. Indicator areas often crossed over and are interreferential, for example the access to Internet providing access to not only economic markets but also mental care for Native American ranchers.

Common denominators in data scale are vital in creating actionable well-being indicators that can be statistically significant and cover all landscapes. Currently, data are collected ad hoc at varying scales which make integration and analyses for most data possible only at the Nation scale (rather than at more local scales, such as watersheds or tracts).

Data are difficult to access and mobilize (Figure 11). They are scattered across Western-style departments and, in raw form, are practically inaccessible to Tribal decision makers. Furthermore, because electronic data systems are not standardized across systems, it is nearly impossible for subject matter experts from different domains (e.g. health or emergency response) to analyze or be aware of interdependencies between their domain and others (e.g. environmental, schools, or agriculture). Siloed information systems are a well-recognized problem within settler nations and are known to adversely impact decision-making culture as they favor hierarchical over lateral communication.

Information and data relevant to Amskapi Piikani decisions may be missing or is generated from outside the Nation. Too often, outsider-defined indicators and variables only capture what is wrong or include indicators that do not capture human health at all (such as Regional Domestic Product) rather than what Piikani define as *living well*. Further, outside data are intermittent, have limited response rates, are of uneven quality, and remain at the Nation scale, a scale too big for more tactical budgeting and decision support. For example, human health data come from US Census and is only updated every 5 years; agricultural and economic health data come from USDA NASS and are updated every 3 years. This information gathered by non-native agencies is simply inadequate for addressing real time COVID-19 response, tackling root issues like food insecurity and unemployment, or securing human well-being.

While data does originate from within the Nation and takes account of what is important locally (e.g. land use census and local Native health organizations delivering supplies and providing elder wellness checks for rural residents weekly), it is often self-directed without integration between datasets and scales. Further, epidemic data and live collection of conditions (local observation made by residents, rural drivers, and residents) which help fill gaps are not incorporated into one information system. This inhibits the Amskapi Piikani from respectfully taking the vital signs of the

Table 1. Outstanding data gaps in Pliikani well-being variable measures.

Individual variable	Rationale	Potential source	Scale of data desired
Quality of Life Index	A composite index of policies and programs, health factors and health outcomes including length and quality of life is efficient evaluative measure (Blackfeet Tribal Health Department, 2017)	US County Health Rankings (Glacier)	Local Community
Micrograms per deciliter (µg/dl) blood cortisol level	Blood cortisol levels reflect heightened environmental stressors and living conditions experienced by Blackfeet People (John-Henderson et al., 2019)	Blackfeet Community College Researchers	Small sample size, not representative of Nation, yet.
% Agreement with, "My community believes I am important" -or- "The energy that I put into my community will make a difference", "I believe I have a lot to give my community"	Community Cohesion and Social capital is core to human system resilience and non-physiological health (Mohatt et al., 2011)	Future Community Health Assessment / Future Ohkomi Survey	Local Community
0 (worst) to 10 (best) Food Environment Index	Geospatial index of access captures food deserts and regional food access quality (County Health Rankings & Roadmaps, 2023)	USDA Food Atlas by County (Glacier)	Local Community
% Of traditional food of total meals served in schools and local food system. # Pounds of grass-fed buffalo/grass-fed beef served on reservation	Closing the gap in (Binimelis et al., 2014)	Future Community Health Assessment / Future Ohkomi Survey	Local Community
# Acres protected for traditional food resources	Prioritizing extent and protection of traditional food systems and harvesting areas.	Future Community Health Assessment / Future Ohkomi Survey	Watershed
Returns Over Variable Costs (Gross Margin)	Financial equity in operations can improve access to finance and annual net profit for Native Agricultural Producers reflecting costs of renting grazing, production, logistics costs & proximity to market.	USDA NASS Core Socioeconomic Statistics	Census District
# Cases of disease in animal populations (i.e., chronic wasting in deer)	Wildlife disease compromises food sovereignty. Monitoring disease is also vital to managing zootomic spillover.	Blackfeet Fish and Wildlife	Wildlife Unit / Blackfeet Nation Scale/ Local Community
Grazing infrastructure inventory / Miles of fence line	Fence line inventory offers greater access for agricultural production and range supported by traditional & regenerative grazing infrastructure.	Blackfeet Bureau of Indian Affairs	Grazing Unit / Blackfeet Nation Scale
# Of Beef / Buffalo Processed locally at processing plant	Ability to create a local value-added agricultural product and generate adequate food to address insecurity in local food system	Blackfeet Agricultural Resource Management Plan / Conservation District & Processing Plant	Blackfeet Nation Scale/Local Community

(Continued)

Table 1. (Continued)

Individual variable	Rationale	Potential source	Scale of data desired
# Of days using the land traditionally in the past 12 months within Blackfeet Homelands (Glacier National Park, Badger Two Medicine, Siksikaitstapi Territories now known as federal and public land)	Connection with homelands land and exercising treaty rights is a vital activity in the perpetuity of culture and secure legal rights.	Future Ohkomi Survey, Blackfoot Confederacy Data, PLHI Camps, Programs & Native Science Field Center Participant Logs	Siksikaitstapi Homelands Scale
% Agreement with the statement, "I Treat the Land Like a Family Member"	Land stewardship and access to traditional land use has been connected to psychosocial and non-physiological well-being, internal kinship with the land supports biocultural stewardship (Mohatt et al., 2011)	Future Community Health Assessment / Ohkomi Survey	Local Community
% Agreement with the statement, "Our Blackfeet traditions of being on the land in times of loss, stress or sadness give me connection and strength".	Measure of cultural resilience and healing of historical trauma	Future Community Health Assessment / Ohkomi Survey	Local Community
# Of days spent at ceremony in the last year	Measure of cultural vitality, resilience, and healing of historical trauma	Future Community Health Assessment / Ohkomi Survey	Local Community
% Agreement with the statement, "I would like to see more of building each other up as Blackfeet People, rather than tearing each other down or being jealous."	Community Cohesion and Social capital is core to human system resilience and non-physiological health (Mohatt et al., 2011)	Future Community Health Assessment / Ohkomi Survey	Local Community
% Agreement with the statement, "My family has my back and I have theirs."	Community Cohesion and Social capital is core to human system resilience and non-physiological health (Mohatt et al., 2011)	Future Community Health Assessment / Ohkomi Survey	Local Community
% Agreement with the statement, "I feel that I have resources, time, experience to share with my fellow Blackfeet people."	Community Cohesion and Social capital is core to human system resilience and non-physiological health (Mohatt et al., 2011)	Future Community Health Assessment / Ohkomi Survey	Local Community
% Agreement with the statement, "Blackfeet values teach me to be humble, respect the land and the animals we harvest, we give before we take."	Reciprocity & regenerative practice to beings is an inherent Siksikaitstapi value. (Bastien, 2004.)	Future Ohkomi Survey	Local Community
Ratio of Short-Term Rentals to Non-Rental	An economic opportunity as well as a vital statistic to monitor in a seasonal tourism economy as a gateway community to Glacier National Park, as well as a driver of housing stress / inequity.	Tribal Housing and Revenue Department	Local Community

WHO: World Health Organization; USDA: US Department of Agriculture; NASS: National Agricultural Statistics Service; PLHI: Pliikani Lodge Health Institute.

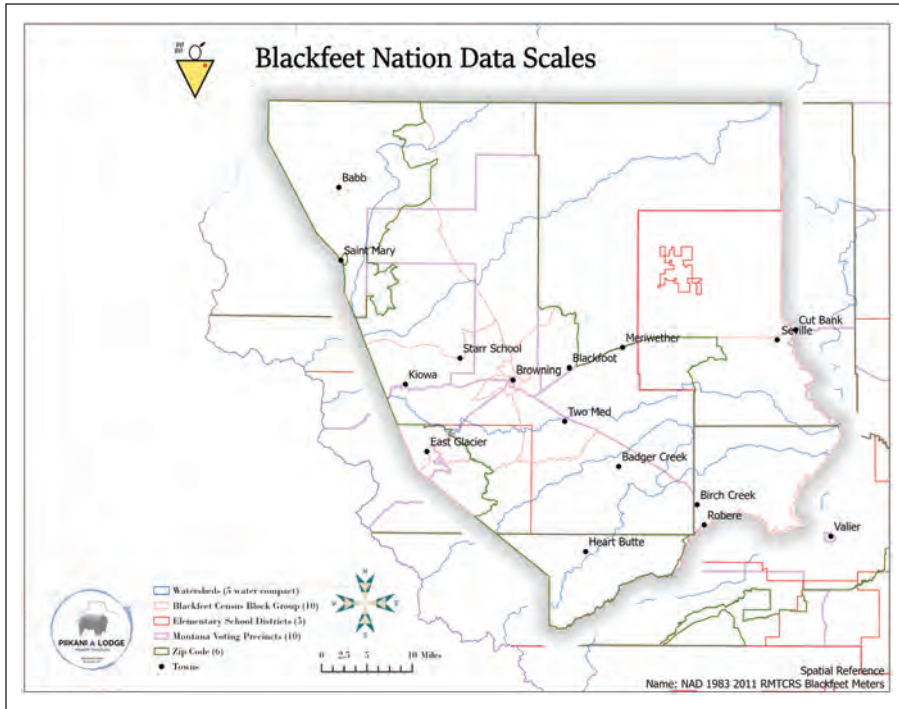


Figure 11. Data is a mixed bag, blind spots remain.

well-being of Piikani people and analyzing it to manage or improve well-being, especially during times of crisis.

Made exponentially worse during the COVID-19 pandemic, Indigenous Nations like Amskapi Piikani govern with limited staff and professional capacity for research and development. This shortage of human and information capital limits the Blackfoot Nation in harnessing its own ability to unlock “big data” and complete powerful analyses that would empower leaders and decision-makers with insights into the health of systems and well-being of people during and after a pandemic. Without the resources and human capacity to evolve decision support systems, the Nation may miss opportunities to blend new tools and “big data” with effective systems of governance and ways of knowing that are thousands of years in the making, thus undermining the exercise of Tribal Sovereignty.

With the foregoing realities, challenges and opportunities in mind, the Piikani Well-being Project offers a roadmap for future survey, data collection, monitoring, updating, and—most importantly—community engagement. Tribally sanctioned and community-led survey development and data collection needs should begin with the formation of a common denominator, zip code, or watershed. By integrating geographically specific attributes into the system, these efforts will then lead to the creation of a live data dashboard to aid and empower Tribal and community decision makers. Monitoring and updating of the PWI with integrated community-led health, agriculture, and land use surveys offers opportunity for longitudinal study and strategic planning that reflect a distinctively Piikani sense of human health and well-being.

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Amplifying the influence of Māori knowledge in environmental management

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Abstract

Modern mapping systems can provide almost everything there is to know about the environment, except what Māori know. So our interests are not that apparent in a mainstream context despite it being widely acknowledged that Māori have a unique and intergenerational relationship with the land- and waterscapes, and the presence of legislative requirements to reflect Māori political agenda in resource management decision-making. He Tātai Whenua is a project that seeks to assemble Māori knowledge and place it alongside existing environmental databases to render this knowledge highly visible and ensure a greater impact on Aotearoa New Zealand rights and environmental regimes. The challenge is constructing a process that maintains the integrity of Māori knowledge as it crosses into domains that are beyond the direct control of Māori communities as kaitiaki, guardians of that knowledge. In this article, He Tātai Whenua is the focal point of discussions around the importance of indigenous leadership, data sovereignty and a social justice agenda to maintain the integrity of Māori knowledge and navigate knowledge boundaries in the research activity. Two approaches are introduced. The first reflects on exchanges between knowledge systems to identify pathways that protect the integrity of Māori knowledge. The second considers how Māori environmental knowledge can be assembled and interact with science in a manner that makes sense from a Māori worldview. Together, these approaches enable us to develop a confidence in collaborative research and increased trust in how research outputs derived from Māori environmental knowledge will be used and applied to realise bicultural spatial governance.

Keywords

Interface, knowledge contests, bicultural spatial governance

He Tātai Whenua is a research project that converts Māori expert knowledge about the landscape into a form that can interact with Geographic Information Systems to improve environmental reporting and monitoring. A key focus of the research is how Māori knowledge and science are brought together so environmental decision-making can 'genuinely value and utilise two of Aotearoa's rich knowledge systems' (Kukutai et al., 2021: 5). In this article, the phrase Māori knowledge-science interface is used

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to refer to the space where these knowledge encounters occur. This article seeks to understand the nature and potential of encounters at the interface to recognise and amplify the influence of Māori knowledge in environmental management and realise more equitable futures for Māori through an accelerated shift towards bicultural spatial governance.

He Tatai Whenua brought together a team of indigenous¹ community leaders, indigenous researchers, indigenous specialist environmental scientists and social scientists, computer scientists, geospatial scientists, and mathematicians to synthesise a landscape classification system that can explore the Māori world through a geometric and geospatial lens. Our team engaged in wānanga or knowledge exchanges to co-create the Māori landscape classification system. For example, our first set of wānanga were simply knowledge sharing exercises with opportunities to explore how team expertise and technology could be used to articulate Māori understandings of the environment (Proctor and Harmsworth, 2021). There were wānanga to understand how mapping technology and non-Māori understandings of the environment have silenced Māori voices and removed tangible markers of our authority, histories, and relationships. There were wānanga that explored the contemporary relevance of Māori forms of mapping such as whakapapa (Forster, 2019a, 2019b). There were wānanga at significant sites for hapū such as old pā sites (fortified villages), marae (tribal centre), streams, and rivers. Team members walked the land and shared place-based knowledge such as local tribal histories and tribal knowledge of local ecology and biodiversity while other members considered how to capture this information with Geographic Information Systems and other geospatial technology. Wānanga typically involved a lot of talking and reimagining how to visualise and map cultural information alongside environmental data.

This collaborative and place-based approach recognised the strategic importance of Māori leadership and Māori knowledge for environmental management. The goal is to generate new methodologies and new tools to disrupt the dominance of scientific information and eliminate forms of environmental decision-making that provide limited recognition of indigenous knowledge, ways of knowing and associated practices. The status quo lends itself to conceptualising the environment as a commodity that can be owned, exploited and indigenous connections extinguished. Such an approach is considered today to be unjust, discriminatory and unsustainable, requiring a reimagining of environment management to realise a more productive, sustainable and inclusive economy (Ministry of Business Innovation Employment (MBIE), 2019).

This article charts our journey towards these goals with a specific focus on amplifying the influence of Māori knowledge and Māori political agenda in modern mapping systems and environmental management. It brings together our conceptual thinking and reflects on how these have been translated to He Tatai Whenua research outcomes. Key questions include: How can an increased visibility of Māori landscape knowledge be achieved in modern mapping systems? How can Māori perspectives be brought alongside landscape classification systems? How can the integrity of Māori knowledge be maintained? How can knowledge contests be mitigated?

Three analytics are woven together to explore these questions. Analytics in this context could be replaced with terms like theory or methodology and simply provides a schema to guide the research enterprise particularly data analysis. The three analytics are whakapapa, governmentality, and assemblage. The whakapapa analytic explores the Māori knowledge-science interface from a Māori perspective as a domain of encounters. The governmentality analytic considers power issues at this interface due to colonisation and the privileging of scientific knowledge. The assemblage analytic considers how to reconstruct the interface as a more equitable and inclusive space.

The analytics have been constructed from an analysis of genealogical sequences, creation narratives (Best, 1924; Mikaere, 2003; Royal, 2003; Smith, 1913–1915), Aotearoa environmental histories (Ali Memon, 1993; Forster, 2014, 2016; Pawson and Brooking, 2011, 2013; Petrie, 2006; Young, 2004), environmental policies (Waitangi Tribunal, 2011; Williams, 2001a, 2001b) and position documents from Māori academics outlining Māori experiences in and aspirations for the New Zealand

research and development sector (Kukutai and Taylor, 2016; Kukutai et al., 2021; Rauika Māngai, 2020; Stats, 2020; Te Mana Raraunga, 2018; The Pūtaiora Writing Group, 2010). Each analytic has its own set of optics for considering how power and influence flows through systems of thought and actions. This information has been mapped and interrogated at wānanga with Māori knowledge systems specialists associated with He Tātai Whenua to test credibility and validity of findings.

The analytics are used here to render the interface knowable; to create a genealogy that defines the nature of and conditions at the interface (i.e. where multiple knowledge systems meet) and reimagine knowledge encounters to enhance and secure the visibility and influence of Māori knowledge. Construction of these analytics is the focus of this article. The analytics applicability is demonstrated through examples of activities at the interface in the Tātai Whenua project. It is argued that culturally appropriate practices are dependent on visualising the interface as an ātea to maintain the distinctiveness of each knowledge system and mediate knowledge encounters towards meaningful, mutually beneficial, and enduring outcomes. The intent is to facilitate engagement in effective collaborative adaptive management and urge a shift towards bicultural spatial governance.

Visualising the interface

This article begins by introducing an approach for visualising the interface or the space where knowledge systems meet. Three analytics are constructed that explore the influence of Māori knowledge on environmental management. This section introduces each analytic – the whakapapa, governmentality, and assemblage analytic – providing information on provenance and intent. An argument for the suitability of this approach is also expressed.

Briefly, whakapapa is a Māori theoretical construct for organising and understanding the world through genealogies; everything has a whakapapa. It is most commonly understood as a system for mapping kinship relationships (i.e. through my parents I am related to my grandparents to my great grandparents and so on) thereby establishing origin, identity and belonging. Whakapapa is a critical source of Māori knowledge. There are whakapapa that reveal links to atua (gods, spiritual forces), that visualise the origin of the world, natural resources and phenomena (i.e. the water cycle) (see, for example, Best, 1924; Royal, 2003; Smith, 1913–1915). The explanatory power of whakapapa has been used to understand new phenomena such as Te Tiriti o Waitangi (Sadler, 2007), Te Tiriti partnerships (Royal, 1998), dispossession through colonialism (Sadler, 2007), indigenous environmental governance (Forster, 2019a, 2019b) and predicting the future (Royal, 1998).

Whakapapa therefore provides an explanation of order and relationships (Royal, 1998). This knowledge base inspires Māori-centred aspirations, agenda, and appropriate actions. In this article, a whakapapa analytic provides a foundation for the research enterprise ensuring that understandings derived from a Māori worldview and Māori political agenda (i.e. indigenous data sovereignty) underpins interpretation and data analysis; whakapapa is a central focus of the inquiry.

Governmentality is a Foucauldian-inspired analytic of power that makes explicit the thoughts involved in the way we govern and are governed (Dean, 1999). Governmentality studies consider whether it is possible to think and act in a different way by mapping systems of thought that underpin activities or operations of government,² that influence ‘economic activity, social life and individual conduct’ (Rose and Miller, 1992: 173). It is however much more than a mapping exercise. Governmentality studies explore ‘how those who seek to govern imagine their world and seek to fashion it anew’ (Rose et al., 2006: 100) or put another way these studies consider how the art of government can be disrupted and transformed towards specific political agenda. Dean (1996: 211) refers to this as the ‘moral regulation of individuals’ and taking responsibility for shaping the actions of others towards certain ends. In this context, governmentality is ‘problem-centred and present-orientated’ (Dean, 1999: 3) so lends itself well to research that seeks to disrupt and transform the status quo.

Assemblage extends on this governmentality tradition. It draws on actor–network theory, systems thinking and the work of Deleuze and Guattari (1987) to understand how the social is constituted through networks (Anderson and MacFarlane, 2011). Like governmentality, assemblage too provides an analytic of power by understanding the ‘emergence, multiplicity and indeterminacy’ (Anderson and MacFarlane, 2011: 124) of networks. As a descriptor, assemblage is concerned with how various elements of a system come together to cohere, co-function and disperse. As a concept, assemblage explores the nature of encounters and as an ethos the objective is to facilitate engagement. Assemblage thinking and associated tools are useful for imagining the terrain that Māori landscape knowledge inhabits when brought alongside existing understandings derived from predominantly science and Western-orientated thought. More importantly this approach is useful for imagining how the terrain can be reassembled to ensure just and equitable outcomes for Māori.

The words Western and science are used frequently throughout this article. Western and indigenous are used in an opposing fashion to signal a distinctiveness of origin and a specific legacy. For example, indigenous knowledge in an Aotearoa context refers to knowledge derived from this land known today as mātauranga Māori or Māori knowledge. Western refers to knowledge derived from outside of Aotearoa (from the west – or at least Edward Said (1978) definition of the west) that was linked to European imperialism and colonisation. Western orientations facilitated indigenous ‘absences, silences and invisibilities’ (Smith, 1999: x) by defining indigeneity, controlling our lifestyles, sovereignty and aspirations, and suppressing the development of indigenous knowledge. These imperial legacies of Western knowledge continue to influence knowledge claims of disciplines and research approaches. Science is a very specialised form of Western knowledge that promotes the pre-eminence of observation and experiment for understanding the physical and natural world. Science has been complicit in ignoring and silencing mātauranga Māori (Waitangi Tribunal, 2011) although as our nation becomes more open and responsive towards embodying the spirit of Te Tiriti o Waitangi and indigenous rights today the science sector is being challenged to be more relevant, accessible and inclusive (Kukutai et al., 2021). One response to this dilemma is the inclusion of Māori expertise and Māori knowledge in science advice and decision-making (Kukutai et al., 2021). The intent is to expand indigenous reach and impact by valuing both knowledge systems and facilitate Western and indigenous knowledge conversations rather than contests in the science sector. The science sector is a phrase that refers to Government investment in science and research to generate innovative and transformative changes to New Zealand’s economy, environment, and society.

Rendering Māori knowledge visible

This section introduces some key definitions and information about Māori knowledge, ways of knowing and associated practices. This baseline is needed to understand how the analytics have been generated, interpreted, and leveraged to challenge dominant discourses and practices.

A whakapapa analytic explores genealogical sequences and associated narratives to critique a specific issue. It is used here alongside a governmentality and assemblage critique to render visible the problem of amplifying the influence of Māori knowledge and Māori political agenda on the governing of natural resources in Aotearoa New Zealand (Aotearoa). As an intellectual enterprise, the intent is to map, disrupt and reimagining environmental management to centre the unique and distinct relationships and interests Māori have with land- and waterscapes; in short to facilitate a move towards bicultural spatial governance. Critical to this shift is an exploration of the ways that Māori knowledge and science interact.

A particular focus of the whakapapa critique is the social phenomena of encounters. In relation to Māori knowledge and science, this is revealed through relationships and experiences at the interface. The interface is conceptualised here as a multifaceted space where environmental discourses, institutions, expertise and actors (Li, 2007) co-exist and sometimes interact towards specific ends.

This whakapapa analytic of *encounters at the interface* is used to consider *how* we can think and act in a different way. It assumes that current environmental management systems are ineffective and inequitable as they fail to substantively reflect Māori political agenda and/or engage appropriately with Māori communities and Māori knowledge (see, for example, Dionisio and Macfarlane, 2021; Hardy and Patterson, 2012; Kukutai et al., 2021; Proctor and Harmsworth, 2021). It also assumes that Māori understandings of encounters can disrupt and transform the status quo and better navigate knowledge boundaries and contests at the interface. The rationale for these assumptions will be explored as part of the forthcoming whakapapa, governmentality, and assemblage critiques.

Genealogical sequences and associated narratives are primary data sources of a whakapapa analytic. These sources provide information about the nature of the world (i.e. order) and the importance of relationships. These glimpses of a Māori worldview map cultural identity and belonging and in doing so provide blueprints (i.e. ‘moral regulation’) for descendants to navigate contemporary life. That is, connections to *atua*, ancestors and heritage form the basis of Māori systems of thought and ethical behaviour (Walker, 1978).

A whakapapa analytic therefore has an enormous potential to centre Māori understandings of encounters for shaping praxis at the Māori knowledge-science interface. Māori understandings of what counts as appropriate encounters and interactions at the interface strongly support a collaborative future-focused, outcome-orientation approach. By reimagining engagement at the interface in this manner, the intent is to amplify the influence of Māori knowledge and accelerate a shift towards bicultural spatial governance.

Constructing the analytics

This section introduces and applies the three analytics to the issue at hand – improved engagement at the interface to amplify the influence of Māori knowledge in environmental management. It begins with a whakapapa analytics that explains Māori perspectives of encounters and engagement for guiding interactions at the interface. Next is a governmentality critique that provides a genealogy of exclusion to contextualise the invisibility of Māori knowledge in environmental management and contemplate challenges at the interface. The section ends with an assemblance analytic that reimagines the interface as an *ātea* to facilitate knowledge encounters and engagement.

Whakapapa analytic for rendering the interface knowable

The interface can be conceptualised as a space where Māori knowledge encounters and engages with science. By rendering the interface knowable, it is possible to navigate the diverse array of opportunities and challenges. Sometimes, Māori knowledge and science come together to co-function towards a common end. While these collaborations are few, there are certainly pockets of good practice (see, for example, Clapcott et al., 2018; Hardy and Patterson, 2012; Mercier and Jackson, 2019). Other times, for various reasons, there is little engagement between the knowledge systems, and this disconnect leads to brief unproductive encounters or knowledge contests diminishing potentiality at the interface. For example, at a 2019 Ministry for the Environment workshop introducing the potential of planetary boundaries thinking for facilitating equity and environmental sustainability (Leach et al., 2018) in Aotearoa, Māori participants refused to engage in the conversation as no consideration had been given to Māori environmental goals or Māori expectations of research.

A Māori understanding of the interface is revealed by genealogical sequences that map the emergence of the natural world through a series of relational states and processes that are critical precursors for sustaining life. The abridged genealogical sequence of Te Kore-Te Po-Te Ao Mārama alludes to three key phases where Te Kore and Te Pō are part of the realm of potential being and Te Ao Mārama became the world of sense-perception (Royal, 2003). In the realm of

potential being our universe evolved through a series of states; Māori Marsdan recorded 44 states associated with Te Kore and 28 states of Te Po (Sadler, 2007) before Te Mauri the life principle emerged (Royal, 2003). The next evolution in our universe generated the conditions for the world of sense-perception. Māori Marsdan identified four critical processes in this evolution that he labelled the foundation principle of all things, the realm of energy and processes, the realm of the mind and the space-time continuum.

The order of each phase and associated processes is important – matter preceded energy, energy preceded consciousness and then the space-time continuum emerged. This tells us that space was only able to emerge after the basic building blocks were generated; space is a product of foundational principles (i.e. molecules), energy (which makes up space), and consciousness (tools to perceive space) (Royal, 2003). Eventually, space became divided into well-defined, autonomous but dependent domains regulated by guardians known as poutiriao (i.e. te waonui o Tāne, te ao o Tangaroa, te wai-puna o Parawhenuamea). These regulatory systems established obligations and responsibilities of poutiriao to protect and encourage appropriate actions thereby maintaining the mauri or health and vitality of the domain.

The process that produced space can be visualised through the following genealogical sequence: te hauora-te ātamai-te āhua-wā-ātea, the breath of life-shape-form-time-space (Royal, 2003: 181). There are three critical elements to this sequence. First, health and well-being are a fundamental basis and function of space. Second, temporal and spatial elements are closely linked. Finally, the first encounter at the ātea was that of Ranginui, Skyfather and Papatūānuku, Earth Mother.

Encounters therefore is a prevalent theme in Māori thought initially revealed through the genealogical sequence Te Kore-Te Pō-Te Ao Mārama. This sequence is recalled through the Māori origin narrative about how the world was created. An abridged and simple version refers to an encounter of Ranginui and Papatūānuku. They met and fell in love existing within Te Pō, the darkness. In time, many children were born living in the space between the parents. This was a cramped and confining existence. To reach their full potential, they needed to transform their world and strategised to separate their parents and create Te Ao Mārama, the world of light. It is in this final state of light that nature and then people evolved. This origin narrative tells a story about ‘how darkness became light, nothing became something, earth and sky were separated and nature evolved’ (Royal, 2007). It explains a process of change, transformation, and expansion that is enacted every day when night gives way to daylight and in Māori welcoming rituals (Durie, 2012). This genealogical sequence and associated narratives position encounters as critical for change, transformation and expansion and creating the conditions to flourish and prosper, a cultural imperative that can be applied to the Māori knowledge-science interface. For example, greater recognition of Te Tiriti o Waitangi in science policy-making demands transformation of the sector towards a more relevant, accessible and inclusive entity (Kukutai et al., 2021).

The encounters themselves emphasise immutable and familial connections. Starting with the first family – Ranginui, Papatūānuku, and their children – atua who created natural resources and natural phenomena. Atua are poutiriao or guardians of the various worldly domains such as the forest, the sea, the river or the sky. This introduces the idea of boundaries and distinctiveness as strategies for maintaining autonomy. In relation to the environment, this means protecting those distinctive elements that define a forest from a waterway or the foreshore. In regard to knowledge, this means recognising the distinctiveness of each system as a protective strategy to resist domination by the other. The points where domains connect are the interface where there is potential for collaborative, productive and enduring encounters to emerge. Autonomy is another critical element of encounters that can be used as a protective strategy to resist domination and enable more enduring and productive engagements to emerge.

Immutable and familial connections also give rise to a system of thought that prioritises an obligation to care and nurture. In relation to the environment, this is called kaitiakitanga. In relation to

people, this is known as manaaki and involves elevating the authority and presence of others. Manaaki is associated with acts of love and generosity, promoting relations that are welcoming, protective, and purposeful that prioritise good health and well-being. It is argued here that these are useful values to guide relations at the Māori knowledge-science interface.

Governmentality analytic: A genealogy of exclusion

In Aotearoa, there are several systems for regulating human interactions with the environment. Understanding the relationship between the various systems and how the art of governing the environment has changed both spatially and temporally is critical for considering how power flows through the system and how the system can be fashioned anew (Rose et al., 2006).

The local indigenous system. The local indigenous system is derived from an understanding of the environment as a physical manifestation of Papatūānuku. According to this worldview, atua exist within the natural environment as poutiriao – guardians who were placed in the world and tasked with looking after specific domains or bounded territory. For example, Tane is considered guardian of the forest and has authority over birds and insects that reside in that domain. Tangaroa and Hinemoana are guardians of the sea exercising authority over all life that resides in the sea and all activities that occur in this space such as seafaring navigation, fishing through to the collection of shellfish. There are numerous narratives that explain the activities and interactions of poutiriao providing a blueprint for understanding appropriate actions by setting expectations, standards and behaviours. A key role therefore of poutiriao is to maintain order and balance; their role is protective and regulatory.

This blueprint has guided our ancestors in their interactions with the tribal territory. It permeates all aspects of communal life establishing a set of obligations and responsibilities to protect the life sustaining capacity of the environment to enable communities to flourish. This is achieved by upholding the authority or mana of the atua, the environment and communities.

Actions that acknowledge and enhance mana are highly valued in te ao Māori. This is reflected by the term mana-enhancing practices that promote empowering and constructive interactions (Munford and Sanders, 2011; Ruwhiu, 2008). Mana-enhancing practices have significant implications for operating at the interface by establishing norms of conduct that encourage thinking and acting in ways that generate strong mutually beneficial relations and respect autonomy.

Colonising the landscape. Encounters with those beyond the Pacific at first introduced substantive trade opportunities. The visitors from afar needed food and supplies including access to resources such as timber to repair ships or support whaling or sealing activities (see for example, Jackson, 1975; Owens, 1992; Sorrenson, 1992). Māori actively engaged with visitors to advance their own political and economic goals accessing new knowledge (i.e. literacy) and agricultural technology, and establishing new markets (i.e. flax industry) to enhance the well-being and prosperity of our communities (Jackson, 1975; Orange, 2020; Owens, 1992; Petrie, 2006); relations were largely cordial and mutually beneficial. Contact unfortunately disclosed the enormous potential of Aotearoa for European settlement as indicated in these remarks from English botanist Joseph Banks (1770), ‘the immense quantity of woodland which was yet uncleared but promised great returns to the people who would take the trouble of clearing it . . . the properest place we have yet seen for establishing a colony’.

Eventually, the settlement agenda and reportedly growing tensions between Māori and visitors led to a formalised relationship between Māori and British Crown embodied within Te Tiriti o Waitangi (the Treaty of Waitangi) (Orange, 2020). While this treaty is the subject of much controversy and there is divergence in relation to its meaning and provisions (see, for example, Independent Panel, 2012; Tawhai and Gray-Sharp, 2011), it is generally accepted that it provided for a form of British governance in Aotearoa while also recognising indigenous sovereignty (Orange, 2020). By the 1850s,

a British colony was being established and British colonisation changed the physical, social, economic and intellectual landscape of Aotearoa. Regarding environmental management, colonisation accelerated a substantive shift in land tenure and what counts as appropriate land use (Williams, 1999) pushing aside and invalidating the local and reducing indigenous sovereignty over the landscape.

