What is "Clean" Water? Sovereignty under the Clean Water Act's Treatment as a State Program

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ABSTRACT

Recent water quality issues for tribal waters, such as the Gold King Mine Spill or the Dakota Access Pipeline, posit that tribal sovereignty is as important a strategy in protecting water quality as other public health policies. The United States Environmental Protection Agency delegates some water quality management authority to tribes under the authority of the Clean Water Act's Treatment As a State program (TAS). Under this program, tribes can develop their own Water Quality Standards for the purposes of the National Pollution Discharge Elimination System. In order to evaluate the effectiveness of this program at advancing the goal of tribal sovereignty, I analyzed toxins regulations for the 44 tribes that have promulgated standards under this program. I found that tribes were meeting the requirements of federal delegation and developing unique standards that exceed those requirements. Additionally, tribal regulation showed dissimilarity, suggesting independence from state and federal regulatory structures. Finally, tribes are using multiple strategies outside numeric standards to pursue their water quality goals. These findings suggest that not only is TAS a program that can advance tribal sovereignty, it is a space where tribes are negotiating frameworks of water quality management.

KEYWORDS

Water quality, Multi-level governance, cultural use, ceremonial use, Indigenous knowledge

INTRODUCTION

Realizing the positive consequences of tribal self-governance, the United States federal government often delegates federal services to sovereign tribal governments. Influenced by civil rights movements of the 1960s, the Indian Self-Determination and Education Assistance Act of 1975 allowed the Departments of the Interior and Health and Human Services to devolve federal services, such as policing, health care provision, and land management, to tribal governments. This marked the end of the termination era, the previous policy of eliminating Native American political status, and the beginning of the self-determination era (Strommer and Osborne 2014). Allowing tribal governments to take a larger role in the provision of federal functions has enabled both more culturally appropriate and effective service delivery in Indian Country (Cornell and Kalt 2010). Despite threats to tribal jurisdiction over non-Indians from the Supreme Court, beginning with *Montana v. United States,* tribal courts have gained increased legitimacy and resources (Suagee and Lowndes 1999). Despite these advancements, tribes must balance the expectations and conditions of providing contemporary federal functions with maintaining the cultural and historical integrity of their governing practices. One key regulatory area that is being delegated to tribes is water quality standard-setting and enforcement, though questions remain about the burden of implementing the program and the effectiveness of doing so.

Despite significant water quality concerns arising both on and off tribal lands, Native American access to safe and clean water lags non-Native populations. The United States Environmental Protection Agency (EPA) has a federal trust responsibility to monitor and enforce water quality on tribal lands. The EPA is involved in listing and setting Maximum Contaminant Levels for toxic chemicals, inspecting sites of concern, and recording and enforcing violations (Griffiths et al. 2012). Yet, EPA inspections of water quality and violation recording are fewer for Native American communities than non-Native ones (Teodoro et al. 2016). Apart from these public health concerns, barriers remain to the full participation of Indigenous peoples in water quality management. Focusing primarily on Southwestern tribes, Chief et. al (2016) identifies four primary challenges in tribes' assertions of legal and political rights to water: cultural and political conflicts with the nature of the doctrine of prior appropriation; water contamination as not only a public health issue, but an emotionally traumatic event that affects religious and subsistence use; prior exclusion from water management negotiations and decisions; and unequal

standing for traditional knowledge in Western water management frameworks. In addition to these barriers, tribes often lack the legal standing to challenge pollution that arises outside of reservation boundaries. While the EPA has a unique trust responsibility to protect the water quality of tribes in the United States, the persistent challenges to water quality and barriers to tribal participation suggest more effective approaches are necessary.

In the spirit of sovereign tribal governance and in recognition of the historical role tribal governments have held in resource management, the EPA's Treatment as a State (TAS) program under the Clean Water Act (CWA) authorizes water quality standard development, enforcement capacity, and funding for tribal governments. Passed in 1987, these amendments to the CWA allow tribal governments to assume the same responsibilities state governments do over water quality setting and enforcement. One illustrative case occurred when the Isleta Pueblo successfully defended water quality standards protecting ceremonial uses and forced the city of Albuquerque to rebuild a wastewater treatment plant (Baker 1996). This case raises questions of whether or not tribes are setting, on balance, higher standards and what the influences are on those standards. If tribes are setting higher standards, it could suggest strong engagement with the program through toxins listings or, potentially, strong liberty from the EPA and states in implementation. It could be the result of Indigenous movements to protect water at a higher standard than the federal government. If tribes are setting lower standards, still above federal baselines, but lower compared to other tribes or states, it might mean that toxins listings are not an appropriate strategy to protect tribal interests or it could imply oppositional roles from states, the federal government, and industry. Despite almost 30 years of TAS implementation, no comprehensive study has documented the reasoning and decision-making processes behind and contents of tribally determined water quality standards, nor how effective such standards have been at providing quality water to tribal populations. As of May 3, 2018, only 44 of 330 eligible tribes have implemented such standards (Diver 2018, EPA 2018). The gap between potential adoption and real adoption of the TAS program suggests that not all tribes find the program meets their governance needs.

This thesis addressed how tribal governments create and enforce water quality standards under the EPA's TAS program. The project evaluated the central research question: How does the CWA TAS program implement principles of tribal sovereignty? I broke down this question to three sub-questions. First, what are the differences in tribal, state, and federal water quality

standards with regard to pollutants, pollutant levels, and use standards? Second, what level of influence do states and the federal bureaucracy have on the independence tribal water quality standards? Finally, what mechanisms do tribes use to bridge tribal needs and indigenous knowledge within the policy mechanisms offered by the EPA? This study examines trends and influences to analyze the political status of the TAS program. This project resulted in the development of comprehensive databases of tribal water quality standards.

BACKGROUND

A History of Native American Policy

The federal government's policies toward tribal governance have shifted from focusing on terminating tribal governments to supporting sovereign roles for them. The Clean Water Act Treatment as a State (TAS) Program is an important addition to the canon of federal Native American environmental policy. In order to understand the context of programs, such as TAS, that support the sovereign decision-making of tribes through delegated federal responsibility, it is important to understand prevailing philosophies of federal Native American Policy. Additionally, tribal jurisdiction is a complex topic that sets important limits on the enforcement of programs like TAS and is easily contextualized through historical context. Provisions of the TAS are best understood through their historical roots and the jurisdictional hurdles the program navigates.

