Dialogues in Human Geography

Commentary

Reflections on the (continued and future) importance of Indigenous geographies

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Abstract
Over a decade ago, RDK Herman wrote on the importance of Indigenous geographies and what made it distinct from the broader field of geography of which it is a part. In this commentary, I take up Herman's provocation by making the case that Indigenous geographies will continue to be a vital part of the field of geography as it moves forward into the future, especially in the ways that we think about, reimagine, and unsettle existing geographical thought and practices, particularly in the ways we relate to the physical and discursive spaces we move within.

Keywords
Indigenous geographies, geographical thought, pedagogy, settler colonialism, empiricism

Geography and Indigenous perspectives

As an Indigenous geographer, the continued viability and vitality of Indigenous geographies are both a key professional and personal interest to me. Interest in Indigenous geographies is also on the upswing amongst many in our field. There is an increasing amount of work on Indigenous topics in geography, but how do we define our subfield and outline Indigenous perspectives in geography more generally? In 2008, RDK Herman wrote an article titled, 'Reflections on the Importance of Indigenous Geographies'. In this piece, Herman contrasts Indigenous geographies with 'Western' empiricist forms of geographical thought in the ways that Indigenous conceptions of space and place centre relationships across all aspects of space and place. In particular, Herman observes:

> In Indigenous sciences, the world is often understood in terms of flows of energies (and sometimes entities) across a permeable boundary between manifest and unmanifest realities. Working relationships with forces deemed 'superstitious' or 'irrational' in modern science are significant aspects of social processes and healing practices. Maintaining these worldviews and practices is an uphill battle against the hegemony of modern scientific thought and the legacy of missionaries and educators who tried so hard to dismantle Indigenous knowledge systems (Herman, 2008: 75).

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Herman positions Indigenous geographies as a way forward for the broader field of geography, and here I would like to take up Herman's provocation and contemplate what this might look like in the discipline. I do so via an ongoing vignette – the ways that I broach these topics in a course that I teach on Indigenous geographies.

Contact zones between empiricism and Indigenous geographical perspectives

Let us start with a brief treatment of the ways in which the field of geography has historically interfaced with Indigenous peoples. I usually begin my Indigenous geographies course with a brief treatment of what geography is and how we define it. We, as geographers, often hold fast to the central definition of our field as the study of relationships between space, place, and those who inhabit said spaces and places. I then introduce concepts of Indigeneity and the ways in which Indigenous peoples relate to space and place, using Herman's reflections as an introduction to the subfield.

At this point, students are often curious about why it is that Indigenous geographies are a pushback against concepts such as empiricism. After all, don't we want to be able to make informed conclusions and judgements about places and spaces if we are to be good geographers? To this, I provide several responses. The first centres around the imperial project and the need for imperial/settler colonial power to make absolute judgements about space and place so that these discursive and physical attributes can be better controlled and governed (Harris, 2004; Herman, 2008; Wainwright and Robertson, 2003).

Chang (2016) writes on the ways that Kanaka (Native Hawai'ian) conceptions of geographies were immediately dismissed by British explorers, including Captain James Cook. For the British, the only way that the Kanaka could engage with the broader world was via European conceptions of exploration and voyage. Even today, Western geography's engagements with Indigenous peoples have been fraught and racked with colonial intent and lack of consent and respect – including the much-written about controversy surrounding the *Mexico Indigena* project, where mapping data from Indigenous territories were transmitted back to the United States Army without the prior knowledge of the Indigenous communities involved (Louis and Grossman, 2020; Mychalejko and Ryan, 2009; Wainwright, 2013). Through all of this, I make the argument that the ways in which geographers have engaged with positivism and empiricism in the Western academy are not in sync with the reality on the ground – we cannot profess to neutrality, as the very ways in which we study our field are wrapped up in dynamics of power.

At this point, my students often ask the question of how we might be able to transform these power structures into ones that are more hospitable to Indigenous thought and perspectives. I turn to the multitude of Indigenous scholars in geography and position them as possible embodiments of Herman and Douglas's argument that Indigenous geographies represent a 'way out' for the field.

For example, scholars such as Goeman (2009, 2013) write about the ways in which alternative cartographies, and conceptions of space and place, can and have been drawn upon by Indigenous scholars in ways that subvert the spatial realities they often find themselves within via the processes of colonialism. In particular, Goeman invokes the writings by Diné poet Esther Belin and the ways that poems created links between Belin's homelands and the urbanized experiences that Belin and many other Indigenous peoples faced in the United States during the relocation/termination era. This invocation demonstrates that Indigenous connections to place were not easily extinguished and managed to find unique ways of being expressed in ways we might not ordinarily conceive of as 'cartographies' or 'geographies', a viewpoint expressed by other Indigenous geographers (Hunt and Stevenson, 2017; Lucchesi, 2018).

I further pushback against traditional 'empiricist' thought in geography by bringing scholars such as Smith (2021) into my teaching – in particular, how her positioning of Indigenous relationships with the living environment in the Arctic disrupts conceptions of that space as an inherently transitory

space in crisis, a viewpoint which raises the spectre of environmental determinism, especially in an era of anthropogenic climate change.

I also push the students' conceptions of how we define a geography, using the interdisciplinary field of science and technology studies as an anchoring point for our inter/transdisciplinary dive into how we think about space. For example, in their book, *Pollution Is Colonialism,* Métis scholar Max Liboiron speaks about land relations and how colonialism disrupts these relations through the lens of plastic pollution (Liboiron, 2021). Although Liboiron is a geography professor (at Memorial University of Newfoundland and Labrador), many of my students do not immediately code their book as a geographic study. However, I point out that, at its heart, it is very much a book of geography by focusing on one dynamic of the relationship to space and pointing towards how Indigenous conceptions of being in good relation to land can counter more harmful modes of engagement.

It is here where I want to turn our attention to the way that I feel that Indigenous geographies can live up to Herman's declaration that it is a way forward for the field as we head further into the twenty-first century.

The continued importance of Indigenous geographies

I believe the best work that Indigenous geographies can do for the discipline going forward is through a further unsettling (pun fully intended) of the ways in which we define our field (Iralu, 2021; de Leeuw and Hunt, 2018). As a discipline, geography seems to have gone through an identity crisis of sorts every few decades – such as the move towards quantitative methods in an attempt to make geography more of a 'hard' science in the background of the Cold War, or the move towards more critical, post-structuralist theory in the 1990s, to today, when many different fields are beginning to lay claim to geographic techniques, and geography departments are closing or transforming themselves into more geospatial-oriented fields (Hall et al., 2015; Smith, 1987). In the current environment, there can be a danger of clinging to dogmatic views of empiricism among certain areas of geography – particularly in the more quantitative sides of the field, which still presume that making absolute judgements about space and place, and hewing to those anchoring points of our discipline, will keep it viable going forward.

Yet the beauty of geography as a whole lies in the ways in which we can break beyond traditional geographic definitions and cartographic understandings. In this, I feel that Indigenous geographies can lead the way, since work by Indigenous scholars not only brings space and place but the interconnected relationships that Indigenous peoples carry within these spatial planes (both discursively, but also geographically, as Indigeneity is global) into conversation with one another and therefore opens up new possibilities for how we view the geographies around us.

In my class, the most common reaction that my students express as they end the course is that their understanding of geography has been expanded and that they are beginning to look at their surroundings in new ways. They speak about the relationships that they have with their environments, and that there is no one 'geographical' understanding that exists – but that the ways in which we relate with space and place are subject to both structures of power and relationships. This includes the relationships we hold both with each other as humans as well as with the environment and more-than-human kin around us (Larsen and Johnson, 2016). To me, this is at the heart of the arguments for Indigenous geographies; when we broaden our understanding of what geography can be, we position ourselves to be of continued relevance and service not only to academia but to humanity going forward. The future is bright for Indigenous geographies, and geography as a whole, which is something that I am personally seeing through increased engagement with the subfield within professional spaces such as the American Association of Geographers and the Canadian Association of Geographers. So, the appetite is there, and the opportunity is here – we only need the courage and the open-mindedness to embrace it.

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"I Can't Breathe:" The Invisible Slow Violence of Breathing Politics in Minneapolis

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"I Can't Breathe:" The Invisible Slow Violence of Breathing Politics in Minneapolis

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ABSTRACT

Following the death of George Floyd in Minneapolis, his utterance, "I can't breathe," reverberated internationally as the world population grappled with the twin specters of life-threatening COVID-19 respiratory morbidities and mounting years under increasingly polarized racist regimes. Despite crisis fatigue, national and international outpourings of solidarity trended on social and mainstream media. However, in this moment, the legacy of structural and slow violences against the living, breathing Minneapolis–St. Paul communities of color were obscured. This article addresses transdisciplinary breathing politics in this mid-sized American city to integrate atmospheric indicators (concentrations of criteria pollutants including particulate matter and gaseous pollutants), traffic indicators (Minnesota Department of Transportation permanent traffic monitoring station data), and social indicators (community responses in newspaper and Twitter archives), ultimately making visible how Floyd's utterance reflects much deeper patterns of stratified urban public health risks and socio-environmental airscape politics.

BULLET POINTS OF FINDINGS

- Breathing politics are racialized in Minneapolis, demonstrating stark differences in traffic and air quality across neighborhoods.
- Through content analysis, it is shown that social media platforms like Twitter can be rich historical records for tracking local public discourse, providing valuable insight to the ways people talk about and conceive topics like environmental justice, breathing politics, and urban equity.
- While hashtag activism on social media flourished in 2020 to address anti-Black racism, it was neither a "tipping point" nor did it show a discernible impact on the nature of environmental justice discourse about breathing politics, despite the steep rise of #ICantBreathe.
- Integrating social, economic, and environmental indicators has the overarching benefit of addressing complex, lived systems.

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Introduction

In 2020, breath became a fraught space between life and death, as the world grappled with the twin specters of COVID-19 respiratory morbidities and mounting years under increasingly polarized racist regimes (Walia 2021). Despite crisis fatigue, the killing of George Floyd–an unarmed black man in Minneapolis–received national and international outpourings of solidarity on social and mainstream media. The event catalyzed conversations about the security of bodies of color, foregrounding connections between direct and structural violencesthat increased the already unequal burdens on bodies of color "since the beginning of record keeping" (Oriola and Knight 2020; Kawachi 2020). In the month following, an estimated 26 million Americans participated in protests (Hamel et al. 2020) organized in over 1400 U.S. locations, across 60 countries, and all populated continents, ossifying the Black Lives Matter movement.

Like in other sites, Minneapolis's racialized breathing violence is an aerosolization of mundane structural neglect. Separating air as a material both independent from breathing bodies and the structures of power that regulate them denies how materiality shapes and is shaped by these contexts. The act of breathing cannot be neatly categorized as a solely embodied act (Ingold 2020)–breathing bodies are shaped by unequal power relations that physically "fuse" with the material matter of air which likewise has the agency to shape bodies (Allen 2020). The physical composition of air is just as socially constructed and imaginative as it is material; air and breathing bodies are inextricably tied to government management systems (Zee 2020) which at times simultaneously hinder and advance aspects of environmental justice (Harrison 2019). These relationships are co-shaped by the mundane processes of contemporary life through "increasingly abject and complex" relationships (Blanchette 2019). The political and socio-material dimensions are imbued in air's cultural artifacts that make meanings–affective, sensory, imaginative–of the otherwise seemingly technological, scientific, and objective (McCormack 2018). By intentionally reassembling parsed datasets–each measuring breathing politics through a different lens–it demonstrates how records both internally and concertedly detect racialized breathing violence. Reassembly can give breathing politics radical potential for equitably integrating complexities (Ahmann and Kenner 2020). Testimonies from everyday people about their affective experiences of breathing violence and structural neglect are typically not integrated into the data management of regulatory structures; doing so is not the sole responsibility of those affected (Grandia 2021). Indeed, documenting "slow violences" (Berlant 2007; Nixon 2011) is implicit on us all.

The tools to understand violence at macro-scales can further obscure violence by diffusing accountability. Socio-environmental terms like the "anthropocene" obscure the disproportional weight of environmental causes and effects on different identities (Davis and Todd 2017; Davis et al. 2019; Schuller 2021), as do interdisciplinary public health terms like "pandemic" in obscuring socio-environmental systems that do not affect all people equally. Air quality is never simply a direct relation of physical metrics alone–it's social and political, and the words used to frame it matter to understanding fundamental shifts in governance and belonging (Liu and Li 2017). Thus, the role of public consciousness and belonging becomes visible in discourse gaps surrounding environmental equity. The stark inequities of respiratory public health are deeply woven into a breathing politics that seared public consciousness in 2020.

At this moment is another legacy of structural and slow violences against the living, breathing Minneapolis–St. Paul communities of color. While long-term inequities and perpetrations of bodies of color subsumed the air of protests–figuratively in public discourse and at times literally in the police's teargas and the smoke of smoldering buildings–public consciousness focused on breathing politics understandably apart from environmental justice. By integrating interdisciplinary environmental records, the "power geometries" (Massey 1993) of race and space in the American city deepens. Interdisciplinary relational approaches (e.g., Marxist urban political ecology) integrate physical-material analyses that acknowledge the socio-political power relations of urban formation (Swyngedouw and Heynen 2003). Positive steps include the Environmental Protection Agency's documented concern that air pollution risks to bodies of color transcend region and income (2021). By likewise acknowledging the community-generated dimensions of understanding air quality (O'Leary, Parr, and El-Sayed 2022) it broadens the scope of understanding breathing politics beyond simply a distant corpus of data representing bodies of color, surveilled and controlled by the state in the form of disembodied monitoring systems. Instead, these data show the interplay of data from state air and traffic monitoring systems with data from the discourse of a watershed local social movement–mundane discourse as a non-state managed monitoring system. These seemingly distinct forms of data suggest persistent racialized qualities and the possibilities and pessimisms related to changing public consciousness.

Racial equity movements use discourse to explicitly engage the slow and invisible violences embedded in state structures and manifest in everyday encounters. Black Lives Matter is considered to be the largest social movement in American history (Buchanan, Bui, and Patel 2020). In June 2020, Black Lives Matter surpassed all other protests and social movements' daily historical mentions on Twitter (including #MeToo, Arab Spring, Occupy Movement, and Brexit) (Alshaabi et al. 2021). The day after Floyd's death 218,000 Tweets used #BlackLivesMatter, growing to over 1 million Tweets two days later, skyrocketing to nearly 8.8 million daily Tweets–marking its peak use since 2013–and sustaining over 2 million Tweets until 7 June, the day following the protests (Anderson et al. 2020). Using raw count data from Twitter Premium API (through a third party tool, TrackMyHashtag), #Icantbreathe demonstrates a tight correlation in its peaks.

A digital vanguard, the social movement of Black Lives Matter, more than other digitally engaged movements, demonstrates how contemporary social and ideological transformations are fomented through powerful rhetoric and discourse on platforms like Twitter. While Twitter access and usership are not a proxy for all human discourse, and indeed obscure other layers of violence, its centrality to America's racial justice movements are widely accepted. Previous literature has tracked how forms of resistance use Twitter to fuel innovative organizational practices (Nummi, Jennings, and Feagin 2019), this public discourse of resistance on Twitter amplifies marginalized voices while educating casual observers (Freelon, McIlwain, and Clark 2016), ultimately both deepening narrative agency among self-identifying members of Black Lives Matter (Yang 2016) and increasing contributions on Twitter of antiracist labor in the form of allyship (Clark 2019). Intersectional research on hashtag activism shows that Twitter users' identities sometimes alter the content and reception of Tweets, providing both amplification

(Williams 2015) and marginalization that impacts the direction and representation of movements (Mueller et al. 2021). This crystallizes social identities, situated perspectives, and ultimately approaches to participation. Twitter content has also provided a window into the ways Black Lives Matter discursively grappled with George Floyd's killing, including cluster maps depicting how social networks can affect moral sentiments about harming people of color (Priniski et al. 2021), the degree to which it facilitated opportunities to address systematic and institutionalized racism (Thelwall and Thelwall 2021), and how it is used as a flashpoint for the reimagination of the right to space in the city (Samayeen, Wong, and McCarthy 2022). Twitter is only partially representative of the full breadth of the movement and culpable of creating an "atmosphere" of its own. However, like the air and traffic monitoring data, it provides a partial record of the mundane gaps of layered lethality.

This article demonstrates how Floyd's utterance reflects much deeper patterns of stratified urban public health risks and socio-environmental airscape politics. There is no one singular culprit at whose feet to lay the blame in these politics–they are indicative of broader, structural neglect and necropolitics that function at mundane levels by design.

We condemn in the strongest of terms the racialized killing of George Floyd, as well as that of other victims of such violence. This article by no means passes judgment on the course or content of hashtag activism, especially with regard to Black Lives Matter and the immediate importance of addressing long standing histories of systemic racism and police brutality in American cities. Nor does this article argue that Floyd's killing obscured or overshadowed the pursuit of everyday breathing justice. Rather, this article asks us to connect systemic racism and police brutality with the parallel and deeply interconnected trajectories of environmental justice. Mary Pratt describes the "uncanny" nature of obstructed breathing in America's historical race-based lynchings, COVID-19 health disparities, and the suffocation of George Floyd and others writing, "They are one and the same—public spectacles with blocked airways as instrument of racial terror" (Pratt 2020). We argue that these inequalities are neither disparate nor strangely unconnected; they are not spectacular or fantastic, but rather are mundane, to the point of obscuring their efficient lethality. The politics of taking away breath in Minneapolis is not a one-time event but has been perpetuated through various means for decades. This research is meant to demonstrate the ways the breathing politics of communities of color in Minneapolis have been historically recorded and how one viscerally violent event catalyzed anti-black racism conversations around the world without being tied to the "invisible" and "slow" violences of everyday breathing politics that cumulatively and longitudinally harm bodies of color–we seek to tie these violences back together, bringing political processes and atmospheric processes together to make an intervention into the dynamic and subtle nature of environmental racism.

Minneapolis Case Background

Before proceeding, it is important to address our focus on the critical context of Minneapolis, and the events surrounding the death of George Floyd in our analysis. The unique socioeconomic and racial characteristics of different areas of Minneapolis,

as well as the deep and life-long personal connections to the city by multiple members of the authorial collective (one of whom belongs to several racialized communities in the city), make it a desirable city to study in this regard. To these people, as well as the multitudes of people who call Minneapolis home, this is not a nebulous place on the internet, or in public consciousness, but this is a space that is personal, and intimate.

The history of Minneapolis is written over its physical and cultural geographies and by tracing the roadways its racial politics emerges. Minneapolis is the largest city in the state of Minnesota, with a population of 429,606 as of 2019 (U.S. Census Bureau 2019a, 2019b). Figure 1 shows the racial demographic within the City of Minneapolis, MN spanning from 2000 to 2020.

Our study brings focus to spatially racialized erasure of breathing lethality through higher resolution, highlighting the differences of the living-breathing city as socio-economically bounded. Breathing justice, as with greater environmental justice, remains oppositional in its approach to improvement–pursuing either "colorblind" aggregate gains (e.g., across Minneapolis) or distributional gains (e.g., improving the most polluted communities) (Harrison 2019). While Minneapolis is not a top city of concern

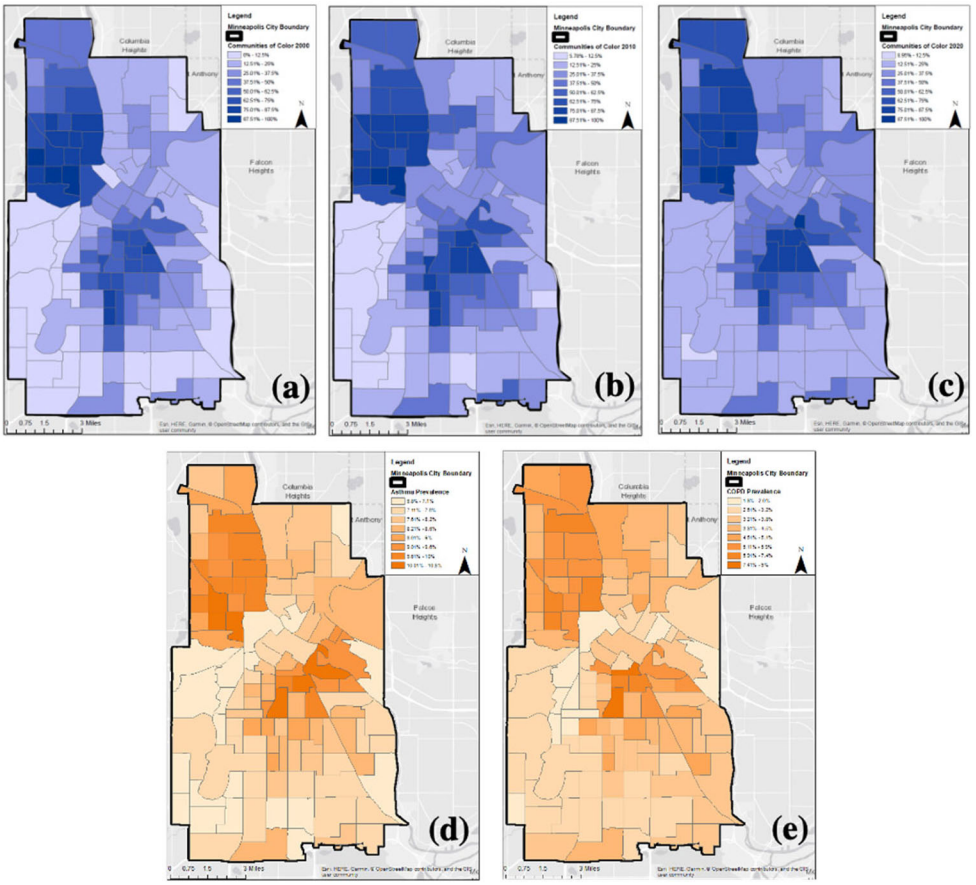

Figure 1. Communities of color population change, asthma, and COPD in Minneapolis, MN (a) population 2000, (b) population 2010, (c) population 2020, (d) asthma prevalence 2018, and (e) COPD prevalence 2018.

based on the American Lung Association's rankings, the air quality poses detrimental human health impacts. Rankings typically average the values of atmospheric pollutants, erasing spatial variances in concentrations of these pollutants. Minneapolis, specifically, demonstrates an increase in the number of cars leading to increases in the concentrations of pollutants in the atmosphere. While overall, the air pollution status has improved in Minneapolis over the years, the ozone and particulate matter concentrations are at high risk of non-attainment conditions according to the NAAQS, especially with the consistent improvement of allowable limits by the EPA (Blankenheim 2013). Further, several other studies have looked at the health impacts of air quality in Minnesota, especially for vulnerable groups (Sulzbach 2006; Johnson et al. 2017; Ghazi, Drawz, and Berman 2022). Figure 1 further shows the prevalence of asthma and COPD as reported by the 500 Cities Project (CDC 2021). A Pearson's Correlation analysis found a strong association (0.760) between the proportion of non-white residents and COPD and an even stronger correlation (0.897) between these census tracts and asthma prevalence. This suggests a disparity in health outcomes between majority white communities and communities of color, which may be attributable to poor air quality.

The Twin Cities metropolitan area lies at the intersection of many major transportation corridors (road, rail, water, air), and these corridors have had major environmental, infrastructural, and societal impacts on this region, particularly in regard to the impacts of road networks on communities of color, and especially in respect to Minneapolis. The construction of Interstate 35 W, within the city during the 1950s and 1960s, for example, destroyed Black and Mexican neighborhoods along a corridor running from south Minneapolis to near the downtown core (Marks 1990; Weber 2020; Onile-Ere 2021).

Urban Interstate construction in Minneapolis, and in the Twin Cities in general, tended to follow racial boundaries–while neighborhoods of color in South Minneapolis fell victim to the wrecking ball, more affluent neighborhoods were spared. For example, the Prospect Park neighborhood in Southeast Minneapolis (and which borders St. Paul) was able to avoid the destruction that the nearby St. Paul neighborhood of Rondo (a major hub of the African-American community in St. Paul) was subject to, with the construction of Interstate 94 in the 1960s (Reicher 2013; Costa, Cattaneo, and Schultz 2018; Beer 2019; Poon 2020; Weber 2020; Minnesota Historical Society, n.d.; Minnesota Department of Transportation, n.d.). Similarly to other places in the United States, Interstate highways in the Twin Cities and the large concrete canyons they created served to divide neighborhoods and to reinforce racial segregation, which was particularly egregious in Northern cities, such as Minneapolis (Donofrio 2020; Miller 2020; University of Minnesota 2020; Smiles 2021).

The environmental impacts of these highways also had and continues to have a major effect on Minneapolis over time. Increased levels of emissions in the Twin Cities by the late 1970s led the State of Minnesota to begin considering implementing emissions testing in the Twin Cities metropolitan area (Midurski et al. 1979) beginning in the 1980s–the emissions testing regime finally began in the Twin Cities in 1991, but only ran until 1999, due to a variety of factors, such as older, "dirtier" cars being taken off of the road, and being replaced by newer, cleaner cars, which led to the Twin Cities meeting Federal standards–at which point, the testing was deemed as no longer necessary (Harlow 2019).

The spatial patterns of poor air quality in Minneapolis go hand-in-hand with the spatial politics of dispossession. This is not new in Minneapolis, being situated upon occupied (stolen) Dakota lands (Wainwright and Robertson 2003; Carlson 2015; Hugill 2016). The city and its surrounding spaces are quite literally built out of the act of dispossession. However, the wholesale dispossession of spaces home to communities of color and their relocation into spaces subject to poor air quality indicators creates a new dimension to this history and contemporary spatial politics as it represents a double dispossession. It not only resulted in a loss of spaces centered around and held by vibrant communities, but it also represents a dispossession of the right to access to clean air, subsequently opening these communities up to the slow violence of air pollution (Richmond and Ross 2009; Hardy, Thompson, and O'Connell 2021; Marks and Miller 2022). Rather than being a public resource available to all, clean air became yet another piece of quality life that was and continues to be denied to communities of color. The phrase "I can't breathe" takes on added urgency in this context, as it represents a slow, undulating—yet lethal marginalization of these communities as more and more is taken away from them (Hicken et al. 2019).

Materials and Methods

By examining interdisciplinary datasets for indications of racialized breathing violence, this article documents the permeation of mundane structural neglect of breathing bodies of color. Each interdisciplinary indicator includes two timescales of breathing politics: longitudinal and recent. These demonstrate longer-term air quality histories that forged infrastructural and institutional conditions and their more recent dynamics in the context of the largely separate, though fundamentally intertwined, movements of heightened racial justice and environmental justice.

Air Quality Methods

Daily data was collected from 10 monitoring stations in Hennepin county in Minnesota. Daily PM_{10}, $PM_{2.5}$, carbon monoxide (CO), ozone (O_3), and nitrogen dioxide (NO_2) measurements from these stations were acquired from the AirNOw Tech Environmental Protection Agency (https://aqs.epa.gov/api) from January, 1st 1999 until 31 December 2020. All sites investigated in this study are shown in Figure 1. Not all air quality sites had data for all investigated years or all pollutants. Sites within Minneapolis were classified for racial demographics as shown in Figure 1. Communities of color designations required more than 75% of the population.

Traffic Methods

Annual average daily traffic (AADT) is a common traffic performance measure used nationwide to quantify the average traffic volume at a given location. The details for this are provided in the article's supplemental materials. AADT within the city of Minneapolis is maintained by the Minnesota Department of Transportation (MnDOT). AADT was retrieved from the MnDOT open source webpage for 40 unique locations,

spanning 28 census tracts, for 18 years (2003–2020) (Minnesota Geospatial Commons 2021). This sample of 40 locations was selected because all 40 sites reported AADT values annually between 2003 and 2020. At the time of this study, no other locations within Minneapolis, MN reported consistent data for the 18 year study period. The population and racial demographics of the 28 census tracts which encompass the 40 AADT locations were collected from the US Census Bureau for 2000, 2010, and 2020 and provided in Figure 1 (US Census Bureau 2020, n.d.).

AADT values were averaged within each census tract. To account for changes in population size as well as to normalize the traffic volume based on population, the average AADT was divided by the population to yield the average AADT per capita. Average AADT per capita was compared between these communities using a two-sample *t*-test with unequal variances as shown in supplemental materials.

Social Discourse Methods

The data indicating the longitudinal patterns of air quality discourse in Minneapolis were gleaned from high circulation newspapers using the StarTribune Archive of historical newspapers digital service and in consultation with the Minnesota Historical Society. The newspaper data has articles found with this search attributed to three different publications: (1) "The Minneapolis Journal" between 1901 and 1906; (2) "The Minneapolis Star" between 1920 and 1982; and (3) "Star Tribune" between 1867 and 2020. Articles were assessed when they contained keywords "asthma," "breath*," "clean air," "air pollution," and "air quality." These keywords were selected through grounded theory and inductive coding techniques (Charmaz 2014; Kozinets 2010; Kozinets et al. 2010; Strauss and Corbin 1997) that sampled the newspaper archive and contemporary social media posts.

Comparatively recent social media discourse data was collected via Twitter's version 1.1 Tweet Search Application Programming Interface (API). The API was queried to collect Tweets containing the same keywords, phrases, or hashtags. It was limited to original Tweets in English that were sent between 1 January 2017 and 31 December 2020 and were geolocated in Minnesota. The geolocation criteria included location information attached to an individual Tweet or to the sending user's profile. A total of 9155 Tweets were collected based on these criteria. The qualitative content analysis used inductive methods from grounded theory, phasing open coding, and axial coding to get a general sense of the most relevant themes and subject terms in existing content patterns. Additional details are available in supplemental materials.

Results

Overview of Air Quality in Minneapolis

Two decades of Minneapolis air pollution were analyzed (1999–2020) across the individual criteria pollutants that are associated with vehicular exhaust, namely: $PM_{2.5}$, PM_{10}, CO, O_3, and NO_2. Daily average concentrations of atmospheric pollutants were averaged on an annual basis at all air monitoring stations available for each year as shown in Figure 2, the standard deviation of each year is also plotted in the figure. The time

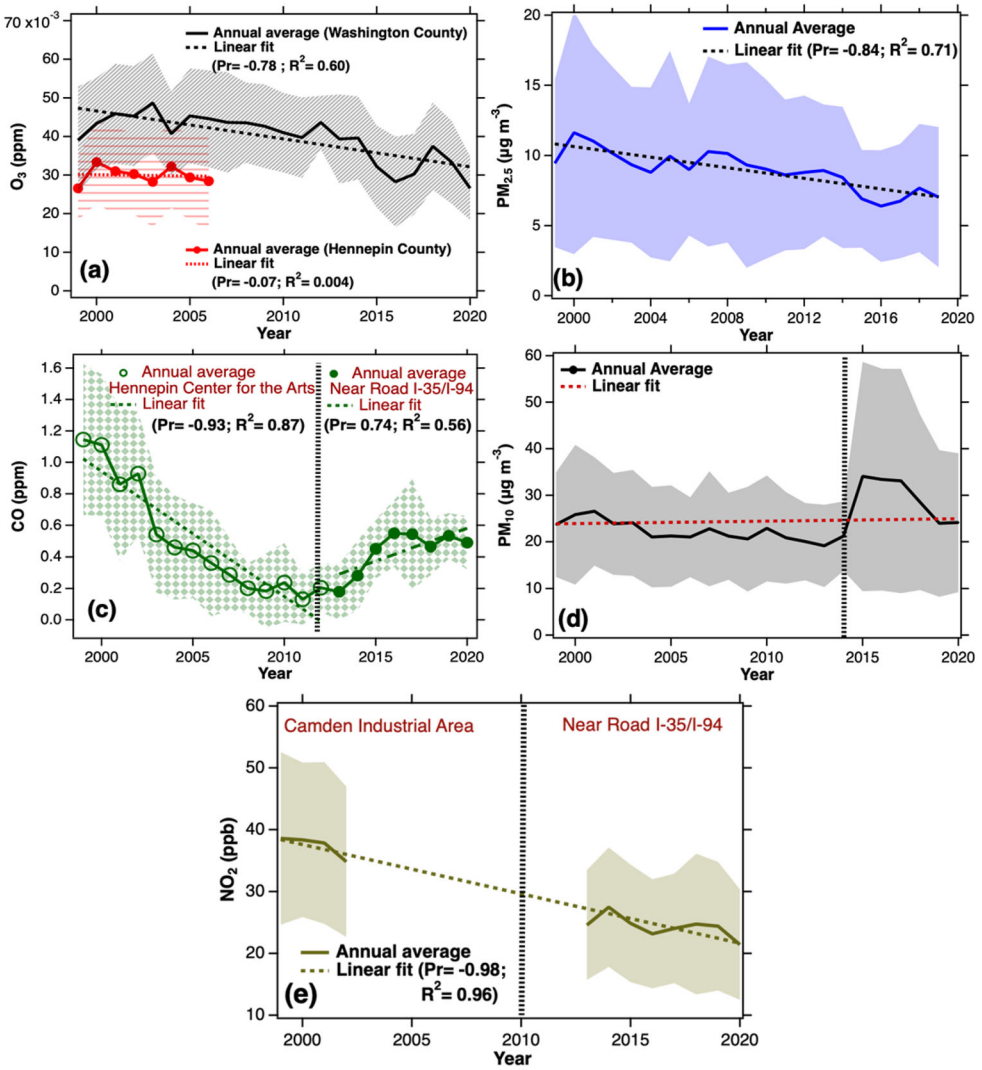

Figure 2. Time series of annual average concentrations of (a) O_3, (b) $PM_{2.5}$, (c) CO, (d) PM_{10}, and (e) NO_2. Shaded areas represent standard deviation of annual averages. Dotted lines refer to the linear fit for each pollutant. Values for the Pearson's correlation (Pr) and the correlation coefficient (R2) are mentioned in each panel.

series of the annual concentrations of pollutants provide insight into the overall trends in air quality in Minneapolis, MN from 1999 till 2020. It could be deduced from Figure 2, there was a decreasing trend in $PM_{2.5}$, O_3, and CO (Figures 2a,b,e, respectively), however, different trends were observed in the concentrations of CO and PM_{10} pollutants from 1999 until 2014, beyond which enhancements in the annual concentrations were observed until 2020 (Figures 2c,d, respectively). The Pearson's coefficients as well as the correlation coefficients were calculated for each pollutant. In the case of CO and due to changes in the behavior of concentrations with time, two linear lines were plotted for each case as shown in Figure 2d.

A decrease of 32.2 ± 15.0% in the median $PM_{2.5}$ concentrations was observed in 2020 compared to values in 1999 with a strong negative correlation between annual concentrations and time equal to −0.84 indicating the strong linear decrease in concentrations with time (Figure 2b). NO_2 concentrations had no data available for 10 years from 2003 to 2013 as shown in the gap in Figure 2e. A decrease in the available median concentrations of NO_2 of 45.5 ± 35.0% in 2020 compared to values in 1999 with a strong negative correlation coefficient corresponding to −0.98. Before the gap, data was monitored in Camden Industrial Area monitoring site, considered as a predominantly community of color) and after the gap, the site has moved to the Near Road I-35/I-94 as shown in Figure 2e. An almost perfect correlation (−0.98) was observed for NO_2 concentrations specifying the reduction of their levels in the last two decades. There was no available data for O_3 beyond 2004 (Figure 2a), hence we could not study the trends in their concentrations, therefore we plotted data pertaining to the nearest county, i.e., Washington County to illustrate trends, if applicable. Decreases in the median value of O3 levels of 30.0 ± 41.0% were observed in 2020 compared to 1999 with a Pearson's coefficient of −0.78, the negative value infers a decrease in concentrations over time as shown in Figure 2a.

Atmospheric chemistry is very complex–atmospheric pollutants are often multi-sourced (including non-local industrial and long-range transport) and their concentrations depend massively on weather conditions. Yet, our previous work (O'Leary, Parr, and El-Sayed 2022) demonstrated correlations between pollutants and traffic. Herein, some pollutants did not exert statistically significant differences between neighborhoods due to the multiple sources of these pollutants, pollutants directly linked to traffic (i.e., CO and PM_{10}) exhibited a different trend. A decrease of ∼16.0 ± 15.0% from 1999 until 2013 was observed for the median values of PM_{10} levels, however, an increase was observed in 2014 and lasted until 2018 after which a decrease was observed again (Figure 2d). Further, concentrations of CO decreased by 55.0 ± 65.0% in 2012 compared to 1999 with a negative Pr = −0.93, however, enhancements in the concentrations were observed from 2013 until 2020 with a positive Pr = 0.56 (Figure 2c). It is noteworthy that the monitoring station has moved from Hennepin Center for the Arts (primarily a community of color) in 1999–2013 to the Near Road I-35/I-94 (primarily a community of color) in 2012 until 2020.

Due to the lack of available data/different sites, we cannot compare sites located in predominantly white versus communities of color for NO_2, CO, and O_3 concentrations, therefore, site comparisons were made for $PM_{2.5}$ and PM_{10} only. Figure 3 depicts boxplots of the concentrations of PM (both $PM_{2.5}$ and PM_{10}) at the sites corresponding to the available data from 2017 to 2020. PM_{10} concentrations were retrieved from four sites namely Pacific Street, Lowry Avenue, City of Lakes Building, and Bottineau/Marshall Terrace. It could be deduced from Figure 4 that the highest concentrations during this period were observed at Pacific Street (located in Minneapolis's Near North community area, which is predominantly a neighborhood of color) (average = 34.7 ± 9.1 μg m^{-3}) followed by Lowry Avenue (average = 24.4 ± 6.5 μg m^{-3}) which is considered a white neighborhood and the lowest concentrations in the City of Lakes Building site (average = 18.9 ± 5.3 μg m^{-3}) and Bottineau/Marshall Terrace (average = 19.6 ± 3.3 μg m^{-3}). As for the $PM_{2.5}$ levels, these were retrieved from four sites namely Anderson School, St Louis

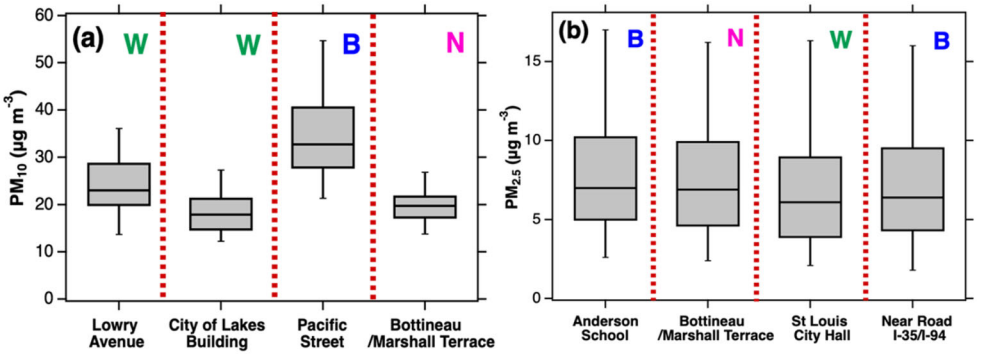

Figure 3. Boxplots of daily (a) PM_{10}, and (b) $PM_{2.5}$ concentrations in MN from 1 January 2017 to 31 December 2020 at different sites. For each site, median (horizontal line), 25th and 75th percentiles (lower and upper box values), as well as 5th and 95th percentiles (vertical lines) are shown. W represents sites with predominantly white communities, B corresponds to sites located in communities of color, and N represents sites with approximately equal populations in 2017–2020.

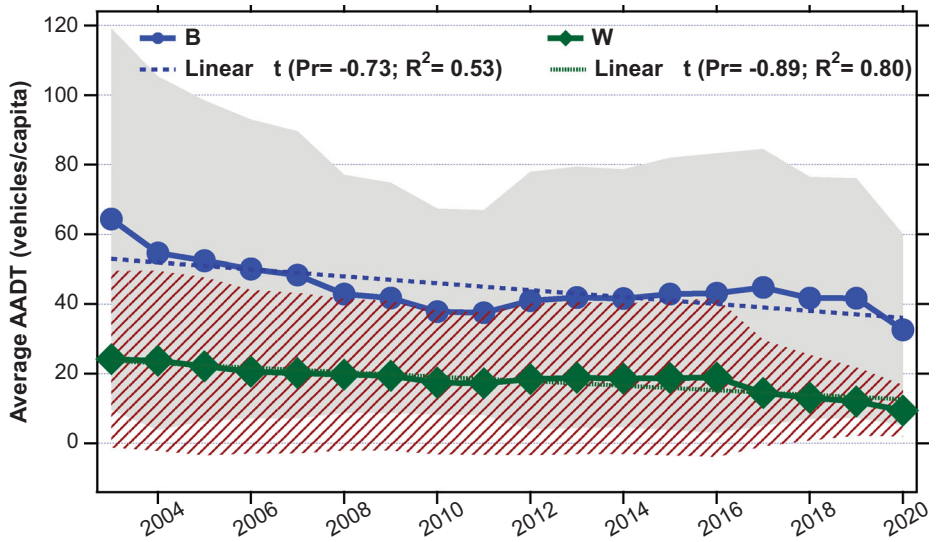

Figure 4. Average AADT per capita for predominantly white communities and communities of color from a sample of 28 census tracts in Minneapolis, MN for 2003–2020.

City Hall, Bottineau/Marshall Terrace, and Near Road sites. However, the $PM_{2.5}$ concentrations did not exhibit any significant change between the four sites. The mean values of the concentrations were $\sim 6.5 \pm 4.5\ \mu g\ m^{-3}$ for all sites indicating that $PM_{2.5}$ exhibited an urban if not a regional pattern compared to a local behavior of PM_{10} concentrations. In 2021, the WHO has modified their average daily $PM_{2.5}$ standards from 10 to 5 ug/m^3 (WHO 2021) implying that average values of $PM_{2.5}$ concentrations in Minneapolis are higher than this value.

Traffic Results

The average AADT per capita for predominantly white communities and communities of color for a sample of 28 census tracts in Minneapolis, MN is provided in Figure 4. The figure clearly shows the persistent and one-sided nature of higher average AADT values, per capita in communities of color within the sample census tracts. The average AADT per capita in communities of color was consistently twice that of predominantly white communities, averaging 2.35 times higher in communities of color between 2003 and 2020.

A *t*-test was conducted to determine if the difference in average AADT between the two communities was statistically significant. The results of a *t*-test (assuming unequal variances) rejected the null hypothesis that predominantly white communities experience equal or greater average AADT per capita when compared to communities of color (p-value < 0.001). This finding strongly suggests that, on average, AADT per capita within the sample census tracts was significantly higher in communities of color in Minneapolis, MN. The results of the *t*-test and *F*-test (on sample variance) are provided in the supplemental.

Social Discourse Results

In the last 150 years of newspaper archive data, keywords for breathing politics have grown at a relatively stable rate. Two periods of increased mention include the early 1900s and a sustained peak from the early 1960s–1980. The first coincides with concerns about urban development, flour milling, and population growth; electricity's impact on interior ventilation; and swamp gas emissions. They do not in themselves explicitly point to classist or racialized concerns about the social distribution of breathing risks. The second peak reflects increased national consciousness around pollution and the statutes of the Clean Air Act (enacted in 1963 and 1970), as well as growing public health and interior ventilation concerns with regard to legionnaires disease. Contrary to national analyses in newspapers of major US cities [New York, Los Angeles, and Washington D.C. (Mayer 2012)], coverage in Minneapolis did not steadily grow over time. The presence of keywords plunged in the 2000s and began to recover in 2016–2020 (perhaps due to the previously mentioned discontinuance of emissions testing in the Twin Cities, as well as the growth of light rail and bus rapid transit in the region), though not enough to recover to the previous line of fit.

Looking more closely at the recent Twitter record from 1 January 2017 to 25 May 2020, the keywords for breathing politics have remained relatively stable as shown in Figure S1, in supplemental materials. Two periods of increased mention in 2018 reflect air quality alerts and the ensuing public discourse. The peak beginning in March 2020 largely reflects general respiratory concerns about the COVID-19 pandemic. The quantitative changes are complemented by changes in the qualitative content of people's discussions of breathing politics (below).

