

Engaging Colonial Entanglements: “Treatment as a State” Policy for Indigenous Water Co-Governance

*Sibyl Diver, Daniel Ahrens, Talia Arbit, and Karen Bakker**

Abstract

In the United States, treatment as a state (TAS) provisions enable eligible Native American tribes to assume the same responsibilities as state governments in setting and implementing water quality standards (WQSs). Following the introduction of TAS through 1987 amendments to the US Clean Water Act (CWA), forty-four US tribes have enacted TAS tribal standards, which may be more stringent than those of neighboring states; can incorporate cultural and/or ceremonial uses; and can be used to influence pollution levels coming from upstream, off-reservation users. To evaluate TAS as a model for Indigenous water co-governance, we examine how Native American tribes are advancing tribal sovereignty and environmental sustainability through TAS, and we engage with conflicting views on whether and how Indigenous self-determination can be advanced through existing bureaucratic and colonial governance systems. We specifically analyze environmental pollutant listings in tribal water quality standards for the forty-four TAS tribes. Findings suggest that TAS tribes are creating more culturally relevant WQSs, which are typically as comprehensive as, and often more stringent than, analogous state regulations. Tribal standards are diverse, and TAS tribes can set standards independently from neighboring states and one another. Further analysis reveals the complexities of TAS policy, whereby colonial entanglements both enable and constrain enhanced Indigenous self-determination.

Self-determination is a key tenet of international agreements on Indigenous rights, including the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP).¹ However, critiques of such agreements question the efficacy of implementation through national legislation (e.g., Charters and Stavenhagen 2009; Lightfoot 2012; Miranda 2007). Given recent endorsements of UNDRIP by

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1. www.un.org/development/desa/indigenouseoples/declaration-on-the-rights-of-indigenous-peoples.html, last accessed June 27, 2019.

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the United States and Canada, and Canada's development of implementing legislation (von Stackelberg 2019), additional research is needed on existing policies that claim to advance Indigenous self-determination at the national and subnational levels. This article evaluates US policy frameworks for advancing Indigenous environmental self-determination in water governance through treatment as state (TAS) provisions under the federal Clean Water Act (CWA). Specifically, we evaluate TAS as a potential model for sustainable Indigenous water co-governance. We analyze the tensions that cooperative federalism initiatives like TAS pose with respect to Indigenous self-determination, particularly where tribes are asked to implement federal laws, while retaining the authority to establish their own laws that are on par with or surpass federal standards.

Approved through the 1987 amendments to the US Clean Water Act, TAS provisions enable eligible Native American tribes to assume the same responsibilities as state governments for setting and implementing water quality standards (WQSS) for tribal lands and waters. Currently, forty-four tribes have established their own WQSS, which are approved by the US Environmental Protection Agency (EPA, n.d.-a) and are implemented through tribal environmental programs (see Figure 1). Both tribes and states are legally required to meet or exceed federal minimums for their WQSS.

Under the CWA policy, tribes and states can determine their own water quality goals in the form of "beneficial uses," which can include cultural or ceremonial uses for tribal waters (Anderson 2015; Grijalva 2006). Tribal standards may be more stringent than neighboring states' standards, and they can apply across jurisdictional boundaries when upstream discharges impact tribal waters. For example, in 1992, the Pueblo of Isleta created stricter WQSS than the neighboring state of New Mexico to protect ceremonial practices that include ingesting water and bathing in the Rio Grande. Upheld by the US Supreme Court, Isleta's WQSS ultimately led the city of Albuquerque, located just a few miles upstream from Isleta farmlands and ceremonial areas, to upgrade a wastewater treatment plant (Baker 1996; Bilut 1994; Lenderman 1998).

Despite almost thirty years of implementation, there has been no comprehensive study of TAS program effectiveness in improving water quality or advancing Indigenous self-determination (Diver 2018). With TAS enabling tribes to generate more culturally relevant water quality standards, the program is one of the few US environmental policies offering this level of tribal governance authority. At the same time, tribes face significant barriers to accessing TAS programs, and for those tribes that do pursue WQSS under TAS, neighboring states and other local entities may be hostile toward assertions of tribal sovereignty. Additional analysis is needed to determine whether the TAS can be a useful model for Indigenous water governance institutions that advance both environmental sustainability and Indigenous self-determination. What do key TAS program indicators, such as environmental pollutant listings, tell us about TAS effectiveness? For tribes that have overcome barriers to access, does TAS

