PSJ Policy Studies Journal

The Policy Studies Journal, Vol. 00, No. 00, 2016

U.S. Environmental Policy Implementation on Tribal Lands: Trust, Neglect, and Justice

Manuel P. Teodoro, Mellie Haider, and David Switzer

This study investigates the implementation of U.S. environmental protection laws under American Indian tribal governance. The landmark laws of the 1970s that form the core of America's environmental policy regime made no mention of American Indian tribal lands, and the subsequent research literature on environmental policy has given them little attention. The U.S. Environmental Protection Agency has primary implementation responsibility for environmental protection laws on tribal lands, which offers a unique opportunity to study direct federal implementation apart from typical joint state–federal implementation. Further, because Indian reservations are homes to a disproportionately poor, historically subjugated racial group, analysis of environmental programs on tribal lands offers a unique perspective on environmental justice. We analyze enforcement of and compliance with the Clean Water Act (CWA) and Safe Drinking Water Act (SDWA) to compare the implementation of environmental policy on tribal lands with nontribal facilities. Analysis reveals that, compared with nontribal facilities, tribal facilities experience less rigorous CWA and SDWA enforcement and are more likely to violate these laws.

KEY WORDS: environmental justice, tribal, water, American Indian, Clean Water Act, Safe Drinking Water Act

Introduction

This study investigates the implementation of U.S. federal environmental protection laws under American Indian tribal governance by analyzing enforcement of and compliance with the Clean Water Act (CWA) and Safe Drinking Water Act (SDWA) among tribal and nontribal facilities. In so doing, we contribute to research on environmental federalism in the United States and reveal striking disparities that carry important implications for policy effectiveness and environmental justice.

In the United States, the groundbreaking national pollution control statutes of the 1970s such as the Clean Air Act (CAA), Resource Conservation and Recovery Act (RCRA), Superfund, CWA, and SDWA were built under a model of regulatory federalism in which responsibility for implementation is shared between federal and state governments. However, originally none of those landmark laws made provision for implementation on tribal lands. Tribal governments hold a unique legal and

Published by Wiley Periodicals, Inc., 350 Main Street, Malden, MA 02148, USA, and 9600 Garsington Road, Oxford, OX4 2DQ.

political status based on the principle of sovereignty established by the U.S. Constitution and confirmed by statutes, executive orders, and judicial decisions. Legally, tribal governments are "domestic, dependent nations," that is, sovereign nations under the legal guardianship of the U.S. government. In the 1980s and 1990s, federal environmental laws were formally extended to tribal lands, and the U.S. Environmental Protection Agency (EPA) administers them in cooperation with the tribes. Although tribes vary widely in economic, demographic, geographic, and organizational conditions, they hold in common this relationship with the U.S. federal government with respect to implementation of environmental regulations.

Over the past two decades, there has been a growing scholarly effort to establish whether there are race- and class-based disparities in environmental risks and regulatory enforcement outcomes in environmental policy (Bryant, 1995; Bullard, 1993; Dion, Lanoie, & Laplante, 1998). Environmental justice advocates claim that environmental risks are disproportionately concentrated among racial minorities and low-income groups, in part as a result of unequal implementation of environmental laws. In approaching this question, scholars have almost exclusively focused on regulatory actions carried out by federal and state governments to enforce environmental laws, with little or no consideration of enforcement and compliance on tribal land. The experience of American Indians has been more extreme than that of other ethnic minorities in the United States. American Indians have experienced systematic efforts by the U.S. government to decimate their populace and cultures, and have had the additional obstacle of the federal government's assertion of plenary authority that can be exercised at any time over tribal governments, resources, and land rights (Wilkins & Stark, 2011). Perhaps nowhere in the United States are environmental justice claims more poignant than on tribal land.

Does environmental policy implementation for tribal facilities differ from nontribal facilities in ways that past environmental justice research suggests? Do tribal facilities receive less stringent regulation than their nontribal counterparts? Do tribal facilities comply with environmental regulations more or less than nontribal facilities?

Past research provides strong theoretical reasons to expect disparities in environmental policy implementation on tribal land, compared with nontribal land. Federal regulators have few political incentives for devoting scarce resources to enforcement on tribal land, especially when tribes may lack the political strength to demand strict enforcement from federal officials. At the same time, many tribal governments serve sparsely populated communities under poor economic conditions, leaving tribes with limited access to the human and financial capital necessary to maintain compliance. Tribal governments are relative latecomers to environmental management, due in large part to their original omission from major environmental laws. Consequently, the tribal role in implementation of federal environmental programs has evolved slowly, and tribes' human and technical capacity to operate regulatory programs remains underdeveloped relative to the rest of the United States (Zaferatos, 2015). In light of these conditions, tribal facilities are expected to violate environmental regulations more frequently than their nontribal counterparts. These same limitations may make regulators reluctant to strictly enforce violations committed by tribal facilities.