Our knowledge of Papatūānuku sustained through Māori lifestyles – living and walking the land, growing, harvesting and hunting, and as encapsulated within our oral histories and narratives, artworks and songs – were rendered invisible and reduced to lines on a map. The technology of mapping reimagined the landscape according to British understandings and agenda (i.e. Crown sovereignty and British settlement). Māori placenames, relationships with *atua*, knowledge and tribal boundaries were erased from the public archive (Smith, 1999). Mapmaking facilitated colonialism and Crown sovereignty by ‘establishing various claims to truth and authority’ (Cosgrove, 2008: 9) and determining what is valued and disregarded to enable government through management and control of territory towards certain outcomes – namely British settlement and agricultural development. These priorities were supported by colonial policy that individualised land ownership to facilitate sale of the tribal territory (Williams, 1999) and amalgamation, assimilation and integration policies to disrupt the influence of Maori communities (Williams, 2001a, 2001b); the intent – to eliminate Māori sovereignty and *tikanga* (appropriate custom) as a basis for governance (Williams, 2001a) and facilitate British settlement and agricultural investment and infrastructure (i.e. drainage). Agriculture became the economic backbone of this country and with it the need to create the conditions that secured the health and vitality of introduced species – grass, cows, sheep, crops and so on at the expense of the endemic. Environmental degradation, loss of biodiversity (Pawson and Brooking, 2011, 2013; Young, 2004), indigenous dispossession, intergenerational poverty (Walker, 1978) and more recently climate change were just a few of the unintended consequences of this development pathway.

The agricultural economy was supported by the science sector fixated on profit through extraction and increased productivity of our natural capital (see, for example, Waitangi Tribunal, 2011). Our knowledge of Papatūānuku was reduced further to land classification systems, knowledge of natural processes, geospatial data and taxonomy. These knowledge forms are mostly devoid of or include simplistic appropriated expressions of indigenous knowledge, ways of knowing and associated practices, and advocate a way of thinking that lends itself to conceptualising the environment as a commodity that can be owned, exploited and extinguished. This approach is considered today to be unjust, discriminatory and unsustainable requiring a reimagining of environment management to realise a more productive, sustainable and inclusive economy and what has been visualised as a ‘transition to clean, green and carbon-neutral New Zealand’ (MBIE, 2019: 6).

Māori communities have a long legacy of resisting this colonial agenda and seeking ways to disrupt the status quo although these efforts had little influence until the 1970s (see, for example, Harris, 2004; Taonui, 2012; Walker, 1978). More substantive gains began to emerge as Māori leveraged Te Tiriti o Waitangi and a rights-based agenda to demand social justice and a greater recognition of indigenous sovereignty. Māori were particularly vocal about the poor health and vitality of waterways and coastal areas and demanded a shift from the development pathway to one that reflected the customary practice of *kaitiakitanga* (see, for example, Waitangi Tribunal, 1983, 1984, 1985, 1987).

Regarding environmental policy, a substantive shift can be attributed to the legislative recognition of *kaitiakitanga* initially alluded to in the Town and Planning Act 1977 (Section 3(1)g) and more explicitly in the Resource Management Act 1991. These changes were linked to a restructure of the country’s environmental policy towards greater recognition of sustainable management; a new emergent international trend at the time (McClellan and Smith, 2001). *Kaitiakitanga* in a policy context acknowledges Māori interests in environmental management and obligates state agencies with environmental responsibilities to provide for these interests in resource management processes. For Māori, a key concern is the ability to continue to practice *kaitiakitanga* – to look after and interact with Papatūānuku and natural resources in the local tribal territory according to custom. The presence of

these legislative provisions has increased Māori involvement in both resource management governance (as Iwi/Hapū representatives) and operations (i.e. through Iwi/Hapū Management Plans) raising some visibility of a Māori voice. However, participation in resource management is variable across the country and constrained by issues of power-sharing, resourcing and knowledge contests (see, for example, Parliamentary Commissioner for the Environment, 1998; Te Puni Kōkiri, 2006). Māori frequently report issues engaging with the Crown and government agencies and are critical and disappointed in the lack of timely and adequate environmental outcomes (see, for example, Nuttall and Ritchie, 1995). Māori seek more equitable and effective opportunities and argue that initiating change is reliant on Māori control (Te Puni Kōkiri, 2006), including the power within resource management processes to visualise the environment through a Māori lens and Māori knowledge. The Māori knowledge-science interface therefore becomes a critical site of resistance where knowledge boundaries and contests can be moderated and redirected towards achieving greater outcomes for Māori. Critical to this transformation is decolonising encounters and centering of Māori knowledge and Māori politics in environmental management.

Relating at the interface. The interface is a space where worlds collide, where ideally a common world is formed to tackle joint concerns. Professor Sir Mason Durie (Rauika Māngai, 2020: 23) described the Māori knowledge-science interface as a space with ‘lots of problems, but lots of opportunities’; it is a dynamic and fragile space. In the context of environmental management, encounters at the interface occur between Māori and Māori, Māori and the Crown, Māori and government agencies, Māori and environmental entities, Māori and scientists and, Māori knowledge and science. Navigating the multitude of priorities and interactions is complex.

Many of the problems at the interface stem from knowledge contests. Currently, the interface is an uneven playing field where the rules of engagement have been established and fiercely defended by one side. Scientific knowledge is positioned as valid, authoritative and is therefore highly valued as evident by considerable state support and investment in scientific enterprise (NZ Treasury, 2022 [2021]). In contrast, the value of Māori knowledge has only recently been recognised by the science sector and primarily due to a state directive in the form of the Vision Mātauranga policy (VM). This policy was created to provide strategic direction in research investment. It promotes research that ‘unlock[s] the innovative potential of Māori knowledge, resources and people to assist New Zealanders to create a better future’ (Ministry of Research Science Technology (MoRST), 2007: 2) by contributing to economic growth and sustainable environmental outcomes. The impact of this policy is unclear. It is a challenging policy to enact for several reasons which will now be explored.

To co-function, worlds must be able to cohere. This requires a high degree of relationship building (i.e. respect) and cross-cultural communication. This is a skill set that is not prevalent in scientific training or scientific research practice (see, for example, Hardy and Patterson, 2012). From a Māori perspective, ātea is a critical element for building this capacity and establishing best practice. A genealogical sequence for ātea has been provided earlier. Ātea is often translated as space. It can also mean ‘to clear’ or ‘to free from obstruction’. This alludes to an important function of space. In relation to encounters for example, space is a way to mediate ‘relationships and establish boundaries’ (Durie, 2012: 75). This is commonly seen in pōwhiri or Māori welcoming rituals as the host and visitors are deliberately kept apart until the terms of engagement are disclosed and shared agenda or joint concerns revealed (Durie, 2012). The space between (i.e. the marae ātea) is a place of negotiation mediated by the regulating presence of atua. Three key atua are present at the marae ātea – Papatūānuku, Tūmataurangi and Rongomatāne. Papatūānuku is closely connected to the core values of aroha (love) and manaaki (generosity and caring for others). These values motivate and shape interactions at the ātea strongly advocating for mana-enhancing practices that optimise the health, well-being, and vitality of others. Tūmataurangi and Rongomatāne are balancing forces for moderating risk, the former representing contests and tensions and the latter consensus and peace. These energies interact to create a

continuum of valid engagement responses that can occur at the ātea spanning from conflict to dispute resolution (i.e. compromise) to harmony. Relations at the ātea are a useful blueprint for cementing co-functioning at the interface.

Another critical limitation at the interface is the Māori knowledge system itself. It is fragmented, underdeveloped and underresourced (Kukutai et al., 2021; Rauika Māngai, 2020) as a direct consequence of colonisation (see, for example, Waitangi Tribunal, 2011). Yet the VM policy does not invest in this area. It must be supported (i.e. investment) to reach its full potential if it is to influence activities at the interface. This includes being able to contribute to setting agenda, decision-making and regulation of practice. It is difficult to engage in issues of joint concern if your voice and aspirations are invisible. Such influence is only possible if the world in which Māori knowledge is created, developed and nourished is robust and autonomous. This does not mean that Māori have not been able to capitalise on the VM policy. There are a few exemplars of strong, effective and productive Māori knowledge-science collaborations (see, for example, Clapcott et al., 2018; Hardy and Patterson, 2012; Mercier and Jackson, 2019). However, significant resourcing and capacity and capability issues prevent substantive innovation and gains. One response to this dilemma is a rights-based argument that prioritises te Tiriti o Waitangi and indigenous rights particularly those associated with indigenous data sovereignty as the foundation of thought and action (Kukutai and Taylor, 2016; Kukutai et al., 2021; Rauika Māngai, 2020; Te Mana Raraunga, 2018). The approach reframes the problem as a social justice and equity issue to be disrupted and transformed to provide greater opportunities for indigenous enterprise. In practice, this means ensuring the voice and interests of both parties to te Tiriti o Waitangi are reflected equally in environmental management by reimagining current governance arrangements and operational activities including knowledge production processes. Regarding knowledge production, the autonomy of each partner is critical as it determines what counts as reliable and relevant information, provides a measure of control over data interpretation and application and prioritises kaitiakitanga of Māori knowledge. Māori setting expectations (i.e. establishing standards and guides for best practice) is key to realising these goals as it will produce greater expressions of bicultural spatial governance through more equitable and effective participation.

Transforming the interface therefore can be visualised through the following genealogical sequence (Figure 1). Knowledge contests can be offset by self-determination when it leads to indigenous control over data sovereignty.

This genealogical sequence acknowledges that initial interactions between Māori knowledge and science have been predominantly unproductive suppressing the use and development of Māori knowledge. A long legacy demanding Māori self-determination over our lives and culture has eventuated, albeit very slowly, in some recognition and limited application of Māori knowledge in environmental management. Further gains can be achieved by decolonising encounters at the interface and privileging Māori knowledge and politics to augment engagement. The adoption of a rights-based approach and more recently indigenous data sovereignty ideals has the potential to amplify the influence of Māori knowledge and accelerate gains for Māori.

In summary, for Māori the VM focus is too narrow as it does not focus on building the capability and capacity of Maori knowledge systems or Maori communities. Rather it invests in research at the interface without little consideration for conditions required for meaningful interactions between knowledge systems. There is also a more fundamental problem associated with a government agency defining and determining use of Māori knowledge. Definitions can be simple, generic and inaccurate. For example, a government agency cannot be a kaitiaki. It can be a steward but a kaitiaki must have whakapapa links and be recognised by the tribe. Māori knowledge is first and foremost a taonga tuku iho, a gift passed down from the ancestors and atua. Māori as kaitiaki of this taonga have obligations and responsibilities to care and protect and ensure its appropriate use. This is difficult to perform when Māori knowledge is removed and relocated into spaces outside Māori control. It is very difficult therefore to co-function in this environment as only a narrow set of outcomes are permissible. To

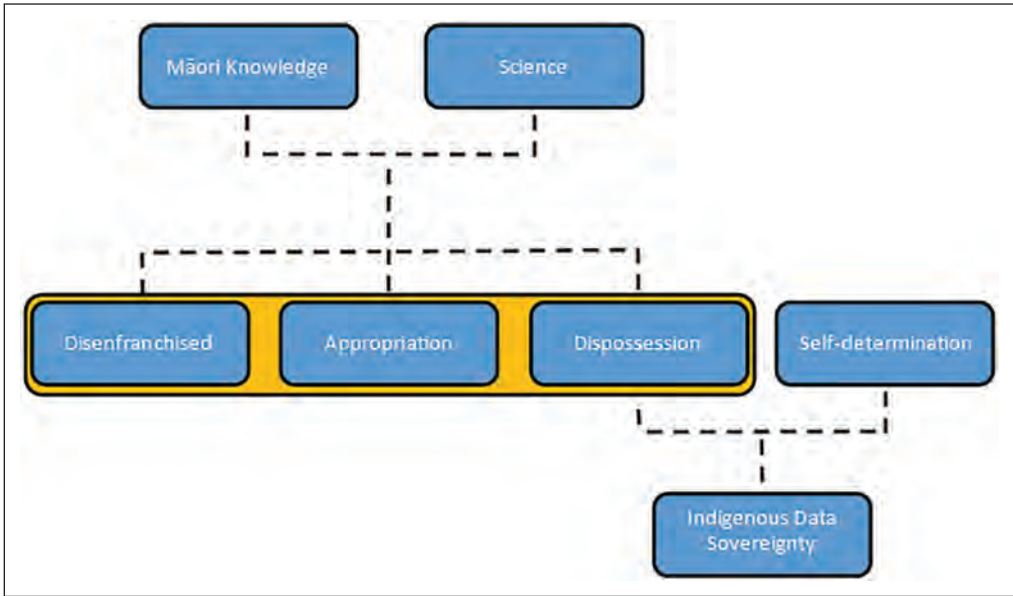


Figure 1. Whakapapa sequence to explain encounters at the Māori knowledge-science interface.

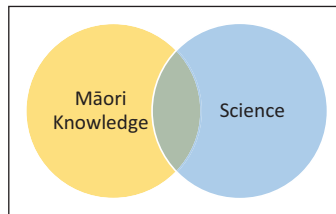


Figure 2. A visual representation of the Māori knowledge-science coherence. The overlapped space is the interface or ātea.

transform the interface, there is a pressing need to dismantling systems that exclude, marginalise and silence. This can be achieved through adoption of a rights-based approach and indigenous data sovereignty ideals and through the centring of ātea as a strategy to mitigate knowledge boundaries and contests at the interface.

Assemblage analytic to render the ātea visible

A key part of reimagining the interface is visualising the space as an ātea (Figure 2). The ātea being explored here comprises of three interdependent spaces; a shared space where Māori knowledge and science come together to deliberate on joint concerns and two separate sovereign spaces where Māori knowledge and science each exist autonomously. Atua can be invited into this shared space to mediate knowledge contests and ensure that mana-enhancing practices underpin interactions thereby establishing best practice. Critical to success is building the capacity and capability to engage through meaningful, mutually beneficial, and enduring relations. These strategies optimise co-functioning and ensure an outcome- and future-focused approach. The autonomous spaces are independent, and independence (i.e. sovereignty) is critical for maintaining the integrity of each knowledge system according to their own ways of knowing and associated practices (i.e. ethics). The intent is to mitigate power

Table 1. A new collaborative adaptive management process visualised by ātea.

He ātea mataara – Being alert: This is a space of observation where the intent is to seize opportunities for growth, change and advancement. Māori knowledge and science are used to be alert and vigilant, and identify and read (i.e., measure) the various signs or environmental indicators. This is a space of innovation where new technologies like hyperspectral remote sensing are deployed to collect data and visualise the environment in new ways.

He ātea whakahui – Moving forward together: This is the confluence or meeting space where knowledge and data, political agenda and multiple interests and aspirations mix. It is a contested space as involves navigating complex relationships and interactions to negotiate the terms of engagement. This step is critical for co-functioning as establishes the parameters of a joint enterprise. Key drivers here are to find a balance between environmental well-being and productivity and, to move towards a knowledge-intensive praxis of environmental management.

He ātea whakakite – Understanding the data: In this space, observational data from both Māori knowledge and science are extrapolated primarily through statistical forecasting and economic modelling to reveal and predict the state of the environment. A key focus is generating relevant and reliable data. An emphasis is placed on co-design and co-creation approaches that make sense to both knowledge systems.

He ātea kōtuitui – Linking data and agenda: In this space, the goal is to leverage data to meet certain ends. This moves the research exercise from a fundamental to applied praxis emphasising growth, change and advancement. A key motivation of this research is enhancing the health and vitality of the environment in a manner that supports a rights-based and social justice agenda of Māori – primarily self-determination and kaitiakitanga.

He ātea whakatinana – Transforming agenda into actions: This is the space where aspirations and priorities are transformed into action. Data are customised and localised in a deliberate and impactful way. This requires the development of monitoring processes and indicators of success to ensure the adaptive management process is relevant and effective.

He waka ātea – Dissemination: A key priority of this space is sharing collaborative experiences to build new capabilities for working across the Māori knowledge-science interface.

contests by disrupting the absolute authority of scientific knowledge towards a recognition that all knowledge systems are relevant and valid. Autonomy, therefore, maximises the ability to cohere in a manner that is collaborative, participatory, just and equitable.

Activities at the ātea

The whakapapa, governmentality and assemblage analytics support a conceptualisation of the interface as an ātea. This conceptualisation renders the interface and what counts as appropriate encounters visible. Visibility is critical for amplifying the influence of Māori knowledge in environmental management. This section explores activities at the ātea as seen in the Tātai Whenua project as an example of how the analytics theory can be expressed in practice.

In the Tātai Whenua project, ātea is used to map the collaborative adaptive management process to weave together hyperspectral remote sensing-derived forecasts and Māori knowledge to indigenise and enhance environmental management. This is critical if both knowledge systems are to inform environmental decision-making and create a shift towards bicultural spatial governance.

Naming and claiming is a decolonising methodology (Smith, 1999). The collaborative adaptive management process is called He Ātea. The use of a Māori name signals a grounding in te ao Māori and an expectation that Māori cultural values, customs and political agenda underpin behaviour and actions to ensure mana-enhancing, constructive and productive relations. The research activity therefore must be inclusive, participatory, and action-orientated (Hardy and Patterson, 2012) and enable multiple knowledge systems and research approaches to be brought together in genuine, meaningful, and enduring ways.

He Ātea visualises as a process a series of distinct but inter-related actions. Table 1 outlines the key intent and activities associated with each space.

Autonomy at the ātea

Autonomy is another key element for optimising engagement at the interface. This is a direct response to the suppression of indigenous knowledge through the colonial project. In this context, autonomy is a strategy for mitigating knowledge contests. It involves upholding the mana and mauri (i.e. integrity) of Māori knowledge to amplify its capacity to influence environmental management.

There are two key autonomy strategies deployed in He Tātai Whenua. The first involves reimagining encounters at the interface according to custom guided by concepts such as ātea and mana. This has already been discussed in length. The second strategy considers how Māori knowledge can be rendered visible and impactful. Our starting point for this was mapping Māori environmental knowledge in a manner reflective of Māori thinking. While the knowledge itself might be old, it is being constructed for a new purpose and care must be taken to ensure that this new form (referred to in the remainder of the article as a new paradigm) has some cultural authenticity and remains connected to te ao Māori. This is critical to avoid misuse and cultural appropriation.

This new paradigm was co-developed by iwi/hapū partners and Māori knowledge specialists through wānanga that considered the nature of Māori knowledge, sources of environmental knowledge and appropriate use. The new paradigm draws on customary understandings of the whare or meeting house to conceptualise Māori expectations of knowledge generation and application. In Māori creation narratives, Ranginui and Papatūānuku were the first whare, and their primary function was to nurture and protect. Another Māori creation narrative where Hinetītama sought knowledge of her parentage highlighted the role of pou (carved posts in the meeting house) as sources of information with instructional intent. So, the metaphor of the whare creates a connection to atua introducing regulatory elements into the paradigm and is a reminder that knowledge is a taonga – a gift handed down from the ancestors. Taonga status is important as it requires Māori knowledge users to consider what constitutes appropriate application.

Another early whare was the whare wānanga – a place of higher learning where Tāne placed the baskets of knowledge for safekeeping and development with the intent that knowledge is used for the common good and to ensure that communities flourish. This creation narrative is expressed in the architect of contemporary carved meeting houses through the rua whetū – a space formed when the rafter of the roof meet on the back wall of the house. This space links the spiritual and physical worlds by acting as a conduit for knowledge and energy from the atua to enter the meeting house and travel down the carved posts to inform and inspire whaikōrero (a ritual of speech-making) and wānanga (a ritual of debate and deliberation). Consequently, the whare can be a place for storing knowledge (known as whare mātauranga), and a space where knowledge can be interpreted and narrated (known as whare kōrero). This new paradigm takes inspiration from all these customary understandings of whare.

The new paradigm is centred around three pou or pillars of a whare called pou taki, pou mātauranga and pou tikanga. Pou taki is where Māori knowledge systems are visualised. This typically involves exploring genealogy sequences and collections or repositories of knowledge associated with tatai whetū (another phrase for creation narrative) and tatai whenua those genealogies that inform us of the order and relationships of nature. Pou mātauranga showcases specific schools of knowledge and associated knowledge forms. For example, kura ahurangi refers to everything that Māori know about the stars and the application of this knowledge to regulating, for example, seasonal practice (i.e. cultivation and harvesting). Pou tikanga is concerned with knowledge production and best practice associated with access, development, and application of Māori knowledge. This is where relationships with iwi/hapū partners is critical. This partnership ensures ethical use of Māori knowledge in this joint enterprise. Such an approach is consistent with Māori expectations of research ethics and data sovereignty. In practice, it prioritises the centring of mana within the knowledge production process to guide encounters and engagement. This reinforces the importance of mana-enhancing practices.

This new paradigm guides He Tātai Whenua research activities. It makes visible an autonomous space where new Māori knowledge can be generated and applied in accordance with custom. It also visualises a series of expectations and processes for creating a confluence at the interface where mana-enhancing practices regulate the interaction of Māori and scientific knowledge.

A key research question of He Tātai Whenua was how te ao Māori could be visualised through a geometric and geospatial lens. To address this question, Māori understandings of the landscape were defined, converted into databases and classification systems, and tested for validity using the new paradigm described above. These understandings were co-produced with six iwi/hapū in the Manawatū Catchment and the emergent classification systems applied to new tools and techniques of mapping to visualise Māori understandings of the landscape. Four examples are briefly described here to demonstrate application of the new paradigm.

The standard approach involves collating and translating Māori ‘data’ such as the identification of significant sites and placenames to existing Geographic Information Systems landscape classifiers. This approach has gained increasing popularity with iwi/hapū engaging in Treaty of Waitangi claims and settlement processes and when advancing iwi/hapū interests through local government resource management activities (Proctor and Harmsworth, 2021). He Tātai Whenua extends on this tradition by broadening the data set to include kōrero tuku iho, waiata and whakairo for example and exploring local data related to the Manawatū River and a coastal wetland ecosystem.

A second body of work adopts a corpus linguistic approach to identify, extract, and analyse a broad range of Māori landscape language (sourced from pou taki and pou mātauranga) with the intent of converting the information into a classification system. The emergent classification system has been applied to a Digital Elevation Model and provided a developing base ontology for other mathematical classification procedures (i.e. geomorphic modelling tools) to visualise the landscape from a Māori perspective.

A major work stream within the project was exploring new ways for iwi/hapū to collect information using GPS data, drones, and other free and open source remotely sensed data from satellites (i.e. handset, SPOT, SENTINEL, etc.). This involved a series of wānanga to share information about new technology and data sets and considering how this information could be leveraged to advance iwi/hapū interests. The information generated from these activities was closely linked to a final work stream that explored new ways to visualise mātauranga-a-iwi (tribal knowledge) using fuzzy logic, geostatistical and probabilistic classification processes with advanced modelling tools. Drawing on this research, one of the iwi/hapū partners in this project used hyperspectral imagery and elevation data to pressure local government to address nitrate leaching and nutrient management associated with increased productivity in their rohe. Another hapū partner generated 3D visualisations of significant sites, streams, and their whare tipuna – carved meeting house. The whare tipuna project linked narratives found in the whare to local sites of significance and land images using virtual reality technology. This technology generated an important resource for tribal members to support knowledge transmission, tribal identity and strengthen social cohesion. This information was also used in Iwi Environmental Management Plans, local government regional plans and to inform participation in the Manawatū River Leaders Forum.

Concluding remark

This article provides a critical commentary on the visibility of Māori knowledge and Māori interests in environmental management through construction of a set of analytics (whakapapa, governmentality and assemblage) to understand contests at the Māori knowledge-science interface. These analytics showed that the current system is ineffective and inequitable and must be disrupted and fashioned anew to facilitate a shift towards bicultural spatial governance so that more equitable and effective participation for Māori can be realised. Rights-based discourses and the indigenous data sovereignty

movement are identified as critical systems of thought for endorsing and achieving this shift. It is also argued that Māori culture is another critical element for effecting change. Māori cultural understandings and appropriate behaviours underpin the mitigation of knowledge contests – mainly through providing a structure for establishing autonomy, understanding encounters, and transforming relationships as regulated by ātea, atua, and mana-enhancing practices. Such an approach underpinned research activity in He Tātai Whenua and produced research outcomes that amplified the presence and influence of Māori leadership and Māori knowledge in environmental management.

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Notes

1. Some scholars choose to capitalise the word indigenous. It is more common not to capitalise in Aotearoa New Zealand and the environmental discipline.
2. Government in this context is broad encompassing the government of self, souls, children, the family and so on rather than the more common understanding of government as practised by the sovereign nation-state.

Glossary

Aotearoa	Māori name for New Zealand
aroha	love
ātea	space, to clear, to free from obstruction
atua	gods, spiritual forces
hapū	subtribes
He Tātai Whenua	name of a research project meaning land classifications
iwi	tribes
kaitiaki	guardians
kaitiakitanga	a Māori cultural practice of caring for and regulating interactions with the environment
kaupapa	values, principles and systems of thought
kōrero tuku iho	historical narratives
kura ahurangi	everything Māori know about the stars and its application to cultivation and harvesting
mana	authority, spiritual vitality
manaaki	generosity, looking after and caring for people
Māori	Indigenous person from Aotearoa New Zealand
marae	tribal centre
marae-ātea	clear space outside the marae
mātauranga-a-iwi	tribal knowledge
mātauranga Māori	Māori knowledge
mauri	essence, integrity
pā	fortified villages

pou	carved posts
poutiriao	spiritual guardians
pōwhiri	Māori welcoming ceremony
pūrākau	narratives, storytelling
rua whētū	space in the rafter of a carved house
taonga	gift, treasure
tatai whetū	creation narratives
Te Tiriti o Waitangi	a treaty between Māori chiefs and the British Crown signed in 1840
tikanga	actions
waewaetakamiria	walking the tribal territory and listening to the land
wānanga	discussions and deliberations
whakapapa	genealogy
whaikōrero	speeches
whare	house
whare kōrero	house of discussion and debate
whare wānanga	house of learning
whare mātauranga	place for storing knowledge

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Toward Alaska Native research and data sovereignty: Observations and experiences from the Yukon Flats

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Yukon Flats

Abstract

Indigenous Peoples research and data sovereignty is of paramount importance to a healthy relationship between Indigenous Peoples and the research enterprise. The development of Indigenous methods and methodologies lends itself to the hot discussion of research and data or, as we posit, knowledge born from Alaska Native communities' experiences and observations since time immemorial. Within the context of climate change, Alaska Native communities in the Yukon Flats National Wildlife Refuge (Flats) are experiencing research fatigue. There are an extraordinary number of researchers applying constant pressure on Alaska Native communities on the Yukon Flats to engage with research ideas and pursuits that are not of their own needs. In concert with large and frequent grant dollars that are promoting research with Alaska Native Peoples and demand grant proposals have components of coproduction of knowledge intertwined with the research. With so much research directed at, not with, Alaska Native communities on the Yukon Flats, never has it been more important to shape research and data sovereignty with Alaska Native communities based on their needs and their worldviews. This article works to demonstrate how established Indigenous methods in collaboration with Alaska Native and Allies scholarship alongside Alaska Native communities inform the future of Alaska Native research and data sovereignty.

Keywords

Alaska Native, research and data sovereignty, Indigenous methods, relationship, responsibility, reciprocity, and redistribution

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Positionality statement

We are a team of Indigenous and Allied scholars, and leaders who have been trained in and worked alongside Western and Indigenous academic methods and community protocols, and Indigenous people and communities. We begin by acknowledging and paying respect to the Nakhwotsii (Ancestors) who have greatly shaped this work, come before us, are with us, and will come after us and who have had a tremendous influence on each of our lives. The Yukon Flats are the traditional homelands of the Gwich'in and Koyukon Peoples. We honor their past, present, and future stewardship of these beautiful lands and the vast generational knowledge that have been imparted upon us. While we critique the harms inflicted by colonization and unethical research, we do so to ensure that this type of research never happens again and with the hope that future researchers will engage in research in a relational way. We do not see ourselves as the experts, but instead work alongside experts who have shared their knowledge and protocols for conducting research in relational ways. The Gwich'in word for land is the same word for person, "Nan"; there is no physical, spiritual, mental, or emotional separation between the two; and the protection of this relationship is our responsibility. Therefore, we recognize and uplift Indigenous sovereignty, and in doing so, we acknowledge and openly share and bring into the light the harms and wounds of past research, so as not to repeat history. This article was written for researchers, tribes, universities, Western managerial agencies, Indigenous Peoples, allies, communities, and anybody interested in the significance of Indigenous People's research and data sovereignty. Deepening the discussion of data sovereignty is about first recognizing that "data" collected from Indigenous Peoples and communities are often their knowledges, born from their experiences and observations. Second, there is an ethical imperative to not have "data," or their knowledges, used to harm Indigenous Peoples but instead collected and utilized in a collaborative way, to uphold Indigenous sovereignty and work toward the collective well-being of the population it is intended to serve.

Introduction and background

There are more than 200 federally recognized tribes throughout Alaska, and while each tribe is sovereign, their ability to exercise inherent sovereignty is diminished by a host of political and legal factors, but also by research practices that are conducted either without their consent and/or without their full collaboration. This has resulted in continued harm that is avoidable if research were to follow established protocols designed by Indigenous Peoples and allies. Such protocols ensure research is responsible, reciprocal, relational, and redistributive (Harris and Wasilewski, 2004)¹ and have been documented in empirical literature by Indigenous scholars (Kovach, 2010; Smith, 1999; Wilson, 2008) and allies. Over the last 20+ years, both Indigenous and non-Indigenous scholars alike have contributed to a growing body of literature about conducting research with and alongside Indigenous Peoples, communities, and their governments (Howitt, 2001; Kovach, 2010; McGregor et al., 2010; Rainie et al., 2019; Smith, 1999; Wilson, 2008). These contributions focus on upholding the sovereign authority of Indigenous Peoples² and communities in the research process and product, in order to ensure research benefits those intended (Inuit Circumpolar Protocols, n.d.). This growing body of literature serves as the foundation to which we add an important contribution: representing the knowledge of Gwich'in and Koyukon voices, which have been absent from much empirical research. Globally, attention has rightfully been given to research ethics, methodologies, methods, design, and review boards when working with Indigenous people/communities. However, there continues to be great distance between Indigenous Peoples, communities, and governments and the development of research plans from the funding of the research, to the initial phases of design, to conducting the research, and, finally, the consideration of the research product itself, namely, where, how, and by whom data will be owned, analyzed, and shared.

When used in Alaska Native communities, Western research methods are most often centered on Western needs, rarely centering or meeting community needs, and they do not protect the communities from harm (Caldwell et al., 2005; Chief et al., 2015; Reo et al., 2017). Thanks to the work of Indigenous communities, Elders, scholars, intellectuals, and Indigenous allies, the needle on academia's moral compass has moved in the right direction. However, in our observations of ongoing research and data collection in Alaska's Yukon Flats, we have found a continued lack of emphasis on the protection and stewardship of research data. Research pursuits serving individual, state, and federal research interests are so normalized that these projects end up placing Alaska Native Peoples and communities in precarious positions.

We recognize that Alaska Native knowledge, that is, their place-based experiences and observations over deep time, is a primary data source and that Western trained and centered researchers collect this knowledge to further their own research aims. Therefore, in this context, Indigenous Knowledge is data. Thus, in research with/about/for Alaska Native people and communities, there is an inherent sovereign right for their knowledge to be used only in their best interest and never to do harm. Indigenous methods and methodologies (IM&M)³ are already situated within the legal framework of tribal sovereignty and are uniquely equipped to guide research conducted in or about Alaska Native Tribes. However, this approach is outside the realm of many academic research Institutional Review Board (IRB) processes, which often are limited to institutional legal protections. This article attempts to address this gap by providing ethical-practical solutions about how best to protect Alaska Native knowledge and peoples in the research process, that is, *data* (emphasis added).

To illustrate, today in the age of climate change, funding agencies seek proposals⁴ that have an Indigenous knowledge or co-production of knowledge component, creating a desire about Alaska for more data collection with Alaska Native Peoples and communities.⁵ Furthermore, climate change being one of, if not the foremost pressing issues in the world today has been a focal point nationally. Whether it is observed in fisheries, forestry, sea-level rise, wildlife movement, warming temperatures, or annual snowfall, these are all relative to daily experiences Gwich'in and Koyukon People navigate. As such, those who do not live on the ground and observe or have experiences daily in the interior of Alaska, where Gwich'in and Koyukon People live, are curious about these experiences. Some researchers and granting agencies in the interest of understanding how the boreal forests are moving further north as the climate warms will approach Gwich'in and Koyukon communities with this research question. To unpack this even further, often these research questions are designed and constructed without first engaging the communities the researchers intend to work with, but beyond that scenario the research itself is not shaped in a way that speaks to the communities' needs, only the researchers. In sum, there is no or very limited relationality built into the pre-, current, and post-research process (Harris and Wasilewski, 2004). While the research grant, as an example, may promote a co-production of knowledge, the initial life of this research project was born from the researchers ideas, which seem to be built on or shaped by Western paradigms. For often, the result is also that researchers seek Alaska Native participation as an afterthought, requiring swift consent from communities who meet researchers and hear their research ideas after they are formulated. This has put a tremendous burden on Alaska Native communities (Yua et al., 2022). The burden thus becomes very real when too often the circumstance is that tribes are asked to quickly review and approve research proposals without full discussion and dialogue. In this common circumstance, this is not meaningful research.