Breathing justice in Tweets in 2017 focused on new programs for Metropolitan bus upgrades. They addressed the need to prioritize the program for (1) "those who live, work, and attend school" near high volume traffic intersections and for (2) areas with a large proportion of asthmatic and respiratory-compromised children affected by low air

quality. Breathing justice topics touched on the respiratory distress of children with section 8 housing assistance and the "mostly black kids" affected. Other Tweets question the logic of putting low-income people in housing that has been formally evaluated with high levels of transportation exhaust. One standout Tweet used #NorthSideVotes to request reparations for chemical exposure related to respiratory disease, though this was the only one approaching justice in such an explicit way.

The characteristics of breathing justice in 2018 included one pointed Tweet that "soul food is not the culprit" of respiratory health risks, instead identifying top harmful emissions from economic engines (traffic and polluting facilities) that two Tweets identified as disproportionately situated in "non-white and low-income communities." Another Tweet succinctly recognized the disproportional impacts of driving on "lower-income people" who themselves do not commute with personal vehicles. Tweets cited government reports on housing and transportation policies that impact "poor and vulnerable people" and urge legislative action. Hashtags called for health equity. Two Tweets connected breathing politics to police brutality. One Tweet describes the school and police brutality of a minor of color, explicitly expressing that children of color suffer more from asthma and trauma than white children. The other Tweet criticizes the state for enabling a "trigger-happy" police force that in the next breath also claims "All Lives Matter."

In 2019, social media discourse about air quality turned more to criticizing personal profit. Tweets berated people and businesses suspected of profiting by externalizing the effects of pollution to the public. A student reflected on the disparity between friends from their own high school ("one of the richest and nicest") and the rival high school, where the majority of friends were asthmatic "from pollution" in the neighborhood. However, some Tweets actively denied the connection between race, housing, and air quality, with unmaterialized claims to evidence. Other Tweets provided pushback against state structures, "Not all families housing matters in MN," delineating the challenges to affordable housing and accessible transportation. This was paralleled in the circulation of a national mainstream news story about "minorities" breathing more air pollution than "whites." Likewise, a Tweet illustrated examples of race and class in areas of other American cities, to demonstrate that in Minneapolis the environment is not an "elitist issue." One Tweet observed that Minnesotans seek to prioritize [environmental justice] because they understand the disproportional impact of vehicle pollution for "communities of color and lower income communities." Action-oriented Tweets outlined solutions, such as building higher density housing with walkable neighborhoods and reducing traffic by increasing rail and electric vehicle options, particularly in "underserved communities."

In early 2020, Tweets addressed inequities as structural violences. The hashtag, #TransitEquityDay, emerged. Tweets cited scientific research to describe historical housing and transportation inequities. Infrastructure programs for I-94 were questioned, particularly the role of cost: transit pricing, congestion pricing, undue externalization of pollution effects, and the long-term costs of climate change. General action for breathing justice included attending rallies and petitioning politicians for brownfield cleanup and reforestation to improve air quality. After the onset of the COVID-19 pandemic, breathing justice Tweets addressed the higher mortality, morbidity, and complications in "Black people," a population Tweeted as more likely to reside in housing in areas with air

pollution. Others identified the poignancy of how COVID-19 exacerbated racial infrastructural violence, one saying "[COVID-19 kills respiratory compromised people.] How many of you [n–] got asthma? [I] keep thinking it's a game." Much like the highway construction that tore communities of color apart in the 1950s and 1960s in the Twin Cities, environmental concerns and questions of air quality provided another lens through which to view which communities/groups of people were viewed as disposable in the eyes of the state.

In the two weeks following the murder of Floyd, Tweets about breathing politics focused on the acute air pollution from protests, including burning buildings, "toxic smoke," and police teargas. Others lamented frustrations through irony about how people of color suffer more from chronic respiratory conditions (e.g., asthma), preventing them from being more involved in the protests and local cleanup efforts because of the air quality, giving the privilege of participation to "white people."

During the rest of 2020, breathing politics Tweets returned to relatively stable frequency and content. Standout breathing justice examples include a Tweet linking asthma and masking to "#SayTheirNames," another listing air pollution as a type of "systemic racism," and those complementing transportation plans which support environmental justice. Others discussed changes to transportation emission standards and practices, air quality disruptions from fires in the Pacific Northwest, and American air quality standards during the pandemic.

Discussion

The effects of poor air quality on communities of color is well-documented (American Lung Association 2020; Lloyd 2021; Tessum et al. 2021; University of Washington 2021). This understanding is easily placed in conversation with the events surrounding George Floyd (Eligon 2016; Beer 2020; Miller 2020; Smiles 2021) and the ongoing effects of the COVID-19 pandemic in Minneapolis, Minnesota, the United States, and the world. Politics of breath is not just a series of abstract case studies without societal and structural connections but is a symptom of politics as a whole. These examples lay bare a politics of breathing that not only exists in a singular moment or street corner but the multi-faceted, structural, long-term neglect in monitoring and protecting bodies of color.

Even if the protest movement that arose from Floyd's death did not focus explicitly on environmental justice, that does not abdicate the responsibility to examine these broader structural politics. In fact, it makes it even more important to do so; failure to interrogate these politics means they are able to continue to operate in relative obscurity, with deadly effect.

Air quality gaps raise a concern about the lack of high resolution of spatially distributed information, which again could point toward racialized surveillance. Pollutants associated with traffic, such as NO_2 and CO have limited monitoring information. Unlike the other pollutants, such as PM concentrations, there is only one monitoring site for NO_2 and CO. The available data demonstrates that, on the short time scale, $PM_{2.5}$ concentrations did not vary between communities of color and those located in predominantly white neighborhoods. This might be due to the secondary processes contributing to this atmospheric mass and consequently the regional nature of this pollutant. Conversely, in the last 4 years

(2017–2020) of the study, PM_{10} measurements were higher in communities of color compared to predominantly white communities by about 47.8%. This is in accord with the fact that the traffic was higher by more than 200% in 2017–2020.

Similarly, the analysis of AADT at 40 locations across a sample of 28 census tracts over the span of 18 years (2003–2020) in Minneapolis, MN found significantly higher traffic levels in communities of color. The findings suggest that, on average, a child born in 2003 and raised in a community of color in Minneapolis, MN was likely exposed to over 42 times the amount of traffic and vehicle emissions over the span of their childhood, than a child born in a different part of the city. A more complete dataset from Minneapolis may yield a different result. However, given the overwhelmingly one-sided nature of the results, it is not likely to change the overall findings that communities of color tend to be exposed to more traffic and vehicle emissions.

The environmental justice dimensions of Minneapolis's breathing politics discourse were not amplified in the astronomic rise of #Icantbreathe. The qualitative content of Tweets did not exist in a vacuum; it demonstrated the engagement of parallel discourse on ethnicized-racialized environmental justice in terms of reparations (Luke and Heynen 2020; Banzhaf, Ma, and Timmins 2019; Gilbert and Williams 2020; Cadieux et al. 2019), those acknowledging ecological debt between spaces within city neighborhoods (Haughton 1999; Stren, White, and Whitney 1992), and within nations and global north/global south relations (Rice 2009; Paredis et al. 2009; Warlenius, Pierce, and Ramasar 2015). Established themes like victim-blaming borrowed arguments from broader anti-Black racism dialogues surrounding foodways (i.e., soul food) (Alkon et al. 2013) to recognize the parallel structural discrimination in respiratory public health. While the environmental justice dimensions engaged with broader Black Lives Matter tenets, this engagement did not find its way to the street (and atmospheric) level structures of harm and neglect that underpinned politics of breath in Minneapolis.

As social movements that are adjacent to environmental justice both lobby for and foment structural change, these changes could rightly ripple into breathing politics. In the case of Minneapolis, larger national cries to "Defund Police" manifested locally as a failed ballot issue transitioning the MPD toward a "public safety" department, as well as a push to rename the Minneapolis Park Police. However, no new environmental actions were evident in Minneapolis's political zeitgeist. This demonstrates the scope for radical shifts in urban geographic histories that point toward addressing deeply unjust power relations, and the levers for more equitable cities beyond the socio-environmental dimensions.

At this "time of fundamental, even revolutionary, change" (Landrigan, Bernstein, and Binagwaho 2020) when dramatic "wake work" was addressing the invisible slow violence of police brutality (Parikh and Bum Kwon 2020), historical discussions of systemic racism and structural violence were at their apex in addressing the premature death by suffocation of bodies of color. Yet, breathing politics in Minneapolis were not transformational to environmental justice discourse, despite their shared core of abstract forms of violence: subject production, surveillance, social control of bodies of color, and state-sanctioned force (Jefferson 2018). This is consistent with the enduring legacies of "hold," or conditions of containing, regulating, and punishing black bodies (Sharpe 2016). The segmentation of these violences allows them to exist without being

interrogated on their interconnection with one another and is something that can be easily overcome with recognition for what it is.

During this crisis of suffocation, structures of state power were able to emerge relatively unscathed. As the U.S. Government's dissipation of structural critique included individualizing COVID-19 public health discourse (Tomori et al. 2022), similarly, the discreet focus on police abolition segmented the broader structural issues underpinning violences against people of color in Minneapolis at all scales. What remained was the defeat of a ballot measure in Minneapolis that sought to abolish the Minneapolis Police Department (Herndon 2021), and broader issues of environmental justice staying untouched, allowing all forms of slow violence to proceed unabated.

Air pollution literature increasingly acknowledges that deeply ingrained social inequities can no longer be erased in theories that democratize risks regardless of intersectional identities like race, class, age, and gender (Beck 1998; Maturo and Moretti 2018). While our case study is at the epicenter of American life, the reverberations of breathing politics on bodies of color can be seen around the world. In the anti-colonial context, the legacies of suffocation are vast, from pandemic travel bans from African countries regardless of prior international spread (Coy 2021; Mueller and Walsh 2021), to persistently, racialized geographies upheld by transnational institutions like the World Bank and International Monetary Fund. The interlinked and parallel structures of surveillance of and violence upon bodies of color require the deterritorialization of the concept of breathing to include its myriad political and embodied aspects, to integrate incomplete and segmented records, and to recognize the pervasive aerosolization of mundane structural neglect.

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Water Back: A Review Centering Rematriation and Indigenous Water Research Sovereignty

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ABSTRACT: The recent Land Back movement has catalysed global solidarity towards addressing the oppression and dispossession of Indigenous Peoples' Lands and territories. Largely absent from the discourse, however, is a discussion of the alienation of Indigenous Peoples from Water by settler-colonial states. Some Indigenous Water Protectors argue that there cannot be Land Back without Water Back. In response to this emergent movement of Water Back, this review of research by Indigenous and non-Indigenous writers traces the discursive patterns of Indigenous Water relationships and rematriation across themes of colonialism, climate change, justice, health, rights, responsibilities, governance and cosmology. It advances a holistic conceptualization of Water Back as a framework for future research sovereignty, focusing mainly on instances in Canada, Australia, Aotearoa New Zealand, and the United States. We present the findings on the current global Waterscape of Indigenous-led research on Indigenous Water issues. Water Back offers an important framework centring Indigenous ways of knowing, doing, and being as a foundation for advancing Indigenous Water research.

KEYWORDS: Water Back, Indigenous Peoples, climate change, water governance, water health, water justice

INTRODUCTION

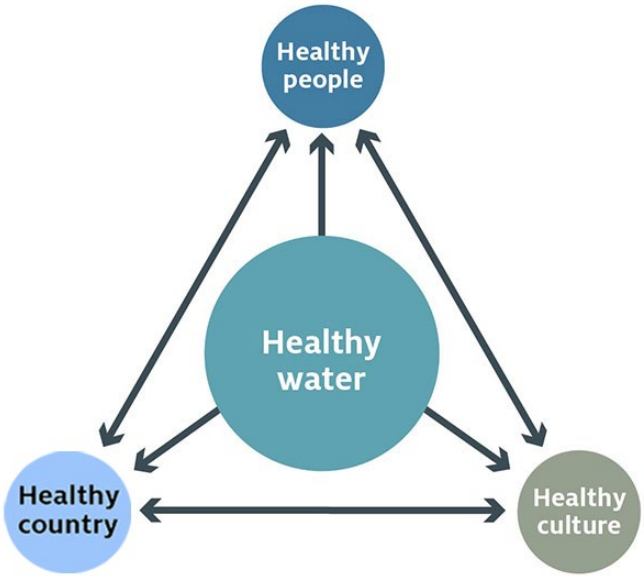
Water is life. This phrase captures not only the sacred essentiality of Water, but that Water itself is a living relation, our connection to the Lands we call home, our first medicine, and our connection to all living beings. As Indigenous Peoples, this ancestral wisdom weaves into our intergenerational scientific traditions and Water epistemologies. Indigenous Peoples and Nations, however, comprise a multiverse of wisdoms, and though we may share ways of knowing Water, our connections to Waterscapes are specific and localised, and have evolved over millennia of intimate stewardship, responsibilities, relationality, respect, reverence, and reciprocity. We also acknowledge the long history of colonial Water laws shaping Indigenous Water rights in settler-colonial states (McCool, 2006; Thorson et al., 2006; Harmsworth et al., 2016; Macpherson, 2019; Godden et al., 2020). Recent studies that broadly examine Indigenous values of, and relationships to, Water break down western silos of Water scholarship that often exclude Indigenous voices, and cross disciplinary boundaries between social and natural sciences. Indigenous voices thus carve out a unique canon of Indigenous Water scholarship which this article puts forward in what we anticipate will be the first of many comprehensive reviews. Indigenous Water research now encompasses an expansive area of Water literature, that includes, but is not limited to, cosmology and governance, colonialism, justice, responsibilities and rights, health and climate change.

Core to our thesis is the existence of numerous Indigenous ways of knowing and being with Water, an understanding of the multitude of threads that interweave and overlap across these knowledge systems, and an awareness of the opportunities for healthy Water futures through restoring inherent rights to apply these knowledges in practice. Water and Waterscapes are crucial to Indigenous Peoples' spirituality, well-being, livelihoods, and identities. As such, Indigenous rights of self-determination span cultural, political, and socioeconomic dimensions of Water (Robison et al., 2018). This message is asserted and evidenced by numerous Indigenous Water scholars; these include a Kamilaroi Water scientist from Australia and the co-authors of Moggridge et al. (2022), who together have established a research methodology for managing Water on traditional Kamilaroi Lands. Moggridge et al. (2022) highlight the urgent need for developing Indigenous Research Methodologies (IRMs) to engage Indigenous Knowledges (IK) and empower Indigenous Peoples to participate in debate around Land and Water management, and around monitoring and policy development. IRMs, as rooted in Indigenous epistemologies and ontologies, represent a helpful shift from positivist forms of research (Wilson, 2001). The protection of Water was and is bound by Indigenous natural law, stories, lore and customs, which provide a system of sustainable management that ensures healthy people and healthy Water for future generations (Lingiari Foundation, 2002). Figure 1 conceptualises these key interrelationships.

As Tewa scientist Gregory Cajete (2004: 55) writes, "Native Science reflects a celebration of renewal. The ultimate aim is not explaining an objectified universe, but rather learning about and understanding responsibilities and relationships and celebrating those that humans establish with the world". Further asserting that new pathways for knowledge co-mobilisation are emerging he notes that, "Native and Western cultures and their seemingly irreconcilably different ways of knowing and relating to the natural world are finding common ground and a basis for dialogue" (ibid: 56). This review seeks to balance the synergies, uniqueness and trajectories of these relationships with Water.

We are first and foremost relatives of Water (Nibi, Nipi, Tó, Lo, Wai, Baa', Uini, Tuu, Gali, Vaa'am, Há, Tsits, Tona, P'oe, Gali). This review's author collective represents 16 Indigenous Nations and communities across two continents and islands connected by Water. We draw our professional perspectives from diverse disciplines and practices including Water science, policy, natural resource stewardship, oceanography, biology, climate research, law, history, engineering, planning, geography, and public health. Though we select from cases and Indigenous Knowledges around the world, this review is centred around the Lands, Waters, and colonies of Canada, Australia, Aotearoa New Zealand, and the United States (CANZUS). Following the Indigenous methodological practice of storywork (Archibald, 2008), we

Figure 1. Healthy Water. The relationship and importance of healthy Water to a healthy country, healthy people, and a healthy culture.



Source: Adapted from Moggridge and Mihinui (2010) in Moggridge (2010).

approached this review through an Indigenous lens that values our lived experiences as Indigenous Peoples with diverse Water relationalities to synthesise and conceptualise our collective Waterscape of Indigenous research. While we are not representative of all Indigenous Peoples globally, we include Peoples from desert landscapes, marine environments, freshwater regions and the areas in between. We thus have knowledge of many types of Water relations. At the same time, most of the literature reviewed here was written in English and our author collective draws most heavily from the global north, where most of us received our education. This review reflects this emplacement. Future reviews by Indigenous authors from the global south with diverse linguistic positionality are warranted. Despite these limitations, we offer this body of literature and this review as a new conceptual framework for reclaiming, rematriating and restoring Indigenous Water sovereignty in research and in practice.

Indigenous Water research centring Indigenous voices grew alongside Indigenous social movements and declarations such as Idle No More, Standing Rock, Cultural Flows, and other Water Protector actions in defence of the sacred (MLDRIN, 2007; Estes, 2019; Gilio-Whitaker, 2019; Moggridge and Thompson, 2021). In the media, there are abundant news stories that track the virulent and violent Water security issues facing Indigenous Peoples (Lam et al., 2017); less well documented, however, are the resilient Water solutions and innovations by Indigenous Peoples that respond to these pressing Water crises. Despite the absence of media coverage of Indigenous resiliency, Indigenous communities have advocated on behalf of Water for generations, and a new generation of Indigenous researchers and scientists is bringing to the fore Indigenous approaches and understandings of our vast unique relationships to Water. These unique approaches to Water research have also drawn the attention of international Water scientists and of forums such as the Intergovernmental Panel on Climate Change (IPCC); they foreground Indigenous intergenerational knowledge of weather, Water, and Land as being crucial to both the understanding of historical climate changes and the shaping of healthy future lifeways (IPCC, 2021). In the first chapter of the 2021 IPCC report (2021: 243), however, we note the acknowledgement "that assessing this knowledge, and integrating it with the scientific literature, remains a challenge to be met", and most of the physical science working group chapters neglect to include Indigenous and local Knowledges in their assessment findings. We likewise foreground a critical need for Water research by

and for Indigenous Peoples. This includes acknowledging and applying the vast amount and breadth of knowledge and research that is already being done by and for our Peoples. This Indigenous Literature Review process supports Water sovereignty, reclamation, rematriation and restoration and is connected to broader Indigenous sovereignty movements that are emerging globally.

Global Water consciousness and solidarity grew in the wake of the Water Protector movement that emerged after the fight by the Standing Rock Sioux Tribe and other Tribal Nations to stop the Dakota Access Pipeline (Robison et al., 2018; Wolfley, 2018; Whyte, 2019a). Soon after, the Land Back movement began to be addressed in the academic literature; it particularly started to draw international attention in 2019, after the Yellowhead Institute, an Indigenous research think tank, published *Land Back: A Yellowhead Institute Red Paper*. The Land Back movement has catalysed global solidarity in addressing the oppression and dispossession of Indigenous Peoples' Lands and territories (Landback, 2021); however, discussions on the alienation of Indigenous Peoples from Water by the settler-colonial state have been largely absent from the discourse. Some Indigenous Water Protectors argue that there cannot be Land Back without Water Back. The Land Back movement has expressed a range of meanings of 'Back', from the literal return of physical territories to the return of Indigenous governance to shared Land to the reinvigoration of intertwined Indigenous relationships to and knowledges of Land (Longman et al., 2020; Riddle and Saddleback, 2020; Koot and Büscher, 2019). These meanings differ from place to place and from movement to movement; the parallel Water Back movement reflects this diversity, as reflected in this review. We also understand Water as inclusive of all manifestations of Water in the hydrologic cycle. There is no separateness of fresh and saltwater. Water Back as a framework and praxis allows us to reclaim our ways of knowing Water as one being, not as separated pieces of itself.

Indigenous Peoples have positioned the framing of 'Water Back', calling for the reclamation and rematriation of Indigenous Water Knowledges that are inclusive of not only rights to Water but responsibilities to Water. In one clear and central articulation of Water Back, the Pueblo Action Alliance's *Water Back Manifesto* recognises that, "Water Back is a step towards Indigenous communities declaring their independence from the US Empire. It also means removing European occupation, clarifying Water rights for Indigenous communities, the application of Indigenous feminist Water and land management practices and the resurgence of Indigenous identity" (Pueblo Action Alliance, 2021). Water Back movements do not conform to any one definition or framing. They will be – and *must be* – as unique as the Indigenous cultures, places and Water relations from which they are born. It is inevitable that they also become uniquely carved by the local and contemporary oppressive settler-colonial contexts through which they must be negotiated. As many Indigenous researchers and activists have pointed out, to turn relations into nouns or otherwise constrained definitions rarely follows Indigenous epistemologies or accountabilities: "A bay is a noun only if Water is *dead*" (Kimmerer, 2013: 55; see also Liboiron, 2021; Watts, 2013). Throughout this review we capitalise 'Water' and other names for more-than-human relations to honour their intrinsic value as living entities, recognizing their profound significance in Indigenous cosmologies and lifeways, where Water is regarded as a sentient being with agency and interconnectedness. To achieve the political intent behind these Water movements, any ideation of Water Back must not constrain our ideas and approaches to such movements; instead, it must provide a platform from which Indigenous Peoples can develop and execute effective strategies for our own aspirations in our own contexts, even as similarities can be articulated for wider-scale connections (Smith, 2012). Key to any such platform is access to both local and global Indigenous Water scholarship from which to derive insights to inform strategies that are linked at multiple levels.

For our Indigenous author team, for our communities, and within the primarily English-language, Indigenous-oriented and -produced research reviewed from CANZUS, Water Back means the return of Water and kin to Indigenous governance in a way that empowers the resurgent Indigenous Water relationships that are integral to Indigenous cultural, biological, spiritual and political sovereignty; this includes cosmogony, ceremony, access, law and policies. Water Back in this way is allowing Water to rematriate relationships with Indigenous Peoples, the Lands that are nourished by Water, and the more-

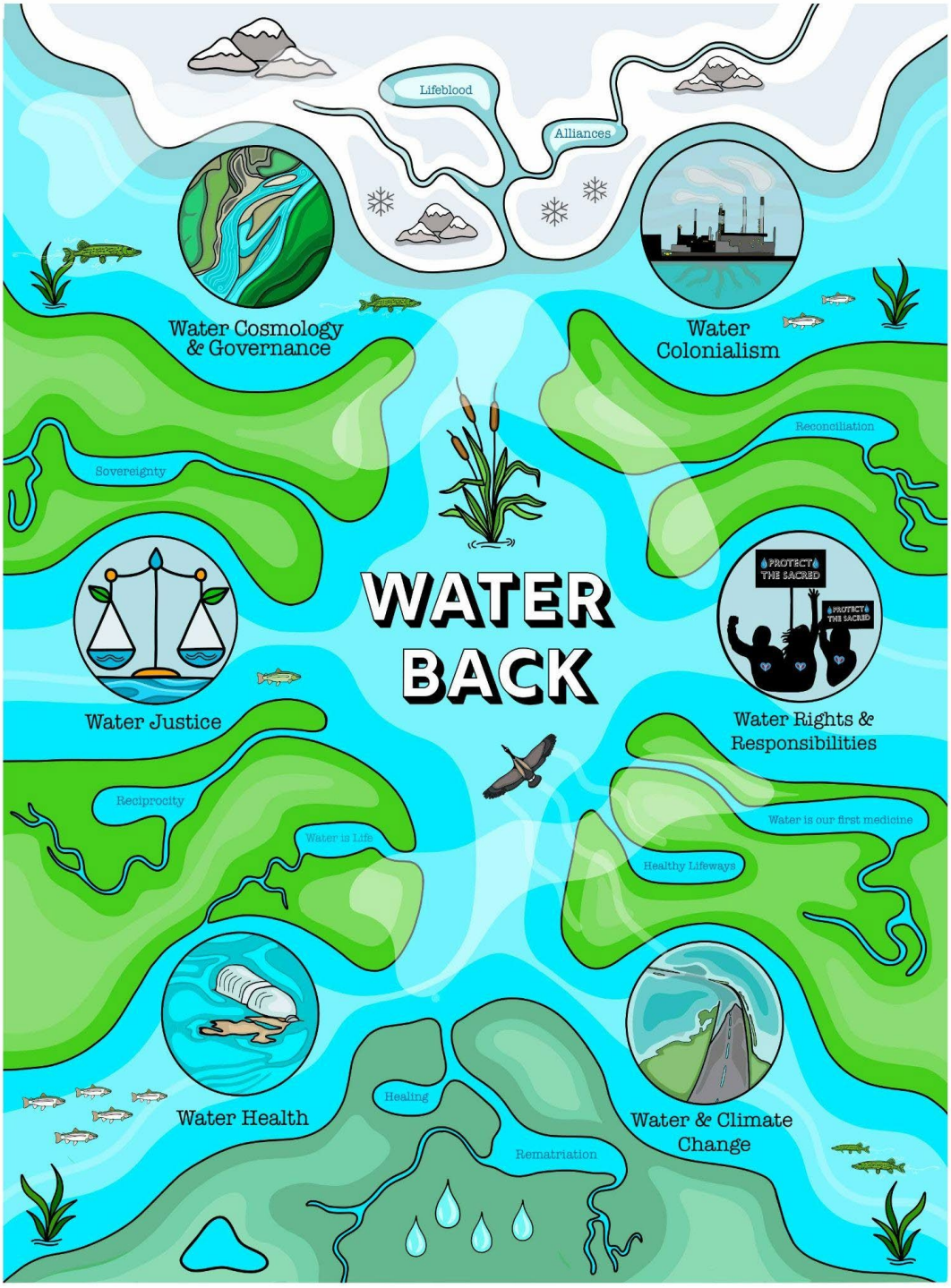
than-human relatives that live within and care for Water. Water Back is the restoration of humanity's responsibility to care for Water and the recognition of Indigenous Peoples' inherent relationships, connections, rights and responsibilities to Water.

Rematriation is a term coined to reinvigorate and inspire humanity to fulfil its duty of care for Mother Earth (Gray, 2022; Newcomb, 1995; Rematriation, 2023). It further describes the process of returning Water, Land, culture, and spirituality to Indigenous women to address the ongoing impacts of colonialism, patriarchy, and gender-based violence (Kuokkanen, 2019; Wires and LaRose, 2019; Rematriation, 2023). The term has gained prominence in Indigenous movement building through the work of the Haudenosaunee-led digital storytelling platform – *Rematriation* – founded by Kaluhyanu:wes Michelle Schenandoah (Onʌyota':aka, Wolf Clan) (Rematriation, 2023). Rematriation further aims to restore balance and promote healing within Indigenous communities by reclaiming Indigenous Knowledges, revitalising cultural practices and obligations, and supporting Indigenous leadership and decision-making power (Tuck, 2011). In the context of the Water Back movement, rematriation seeks to restore Indigenous ways of caring for Water and aligning with it as a sacred being, by returning and restoring Indigenous ways of knowing and being in relation to Mother Earth. It also refers to returning decision-making power, knowledge, and responsibility for Water to Indigenous Peoples, recognizing our significant roles in Water governance. This can involve restoring Indigenous Water ceremonies, management practices, recognizing and supporting grandmother Water keepers, and addressing the impacts of colonialism and patriarchy on our access to and relationship to Land and Water.

In response to this emergent movement, this Indigenous Literature Review aligns with the principles of rematriation, reclamation, and restoration, emphasising the significance of centring Indigenous leadership, authority, and knowledge in Water research. It traces the discursive patterns of Indigenous Water relationality across themes of colonialism, justice, health, rights, responsibilities, climate change, cosmology and governance. The review contributes to a holistic conceptualisation of Water Back to support research that advances Indigenous Water sovereignty (see Figure 2).

Water Back offers a new framework that centres Indigenous epistemologies and histories as a foundation for advancing Indigenous Water research into the next decade. While there are many articulations of Water Back, a crucial element of it is the explicit acknowledgement of the positionality of Water researchers. Research on Indigenous Waters or in Indigenous territories has all too often failed to engage or cite Indigenous scholarship; instead, it defers to studies and narratives from externalised perspectives that are glimpsed through a settler-colonial gaze/lens, consistent with what is often referred to as 'helicopter' or 'parachute' research that has led to extractionary research or incomplete narratives (Minasny et al., 2020; Dion et al., 2020). Research sovereignty refers to research that is led and conducted by Indigenous Peoples for Indigenous Peoples. It upholds the rights and responsibilities of Indigenous communities to have a voice and authority in decision making when it comes to research on our Lands, Peoples, and Water. This principle is essential for promoting the decolonization and indigenization of research, as it prioritizes Indigenous perspectives, values, and beliefs and recognizes the rights, relationships, and responsibilities of Indigenous communities. While the term 'sovereignty' originated in the context of European struggles for land, we adopt this terminology as a key determinant of contemporary Indigenous Nations' exercise of power for Water protection. Here, we establish a sovereign Water researchscape by foregrounding work that is led by Indigenous Water researchers, stewards, relatives and allies wherein Indigenous worldviews and relational accountability to communities remain embedded. Water research sovereignty allows Indigenous Nations and communities to have complete control over their Water data. Research on Water governance can be led by Indigenous scholars and may be open to non-Indigenous researchers who work alongside Indigenous governments through allyship and co-partnerships of Water research. Research sovereignty is a key principle of the Water Back movement, ensuring that Indigenous Water science, cosmology, and stories are shared and told by those who belong to the Water and who have a connection to the communities they work with and for.

Figure 2. Water Back. Conceptualisations of the different intersecting elements of Water Back movements across the six core Water themes present in the literature.



Source: Author created figure illustrated by Hawlii Pichette.

Note: While different Water Back movements may focus on only a few of the elements in the figure, all are crucial for understanding the movement as a whole.

Methods

Literature reviews are essential components of research, enabling a comprehensive understanding of existing knowledge and identifying research gaps (Jesson et al., 2011). Various approaches, such as systematic, integrative, scoping, and narrative reviews, have been utilised to synthesise literature in different fields (Tranfield et al., 2003; Torraco, 2005; Arksey and O'Malley, 2005; Rother, 2007). However, these conventional approaches do not adequately capture Indigenous perspectives and knowledge, particularly in areas like Indigenous Water research (Grant et al., 2009). This necessitated the development of a distinct methodology, as existing review types did not align with our purpose of identifying and analysing Indigenous Water research literature through a relational and collective participatory storytelling approach.

Guidelines for conducting literature reviews have been established in disciplines such as psychology (Baumeister and Leary, 1997) and social sciences (Davis et al., 2014). However, we recognized the need to draw on guidelines specifically tailored to Indigenous studies to inform our approach. By doing so, we developed an Indigenous Literature Review process that respects Indigenous Knowledge Systems and empowers diverse perspectives, enabling a more comprehensive understanding of the Indigenous research topic. By contextualising our methodology within the framework of Indigenous studies, we aim to fill a gap in existing literature review approaches and contribute to the growing body of Indigenous research methodologies (Chilisa, 2012; Drawson et al., 2017; McGregor et al., 2018).

We developed an Indigenous Literature Review process based on Indigenous Research Methods (IRMs) privileging connection, accountability, and relationality (Wilson, 2008; Smith, 2012) that led to greater representation of the research Waterscapes of the author collective's broader network of expertise and disciplinary diversity (See Figure 3). The Indigenous Literature Review Process includes four phases: (1) Building Relationships; (2) Indigenous Methods: Gathering Knowledge; (3) Indigenous Synthesis: Collective Storytelling and Analysis of Literature; and (4) Culturally Respectful Knowledge Sharing.

Building relationships

The 'Building Relationships' phase of the Indigenous Literature Review process centres around the establishment of meaningful connections between Indigenous researchers (Burchill et al., 2011). These relationships are essential to ensure that Indigenous perspectives, trust, and respect for Indigenous protocols underpin the entire literature search process. Through this phase, the focus is on bringing together Indigenous researchers who may not have worked together previously and linking them through the author writing collective. This collective approach promotes collaboration and the sharing of diverse perspectives, enabling a more comprehensive and inclusive review. Our author collective engaged in discussions (May – July 2021) to meet one another and share our expertise in Water research, as well as our diverse relationships to Water. These conversations not only included introductions in Indigenous languages but also included answering the question: "What Water do you belong to?"

This phase further signifies a departure from dominant literature review processes that tend to be individualistic in nature. Instead, it embraces Indigenous Research Methodologies (IRM) and collective approaches that align with Indigenous research sovereignty. By centring Indigenous perspectives, trust, and respect, this phase lays the foundation for a literature review process that is grounded in cultural integrity, reciprocity, and collective empowerment. Thus, throughout the Indigenous Literature Review, relationality, accountability, and respect for Indigenous protocols are paramount. In this process the author collective acknowledges and follows appropriate measures to honour Indigenous research as a ceremony. This involves demonstrating respect for local Indigenous protocols, showing gratitude, and actively engaging in reciprocity with the Indigenous communities and knowledge holders involved. By embracing an Action Research approach, which combines theory and practice, the literature review process becomes an opportunity to develop practical solutions that foster the well-being and flourishing

Figure 3. Indigenous literature review.

Source. Created by the authors via Canva.com.

of Indigenous Peoples and our communities (Fredericks et al., 2014). This approach emphasises the collective definition of issues to be addressed, the development of work processes, and the collaborative conduct of the research itself. The author collective engaged in discussions (June – August 2021) to co-define the thematic conceptualizations of the Water Back framework based on author expertise, experience, and the literature. Following IRMs, we began with the themes and issues of importance to Indigenous social movements (Smith, 2012), to our home communities and Nations (Bishop, 1999; Wilson, 2008; Reano, 2020), and we refined these as a participatory collective (Bishop, 1999; Vaioleti, 2006).

Indigenous methods: Gathering knowledge

The 'Gathering Knowledge' phase of the Indigenous Literature Review process embraces and respects Indigenous epistemologies and approaches to gathering knowledge. This entails utilising conversational and participatory methods that value Indigenous ways of knowing and understanding. By foregrounding Indigenous authorship, community research, and research questions, this phase respects and upholds Indigenous research sovereignty. It recognizes that Indigenous Knowledge is essential to the review and to authentically represent Indigenous perspectives and experiences. The process incorporated a critical examination of author positionality, emphasising Indigenous identity, accountability, and community context. In reviewing the literature, we prioritised Indigenous authorship, research done with, by, or for Indigenous social movements and communities, and studies prioritising Indigenous research questions. By actively including literature from other Indigenous authors, we sought to align with research sovereignty (See Figure 4). We carefully gathered, added, and vetted the literature based on our positionality and experiences as Indigenous Peoples, ensuring that our selection process was informed

by an Indigenous lens. This approach aimed to authentically represent Indigenous Knowledge Systems and promote the relevance and inclusivity of the review.

To gather knowledge for an Indigenous Literature Review, a comprehensive search for relevant literature is conducted, drawing from both academic databases and Indigenous Knowledge sources. This involves going beyond dominant academic sources and engaging with Indigenous community members, Elders, and other knowledge holders who possess valuable insights and wisdom. Informed by the Hunting Gathering focus group method developed by Burchill et al. (2011) we conceptualised this phase of the literature review to include the process of gathering data or information on Water research in ways that respected each author's Indigenous perspective as well as the protocols of the Indigenous Waterscapes we were engaging. In doing so the gathering approach aimed to create "a sense of purpose and a sense of community in a culturally safe environment" (Burchill et al., 2011: 35). This approach aligns with Indigenous practices of knowledge acquisition, emphasising the importance of cultural protocols, respectful engagement, and reciprocity.

We also recruited additional authors and collaborators to fill in gaps in geography or thematic expertise. This chosen method of recruitment, rather than merely reviewing more literature, is aligned with Māori scholar Linda Tuhiwai Smith's (2012) IRM strategies of connection, testimony, and networking. These processes determined not only applicable themes, but which articles were selected for review within each theme. By integrating Indigenous epistemologies, community research, and Indigenous Knowledge sources, the 'Gathering Knowledge' phase ensures a holistic and inclusive approach to knowledge acquisition. It recognizes the richness and depth of Indigenous Knowledge Systems. Ultimately, it encourages a review process grounded in cultural integrity, relationality, and the acknowledgment of Indigenous ways of knowing as vital sources of wisdom and understanding.

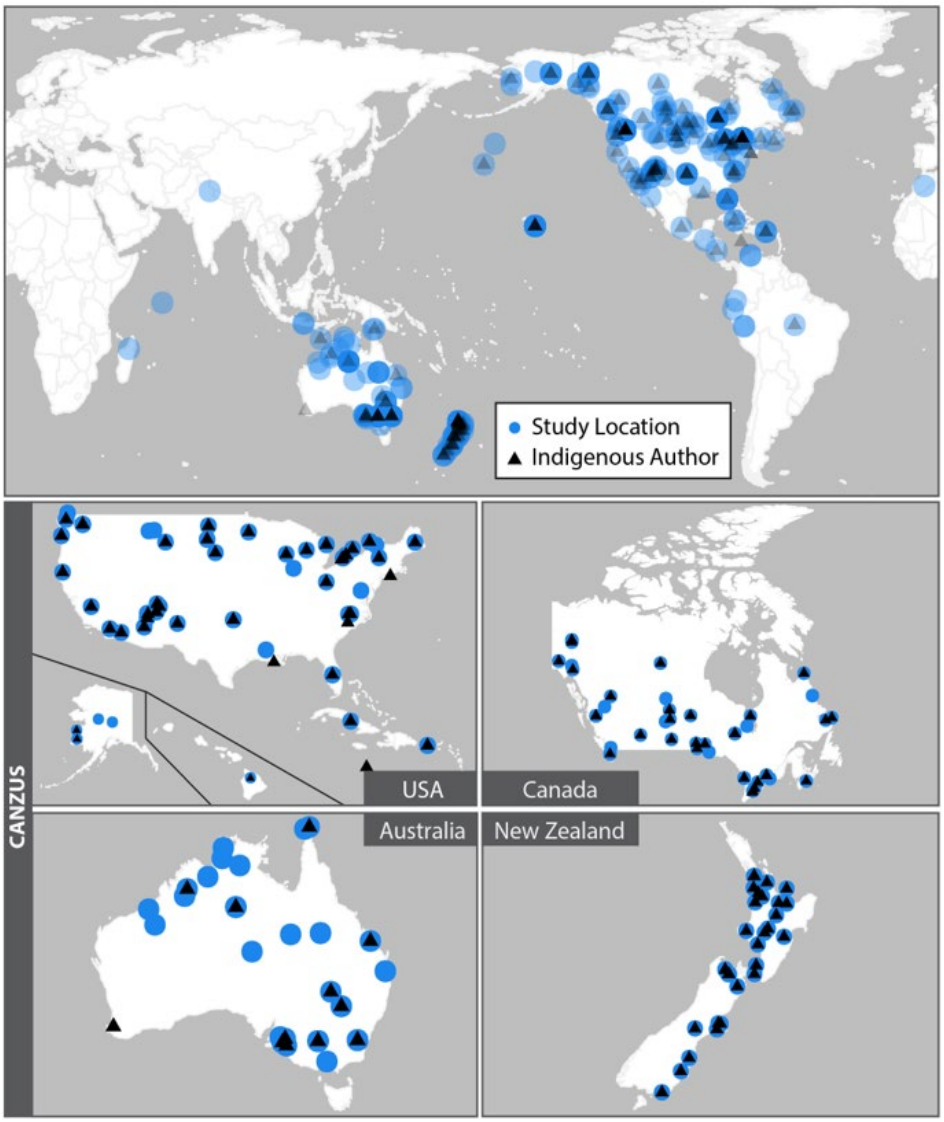
Indigenous synthesis: Collective storytelling and analysis of literature

The 'Collective Storytelling and Analysis of Literature' phase is a transformative process that involves synthesising Indigenous literature through an Indigenizing lens. This phase embraces the power of collective storytelling and analysis, recognizing the diversity and richness of Indigenous Knowledge Systems. By drawing upon multiple perspectives and experiences, the synthesis of the literature reflects a holistic understanding of Indigenous issues and realities. To analyse research on Water Back, we worked iteratively and inductively to construct themes from the gathered body of evidence on the present Indigenous issues faced across our communities. However, we acknowledge the gaps in the Indigenous Water research analysed for this review as study locations are concentrated in English accessible literature, primarily from the global north and particularly CANZUS. We reviewed 419 articles across the six dimensions of the Water Back framework (See Figure 2 and 4).

To ensure a culturally respectful and comprehensive synthesis, the collective engages in a process of Storywork analysis. This involves assessing the relevance, quality, and alignment of the literature with Indigenous principles such as "respect, responsibility, reciprocity, reverence, holism, interrelatedness and synergy" (Archibald, 2008: 140). The analysis is conducted in consultation with the collective, grounding it in Indigenous perspectives and ensuring that it reflects the unique needs and aspirations of Indigenous communities. By breaking away from dominant conceptions of a literature review and working within an Indigenous framework, this process fosters a deeper understanding and appreciation of Indigenous Knowledge Systems. Reflecting the diversity of our author's collective, our process also incorporated the Whakawhiti kōrero method developed for designing assessment tools by Māori scholars Elder et al. (2015: 2), which calls for the exchange of ideas, as well as "active discussion and negotiation". Through dialogue and collaboration, the author collective develops Indigenous-specific criteria, themes, conceptual models, and or frameworks that enable a comprehensive and culturally responsive analysis of the literature. We met monthly to discuss articles and coding of the database (September 2021-February 2023). All authors participated in a survey to develop a synthesised definition for Water Back,

Rematriation, and Research Sovereignty as articulated in the literature and presented in the review article. To ensure that, to the extent possible, Indigenous-specific local contexts, cultures, places, methods, and languages were not misinterpreted, we requested that a member of our research team from the same nation, region or language group review the article. This exchange of ideas fosters a shared understanding and ownership of the review process, ensuring that it is a collective endeavour rooted in Indigenous values and principles.

Figure 4. Water Back Research Atlas. The world map (top) illustrates the location of studies (blue) conducted by Indigenous authors and the Indigenous author's location (black).



Source: Author created based on database (See Supplementary Material).

Notes: The transparency of the study and Indigenous author location demonstrates the density of studies performed across the globe among 419 reviewed articles (see Supplementary Material). Indigenous authorship was determined based on self-identification by the reviewed article's author(s) as listed within their biographies or positionality statements included in the referenced literature and/or as documented within their publicly accessible biographies or website(s), and community knowledge from respective networks.

Culturally respectful knowledge sharing

In the process of disseminating the findings of the literature review, our primary aim was to ensure that the information is shared in a culturally appropriate manner, reflecting the collective's understanding and ensuring accessibility for Indigenous Peoples and communities. To achieve this, we engaged in ongoing reflection and evaluation of the review process, continuously identifying areas for improvement to ensure the review remains relevant and responsive to the needs of Indigenous Peoples. To identify types of knowledge sharing that would align with Water research, we hosted discussions among the author collective (August 2022 – May 2023), recognizing the value of each member's Indigenous perspective. Through these discussions, we sought to determine how the knowledge gathered in this review could be shared in a meaningful, collaborative and inclusive format.

