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RESEARCH ARTICLE

Governing water insecurity: navigating indigenous water rights and regulatory politics in settler colonial states

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ABSTRACT

Indigenous peoples experience water insecurity disproportionately. There are many parallels between the injustices experienced by racialized and marginalized populations and Indigenous peoples. However, the water insecurity experienced by Indigenous peoples is distinctly shaped by settler colonialism. This article draws on examples from Canada and the United States to illustrate how jurisdictional and regulatory injustices along with the broader political and economic asymmetries advanced by settler colonial States (re-)produce water insecurity for Indigenous peoples. We conclude by engaging with how Indigenous peoples are pushing back against these arrangements using State and non-State strategies by revitalizing Indigenous knowledge and governance systems.

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Introduction

Indigenous peoples[1] in settler colonial countries such as Australia, Canada, New Zealand and the United States experience acute disparities concerning drinking water insecurity (Arsenault, 2020; Awume et al., 2020; Henwood et al., 2019; Latchmore et al., 2018; Mitchell, 2019).[2] In Canada, the First Nation drinking water crisis is considered to be among the most pressing policy issues, where approximately one-third of First Nations peoples living on reserves face health threats from high-risk water systems (McGregor, 2014). There are presently 57 long-term drinking water advisories in effect in 39 First Nation communities (Indigenous Services Canada, 2021). Some of these advisories date as far back as 1995, such as Shoal Lake First Nation, meaning that many community members have grown-up without ever having access to clean, safe drinking water. Likewise, Indigenous peoples in the United States face water insecurity stemming from disputes over rights and jurisdiction, inconsistent regulation, lack of dependable infrastructures, and scarcity due to climate change (Conroy-Ben & Richard, 2018; Cozzetto et al., 2013; Cummins et al., 2010; Mitchell, 2019). In the United States, 5.8% of Native American households lack complete plumbing. As a result, Native American households are 19 times more likely than White households to lack indoor plumbing (Roller et al., 2019). Water insecurity has made Indigenous peoples in Canada and the United States

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more vulnerable to COVID-19 transmission. The Navajo Nation, where co-authors Andrew Curley and Teresa Montoya are situated, is among the hardest hit tribal nations in the United States.

In this paper we examine the ways that settler colonialism (re)produces water (in) security for Indigenous peoples.[3] Following Wilson et al. (2019), we argue that water insecurity frameworks must be reimagined to account more fully for Indigenous water relationships and to acknowledge settler colonialism as a root cause. To support this, we present case studies of water insecurity for Indigenous peoples in two settler colonial States[4]: Canada and the United States. In the Canadian example, which discusses the 'First Nation water crisis', we link water insecurity to historical and ongoing processes of dispossession through the legal instruments of treaties and legacies of resource development that contaminate water sources and alter river flows. In the United States, we examine the specific regulatory and legal practices between Arizona and the Navajo Nation to identify logics of 'colonial enclosure' (Curley, 2019a) and 'permeability' (Montoya, 2019) that contribute towards ongoing water insecurity for Diné communities. Overall, we find that regulatory and jurisdictional injustices and the broader political and economic asymmetries advanced by settler colonial States are at the root of water insecurity for Indigenous peoples. We also highlight the ways Indigenous peoples resist and work through these arrangements using a variety of State and non-State strategies, largely rooted in the revitalization of Indigenous knowledge and governance systems. Before turning to our case studies, we highlight our collective positionality and engage in further theorization related to water insecurity, settler colonialism and the State.

Positionality

We are four early-career academics of both Indigenous and settler origins who study Indigenous water governance and politics. Nicole Wilson is a scholar of settler origin born in Calgary, Alberta (Treaty 7 territory), Rachel Arsenault is Ojibwe and Odawa from the Wiikwemkoong First Nation, and both Teresa Montoya and Andrew Curley are Diné and members of the Navajo Nation. Reflexivity regarding our identities is fundamental to our shared perspectives on the topic of water relations, security and governance as well as inspiring our continuous efforts.

Indigenous peoples, settler colonialism and water insecurity

Mirroring the broader water insecurity literature, research about Indigenous peoples has often focused on the material dimensions of household water insecurity including water access, quantity, quality and affordability (Goldhar et al., 2013; Medeiros et al., 2017; Wright et al., 2017). As Jepson et al. (2017) note, such framings, while important, fail to account for the influence of water–society relationships on water insecurity. This includes the complex and diverse ways that water is accessed, valued and governed as well as the socio-political structures and processes that shape these relationships (Linton, 2010). Accordingly, uneven power relations in water governance and politics play a critical role in shaping water insecurity and well-being (Miller et al., 2020). Water insecurity frameworks must account for the ways that water links Indigenous bodies to settler colonial infrastructure and governance systems (Latchmore et al., 2018; Mitchell,

2019; Wilson & Inkster, 2018). To achieve this, we engage with scholarship from the fields of Indigenous water governance and politics as well as critical Indigenous studies.