Western research protocols essentially have different goals—to promote the ideas of the individual researchers, which lie in stark contrast to Indigenous research, which centers community needs and outcomes. The central tenet to the overarching issues we are bringing forward is that Western research protocols are built on Western needs primarily, in that for academic, federal, and state institutions interested in research, that research is for their interests. Each of these institutions was built on the ideologies of empire (cf. Smith, 1999), meaning they were created for the benefit of themselves and house academic and institutional commitments to, primarily, themselves.

IM&M are culturally grounded and holistic in nature, requiring ethical rigor and accountability to the community from the outset of the research. IM&M are about, but not limited to, the inclusivity of Indigenous community values. For those unaware of Indigenous protocols, IM&M include seeking permission to be present in the community and working alongside the community and lead research in a value-driven manner, following community and/or tribal protocols. The process of taking into account the entire community, on both the community-based and tribally led research, moves beyond typical, Western practices of research extraction and works to understand the implications and associated impacts of research, both beneficial and detrimental, on Indigenous communities. Before conducting research, researchers must consider how the research they aim to conduct can either positively or negatively contribute to community well-being and initiatives. One way to accomplish this is to engage in tribally participatory research (Fisher and Ball, 2003) and/or community-based participatory research (Collins et al., 2018), whereby an equitable relationship between researchers and communities is established by inviting Indigenous communities into project leadership. This community-based practice contributes to creating productive research methodologies that center Alaska Native data sovereignty.

As the line of researchers seeking to work with Alaska Native Peoples and communities grows, an equitable bridge must be built to ensure community-based ethical requirements of research are met. Our work alongside tribal communities in the interior of Alaska demonstrates three gaps in current methods literature that must be addressed to further Alaska Native research and data sovereignty. The first gap is the lack of meaningful responsibility Western and Western-trained researchers take in creating research-based relationships with Tribal Peoples and Communities. Researchers and their sponsors fail to recognize and honor the inherent sovereignty of tribal governments within Alaska. This has been exacerbated by the surge of research directed at Indigenous Knowledge systems in the United States and by the IRB protocols which do not require researchers to uphold tribal governance protocols. In response to this lack of consideration, some tribes and tribal colleges created their own IRB processes. The result is a gap between tribal IRBs, which focus on protecting Indigenous knowledge and data, and university IRBs, which focus on legal compliance in order to minimize recourse resulting from botched research and mismanaged data. The second gap is between the call for new and inclusive methods (the field-based practices) that uphold IM&M, and the dearth of information about what and how methods actually work in Indigenous communities. And, finally, the more glaring of the three gaps is the ways data or the knowledge from Alaska Native communities and people (really Indigenous people writ-large) is owned, analyzed, and shared. Of the three gaps identified, the third is a pressing issue and the focus of this article as it contains the greatest potential to cause direct harm to Alaska Native Peoples and communities. Predominantly, the more pressing issue created is that data collected from Alaska Native communities is used to harm those communities by limiting their ability to hunt and/or fish or, more directly, feed their families.

To that end, this article is intended to provide guidance when conducting research with and/or in Indigenous communities, and more specifically appropriate protocols for engagement in research with Alaska Natives in the Yukon Flats. We, as authors, center the work of La Donna Harris and Jacqueline Wasilewski, who wrote about the Four Rs, Relationship, Responsibility, Reciprocity, and Redistribution, as underpinnings to Indigenous research and their juxtaposition to the underpinnings of Western research, the Two Ps, Power and Profit. Utilizing the four Rs to frame our discussion demonstrates how one can frame academic concepts in alignment with Indigenous/Alaska Native values and we call on researchers to do the same. As explained by Harris and Wasilewski, the four Rs are foundational Indigenous values, and their fluidity allows each value to amplify the next from which to frame a discussion on Indigenous research and data sovereignty.

We begin with the values and protocols of *responsibility* to ground our discussion of Indigenous research methods and methodologies, and to demonstrate the need for Alaska Native research and data sovereignty. In sections to follow, *reciprocity* highlights the Yukon Flats study area as a demonstration of current research relationships between Alaska Native Peoples, communities, and

governments and university, state, and federal researchers. This demonstration illustrates that while research relationships are founded in part on collaboration and data-sharing, attempting to maintain the spirit of natural resources co-management, the reality is one of hierarchical relationships and a struggle for Alaska Native self-governance. We contextualize the imbalance of self-governance by discussing case studies regarding moose management. Continuing with the Yukon Flats case study, we move on to *relationship* by showing how self-governance agreements with federal conservation units are based on Western or settler ideals and identified needs, which are not relational but contractual, and therefore can and do disenfranchise Alaska Native Peoples and communities. Furthermore, this article offers a way forward in the context of *redistribution* of Alaska Native research and data sovereignty by examining strategies created by Alaska Native scholars, intellectuals, and allies.⁶ These strategies, combined with new protocols for Alaska Tribes, based on experiential field work with interior Alaska Native communities, can provide for practical research methods and methodologies that support Alaska Natives research and data sovereignty.

Responsibility: Community obligation

Research as an enterprise is an industry which largely extracts from Alaska Native and Indigenous communities. Western research, without consideration of Indigenous worldviews, is often about Western needs, which disregards Indigenous Peoples' needs and ideologies (Johnson et al., 2007; Louis, 2007; Smith, 1999). The fundamental concern is research led by universities, federal, and state agencies in relation to Alaska Native communities has minimal benefit to Alaska Native communities, either in its conception or in its outcomes. Many communities on the Yukon Flats are experiencing research fatigue,⁷ demonstrating the people themselves are an afterthought in research. Moreover, as an example, the fatigue stems from too many researchers either proposing research or doing research on the community rather than alongside the community. The proposition of the research is typically from the researcher's interests, as stated above, but also the resources and time it takes to appropriately vet the proposed research through the right channels can be exhausting. Communities on the Yukon Flats are small, members of the community that are tasked with vetting the research proposals already have jobs that carry a large amount of work, and this work is or can be an add-on. It is exhausting to not only vet research and measure the potential implications of the proposed research on the community (i.e. harm), but to evaluate another proposal that views the community as the subject or the source of data rather than the teachers or respected knowledge holders/keepers is exhausting. In all, this creates physical, emotional, and mental fatigue.

It is the responsibility of the professionals who profit from the industry of research to ensure research benefits those whose knowledge or data are collected, through the creation of meaningful relationships with the community. Alaska Native communities have become central to a growing body of research interests; therefore, as a starting point, it is paramount that the research enterprise acknowledge that these communities retain inherent sovereign tribal rights over how and by whom research is defined, designed, and conducted, as well as how Alaska Native knowledge as data is generated, handled, stored, shared, and protected. In recognition of these inherent rights, both Indigenous and non-Indigenous scholars have contributed to a growing body of literature about working alongside Indigenous communities.⁸

When undertaking research in Alaska Native communities, no matter the discipline or the intent, the onus is on the researcher to acquaint themselves with the methods and methodologies Indigenous scholars and others have documented. Specifically in Alaska, Indigenous Scholars, such as Stephanie Russo Carroll (Rainie), Dene/Ahtna Athabascan, document issues, concerns, and solutions to provide for Indigenous sovereign design, collection, and ownership of their own data. This approach of upholding Indigenous sovereignty in research provides for more meaningful, useful, and productive

research, delivering outcomes that benefit those intended. It is the responsibility of researchers working with Indigenous Peoples to be familiar with these Indigenous approaches, to provide a roadmap of the benefits of upholding community protocols, and to address any bias and/or predisposition they may have about Indigenous Peoples or research in general (Carroll et al., 2019; Rainie et al., 2019; Ranco, 2006; Rodriguez-Lonebear, 2016; Tahu and Taylor, 2016). The earliest work by Linda Tuhwai Smith, Maori, in 1999 on Indigenous methodologies sought to establish a narrative that empowers the Indigenous voice in research. As Smith states, “‘research’ is probably one of the dirtiest words in the Indigenous world’s vocabulary” and “fails to improve the conditions of the people who are researched” (Smith, 1999: 1). Essentially, research or at least the empire of research in the Western paradigm has situated Indigenous people as the subject to be studied for the benefit or need of the researcher. The literature Smith, Margaret Kovach, Shawn Wilson, and many others contribute to is, at its core, a manifesto directed at creating an awareness of the issues, but more importantly demonstrating that Indigenous people have the right to refuse or shape their own research futures.

Scholarship also demonstrates that community-based participatory research/methodologies (Coombes et al., 2014), for example, can be applied using techniques and methods consistent with Western protocols, but explained using Indigenous worldviews (Hikuroa et al., 2011). Specifically, existing methodologies can be adapted to fit research with and in Indigenous communities; there is possibility for agility (Tano, 2006), meaning it might be flexible. The message here is clear: efforts to reshape methodologies that center Indigenous needs and are expressed by Indigenous people in their worldview will ultimately benefit and be more inclusive of Indigenous people, though not all Indigenous scholars agree or perscribe.⁹ The learning opportunity that Smith and others bring to our attention, whether in New Zealand, Australia, Canada, or the United States, is common all over the world and include two main ideas: (1) that Western methodologies applied in Indigenous communities need an Indigenous worldview born from those places, and (2) that methodologies, no matter their origins, should be centered on needs expressed by Indigenous communities. For example, as Kendall et al. (2011) state, in regard to why healthcare research in Australia about Aboriginal people largely misrepresents Aboriginal concerns, “one possible explanation for this lack of impact (nationally) is the fact that research has focused on Western ways of knowing that fail to fully reflect the needs of Indigenous communities” (Kendall et al., 2011: 1719).

Recasting this research through an Indigenous lens it would have first centered the needs of the Aboriginal community. To break this down even further, beyond the first primary need to center the research on community needs, again Western research paradigms focus on Western needs. This particular study’s research questions were first about what the researchers thought was important and/or wanted to know. The key word in the quote above is “knowing,” the practice of forcing or directing a worldview onto another—in other words, knowing for the sake of knowing but not knowing for the sake of others’ well-being. The entire orientation of the work was first about identifying issues of concern as the issues were seen through a Western lens, and then the interpretation of the data was again viewed through a Western lens. Māori scholar Moana Jackson shared that if a comparative measure is made by which one population is measured by the scale or metrics of another different population, the research from the outset is flawed. In comparative studies, if a comparative has to be done, it is better to compare the subject to the society to which that person belongs (Jackson, 2009). In this instance, the Aboriginal population who ideally would need national support for health care needs, as most societies do in modernity, are being misrepresented in the data due to the lack of care the researchers had to engage with the communities which the researchers are researching. Then, the harm that is inflicted, to mention one, is the ongoing lack of health care support in the needed places. To name a few disparities in this dichotomy, without meaningful community engagement, led by the community, research continues to be an ongoing abstraction of inaccurate information that either completely mischaracterizes or misses opportunities to make a difference for those communities, or outright harms the communities.

Reciprocity: Cyclical obligation

Reciprocity is a consummate reminder to all of creation that humans are merely a part of, not a part from, the cyclical foundation of a living universe, and our intentions to give should far out-weigh our desire to receive. Reciprocity in the context of research and data sovereignty references the value that the funding of research, the design of research, the conducting of research, and the research product, namely, where, how, and by whom data are owned, analyzed, and shared, should and must be beneficial to those of the place and to those engaged in the research. Alaska Native Peoples and communities have graciously accommodated Western research needs since first contact, in an extractive one-sided relationship. In the Yukon Flats, the foundation of relationships between tribal, university, federal, and state representatives are based in Western values, missing the values of holistic, ecologically grounded stewardship of the Gwich'in and Koyukon Peoples of the region. Tribal, university, federal, and state representatives have attempted to build relationships promoting inclusivity to benefit all Alaska residents; however, the non-Indigenous approaches to natural resources management limit the productivity of these relationships (Alliance for a Just Society (AJS) and Council of Athabascan Tribal Governments (CATG) 2010; CATG, 2016).

Of the approximately 425,000,000 million acres in Alaska, the Yukon Flats National Wildlife Refuge (the Refuge) makes up 18 million acres in the interior of Alaska as designated by the Alaska National Interests Lands Conservation Act, 1980 (ANILCA). The Refuge is under the jurisdiction and management of the United States Fish and Wildlife Service (USFWS, 2017b). Alaska Natives, specifically Gwich'in and Koyukon communities of the Yukon Flats, have stewarded their/these traditional territories for millennia, through delicate systems of living with ecosystems based on reciprocity and relationships. They have and continue to practice Traditional and Customary (T&C) lifeways by hunting, trapping, fishing, and gathering in this remote geography. Gwich'in and Koyukon governing bodies have forged relationships with the Refuge managers, U.S. Fish and Wildlife Service (USFWS), to promote Gwich'in and Koyukon self-governance.

As 18 million acres of the traditional territories of the Gwich'in and Koyukon Tribes are now a National Wildlife Refuge, Alaska Natives have been forced to participate in Western models of land ownership within the region as the Alaska Native Claims Settlement Act (ANSCA) dictates. The ANSCA in 1971 disrupted Indigenous patterns of stewardship and relationship with place by placing fractions of traditional territories into Western land ownership patterns, held by 12 Alaska Native regional and 200 village corporations.¹⁰ Alaska Tribes, as distinct political governments, have no jurisdiction or regulatory authority over lands held by Alaska Native corporations, or federal or state governments. ANSCA and ANILCA stripped tribes of traditional lands in the Yukon Flats over which they had jurisdictional authority. One example of what remains is a jurisdictional jigsaw puzzle of competing and unclear interests between at least six different entities, federal, state, regional corporation, village corporation, individuals, and tribes. Thus, currently for Alaska Natives on the Yukon Flats, formal self-governance agreements with federal management agencies are a primary avenue to exercise voice, as Gwich'in and Koyukon rely on these natural resources for their livelihood. Self-governance agreements are negotiated contracts on the Yukon Flats are essential to annual funding agreements with eligible tribes and tribal consortia, coordinates the collection of budget and performance data from self-governance tribes, resolves issues that are identified in financial and program audits of tribal self-governance operations and distributes funding to self governance tribes. (BIA—OSG, n.d.)

Unfortunately, such self-governance agreements have historically failed to consider the best interest of tribal communities located within the Yukon Flats. In addition, they have failed to consider tribal research needs on the Yukon Flats, as research priorities are dictated by federal agencies. Tribes on the Yukon Flats are disadvantaged in the formation of these self-governance agreements in two primary ways. First, the self-governance agreements are discretionary, providing federal agencies complete control of the negotiations. Second, as stated, tribes have no continuous jurisdictional authority over their traditional homelands. Federal agencies take full advantage of these disparities by

influencing self-governance agreements in their favor. Importantly though, in exchange for diminished leverage, Gwich'in and Koyukon maintain the practice of self-governance. Tribal consortia have formed to advocate and negotiate with federal agencies over T&C uses of natural resources on the Yukon Flats. An important part of the relationship between tribal communities and federal agencies is the gathering and sharing of data for management purposes, though this flow of gathering and sharing data has been historically unilateral serving federal needs.

The tribal consortium working toward self-governance on behalf of eight Gwich'in and two Koyukon villages on the Yukon Flats is the Council of Athabascan Tribal Governments (CATG). CATG was partially formed in response to massive loss of lands that started when Alaska was purchased in the *Treaty of Cession, 1867* by the United States. Land loss continued, due primarily to ANSCA and ANILCA which stripped Indigenous hunting and fishing rights in their homelands. CATG advocates for tribal self-governance of education, health care, and natural resources.¹¹ Through self-governance Annual Funding Agreements (AFAs), the CATG natural resources department (CATG-NR) expresses and negotiates goals of the tribes with USFWS in an effort to secure as well as elevate T&C lifeways and traditional land stewardship (AJS and CATG, 2010). AFAs are funds that, in theory, support USFWS needs as well as CATG needs. Part of CATG's natural resources work, and negotiations range from conservation of natural habitats to subsistence¹² to wildlife harvest data collection/sharing.¹³ An important point to be made in relation to research and data sovereignty, the AFA serves multiple purposes, one is funding but also the second being a recognition that it is a negotiation with a tribal governing body.¹⁴ Thus, the relationship at its core is an expression of Alaska Native self-governance and a recognition of such authority by USFWS. The relationship is a demonstration that tribes want timely, inclusive, and morally grounded Tribal Consultation. In sum, the relationship is a recognition of the "special geographic, historic, and cultural significance" of the Yukon Flats National Wildlife Refuge to CATG member tribes, therefore affording tribes a contractual relationship with the federal government to conduct "selected federal program, functions, services, and activities," including collecting and sharing desired data. Thus, the relationship is more contractual than relational, that is you provide these services for a set rate of funding. The Refuge is managed remotely from USFWS headquarters in Fairbanks, Alaska,¹⁵ limiting the efficiency of the agency, so they work with CATG-NR to conduct selected activities within the Refuge. In order to obtain accurate and current data of moose populations, as an example, USFWS will fly moose surveys for estimates of the population and this work has at times been contracted to CATG-NR. In the past, CATG-NR has collaborated with USFWS to create mapping projects and data collection that identify moose harvest locations (Johnson et al., 2016) throughout the Yukon Flats.¹⁶

The contractual relationship outlined in the AFA legally binds the two self-governing entities.^{17,18} While the contract-based relationship between CATG-NR and USFWS may have formed under tumultuous and unprecedented conditions, it seems there are examples that the relationship is mutually beneficial when CATG is treated as an equal and when they are both reliant on one another for operational needs. USFWS needs CATG-NR for data collection to support management objectives and CATG-NR benefits from receiving funding from USFWS for management purposes as well, though not usually based on the Tribal Peoples', communities', governments', or CATG's identified needs.

Case in point: Collection, analysis, and sharing of moose harvest data

For the purposes of this article, we have chosen to highlight a critical research area of concern: moose management. Moose are a cornerstone species to the T&C lifeway of the Yukon Flats, and their populations have remained low across the region. Most recently, a good faith effort was made to contact Gwich'in and Koyukon providers on the Yukon Flats, asking them to identify geographies where moose populations were being harvested during their traditional hunting season. In 2016, in collaboration with CATG-NR, Alaska Trappers Association, University of Alaska Fairbanks Biology and Wildlife Department, and National Science Foundation Alaska EPSCoR, a paper was published titled

“Quantifying Rural Hunter Access in Alaska,” which identified geographies or river corridor locations where Gwich’in and Koyukon providers sought and harvested moose using current and historic data dating back to 1941 (Johnson et al., 2016). In past studies, hunters were asked to identify locations on a map where they hunted moose; then, some of those locations were plotted on a map to outline where the majority of moose were harvested and located during hunting season. The data were then compared to moose density estimates from flyover surveys in the areas of interest (Johnson et al., 2016). The study effectively did two things. First, it illustrated primary T&C hunting locations and, second, where moose were successfully harvested during the hunting season. To test accuracy, data retrieved from the study were compared to data from CATG-NR and other studies, one of which asked households to report locations and number of moose harvests. While most studies to determine hunter access rely on quantitative data, that is, flyover surveys, moose density data, the novelty of this study, as explained by the authors, was a mixed methods approach by combining the quantitative data with the qualitative data which in this case was hunters’ knowledge or what is referenced as Traditional Ecological Knowledge (TEK).

An important point in this example is the unique incorporation of a mixed methods approach; although studies like this have been conducted previously, there is no evidence the data were applied to decision-making. Meaning, if flyover surveys and TEK are sources to determine hunting regulations, there is limited documentation from USFWS that this knowledge has influenced decision-making, rather simply population data alone. The quantitative data are useful although the data from flyovers and moose harvest household survey data historically have mixed accuracy. These flaws occur for two reasons, the total geography covered in flyovers is limited and extrapolation techniques are employed, and there can be a distrust between those collecting and those reporting the moose harvest data. Thus, USFWS contracts with CATG-NR to collect harvest data to ensure greater accuracy through the use of tribal surveyors. Therefore, without accurate local knowledge from those on the ground, the data are incomplete and have higher rates of inaccuracy. History demonstrates the use of the quantitative population data is the driving force in decision-making, leading to distrust in participation in local surveying as a key to affect management. The distrust being that the numbers are inaccurate and a common error known by those who are to be subjected to the decision-making. The distrust of the research process related to moose management throughout the Yukon Flats has validity, as there is a history of selected application of Western approaches to research. Essentially, the decision-making is ineffective in meeting tribal needs because tribally sourced data are not employed in decision-making, demonstrating limited reciprocity in research.

The knowledge of the Gwich’in and Koyukon providers cannot be overlooked as it is central to all research parties’ needs and without it the study would be severely limited. Hunters provided two primary sources of data: (1) moose harvest locations and (2) harvest methods. As hunters rely on moose for cultural and food security needs, they traverse these geographies with frequency and are the only ones with this unique spatial knowledge of their homelands. This knowledge is the data these research projects require, of which the ensuing ownership, analysis, and sharing creates the potential for harm. Once hunter knowledge is published, it is then accessible for public consumption, and those locations can become vulnerable. They become vulnerable because now those locations are known. The core objective of Johnson’s paper, and others like it in interior Alaska, is consistently couched in the rhetoric of co-management, or to manage the Yukon Flats more effectively. It is important to note the life span, use, and potential harm data sharing of this nature could bring to tribes, and perhaps more importantly Gwich’in and Koyukon providers.¹⁹ Ensuing data analysis, Johnson problematically states, may lead to a negative effect upon T&C practices: “if the goal of managers is to maintain moose numbers, rather than estimate harvest amount, they may consider liberalizing harvest in areas with less access, and restricting harvest in high access areas” (Johnson et al., 2016: 10).

This is a clear demonstration of research that does not recognize tribal sovereignty or center tribal needs. The ownership, analysis, and sharing of data are not governed by tribal needs. In this instance,

why share harvest locations in publications, why analyze the data without consideration of impact to tribal T&C practices, and who owns the data in conclusion? This demonstrates that well-intended research, self-governance agreements, and cooperative research does not ensure incorporation of an Indigenous worldview or guidance by IM&M principles, resulting in potential for harm to Alaska Native communities. To ensure unintended impacts to Alaska Native Peoples and communities, researchers should recognize tribal sovereignty from the inception of the research question to the ownership, analysis, and sharing of the data. As tribal sovereignty in research is recognized, accuracy of data and knowledge will increase, trust will build, management and stewardship will improve, and wildlife populations will be healthier. In this way, all researchers can build reciprocal relationships with Alaska Native Peoples and communities, securing the community's best interests in the use of data for the protection of T&C practices. Fundamentally, in order to create protocols that consider the potential harm that data can be used to impose on Alaska Natives, the entities proposing the research need to understand potential harms and the tribe's sovereign rights. Unpacking this a bit more, tribal governments can work with hunters, community members, and allies to identify potential harms that data can create. Those harms can be then shaped into policy that speaks directly to tribal research protocols. Then, each research entity such as the federal, academic, and state would have to sign a legally binding agreement that could help modify behavior and create awareness that works to minimize and hopefully alleviate harm.

Relationship: Kinship obligation

Alaska Native Peoples, communities, and governments on the Yukon Flats seek equitable research relationships which provide for their needs on their terms. A healthy research relationship relies on trust, and the processes used to build trust. On the Yukon Flats, the central tenet of human existence is reliant upon the health of all of creation, and "so, our societal task is to make sure that everyone feels included and feels that they can make their contribution to our common good" (Harris and Wasilewski, 2004: 4). Conducting research in relationship, with respect and trust, as we see within the moose management illustration, produces data with greater accuracy and validity, data with more applicability to the issues it seeks to address. Therefore, conducting research in relationship produces better research.

Gwich'in and Koyukon people have successfully provided for their communities in their homelands for over 20,000 years (Our Arctic Refuge, 2022), and Gwich'in have been in the Yukon Flats for over 600 generations. What kind of relationship might they have shaped with the environment in this amount of time, over so many generations? This is the deep spatial, temporal, and ecological knowledge (data) researchers seek. The possible applications of this unique and rich data in the fields of wildlife biology and management are infinite (Halvorson and Davis, 1996). For example, data are used to make decisions on regulations regarding harvest (seasonality, bag limits, methods and means), particularly in geographies that are remote and not often accessed by the managing entities, that is, traditional Alaska Native homelands (National Research Council (NRC), 1997). Alaska Native Peoples (hunters/surveyors), communities, and governments (CATG-NR) located across remote Alaskan landscapes like the Yukon Flats are the only source of accurate and valid knowledge and data. If Gwich'in and Koyukon providers in the study above had not shared the location of moose, the research would have been incomplete at best, and potentially largely inaccurate.

The case study further illustrates potential for ill-handled T&C hunter knowledge to harm T&C practices. Here, in the context of historically low moose populations in the Yukon Flats, managing excessive predation is a task of Western management systems. If added hunting pressure from non-native hunters creates more stress on the moose population, then increased regulatory limitations on moose hunting in the Yukon Flats could occur. Increased regulatory limitations on hunting often leads to increased policing in areas identified as high harvest and access areas, which in turn leads to

increased criminalization of Gwich'in and Koyukon providers. These limitations would not be the result of natural phenomena, like diseases or climate change (McNeeley, 2012), but of a research relationship that did not maintain as a central tenet to the sovereignty of Indigenous Knowledge. As former Yukon Flats Refuge Enforcement Officer Michael Hinkes (December 10, 2009) stated, "I have worked all across the State of Alaska enforcing fish and wildlife regulations, and nowhere else in the state have I seen such a regulatory nightmare for subsistence users as the Yukon Flats" (Britton, 2015).

By definition, Alaska Native hunters in Alaska are Alaskan residents. Everyone, including non-Native Alaskan hunters, has equal rights and equal access to "subsistence" hunting according to the State of Alaska. If a non-rural–non-native Alaskan hunter can access these remote locations, and the location is open to hunting by state law, they can harvest the same food source as Alaska Natives living in their home communities.²⁰ For Gwich'in and Koyukon living in their homelands, T&C hunting is vital to spirituality, community wellness and the transmission of generational knowledge and ways of life, and food security (AJS and CATG, 2010; CATG, 2016; Walsey and Brewer, 2018).²¹ As one Gwich'in hunter from Venetie, Alaska, explained the difference between state definitions of subsistence and tribal T&C practices, "we don't just mean using the resource, but using the tribal methods and acting out culture and complying with those values, and we do those things because they are a measure of protection for the land and its resources" (USFWS, 2017a: Para.1).

The relationship between data sovereignty and better research is first and foremost about respecting and acting in accordance with the legal and political identity of Indigenous Nations tribal sovereignty, globally. To also recognize that tribal sovereignty, true tribal sovereignty is not a colonial exercise, it is not a permission granted by colonial empires, and it is indeed inherent. Given it is inherent, the phrase "tribal sovereignty" is simply used as a starting point to new, ongoing, and future government-to-government relationships. As inherent, then tribes have always worked to maintain order within their societies and the universe itself, not to control it, but to work alongside the living universe. Then, researchers must realize that all proposed research is essentially relationally based; whether the researcher or Western institutions legitimize that or not, it remains a worldview of Alaska Natives and generally Indigenous People. If you're going to do research with Alaska Natives, the expectation is a genuine human investment in the values and beliefs of the community, to listen and commit to learning.

Redistribution: Sharing obligation

The redistribution of research "is to balance and rebalance relationships" with the communities and peoples researchers intend to work with (Harris and Wasilewski, 2004: 5). Gwich'in and Koyukon identity and well-being revolve around sharing, with your relations, with anyone who walks through your door, and with the greater world in which you exist. As co-author Black states, thus, sharing and taking care of one another are deep-rooted cultural values passed down through the generations. While times have changed and the level of interdependence is not a life or death matter, there continues to be a commitment to caring for one another. (Black, 2017: 83)

Wealth can be measured by how much people give away versus how much people accumulate, from food to wood to beadwork; sharing in the form of redistribution is foundational to the communities in the Yukon Flats. These lifeways are born from experiences and observations of Gwich'in and Koyukon living in their homelands for thousands of years, and embedded within this "deep time" are the intimate connections to place and all that it embodies.

Most Western research paradigms require that researchers remain "objective" in an effort to remain unbiased and not skew the data. However, there is a growing cadre of Alaska Native scholars and allies, who are engaging in relation-based research (Black, 2017; Brower, 2016; Stern, 2018) while remaking research relationships and redistributing knowledge back to its rightful place (i.e. communities). This

Alaska Native-led research has helped to heal the wounds from harmful research conducted in the past and also to chart a new path forward, where Indigenous epistemologies and ontologies are centered in the process of research. These Indigenous scholars have also centered the concepts of responsibility, reciprocity, relationship, and redistribution as foundational to their research and it has led to long-term and relevant research in each of their respective communities.

Although not explicitly stated, it is assumed that researchers understand the need to work with local peoples and communities to assure no harm is done by the research itself. In the United States, IRBs approve and review as well as monitor the risk-benefit of research on or about humans (National Institute of Environmental Sciences (NIEHS), 2017). At the university level, IRBs are beginning to position themselves as ethically reliable when reviewing research proposed in Indigenous communities by appointing board members who are familiar with IM&M. However, the worldviews of distinct Indigenous communities are not a part of this university process (Burhansstipanov and Schumacher, 2005). University IRBs do provide some basic human rights protections, but they do not speak to tribal sovereignty or further invest in a review of implications of data collection, ownership, analysis, and sharing. Establishing first the research needs of the community, data ownership, analysis, and sharing are paramount to a healthy relationship, but beyond that is the need to have an honest dialogue about the nature of the research. In other words, what is the intent and who benefits?

Individual researchers and the entities they represent (universities, state and federal agencies, and funders) need to come to terms with the protocols present in this article and others in order to minimize potential harm to Alaska Native communities. The path(s) forward, well beyond the fundamental step of finding and engaging with the literature cited in this article, is for research relationships to be positioned within the cultural values of tribal relationships, as the tribes define them. This is carried out more formally by creating government-to-government research agreements with Alaska Native Peoples, communities, and governments. An important point in this discussion brought forward by MacDonald (2017) is that Indigenous communities in South America have long established research protocols that vet research interests against community needs. Essentially, Indigenous people are privy to the ways they are being taken advantage of and recognize the need to develop their own regulatory, civil laws and/or research protocols, and codes to maintain the integral sovereign rights to their knowledge; they are after-all the data—knowledge sources.

Respecting Indigenous Peoples' knowledge and data sovereignty is one way to solidify Indigenous Peoples' inherent rights of T&C ways of life in their homelands. Knowledge, in a very real way, is Indigenous communities' most precious commodity. Knowledge is passed down from generation to generation as well as with those who demonstrate a vested interest in learning. However, in reality, this generosity in sharing knowledge with outsiders has resulted in exploitation. In the past and present, Indigenous peoples' knowledge has been used to exploit (Brewer and Kronk Warner, 2014) and harm as well as help communities. Research is an industry, and as noted, research in the arctic inclusive of Indigenous knowledge is currently flooded with funding. Researchers and their institutions financially benefit from Indigenous knowledge and research conducted in Alaska Native communities, with minimal financial benefit reaching Alaska Native Peoples and communities. In the future, it is better to protect that knowledge unequivocally. Indigenous knowledge can be stewarded in the same ways it is disseminated, using community protocols.

Alaska Native research and data sovereignty is not about asking permission, nor waiting for external validation of approach. This is about doing the practice and application of stewarding how research is conducted and how data are used to depict and manage Alaska Native homelands and T&C practices. At its core, this is about a rebalance of morality or the four Rs and decolonizing research; the work of protecting from harm is about clarifying tribal control over their knowledge and traditional homelands. Tribal needs should be prioritized when research projects are vetted.

Ideally, anybody who engages Alaska Natives on the Yukon Flats in research, whether invited or on their own accord, should be aware of the existing foundational work on IM&M and tribal

governance protocols. Beyond framing the work in a manner that is respectful of IM&M, researchers should work with Alaska Natives to consider, create, and adhere to Alaska Native and tribal government research and data sovereignty protocols based on community values. If there is no formal process, ask what is appropriate and explore the potential harms with the community if the data are made public, not just the harms a university IRB identifies. The moose management case study shared provides an illustration of the T&C issues at stake for Alaska Natives, and why long-term protection of data is paramount. The evolving nature of data use and protection brings this discussion forward, but the important point is that knowledge is owned by the tribe and its citizens.

While the work to eradicate all sensitive information from the public purview has not been formalized just yet, a number of Gwich'in and Koyukon Elders on the Yukon Flats are asking important questions about the use and protection of their knowledge. Formal research codes have been and are being created. Elders remain adamant that knowledge be transmitted to Gwich'in and Koyukon youth and those interested who uphold the integrity of the knowledge in accordance with community values. No matter how well-intentioned research is, the abuse of Gwich'in and Koyukon knowledge and of IM&M permeates the intellectual discourse of research in Alaska. It is clear, without community and tribally based research protocols based on Indigenous values, abuses will continue.