This study tests for disparities in environmental compliance and enforcement between tribal and nontribal facilities. In so doing, we heed Ronquillo's (2011) call to examine the governance and management of American Indian communities, both for its own sake and as a means of understanding public intergovernmental public policy more generally. As the first study of its kind, the goal of the present research is to evaluate the first-order proposition that the implementation of federal environmental programs in Indian Country is significantly different from the rest of the United States. To that end, we intentionally paint tribes with a broad analytical brush, leaving aside the considerable heterogeneity among tribes in order to focus on the differences between tribal and nontribal facilities as categories. Specifically, we analyze regulatory enforcement (i.e., inspections) and noncompliance (i.e., violations) among municipal wastewater treatment facilities (Publicly Owned Treatment Works, or POTW) regulated under the CWA from 2010 through the first quarter of 2015. We also analyze drinking water utilities' compliance with the SDWA from 2010 to 2015, as well as state and federal enforcement of the SDWA. For both programs, we compare the regulation of tribal facilities with nontribal facilities. To our knowledge, this study is the first systematic, large-scale statistical analysis of inequities in regulatory enforcement on tribal land.

To summarize the key results, we find that regulatory enforcement is less rigorous and violations more frequent for facilities located on tribal land, compared with similar facilities on nontribal land. In addition to its implications for health and environmental quality, this study makes important contributions to environmental justice research because tribal governments serve and are homes to a historically oppressed and disadvantaged racial minority. Establishing significant implementation disparities between tribal and nontribal facilities lays the groundwork for deeper investigation into the factors and mechanisms that cause the disparity and variation in environmental implementation across tribes.

The balance of this paper proceeds as follows. In the next section, we briefly review the research literature on environmental federalism, with attention to the ways that U.S. federal environmental laws assign responsibility for implementation to state governments and their implications for environmental justice. This review offers a point of departure for a concise history of environmental policies in the context of tribal governments. Grounded in the literature on environmental justice as an implementation phenomenon and the strategic logic of regulation, we lay out a series of theoretical expectations about enforcement of and facility compliance with environmental regulations on tribal lands. Our empirical analysis of CWA and SDWA enforcement and compliance follows. After reporting our results, we conclude with a discussion of their policy implications and directions for future research.

Environmental Federalism, Environmental Justice, and Tribal Governance

Several of the landmark U.S. environmental laws that were enacted in the 1960s and 1970s established shared responsibility for regulation and implementation between the federal and state governments. Beginning with the CAA in 1970, Congress built explicit roles for states in the administration of new environmental laws

(Jones, 1974, 1975); the CWA, SDWA, and RCRA followed suit. Under each of these laws, the U.S. Environmental Protection Agency (EPA) establishes technology-based environmental quality standards. States may then opt to administer the laws directly in cooperation with the EPA—known as administrative "primacy." Alternatively, states may allow the EPA to administer regulations directly. Administration consists of monitoring facilities and enforcing their compliance with quality standards. Significant research under the banner of "environmental federalism" has examined the effects and effectiveness of shared state-federal governance over environmental issues (e.g., Crotty, 1987; Jones, 1975; Konisky, 2007; Lowry, 1992; Oates, 2001; Posner, 1998; Rabe, 1999; Scheberle, 2004, among many others).

Regulatory Implementation and Environmental Justice

The earliest empirical research on environmental justice focused on the inequitable distribution of environmental risk along racial, ethnic, and socioeconomic lines (e.g., Boer, Pastor, Sadd, & Snyder, 1997; Downey, 1998; Hamilton, 1995; Hird & Reese, 1998; Lanoie, Laplante, & Roy, Mohai & Bryant, 1992; Yandle & Burton, 1996). A second stream of research has examined inequities in the enforcement of environmental laws. Lavelle and Coyle (1992) found that fines for CAA, CWA, RCRA, and Superfund violations in poor and minority areas were significantly lower than more wealthy and white communities.[1] More recent research has found evidence of inequitable enforcement of the CAA, CWA, and/or RCRA by state regulators in lower-SES areas or areas with high concentrations of non-white populations (e.g., Konisky, 2009; Konisky & Schario, 2010; Opp, 2012; Spina, 2015). Central to this line of inquiry is the idea that state and federal implementation of environmental regulation is subject to political influence in ways that can lead to racial- and/or class-based inequities.

Federal–Tribal Trust Responsibility and Environmental (In)Justice

As noted earlier, the United States has a unique political and legal relationship with Native American Tribes established through the Constitution and confirmed by subsequent treaties, statutes, executive orders, and judicial decisions. Emanating from this unique relationship is the "trust doctrine" establishing the federal government's relationship and fiduciary responsibility to federally recognized Indian tribes and individual Indian beneficiaries.

The existence of the trust relationship between the United States and Native American Tribes was first acknowledged by the U.S. Supreme Court in *Cherokee Nation v. Georgia* (1831), which found that tribes are "domestic dependent nations" existing in a state of pupilage with relations to the United States resembling that of a ward to his guardian. This characterization is the basis for the trust relationship between the United States and tribal governments. While interpretation and implementation of the trust doctrine has evolved and widely varied since *Cherokee Nation v. Georgia*, the trust relationship endures as the most important principle in federal Indian policy.

Subsequent court decisions extended the federal government's trust obligations to environmental protections on tribal lands (Ranco, 2008). In *U.S. v. White Mountain Apache Tribe* (2003), the court affirmed that the occupation of land held in trust implies a duty to maintain and preserve the trust asset—thus making the federal government liable for breaches of such duties. Similarly, in *United States v. Mitchell* (1983), the court held that the federal government was liable for mismanagement of forest resources on tribal lands. In *United States v. Navajo Nation* (2009), the court once again held that a trustee is required to preserve and maintain trust assets and must not allow them to "fall into ruin on his watch."