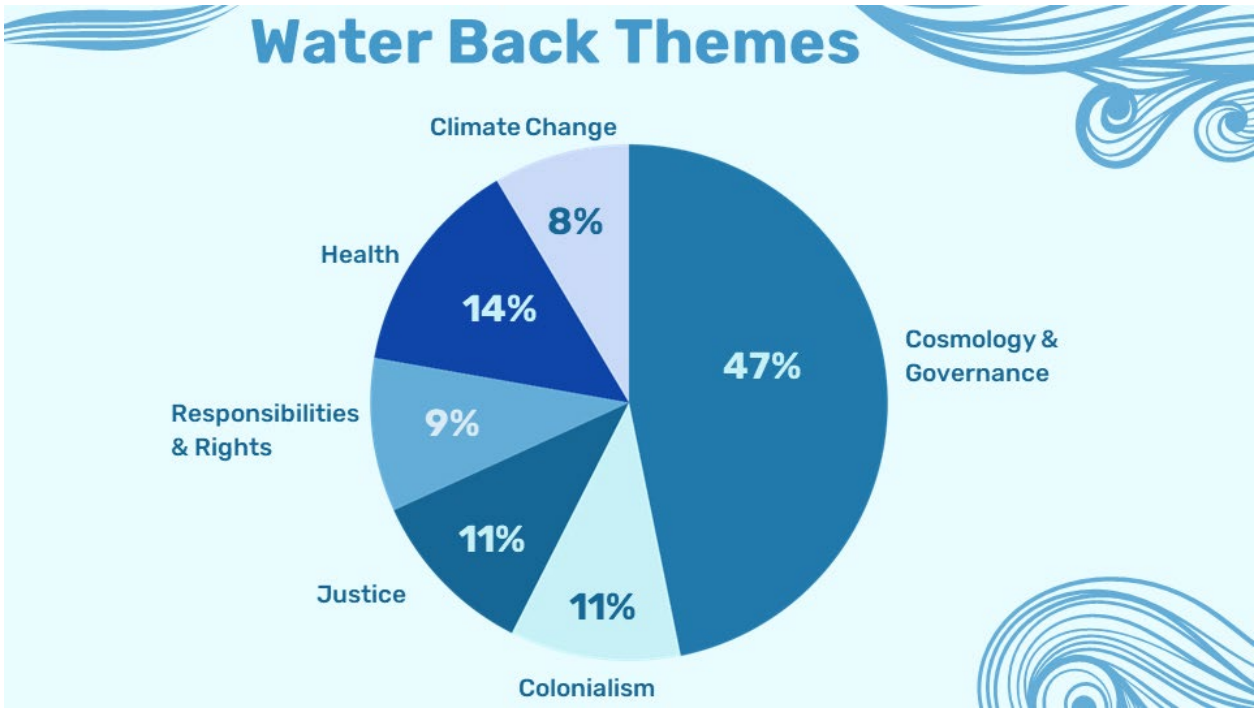
One significant outcome of our Indigenous Literature Review process was the recognition of the absence of an existing database specifically dedicated to Indigenous Water research literature. In response, we made the decision to create a comprehensive database of the Indigenous Water research literature that we reviewed. This database is accessible as supplementary material, and we are committed to its maintenance and ongoing development. Moreover, we extend an invitation for contributions from individuals or communities globally, recognizing the importance of collective engagement and shared responsibility in building a living reflection of our relationality and commitment to Indigenous Water research sovereignty.

Findings

The findings of this review article, informed by Water Back thematic analysis, shed light on the critical intersections between the Water Back movement, rematriation and research sovereignty. Through an examination of diverse literature sources, the review identifies key themes that emerged, including the centrality of Water in Indigenous lifeways, the importance of rematriation and Indigenous sovereignty, the impact of colonialism and Water injustice, and the need for collaborative and holistic approaches to Water research. These results provide valuable insights into the ongoing efforts to restore Indigenous relationships with Water and advance Water justice, highlighting the urgent need for transformative change in how Water research is conducted and by whom.

Of the reviewed articles, 62% (n=261) were authored or co-authored by Indigenous Peoples, highlighting their active involvement in Water research. The literature reviewed and database created include literature written by non-Indigenous authors where the Water research was done with or for Indigenous Peoples and or communities, but may not have extended authorship to Indigenous Peoples from the engaged Waterscape. Each article was reviewed and manually coded for the associated theme (see Supplementary Material). The analysis shows that the most prominent Water Back themes were Cosmology and Governance (47%) and Health (14%) (see Figure 5).

Figure 5. Water Back themes.



Note: This figure illustrates the distribution of themes in the literature on Indigenous Water research. The data represents the percentage of coverage for each theme within the reviewed literature. (n = 419).

Source. Author created. See Supplementary Material.

The prominence of the Cosmology & Governance theme in the reviewed literature can be attributed to its critical importance in understanding the complex relationships between Indigenous Peoples, Water, and our cultural, social, economic, and political systems. These themes are interconnected and serve as foundational elements for Indigenous Water research, as they shape Indigenous perspectives, Knowledge Systems, and approaches to Water rematriation. Scholars emphasise the Cosmology & Governance theme in the literature to address the historical marginalisation of Indigenous Knowledges and perspectives in discussions on Water governance, policy, and practice. By centring Indigenous Knowledge Systems, scholars aim to challenge the dominant western-centric narratives and frameworks that have often disregarded or undervalued Indigenous perspectives on Water. Recognizing the importance of Indigenous cosmology and governance allows for a more holistic and culturally grounded understanding of the relationships between Indigenous Peoples and Water. This approach not only respects Indigenous sovereignty and self-determination but also contributes to more inclusive and equitable Water governance. Ultimately, scholars prioritise this theme to promote Indigenization, foster collaboration, and support the revitalization and rematriation of Indigenous Knowledge Systems and practices in Water research. Moreover, examining the intersectionality of these themes provides a comprehensive understanding of the complex interactions between climate change, cosmology & governance, health, responsibilities & rights, justice, and colonialism, offering insights for reciprocal, relational, and respectful Water research practices that uphold Indigenous sovereignty and well-being.

This review highlights the vast Water Knowledges, long history and robust movement to bring Water Back into balance with Indigenous Peoples' lifeways. The next section recognises Indigenous Peoples' unique understandings and relationships to Water as a living entity through Water Cosmology and Governance. The subsequent section on Water Colonialism explores the tensions between settler-

colonial and Indigenous political relations for Water protection. The section on Water Justice then explores distributional, procedural and recognitional justice issues related to Indigenous Waters; it goes on to identify the power imbalances present in existing Water rights frameworks that prioritise settler-colonial property rights and exclusive, individual ownership of Water over collective responsibilities to Water. The section on Water Responsibilities and Rights that follows further examines Indigenous innovations in response to systemic barriers to participation in Water decision-making. In the Water Health section, we explore the biophysical impacts of Water colonialism, not only on Indigenous Peoples but on the Waters themselves and on the beings who rely on Water. The final section on Water and Climate Change explores the pressing climate crisis that is facing Indigenous Waters. This section further explores the interconnected nature of climate and Water injustice and the disproportionate burdens of environmental and climate change harms that are carried by Water and Indigenous communities. The first step in dismantling systems of oppression is rematriating Water and supporting sovereignty in Water research such that it centres the leadership and guiding insights of Indigenous Peoples, Nations and communities.

WATER COSMOLOGY AND GOVERNANCE

For decades, Indigenous researchers around the globe have articulated our relationships to Water. We have noted that these extend far beyond the need for consumption, agriculture, sanitation and other utility-based relationships (Abate and Warner, 2013; Anderson, 2010; Borrows, 1997; Craft, 2013; Deloria, 1970; Cajete, 1999). Common to Indigenous cultures and belief systems is the recognition of Water as a gift and a responsibility that is granted from the more-than-human realm. Both Indigenous and non-Indigenous ontologies and cosmologies describe the origins and ordering of the world, how the world holds together, and what our relationships to the world are. In all cases, Indigenous and otherwise, these concepts of how the world works dictate how we interact with Water and with each other. Valuing Water as a sacred gift, for instance, will result in different actions rather than knowing Water as a resource to be harnessed purely for consumption, economic gain, and exploitation. In this way, Indigenous Water cosmologies shape Indigenous Water governance (Arsenault, 2020, 2021; Borrows, 1997; Craft, 2013; Leonard, 2019; Smith, 2012).

In recent decades global acknowledgment of Indigenous Water cosmology and governance emerged alongside the phenomena of Indigenous water declarations beginning with the ratification of the Indigenous Peoples Kyoto Water Declaration at the Third World Water Forum in 2003. This unprecedented Water declaration affirmed Indigenous Peoples' relationship to Water as well as Indigenous rights to Water and self-determination (IPKWD, 2003). In subsequent years new Indigenous Water declarations have emerged across scales from local to international, affirming Indigenous Water relationality (Poirier and Schartmueller, 2012; McGregor, 2014; Taylor et al., 2016; Craft and King, 2021). In 2007, advocacy for Indigenous Water governance was further bolstered with the adoption of the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). Although research and advocacy on Indigenous Water cosmology and governance certainly existed before 2007 (Cushman, 2004; McCool, 2006; Thorson et al., 2006; Wolf, 2000) specific mention of Indigenous Water Knowledge was largely absent from settler-colonial state international agreements prior to the signing of the UNDRIP, which articulates protections for Indigenous Water rights and responsibilities (United Nations General Assembly, 2007). Since 2007, the need to include and recognize the value of Traditional Ecological Knowledge and later Indigenous science for addressing global environmental challenges has grown internationally (McGregor, 2014).

Many Indigenous Peoples around the world, from Aotearoa New Zealand and Australia to Africa and from Asia to North America assert that one of the most critical human priorities should be ensuring that our ways of living do not negatively impact present and future generations. Smith, Chilisa, and Borrows discuss the concept of 'relational accountability', which is based on a recognition of the

interconnectedness between people and nature and on coexistence in general (Arsenault, 2020, 2021; Borrows, 1997; Chilisa, 2012; Smith, 2012; Wilson, 2008). Just as Indigenous Peoples are acutely aware that present and future generations will be harmed by unsustainable, extractive and exploitive lifestyles, we understand that this harm extends to the natural world and to other Peoples. The sacred relationships to Water have dictated Indigenous key priorities and values of posterity, relational accountability, and reciprocity; these in turn, have shaped ancestral Indigenous Water laws that continue today (Arsenault et al., 2018; Borrows, 1997; Chiefs of Ontario, 2008; Craft, 2013). Indigenous Water cosmologies also underpin Indigenous and sustainable irrigated cultivation systems such as the Hagdan-hagdang Palayan ng Banawe, the Ifugao rice terraces in the Philippines (Acabado and Martin, 2016) and the Balinese subak, the paddy irrigation system that was developed there in the 9th century. (Roth, 2014; Lansing et al., 2014). The drive to restore relational accountability and other Indigenous values and to restore systems of Indigenous Water governance motivate a contemporary call for transformative and re-Indigenised research (Arsenault, 2020, 2021; Borrows, 1997; Chilisa, 2012; Leonard, 2019; Smith, 2012).

Indigenous Peoples in Canada and the United States have shared their relationships to Water through Creation Stories (cosmogonies and cosmologies) and more generally through storytelling (Anderson, 2010; Borrows, 1997; FNEATWG, 2016). Water is a sacred link to the Creator, to Ancestors, and to present and future generations; it is a critical element of Indigenous Creation Stories. The profound cultural significance of Water has been expressed by 11 Indigenous Grandmothers from various regions in Canada, who share a collective understanding that Water represents an eternal connection to the Creator (Anderson, 2010). Each person passes through Water right before birth, and in many cultures, Indigenous Peoples are also bathed in Water they belong to at birth and after death (Leonard, 2019; Anderson, 2010). As a sacred gift from the Creator, Water must be respected, conserved and protected for future generations in the same way that Water was cared for by our Ancestors before us (Borrows, 1997; Craft, 2013; Chiefs of Ontario, 2008; McGregor, 2014, 2015; Nelson, 2013; FNEATWG, 2016; Walkem, 2007).

Indigenous Peoples beyond North America also assert our close relationships with Water and the need to protect Water for current and future generations (Te Aho, 2011; Smith, 2012; McGregor, 2015; Taylor et al., 2016; Robison et al., 2018). In Aotearoa New Zealand, for example, Linda Tuhiwai Smith shared how Māori relate to Water as a living entity with a spirit (Smith, 2012). The Māori perspective and the resultant relations with Water led to the fight for, and recognition of, legal 'personhood' status for the Whanganui River in Aotearoa New Zealand (Ruru, 2018). In Hawai'i, the phrase "ola i ka wai" calls for the restoration of ancestral flows of Water. Native Hawaiians hold that Wai (Water) feeds Hāloa, the cosmological Elder brother of the Hawaiian people, who is also known as kalo (staple food of taro, *Colocasia esculenta*). The stewardship of Water is thus a moral obligation to support life-giving ecological kinships (Kameʻeleihiwa, 1992; Sproat, 2015).

Principles of 'caring for Water' are prevalent among Indigenous Peoples in Australia who have "an intimate connection with surface water and groundwater and how it relates to the sky and land" (Moggridge and Thompson, 2021: 1). Water, in this sense, promotes reciprocity, connectivity and stewardship, which are grounded in a holistic governance framework (Hemming and Rigney, 2014). In this way, 'caring for Water' is an Indigenous Knowledge framework that emphasises relationships and connectivity over an exclusive focus on the economic value of Water (Jackson and Palmer, 2012). Within this Indigenous worldview, Water has multiple overlapping valuations that are guided by the Dreamtime (time of creation); these contrast with non-Indigenous perspectives whereby Water is "a resource owned and/or managed by the state, with competing commercial, environmental, recreational, and cultural values" (Jackson and Palmer, 2012: 5). The Murray-Darling Basin (MDB) comprises over 1 million square kilometres of Australia's land mass; it crosses four states, one territory, and over 40 Indigenous Nations with Water rights claims (Jackson et al., 2015; Lynch et al., 2013). The *Kaldowinyeri* (creation) of the rivers Murray and Darling recount the river serpent, Murray Cod, and Ancestors including Ngurunderi – powerful Dreamtime beings – who shaped the rivers into their current existence and instilled governance principles that constitute much of the IK management of the Water today (Jackson et al., 2012). According

to Moggridge and Thompson (2021: 4) many Indigenous Nations across Australia share an understanding of caring for Water that emanates from the saying "Garima gala nyabay. Gala nyabay garama ngali ngih" "Look after the Water. The Water looks after us". Marshall (2014, 2017) reflects on the notion that despite the significant political and social change that has affected Indigenous communities in the last 200+ years, the sacredness of Water remains formative in shaping identity and values.

In diverse and unique ways, Indigenous Peoples around the world celebrate Water through song, origin stories, dance, teachings and ceremonies. These demonstrate the individual and collective responsibility to respect Water, protect Water, and love Water. Far more than a resource or a commodity to be bought and sold, Water to many Indigenous Peoples is our connection to Creation and to all life, and we must treat Water as a sacred gift which has been shared with all living beings (Chiefs of Ontario, 2008; Smith, 2012).

Water cosmologies and knowledge systems

Cosmologies, informed by observations and Indigenous Knowledge Systems, are essential for caring for Water. Indigenous understandings of the natural world and the importance of sustainable hunting, fishing, navigating, gathering and cultivation practices are commonly referred to in academic literature as Traditional Knowledge (TK), Traditional Ecological Knowledge (TEK), Indigenous Knowledge Systems (IKS), Native Science, or Ancestral Knowledge (Arsenault, 2020; Borrows, 1997; Chilisa, 2012; Smith, 2012; McGregor, 2014, 2015; Oliveira, 2014; Cajete, 2000; Kawagley, 1996). In Indigenous communities, these go by different names such as Hawaiian ʻike or ʻike ʻāina kūpuna, Inuit Qaujimajatuqangit, mātauranga Māori (Stewart-Harawira, 2020), Caribbean aitakuwahi (Josephs, 2016; David-Chavez, 2020) or Australian First Nation the dreaming or songlines (songlines is a description of Dreamtime or creation sites linked by song along a path which the ancestors travelled; many are Water based especially in a dry landscape) (Moggridge et al., 2019). In Indigenous Australia Dreaming is an English word with many different language meanings across Australia and with deep connotations among Indigenous Peoples. These terms remind us of the diversity of knowledges and of the importance of considering how knowledge is conceptualised through generations and how information is obtained, ordered, passed down intergenerationally, and applied to support balanced relations with and in the world.

As Indigenous Peoples, we have used cosmology-guided observations and Knowledge Systems to sustain our survival for thousands of years. Globally, UNDRIP protects Indigenous Peoples' relationships with Water which is evidenced by Articles 25 and 26 (United Nations General Assembly, 2007). Article 25 describes the right that Indigenous Peoples have to "maintain their spiritual relationship with their traditionally owned or otherwise occupied [L]ands, territories, [W]ater, and coastal [S]eas". Furthermore, Article 26 adds that Indigenous Peoples have "legal recognition and protection…with due respect to the customs..[and] traditions… of the Indigenous peoples concerned" (United Nations General Assembly, 2007). As highlighted in the 2011 Mandaluyong Declaration,

> Our spirituality which link[s] humans and nature, the seen and the unseen, the past, present, and future, and the living and non-living has been and remains as the foundation of our sustainable resource management and use. We believe that if we continue to live by our values and still use our sustainable systems and practices for meeting our basic needs, we can adapt better to climate change.

Describing an explicit relationship of honour and respect towards the environment, these Indigenous oral histories and original teachings have been long valued within Indigenous communities. The recent interest in Indigenous Knowledges by settler-colonial societies highlights the recognition of their value to non-Indigenous governments. This growing interest in IK and TEK among non-Indigenous communities also highlights the need to acknowledge the absence of a singular definition for these terms. This complexity emerges from the rich diversity of Indigenous Peoples and our longstanding practice of TEK for thousands of years (McGregor, 2004). Indeed, many Indigenous Peoples express that Indigenous Knowledges are the way that Indigenous People live our lives. These Knowledges have been passed down

from Elders through oral traditions; they often come through observation and interaction with plants and animals, landscapes and Waterscapes in the surrounding environment.

Indigenous Peoples are rematriating Indigenous Water Knowledges through hosting gatherings and symposia to share Water research. One watershed event occurred in 2010 when the National Centre for Māori Research Excellence hosted a Water symposium in Christchurch, Aotearoa New Zealand (Muru-Lanning, 2012). Muru-Lanning (ibid) positions the need for Indigenous scientists to lead Indigenous freshwater research as they possess relational accountability for authenticity in use of mātauranga Māori for Water governance. As Challies and Tadaki (2022: 6) state,

> Te Mana o te Wai needs to be coupled directly with efforts to reclaim and practice Indigenous sovereignty. Without meaningfully empowering Māori to fulfil their roles as environmental guardians (kaitiaki), implementation of Te Mana o te Wai risks becoming a symbolic appropriation of Indigenous concepts, furthering and perhaps even legitimating dispossession.

The deliberate inclusion of IKS in Water governance holds the potential to facilitate the restoration of Indigenous Peoples as primary decision-makers. By recognizing and valuing the wisdom, experiences, and practices embedded in IKS, a transformative shift can occur, empowering Indigenous Peoples to reclaim our rightful roles and responsibilities in safeguarding Water. This reclamation not only promotes holistic and sustainable approaches to Water governance but also nurtures the rematriation of Indigenous cultures, Knowledge Systems, and self-determination.

Knowledge systems aid the restoration of Indigenous Water governance

Across settler-colonial states, Indigenous Peoples have struggled to gain Water Back in all its manifestations; difficulties have arisen due to the politics of recognition (Coulthard, 2007), the exclusion of Indigenous leaders from Water decision-making institutions (Emanuel and Wilkins, 2020), and discrimination against Indigenous women (Anderson, 2010). However, Indigenous Peoples have found ways to circumvent dominant oppressive Water regimes founded on logics of Water coloniality, by including IKS/TEK in environmental problem-solving. Indigenous Water governance is a 'hydrosocial' challenge whereby management of Water is a product of the relationship between its natural and physical components and its social and political context (Norman, 2015). For integration of IKS to be effective, communication flows must engage Indigenous Peoples from the outset of the planning process and must be maintained with consistent follow-up and exchange of ideas. Failure to achieve meaningful sharing of power structures with Indigenous Peoples in Water regimes is shaped by differing world views of Water policymakers and by institutionalised historical traumas and injustices committed against Indigenous Peoples that were designed to remove our environmental sovereignty (Biggs et al., 2011; Bernhardt, 2020). Transformative research is more urgent than ever. Recent scholarship on the current geological age known as the Anthropocene has articulated how human activity has decimated the environment, leading to our climate crisis (Todd, 2015). Community-driven research on the Anthropocene can build partnerships between Water management systems and IKS (Pandya, 2014). Shinnecock Water scientist Kelsey Leonard in researching the Great Lakes defines Indigenous Water governance as the "practices of nationhood, decision-making, citizenship, and diplomacy by Indigenous Peoples in fulfilment of responsibility to future generations and Water as a living relation" (Leonard, 2019: xxi).

Anishinaabe scholar Deborah McGregor has for several decades advocated for, and researched extensively on, TEK; she has both drawn on the teachings of her community Elders in the implementation of her people's knowledge within western natural resource management systems, and utilised Indigenous research methodologies for environmental research. In 2008, McGregor published *Aboriginal Perspectives from the 2000 State of the Lakes Ecosystem Conference (SOLEC)*, marking the first time that Indigenous perspectives were included on the regional conference's agenda. Indigenous communities from the Great Lakes region were previously excluded from giving input on the ecological conditions of

the lakes (McGregor, 2008). Following the event, non-Indigenous environmentalists began reaching out to Indigenous knowledge-holders for input on implementing IK in the management of Water quality within the larger Great Lakes region. Indigenous participation increased by including discussions on how TEK, IKS, and western science could complement each other while conducting Great Lakes environmental research (Arsenault et al., 2018). As scientific institutions and professionals begin to recognise the importance of IKS to a fuller understanding of Water-dependent ecosystems, more opportunities are generated for listening, for stronger and more equitable partnerships to restore health to Water bodies, and for the formation of coalitions to help advance environmental justice and restore Indigenous Water governance.

In CANZUS nations, a growing recognition of the value of IKS is currently being reflected in policy guidance across different levels of government (Arsenault, 2020; Government of Ontario, 2018). For example, the Canadian Department of Fisheries and Oceans updated the Fisheries Act in 2019 to require IK to be part of decision-making (Government of Canada, 2019). The US White House Office of Science, Technology and Policy and the Council on Environmental Quality similarly issued a memorandum in November 2021 which formally recognised IK and committed to, "elevating Indigenous Traditional Ecological Knowledge (ITEK) in federal scientific and policy processes" (The White House, 2021). Indigenous Peoples, however, have been asserting the value and validity of IKS since time immemorial; they contend that integration of IKS into settler-state laws and sciences does not necessarily mean that Indigenous Water cosmologies are simultaneously valued (Deloria, 1970; Borrows, 1997; Chilisa, 2012; Smith, 2012). Non-Indigenous academics also typically emphasise the ecological component of IKS rather than their spiritual and relational foundations or the well-being of Indigenous Peoples themselves (Kapyrka and Dockstator, 2012; McGregor, 2021; Reano, 2020). While interest in Indigenous Science and Knowledge Systems is on the rise globally, discussions among Indigenous Peoples recognise the ongoing challenges around authenticity, efficacy and problematic 'integration' (Nadasdy, 1999; Bohensky and Maru, 2011; David-Chavez and Gavin, 2018).

In response to the historical exclusion of Indigenous Peoples in basin planning and the development of new national Water policies in Australia, Indigenous Nations formed a Water institution in 1998 to advocate for Water rights; this was known as the Murray Lower Darling Rivers Indigenous Nations (MLDRIN) (Hunt, 2012). MLDRIN, representing over 20 Indigenous Nations along the southern Murray River, serves as a forum for Indigenous Nations to share information with one another and engage as a unified network with the Murray-Darling Basin Authority (MDBA) in the development of basin management practices (Hunt, 2012; MLDRIN, 2007). MLDRIN describes itself as a "confederation" of Indigenous Nations, that constitutes an alliance of political entities, built from pre-colonisation systems of family connections, trade and exchange (Hill et al., 2012; Weir, 2009). Delegates to MLDRIN stress that it does not substitute for the authority of traditional owners; rather, it provides a means of establishing their distinct political status (Hill et al., 2012). As a result of the success of MLDRIN in paving a pathway for Water security in the MDB, another institution in 2010 was formed called the Northern Basin Aboriginal Nations (NBAN), which represents 21 Indigenous Nations across the northern portion of the MDB (Moggridge and Thompson, 2021). NBAN is working with MLDRIN to advocate for Indigenous decision-making powers in the basin and for allocation of funding for Indigenous research needs in the basin especially pertaining to cultural flows (Mooney and Cullen, 2019; Moggridge and Thompson, 2021). NBAN and MLDRIN are also actively working to develop their own policies for Water allocation and management in the basin that are reflective of Indigenous Water values, Knowledges and cosmology (Mooney and Cullen, 2019; Moggridge and Thompson, 2021). Water governance is now on a path towards nation-building, with Indigenous communities such as the Kamilaroi, who are developing methodologies to inform and influence Water management (Moggridge et al., 2022) and the Ngarrindjeri leading the way in developing creative nation-to-nation partnerships for Water decision-making (Hemming et al., 2017). Additional examples include the Martuwarra/Fitzroy River Declaration and the

establishment of an Indigenous-led council to ensure river management of the Martuwarra (Poelina et al., 2019).

The dominant society's engagement with TEK has led to powerful metaphors for knowledge pluralism (Kimmerer, 2013; Tengö et al., 2014) and reciprocity of complementary and mutually-enhancing Knowledge Systems (Chilisa, 2012; Bang and Medin, 2010; Barnhardt and Kawagley, 2005). Reid et al. (2021) highlight Elder Albert Marshall's Mi'kmaw concept of Etuaptmumk or 'two-eyed seeing' through which we can, "build an ethic of knowledge coexistence and complementarity in knowledge generation" (Reid et al., 2021: 245). In this way, a key outcome of increased valuation of TEK is increased collaboration with Indigenous Peoples to achieve environmental stewardship goals (Whyte, 2013). Indigenous perspectives on TK, TEK, IKS, knowledge pluralism, reciprocity, and collaboration easily extend to restoration of contemporary Indigenous Water governance and motivate researchers to engage in transformative and meaningful research and collaboration with Indigenous communities (Arsenault, 2020, 2021; Chilisa, 2012; Smith, 2012).

Māori hapū and iwi in Aotearoa New Zealand are asserting their mana motuhake and rangatiratanga in management of freshwater in many ways. More and more, the country's freshwater management legislation, policy and governance are better reflecting Māori worldviews and cosmologies.

> In te ao Māori – ancestral Māori ways of living – rivers and lakes are the tears of Ranginui, the sky father, mourning his separation from Papatuūānuku, the earth mother, and people are their descendants, joined in complex whakapapa that link all forms of life together (Salmond et al., 2019: 45).

The concept of whakapapa (genealogy) is central to contemporary expressions of Māori cosmologies in freshwater management. A well-known case in point is the establishment of the Te Awa Tupua (Whanganui River Claims Settlement) Act 2017 (Ruru, 2018; Winter, 2021). After a long history of grievance-making, Whanganui iwi negotiated the legal recognition of the Whanganui Awa as a legal person embedding the rights of the river in law. The legal personhood of the Awa aligns with its recognition as a tupuna (ancestor) for Whanganui iwi. Mauri (life-force or essence) is another fundamental concept in Māori cosmologies that is progressively being recognised in freshwater management (Hopkins, 2018; Michel et al., 2019; Hikuroa et al., 2018; Stewart-Harawira, 2019; Harmsworth et al., 2016). Most notable are the monitoring frameworks that work to bring the mauri of the Waterways into consideration in decision-making in a quantitative way (Robb et al., 2015). The recognition of the concept of mana in freshwater policy and legislation is now changing the face of freshwater management in Aotearoa New Zealand (Kitson and Cain, 2022; New Zealand Government, 2020; Te Aho, 2019). After several iterations, Te Mana o Te Wai now sets an explicit hierarchy of priorities in the National Policy Statement for Freshwater Management 2020. The hierarchy places the health and wellbeing of the Waterways ahead of human needs, which both prioritise economic development and use of freshwater. While such recognition of Māori worldviews in the freshwater management system in Aotearoa is a significant milestone in Māori freshwater advocacy, the extent to which they actually embed the full extent of Māori values and worldview is debated (see, for example, Taylor, 2022). Nonetheless, each of the many models marks a significant step forward in restoring Indigenous relational values in freshwater management and critiquing such models will drive us on that continued trajectory.

Indigenous Peoples have long recognized the unique power of Water: no one has the authority to control its flow across Mother Earth, and it cannot be treated as a colonial asset. 'Colonial asset' refers to the view of Water as a resource that is extracted and valued only for its usefulness to humans, a perspective that diverges from most Indigenous cosmologies (Deloria, 1970; Borrows, 1997; Smith, 2012). Xiye Bastida, a youth Water champion from San Pedro Tultepec, Mexico, recognizes the value of Indigenous cosmology in addressing Water governance issues. With first-hand experience of the impact of flooding and environmental degradation on Indigenous communities, she brings her knowledge and cosmology to the forefront of the Water Back movement. In an interview with Vox magazine she says, "We don't call water a resource; we call it a sacred element (…) The relationship we have with everything

that Earth offers, it's about reciprocity. That's the only way we are going to learn how to shift our culture from an extraction culture to a balanced and harmonious culture with the land" (Burton, 2019). As someone who values Indigenous cosmology for Water governance, Xiye Bastida brings a unique perspective to her work in protecting Water. Hailing from the Otomi-Toltec community in Mexico, Bastida sees Water as sacred kin. Rather than a unidirectional relationship with Water and other parts of the natural world, Indigenous Peoples relate to Water through concepts of kinship, responsibility, reciprocal obligation, participation, and co-creation, as expressed and perpetuated through unique Indigenous and cultural cosmologies and customary forms of governance. Extractive colonial logics and institutions, however, continue to attempt to destroy these relations. The subsequent section explores Water colonialism literature that positions these violent interruptions of Indigenous Water cosmologies and governance as both unjust and as a form of physical, spiritual and cultural harm.

WATER COLONIALISM

Contemporary Water injustices facing Indigenous Peoples are linked to experiences of Water colonialism. Robison et al. (2018) define these as the "living legacy" of settler-colonial institutions, processes, and laws that enable physical Water theft or the removal of Indigenous Peoples from Water and from Water decision-making. For instance, based on the geographical contiguity of rivers, Law Professor Robert J. Miller observes that the European doctrine of discovery – which has been used to dispossess Native Peoples from our ancestral Land and resources worldwide – held that the European 'discovery' of the mouth of a river created a claim over the entire Watershed as well as over any adjacent coast (Miller and Ruru, 2008; Miller et al., 2010; Miller, 2011). There are many types of colonialism, including settler-colonialism (where colonisers stay and occupy Indigenous Lands and Waters), extractive colonialism (where raw materials are stripped from the Land and transported to colonial centres), and imperial colonialism (where colonial powers use force to annex territory). All of these may overlap and reinforce one another (Kauanui, 2016; King, 2019). Indigenous scholars and knowledge-holders articulate some characteristics that these colonialisms have in common. This includes the domination of Indigenous Peoples in their homelands, not only through genocide but also through the severing of Indigenous Peoples from Land which includes Water, language, self-governance and life-giving kinships (Whyte, 2016a). Ongoing colonialism perpetuates Indigenous dispossession through continued prioritisation of non-Indigenous access and exploitation of Indigenous lives, Lands and Waters for settler-colonial goals, desires, objectification and futures (Neville and Coulthard, 2019; Liboiron, 2021).

In this way, obstacles to Water Back can be explained through the legacy of colonial Water regimes that have in large part led to the alienation of Indigenous Peoples' agency to maintain Water relationality (Robison et al., 2018). This may include Water diversion, harvesting, damming, draining, pumping, enclosure, pollution, technological control, theft and privatisation, all of which are strategies and effects that are reviewed by this article. According to Abate and Warner (2013: 11-12),

> [M]any indigenous communities (…) share a unique connection to the land that is often not present in the dominant society. This connection resides in both legal and a spiritual or cultural context. Following colonization from outside societies, many indigenous communities found themselves relegated to certain territories within the dominant nation (…). Beyond legal considerations, many indigenous peoples also have a strong spiritual and cultural connection to the land upon which they reside or to their traditional homelands. For many indigenous peoples, their spirituality is intimately connected to the earth and their environment.

Water colonialism is interwoven with advancements and development of infrastructure (Curley, 2021). Diné geographer Andrew Curley argues that infrastructure development in the arid southwest of the US cannot be disentangled from Indigenous Peoples' loss of Water. In fact, the colonial design to civilise the southwest required the manipulation of Water away from Indigenous Peoples into the cosmopolitan capitalist schemes that created sprawling desert cities such as Phoenix, Arizona and Las Vegas, Nevada

(ibid). Water colonialism, however, was not solely through expansions of manifest destiny; it also took more 'benevolent' forms such as the creation of parks and marine protected areas that restrict Indigenous access to homelands and home Waters, sometimes called eco-colonialism or environmental colonialism (Ruru, 2012; Sepulveda, 2018; Gilio-Whitaker, 2019).

In Aotearoa New Zealand the entrenched utilitarian understanding of Water relationality in policy and legislation is made apparent time and time again as Māori hapū and iwi challenge Water allocation decisions and consents (Stewart-Harawira, 2020). In 2011, in a case where hapū along the Waitotara Awa in south Taranaki contested a Water-take consent application, Ester Tinirau highlighted the divergence between Māori and settler-colonial values for freshwater, pointing out that, "the applicants and the hap[ū] had ended up talking past each other because of divergent values and understanding" (Taranaki Regional Council, 2010: 5). She also laid bare the need, yet apparent inability, for freshwater policy, legislation and decision-making structures to better recognise and give weight to "cultural and spiritual concerns" and "matters relating to M[ā]ori values" (ibid). The recent introduction of the concept of Te Mana o Te Wai into national legislation, the broader legislative reform that is underway in Aotearoa, and the many hapū and iwi-level arrangements that have been hard won, are helping put in place a freshwater management and decision-making system that can better support diverse Māori cultural and spiritual values. These, paired with the many novel freshwater monitoring frameworks that hapū and iwi are developing and implementing (Awatere and Harmsworth, 2014; Rainforth and Harmsworth, 2019; Crow et al., 2020), seem set to diminish the prominence of utilitarian values in driving freshwater decision-making.

From some Indigenous perspectives, Land and Water cannot truly be "stolen" because they are relations, not objects that can be taken (Palmer, 2020: 795). We Indigenous Peoples, however, still often articulate Land and Water as 'stolen' through the language and logics of settler-colonial societies that understand relationships as things rather than relations (Watts, 2013). A better way to understand the injustices of settler-colonialism might be as the extinguishing of life through the splitting of Indigenous relations (obligations) to Land and Water, including the literal extinguishment of life through physical death. "[E]nvironmental injustice cuts at the fabric of systems of responsibilities that connect [nonhuman] people to humans, nonhumans and ecosystems. Environmental injustice can be seen as an affront to peoples' capacities to experience themselves in the world as having responsibilities for the upkeep, or continuance, of their societies" (Whyte, 2016a: 9). It is, in other words, a destruction of lifeworlds, life, and physical worlds (Sepulveda, 2018; Estes, 2019; Gilio-Whitaker, 2019).

In the US, this destruction relates partly to dam construction and the impact it has had upon our Water relatives, on Indigenous Water rights (and responsibilities), and on the entire ecosystem. Dam placement has displaced many Indigenous Peoples and has impacted sources of traditional foods such as salmon and lamprey, which are important first foods for many Northwest and Great Basin Peoples (Russell, 2012; Schneider, 2013). There are 274 hydroelectric dams within the Columbia River Watershed (Osborn, 2012). Many of them serve as major obstacles to the practicing of Indigenous lifeways. Two in particular have had great impacts upon the region's energy; these are the Bonneville Dam, built in 1933, which is located on the border between Oregon and Washington, and the Dalles Dam which was built in 1952 (Robison et al., 2018). These dams were built in the prime hunting and fishing areas of many Indigenous communities; in at least one case, they were in violation of Treaty Rights. In 2019, the Yakama Tribes called for removal of the Dalles Dam located in Celilo Falls, a revered space for salmon fishing. Yakama Nation Tribal Council Chairman JoDe Goudy described the dam as a "colonial doctrine of Christian discovery" (Goodykoontz, 2019). In their call for removal, the Tribes stated that the US government did not have the Yakama Nation's free, prior and informed consent, which was required under their 1855 Treaty. The Bonneville Dam has had a direct negative impact on the fishing economy, which has resulted in the creation of the Columbia River Inter-Tribal Fish Commission (CRITFC, 2021). The Shoshone-Bannock Tribes of Idaho have also made a call for the removal of the four Lower Snake River dams, as they directly impact culture, spirituality and their way of life (Shoshone-Bannock Tribes, 2021).

In Canada, First Nations, Inuit and Métis have also faced Water injustices through the proliferation of hydroelectric dams. As Professor Ramona Neckoway from the Nisichawayasihk Cree Nation, a hydro-affected community in northern Manitoba, underscores,

> Over the last decade or so, and in addition to witnessing the widespread and cumulative impacts of Hydro in our territories, I have witnessed incredible acts of courage, individual and collective acts of 'resurgence'. Thankfully, many Hydro-affected peoples and communities in northern Manitoba have not and are not cowering to the new steel thunderbirds that have invaded our horizons. Since the 1970's, when the plans and visions of developers became known to our grandfathers, Ithinewuk responded swiftly and collectively to protect the rights and livelihoods of our communities. Despite the setter-colonialism that we have been and continue to experience, and particularly where Hydro is concerned, Ithinewuk are drawing upon their teachings, languages, stories and values and confronting the settler-colonialism that has been imported into our communities. The steel towers may bring energy that makes us somewhat comfortable, but the cost is high and the consequences far-reaching (Neckoway, 2018: 154).

These acts of resurgence are the embodiment of Water Back. They represent a larger movement for Water protection that has been mobilised by Indigenous Peoples and Nations across Canada who are responding to the ongoing settler-colonialism of the federal and provincial governments. These acts of Water colonialism have manifested not only through hydropolitics (Daigle, 2018) but also in the many First Nations Water crises; these include mercury contamination in Grassy Narrows (Simpson et al., 2009), a more than 28-year boil Water advisory in Neskantaga First Nation (Castleden et al., 2017), and groundwater depletion by the bottled Water industry in Six Nations of the Grand River (Sioui et al., 2022).

Water has consistently been used as a tool of colonisation. In Australia, the removal of Indigenous Peoples from high-value Water areas was a way to promote the growth of settler communities and agricultural production on the Land, with little concern for environmental degradation (Connell, 2011; Connell and Grafton, 2011; Short, 2003). Dispossession of Indigenous Peoples in the MDB from our Waters came in waves of violence, disease, poisoning of Waterholes, forced relocations, stolen generations and systematic attempts to wage biological warfare for cultural extermination (Lynch et al., 2013; Short, 2003). In 1860, the Yorta Yorta petitioned the Victorian government – unsuccessfully – to stop the destruction of their natural fishing areas by paddle steamers (Lynch et al., 2013). In 1886 with the approval of the Irrigation Act in Victoria, Water was declared a "public resource" (Poirier and Schartmueller, 2012); however, Aboriginal People were not considered citizens of the state and were therefore not members of the 'public' with equal rights to share in the development and management of Water. Early conflicts over Water use were geared towards issues of navigation and trade, none of which included MDB relationality and use by Indigenous Peoples. With the introduction of irrigation settlements, it was necessary for the states of New South Wales, Victoria, and South Australia to sign the 1915 River Murray Water Act to provide minimum Water entitlements for Water and flow-sharing (Wheeler et al., 2014).

Notably, as this marked the shift from policies of colonisation to policies promoting assimilation, Indigenous Nations were excluded as parties to the 1915 Act. Indigenous Peoples, however, did use the courts when necessary to challenge our absence from political processes for Water management. In the early part of the 20th century, Aboriginal claimants unsuccessfully brought litigation to protect the construction of weirs in their traditional territories; known as the 'Roper River weir case', it is the earliest found court case adjudicating Indigenous Water management practices in Australia (Barber and Jackson, 2015). More recently, some scholars have argued that the National Water Initiative (NWI) is a form of 'water colonialism', as it embeds Water decision-making power in the Australian government and discounts Indigenous Water Knowledges that cares for Water (Howey and Grealy, 2021). Water colonialism is thus not a vestige of past harm, but rather is ongoing today in the form of contemporary Land grabs aimed at acquiring the additional Water necessary for the proliferation of energy, agriculture and other extractive industries (Hartwig et al., 2020).

Colonialism is not a series of discrete events, and it is not about the intents, values, or heritages of settlers. It is, "not even a structure, but a milieu or active set of relations that we can push on, move around in, and redo from moment to moment" (King, 2019: 40; see also NYSHN, 2016). Following la paperson (2017), we can think of settler-colonialism as,

> [a set of technologies] "of alienation, separation, conversion of land into property and of people into targets of subjection (…) that enable the 'eventful' history of plunder and disappearance. Property law is a settler-colonial technology. The weapons that enforce it, the knowledge institutions that legitimise it, the financial institutions that operationalize it, are also technologies. Like all technologies, they evolve and spread" (la paperson, 2017: 5).

Even so, however, we "refuse the master narrative that technology is loyal to the master" and understand that "[e]ven when they are dangerous, understanding [colonial Water] technologies provides us some pathways for decolonizing work" (ibid: xiv). This article documents both the ways that colonialism impacts Water and some of these efforts to push, move, and undo Water colonialism. We emphasise that Water is not only sacred, but powerful (Peltier, 2018). Harnessing its power for colonial purposes does not align with Indigenous Knowledges of working with and for the sacred relative and entity, Water.

WATER JUSTICE

Indigenous Water justice recognises that Water is a living entity. In doing so, Water justice moves beyond conceptualisations solely focused on fairness, equity and participation of humans in Water decision-making, to also include relationality. It asks – "What does the Water need?". In their seminal legal article on Indigenous Water justice, Robison et al. (2018) underscore the pre-eminence of UNDRIP as the foundation of international law supporting Indigenous rights for Water protection and ultimately shaping the hydropolitics of Water Back for Indigenous Peoples. Moreover, Indigenous Water justice recognises the rights of humans and more-than-human relations, while balancing individual and collective responsibilities (ibid).

In 2015, Anishinaabe-kwe scholar Deborah McGregor positioned natural law as being key to realising Water justice. She positions "the concept of zaagidowin (or 'love') as central to achieving Water justice" (McGregor, 2015: 72). McGregor (ibid) puts forward the following definition of Water justice:

> Water justice, in Anishinaabek understanding, considers not only the trauma experienced by people and other life due to Water contamination, etc.; but values the Waters themselves as sentient beings in need of healing from historical traumas. Only when the Waters are well and able to fulfil their duties to all of Creation is Water justice achieved.

This positionality highlights the deep sentience of Water as a living entity deserving of justice (McGregor et al., 2020). Within this understanding justice is not for humans alone; it is also for the Water. Moreover, conceptions of restoration must shift away from anthropocentric-driven Water quality standards to ecocentric practices of "loving responsibility" to Water for our collective healing (McGregor, 2015). McGregor (ibid) also notes that Indigenous Water justice moves beyond assertions of "Water as a human right" or "commodity" to assert that the Water itself is deserving of justice (McGregor, 2015: 72). Ulloa (2020), in describing Water injustices facing the Wayúu People of Colombia due to mining, similarly notes that the commodification of Water promotes conflict. Water justice is shaped by the politics of Water, which includes dimensions of access, distribution, fairness, control, decision-making power and recognition of Water as a living relation (Wilson and Inkster, 2018; Yazzie and Baldy, 2018; Taylor et al., 2019; Ulloa, 2020; Hartwig et al., 2021; Hernandez, 2022). In this way, Water justice encompasses more than just humans; it recognises the interconnectedness of Water, including all life that depends on Water to exist and thrive (Ulloa, 2020).