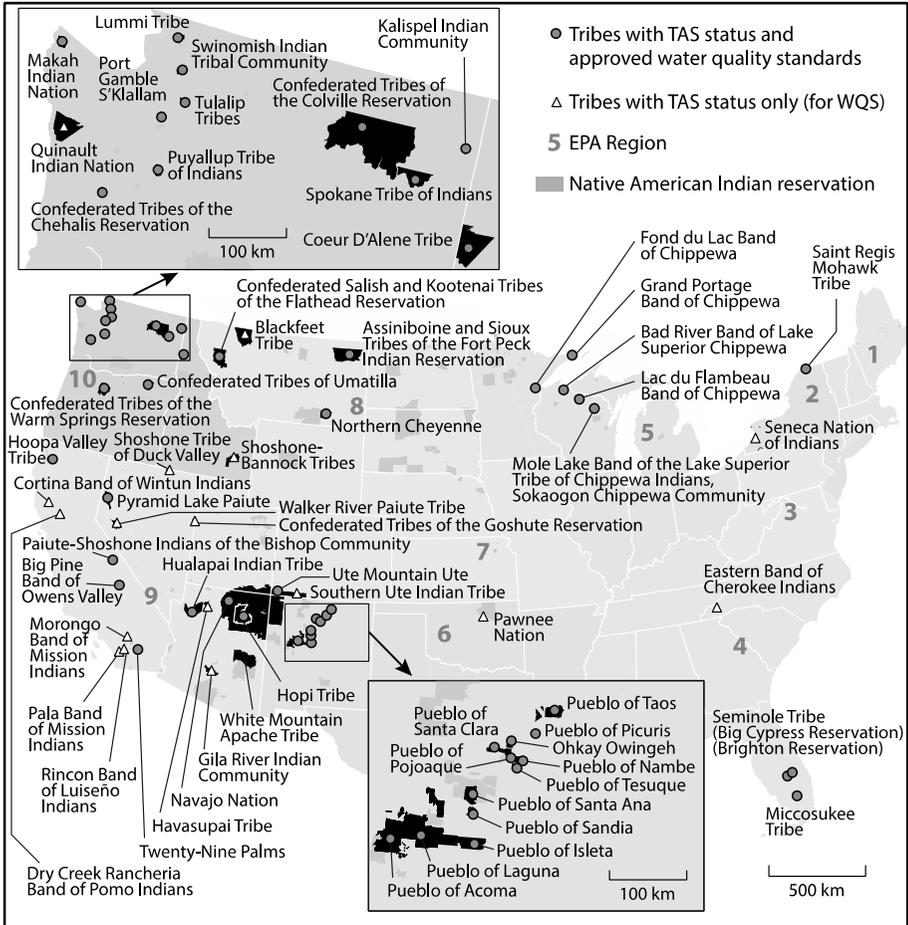


Figure 1
 U.S. Tribes with Water Quality Standards (WQSs) Approved Under Clean Water Act TAS Provisions, as of January 2019

This map also shows tribes that have received TAS status for the purpose of setting tribal WQSs and whose standards are not yet approved. See current EPA TAS approvals at www.epa.gov/wqs-tech/epa-actions-tribal-water-quality-standards-and-contacts, last accessed June 27, 2019. Map by Eric Leinberger, Department of Geography, University of British Columbia. (Color version of map available at https://www.mitpressjournals.org/doi/suppl/10.1162/glep_a_00517/suppl_file/glep_a_00517-suppl.pdf).

enable sustainability and self-governance, as opposed to capture from external entities? What lessons can be drawn from TAS for advancing Indigenous rights in other federalist systems, or outside thereof?

The academic literature features significant concerns about whether Indigenous self-determination can be effectively pursued through existing colonial governance frameworks (e.g., Alfred 2005; Coulthard 2007; Simpson 2017);

these debates also apply to water governance. For Indigenous peoples, water governance is not simply a management issue. Rather, water governance is intertwined with cultural survival: access to traditional foods, community health, cultural practices, and the ability to maintain long-standing spiritual relationships with water bodies (Borrows 1997; Hallenbeck 2015; McGregor 2004, 2008, 2012, 2014; von der Porten et al. 2016; Wilson and Inkster, 2018). Such findings indicate that Indigenous peoples need to be engaged in designing water governance systems from the ground up, in a holistic manner that respects the integrity of land–water interrelationships.

In the US context, Indigenous water governance institutions are often based on dominant Western governance frameworks and funded by federal grants, two conditions that often reinforce existing power imbalances and the subordination of Indigenous knowledge traditions. Existing studies illustrate the tensions around pursuing Indigenous self-determination through tribal environmental regulatory programs, such as TAS (Diver 2018). On the one hand, Ranco and Suagee (2007, 702) describe tribal environmental programs as “laboratories for creativity,” which draw from multiple knowledge systems leading to Indigenous innovations for water governance. For example, the Confederate Tribes of Umatilla preface their tribal water code by acknowledging “*Plíx iwá čúúš*” (Water is medicine) (Confederated Tribes of the Umatilla Indian Reservation 2005). On the other hand, Saunders (2010) depicts tribal environmental regulation as a highly constrained initiative and a balancing act, which tribes may choose to undertake at the cost of inciting opposition from neighboring state governments. For instance, the Pawnee Nation of Oklahoma’s efforts to establish WQs in 2004 were met by lawsuits and legislation limiting tribal sovereignty (Chandler 1994; Williams 1993).

Indigenous scholars have also voiced strong critiques of federalist governance frameworks, where federal regulatory responsibilities are delegated to states having no legally defined trust obligation toward tribes (Corntassel and Witmer 2008). With TAS, tribes are leveraging the same legal and regulatory structures that were initially developed to support and coordinate state regulation. In doing so, eligible tribes must depend on federal agencies to certify their capability to assume regulatory authority over WQs for tribal waters. Underfunded tribal governments must also contend with federal and state government entities in a multilevel governance context, characterized by uneven power dynamics. Such political realities call into question how much independence TAS tribes can maintain in developing tribal WQs and their ability to implement tribal regulations for water quality in practice.

With these sustainability and self-determination challenges in mind, this study evaluates TAS programs, using environmental pollutant listings in tribal water quality standards for forty-four TAS tribes as an indicator of program effectiveness. To consider the strength and independence of tribal WQs, relative to neighboring state jurisdictions, we compared tribal pollutant listings to state and federal standards and also to one another. Evaluating whether TAS tribes

are caught in a “race to the bottom” for environmental outcomes, we compared the stringency of tribal standards to those of neighboring states and also determined if tribal standards met federal minimums. Recognizing the challenges tribes can face in pursuing self-determination through colonial governance structures, we considered whether TAS tribes had sufficient independence from states and federal agencies to create unique environmental pollutant listings for tribal WQSSs, as opposed to duplicating state listings or regional-level EPA templates.

The article is structured as follows. We begin by reviewing the literature on key aspects of TAS policy, along with its possibilities and critiques, in terms of current debates on Indigenous self-determination. This includes a discussion of the contested politics of recognition that are inherent to dominant environmental governance frameworks (Coulthard 2007, 2014; Reo et al. 2017). We then present our methods and results for comparing tribal water quality standards, focusing on our analysis of environmental pollutant listings for tribal WQSSs. The discussion and conclusion connect our empirical findings with the literature on water governance by Indigenous communities (Borrows 1997; Hallenbeck 2015; McGregor 2014; Powell and Curley 2008; von der Porten et al. 2016; Wilson and Inkster 2018; Yates et al. 2017) and consider how TAS might function as a model for Indigenous water self-governance and as a potential tool for advancing UNDRIP principles at the nation level.