Data extrapolated from the research need a permanent home under tribal control, complete with a legal process that details control over data based upon the values of the Indigenous Peoples, communities, and governments. Tribes and researchers must consider how knowledge and data can be analyzed and shared in ways that both harm and help tribes, currently and in the future, so making data public can create unforeseen impacts and consequences. As MacDonald points out, some researchers are intimidated by this process or know little about it, do not want to step on toes, and are not used to others owning data produced as a result of research they have led (MacDonald, 2017), but this is the protocol: be present, transparent, honest, listen, and learn.

To conduct ethical, meaningful, accurate research with integrity alongside Alaska Native Peoples, communities, and governments on the Yukon Flats, Alaska researchers must ask

1. Am I conducting research *Responsibly*?
Am I promoting tribal sovereignty, including tribal sovereignty over research and data? Are the peoples, communities, and governments defining the research objectives, does the research meet their needs? Are Indigenous People and/or Indigenous Communities leading the research design, data analysis, and data sharing protocols?
2. Am I conducting research in *Reciprocity*?
Am I investing in the peoples, communities, and governments mutually as I am asking them to invest in me and the research? Is time invested with Elders to seek grounding and guidance? Is time invested in Youth to build voice and capacity?
3. Am I conducting research in *Relationship*?
Am I conducting research that is respectful and aligned with the values of the traditional homelands within which the research is being conducted.
4. Am I conducting research with *Redistribution*?
Are Indigenous People and/or Indigenous Communities mutually benefiting from the research financially, in policy, or otherwise?

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Notes

1. For a more in-depth Alaska Native perspective, please consult the work of Dr. Stephanie Russo Carroll (Rainie), Ahtna Athabaskan, Assistant Professor of Public Health Policy and Management at the Community, Environment and Policy Department, University of Arizona, and co-founder of the US Indigenous Data Sovereignty Network and the International Indigenous Data Sovereignty Interest Group at the Research Data Alliance.
2. Please note that we will be using the terms Indigenous, Alaska Native, and tribal interchangeably throughout this article, as we feel the issues presented here are important for all Indigenous Peoples and Communities but specific also when we speak about Alaska Native.
3. There is a difference between methods and methodologies—simply methods are the practice and methodologies are the theories of structuring and carrying out research.
4. An important note here, these grant funding streams are designed to promote the relationship between the grantee and grantor, but rarely do the granting agencies have direct relationships with tribal communities; therefore, much of the funding does not go to assist tribal needs, that is, research interests, directly.
5. This article is focused on harm to the communities as opposed to the individual. However, the examples used affect both the community and individual. A recent development that is encouraging, Elder's councils are now meeting semi-regularly throughout the interior of Alaska; they are asking important questions about the intentions and protection of data born from research. Thus, this article hopes to honor Gwich'in and Koyukon Elder's leadership of self-governance and help to move that discussion along.
6. While this article is focused on the United States, there are other Indigenous Nations doing important work in this area for over 20 years, in Canada, New Zealand, and other countries.
7. To be clear, there are a great deal of researchers trying to work with the communities, from government to non-profit and health care to education.
8. This article does not cover all of Indigenous research and data sovereignty, as this is an international and ongoing conversation to include but not limited to use and overall implications related to collection, handling, storage and sharing of, as well as access.
9. Not all scholars of Indigenous methodologies agrees that some Western methods can be agile enough to incorporate Indigenous worldviews, such as Margret Kovach who argues that Western methods are not adaptable enough to fit Indigenous contexts and worldviews, and that the overarching goals, worldviews, and interests are too different.
10. The exception being individual allotments assigned to families, Venetie's reservation status as well as the 1.8 million acres owned by Venetie and Arctic Villages. For more information, see <https://www.oyez.org/cases/1997/96-1577>.
11. In order to make way for the Trans-Alaska Pipeline, the Alaska Native Claims Settlement Act of 1971 extinguished over 360 million acres of Alaska Native title to land and created 12 regional and over 200 village corporations that act as a business, owned by Alaska Natives, that work in the best interest of Alaska Native people. The Alaska National Lands Interest Conservation Act of 1980 took another 157 million acres of Alaska Native land and put it into national parks, wildlife refuges, and reserves.
12. It is important to understand that "subsistence" is a colonial word used by federal and state governments to describe in legal terms how Alaska Natives and non-native Alaskan residents harvest foods and resources (AF&WCF v. SDFG 289P.3d 903). However, subsistence is not a word used by all Alaska Natives on the Yukon Flats. Subsistence, in the Gwich'in language, is *teediraa'in*, which translates as "striving to survive." The common/preferable phrase used by many Gwich'in and Koyukon in Council of Athabaskan Tribal Governments (CATG) villages is *traditional and customary* (T&C) when referencing these practices, which separates them culturally and in time-and-place from non-native Alaskans, even though the state or federal government does not recognize these inherent rights as separate (refer to discussion below) (CATG, 2010).
13. An Annual Funding Agreement is essentially a legally binding contract between a self-governing body and a federal agency, in this case the CATG and US Fish and Wildlife that take place annually.
14. Federal agencies are tasked with working with Alaska Native Tribes, such as the Bureau of Land Management, and they need to be educated on what Annual Funding Agreements (AFAs) are and how they work. There are numerous reports of Tribal Consortia having to educate federal agencies on these matters. This speaks volumes to the importance of tribal needs being met by these agencies, if these agencies do not understand the fundamental premise to which has created these relationships, then how are they to carry out these tasks.

15. Few, if any, of the 13 United States Fish and Wildlife Service (USFWS) employees live in the communities on the Yukon Flats or practice a traditional and customary lifestyle in this geography.
16. A more concerted effort to identify the reasons why CATG was formed speaks to an ongoing Alaska Native and non-Native dichotomy centered on the politics of land ownership, and self-governance. CATG was conceived in the early 1980s, amid growing health concerns arising from villagers in regard to diseases like “diabetes, cancer, and alcoholism” never before seen in Gwich’in and Koyukon populations (CATG.org/our-history). CATG, formed under the auspices of various tribes on the Yukon Flats, as a self-governing action-oriented advocacy consortium on behalf of Fort Yukon, Beaver, Stevens, Arctic, Birch Creek, Chalkytsik, Venetie, Circle, Rampart, and Canyon Alaska Native villages. CATG was identified as a need by nearly every tribal government on the Yukon Flats, to lead in advocacy and negotiate for tribal control of natural resources, health care, and education on the Yukon Flats.
17. There are other forms of negotiations and advocacy CATG does for health care, and education, which are important, but for this article, we work with American Indian and Alaska Natives on land tenure and natural resources so it seems obvious for us to stick to that line of reasoning.
18. In total, there are two AFAs CATG negotiates: (1) with FWS, explained above and (2) with the Bureau of Land Management (BLM) fire service to provide firefighter training and testing to build capacity in the villages. For more information, see <http://www.catg.org/natural-resources/emergency-firefighting/>
19. Another interesting and important point to make, but in order to maintain a consistent message not included in the text above, is the data collected by BLM and CATG on Gwich’in cultural significance of various geographies throughout the Black River. The data collected become invaluable for the purposes of fighting proposed mining operations as well as for Gwich’in villagers who are interested in preserving cultural sites. For more information, see https://www.washingtonpost.com/news/energy-environment/wp/2017/01/05/the-obama-administration-just-moved-to-protect-some-of-the-most-remote-areas-of-alaska/?utm_term=.416e9c671212. Thus, data can also be culturally relevant to tribes as well.
20. For the purposes of accuracy, federal closure of area 25D west, which includes the villages of Beaver, Birch Creek, and Stevens is closed to non-rural hunters and the state regulates this by pushing this to a tier 2 permit system (harder to obtain) in the same area because of low moose populations.
21. An important note, the use of rural and non-rural are Western constructs, which can and do divide Alaska Native Peoples in ways that compromise their access to traditional ways of life, culture, and spirituality. We use these terms in this article in order to maintain consistency, but prefer Alaska Native and non-Alaska Native. Moose are not merely a food source. Urban Alaska Native hunters are also marginalized but have the same connections to their homelands and traditional ways of life and spiritual practices.

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Gwich'in Ancestors (Nakhwotsii).

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Decolonial subjectivities in participatory action research: Resident researcher experiences in the 2021 Guåhan Survey

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Abstract

Scholarship on participatory action research (PAR) has come a long way since its foundations in Paulo Freire. However, it leaves much room to understand the personal transformations at stake in everyday residents' participation in PAR—a key mechanism through which PAR contributes to long-term social change in local communities. This literature gap is particularly salient for decolonial PAR, which incorporates Indigenous communities at every stage of the research process, and which is explicitly committed to the political goal of decolonization (i.e. the repatriation of Indigenous lands and oceans). Borrowing heavily from feminist geographical PAR scholarship, we articulate the concept of “decolonial subjectivities” to capture the dynamic, embodied ways in which resident researchers in decolonial PAR connect their own knowledge, experiences, and relationships with ongoing local struggles for Indigenous sovereignty. We then elaborate on this concept through a qualitative analysis of four waves of weekly reflections from five resident researchers in a decolonial PAR project in Guåhan—a modern-day colony, unincorporated territory of the United States, and the southernmost island of Låguas yan Gåni (or the Mariånas archipelago). We find two distinct shifts in resident researchers' decolonial subjectivities over time: (1) deepening embodied connection to decolonization through situating one's role in decolonization within a broader set of familial and community relationships; and (2) deepening embodiment of

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role as decolonial researchers through affirming one's expertise and power to effectuate change as a researcher supporting and facilitating the continued, ongoing struggle for Indigenous sovereignty.

Keywords

Participatory action research, subjectivity, feminism, decolonization, Chamoru

Participatory methodologies challenge the traditional hierarchical relationship between researcher and subject by incorporating everyday residents ("resident researchers," henceforth RRs) at every stage of the research process—from research design and data collection to data analysis, results dissemination, and beyond (Cornwall and Jewkes, 1995). Participatory action research (PAR) is a specific branch of participatory research. Drawing on anti-foundationalist philosophical tradition of pragmatism (Dewey, 1998; Flyvbjerg, 2004; Greenwood, 2007; James, 2000) and the practical framework of Paulo Freire's (2000 [1970]) popular education, it includes an additional second component: *conscientização*,¹ often translated as critical consciousness or conscientization, which involves reflection, motivation, and action as part of the research process to produce collective social change.

In research centered on Indigenous communities, the use of PAR methodologies is not new. Since whaea (teacher) Linda Tuhiwai Smith's (1999) foundational monograph on Indigenous methodologies, many Indigenous scholars have lauded the utility of PAR in connecting knowledge-production to ethical considerations of Indigenous values, intellectual considerations of Indigenous epistemologies, and political considerations of accountability (Goodyear-Ka'ōpua, 2016; Phan and Lee, 2022; Smith, 2005; Tuck, 2009). In the field of geography and planning, PAR is also becoming increasingly common practice in Indigenous contexts (Nakamura, 2015; Porter et al., 2017; Sandercock and Attili, 2014; Vasudevan and Novoa, 2022).

Methodologically, PAR has come a long way since its early formulations. On the first component of participation, we have an improved general understanding of how power relations within the PAR team are related to (and often constrained by) macrostructural inequalities (Ozano and Khatri, 2018) and how good PAR design provides meaningful opportunities for professional researchers and RRs alike to recognize and reconfigure power relations within the team over time (Kesby et al., 2007; Mason, 2015; Taylor, 1999). On the participation of Indigenous communities in particular, we also better understand some of the challenges and tensions associated with having Indigenous and non-Indigenous research members, and with promoting productive engagements between Indigenous epistemologies and Western research paradigms (Datta, 2018; Datta et al., 2015; Howard, 2017).

On the second component of *conscientização*, we have made considerable strides in developing conceptually and analytically precise tools to track and evaluate whether PAR projects actually do cultivate *conscientização*, and the extent to which they are effective at doing so (Jemal, 2017; Watts et al., 2011). However, scholars have overwhelmingly focused on in-depth analyses of any of *conscientização*'s constitutive elements. While these advances are certainly important for PAR design and construct validity, they leave much room for understanding how *conscientização* connects to broader theories of change (Tuck, 2009). In particular, they miss how *conscientização* functions more broadly as a site of personal transformation for RRs (Cahill, 2007b)—a key mechanism through which PAR contributes to long-term social change in local communities. This literature gap is particularly salient for decolonial PAR, which incorporates Indigenous communities at every stage of the research process, and which is explicitly committed to the political goal of decolonization (i.e. the repatriation of Indigenous lands and oceans).

In this article, we thus set out to answer the following question: how do personal transformations manifest for RRs in decolonial PAR? Borrowing from feminist geographical PAR scholarship, we articulate the concept of "decolonial subjectivities" to capture the personal transformations of RRs in decolonial PAR. At the broadest level, decolonial subjectivities entail the dynamic, embodied ways in which RRs connect their own knowledge, experiences, and relationships with ongoing local struggles for Indigenous sovereignty.

Drawing on the literature on conscientização and feminist geographical PAR, we begin the article by way of offering a theoretical framework for understanding decolonial subjectivities. We then empirically elaborate on this concept through an analysis of four waves of weekly reflections from five RRs in the 2021 Guåhan Survey, a decolonial PAR project based in Guåhan² (meaning “we have” in fino’ Chamoru, commonly known as Guam)—the southernmost island of Lâguas yan Gâni (the Mariãnas archipelago), a modern-day colony, and unincorporated territory of the United States.

Conscientização

In the original formulation of conscientização in Freire’s landmark *Pedagogy of the Oppressed*, it is defined in several ways. In one instance, Freire (2000 [1970]: 160) speaks of conscientização as the “means of which the people, through a true praxis, leave behind the status of objects to assume the status of historical Subjects,” or the process through which individuals take ownership over their capacity to change the historical circumstances that they find themselves in. Importantly, it “does not stop at the level of mere subjective perception of a situation, but through action prepares men [*sic*] for the struggle against the obstacles to their humanization” (Freire, 2000 [1970]: 119). In other words, conscientização involves three distinct elements of reflection, motivation, and action.

Reflection denotes the continuous, iterative process of understanding how practice is done—what, when, where, and why it works well or not (Dewey, 1933). In the context of PAR, it involves moving dynamically between the closed, rigid formulations of theory and the open, spontaneous formulations of experience, to raise questions about and shed light on how the research process is changing the way that one thinks about one’s relationship to injustice and inequality, and consequently one’s role in social change (Jemal, 2017; Schön, 1983). Reflections are typically structured as a series of semi-structured prompts, to encourage critical engagement with these particular questions, while leaving room for thoughts from the field. To track and encourage reflections throughout the PAR process, scholars have used many different kinds of tools—individual journaling (Alt and Raichel, 2020; Draissi et al., 2021), group discussions (Cahill, 2007b), video blogs (Frazier and Eick, 2015), to photography (Stack and Wang, 2018).

Motivation broadly involves feeling like one’s voice is heard (Branquinho et al., 2020) and an “expressed commitment to address societal inequalities and produce social change” (Diemer et al., 2017: 479). The element of motivation is distinctive in its particular orientation toward action. For instance, the adjacent concept of political efficacy—prominent in the field of political psychology—broadly measures whether individuals feel like they have influence over the policy process and/or whether policymakers care about their opinions (Craig and Maggiotto, 1982; García, 2021). Motivation takes this concept one step further: it serves as the theoretical bridge linking political efficacy to political action and is concerned with whether one’s sentiments toward one’s voice translates into material commitments to redressing injustice (Diemer and Rapa, 2016).

Among the three distinctive parts of conscientização, action is perhaps the most open-ended. Broadly, action aims to “challenge inequitable social structures and produce social change” (Diemer et al., 2021: 12). This could involve community organizing to address shared grievances (Minkler, 2000), holding public education workshops and launching campaigns to raise awareness about issues studied (Fine, 2009), or co-authoring academic publications to lend legitimacy to practitioner knowledge and expertise (Brydon-Miller and Maguire, 2009).

Yet, while this body of literature is enormously helpful in clarifying the analytically distinct elements of conscientização, they are perhaps less useful in capturing how conscientização occurs in actual PAR practice, and how PAR ultimately connects to broader processes of social change. On both counts, the feminist geographical PAR scholarship offers useful insights.

Feminist geographical PAR and subjectivities

While feminist geography itself comprises a heterogeneous set of theoretical and methodological approaches, it largely converges on its attentiveness to the body—particularly as a site of emotion,

power, and change, and the ways in which these features play a constitutive role in the un/making of place, space, and scale (Nelson and Seager, 2007; Sharp, 2009). In the feminist geographical PAR literature, scholars start from the premise that conscientização is an embodied, emotional and relational process that is influenced by myriad social and geographical forces over time, and that PAR constitutes but one institutional context that RRs inhabit (Cahill, 2007b).

This theoretical framework has enormous implications for how we conceptualize conscientização. Attending to the openness, messiness, and unpredictability of the research process (Billo and Hiemstra, 2013), feminist geographical PAR scholars highlight how PAR design changes over time, often in unexpected ways (Houston et al., 2010). This poses methodological challenges to the application of static measures of conscientização, which implicitly assumes an unchanging, stable PAR model. Instead, with greater attentiveness to the embodied experiences of specific RRs in specific geographical contexts over time, feminist PAR scholars instead propose analyzing RR subjectivities—defined as “the conscious and unconscious thoughts and notions of an individual, one’s sense of oneself and way of understanding one’s relation to the world” (Weedon, 1987: 32–33, cited in Cahill, 2007c). That is, subjectivity captures the “new ways of being in the world which are both situated within specific geographical settings and at the same time represent a perspective on one’s relation to others and the world” (Cahill, 2007a: 2863).

Subjectivity is distinct from the related idea of positionality. The latter is primarily concerned with power, and the ways in which power inequalities are inscribed, reinforced, and/or contested along axes of identity. The former is a broader category: while it certainly can (and should) involve analyses of power, it centers the embodied experiences of RRs in ways that generally highlight their shifting experiences, knowledges, and emotions over time. This entails

recognizing how aspirations and desires affect both what we research and how we position ourselves with respect to our research community; identifying how feelings of affiliation, disaffiliation, enthusiasm, and discomfort open new ways of knowing and understanding; and considering how acknowledging our own multiple and fractured subjectivities can help us better understand those with whom we work. (Whitson, 2017: 300)

To track the dynamic evolution of subjectivities over time, feminist geographical PAR practitioners use a range of methods—from group discussion (Cahill, 2007b; Gustafson and Brunger, 2014), autoethnography (Whitson, 2017), to the familiar PAR tool of reflective journaling (Stapleton and Mayock, 2022).

Building on Mountz et al.’s (2003: 29) insight that “there is an undertheorised relationship between the politics of academic research projects and the broader political movements with which they engage,” we argue that the specific political goals of PAR constitute an underexplored contextual dimension of subjectivities. In feminist geographical PAR studies of subjectivity, this has certainly been at least implicitly recognized. Consider Caitlin Cahill’s *Makes Me Mad* PAR project with six young women from the Lower East Side of New York City, whose explicit political goal was to “‘speak back’ following a long line of feminists and scholars of color who have used research as a means to critique the dominant perspective based on their own situated experiences of racism, sexism, and structural poverty” (Cahill, 2007b: 272). Throughout the article, her RRs precisely articulate their subjectivities in relation to their embodied thoughts and emotions (frustration and anger among them) about the dominant stereotypes of “urban womyn of color” in their neighborhood, suggesting that subjectivities are often articulated in relation to the specific political goals of particular PAR projects.

Decolonial PAR, decolonial subjectivities

Commitment to the political goal of decolonization—in addition to Indigenous community participation at every stage of the research process—is precisely what distinguishes *decolonial PAR* from other types of PAR. Concomitantly, attentiveness to this goal is useful in understanding the distinctive contours of decolonial subjectivities of RRs in decolonial PAR. A ubiquitous term today,

“decolonization” has been employed by postcolonial scholars to challenge the universalizing impulses of Euro-American academia denote theories and methodologies capturing the grounded empirical realities of the Global South (Connell, 2014; Roy, 2016), and by Indigenous scholars to capture the Indigenous struggles against the forces of Indigenous dispossession perpetuated by historical and ongoing empire and colonialism (Aguon, 2015; Cornassel, 2012; Steinman, 2016).

It is in this latter sense that we refer to decolonization. Starting from the premise that “decolonization is not a metaphor,” we view decolonial PAR as PAR that actively supports “the repatriation of Indigenous land and life” (Tuck and Yang, 2012: 21), and that produces both the knowledge and community infrastructure to “create within a working space that which has been systematically denied to us” (Tuck and Fine, 2016: 165). At the same time, the political goal of decolonization cannot be properly understood in a vacuum: it requires attending to and dismantling the specific social, cultural, legal, political, and economic mechanisms through which Indigenous peoples are denied our “natural” political right to sovereign control our own land, oceans, and nations (Wilkins and Stark, 2017: 51).

Following kumu (teacher) Haunani-Kay Trask (2008) and Dean Saranillio (2018) who challenge naturalized political affinities between Indigenous peoples and decolonization on one hand, and between settlers and Indigenous dispossession on the other, we affirm that everyone—Indigenous and settlers alike—can be aligned with decolonization, Indigenous dispossession, or the wide spectrum of gray in between. Decolonial subjectivities therefore can be cultivated among both Indigenous and settler RRs alike, and serve to capture the ways in which conscientização constitutes a dynamic, embodied, and relational experience inextricably tied to the political goal of decolonization.

Decolonization struggles in Guåhan

We ground our empirical elaboration of decolonial subjectivities in a decolonial PAR project in Guåhan. As of 2022, the United Nations considers Guåhan as one of 17 non-self-governing territories around the world “whose people have not yet attained a full measure of self-government.” In this context, self-government would entail one of three internationally recognized political statuses— independence (i.e. national sovereignty), free association (i.e. national sovereignty with an international agreement with the United States for economic aid in exchange for military presence), and statehood. Per 2020 US decennial census data, Chamorus comprise approximately 37% of the island’s 154,000 people.

Currently, the Government of Guam (the territory-level government formalized through the 1950 Organic Act of Guam, which has the Governor of Guam as its executive, and the US President as its head of state) is legally prohibited from conducting a non-binding political status plebiscite for the “Native Inhabitants of Guam.” This plebiscite would allow for Indigenous Chamorus—and settlers who “became U.S. Citizens by virtue of the authority and enactment of the 1950 Organic Act of Guam and descendants of those persons” (per section 21001(e) of Guåhan’s 2000 Plebiscite Law)—to be exclusive voters in an island-wide survey of residents’ political preferences for Guåhan’s political status. As a result of a 2019 ruling by the US Court of Appeals for the Ninth Circuit (*Davis v. Guam*), it was concluded that any political status plebiscite restricted to the island’s “Native Inhabitants” would “[employ] ancestry as a proxy for race in violation of the Fifteenth Amendment” (932F. 3d 822 (9th Cir. 2019)).

Worse, the most recent public dataset on the subject, to our knowledge, is the 1982 Chamoru-only referendum on political status—collected a full four decades before the writing of this article. This is enabled, in part, by how US state-sponsored demographic surveys (such as the decennial census) do not ask questions about preferences for political status. Against the backdrop of federal judicial constraints upon the Government of Guam, and persistent data gaps on Chamoru preferences for Guåhan’s political future, the 2021 Guåhan Survey was conceived to provide a Chamoru-only platform to affirm the stolen right to express our preferences for our island’s political future.

The 2021 Guåhan Survey

The survey project team comprises nine researchers. It is co-led by two professional researchers—KL, a Chamoru PhD candidate, and NP, a second-generation Vietnamese refugee and professor. The incorporation of community members happened in two stages. In the first stage, we reached out to a Chamoru sovereignty group to gauge interest in the project in January 2021, then held six PAR workshops (each between 1 and 1.5 hours long) between March and July 2021 with three Chamoru sovereignty activists. This included collaboratively identifying a set of four Chamoru values to ground the project, and operationalizing each as concrete PAR design decisions; establishing public-facing action goals that formally articulated our commitments to being accountable to Chamoru communities in Guåhan; and co-designing the survey questions. Ultimately, we landed on the following three research questions: (1) What does it mean to be Chamoru? (2) What do Chamorus care about in and envision for their futures? and (3) What are the social and geographical factors shaping contemporary Chamoru political attitudes toward sovereignty and decolonization?

At the beginning of July 2021, we sent out a call for RRs to the Chamoru sovereignty activists, their affiliated organizational and personal networks, as well as staff and faculty members at the two largest local higher educational institutions—the University of Guam and Guam Community College. In our call, we asked applicants to provide their résumés and a one-paragraph statement describing their positionality and interest in participating in the survey.

Given our limited project budget, relatively small stipends, and data collection timeline (conducted over the period of a month, during the summer semester when school was out), our applicants were uniformly undergraduate students. Applicants were ultimately selected to obtain diversity in terms of gender, academic training, and professional interests, and selected for demonstrated interest in decolonization. One of the Chamoru sovereignty activists opted to continue their involvement in the data collection process, while the others offered continued input and guidance; four more RRs then joined the team. All RRs are born and raised in Guåhan, and comprised four Chamorus and one Filipina.

Throughout the PAR process, the professional researchers employed a feminist praxis of “mentoring with,” which entails “reciprocal support and mutual benefit, infusing a feminist ethics of care” (Goerisch et al., 2019: 1740). Over the course of our month-long data collection process, our team spent time together in multiple ways: we had weekly check-ins, conducted outreach together in shopping malls and farmer’s markets, shared meals, conducted local media engagement (through podcasts, radio shows, press interviews) to increase public awareness about the survey process and results, and maintained a shared WhatsApp group for continuous communication. In these different avenues, the co-PIs collectively offered their own expertise as researchers to help facilitate and enrich the data collection process while promoting mutual learning through emphasizing the expertise of RRs as “cultural navigators” with invaluable insider knowledge of the island’s local context (Ozano and Khatri, 2018). More specifically, the co-PIs emphasized how RRs can and should draw on their own experiences to make the research project appealing and accessible to everyday Chamoru residents, to design and implement outreach strategies that meet people where they’re at, and to draw from their own experiences to articulate the value of the project to local Chamoru communities.

Aligned with feminist geographical PAR praxis, the co-PIs emphasized the importance of self-care throughout the research process while providing space for RRs to discuss their anxieties, struggles, concerns, and lessons learned during the data collection process. Above and beyond the repeated, informal interactions that characterized our ethics of care, RRs were also asked to formally reflect on their evolving experiences in the project. Recognizing the importance of relationality as a key feminist strategy to reconfigure power relations within PAR, we employed “dialogue journaling” to facilitate RR reflections (Daniels and Daniels, 2014; Konishi and Park, 2017). This technique involves exchanging written journals between two or more PAR team members as part of collective, interactive, and relational reflection.

Dialogue journaling was critical in ensuring that the written reflections were a meaningful empirical window into RRs' decolonial subjectivities. PAR reflections are all too often perceived as rote assignments (Draissi et al., 2021), rather than genuine opportunities for honest and transparent communication about personal thoughts and feelings. With the co-PIs modeling transparency in their own written reflections, RRs were encouraged to approach the reflection exercises with the same spirit. Furthermore, by providing a platform that emphasized our shared anxieties, struggles, and uncertainties about the PAR process and the future of Guáhan, dialogue journaling also helped to flatten out power relations within the team, thereby encouraging even more vulnerability and honesty.

Methods

Over the course of the 2021 Guáhan Survey, RRs provided four rounds of reflections to track their evolving thoughts and feelings about the project, and to identify opportunities for mentorship with and mutual learning alongside the co-PIs. Four rounds of reflections were solicited in total: (1) after first in-person training and before formal data collection began ($n=5$); (2) after the first week of data collection ($n=5$); (3) after the second week of data collection ($n=3$); and (4) after the conclusion of data collection ($n=5$). As this article is primarily interested in the cultivation of decolonial subjectivities among RRs, we focus specifically on these reflections and exclude from our analysis the replies from professional researchers.

For each round of reflections, different prompts were given to facilitate the writing process. The first reflection served as a personal introduction: RRs were asked to share why they are invested in the project, what they hope to gain, how they plan on practicing self-care during the outreach process, and what their long-term goals are. The second and third reflections centered on the survey outreach process: RRs were asked to reflect on what went well, outreach challenges, emotional struggles, lessons learned, and on how survey's outreach strategy could be modified to better capture the voices of key Chamoru groups outlined in the survey's heterogeneous purposive sampling strategy. In the final reflection, RRs were asked to share their general thoughts and feelings on their involvement in the survey—how they feel about the overall research process, what they learned, and how the experience has shaped their relationship to Indigenous sovereignty movements. The mean length of reflections was 398 words, with the first and final reflections typically longer than the rest.

We systematically analyzed these reflections through a multi-stage, open, iterative coding process in ATLAS.ti, a qualitative coding and analysis software. First, following techniques of structural coding, we developed a preliminary codebook based on themes identified from our synthesis of the literature on subjectivities and decolonial PAR (MacQueen et al., 1998). Second, we used open coding techniques to capture emerging themes during preliminary scans of the reflections (Auerbach and Silverstein, 2003). Third, the preliminary codebook was tested on five randomly sampled reflections and subsequently modified to address duplicates, redundancies, and inadequacies. The final codebook was then applied to our universe of 18 total reflections. The three iteratively modified versions of the codebook are detailed in Tables A1, A2, and A3 in Appendix 1.

Findings

Drawing on our analysis of RR reflections, we find that two sets of personal transformations accompany the cultivation of decolonial subjectivities in decolonial PAR: (1) deepening embodied connection to decolonization through situating one's role in decolonization within a broader set of familial and community relationships; and (2) deepening embodiment of role as decolonial researchers through affirming one's expertise and power to effectuate change as a researcher supporting and facilitating the continued, ongoing struggle for Indigenous sovereignty. For purposes of transparency, citations of reflections are associated with the relevant RR co-authors' initials and reflection number.

Embodied connections to decolonization

RRs uniformly expressed their embodied connection to decolonization through situating themselves within a broader set of relationships (especially with their families and local Chamoru communities), and increasingly communicating their evolving thoughts and emotions about decolonization through these relationships. They appreciated their relationships within our research team of a “growing network of brilliant, like-minded, emerging Chamoru scholars” (NF R1), as well as the co-PIs’ “considerate and supportive” (AP R4) approach to mutual care. However, the bulk of their reflections were spent discussing their relationships with their families and with local Chamoru communities.

As part of the outreach process, RRs started outreach by engaging their own families and personal networks. For some, these efforts were some of the first opportunities to engage in these conversations. For one Chamoru RR, such conversations “rarely happened among . . . family and friends since it was [*sic*] always heated with debate, disappointment and disagreement” (CQ R4). Survey outreach provided her with opportunities to learn more about the questions and thoughts that her family members had about Guåhan’s political future, which opened a space for both the RR and her family members to discuss decolonization and deepened her understanding of their viewpoints, however different from her own. In a particularly poignant experience of a family gathering, she recounted,

At this point, most of my immediate family is here (some that took the survey, some that didn’t) and they were all talking about the survey. After I helped my cousin take the survey, we have a small circle of me and my family members talking about issues, concerns, and history of Guam. It was crazy (a good kind). I had never had conversations like these with my uncle and my cousin and mind you, we all have different views about the plebiscite. . . In that moment, I was so scared to push anyone’s buttons, but I was also relieved that I can finally have these kinds of conversations with my family. I feel that working on the survey outreach helped me in taking a step back and remembering to respect others’ views even if they did not match my own. . . If I had never been a part of this survey as an assistant, I would have never been able to be granted this conversation among my family and for that I am grateful. (CQ R3)

Here, the RR shares how her involvement in the project occasioned a shift in her family’s dynamics around issues of decolonization. While she had once been “scared to push anyone’s buttons,” she came to feel more comfortable holding respectful conversations with family members around the politics of the PAR project, even with those with whom she strongly disagreed. For this RR, involvement in the project not only deepened her understanding of the viewpoints of her family members, but also led to an embodied change in her relationships with them.

The Filipina RR also noted an embodied change in her relationship to the survey and decolonization. In her initial reflection, she wrote, “I understand I am not Chamoru by blood but I do call this island home and I want to help in any way that I can to better the community and progress towards a greater future” (AP R1). These somewhat abstract references to Guåhan (“I do call this island home”) and its Indigenous peoples (“the community”) contrast with the more intimate character of her penultimate reflection:

For me one of my main “whys” [to be involved in the project] is mainly to help to build a better future for my nieces and nephews that are Chamoru and deserve to be equipped with tools of data to help to shape what they want to do and build a greater island community. (AP R3)

As this account indicates, her more abstract and less-embodied feelings about the project at its inception shifted to a more concrete and embodied account of her responsibilities to her Chamoru family members, who “deserve” to have access to knowledge and resources to shape their island’s decolonial future.