Indigenous Water justice is also inextricably linked to Indigenous assertions with regard to social justice, climate justice, and environmental justice (Estes, 2019; Hartwig et al., 2021). Wilson et al. (2021) highlight that Indigenous Water injustice often manifests as regulatory and jurisdictional injustice whereby the law is weaponised to disenfranchise Indigenous Peoples from Water decision-making processes. These processes can turn violent, and murders of Indigenous environmental defenders are increasing globally (Glazebrook and Opoku, 2018; Le Billon and Lujala, 2020; Tran et al., 2020; Scheidel et al., 2020). Around the world, Indigenous Peoples and communities facing conflicts of "Water access rights and entitlements" make up nearly half (1651 of 3446) of all documented cases of groups mobilising to face environmental justice conflicts (Temper et al., 2015). Global data in the EJAtlas (Temper et al., 2015) shows, "Indigenous people mobilize most frequently against damaging environmental conflicts" (Scheidel et al., 2020: 6) and that when Indigenous Peoples are engaged in mobilisation against these conflicts, they "face significantly higher rates of violence" (ibid: 2). Indigenous women are also recognised as disproportionately impacted by, and mobilising in uniquely large numbers against, natural resource development in order to protect Waters and bring about justice for our families and future generations (Deonandan et al., 2017; Klasing, 2016; Chiblow, 2019). Moreover, Indigenous women play a central role in Indigenous movements that are connected to Water protection, famously through #IdleNoMore (John, 2015), #NoDAPL (Estes and Dhillon, 2019; Privott, 2019), and #TinyHouseWarriors (Cantieri, 2018).

The Injustice of settler-colonial Water relations are abundantly evident in Aotearoa New Zealand. In their book, *Decolonising Blue Spaces in the Anthropocene* (2021), Meg Parsons, Karen Fisher and Roa Petra Crease explore the historical context of the Waipā River (the ancestral Awa of two of the authors) through an environmental Indigenous justice framing. The authors,

> demonstrate, through this book, that the environmental changes that took place within the Waipā catchment were (and are still) unjust because those changes (directed by one society for its benefit) robbed local Māori iwi, hapū and whānau of their capacities to experience their landscapes and waterscapes (their worlds) on their terms; which included their subsistence and flourishing as well as their abilities to maintain their systems of responsibilities (Parsons et al., 2021: 466-467).

Of course, the injustice goes beyond unequal distribution of the "environmental risks and benefit" (ibid: 468). The sentiment of this injustice remains evident in the response of New Zealand's Federated Farmers to a proposal that Māori could be granted set Water allocations. The farming lobby group feared the security of their own allocations as "all available Water has already been allocated" (The Economist, 2015). Their response reveals the continued economic marginalisation of Māori and the limited appetite for any restorative justice model. Behind many of the advances for Māori rangatiratanga over freshwater taonga are Treaty of Waitangi claims settlement processes, which Margaret Mutu suggests are in some ways "smoke and mirrors" (Mutu, 2018). She argues that successive governments have avoided any engagements in restorative justice and that there is "no prospect for justice and reconciliation for Māori without constitutional transformation" (ibid: 208). Entangled with these claims for justice for Māori is justice for tupuna Awa. The practicalities of these rights of nature, such as those embedded in Te Awa Tupua (Whanganui River Claims Settlement) Act 2017, are being explored in literature and in practice (Brierley et al., 2018).

Despite global Water protection movements advancing Water Back principles, Indigenous Water justice is often an omitted topic in international law and policy-making (Taylor et al., 2019). Hartwig et al. (2022) advocate for the redistribution of Water benefits including Water rights to Indigenous Peoples as an equitable path forward. Additionally, other Water scholars propose that government agencies must recognize Indigenous self-determination and sovereignty to actively work to reconcile the legacy of Water harm. Taylor et al. (ibid) argue that global Water governance frameworks that exclude assertions of "Indigenous Water justice and UNDRIP cannot be dismissed as simply oversights. It is a manifestation of ideological positions about Water and political interests. Implementing UNDRIP necessarily changes the discourse about authority for Water, sovereignty, and the relationships between Indigenous Peoples,

Water and states" (ibid: 12). Adoption and implementation of UNDRIP is critical to achieving Indigenous Water justice and furthering Indigenous Peoples rights to self-determination (Robison et al., 2018). Moreover, Water justice paradigms must be equally inclusive of the human right to Water, Indigenous rights, and the rights of Water itself. Emerging Indigenous Water justice paradigms advancing recognition of the inherent rights of Water itself include cultural flows and legal personhood (Ruru, 2018; Woods et al., 2022).

Indigenous-led Water institutions that can advocate on behalf of Indigenous Peoples and Nations and for Water are also critical to achieving Water justice. New Indigenous Water institutions have emerged in recent years across Canada, Australia, Aotearoa New Zealand, the US and elsewhere to advance Indigenous Water justice. For example, the Murray Lower Darling Rivers Indigenous Nations (MLDRIN) and the Northern Basin Aboriginal Nations (NBAN) have been instrumental in advancing Indigenous Water rights and interests in the Murray-Darling Basin in Australia (Woods et al., 2022). Other Indigenous Water institutions such as the Great Lakes Indian Fish and Wildlife Commission and the Columbia River Intertribal Fish Commission have had similar success in advancing Indigenous Water justice (CRITFC, 2021; GLIFWC, 2021; Leonard, 2021a). These institutions embrace Indigenous ways of knowing; they recognise that Indigenous Water justice can only be advanced by understanding our inherent responsibilities to Water as a living relation.

WATER RESPONSIBILITIES AND RIGHTS

Advancement of Water Back movements are challenged by the economic systems that dominate settler-colonial states, where Water markets and valuing of Water as a commodity are long-standing barriers to Indigenous Water protection. Settler-colonial Water regimes prioritise Water rights over responsibilities. The tensions between Indigenous and non-Indigenous worldviews for valuing Water are symptomatic of the Indigenous Water crisis.

Rights-based frameworks

While many Indigenous Peoples, Nations, and communities choose to engage with the settler-state to secure rights (Taylor et al., 2021; Te Aho, 2011, 2019), there is also a critique of the limits of state-recognised rights when it comes to Indigenous models of justice (Jenkins et al., 2021). Building on the writing of Franz Fanon, Glen Coulthard wrote about how colonial-state recognition of Indigenous rights, access, identity and/or political standing occurs in ongoing contexts of domination and that the terms of recognition and accommodation are determined by their legibility to, and the degree to which they are in the interests of the hegemonic settler-state (Coulthard, 2007).

In the western US, Water rights are primarily governed by the Doctrine of Prior Appropriation. Indigenous scholar Bernhardt asserts that the same the presumptions and philosophies driving the agenda of Manifest Destiny that supported the Homestead Acts and the Doctrine of Discovery are the same as those that have shaped Water rights in the western US; these include Water allocation based on "first in time, first in right" and property rights that are based on the alteration of Water sources from their natural state (Bernhardt, 2020: 225). Water rights for Tribal Nations are reserved under the Winters Doctrine, whereby priority is established at the time of the creation of the reservation. After the Winters decision of 1908, it was unclear whether reserved rights for groundwater were also established (Quesenberry et al., 2015). In 2003, after many years of litigation and negotiation under the Gila River Adjudication, the Arizona Supreme Court ruled that groundwater rights were reserved under the Winters Doctrine (ibid). Outside of Arizona the protection of Indigenous groundwater rights still remained unsettled. However in 2017, in *Agua Caliente Band of Cahuilla Indians v. Coachella Valley Water District*, the US Court of Appeals for the Ninth Circuit held that Tribal Nations have priority groundwater rights (Zablan, 2018). According to Womble et al. (2018: 453), the "ruling establishes a new standard throughout nine western states within the lower court's jurisdiction and establishes persuasive, although

nonbinding, legal precedent for the rest of the United States". Pueblo Water rights are also recognised through the *1848 Treaty of Guadalupe Hidalgo*. Many Water basins in the west are, however, over-allocated challenging the ability of Tribal Nations to exercise their rights to Water.

Water rights for Tribal Nations were originally not included at the creation of interstate compacts such as the 1938 Rio Grande Compact and the 1922 Colorado River Compact (McCool, 2006; Curley, 2019, 2021; Robison et al., 2021). This leaves many western states responsible for designating portions of their allocations through Water compacts with Tribal Nations. Although Tribal Nations have priority by virtue of their seniority, Tribal Water rights are typically determined through Water rights settlements. Two drawbacks of Water settlements are that Tribal Nations are prone to settling for a reduced quantity of Water, and that under 'use it or lose it' scenarios, most Tribal Nations lack the initial infrastructure needed to develop Water and put it to 'beneficial use' (defined by Eurocentrism). Deol and Colby (2018) examined correlations between quantified Water rights, infrastructure and economic development and found that Tribes with quantified Water rights have higher agricultural revenue and are more likely to operate casinos. Although Water rights are reserved under the Winters Doctrine, quantity estimates during settlement negotiations are based on population growth and economic development. Some Tribal Nations (i.e., reservations) may see population declines because of inadequate infrastructure, development, and housing, and due to opportunities that attract citizens to move off-reservation, whether part- or full-time. Relying on Water quantity for settlements is also subject to poor US Census reporting and does not fully consider the future plans of Tribal Communities to establish permanent homelands. Curley (2019) argues that Tribal Water rights settlements are forms of colonial enclosures that deprive Indigenous Nations of our rights to Water and our relationships to the environment; in this, Curley is referring to the San Juan River Basin settlement of 2005 with the Navajo Nation and the Navajo-Hopi Little Colorado River Water Rights Settlement Act of 2012. Wilson et al. (2021) also examine how frameworks of self-determination and Tribal sovereignty clash with reIndigenisation frameworks during Tribal Water rights settlements in the US.

Water rights are constantly under attack in many Indigenous communities throughout the world. In 2010 the Apsáalooke or Crow Nation signed a compact, the Crow Tribal Water Settlement of 2010 to address ageing infrastructure and irrigation in Apsáalooke communities. In the process, however, the Crow Nation gave up Water rights to all basins except the Bighorn River Basin. The settlement states that,

> Once approved by S. 375, and ratified by the Tribe's membership, the Compact is the full and final settlement of the Tribe's Water rights within the State of Montana and the Tribe waives any claims to Montana Water rights not contained in the Compact (United States, 2010: 7).

The Confederated Salish and Kootenai Tribes also ceded some Water rights in order to gain control of the National Bison Range through the Bison Range Restoration legislation, as part of the Montana Water Rights Protection Act in 2020. As Diné geographer Andrew Curley underscores,

> Indian Water settlements are forms of colonial enclosures, built on a lineage of law that replicates and perpetuates edicts of dispossession and colonialism that are foundational to the United States. They enclose upon unquantified Indigenous rights to use and access the continent's Water resources (Curley, 2019: 15).

This legacy of exclusion and dispossession of Indigenous Peoples from Water, entrenched within settler-colonial state Water laws, has emboldened Water Protectors to advocate for Water Back.

In Hawai'i, Wai (Water) is a public trust resource. This concept is grounded in the Hawai'i state constitution and the Hawai'i water code and is reaffirmed through Hawai'i State Supreme Court rulings (Sproat, 2015). The 1978 amendments to the Hawai'i state constitution established that all natural resources, including Water, are held in trust by the state for the benefit of the people (Article XI, Sections 1 and 7). The same constitution also asserts that the state shall protect traditional and customary rights of Native Hawaiians (Article XII, Section 7), and established policy to support this through the Hawai'i water code (HRS 174C) and designate a seven-member Water Commission as the implementing body for

this policy. While the Commission was tasked with balancing a dual mandate of upholding the public trust while ensuring, "reasonable and beneficial use", the composition of the Commission has tended to favour large landowner interests. The enforcement and implementation of the framework establishing Wai as a public trust resource has thus most often required litigation, placing the burden of proof on communities who are advocating for restoration of surface flows that were initially diverted a century ago in the sugar plantation era pre-dating the Water Code (Cantor et al., 2020; Sproat, 2015, 2010). Over the decades, Hawai'i State Supreme Court rulings have consistently clarified public trust purposes to include environmental protection, traditional and customary use, appurtenant rights and domestic uses, and reservations of the Department of Hawaiian Home Lands (DHHL) (Sproat, 2015). In this sense, Native Hawaiian access to Water for traditional practices and environmental stewardship has protection under the state constitution, even though Native Hawaiians are not represented by a sovereign representative government with sovereign territory.

According to Jackson and Palmer (2012), the Australian Native Title Act of 1993 was the first recognition of Indigenous Water rights by the Government of Australia, although it was limited to inland Waters under Australian law. The Act, however, only recognised Indigenous rights for personal, domestic and cultural needs; it purposefully excluded Indigenous Water rights for commercial purposes (ibid.). After the passage of the Act, Indigenous Peoples were able to negotiate Water rights, but the 1998 Native Title Amendment Act prohibited further negotiations (Tan and Jackson, 2013). In response to the restrictive nature of the amendments and the clipping of Native Title rights, Indigenous Nations began to organise at the regional, national and international levels to assert our Indigenous Water rights claims. In Australia, in 2004 the NWI marked an evolution in Indigenous Water policy in the MDB because it was the first time the Australian government recognised the need to incorporate Indigenous Peoples into Water management (Jackson et al., 2015). As Jackson et al. (2015: 142) note, the NWI recommends that states *should* take into account "native title interests, to assess and include Indigenous customary, social, and spiritual objectives in Water plans, and to engage with Indigenous communities in their development"; however, the NWI does not go far enough stopping short of requiring states to include these meaningful levels of Indigenous engagement. Biennial assessments of the NWI in 2009 and 2011 found that Indigenous engagement across jurisdictions for basin planning is minimal and that explicit Indigenous interests in Water plans are rare (Tan and Jackson, 2013). The denial of Water rights has also meant that Indigenous Peoples have not benefitted from accumulation of intergenerational wealth in comparison to Australian settlers who have engaged in trading of entitlements in Water markets (Hartwig et al., 2020). The NWI is outdated and lacks real outcomes for Indigenous Water rights and is under review as recommended by the Productivity Commission (PC, 2021) which included a recommendation of: "increasing Indigenous Australians' involvement and influence in water resource management", Indigenous Peoples hold little hope of changes in Water ownership and rights in Australia.

Māori Water rights and ownership are perceived as being controversial in Aotearoa New Zealand (Strang, 2014; Sullivan, 2017). Amidst government musings over the privatisation of Water resources, Māori asserted our rights and interests in freshwater. Despite the Waitangi Tribunal finding that, "Māori do possess rights in Water bodies akin to ownership", the government refuses to recognise those rights (Erueti, 2016: 58). The discourse persists as an ongoing debate amongst Māori with iwi, such as Ngāi Tahu, developing a clear rationale and strategies for negotiating the recognition of those rights. Ngāi Tahu have since taken legal action against the Crown to assert those rights, with Ngāti Kahungunu joining the legal action to have our rights to freshwater recognised. Erueti (2016) maps three arguments through which Māori Water rights could be negotiated, contributing to a framework for Māori hapū and iwi to continue to assert and negotiate recognition for their Water rights. Set amongst broader conversations about Water trading schemes and their potential to support better Water management in Aotearoa, it seems inevitable that Māori rangatiratanga over freshwater as a taonga, as guaranteed in Te Tiriti o Waitangi, will include an element of fiscal control. Importantly, this concept of rangatiratanga does not simply track with notions of 'ownership', rather, "as a concept and a practice [it] encompasses rights,

responsibilities and obligations. And that includes the obligation to do what we can to stop the continued degradation of our freshwater system" (Te Rūnanga o Ngāi Tahu, 2020). These assertions of Water rights embody how hapū and iwi are exercising their rangatiratanga – our rights and responsibilities.

In sum, Water rights exist within the settler-colonial state property rights regime and, as shown in the literature, this may further perpetuate colonialism and Water loss for Indigenous Peoples. At the same time, recent Indigenous Water innovations and research aim to move away from colonial framings of Water rights and articulate Indigenous Water Knowledges within responsibility-based frameworks.

Responsibility-based frameworks

Indigenous justice and legal frameworks tend to focus on relationality and responsibility and on ensuring that those connections are intact and flourishing (Borrows, 2010; Todd, 2016; Whyte, 2016b). In these Indigenous legal orders, Water is understood as a living entity with its own rights, supported through Water-human relations and human responsibilities to Water and Life. As Jenkins et al. (2021) highlight, competing Water values create biased or exclusive Water security models that often prioritise economic or human rights over the rights and responsibilities of the Water itself. Colville Confederated Tribes scholar Dina Gilio-Whitaker has written about Indigenous environmental justice paradigms that exceed the frameworks of the state, frameworks that, "must be capable of a political scale beyond the homogenising, assimilationist, capitalist State. [They] must conform to a model that can frame issues in terms of their colonial condition and can affirm decolonization as a potential framework within which environmental justice can be made available to the" (Gilio-Whitaker, 2019: 25).

Hawaiian communities continue to face resistance in our efforts to restore and access Wai (see, for example, Hoʻokano, 2014; Scheuer and Isaki, 2021). Besides power asymmetries between development interests and Hawaiian communities, the legal and administrative arenas of current Water decision-making require quantification of the amounts of Water that are necessary to support ecosystems and traditional and customary practices. These calculations present a tremendous challenge when some diverted streams have been dry for over 100 years, when even the science of hydrology struggles to characterise surface-groundwater exchange, and when even groundwater-dependent coastal ecosystems supporting traditional gathering practices have not been fully characterised (Oki, 2003; Cantor et al., 2020; Sproat, 2011). The existing accounting-oriented framework of decision-making prioritises permitted Water users over in-stream or in-ground values. At the same time, many DHHL entitlements to Water for Hawaiian homesteading remain unfulfilled (Liu, 2002). Since 2012, at least one member of the Commission must possess expertise in traditional Hawaiian Water resource management (HRS 174C-7[b]). In conjunction with the organisation of Hawaiian and environmental coalitions, this and other factors have helped facilitate the restoration of flows to previously dry streams and their communities. More than a demand for individual Water rights, the framing of collective social responsibility to Wai and to all life that is dependent on it has been a powerful force for cultivating alliances for the restoration and stewardship of Wai, including in researcher-community realms.

As Stewart-Harawira (2020: 3) similarly expresses, in Aotearoa New Zealand there is an understanding of an "ecological ethic of responsibility" that one is connected to through our whakapapa (genealogy). In this way, Stewart-Harawira emphasises the relational responsibilities that humans have to Water as "kaitiaki (stewards)" (ibid). Burdon et al. (2015: 337) suggest that, in Australia, a "consequence of this ethic of responsibility" of 'caring for Water' is that Indigenous Peoples must fulfil our obligations to our relation – Water – and that any exclusion of Indigenous participation from Water decision-making in basin governance is an affront not just to our inherent Water rights but to our cultural and spiritual responsibilities. How then might responsibility-based and rights-based frameworks evolve to support Indigenous movements for Water Back?

Blended paths forward for responsibilities and rights

Transboundary Water agreements are the foundational international legal mechanism by which to secure Water rights and responsibilities; however, treaties with Indigenous Nations are often overlooked as the first transboundary Water agreements (Leonard, 2019; Wolf, 2000). Treaties with Indigenous Nations are international agreements made with settler-colonial governments such as the British Crown (the colonial Government of Canada), the United States, and Aotearoa New Zealand. Historically, treaties also demarcated geographic boundaries between Indigenous Lands and settler Lands. In Australia, where treaties were not signed with Indigenous Peoples, new nation-building efforts have carved out a movement for the recognition of cultural flows or Indigenous flows that are guaranteed "to each Indigenous Nation to enable them to exercise their custodial responsibilities to care for the river system" (Moggridge and Thompson, 2021: 6). For Māori in Aotearoa New Zealand, the assertion of Māori concepts of mana motuhake and rangatiratanga are explicit shifts from contemporary notions of 'ownership'; they recognise a more relational connection to freshwater with both rights and responsibilities. In Canada, recent education on treaty history has brought an awareness that all Lands are Treaty Lands and that all Canadians are Treaty People. Indigenous scholars Aimée Craft and Lucas King have researched and published work on how the Anishinaabek within the Treaty #3 region have produced a Nibi (Water) Declaration of Treaty #3. This declaration supports Indigenous legal protections for the Water. Its main goal is to "help advance the Watershed management planning in the Treaty #3 territory" (Craft and King, 2021: 1). The declaration was founded to establish Anishinaabek jurisdiction in Treaty #3 and to help reIndigenise governmental processes of Water decision-making. Ultimately, the ability to restore responsibilities for caring for Water to Indigenous Peoples also helps to restore Water health.

WATER HEALTH

Humans, animals and plants cannot live without Water. Water is an indispensable molecule in the human body, consisting of two hydrogen atoms and one oxygen atom. It is responsible for constituting around 60% of the body's mass, enabling vital functions such as nutrient transportation, waste removal, temperature regulation, and supporting overall health and well-being (USGS, 2021). Water is essential to every living being; it is necessary for such things as washing hands and clothes, preparing food, staying hydrated, and participates in traditional ceremonial practices. As previously mentioned, Water also connects humans to the spiritual world. Indigenous Peoples' lack of access to Water and sanitation has severe human health implications that are prevalent across settler-colonial states (Hartwig et al., 2020; Wilson et al., 2021). In large part, deteriorating Water Health and thereby deteriorating human, plant and animal relatives' health can be linked to environmental racism, biodiversity loss and climate change (Whyte, 2016b; Waldron, 2018).

Water security comprises access to safe, reliable, sufficient and affordable Water that supports thriving communities (Jepson et al., 2017). In the global north, research has shown that the idea of universal Water security is a myth (Barlow, 2016; Meehan et al., 2020), and similar experiences affect other geographies. Gaps in Water provision and access are not simply a case of 'technical' issues or network failures; rather, they are, the product of a system of racialised dispossession, colonialism and property rights, often through and at the hands of the state (Curley, 2019; Leonard, 2019). Moreover, what counts as trustworthy, clean and safe Water can differ between state definitions and Indigenous definitions, impacting Water quality and security (see, for example, Wilson et al., 2021). Indigenous Peoples across the CANZUS settler-colonial states often rely on decentralised drinking Water systems that are more prone to contamination (Russell et al., 2020; Leonard 2021b; Harmsworth, 2014; Bradford et al., 2016).

In Canada, Water Health is a key area in Indigenous Water research, particularly studies examining First Nation Water crises and long-term boil Water advisories (Bradford et al., 2016; McGregor, 2012). As

Meehan et al. (2020: 5) note, "the displacement and forced relocation of Indigenous peoples to reserves were accompanied by a lack of planning for infrastructure development or policy frameworks to ensure universal water and sanitation". Indigenous Nations and communities not only lack access to many basic Water services, but our suffering is often ignored by the media. According to Lam et al. (2017), the limited media coverage of these issues poses a challenge in addressing the water-related health crises many Indigenous communities face because it can undermine public and government interest. Frequent drinking water advisories and persistent Water quality concerns further highlight the urgent need for action to ensure safe and healthy Water in First Nations (Bradford et al., 2016). Today, there are Indigenous-led movements to revise safe drinking Water standards to ensure that all First Nation reserves are protected, where prior governmental fragmentation may have left them victim to regulatory gaps (Hanrahan, 2017; White et al., 2012). Black and McBean (2017: 248) underscore the need for an Indigenous national Water strategy to address these issues, emphasizing key areas such as "legislation, jurisdiction, regulation, funding, technical components, and policy and governance". They further argue that any strategy developed should aim to be 'bottom-up' and 'participatory', considering "community-specific needs, historical context, and urgency" to effectively address these pressing water crises (ibid). However, these movements for healthy Water and healthy people require improved access to Water data for Indigenous Nations and communities.

Water data plays a crucial role in understanding and managing Water for the protection of health and well-being of ecosystems and Indigenous Peoples (Sugg, 2022). The concept of Indigenous Peoples' Water research sovereignty acknowledges our rights and authority to collect, own, and govern Water data. Water data is essential for Indigenous Nations and communities for several reasons. Firstly, monitoring Water quality, aquifer levels, and basin Water quantity is vital for assessing the health and availability of Water within our territories (Restrepo-Osorio et al., 2022; Yong et al., 2019). By collecting and analysing data on Water quality parameters, such as pH, dissolved oxygen, and contaminant levels, Indigenous Nations and communities can identify potential threats to the environment and public health and take appropriate measures to safeguard Water (ibid). Additionally, tracking aquifer levels helps Indigenous Nations and communities understand the sustainability of groundwater sources, informing decisions on Water allocation and management (ibid). Basin Water quantity data is vital for fulfilling Water settlement agreements, as it provides evidence of historical water availability in different areas (ibid). This data is essential for negotiating fair Water rights and ensuring compliance with treaties and other legal agreements. Furthermore, Indigenous Nations can use Water data to collaborate with private landowners and Water managers, promoting sustainable practices that improve Watershed conditions (ibid). Promoting data sharing practices, as well as improving access to necessary technology and capacity training for Indigenous data scientists, is crucial for addressing the existing gaps and improving Tribal Nation access to Water data. With improved access to and collection of Water data, Indigenous Peoples can effectively assess current conditions, enhance Water decision-making and improve watershed health. However, the absence of comprehensive Water data for Indigenous Peoples is not only a result of historical marginalisation but also an outcome of settler-colonialism and other systemic factors that perpetuate threats to Water health.

In settler-colonial states, practices that have been directly harmful to Indigenous Lands and lifeways have been tied to injustices towards Water or involving threats to Water health (see Murdocca, 2010). The Pick-Sloan Missouri Basin Program of the 1930s (formerly called the Missouri River Basin Project), for example, in the Missouri River basin in the US, resulted in the flooding and destruction of large swaths of Lands belonging to Tribal Nations on the Great Plains in the name of increased settler access to, and benefits from, the Water of the Missouri River (Estes, 2019). The very Waters that were beneficial and important to Indigenous communities ended up being the same Waters that flooded the communities and Tribal Lands (ibid). Of course, the Missouri would become the centre of another controversy decades later, with the construction of the Dakota Access Pipeline, which crossed the Missouri River in ceded territories near the Standing Rock reservation. The construction of this pipeline gave rise to fears around

the risks to drinking Water in Tribal Nations if the pipeline leaked into the river (ibid). Such fears are not unfounded, since in 1991, —just 560 kilometres to the east, Enbridge's Line 3 pipeline leaked onto the Prairie River (a tributary of the Mississippi River) in ceded Anishinaabe territories, in what is understood to be the largest inland oil spill in US history (Kraker and Marohn, 2021). Had it not been for the fact that it was winter when the spill happened, the oil would have spread to the Mississippi, which was just a few kilometres away from the spill site (ibid).

Unfortunately, this pattern of Water harm also emerged in the 2015 Gold King Mine Spill, which resulted in the release of three million gallons of acid mine drainage into the Animas and San Juan Rivers within the Colorado River Basin, harming Water critical for the livelihoods of citizens of the Southern Ute Indian Tribe, the Navajo Nation, the Ute Mountain Ute Indian Tribe, and the Jicarilla Apache Tribe among other Tribes in the basin (Cavazos et al., 2019; Chief et al., 2016a; Chief et al.,2016b). In a more recent example, the COVID-19 pandemic spread across Tribal Nations at disproportionately high rates. The recommendation was to wash hands frequently, however many Tribal Nations do not have running Water or access to clean Water on a daily basis (Leonard, 2020a, 2020b; Tanana et al., 2021b; Eichelberger, 2010, 2018). In the Navajo Nation, access to clean Water (Tó) is a struggle for both humans and livestock. The US government has mined the Lands of the Navajo Nation and left many mine pits with radioactive tailings and debris that has made its way into the Land and Water systems (Jones et al., 2020). Wilson et al. (2021) argue that contamination of Water can also be driven by settler occupation. A process they call "contamination by occupation" that can be remedied through incremental reassertions of Indigenous sovereignty in Water decision-making (ibid: 12). In response to these threats to Water health, federally recognized Tribes have increasingly utilised the Clean Water Act and its Water quality standards to protect against contamination, including incidents like oil spills (Diver, 2018).

The Treatment in the same manner as a State (TAS) status delegated to federally recognized Tribes under the Clean Water Act (CWA) plays a pivotal role in safeguarding Water health and ensuring the protection of Tribal Waters (Tanana et al., 2021a). Scholars have examined the legal and policy frameworks surrounding TAS provisions and their implications for Tribal Nations' Water management (Robison et al., 2018; Tanana et al., 2021b). There are also tensions present in the administrative processes that determine how Tribes are delegated TAS status. According to Kyle Powys Whyte (2011), a Potawatomi philosopher, the implications of TAS status on Tribal Nations' efforts to protect Water health reveal the intricate complexities and challenges it presents in terms of preserving Tribal sovereignty and avoiding subordination to federal agencies. In some instances TAS status does not provide sufficient protection against the potential harm to Water health caused by the actions of large government entities and corporations (Cavazos et al., 2019; Diver, 2018). Moreover, without TAS status the CWA and federal Water quality standards do not apply to many waterways within Tribal territories. Although in 2023, the Environmental Protection Agency proposed a new rule to close this decades long loophole (US EPA, 2023). In terms of practical implementation and challenges, Cohn et al. (2022) explore Nimiipúu (Nez Perce) spatio-temporalities of Water and underscore significant issues such as colonialism, U.S. state and local challenges to Tribal Water quality standards, and the temporal scale mismatch within Water governance frameworks like the Clean Water Act. The research highlights how these factors impede long-term thinking and Tribal efforts to protect Water health. Moreover, research by Diver et al. (2019) recognizes the inherited vestiges of colonialism present in the TAS framework. The authors argue that although Tribes may choose to engage with federal regulatory policies (i.e., CWA) we should do so while also establishing our own Water quality standards and ordinances within our Indigenous legal systems to ensure the preservation of Water health (Diver et al., 2019; Leonard, 2019).

Additionally, the issue of Water health, particularly Water quality, remains an ongoing concern in Aotearoa New Zealand (Elston et al., 2015; Stewart-Harawira, 2020). The settler colonial history of Aotearoa New Zealand has seen the removal and drainage of many Water bodies and the harnessing of what remains for agricultural use (Elston et al., 2015). Intensive agriculture remains the primary contributor to the poor quality and health of freshwater systems both for surface and groundwater, and

is impacting environmental and human health (Elston et al., 2015; Joy, 2019). While the economic dependence on high density and high input agriculture is not entirely movable through influence on freshwater policy, embedding Te Mana o Te Wai in the National Policy Statement for Freshwater Management may improve at least reducing nutrient leaching and sediment runoff into Waterways. It is also important that management of Water quality not only involve Māori but include leadership at the relevant hapū level (Morgan, 2006). In this way maintaining Water Health is an intimate act which depends on ensuring a strong fit of governance scale that empowers local relationality and understanding of caring for Water. Stewart-Harawira (2020) documents how Māori leadership in developing freshwater health frameworks has shaped global Water conservation efforts. Specifically, the Cultural Health Index and the Mauri models prioritise mātauranga Māori and allow for culturally informed decision-making (Stewart-Harawira, 2020; Harmsworth et al., 2016; Townsend et al., 2004). The incorporation of Indigenous values into freshwater monitoring frameworks coincides with similar advancements in Australia to establish cultural and Indigenous flows in Water Health management (Harmsworth et al., 2016; Pinner et al., 2019).

Across Australia, Indigenous Peoples experience higher rates of exposure to waterborne illnesses than do non-Indigenous people (Hall, 2019; Hall et al., 2022). These health inequalities are driven by Water, Sanitation and Hygiene (WASH) services that are less safe than those of the general population of Australia with remote Indigenous communities being more at risk (Hall, 2019). Improved drinking Water and sanitation standards across Australia should align with the Australian government's commitment to achieving the Sustainable Development Goals (SDGs), including the realisation of SDG 6, which is "to ensure water and sanitation for all" (United Nations, 2015). Despite this pledge, it has been noted that service levels in remote communities are at a lower standard and that they suffer more major disruptions than do residents of non-Indigenous and urban centres (Hall et al., 2022). Russell et al. (2020) also highlight that Indigenous Peoples can have increased exposure to contaminated surface Water due to cultural and spiritual activities that go beyond drinking Water to bathing and other Water-based activities. The authors further found that Indigenous Water Knowledges of billabongs, rivers, creeks, etc. include awareness of seasonal Water health indicators that help evaluate surface Water quality; when combined with other scientific methods, these indicators may be beneficial in the ongoing management of waterbody health (Russell et al., 2020). Moggridge and Thompson (2021) put forward the concept that healthy Water is interconnected with a healthy country, healthy people and a healthy culture (see Figure 1).

Water Health includes human-Water interactions such as Water safety and drowning (Phillips, 2020). Indigenous Peoples understand that Water as a source of life not only gives life but can also take it away if Water is not respected. As such, access and 'health' are not synonymous. Health and wellness are better understood as a condition where shared responsibilities between Water and people can flourish (Chiblow, 2019; Figueroa and Waitt, 2008; McGregor, 2010; Dotson and Whyte, 2013). Indigenous women are often at the forefront of advocating for the protection of Water Health. Water Protectors include women like Judy Da Silva, who has fought tirelessly for the restoration of Water health to her home community of Grassy Narrows, where Water has suffered from mercury poisoning for decades (Simpson et al., 2009). As Indigenous Peoples our Water insecurity and the absence of Water Health has been shaped not only by our experiences of settler-colonialism but also increasingly by the effects of anthropogenically induced climate change (Hall and Crosby, 2020; Sanderson et al., 2020; Leonard, 2021b).

WATER AND CLIMATE CHANGE

In this section, we outline the inherent tensions that Indigenous communities face through the dual narratives of marginalisation and resilience. We review related historical and policy contexts that situate these stories and we highlight present opportunities in the face of climate change and our current climate

crisis. The relationship between Water and climate change for Indigenous Nations and communities engages themes that are woven throughout this article, further situating the need to support human and environmental rights and equity on an intergenerational time scale within the Water Back movement. Climatic change impacts on Water security not only threaten existing biodiversity and Water Health, but also the health of future generations of all relations. This section especially interconnects with Water colonialism, given the implications of settler-colonial and capitalist agendas as drivers of current climate crises (Whyte, 2016b; Funes, 2022). Indigenous Peoples are subjected to disproportionate effects from the impacts of climate change on Water and from the secondary impacts on beings that are dependent on Water, which are necessary for maintaining life and core cultural and ceremonial practices. We also carry critical guidance in the form of Indigenous Knowledge Systems and practices for observing and adapting to climate change (IPCC, 2014; STACCWG, 2021; Jantarasami et al., 2018). As described by Wildcat, a Yuchi scholar of the Muscogee Nation of Oklahoma,

> awareness of climate change is the result of practical lifeway experiences and sensitivity to the rhythms of seasons that make them particularly knowledgeable about what is going on where they live and Indigenous peoples draw on practical lifeway experiences – not one person's experience – but that of entire nations and communities to share multi-generational "deep spatial" Knowledges of empirical landscapes and seascapes (Wildcat, 2013: 510).

For Indigenous Peoples, climate change and adaptation discourses pose certain risks of exploitation or further marginalisation. Properly leveraged, however, they also present opportunities to assert Native claims, confront historical injustices, and expand ethics of stewardship and kinship into policymaking, which can effectively shift Indigenous Knowledges, cultures and histories from the margins to the centre (Smith, 2012; Whyte, 2013). The case studies and anecdotes included in this review highlight a handful of lived experiences which, though they are embedded in unique policy, geography and historical contexts, share similarities in terms of this duality of resilience and marginalisation.

As climate change impacts progress, there is also increasing awareness of vulnerabilities linked to colonial dispossession and environmental changes that alter landscapes and threaten Indigenous spiritual and cultural connections to territories and homelands (Abate and Warner, 2013; Garriga-López, 2019). Indigenous hydrologists and earth scientists are now leading cultural and context-rich studies on climate change-related Water impacts within our respective communities and Nations. Emanuel (2018), for example, demonstrates how climate change will potentially impact the Lumbee River Watershed and the Lumbee Tribe of North Carolina. The study findings acknowledge the particular vulnerability faced by a Tribe that is not federally recognised, due to lack of access to resources and protection. The collaborative research conducted by Tulley-Cordova et al. (2018) and Tsinnajinnie et al. (2018), in close partnership with the Navajo Nation Water Management Branch, is a strong example for Indigenous-led Water research on climate change. By working together, these partnerships between Indigenous scientists and Tribes actively address Water security concerns impacting livelihoods of those living on the Navajo Nation. Through their research on trends in precipitation and snowpack, they not only contribute to the understanding of climate change impacts on Water resources, but also empower Indigenous communities to develop effective strategies for adaptation and resilience. These partnerships foster the integration of Indigenous Knowledge Systems, ensuring that Traditional Ecological Knowledge and cultural perspectives are valued and incorporated in the face of environmental challenges.

Among climate change-related Water impacts on Indigenous Peoples, impacts on Tribes in the US that have been noted by Cozzetto et al. (2013: 570) include,

> 1) Water supply and management (including Water sources and infrastructure), 2) aquatic species important for culture and subsistence, 3) ranching and agriculture particularly from climate extremes (e.g.; droughts, floods), 4) Tribal sovereignty and rights associated with Water resources, fishing, hunting, and gathering, and 5) soil quality (e.g.; from coastal and riverine erosion prompting Tribal relocation or from drought-related Land degradation) (Cozzetto et al., 2013: 570).

Cozzetto et al. (ibid) also expressed the need for more relevant and culturally appropriate studies of Water and Land, planning and implementation of projects, and incorporation of TEK at all stages of climate adaptation processes. Apsáalooke/Crow Tribal members from the Northern Plains of North America observed how hydroclimatic impacts such as declining snowpack, warming winters, increased flooding, hotter summers, increasing wildfires, and impacts to ecosystems interact with other environmental, historical, economic, and cultural factors that shape the overall vulnerability of their Tribe and Water to climate change (Martin et al., 2020). Similar Water impacts that are connected to other factors are seen in Indigenous communities and Nations throughout various regions of the world; these include Ocean acidification, increases in plastic pollution as ice melts, and other sources of freshwater and marine pollution linked to climate change. All of these not only impact aquatic ecosystems; they also impact food sovereignty and cultural, ethical and physical forms of wellness associated with practices around traditional food (Hoover, 2017; Ngata and Liboiron, 2020). In a community-driven and Inuit-led study in Nunatsiavut, in Labrador, Canada, participants described how a mounting vulnerability to weather due to climate change required increasing attention: "You have to be more attentive to what the land is doing. Like when was the frost and how much Water did you get (…)" (Middleton et al., 2020: 113137). Riskier, or less, access to ice or to safe Water conditions due to climate events was also strongly articulated as a source of sadness, grief and an inability to feel well (Durkalek et al., 2015).

Surface Water sources in the southwestern US that are fed by snow and rainfall from mountains are few and far between. Many Indigenous communities are thus located in areas where groundwater is easily accessible through springs or shallow wells. Several place names on the Navajo Nation refer to groundwater sources that have been the primary source of Water for Indigenous communities since time immemorial. With lack of infrastructure to transport surface Water resources, groundwater continues to be the most important source of Water for Indigenous communities in the southwest. Several large aquifers, however, such as the Navajo (N-aquifer) are being depleted from extractive energy practices (Higgins, 2010). This is leaving Indigenous Nations and communities without a backup source of Water, as climate change impacts both groundwater and surface Water resources. Similarly, in the northwestern US, climate change continues to impact Indigenous communities. With the decrease in snowpack and precipitation, and the rapid glacial melts, Water resources are becoming more and more depleted. For the Crow Nation, the future of access to Water is heavily dependent on the Yellowtail Dam, whose reservoir is fed by the headwaters of the Bighorn River, which are also the headwaters of the Wind River in the Rocky Mountains (Martin et al., 2020). As Indigenous Peoples around the world face the increasing impacts of climate change on our Water and cultural practices, the Water Back movement becomes even more imperative in ensuring the preservation and sustainable management of Water for future generations.

Indigenous communities on Oceanic islands and in coastal regions are also experiencing the impacts of climate change. In Hawai'i, drying streams and more frequent flooding are already negatively affecting farmers' abilities to mālama Hāloa (perpetuate our kinship practices) by growing kalo (taro). The decreasing success rate of this culturally important staple crop exacerbates the challenges faced by families and communities in sustaining our livelihoods, including our cultural practices and identity. At the shoreline, decreasing coastal groundwater discharge is exacerbated by development-related demands for Water, which in turn affects nearshore limu (macroalgae or seaweed), fisheries and associated cultural gathering. These impacts will only intensify with climate change (Sproat, 2016). In the Caribbean region, Indigenous communities are experiencing climate change impacts on Water in the form of severe flooding and drought, rising sea levels, salinisation of freshwater used for drinking Water and crops, and loss of marine communities due to coral bleaching and Ocean acidification (UNESCO, 2020). In these regions, the physical impacts of climate change on Water exacerbate existing stressors on Indigenous communities that stem from histories of forced displacement and lack of legal title to customary Lands (Garriga-López, 2019). In these contexts, climate change is expected to intensify existing conflict and disparities (Keener et al., 2012).

Without proactive measures to combat climate change in Australia, the impacts outlined in the Intergovernmental Panel on Climate Change (IPCC) WGII Sixth Assessment Report (IPCC, 2021: 9-11) will exacerbate existing socio-economic inequalities and disproportionately affect Indigenous Peoples, further limiting our opportunities for adaptation. Further climate change is already threatening Indigenous Water security and is also threatening loss of biocultural diversity, nutritional changes through unavailability of traditional foods and forced diet change, and loss of land and cultural resources through erosion and sea-level rise documented both in Australia and the Caribbean (TSRA, 2018; Ezcurra and Rivera-Collazo, 2018). This includes episodes of high sea levels causing the buried ancestors to be exhumed from erosion and storm surge as well as other risks to cultural heritage sites along coastlines. In Australia's Northern Territory, the impacts of climate change are are occurring in the form of increased frequency of droughts and limited precipitation events for the recharge of the groundwater aquifers from which drinking Water supplies are largely drawn (Howey and Grealy, 2021).

In Aotearoa New Zealand many rural marae already face Water insecurity concerns that are likely to be exacerbated by climate change (Jones et al., 2014). Droughts have become an annual occurrence for some marae and are increasing in intensity and duration (Johnson et al., 2022). Moreover, the stress of Water insecurity often falls disproportionately on wāhine Māori caring for our whānau, and in rural communities climate change induced Water stress will further exacerbate existing inequalities and poverty (ibid). The review also highlighted the need for more research on the impacts of climate change on Māori Water relations.

Considering these impacts, both within on-the-ground community stories and in high-level scientific forums, two different discourses emerge: one of vulnerability and the other of adaptive capacity related to IKS and practices. The 2014 Intergovernmental Panel on Climate Change (IPCC) report states, for example, in regard to climate change impacts, that, "Livelihoods and lifestyles of indigenous peoples, pastoralists, and fisherfolk, often dependent on natural resources, are highly sensitive to climate change and climate change policies, especially those that marginalise their knowledge, values, and activities". Elsewhere, on climate change adaptation, it states that, "Indigenous, local, and traditional knowledge systems and practices, including indigenous peoples' holistic view of community and environment, are a major resource for adapting to climate change, but these have not been used consistently in existing adaptation efforts" (IPCC, 2014). In the global context, the IPCC and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) recognise disproportionate impacts of climate change and climate change policies on Indigenous Peoples, on our cultures, and on natural resource dependent livelihoods, while also increasingly emphasising the critical value of Indigenous and local Knowledges and practices for addressing climate change adaptation (Adger et al., 2014; Tengö et al., 2014). In the 2021 IPCC report, there is high confidence that, "Water cycle variability and extremes are projected to increase faster than average changes in most regions of the world and under all emission scenarios" (IPCC, 2021). This emphasises the importance of Indigenous and local Knowledges to understanding historical climate changes – including observation of sea level rise in Australia (Nunn and Reid, 2016) and changes in sea surface temperature and Ocean currents on the Peruvian coast and in the equatorial Pacific (Cushman, 2004) – and for enhancing climate adaptive capacity.