In Pursuit of Indigenous Water Governance

Indigenous leaders are taking multiple approaches to expanding self-determination in water governance. One strand of scholarship on this topic emphasizes the resurgence of Indigenous knowledge, law, and governance (Borrows 2002; Craft 2013; Napoleon and Friedland, 2016; Simpson 2017). This work responds to the ongoing dispossession of Indigenous lands through extractive development (e.g., Pasternak 2017), highlights Indigenous resistance strategies (Parker and Grossman, 2012; Norman 2017), and critiques state policies that reinforce colonial thought models in contemporary Indigenous governance institutions (Alfred 2005; Barker 2005; Coffey and Tsosie 2001; Coulthard 2014; Curley, this issue; Stark 2013). These scholars reject the politics of recognition that limit Indigenous sovereignty and facilitate the assimilation of Indigenous knowledge systems into colonial frameworks (Coulthard 2014) and instead call for Indigenous resurgence efforts that are occurring within Indigenous communities, outside of state-driven negotiations (Simpson 2017). For example, moving beyond nation-state governance models, Simpson seeks Indigenous nationhood “based on the idea that the earth gives and sustains all life” (8) and the importance of being in relationship with all of creation. This approach brings a deep understanding of the mutual obligations between humans and the natural world embedded in Indigenous knowledge and governance systems (Borrows 1997; Diver et al. 2019; Hakopa 2011; McGregor 2014; Vaughan 2018)—a difficult endeavor to achieve within non-Indigenous spaces of state regulation (e.g., Brody 1981; Nadasdy 2004; Weir 2009).

Additional scholarship addresses nation-building strategies that engage with the severe socioeconomic inequalities faced by many tribes (Cornell 2013; Cornell and Kalt 1998) and the challenges of working with flawed legal frameworks that limit Indigenous self-determination. This research surfaces the inequities that arise from working within the colonial legal and regulatory systems (Corntassel and Witmer 2008; Deloria and Lytle 1984; Tsosie 2001; Wilkins and Lomawaima 2001; Wilkinson 2005) and explores the creative interventions by Indigenous leaders to insert themselves into a colonial system of governance that they did not participate in creating (e.g., Hanna et al. 2011; Jorgensen 2007). Despite the lack of fit, or “cultural match” (Cornell and Kalt 1998), Indigenous communities have taken on “third space” strategies for building their self-governance capacity, such as accessing business opportunities that enable tribes to buy back ancestral lands (Bruyneel 2007). In such multijurisdictional contexts, tribal capacity building and economic diversification efforts unavoidably engage with colonial governance structures (e.g., Deloria 2006).

These two approaches to Indigenous self-determination are neither comprehensive nor mutually exclusive. However, they highlight the tensions between “realism and idealism” that characterize the parallel efforts of tribal officials working within existing political structures and tribal leaders working to reinvent tribal governance outside of dominant sociopolitical structures (Deloria and Lytle 1984, 242). This framing also reveals some of the underlying assumptions of international agreements like UNDRIP, which often recapitulate the position of Indigenous peoples as “nations within” (Deloria and Lytle 1984; Hanna and Vanclay 2013), or nations that retain some level of autonomy to operate within the dominant state.

While a full examination of UNDRIP is beyond the scope of this publication, recent scholarship assessing how UNDRIP implementation might address key challenges for Indigenous water governance provides an orientation for our analysis (see Askew et al. 2017). Research on UNDRIP and Indigenous water governance addresses the following themes: (1) the right to Indigenous self-determination (e.g., Articles 3, 32:1); (2) Indigenous rights to their traditional lands and waters (e.g., Articles 25, 26); (3) free, prior, and informed consent (e.g., Article 19); (4) self-representation (e.g., Articles 23, 28, 4); and (5) effective mechanisms for redress (e.g., Articles 27, 32:3) (Askew et al. 2017). Given its focus on consent, self-representation, redress, and so on, UNDRIP provides a supporting framework for what is sometimes referred to as “internal self-determination,” which can be contrasted with other approaches focused on “external self-determination” that may include Indigenous statehood (Hanna and Vanclay 2013, 148). Similar to UNDRIP, TAS also envisions Indigenous self-determination within dominant state structures, as discussed below.

Origins of Treatment as a State

As with many US environmental laws, the 1972 Clean Water Act (CWA), which established federal regulation of point source water pollution, is based on a

cooperative federalism model, where the federal government delegates significant environmental regulatory authority to states. In its initial form, the CWA did not address tribal sovereignty or the environmental regulation of tribal lands (Grijalva 2006; Mazurek et al. 1998). Rather, it was the 1987 CWA amendments that introduced TAS provisions enabling tribes to take on the same administrative authority as states over selected programs. Thus, in the TAS context, US environmental federalism has been expanded to include tribes.

Reflecting the recent self-determination era in US federal Indian law, the shift toward recognizing tribal governance authority within federal statutes was years in the making. It followed significant pressure from the 1960s Native American rights movement; a dramatic increase in court rulings on tribal issues; new federal legislation on self-determination; and increased tribal government capacity (Wilkinson 2005; Wilkinson and American Indian Lawyer Training Program 2004). Rejecting federal Indian policy positions of paternalism, termination, and assimilation, President Nixon's 1970 Congressional Address called for moving away from direct federal operation of Indian programs and delegating federal program implementation responsibility (as well as adequate federal financial support) to interested tribes (Nixon 1970). As legal scholar Charles Wilkinson explains, "tribal sovereignty predated the formation of the United States and continued after it" (Wilkinson 1987, 103). Today, US tribal governments are generally recognized as having a unique political status, which positions them as a third sovereign (i.e., tribes, states, and the federal government) (Kickingbird et al. 1983). At the same time, ongoing colonial processes have consistently denied tribal control over and access to the traditional lands and waters (Barker 2005). As Indigenous scholars Wilkins and Lomawaima (2001, 5) point out, "the relationship between American Indian tribes and the U.S. federal government is an ongoing contest over sovereignty."

TAS arose in the 1970s under the aegis of the EPA. At this time, the newly formed EPA was faced with a regulatory void, because states with delegated responsibility for implementing federal environmental programs lacked regulatory authority over tribal lands. If state WQSs did not apply to tribal lands, what was the appropriate standard? In the early 1970s, the EPA began to carve out a state-like role for tribes within some of its regulatory processes (Grijalva 2006). In 1980, the EPA became the first US federal agency to establish a formal Indian policy, centered on tribal implementation of federal environmental programs on Indian reservations (Baker 1996; Grijalva 2006).