Scholarship on Indigenous water governance and politics highlights how the expansion of settler colonial States was, and continues to be, tied to the dispossession of Indigenous peoples through mechanisms that include policy and law, ideology, and discourses about identity (Curley, 2019b; Daigle, 2018; Montoya, 2017; Todd, 2018; Yazzie & Baldy, 2018). Indigenous water governance tends to centre on the understanding that water is a more-than-human person or a living entity to which there are relational responsibilities, a principle central to Indigenous sovereignty, livelihood and survival (e.g., Craft, 2018; McGregor, 2014). In contrast, settler colonial water governance is rooted in Modern water – a concept used to describe frameworks that view water as a solely material substance or commodity, something quantifiable, manageable and ultimately available for unsustainable human use (McGregor, 2014; Wilson & Inkster, 2018). These modernist ideas of water, which are at the root of settler colonial State water governance, impose significant ontological and material violence on Indigenous peoples as they permeate water law, infrastructures, and assessments of water insecurity and risk, to the exclusion of Indigenous cultural, spiritual and physical health as well as the health of water itself (Wilson et al., 2019; see also Meehan et al., 2020).

Critical Indigenous scholars raise concerns about the nature of the settler colonial States, which have implications for water insecurity. Colonial understandings of sovereignty and jurisdiction assume that States alone exercise the final authority over a given territory. Indigenous studies scholars continually encounter this assumption, despite the recognition that increasing connections between domestic and international politics makes absolute sovereignty a myth (Barker, 2005). For Indigenous nations in the United States and Canada, discourses of sovereignty are tied to notions of self-determination and decolonization – although 'sovereignty' is sometimes questioned regarding its 'appropriateness' due to its inherent limitations as implemented by settler States (Barker, 2005; Nadasdy, 2017).

Indigenous governance systems and legal orders pose existential threats to the legitimacy of settler States (Reo & Whyte, 2012). While settler States consider individual Indigenous people as citizens, Indigenous peoples identify as nations whose territories have been colonized and dispossessed by these States and who nonetheless continue to assert their self-determination. The tension between these positions creates a contradiction in the direction of water politics and governance between the settler State and Indigenous nations. On the one hand, the State works to limit Indigenous peoples' collective water rights while, on the other, expanding individual water access in limited and piecemeal ways. This continued environmental injustice plays out across the continents and between settler and Indigenous communities. The Dakota Access Pipeline (oil), among other infrastructure projects, threatens the water security of the Standing Rock Sioux Tribe (Estes, 2019; Gilio-Whitaker, 2019). The Atlantic Coast Pipeline (natural gas) threatens the Black River, a source of water and identity for the Lumbee Nation (Emanuel, 2019).[5] Beyond access to clean water enabled by infrastructure, Potawatomi scholar Kyle Whyte (Whyte, 2018) argues that settler colonial governance fundamentally disrupts Indigenous ecologies and relationships with the land and water, undermining Indigenous notions of collective continuance.

Indigenous scholars in Canada have articulated a politics and practice of resurgence that prioritizes Indigenous governance traditions over State recognized tribal

governments (Alfred & Corntassel, 2005; Dorries et al., 2019). Yellowknives Dene scholar Glen Coulthard (2014) argues that the process of recognition requires Indigenous nations to alter practices and understandings of human and non-human relationships with land and water in ways that perpetuate dependent and reactionary Indigenous–State dynamics. In such a view, settler colonial States work in opposition to Indigenous peoples and their governance systems. Critiques of State recognition raise important issues about the need to develop Indigenous governance alternatives without dependence on or reference to States and their associated agendas (Coulthard, 2014; Simpson, 2017).

Others note the utility of critiquing recognition politics while simultaneously working to build Indigenous alternatives (Dennison, 2012; Simpson, 2014). Kahnawake Mohawk scholar Audra Simpson develops the concept of 'nested sovereignty' to discuss how 'sovereignty may exist within sovereignty. One does not entirely negate the other, but they necessarily stand in terrific tension and pose serious jurisdictional and normative challenges to each other' (2014, p. 10). Thus, Indigenous nations work through and against these structures with their pre-existing forms of governance that maintain relationships with the other-than-human world, including water (e.g., Craft, 2018; Ladner, 2014; Stark, 2010). These forms of resistance often involve multiple State and non-State strategies to assert their sovereignty and responsibilities to water (Curran, 2019; Wilson, 2019).

Recent scholarship in critical Indigenous studies and Indigenous water governance identifies the need to rethink the role of settler colonial States in both managing and perpetuating issues of water security for Indigenous peoples. In particular, we engage with this literature to highlight the idea that Indigenous peoples have a very different relationship with settler colonial States, as sovereign nations rather than citizens of States. In failing to acknowledge Indigenous sovereignty, water insecurity frameworks risk insinuating a relationship with the State that is paternalistic and colonial. Here, States are considered to have a fiduciary and legal responsibility to secure water for Indigenous peoples – one that it never fulfils. Likewise, there are similar critiques of (neo-)liberal States concerning water insecurity faced by poor and racialized communities (Meehan et al., 2020). Subsequently, we use case studies from Canada and the United States to explore how settler colonial laws and epistemologies continue to shape experiences of water insecurity for Indigenous peoples. In doing so we ask what we can learn from the ways that Indigenous peoples are resisting settler colonial injustice to achieve water insecurity in their nations and communities.