We also observe the need to remain attentive to which members within the community maintain these Knowledges; for example, Indigenous climate champion Hindou Oumarou Ibrahim, president of the Association for Indigenous Women and Peoples of Chad and member of the Mbororo pastoralist community, asserts that Indigenous women – as those who hold knowledge of Water and Land protection, food harvesting and traditional medicines – hold a critical role regarding the observation and addressing of climate change impacts on our communities (Portalewska, 2018). The language in the IPCC reports suggests that the global community sees Indigenous Peoples as both, victims of a climate change problem we did not create, and as keepers of Traditional Knowledge Systems that may inform and improve states' adaptive capacities (IPCC, 2021). The language used in the IPCC reports reflects a perception of Indigenous Peoples as presenting both a moral dilemma and a valuable resource. As climate

scientists increasingly engage with Indigenous Peoples in their desire to gain access to Indigenous Knowledges, extractive and colonial-informed practices have dominated; these have taken the form of, for example, externally driven research agendas and the lack of Indigenous governance of, or access to, data extracted from our communities (David-Chavez and Gavin, 2018). We must shift away from this and look to Indigenous self-determined and equitable partnerships.

As international, national and local climate adaptation policy-making proceeds, developing equitable relationships with Indigenous communities should be an important goal. Indigenous legal scholar Rebecca Tsosie pushes aside the victim/vulnerability/moral discourse and instead frames climate change as an issue of international justice. She writes that current climate adaptation strategies undermine Indigenous Peoples' rights to self-determination in a myriad of ways, including forced migration and/or challenges to political sovereignty in the case of Tribal governments interacting with the US Federal Government (Tsosie, 2010, 2013). The specifics of each case depend on Indigenous Peoples' relationship to the nation-state and on whether the community has political sovereignty and the rights associated with federal recognition or remain under ongoing colonial occupation. Regardless of political status, Tsosie argues, Indigenous Peoples have a recognised right to self-determination that is being challenged by international resistance not only to their mitigation efforts but also to their adaptation strategies (ibid). Climate justice must, "transcend narrow accounts of social justice (…) or of reparative justice for harms, such as relocations (…). Instead, national and international policies and programs should fairly consider and respect the different cultures, values, and circumstances of affected populations" (Tsosie, 2013: 10). Further, recommendations for addressing threats to local and Indigenous Knowledge Systems include ensuring, "full and effective participation and engagement of Indigenous Peoples and local communities in regional, national, and international decision-making about land, ocean spaces, natural resource management, and climate change mitigation" (Fernández-Llamazares et al., 2021: 156). The call for the full and effective participation of Indigenous Peoples in decision-making processes aligns with the principles of Water Back, which seeks to rematriate Indigenous sovereignty and agency over Water. This inclusion ensures the recognition and preservation of Indigenous Knowledge Systems, values, and rights in relation to Water.

As the climate crisis forces human societies to reflect upon our relationships with Water and nature, we observe opportunity and growing support for Indigenous-led justice- and kinship-based climate planning and adaptation initiatives. Potawatomi philosopher and scholar Kyle Powys Whyte calls attention to justice-based climate adaptation as framed around Peoples' collective continuance, sustained by relationships from the ecological to the political. As Whyte observes, justice is situated within systems of responsibilities; he further observes that climate change, "threatens collective continuance by changing the contexts in which systems of responsibilities are meaningful" (Whyte, 2013: 520). At the same time, he considers the possibility that political orders are also capable of facilitating continuance. We extend his four policies of climate adaptation to pursue a 'justice forward' approach that centres on systems of responsibilities to support the collective continuance of Indigenous Peoples. The four policy recommendations include, (1) ensuring that adaptation planning is a process of equitable codesign with Indigenous communities/governments, (2) upholding existing historical responsibilities to Indigenous communities, (3) supporting participatory research that engages multiple Knowledge Systems (scientific and Indigenous Knowledge Systems), and (4) enhancing multiparty governance and wider partnerships, given the transboundary challenges of climate change (ibid). The implementation of such arrangements requires the normally slow work of building relationships and the requisite consent, trust, accountability and reciprocity, which are easily cast aside in an urgency-filled climate response that is centred around preventing ecological tipping points (Whyte, 2019a). But what if climate action was centred around the urgency of re-establishing kin-centric relationships?

Around the globe, Indigenous-led climate adaptation and planning efforts underway and guiding resources, centre relational responsibilities to Water, kinship ties, and intergenerational accountability. Indigenous aquaculture communities in Hawai'i , for example, developed a climate change assessment

of our practice (Hui Mālama Loko Iʻa, 2020) and over 60 Tribal entities in the US have engaged in climate change assessments or action plans (ITEP, 2021). *Dibaginjigaadeg Anishinaabe Ezhitwaad: A Tribal Climate Adaptation Menu* was developed by Ojibwe and Menominee Tribal partners and the Great Lakes Indian Fish and Wildlife Commission in the US; it emphasises Indigenous language, concepts and values within climate adaptation planning (Tribal Adaptation Menu Team, 2019). This includes the importance of relational connections with more-than-human beings and strategies for maintaining or restoring Nibi (Water) quality (Tribal Adaptation Menu Team, 2019). Moving east, coastal Tribal Nations along the northeast and mid-Atlantic coastlines can apply the WAMPUM Indigenous adaptation framework for sea level rise, as guided by Indigenous responses and knowledges for adaptation; this framework includes strategies to, "witness, acknowledge, mend, protect, unite, and move" (Leonard, 2021b: 847). On the Caribbean islands, we observe pathways for climate adaptation and resilience through sustaining and regenerating IK of hurricane-adapted traditional architecture and rain-fed agricultural practices, and IK regarding ecological and astronomical indicators for determining seasonal shifts, changing weather patterns, and when to plant or harvest crops and materials (David-Chavez and Ortiz, 2018; UNESCO, 2020). In the Sahel region of Chad, Ibrahim has developed a participatory mapping approach that she describes as being able to, "leverage indigenous knowledge and nature-based solutions to protect and share fresh-Water resources, identify drought-resistant crops, and help combat climate change and desertification through sustainable pastoralism" (Ibrahim, 2021). Advancing Indigenous Water research sovereignty requires Indigenous-led partnerships of mutual benefit in adapting to climate change.

The Yukon First Nations Climate Action Fellows, who graduated in 2023 from their fellowship program, embody the concept of Water Back through their "reconnection vision". They aim to move away from an anthropocentric view of the world and instead focus on reconnecting with the Land and Water and restoring balance to the environment. Their climate action plan looks at various topics such as governance, education, food sovereignty, and resource extraction. The fellows consulted with community members, including elders and youth, to ensure that their plan is reflective of their worldview and addresses the emotional, mental, physical, and spiritual concerns of their communities (YFNCA, 2023). Their approach is based on traditional knowledge and a "two-eyed seeing" approach that combines both western and Indigenous ways of knowing. The fellows are recognized as leaders in their communities and are inspiring others to act in addressing climate change while respecting the Land and Water. Shauna Yeomans-Lindstrom (Geehaadastee), one of the fellows, explained that they prioritise Indigenous approaches to climate action by asking different questions, such as "how can we help the salmon thrive?" rather than "how much salmon can we take" (Amminson, 2023). The future of Indigenous-led climate change Water research will be more transdisciplinary, more focused on justice, more inclusive of IKS, intergenerational, and more motivated by its desire to benefit Indigenous Nations and communities.

CONCLUSIONS AND FUTURE RESEARCH

Indigenous Water research is a changing Waterscape in which Indigenous scholars continue to reclaim and re-story Indigenous Water Knowledges and traditional ways of knowing. In this paper, we outline a Water Back framework for Water research that is led by Indigenous Nations, communities and scholars as an exercise in research sovereignty. While there are many place-based and struggle-specific ways to understand Water Back, just as there are for Land Back, this review has highlighted core elements and principles of Water Back that resonate across the places, cases and movements reviewed. Indigenous Water scholarship advancing Water Back covers the thematic areas of: (1) Water Cosmology and Governance, (2) Water Colonialism, (3) Water Justice, (4) Water Responsibilities and Rights, (5) Water Health, and (6) Water and Climate Change.

The settler-colonial experience of Indigenous Peoples, landscapes and their freshwater systems are certainly nuanced, but they have striking similarities around the world. That experience has left

Indigenous Peoples ostracised from our Water relations and associated lifeways, while the landscapes and Waters themselves have been inextricably, and perhaps irreversibly changed. Add the unpredictable future of global climate systems and it is perhaps unlikely to return to our Water relations of old. The concept of change, however, is not new to Indigenous Peoples and cultures. Indeed our cultures have continually adapted in relationship to new and changed Waterscapes, landscapes, seascapes and climates. What seems evident, though, is that settler-colonial paradigms that centre utilitarian Water relations are good for neither Mother Earth, humanity, nor our more-than-human relations. Returning to Indigenous Water relations is imperative at the global scale as much as at the local scale. Water Back offers a structured platform from which Indigenous Peoples can exercise Water advocacy at the local scale, taking inspiration and insights from other Indigenous actors. Fundamental to any such platform is access to local narratives of Indigenous advocacy from around the world. Here, we profile and privilege Indigenous Water scholarship in a performative show of strength; we do so in solidarity with Indigenous Water Protectors and scholars, to bolster them and to help them build on the work of current and past Indigenous Water scholars and advocates and on that of our non-Indigenous allies. In doing so, we pay homage to their efforts and skill and to the hardships they have faced, and give comfort as we take up the torch with and amongst our own communities. A true Water Back movement should be led by Indigenous Peoples who are firmly embedded in our worldviews, beliefs, knowledges, and traditions. The neoliberal and capitalist contemporary world order seems at odds with living in good relation. By connecting with our Water relations of old and new, we adapt to an ever changing world.

Democratising Water research requires empowering Indigenous rights to self-determination and responsibilities for Water kinship and stewardship. Indigenous Water champions continue to rise to stand on the frontlines of our most pressing planetary challenges. Young people such as Xiuhtezcatl Martinez highlight that youth are not future leaders but existing Water champions. As he puts it,

> People say that we're the *future* right, that we're going to inherit this planet, and in the *future* we're going to be able to make a difference. And it's amazing to see young people stand up and say "We're not going to wait until then, we're going to do something *now*" (Martinez, 2017; see also Conrad, 2021).

These calls to action echo the messages of Indigenous youth changemaker and Anishinabek Nation Chief Water Commissioner Autumn Peltier, who in 2019, when addressing the Global Landscapes Forum at the United Nations highlighted the, "need to have more elders and youth together sitting at the decision table when people make decisions about our lands and Waters" (Erskine, 2019). Indigenous Water research can shape this desire into reality. Valuing Indigenous Knowledges for addressing global Water crises also requires valuing Indigenous researchers. Lastly, the path forward must reconcile the historical and contemporary Water injustices and colonialism that continue to obstruct Indigenous-led Water research for Water Back.

Through this process of rematriation, guided by an Indigenous relational worldview, the Water Back movement emerges as a powerful force shaping the future of Water research. It acknowledges Water as the lifeblood of Mother Earth and emphasizes the need for alliances, research sovereignty, and reconciliation to address the pressing challenges we face. By embracing reciprocity and recognizing that Water is life, the movement envisions a future where healthy lifeways and healing are intertwined with our relationship to Water. In this vision, Water rematriation becomes a transformative path, allowing humanity to be rematriated into the care of Mother Earth and her life-giving Waters. It is through this collective commitment to honouring Water as our first medicine that we can honour the Water for sustaining our collective well-being.

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SUPPLEMENTARY MATERIAL

Codebook: The codebook presented here provides a comprehensive overview of the categories contained in the database of Indigenous Water research.

The 419 references collected and analysed can be found here.

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20
ANISHINAABEG IN SPACE

Deondre Smiles

Introduction

Setting: A bright summer morning in northeastern Minnesota's Iron Range, some day in the not-too-distant future…

It is finally, at long last, launch day at the Anangoog Inaawanidiwaad spaceport in this remote part of northern Minnesota. The hard work, the dreams, the sacrifice of many Anishinaabeg scholars, scientists, astronomers, engineers, community members, elders, and even children are about to pay off, as after years of hard work and ingenuity, the Anishinaabe space programme is finally ready to launch with the first voyage of the Animikii rocket, carrying the Bikwaakwad probe into space, to begin a voyage that will take it far beyond the limits of the solar system, much in the same vein as the Pioneer and Voyager satellites of historic lore. The goal of this first launch of what will become many as part of the broader Bikwaakwad programme is to investigate the limits of the solar system and the celestial bodies further afield, in what promises to provide great benefits for Anishinaabeg astronomical knowledge.

The platitudes are effusive and frequent. One elder speaks about the programme as providing a way to "engage with the stars in a good way, and to continue to provide our future generations with knowledge about the world beyond this Earth". An engineer on the programme speaks about this new Anishinaabeg engagement in space and NASA's eager collaboration with it as the realisation of the truth that Anishinaabeg scientific knowledge, especially about the stars, and the dominant "Western" form of astronomical knowledge are both valid, on their own merits. Other scientists comment on the fact that the data generated from this project will be collected through non-extractive means, and will be freely shared with communities and peoples across the globe—that the Anishinaabeg go to space not to conquer or to settle, but to better understand the spaces and places beyond Earth with which they must live in good relations. The various non-Indigenous dignitaries and scientists who have come are amazed at what they see. The more numerous representatives from other Indigenous nations are not only amazed but also filled with pride, because many non-Anishinaabe Indigenous peoples also helped with the development of this space programme, and their communities are hard at work developing their own engagements with space.

The launch site, constructed with sustainable materials, is placed within a reclaimed iron ore mine—the site chosen by Anishinaabe community elders as a reclaiming of stolen land that had been brutally exploited but would now serve as a site of Anishinaabeg resurgence. Construction on the site had not only provided jobs for many tribal members but also revitalised an area

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of Minnesota that had long struggled economically. The Animiikii rocket rises tall over the former mine site, its white body decorated with Anishinaabe floral beadwork patterns. The time has finally come for launch. The countdown begins. "*Midaaswi… zhaangaswi…*" the announcer begins counting down in Ojibwemowin. "*Niswi… niizh… bezhig…*" they finish, as the rocket takes off with a deafening roar amid the smoke and flame of liftoff. The rocket gains altitude quickly, moving through the atmosphere and its various stages, eventually crossing into outer space itself. The probe is launched from the rocket as the rocket begins to gracefully float back to Earth, and Bikwaakwad I begins its journey out into the stars…

The above narrative is a contrived piece of fiction, of course; a flight (no pun intended) of the author's (my) fancy. There is no Anishinaabeg space programme. While one could reasonably argue that there is never a *zero* chance, the actual chance of a spacecraft designed and built by Anishinaabeg being launched from the Iron Range—or, quite frankly, from anywhere—is probably very close to zero. But, that is not the point of the above story—it represents just one imagining of the potential futures for continued Indigenous engagement with the stars, couched within contexts that we understand very well in the so-called United States—the excitement surrounding space launches and the dreams and meanings that we attribute to space exploration, especially the desire to explore the unknown and make it knowable. It also represents a growing tradition of Indigenous engagement with futurisms and how these engagements apply to our broader environments, including by Anishinaabe writer Grace Dillon (Dillon and Marques 2021) and Kyle Powys Whyte (2017, 2018).

In an era of ever-increasing climate crisis, the stars are often presented as an avenue of potential for us to create a new beginning for humanity. However, in the context of the United States, there is also a darker legacy to engagement with space, one couched in questions of colonialism, exploitation, and hegemony (Werth 2004; Cornish 2019; Treviño 2020). Those legacies have also found their way into contemporaneous engagement with space in many ways, ranging from disregard and exploitation of Indigenous lands in the name of space exploration (Prescod-Weinstein et al. 2020; Smiles 2020) to questions about the exploitation of extraterrestrial spaces and places (Marshall 1995). These actions threaten to recreate the same logics of colonisation in space as has been done on Earth (Smiles 2020; Treviño 2020). So, what can be done about this?

In my previous foray into these topics, I positioned Indigenous conceptions of space as a potential counterweight to settler colonial logics of space, both terrestrially and extraterrestrially (Young 1987; Marshall 1995; Kahanamoku et al. 2020; Prescod-Weinstein et al. 2020; Smiles 2020). While that previous chapter focused on the United States' fraught history with these topics, in this chapter, I seek to bring my analysis both a bit deeper and a bit closer to home in exploring the ways that my own people, the Anishinaabe/Ojibwe nation, have engaged with the stars. I position my own people's astronomical knowledge and our systems of accountability and relation with the land and more-than-human kin here on Earth together to provide one potential way through which an ethical engagement with the cosmos might take place. Although we may never get our own space programme, our connections with the stars can still serve as a guide in how to conduct ourselves among them.

My narrative will proceed as follows. I begin by defining settler colonialism briefly and then return to existing threads on how settler colonialism functions in concert with imperialism and capitalism in certain aspects of contemporary space engagement, in particular questions of resource extraction and evading anthropogenic climate/environmental crisis. Next, I turn to Anishinaabe and other Indigenous ontologies of astronomy and space, defining the ways that these ontologies run counter to settler colonial logics of space exploration. Finally, I conclude by pointing out some ways that Anishinaabe people are engaging ethically with the stars in the present day, without having to leave Earth. In all of this, I seek to make the argument that we do not need to export ecological crisis to the stars to explore them or to expand humanity's reach beyond Earth.

Settler Colonialism in Space, Redux: Resource Extraction, Space Colonisation, and Climate/Environmental Crisis

To understand the ways in which logics of settler colonialism extend into space exploration and engagement, it is of course necessary to outline scholarship that has been written about it. While there is not one exact definition of settler colonialism, and it is experienced differently across geographies, there are some common traits of the phenomenon. I begin by turning to the noted settler colonial scholars such as the late Patrick Wolfe (2006), who defines settler colonialism as a unique form of colonialism which is built around the enduring occupation of land by a colonising power, at the expense of the displacement of any Indigenous peoples who may have been present on the land before. This form of colonialism is positioned as distinct from more extractive forms of colonialism as the land itself is central to the goals of colonialism in settler contexts, versus forms of colonialism where natural resources and other forms of material/economic gain were to be extracted and sent back to the colonial metropole (Wolfe 2006). To put it simply, as Wolfe does, "Land is life—or, at least, land is necessary for life" (2006: 387). However, recent scholarship within contexts of settler colonial studies begin to chip away at Wolfe's assertions about settler colonialism.

This critique is multifaceted. Scholars such as Tiffany Lethabo King (2019) have critiqued Wolfe and some of his white contemporaries, such as Lorenzo Veracini, as dominating discourse surrounding settler colonial studies at the expense of Black and Indigenous voices. King in particular describes the ways that settler colonial scholarship has historically centred the settler colonial relationship around an Indigenous–settler dyad, while ignoring the roles that other racialised peoples have played in broader settler colonial structures. Other scholars, such as Sai Englert (2020), have critiqued the ways in which settler colonialism engages with the question of exploitation in settler colonies, and this is the critique that is most important to our discussion. In particular, Englert asserts that by attempting to draw artificial boundaries between "settler" colonialism and "traditional" or "extractive" forms of colonialism, settler colonialism as a concept fails to engage with the ways that it functions through the dispossession of land from its inhabitants via the exploitation of Indigenous peoples (Englert 2020). In particular, Englert employs a Marxist analysis of how class in settler societies is defined chiefly through struggles over who exactly benefits from Indigenous dispossession and exploitation via primitive accumulation (Englert 2020).

This is important because it fundamentally shifts how we think about settler colonialism and its role in constructing and defining itself—if we follow Englert's model of how the settler state constructs and defines itself, it is not enough to violently dispossess Indigenous peoples of their land and engage in campaigns of cultural and physical genocide against them. Rather, the class structure of the settler state is predicated on who can exploit Indigenous lands and peoples the most.

This exploitation takes many different forms, in pursuit of a variety of different economic goals. For example, in North America, where I live, work, and research, there is scholarship that attends to the burgeoning petroleum industry and the way that it operates through the theft and pollution of Indigenous lands, as well as its accompanying effects on Indigenous bodies, alongside broader conversation about the ways that environmental injustice far too often breaks down along racialised lines, with the greatest effect on marginalised peoples (which includes Indigenous peoples and communities) (Preston 2013, 2017; Shadaan and Murphy 2020). Similar work focuses on contexts such as occupied Palestine (Jaber 2019). The implications from this scholarship are painfully clear—settler colonial development and articulation of settler colonial society are intrinsically tied with exploitation of Indigenous land and environment, a conclusion that grimly exists in lockstep with Englert's thoughts on the topic.

This must also be tied together with questions of resource extraction and resource contestation in broader global contexts. The work of Julie Klinger provides an important bridge by which

we can turn these conversations toward exploitation in outer space. In particular, Klinger speaks on the ways in which the pursuit of rare-earth minerals, which has run rampant in a variety of terrestrial environments on Earth, now begins to look toward places beyond the Earth for new venues of exploitation, such as the Moon (Klinger 2015, 2017). In particular, Klinger invokes the concept of the frontier as being key to understanding why it is that we are eager to conduct mining on places like the Moon—the idea that rare-earth minerals are rare on Earth and therefore we must go to the Moon to mine them, while false, according to Klinger, can invoke strong emotions related to discovery and geopolitical rivalry, creating yet another "frontier" that must be discovered, conquered, and made use of by geopolitical competitions (Klinger 2017). Of course, the nature of space exploration as being intrinsically tied into questions of maintenance of empire/hegemony both on Earth and in extraterrestrial space makes sense, given the historical and contemporaneous role of this pursuit in the development of national pride and scientific superiority (Dunnett et al. 2019; Smiles 2020; Treviño 2020).

Conversations such as those had by scholars such as Klinger about the ethics of resource extraction in outer/uninhabited space are just one side of the coin, unfortunately. In recent decades (and even more frequently in recent years), there has been another scholarship that has presented resource extraction in outer space as something that not only is possible but can be presented ethically. Some works have approached this topic from legal frameworks, seeking to define what rights nations have in the exploitation of resources in "uninhabited" environments such as Antarctica, the ocean floor, and outer space, or whether wealthier, more powerful countries should share these resources with smaller, geopolitically "weaker" countries (Frakes 2003; Tennen 2010). Other articles muse on the ambiguity of law related to potential resource extraction in space, stating that clarity is needed, if only to ensure that humankind's engagement with the "frontier" of space can proceed unimpeded (Johnson 2011). These articles present the rapid scarcity of resources on Earth and the need to explore new spaces, such as extraterrestrial space, as a fait accompli (an argument that scholars such as Klinger poke holes in). Recent discoveries such as the existence of water on broader areas of the Moon than previously discovered (Wasser 2020) or of large quantities of gold inside a large asteroid, sixteen Psyche—large enough, says Smith (2019), for each person on Earth to get US$93 million from a hypothetical sale of all of it—show the growing public consciousness about resources in outer space, and the inevitability of the extraction and use of said resources. Smith (2019) writes not on the ethics of mining such an asteroid but rather on the economic impact of such a large quantity of gold hitting the market: the mining of asteroids like sixteen Psyche is seen as a done deal. Rather distressingly from an Earthbound perspective, Smith gives examples such as Spanish mining of gold in colonial Latin America or British/South African diamond mining, focusing on the economic impact of these activities versus the brutal human impact these activities brought about. But, this rationalisation isn't just couched in raw extractive logic. Questions about resource extraction centre around whether or not it can be done *ethically*, and the mechanisms through which that might be achieved (such as environmental impact assessments), not whether or not we should be doing it at all (Dallas et al. 2020; Dallas et al. 2021).

The marriage of economics and space exploration is coming together in other ways as well. Billionaires such as Jeff Bezos and Elon Musk have also turned their gaze towards the stars as a potential setting for humanity's future. Citing anthropogenic and socioeconomic factors, these tech moguls point towards a future in outer-space colonisation as a cure for these issues. "It's time to go back to the moon, this time to stay", said Bezos at the 2019 unveiling of a lunar lander that his company Blue Origin designed, going on to say that he believed heavy/extractive industries could be successfully carried out in extraterrestrial colonies, sparing the Earth from further anthropogenic change (Youn and Theodorou 2019). Bezos's trip to the edge of space in 2021 represents another step in his eventual goal of bringing humanity en masse into outer space to live and work (Bender 2021). While Bezos's vision focuses on the Moon and in potential

self-contained colonies in space, dubbed O'Neill colonies, Musk has set his sights even further afield—Mars (Powell 2019; Hamilton 2021). Musk's company, SpaceX, minces no words when describing the potential for colonisation of Mars:

> At an average distance of 140 million miles, Mars is one of Earth's closest habitable neighbors. Mars is about half again as far from the Sun as Earth is, so it still has decent sunlight. It is a little cold, but we can warm it up. Its atmosphere is primarily CO2 [*sic*] with some nitrogen and argon and a few other trace elements, which means that we can grow plants on Mars just by compressing the atmosphere. Gravity on Mars is about 38% of that of Earth, so you would be able to lift heavy things and bound around. Furthermore, the day is remarkably close to that of Earth.
>
> *(SpaceX 2021)*

Of course, in the meantime, these men (alongside other tech moguls such as Richard Branson) are testing the technologies they believe will bring humanity beyond Earth via short-term flights/voyages (Ascott 2021; Bender 2021).

Compared to Earth, where questions of colonisation and exploration have become mired in ethical questions and conversations surrounding power and privilege, space presents an easy way to think about expansion and growth in a way that does not harm anyone. This thinking is not new, of course—the logical line of thought is that if there are no Indigenous peoples living in space to contend with, it makes outer-space exploration, from an ethical standpoint, not only possible but desirable. This logic underpinned the works of physicists such as Gerald K. O'Neill—a direct source of inspiration to Jeff Bezos in particular (Bender 2021)—who stated in 1974: "[W]e can colonize space and do so without robbing or harming anyone and without polluting anything" (O'Neill 1974: 32).

O'Neill continues:

> Space exploration so far, like Antarctic exploration before it, has consisted of short-term scientific expeditions, wholly dependent for survival on supplies brought from home. If, in contrast, we use the matter and energy available in space to colonize and build, we can achieve great productivity of food and material goods. Then, in a time short enough to be useful, the exponential growth of colonies can reach the point at which the colonies can be of great benefit to the entire human race.
>
> *(O'Neill 1974: 32)*

With reasoning such as this, colonisation of outer space takes on an altruistic tone. Men like Bezos and Musk appear at first glance to be motivated by a desire to ensure humanity has a future—Musk stated in 2020, "If there's something terrible that happens on Earth, either made by humans or natural, we want to have, like, life insurance for life as a whole" (Wattles 2020). The acceleration of anthropogenic climate and environmental change on Earth makes the situation more dire—according to Rebecca Lindsay and Luann Dahlman of NOAA (2021), our planet's temperature has risen by nearly 0.1°C since the late nineteenth century, and when viewed over the last forty years, that rise in temperature has more than doubled. But other individuals have pointed out that there is far more than meets the eye as far as these billionaires' desire to explore outer space. Some have pointed out the inherent danger in attempting to colonise places like Mars, given the environmental, logistical, and technological challenges that would be present, such as lack of atmosphere, exposure to space-bound radiation, and the outright lack of technology to even attempt to do things like terraform Mars (Hamilton 2021; Stirone 2021). Other critiques revolve around the lack of democracy that would exist in an extraterrestrial economy, or around

the fact that even if there ended up being no resources to extract on a place like Mars, colonies would inherently become a money-making enterprise for men like Musk via tourism and other means (Stirone 2018; Wattles 2020).

These critiques, alongside the broader narratives and motivations that drive men like Bezos and Musk to push for colonisation in space, are in line with the thinking of Englert (2020)—it is spatial colonisation with land and resources in mind, and therefore, it is settler colonialism. Even if there are no Indigenous peoples to be found on planets such as Mars, it is already clear that settler colonial logics do not require the displacement of Indigenous peoples to function—in fact, it is desirable if they do not (Smiles 2020). The potential for prestige, both economically and socially, still exists in extraterrestrial space and allows its champions to ignore their own roles in anthropogenic change here on Earth (Abbruzzese 2019). But, in the face of apocalypse, is this form of engagement with space an inevitability?

Such a conclusion would suggest that the futures being presented by figures like Bezos and Musk are the only potential futures that are available to us. However, I argue that there exists a broader contestation over the potential futures of humanity in outer space, as well as different conceptions of what engagement might look like for humans and the environment alike. Returning to my opening vignette of what Anishinaabe engagements with outer space might look like, I now turn to the contemporary actions and viewpoints that Anishinaabe people express related to the stars.

Anishinaabe Ontologies of Environments and (Extraterrestrial) Space

Scholars such as Kyle Powys Whyte (2017, 2018) would respond to a presumed inevitability of colonial, extractive, and potentially apocalyptic futures for humanity with the answer that for Indigenous peoples, the apocalypse has already come and gone, and that Indigenous peoples are still here and are thriving in spite of the apocalypses that they have endured. While this chapter is not focused on how we can effectively combat climate crisis (an entire collection of books would be needed just to scratch the surface), I do want to use Whyte's work to make a key argument as to how we engage with outer space—that we do not need to replicate logics of capitalism and colonialism in outer space as we have created these logics here on Earth, and that systems of accountability and relation to land here on Earth can be applied to the stars.

Part of this comes from our own Anishinaabe creation story, which is something with which I begin every class or guest lecture that focuses on the environment. Our origin story, the creation of what we call Turtle Island, while too long to recount here, teaches the very important lesson that in our worldview, every part of the environment is interconnected. The animals who banded together to help create a new world out of the waters that inundated the old one were able to do so once they realised that they were stronger together than when they tried to do the work on their own. Of particular importance in the version of the story that I tell is that humans are not mentioned. To me, this is because as Anishinaabe, we are the least important part of the environment. This is not to say that we are not important as people but rather that because of the hard work of our more-than-human kin in creating the world we inhabit, we are bound by webs of relations to them and must do our best to protect them. These relations extend to the stars themselves and how we view them as Anishinaabe people. For example, many of the constellations in the night sky hold stories about our animal kin, as well as other culturally important stories and lessons for our people (Lee et al. 2014; Mitchell et al. 2020; Rajala 2020). The Anishinaabe concept of *mino-bimaadiziwin*, or living in a good way also applies to these relations—much as we try to live in a good, positive way with ourselves and one another as Anishinaabe, we also must live in a good way with our more-than-human kin, which includes the ways we engage—or do not engage—with them.

There are a growing number of Anishinaabe and Indigenous community members who are actively endeavouring to pass on this Anishinaabe knowledge of space and the stars to the younger generations. Individuals such as Annette Lee (Lakota), Carl Gawboy (Anishinaabe), Melanie Goodchild (Anishinaabe), and Michael Wassegijig Price (Anishinaabe) have made this knowledge available via a variety of means, such as star maps, publications, visual art, and even workshops and curricula designed for school-age children, hosted in particular by the Native Skywatchers project (Lee 2012, 2013; Lee, Rock, et al. 2013; Olson 2015; King 2014; "Our Manifest Galaxy" 2019; Gawboy et al. 2020; Lee, Maryboy, et al. 2020; Rajala 2020; Olson n.d.).

These scholars tie astronomical knowledge to the continued vitality of Anishinaabe/Indigenous culture. As Lee and others say: "As with many North American tribes much cultural knowledge, especially cultural astronomy, has been lost. The goal of the Native Skywatchers programming is to build community around the native star knowledge" (Lee, Rock et al. 2013: 153). Relationships between individuals and their environments, in this case, the stars, are central to Indigenous conceptions of space, they argue:

> Astronomy as presented in planetarium shows can be beautiful but ultimately distant with no way for audiences to link what they are viewing to their everyday lives. In contrast, Indigenous astronomy has people at its center. It is about people, relationships and the sky, not just about the sky.
>
> *(Lee, Maryboy et al. 2020: 76)*

This dissemination of Indigenous star knowledge is not limited to the classroom or the art exhibit, however. Indigenous nations have been collaborating with space agencies such as NASA for a long time (Bartels 2019; Bean 2018; Smiles 2020), and Anishinaabe astronomical knowledge has long featured in similar collaborations, in both terrestrial and extraterrestrial contexts. In 2011, Michael Wassegijig Price organised an internship with NASA at Minnesota's White Earth Tribal and Community College that focused on geospatial applications (Price 2011). Part of a broader collaboration between NASA and tribal colleges across the United States, the internship participants learned geospatial skills such as GIS and applied these towards research and work towards stewardship of vital community resources such as wild rice, or as we call it in Ojibwemowin, *manoomin* (Price 2011). Of course, Anishinaabe knowledge can be applied to NASA activities beyond the Earth. Native Skywatchers' pamphlet (Gawboy et al. 2020) entitled "Two-Eyed Seeing: Ojibwe Astronomy & NASA Moon to Mars" brings Anishinaabe terrestrial and extraterrestrial knowledge into conversation with NASA's efforts to return to the Moon as a pedagogical tool, using the concept of "Two-Eyed Seeing", or the bringing together of Indigenous and non-Indigenous perspectives, to provide students with a clearer picture of the ways that these two knowledge systems can collaborate in order to engage with the stars in a whole new way.

Conclusion

In my previous work, I presented Indigenous conceptions of space as a foil to colonial logics of space exploration—an engagement that I still feel can provide a way forward in how we engage with space. However, I want to challenge and expand my own previous thinking on this topic. Previously, I said that contending with Indigenous modes of astronomical knowledge could help the settler state and settler society practice self-reflexivity in the way that it conceptualises control and exploration of terrestrial and extraterrestrial space. It is worth asking why we go to space, not just whether or not it is possible, as well as who benefits from these actions and who is harmed. However, continuing events such as contestations over Earthbound spaces of space exploration such as Mauna Kea, as well as my own anxieties surrounding the role of Indigenous knowledge

in the academy, lead me to think that it is not enough to simply acknowledge and pay heed to Indigenous astronomical knowledge when we talk about the future of humanity and our potential existence beyond Earth. Indigenous viewpoints and knowledges cannot be acknowledged simply for the sake of using them without allowing Indigenous peoples and communities active input and to have a stake in the work being done. This form of academic knowledge production trends close to what Indigenous scholars such as Glen Coulthard (2014) describe as politics of recognition, or the allowing of Indigenous sovereignty/power/perspectives/knowledge only as much prominence as is possible without threatening the structures of the settler colonial state/settler society. This represents a particularly extractive and damaging politics of recognition that acts against the words of other Indigenous scholars such as Devon Mihesuah and others (1998), who advocate that when our knowledges are being told, we must always try to make sure that we are the ones who are doing the telling.

What is clear about the work being done by Indigenous peoples such as Lee, Gawboy, Price, and others is that they are producing and promoting astronomical knowledge for Indigenous peoples, by Indigenous peoples. Instead of taking a supporting role or having to rely on Western academia and dominant science to tell these stories, they are doing so themselves, and the benefits flow directly to Indigenous peoples. And these benefits are not those of gaining yet another foothold onto space or beyond Earth, or making possible forms of environmental exploitation, or enriching entrepreneurs who use outer space as a pressure release valve for anthropogenic climate crisis on Earth. Instead, this engagement centres around the desire to preserve relationships between people and the environments around them. Rather than seeking to master extraterrestrial space or make it into something that materially benefits humanity, Anishinaabe astronomical knowledge seeks to educate and to remind us of the obligations that we've had since the creation of our world. Not only this, but it can represent a way to turn back inwards into how we engage with the Earth itself, and perhaps might represent another way forward out of climate crisis.

What might the end goal of all this look like? To return to the story at the beginning of this chapter, I still do not know if we will ever see an Anishinaabe space programme, as wonderful and exciting as it may be. But, if we do, the Anishinaabe thinkers and community members might very well point back to the work of folks such as Lee, Gawboy, and others as having made it possible to bring such a thing from dreams to reality. But, it is also clear that we do not need to replicate what settler society is doing in space exploration and exploitation in order to bring the stars closer to us—we are already doing so, and in fact, bringing the stars into conversation with our worldviews as Anishinaabe can also allow us to continue to make space for the other important participant in this conversation—the Earth itself.

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7 Decolonial Methods

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Synopsis

This chapter approaches methods and guidelines for decolonial geographic research through a lens of conducting ethical, respectful research with Indigenous communities in both human and physical geography, and across the quantitative-qualitative spectrum. Using a historical and contemporary discussion of the entanglement of the discipline of Geography with colonial and imperial structures, along with an overview of potential steps that researchers should bear in mind when engaging with Indigenous communities in research endeavors, this chapter works to answer the key questions: What comprises decolonial research? How can researchers in Geography work towards accomplishing it in a way that is attentive to the needs of communities they work with and within, while meeting their own research objectives? Special attention is paid to the unique needs of students and early career scholars.

7.1 Introduction

Over the past generations, the engagement of the discipline of Geography with Indigenous peoples has deepened and increased in various directions, including in the realm of research. The impact of contemporary research areas in Geography[1], including analyses of climate change, human-environment interactions, and geospatial work has extended to include work on Indigenous and Indigenous-related topics. Alongside this increased engagement with Indigenous peoples is a growing aspiration towards 'decolonizing' Geography, both via increasing visibility of Indigenous viewpoints and perspectives (Herman 2008; Coombes et. al 2014) and through a reckoning of what it means to do ethical and respectful work with Indigenous communities, which is just one of many contexts in which one might practice decolonial research methodologies.

Understanding the contours around decolonial research and how to do it effectively, particularly with Indigenous communities, requires the need to consider community safety and to work against a long, troubling history of Geography's engagement with Indigenous communities, and marginalized communities more generally. But there is also a strong personal benefit to pursuing a 'decolonial' research methodology – it increases the researcher's attention to politics of care and to the possibility of constructing knowledge that comes via reciprocity and co-production, rather than extractive, colonial logics.

This chapter is a foray into potential avenues through which to pursue decolonial research, through the lens of ethical and respectful research with Indigenous communities. Picking up on the considerable scholarship that has been done in this regard by geographers such as Sarah Radcliffe (2022), I want to build upon these developments by providing an intervention based out of my own research practice for two reasons. First, the increased engagement with Indigenous communities within Geography is a motivating factor for choosing this avenue through which to convey decolonial research methods. The second motivation is my own positionality and relationship to the subject. I am an Anishinaabe man who lives and teaches Indigenous geographies in Canada, a settler state which is undergoing its own dialogue and political processes surrounding reconciliation and the possibilities of decolonizing structures that have been harmful to Indigenous peoples for generations. My words come from my own experiences working with Indigenous communities and co-producing knowledge with them, and I have experience with Indigenous structures within broader organizations of Geography: I have served in a number of leadership roles within the American Association of Geographers' Indigenous Peoples' Specialty Group (AAG-IPSG), and at the time of writing this chapter, am co-Chair of the Indigenous Peoples' Working Group of the Canadian Association of Geographers (IPWG-CAG). But besides my professional experience, this chapter is also born out of my own personal viewpoints, and how they have evolved and shifted through my own engagement with Indigenous peoples and with exploring alternatives to extractive modes of knowledge production.

In this, I think there is utility for geographers who are working towards possibilities in decolonial research in a variety of geographic contexts, not just with Indigenous peoples, but marginalized communities globally and close to home, and even with the ways that we position ourselves within this work. De Leeuw and Hunt point out that geographers engaged in decolonial efforts

> […] seek to understand the spatialization of settler colonial power in the hopes of undoing at least some of its resiliency. In many cases, by documenting the way settler colonial power ascends to unquestioned normalcy and recirculates as natural and given, the decolonizing project becomes one of suggesting counter realities or alternative ways of knowing and being. This is especially the case when those alternative ways are put forth by Indigenous peoples […] (2018: 6).

Although my own positionality and subjectivity come from being an Indigenous person within a settler state, Indigeneity and Indigenous perspectives are global in nature, and thinking about decolonial methods through an Indigenous lens can also interface with other critical approaches, such as anti-racist, feminist, and queer geographical research approaches. While each approach has its own unique and specific contexts

that will guide research, working to *deconstruct hegemonic structures of power and replace them with new structures based in equity and justice* are efforts that all of these approaches have in common, methodologically, but geographically as well – these are approaches that can (should) be used anywhere in the world. In an era when Geography contends with its own debates around ethics in research and how to make them more just (Arceño et al., 2021; Radcliffe, 2022) it is important for researchers at all stages of their careers to understand how to work towards a potential decolonial future of the field.

This chapter proceeds as follows – I briefly address the engagement of Geography with broader structures of power and the implication of these engagements with Indigenous peoples. I then delve into decolonial geography as an emergent and powerful method in its own right beyond a pushback against colonial logics. Next, I offer my own potential frameworks through which to think about a decolonial research method, via my recommendations for doing ethical work with Indigenous communities. Finally, I conclude by thinking about the broader implications of doing 'decolonial work' – what do they mean? What sorts of futures does it point towards? What further work needs to be done to help bring it about?

7.2 Understanding Colonial Geographical Research

Geography has long had a close relationship with structures of power, empire, and colonization (Godlewska and Smith, 1994). This colonization not only occupied physical space, but also moved to occupy discursive space in the way that people understood space and place(s). Western/European modes of geographic knowledge, similarly to other knowledge produced in the colonial *metropole* was viewed as the sole, 'objective' truth. European explorers and others who engaged with geospatial concepts felt empowered to make absolute statements about spaces, and about those who lived in and engaged with given spaces; their words were viewed as those of 'experts'.

For example, David Chang (2016) writes about the ways in which Captain James Cook and other British explorers who engaged with Kānaka Maoli (Indigenous Hawai'ians) carried with them a sense of spatial superiority – the British argued that their arrival on the Hawai'ian Islands marked the introduction of Kānaka to the broader world, and that Hawai'ians were only made visible because of their 'discovery' by the British; they were illegible to the world before that moment. The implications of these historical moments are clear – Indigenous knowledge, and more broadly, non-Western knowledge is pushed to the peripheries and made less visible, or invisible in favor of Western, or as Max Liboiron (2021) describes it, *dominant* science and knowledge production. This form of developing knowledge was both extractive and othering – it disregarded the pieces of Indigenous knowledge that it could not co-opt and use for its own means.

This extractive, othering form of knowledge production and its interactions with Geography occur in the present day as well. In the past decade, there has been an upswelling of debate in Geography regarding research with Indigenous communities and the importance of transparency and ethics in such work. This has in no small part been spurred by the controversial *Mexico Indigena* project by researchers at the University of Kansas, who carried out participatory mapping projects with Indigenous communities in Mexico while being less than transparent about sourcing some of their

funding from the United States' military and in return transmitting the mapped data obtained from the communities back to the United States for use in counter-insurgency training/planning (Wainwright, 2013; Bryan and Wood, 2015). This is a well-known example that has received a great deal of attention in Geography, but there are also many smaller acts, performed through the lack of ethical consideration, or outright malice, that have also harmed Indigenous groups and broken any sense of trust established by more ethical researchers.

Both historical and contemporary developments have spurred larger conversations about how to do respectful work with Indigenous and other marginalized communities, as well as the responsibilities that geographers have towards making sure we are properly trained on how to carry out this ethical and respectful work (Louis, 2007; Louis and Grossman, 2009; Arceño et. al, 2021) But, what does this look like in the context of creating and practicing decolonial methods?

7.3 Scholarship in Decolonial Methods

There has been considerable effort by geographers to develop and enact a decolonial research agenda and research methodology, both in terms of defining what exactly constitutes decolonial research and the specifics of its practice. Sarah Radcliffe (2022) provides a critical two-pronged approach towards the coloniality of Geography as a structure that decolonial geographies push back against. One prong focuses on the actual physical, spatial, and discursive ways in which coloniality exists within lowercase g geography – she uses the British city of Bristol as an example, as a *place* where colonialism and the spatial patterns that it influences (trade, migration) coalesce and articulate themselves in various ways. One striking example that Radcliffe uses is an embattled statue of a colonial era trader that was installed a century and a half after his death to commemorate Bristol's past as a colonial hub (only challenged spatially by a statue of a Black protestor nearby) (Radcliffe, 2022).

Secondly, Radcliffe takes aim at the colonial nature of capital-G Geography—she notes that in a period from roughly 2005–2015, only 4.4% of Geography PhDs awarded in the United Kingdom, and 8% of PhDs awarded in the United States were earned by graduates of color. These numbers are not surprising to me – I was one of a small group of non-White PhD students in my graduate program and was the first Native American to earn a PhD from my department.