Above and beyond linking decolonization to their families, RRs’ relationships to local Chamoru communities featured more prominently across the board, over the course of the decolonial PAR

process. In the initial reflection, RRs often employed impersonal, abstract language in speaking of “the Chamoru people” (NASA R1, NF R1, JM R1) and “the community” (AP R1). Over time, RRs increasingly referenced community through the intimate language of “my” (NF R4, JM R4) and “our” (AP R4, CQ R3, CQ R4, NF R4). Far from a simple semantic shift, this reveals a deepened intimacy in RRs’ relationships with Chamoru communities—or, as one RR puts it, “a stronger connection to my people” (NF R4).

This was in part because “most times the survey after its [administration to respondents] would often be accompanied by a story or two about [respondents’] experiences on the island” (JM R4). Such conversations often offered abundant opportunities to learn about the lives of specific people, who raised myriad concerns about

self-determination, homelessness in Guam, lack of upholding Chamoru customs/aspects of the Chamoru culture, the state of Litekyan [a sacred site on the northern tip of the island, adjacent to the Andersen Air Force Base, where the US military is currently constructing a live-fire training range complex], and the military buildup. (NASA R4)

These unexpected and often memorable stories prompted some RRs to describe their specific encounters with strangers (NASA R2, JM R2) and to consider more deeply how the outreach process was working (or not) for specific subgroups such as veterans, members of the National Guard and Air Force (NASA R3), *manâmkö* (elders), and *manhoben* (youth) (CQ R2, JM R4).

These encounters proved instructive and transformative in several ways. RRs celebrated the “wholehearted embrace” (NF R4) and the “abundance of support and feedback we have gained from our island community” (CQ R4). While community responses to the survey varied, all RRs observed a connecting thread between their outreach interactions and the cultivation of a more grounded, embodied sense of the Chamoru people as a whole. In the most sustained meditation on lessons learned from the intimacies of community ties, one RR shared,

In conducting outreach and connecting with so many in our community, I grew inspired by the strong sense of pride and sense of self found among our people. My overall experience with connecting with our community proved to me that despite sometimes being concealed and overshadowed by outsider-imposed notions and standards, the Chamoru culture and its many pillars remain alive and well among Chamorus in Guåhan today. Moreover, Chamorus are actively resisting the colonial forces that seek to displace and erode the cultural values and practices that have sustained them for centuries. Despite the highly entangled nature of the Chamoru story, and naysayers that may argue otherwise, Chamorus have a unique and genuine identity. This sense of identity and belonging is especially important to the Chamoru people’s ongoing quest for self-determination and decolonization. . . (NF R4)

The experiences of speaking to diverse Chamorus across Guåhan helped RRs to identify and critique dominant colonial narratives (“outsider-imposed notions and standards”) about the Chamoru people. Instead, through specific encounters with family and community members, they increasingly recognized the continuity of Chamoru “identity” and “belonging,” and the everyday ways in which they are affirmed and defended by Chamorus across the island. Thus, in addition to cultivating a deeper understanding of individual Chamorus and their stories and views, the research process also enabled a rearticulation of the Chamoru community as a cohesive whole grounded in Chamoru culture rather than fragmented by political disagreements and ideological dissonance.

Embodiment of role as decolonial researchers

As RRs were precisely selected for their interest in and/or involvement in decolonization, initial reflections uniformly communicated the importance of the 2021 Guåhan Survey in shaping the “future” of Guåhan. Indeed, RRs participated in the PAR process already eager to “conduct similar

research ourselves and continue to grow Guåhan's overall capacity for research and community work" (NF R1), to spread the "mindset" of "Data is power. Power to the people" (NASA R1), to "gain a richer understanding of other's understanding of identity and community at large" (JM R1), and to "give back to the community that has given so much to me" (AP R1). In a particularly poignant and hopeful account of her involvement in the project, one RR wrote,

I have not seen or heard anything like this before. Never have I ever been asked "Well, what do you care about for your island and your people and what do you hope the future to be?" The closest thing to that kind of question is when the military says we have XX amount of days to send a letter to an email voicing our concerns of whatever kind of training or new construction they are trying to implement that will greatly affect our land, people, and/or culture. Even if they say we are to voice our concerns, it seems as if [our concerns] are never heard, since our land has been taken from us, destroyed, and turned into unfamiliar sites to help the progression of their efforts in "keeping us free." Our ancestors just dug up and distributed, placed in paper bags, and hidden where no one knows whenever they want to, whenever they feel like. Even [our ancestors] cannot fully rest in their own grave without being ordered to be bothered by white men in uniform who have no ties here. So when we ask people to lift their voice, I truly hope they say what they feel and I hope that this data will in fact assure our policymakers that we do not want this or that. I hope it makes the military realize that maybe we don't want them here at all. (CQ R1)

While this sustained meditation on the political stakes of the project was decidedly uncharacteristic of initial reflections, it nonetheless captures a sense of the pain and optimism driving RR participation in the project, and articulates their pre-existing decolonial commitments to Chamoru cultural resurgence, Chamoru sovereign control over our own land and ocean, and to ensuring peace for our ancestors' remains.

Despite these pre-existing commitments, early stages of their involvement saw the RRs feeling "uncomfortable" (AP R1), "anxiety" (NASA R1), "very nervous" and "mamåhlaio (embarrassed, shy) to go up to people" (CQ R2). In a particularly distressing case, one RR shared how he felt "fearful for risk of failure," that he was "not pulling [his] weight," and blames himself for not doing enough at an outreach event at a local farmer's market (JM R2). As one RR points out, these negative emotions may have been exacerbated by the COVID-19 pandemic (NASA R4), and/or by how challenging public speaking can be for introverts (NASA R3). These initial sentiments reflect an overarching uncertainty about their specific role as researchers amid Chamoru decolonization struggles.

Learning about the ropes of the PAR process was central to addressing at least some of these feelings and cementing RRs' embodied experience of themselves as key changemakers in advancing decolonization. In the immediate aftermath of the first weekly check-in, one RR shared some of the lessons from his newfound research expertise, by identifying specific issues with his outreach efforts and formulating corresponding solutions to address them:

Thanks to our team meeting. . . I've been able to work on improving my personal outreach strategy through such things as strengthening my survey elevator pitch and limiting prejudging, as [AP] describes it. Following this week, I can definitely improve on outreach by always having a rack card [i.e. survey outreach brochure] on hand in case I run into a potential participant when I'm out and about and not necessarily doing survey outreach. (NF R2)

Far from being a mere exercise in lesson-drawing, this represents an early articulation of a deeper shift toward seeing himself as a researcher with expertise in PAR methodology and survey research. In this RR's final reflection, he shared that he "not only learned the importance of collecting and using data in ways that are helpful and uplifting, but gained invaluable knowledge and skills that are sure to inform and benefit any future research projects [he] undertakes." This transformation was certainly not unique to this RR and was indeed evident across the board.

Over time, RRs leaned powerfully into their newly affirmed expertise as researchers and offered salient methodological critiques of the project. One observed that technological barriers of the online survey and the small font size of the paper survey posed barriers to manåmko', and suggested that

future decolonial research adopt a “sit-down” interview-based format instead (CQ R2)—a sentiment echoed by another RR eager to properly document the myriad stories shared by Chamoru respondents during the outreach process (JM R4). Others recognized that the data collected are “critical and pertinent to understanding the atmosphere of the island” (JM R4), but nonetheless shared concerns about how the survey is “unrepresentative of the wide variety of CHamorus across the socioeconomic spectrum” (NF R2) and doesn’t tell the “whole story” (JM R4).

Importantly, not all RRs expressed their growing confidence as decolonial researchers in the same way, or in a linear fashion. As mentioned before, the survey outreach process involved various forms of engagement with a variety of audiences in multiple in-person venues and virtual platforms. One RR discusses her experience participating in a local news interview in the following way:

After the interview, I think I just struggle with media in general. I still don’t think I’m knowledgeable or well-spoken enough to have my thoughts and opinions published in papers or said during interviews. I think I feel more intimidated with how public it is because I do feel more comfortable talking about it in private with someone who may have differing opinions or thoughts than in public. (NASA R3)

Here, she recognized her discomfort with doing media engagement, but nonetheless embraced how she *is* capable of conducting research in more “private” contexts, indicating a deeper understanding of how she might approach research on her own terms in the future. In that spirit, by her final reflection, she fully embraced her role as a decolonial researcher, asserting how she “plan[s] to personally use this data for any academic papers or projects in the future,” as part of her commitment to “amplifying CHamoru voices, opinions, and concerns” (NASA R4).

As the previous section discussed, many RRs felt that an embodied connection to their family or community enabled them to respect the political views of others on decolonization, even when it differed from their own. In addition, many also manifested an appreciation for *how* this kind of orientation can be cultivated. Recognizing that “everyone wants and deserves an opportunity to be heard,” some emphasized the importance of “not go[ing] in with any expectations, to allow for an open mind and genuine . . . conversation” (AP R4), while others learned how to “respectfully agree to disagree” (CQ R4). Mirroring themes discussed in the previous section, this indicates how RRs’ embodied and relational experiences of doing community outreach enabled them to gain a better sense of how to make others feel comfortable, how to be open and present in engaging others in conversation, and how to pitch research in ways that resonate with everyday people. As one RR notes, this is particularly important because poor and working-class Chamorus are often left out of the island-wide conversation on decolonization, yet “those who are not of higher academia are just as important of people to listen to and learn from” (NASA R4).

This section thus demonstrates another personal transformation at stake in decolonial PAR—wherein RRs shift from community residents learning the ropes of research, to seeing themselves as capable decolonial researchers with the capacity of both producing knowledge to advance decolonization and holding space for Indigenous residents to play a critical role in this collective process.

Conclusion

As the academic fields of geography and planning are renewing their investments in racial justice and decolonization, we need more research seeking to advance both of these causes. In Guåhan, our decolonization struggles certainly do not have the luxury of time. Enabled by Guåhan’s current political status and concomitant lack of robust bargaining mechanisms with the United States, the US military is making swift progress on the construction of a firing range in the sacred site of Litekyan (or Ritidian Point)—in spite of fierce Indigenous opposition, led by the grassroots group Prutehi Litekyan (Na’puti, 2019). Home to some of our island’s largest and oldest limestone forests, hundreds of endangered species, medicinal plants for suruhånu (traditional Chamoru healers), and

ancient Chamoru relics (e.g. latte stones, pots), our land, waters, culture, other-than human flora and fauna relatives, and our sovereignty are at stake.

At this critical juncture, decolonial PAR can play a key role in connecting academic research to ongoing decolonization struggles in Guåhan and beyond, not least through cultivating decolonial subjectivities in RRs. However, far from offering an exhaustive characterization of decolonial subjectivities, this article leaves much room for future research. For instance, beyond dialogue journaling, how might other reflection tools more effectively capture the dynamic, embodied ways in which decolonial subjectivities shift over time? How might PAR design be better structured to more effectively cultivate decolonial subjectivities in RRs? How might decolonial subjectivities enable social change at broader scales—the island, archipelago, ocean, globe? How are these processes ultimately mediated by the geographically uneven articulations of empire and colonialism on one hand, and of decolonization movements on the other? Furthermore, while our focus on RRs is helpful in understanding how PAR connects to local social change, how might the decolonial subjectivities of professional researchers also change over time, and with what implications for the institutions and communities that they inhabit?

Importantly, such questions are only surfaced through fruitful cross-pollination between feminist and decolonial PAR praxis. Above all, this article highlights how feminist PAR—through centering relationality and care in PAR design, and through centering subjectivities in understanding conscientização—can shed light on important pathways through which PAR contributes to local Indigenous sovereignty struggles. Moving forward, we thus call for more scholarship at the intersection of feminist and decolonial PAR, to more sensitively attend to the complex relationship between participatory research methodologies and the political project of decolonization writ large.

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Notes

1. We opt to use the original “conscientização” rather than its common English translations to retain its genealogical roots in the Latin American context of Brazil.
2. Throughout this article, we do not italicize any Chamoru or other Indigenous words to avoid the implications of exoticization and foreignness.

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Appendix I

Codebook_v1 (based on theoretical framework).

Code	Description
embodied connections to decolonization	general references to relationship between self, other, community, and/or other communities across space and scale, uncaptured by subthemes
identity and positionality	references to non/indigeneity
connection to research team	references to others on the research team (including co-Pis and other resident researchers)
connection to broader chamoru community	references to chamoru community as part of outreach, understanding and feeling stakes of project etc.
connection to sovereignty	references to the island, to <i>lâguas yan gâni</i> , to that which has been stolen
connection to decolonization struggles elsewhere	references to other indigenous struggles occurring outside the context of <i>guâhan</i> or <i>lâguas yan gâni</i>
embodied commitment to decolonization	general references to political efficacy and commitment to active involvement in decolonization efforts, uncaptured by subthemes
learning	references to learning from data collection and outreach process about role of PAR project in decolonization
responsibility	references to moral and/or political responsibility to advance decolonization
affirmation of power to effectuate change	references to understanding one's skills and strengths, and how PAR involvement can make a difference for decolonization struggles
commitment to action	direct references to active involvement in decolonization efforts
care	references to caring for self and/or others as part of feminist and decolonial praxis

PAR: participatory action research.

Codebook_v2 (after incorporating open coding).

Code	Description
embodied connections to decolonization	general references to relationship between self, other, community, and/or other communities across space and scale, uncaptured by subthemes
identity and positionality	references to non/indigeneity
connection to co-Pis	references to co-Pis (mentorship, culture, care)
connection to resident researchers	references to resident researchers (collaboration, learning, care)
connection to family	references to family members as part of outreach, understanding and feeling stakes of project etc.
connection to broader chamoru community	references to chamoru community as part of outreach, understanding and feeling stakes of project etc.
connection to decolonization struggles elsewhere	references to the island, to <i>lâguas yan gâni</i> , to that which has been stolen
struggles elsewhere	references to other indigenous struggles occurring outside the context of <i>guâhan</i> or <i>lâguas yan gâni</i>
embodied commitment to decolonization	general references to political efficacy and commitment to active involvement in decolonization efforts, uncaptured by subthemes
learning	references to learning from data collection and outreach process about role of PAR project in decolonization
recognition of work yet to be done	references to shortfalls in and limits to PAR project, and/or future work that needs to be done to advance decolonization
responsibility	references to moral and/or political responsibility to advance decolonization
affirmation of power to effectuate change	references to understanding one's skills, strengths and/or general capacity to make a difference for decolonization struggles
commitment to action	direct references to active involvement in decolonization efforts
care	references to caring for self and/or others as part of feminist and decolonial praxis
personal struggles	references to self-doubt, insecurity, uncertainty

PAR: participatory action research.

Codebook_v3 (after trial coding of five randomly sampled reflections).

v3

Code	Description
embodied connections to decolonization	general references to relationship between self, other, community, and/or other communities across space and scale, uncaptured by subthemes
identity and positionality	references to non/indigeneity
connection to co-Pis	references to co-Pis (mentorship, culture, care)
connection to resident researchers	references to resident researchers (collaboration, learning, care)
connection to family	references to family members
connection to broader chamoru community	references to chamoru community
connection to decolonization	references to the island, to <i>lāguas yan gāni</i> , to that which has been stolen, to the political stakes of the project
connection to decolonization struggles elsewhere	references to other indigenous struggles occurring outside the context of <i>guāhan</i> or <i>lāguas yan gāni</i>
embodied commitment to decolonization	general references to political efficacy and commitment to active involvement in decolonization efforts, uncaptured by subthemes
learning	references to learning from data collection and outreach process about role of PAR project in decolonization
recognition of work yet to be done	references to shortfalls in and limits to PAR project, and/or future work that needs to be done to advance decolonization
affirmation of power to effectuate change	references to understanding one's skills, strengths and/or general capacity to make a difference for decolonization struggles
commitment to action	direct references to active involvement in decolonization efforts
care	references to caring for self and/or others as part of feminist and decolonial praxis
personal struggles	references to self-doubt, insecurity, uncertainty, exhaustion, being a people pleaser, disregarding own needs

PAR: participatory action research.

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Operationalising Indigenous data sovereignty in environmental research and governance

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Abstract

In the face of climate change, Western environmental research and governance processes and institutions are increasingly seeking to learn from and harness Indigenous peoples knowledges, perspectives, and practices of land and water management. There are both opportunities and risks for Indigenous groups seeking to exploit these opportunities to (re)connect with their homelands and reinvigorate dormant cultural practices. This article considers these issues by highlighting the barriers, risks, and opportunities, across three case environmental study sites – cultural burning, Geographic Information Systems (GIS) mapping, and marine science. We offer Indigenous data sovereignty and Indigenous data governance as both guiding principles and a practical blueprint that can make safe these intercultural environmental collaborations by mitigating against perverse or unintended consequences of Indigenous knowledge theft, as well as maximising opportunities to foster sustainable self-determination and self-governance.

Keywords

Indigenous data sovereignty, environmental research, environmental policy, decolonised research methods

Introduction

In the face of climate change, and the natural disasters it produces, Indigenous peoples land and water management knowledges, perspectives, and practices have come into sharp focus by environmental researchers and governing practitioners (Cumpston, 2020; David-Chavez and Gavin, 2018; Intergovernmental Panel on Climate Change (IPCC), 2022; Neale, 2020). The goal seems clear: to harness and learn from Indigenous peoples' knowledges, perspectives and practices, and apply these to mitigate against the impacts of climate change and create more resilient landscapes and

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communities (David-Chavez and Gavin, 2018; Intergovernmental Panel on Climate Change, 2022). These strategic openings offer opportunities for Indigenous peoples to (re)connect with their traditional territories and reinvigorate their knowledges and traditions after centuries of oppression and disconnection (Davis and Todd, 2017; Nursey-Bray et al., 2019). Conversely, these engagements also carry significant risks to Indigenous peoples and their knowledges.

Historical colonisation and contemporary settler-colonialism have created systems, structures and processes that marginalise, discriminate and oppress Indigenous peoples (Alfred and Corntassel, 2005; Veracini, 2011; Wolfe, 2006). These systems of marginalisation, discrimination and oppression are observed in many parts of society such as the high rates of Indigenous incarceration (Shepherd et al., 2020), poverty, homelessness and removal of children (Bradford, 2020), and low rates of educational attainment, home ownership, economic participation and political representation (Altman et al., 2008; Bishop, 2021; Campbell et al., 2012; Houkamau and Sibley, 2015). Many of these features are shared by Indigenous peoples internationally in settler states such as Aotearoa New Zealand, Australia, Canada and the United States, suggesting that these phenomena are connected in a larger colonial project designed to control Indigenous peoples' lands, and disempower them to respond (Alfred and Corntassel, 2005; Wolfe, 2006). We conjecture that over time, these processes have not abated and have in some ways intensified. It is in this settler-colonial context that we examine Indigenous peoples' engagements with Western environmental research and governance practices, processes and institutions.

In this article, we examine the exponential growth in reference to Indigenous knowledges and practices in the fields of environmental research and governance. We seek to understand the drivers for this increasing recognition and ask whether a growing acknowledgement of the value of Indigenous knowledges represents meaningful opportunities for Indigenous peoples or simply the reproduction of Western modalities of extraction that have complicated Indigenous-settler relations since contact. The scope of these engagements varies widely from project-based collaborations in local communities, scientific collaborations examining a raft of environmental matters or ecological services, to jointly managed national parks and protected areas. They occur across a vast array of landscapes such as deserts, forests, coastlines and mountains, and include the management of fresh and saltwater. Within these engagements appears to be a hunger on the part of non-Indigenous environmental managers and researchers to learn about Indigenous peoples knowledges (knowledges), to understand Indigenous peoples relationships with their territories (perspectives), and to observe, record and evaluate Indigenous peoples land and water management practices (practices). In this article we collectivise the concurrent systems of knowledges, perspectives and practices into a new term: Indigenous environmental data.

As Indigenous peoples then, we find ourselves at a juncture of intersecting interests. On one hand, we feel compelled to seize opportunities to (re)connect with our territories, to practice our traditions, and strengthen and transmit culture. Should collaborations with settler environmental research and governance facilitate these connections, then it is in our collective interests to pursue these opportunities. Yet we cannot ignore our settler-colonial realities which uphold systems and structures that continue to marginalise and oppress. In the context of this article, we focus attention on Indigenous concerns that our environmental data will be appropriated and used to make safe and enhance environments that settler-colonialists themselves have desecrated and mismanaged (Gammage, 2011). Encouraged by the work of Potawatomi philosopher Kyle Powys Whyte (2017), we find ourselves asking, 'In what ways does the collection and sharing of Indigenous environmental data propagate settler futurity through the maintenance of the settler-colonial status quo?' With this in mind, the project that arises then, is the creation of meaningful intercultural engagements that bring about Indigenous custodianship of thriving environments, while mitigating against perverse or unintended consequences such as the appropriation and misuse of Indigenous environmental data. We suggest

that the principles and practices of Indigenous data sovereignty offer both the intellectual framework and practical blueprint to make safe Indigenous environmental data in the context of settler environmental research and governance.

To have this yarn,¹ we will first introduce the concept of Indigenous data sovereignty and Indigenous data governance, drawing attention to their emergence as an international field of study and their contributions to policy and practice. We then examine the increasing recognition of the value of Indigenous peoples knowledges in Western environmental research and governance. This engagement is contextualised through the examination of three case-study areas: fire management, Geographic Information Systems (GIS) and marine research. Finally, we examine some of the risks, barriers and opportunities in these engagements. We then apply Indigenous data sovereignty principles to reveal a pathway to maximise the opportunities in intercultural collaborations while protecting Indigenous environmental data.

We write as a group of Indigenous academics from the continent currently known as Australia. Bhiamie Williamson is a Euahlayi man from north-west New South Wales, with familial attachments to north-west Queensland. He has an academic and professional background in Indigenous governance and cultural land management, with a particular focus on cultural burning. Being educated in Australia, Bhiamie has also studied in both Canada and the United States, bringing an awareness of the common challenges, and differences, between Indigenous peoples in various settler-colonial states. Sam Provost is a Yuin man from the south coast of New South Wales with Irish and Scottish settler heritage. Sam has an academic background in biodiversity conservation and GIS, with a research focus on holding Indigenous and settler understandings of place in conversation with one another towards the better management of the country. Cassandra Price is a Muruwari/Gangugari woman, raised on traditional lands of the Juru people in North Queensland, with an academic and professional background in marine science, climate ecology, Indigenous health and policy. Cassandra has developed and implemented Indigenous data governance policies, structures and processes to support Indigenous data sovereignty in her various roles. Bhiamie, Sam and Cassandra are members of the Maiam nayri Wingara Indigenous Data Sovereignty Collective. Maiam nayri Wingara is a group of Indigenous academics from various disciplines including demography, statistics, public health, geography and social science, dedicated to progressing Indigenous data sovereignty and Indigenous data governance throughout Australia. Maiam nayri Wingara forms a chapter in the Global Indigenous Data Alliance (GIDA), whose other groups include Te Mana Raraunga: Maori Data Sovereignty Network, and the United States Indigenous Data Sovereignty Network (USIDSN). In this article, we bring together our collective interest in, and desire to progress, Indigenous data sovereignty with our common work in adjacent fields of environmental research and governance. We each reflect on our areas of expertise and identify common risks in intercultural collaborations that we feel can be mitigated against through the practical application of Indigenous data sovereignty. We write this article for an international audience; such are the shared issues in Indigenous data sovereignty and environmental research and governance throughout the settler-colonial world. However, we remain grounded through our experiences as Indigenous peoples from, and our work with Indigenous groups throughout, Australia.

An introduction to Indigenous data sovereignty

Indigenous data sovereignty finds its roots in the inherent sovereignty of Indigenous peoples as affirmed in the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) which recognises the rights of Indigenous Peoples to control, protect, maintain and develop their cultural heritage, traditional knowledge and traditional cultural expressions, including manifestations of their sciences, technologies and cultures (United Nations, 2007). Similarly, the UN Sustainable Development

Goals consider data collection and management vital for building the sovereignty of Indigenous populations.

In this article we align with the following definitions, which were adopted at a summit hosted by the Maïam nayri Wingara Indigenous Data Sovereignty Collective and the Australian Indigenous Data Governance Institute in Canberra, Australia, in June 2018:

‘Indigenous Data’ refers to information or knowledge, in any format or medium, which is about and may affect Indigenous peoples both collectively and individually.

‘Indigenous Data Sovereignty’ refers to the right of Indigenous peoples to exercise ownership over Indigenous Data. Ownership of data can be expressed through the creation, collection, access, analysis, interpretation, management, dissemination and reuse of Indigenous Data.

‘Indigenous Data Governance’ refers to the right of Indigenous peoples to autonomously decide what, how and why Indigenous Data are collected, accessed and used. It ensures that data on or about Indigenous peoples reflects our priorities, values, cultures, worldviews and diversity (Maïam nayri Wingara & Australian Indigenous Governance Institute, 2018).

Indigenous data sovereignty has developed as both an academic field, and in policy and practice, over the past decade in response to poor data practices by governments, government agencies, researchers and research institutions. This includes not making Indigenous data accessible and available to Indigenous peoples, and using (or misusing) data to maintain pejorative stereotypes and paint Indigenous peoples as a ‘problem’ to be fixed (Ellinghaus, 2003). On this last point, Walter (2018) describes this through the BADDR framework, that is, data that are ‘Blaming, Aggregate, Decontextualised, Deficit and Restricted’ (p. 258).

What is missed in these data processes is collection of data that is valued by Indigenous peoples, including representative bodies such as First Nations governments, community-controlled organisations and tribal corporations. Rarely are Indigenous peoples considered legitimate end-users of data and thus, collection of data, primarily by government agencies, does not account for variables and data points that provide any basis for good governance and decision making.

In response, Indigenous academics, policymakers and community leaders have created and continue to progress the field of Indigenous data sovereignty and its activation mechanism, Indigenous data governance.

Indigenous data sovereignty includes data on Indigenous individuals, such as students in education or patients in healthcare, as well as collectively as groups, communities and nations. At both levels – individual and collective – Indigenous peoples possess unique rights over their data as highlighted in the UNDRIP. This includes rights to govern data about cultural knowledge, and land and resources (Rainie et al., 2019). In this way, Indigenous data sovereignty is an expression of Indigenous peoples inherent rights to self-determination and self-governance (United Nations, 2007: Art 18), and includes the rights of Indigenous Peoples to determine the means of collection, access, analysis, interpretation, management, dissemination and reuse of their data (Kukutai and Taylor, 2016; Snipp, 2016).

As complex as the terminology, practices, infrastructure, policies and more are in relation to Indigenous data sovereignty, it can be reduced to a simple philosophy: Indigenous control of, and benefit from, the entire data life cycle, that is: inception (which data are collected and why?), collection (how is the data gathered?), storage (what does software and physical infrastructure look like and what laws govern it?), access and permissions (who can view the data and under what conditions?), analysis (in what ways are the data interrogated?), storage (how are the data organised?) interpretation (what does the data mean?), representation (how are data communicated clearly with Indigenous peoples?) and reuse (how can existing data continue to add value?). A commitment to Indigenous data

governance makes it possible to embed the principles of Indigenous data sovereignty no matter where data are held or by whom.

There have been important gains in Indigenous data sovereignty and governance in recent years. In Australia, Nyamba Buru Yawuru, the prescribed native title corporation for Yawuru people in the Kimberly region conducted a community wellbeing survey to categorise Indigenous peoples living in the Broome area (over which they are recognised native title holders) as well as to gather information on community health and wellbeing (Taylor et al., 2014). Since then, the Mayi Kuwayu longitudinal study of Indigenous wellbeing has been conducted by an Indigenous public health team at the Australian National University (Mayi Kuwayu National Study of Aboriginal and Torres Strait Islander Wellbeing, 2022). This study is the largest of its kind, gathering information on a range of health and wellbeing variables including culture, housing, health, education, racism (i.e. those who have experienced it and how) and more. This data set is stewarded by an Indigenous data governance committee that manages access to these data by researchers and external organisations.

Outside of Australia, Indigenous academics have taken steps to addressing these imbalances, such as through development of the CARE principles for Indigenous data governance. CARE is an acronym meaning Collective benefit, Authority to control, Responsibility and Ethical (Carroll et al., 2021). Carroll et al. (2021) state that

The CARE Principles for ‘Indigenous Data Governance’ empower Indigenous Peoples by shifting the focus from regulated consultation to value-based relationships that position data approaches within Indigenous cultures and knowledge systems to the benefit of Indigenous Peoples. This shift ultimately promotes equitable participation in processes of data reuse, which will result in more equitable outcomes. (p. 3)

Building on the CARE Principles, Indigenous academics and data practitioners have recently developed Biocultural (BC) labels (ENRICH, 2021; Local Contexts, 2022). BC labels build upon Traditional Knowledge (TK) labels, which have emerged as a critical tool for addressing ownership access and control over Indigenous data (Anderson and Hudson, 2020; ENRICH, 2021). These labels define the community expectations, and consent regarding appropriate and future use of Indigenous environmental data (Anderson and Hudson, 2020). The labels are directly incorporated into the digital infrastructure of data management systems and work at the level of metadata to enhance local-based decision making and Indigenous governance (Carroll et al., 2021). These BC labels, initiated by Indigenous people, demonstrate the innovative methods that are currently being developed under the umbrella of Indigenous data sovereignty and governance, and offer significant opportunity for environmental research and governance institutions to engage practically with Indigenous data. Importantly, these data management tools provide a mechanism for Indigenous peoples to safeguard their own data in an era of Big and Open Data (Walter et al., 2021). These examples demonstrate how Indigenous peoples, academics and leaders are progressing Indigenous data sovereignty and governance.

Yet despite its global significance and relevance to a great number of areas in society, Indigenous data sovereignty is currently applied unevenly across sectors. In our shared work, and in the context of this article, we describe the disciplines that underpin environmental research and governance as an Indigenous data sovereignty wasteland.

Indigenous environmental data in research and governance

The following section tracks the rise in engagement between Indigenous environmental data in environmental research and governance, and the apparent conditions under which these data are valued by Western science.

The utility of Indigenous environmental data for addressing the complexity of environmental problems such as anthropogenic climate change, mass extinction and pollution is attracting increasing

attention in the academic literature (David-Chavez and Gavin, 2018). In order to better understand the context of this trend and to gain a clearer perspective of its drivers, we seek to answer two key questions: At what point did this engagement begin and at what rate is it occurring? To attempt to answer these questions, we ran a scoping review in Scopus, the largest abstract and citation database of peer-reviewed literature in the fields of science, technology, medicine, social sciences, and arts and humanities. The aim of the literature review was to graphically represent the amount and frequency that peer reviewed publications in the disciplines of environmental science referred to Indigenous knowledges, and synonyms thereof. Figure 1 illustrates an exponential rise in the number of publications in the period 1980–2021 in the discipline of environmental science that refer to Indigenous knowledges.² This date range was selected because, according to the Scopus database, prior to 1980 there were no consistent annual publications (outliers prior to 1980 were 1974=1, 1976=1 and 1978=1).

Figure 1 demonstrates a clear trend of increased engagement between environmental science as a meta-field and Indigenous knowledges. More research is needed to dig deeper into this analysis and reveal the nature and extent of these collaborations, as well as whether it is more pronounced in certain scientific disciplines than others.

Articulations of the value that Indigenous environmental data can add to the myriad fields of environmental research are often utilitarian in nature. For example, in a paper by Stevenson (1996) detailing the difficulties and opportunities related to incorporating Indigenous knowledges into Environmental Impact Assessment processes in northern Canada, he writes, ‘The intention of this paper was not to debase traditional knowledge. Rather, it was to elucidate a process for *maximising the full contributions* of Aboriginal people and *their entire knowledge base* [emphasis added]’ (p. 287). Similarly, with a comparable move in a different field, Tengö et al. (2014) explain that ‘Indigenous and local knowledge systems, developed through experimentation, adaptation, and co-evolution over long periods of time can provide *valid and useful* [emphasis added] knowledge, as well as methods, theory and practices for sustainable ecosystem management’ (p. 579). David-Chavez and Gavin (2018) conducted a systemic review of global literature relating to the fields of climate studies and Indigenous peoples. In this study they found that

On a global scale we find that the vast majority of climate studies (87%) practice an extractive model in which researchers use Indigenous knowledge systems with minimal participation or decision-making authority from communities who hold them. (David-Chavez and Gavin, 2018: 8)

While displaying various degrees of subtlety, the extractive nature of Western scientific approaches to harnessing Indigenous environmental data to serve its own purposes – in this case, development and sustainability (more on how this is at odds with Indigenous paradigms later). Although well-meaning, espousing the benefits of leveraging ‘alternative’ worldviews to help solve what Western science has identified as wicked problems demonstrates a lack of understanding of the power imbalances that have marred cross-cultural engagements.