In 1987, Congress confirmed the EPA's approach through its TAS guidelines in Section 518 of the CWA. In order for a tribe to administer its own WQS program, the EPA must approve its eligibility for TAS status under Section 303 of the CWA. To be eligible, a tribe must be federally recognized, have a governing body and trust land, and be capable of carrying out the functions of an effective water quality standards program (EPA, n.d.-b). Following TAS approval, the EPA issues a separate approval for tribal WQSs. Importantly, the EPA provides technical support to tribal water programs, as well as some

funding (e.g., Section 106 and GAP program funds), and federal trust responsibility is maintained within the TAS policy framework. EPA decision-making for TAS applications typically occurs at the regional level: the federal agency is made up of ten different regional administrative offices, each representing approximately four to ten states and/or other nonfederal governmental bodies.

TAS Policy: Critical Perspectives and Possibilities for Indigenous Self-Determination

Existing scholarship on Indigenous self-determination offers some important critiques of TAS. The TAS model is based on the premise of treating Native American tribes in a manner similar to states, for the purpose of delegating federal regulatory authority over existing CWA programs. The explicit delegation of authority to tribes indicates that TAS extends beyond a tribal consultation process. However, at this time, only forty-four tribes have adopted tribal WQSs under TAS. This is out of 60 tribes that have applied to administer a TAS program for WQS and have been found eligible, and approximately 330 tribes that may be eligible to apply for TAS under the CWA. The gap between tribal eligibility and adoption of tribal WQSs suggests that the TAS program does not meet the governance needs or agendas of all tribes (Diver 2018).

Why would this be the case? One key issue appears to be the fact that the TAS framework is fully located within the existing US regulatory framework, yet tribal water relations typically do not fit into the predefined, bureaucratic processes developed to support federal regulation. While tribes and state agencies often share the basic goals of protecting human health and ecological functions (e.g., deLemos et al. 2009), tribes have distinct values and needs around water protection. For many tribes, water quality protection is embedded in Indigenous knowledge, emphasizing the mutual responsibilities and reciprocal relations between Indigenous peoples and water (Arsenault et al. 2018; Lake et al. 2010; McGregor 2014). However, more holistic values embedded within Indigenous knowledges are often subsumed by bureaucratic frameworks that facilitate the “standardization, sectorization, and instrumentality” of knowledge systems (Martello 2001, 137). Dominant state agencies may also question the validity of Indigenous knowledge, as well as tribes’ inherent authority to self-govern, thereby undermining tribal environmental governance (Brody 1981; Nadasdy 2004).

Tribes also face challenges to their legal and political rights to water (Chief et al. 2016). For example, many tribes lack jurisdictional authority and the resources to implement environmental regulations (e.g., Doyle et al. 2018). This is, in part, due to the colonial legacies of US allotment policies, which dispossessed many tribes of their homelands and turned existing reservations into a patchwork of individually owned fee lands (Indian and non-Indian) that are interspersed with tribal trust lands (Corntassel and Witmer 2008). In some cases, tribes may eschew TAS and instead adopt their own non-TAS

water quality standards and water codes, although tribally approved standards primarily apply to tribal members on tribal lands (Berry 2016; Vesely 2014).

Adding to this critique, TAS eligibility and application requirements, as well as the politics around TAS, prevent many tribes from accessing the program. Only federally recognized tribes with trust lands (formal or informal reservations) can apply, which excludes all unrecognized tribes, some recognized tribes with limited jurisdictional authority, and almost all Alaska Natives (Saunders 2010). Eligible tribes often lack the resources to apply for or implement programs (Lefthand-Begay 2014). Eligible tribes may also forgo TAS programs due to ongoing threats of lawsuits from states, individuals, or political groups that are hostile to assertions of tribal sovereignty (Galloway 1995; Rey-Bear 1995). For example, in 2000, when the Penobscot and Passamaquoddy tribes requested stricter state water quality standards for dioxin discharges by paper and pulp mills, state opponents filed a lawsuit leveraging the Maine Freedom of Access Act to gain all materials on tribal authority (Rodgers 2004). In 2004, after the Pawnee Nation of Oklahoma gained EPA-approved WQSS, the state of Oklahoma filed suit. Tribal opponents also inserted a legislative amendment in an unrelated bill that restricted tribal sovereignty for Oklahoma tribes seeking TAS status (Grant 2007; Saunders 2010). These cases suggest a double bind for tribal environmental self-determination: if a tribe regulates aggressively to protect community and ecosystem health, they may provoke a costly legal battle, thereby draining tribal resources and threatening tribal self-governance.

In addition, TAS offers only a partial delegation of authority to participating tribes (Whyte 2011). As Alfred (2005, 35) writes, many Indigenous peoples have long questioned the viability of working within dominant governance models that “recognize Indigenous sovereignty yet always subsume it to that of the state.” For example, the EPA retains final authority with approving tribal eligibility for TAS and WQSS standards. When multijurisdictional conflicts arise, tribes cannot compel the EPA to intervene. Even for TAS-approved tribes, legal limits on tribal jurisdiction may still prevent tribal governments from enforcing their own tribal codes, particularly for non-Indian users (Doyle et al. 2018). In terms of cultural match (Cornell and Kalt 1998, 201), the EPA’s risk models regarding environmental pollutant exposures may not represent true environmental risks to tribal citizens engaging in particular cultural practices (O’Neill 2000). To avoid lengthy EPA deliberation over tribal proposals, some tribes forgo challenging existing models for WQSS and instead mimic existing federal or state programs (Grant 2007; Ranco 2009). Unfortunately, such pragmatism can increase the risk of substituting state or federal values for the values of an individual tribe (Lefthand-Begay 2014).