Prior to colonization from the United States, tribes were self-governing sovereign entities. Though the federal government retained plenary power to limit such authority, tribal governments have inherent autonomy that predates American sovereignty as recognized by both the signing of treaties with tribes as sovereigns and the Interstate Commerce Clause (Newton 2012). The early signing of treaties with many tribes guaranteed rights to land, health care, economic development, and education among other benefits, some explicit while others arose from judicial interpretation, in exchange for giving up the rights to vast parcels of land to the United States. After the 1871 Indian Appropriations Act ended the United States' treaty-making abilities, the United States government took the position that tribes need to be self-sufficient and began converting reservation land into taxable, fee-patent land through the Dawes Act during a period known as allotment. Due to the undesirability of much of the land and difficulty in paying

taxes among other reasons, over 65 percent of tribal land on reservations was lost as of a 1999 accounting (Merjian 2010). However, in 1934, the Indian Reorganization Act (IRA), the primary legislative component of the Indian New Deal, was passed to stem the tide of land loss and created what is considered the modern-day reservation system. The IRA remains controversial as it asked tribes to commit to self-governance provisions that did not always correspond with traditional systems of government (Newton 2012). Later, in an effort to escape obligations created by treaties and the IRA, the federal government began to terminate tribal status for many tribes in the United States. Though preceded in the 1940s by a series of acts with limited impact, the policy was articulated in a 1953 Congressional declaration setting forth that tribes would be terminated individually through legislation (Wilkinson and Biggs 1977). That period ended after intense activism, and the federal government entered the most recent period of tribal governance, tribal self-determination and sovereignty. Embodied by the Indian Self Determination and Education Assistance Act of 1975, this period marked the return of federal functions to tribal governments. For example, tribes could offer their own policing services rather than the Bureau of Indian Affairs. This return to tribal self-government has mostly been praised, though tribes remain wary of possible steps backward.

Recent shifts towards federal support of tribal sovereignty do not erase the legacies of past policies on tribal governments today, particularly regarding land ownership and jurisdiction. Contemporary tribal land ownership categories include: trust land, land held in trust by the federal government for the benefit of the tribe, allocated trust land, land allotted to Indian individuals held in trust by the federal government for the benefit of the individual often fractionated among its heirs, and fee land, privately-held land either by individuals or the tribe (NRCS n.d.). A tribe can assert legal jurisdiction over reservation lands in Indian Country, which is generally considered as all land held in trust by the United States government. However, tribal jurisdiction remains limited. Tribal courts can try most cases among Indians, sharing jurisdiction with federal courts, however, as established in the 1981 *Montana v. United States* decision, they can only hear civil cases against non-Indians when the non-Indian has entered into a consensual agreement with the tribe or when lacking jurisdiction would substantially threaten the powers of tribal self-government (Newton 2012). While tribal governments continue to assume more self-governing authority, they remain hamstrung by limits on tribal jurisdiction. These limitations on

tribal jurisdiction are important in considering tribes' ability to enforce their tribal codes, particularly in the area of water quality, over non-Indian users.

The Treatment As a State Program

The Clean Water Act Treatment as a State Program is best understood through these issues of sovereignty, self-determination, and jurisdiction. The Clean Water Act (CWA) was passed in 1972 to enable the federal government to regulate point source pollution in waters of federal jurisdiction. Point source pollution is pollution emitted from a pipe or discrete outlet, such as a wastewater pipe whereas non-point source pollution has no single source, for example, dispersed runoff from agriculture. The CWA calls for the establishment of the National Pollution Discharge Elimination System (NPDES), which requires permitting of point sources by states to consider water quality standards and beneficial uses of water by all states through which the water body flows (US EPA 2015). In keeping with the goals of the self-determination era of Native American Policy, in 1987, Congress amended the CWA to enable interested tribes to achieve Treatment as a State (TAS) under provisions of the Act.

The Treatment as a State program consists of authorizations for specific programs of the CWA and the Safe Drinking Water Act (SDWA). In order to achieve TAS status a tribe must apply and show it is "Federally recognized; Have a governing body carrying out substantial governmental duties and powers over a Federal Indian Reservation; Have appropriate authority to regulate the quality of reservation waters; and, Be capable of carrying out the functions of an effective water quality standards program" (EPA 2017). The EPA Regional office approves these applications following comment periods. While other TAS programs exist for clean water pollution prevention funding programs, of particular interest here is TAS for Water Quality Standards (WQSs) (EPA 2014). Section 303 grants tribes the ability to set WQSs for the NPDES program. This is a two-step process, tribes must first get a grant of authority to administer such standards, then have the WQSs reviewed and approved by the EPA. As of May 3, 2018, 57 tribes hold this authority, and 44 of them developed WQSs under the program. These WQSs must protect at a minimum, the federally recommended standards, meaning the EPA is a floor for the standards. Typically, standards consist of a few notable sections, such as listings of designated

uses, such as recreation or ceremonial uses, narrative criteria, water quality goals for specific water bodies, and numeric standards for toxins.

The Section 303 approval opens new opportunities for tribes to engage in water resources management. This enables greater tribal sovereignty in the protection and management of their water resources in three notable realms: setting higher standards than surrounding jurisdictions, including cultural and religious uses, and providing an avenue to engage with upstream users (Diver 2018).

Sovereignty, Epistemology, and the Treatment As a State Program

The implications of TAS's expansion of sovereignty provide both increased opportunity and constraints as tribes decide their water resource management. First, the TAS program exists at a crossroads of tribal and federal jurisdiction. The independence and deference delegated to tribes by the federal government is important to consider in this era of tribal self-determination. Second, TAS incorporates tribes into the model of sovereignty held by states, despite the two having very different sources and meanings. Third, tribes often face opposition to expansions of their jurisdiction from adjacent state and local jurisdictions. Fourth, tribes often have capacity constraints that prevent undertaking all government programs. Finally, there exist tensions between the framework offered by TAS and the framework of water governance that tribes could pursue independently.