Case studies

In this section we discuss two case studies of the First Nation drinking water crisis in Shoal Lake First Nation and Water insecurity in the Navajo Nation. Through these case studies, we trace the ways that settler water governance shapes water security including jurisdictional and regulatory arrangements governing drinking water (Figure 1).

Case study 1: First Nation drinking water crisis

In Canada, First Nations people living on State-recognized 'reserves', often within the traditional homelands of these nations, face serious and prolonged drinking water and sanitation issues – collectively termed 'the First Nation water crisis' (Arsenault, 2020;

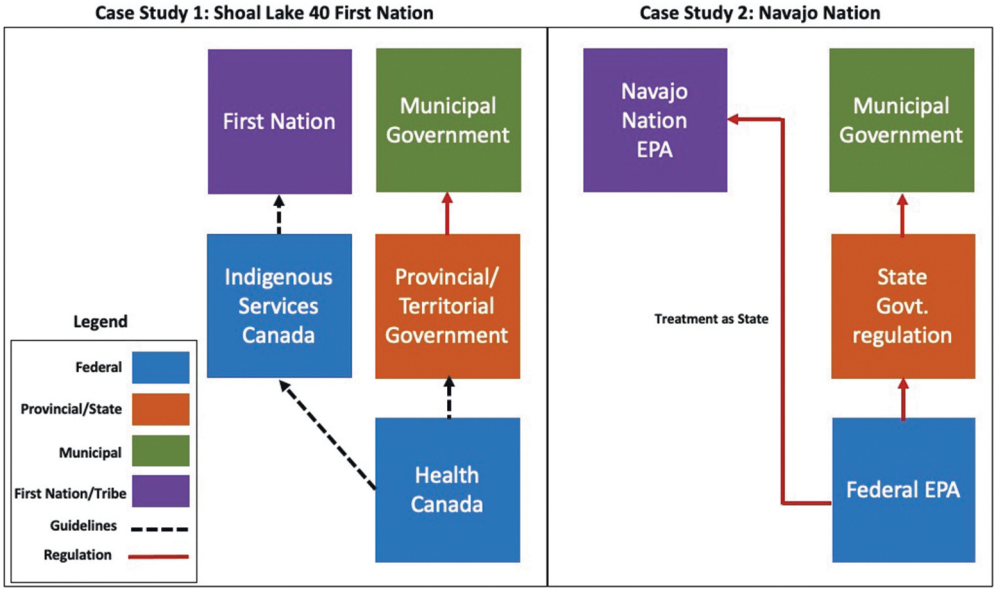

Figure 1. Drinking water security for Shoal Lake 40 First Nation and Navajo Nation are both shaped by settler colonial water governance structures. In the former, the First Nation drinking water crisis is, in part, a product of regulatory gaps where drinking water regulations, which are a provincial authority, do not apply on reserves. Navajo Nation, through 'treatment as state' provisions, has the recognized authority to create and enforce drinking water regulations, yet as our case study shows, this is not adequate to address drinking water insecurity.

Human Rights Watch (HRW), 2016). A National Assessment of First Nations Water and Wastewater Systems, conducted in 2003 and 2011, revealed that high-risk water systems – defined as those with major deficiencies – pose a significant risk to water quality and threatens the health of one-third of First Nations people living on reserves (McGregor, 2014). For decades, First Nations have lacked the same access to water for drinking and sanitation that is enjoyed throughout the rest of Canada (Arsenault, 2020; Awume et al., 2020). In some communities, rashes have appeared on children from bathing in contaminated water, while other communities have had their water systems degrade from 'boil water advisory' status to 'do not consume' advisories (Arsenault, 2020; HRW, 2016). In 2016, Human Rights Watch documented the impacts of serious and persistent drinking water and sanitation problems for the thousands of First Nations people. The findings of a 2016 report detailed a range of issues contributing to the crisis, such as a lack of water quality regulations, inadequate funding, infrastructure deficits and poor source water quality (HRW, 2016).

Shoal Lake First Nation (Shoal Lake No. 40) – located on the border of Manitoba and Ontario, Canada – has been dealing with numerous challenges since 1919 when the Canadian government built an aqueduct for the growing city of Winnipeg, Manitoba (HRW, 2016). The aqueduct provided clean water to the settler community and dispossessed the Anishinaabe people of Shoal Lake of their land (Perry, 2016). The community, which had been located on been a peninsula before the aqueduct was built, was transformed into a man-made island. This effectively isolated the community and resulted in

hazardous travelling conditions to the mainland (Perry, 2016). Furthermore, the side of the lake from where the community drew their water became heavily contaminated in the decades that followed. In 1995, Shoal Lake received a new water treatment system, but due to design flaws, the community was again placed on a boil water advisory in 1997 (HRW, 2016). Despite the renewed boil water advisory, the Manitoba government stated that Shoal Lake had been adequately compensated (Perry, 2016). In June 2019, the 'freedom road' reconnected the community to the mainland through the construction of an all-season road, making it possible for their critical infrastructure needs to be met. A new water treatment plant is currently under construction at Shoal Lake. While the project was slated to be completed in December 2020, as of February 2021 it is still listed as under construction.