On the other hand, TAS provisions and tribal WQSS can help address key environmental regulation challenges on tribal trust lands. While the EPA has a trust responsibility to protect the water quality of US tribes, the federal agency is often unable to do so effectively, due in part to limited agency funding

(Conroy-Ben and Richard 2018; Grant 2007; Teodoro et al. 2016). Thus strengths of TAS programs include (1) support for tribal goal setting and (2) increased tribal governance authority both on and off the reservation (Diver 2018). TAS approval opens new opportunities for tribes to set their own water quality goals through “beneficial uses” that are guided by an individual tribe’s values. Tribes may set higher standards than surrounding jurisdictions and may also include cultural, ceremonial, and/or religious uses in their standards (Dussias 1999; Galloway 1995). The TAS legal framework allows for and anticipates differences among sovereigns. As Reinhard (2009, 559) points out, the “EPA decides to approve or reject a use by evaluating whether it is attainable and consistent with the CWA’s objective, not by evaluating the principles behind the use.” Thus the TAS regulatory framework provides the flexibility for tribes to set their own goals, based on their own values and interest.

By leveraging procedural environmental regulation requirements that are enforced by the EPA, TAS tribes can also gain a seat at the decision-making table to potentially influence development projects affecting tribal waters, including upstream off-reservation users (Chandler 1994; Galloway 1995). For example, the EPA must notify any downstream tribes with approved WQs of potential discharges affecting the tribe’s water quality. Under Section 401 of the CWA, a tribe with federally approved WQs can challenge the issuance of federal discharge permits into tribal waters. Importantly, working within EPA structures can be advantageous for tribes because of the substantial deference that the US legal system offers to the EPA’s interpretation of environmental statutes as a federal agency (Grijalva 2003; Leisy 1999; Maccabee 2015; Rey-Bear 1995). EPA confirmations of tribal regulatory authority under TAS provisions of the CWA have consistently been upheld in court (Anderson 2015). And although this issue has been problematic in the past, TAS provisions are increasingly helping tribes to regulate the fragmented patchwork of property regimes within reservation boundaries (Anderson 2015).² TAS can also help grow tribal environmental programs, which support additional tribal governance capacity and jobs (e.g., Diver 2016, 2017).

Methods

In this article, we evaluate environmental pollutant listings for forty-four tribes with WQs as one indicator of whether tribes can advance self-determination through TAS programs. The work also considers whether TAS tribes can independently

2. In May 2016, the EPA issued a revised interpretation of the CWA Tribal Provision (Section 518) through formal rule making. The reinterpretation determines that Section 518 includes an express delegation of authority by Congress to Indian tribes to administer regulatory programs over their entire reservations, a regulatory framework that is similar to the Clean Air Act. With this regulatory shift, many TAS legal review processes now require significantly less time and resources from tribes. See www.epa.gov/sites/production/files/2016-05/documents/fact_sheet_cwa_tas_final_reinterp_rule_5-2-16_508c.pdf, last accessed June 27, 2019.

establish their own distinct standards, relative to neighboring states and other tribes. We view environmental pollutant listings as a useful indicator because of the important role that they play in the enforcement of tribal WQSS.

Our analysis used published WQSSs to develop a database of pollutants regulated by tribes and relevant states. We also referred to the EPA's National Recommended Water Quality Criteria as the federal baseline for WQSSs. We cataloged pollutants listed by a given tribe ($n = 44$) or state ($n = 13$). The maximum and minimum numbers of pollutants listed ranged from 37 to 403 pollutants for tribes and from 75 to 659 pollutants for relevant states. In some cases, pollutants were listed under narrative criteria, which we also cataloged. Some tribes incorporated standards by reference, which we included in the total count of pollutants. Although other parameters with numeric criteria (e.g., pH, color, turbidity) are important indicators of water quality, we did not count these for our pollutant comparison.³

Because pollutant standards are set at different levels for different purposes (human health, aquatic life, etc.), we generated a list of distinct pollutants regulated by a given tribe or state. In other words, if a tribe regulated mercury for human health purposes, and again for aquatic life, we counted this as a single regulated pollutant. To ensure consistency, we referred to individual pollutants using the unique registry number assigned by the Chemical Abstracts Service (CAS number). If a single numeric criterion was listed for multiple pollutants, we treated this as separate listing for each pollutant. Due to the complexity of standards (e.g., tribes and states use different units of measurement to express toxicity and regulate the same pollutants at different levels for different purposes through both narrative and numeric formats), we did not compare the numeric levels of pollutants.

To evaluate levels of environmental regulation, we determined whether a given state or tribe had listed pollutants from the EPA's recommended list (EPA pollutants) and noted any additional pollutants being regulated beyond EPA recommendations (non-EPA pollutants). Second, we compared the total number of pollutants listed for WQSSs by tribes versus states, while also comparing numbers of EPA and non-EPA pollutants. We completed an *F*-test to evaluate variances, then a two-tailed *T*-test to evaluate significance with alpha equal to 0.05.

To consider the extent to which tribes can self-determine distinct WQSSs, independently from neighboring states and other tribes, we conducted a similarity analysis among tribes to measure whether a particular state or regulatory region had a strong influence on tribal WQSSs. The similarity test also allowed us to identify cases where tribes were swapping out specific pollutants in their regulations in order to meet their individual needs.

3. A complete list of EPA-recommended pollutants included in the analysis is available upon request.

Table 1

Average Pairwise Difference in the Pollutants Listed for Groups of Tribes Located in the Same State, Listed by Percentile

<i>Grouping</i>	<i>Average Pairwise Difference</i>	<i>National Percentile</i>
Florida (<i>n</i> = 2)	120	8
Minnesota (<i>n</i> = 2)	118	9
California (<i>n</i> = 4)	69	40
New Mexico (<i>n</i> = 12)	67	47
Montana (<i>n</i> = 3)	58	50
Arizona (<i>n</i> = 4)	49	66
Wisconsin (<i>n</i> = 3)	36	84
Oregon (<i>n</i> = 2)	28	86
Washington (<i>n</i> = 8)	33	99

Note. National percentile demonstrates the likelihood of finding the observed average pairwise difference, based on the national distribution of existing tribal WQSs. A low percentile means that an observed tribal grouping has a high degree of difference compared to expected values. This analysis only includes states with two or more tribes.