Environmental Implementation under Tribal Governance

As noted earlier, the major environmental laws of the 1960s and 1970s made no mention of American Indian tribal lands. Perhaps not coincidently, the subsequent research literatures on environmental federalism and environmental justice as an implementation phenomenon have paid little attention to tribes.

At the same time that U.S. national environmental policy was changing significantly, so too was the relationship between tribes and the U.S. government. Since 1975, the federal government's Indian Policy has been tribal self-determination, articulated in the Self-Determination and Education Assistance Act of 1975 (Wilkins & Stark, 2011). In 1984, President Ronald Reagan published a Federal Indian Policy supporting the primary role of tribal governments in matters affecting American Indian reservations. That policy stressed two related themes: (1) that the federal government will pursue the principle of Indian "self-government" and (2) that it will work directly with tribal governments on a "government-to-government" basis (Ruckelshaus, 1984). Although the EPA had previously issued general statements that recognized the importance of tribal governments, the 1984 policy consolidated and expanded on existing policy in a manner consistent with the overall federal position in support of tribal "self-government" and "government-to-government" relations (Ruckelshaus, 1984).

Although existing public policy research offers little evidence about the implementation of environmental regulation on tribal lands specifically, the literature on environmental policy implementation provides strong theoretical reasons to expect that regulatory compliance is worse and enforcement less rigorous under tribal government, compared with nontribal facilities. Both logics are rooted in an understanding of government regulators as strategic political actors who weigh the costs and benefits of enforcement when making implementation decisions.

First, regulators have little political incentive to allocate scarce resources to environmental enforcement on tribal lands; to the extent that government behavior is influenced by the political demands of the potentially affected populations, American Indians are uniquely vulnerable. American Indians and Alaskan Natives constitute just 1.2 percent of the U.S. population and have no formal representation in Congress. Political participation is strongly and positively correlated with socioeconomic status (Brady, Verba, & Schlozman, 1995), and poverty among American Indians is higher than any other racial group in the United States (McCartney, Bishaw, &

Fontenot, 2013), as is alcoholism (Chartier & Caetano, 2010), and illicit drug use (U.S. Department of Health and Human Services [HHS], 2014). American Indians lag behind all other races and ethnicities in educational attainment (Kena, Aud, & Johnson, 2014). Konisky (2009) argues that because government behavior is influenced by the political capacity (i.e., wealth, education, organizational skill) of potentially affected communities, environmental enforcement may be less vigorous in communities with low-income populations. Konisky and Reenock (2013) argue that environmental regulators respond with assertive enforcement where populations can mobilize to demand environmental enforcement. Where communities are less likely to mobilize or lack resources to demand government action, regulators lack the incentive to enforce regulations vigorously. To put their limited political influence in perspective, it was not until 1994 that representatives from the 567 federally recognized tribes were invited to meet in an official capacity with a U.S. president to discuss matters pressing to American Indians (Wilkins & Stark, 2011). Given their overall poor social conditions, severely limited political representation, and scattered populations, we expect that citizens on tribal lands are less likely to mobilize in support of environmental enforcement than other citizens.

Second, regulators are expected to enforce environmental laws less vigorously on tribal lands because many of the facilities on tribal lands are owned and/or operated by tribal governments. Past research suggests that government regulators have limited ability to sanction other government agencies (in this case, tribal agencies) (Durant, 1985; Konisky & Teodoro, 2016; Wilson & Rachal, 1977), and that regulators might be reluctant to punish regulated public agencies because they may sympathize with or identify as fellow public servants who operate under significant resource constraints (Davies & Probst, 2001; Paehlke, 1991; Scheberle, 2004). To the extent that regulated facilities on tribal lands are operated by tribal governments (as is the case with wastewater and drinking water utilities) and face major resource constraints, we expect tribal facilities to receive less rigorous enforcement. Based only on these expectations about the strategic logic of environmental regulators, a simple hypothesis about enforcement follows:

> *Hypothesis 1: Enforcement–Tribal facilities experience less rigorous enforcement of environmental regulations than do nontribal facilities.*

Meanwhile, we expect regulatory compliance (i.e., violations) for tribal facilities to be worse than nontribal facilities for three main reasons. First, the complex regulatory requirements of the major U.S. environmental policies provide a major challenge to small local governments that may lack the human capital and administrative capacity necessary for compliance (Hanford & Sokolow, 1987; Oxenford & Barrett, 2016; Teodoro & Switzer, 2016; Weiland, 1998). Tribal facilities tend to operate in isolated and relatively resource-poor communities, and so are expected to struggle with complex regulatory compliance due to capacity constraints just as smaller local governments of all kinds do. Administrative capacity for environmental regulations is even more challenging for tribal governments owing to their exclusion from the

original environmental statutes of the 1970s: many tribes are decades behind their nontribal counterparts in developing management systems for environmental programs (Zaferatos, 2015).