First, at the heart of the TAS statute is a conflict between limitations on tribal jurisdiction over non-Indians and the importance of tribal engagement in protecting their water quality, particularly in regulating upstream polluters. As noted earlier, tribes have limited authority to enforce tribal laws against non-Indian violators on tribal lands. While some might argue, like the City of Albuquerque did in its case against Isleta Pueblo, that TAS is an unconstitutional grant of sovereign authority over non-Indian stakeholders, TAS finds its legal footing in a grant of federal authority. Since enforcement of standards arises from federal authority under the CWA, it is, legally considered a delegated authority that can be curtailed by the plenary power of the United States. While this is can prove legally advantageous, as in the Isleta case, it means that the powers of this program are retained by the federal government (Anderson 2015). This sets up tensions, when, for example, the federal government chooses to not to bring enforcement actions

against polluters who violate tribal water quality standards (Conference Attendee 2017). That is, tribes cannot compel the EPA to intervene in violations of federal law that impact the tribe, though tribes retain the ability to execute their own laws for on-reservation violations by Indians, as well as by non-Indians in limited circumstances. Multi-level governance can set the stage for both conflict and cooperation between tribes and the federal government.

Second, TAS also posits different models of sovereignty in its treatment of tribes as states, not nations. Considering tribes signed treaties with the United States government, in the early years of jurisprudence, the Marshall Trilogy of case law established tribes as "domestic dependent nations," not states (Newton 2012). The distinction is important, as tribal sovereignty is inherent and preexisting, not granted by the Constitution as is state sovereignty. The TAS program offers the same sovereignty and standing to tribes that the CWA grants to states. Thus, while tribes are granted enhanced sovereignty, some tribal environmental professionals have raised concerns about assimilation (Seifer 2016). More than in name alone, tribes and states are not coequal. There are disparities in access to EPA capacity-building funding making the burden of developing WQSs more difficult (Grijalva 2005). This is in addition to a lack of knowledge of tribal governance laws, treaties, and principles that often holds tribes back in the application process due to heavy administrative burdens (Anderson 2015). Whether tribes are setting standards similar to states or setting their own course is key to understanding if this program might be assimilating tribal governance into another form of sovereignty.

Third, when expanding their jurisdiction, tribes often face legal threats from states and adjoining jurisdictions to curtail such authority. If a tribe regulates too aggressively, upstream jurisdictions might be provoked by new, stricter discharge requirements and raise the potential of a costly legal battle. If a tribe fails to regulate sufficiently, it will fail to protect the health of its citizens. Such was the case in Oklahoma, when after the Pawnee Nation achieved TAS status and received approval for WQS, a rider was attached to a transportation bill forcing new restrictions on Oklahoma tribes seeking TAS (Saunders 2009). Tribes are stuck in a double bind and play a difficult dance with adjacent jurisdictions. As part of the TAS application, the EPA solicits comments from local and state governments regarding jurisdiction that could threaten a tribes application (GAO 2015). For example, the Navajo Nation has applied for TAS through staggered applications of different components of its water management program to avoid challenges of its jurisdictional boundaries from local and state governments (Grant 2007). Like other regulatory

programs, tribal governments must be careful in regulating enough to protect their citizens, but avoiding threats to their sovereignty.

Fourth, an important component of the application to achieve TAS is that the tribes must show the governmental capacity to regulate. Many tribes are concerned with the cost of implementation as the EPA requires demonstrated governmental capacity as part of the application. For example, the EPA was concerned with the lack of professional engineers in the Navajo Nation's program, but was assuaged by the hiring of a hydrologist (Grant 2007). This case is not illustrative of all of Indian Country, as not every tribe has the resources of a larger tribe, like the Navajo Nation. Tribes might not apply due to the pressures it would place on their environmental programs. However, if tribes are regulating many toxins, it could suggest that, for the tribes that engage in TAS, it is possible to develop a scientifically robust set of standards, rejecting the notion that tribes are incapable of managing their own programs. The intense federal scrutiny raises the aforementioned concerns of how much autonomy tribes have in developing sovereign models of resource management.

Finally, cultural uses are an important consideration for tribal governments developing water quality standards under TAS. In *City of Albuquerque vs. Browner,* the Isleta Pueblo promulgated water quality standards that protected primary bodily contact and possible ingestion of water, as part of its religious ceremonies. However, such cases have raised questions of privacy and sovereignty over religious ceremonies. Tribes generally prefer to keep ceremonies private. Regulating for such uses, though, requires disclosure of enough information about the ceremony to protect its use and justify such protections (Baker 1996). Tribes must make decisions about what components of their ceremonies they are willing to make public in order to protect them, and so must the EPA decide how much information to require from tribes in promulgating said regulations. In addition to concerns about privacy, questions remain about whether or not Western models of water quality management are adequate for tribes. There is some evidence EPA officials are resistant to the inclusion of Indigenous knowledge in the development of Water Quality Standards (Lefthand-Begay 2014). Additionally, Western models of environmental risk embedded in the EPA's water quality management strategy may not represent true environmental risks to tribal citizens (O'Neill 2000).

The TAS program provides a promising path to sovereignty for tribes looking to regulate their own water quality, though it must contend with a checkered history of Native American

policy and jurisprudence. Tribal sovereignty over water quality management must find the light to grow under the shadow of state and federal limitations. As tribal governments push for sovereignty, the decision to participate in TAS is a strategic and self-determined one, balancing the tradeoffs of engaging with an incompatible resources management framework with potential benefits. If the TAS program is to effectively serve Native Americans, it must be supported by tribal governments self-determining appropriate natural resource management strategies.

METHODS

In order to understand tribal participation in Treatment as a State Water Quality Standards (WQS) regulation, I collected Tribal and State WQSs toxins regulations. After tribes have achieved TAS capabilities, the next step is to create WQS. Following approval from the EPA, these WQS are posted on the EPA's website. Additionally, State WQS are also publicly available through the EPA. Standards were downloaded, and metadata including the date of approval of TAS Status, date of approval of TAS WQS, State(s) in (if tribe), and the EPA Region, was gathered.