For the similarity analysis, we grouped tribes by state and EPA region and then calculated the pairwise difference between individual pollutants listed in tribal WQSs, resulting in the average difference of all potential pairings for any two tribes in the given state or region.⁴ This difference was calculated as the sum of the differences between two tribes for the presence or absence of each pollutant. (That is, if two tribes regulated the same pollutant, the pairwise difference was 0. If one tribe regulated and the other did not, the pairwise difference was 1. Thus a lower pairwise difference overall indicates a greater degree of similarity between WQSs for two tribes.) By randomly sampling our national tribal WQS database (all forty-four tribal WQSs), we generated an index for the level of dissimilarity expected for the relevant group size. We then used MatLab to analyze national distributions of potential pairings in our database.⁵ Based on the national distribution, we generated expected differences in tribal WQSs, relative to group size, which we expressed as a national percentile (see Tables 1 and 2).

4. The Navajo Nation was included in the multiple calculations (i.e., comparisons for Arizona, New Mexico, and EPA region 9).
5. If the number of national groupings was less than one hundred thousand, the distribution consisted of the complete listing of groupings. If the number was greater than one hundred thousand, the groupings were selected randomly, due to limitations in computing power.

Table 2

Average Pairwise Difference in the Pollutants Listed for Groups of Tribes Located in the Same EPA Administrative Region, Listed by Percentile

<i>Grouping</i>	<i>Average Pairwise Difference</i>	<i>National Percentile</i>
Region 4 (<i>n</i> = 2)	120	8
Region 6 (<i>n</i> = 11)	69	40
Region 5 (<i>n</i> = 5)	62	50
Region 8 (<i>n</i> = 4)	57	56
Region 9 (<i>n</i> = 9)	57	66
Region 10 (<i>n</i> = 11)	29	98

Note. Some EPA regions do not include any tribes with TAS-approved WQs (see Figure 1).

Results

Environmental Outcomes: Meeting Federal Baselines

Overall, TAS tribes with WQs have successfully met the federal government's minimum standards for water quality protection and are on par with states in regulating most EPA-recommended pollutants. The EPA recommends including approximately 150 substances (or 142 distinct pollutants) for WQs, with some flexibility based on regulatory context. Both tribes and states listed about 110 of the 142 EPA-recommended pollutants for setting water quality criteria (see Figure 2). All but one tribe and every state also listed additional non-EPA pollutants, or pollutants not currently included on the EPA's recommended list.

Self-Determination Outcomes: Comparing Tribal and State Standards

The differences in the average number of pollutants listed by tribes and states were not statistically significant ($p = 0.42, 0.32,$ and 0.52 for total pollutants, non-EPA, and EPA pollutants, respectively), indicating that tribes are generally regulating on par with states. At the same time, a state-by-state comparison showed that more than half of TAS tribes, or twenty-seven of the forty-four tribes, listed more pollutants in their WQs than respective states (see Figure 3).⁶ Thus tribal standards are often more stringent for environmental pollutant listings than neighboring state regulations.

Trends differed by state (see Figures 3 and 4). A few states, like New York and Montana, listed many hundreds of pollutants in their WQs, and tribal listings were comparatively lower in these cases. Other states, like Wisconsin, Florida,

6. Since it borders both New Mexico and Arizona, the Navajo Nation was double-counted in this calculation.

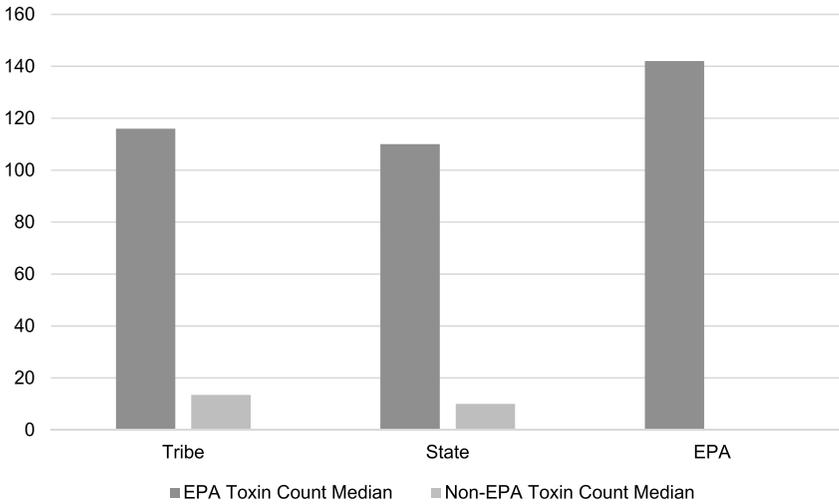


Figure 2
Median Number of Pollutants Listed by Tribes and States in Their WQSS

EPA-recommended pollutants and non-EPA pollutants are reported separately. The total number of EPA-recommended pollutants is shown at right.

and Nevada, had less comprehensive standards than neighboring tribes (more than a 15 percent difference). In Minnesota, New Mexico, Arizona, California, Idaho, Oregon, and Washington, the average numbers of pollutants listed by tribes and states were roughly similar (less than a 15 percent difference). We also observed diversity among standards for neighboring tribes within the same state, especially for New Mexico, which has the largest number of TAS tribes for a given state.

Self-Determination Outcomes: Comparing Standards Among Tribes

Based on concerns over the independence of tribal environmental regulation in more hostile states or federal administrative regions, we examined the similarity among pollutants listed in tribal standards by state and by EPA region.⁷ Our findings showed dissimilarity among tribal WQSS, suggesting that tribes can regulate independently from states and one another. Groups of tribes in Florida, Minnesota, New Mexico, Montana, Arizona, and California and EPA regions 4, 5, 6, 8, and 9 were more dissimilar from one another, positioned below the 66th percentile for expected difference among tribal standards. Of these groups, tribal standards were highly dissimilar in Florida (8th percentile) and Minnesota (9th percentile). The strongest similarities among tribal WQSS were observed for the states of Washington, Oregon, and Wisconsin and EPA region 10 (see Tables 1 and 2).

7. All groupings with only one tribe (EPA region 2, New York, Nevada, Colorado, and Idaho) were excluded from this analysis.