Long-term trends in federal budgeting put tribal facilities at a further disadvantage, even relative to other comparably small, isolated water systems. Federal government financial support for water and sewer infrastructure construction was highest in the 1970s and early 1980s. Federal grants funded construction of water supply and treatment facilities across the United States in order to help utilities comply with new environmental regulations (Congressional Budget Office [CBO], 2015). From 1972 to 1982, federal water and sewer construction grants approached 20 percent of federal infrastructure spending. This federal support declined markedly from 1982 to 1988, significantly reducing the availability of water and wastewater infrastructure grants—just as the CWA and SDWA were being extended to tribal lands. Over the past 20 years, federal grants for water and sewer systems are just 4 percent of federal infrastructure spending (CBO, 2015), with tribal facilities allotted 1.5–2.0 percent of that funding (EPA, 2013). Consequently, much of the federal financial support that helped (and continues to help) nontribal facilities attain compliance was no longer available by the time tribal governments began their effort.

The third reason to expect poorer regulatory compliance among tribal facilities follows from our first hypothesis: when regulated facilities receive less vigorous enforcement, we expect that their managers will tend to place less emphasis on regulatory compliance, given limited resources and the high costs associated with compliance. Therefore, we expect that tribal facilities will place less emphasis on regulatory compliance than nontribal facilities, all else equal. Thus, our second hypothesis is:

> *Hypothesis 2: Compliance–Tribal facilities are less compliant with environmental regulations than nontribal facilities.*

For analytical purposes, these hypotheses put all utilities into one of two categories: tribal or nontribal. This binary categorization belies significant variation across tribes in resources, political institutions, and administrative capacity, all of which might help explain differences in environmental policy implementation. These differences merit further study (a point to which we return later), but our present aim is to evaluate the first-order proposition of an environmental implementation disparity in Indian Country.

Analysis of Environmental Implementation under Tribal Governance

We evaluate these two hypotheses with statistical analyses of regulatory enforcement and compliance among wastewater treatment facilities regulated under the CWA and drinking water utilities regulated under the SDWA. The key independent variable throughout our analysis is *tribal* facilities regulated under the CWA and SDWA, which we measure with a binary dummy coded one if the POTW or drinking water utility is a tribal facility (i.e., owned and/or operated by a tribal

government and zero otherwise) to evaluate whether there are differences in regulatory outcomes between tribal and nontribal facilities. The CWA and SDWA share a similar basic framework, but are implemented in somewhat different ways. Here, we briefly introduce the two programs before describing our analytical methodology.

Clean Water Act

The principal objective of the CWA is to restore and maintain the chemical, physical, and biological integrity of the nation's surface waters. The CWA is implemented through several regulatory programs, chiefly the National Pollution Discharge Elimination System (NPDES). A POTW that intends to discharge into the nation's waters must obtain a NPDES permit prior to initiating its discharge. NPDES permits establish effluent limits including type and quantity restrictions, pollutant monitoring, record keeping, and reporting requirements for which each facility must comply. The CWA requires POTW managers to collect samples of effluent discharges at the frequencies and locations specified in their permits and submit monitoring reports to the regulator.

Once a facility has received a NPDES permit, the enforcement process begins with compliance monitoring. All but four states have opted to assume administrative primacy over the CWA, and so state agencies monitor compliance in most of the United States. The EPA oversees these state programs, and retains direct implementation responsibility for the remaining states (Idaho, Massachusetts, New Hampshire, and New Mexico), as well as all facilities in Indian country. That is, tribal wastewater facilities are regulated directly by the EPA, not by state environmental agencies.

Compliance with NPDES permits requires POTW facilities to self-monitor and report results to their permitting authorities on a continuing (typically monthly) basis. Notwithstanding these self-monitoring requirements, facility inspections are the principal means by which facility violations are detected. Thus, inspections play an integral part of EPA's compliance monitoring as they identify instances of noncompliance. When a CWA violation is detected during an inspection, the facility is noted as being in "noncompliance" and issued a warning letter or an "informal" notice of violation as a first step in the enforcement process. Such warning indicates that a facility should take steps to return the facility to compliance or face subsequent enforcement actions. If noncompliance persists, "formal" enforcement in the form of administrative orders and civil penalties may follow.

Safe Drinking Water Act

Under the SDWA, all public drinking water systems in the United States have to meet certain requirements in order to ensure the provision of potable water to citizens. The SDWA, like the CWA, is administered in cooperation with state governments, federal government, and tribal governments. The EPA sets national standards for utilities, and states have the option of assuming responsibility for

implementation; all states but Wyoming have assumed implementation responsibility for the SDWA. Just as with the CWA, the federal EPA retains SDWA implementation responsibility for tribal drinking water facilities.

The SDWA requires utilities to perform tasks related to both drinking water contamination and monitoring and reporting. We group violations of the SDWA into two distinct categories. *Health violations* represent a utility's ability to keep contaminants in the water supply below acceptable levels. Included in this category are maximum contaminant limit violations, which occur when a utility is unable to keep the contaminants in the water below designated levels, and treatment technique violations, which occur when a utility does not use acceptable methods of treatment for their water supply. Additionally, the SDWA requires utilities to follow certain protocols with regard to testing of their water, filing of reports, and communication with the public. These include what the EPA calls "monitoring and reporting" violations and "other" violations. The SDWA requires water samples to be sent to the lab at certain time intervals, the issuing of boiled water notices, or simply sending out an annual report to the residents. We call violations of these requirements *management violations*. Because of the major difference in these requirements, we analyze them separately.