This push to engage Indigenous environmental data extends beyond concerned researchers and into international environmental bodies. In recent years, the Intergovernmental Panel on Climate Change (IPCC) has increased references to Indigenous environmental data in their reports. The 2014 Fifth Assessment positioned Indigenous knowledges as ‘a major resource for adapting to climate change’ (Pachauri et al., 2015: 19), however, as Ford et al. (2016) argued, while Indigenous peoples and knowledges were considered to be valuable, ‘there is little critical engagement with indigenous knowledge systems, and the historical and contextual complexities of indigenous experiences are largely overlooked’ (p. 349). While the IPCC outwardly advocates for the importance of Indigenous environmental data in their processes, an inability to deliver tangible progress in this space has prompted critique. A recent analysis of the modes of knowledge production in the IPCC (Rashidi and Lyons, 2021: 2) finds that Indigenous knowledges are ‘positioned as sources of information that may

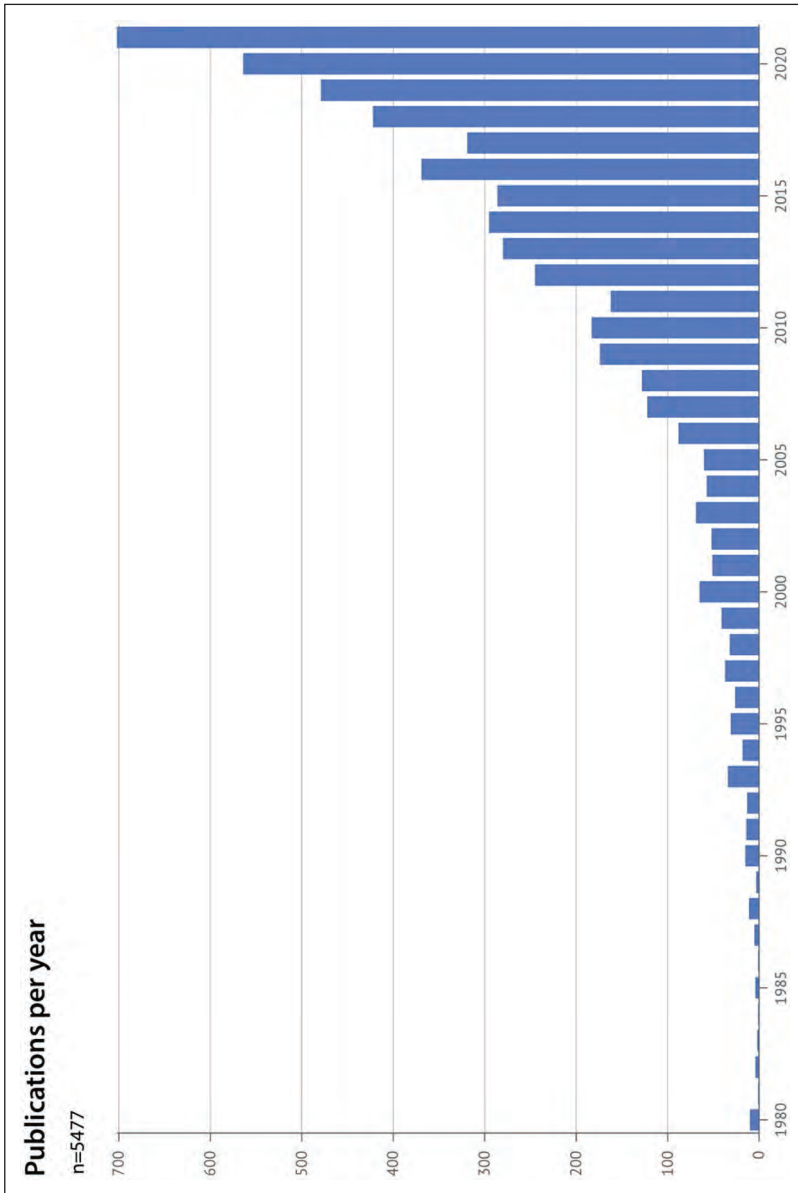


Figure 1. Number of publications per year referring to indigenous knowledges in the discipline of environmental science between 1980 and 2021.

supplement science', while Indigenous peoples are 'situated as vulnerable to climate change, rather than actors who may be empowered by the tools of their own knowledge systems'. The recent publication of the IPCC 2022 Sixth Assessment has attempted to address this critique, and for the first time have included Indigenous knowledges in the report (Intergovernmental Panel on Climate Change, 2022). However, Indigenous scholars have highlighted the extractive nature of this inclusion due to a failure to ensure Indigenous leadership in the IPCC authorship team (Moggridge et al., 2022a). That one of the largest transnational research bodies has yet been unable to engage Indigenous peoples and their knowledges in a meaningful way may be indicative of a broader issue underpinning Western scientific approaches to knowledge production.

Indigenous environmental data is produced through connections to the earth, cultural identity, language, traditional kinship systems and the valuing of cultural knowledge holders within a community (Moggridge et al., 2022b). Where Indigenous peoples and their data have drawn the focus of Western scientific research, meaningful engagement has often been undermined by unequal power dynamics, coercion and knowledge theft (Ermine et al., 2004; Whitt, 2009). These trends exist historically but have also been identified contemporarily. David-Chavez and Gavin (2018) found that

When considering Indigenous knowledges in climate research studies we must also consider intellectual property rights and potential problematic risks to communities. Findings from this study infer that for most climate studies (n = 101, 81%), researchers from outside the community will inevitably be cited in connection with Indigenous knowledge reported in the research findings. (p. 11)

Despite the fraught process of engagement and inclusion, Indigenous knowledges in environmental research are rapidly increasing. Examination of the contexts under which Indigenous environmental data is considered valuable by environmental research and governance is worth pursuing. Historical and contemporary engagement of these data has tended to occur only under particular circumstances, while largely being disregarded otherwise. Looking to the key spaces in which intimate knowledges of landscapes, hydrological processes, and plant and animal distribution are valued by environmental research, we see that settler states of crises often drive motivations for engagement. This is particularly apparent in climate change research, where, due to historical adaptation and mobilisation in response to large-scale climatic shifts, Indigenous communities are framed as fonts of knowledge for resilience and adaptive capacity (Nurse-Bray et al., 2020; Whyte, 2017).

The leveraging of Indigenous knowledges in response to settler crises is not a new phenomenon. Consider the enlistment of Aboriginal and Native American guides by early European settlers such as Burke and Wills in Australia, or Lewis and Clark on Turtle Island (United States). The survival of these foreigners, charged with scientific exploration and the categorisation of 'new lands', relied heavily on local Indigenous knowledge. While these engagements may have been couched as attempts to understand the cultural and epistemological frameworks of Indigenous peoples, the result was more often the utilisation of Indigenous knowledges of these landscapes to ensure safe passage and the expansion of empire.

This harnessing of Indigenous environmental data towards the proliferation of settler colonialism can be seen globally. As if shocked, Duncan (2012) laments that not only was Turtle Island inhabited prior to the Corps of Discovery, he writes that 'the even harder truth is this: Without those Indians, Lewis and Clark would never have made it to the Pacific Ocean and back' (p. 106). Similarly, on the role that Indigenous environmental data played in this early tranche of scientific exploration in Australia, Host and Milroy (2001) write, 'from the earliest days of European settlement, Western Australia has relied like other Australian states on the skills and labour of Aboriginal people. Without their expertise as guides and trackers, colonial expansion would have been severely restricted' (p. 6). The expansion of the cattle industry throughout northern Australia offers another compelling example of how Indigenous peoples knowledges of landscapes have been leveraged against the country³ they

are obliged to care for. Knowledges of waterholes and safe travel routes throughout northern Australia provided the basis from which colonial settlers established a thriving cattle industry throughout northern Australia, with Indigenous men and women offering both the Indigenous environmental data as well as physical (and frequently unpaid) labour (Smith, 2003).

Within this context, these prototypical engagements of Indigenous knowledges can be read as the first instances of intercultural environmental collaborations, and arguably set the power dynamics for research and governance ever since. Even today, struggles of power can be observed in discourses of ‘environment’ and ‘management’ (Weir, 2021). Weir illuminates:

The language of environmental management is the language of whose perspectives are considered valid and authoritative, and, thus, whose priorities matter, and what might be done about them (2021: 175).

We continue this exploration of power dynamics through consideration of the barriers, risks and opportunities that remain in these intercultural collaborations. We consider three environmental domains to do this – fire management, GIS, and marine research. These case studies are informed by our individual experiences of research and collaboration in our respective fields and communities of partnership.

Fire management

Indigenous burning practices vary widely throughout the world. After all, the burning practices of Indigenous groups in northern Australia’s savannah will be ill-equipped to respond to environmental conditions in temperate forests in south-eastern Australia. This highly localised and place-based system of knowledge and practice has developed over millennia (Gammage, 2011; Steffensen, 2020). Indeed, the use of fire throughout the continent has shaped many native species that now require fire to survive and propagate (Gammage, 2011; Steffensen, 2020). For instance, there are seed pods that require smoke to germinate, native grasses that regenerate following low-intensity fire, bird species that use burning as strategic opportunities for hunting, and more. Although the use of fire was widespread, it was a practice that was closely guarded and supervised by senior cultural leaders (Steffensen, 2020).

The advent of colonisation including the removal of Indigenous groups from their traditional territories, the privatisation of land, land clearing for industry and urbanisation, resulting in many Indigenous fire management practices being suppressed, and lying dormant for many generations (Department of Environment, Land, Water and Planning, 2020; Smith et al., 2021). But these knowledges are waking up, stoked by an acknowledgement that Australia is a landscape that has evolved with and requires fire, as well as the need to respond to climate change including the natural disasters, such as wildfires, it drives (Neale, 2020; Smith et al., 2021).

Indigenous groups throughout northern Australia have led in this cultural burning renaissance (Altman and Fisher, 2020; Russell-Smith et al., 2010). In Australia’s north, twin features of savannah grasslands and monsoonal weather patterns produce highly flammable ecosystems (Russell-Smith et al., 2010). Added to these natural factors is the generational mismanagement of lands and waters by government agencies, mining industries and private landholders, creating a volatile landscape that by the 1980s was experiencing regular catastrophic wildfires (Kerins, 2012). The return of lands to Indigenous peoples, particularly in the Northern Territory through the Aboriginal Land Rights Act (Cth) 1976, permitted Indigenous groups to return to their territories and later, re-establish their burning regimes. The results of these practices have been stunning, with a demonstrable impact in reducing the frequency, size and severity of late season wildfire (Altman and Fisher, 2020; Kerins, 2012; Resilient Landscapes Hub, 2014).

As these programmes have expanded and evidence collected to demonstrate their impact, Indigenous fire programmes have grown throughout central Australia and increasingly, southern

temperate Australia (Neale et al., 2019; Smith et al., 2021). Indigenous burning programmes have also re-emerged throughout Turtle Island including northern California and Oregon (Marks-Block et al., 2021), British Columbia (Boutsalis, 2020), as well as southern Africa such as in Botswana (Johnston, 2020). Reinvigorating fire management traditions offer immense opportunity for Indigenous peoples as a method to reconnect with their traditional territories, to awaken dormant cultural–environmental practices, to transmit culture, and to create economic and community development through cultural land management programmes (Kerins, 2012).

Geographic Information Systems

GIS are software programmes developed for the storage, analysis and representation of digital geospatial data (Chang, 2019). GIS has emerged as the predominant suite of tools used by governments and practitioners for spatial governance and planning (Tomić Reljić et al., 2017; van Maarseveen et al., 2019), natural resource management (Zhu, 2016), biodiversity conservation (Doxa et al., 2016; Foody, 2008) and disaster response and management (Tomaszewski, 2021). At the same time, GIS is being harnessed by researchers and geospatial analysts to produce intricate and detailed spatial models that tell us new information about the landscapes we inhabit and belong to (Lü et al., 2019). Both use cases – from the logistical to the leading edge – offer novel opportunities for Indigenous peoples to articulate the unique relationships they share with their environments, and to influence the representation and management thereof.

Indigenous relationality means many different things to different peoples and communities. One of the ways that it manifests is as spirals of complex kinship webs that hold Indigenous peoples together and in place, which grounds us and emerges as ‘culturally specific and gendered axiologies, ontologies, and epistemologies that are connected to the earth’ (Moreton-Robinson, 2017: 1). While it is unlikely that this level of complexity ever could, or should, be represented in a software programme, GIS offers insights to this depth of place through its capacity to hold and display large amounts of information in a relatively accessible format. The novel and creative uses of GIS emerging in the academic literature show immense potential for exploring the interface between people and place. This capacity for creativity, coupled with rapid advances in remote sensing and mapping technology (Rose et al., 2015; Toth and Józków, 2016), has resulted in the uptake of GIS by Indigenous peoples globally. The development of Indigenous GIS has proven valuable across a range of cultural and geographic contexts with notable examples, including the interfacing of Indigenous spatial and cultural information with Western science for the Iñupiat community in Alaska (Eisner et al., 2012), asserting Indigenous rights to land and management over cultural resources for the Yawuru people of Broome (Potter et al., 2016), and supporting Indigenous agroecology for the Māori Te Kaio farm community in Aotearoa New Zealand (Moore et al., 2016).

Marine research

The field of marine research is broad and includes genomics, oceanography, marine modelling, marine biology and ecology, fisheries and aquaculture. In Australia, marine research agendas are largely geared towards answering questions set out by settler–colonial research institutions, leaving little room for Indigenous-led marine research (Austin et al., 2019). Since contact, Indigenous peoples have struggled for recognition of their legal rights to Sea Country and the resources therein (Rist et al., 2019; Smyth, 1993). Sea Country (or Saltwater Country) is a collective term for the marine environments that coastal Indigenous peoples belong to (Rist et al., 2019). Traditional Owners have been an active part of the Australian coastal landscape for thousands of years and have developed responsibilities and obligations to protect, manage and to look after Sea Country through customary lore and practice (Moggridge et al., 2022b). Aboriginal and Torres Strait Islander peoples, knowledge systems, values and rights for

Sea Country are multifaceted and have only recently been recognised and incorporated into policy, decision-making and contemporary maritime management (Rist et al., 2019).

Most existing Indigenous-led or co-managed marine research projects have developed within the marine park management space such as in marine protected areas and Indigenous protected areas. These projects aim to integrate Indigenous knowledge and Western science in support of decision-making, policy development, research and management (see Kimberley Indigenous Saltwater Science Project, Great Barrier Reef Marine Park, Girringun Region). These projects predominantly occur on Sea Country where the rights of Traditional Owners have been recognised through legislation such as the *Native Title Act 1993* or elsewhere have been recognised by the government via the International Union for the Conservation of Nature (IUCN) (Rist et al., 2019). However, opportunities for Indigenous management of Sea Country where Traditional Owner rights are not currently recognised are severely limited and there are few accountability mechanisms in place to ensure that governments and research institutions prioritise Indigenous aspirations or concerns. At present, while the recognition of Aboriginal and Torres Strait Islander rights to Sea Country is patchy at best, most marine research projects are not obliged to engage Traditional Owners meaningfully, despite the research happening on and in, Sea Country.

Discussion

In the sections above we have demonstrated that collaborations between Indigenous peoples and environmental research and governance are increasing exponentially (Figure 1). These collaborations are no doubt wide-ranging, varying in their size, scope and content. Moreover, they vary in their partnership arrangements from project-based activities, research and scientific collaborations, co-management agreements and more. By considering the three case-study areas of fire management, GIS and marine research as a small but representative sample of the forms these collaborations take, we highlight several commonalities that exist across these intercultural collaborations. These are organised into themes in three distinct but interrelated domains: barriers, risks and opportunities.

Barriers

There remain significant barriers for Indigenous peoples when engaging in environmental research and governance. Although we identify these challenges in the modern context, many have roots in early processes of colonisation and ensuing settler-colonialism. By highlighting the barriers that Indigenous peoples face in engaging fire management, GIS and marine research, we do not aim to discourage their uses and development. Rather, we do so to identify possible strategies to promote meaningful and reciprocal opportunities.

Following the horrific 2019–2020 ‘Black Summer’ bushfires which impacted vast areas throughout Australia, interest in Indigenous peoples’ burning practices as a tool to mitigate future catastrophic wildfire exploded. There was widespread interest in these practices as evidenced through national and international media (see Altman and Fisher, 2020; Bowman and Lehman, 2020; Funes, 2021; Neale, 2020), and, significantly, in the post-fire Royal Commission (Binskin et al., 2020).

Examining these engagements reveals that much of the interests in Indigenous peoples’ fire practices are predicated on how to manage the threat to other people’s lives or livelihoods, or how they can value-add to existing settler land and fire management regimes (Weir, 2021). These issues have been highlighted by a very few number of non-Indigenous scholars, such as Dr Timothy Neale (2020), who asks:

For non-Indigenous people with an established or new interest in this issue, the vital question to ask is: what are we trying to achieve in seeking to support cultural burning? Are we, the beneficiaries of colonial

dispossession, simply trying to make our lifestyles, houses and property safer from the increasingly combustible landscapes we have helped create? After everything, are we still looking for help without reciprocity?

While Dr Jessica Weir puts it more bluntly:

Indigenous people to not need to ask, nor offer something useful, in order to be involved in environmental management on their own territory (2021: 75).

Yet, even if settler land and fire management agencies were to find common ground and support the practical self-determination of Indigenous peoples through applying cultural burning, it remains that Indigenous groups must operate within systems and structures that configure power imbalances against us (Freeman et al., 2021; Williamson, 2021).

For instance, settler fire management practices, such as hazard reduction burning, usually consist of establishing hard containment lines to ignite and halt the spread of introduced fire. Fires that escape containment lines are perceived as undesirable, even threatening, and often result in investigations to ascertain what went wrong. Indigenous perspectives of fire management are generally less concerned with hard boundaries, with more interest focused on fire behaviour. Should a deliberately lit fire snake its way through a forested landscape, cleaning up the forest floor without threatening the canopy, creating regenerative smoke for seed pods, and allowing smaller creatures such as insects, invertebrates and amphibians, to escape and find refuge, then why should a fire not be free to burn for as long as it desires? After all, a fire exhibiting this behaviour is generally easy to control and extinguish, should it encroach on housing or infrastructure. Of course, there is risk involved with this, centrally being that if a fire is left to smoulder that a change in weather conditions can lead to a damaging outbreak. This is why senior knowledge holders, with deep systems of knowledge about climate and the landscapes they belong to, are the authority – because they possess the knowledge of when a fire can safely be left to burn (Steffensen, 2020). Another example is evident when considering the times that fires are introduced. Historically, Western fire practices are performed during the day, due to the 9–5 working hours of fire and land management staff. Indigenous fire regimes often begin in the late evening, introducing fire into the landscape prior to the night offering cooler conditions (Freeman et al., 2021). Burning at night has the added advantage of allowing people to clearly see the fire, thus making it easier to manage.

These examples, of which there are many more, are offered simply to illustrate the myriad ways that Indigenous peoples use fire, and to make clear that even when Indigenous peoples are ‘supported’ to conduct cultural burning, they are often required to perform these activities in ways that accord with settler laws and regulation (Freeman et al., 2021; Williamson, 2021). In the excitement of settler institutions and society realising the enormous potential offered by Indigenous peoples burning practices, what is often missed are the conditions enforced by settler institutions. As Smith et al. states:

The intensely contested nature of wildfire policy and relatively recent prominence of Indigenous fire management means there is little literature that explicitly deals with why and how intercultural fire collaborations succeed or fail (2021: 82).

In this way, environmental research and governance must recognise the barriers they impose, and undertake to move away from questions such as ‘how can Indigenous peoples burning practices improve settler fire management regimes?’, and towards questions like, ‘what reforms are needed in settler institutions that can foster deeper collaborations with Indigenous peoples, including their cultural burning practices, if Indigenous peoples are able and willing to collaborate?’

In the spaces of GIS, the increase in engagement by Indigenous peoples and communities comes with challenges. In settler states such as Aotearoa New Zealand, Australia, Canada and the United States, GIS and cartography remain grounded in settler logics of possession (Moreton-Robinson,

2015) that have played a key role in the dispossession of Indigenous peoples of their territories, lands, and waters. For instance, the inscription of cadastral spatial models – the representation of the metes and bounds of settler property – over Indigenous territory has been framed as a crucial process in the administration of the settler colonial project (Adams, 2002; Black, 2018; Mar and Edmonds, 2010). Indigenous understandings of place do not fit neatly into blocks and property allotments. Instead, landscapes are experienced as a continuous entity connected through family, culture and relationships with the non-living. Despite the work done to decolonise geography and cartography, we remain hamstrung by spatial models and data structures that have not emerged from Indigenous lifeways. This distillation of landscapes into a series of lines, polygons and points raises questions about the appropriateness of GIS for modelling Indigenous relationality, prompting spatial analysts to decolonise the ways we think about representation.

Another key barrier to the production of Indigenous GIS is the preventive costs of the industry, which has the unintended consequence of exacerbating Indigenous peoples and communities' data precarity. The often-prohibitive costs of maintaining GIS software licences and mapping software can have the adverse effect of encouraging communities to outsource their data collection and management processes. This results in Indigenous environmental data being stored with institutions that can afford it, such as universities or government institutions. This is worsened by institutional gatekeeping that continues to position researchers as experts, while Indigenous peoples are framed as untapped wells of environmental knowledge, but somehow unable to learn the skills to do the work themselves. In response, thoughtful GIS research must address questions of who has the training and capacity to collect data, make maps, run analysis and leverage outputs to support decision making.

In marine research and governance, inadequate engagement of Indigenous peoples remains one of the key barriers. Central to this issue is that while ethical guidelines have been developed to ensure that research with Indigenous people in Australia is highly moderated, these Codes of Ethics do not often apply to marine research which falls under animal or environmental research. The lack of Indigenous representation in marine research is concerning, especially as the current literature often frames Indigenous engagement as a tick-box exercise to support Western marine research priorities (see Figure 1 in Melbourne-Thomas et al., 2021). Furthermore, under Article 31 of UNDRIP, Indigenous peoples have the fundamental right to consent to the use of their cultural heritage, meaning that researchers and institutions wishing to undertake research on Sea Country are obliged to obtain free, prior, and informed consent before research is conducted. However, this is not often practised unless the Traditional Owners of the area are formally recognised.

The impacts of climate-induced changes in the marine environment are affecting Indigenous peoples, although Indigenous people have limited input into the research agendas to mitigate these impacts. For example, The East Coast of Lutruwita/Tasmania, Australia, is one of the world's fastest warming marine areas (Hobday and Pecl, 2014) and the impacts of climate-induced changes in the marine environment are already being observed. These changes are impacting on the local Aboriginal community – the Palawa People – with significant cultural loss (i.e. cultural sights impacted from rising sea levels) (Pecl et al., 2019), loss of connection to Sea Country due to the decline of the maireener rainbow kelp shells (Lee, 2017) and negative impacts to traditional food sources (i.e. short-tailed shearwater, *Ardenna tenuirostris*, yolla in Aboriginal language) (Pecl et al., 2019). However, the monitoring of these cultural species is mostly conducted without input or consultation from the Palawa People and as a result, they have limited or no access to, or control over these data. Palawa people experience exclusion partly because they have limited recognition of extant rights to marine resources and access to resources is only through legislation (e.g. *Living Marine Resources Management Act 1995*, and *Wildlife Regulations 2010*) (Department of Natural Resources and Environment Tasmania, 2021; Pecl et al., 2019), and partly due to the failure of Western marine science researchers to recognise the inherent rights of Indigenous peoples as per UNDRIP, and include them in research design and management accordingly.

Risks

In addition to barriers, there are notable risks to Indigenous peoples in intercultural environmental collaborations (David-Chavez and Gavin, 2018). If left unnamed and unattended, the profile of these risks rises. We consider the risks in our three case-studies as exemplary of the associated risks to Indigenous peoples in this context. Exploring the potential for perverse or unintended consequences opens a discussion of how they may be mitigated against.

In the context of fire management, Indigenous environmental data draws on many interrelated and overlapping systems of knowledge including knowledge of climate, landscapes, ecologies, native species, water resources, recent fire history, forest resources, sacred sites, experiences of colonisation and more. These data are a strategic resource for Indigenous groups, offering important information about landscapes that they can draw upon when introducing fire into the landscape, as well as responding to natural hazards, such as wildfire. Through intercultural environmental collaborations, these data become exposed.

As highlighted earlier, the positioning of Indigenous peoples fire management practices as an add-on, supplementing settler fire management regimes, is widespread. The logic that underpins this practice is that fire management practices can, and should be, decoupled from the contexts in which they have been developed. This knowledge extraction undermines systemic calls to support the self-determination of Indigenous peoples, and the potential for these opportunities to foster more just terms between Indigenous and settler peoples. These concerns have been raised in the Victorian Traditional Owner Cultural Fire Strategy which states:

The protection and management of Traditional Fire Knowledge is critical as knowledge has been stolen, misappropriated and disrespected in the past. (Department of Environment, Land, Water and Planning, 2020: 18)

But it is not only in the extraction and disrespect of these sacred Indigenous environmental data that we observe risk. There is a commercial value proposition in Indigenous fire management practices as a technology capable of mitigating against catastrophic wildfire. As landscapes become more and more combustible, there are monetary opportunities for Indigenous peoples who can demonstrate effective mitigation through applying fire in the landscape. These commercial opportunities can come from multiple sources, including private landholders willing to pay groups to promote healthy landscapes and insulate infrastructure against wildfire threats, as well as insurance companies that may accredit Indigenous groups, and offer reduced premiums for customers who engage Indigenous peoples to reduce the threat profile over their properties, infrastructure or livestock, using cultural burning. Losing control of these data therefore threatens the ability of Indigenous groups to develop economically.

Similarly, engagement with GIS has the potential to pose serious risks to Indigenous peoples environmental data. If handled with care, the collection of Indigenous environmental data for GIS could be a generative cultural experience that opens a dialogue of care and allows for the invigoration of Indigenous epistemologies. If, however, the collection of these data reproduces the extractive modes of engagement that seek to understand knowledge outside of the bounds of its production, a space opens for ontological violence (Whitt, 2009). Scholars have questioned the appropriateness of applying cartographic systems developed from within Western, Cartesian logics to Indigenous use cases. Key critiques of the development of Indigenous GIS include the potential for the continued extraction and decontextualisation of Indigenous knowledges, and the assimilation of Indigenous epistemologies (Chambers, 2006; Engle, 2001; Hunt and Stevenson, 2017; Reid and Sieber, 2020; Rundstrom, 2013; Thatcher and Imaoka, 2018).

Negative experiences of research have taught Indigenous peoples to be cautious (Smith, 2013), diminishing communities' willingness to engage in map making. In GIS, data misuse and misrepresentation are more likely to occur in instances where outside parties such as governments, researchers,

or non-governmental organisations (NGOs), seek to collect data to serve their own agendas. Once Indigenous environmental data are collected and digitised, the potential for negative outcomes increases significantly. If questions of data ownership and governance, appropriate uses, access and permissions, and the costs of maintaining databases aren't addressed ahead of time, communities open themselves to a raft of risks.

Similarly, the incorporation of Indigenous knowledges in marine research is increasing rapidly. Researchers are beginning to realise that by not engaging with Indigenous people and their knowledges, they limit the potential impact of their research (and fail to meet the needs of Indigenous people) (Trisos et al., 2021). Where Indigenous knowledges are being sought out, risks to Indigenous peoples such as cultural violence, loss of data ownership and misrepresentation increase. Since colonisation, Indigenous people have been disempowered when speaking our own knowledges and telling our stories, with Western epistemic hegemony marginalising Indigenous experiences (Lovett et al., 2020; Rigney, 2001; Wolfe, 1999). In some cases, this has led to settler scientists claiming a discovery where knowledge of the subject was already shared freely by Indigenous peoples (Trisos et al., 2021). Unfortunately, this dynamic persists in marine research.

This desire for marine research to leverage Indigenous environmental data raises a number of concerns and challenges for Indigenous communities, particularly around the protection, access and use of data. The demand for open access data, which is becoming a prerequisite for many environmental and marine research scientific journals (see *Proceeding of the Royal Society and Scientific Data – Nature*), has the potential to exacerbate these issues. Moreover, there have been calls to create Indigenous knowledge databases for use in Western science (Melbourne-Thomas et al., 2021). This is a concern as historical and contemporary data practices are poor, and when filtered through a settler-colonial cultural lens, can be coloured by notions of racial superiority, racism and sexism. In addition, Western data science agendas tend towards homogeneity and can strip Indigenous data of their diversity (Schnarch, 2004). Pushing an open data agenda normalises the assimilation and theft of Indigenous knowledges. For example, if a researcher collects Indigenous knowledges and digitises them, they can openly share that data without consent or oversight (Rainie et al., 2019). These stories belong to the original storyteller, or are communally held within the clan and tribal groups (Trisos et al., 2021) and should be treated accordingly.

Opportunities

Despite the barriers and risks, there remain myriad opportunities available to Indigenous peoples through intercultural environmental collaborations. These opportunities can be short-, medium- or long-term, they can be tangible (or direct) and intangible (or indirect) and they can benefit more than one party, including Country.

The ancient burning practices of Indigenous peoples have been shown to reduce the impacts of late, hot season bushfires. Indeed, recent research has demonstrated that only since the advent of colonisation have the waves of catastrophic bushfires now so common throughout Australia, taken hold (Mariani et al., 2022). Traditional fire management practices of Indigenous peoples promoted heterogeneous landscapes, cultivated native seeds, grasses, flowers, utilised fire as a tool to hunt game, kept for warmth, cooking and ceremony and reduced wildfire risk (Gammage, 2011; Mariani et al., 2022). Utilising fire as a land management tool has been interrupted due to removal from, and marginalisation in the management of, Country (Neale et al., 2019). This has resulted in the introduction of invasive weeds, grasses and pest species, and the transformation of landscapes through land clearing, urbanisation and damming (Freeman et al., 2021; Smith et al., 2021; Williamson, 2021). There are also the growing impacts of climate change driving increased fire threats in many of Australia's forest and savannah landscapes. Despite the interruptions Indigenous peoples have incurred, many still possess intimate knowledges of fire in landscapes. Because the threat of catastrophic fire is now so

extreme in many parts of the world, the opportunities for the resurgence of Indigenous fire management practices are immense. Within this new reality are a series of opportunities for Indigenous peoples to return to, and (re)connect with, their Country. In this way, using fire to provide important ecosystem services and reducing the threat of catastrophic wildfire, is a useful proxy for communities looking to re-establish relationships with homelands and rekindle ancient knowledge systems. To carry out prescribed burning also requires training, equipment and paid employment, providing important community and economic development opportunities to Indigenous groups. But it is not only in fire management that opportunities exist.

Indigenous engagement of GIS around the world is increasing, with communities and people using geospatial systems to record, store and manage their cultural knowledges and values (Potter et al., 2016), produce meaningful narratives about their relationships to landscapes (Jernigan and Roach, 2021), and assert their rights and interests over their territories, lands and waters (Hemsworth et al., 2021). The process of collecting digital spatial information to include in GIS can provide Indigenous peoples a space to share knowledge between generations while slowing the rates at which these knowledges are being lost. Moreover, moving beyond the limitations of a traditional paper maps allows for seemingly endless possibilities for the interrogation, analysis, and representation of Indigenous cultural and environmental data. For Indigenous peoples, this can mean the freedom to develop novel ways of articulating the spatial relationships that shape the way we see and interact with the world. Importantly, combining Indigenous environmental data with freely available spatial information such as wildfire, climate change and biodiversity data can help mitigate the impacts of environmental change on cultural values and relationships with more-than-human kin.

One of the key benefits of using GIS to collect, store and represent sensitive cultural information is that Indigenous protocols for data management and access can be integrated into its processes. GIS stores information in relational databases that can then be used to interrogate the interactions between landscapes (terrain, topography, resources, infrastructure) and human understandings of space (culture, history, identity). A common approach to GIS analysis is the representation of geospatial data stacked as layers, allowing users to create knowledge about relationships. While traditionally used to model the relationships between various biophysical information (Chang, 2019), this layered data approach is well suited to Indigenous cultural data because it aligns with Indigenous episteme, where landscapes of cultural significance are often separated into tiers of hierarchical and gendered knowledge.

Creating opportunities for Indigenous peoples to operationalise their knowledges in marine research will ensure the appropriate management of culturally significant species, while cultivating productive intercultural collaboration in the research conducted on Sea Country that align with Indigenous obligations to care for Country in sustainable ways. For example, the yolla (short-tailed shearwater) is a significant cultural and socio-economic species to Indigenous communities throughout Tasmania (Skira, 1986, 1990), and is a widely studied species in marine science, as it is an indicator taxa for monitoring large-scale resource availability and environmental changes within the marine environment (Price et al., 2020, 2021; Springer et al., 2018). However, at present, few synergies exist between Western marine science and Palawa people to manage the species, despite the concerns about the impacts of climate on the species (Price et al., 2020, 2021) and potential loss of cultural knowledge (Pecl et al., 2019). Yolla chicks are subject to annual commercial and recreational harvesting (often called mutton birding) and Palawa people operate the commercial harvest, yet the Department of Natural Resources and Environment Tasmania (DNRET) monitor and manage the annual harvest (Skira, 1986, 1990). The monitoring data (abundance of chick and adults) and harvest data (the number of chicks harvested annually) are collected by DNRET to inform management and policy decisions (Department of Natural Resources and Environment Tasmania, 2021). External institutions (e.g. universities) and organisations (e.g. Birdlife Australia) can apply to access these data for research without any oversight from the Tasmanian Aboriginal Community. Meaningful and equitable

collaboration between Palawa peoples, government and research institutions would ensure the ethical conduct of research, help to set culturally informed research priorities, and enable Indigenous access to and control over the data. Ensuring that Indigenous worldviews, perspectives, priorities, rights and aspirations are incorporated into marine research will strengthen Indigenous decision-making and the health of Sea Country.