Here, Radcliffe sets the stage for a solution – we as a discipline are surrounded by both vestiges of colonialism *and* its ongoing reproduction, both in the spaces in which we study and work, and in the very intellectual spaces we move within. She points towards decolonial work that has been done in Geography (the discipline) and in geography (places) to effectively resist these processes. Radcliffe explicitly states as much in her writings, positioning decolonial work in Geography as work that actively brings marginalized and othered voices to the fore to build a framework of reciprocity and the dismantling of colonial structures. Efforts both within *institutions* (such as decolonial student movements across Global North and South) as well as the ways in which we can remap and therefore rewrite the narratives of *place* (such as The Mapping Indigenous LA project that engages with Indigenous histories of Los Angeles; https://mila.ss.ucla.edu) are examples Radcliffe uses to show how research in geography can be decolonial.

Indigenous and other scholars of color have picked up similar threads in equally powerful and transformative ways. Daigle and Ramirez (2019) position decoloniality in Geography as something that necessarily escapes an easy definition – due to its very nature in dismantling and reshaping, it is something that is constantly in flux, being constructed, articulated, and then reconstructed and rearticulated as it goes along. Building on the work of Simpson (2017), they describe decolonial geographies as a constellation, or an assemblage of different articulations of resistance and resurgence (Daigle and Ramirez, 2019). This points towards decolonial geographies, and by extension, decolonial geographic research as something that is transformative, in constant motion, that challenges our conceptions of long-standing geographic research methodologies, as Coombes et al. (2014) assert. So, how do we (and you as the reader) bring this transformation into our work – what might it look like? In what follows, I provide one potential avenue.

7.4 A 'Recipe' for Decolonial Geographical Research

Let me begin by saying that talking about 'decolonial' research methodologies in terms of a recipe might be a bit … unsettling to some readers (no pun intended). Decolonial approaches are not commonly taught in research methods classes, which is why I have chosen this way to describe how one might construct such a methodology for their own geographic work. A recipe is a common and accessible framework through which to describe this sort of thing – we all follow recipes all the time, whether it is as simple as making a sandwich, or as complicated as making a four-course dinner – it consists of detailed steps towards an end point. In the case of a recipe for food, it results in a delicious meal. In the case of a research 'recipe', it builds a respectful, ethical relationship with communities.

Further, using a 'recipe' approach purposefully emphasizes the building up, creative, and generative practices of making something new, which is in direct contrast to the breaking apart, fragmentation, and destruction inherent in colonial structures and practices. That is, by focusing on building fresh understandings that are rooted in relations of trust and respect, we can counteract (though not necessarily compensate for) the ruinous processes of colonialism. This ontological shift can be liberating for scholars and the communities they work with.

Another reason that I chose a 'recipe' as a framework is that we follow a recipe whether we are expressly conscious of it or not. Even in the cases that we 'throw' something together for a meal, we are still following a recipe, even it if is a bit unstructured. It becomes an automatic thing: with our most familiar recipes, we take the detailed steps with confidence, without hesitation. We can think about doing decolonial research in the same way: we understand the necessary steps and are able to go forward with confidence in practice. While I caution that decolonial research should never be done without thought or attention (much like you'd never turn your back on a baking pie for too long), I do feel that one can be thoughtful and intentional about the necessary steps to a point where the actions become deeply ingrained.

A few other words of caution before we proceed – not all recipes are the same. Obviously, there are different ways of making a specific food item – let's take *miini-baashkiminasigani-biitoosijigani-bakwezhigan* (the word for blueberry pie in my nation's language), for example. How I might bake a blueberry pie (likely very poorly)

would be different than say, how my mother-in-law would. Ultimately, your 'recipe' for decolonial geographic research will be unique to you, your project, the communities that you are working with, and the circumstances and conditions that tie all of these things together.

Therefore, I intend the following directions to be general pieces of guidance for you to think about as you begin your own research, based off my own experience in doing Indigenous geographical work. Hopefully many of the pieces of advice that I share are useful to you, but there may be things that you may not need—there also may be additional considerations that may not be covered here. By sharing my own experiences, I hope that you will feel more comfortable engaging in truly generative work with Indigenous communities. My choice of Indigenous research methodologies is crafted from my own work and experiences, bringing my own positionality and subjectivity into the work that I do, but I am confident that these steps can be easily portable and applicable to many different contexts that fall within 'decolonial' research methods.

Recipe

Step 1: 2 parts research methodology

To do any research project you need to construct a methodology. Fortunately, the basic parts of an Indigenous research methodology are the same as any other. The key parts of a good research methodology (see also Ch. 1) are shown in Box 7.1.

Box 7.1 Building your research methodology

- Identify the research problem – what is the issue or topic that drives you to do your research project?
- Define your research question/questions – what are the questions that guide your work? How do the answers to this question connect to your research problem? What sorts of data or evidence do you need to help you answer your research problem, and by extension, research questions?
- Scope out appropriate methods – how exactly do you plan to go about this work? In geography, we typically follow three types of methodological work – qualitative work, quantitative work, or more commonly, a mixture of both, or 'mixed methods' – what works best for your project? Specific examples of these sorts of methods include geospatial analysis, interviews, oral histories, archival analysis, mapping (see related chapters in this volume) – what are the methods that will best help you to answer the questions that you have for your work?
- Identify the broader impacts – what do you hope to accomplish with your work? What will your work contribute academically or societally?
- Sketch a list of potential products/projects – will there be anything that comes out of your work: books, chapters, papers, presentations, posters, theses/dissertations, 'grey' literature such as op-eds, media articles, etc.?
- Choose your location – in a discipline such as Geography, space and place are extremely important, and this is especially true in determining where you will do your work. Why do you want to do work in a specific place/places? What specifically about that place/those places makes them important to your work?

(*Continued*)

- Consider possible research participants – whether you are interested in more human-focused work or examining an element of the physical environment, identifying a place's communities or groups is very important. You will want to have an idea very early in constructing your methodology of the people who you will be working and communicating with for any place-based projects, recognizing too that there may be factions or sub-groups who disagree with each other.
- Determine your timeframe – how long will it take you to do this work? What is the timeline for each step of your research? Is there a possibility of work or relationships lasting beyond the scope of data collection?

When doing work with Indigenous communities, there are also extra steps that you will want to take and be mindful of when constructing your methodology, due to the history of harms done in Indigenous communities, both in research more generally, and in Indigenous-focused work. There exists a wide variety of scholarship written by Indigenous scholars on how to be mindful of this history and how to overcome it when doing Indigenous focused work, including Linda Tuhiwai Smith's acclaimed book *Decolonizing Methodologies* (1999); a series of papers written by the American Association of Geographers' Indigenous Peoples' Specialty Group (IPSG-AAG, 2010); and others (e.g. Louis and Grossman, 2009) on key considerations and questions to take into account when doing work with Indigenous communities. In particular, the 2010 IPSG-AAG papers urge geographers to actively involve Indigenous communities in the earliest steps of constructing the methodology, as communities may have insights into the feasibility of certain aspects of the work that is proposed. Additionally, such an approach allows the community to guide the work being done, allowing active input and creating possibilities for the work to be generative and beneficial to community members (IPSG-AAG, 2010).

Step 2: 3 measures of Positionality and critical reflexivity

Positionality is very important to keep in mind when working towards a decolonial methodology. Positionality is a fluid, relational dimension of our identities that depends on where we are and whom we are with, and is imbued with deep-seated power structures in relation to the communities and groups that we are working with. For example, if you are a non-Indigenous person working in an Indigenous community, what sorts of roles and identities you take on in this work is a question that even Indigenous researchers ourselves must ask, including in our home communities, because our identities involve many subject positions shaped by intersecting dimensions of power. A consideration of positionality raises the question: Are you an insider or an outsider? And, if you are an insider, what unique challenges might arise from this (Rose, 1997; Chavez, 2008; Nagar, 2014; Whitson, 2017)? How might these relations and positions shift when you are moving through space or interacting with different individuals? Being aware of your positionality – particularly in dimensions where you may be constructed as having more power – is a foundation of achieving a respectful co-production of knowledge.

Respectful co-production of knowledge also depends on researchers' practice of critical reflexivity, defined here as thinking critically about our own social, economic,

and cultural positions, as well as what kinds of privileges and power those may confer upon us. For example, when I enter an Indigenous community, I must remember that even though I am Indigenous myself, I carry with me the backing of colonial structures, such as my institution and funding agencies – this can shape my relationships with Indigenous communities in many ways, both visibly and otherwise. Although my own perspectives and worldview might be Indigenous, they are likely not the same as the community I am visiting – there may be ideas and points of view I carry that are not shared by the community. Maintaining critical self-reflection requires frequently assessing your own actions, roles, assumptions, and attitudes and holding them up for rigorous scrutiny.

Step 3: Engage with research oversight processes

There will almost always be some form of research oversight in an Indigenous (or other marginalized) community in the context in which you work – institutional and research review boards, ethics boards, tribal councils, community councils, community members asking you what you're doing, and so on. Much of this is due to a larger, unfortunate legacy of harms done to marginalized groups, particularly Indigenous communities and communities of color, in the name of academic research and knowledge production. As a result, communities have begun developing robust mechanisms of oversight in order to protect their members from harm (Simpson, 2017 Buffalo et al., 2019).

This represents a first line of evaluation and defense for communities. Another common line of defense or oversight process is a bit longer standing and less institutionalized – asking questions. People will want to know what your plans are and why it is that you are seeking out their involvement and participation. Why are you coming to their community? Why should they trust you or commit their time and energy to work with you? How might their community benefit from the research? What checks are in place to prevent exploitation or abuse of community knowledge? Be prepared for this – think about the types of questions you foresee communities having. Having a solid research problem and methods will be useful here, particularly when being asked about potential benefits or potential harms.

Some modes of research oversight are rather straightforward, such as answering people's questions or speaking directly to participants, while others may involve speaking to a community or tribal council, or filling out formal applications, which can include submitting consent forms and other documentation – this is of course in coordination with the ethics process you will likely be going through at your primary institution. It is prudent to budget for this in your research timeframe – your deadlines are not necessarily a priority for community leaders protecting their members and knowledge.

Step 4: Consent/assent as an ongoing process

Obtaining informed consent is indispensable in the research process; it means everyone you are working with is fully aware of what your project involves, of potential risks or benefits, how you will be using information they share, what level of anonymity/confidentiality they can expect from you, and what their rights are. Generally, if someone has not explicitly said 'yes' to consenting or participating in a project, you should

treat it as if they have said 'no' (though see useful consideration of the use of deception in ethnography in Marzano, 2007).

Furthermore, consent (and assent if you are working with youth – see Ch. 3 on research ethics) is never a one-time thing. People have the right to change their minds, and they may do so at any time, for any reason. Just because a participant signs a consent form does not mean they cannot withdraw consent or change the terms of their participation at any point.

That brings me to the consent form – you will likely have developed a consent form by this point – as most institutional ethics boards and many community oversight boards/groups will ask for them as part of your ethics review. Consent documents can take many different forms and have different information based on the specific needs of your project. However, one thing that will be common across all geographical and methodological contexts is that you will want to make sure that your consent form is as accessible as possible. This means making the language plain and easy to understand, providing multiple language options if that is relevant to your community's population, and avoiding overly technical jargon or terms that can be easily misunderstood.

Lastly, because consent is an ongoing process, it is a good idea to occasionally check in and make sure that your research participants still consent and understand what is going on with the project. This does not necessarily have to mean reconsenting them but can look like just checking in and answering any questions that they might have. There is the possibility that you may be mandated to do this, but even if you aren't, it is a good practice to stay in touch anyways.

Step 5: Knowledge co-production and support/Data stewardship and repatriation

Geographers have embraced community based, participatory research in recent decades (see Ch. 39, Breitbart, 2016, Kindon, 2021), finding that co-producing knowledge with communities aligns well with many of the critical theoretical frameworks of feminist, anti-racist, queer, and other stances. However, I want to start by problematizing the use of the method from a decolonial position. Coombes et al. (2014) challenge long-standing assumptions about participatory research models, in particular criticizing the tendency of the power dynamics in such relationships to solely rest with the person with the most advanced academic degree, which often is the researchers themselves. A sterile, uncritical, or tokenistic application of 'participatory' research can mask the lack of transparency for participants, and can overstate the benefits to their community. Recall the *Mexico Indigena* project, mentioned above. It was framed as a community participatory project, where Indigenous community members helped to map their own territories (Bryan and Wood, 2017). However, the lead researchers were not forthright about the ultimate use of the data or their funding sources.

Does this mean that participatory research is inherently suspect? Absolutely not. Rather, it is important to understand that communities possess their own knowledge and have the right to participate in all aspects of how that knowledge is used in research projects. Any data or information that you obtain from communities belongs to the communities themselves. It also means that they have an active stake in the work that you are doing. This may take the form of them desiring to help co-produce any products that may come out of the project, even co-author the publications (e.g. Sangtin Writers with Richa Nagar, 2006). Geographers such as Sarah Elwood (2008),

Sarah Smith (2011), and Sarah de Leeuw et al. (2012) and others point towards the ways in which active collaboration with research participants can strengthen the work being done, and allow community voices to come to the fore. Engaging community members in actively participating in data collection/creation can also be a valuable act of reciprocity.

Collaborative and participatory research means that the community ultimately owns their own words, their own data, and their own knowledge: it is not yours to keep permanently. At the very start of your research, you will need to think about how to ultimately return data and the products that will come out of your research; indeed, you should be engaging in honest, transparent conversations with community members about project outcomes as the research evolves. In some cases, communities will ask that any data, maps, recordings, transcripts, or other information collected from community members/research participants be returned at the end of a research project. Many communities request the right to review any products that come out of the project, such as theses, dissertations, articles, book chapters, research presentations or anything else that publicly represents the research. While these things may appear onerous or add extra steps of protocol and complexity to one's research project, these practices are born out of a long history of data being taken out of communities ('extracted'), used in ways the communities may not have intended, and never returned (Whitener, 2010; Harding et. al, 2012; Henderson, 2018; Buffalo et. al, 2019; Tsosie et. al, 2019). If you are to effect a decolonial research methodology, this is one of the most important aspects to remember and abide by.

Step 6: Necessary Utensils – how to support decolonial research in Geography?

If we are to upend colonial and extractive structures and history in Geography, support is essential. Fortunately, national and international professional organizations in Geography such as the American Association of Geographers (AAG), the Royal Geographical Society with the Institute of British Geographers (RGS-IBG) in the U.K., and the International Geographical Union (IGU/UGI), as well as Geography departments around the world, have increasingly taken on questions of ethics in our work as geographers. In its new Code of Ethics (2021), for example, the AAG responds to the controversy over transparency of funding sources:

> Geographers should reject funding from any sponsor that compromises the principles of ethical research. The conditions under which data can be used, and restrictions on the use of data after the end of a research project, should be clarified prior to accepting funds. Ethical quandaries are particularly likely to be encountered when seeking funding from military, intelligence, security, and policing agencies as well as private corporations to support research or to undertake government- or corporate-sponsored projects. Geographers should be open and candid, avoiding undertaking any task that requires us to compromise our professional and ethical responsibilities (AAG, 2021).

Other language in the revised AAG ethics statement relates to being aware of the potentials of harm when working with racialized and marginalized groups, as well as being mindful of relationships with both humans and the non-human world (AAG, 2021).

The RGS-IBG states in part its ethics policy (2022):

> The Society requires the research it funds to be conducted in an ethical manner. The following considerations should therefore apply to all research supported by the Society, whether through financial support, or implicit support through presentation at the Society, Research Group conferences, or other Society events or publication in Society journals:
>
> - accurate reporting of findings, and a commitment to enabling others to replicate results where possible.
> - fair dealing in respect of other researchers and their intellectual property.
> - honesty to research staff and students about the purpose, methods and intended and possible use of the research and any risks involved.
> - confidentiality of information supplied by research subjects and anonymity of respondents (unless otherwise agreed with research subjects and respondents).
> - independence and impartiality of researchers to the subject of the research.
> - maintaining the highest ethical standards in all settings.

The School of Geography at the University of Otago in Aotearoa states (2022): 'The School of Geography has the responsibility to ensure that the rights and well-being of all human participants involved in teaching and research activities are protected. To this end, all studies and related research activities are subject to approval by the appropriate ethical committee.'

So, institutions and structures in Geography *are* thinking about ethics, making it easier to provide structures for education and training on how to do ethical research in Geography (see Ch. 3 and Arceno et. al, 2021). However, mere training is insufficient. Support also needs to extend to pursuing research methods and ways of knowledge that may not fit into 'dominant' academic ways of doing work – what might it look like, for example, for a research product to *not* be released to wider circulation, especially if it focuses on sensitive topics? As Elizabeth Gagen (2021) points out, harms don't just occur in interactions with living human beings – they can also happen through objects and images such as photographs, recordings, documents, and artefacts that may contain sensitive or protected knowledge. Thus, doing decolonial research may mean crafting an arrangement in which the results of research flow back to the community rather than to the researcher or into academic publications.

7.5 Cook Time: Timeframes for Doing a Research Project

In the process of making our figurative blueberry pie, it will take time for the pie to bake. Putting together and following a decolonial research methodology with Indigenous communities is something that will require time and plenty of attention. It is not something to be rushed through, or there is a risk of harming communities. Thinking about the timeframe in which your work will take place is extremely

important and should ideally begin when conceptualizing your planned research. It can happen before or during the development of your methodology – how long do you foresee this work taking? At an early stage, you may not have concrete timeframes, but it is good to at least make some estimates of how long work might take, especially if there are some elements that might take longer such as mapping, remote sensing, interviews, etc. I cannot overstate enough that talking to communities and getting their input early and often is indispensable. You cannot do Indigenous/decolonial research without talking to communities and potential research participants: excluding them from early decisions about the research plan will perpetuate harms, and create the very top-down dynamic we are trying to avoid. It is never too early to make contact and open lines of communication to allow the maximum time possible to connect with communities, engaged with research oversight processes, and begin to build research relationships. For suggestions on *how* to connect with communities, see Box 7.2.

Box 7.2 Suggestions for connecting with communities

- Draw from your existing networks – friends, family, peers, instructors, teachers
- Learn as much as you can about the community of interest and identify leaders or well-connected members (though see Ch. 12 for cautions about 'gate-keepers')
- Volunteer with community organizations, schools, or mutual aid groups to begin your relationship based on service
- Spread the word via social media about your project and that you are looking for contacts to participate
- Reach out to service or cultural organizations that support or interact with the community (again, be cautious of power relations here)

For example, in my dissertation research, I began reaching out to communities months before I did any fieldwork. I did so by e-mailing, phone calling, and visiting community leaders, local boards and agencies related to research oversight in person. The time available to a researcher to do these things will obviously be different based on where they are at – undergraduate and graduate students may be more pressed for time than faculty, for example. Based on research oversight conversations with your institution and your communities of interest, you should have an idea for how long the work will take; frank communication about delays or changes to the timeframe will also be important here.

Be mindful of the timeframe *beyond* the planned data collection or direct research work as well. It can be easy to assume that once the last piece of data has been collected, the last map is created, or the last interview is finished, and the final products are created, that you have reached the end of the project, but, in fact, it does not mean the end of your active accountability to the community. Simply leaving and dropping all engagement with a community is harmful and is in the vein of 'parachute' researchers who drop in to engage in research that is clearly extractive. On-going ethics review and data repatriation and stewardship may mean that you are in active communication with communities for some time to come, even long after the active part of your project is complete.

There are also other relationships that may come about from your work. In my own work, I've accepted and embraced the fact that I will be connected to the individuals and communities that I have been in conversation and collaboration with – some of these people have not only been my collaborators, but also have become my friends as well. If these types of relationships arise out of your own work, embrace and respect them, as they will likely be born from mutual respect and reciprocal relations (IPSG-AAG, 2010).

This can present a challenge to junior scholars, particularly students, who are on very compressed time schedules vis-à-vis funding and requirements of their programs. These pressures cannot be totally done away with, but they can be managed and alleviated. My recommendation here, besides being diligent about setting to work on building relationships early on, is to work with your advisors and mentors to determine an appropriate scale and scope of the work. It may not be feasible to work with multiple communities in a project, for example, but you might pick one or two and focus on building relationships with them. You can add other communities later, or you may find that the time and care needed to work with one community can yield a generative relationship that can last a long time and yield surprising outcomes.

7.6 Concluding Thoughts: What Does 'Decolonial Research' Even Mean?

What sorts of futures does 'decolonial research' point towards? What further work needs to be done to help bring them about? I posit that decolonial research points toward a future where colonial forms of knowledge are de-emphasized in favour of the knowledge held by marginalized and colonized people in a given place, and where these diverse knowledges are validated as having equal, if not more standing than forms of knowledge built upon colonialism and extraction. In order to bring decolonial research about, I argue that it will take a fundamental reshaping of how we view those diverse knowledges and their ability to stand on their own without qualification and validation by dominant structures in academia. Consider again Chang's (2016) engagement with the contact between British explorers and Kānaka Maoli in the 1770s. While the British felt that their geospatial awareness and engagement of the world was superior to Kānaka, Chang argues the exact opposite:

> Spurred by this same belief that the world was a wide- open place to seek and understand, Native Hawaiians engaged in an intense process of global exploration in the century after foreigners appeared in Hawai'i in 1778. Some sailed to distant lands, as Pele had done. Others explored the world without leaving home, by engaging with foreign people; poring over, translating, and writing books about far- off countries; and in many other ways embracing world exploration. But why did Kānaka turn to exploring the globe so quickly and enthusiastically? In part, they did this because the Hawaiian exploration of the world did not truly begin with Cook's arrival. (Chang, 2016: 2)

Chang pokes a hole in the idea that 'Western' conceptions of geography held sway – the Kānaka didn't need it, they had their own, and used it to great effect. By bringing

Indigenous knowledge to the forefront, Chang moves us towards a definition of decolonial methods.

It's worth returning to the question of just how do we define decolonial geography, or decolonial research? I argue that it is the active deconstruction of western, hegemonic ways of knowing about space and place, and opening them up to multitudes, or as Ramirez and Daigle (2019) put it, *constellations of knowledge* that shape the way we view the world around us. In doing this, we make possible liberatory, radical resurgent politics of land (Simpson, 2017). Tuck and Yang (2012) point out that decolonization is not merely a metaphor. Radcliffe (2022) similarly cautions that decolonization is not just simply labelling something, it is an active effort to change structures, to move from a colonial way of being and knowing towards one that rejects these things and not only embraces diverse ways of knowing and being, but centers colonized voices and places them at the forefront of change, whether it is societal, or academic.

This should not be confused with a politics of recognition where Indigenous, Black, Latine, queer, disabled and other forms of Geography become a spectacle to be consumed – Daigle (2019) explicitly critiques this and instead points towards the responsibility of Indigenous knowledge in particular to disrupt colonial knowledge and political structures. The British explorers in 1778 Hawai'i were not prepared to deal with knowledge systems that decentered their own – my hope is in the twenty-first century, geographers are in a better position to emerge from encounters with knowledge systems other than their own. But these encounters can be disquieting.

Indeed, the act of critically engaging with our own selves in research, of *actually* decolonizing, of breaking down colonial ways of knowing and being that we have been taught in academia is not meant to be warm and fuzzy – it is, as Howitt (2020) describes it, unsettling. There may be a point in working towards a decolonial research methodology where you may feel uncomfortable as it is revealed to you the ways that you have benefited from the accrual of colonial practices, especially in contexts where communities may be asking a lot of you or may be taking on a larger role in oversight or knowledge co-production. I have found that this is the moment where many people may falter in their pursuit – we are trained as academics, as researchers to be guided by a desire to improve our field, and to make the world a better place. Being confronted and challenged when we are coming from a professed benevolent place is not the easiest process to endure. Even I, an Indigenous researcher, have contended with this – community members pointedly pushed back against aspects of my own work and methods that they found to be 'colonial'. It was a very humbling experience for me. However, I argue that this was a *necessary* experience for me to go through, and one that can be generative for anyone in similar contexts, because through unsettling our own preconceived notions of what our work is and what our discipline is, we create the groundwork necessary to build something better.

What I have described here is just one potential path towards decolonial methods. My hope is that people all over the world read this chapter – this will mean that people are doing different projects, with different outcomes, with different communities, in different geographies. You will need to be mindful of local contexts. Maybe your methodology isn't represented by baking a blueberry pie. Maybe it's an apple pie. Maybe it's a shepherd's pie. Maybe it's a dumpling. The point is, it will take steps to create, and this will happen through hard work, cooperation, and keeping an open mind toward what can come from your work – and with any luck, you may help foster a generative process that can lead to truly decolonial futures in our discipline.

Note

1 In keeping with Radcliffe's distinction (discussed below), I use Geography to indicate the academic discipline and geography to indicate the broader meanings of place, space, and environment.

Further Reading

- **Daigleand Ramírez** (2019): A piece that traces the intellectual and grounded traditions and trends that underlie decolonial geographies in a variety of contexts, especially in regard to how decolonial geographies has been reclaimed by colonized peoples.
- **de Leeuw et al.**. (2012): This piece places community participatory based work in conversation with Indigenous geographies, highlighting the generative outcomes that can arise from such conversations and engagements.
- **Radcliffe** (2022): Radcliffe focuses on the definition of what decolonial geographies has looked like and can look like, especially through the reshaping and remaking of geographic space, both in real time/real space as well as within the very field of geography itself.

Note: Full details of the above can be found in the references list below.

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Autopsy And State Violence: Implications In The Death Investigation Of George Floyd

Deondre Smiles

The killing of George Floyd by former officer Derek Chauvin of the Minneapolis Police Department on May 25th, 2020 proved to be the catalyst for yet another set of contestations between people of color and the punitive structures of the U.S. state. One part of this contestation played out in Minneapolis, where protestors took to the streets to express their sadness, shock, and rage at Floyd's murder. These protests took center stage in the consciousness of the world, and once again demanded a reckoning with the pervasiveness of state-sanctioned murder of Black, Indigenous, and other people of color in the United States. These protests were soon followed by another contestation, one that garnered significantly less media attention, but was no less important: the struggle to properly assign a cause of Floyd's death. While a criminal trial against Chauvin eventually proceeded, the process of determining the definitive cause of death required an additional autopsy due to doubts regarding the initial report by the Hennepin County Medical Examiner. This second autopsy was critical in the criminal trial against Chauvin and in his ultimate conviction.

In a system where coroners and medical examiners are empowered to make definitive statements as to the cause of one's death, Floyd's death reveals the gaps and structural weaknesses of these processes. How might we critically examine the assumed 'objectivity' and 'neutrality' of the autopsy process in cases where law enforcement structures play a significant role in the initial death investigation, *especially* in cases that are imbued with questions of police violence and racialized death?

To understand these gaps, assumptions, and the biases revealed in the aftermath of Floyd's death, I define what the act of autopsy is and how law enforcement is served by it. I recount the events surrounding the autopsy of George Floyd and the differing causes of death that were declared. Turning to the ways coroners/medical examiners work in the service of law enforcement, I show how forensic work becomes intertwined with state power, demonstrating how 'objectivity' often protects said power. Finally, I contemplate the implications of these queries in regard to autopsy and the medical examiner/coroner position, given the increased attention in American society to BIPOC deaths at the hands of the state.

My hope is that this writing can spur conversations on how we approach the politics of death investigations, especially in a time where death is all-too widespread in the public consciousness, in both public health and state brutality contexts. This work touches upon questions of systemic racism, the disproportionate killing of Black Americans by the police, and the ways in which autopsy implicates both of these things within structures of state power. This work is not novel to me, as I have written and researched the fraught nature of autopsy in Indigenous communities for most of my academic career, particularly in the context of Minnesota (Smiles 2018, 2020). The aftermath of Floyd's death and the ensuing controversy over the autopsy of his body thus was all too familiar and saddening to me. Additionally, the location of Floyd's death is a neighborhood in South Minneapolis where I spent much of my childhood. For this, I feel

compelled in this moment to address the myriad legal and medical structures that define the act of autopsy, to assess how it comes to bear on the dead, and to account for how it factored into the contestations over the documented cause of Floyd's death.

What is autopsy and who does it serve?

Defining Forensic and Medical Autopsies

Part of unpacking the definition/s of autopsy is understanding the origins/history of the process. The history of human pathology, the broader science that underpins autopsy, dates back to ancient Egypt and Greece. The history of autopsy as we understand it today dates to the 12th century when Holy Roman Emperor Frederick II allowed for the dissection of criminals to generate medical knowledge. Over the next few centuries, anatomical pathology and autopsy became more widely practiced. By the 17th century, European doctors were routinely publishing works about the vast information that they were able to obtain via autopsy (Sanchez, in Collins 2007). The science of pathology has not just been of interest in medicine but also to philosophers and social scientists, most notably Foucault and Freud. Foucault wrote of 'anatomical pathology' as something that opened up analyses of the causes of death, and would further medical knowledge. Freud talked about the psychological effects of the autopsy, and how it was sometimes difficult for medical professionals to detach living adjectives from the corpse (Keller and Albarracin 2012).

In the United States, formal education about autopsy/anatomical pathology became more widespread in the late 19th and early 20th centuries, especially after World War II. The College of American Pathologists defines autopsy as:

> *The postmortem examination of a decedent for the purpose of determining the presence and/or extent of disease and/or injury, cause and manner of death, and/or quality and efficiency of care. The autopsy is a diagnostic medical procedure that encompasses review of all available pertinent medical records and historical information, appropriate clinical consultation, and examination of the decent by one or more of several modalities including (but not limited to) surgical techniques, dissection, imaging, microscopy, and/or laboratory analysis. (American College of Pathologists 2015, in Collins 2017: 35).*

Most scholarly texts define autopsy in similar dry academic terms: 'Confirmation, clarification and correction of pre-mortem (pre-death) diagnoses', 'discovery and definition of new diseases', 'evaluation of new diagnostic tests', 'investigation of environmental hazards', 'investigation of occupational disease', 'contributions to medical and epidemiologic research', and 'establishing vital mortality statistics' are listed among the benefits of autopsy to medical professionals in a textbook on autopsy (Burton in Collins 2017).

However, not all autopsies are the same. They differ based on their specific investigative aims. A forensic autopsy is conducted in death investigation cases where foul play is suspected, such as homicides or accidents (Schiandl and Collins in Collins 2017). It is both political and scientific in its aims. Representatives of a county coroner's office, whom I interviewed as a part of my dissertation research, explained that the focus in a forensic autopsy is on collecting evidence and legal documentation; whereas the procedure itself mostly focuses on the external surfaces of the body, except in cases where a natural disease may have contributed to the death. The representatives added that the state laws that governed their activities were explicit about the cases where the coroner's office might have jurisdiction over a body, such as when there is trauma to the body, or when the manner of death causes suspicion that it was unnatural.

Minnesota's death investigation statute, which was the relevant statute in the case of Floyd's death, gives wide latitude around when to conduct an autopsy, listing over 15 contexts in which autopsies *must* be conducted by a medical examiner/coroner. However, regardless of the cause of death, or whether or not it is explicitly listed in the statute, in Minnesota the medical examiner/coroner has the ultimate authority to determine whether or not an autopsy should be

done (State of Minnesota 2015). Moreover, this is not limited to Minnesota. Virtually all statutes in the United States that empower the coroner/medical examiner to do their jobs gives them an extremely wide latitude as to when an investigation is necessary. If the cause of death is unknown, a death investigation will likely need to be carried out to assign a cause of death. This is important to the state in its collection of vital statistics, epidemiological concerns, and in the case of Floyd, whether or not to pursue criminal charges against Officer Chauvin.

The political nature of the coroner versus the medical examiner

Views on who is allowed to 'speak for the dead' have increasingly shifted in the United States over the last few decades. The titles 'coroner' and 'medical examiner' are often used interchangeably. However, there are key legal differences between them, including the political nature of one role versus another. A coroner is an elected position in many jurisdictions, such as at the state, district or county level, and therefore could theoretically be occupied by someone who is not trained in pathology or does not have a medical degree at all (Timmermans 2006). Many, but not all, states additionally require that coroners have medical degrees (Hanzlick 2007). In Franklin County, Ohio, where I lived for five years, the current coroner is a pediatrician and must run for reelection periodically (Jarman and Manning 2014).

Because of the largely political nature of the coroner position, historically, there have been concerns over the susceptibility of coroners to corruption and bias. Over the last few decades in the United States, there has been a move towards a system of medical examiners, who have prerequisite educational background and professional experience, to lead death investigations (Timmermans 2006). While in some cases state law requires counties or other local governmental units to have a 'coroner's office', this has simply become an anachronistic term, as many of these offices have switched over to a medical examiner system to (purportedly) lessen political influence (Washoe County 2020).

Despite this shift, there is little consistency in death investigation systems in the United States. On a state-by-state basis: 21 states and Washington D.C. only use a medical examiner system for death investigations, 11 states only use a coroner system, and 18 states, including Minnesota, use a combination of the two (National Public Radio 2011; CDC 2020). Further, in Minnesota itself, 59 counties use a medical examiner system (including Hennepin County, where Floyd died), 20 counties use a coroner-based system, and 8 counties, along with the Red Lake Nation, use a mixture of the two (State of Minnesota 2021).

The relationships between the medical examiners' offices and the state itself varies from state to state. In many states, the medical examiners' office is run by the state, county, or district, but in other cases, private firms contract with local governments to carry out this service (National Public Radio 2011; Smiles 2018). This complexity of relationships between medical examiners/coroners and the state, as well as the supposed neutrality of the medical examiner versus the coroner, led to the controversy over Floyd's autopsy.

The politics of autopsy

Autopsy is clearly a medical and scientific procedure, but as we know, science is not apolitical. One of the most important political benefits of autopsy, or death investigations more broadly, is its contribution to law enforcement and public health statistics via the production of death certificates outlining the cause of death. Knowing the cause of death is vitally important to the state because this knowledge allows the state to know how it might secure life from diseases or other public health threats. In the United States in particular, but also internationally, information acquired through autopsies circulates at the local/subnational and national levels and are used in programs meant to safeguard the health and safety of the country and its citizens (Hanzlick 2006).

Scholarship on the state's use of such statistics often focuses on the *violence* of this action, such as when such information is used in the service of population control, legitimizing the ability to kill in ways that benefit the hegemonic needs of the state, or even the simple profitability of allowing people to die (Mbembe 2003). Although autopsy can be seen as a banal, legally necessary procedure, its implications are not banal. Through this process, the state positions itself as being the ultimate arbiter of death. One is not officially "dead" unless the state declares them so. Therefore,

through the act of autopsy, death is effectively intertwined with state power and could be subject to influence from its political structures. The controversy surrounding the autopsy of Floyd powerfully demonstrates how this fraught relationship plays out.

The death and autopsy of George Floyd

On May 25th, 2020, George Floyd was killed by Minneapolis police officer Derek Chauvin during an arrest in front of Cup Foods, at the intersection of East 38th Street and Chicago Ave South, on Minneapolis' South Side. Police officers were initially called to the convenience store due to a report of Floyd using counterfeit money in order to buy cigarettes. According to body cam footage, Floyd was found in his car, made to step out at gunpoint, and was brought to a squad car nearby. Floyd felt claustrophobic, refused to sit in the back of the squad car, and pushed himself out of the other side of the car; the officers proceeded to pin him on the ground, with Chauvin kneeling on his neck for between 8 to 10 minutes (New York Times 2020; Levinson 2021). During this time period, one of the officers took Floyd's pulse at the urging of bystanders and found that there was no pulse, but the officers continued to hold Floyd down until paramedics arrived and took Floyd to the hospital, where he was declared dead.

As per Minnesota state law, Floyd's body underwent an autopsy the next day, due to the nature of Floyd's death and the potential for a criminal investigation of Chauvin's actions. The autopsy was carried out by the Hennepin County Medical Examiner's office, which has jurisdiction over investigating deaths in Minneapolis. Things seemed to be proceeding along in a standard manner, until the preliminary report that came out from the medical examiner's office did not directly mention asphyxiation as a cause of death. Asphyxiation was widely expected due to the way in which Floyd was restrained. After all, millions of people had witnessed Chauvin put his knee on Floyd's neck, in-person and through video recording.

The final autopsy report cited blunt force trauma and 'cardiopulmonary arrest complicated by law enforcement subdual, restraint, and neck compression,' linked with heart disease as 'final diagnoses.' Additionally, it mentioned that Floyd had signs of having contracted the COVID-19 virus prior to his death, and had drugs in his system (Reimann 2020). What this meant was that although the death was ruled a homicide, the causes of death assigned by the medical examiner's office did not directly attribute Floyd's death to Chauvin. Consequently, Chauvin was initially charged with a lesser count of murder. At the request of the Floyd family, an independent autopsy was carried out, which reported that Floyd *did* die from asphyxiation (Donaghue 2020; Stanley 2020). This raised many questions. Who was 'right' and who was 'wrong'? Why was it that the county medical examiner's autopsy and the independent autopsy came to different conclusions about the cause of Floyd's death?

Some physicians, such as Judy Melinek, a pathologist from California, spoke up in support of the Hennepin County Medical Examiner, arguing that not all of the facts from the medical examiner's report were taken into account. Additionally, Melinek cited that the complete materials needed to come to an informed conclusion on the cause of death were not available in the independent autopsy. Melinek and other supporters also cited that death investigations are rarely straightforward, and there are often causes of death that might be revealed during the death investigation (Koerth 2020; Melinek 2020).

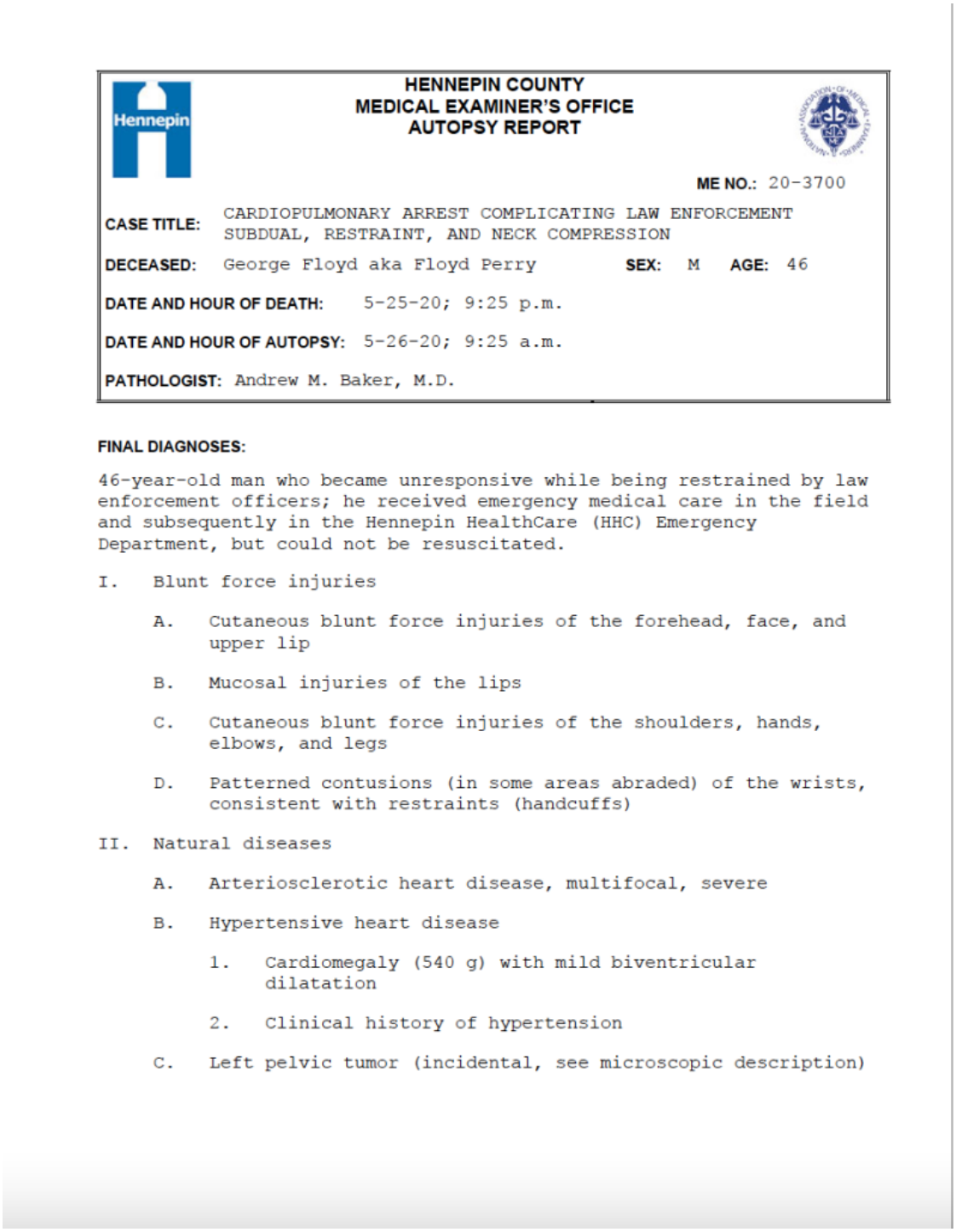
Other medical professionals did not take the county medical examiner's words at face value. Another group of physicians called out what they described as "gaslighting" of Floyd's family and the public. Dr. Ann Crawford-Roberts and others wrote an editorial criticizing what they described as the weaponization of medical science against Floyd and his family:

> "…the public was left to reconcile manipulated medical language with the evidence they had personally witnessed. Ultimately, the initial report overstated and misrepresented the role of chronic medical conditions, inappropriately alluded to intoxicants, and failed to acknowledge the stark reality that *but for* the defendant's knee on George Floyd's neck, he would not be dead today."

Their critique continued:

> "By inaccurately portraying the medical findings from the autopsy of George Floyd, the legal system and media emboldened white supremacy, all under the cloak of authoritative scientific rhetoric…This state of affairs is not an outlier—it is part of a patterned and tactical distortion of facts wherein autopsy reports are manipulated to bury police violence and uphold white supremacy." (2020)

What do these debates around what or who killed Floyd mean in the context of the death of a Black man at the hands of police? How can we possibly explain oppositional, even contradictory, positions and opinions surrounding the validity of the report from the Hennepin County Medical Examiner's office? What facilitates the seeming lack of acknowledgement of the direct role of police administered violence in Floyd's death? The answer lies in the intimate entanglements of the structures of state power, in particular law enforcement, with processes of death investigation by the state.



HENNEPIN COUNTY
MEDICAL EXAMINER'S OFFICE
AUTOPSY REPORT

ME NO.: 20-3700

CASE TITLE: CARDIOPULMONARY ARREST COMPLICATING LAW ENFORCEMENT SUBDUAL, RESTRAINT, AND NECK COMPRESSION

DECEASED: George Floyd aka Floyd Perry SEX: M AGE: 46

DATE AND HOUR OF DEATH: 5-25-20; 9:25 p.m.

DATE AND HOUR OF AUTOPSY: 5-26-20; 9:25 a.m.

PATHOLOGIST: Andrew M. Baker, M.D.

FINAL DIAGNOSES:

46-year-old man who became unresponsive while being restrained by law enforcement officers; he received emergency medical care in the field and subsequently in the Hennepin HealthCare (HHC) Emergency Department, but could not be resuscitated.

I. Blunt force injuries

A. Cutaneous blunt force injuries of the forehead, face, and upper lip

B. Mucosal injuries of the lips

C. Cutaneous blunt force injuries of the shoulders, hands, elbows, and legs

D. Patterned contusions (in some areas abraded) of the wrists, consistent with restraints (handcuffs)

II. Natural diseases

A. Arteriosclerotic heart disease, multifocal, severe

B. Hypertensive heart disease

1. Cardiomegaly (540 g) with mild biventricular dilatation

2. Clinical history of hypertension

C. Left pelvic tumor (incidental, see microscopic description)

First page from Floyd's autopsy report (Baker, 2020).