When a utility is found to be in violation of either the health or monitoring requirements of the SDWA, the responsible agency (either state or federal) must decide on the appropriate action to attempt to bring the utility back into compliance. The SDWA has clear levels of enforcement stringency, which allows us to investigate differences in levels of enforcement across tribal and nontribal utilities. Enforcement actions under the SDWA are divided into three distinct classifications: "formal," "informal," and "resolving." "Formal" enforcement actions may involve the filing of civil or criminal court cases, the assessment of administrative penalties, or injunctions. These are more stringent than "informal" enforcement actions, which may require a visit from an EPA technician, a public notification, or some form of compliance meeting. Finally, "resolving" actions involve little to no actual penalty, and may be the result of an intentional nonaction by the regulatory agency.

Data

Our analyses of CWA and SDWA enforcement and compliance employ separate data sources. We describe data sources for each in turn.

Clean Water Act. We draw our data for the CWA analysis from several sources. We obtained data on regulated POTWs from the EPA's Enforcement and Compliance History Online (ECHO) database. ECHO includes information on permits, inspections, violations, and enforcement actions for all POTW in the United States and its territories.[2] We evaluate data made available on all POTW facilities regulated under the CWA from 2010 through the first quarter of 2015 for 16,323 POTWs. Demographic data were drawn from 2013 American Community Survey (ACS) 5-year estimates.

We analyze two dependent variables for the CWA, corresponding with the two hypotheses under evaluation. The dependent variable in our CWA enforcement

Table 1. Summary Statistics for CWA Variables

Continuous Variables	Mean	Std. Dev.	Min	Max
Quarters in noncompliance	5.2	4.6	0	12
Inspections	3.2	4.8	0	65
% non-white	19.4	22.4	0	100
% unemployed	8.7	3.2	0	28.8
Median income (thousands)	49.12	12.91	19.98	122.23
% with bachelor's degree	22.0	9.4	5.1	72.0
Design flow (millions)	3.7	42.6	0	4,453
Binary Variables	**Percentage**			
Tribal facilities	0.74			
Major/minor status	26.29			
N = 11,606				

Note: Design flow is the amount of wastewater flow in the million gallons per day the facility is designed for. Items with a minimum of 0 and a maximum of 1 are dummies. Education is the percent of the population with at least a bachelor's degree.

model is the number of POTW inspections from 2010 through the first quarter of 2015. The dependent variable in our CWA compliance model is a count of quarters in which the POTW facility is in noncompliance. Analysis is restricted to the three-year (twelve-quarter) timeframe over which the EPA makes data available; for this study, the period of compliance analysis is the second quarter of 2012 through the first quarter of 2015. Descriptive statistics for CWA variables can be seen in Table 1.

Our analysis also includes several control variables. POTWs and the communities that they serve differ in various ways that can influence enforcement of and compliance with the CWA. To account for these differences, we include a measure for the percentage of the surrounding population over 25 years of age that have at least a bachelor's degree. We control for the health of the county economy surrounding the POTW facility with a measure of the county's unemployment rate (Helland, 1998). We also include several contextual control variables frequently used in the environmental justice literature including median household income, and the percentage of minority population living within a 3-mile radius of the POTW facility as reported by EPA. Based on the environmental justice literature, we expect the percentage of minority population surrounding the facility to be negatively correlated with inspections and positively correlated with noncompliance. Similarly, we expect income to correlate positively with facility inspections and negatively with facility noncompliance. All of these control variables are measured at the county level based on the county where the regulated facility is located, which is the finest geographic unit available for all facilities.[3]

We control for size of the facility in two different ways. Larger facilities, listed as "major" facilities by the EPA, have a relatively higher level of pollutant discharge than "minor" facilities. To control for this, we include a dichotomous variable designated "1" if the POTW facility is a "major" facility or "0" if it is a "minor" facility. We also control for the size of the POTW's capacity with a measure of "total design flow," or the amount of wastewater that facility is designed to process, measured in millions of gallons per day (MGD). This variable is logged since the difference

between 3 MGD and 4 MGD is much more important for analytical purposes than the difference between 50 MGD and 51 MGD.

Last, because previous studies have found variation in terms of intergovernmental factors that may influence enforcement (Hunter & Waterman, 1992; Scheberle, 2004) we include a dummy for each of the 10 EPA regions. These EPA regional controls are especially important for the present analysis because the EPA administers the CWA and SDWA directly on tribal lands through regional offices, not through state agencies.

Safe Drinking Water Act. We draw our data for the SDWA portion of our analysis from the Safe Drinking Water Information System (SDWIS) database. The SDWIS includes data on a number of utility characteristics, including utility size, source of water, utility ownership, location, and compliance and enforcement records for all public water systems in the United States. We evaluate all water systems serving populations of 3,300 or more. These comprise all utilities that the EPA classifies as medium size or larger.

The dependent variable in our model of SDWA enforcement is whether a noncompliant utility received a "formal" enforcement action from the regulatory agency or not. We code utilities that received a formal enforcement action as 1, and those that did not as 0. Of the utilities that received enforcement actions from 2010 to 2015, 20.5 percent of them received formal enforcement actions against them.