In order to understand national trends in tribal water quality standards, I collected and analyzed the content of Treatment as a State Tribal Water Quality Standards toxins regulations. For each numeric water quality standard for a state or tribe, the toxins that were regulated with numeric quantities were catalogued in a spreadsheet. These quantities were typically found in tables of toxins regulation. This study looks exclusively at a presence/absence comparison of toxins though there are other mechanisms of regulation in these standards including, but not limited to, designated use restrictions, narrative criteria, and anti-degradation policy. These qualities will be examined in a later analysis. I selected a presence/absence analysis due to the multiple ways that federal, state, and tribal governments communicate numeric standards, including Maximum Contaminant Levels vs. The toxins were then categorized as to whether or not the chemicals were regulated by the EPA, whether or not they regulated human health or aquatic life, and whether or not they were included among numeric criteria, but opted to use narrative criteria. Any necessary notes were added to the spreadsheet. If a single numeric criteria existed for multiple chemical criteria, it was treated as separate regulations for each chemical. For example, if a tribe regulated the sum of Nitrate and Nitrite, it would be treated as a regulation

for Nitrate and a regulation for Nitrite. As this study compares the presence and absence of chemicals in regulation listings, it was important to be able to compare chemical-by-chemical, rather than grouping-by-grouping. Additionally, when tribes incorporated other standards by reference a best effort was made to locate and incorporate each standard. While completing this analysis, notes were taken on strategies tribes used to bridge the TAS framework with tribal uses and knowledge.

To understand the content of these water quality standards, I completed a comparative analysis of water quality standards between tribes and states. In order to understand the overall trends of tribal water quality management, I compared State and Tribal WQS in the above categories listed. The two were compared in terms of mean values of the categories: EPA regulated toxins, non-EPA regulated toxins, and total unique toxins. For the analyses in this study, only toxins with CAS numbers listed under the Toxic Substances Control Act were included. For this analysis, I counted the number of unique toxins regulated. That is, I compiled a list of all toxins listed as Human Health toxins and all Aquatic Life toxins and eliminated the duplicates. A future study will address the significance of the distinction between the two.

In order to test the influence of state and regional governance structures on tribal standards, I conducted a similarity analysis of the presence and absence of toxins. In order to compare the effect a particular grouping may have on tribal WQS, I grouped tribes by state and EPA Region. then calculated the pairwise difference of the grouping. The pairwise difference is calculated as the average difference of all potential pairings of any two tribes in the region. The difference is calculated as the sum of the differences in the presence and absence of each toxin. If two matrices are the identical, the pairwise difference is 0. If two matrices do not share any toxins, the pairwise difference is the sum of the counts of their entries. Thus, a lower pairwise difference indicates a greater degree of similarity. For example, if the tribes in a region or state are very similar to each other, and also to the state they are in, we can say that the tribal standards are closely tied to the state standards.

In mathematical notation, for any two matrices, X and Y, projected onto the same basis vector of the union of their toxin list, the difference is calculated as:

$$Difference(X, Y) = |X - Y|$$

Then, the pairwise average of some set of *n* vectors, X, Y, Z…, can be calculated as:

$$Pairwise\ Average = \frac{1}{\binom{n}{2}} \sum_{a=0}^{\binom{n}{2}} Difference(X,Y)$$

where each Difference calculated is the next enumeration of the combination of n vectors chosen two at a time.

In order to evaluate the significance of these pairings, I created national distributions of potential pairings as the same size as the grouping in question. For example, there are 44 tribes nationally participating in the TAS program. In order to understand if the tribes in Arizona are similar to one another, I calculated the pairwise average of the four Arizona tribes. Then, I calculated the pairwise average for four tribes chosen at random from the nation. In general, if the number of national groupings was less than 100,000, the distribution consisted of the complete listing of groupings. If the number was greater than 100,000, the groupings were selected randomly, due to limitations in computing power. The analysis was completed in Matlab (The MathWorks Inc. 2015).

To contextualize this study, I attended the EPA Region 9 Tribal EPA conference to understand the greater regulatory context and identify relevant documentation, regulation, and stakeholders. Additionally, I attended the Klamath Basin Monitoring Program Fall meeting. Finally, I spoke with a tribal environmental professional at Navajo Nation, who provided background information on water quality enforcement.

RESULTS

Primacy Analysis

Of the 138 distinct toxins the EPA recommends regulating, tribes and states regulated a similar proportion of that total, about 100 of 138. Every tribe and every state regulated additional chemicals that the EPA did not recommend. However, states, on average, regulated more additional chemicals than tribes did, though some states such as New York and Montana, skew the average.

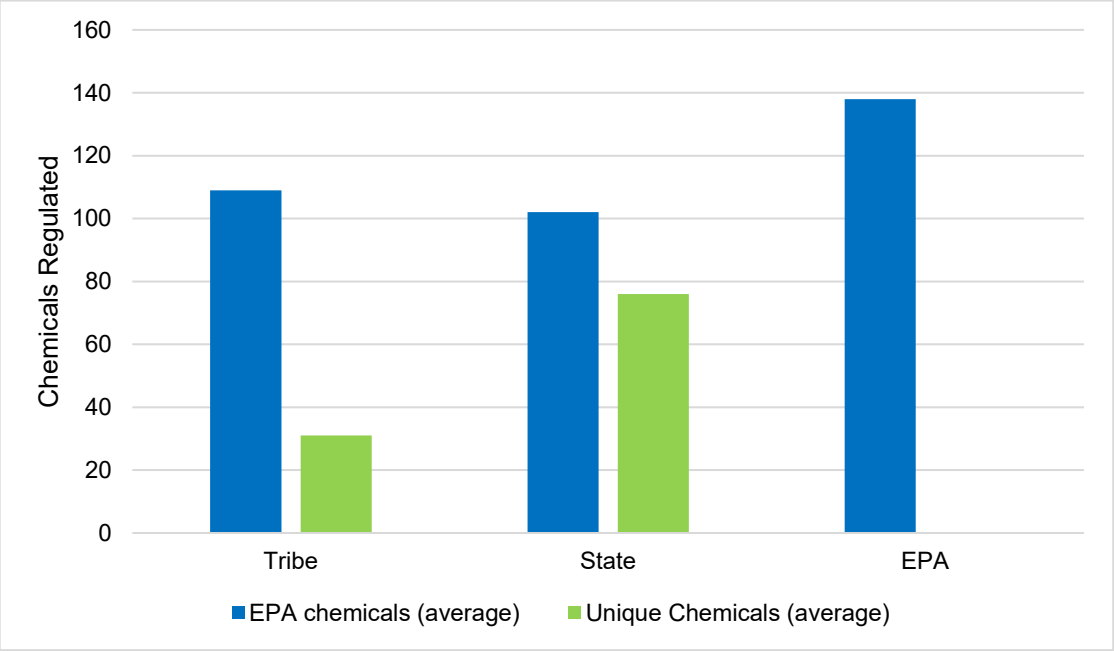

Figure 1: Toxin Primacy Analysis. Nationwide average of the number of chemicals that the EPA regulates that tribes and states also regulate for alongside number of chemicals states and tribes regulate that the EPA does not regulate for.