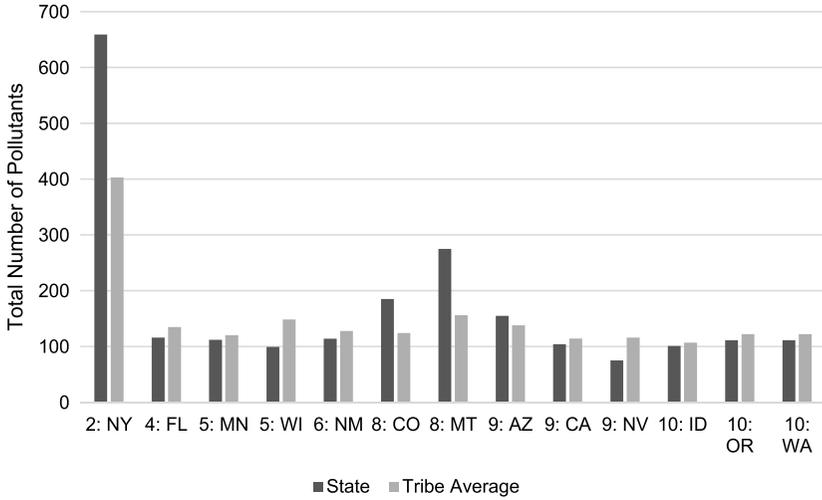


Figure 3
Average Number of Pollutants Listed by Tribes and Relevant State

EPA region numbers are listed as a prefix to the two-letter state abbreviation.

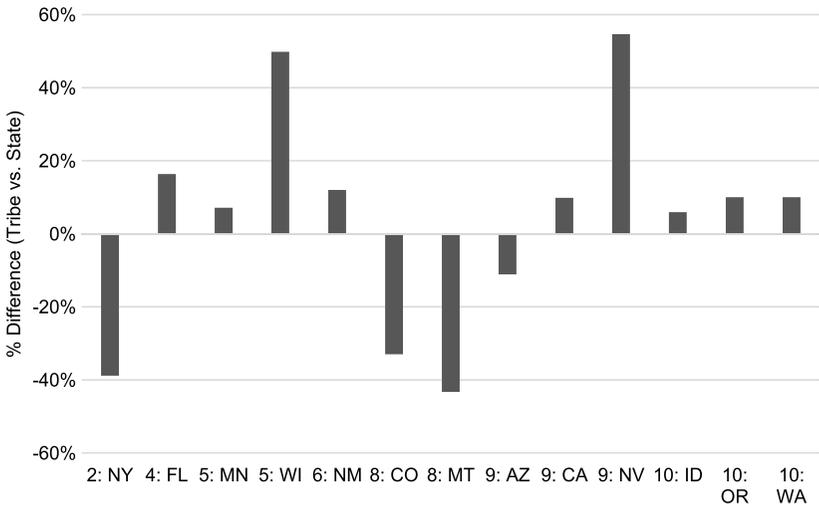


Figure 4
Percentage Difference Between the Average Number of Pollutants Listed by State and by Tribes in a Given State

EPA region numbers are shown as a prefix to the two-letter state identifier. Negative percentages indicate that the number of tribally listed pollutants, on average, is lower than the state number. Positive percentages show that the number of tribally listed pollutants, on average, is higher than the state number.

Discussion

Our discussion addresses several challenges to advancing Indigenous water governance: (1) ensuring protective levels of environmental standards and accountability to them when devolving regulatory authority, (2) supporting self-determination of tribal governance institutions given the realities of uneven power relations and hostility toward tribes, and (3) overcoming the limitations of colonial governance models for Indigenous self-governance initiatives. By examining TAS in the context of UNDRIP, we also consider opportunities for (4) implementing globally determined principles of Indigenous self-determination through nation-level water governance policies, such as TAS.

Despite concerns over the devolution of environmental regulatory authority triggering a “race to the bottom,” TAS tribes with WQs have successfully met the federal government’s minimum standards for water quality protection and are generally on par with states. In addition, more than half of TAS tribes list more pollutants in their WQs than their neighboring states, and almost all TAS tribes are regulating additional pollutants beyond EPA recommendations. We acknowledge that most tribes face difficulties with lack of funding and limited infrastructure and also that this study does not follow specific cases of policy implementation. Nevertheless, a number of US tribes have demonstrated their capability, technical capacity, and interest in forwarding tribal water protection goals through TAS.

While the legal literature emphasizes hostility toward assertions of tribal sovereignty and barriers to participation, a number of TAS tribes have surmounted challenges in accessing the program. Variation among tribal WQs demonstrates that tribes are advancing self-determination through distinct tribal standards and not simply replicating “boilerplate” state standards or regional EPA templates. This suggests that TAS tribes are not entirely subject to the whims of regional EPA administrators or neighboring state governments and are maintaining some level of independence in setting WQs. At the same time, our study does not claim to address the immense complexities of US tribal–state interactions.

Building off our literature review and concerns with applying colonial policies to Indigenous water governance, we acknowledge that the federal government controls the overarching TAS regulatory framework, including tribal entry. Furthermore, the historical trajectory of federal funding for state agencies, which can function as regulatory competitors with neighboring tribal governments, exacerbates uneven power relations. There are also significant concerns with cultural match. Thus TAS programs do not fully support the position of tribes as a third sovereign.

Still, given the hostile political environments many tribes are operating within, tribes are gaining some advantages from leveraging pre-existing colonial governance frameworks, particularly around regulatory capacity and conflict resolution among sovereigns. Instead of creating an entirely new set of legal orders, TAS tribes work within dominant regulatory systems that are both federally recognized and federally funded. Because tribal water quality standards are based

on the EPA's highly developed procedural regulations, TAS tribes benefit from existing EPA enforcement and conflict resolution mechanisms. Due to the judicial deference afforded to federal agencies in US courts, asserting tribal WQSS within EPA structures can convey some legal protections for tribes. For example, litigation to date on TAS has targeted EPA policy implementation, as opposed to challenging tribes directly. Finally, the EPA has developed an extensive regulatory and policy framework supporting TAS, which explicitly maintains federal trust responsibility, precludes state authority over tribal waters, and embraces tribal self-determination as a central goal.