Water insecurity is interconnected with other systemic inequalities faced by First Nations. The reports for both the inquest into the deaths of seven First Nation youth in Thunder Bay Ontario (between 2000 and 2011) and the nationwide *Inquest into Missing and Murdered Indigenous Women and Girls* list a lack of access to clean drinking water, along with other along with other basic services and infrastructures, as factors that contribute to the vulnerability of First Nations peoples. In this sense, the First Nation drinking water crisis can be seen as one of the many systemic inequalities that contribute to the vulnerability of First Nation youth and Indigenous women, girls, and Two-Spirit and transgender people (Arsenault, 2020; National Inquiry into Missing and Murdered Indigenous Women and Girls, 2019; Ontario Ministry of the Solicitor General, 2016). These deficits exacerbate other risks facing First Nations such as the COVID-19 pandemic, where access to water for handwashing is essential. While water (in)security affects the ability of Indigenous peoples to meet their needs, it also highlights the common roots of these disparities and the systemic inequalities created through settler colonial policies.

The First Nation drinking water crisis is a direct result of Canada's fragmented and colonial water governance system, where federal, provincial and municipal governments claim different scales and kinds of authority over water. While provincial governments are largely responsible for freshwater and delegate drinking water to municipalities, the federal government has a responsibility for drinking water on First Nation reserves. The Indian Act of 1876 governs a broad range of issues (e.g., registration for Indian 'status', governance, land use, healthcare and education) relating to Indian reserves and Indian 'bands'. Furthermore, Section 91(24) of Canada's Constitution Act (1867) allocates Indigenous issues to federal (rather than provincial) governments. Despite never having been ceded, the Canadian Constitution Act (1982), which divides responsibility for water between the federal and provincial and territorial governments (Boyd, 2003), is silent on the matter of Indigenous water rights and authorities. Whereas Section 35(1) recognizes and affirms Aboriginal and treaty rights, to date, the question of whether water is included within Aboriginal title remains outstanding and has yet to be settled by the Canadian courts (Phare, 2009).

In response to the First Nation drinking water crisis – the federal government increased investments and launched a First Nation Water Management Strategy (FNWMS) in 2003 (McGregor, 2014). While the strategy came with a C$600 million budget that would be allocated over several years, only 67% of this budget made it into First Nation communities with the rest funding the implementation efforts of the federal

government and First Nation organizations assisting these communities (McGregor, 2014; Phare, 2009). The budget seemed like a significant investment, but Phare (2009) reports findings from the Assembly of First Nations (AFN) to indicate that First Nations were only receiving half the funding that municipalities received for the same water treatment services. Furthermore, First Nations only receive 80% of the funding required to operate and maintain their water systems, leaving many already impoverished communities to come up with the remaining 20%. Water systems in communities who are unable to fund their portion routinely fall into disrepair resulting in boil water advisories and shorter than intended infrastructure life spans (Arsenault, 2020; HRW, 2016).

The Safe Drinking Water for First Nations Act (SDWFNA) provides another example of the failed approaches to addressing water insecurity among on reserve First Nations. The goal of the SDWFNA was to enable the Canadian federal government to develop enforceable water regulations and ensure access to safe, clean and reliable drinking water on reserves. The federal government introduced the SDWFNA in 2013, which was met with significant opposition from First Nations. Critiques related to a lack of consultation with First Nations, ambiguity around who would hold legislative authority and concerns that parts of the SWFNA conflicted with treaty rights. Furthermore, there were concerns that the SDWFNA would shift liability for drinking water issues to First Nations, without a commitment to building First Nation capacity through funding, training or otherwise (Arsenault, 2020; AFN, 2017; McGregor, 2014). While the SDWFNA had undergone significant amendments since the first version was drafted in 2008, it continues to face opposition. For instance, Chiefs of Ontario (COO) stressed that the bill violates treaties and is unconstitutional as it 'permits the abrogation and derogation of constitutionally protected Aboriginal and Treaty rights' (COO, 2013, pp. 2–3). Despite these objections, the SDWFNA was passed into law.