Specificity Analysis

Across all regions, 30 of 42 tribes regulate more toxins than the state they are in. However, trends differ across states and by EPA Region. On balance, in Florida, Wisconsin, and New Mexico, tribes generally regulate for toxins more than the state they are in. In New York and Montana, tribes generally regulate for toxins less. In Minnesota, Colorado, Arizona, California, Nevada, Idaho, Oregon, and Washington, the numbers between tribes and states are

roughly similar. Additionally, the year that standards were promulgated does not appear to have a strong effect on total unique toxin listings.

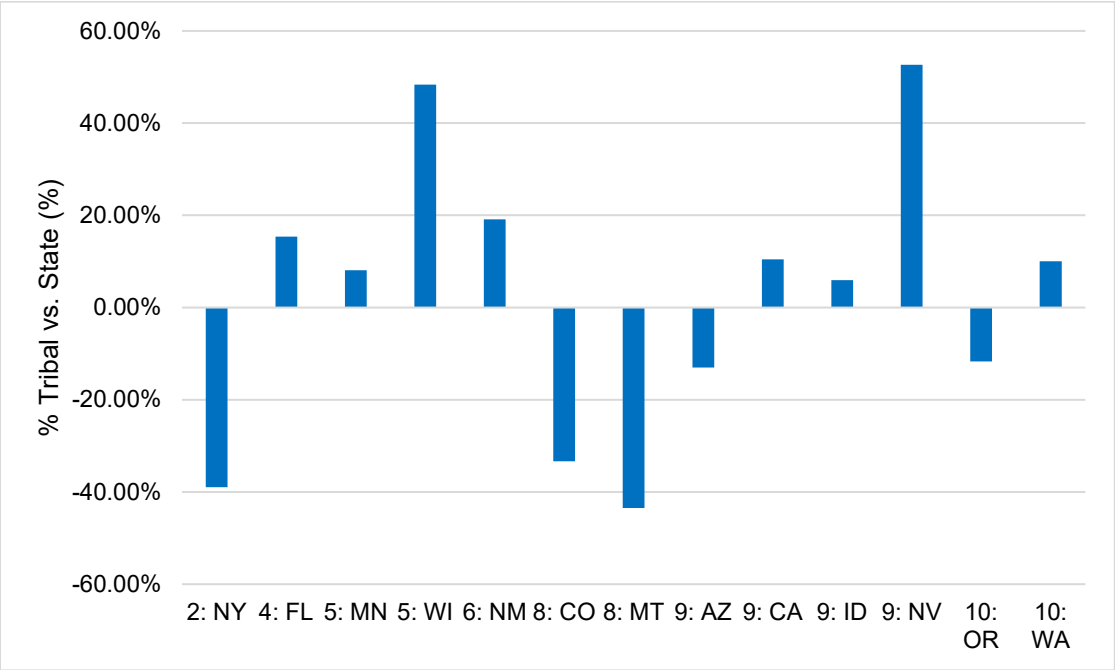

Figure 2: Percentage Unique Toxin Listings. The percent difference between the average number of unique listings of toxins in tribes in a state and the number of unique listings of toxins of that state. EPA Region numbers are listed by the state two-letter identifier for reference. Negative numbers mean the average number of tribal unique listings is lower than the state. Positive numbers mean it is higher.

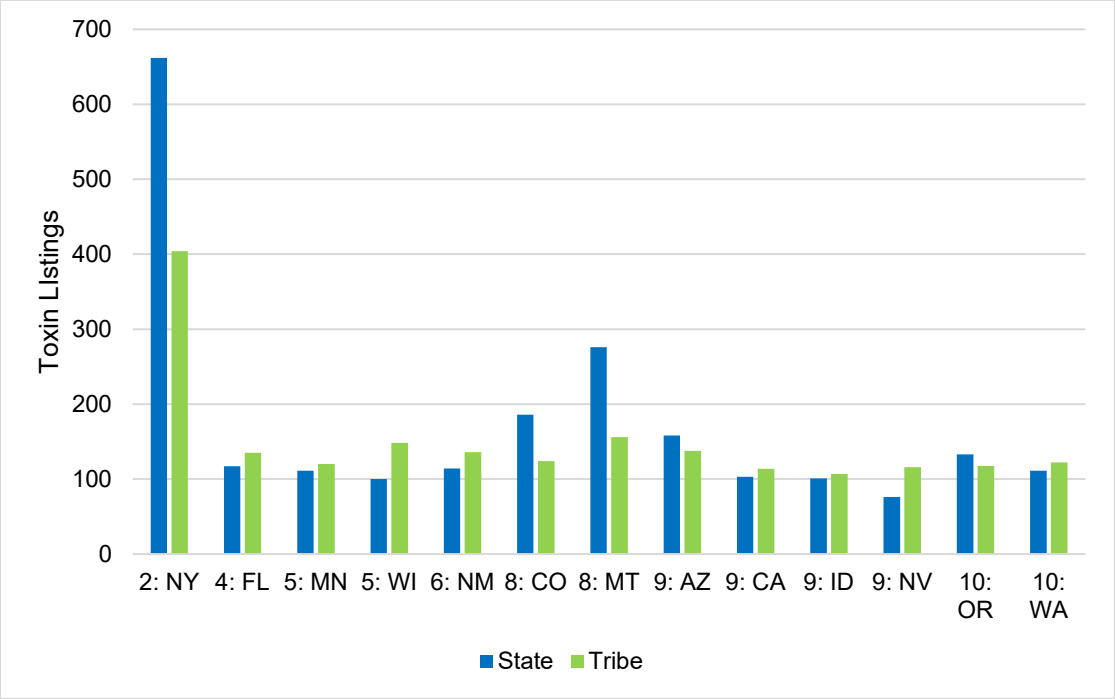

Figure 3: Number Unique Toxin Listings. The average number of unique listings of toxins in tribes in a state and the number of unique listings of toxins of that state. EPA Region numbers are listed by the state two-letter identifier for reference.