Embedding Indigenous data sovereignty in environmental research and governance

In this section, we propose that the principles of Indigenous data sovereignty and Indigenous data governance offer both the intellectual framework as well as practical pathways to address barriers and mitigate against the risks in intercultural environmental collaborations. We seek to demonstrate the value proposition that Indigenous data sovereignty represents by ensuring that the opportunities in intercultural environmental collaborations, some of which are highlighted above, can be maximised through meaningful and safe collaborations.

In order to progress Indigenous data sovereignty in environmental research and governance we propose the following practical steps:

- Educational opportunities are offered to Indigenous groups so as to be aware of their inherent data rights and mechanisms to protect their environmental data;
- All universities, scientific, environmental and research institutions, settler governments and government agencies formally endorse the CARE Principles for Indigenous data governance;
- All partnerships between Indigenous groups and settler organisations and institutions in the myriad fields of environmental research develop clear data agreements.

As stated earlier, Indigenous data sovereignty is an expression of Indigenous peoples inherent rights to self-determination and self-governance. Fundamentally, Indigenous data sovereignty seeks to do two things: transform data systems that seek to frame and reinforce Indigenous deficit, and develop data processes that provide the basis to support the sustainable self-determination of Indigenous peoples. While operationalising Indigenous data sovereignty in environmental research and governance will positively impact the first of these aspirations, it is primarily concerned with supporting the second: providing a basis to support sustainable self-determination.

While the disciplines of health, genomics and demography have begun to grapple with Indigenous data sovereignty, the myriad fields of environmental research and governance can be understood as an Indigenous data sovereignty wasteland. This does not mean that practical steps have not already been taken to address these gaps. We previously highlighted the development of BC labels which build upon TK labels, as a method of Indigenous innovation in data sovereignty and governance. However, we note that this innovation is Indigenous led. Notwithstanding that some non-Indigenous research collaborations now address the concerns posed by, and seeks to safeguard, Indigenous environmental data, we consider the efforts to date substandard and in need of reconfiguring.

Enacting Indigenous data sovereignty through the ownership and management of Indigenous data allows us to imagine novel modes of engagement based on the CARE Principles for Indigenous data governance. Informed by our discussion of the barriers, risks and opportunities above, let us consider a project that begins with a commitment to Indigenous data governance and the ‘right of Indigenous peoples to autonomously decide what, how and why Indigenous Data are collected, accessed and used’ (Maiam nayri Wingara & Australian Indigenous Governance Institute, 2018). This would require Indigenous peoples defining their own needs and aspirations for the research project, deciding which data require collection, and determining the cultural protocols that tell us how these data can be used. Importantly, foregrounding these discussions prior to forming partnerships or negotiating agreements allows Indigenous peoples to think carefully about how data that are capable of being

collected and stored digitally such as the characteristics of plant species, GIS maps or tidal histories, can be safeguarded into the future with conditional access and Indigenous oversight of secondary data (such as repositories).

For example, enacting Indigenous data sovereignty and governance in fire management would require discussion and agreement making between Indigenous and settler institutions as to what data are collected, how they are collected, for what purposes they can be used and any conditions on the secondary use of such data. Stipulating these criteria would ensure that Indigenous peoples can share their knowledge of cultural burning with confidence that this information will not be misappropriated or misused. Similarly, the barriers and risks in engaging Indigenous environmental data in GIS (the abstraction of landscapes and relationships into lines, points and polygons; the risks of data misuse) could be mitigated through Indigenous-led research design, the centring of local ontologies, and strong protocols for the use and reuse of Indigenous spatial data. Operationalising Indigenous data sovereignty through Indigenous data governance would also empower Indigenous peoples working in the field of marine research by ensuring that the priorities and aspirations of Indigenous peoples are incorporated into the marine research agenda through the institutionalisation of Indigenous decision-making in programme design, data capture, access to data, monitoring and analysis. This will also ensure that Indigenous people who are also Traditional Owners (both recognised or unrecognised by the state) have the ability to care for Sea Country in line with cultural obligations through leading marine research agendas.

In these examples, the potential for the coercion of Indigenous peoples into research, the extraction and ‘harnessing’ of Indigenous knowledges, and the abstraction and distillation of Indigenous environmental data to suit non-Indigenous agendas and narratives is drastically reduced. In-house management of data creates an environment where individuals feel that sharing their knowledge is safe and generative, while balancing the power dynamic in research by positioning Indigenous peoples and communities as the owners of their data. This repositioning empowers us to pursue the benefits of research including cultural, social, environmental, and importantly, economic. Indigenous data sovereignty and governance provides security for Indigenous peoples considering the commercial opportunities associated with Indigenous environmental data, such as through the use of cultural burning, fee-for-service production of Indigenous spatial information, and the sustainable harvest of marine resources.

Conclusion

In the same way that early European explorers sought out Indigenous knowledges to secure safe passage through what they considered to be treacherous and unforgiving landscapes (Moreton-Robinson, 2015), today Indigenous knowledges continue to be engaged in response to settler crises and the safeguarding of settler futures. The perpetuations of these extractive modes of engagement are illustrated in the growing reference to Indigenous Knowledges in climate change research. While often couched in the terms of inclusion and equity, the trend towards seeking out Indigenous environmental data to mitigate dangerous global warming, or to gain insight into climate change adaptation strategies appears more closely tied to the protection of settler-colonial futures. As Potawatomi philosopher Kyle Powys Whyte has argued, Western climate science and the rhetoric of sustainability is geared towards maintaining the settler colonial status quo, whereas Indigenous peoples tend to be less interested in the continuation of the present situation (Whyte, 2017). Environmental research and governance that continues the practices of extracting Indigenous environmental data while failing to recognise and account for the history of colonialism that Western science has helped to facilitate can thus be read as a re-enactment of the enlisting of Indigenous people and knowledges that was used to aid the expansion of colonialism.

In this article we align with the findings of David-Chavez and Gavin (2018), further revealing that where Indigenous environmental data has been valued by researchers and government institutions in the past, collaborations have frequently been geared towards the harnessing of Indigenous

environmental data with little acknowledgement that these data are necessarily produced and must remain within Indigenous contexts. This has resulted in a power imbalance that ensures the benefits of research flow to settler environmental institutions and practices, not Indigenous peoples. We offer Indigenous data sovereignty and governance as an intellectual framework and practical blueprint capable of correcting the course to ensure that Indigenous peoples enjoy at least equally, if not more, the benefits from intercultural environmental collaborations.

Operationalising Indigenous data sovereignty through the application of the CARE Principles for Indigenous data governance is a solution for the assertion of the rights of Indigenous peoples through empowerment in environmental research and governance. This includes through partnerships with the environmental and research institutions that are engaging Indigenous peoples in ever-increasing frequency, as well as repositories that hold the secondary data of Indigenous peoples. To set a new path, environmental research and governance institutions and repositories must be able and willing to transform; to be agents of empowerment in support of Indigenous peoples.

As a group of Indigenous academics in various fields of environmental research and governance, we see the cultivation of a thriving Indigenous environmental research and governance sector to bring about Indigenous empowerment, while ensuring that the health of Country is prioritised in the process. Ultimately, we argue that under the right conditions, bringing together Indigenous and Western knowledges of the environment can create much needed new knowledge, enhance land and water management practices, and create networks of healthy Indigenous nations and landscapes, that can support our peoples and the planet as we grapple with changing and uncertain futures.


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Notes

1. Yarn is an Aboriginal–English term used to describe a specific mode of conversing in culturally grounded ways. It is widely used as an Indigenous approach to discussions and is now widely utilised as a research method in Indigenous contexts; see Bessarab and Ng'andu (2010).
2. The Scopus search string used to create this graph is: TITLE-ABS-KEY ({Indigenous knowledge} OR {indigenous knowledges} OR {traditional ecological knowledge} OR {traditional knowledge} OR {traditional knowledges} OR {first nations knowledge} OR {first nations knowledges} OR {aboriginal knowledge} OR {aboriginal knowledges} OR {Māori knowledge} OR {Māori knowledges} OR {local knowledge} OR {local knowledges}) AND (LIMIT-TO (DOCTYPE, "ar") OR LIMIT-TO (DOCTYPE, "ch") OR LIMIT-TO (DOCTYPE, "bk")) AND (LIMIT-TO (SUBJAREA, "ENVI")).
3. 'Country' is an Aboriginal–English term used by Indigenous peoples from Australia to denote special relationships with, and the living nature of, land and water scapes – see Bird-Rose (1996).

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Life and times of data access: Regarding Native Lands

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Abstract

It is challenging to understand the full and detailed story of Native People's lands in the United States. In this article, we contend that reliable and accessible data regarding Native People's lands complicate and perpetuate those challenges. Stemming from the implications of colonial ideologies, such as the General Allotment Act of 1887, Native Peoples' land-based data are difficult to access for Tribal Nations and researchers. Land data have been and continue to be obscured by U.S. federal processes and are dependent on unreliable systems of outdated and exclusive practices that consistently marginalize Native Peoples. Therefore, those data do not adequately inform Tribal land planning initiatives. In this article we recommend new processes that strengthen Tribal data sovereignty as the fundamental underpinnings to an inclusive and protected data in the future.

Keywords

Data, research, sovereignty, indigenous

We are a group of Indigenous and Allied scholars who partner with Indigenous Peoples. We represent only ourselves and work to hold up Indigenous Peoples' inherent sovereign rights in a variety of ways, one of which is the protection, pursuit, and creation of Indigenous Peoples Data and Research Sovereignty. This collective commentary synthesizes cumulative years of frustration working with

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Indigenous Peoples' data in the United States. At a time where reliable data are considered paramount to successful projects, initiatives, legal claims, advocacy, and land planning, access to quality and reliable information is particularly problematic regarding Native Lands.¹ Data have been used historically to colonize, commodify, and extract wealth from nature by dispossessing the original stewards of these lands. The steps of this structural oppression have been well hidden, but today, much can be uncovered and reclaimed by enforcing Indigenous Peoples Data and Research Sovereignty.

This special journal issue contributes to the growing body of literature that works toward the fundamental, yet complicated, tasks of defining, securing, and assuring Indigenous Peoples Data and Research Sovereignty. Some manuscripts provide examples of successfully partnering with Indigenous Peoples on their own initiatives. Other papers explore theoretical concepts to encourage a deeper understanding of the learning opportunities within essential scholarship of the topic. Many authors in this special issue have ongoing relationships with Indigenous communities, which seems to be couched in research that is first and foremost established in trust. Together, these papers inspire and demonstrate the tremendous growth in Indigenous Peoples Data and Research Sovereignty over the last 30 years. While the field and topic expand in a positive way, there is another part of this conversation that needs the same amount of attention that has been paid to the issues highlighted in this commentary.

Indigenous Peoples Data and Research Sovereignty

Globally, Indigenous Peoples steward over one quarter of the Earth's lands and many of the remaining non-renewable natural resources (Garnett et al., 2018). The long-standing stewardship responsibility crosses generations and has been shown to be critical to biodiversity (Lamn et al., 2022). However, Indigenous Peoples' land stewardship today is complicated by extractive research practices; data mining and hoarding by researchers, governments, and other institutions; and Indigenous Peoples' limited access to data about their own lands (Carroll, Rodriguez-Lonebear, et al., 2019; David-Chavez and Gavin, 2018; Emanuel and Bird, 2022). Indigenous Peoples and "nations are those which, having a historical continuity with pre-invasion and pre-colonial societies that developed on their territories, consider themselves distinct from other sectors of the societies now prevailing on those territories, or parts of them. They form at present non-dominant sectors of society and are determined to preserve, develop and transmit to future generations their ancestral territories, and their ethnic identity, as the basis of their continued existence as peoples, in accordance with their own cultural patterns, social institutions, and legal system" whether recognized by colonial powers or not (Cobo, 1981). Indigenous Peoples' data include both tangible and intangible information, knowledge, and specimens about their peoples, governments, and non-human relations that are digitized and entered into the data ecosystem (Carroll, Kukutai, et al., 2019; Duarte et al., 2020; Kukutai and Taylor, 2016).

This special journal issue centers Indigenous Peoples Data and Research Sovereignty, which recognizes and adheres to Indigenous Peoples' inherent sovereign rights to govern research processes and steward data across the data lifecycle to maintain relationships, use, and benefit from data and other research outputs (Carroll, Rodriguez-Lonebear, et al., 2019; Carroll et al., 2020). Within this context, Indigenous Peoples shape their own research and data futures by setting their own research agendas and creating ways to maintain relationships and responsibilities to their data (Carroll et al., 2022). Central to the exercise of Indigenous Peoples Research and Data Sovereignty are the rights to collective privacy, ongoing consent, including the right to refuse research or data requests that do not adhere to their protocols or needs (Global Indigenous Data Alliance (GIDA), 2023).

Indigenous Peoples Data and Research Sovereignty has been a topic of discussion in Indigenous Methods and Methodologies literature for over 30 years by Indigenous people, allies, as well as antagonists, and has been reaffirmed by the United Nations Declaration on the Rights of Indigenous Peoples (Chilisa, 2019; Deloria, 1988, 1998; Medicine, 1988; Smith, 2021; Wilson, 2020). Today, Indigenous

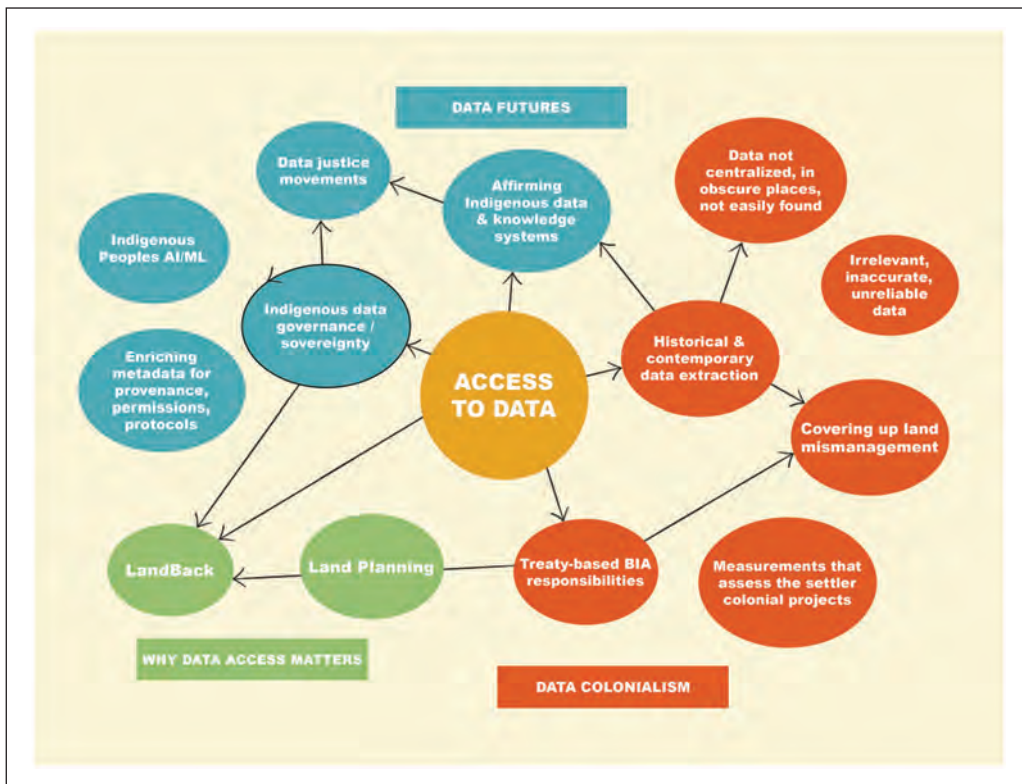


Figure 1. Relational map of access to data in Native Lands.

Source: Chesnais et al. (2023).

AI/ML: artificial intelligence/machine learning.

Peoples Data and Research Sovereignty continues to expand in expression and action (Chilisa, 2019; Walter et al., 2021). The varied perspectives in the literature include, but are not limited to, academics, researchers, federal, state, and tribal agencies and non-profit organizations the world over. The cumulative movement from Indigenous Peoples and allies underscores Indigenous Peoples’ inherent sovereign right to control any and all data that are derived from them and/or their lands.

Why data access matters for Native Lands

This commentary is a collaborative effort to inform a variety of readers about the issues of data access and why it matters for Native Peoples in the United States. In our day jobs, we have each dealt with countless examples of data hurdles. Here, we recollect our unique experiences synthesized into a broad enough picture to build a visual representation of the data caveats. The result is the following Mind Map (Figure 1). While we chose to focus here on Data Access, it relates closely to other key themes tying to Data colonialism, Land planning, Indigenous Knowledge systems and sovereignty, and important tenets present throughout this special journal issue. This Map is a work in progress, it does not exhaust the discussion by any means, and each topic is a paper or book in itself, but our goal is to provide a more thorough analysis of each topic in the future.

The primary struggle, of the many challenges to advancing Indigenous Peoples’ Data and Research Sovereignty, that we bring to the fore, confronts the authors of this commentary daily in the work we do alongside Indigenous Peoples. The struggle is *access* to data. In the United States, tribes and tribal

members do not have adequate and equitable access to data which limits their ability to use, benefit, and govern those data. This particular issue, like the other topics in this special journal issue, has many layers. Fundamentally, tribes and tribal allies lack direct access to land data. Many tribes in the United States rely on the Bureau of Indian Affairs (BIA) for their land-related data needs. A federal agency under the Department of Interior, the BIA is tasked with maintaining “government-to-government relationships with Indian tribes and facilitating support for tribal people and tribal governments” (bia.gov). Essentially, the BIA is the controlling fiduciary and trust agent of federal government-to-tribal government relations, born from legally binding treaties and a self-appointed (by the US government) ward-guardian relationship over tribes (Fletcher, 2006). For example, in the northern Great Plains region, in the context of tribal lands, potential revenue from tribal lands is overseen by the BIA. Mechanisms and controls of the BIA which oversee the collection and distribution of revenue from tribal lands, both tribal and individual tribal member-owned, are primarily managed by the BIA.

Reclaiming and asserting data futures

Much of the personal and professional work the authors of this commentary have been engaged with over the course of their careers centers on the empowerment of Indigenous Nations through fair and equitable self-governance. The conceptions of “fair and equitable,” from Indigenous Peoples perspectives, stem from Indigenous observations and experiences over millennia of interacting/relationality with their traditional homelands. The conception of fair and equitable from a BIA perspective stems from the very fundamental aspects of an agency’s illusion that appointing one-self as the entity that controls and distributes land-holding equity on Native Lands is reasonably ethical and morally sound. Now in modernity, at least from the Indigenous experience, these interactions have recently evolved to include what is fair and equitable land management, such as appraisals and leasing of tribal lands. Leasing of tribal (tribe and individual) lands is generally a BIA responsibility, as in most cases on the northern plains, the BIA works to both appraise and negotiate leases for tribes and individuals. For example, one reason to appraise lands is for the purpose of leasing for agricultural endeavors. Agriculture-related leases on some reservations, such as Pine Ridge, South Dakota for example, are dominated by non-native farmers.

For context, agriculture, or yeoman agriculture, a foundational component of the assimilationist agenda in the 1880s was, at least on paper, the core objective of the federal government: to turn Natives in the United States into yeoman farmers. The General Allotment Act of 1887 was created to do this very thing, break up tribal lands held communally and generally assign 160 acres of land to the head of the household to be farmed. The “act caused Indian land holdings to plunge from 138 million acres in 1887 to 48 million acres by 1934 when allotment ended” (Indian Land Tenure Foundation, History, 2023). Withholding the fact that many Indigenous Peoples were already outstanding farmers and had been participating in cultivating crops for sustenance since time immemorial. Also, regarding the “amount of tillable land on each reservation and its population; the numbers clearly show that on most reservations, the amount of land required for allotment under the Dawes Act far exceeded that of tillable land” (Schwartz, 2000). While scholars are still working to understand the full-scale impact that allotment had and still has on tribal lands, leading scholars of allotment seem to all agree that allotment was a ploy to steal Native Lands (Carlson, 1981; Dippie, 1982; Hoxie, 2001; Prucha, 1984; Sutton, 2002; and so on). What we would like to bring to the reader’s attention is that much of the data born from the implications of allotment are obscured by the very entity that is tasked with the empowerment of Natives in the United States, the BIA (Cobell v. Salazar, 1996; Meriam Report, 1928).

Even the most basic data, for example, land area totals for each reservation, are not regularly published or easily obtained, making public consumption or even scrutiny nearly impossible. An author of this commentary filed a Freedom of Information Act (FOIA) for the land area totals for all US Native Lands. It took the BIA nearly 2 years to fulfill this request for data.² Upon the initial evaluation

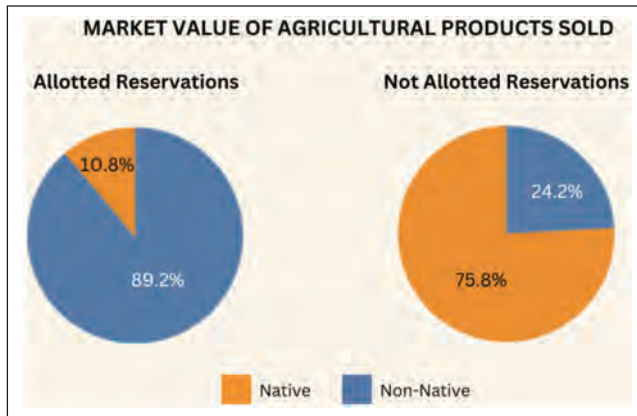


Figure 2. Racial distribution of agricultural revenue for allotted and non-allotted reservations.
 Source: Bartecchi (2023).

of the data received, there are discrepancies of hundreds of thousands of acres for a total acreage of trust lands on reservations when compared to state land area totals records.³ We are still investigating whether this discrepancy spans from mishandling or mis-collecting records, but if States and the federal government do not have matching records, how can they accurately inform economic policies? More importantly for Native Lands, how can the BIA honor its fiduciary responsibilities? Without important record-keeping related to the data, which, as indicated, is difficult to come by, we are left to draw our own educated conclusions. Currently, we are analyzing and scrutinizing these issues and plan to have a conclusion soon. The fact that BIA does not regularly publish these data and that it could only be obtained through the FOIA process means that problems like this exist and can languish unnoticed for decades; this lack of transparency also allows the continuation of economic injustices. At the end of the day, tribes generally do not have direct access to these data, it is housed by and with the BIA, and if tribes do not have direct access to data about their lands, how can they make well-rounded decisions about the tribe's future?

Staying within the context of the assimilationist agenda and attempting to assess the impact of allotment, one of the many questions we and countless others have been searching for is essentially post-allotment agriculture data, in particular total agricultural revenue on allotted reservations since allotment. In short, we have found that there is a significant racial difference in the share of market value from agricultural products sold depending on whether the reservation was allotted. Given many Natives in the United States were forced into allotment, this clearly shows the contemporary impact of these policies on Native agriculture and how allotment has structured and maintains racial inequality. From the time of allotment until today, what is the total revenue extracted from racist policies on Native Lands, and does this demonstrate fair and equitable practices within the BIA?

Figure 2 illustrates the detrimental and long-enduring impact that allotment policies have had on Native agriculture. The BIA holds 66 million acres of lands in trust for various tribes and individual tribal members. Approximately 46 million acres (69%) of this land is used for farming and grazing by livestock and game animals. When we compare allotted versus non-allotted reservations in the 2017 United States Department of Agriculture (USDA) data for Native Reservations, it is clear that non-natives are the primary beneficiaries of agriculture on allotted reservations. Non-natives capture over 89% of the market value of agricultural products sold. From another perspective, using the same USDA data in 2017,⁴ Natives captured only 12.89% of the agriculture revenue generated on their lands versus 87.11% captured by non-natives. In addition, non-natives controlled 86.33% of harvested

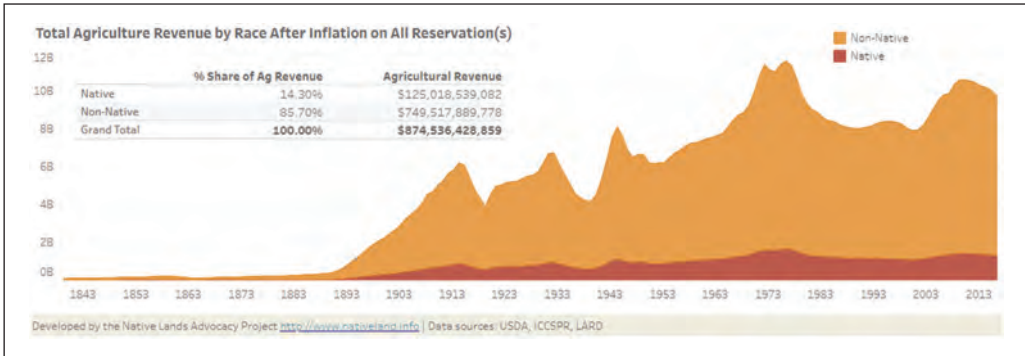


Figure 3. Racial distribution of agriculture revenue on US Reservation lands, 1840–2017.

Source: Bartecchi (2023).

croplands and 72.16% of the livestock. By contrast, in reservations that were not allotted, non-natives capture 24.2% of the market value. The most likely cause of this is the high degree of fractional ownership, fee-patented lands, and widespread agriculture leasing (to non-native farmers) that allotment policies introduced onto reservations.

The agricultural disparity endemic on Native reservations can thus be traced back to the passage of General Allotment Act of 1887 and subsequent amendments that ceded and opened up Native Lands to non-native farmers and ranchers. In fact, we estimate the lost agriculture revenue⁵ on reservations as a result of these policies to exceed \$749 billion since the late 1800s (Figure 3). Of course, with limited access to data and an assumed mismanagement of data, we estimate the true damage of neglect and malfeasance regarding the Government’s role as fiduciary and trust agent to be much higher.

In conjunction, for lands to be leased for agricultural endeavors or sold, they must first be valued, that is, appraised (Figure 4). The ways in which Native Lands were appraised, post allotment, were/are contentious and do not appear to be uniform—contentious because there was not a clear uniform standard for how lands were valued. In Oklahoma, for example, pre-1953, “Indian Farmers” and “Farm Management Supervisors,” who were also BIA employees, provided the valuation of Native Lands. Up until the early 1900s, the Allotment Act generally prevented⁶ Natives from selling their lands; thus, there was not a major need for appraisals, though we can clearly see thousands of acres of land left Native ownership during this time period. When appraisals were needed pre-1953,⁷ much of the valuation was based on rudimentary indicators that would essentially promote the production of monolithic agriculture. Such indicators included the general working “Indian Farmer” knowledge of the “price paid for farms in the immediate area” or a “loose system of comparable sales” (Haney, 1961: 6). While much of the appraisal process in the years leading up to 1953 was “loose,” in 1953, the number of needed appraisals, due to changes in federal policy that had prevented sale, but not prevented all Natives from selling their lands, were lifted, and the need for appraisals grew.⁸ A committee was created made up of BIA realty professionals and soil experts who were familiar with Oklahoma and primarily focused on soil productivity (Haney, 1961, p. 8). This particular system lasted until 1955 when new standards were created, and more uniformity in appraisals was and continued to be refined.

While appraising lands in Oklahoma up until the reform of appraisals began to take hold within the BIA in 1953 and refined over the years, one of the questions that we maintain is what is known about those Native Lands prior to 1953. Bell Haney reports that between a 10-year period of 1947 and 1957, the Cheyenne-Arapaho lost 34.6 thousand acres, Kiowa lost 85.6 thousand acres, Osage lost 107.6 thousand acres, and the Shawnee lost 11.7 thousand acres (Haney, 1961: 18). Though the Indian Reorganization Act (IRA) of 1934 officially stopped allotment, which many scholars

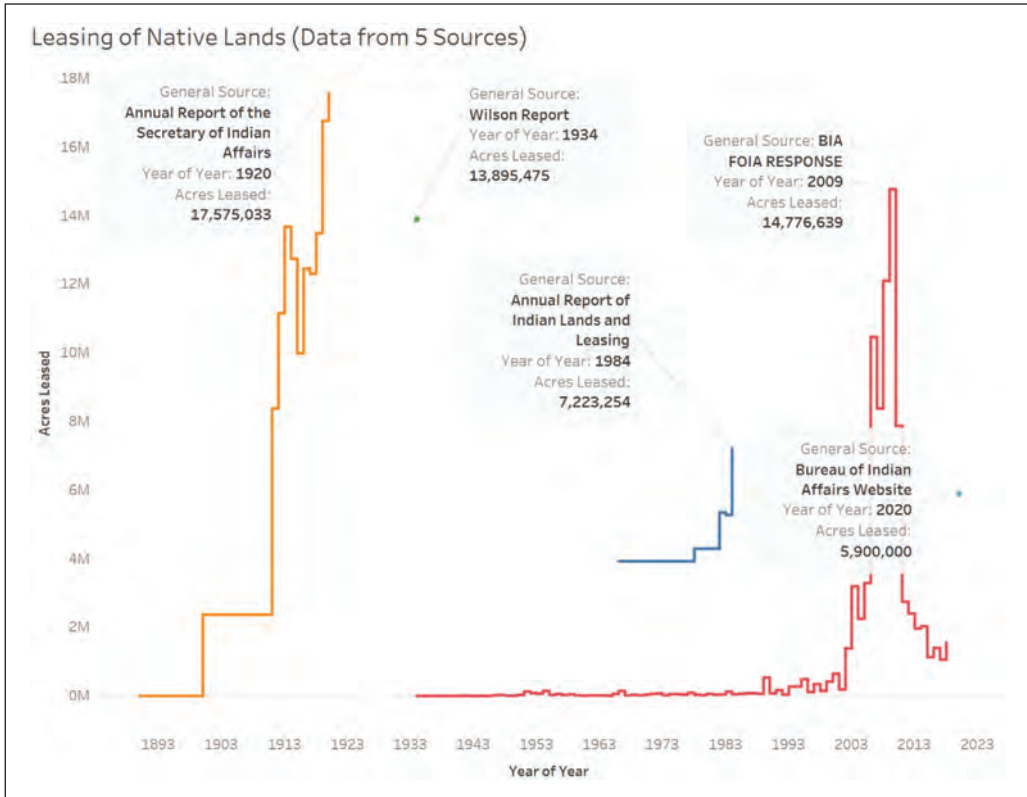


Figure 4. Comparison in total acres of agriculture leased on US Reservations for five government sources for the period of 1890–2019. Source: Bartecchi (2023).

equate to a loss of 90 million acres of Native Land total between Allotment in 1887–1934 IRA, these numbers demonstrate ongoing land loss 23 years after allotment ended. Based on our work, this is a microcosm in the bigger picture of Native Lands lost and tracking land loss (Farrell, 2021). With the documented land loss, our question is, “How were these lands valued if the appraisal took place during a time of ‘loose’ appraising?” Where are those data? Generally speaking, there is an inquiry/accounting that needs to be made regarding the fair and equitable appraisal of Native Lands sold and leased not only during the eras represented in this commentary but also leading up to the present day.

As we are aware, there has been an increase in the amount of Indian land leased and sold to Whites, a decrease in the rate of capital accumulation by Native farmers, a decrease in the rate at which Natives were presented and learned farming and a reduction in group cooperation in economic matters that would further truncate Native agriculture. Though the era in which assimilationists’ agricultural agendas are long gone, the implications persist.

Beyond settler colonial data scapes

Moving toward a more inclusive and equitable Indigenous Peoples Data and Research Sovereignty future, it is worth pointing out that only recently (8/16/21) the BIA updated the code of federal regulations (CFR) regarding Indian Land Title and Record, which had not been updated since 1981 (Federal Register, 2023). Regarding access to data, the CFR contains no statute about the amount of time the

BIA has to fulfill requests. Given this encumbrance, tribes, individual tribal members, and allies are better off filing a FOIA for land information knowing that these are tracked and there is a time requirement for FOIAs. However, wait time often takes months or years. This considerably slows down research and planning, and can result in the data not being made available or shared.

Currently, the BIA outsources data inquiries/access to private companies such as CGI Group Inc.⁹ In conjunction, the Bureau of Land Management, the federal tribal lands trustee, which also houses sensitive tribal lands data that can assist tribes land management initiatives, such as patent data, also outsources data access to a private company called IHS Markit Ltd. IHS Markit Ltd.,¹⁰ like CGI, then makes these data available for a fee to *whomever* can pay. For example, an inquiry to map General Land Office data down to the parcel for a particular reservation was sent to IHS Markit Ltd. If the map produced was quality and there was a desire to proceed with mapping all Native reservations in the United States, the preliminary estimated quote came back in the hundreds of thousands of dollars. To bring this point home, IHS Markit Ltd. offered to sell authors on this commentary Native Lands data. This literally means that anyone wealthy enough to pay for these data can access sensitive information about Native Lands that tribes themselves struggle to access. So, in the age of Big Data and Open Data, are we moving in a positive direction where fair and equitable treatment (i.e. access to data regarding Native Lands) of Native People by the federal agencies who are both fiduciary and trustee or are we going backwards?