Water insecurity for First Nations is often treated as a technical rather than a political problem. However, we link water insecurity to historical and ongoing processes of land dispossession through the legal mechanisms of treaties and legacies of resource development that contaminate water sources and alter river flows. Canada's federal government has devolved administrative responsibility for many social services to First Nations on reserve, but federal funds remain the primary source of revenue for most communities. First Nations chiefs and councils provide services and even own and operate water and wastewater systems on reserve (HRW, 2016). Their power to govern, however, is significantly limited by the far-reaching role of the federal government as dictated by the Indian Act. As Cree scholar Kiera Ladner (Ladner, 2014) points out, many within First Nations critique The Indian Act as a form of 'political genocide', or policies and practices that were designed to eliminate Indigenous sovereignty and governance systems and replace them with '"civilized" governance'. Mushkegowuk (Cree) scholar Michelle Daigle (2018, p. 162), emphasizes the need to situate 'drinking water issues within structural colonial legacies and continuities such as the Canadian government's ongoing disinvestment in infrastructure within Indigenous communities'. Indeed, two decades of federal audits show a pattern of 'overpromising and underperforming' with water infrastructure on reserves (HRW, 2016).

Addressing the root causes of water insecurity in Canada involves the assertion of Indigenous peoples' inherent rights to water. Indigenous peoples across Canada are asserting their water rights and responsibilities to protect water using a variety of

approaches such as water declarations, policies and the revitalization of Indigenous law (e.g., Craft, 2018). The AFN water strategy states:

> First Nations inherent right to self-government extends to our right to manage and govern our waters. We have a right to make our own water and environmental laws and to practice our customary and Indigenous legal orders. Many First Nations live without sufficient water allocations and suffer frequent infringements on their Aboriginal and Treaty rights to water. (AFN, 2013)

Concerning drinking water, the AFN is seeking to co-develop legislation to repeal and replace the SDWFNA (AFN, 2017). Since the spring of 2019, the AFN is leading an engagement process in partnership with Indigenous Services Canada to co-develop options to address First Nations concerns about the SDWFNA in ways that align with First Nation water rights and responsibilities referenced above (Indigenous and Northern Affairs Canada, 2019). While the Government of Canada has stated it will work in full partnership with First Nations to advance 'options', the Act has not yet been repealed or replaced.

Case study 2: Water insecurity and colonial enclosures in the Navajo Nation

Like the previous case study in Canada, we contend that water insecurity is an outcome of settler colonial governance, capitalist development and privileging of colonial epistemologies to the detriment of Indigenous nations and communities. In this second case study we illustrate how water insecurity for the Navajo Nation is evident in unequal infrastructure that diverts resources to urban cities, disproportionate access to clean water sources stemming from a legacy of toxic extraction in the region, and extreme drought driven by accelerated climate change.

In the United States and Canada, Indigenous water rights conform to colonial water laws, what Andrew Curley refers to as a form of 'colonial enclosure' (Curley, 2019a; see also Curran, 2019). In western states and provinces, these laws are based on legal concepts like 'prior appropriation' and 'first in use, first in right' (McCool, 2006). In the United States, the Bureau of Reclamation and Army Corps of Engineers competed to dam the rivers of the west and secure water for White settlement. The denial of Indigenous water rights accompanied westward expansion and the development of 'the sunbelt' in Arizona, California and Nevada.

With White immigration into Diné and neighbouring tribal homelands, the federal government and state governments needed to secure perennial water sources to fulfil development ambitions. Water was ontologically rendered into a commodity, something quantifiable, exchangeable and ultimately accountable (Yates et al., 2017).

The Colorado River is one of the most important and politically contentious rivers on the continent. In the Colorado Compact of 1922, the seven Colorado River basin states (Arizona, California, Nevada, Utah, Wyoming, Colorado and New Mexico) divided the entirety of the river and its tributaries, excluding Indigenous nations that had relied on it for generations. Today, Indigenous water claims in the West are determined largely in the form of water settlements – modern forms of treaties between tribes and states.

In 2010, for example, the State of Arizona and the Navajo Nation negotiated the final terms for the Little Colorado River and the Colorado River. The settlement, called 'the

Lower Basin River Settlement', encompassed both rivers and stipulated that the Navajo Nation would not contest existing dams and diversions upstream. In exchange, the Navajo and Hopi nations requested an expansive water infrastructure project connecting water from the Colorado River to the Hopi reservation, located geographically in between the Navajo Nation. This was a western water pipeline, slated at US$800 million. Before this negotiation could proceed, former Arizona Senator Jon Kyl removed the water supply project, arguing its inclusion was 'too expensive for taxpayers'. To this day no project is forthcoming and water infrastructure is left in a lacklustre status.

As this failed negotiation demonstrates, structural violence is perpetuated by political difference-making that emerges over time and in different forms, first as neglect of infrastructure, then as a pandemic hotspot. These problems compound the burden of ongoing settler colonialism through biopolitical regimes of water rights, water law and water infrastructure. These racialized legal frameworks are likewise reflected in regulatory politics for the environment and water.

According to a recent study, 'Native American'[6] households are 19 times more likely than White households to lack indoor plumbing (Roller et al., 2019). Disparities in access to and regulation of safe drinking water are associated with health disparities for tribal and other vulnerable populations (Doyle et al., 2018; VanDerslice, 2011). Such statistics suggest that environmental regulations are unevenly applied along racial and class lines and, as such, are often unclearly defined in enforcement (Pellow, 2000).