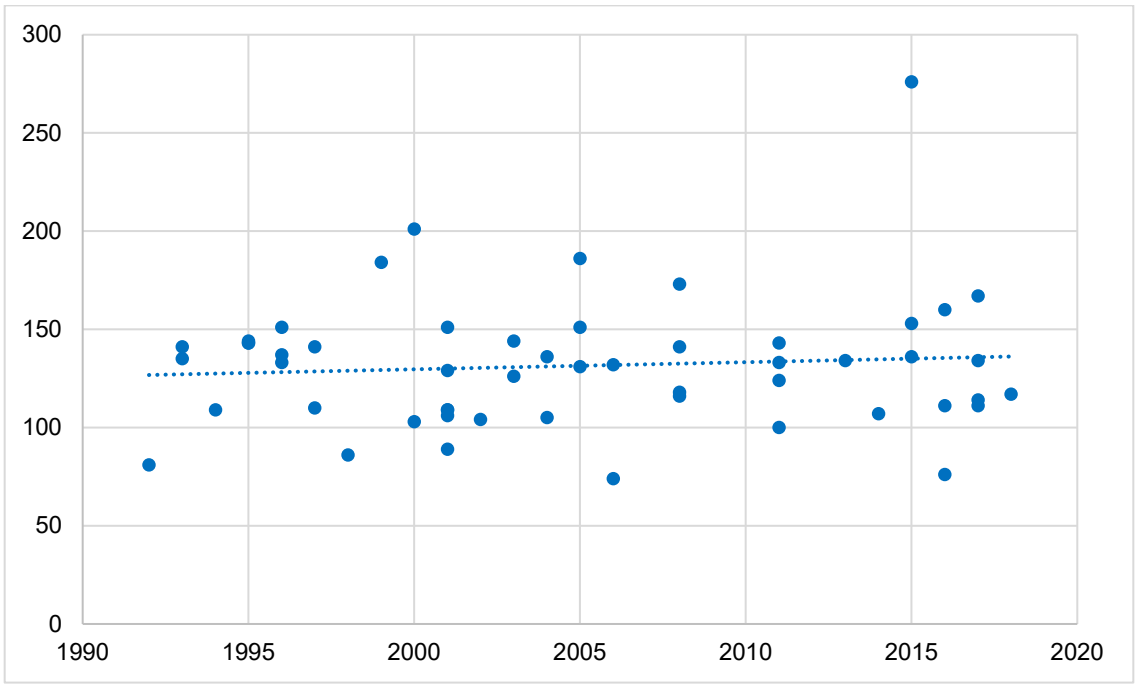

Figure 4: Total Unique Toxin Listings by Year. The number of toxins listings for both tribes and states by year listed. A weak trend-line is shown. New York (listings = 662) is excluded from this view for legibility.

Similarity Analysis

In order to calculate the effect of various groupings, pairwise averages for number of toxins including within WQS were calculated for tribes in states and regions. All groupings with only one tribe are excluded from this analysis (Region 2, State of New York, State of Nevada, State of Colorado, and State of Idaho). If the Regional grouping and state grouping are the same they are listed together (i.e. Florida is the only state with TAS tribes in Region 4). A high percentile means the grouping indicates a higher degree of similarity than a lower grouping.

Table 1: Similarity Analysis. This table shows the similarity of various groupings, their statistical comparison to random sampling, and the average percentage overlap of tribal standards with state standards. National percentile reflects the percentile of the similarity index in a distribution of similarity indices of random samples of all tribes that participate in TAS. The Overlap Percentage represents the average percentage of a state's toxin listings for which tribes in that state also regulate.

EPA Region	Grouping	Pairwise Average	National Percentile	Overlap (%)
Region 4	Region 4/Florida (n = 2)	147	6	75
Region 5	Region 5 (n = 5)	63.6	69	74
	Minnesota (n = 2)	121	24	67
	Wisconsin (n = 3)	36.7	91	79
Region 6	Region 6/New Mexico (n = 11)	81.9	41	90
Region 8	Region 8 (n = 4)	63.6	45	50
	Montana (n = 3)	76.7	44	53
Region 9	Region 9 (n = 9)	57.72	88	80
	Arizona (n = 4)	49.7	85	78
	California (n = 4)	69	57	82
Region 10	Region 10 (n = 11)	29.12	98	93
	Oregon (n = 2)	27	91	86
	Washington (n = 8)	33	98	94

Qualitative Analysis

Tribes pursued a variety of mechanisms to bridge tribal interests and knowledge with the TAS framework. These mechanisms were found and the intersection of narrative and numeric strategies, and tribes used varying levels of specificity to describe these strategies.

Table 2: TAS Strategies. This table shows the similarity of various groupings, their statistical comparison to random sampling, and the average percentage overlap of tribal standards with state standards.

	Non-Specific Use	**Specific Use**
Narrative		Designated Uses (For Ceremonial or Religious Use; Listing uses for water bodies (e.g. ingestion, bodily contact) Value statements; Narrative descriptions of water bodies
Numeric	Altering fish consumption rates for equations	Naming of use and numeric standard together (e.g. Wild rice and Sulfate levels)

DISCUSSION

Under Treatment as a State status, tribal governments are enacting novel, though limited, expansions of their sovereign governance capabilities. This study's analysis of tribal water quality policy documents and toxins listings revealed trends of limited advancement of tribal sovereignty. Tribes are meeting EPA primacy requirements, and regulating more chemicals. Tribes also show, in general, patterns of dissimilarity, suggesting independence from states and other regulatory structures, though, in some regions, decision-making appears constrained. It additionally shows that tribes are subverting the Western water management framework offered by TAS to include more tribal values, uses, and knowledge. This study points to TAS offering some latitude for tribes, though substantial tradeoffs as well.

Quantitative Analysis

Tribes show small, but significant enactments of sovereign and separate governance in a numerical analysis of toxins included within tribal water quality standards. The CWA requires that tribal water quality standards cover at least the federal government's standards, so it is a statutory requirement then that tribes' standards regulate many, though not all, of the EPA's standards (Figure 1). On average, Tribes and States do not regulate every chemical the EPA currently regulates, however, the difference can likely be explained due to the EPA's strengthening standards over time. This finding verifies that tribes must adopt the EPA's water resources management framework to participate in this expansion of sovereignty.