Uncomfortable intimacies: coroner/medical examiner and the state

Let me begin by saying that the intimate and troubling connections between structures of state power and the coroner/medical examiner are not new, especially in Minnesota. I wrote about a controversy in Northern Minnesota several years ago, where a local county medical examiner attempted to proceed with the autopsies of two Indigenous individuals despite the strident religious objections of their families (Smiles 2018). In one of these cases, the medical examiner's staff held the body inside a rented space at a university medical school and asked the police to watch the family of the deceased who were attempting to hold funeral rites. The medical examiner called upon law enforcement to prevent the family from attempting to recover the body of their loved one. Thus, the medical examiner was able to rely on its close relationship with state structures to go against the family's wishes.

The ability of law enforcement to put undue pressure upon coroners in their investigations have also come to light. In some states, the coroner or medical examiner's offices are located within sheriff's offices and other structures of law enforcement, creating the risk of potential conflicts of interest (Feldman 2020; Singh 2020). In 2017, two coroners in California resigned due to the revelation that they changed the causes of death of individuals who had died in custody due to pressure from the local police department (Balko 2017). One can retort, "Well, Deondre, those were *coroners*, elected officials with political agendas rather than medical examiners, who as you mentioned earlier could be susceptible to corruption." And this is a legitimate critique, given the elected/political nature of the coroner position. We don't want to jump to the conclusion that in the case of Floyd, the medical examiner was under pressure from the Minneapolis police to come to a cause of death that would create the least amount of legal jeopardy to Derek Chauvin. There is no evidence to suggest that is the case, and to say otherwise would be libelous. However, it should be noted, as per one source, 1 in 5 coroners/medical examiners have reported being forced to report in cases of police related killings causes of death that do not directly implicate police. 'Excited delirium' has gained particular traction as a commonly cited cause of death while in police custody (Michaels 2020).

In these cases, autopsy obscures state violence via statistical means. The act of autopsy extracts a significant amount of demographic and vital data about an individual. For example, a 'typical' Minnesota death certificate has well over 100 different columns containing demographic and vital data. (Minnesota Department of Health 2019). There is an extremely detailed system of codes and indicators that populate this spreadsheet of death. Often, the inclusion of co-morbidities that were not directly related to the cause of death being investigated has also been critiqued as a technique for allowing police violence to slip through unnoticed by legal structures, as well as creating problematic narratives around the perceived health and durability of victims, especially victims of color–victims like George Floyd (Singh 2020). The convoluted language of death investigations combined with the assumption of poor health in people of color is problematic (Crawford-Roberts et. al. 2020; Singh 2020). This becomes even more problematic when paired with the history of law enforcement using undue influence on coroners/medical examiners to obscure police-related deaths (Goodman et. al. 2020).

In ICD-10, which is the prevailing system of classifications used to diagnose causes of death in investigation, there are a multitude of codes, diagnosing hundreds of natural and 'unnatural' causes of death. Death via the actions of law enforcement is covered under a set of categories in ICD-10, labeled 'lawful interventions', which are designed to be used in conjunction with other ICD codes when assigning a cause of death. This provides a complex system that can allow for deaths at the hands of police to be classified in a way that shields against charges of police brutality.

In the case of the resistance shown by the Indigenous families in Northern Minnesota, they were ultimately able to win the release of their loved ones' bodies. The case also created an impetus for changes in the Minnesota state statutes relating to autopsy and sparked debate about the role of religious objections/freedom in death investigations and implications for future contestations around autopsy (Kulick et. al. 2016; Smiles 2018). George Floyd's case is different in some important ways. The political positioning of the deceased in relation to the state is different in that Indigenous tribal members in the United States have a unique political status/sovereignty that Floyd did not. It is also different in the area of consent. Unlike the Indigenous families in Northern Minnesota, Floyd's family did not object to an autopsy being done. Rather, what they objected to was the conclusion reached by the first autopsy, as it minimized the severity of Chauvin's actions and undermined what people had witnessed with their own eyes. Yet, there is a key similarity between the two cases. In the Northern Minnesota case in 2015, the medical examiner relied on the argument that he was just doing his job, even though his actions openly disregarded the families' religious beliefs and cultural sovereignty. Minnesota state law supported his actions due to the assumed 'impartiality' and legal backing associated with the medical examiner position (Kulick et. al. 2016; Smiles 2018). In the case of Floyd, the judgment of the medical examiner regarding the cause of his death was similarly not challenged by dominant state, legal, and political structures such as prosecutors or the courts.

The fact that the initial report ran counter to what was witnessed by so many people raises some pressing questions. Some experts on the practice maintained that the Hennepin County Medical Examiner had acted within his expertise even after the findings of the independent autopsy came out. We take autopsy and death investigations as a given in instances of unnatural death because we've positioned this process as the 'official' way of understanding how an individual dies. But what happens when the answer runs counter to what we witness and know to be true in a way that is so intimately tied up with processes of state violence, such as police-related killings?

Despite all, it does bear pointing out that citizens are becoming more and more aware of this disjuncture, and are increasingly beginning to voice their displeasure with it. This can lead to backlash against medical examiners/coroners. For example, one petition for the removal of (Hennepin County Medical Examiner) Baker has over 180,000 signatures (*"Charge the Hennepin County Medical Examiner for minimizing George Floyd's C.O.D."* 2021). Ultimately, what this means is that it may become more important for medical examiners/coroners to be open and forthright about the connections between their work and structures of state power such as law enforcement, to meet increased public demands for accountability and transparency.

Future considerations

Physicians such as Ann Crawford-Roberts argue that science, especially medical science, is not neutral nor objective, and that state power, structural inequality and systemic racism can make themselves apparent in this work. This points to the possibility that the physician/coroner/medical examining community is beginning to take stock of the ways in which their work occupies a fraught space adjacent to, and in some cases intimately tied to, these structures, and that some members of this community are beginning to agitate for a more pronounced separation between them. As Dr. Justin Feldman, an epidemiology professor, stated in a Washington Post editorial, "Without independent death investigations, it will be hard to ensure police accountability… If we want the truth about the deaths of Floyd and other people like him, we have to make sure that death investigators are free to seek it out and to speak it publicly."

Medical doctors are also speaking out on the role of medical examiners and coroners in investigating in-custody deaths. Following the contestations around Floyd's autopsy results, physicians around the country called for the review of in-custody deaths investigated by a Maryland medical examiner who testified that Chauvin did not murder Floyd. Even before Floyd's death, there was widespread call for more robust training and professional standards for coroners, especially in the area of medical training and more independent oversight on their work (Thompson 2017; Low and Lamba 2020; Scientific American 2021). This rising public consciousness can lead to increased scrutiny surrounding autopsies that are done in cases involving law enforcement and it can also make it possible for autopsies to be a crucial tool in ensuring accountability for law enforcement in investigations such as Floyd's.

Autopsy can represent a banal, quotidian, yet particularly effective form of 'violence' against the body that brings together structures of the settler-colonial state upon a deceased body. This holds true in the case of George Floyd, and more broadly in the investigation of cases of police-related killings. The political processes and power structures that surround our bodies in life do not cease at the moment of death, but rather, death can bring about whole new ways in which state power can act on a body. Obscuring the role of the police, and therefore, the state in cases like Floyd's can result in devastating consequences for one's dignity and the pursuit of justice. This is yet another call for us to extend our analysis across the entire lifecycle, all the way into death itself. Death itself is political and the processes surrounding how we investigate and declare death are not 'neutral.'

Personally, while I have often spoken about my desire to move away from doing work on the role of autopsy in processes of state power, the case of George Floyd reminds me that this work may never be finished as long as people are killed at the hands of structures of state power. Although it may be draining and heavy, it does point towards the possibility of liberatory futures in the ways that we approach death. Therefore, I stand prepared to continue this work with renewed determination. Although justice eventually came for George Floyd himself, when cases like this arise yet again, we must continue to push for accountability, transparency, and the dignity of the dead. Through this, we can push for true justice and liberation for Black, Indigenous and other lives of color, both in life and death.

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INTERVIEW

Finding a good starting place: An interview with scholars in the CLEAR Lab

María Fernanda Yanchapaxi[a], Max Liboiron[b], Katherine Crocker[c], Deondre Smiles[d], and Eve Tuck[a]

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ABSTRACT
The CLEAR lab is an interdisciplinary plastic pollution laboratory whose methods foreground humility and good land relations. In this interview, María Fernanda Yanchapaxi and Eve Tuck speak with CLEAR lab founder, Max Liboiron, and co-investigators, Katherine Crocker and Deondre Smiles. Together, they explore Indigenous perspectives on climate change and outline the problems with how Western education thinks about it. Our guests question individualism in the understandings of and responses to climate change and reveal the importance of dismantling individual saviour complex perspectives embedded in educational approaches. Our guests invite educators to reflect on and redefine the values at the core of their practice and seek new ways to act on them.

Max:
My name is Max Liboiron. I am Michif or Red River Métis. I grew up on Treaty 6 Territory in Lac la Biche, but my family is from Red River, Manitoba through the Woodman line. My pronouns are they/them. I direct CLEAR, the Civic Laboratory for Environmental Action Research, based in St. John's, Newfoundland and Labrador, Beothuk homelands. And both Dr. Crocker and Dr. Smiles are part of CLEAR which is what brings us together as co-teachers and co-learners today.

Katherine:
Hawé, we Kanza nikashinga, we Katherine Crocker migreche bli[n]. My English name is Katherine Crocker, and I am a mixed settler/Kaw citizen of the Kaw Nation of Oklahoma. I am speaking to you from the occupied territory of Lenape and Wappinger nations, which is lately known as the New York Metropolitan Area of the United States. My pronouns are they/them and she/her. I am currently a postdoc at Albert Einstein College of Medicine and also a member of CLEAR.

CONTACT Max Liboiron mliboiron@mun.ca Memorial University, St. John's, Newfoundland, Canada.

Deondre:
My name is Dr. Deondre Smiles. I am of the Bullhead Clan and I'm a citizen of the Leech Lake Band of Ojibwe. I am of Black, Ojibwe and settler ancestry. I'm a co-investigator in the CLEAR Lab. My regular day job is as an Assistant Professor of Geography at the University of Victoria where I am the director of a new lab called the Geographic Indigenous Futures Collaboratory.

Eve:
In education, where do you see conversations about climate crisis getting stuck? Where are the problems in how these conversations are framed or are understood?

Katherine:
The more I learn, especially as a co-learner in CLEAR, the more I come to consider individualism itself to be a sticking point. Climate change is something that affects communities and metacommunities differently depending on where we are in the world, what access we have to resources, and what resources are taken away from our communities. But it still affects whole communities. Individuals can't solve problems at a community, or metacommunity, or global level. CLEAR is a collective and it focuses on developing methods in that collective paradigm (CLEAR., 2021).

Deondre:
A lot of times, when we learn about climate crisis, it is a very individualistic kind of approach. It's fighting settler paradigms where it's always: "Well, if you don't recycle, if you don't take all these individual actions, you are contributing to the Anthropocene, to the climate crisis." It's part of the savior complex. A lot of times that does come through in education. We focus on the individual.

Max:
The other sticking point with climate change is that it's a symptom of a greater set of relations. And so, what we do at CLEAR and what I do when I teach is really focused on colonialism as a type of land relation that begets things like climate change, and plastic pollution, and violence against women and gender minorities. So, it's proliferating these issues and they all lead back to colonial land relations, and dealing with that at CLEAR needs all of our knowledges.

Eve:
Max, I remember being at a café with you one time, and I felt shy about how many little tiny milk containers I was using in my coffee in front of you. When I told you this, you helped me to see this in a different way.

Max:
Because of my work, people often feel self-conscious about their plastic around me. And I don't even notice, because it does not matter. I think one way to think about scale in a non-individualist way is to think about which relationships matter to the issues that you're dealing with.

When it comes to something like climate change or plastic pollution, your individual choices—no matter what you do—will not move the needle on those problems. They

might scale up a little as a citizen, say, when you're voting or putting in your input in policy. They might scale up to relations that matter as part of an Indigenous nation that has sovereignty and governs land, and is in relation with many generations that you're drawing through and towards. They might scale up more as a scientist, although we can talk about that fairly poor theory of change in science where the assumption is that more data somehow results in more change. But scientists have a different type of authority and therefore jurisdiction.

Carrying the weight of a collective as an individual is a super bad misunderstanding of scale, and relations, and obligation. And it's not a surprise that what Deondre called the saviour complex comes out of Western, individualistic, and capitalist traditions because I think each of those is invested in mismatching scales—they put work into promoting a misalignment of scales between problem and intervention.

Eve:
This misalignment of scale certainly informs climate education as it's done in K–12 schooling and then also climate education as it's understood in teacher education. "We just need to encourage people to use less plastic, and recycle more, and take fewer showers," and so on. When I meet a scientist like you who is a scientist of the harms of colonialism rather than one who is invested in individual actions as being a form of redress, then the theories of change are surprising to me because even as a person who cares very much about decolonization, I don't feel like those are the ones that I have access to as also a person who is moving, and consuming, and making life in the world.

Max:
When I say that your individual choices don't matter, I don't mean your ethics. Ethics matter because your ethics are not individual. They're always collective. And if you think they're individual, you've misunderstood ethics. So, you wanting to use fewer mini milk containers is not nothing. That scales in that it recognizes that you are part of larger collectives, and it is an orientation. And orientations, which means the direction you're moving in with others, matters, but not in the way of, like, you will turn the needle on the tonnage of plastic pollution because of your milk use. I think confusing being ethical with meaningful action happens a lot in universities.

Deondre:
I teach a course on Indigenous environmental activism, and one of the very first things I talk about in the class is the weird contradiction that marginalized and racialized people are kind of placed within. You know, there is always that individual ethics of action, as Max mentioned, that you have to be mindful of. But a lot of times, I think when it comes to education in the ways that racialized, marginalized, and colonized people are placed within, their individual actions count more than other people's actions.

One of the things I talk about is the time old paradox of Indigenous nations that are forced to engage in resource extraction and other extractive industries in order to cope with the pressures of capitalism. And people will wave their fingers at them and say, "No, don't do that."

What I really felt was missing in a lot of my education when I learned about environmental issues was these larger scale processes of capitalism and colonialism that are underpinning them.

Katherine:
And it's not just that a lot of our Nations are forced to participate in various extractive industries. It's in order to survive. It's also that if we refuse to participate in those industries, what will happen is our resources will be taken away or we won't have enough resources to impersonate respectability politics. When that happens, we experience further loss, things like having our children taken away. There's not a way out of it.

At the same time, I can get tangled up in the difference between taking accountability for my individual actions versus taking on responsibility for all of the plastic pollution because I buy things in plastic. And I think that's something that some of my community members also get stuck in as "are we bad Indians because we are participating?" And, how do we disentangle individual accountability and being in good relations? I think that's one thing I really enjoy about Max's work in general, is that the clarity with which they disentangle these two things.

Fernanda:
What might be some of the big contradictions or hypocrisies that you have identified between faculties of education, or teachers, or schools as collective about climate crisis?

Deondre:
One of the really big contradictions that we often kind of find with this kind of stuff is really it boils down to kind of that savior complex.

If only we can tech our way out of this, everything will be alright. If we could only pool a ton of money, if only we can bring more flow of capital into the Global North to try to fix the problems of the Global South. It really leads to this individualistic moral high ground approach. And we find out that it really doesn't make a difference on the ground. What's really nice about what we do in CLEAR is that because of the collective way that we do things, individuals don't really pop out.

Max:
We all know that when a group is in power or is benefiting from those in power, there will always be a gap between verbal commitments and actions. Sara Ahmed (2021) says that's what verbal commitments are—smokescreens to action. And so, one of the big things we work on in CLEAR is that we don't do verbal commitments. We always start from values and things flow concretely from those values. One of our orienting values is humility. When we start with humility, our connections to others, the training we do is based in peer to peer training, for instance. And we take turns speaking in the lab. And that requires stepping back. So, these things are very interwoven I think when you start with values instead of like political commitments, or statements of commitment, or flavor of the month commitments, which always, always leave these gaps. It's how gaps are born.

Katherine:
Dominant culture encourages even those of us who are really invested in addressing climate change on a values level to try to do this by reinvesting in practices, or institutions, or precedents that are preexisting and actually accelerating the problem. Pushing our perception of "oh, no, is climate change happening" to the Global South by taking more resources away from heavily colonized places is not actually going to solve anything. Something that CLEAR does that I really appreciate learning from is starting with values and asking, "What is a good starting place?" and "How would we know a good starting place when we find it?"

Eve:
When you are teaching about climate crises, what stories from communities do you share with others that deeply illustrate the seriousness and what stories reveal community actions, or interventions, or perhaps resistance against climate crisis?

Deondre:
I teach a course on Indigenous environmental activism. And one of the very first things that we talked about in the course is that, and one of the things that we know in Indigenous academia, in Indigenous communities more broadly, is that people really like to feed off of Indigenous trauma. Like, Indigenous trauma, and sadness, and things like that seem to be that kind of bar that a story has to reach or an example has to reach in order to express its seriousness. Like people feed off of Indigenous trauma in various ways. And I really try to push back against that because I like to tell my students if we focused solely on the trauma as a way of demonstrating the seriousness, right, then we start to erase the agency of communities in the actions that they take to try to tackle climate change.

I really try to subvert that by bringing in guest speakers who are doing the work on the ground because almost like 100% of the time, their stories are always full of hope. They're full of energy, hope, and action.

Katherine:
Like Deondre, I also don't tell stories. I'm currently located in medical biology spaces. Few would be surprised how often I'm asked for stories of various Indigenous traumas or my experiences as an Indigenous person. And I think people ask me these questions because they really want to understand my perspective. They think they're coming with as open of hearts as they can manage. I also get the sense that frequently this is linked to their own desire for emotional catharsis about something. There's this sense that you have to observe a spectacle in order to vicariously participate in what could be seen (or, as Deondre has said, fetishized) as a form of resilience. And that's a form of catharsis.

What I do instead is to turn the tables and ask, you know, "What are your stories? What are your community experiences? What have you seen that happens to your community, or the place you grow up, or your family as a result of climate change?" And I don't say it, but I'm asking them to do that work partly because I want them to experience their own vulnerability rather than what they perceive to be mine.

Max:
I also don't usually share stories for the exact same reasons. And I learned this from you, Eve, your *Suspending Damage* paper (Tuck, 2009), which I assign to almost all of my classes because that theory of change where you have to show the blood, and guts, and trauma, and harm in order to prove that something is bad enough for justice to happen is not okay. And I find even if I try and tell stories that are sort of in the gray area, they get sucked right back down into trauma narratives, which of course has centralized certain communities as traumatized, or always in trouble, or in deficit.

Instead, what we do in CLEAR is that we partner with Indigenous communities or with local fishing communities. And what happens is that through partnership, you have to negotiate relations and then you get nuanced and then the story starts coming out of that *partnership* and then you get the feeling of knowing. I think the reason people ask for stories is so that they can get that feeling that is supposed to steer them in a certain direction and to teach them certain things that just facts can't. And I think that leads to the issues that Katherine and Deondre are talking about.

But through partnership, the obligation of partnership, I think it gets you further and firmer. I am very much for a theory of change where if someone doesn't believe there's an issue, doesn't believe that climate change is a problem, you're not going to change their mind, or heart, or soul. So, just work with people who are already onboard with that and *do* things as opposed to the energy it takes to tell the super convincing stories of whatever.

It's not that it's not important to teach the urgency or seriousness, which is what foregrounds partnership and its obligation, but this idea that you have to universally convince everyone is no good—universalism is a very Western and dominant idea and it's not actually shared across a lot of cosmologies. It's about focusing on the people who are going to move the truck as opposed to convincing people that, yes, it is up to mud to its fenders. I mean, let's just move the truck. And if you see a denier in the mud and they're denying that, well, we'll throw them a line, but then we got to go.

Eve:
You know that I agree. At the same time, I'm trying to be thoughtful about my internal panic when we're talking about letting go of the project of trying to convince or educate deniers. In part, that is because Indigenous peoples, like on St. Paul Island where my family is from, experience climate crises that are sped up by other people's behaviors. For this reason, I'm invested in the behavior of people who don't care about what I would ever think or say. It's a conundrum for me as an educator, for me as a person who's watching rising waters where my family lives.

Deondre:
I want to piggyback off of what Max says about the pitfalls of a universalist outlook because it always gets weaponized against Indigenous people. We always have to have the burden of proof to try to convince everybody of our cosmologies or ontologies and things like that and also academics. I can guarantee probably all five of

us in this room have had somebody say to us, "Oh, well, you need to convince me of the utility of this."

What Max said really resonates with me because there is that point where obviously you want to try to educate people, but also, to use a little folksy analogy here, you can lead the horse to water. You can't make it drink. I can do all the educating I can, but if somebody is that convinced that they don't want to listen to what I have to say, at some point, I have to spend my energy on people that want to listen. So, I say that. But also recognizing with you, Eve, kind of the inherent discomfort that can come with that. I got this fancy PhD and got these letters after my name because I need to educate people. I enjoy teaching and things like that. So, how do we sit with that?

Fernanda:
How do you see faculties or schools of education open or reluctant about pushing for structural change? What does structural change look like in education? What different imaginaries will that require of all of us who are colleagues, who are educators, educational researchers, or curriculum developers?

Katherine:
I see a lot of effort in dominant culture, academic, and professional spaces to embrace structural changes oriented around social justice. There are a lot of different acronyms that use or reference the words "justice," "equity," "diversity," and "inclusion." I wouldn't say I perceive a lack of expressed openness because to me that implies some sort of ideological resistance to change, but I notice that there's a lack of actual disruption or commitment to what that change would mean.

I think the way Max directs CLEAR provides a good example of how positive disruption of institutional structures can happen—especially towards openness and accountability. And I also think that's not a generally transferable model because it's intensely place-based and community-focused and designed to serve specific communities and their self-identified interests.

Deondre:
I think that the modern university, the modern North American university is inherently a conservative space. But you know, the fact of the matter is if you continue to do things the same way, you'll notice that things don't change because you haven't taken a step to see what else is possible. CLEAR is just one example of the ways that you can open up new possibilities by changing what you're doing. So, in grant funding structures, what CLEAR does, you talk about funds that go to the community. That it isn't just eating up an overhead in cost from the lab, but also funding stays with the community or broader accountabilities.

There's certain knowledges and certain things that don't get shared outside of the community, at any rate. We don't share anything without community consent or we don't even share anything about our lab without lab consent. And because of even the small things like that, that's an example of a way that even just kind of small little changes can lead to kind of more radical change. I think other institutions could do the same.

Katherine:
I think something that might get lost to people who don't see the work that Max does is that there's a huge amount of labor and effort put into boundaries so that CLEAR can be insulated from things like what Deondre identifies.

Max:
I think this question is another way of asking, "what are your theories of change"? I don't know if it's a theory of change, but there's a saying from the Zapatistas: It's not only that another world is possible, but another *possible* as possible (Ejército Zapatista de Liberación Nacional, 1996). So, even the theories of change that are readily available to you, no, because most of those conserve structure—like recycling, or verbal commitments to equity. It's really hard to imagine beyond those things. CLEAR tries to practice anticolonial relations in every part of our work—so anti-colonial budgeting. What does that mean? Well, we have to figure that out. And that takes imagination because it's not obvious.

And what Katherine says is if you're zigging when everyone is zagging, you have to put a lot of boundaries and safeties in place because the people you're bringing with you, you don't want to lose them off the side when suddenly you're going left and everyone else has gone right. A lot of that is invisible labour.

Because there aren't a lot of road maps for some of this, we produce a lot of stuff that is free and available online, including a collective manual on how we run CLEAR. So, you can just look it up. A lot of our work is on the CLEAR website, on Twitter. Our request, rather than asking for more meetings with us, is that people go and read the things we've already made for them.

Katherine:
And then cite us.

Max:
Yes, and then cite us. That's an ongoing problem with our "grey literature." Also check out the work of other collectives, such as the Women's Earth Alliance & Native Youth Sexual Health Network's (2016) *Violence on the Land is Violence on our Bodies*, which is about how colonialism is the cause of both missing and murdered Indigenous women and girls as well as ecological devastation.

Deondre:
Another example is a report that came out from a number of Tribal Nations in Minnesota two years ago called *The Minnesota Wild Rice Task Force Report* (2018). Very plainly named, but it was literally a collaborative effort by Tribal Nations to answer the question from the State of Minnesota "Well, what should we do to help preserve the health of wild rice beds?" And the tribal nations said, "We've done years of research on this. Here is literally the guidebook that you need to follow in order to do right by us, our treaty obligations, and our nonhuman kin, which in this case includes wild rice."

Notes on contributors

María Fernanda Yanchapaxi is a Ph.D. student in the Social Justice Education Department at the Ontario Institute for Studies in Education, at the University of Toronto. Yanchapaxi is Kichwa/Mestiza from Panzaleo territory (Sigchos, Ecuador) where her family still lives. Her research examines the suitability of the intellectual property system to protect Indigenous knowledges and its impact on the assertion of Indigenous knowledge sovereignty.

Dr. Max Liboiron (Michif, they/them) Liboiron is an Associate Professor in Geography at Memorial University, Canada. Their lab, CLEAR, is an interdisciplinary plastic pollution laboratory whose methods foreground humility and good land relations.

Dr. Katherine Crocker (Kaw, they/she) is an interdisciplinary biologist interested in how animals are influenced by the environments of our ancestors, and how we gain and describe knowledge. They earned their PhD in Ecology and Evolutionary Biology (and their MS in Post-Secondary Science Education) from the University of Michigan. They are currently a postdoctoral research fellow in the Department of Genetics at Albert Einstein College of Medicine, and a co-Investigator in Dr. Max Liboiron's CLEAR lab.

Dr. Deondre Smiles (he/him/wiin) is an Assistant Professor in the Department of Geography at the University of Victoria (BC, Canada). A citizen of the Leech Lake Band of Ojibwe, Smiles' research interests are multifaceted, focusing on critical Indigenous geographies, political ecology, Indigenous cultural resource preservation, and science/technology studies. Smiles is a co-investigator in the CLEAR Lab and is the director of the Geographic Indigenous Futures Collaboratory (or GIF Lab) at UVic.

Eve Tuck is Associate Professor of Critical Race and Indigenous Studies at the Ontario Institute for Studies in Education (OISE), University of Toronto. She is Canada Research Chair of Indigenous Methodologies with Youth and Communities. Tuck is the founding director of the Tkaronto CIRCLE Lab. Tuck is Unangax̂ and is an enrolled member of the Aleut Community of St. Paul Island, Alaska.

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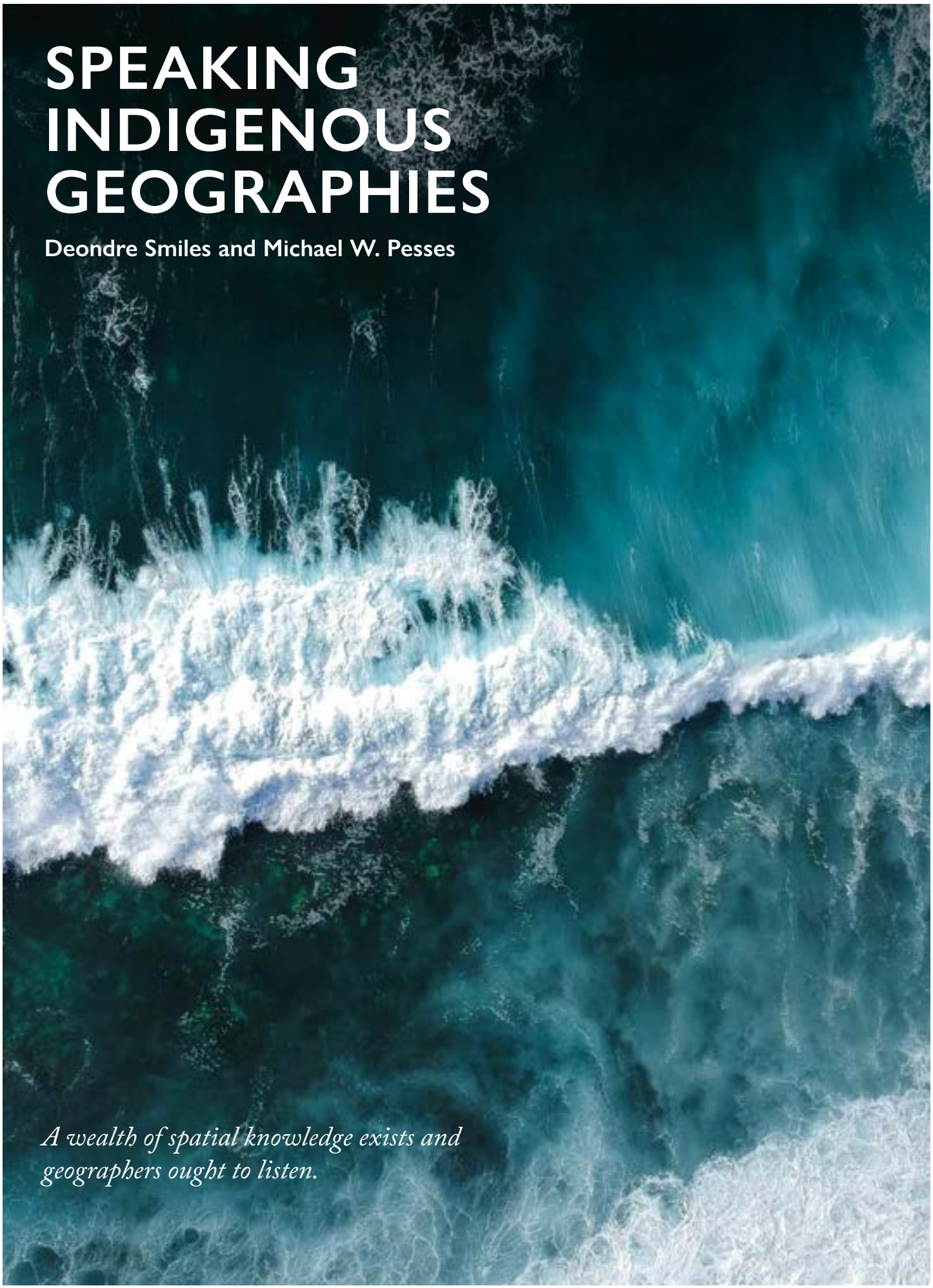


SPEAKING INDIGENOUS GEOGRAPHIES

Deondre Smiles and Michael W. Pesses

A wealth of spatial knowledge exists and geographers ought to listen.

We have put together this annotated bibliography to begin to expose geographers to thoughts that transcend their specialized groupings. In other words, one does not need to be an Indigenous scholar to benefit from the concepts and examples in these books. The following works all approach space and place from the perspective of those Indigenous to the region, while simultaneously utilizing imposed settler practices to produce a distinct form of knowledge. As Mishuana Goeman asks below, "What happens when the poet takes over the cartographer's tools?" Getting to a more equitable, sustainable, and just future will require demolishing rigid disciplinary borders and turf and instead embracing heretofore unknown epistemologies and ontologies. Unknown at least, within much of academia.

Our hope with what follows is to give voice to a rather underrepresented population within our discipline as well as to reveal the incredible wealth of knowledge, beauty, and justice that has been overlooked with such underrepresentation. Those working in any facet of geography will benefit from how these books can challenge that which we take for granted about the world around us.

Blu Barnd, Natchee, *Native Space: Geographic Strategies To Unsettle Settler Colonialism.* Corvallis: Oregon State University Press, 2017.

Natchee Blu Barnd presents several case studies of Indigenous peoples using and remaking the mundane geographies in which they inhabit, asserting their historic and sometimes newly re-established presence in their historic territories in spite of the eliminatory nature of settler colonialism. For example, Blu Barnd speaks of the ways that the presence of original Indigenous languages on street signs along with their English names remind the viewer that they stand within Indigenous space, in the face of settler frameworks that also use Indigenous names in a co-option of Indigenous identity.

Blu Barnd turns his focus to the differing ways that a Kansas town, Satanta, and the Kiowa people, approach the legacy of a historical Kiowa leader, Set-tainte, the namesake of Satanta. Pow-wows carried out by the Kiowa in remembrance of Set-tainte take place alongside the crowning of a Chief and Princess of Satanta, which more often than not are white Satanta residents wearing historical approximations of 'Kiowa' regalia. Through this analysis, Blu Barnd continues his argument that settler colonialism seeks to cover their historic dispossession of Indigenous peoples by 'adopting' certain aspects of Indigenous culture and identity. However, despite this, the Kiowa have learned to maintain their cultural and political sovereignty within their Oklahoma home, or as Blu Barnd puts it, "site-in-exile," (92) have held onto and maintained the true story behind Set-tainte, and in recent years, have established a presence in Satanta's celebration through the involvement of tribal members performing Kiowa.

Blu Barnd also speaks the ability of art to mark "Native space", giving accounts of the ways that Indigenous artists, in particular, Kanza people, have depicted the historic dispossession of their homelands in Kansas. "Historic" maps depicting the opening of Kansas to settlement are marked over by visual representations of Indigenous people, showing that this settlement and claiming of settler colonial space occurs through the displacement of its original inhabitants (Blu Barnd). Other artists utilize maps in a similar manner, erasing or obscuring the names of American states in favor of the names of tribes who inhabit these places. These art installations, among others, serve to unmistakably declare their spaces as Native, regardless of how settler colonialism has sought to "remake" them as settler space.

Coté, Charlotte, *Spirits of Our Whaling Ancestors: Revitalizing Makah and Nuu-chah-nulth Traditions.* Seattle: University of Washington Press, 2010.

Spirits of Our Whaling Ancestors is a call to understanding the cultural and social elements of foodways and to acknowledge the biases settler cultures impose on Indigenous ones. Charlotte Coté, who is Nuu-chah-nulth, opens her book with a description of a controversial 1999 whale hunt by the Makah off the northern Pacific Coast. The killing of whales has been seen as barbaric by Euro-Americans, at least in recent decades, but still maintains an important place within the related Makah and Nuu-chah-nulth cultures. While this is not the only study of these Indigenous groups or even this specific hunt, Coté, as an insider, is able to discuss whaling, food, and indigeneity with a language unavailable to settlers. Right from the beginning, Coté's verb choice and sentence construction reveals a distinct relationship between humans and nature: "A thirty-foot maa'ak (gray whale) gave its life to feed the Makah people" (3). Whaling is more than

"What happens when the poet takes over the cartographer's tools?"

-Mishuana Goeman

a means to material sustenance; it is one of several traditions that Coté argues has been crucial for maintaining a semblance of culture despite centuries of imperial attack. Whaling is part of "a line that threads from our precontact cultures to the present day. That line has been stretched, it has been tattered, it has been weakened—but it has not been destroyed" (7).

The idea of hunting whales is problematic for many non-Indigenous North Americans due to the intelligence of the creatures as well as their relatively small populations. Coté acknowledges the place of whales in the world: "Whales are special. And they are wonderful and beautiful. My people do not deny this. And they have remained in our lives and cultures as sacred and respected animals, but they were also once and important food source" (206). The leap for non-Indigenous readers is to connect the respect the Makah and Nuu-chah-nulth have for the animals to the practice of hunting. Coté explains the Nuu-chah-nulth concept of hishuk'ish tsawalk which translates to "everything is one," an ecological worldview often attributed to John Muir but was clearly already in practice in North America for millennia. Coté argues that the imposed philosophical and economic systems by colonial forces were the "diametric opposite" of hishuk'ish tsawalk and led to the end of Indigenous whaling practices (42). Using a mix of sources, including oral traditions, Coté tells a story of nineteenth century efforts in disciplinary power to strip native children of their culture in the spirit of assimilation, the outlawing of cultural practices, and present-day efforts to reclaim cultural practices like the potlatch, canoeing, and of course, whaling. Despite Western ideas about ecological balance, Coté is arguing for a cultural connection to food that came well before the commercial hunting of whales by Euro-Americans that led to their rapid population decline. She discusses the past traditions of whaling and the potlatch, while also talking to modern day Makah and Nuu-chah-nulth people about the importance of maintaining a connection to the past.

What is interesting, and a repeated trope in treaty rights battles in the United States, is the demand for stasis of Indigenous culture. Coté points out that much of the criticisms of the 1999 Makah hunt and efforts to continue the practice were tied to the perceived inauthenticity of the Indians. The agreement with the federal government was to use a high-powered rifle to quickly kill the whale in a manner much less painful than a harpoon death, but opponents of the hunt argued that the hunt should replicate one from the nineteenth century to justify its cultural significance. Effectively, the Makah could only really be Makah if they maintained precontact practices. Spirits of Our Whaling Ancestors reveals the inherently social concept of nature and conservation as well as their connection to culinary imperialism, in which the settler nations maintain "the power to determine what we eat" (205-6). While a reader still might not relish the thought of hunting whales off the Pacific Coast by the end of the book, they will hopefully interrogate the importance of their own foodways and work to give the same respect to Indigenous groups.

Goeman, Mishuana, *Mark My Words: Native Women Mapping Our Nations*. Minneapolis: University of Minnesota Press, 2013.

"What happens when the poet takes over the cartographer's tools?" asks Mishuana Goeman (119). Goeman outlines a history of Indigenous women using technique such as art, stories, and poetry as means through which they map the spaces in which they inhabit, in the face of the more colonial-esque usage of maps by settler colonial states to dispossesses Indigenous peoples of their territories. The role of Indigenous women is especially important, Goeman argues, as it provides a counterpoint to the gendered violences and power structures that often accompanies settler colonialism. She approaches the work of a 19th century Mohawk fiction author as work that interrogates the roles of gender, and individual freedom in Canada, especially in regard to the *Indian Act* of 1876 and policies of assimilation. Poetry, as Goeman shows, was used to represent the division between reservation and off-reservation, rural and urban, the implications this had for the individual identity of a Native American in the United States during the Federal policies of relocation and termination, and the continued assertions of Indigenous identity in spite of these disruptive policies. Other poetry focuses on Indigenous spatial thought and placing Indigenous bodies within an increasingly neoliberal, multicultural world. Stories told and written by Indigenous women reshape and disrupt borders and settler colonial understandings about territory and space, replacing them with a spatial knowledge and understanding based upon Indigenous histories and world views. These acts are all geographical, of course, but they are accomplished through acts that the Western academy may not always recognize as geographical—or that are recognized as Western forms of geography, remade into an Indigenous geography.

Poblete, JoAnna, *Balancing the Tides: Marine Practices in American Sāmoa*. Honolulu: University of Hawai'i, 2020.

Okay, full disclosure, Pesses made the maps in this book, but they are definitely the least impressive aspect of this much needed work of labor history and environmental management. Poblete's Filipina heritage has led her to explore indigeneity in unincorporated territories, studying the liminal spaces of being subjects while never fully belonging to the American empire. Of all of the unincorporated territories, American Sāmoa is interesting, she argues, because "instead of native customs being erased by missionaries, as in Hawai'i, and intense Americanization such as those in the Philippines, Puerto Rico, and Guam, American Sāmoa differed from other colonized regions because the US government has historically accommodated Indigenous practices in this area" (2). While the United States controlled global policies like trade and military decisions, everyday life in American Sāmoa stayed under fa'amātai, the inherited role of chieftains in leadership and social decisions. Despite a continuation of Indigenous practices, American control has meant that capitalism has influenced life in American Sāmoa, either by shifting subsistence fishing practices to commercial ones or by making Sāmoans wage laborers. A big theme within Balancing the Tides is that under American control, despite the maintenance of Indigenous practices and beliefs, the ocean has become a source of revenue rather than a space of reciprocity.

The balance of colonial oversight with local decision making is a fascinating case study of the maintenance of imperial control. Local policy incorporates vā and vā fealoa'i. The first, vā, Poblete describes as "social space relations" (15). Vā is the space between people, non-human beings, and the land, not simply an empty void between two bodies, but a produced space of love, service, and respect. Vā fealoa'i is specifically the social respect within American Sāmoan society. By incorporating vā fealoa'i into marine sanctuary and fishery management practices, as well as capitalist industry, Indigenous Sāmoans were much more accepting of imposed scientific management despite having different goals or desires. Both vā and vā fealoa'i are valuable concepts worthy of adoption into the rest of American life and policy, but as Poblete shows, they are not immune from the forces of global capitalism. Chapter 2 specifically explores the tuna industry in American Sāmoa. The book is a good reminder of the flexibilities of global capitalism, including that up until 2009, the "Made in the USA" labeled canned tuna we bought in most American stores was produced by Indigenous workers who are not

protected by US labor laws (57). While corporations utilized vā fealoa'i through things like funeral benefits to keep workers happy, they balked at the push to raise the minimum wage in American Sāmoa. Poblete shows a dependency upon wage labor that grew after World War II leading many Indigenous Sāmoans to resist increased wages to keep the industry alive and criticizing American congressional efforts for not understanding American Sāmoa. Paying a living wage led to the closure of one canning factory and its relocation to Georgia.

The book also covers the creation of a National Marine Sanctuary and its violation of vā in the decision making process as well as conservation practices in the territory. A lack of vā led to a lack of trust and cooperation with environmental management. Ultimately, *Balancing the Tides* is an excellent reminder to not take concepts like citizenship, nationality, indigeneity, and the environment for granted, nor as static, as well as an example of how material economic relations are so often at the heart of both colonial and Indigenous relations. Further, Poblete encourages us to think about vā: "How does one's outlook on life change when a balance in all relationships is the highest priority?" (138). The book is open access and can be found here: https://library.oapen.org/bitstream/handle/20.500.12657/23603/9780824883393.pdf?sequence=1&isAllowed=y

Simpson, Leanne Betasamosake, *As We Have Always Done: Indigenous Freedom Through Radical Resistance*. Minneapolis: University of Minnesota Press, 2017.

Nishnaabeg scholar and author Leanne Betasamosake Simpson presents the idea of land—aki—as being of vital importance to the cultural survival and resilience of her fellow Nishnaabeg. Simpson forcefully rejects the idea that Indigenous peoples are best served by allowing themselves to be enrolled in the systems of power wielded by modern, neoliberal, multicultural settler colonial states. Doing so only legitimizes the continued separation of Indigenous people from their land, the erosion of their cultures, and the continued slow 'elimination' of them as a people. Instead, Simpson argues, Indigenous people should look to their traditional cultural practices and their connection to their land and environment as ways to ensure their survival. Using Nishnaabeg everyday cultural practices and ways of thinking about their relationship to their land and their histories as an example, Simpson makes the effective assertion that Indigenous peoples simply only need to do the same things that their ancestors have done for centuries in order to resist assimilation and elimination at the hands of the settler colonial state, and the environmental destruction that often accompanies such elimination.

"This is what my Ancestors wanted for me, for us. They wanted for our generation to practice Nishnaabeg governance over our homeland," states Simpson (9). "My nationhood doesn't just radiate outwards, it also radiates inwards. It is my physical body, my mind, and my spirit…This is the intense love of land, of family, and of our nations that has always been the spine of Indigenous resistance" (9). Simpson is making the strong argument that to be proudly Nishnaabeg is to be in support of our traditional ways of living and governing ourselves; resistance is an integral part of our positionality whether we recognize it or not.

FALL 2022 APCG MEETING @ WESTERN WASHINGTON UNIVERSITY

The next APCG Meeting will be held in beautiful Bellingham, Washington at Western Washington University, with exact dates yet to be determined. This will be a hybrid conference, allowing you to attend in person or via Zoom. This hybrid option is not just for pandemics, but a new modality to allow for an eco-, schedule-, and budget-friendly alternative that still allows you to partake in the event. Hope to see you there!

Erasing Indigenous History, Then and Now

By **Deondre Smiles**

Two pictures of Tom Torlino, a member of the Navajo Nation, depicting him before and after his time at the Carlisle Indian Industrial School, 1882.

Editor's Note:
When historians construct narratives about the past they exclude as well as include—and nowhere is that more apparent than in the way Native people have been erased from most histories of the United States. This month, Geographer Deondre Smiles (Leech Lake Band of Ojibwe) invites us to reexamine the conventional stories

Americans tell themselves from a Native point of view. At stake is not only a fuller understanding of our history but, as Smiles notes, a people erased from the past are easily erased from the present also.