Our analysis of SDWA compliance employs two dependent variables in order to model compliance with the distinct health and monitoring/reporting responsibilities of utilities. *Health violations* is a count of the number of "maximum contaminant limit" and "treatment technique" violations a utility received in a given year, while *management violations* is a count of the number of "monitoring and reporting" and "other" violations. The separation of violations into these distinct categories is supported by their very low correlation over this time period ($\rho = 0.05$).

As with our CWA analysis, we include a number of control variables in our analysis of SDWA compliance and enforcement. First, private utilities have been found to perform better than public utilities in terms of SDWA compliance (Konisky & Teodoro, 2016), so we include a dummy variable for ownership. Water source may also have an impact on violations. Groundwater tends to have fewer contaminants than surface water, so utilities that use surface water are expected to have more health violations than those that use groundwater (Wallsten & Kosec, 2008). Similarly, we expect that utilities that purchase their water from wholesale water supplies will have fewer health violations, as the wholesale provider is responsible for initial source quality and treatment processes (Teodoro, 2014; Wallsten & Kosec, 2008). We do not expect that either water source variable would significantly affect management compliance. Utility age could be expected to affect compliance with the SDWA, since older systems may have aging technology and infrastructure, and would be more likely to commit health violations. The SDWIS contains no information on the exact age of water systems, so as a next-best alternative, we created a *new system* variable that was coded 1 if the system existed in the system in 1981 (the SDWIS's first year), and 0 if it entered the system at a later date. We also included a

Table 2. Summary Statistics for SDWA Variables

Continuous Variables	Mean	Std. Dev.	Min	Max
Management violations	0.82	4.90	0	301
Health violations	0.18	1.14	0	75
% non-white	28.97	20.50	0.57	98.75
% unemployed	9.69	2.94	1	28.8
Median income (thousands)	52.15	14.14	19.99	122.24
% with bachelor's degree	25.03	10.38	5.1	74.4
Logged population served	9.69	1.07	8.10	15.93
Binary Variables	**Percentage**			
Formal enforcement	20.53			
Tribal utility	0.73			
Private	11.47			
Ground water	23.17			
Purchased water	28.68			
New system	11.38			
N = 52,350				

variable for the size of the populations served by the utility, since smaller utilities often lack the capacity to comply with the regulations of the SDWA (Scheberle, 2004). We included in our SDWA models the same demographic data used in the CWA models, drawn from the ACS 2013 five-year estimates. Table 2 reports descriptive statistics for the SDWA variables.

Models

A significant merit of the data we analyze here is that they provide saturation samples; for the period of analysis, our dataset includes every CWA inspection and case of noncompliance, as well as every SDWA violation and enforcement action. In other words, the entire populations of U.S. POTWs and drinking water systems are included. With such a dataset, statistical regression analysis helps isolate differences in implementation across tribal and nontribal facilities from the other correlates of enforcement and violations. As the entire populations are included in the analysis, the observed correlations are true for the population; "statistical significance" in this analysis refers to the confidence with which we can discern correlations from unobserved or random processes that created the data.

Clean Water Act. We employ two count models to examine differences in CWA enforcement (inspections) and compliance for tribal and nontribal POTWs. Because the numbers of inspections take only discrete and nonnegative values, we use a negative binomial regression to analyze the factors affecting the number of inspections in a POTW facility. In this case, the dependent variables are overdispersed, and therefore a negative binomial estimator is appropriate (Grogger & Carson, 1991).

Our analysis of CWA compliance uses a zero-inflated negative binomial regression model to accommodate particular features of the dependent variable. A zero-inflated count model lets zeros occur as both a binary and count process. Under the CWA, findings of noncompliance largely occur following inspection actions. Thus,

facilities with no quarters in noncompliance may either reflect a truly compliant facility or, alternatively, facilities that may have a violation that went undetected due to a lack of inspections, which is consistent with our expectations that tribal facilities receive less rigorous enforcement than nontribal facilities. The zero-inflated negative binomial estimator allows us to model explicitly the observed zeros in our data (Konisky & Woods, 2010). In this way, our estimates of CWA compliance account for variation in the inspection regime.

Safe Drinking Water Act. For our investigation of SDWA enforcement, we use a logistic regression model as the dependent variable is a dichotomous measure of whether a violating utility received a formal enforcement action or not. Included in the model was a count of the previous year's violations, as well as year fixed effects and dummy variables for EPA region.

Our measure of compliance is a count of the number of violations in a given year by a utility, so we use a negative binomial model for both health and management violations. As with the CWA data, the counts of SDWA violation are overdispersed, so again a negative binomial model is the appropriate estimator. A lagged dependent variable is included in each model, along with EPA region dummy variables and year fixed effects. SDWA violations are detected through a regimented monitoring process, rather than from discrete inspections by regulatory officials. For this reason, the zero-inflation procedure is not warranted and it is not necessary to include a measure of inspections as a covariate in estimates of SDWA violations.

Unobserved Noncompliance? As is the case in many studies investigating compliance with and enforcement of government regulations, the possibility of unobserved noncompliance merits brief discussion. Konisky and Reenock (2013) argue that a lack of political resources in poor and minority communities may lead regulators to systematically underreport noncompliance in these areas, as these communities will be less likely to mobilize against environmental threats. They use detection-controlled estimation (DCE) to model this process in the context of CAA compliance. Although the DCE procedure is useful in some contexts, it is unnecessary for the present analysis for several reasons.