Though the promotion of and adherence to tribal self-determination and sovereignty is the primary task of the BIA, it seems the very underpinnings of assimilation may prove to have always been and continue to be a farce with limited and at times no access to timely and accurate data. It seems that while Native People in the United States are encouraged to participate in the very foundational concept this country was built on, they are at the same time paralyzed by the very entity that is tasked with empowering them, the BIA. While the Federal Government has repeatedly acknowledged the failures of its policies on Native Lands, it has never addressed them to the extent necessary to fix them, which is the reason why the disparity has persisted to this day.

Productive data relations

As a result of these enduring issues surrounding access to meaningful data, the following are paramount for the federal government to improve Data Relations with Native Nations:

1. Release all land class maps to tribes and tribal land holders.
2. Release all data being withheld from tribes and individual tribal land holders regarding their lands.
3. Create regionally based data centers for tribes, at aggregations of their own choosing, supported by congressional appropriations. Not to eliminate or absolve the BIA of mismanagement of Native Lands, Native Lands data, or federal treaty responsibilities.
4. Issue federal directives in support of Indigenous Peoples Research and Data Sovereignty adhering to tribal rights and responsibilities to access, use, and govern and steward their data wherever it may be.

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Notes

1. Native Lands being defined in this commentary as current lands Native Americans, Alaska Natives, and Native Hawaiians occupy, own, and steward, which does consist of traditional homelands.
2. FOIA Timeline: <https://www.dol.gov/general/foia/guide#:~:text=How%20Long%20Will%20It%20Take,%2C%20Sundays%2C%20and%20legal%20holidays.>
3. Dashboard: <https://nativeland.info/blog/dashboard/land-area-totals-for-us-native-lands/>
4. <https://nativeland.info/blog/dashboard/usda-census-of-agriculture-for-american-indian-reservations/>
5. Lost Agriculture Revenue Database, Native Lands Advocacy Project <https://nativeland.info/blog/dashboard/agriculture-revenue-from-contemporary-us-native-lands/>
6. General Allotment Act, 1887. Sec. 5. “That upon the approval of the allotments provided for in this act by the Secretary of the Interior, he shall cause patents to issue therefor in the name of the allottees, which patents shall be of the legal effect, and declare that the United States does and will hold the land thus allotted, for the period of twenty-five years, in trust for the sole use and benefit of the Indian to whom such allotment shall have been made, or, in case of his decease, of his heirs according to the laws of the State or Territory where such land is located, and that at the expiration of said period the United States will convey the same by patent to said Indian, or his heirs as aforesaid, in fee, discharged of said trust and free of all charge or incumbrance whatsoever.”
7. When Bureau of Indian Affairs (BIA) began implementing uniform standards in Oklahoma.
8. Although a 25-year buffer outlined in the Dawes Act prevented the sale/loss of Native Lands, before 25 years were up “the 1902 legislation known as the ‘Dead Indian Act’ was passed that allowed Indian landowners to sell lands they inherited even if they were still in trust. In 1906, the Burke Act was passed, which authorized the secretary of the interior to decide whether an Indian person was ‘competent’ to manage his or her lands. If the Indian person was deemed “competent,” the secretary could take the land out of trust and the land would become taxable” (<https://iltf.org/land-issues/history/#:~:text=In%201906%2C%20the%20Burke%20Act,the%20land%20would%20become%20taxable.>)
9. CGI—<https://www.cgi.com/en/bureau-indian-affairs-outsources-technology-and-support-land-trust-management-to-cgi> & <https://www.cgi.com/en/bureau-indian-affairs-outsources-technology-and-support-land-trust-management-cgi-signs-five-year-co>
10. IHS Markit merged with S&P in 2022 (https://en.wikipedia.org/wiki/IHS_Markit). Both CGI and IHS Markit work with oil and gas companies.

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The honorable harvest of Indigenous data

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Abstract

This commentary invites readers into a thought experiment to help decolonize thinking and gain insight into Indigenous research paradigms. It uses Anishinaabeg language and concepts such as the “honorable harvest,” and the “grammar of animacy,” to re-frame the way people can approach and think about knowledge production and data collecting. Through examples of relationship building and engaging in cultural protocols, this commentary offers ways to be a good relative in research.

Keywords

Data collection, Indigenous languages, research paradigms, honorable harvest

“Data Dance Give-away”

Do we dare to give and be given

how do you make a mark in the sand

in a river, in the sky?

Seeking knowing

We process moments

Calculate trust

Build kinship

Gather seeds

Harvest with care

Nourish relations

Since Linda Tuhiwai’s (1999) contemporary classic *Decolonizing Methodologies*, Indigenous scholars, academics, teachers, and students have had a new vocabulary and system for talking about the ways we, diverse Indigenous peoples, know our worlds. We have an updated language to translate ancestral ways of learning and knowing and how we gather and share knowledge with others. Decolonizing methodologies helped us uncover what “we have always done,” to paraphrase Ojibwe scholar Leanne Simpson’s (2020) exceptional book that theorizes and expounds on a radical resurgent

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theory through Anishinaabeg peoples' ways of knowing, learning, doing, and being. In the last 20 years, there's been a proliferation of new publications and resources created and shared to address Indigenous research methodologies in academia and in our communities. We are truly in the midst of an efflorescence as Indigenous knowledge producers resisting colonialism and re-claiming our rights and responsibilities as guardians of the future.

This special journal issue here is a new contribution to this growing field in higher education, tribal education, and Indigenous research sovereignty. In this commentary, I address two of the eight phases that we, as special issue editors (Johnson et al., 2023), have identified as key in Indigenous research processes: relationship building and cultural protocols. I offer a thought experiment to help decolonize thinking and gain insight into Indigenous research paradigms. I suggest a cognitive interruption to pause, suspend, and re-frame the way we approach and think about knowledge and language as I, and many of the contributors here, consider "how to be a good relative in research."¹

To be a good relative in research, we must build strong relationships and respect Indigenous cultural protocols. Given the vast diversity of Indigenous nations in the United States alone (over 570) and First Nations and other Indigenous groups around the world, it is important to first do your own research, listen, and learn about the different ways diverse Native peoples make relations and enact cultural protocols. Here, I offer a perspective from my Anishinaabeg way and tie it to other Indigenous nations of Turtle Island that speak similar languages rooted in what is called the Algonquian language family. I think this approach may also speak to larger, common Indigenous values, many of which are discussed throughout these articles and encoded in instruments like the UN "Declaration on the Rights of Indigenous Peoples" and other related documents (Held, 2019). It's important to remember that diverse cultural protocols are expressed daily in long houses, round houses, tipis, and other traditional learning lodges, as well as in universities, tribal courts, hospitals, museums, community centers, homes, and other places around the world where Indigenous peoples gather and assert intellectual and cultural sovereignty.

Anishinaabeg thought-experiment

I now propose a thought-experiment, a sort of linguistic Anishinaabeg mind-trick, to re-think the ways we understand and gather knowledge. For this experiment, we'll utilize two critical frameworks, namely, "learning the grammar of animacy" and the "honorable harvest," as articulated by Robin Wall Kimmerer in her landmark book *Braiding Sweetgrass* (2013). According to Kimmerer, "English is a noun-based language, somehow appropriate to a culture so obsessed with things. Only 30% of English words are verbs, but in Potawatomi that proportion is 70%" (p. 53). She points out that Potawatomi and other Anishinaabeg languages (Ojibwe and Odawa), as part of the larger Algonquian language family, are deeply verb-based, meaning they describe a world that is dynamic and animate, a world of actions, processes, flux, and change. The Algonquian language family is one of the largest precolonial and contemporary Indigenous languages spoken in North America, in terms of both the number of speakers and geographical area covered (US Department of Commerce, 2013).² The forced shift in language, in grammar, from Anishinaabemowin to English or French during colonial times, created a profound shift in thinking and being. There is much scholarly debate about the relationship between language and thought and language and perception (Zlatev and Blomberg, 2015). The Sapir-Whorf hypothesis of the 1940s proposed that language determines thought, but that theory was criticized for being too deterministic and not having enough data behind it (Takano, 1989). Yet this notion persists, as W. Richard West, Jr, founding director of the National Museum of the American Indian and member of the Southern Cheyenne tribe of Oklahoma, stated so well: "Language is central to cultural identity. It is the code containing the subtleties and secrets of cultural life. In many ways, language determines thought."³

With the power of language in mind, for this experiment, I propose replacing the noun "knowledge" with the verb "to know" or "knowing." So, instead of referring to Indigenous knowledge systems or Traditional Ecological knowledge, I refer to "ecological knowing" or "ways of knowing" for this essay. *Ways of knowing* implies a plurality of ways or methods and an active process that is not complete or

final. It also carries humility in it as it does not convey a singular, authorized body of knowledge, such as “western science” or even “Indigenous knowledge.” Knowledge as a noun can get turned into a thing, a product, a commodity. It can become mono-cognitive, mono-cultural, mono-lithic, *one* way. Indian physicist and activist Vandana Shiva (1993) warns us of these “monocultures of the mind.” She shares that these monocultures stem from a colonial way of thinking that is rooted in and reinforces the idea of a superior, separate self that is antithetical to most Indigenous ways of thinking and knowing.

The grammar of animacy opens poly-cognitive and poly-cultural ways of knowing. It’s the language of relationship, of deep listening that embraces multiple ways of making kin with the many beings we share place with, whether oak trees and shale mountains, hummingbirds and saguaro cactus, or lizards and flowing rivers, and of course, with our own species, fellow mammalian two-leggeds of the five-fingered clan of many ages, colors, sizes, languages, places, and worldviews.

Now that we’ve re-framed the way we think about and approach knowing, how do we ethically gather and honorably harvest the knowing of others for our research? What is the purpose of our search? What’s our data? Where did our research question(s) come from? Is it a general inquiry and curiosity, or is it a carefully considered and vetted set of research questions co-produced with the communities I want to learn from? Why is it important *to me*? How will it support me and support others? Who benefits and who loses by sharing these ways of knowing? To address these questions, I look to my ancestors for answers and ask more questions: How did our Ojibwe cultural hero Nanaboozhoo engage with ecological knowing? How did Sky Woman learn to live on Turtle’s back? They gained ways of knowing through protocols, through learning, through listening, through honorable and respectful forms of engagement, through entering “ethical spaces of engagement.”⁴

Joining the ethical space of engagement requires thoughtful connection. First, we meet, share stories, listen to each other’s values and intentions, observe each other’s body language, earn respect, share humor and food, visit each other’s homes, exchange gifts, sing and dance, feel safe and heard, and many other diverse and beautiful ways humans engage in making kin. Ojibwe authors Latulippe et al. in this journal refer to *maanjiwe nendamowinaan*, “the gathering of minds.” This process can take a few months to several years, and even decades. Sometimes a relative is made in a moment. Yet this process of making kin, or *kinning*, as I have called it, is ongoing and continuous (Hausdoerffer, 2021: 136). Relationships need to be renewed and reviewed and evaluated over time. Some are more formal with official types of cultural protocols at certain times of the year and others less formal and more playful with fluid kinship engagements, but all research relationships must be taken seriously and righteously. Once this process is in a good place, with trust established, clear communication, mutual goals, equitable power, reciprocal sharing, and a shared definition of research and a co-produced plan, data gathering may begin.

Redefining data

In mainstream academic research, especially in the natural and social sciences, knowledge is gained as data. As researchers, we should strive to have large data sets made up of lots of data points. Data is critical and important, such as levels of benzene in drinking water or number of young people who vote in a certain county. Data shows us trends. Almost anything can be turned into “data,” especially if it is measurable in standard numbers. One of the hallmarks of Western science, medicine, and engineering is the acquisition of data that’s then analyzed using statistical and other quantitative measurements to reveal trends and hidden information. This has led to vaccines and electric cars, satellites, and so many other aspects of modern living. Yet this type of data often leaves out other forms of knowing more akin to the grammar of animacy, what Greg Cajete (2000) points out as a key distinction between Western and Indigenous sciences, and that the former is based on the idea of objective observation and the latter on the idea of subjective participation or intersubjectivity (Held, 2019). This intimacy and kinship with that which we are engaging engenders qualities and subtle meanings that cannot so easily be measured, or ethically should *not* be measured.

If we look at the word “data,” according to the Etymology online dictionary, one of its root meanings is, “to dare to give.” Is data taken or given? Data is often taken and is a key step in the scientific method and in every doctoral student’s research plan. But it is interesting to think of data as having agency to “dare to give.” In the grammar of animacy, some data is animate. This question of if data is taken or given or is animate or passive is at the root of the “decolonial turn”⁵ and revolution in knowledge research and data sovereignty, which two of our articles directly address. Indigenous scholars in this issue and in this growing field are saying that ways of knowing must be given with free, prior and informed consent through cultural protocols and ethical forms of engagement. Data cannot be taken without consent, and both terms, “data” and “consent,” must be fully vetted and defined for shared understanding. For many Indigenous peoples, what is often called “data” by scientists are relatives or ancestors to them. For example, Dr Clay Dumont, a Klamath sociologist, created a class at San Francisco State University called “Data or Ancestors?”⁶ to discuss the Native American Graves Protection and Repatriation Act. One of his points was that data can be dismissed, deleted, and dissected, while ancestors must be honored, respected, and cared for. “Two-eyed seeing,” another theme in this issue, requires resolving these different research paradigms and approaches to data so that they are complimentary and reciprocal not in conflict.

Some may try to side-step cultural protocols because they think general ideas, concepts, stories, or other non-quantifiable aspects of knowing are not “data.” But as you read in some of our articles, stories are data sources, and Indigenous peoples are developing our own metrics. As Indigenous researchers, many of us are interested in re-writing and re-*righting* history and combating the erasure of our people’s presence on the land. History, philosophy, religious studies, journalism, and related fields do not generally rely on the same kind of measurable data, or metrics, as the natural and social sciences. Humanities scholars and those who use qualitative methods often engage in narrative scholarship by using the power of story and narrative to convey meaning and value and create new ways of knowing. Jo-Ann Archibald (2008), for example, calls this “story-work.” Much of what many of us call Indigenous science is deeply rooted in this story-work. So, data is a tricky concept when utilizing decolonial methodologies, but an important and exciting one to explore and define with Indigenous research partners (for example, see Kyrstal Tsosie’s Native BioData Consortium).

To continue this ongoing experiment, we will now consider data as food and will re-frame research as harvesting, so instead of “researching data” we will “harvest food.” So, what are the cultural protocols involved with honorably harvesting food?

The honorable harvest

The honorable harvest is a set of principles and original instructions shared by many Indigenous peoples and land-based people who harvest from the land for cultural wellbeing. They are based on the ways Native peoples gather food (plants, animals, fungi, algae, etc.), water, medicines, minerals, and other elements from the Earth. They outline an ethic of respect, responsibility, and reciprocity that is counter to the modern practice of hyper-consumerism.

Robin Kimmerer (2013: 183) succinctly summarized the principles of the honorable harvest:

- Know the ways of the ones who take care of you, so that you may take care of them.
- Introduce yourself. Be accountable as the one who comes asking for life.
- Ask permission before taking. Abide by the answer.
- Never take the first. Never take the last.
- Take only what you need.
- Take only that which is given.
- Never take more than half. Leave some for others.
- Harvest in a way that minimizes harm.
- Use the harvest respectfully. Never waste what you have taken.
- Share.

- Give thanks for what you have been given.
- Give a gift, in reciprocity for what you have taken.
- Sustain the ones who sustain you and the earth will last forever.

I propose experimenting with the tenets of this honorable harvest for data gathering. How would research change? In the process of “harvesting food,” we then can anticipate how we will *prepare*, *ingest*, and *metabolize* this food, what’s generally called “data analysis.” Continuing with the food metaphor, if we are gathering seeds, this includes the cleaning, processing, sifting, winnowing, sorting, and evaluating process. The grammar of animacy and the honorable harvest tell me to harvest with care and intention and to consume and digest slowly. In foodie language, we’re talking slow food not fast food. Yet sometimes there are urgent issues: a river is polluted with toxic mine tailings, for example, and food/data must be gathered quickly. In these urgent cases, there will be *other* types of protocols to consider to make quick decisions about potentially life-threatening impacts. Sometimes storms are coming, and you need community to harvest all the corn quickly.

A harvester of food needs to be agile, nimble, and quick on their feet to plan well and intentionally harvest but also be able to respond quickly when the inevitable changes and surprises occur. I’ve had experiences, for example, where I’m talking to an elder about conducting an interview in the future; we are going over questions, topics, timing, consent, and so on and then they say, “turn on the recorder,” and want to tell a story or share a teaching then and there and want it harvested! That’s usually a good sign, as trust has been established and something has been inspired. I’ve also taken months and years to plan an interview or event to document or record only to arrive and find it has been canceled for some unknown reason. As we indicate in the editors’ introduction, these extra steps of making kin and honoring cultural protocols require extra time and effort, and flexibility. It’s burdensome and often unpredictable. Yet it’s the only way to proceed with ethical care and accountability in Indigenous communities.

In closing

To recap our experiment, we engaged with language play to change our thinking about research. Utilizing the grammar of animacy, we temporarily shifted the word knowledge to knowing to transform a common noun into a verb with multiple entry points or different *ways* of knowing and being open to dynamic changes. We considered how to come together in an ethical space of engagement to build trust, engender kinship, and bring our minds together in a good way. This is the essence of relationship building, yet each Indigenous nation, community, and group will have large and small differences about gift exchange, eye contact, body language, and other nuanced signals and gestures of trust building. And these relationships must be continuously assessed, evaluated, and renewed. They too are animate and dynamic so need attentive care. Once we build good relationships, we move to learning cultural protocols and agreeing to the research agenda. We considered the meaning of the word “data” and experimented with thinking of it as animate, transforming the idea of inert data into animate beings. We then re-framed the idea of “collecting data” to “harvesting food” and employed the honorable harvest principles for gathering ways of knowing. We considered whether data is given or taken and how asking that question brings up interesting questions of consent, reciprocity, transparency, and accountability. One of the honorable harvest tenets is: “only take that which is freely given,” like ripe summer apples falling to the ground. What if data, whether photographs, notes, water temperatures, or other “data points,” were gathered in this way? I do not know the answer, but I believe that asking this, and other related questions, is very important if we want to continue to decolonize research and revitalize Indigenous epistemologies.

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Notes

1. “Being a good relative in research” was the title of the Sixth Annual 2022 Doing Research in Indigenous Communities Conference at Arizona State University on 16 December. <https://chs.asu.edu/dric> and video: <https://youtu.be/TIKVwiLoZ1s>
2. <https://www2.census.gov/library/publications/2011/acs/acsbr10-10.pdf>
3. <https://americanindian.si.edu/nk360/code-talkers/native-languages/#:~:text=Native%20American%20tribes%20have%20lived,speakers%20of%20their%20tribes%20languages.>
4. See Ermine (2007).
5. See Couldry and Mejias (2023).
6. This phrase was created by Dr Clayton Dumont, who designed and taught a course called, “Ancestors or Data? Culture, Conflict, and NAGPRA” in the Sociology and AIS departments at San Francisco State University, San Francisco, CA.

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Indigenous cartographies and mapping abundance

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Abstract

Indigenous cartographies developed in Indigenous homelands in response to the distinctive relationships each Indigenous community had with its respective environments. Oftentimes, these cartographies are embedded in important cultural practices and maintained through mentored learning processes. The spatial knowledge recorded and shared in these systems encourages an attitude of environmental care and sustainable accountability. Returning to these systems has been instrumental for Indigenous communities who are reconnecting with their ancestral wisdom. Including these perspectives in classrooms by adding the articles from this special double edition to reading lists will expand the depth of discussions geographers have about Indigenous research and their responsibilities (as opposed to roles) to the process.

Keywords

Indigenous cartography, Indigenous mapping, Zuni Maps, mapping abundance, Kūkulu: Pillars of Mauna-a-Wākea

Indigenous cartographies are dynamic, multimodal systems of storing and sharing spatial knowledge that reflect Indigenous understandings of and relationships with the world they perceive. A world filled with an abundance of relatives, most of whom are not human but are recognized and treated as though they are family because we depend on each other to thrive in good times and survive in tough times. The spatial knowledges that emerge from these worlds honor and reflect the homelands, peoples, and practices from which they originate. Oftentimes, these systems of knowing are embedded in important cultural practices such as gathering medicine, hunting game, or finding a good place to build a home and encourage an attitude of care and accountability. Like the fascia of connective tissue found just below the skin, these systems stabilize and strengthen Indigenous ways of coexisting with the natural world to ensure sustained and resilient abundance. Indigenous mapping is both a process and a product of Indigenous cartographies. Together, they form an important part of why many Indigenous communities could survive in their homelands for hundreds if not thousands of years. Indigenous cartographic expressions are found in the intricacies of weaving baskets, felting fabrics, and braiding sweetgrass. These processes and practices are handed down to younger generations, who are mentored and molded to maintain a cultural ethos of respect and responsibility.

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From the moment colonial expansionists entered Indigenous homelands, their cartographers and surveyors “marginalized Indigenous peoples, silencing Indigenous spatial knowledge systems, which led to, in many cases, irrevocably severing Indigenous relationships with their cultural landscapes” (Louis, 2017: 10). Indigenous expressions of cartography, such as those described above, were deemed irrelevant and cast aside for colonial cartographies of surveillance and land ownership. In response, Indigenous “acts of resistance” have manifested cartographically for generations. As long as nation-states continue to employ cartographic techniques and expressions with the goal of removing Indigenous people from their homelands, extracting their “resources,” and eradicating access to sustainable livelihoods, there will be counter-mappers who support and encourage Indigenous people to assert their “rights” to access, manage, and use their traditional homelands (Louis et al., 2012).

Today, Indigenous cartographies and Indigenous mapping mean different things to different people, but both hold the fading resonance of mistrust and misrepresentation. Within the halls of academia, one faction sees cartographic processes and practices as malleable to the wielder’s intent (Caquard and Cartwright, 2014; Palmer and Korson, 2020; Pearce and Hornsby, 2020). Allowing Indigenous communities to drive the design and dictate the content demonstrates that creative collaborations can lead to useful blendings, for example, by supporting disempowered people’s control over how stories about their homelands are shared, including their origins, migrations, and locations of hunting, fishing, and medicine grounds. Another faction sees the terms as embracing the contentious and political nature of Indigenous relationships with colonial cartographies and their continued forms of oppression (Lowan-Trudeau, 2021; Sium and Ritskes, 2013). They recognize and use the “power of the map” to resist colonial domination and those “acts of violence” emerging from their unrestricted, exploitative, and nonreciprocal socio-ecological practices (Lucchesi, 2019; Rose-Redwood et al., 2020). Still yet, another faction believes these kinds of terms belong to the realm of academia and that Indigenous academics use them to provide a common ground to discuss distinctive qualities of Indigenous spatial knowledge systems. They do not accept colonial cartographic conventions as capable of properly representing Indigenous cartographic engagements (Fujikane, 2021; Louis, 2017; Uluocha, 2018; Williams, 2022). They are more focused on defining their own culturally consistent, ancestral, and/or “historic geographies in the ways that best suit our communities and the cultures from whence we come” (Lenk, 2018: 42) and often push the boundaries of understanding the performative nature of Indigenous cartographies (Louis, 2017; Sletto et al., 2021).

Jim Enote and the Zuni Maps Art project intentionally challenge cartographic boundaries of what constitutes a map. He recognized that “modern maps hold no memory of what the land was before” and too few of us “have paused to consider that maps do not tell us where we are from or who we are. Many of us do not know the stories of the land in the places where we live” (Enote, 2018). They set out to create “counter maps” he defines as “maps that reclaim the names of Zuni places and depict the land of the A:shiwí (Zuni) as they know and see it, immersing the viewer in a landscape interwoven with culture, story, and prayer” (Enote, 2018).

Incorporating prayer into the map is not only culturally informative, it maintains place-based social relationships and also allows map readers and listeners to re-enact and reconnect with ancestral and historical practices of survival and abundance. Zuni maps are artistic cartographies filled with symbolism that provide a different way of engaging with the world; it offers a different way of looking and knowing. These maps help orient the A:shiwí to their identity as a people, including their place within the landscape, and to restore ancestral and historical connections and relationships with their cultural landscape.

Shared with each household in the community, Zuni maps become the touchstone that beckons for its story to be shared; it is an invitation to map the places that live in your memory and give equal consideration to those voices of the land that are mere whispers on the wind. The Zuni maps are modern Indigenous cartographic examples of the benefits of taking the time to deeply listen to the land “to

ensure the resilience and well-being of the places where we live” (Enote, 2018). This is especially evident with Indigenous earth-based origin stories that often interweave lessons of enduring resilience and survival.

In Hawai‘i, there was no specific class of people who drew maps. Instead, we had orators who were trained to remember, composers who threaded ecological knowledge and ancestral traditions of worship into our landscapes, and dancers who embraced the energetics of the choreography to become the winds, rains, and waves. Since Kanaka Maoli “recognize the forces of nature and other metaphysical elements as fundamental spatial relationships” (Louis, 2017: xviii), Kanaka Maoli cartography challenges cartographic sensibilities of reality by providing for those the geospiritual relationships master practitioners must nurture and maintain with their genealogical relations as well as those associated with their profession.

Candace Fujikane extends discussions of Kanaka Maoli cartographies, expressing them as cartographies of abundance. She describes the mo‘olelo (storied historical record) of the migration of the mo‘o (reptilian water deities) to Hawai‘i from their home in the clouds as a Kanaka Maoli cartographic expression of climate change. She identifies the art of *kilo* as “key to recording changes in the earth in story and song, *and such changes were met with renewed efforts to conserve, protect, and enhance abundance*” (Fujikane, 2021: 3, italics not in original). Fujikane explains that Kanaka Maoli cartographies encourage humans to respond to changes in their environment and oftentimes provide clues or directions for Indigenous resilience and survival within these cartographic performances of mo‘olelo and mele (song).

Reorienting cartographic output to serve Indigenous perceptions of abundance intertwined with an ethic of care and responsibility is a sharp contrast to the colonial cartographic perception and presentation of Indigenous lands as wastelands with scarcely any evidence of human interaction or resources of value. This contrast is highlighted in Fujikane’s analysis of “the struggle Kanaka Maoli and their allies have taken to protect the sacred mountain lands of Mauna a Wākea from the construction of the Thirty Meter Telescope (TMT)” (Fujikane, 2021: 87). The construction of the TMT on Mauna Kea (shortened form of Mauna a Wākea) has been opposed by Kia‘i Mauna (mountain guardians, henceforth to be shortened to Kia‘i or guardians), because it is the most sacred mountain in Hawai‘i. That should be enough. But with today’s legal system in Hawai‘i supporting the current political leadership, who continue to validate and employ colonial cartographic techniques, Kia‘i were forced to take their concerns to court.

Kia‘i court petitioners provided cartographic evidence of the abundance of water forms on Mauna Kea found in oli, mele, and mo‘olelo. The State’s cartographic presentation continued the perception of the land as a wasteland with scarcely any resources. Ultimately, the State cartographic presentation won the legal battle to exclude any person or entity who could speak on behalf of the water forms under threat. But the Kia‘i court petitioner’s cartographic presentation of abundance, care, and responsibility resonated with a growing community of supporters.

Appealing to that growing community and nourishing the efforts of Kia‘i Mauna worldwide, Kūkulu: Pillars of Mauna-a-Wākea, a traveling art exhibit, was launched in 2017. It was a project conscientiously curated by Aunty Pualani Case, a Kumu Hula (Hawai‘i dance teacher) and an educator of Kanaka Maoli lifeways who holds multiple degrees, served the community as a public school teacher on Hawai‘i Island for 30 years, and became a litigant against the building of the TMT. The Kūkulu exhibit was Aunty Pua’s response to questions posed by a group of Indigenous geographers seeking answers “to how Indigenous communities from different cultures and ecologies are engaging in action to protect their lands and restore the relational practices that support wellness for their peoples” (Richmond et al., 2023). In the book, *Because the Land Is Who We Are*, Aunty Pua explains that her most important goal for the exhibit was to “bring the Mauna to the people.” She believes that “there must be reconnection before there can be repossession” (Richmond et al., 2023). The book chapter on Kūkulu chronicles the courage, challenges, and strategies used

by Kia'i who object to the environmental, cultural, and spiritual impacts of a massive 18-story, five-acre telescope complex on sacred land.

Using guiding principles for establishing ancestral alignments, Aunty Pua curated a geospiritually connected arrangement of artworks and artifacts, bringing Mauna Kea's sacredness into a space made safe to delve deeply into difficult conversations through culturally implemented and contextually relevant participatory engagements. She dedicated the exhibit to the *Protect Mauna Kea Movement*. Her intention was not only to bring the Mauna to the masses but also to humanize Kia'i, who were villainized by local and mass media. Through careful thought and consideration, the exhibit layout reflected, portrayed, and emanated the spirit of Mauna Kea. Exhibit rooms became landscapes of time and place. Stories of resistance line the walls as art, photographs, and objects honor the Kia'i. Each artwork was woven into the fabric of collective lived memories of resistance which then became a vehicle for autonomous storytelling. As such, Kūkulu is an opportunity to experience the sacredness of Mauna Kea through the lens of Kia'i.

The exhibit expanded and transformed my understanding of *Kānaka Maoli* (Native Hawaiians) cartographic engagements. I now see them as a living, daily dance of our relational responsibilities to our ancestral alignments. "Cartographically, the *Kūkulu* Room design was intentionally laid out to evoke the spiritual first and foremost" (Richmond et al., 2023). Only after that connection was established could Aunty Pua begin "to create a cohesive 'story' around the room that was layered with meaning, centering design around traditional *Kānaka Maoli* understanding of regions that extend from ocean to mountain to celestial expanse" (Richmond et al., 2023). The final and most important step in the cartographic engagement was how the "stories came to life on opening day as dancers, chanters, and musical instruments were engaged to 'awaken' the artistic contributions and 'invited' the deities to be present" (Richmond et al., 2023).

The first exhibit was at the Hawaiian Cultural Center of Hāmākua for 30 months and held no less than five installations. The next exhibit was opened in Kona and held artworks from both Kona and Ka'ū districts of Hawai'i Island. The Hilo and Puna districts of Hawai'i Island held an exhibit honoring the ho'okupu (gifts) that were presented by worldwide supporters during the 2019 occupation and protest halting the construction of TMT. After COVID overwhelmed the world, the exhibits were put on pause. Now, Aunty Pua has communities wanting her to bring the exhibit to them. As of this writing, Kūkulu has been in University of California (UC) Santa Cruz and is in the planning stages for an opening at UC Santa Barbara and UC Davis and one in conjunction with the Winnemem Wintu's Run4Salmon Prayer Journey. Each is conscientiously curated to honor the pillars who stand for Mauna Kea living in those areas. According to Aunty Pua, "Kūkulu will be available to all communities who request an exhibit as these exhibits will continue to connect generations of Kia'i, bring the mountain to the masses, and honor the pillars of Mauna Kea" (Richmond et al., 2023).

These examples of Indigenous cartographic expression and engagement continue to flourish for a reason. They recalibrate our way of being in the world, remind us of our responsibilities, and reconnect us with ancestral alignments. Indigenous community scholars and practitioners such as Jim Enoté and Aunty Pua Case and academic advocates such as Candace Fujikane are expanding cartographic paradigms to be more inclusive of Indigenous cartographic priorities and processes. Processes that include deeply spiritual connections with the visible and ancestral realms, where prayers and performances validate Indigenous cultural resilience. Many of the cartographers mentioned in this commentary have been working for decades to provide safe spaces for Indigenous cartographies to come to fruition. Each has moved the bounding boxes of acceptable cartographies allowing the people they work with to elevate their geographic knowledge and represent it in ways that are consistent with their cultural traditions.

Those interested in truly evolving cartographic processes in a manner that includes Indigenous perspectives must seriously consider the value of posthuman ontologies. Elsewhere I wrote that this

is essential for any geographic research focused on Indigenous cultures and communities as it elevates the Indigenous ingenuity and intellect that best understands the highly localized, generalizable wisdom that Indigenous peoples have maintained over generations. The best way to realize this shift is to accept and respect the dawning of Indigenous research sovereignty. (Richmond et al., 2022: 88)

This issue is another important step in that direction, as it uses established knowledge hierarchies to elevate perspectives that are more relevant to Indigenous realities. The next important step is getting these articles from this edition into classrooms so the next generation of cartographers, and by extension geographers, are more accepting of, if not advocating for, Indigenous research sovereignty and, by extension, Indigenous cartographic engagements.

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