This work suggests that tribal WQSS may provide a model for actualizing UNDRIP self-determination principles. Drawing on selected UNDRIP articles discussed earlier, we see key areas where TAS can inform UNDRIP implementation through nation-level water governance institutions. First, by finding unique ways to include culturally relevant standards for tribal waters, TAS tribes have made important strides for Indigenous self-determination at the policy and operational levels, even while federal agencies manage the overarching TAS policy framework (see Diver 2018). With the delegation of specific federal powers to tribes, the program extends beyond a tribal consultation framework. Thus TAS does carve out meaningful decision-making space for tribes to self-determine their own water governance priorities, based on their own needs and values. At the same time, federal regulatory agencies are charged with coordinating environmental protection across multiple jurisdictions. This includes the EPA setting minimum standards and providing conflict resolution mechanisms for tribes and states. Second, the policy supports Indigenous land and water rights by increasing tribal governance authority over territories where colonial policies have fragmented property ownership and environmental regulation. TAS also enhances Indigenous land rights through EPA administrative procedures that anticipate and respond to upstream pollution problems originating outside tribal territories. Third, TAS for WQSS enables a meaningful informed consent process for tribes by enabling direct tribal participation in EPA permitting processes for regulating upstream discharges. EPA technical support frameworks, including regional tribal operations committees, facilitate ongoing consent processes. Fourth, by building capacity for tribal water governance institutions, TAS programs increase Indigenous self-representation in decisions affecting tribal lands and waters. A fifth component of UNDRIP is redress for prior harms, such as colonial legacies that have enabled disproportionate impacts of environmental harms to tribal lands and waters, which are not included in the TAS framework.

Placing our TAS analysis in the context of broader debates on Indigenous water self-governance, we see TAS tribes carving out space for self-governance within dominant regulatory systems. This is a practical co-governance approach premised on the assumption that tribes have adequate policy space to self-define and actualize their priorities within pre-existing governance frameworks set by nontribal governments. As Dennison (2012) writes, tribes have “maneuvered”

within such colonial entanglements (8) to bring about their own vision of the future, although “assuming full sovereignty requires time and resources,” (145), which are not equally accessible to all tribes. Given the negative experiences many tribes have had with bureaucratic structures that subsume Indigenous governance and knowledge production (e.g., Nadasdy 2004), we recognize the limitations for tribes engaging with TAS as a colonial entanglement that both enables and constrains Indigenous self-determination.

Conclusions

This article recognizes the commitment many Indigenous communities have made to protecting their water sources and water relations. Our analysis indicates that TAS tribes have, on balance, developed standards that are on par with, and often more stringent than, neighboring states. This study also suggests that TAS tribes can self-determine their standards independently from states, federal agencies, and one another. This recognizes the importance of understanding tribes as diverse entities who are developing environmental standards that fit with their own distinct cultures and interests. For this reason, we view TAS, tribal WQSs, and their supporting regulatory policies as an instructive point of reference in debates over Indigenous water governance initiatives and self-determination. Our analysis also considers the problematic entanglements of environmental governance frameworks like TAS in colonial legacies (e.g., Dennison 2012). TAS programs that delegate federal regulatory responsibility to tribes continue to privilege Western, bureaucratic frameworks of water governance. While TAS programs do facilitate key aspects of UNDRIP, they do not envision redress for colonial legacies that have led to disproportionate impacts of environmental harms to tribal lands and waters.

TAS can function as a model for Indigenous water co-governance within other federal systems based on key program components that support Indigenous self-determination. These include (1) tribally driven goal setting and program design that can address each tribe’s distinct water quality needs, including cultural and ceremonial uses of tribal waters; (2) clear recognition of boundaries for Indigenous lands and waters and the legitimacy of Indigenous self-governance institutions; and (3) formal institutional relationships with centralized governance institutions, like the EPA, that have clear policies supporting tribal self-determination and also have the necessary enforcement and conflict resolution capacity to strengthen accountability to tribal standards across jurisdictions. As pointed out by multiple studies, tribes require adequate resources as a precondition for their ability to access federal TAS programs and develop their own WQSs. While building tribal capacity to support scientific standards for water quality is part of this work, tribes also require resources and capacity to address the legal complexities with negotiating tribal jurisdiction over land and water.

In addition to the work many tribes are doing to engage within federal regulatory policy, there is a much broader range of resurgence work (e.g., engaging Indigenous youth in land-based learning), which is potentially more transformative in the long term. Tribes are also working through their own legal orders to set water quality standards and ordinances. These tribes can still look to TAS as a useful framework. For example, TAS sets up a flexible model for tribes to self-define culturally beneficial uses in their own water codes and ordinances. TAS-based WQs also provide examples of how tribes have chosen to express their standards in different ways, often selecting standards that extend beyond federal minimums. In this way, self-governing tribes can use TAS-like standards to inform tribal planning and zoning initiatives, particularly when envisioning water governance mechanisms that facilitate diplomacy across multiple jurisdictions and sovereigns. Thus our analysis points out the value and complexities of parallel engagement in dominant colonial governance frameworks and tribally defined water governance systems. This research also establishes a need for future work to re-envision water governance policies that advance both sustainability and self-determination.

Sibyl Diver is a researcher at Stanford University in the Department of Earth System Science. She does community-engaged research on Indigenous water governance, focusing on Pacific Northwest salmon watersheds. She received her PhD in environmental science from the University of California, Berkeley. Sibyl began working on these issues as a Russian translator, facilitating international exchanges for Indigenous community leaders on land rights and Indigenous resource management.

Daniel Ahrens recently received his BS in environmental science from the University of California, Berkeley. Daniel currently works as a Communications Associate and Princeton in Asia Fellow at RECOFTC—The Center for People and Forests in Bangkok, Thailand. In the fall of 2020, he will begin studies for a JD at Stanford Law School. Daniel's research interests are in Indigenous policy and cooperative management.

Talia Arbit currently works as a sustainability professional in the Bay Area. She studied environmental biology at Columbia University and received her MA in urban education from LMU, with a focus on environmental education. At both Columbia and Stanford Universities, Talia has conducted research on water management, treatment, and contamination issues.

Karen Bakker is a professor and Canada Research Chair at the University of British Columbia, where she is the director of the Program on Water Governance. She is the author of more than one hundred academic publications, including *Privatizing Water* (2010) and *An Uncooperative Commodity* (2004).

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