Tribes are also regulating more chemicals than the EPA, and, on balance, more chemicals than the state they are in (Figure 1). The finding that tribes regulate on average, approximately 30 more unique toxins, and that three-quarters of tribes regulate more unique toxins then the state they are in, mean that tribes are expanding their jurisdiction passed what the EPA offers. This engagement with the framework suggests that tribe find it is an adequate tool, among many, to advance their interests. This verifies previous findings that the EPA's programs insufficiently cover the water management goals of tribes (Teodoro et al. 2016). Additionally, it shows that tribes in the TAS program have the technical capacity to create WQSs at a greater extent than

states. That is, if tribes are allowed to set their own standards, in general, they regulate more toxins than states and the federal government.

There are interesting regional trends present in the data. Some states, like New York and Montana, list many hundreds of toxins in their WQSs. The lower percentages of tribal toxins listings are likely due to gaps in technical capacity to set, much less monitor and regulate for such high numbers of toxins. Other states, like New Mexico, have much lower standards, meaning that tribes list more toxins on average. This implies New Mexico's standards are insufficient for tribal needs.

Apart from setting higher standards, another possible measure of sovereignty is independence. If all the tribes within a state show similar standards to each other and to the state, it might imply the state has a strong influence on the standards, and tribes are pressured by the state to adopt similar standards. It could also mean that tribes find state regulations sufficient, or that tribes follow similar strategies in developing their standards. However, the presence of dissimilarity is enough to show that tribes can pursue sovereign standards, whereas the presence of similarity leaves it an open question.

In a few cases, tribes show strong similarity in regions or states. This could be due to either matching or influence from the state or region. Matching would mean that tribes might want their standards to be comparable to other tribes in a similar geographic region and adopt similar standards. If a state or EPA region had strong influence on the process however, that could also indicate a strong matching effect. The strongest similarities found in this analysis are the states of Washington, Oregon, Arizona, and Wisconsin, and EPA Regions 9 and 10. The matching effects are potentially due to state influence, as all these groupings have an average tribal overlap with the state of greater than 78%. In Wisconsin and Washington, the tribal average number of toxins is higher than the state's standards whereas in Arizona and Oregon, the tribal average is lower than the state's standards.

A notable component of this analysis, however, is not the similarity, but the dissimilarity exhibited for most of the groupings. This means, that tribes are, in general, regulating independently from one another (above the floor of the baseline EPA standards). If tribes can regulate independently from one another, it provides some support for the idea that the Treatment As a State program supports the sovereign decision-making processes of tribes. This

pushes back on the notion that states and the federal bureaucracy significantly impact the program (Saunders 2009).

Yet, a model of sovereignty where tribes are aggressively pursuing their standards seems less applicable here. For the most part, while slightly higher, there is not enough of a difference to suggest tribes, on the whole, are substantially pushing the envelope. This data also has a slight confirmation bias in this respect. The tribes studied here participate in this program and that have promulgated WQSs, whereas other tribes might not even attempt to do so. Such a method also ignores the substantial legal threat tribes face when they expand their sovereign governance systems. States and local governments are often oppositional threats to tribal governance. Though tribes exhibit diversity, that does not necessarily mean they are promoting a more expansive agenda.

Qualitative Analysis

Apart from numerical standards, analysis of the text of water quality standards reveals unique mechanisms for tribes to set more stringent standards. In particular, there arise three notable bridge mechanisms with varying degrees of specificity and technicality (Table 2).

First, some tribes choose to alter the underlying assumptions of the technical framework offered by the EPA. Perhaps heading O'Neill's call (2000), some tribes choose to alter the assumptions that drive the technical processes of calculating environmental risk, thus altering the standards. The Spokane Tribe of Washington notably uses this approach to their standards, where the fish consumption rate is set at 865 grams/d and their water consumption rate is 4L/d, well above average consumption rates. These values were derived from an academic study a traditional pre-colonial diet for the Spokane tribe (Harper et al. 2002). In their approval letter attached to the standards, the EPA affirms that tribes do not need to justify a use, such as a traditional diet, solely based on the number of people participating nor differences in water quality goals. This strategy shows that by altering the assumptions, while leaving the risk analysis intact, tribes can include local knowledge in their standards and protect tribal uses. \

A second strategy consists of broad narrative descriptions, either in designated uses or value statements. A tribe may list religious ceremony as a designated use for its water bodies. This is a strategy advanced by the Isleta Pueblo in the aforementioned seminal case *City of*

Albuquerque vs. Browner (Monette 1996). The potential of ingestion in a ceremony was used to set high arsenic standards. Broad standards can both protect a tribe in enabling it to address unforeseen violations without relying on technical standards. Additionally, it offers some privacy for religious use. However, the lack of specificity often means that tribes do not have sufficient legal backing if challenged.

A final strategy merges the two in that it names both a use and a numeric standard for it. This is seen, for example, in the Fond du Lac Band of Lake Superior Chippewa's standards (2001). The standards note, "Any lake or stream which supports wild rice growth shall not exceed instantaneous maximum sulfate levels of 10 milligrams per liter." This standard both names a culturally significant use, wild rice growth, and a corresponding standard to protect it, 10 milligrams per liter. This approach does not have the same broad applicability of naming a designated use, but has the technical basis of the first approach. This fusion of tribal interests in the TAS program shows the potential, though limited, for advancement of tribal sovereignty in this framework.

Another observation is that many tribes use similar formatting in their standards to state governments. This could imply that tribes first, want their standards to be comparable during challenges, but, secondly, by engaging the policy framework of a state government avoid challenges to their legitimacy and can engage in more substantial government-to-government relationships. Tribes seem to be engaging with the framework of policy offered by TAS rather than subverting it entirely.

As mentioned above, tribes find ways to slip in Indigenous knowledge and water governance within the TAS policies. This means that tribes are simultaneously engaging and subverting the TAS framework, pushing for expansions of tribal sovereignty in the limited policy avenues offered. This simultaneous entrance into the federal space and subversion could be evidence of tribes working in what has been described as the "third space" of sovereignty (Bruyneel 2007). This concept describes places where neither tribal nor federal sovereignty are wholly adequate descriptors, and tribes can cross boundaries to advance political objectives. TAS appears to be such a place, where tribes have discovered options to pursue their sovereign goals within the framework offered by the United States.