> *"We birthed a nation from nothing. I mean, there was nothing here…I mean, yes we have Native Americans but candidly there isn't much Native American culture in American culture."*
>
> —Rick Santorum, April 2021

Former Pennsylvania senator (and CNN commentator) Rick Santorum made those comments at a conservative student organization-hosted conference. They were given as part of a speech about the beginnings of what we now call the United States, and they have garnered criticism and controversy from a wide spectrum of American society. He is now an ex-CNN commentator.

Rick Santorum giving a speech at the Young American Foundation event, 2021.

Santorum's comments were rightfully criticized as being dismissive of a long history of genocide in the United States against Native peoples and cultures, as well as being historically ignorant. We must call this sort of behavior out when we see it.

However, Santorum's comments point to a much deeper structural myth of the treatment of Native peoples in the United States that Americans have constructed over time. What I mean by this, is that American history has been constructed in a way that completely ignores Indigenous histories and Indigenous presence upon the lands that we now call the "United States."

In constructing such a history, we conveniently ignore that land theft and Indigenous erasure have quite literally shaped the development of this country. We've been conditioned to accept this "whitewashed," Indigenous-free accounting of the past as a "given" in American history and the construction of this country. And the implications of this historical erasure have been profound for how we view the very presence and role of Indigenous peoples in contemporary American society.

A group of Apache Native American children pose for a portrait four months after arriving at Carlisle Industrial Indian School in Pennsylvania, ca. 1880s.

Let's take this structural myth that Santorum presented, break it apart into its constituent pieces, and explore the histories that have given rise to it. Engaging with these histories head-on will open our eyes to facts that run counter to Santorum's claims.

The United States was not built out of nothing, and the fact that Indigenous cultures are not part of the dominant American "culture" is a calculated action. And this erasure does not mean that Native cultures do not exist, or that our relationships with the lands on which this settler colony is built are any less valid.

"Birthing a Nation from Nothing"

Many Americans believe the lands that comprise the United States have a fairly recent history of human habitation. If one was to ask a group of Americans to name a few of the formative events in American history, they would be likely to hear Christopher Columbus "discovering the New World" (not exactly related to the United States nor historically accurate but never mind); Pilgrims arriving at Plymouth; the Declaration of Independence and Revolutionary War; the Civil War; and the opening/settling of the West.

American Progress *(1872) by John Gast*

I want to focus on the last example, the “opening” of the American West. But before I do that, let me outline a key term: settler colonialism.

This was a distinct form of colonialism built upon the settlement of a geographic space by non-native people and the displacement of the Indigenous communities who lived in that space. Rather than more extractive forms of “resource colonialism,” where the goal was to exploit natural resources until those resources ran out, the settler colony was meant to be permanent.

Of course, the settler colony could also center around resource extraction, but the larger goal of settler colonies is to control the space. Scholars consider the United States a settler colony along with Canada, Australia, New Zealand, South Africa, Israel, and others.

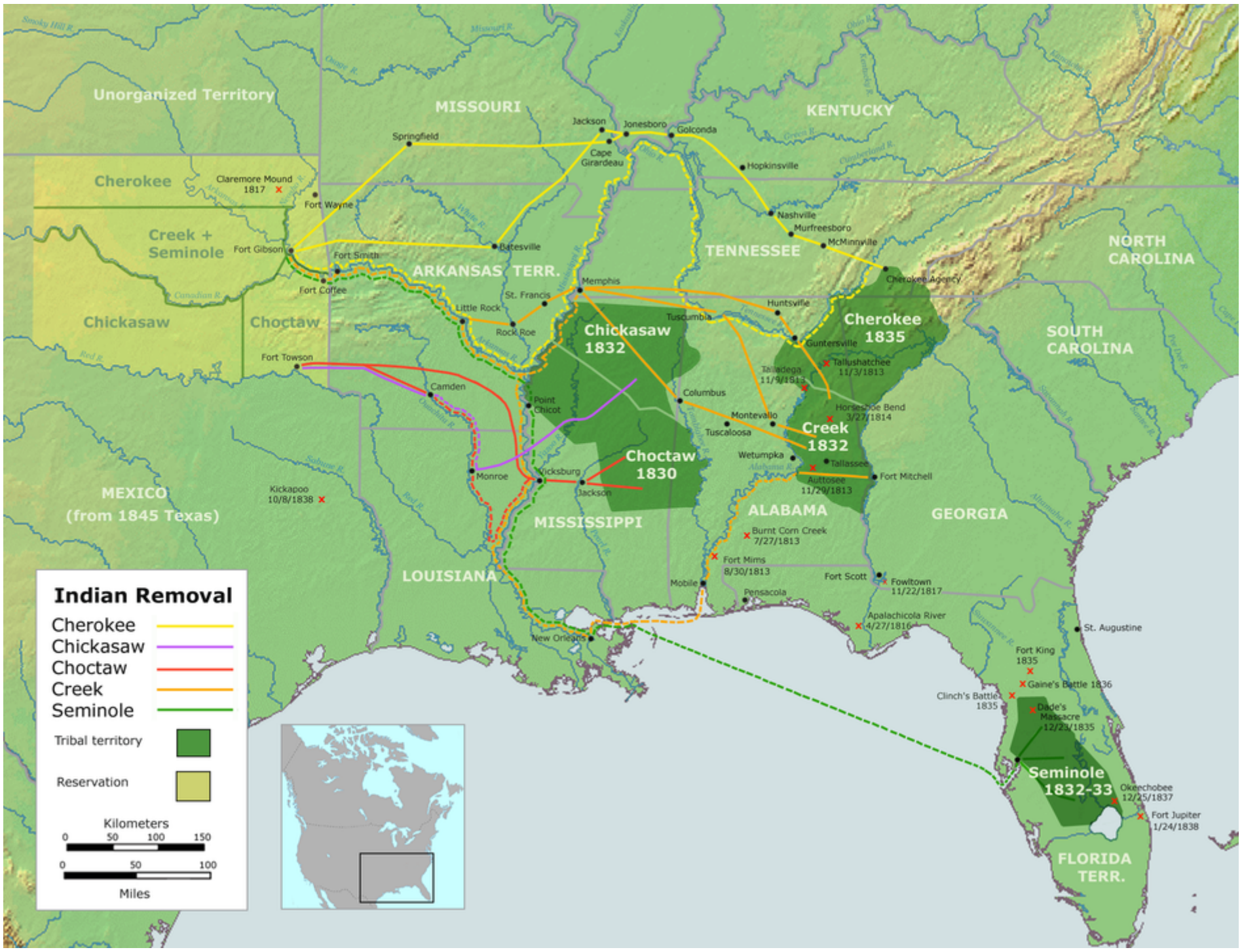
Let’s return to the “opening” of the American West where, in the standard telling, settlers and “pioneers” pushed forward and westward from the original 13 states across the Appalachians towards the Mississippi and eventually the Pacific Ocean, forming new settlements in new territories.

Daniel Boone Escorting Settlers through the Cumberland Gap *(1851–52) by George Caleb Bingham.*

Rugged frontier explorers such as Daniel Boone, Lewis and Clark, and others loom large in these histories and supposedly testify to the individual spirit and drive of American settlers as they worked to a build a new country out of the “wilderness.” It’s a story designed to inspire pride and confidence in any American about the heritage and spirit of our country.

Except, there’s a lot more to this history than that. Beneath the feel-good, pride-inspiring stories about hardworking Americans building a country out of “nothing,” there is also the story of dispossession and genocide.

Indigenous nations dwelled in those territories and landscapes that American settlers coveted. Overt military force was usually deployed to dispossess these nations of their land.

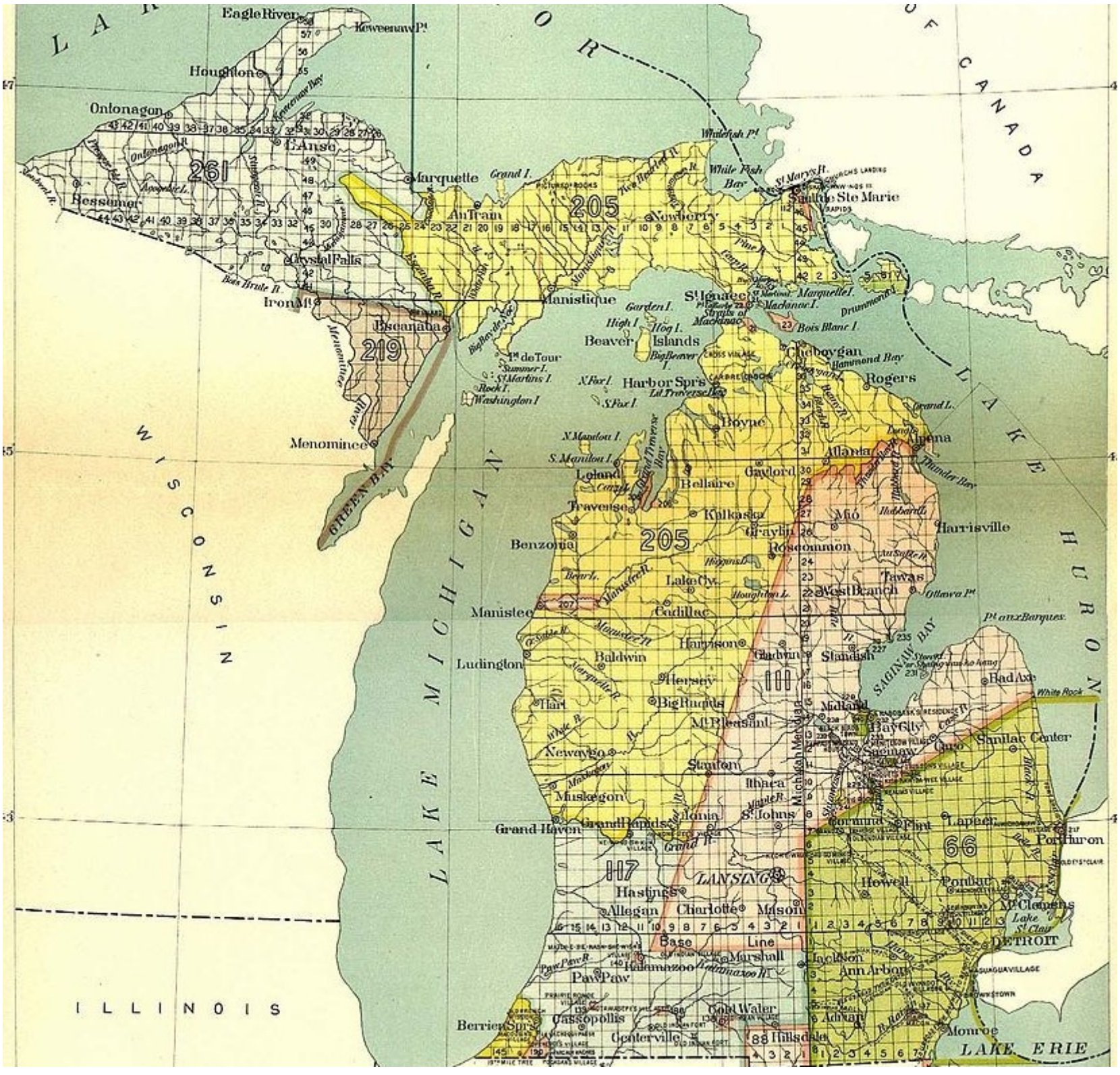


This map of the Trail of Tears depicts the routes taken to forcibly relocate Native Americans from the Southeastern United States to present-day Oklahoma between 1836 and 1839.

The "Trail of Tears," which is probably one of the better-known examples of dispossession, was a relocation of tribes in the Southeastern United States westward towards the Mississippi River and eventually into what was known as the "Indian Territory," now the state of Oklahoma. The land that was stolen became a central part of the plantation economy of the South, worked by slave labor to create wealth for white settler landowners.

These relocations were, of course, just a chapter in a long history of violent dispossessions and seizures of Indigenous land in the United States. The prevailing opinion was that since Indigenous peoples were not using the land in ways that settlers considered "productive," the land was in far better hands being owned and used by settlers.

In other cases, land passed into the hands of the United States and settlers through ostensibly "legal" means, via land cession treaties. Under the terms of these treaties, Indigenous tribes agreed to give up lands and relocate to other spaces, or as time went on, to reservations, parcels set aside for them by the U.S. government.

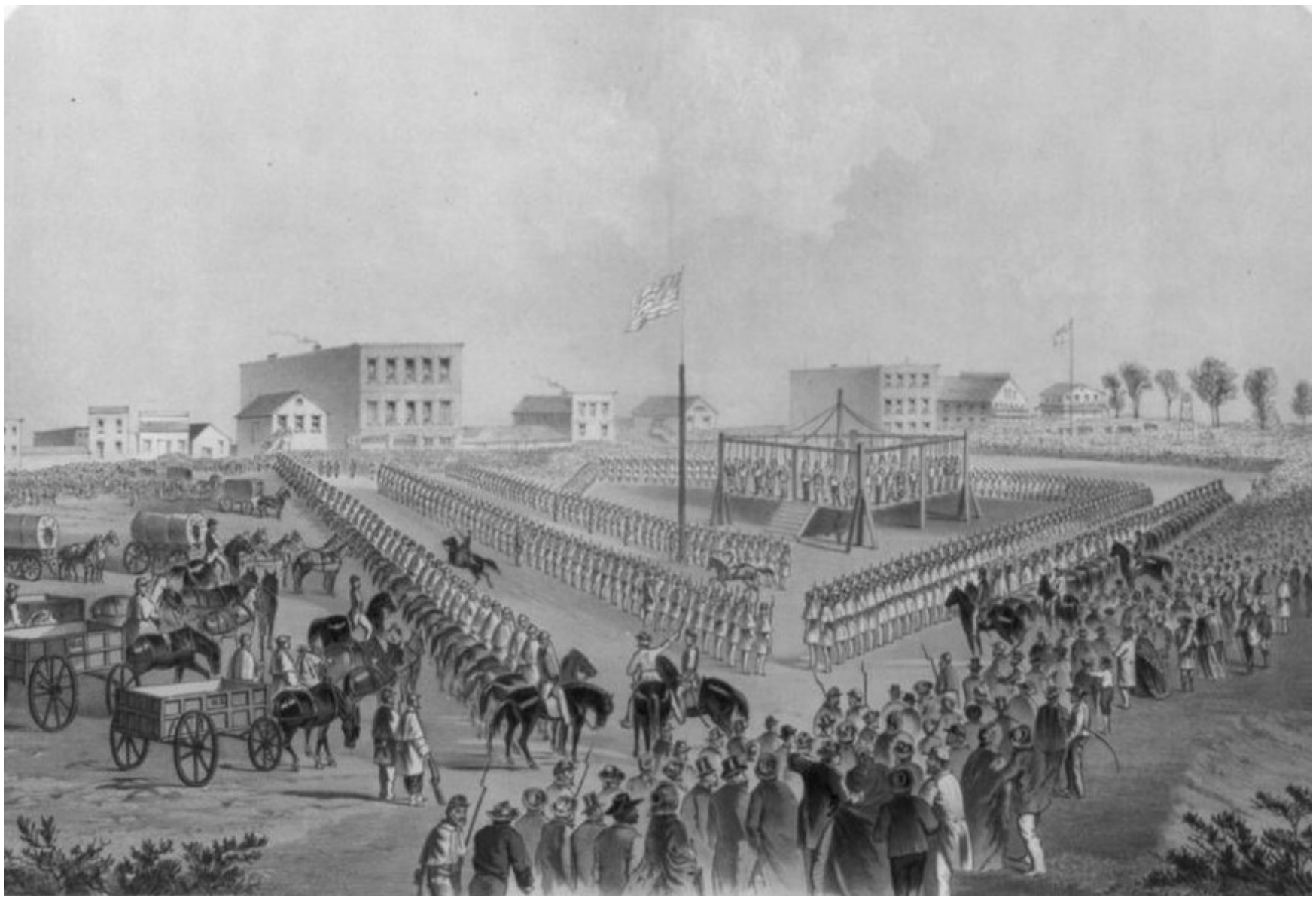


This 19th-century map depicts the major Native American land cessions that occurred between 1784-1894 as a result of treaties. These cessions resulted in the formation of what is now Michigan.

In return for giving up lands, tribes were often guaranteed to retain certain rights in the ceded land, such as hunting, fishing, and gathering rights. The government often promised financial compensation as well in the form of annuity payments to tribes. In theory, this meant that tribes were being well compensated for their land cessions, and the United States gained access to more land for settlement—a win-win scenario.

Except, of course, things very frequently did not work out that way, to the detriment of tribal nations. Treaty rights were infrequently honored or respected, annuity payments were often late or nonexistent, and settler pressures on reservation land led to conflicts.

One notable example of the latter is the U.S.-Dakota War of 1862, a clash overshadowed by the Civil War. In this fight, Dakota peoples in Minnesota had been pushed onto a small reservation in return for promised annuities and other treaty rights. Increased demands for land by Minnesota settlers whittled down the Dakota reservation, and due to the Civil War, annuity payments were usually late if they came at all.



Drawing of the 1862 mass execution in Mankato, Minnesota following the U.S.-Dakota War.

Settler store owners at reservation trading posts were less than sympathetic to the Dakotas' situation. In this tense atmosphere, a confrontation between some Dakota youth and a settler farmer touched off a bloody clash that ended with the defeat of the Dakota, the loss of their reservation, and the exile of many tribal members westwards out of Minnesota into what we now know as Nebraska and the Dakotas. Thirty-eight Dakota were hanged at Mankato, Minnesota in what is recognized as the largest mass execution in American history.

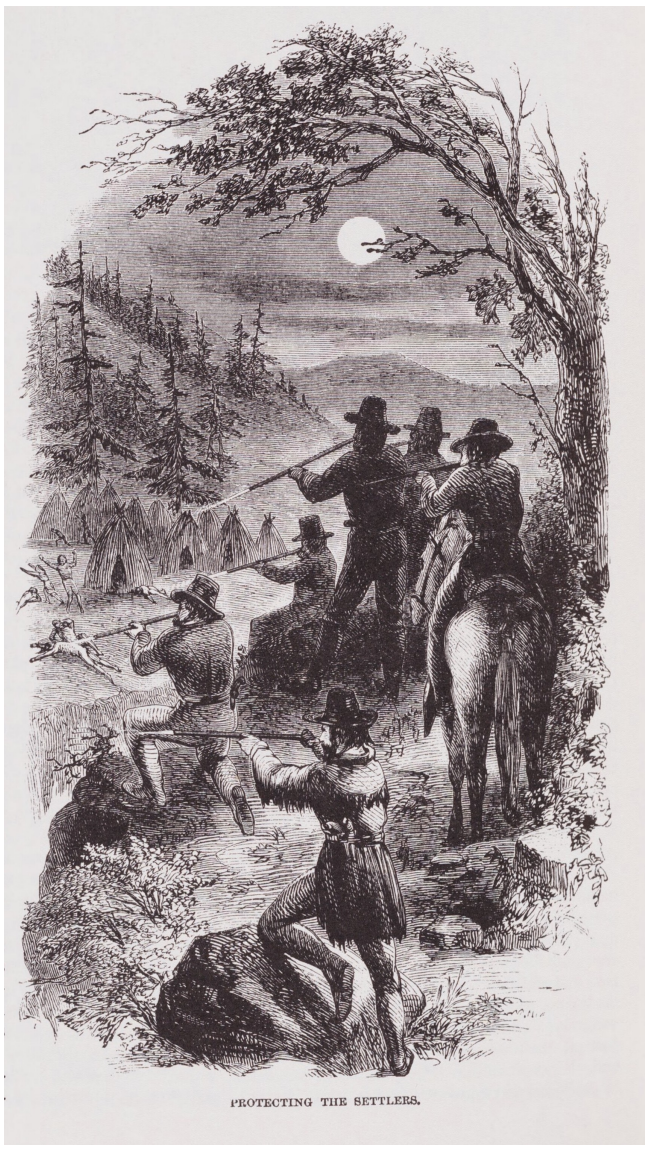
There are countless other examples of this, of course, including ones that have made their way into popular consciousness.

For example, many Americans are familiar at least with the California Gold Rush, which was far more than a rush of people seeking to make it rich. It also was a time of extreme violence to Indigenous peoples in California. Prospectors and other settlers attacked Indigenous settlements, killing many tribal members. Meanwhile, the process of prospecting itself did widespread ecological damage to waterways and rivers in California and undermined the health of Indigenous communities in the process.

Acts of dispossession often come down to us not as history but as sports nicknames, such as the Gold Rush and the San Francisco 49ers NFL team.

Another example, in 1889 the "Indian Territory," which had been set aside for tribal nations that had been relocated from the east, was to be opened up for settlement by American settlers. Many settlers who had pushed for the opening of the Territory snuck in early and staked their claims before the land was fully opened to settlement. These people were known as "Boomers" and "Sooners," names that have come to be associated with the University of Oklahoma, both through its nickname (the Sooners) and its well-known fight song, *Boomer Sooner*.

The General Allotment Act of 1887, known as the Dawes Act, formalized the reallocation of millions of acres from Indigenous to white control. The Dawes Act divvied up Native land into individual parcels given to Native nuclear



This illustration titled "Protecting The Settlers" is found in JR Browne's work "The Indians Of

families. Anything “left over” was sold off to white settlers and real estate investors. Roughly 100 million acres moved from Indigenous control to settler ownership in the subsequent 50 years.

California" from 1864. It portrays militia men massacring Native Americans in California.

This is how the West was won. And dispossession was an inherent aspect of many widely celebrated parts of the American past.

Once the land was taken, the American settler state systematically broke down Indigenous identities. Indigenous children were taken from their families and communities and sent to boarding schools far from their homes, where they were trained to adopt settler customs. They received industrial training designed to help them assimilate into American settler society and take up manual labor roles within the settler economy.

Pupils at the Carlisle Indian Industrial School, Pennsylvania, ca. 1900. It is estimated that from 1879 to 1918, over 10,000 Native American children from 140 tribes attended Carlisle.

The blood quantum policy, or the idea that the amount of “Indian blood” in an Indigenous person could be determined mathematically, led to situations where individuals could lose their tribal citizenship (and accompanying rights and benefits) because of their parentage.

In the mid-20th century, federal policies of relocation and termination resulted in the removal of recognition and treaty rights from some tribal nations, and pushed tribal members to urban centers, which further eroded tribal communities and identities.

“*I mean, yes we have Native Americans…*”

As an Ojibwe scholar, teaching Indigenous topics is not new to me—I have been doing it for my entire career. I recently finished teaching a course on Indigenous Environmental Activism, and one of the things that I immediately thought to do was to teach a far more expanded version of the history that I just outlined above.

Members of the Indigenous Environmental Network protest the Keystone XL pipeline and fracking in Washington D.C., 2013. (Image by Ben Schumin)

Some of the most common refrains that I heard from my students as I went through the early part of the semester were, “Wow, I didn’t know that these things happened,” and, “Why didn’t we learn more about Native Americans before this class?” Part of this, I argue, comes from the ways in which this history is taught, or is not taught, in schools, both K-12 and college.

I consider myself fortunate to have learned this history, but I am Indigenous myself, being a citizen of the Leech Lake Band of Ojibwe, and I grew up in a state (Minnesota) that has dedicated more attention to Native history and cultures in its educational curricula than other states. (Wisconsin is another notable example of a state that has mandated Indigenous topics in educational curricula.)

The school district I attended had a robust Native educational program—something that I recognize that not every school district has. Even so, when I was able to get access to educational programming from our Native education specialist, Native history was something that we focused once or perhaps twice a year during our social studies classes.

Samoset entering the Plymouth settlement in 1621, thus making the first contact between Native Americans and the Pilgrims.

Rather, we learned about the “defining moments” in American history, moments that centered settler perspectives and settler figures. It wasn’t until I got to college that I was able to take a class that focused solely on Indigenous histories and cultures.

Of course, Santorum’s remarks go far beyond just a simple lack of understanding of Native identity. A robust historical accounting quickly reveals that his remarks are just one in a long line of ignorant remarks made by American politicians about Native Americans.

They include George Washington’s statement that “Indians and wolves are both beasts of prey, tho' they differ in shape,” and Thomas Jefferson’s oath, “If ever we are constrained to lift the hatchet against any tribe, we will never lay it down till that tribe is exterminated, or driven beyond the Mississippi.”

And they range from Teddy Roosevelt’s “I don't go so far as to think that the only good Indians are dead Indians, but I believe nine out of ten are, and I shouldn't like to inquire too closely into the case of the tenth,” to Donald Trump’s calling Senator Elizabeth Warren “Pocahontas.”

Even in the cases where Indigenous peoples are mentioned in some of the most commonly known American historical stories, they are positioned as secondary and often are inaccurately described or portrayed.

Sacagawea (right) with Lewis and Clark at the Three Forks, as depicted in a mural at the Montana House of Representatives.

No matter what has been said, or what has been taught (or not taught), it is clear: For much of this country's history, Indigenous perspectives and histories have been steadily marginalized and covered up in favor of histories that center on settler colonialism and the ways in which the American settler colony has built itself up.

Individuals such as Squanto, Sacagawea, Pocahontas, and other historic Indigenous figures are portrayed as mere adjuncts to settlers (such as the Pilgrims, the Jamestown colonists, and Lewis & Clark), rather than individuals with agency and motivations of their own, or as part of a larger cultural and political world with its own agendas and struggles.

We often acknowledge that Indigenous peoples did exist, but that recognition is placed in the past tense—tribes are portrayed as having historically once lived in a given space, but then they disappeared. Or their histories trail off, as if they simply stopped existing after a certain point.

Protest against the name and mascot of the Washington Redskins in Minneapolis, 2014.

Not only are we misrepresented by histories, but there is often little attention paid to us in contemporary frameworks. Put bluntly: people forget that Native peoples are still here, and that we have cultural, geographical, and political frameworks that have existed and endured through the history of the United States as well.

The way we tell history and these current views are connected: the writing of Indigenous peoples out of history has led to writing them out of the present as well.

Even in places from which Native peoples were removed, such as Ohio and other places in the Eastern United States, there are thriving and robust communities of Native people in urban centers with their own histories and cultural frameworks.

Many conservative politicians and commentators, like Santorum, have pushed back against what they see as the teaching of “critical race theory” in American classrooms. This label seems to be a catch-all term for any sort of curriculum that brings into question structures of power, privilege, and white supremacy.

A statue of Christopher Columbus lays toppled outside the Minnesota State Capitol in June 2020 during the George Floyd protests.

Of course, for Indigenous peoples, this is nothing new. Anytime Indigenous peoples in the United States have pushed for a more historically accurate telling of American history in respect to Indigenous nations and communities, they are often met with a variety of responses, none of which are good. The combinations and exact verbal permutations of these responses vary, of course, but these are the sort of "generic" responses that I've received in speaking on these topics:

"Why can't we have pride in our country's history without being made to feel bad or apologize for being Americans/settlers?"

"Native Americans lost, and histories are written by the victors, so get over it."

"You already get special treatment/free money/casino money/special rights, so why are you complaining?" (a particularly annoying one to me).

These sorts of responses betray a lack of understanding of the role of Indigenous peoples in American history and show a resistance to learning about these histories.

I argue that if these folks were to learn a bit more about these histories, it not only would chip away at many of the myths that have been built up in the ways that we have constructed American history, but it also would have profound implications for how settler Americans view Indigenous peoples' roles in contemporary American society.

Viewing Indigenous peoples as vibrant communities with long histories and possessing cultural and political sovereignty that extends to the present day makes it much tougher to view us as caricatures, as insulting sports team mascots or other stereotypical depictions.

A Standing Rock solidarity march in San Francisco to protest the Dakota Access Pipeline that would run through Sioux land, 2016.

It makes it tougher to justify extractive resource production and infrastructure such as mining and pipelines, especially those that run through reservations or even through land ceded by treaty. Just because a space isn't located within a reservation boundary doesn't mean that there aren't ongoing relationships between the land and Indigenous communities.

It calls into question the very nature of how many of the cities, towns, and settlements that make up the United States came to be on the land that they're on—were they truly created through the hard work and sacrifice of American forefathers and pioneers, as many people including Santorum claim?

Or are these places built upon stolen land, written into histories that erase Indigenous histories and whitewash the violence through which this country was created? And if this is truly the case, what obligations does the United States have to the tribal nations who call these lands home? Could it be that Indigenous political and cultural sovereignty could not only still exist, but do so in a vibrant and resurgent way?

September, 2021

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Suggested Reading

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Shoals of 'unsettlement': A review of The Black Shoals: Offshore Formations of Black and Native Studies by Tiffany Lethabo King

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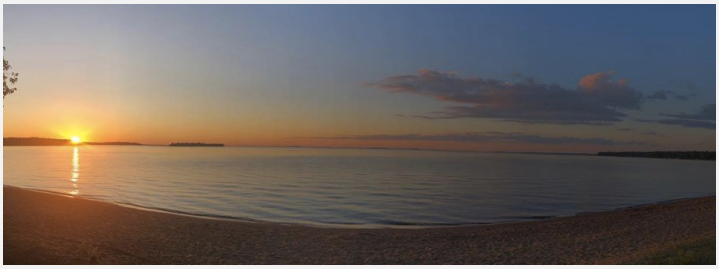

In the settler colony, what might it look like to draw together both Black Studies and Indigenous Studies in a way that can lead to new possibilities, new emergent properties, and a new path to view the ways that settler colonialism touches bodies and touches life within its histories and within its borders? In *The Black Shoals: Offshore Formations of Black and Native Studies*, Tiffany Lethabo King pulls the reader towards these possibilities through her articulation of how Black epistemologies meet Indigenous epistemologies in ways that unsettle how each is viewed in relationship to each other, as well as their entangled relationships to the multiple spaces of the settler colonial state.

King uses the idea of the shoal, its linkages to land and water, the connotations of the shoal within Black diasporic studies, and the very real definition of the shoal as an

ever-changing and unpredictable formation. By doing so, King re-orients us to the possibilities that come from bringing together Black and Indigenous Studies. She demonstrates that histories, geographies, and ways of being, are also unpredictable and shifting, yet are vital foci to bring together Black and Indigenous liberation within the settler colony.

Throughout the book, King does this in several effective ways. In one chapter, it is via the description of the 'errant grammars' that are used to describe and define Black and Indigenous bodies within the contexts of settler colonialism. In another chapter, it is through an interrogation of the ways that colonial cartographies inscribe Blackness and Indigeneity within given spaces. Another chapter explores the very 'fleshy'—to borrow a term from Povinelli (2002)—ways that slavery and colonialism touches the Black body, via the ways that fungibility, porosity, and indigo dye define and shape Black life on the plantation. In the concluding chapters, King explores the nature of Black-Native erotics and what this can create in the realm of Black-Native cooperation and shared liberation, leading to new forms of existence and being, intellectually, physically, and politically. King continually returns to the idea of shoals as zones of contact where these new forms of existence can spring forth, albeit zones that are constantly shifting and remaking themselves, unsettling conceptions of what they should be, but rather demanding our attention towards what they could be.

The time has never been more fortuitous to be engaging with the work that King presents in this book. There are clear and vocal conversations of Black fungibility—and liberation, driven by the deaths of George Floyd, Breonna Taylor (among others) and their accompanying protests. These exist alongside conversations of Indigenous visibility and sovereignty driven by events such as continued Indigenous resistance against pipelines, the recent *McGirt* court case, and increased pushback against Indigenous representation in settler colonial society (NoiseCat, 2020). Exhortations that Indigenous liberation in this settler colony can only exist alongside Black liberation continue to grow in volume, and in acceptance in both Black and Indigenous consciousness. Indigenous people are recognizing the undercurrents of anti-Blackness that have afflicted their communities and are confronting it. It appears that we may be headed towards, yet another shifting shoal, one that may promise liberation and vitality for all who are marginalized and oppressed.

In the process of writing this review, I have had the pleasure to discuss this work with several of my good friends and colleagues. Our shared excitement and desire to

engage with this book and its intellectual contributions was apparent. However, I quickly found that I was discovering a 'shoal' of our own with several of my colleagues regarding our thoughts on the role of Indigenous thought and epistemologies within the context of the book. Our conversations centered on whether or not Indigenous thought was being centered in the book or whether it lay more in the background, taking a backseat role to the admirable intellectual contributions of Black scholars such as Katherine McKittrick and Sylvia Wynter. It was not that there was a dearth of Indigenous scholarship—King skillfully tends to the work of Audra Simpson, Leanne Simpson, Kim TallBear, Eve Tuck, and more. However, we felt unsettled (no pun intended) in relation to the ways that Indigenous thought contributes to the 'shoal' and grappled with how to reconcile Black and Indigenous epistemologies in this inherently shifting context. I argue that this is the beauty of King's work—the point that she seeks to make is using the shoal as an object of inquiry is a re-positioning the ways that we do academic work in reference to the settler colony. In defining the intersection of Black and Indigenous Studies in the settler colony as another shoal that is shifting and remaking itself, she implores us to engage in some direly needed self-reflexivity.

To return to Chapter 1, King criticizes settler colonial studies as being white-dominated, and prone to viewing relationships in the settler colony as consisting of a settler-Indigenous dyad, erasing Black people from the narratives of violence and domination that underpin the very field. "The field of White settler colonial studies has yet to truly reckon with the ways that it erases Indigenous knowledge and forms of Indigenous politics of decolonization…Also, the field reproduces a rigid settler-Indigenous binary that erases Black people and anti-Black violence from its analytical frame," says King (2019: 66-67). I think that this is a powerful moment in King's narrative where settler colonial scholars are placed right on a shoal and may not even realize it—we are viewing the very unsettlement of settler colonial studies. What is to be done? In order to move forward, one might have to literally backtrack. King's work provides us with a potential roadmap towards an alternative viewing of the relationship between the settler colony, Black people, and Indigenous peoples—what King terms 'black vernaculars/grammars of conquest' and Indigenous feminist scholarship. This couches inquiry into settler colonial violence within the lived experiences of the very groups that have been targeted and are continued to be targeted, rather than from the gaze of the settler themselves.

I view King's book as an open invitation for us as Indigenous scholars to dismantle the myopic settler-Indigenous dyad that is endemic in settler colonial studies, and to

recognize and embrace the possibilities that can spring forth in the contact zones between Indigenous scholarship (especially Indigenous feminist scholarship) and Black scholarship and epistemologies. It is not up to the settler to define this relationship, but it is up to Black and Indigenous scholars and people, coming together to create new possibilities and new ways of knowing. Rather than viewing the 'shoal' as a zone of uncertainty, we must view its unsettled quality as intrinsically important to unsettling the very intellectual theories and canons that define our existence in this settler colony. At this moment when the prospects and possibilities of Black and Indigenous liberation are closely tied together, the shoal that is being constructed is itself an emergent property that we must do our part to help shape. Although we may not know what will ultimately come of our work, we can take hope in knowing that it will ultimately be better than what came before, as we work to dismantle settler colonialism and its futurity.

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Guest Editorial

George Floyd, Minneapolis, and spaces of hope and liberation

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It scarcely needs to be said that the murder of George Floyd at the hands of former Minneapolis police officer (and convicted felon) Derek Chauvin in late May 2020, and the accompanying protests and resistance that followed both in Minneapolis and around the world, was momentous for many people, myself included. Out of all the events that could have happened in the home stretch of writing my doctoral dissertation, seeing my home city become the latest focal point of police violence, brutality, and resistance was perhaps the last thing that I expected.

For days after Floyd's killing, my attention was firmly planted on home—I will openly admit that not a lot of dissertation work got done during that period, but how could I focus on my dissertation at a time when the convergence of spatial affect informed by childhood memories and a healthy dose of homesickness was particularly potent for me?

After all, George Floyd lost his life in front of a neighborhood convenience store that I had passed by many times as a young child growing up in South Minneapolis—it's within a six-block radius of many of my childhood spaces, including my old elementary school and several apartment buildings that I lived in as a young child. The protests in front of the Fourth Precinct and its immediate vicinity occurred in the same spaces that my parents and I would visit for grocery shopping, or a trip to the nearby Target. Young Deondre likely looked at the police precinct building on one of these trips and then probably looked away, not giving it a second thought—the next time I happen to go past that space, I will know better.

The events made me feel concern and worry for the many members of my family that still call Minneapolis home. All of this was amplified by the fact that due to the ongoing COVID-19 pandemic, I simply could not return home to be with the friends and family whose emotional and physical well-being were at stake.

In Ohio and online, friends and colleagues expressed solidarity and support when I expressed my distress—'We are surprised that something like this would happen in Minneapolis of all places', they would say to me. Of course, others, particularly social media-savvy suburban Minnesotans, would attribute the protests to the inherent 'dangerousness' of Minneapolis, and another example of why it should be avoided. As a geographer and a Minneapolitan of color, it is clear to me that this is indicative of the ways in which we inscribe certain spaces as 'safe' or 'dangerous' based on conditions such as police violence, and the ways in which, in the case of Minneapolis, such violence makes itself felt upon

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space in both spectacular and quotidian ways (Smiles, 2018).

Of course, Floyd's death is not the first time that Minnesota or the Twin Cities have gotten in the news for the death of a Black man at the hands of the police. The death of Philando Castile in 2016, as well as the very recent death of Daunte Wright in the Minneapolis suburb of Brooklyn Center (another familiar space from my childhood), are other moments that have grabbed the nation's and the world's attention—particularly since Wright's death occurred during the trial of Derek Chauvin. However, people from outside of Minnesota are often surprised when I and other Black, Indigenous, and other Minnesotans of color mention that these supposedly 'spectacular' moments of police violence are simply footnotes in a larger history of segregation and state violence that extends back to the early histories of the settler colony known as Minnesota.

The Twin Cities have always been fraught spaces for people of color. For example, rising Indigenous populations in the Twin Cities due to processes of relocation from rural Minnesota and other places in the Midwest after World War II led to increased friction between Indigenous peoples and police, with Native community members forming the American Indian Movement in 1968 in response to police brutality (D'Arcus, 2010). In regard to Black Minnesotans, Minneapolis and St. Paul were among the most segregated cities in the United States, on par with cities in the Jim Crow South, but with the protection of the historical veneer of Minnesota as a Northern state without statewide *de jure* segregation (University of Minnesota, 2020). Racial covenants and redlining ensured that White Minnesotans were the only ones allowed to live in desired neighborhoods (Miller, 2020; University of Minnesota, 2020). The historical Black neighborhood of Rondo in St Paul went under the bulldozer in the 1960s, as Interstate 94 carved a concrete and asphalt cavern right through the middle of the city. Riots such as the one that occurred along Plymouth Avenue in 1967 led to increased disinvestment in parts of Minneapolis itself and white flight toward increasingly segregated suburbs (Einhorn and Chiwaya, 2016; Eligon, 2016).

Even in the parlance of everyday Twin Cities denizens, racialized spaces take on coded meanings about their safety or non-safety. Let's take Minneapolis as an example: areas of the city and place names such as southwest Minneapolis, Prospect Park, Uptown, 'Nordeast' Minneapolis, and '50th and France' suggest safety, vibrancy—these are also very white spaces, both historically and contemporaneously through processes of gentrification. Places such as North Minneapolis, parts of South Minneapolis, West Broadway, Little Earth, Lake Street, and Cedar-Riverside often have subtle connections with danger, crime—these are the places you don't want to be after night, as so many suburbanites and well-to-do Minneapolitans will likely tell you. They also happen to be spaces that have large proportions of Black and Indigenous residents. They grapple with fraught relationships with the police and continued disinvestment and neglect by city leaders (Chapman, 2021). To take a different analysis of Achille Mbembe's (2003) idea of *necropolitics*, these are the spaces where death is acceptable in the eyes of the state, both through political and economic disinvestment as well as shootings (police-related and otherwise) and other forms of violence. The Minneapolis Police Department figures heavily in this maelstrom of state violence and necropolitics—for example, Black Minneapolitans are far more likely to be stopped, arrested, or subject to force than White Minneapolitans, despite only making up about 20% of the city's population (Beer, 2020; Furber et al., 2020).

Motivations for the protests that arose surrounding George Floyd's death (and recently with Daunte Wright's death) will likely vary depending on who you ask and the spaces they inhabit. As I mentioned earlier, many of my suburbanite associates, as well as the typical denizens of social media posts surrounding the protests, chalked up the protests to being merely 'riots', acts of violence carried out by 'thugs' who simply wanted to take advantage of the situation to steal, smash, and burn. *Of course*, protests took place where they did, people would say—those neighborhoods were already dangerous, and the protests simply reinforced that.

However, to many others, myself included, the protests were another example of the ways in which

Figure 1. Memorials at George Floyd Square, May 2021 (Photo Credit: Author).

spaces of state violence can be remade into spaces of hope, liberation, and the possibility of a better future. This work isn't new in Minneapolis. For example, Tia-Simone Gardner (2021) presents tiny homes as an example of the ways in which Black Minneapolitans may be able to achieve broader home ownership in a gentrified and de facto segregated city. Despite the inherent risk of being yet another example of Black fugitivity due to the access and mobilities that they might provide, tiny homes also represent the creation of what Gardner describes as 'workable' architectural geographies that present alternative futures to capitalism and gentrification (Gardner, 2021).

What has happened in Minneapolis surrounding George Floyd's death, and what has happened in places like Brooklyn Center, Ferguson, Washington, DC, and countless other places where collective anger has taken to the streets to protest police violence also represents a challenge to the continued marginalization of Black, Indigenous, and other spaces of color through disinvestment and neglect by the state. Minneapolitans of color, and to be quite frank, people of color in cities across the United States, are not content with the status quo. To me, they are building upon what scholars such as Beth Rose Middleton Manning (2019) have described as 'geographies of hope', and what other scholars such as Adam Bledsoe and Willie Jamaal Wright (2019) describe as the pluralities of Black geographies. Although they draw on different situated knowledges—Middleton writes about this in contexts of repatriation of Indigenous remains while

Figure 2. 'Where There's People There's Power' at George Floyd Square, May 2021 (Photo Credit: Author).

Bledsoe and Wright are writing about the various spatial articulations and re-articulations of Black expression and resistance—I feel that questions of hope, healing, the possibility of a brighter future, and the ways in which these concepts intertwine with space have just as much applicability to the living. In this case, through the 'spectacular' act of protest and collective resistance, people are pushing toward a future where the 'quotidian' is no longer tinged with necropolitical violence at the hands of the police. They refuse to allow spaces of violence and death to remain as such—they instead become spaces of hope and liberation.

At the time of writing this editorial, I did finally make it back home to Minneapolis to visit family, in early May 2021. As a part of my visit, my wife and I took some time to visit George Floyd Square, and the place where Floyd was killed. We parked our car a block away from the intersection of 38th and Chicago/George Floyd Square, as the intersection/square itself is blocked off to traffic. In the square was a series of memorials, including a sculpture of a raised fist, a large painting of George himself, and, of course, flowers and other mementos at the exact location where Derek Chauvin killed George Floyd in front of Cup Foods (Figure 1). A gas station across the street was covered in art, including a large slogan on a canopy: 'WHERE THERE'S PEOPLE THERE'S POWER' (Figure 2). On that Sunday morning, only a few people were there, and worship music filled the air from an outdoor service carried on at a church on another side of the intersection.

I am still grappling with the emotions of being back home and being in that space, but one feeling that did come to the fore and has stuck with me is a feeling of hope in the work that folks in Minneapolis and across the country are doing to reshape the spaces that surround them into spaces of life. I refuse to subscribe to the sentiment which some politicians have expressed that George Floyd's death is a form of noble sacrifice that has opened our eyes to the realities of police violence and racial inequality in the United States. For Americans of color, we've always had our eyes open to these things. I'd like to believe that the work that is being done through organizing, protesting, and building consciousness and awareness of these issues is not in response to some 'sacrifice', but it is instead building toward a potential future where killings such as what happened with Philando Castile, George Floyd, Daunte Wright, Breonna Taylor, Botham Jean, and many others do not need to occur at all. As a Black and Ojibwe geographer who studies the political possibilities that can come out of forms of resistance, especially everyday resistance, I am still confident that these things can help point the way forward toward a liberatory future.

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