In the Navajo Nation, an estimated 40% of Navajo tribal members rely on hauling water for domestic use, at costs up to 20 times more than non-Navajo water users in surrounding areas (Deitz & Meehan, 2019; Navajo Department of Water Resources (NDWR), 2003). To mitigate costs associated with travel or water purchase, many Navajo families resort to using local unregulated water sources such as 'livestock only' wells that often contain excessive quantities of contaminants and pathogens. Studies undertaken by Diné scientists have revealed concerning levels of uranium and arsenic in these unregulated water sources (Credo et al., 2019; Ingram et al., 2020).

The persistent presence of heavy metal contamination follows a history of rampant resource extraction within and adjacent to current reservation boundaries. From 1944 to 1986, the Navajo Nation was the site of the largest production of domestic uranium in the burgeoning military–industrial complex in the United States. Because of this wanton development, there are currently over 500 abandoned uranium mines (AMUs) within the Navajo Nation – a region that extends 27,000 square miles across the current states of Arizona, New Mexico and Utah. Though the Navajo Nation issued a moratorium on uranium mining on reservation lands in 2005, the toxic legacy of these extractive practices remains in the form of groundwater contamination. The digestion and inhalation of heavy metals are directly correlated to deleterious health outcomes, such as kidney and cardiovascular disease, neurocognitive disorders, hypertension, and increased incidence of cancer (Lewis et al., 2017). Since 2008, the EPA has entered into 'five-year plans' with the Navajo Nation to remediate the most contaminated mine sites, but to date most of them have yet to be cleaned up. As of 2019, there are approximately 524 uranium mine sites, with only 219 sites having funds available for clean-up efforts, leaving a total of 305 sites left to be remediated (Navajo Nation Office of the President and Vice President, 2019).

Although several environmental regulations were passed in the early 1970s, including the Clean Water Act of 1972 and the Safe Drinking Water Act of 1974, the application of these provisions has proven less straightforward for tribal nations. Not until 1987 did Congress amend the Clean Water Act to allow tribes with 'treatment as states' (TAS). With this designation, tribes can develop environmental standards if the minimum federal standards are met or exceeded – just as states must ensure these benchmarks when they apply for primary enforcement responsibility (known as 'primacy'). For many tribes, these standards are often more stringent than adjacent or overlapping state jurisdictions as they can consider specific cultural and/or ceremonial concerns not included within federal water standards (Diver et al., 2019; Galloway, 1995; Grant, 2006), not to mention concerns about environmental contamination posed by the disproportionate number of toxic discharges on reservation land. As of 2019, an estimated 44 tribal nations have taken advantage of the TAS policy to enact their own environmental standards (Diver et al., 2019). The Navajo Nation Safe Drinking Water Act (NNSDWA), for instance, was initially adopted by the Navajo Nation Council in 1995 and followed by revisions in 2001 specific to public water systems and other reporting and certification requirements. The US Environmental Protection Agency (EPA) granted TAS designation in 2006 which allows the Navajo Nation Water Quality Program to enact and regulate its own water quality standards within tribal territories.

The ability of the Navajo EPA to enforce regulatory standards, however, is limited by its jurisdiction across discontinuous non-Native land parcels and individuals within the geographical boundaries of the reservation (Brockman, 1992). Large areas of the Navajo Nation are so-called 'checkerboard' lands, owing to the 19th federal land allotment programmes that dispossessed Diné people of their ancestral territories following the establishment of the railroad (U.S. Department of Interior, 2019). Today remnants of this settler colonial system of land privatization continue to limit the exercise of Navajo sovereignty and jurisdiction. As a default, parcels located in between but not a part of the reservation that is classified as 'Indian country' fall under the regulatory authority of the EPA. Yet there is precedent for state disputes over these classifications and clarity over which regulatory authority maintains primacy remains elusive in several instances. For example, in 2015, Navajo residents living in the community of Sanders, AZ – a 2.4 square mile census designated place surrounded by but not a part of the Navajo Nation – were notified about exceedances of uranium in their community water system following an independent study conducted by Diné environmental science researcher Rock (2017). His research found several water sources along the Puerco River exceeded the federal maximum contaminant level (MCL) of 30 μg/L for uranium. This finding is causally linked to the 1979 Church Rock uranium mill tailings spill that discharged more than 1100 tons of radioactive mill waste and 95 million gallons of toxic effluent down Pipeline Arroyo and into the Puerco River which eventually reached the community of Sanders. The level of radioactive release from this spill is much more than the Three Mile Island disaster that occurred just a few months prior (Brugge et al., 2007).