Limitations and Future Directions

While this study delineates the boundaries of the bureaucratic mechanisms of the TAS status, work remains. New methodologies need to be developed to compare the effectiveness of water quality enforcement, not to mention water quality itself, for tribes with and without TAS. There is no agreed-upon mechanism for studying water quality enforcement effectiveness, but some approaches suggest studying violations or water quality indicators (Teodoro et al. 2016, Drevno 2016). This analysis only analyzes the state of the WQSs, but does not reveal outcomes. Additionally, this study only examines final policy outcomes, but additional work could be done to analyze the policymaking process in deciding water quality standards. While this study allows for the inference of trends, it is not a causal study, so additional work is needed to elucidate the mechanisms of policy formation. Finally, this study can only measure water quality standards through total chemical references, not whether specific standards are higher or lower. This is due to the disparate nature of measurement of standards, whether Maximum Contaminant Levels, or acute/chronic exposure measurements, among others. A toxicology study might shed light on potential trends.

CONCLUSION

Tribal governments move to advance their sovereignty through a variety of arenas, including TAS. An analysis of the strategies of tribes engaged with TAS posits that tribal governments are already finding ways to subvert the framework of the TAS to advance tribal interests, uses, and knowledge. Numeric findings support this, showing that tribes are extending their regulatory standards beyond the stringency levels used by states and exhibit a strong degree of independence in their regulation. TAS provides an avenue through which tribal governments are pushing back on Western water management frameworks. In this sense, while TAS was designed to assimilate tribes into a Western water management framework through the delegation of a federal program, tribes are finding in success in advancing their sovereign reach, through administration of the program, and values, through subversions of its framework.

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APPENDIX A: List of Tribes in Treatment as a State Program (EPA 2018)

Tribe	EPA Region	Date Found Eligible to Administer a WQS Program (TAS)	Date Initial WQS Approved by EPA
Assiniboine and Sioux Tribes of the Fort Peck Indian Reservation (MT)	8	8/29/96	4/25/00
Bad River Band of Lake Superior Chippewa (WI)	5	6/26/09	9/21/11
Big Pine Band of Owens Valley (CA)	9	10/24/05	1/18/06
Blackfeet Tribe (MT)	8	5/2/12	
Coeur D'Alene Tribe (ID)	10	8/5/05	6/12/14
Confederated Salish and Kootenai Tribes of the Flathead Reservation (MT)	8	3/1/95	3/18/96
Confederated Tribes of the Chehalis Reservation (WA)	10	3/7/95	2/3/97
Confederated Tribes of the Colville Reservation (WA)	10	Not applicable	1989-07-06 (promulgation)
Confederated Tribes of the Warm Springs Reservation (OR)	10	5/25/99	9/28/01
Confederated Tribes of Umatilla (OR)	10	4/30/01	10/18/01
Cortina Band of Wintun Indians (CA)	9	4/7/16	
Dry Creek Rancheria Band of Pomo Indians (CA)	9	10/17/11	
Eastern Band of Cherokee Indians (NC)	4	1/26/15	
Fond du Lac Band of Chippewa (MN)	5	5/16/96	12/27/01
Grand Portage Band of Chippewa (MN)	5	7/16/96	11/2/05

Havasupai Tribe (AZ)	9	4/26/11	
Hoopa Valley Tribe	9	5/17/96	9/11/02
Hopi Tribe (AZ)	9	4/23/08	7/8/08
Hualapai Indian Tribe (AZ)	9	7/22/04	9/17/04
Kalispel Indian Community (WA)	10	11/4/02	6/24/04
Lac du Flambeau Band of Chippewa (WI)	5	4/8/08	9/17/10
Lummi Tribe (WA)	10	3/5/07	9/30/08
Makah Indian Nation (WA)	10	12/23/03	9/29/06
Miccosukee Tribe (FL)	4	12/20/94	5/25/99
			2001-03-15 (Miccosukee Reserve Area)
Mole Lake Band of the Lake Superior Tribe of Chippewa Indians, Sokaogon Chippewa Community (WI)	5	9/29/95	1/22/96
Morongo Band of Mission Indians	9	4/3/18	
Navajo Nation (AZ, NM, UT)	9	1/20/06	4/11/06
Northern Cheyenne (MT)	8	8/11/06	3/21/13
Ohkay Owingeh (NM) (formerly the Pueblo of San Juan)	6	5/12/93	9/16/93
Paiute-Shoshone Indians of the Bishop Community (CA)	9	4/11/06	8/15/08
Pala Band of Mission Indians (CA)	9	4/19/16	
Pawnee Nation (OK)	6	11/4/04	
Port Gamble S'Klallam (WA)	10	9/24/03	9/27/05
Pueblo of Acoma (NM)	6	4/17/01	4/17/01
Pueblo of Isleta (NM)	6	10/13/92	12/24/92
Pueblo of Laguna (NM)	6	12/20/16	7/19/17

Pueblo of Nambe (NM)	6	8/18/95	8/18/95
Pueblo of Picuris (NM)	6	8/7/95	8/7/95
Pueblo of Pojoaque (NM)	6	3/21/96	3/21/96
Pueblo of Sandia (NM)	6	12/24/92	8/10/93
Pueblo of Santa Ana (NM)	6	7/20/15	8/31/15
Pueblo of Santa Clara (NM)	6	7/19/95	7/19/95
Pueblo of Taos (NM)	6	12/8/05	6/19/06
Pueblo of Tesuque (NM)	6	4/29/97	4/29/97
Puyallup Tribe of Indians (WA)	10	5/25/94	10/31/94
Pyramid Lake Paiute (NV)	9	1/30/07	12/19/08
Rincon Band of Luiseño Indians	9	4/3/18	
Saint Regis Mohawk Tribe (NY)	2	10/16/02	9/14/07
Seminole Tribe (FL)	4	6/1/94	1997-09-26 (Big Cypress Reservation)
			1998-11-18 (Brighton Reservation)
Shoshone-Bannock Tribes (ID)	10	9/5/08	
Southern Ute Indian Tribe (CO)	8	3/28/18	
Spokane Tribe of Indians (WA)	10	7/23/02	4/22/03
Swinomish Indian Tribal Community (WA)	10	4/18/08	8/25/17
Tulalip Tribes (WA)	10	5/9/96	
Twenty-Nine Palms (CA)	9	10/26/06	8/20/15
Ute Mountain Ute (CO)	8	9/26/05	10/19/11
Walker River Paiute Tribe (NV)	9	2/29/16	
White Mountain Apache Tribe (AZ)	9	2/3/97	9/27/01