In the case of the CWA, any nonreporting bias that occurs will work in favor of the null hypothesis in our estimates of violations. According to Konisky and Reenock's (2013) logic, tribal facilities would be among the most likely to have noncompliance strategically unreported because Indian tribes are among the most disadvantaged groups in the United States. Any significant finding that tribal facilities violate at higher rates would be in spite of this possibility, not because of it. Motivated underreporting is also not a serious concern in our enforcement models. That tribal facilities are regulated by the EPA directly (as opposed to state agencies) makes underreporting unlikely; there is little incentive for the EPA to underreport their own efforts strategically. Finally, the use of the zero-inflation model makes the use of DCE redundant: any intentional nonreporting of violations resulting in artificial zeroes should be taken into account by the zero-inflation stage of the estimation. With respect to the SDWA, the logic that leads to the strategic underreporting of violators in the case of the CAA does not apply. The SDWA reporting regime does not

Table 3. Negative Binomial Regression Predicting Enforcement (POTW Inspections) of CWA 2010–15

	Coefficient	*p*-Value	Marginal Effect
Tribal facility	−0.59 (0.15)	<0.01	−1.95
% non-white	−0.02 (0.00)	<0.01	−0.02
% unemployed	−0.03 (0.00)	<0.01	−0.1
Median income	−0.00 (0.00)	<0.01	−0.00
% with bachelor's	−0.01 (0.00)	0.03	−0.01
Design flow	0.12 (0.01)	<0.01	+0.39
Major/minor status	0.29 (0.03)	<0.01	+1.00
Constant	1.66 (0.10)		
Observations	11,606		
Wald test χ^2 (df17)	362.91		
Prob > χ^2	<0.01		

Note: Standard errors in parentheses. Design flow is the amount of wastewater flow in the million gallons per day (MGD) the facility is designed for. Models also include EPA Region Dummy Variables.

rely on inspections in the same way the CAA does, meaning that the determination of a violation is strictly procedural, and there is no room for strategic underreporting of the type described by Konisky and Reenock (2013). While a 2011 audit of SDWIS found that violations may be underreported in the dataset (U.S. GAO, 2011), it did not find evidence of any motivated underreporting or systematic bias. Thus, for purposes of inference, we may reasonably assume that errors in the SDWIS are randomly distributed and so bias parameter estimates in favor of a null result in hypothesis testing.

Results

The results of our statistical analyses are reported in Tables 3–6. We discuss the results for each program in turn.

Clean Water Act. Table 3 shows our estimates of CWA enforcement (i.e., inspections), which strongly affirm hypothesis 1. The negative coefficient on tribal facilities was strong and significant, and indicates that tribal facilities received approximately 1.9 fewer inspections than nontribal facilities—approximately 44 percent fewer inspections than nontribal facilities over the five-year period of analysis (with other variables at their means).

The results from our model of CWA compliance are shown in Table 4. Differences in observed compliance between tribal and nontribal facilities may occur for two reasons: (1) actual differences in compliance and/or (2) differences in detected compliance. Since inspections are the principal means by which noncompliance is detected and tribal facilities receive significantly fewer inspections, it is reasonable to surmise that fewer violations will be detected in tribal facilities in part because they are inspected less frequently, even if they are actually in compliance more frequently. Our zero-inflated negative binomial model of quarters in noncompliance accounts for the two reasons there may be zero counts with these compliance data. The zero inflation coefficient for inspections in Table 4 is negative and statistically significant, affirming our approach: the (log) odds of an "excess zero" in noncompliance count

Table 4. Zero-Inflated Negative Binomial Regression Predicting Violations (Quarters in Noncompliance) of CWA, 2012–First Quarter 2015

	Inflation Model		Count Model		
	Coefficient	*p*-Value	Coefficient	*p*-Value	Marginal Effect
Tribal facility	−0.03 (0.35)	0.93	0.21 (0.09)	0.01	+1.14
Inspections	−0.19 (0.01)	<0.01	0.01 (0.00)	<0.01	+0.20
% non-white			−0.00 (0.00)	<0.01	−0.01
% unemployed			0.01 (0.00)	<0.01	+0.05
Median income			−0.00 (0.00)	0.08	−0.00
% with bachelor's			−0.00 (0.00)	0.02	−0.01
Design flow	−0.42 (0.01)	<0.01	0.04 (0.01)	<0.01	+0.58
Major/minor status			−0.06 (0.02)	<0.01	+0.30
Constant			1.7 (0.06)		
Observations	11,606				
Wald test χ^2 (df217)	327.75				
Prob > χ^2	<0.01				

Note: Standard errors in parentheses. Model also include EPA region dummy variables. Marginal effects calculated with variables at means.

decreases by 0.19 for every additional facility inspection. In other words, more inspections increase the likelihood that a facility showing no quarters in noncompliance was truly due to facility compliance and not because violations went undetected.

The main results from our model of CWA compliance are shown in the "count model" columns of Table 4, which predict the number of quarters in noncompliance for facilities. Our estimates are consistent with hypothesis 2: tribal facilities experience over one additional quarter in noncompliance compared to nontribal facilities. That is, all else equal, tribal facilities that violate the CWA experience 23 percent more quarters in noncompliance than their nontribal counterparts.