The main problem for addressing this toxic contamination was a question of jurisdiction. The private well and water company were under the regulatory authority of the Arizona Department of Environmental Quality. Despite the majority Navajo demography of Sanders, the Navajo Nation EPA could not enforce the gross radionuclide

violations of the water system. This is one instance where the 'Indian country' designation did not apply. Thus, in theory, TAS classifications empower tribes to enact primary regulatory authority over their nations, but in practice such actions are hindered by the legacy of settler allotment policies. The checkerboard allotments in and between tribal trust land are vulnerable to lapses in regulation where competing private interests may take advantage of these spaces perceived to be devoid of Indigenous authority and jurisdiction, what Montoya (2019) refers to as a 'politics of permeability' to describe the 'unevenness of settler governance and its violent effects as well as the potential for alternative political formations'. As this example illustrates, the movement of contamination across and between multiple state, federal and tribal jurisdictions presents ongoing challenges for environmental regulation and remediation. In this way, the inconsistent enforcement of water regulations and delayed environmental remediation can too easily be explained as a matter of ambiguous jurisdiction rather than an outcome of historic settler colonial land policy or racialized policies. As a result, the mobilization of Diné communities at a local rather than tribal level offers an insight into innovative and decolonial approaches to water insecurity. This includes community led efforts such as the Little Colorado River Watershed Association that manages farm and water catchment projects, Rock's (2017) community based participatory research project and the subsequent formation of the Puerco Valley Uranium Task Force to confront radionuclide water contamination in the community of Sanders, as well as the female collective Tó Bei Nihi Dziil (meaning, Water is Our Strength) that formed in the aftermath of the Gold King Mine spill to organize teach-ins about issues of Diné water insecurity and food sovereignty.

Despite the endurance of the aforementioned jurisdictional challenges, these collective efforts have responded to and engaged matters of water rights and contamination across the Navajo Nation, leveraging action from tribal, state and grassroots actors.

Discussion

In this paper we argue that settler colonialism (re)produces water insecurity for Indigenous peoples in distinct ways. We present case studies of the First Nation drinking water crisis and water insecurity faced by the citizens of Navajo Nation that illustrate how water governance in the settler colonial States of Canada and the United States, are both underpinned by modernist systems of infrastructure and governance, which are often discriminatory or hostile to Indigenous water rights and neglect service provision to Indigenous communities (Daigle, 2018; McGregor, 2014). Presently, the consequences of such hostility are laid bare by the vulnerability of Indigenous communities to the global coronavirus pandemic, due to water insecurity and other systemic inequalities, exemplifies the kinds of violence that settler colonial governance and infrastructures impose on Indigenous bodies.

More specifically, we find two important ways that settler colonialism (re)produces water insecurity for Indigenous peoples. First, settler colonialism is a source of regulatory and jurisdictional injustice. We use the term 'regulatory and jurisdictional injustices' to refer to those elements of water insecurity that are directly created by legal frameworks governing water in settler colonial States (Bakker et al., 2018). While Indigenous peoples have inherent rights and responsibilities to the waters that flow from their Indigenous

legal orders (Craft, 2018), settler colonial legal systems frequently deny Indigenous water rights or seek to define them in ways that create systemic barriers to achieving water security (Curley, 2019b; McGregor, 2014). In the United States, the uncertainty of territorial boundaries, from haphazard colonial mapping projects into the present, has created enduring problems for tribal jurisdiction over water. In an examination of regulatory and legal practices between the State of Arizona and the Navajo Nation, we identify specific mechanisms of colonial indifference and enclosure that contribute towards ongoing water scarcity for Diné communities. Understanding water through both an ideological and material framework, we show that water exists in paper form, as a jurisdictional arrangement, and toxic poison – containing the residues of lax environmental regulation in a region surrounded by colonial extraction. Moreover, we contend that settler colonial policies of land dispossession and water quantification constructed in the late 19th into the early 20th century are rematerialized in debates over sovereignty and jurisdiction in the 21st century. For instance, the United States claims federal authority over navigable waters, denying Indigenous pre-existing sovereignty (and ability to claim water as independent stakeholders). States exert the right to establish water governance for riparian and aquifer waters in ways that aid settlement, industry (such as mining) and municipal expansion. Therefore, it seems the enduring disputes of Indigenous land and jurisdiction, and subsequently Indian water rights, remain a question of unrecognized sovereignty, while environmental and water regulations remain a problem of uncertain jurisdiction.

In Canada, similar regulatory and jurisdictional injustices shape access to safe drinking water for First Nations. As an example, McFarlane (2019) uses historical and contemporary water rights data to show the outcomes of settler colonial water law for First Nations in British Columbia. She finds that colonially imposed laws and licensing processes have 'contributed to significant water insecurity for First Nations, underscoring the injustice enacted through the exclusion of Indigenous water rights from legal reforms' (p. iii). The combination of competing jurisdictional priorities between First Nations, provinces and the federal government, limited clarity on roles and responsibilities, and a lack of cooperation among jurisdictions have resulted in systemic governance gaps leading to increased risk in water supply systems and widespread underfunding (Arsenault, 2020; McGregor, 2014). While one can easily get lost in the intricacies of law and jurisdiction concerning water and Indigenous peoples in Canada and the United States, our focus on the settler colonial realities in these countries makes it possible to refuse the short-sightedness and violence inherent in proposed solutions to water insecurity that suggest we must merely invest in infrastructure. Instead, we argue that water insecurity for Indigenous peoples in these contexts cannot be addressed without a shift in the broader settler colonial jurisdictional arrangements and regulatory systems.

Second, our case studies illustrate that water insecurity for Indigenous peoples is also indirectly (re)produced by settler colonial relations that drive environmental change. For instance, in both Canada and the United States water quality and availability are impaired by resource development (e.g., mining degrades water quality) and climate change (e.g., increasing temperatures alter water quality, quantity and flows). We see this as a process of 'contamination through occupation' through which settler colonialism and associated occupation by settlers is itself a form of 'contamination' (Simpson et al., 2009). Furthermore, (neo-liberal) settler colonialism is the root cause of other ontological,

political and material disruptions to relationships to water that undermine Indigenous notions of collective continuance (e.g., climate change and resource development) (Daigle, 2018; Whyte, 2016). More specifically, Coulthard (2014, p. 156) argues that settler colonialism is a form of governmentality or a 'relatively diffuse set of governing relations that operate through circumscribed modes of recognition that structurally ensures continued access to Indigenous peoples' lands and resources by producing neoliberal subjectivities that co-opt Indigenous peoples into becoming instruments of their own dispossession'. Understanding drivers of water insecurity, such as climate change and resource development, as fundamental to the existence of settler colonialism further highlights the necessity to transform the broader settler colonial and capitalist relationships.

Looking forward, our case studies highlight how drinking water security for Indigenous peoples can only be achieved through decolonizing the water governance system, and more broadly, in Indigenous–State relationships. While not mutually exclusive, there are two main approaches to decolonizing water governance. First, water governance systems may be reformed through efforts to engage Indigenous peoples within State-led governance processes (e.g., recognizing Indigenous water rights and responsibilities). Second, water governance systems can be decolonized by transforming Indigenous–State relationships (Von der Porten & De Loë, 2014). As Tuck and Yang (2012) stipulate, '[d]ecolonization is not a metaphor' that can stand in for anything but the struggle of Indigenous peoples to regain sovereignty. Decolonization requires Indigenous-led processes that promote fundamental change between Indigenous peoples and settler colonial States and populations in ways that generate alternative institutions and relations (Yazzie & Baldy, 2018). Our case examples suggest decolonizing water governance systems to develop Indigenous alternatives is necessary to address the root causes of drinking water insecurity. For instance, the Government of Canada could repeal that SDWFNA in favour of an alternative that respects First Nation self-determination.

Conclusions

In this paper we have shown how settler colonial water governance was premised on ontological reductions of land and water into separable resources. These abstractions rendered water as an object to be mapped, quantified, allocated, and governed and disregarded collective assertions of inherent Indigenous water rights and relationships across the continent. In this original act of colonization, the settler States of Canada and the United States sought to dispossess Indigenous peoples of their relationships, claims, practices, knowledge and responsibilities in water governance. Nevertheless, we see how Indigenous peoples continually assert their sovereignty to resist these impositions to address the many manifestations of water insecurity. As with the Navajo Nation example, and the above reference to the revitalization of Indigenous legal orders in Canada show, decolonizing water relationships involves navigating settler colonial legal systems and tools in a way that strategically assert their own understandings of sovereignty as well as inherent rights and responsibilities to water. While the long-term goal is decolonization, incremental changes through community-led efforts are equal assertions of sovereignty and are fundamental to achieving water security for Indigenous peoples and nations.

Notes

1. 'Indigenous' is an umbrella term for peoples that claim historical continuity with their homelands. We use it as an inclusive term to refer to First Nations, Inuit and Métis people in Canada, and both federally and state-recognized tribes in the United States. Although antiquated, the term 'Tribe' is still used in federal–Indian law to refer to the central governments of Indigenous nations in the United States. We recognize these are colonial categories. Where possible, we prioritize self-designated names.
2. Household water insecurity is the opposite of water security and is defined as any deficiency in safe, reliable, sufficient and affordable water necessary for a thriving life (Jepson et al., 2017).
3. Settler colonialism is a form of colonialism where colonizers dispossess Indigenous peoples of their land for settlement and resource development (Coulthard, 2014; Wolfe, 2006). While colonialism and settler colonialism involve domination by an external power, only settler colonialism aims to displace Indigenous peoples with a settler society (Wolfe, 2006). Colonialism is often framed as a historical event that we are seeking to 'reconcile' in the present. However, as Wolfe (2006) notes, settler colonialism is a structure, not an event. It is a 'complex social formation' and that has continuity over time.
4. We use the term 'State' as synonymous with nation-states including subnational governments that are part of the settler colonial scaffolding. By contrast, 'states' refers to subnational political units of the United States, analogous to Canadian provinces and territories. States are not 'discrete' entities or an ontological given (Harris, 2017). Thus, we attend to States as an ideological project that legitimizes government institutions and processes, which sometimes have contradictory agendas and interests (Harris, 2017; Nadasdy, 2017).
5. On 5 July 2020, Dominion and Duke energy companies abandoned the Atlantic Coast Pipeline after years of litigation.
6. The study used American Community Survey data that records Indigenous peoples as 'Native American' and makes little effort to distinguish between the nation of Indigenous respondents.

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