The results with respect to the control variables are generally consistent with most environmental justice hypotheses. As expected, there were fewer inspections and significantly higher violations in communities with a higher percentage of minorities. Surprisingly, while income was a significant predictor of inspections, the relationship was negatively correlated. Controls for Total Design Flow and Major/Minor Status were significantly associated with both inspections and quarters in noncompliance; these findings were robust across both models. Educational attainment was not a significant predictor of enforcement or compliance.

Safe Drinking Water Act. The results of our analysis of SDWA enforcement and compliance are reported in Tables 5 and 6. Table 5 shows that, consistent with hypothesis 1, noncompliant tribal utilities were significantly less likely to receive formal enforcement actions than were nontribal utilities. After controlling for utility characteristics and EPA region fixed effects, noncompliant tribal utilities are predicted to be 12 percent less likely to receive a formal enforcement than their nontribal counterparts.

Table 6 contains the results of our two negative binomial regressions predicting health and monitoring violations of the SDWA from 2010 to 2015. Model (1) shows the results of our model predicting management violations, while model (2) shows the results for health violations. Once again, the results for tribal utilities are

Table 5. Logistic Regression Predicting Formal Enforcement of SDWA 2010–15

	Coefficient	*p*-Value	Marginal Effect
Tribal utility	−0.76 (0.29)	0.01	−0.12
Lagged violations	0.01 (0.00)	<0.01	+0.00
% non-white	−0.01 (0.00)	<0.01	−0.00
% unemployed	0.04 (0.01)	<0.01	+0.01
Median income	0.00 (0.00)	0.06	+0.00
% with bachelor's	−0.01 (0.00)	0.01	−0.00
Private	−0.45 (0.09)	<0.01	−0.06
Ground water	−0.14 (0.08)	0.06	−0.02
Purchased water	0.24 (0.06)	<0.01	+0.03
New system	−0.07 (0.09)	0.40	−0.00
Logged population served	0.02 (0.03)	0.40	−0.01
Constant	−1.38 (0.31)		
Observations	11,505		
Wald test χ^2 (df25)	1,123.32		
Prob > χ^2	<0.01		

Note: Standard errors in parentheses. Models also include EPA region dummy variables and year fixed effects. Marginal effects calculated with variables at means.

consistent with hypothesis 2. Tribal utilities were found to have significantly more health and monitoring violations than nontribal utilities. In substantive terms, the difference is astonishing: tribal utilities were found to have on average 1.03 more management violations than nontribal utilities, equivalent to a 125 percent increase. For health violations, tribal utilities were found to have 0.10 more violations than nontribal, a 57 percent increase. The models of SDWA enforcement and compliance together suggest that tribal utilities struggle with meeting the regulatory requirements of the SDWA, and are far less likely to be harshly punished when they fail to do so.

The results for our control variables mostly conformed to our expectations. Private utilities were found to comply with both the health and management regulations of the SDWA at higher rates than public. Utilities that utilize groundwater and purchased water averaged fewer health violations. Newer systems complied with the health requirements at a higher rate. Additionally, utility size had the expected effect, as larger utilities performed better than smaller ones. System age and source water significantly predicted management violations, as well. Utilities that make use of groundwater were found to have more management violations than those who use surface water, while purchased water users and newer systems both had higher rates of compliance.

With respect to the demographic variables of interest, utilities in high minority areas had more management violations, but fewer health violations. Although these effects were statistically significant at conventional levels, they are substantively small, with a one standard deviation increase in minority population resulting in just a 4 percent decrease and a 5 percent increase in health violations and monitoring violations, respectively. Income did not have a large or significant effect on compliance with either type of regulation, while unemployment was significant in the management compliance model, albeit in the opposite of the expected direction. More educated populations were associated with fewer health and monitoring violations,

Table 6. Negative Binomial Regression Predicting Violations of SDWA 2010–15

	Management Violations (1)			Health Violations (2)		
Management Violations	Coefficient	*p*-Value	Marginal Effect	Coefficient	*p*-Value	Marginal Effect
Tribal utility	1.48 (0.16)	<0.01	+1.03	0.87 (0.18)	<0.01	+0.10
Lagged violations	0.12 (0.01)	<0.01	+0.08	0.81 (0.02)	<0.01	+0.09
% non-white	0.00 (0.00)	<0.01	+0.00	−0.01 (0.00)	<0.01	−0.00
% unemployed	−0.03 (0.01)	<0.01	−0.02	0.00 (0.01)	0.66	+0.00
Median income	−0.00 (0.00)	0.01	−0.00	−0.00 (0.00)	0.17	−0.00
% with bachelor's	−0.01 (0.00)	<0.01	−0.01	−0.02 (0.00)	<0.01	−0.00
Private	−0.10 (0.04)	0.03	−0.07	−0.41 (0.06)	<0.01	−0.04
Ground water	0.36 (0.04)	<0.01	+0.25	−0.18 (0.05)	<0.01	−0.02
Purchased water	−0.23 (0.03)	<0.01	−0.16	−0.25 (0.04)	<0.01	−0.03
New system	−0.21 (0.05)	<0.01	−0.15	−0.13 (0.06)	0.02	−0.01
Logged population served	−0.04 (0.01)	0.01	−0.03	−0.07 (0.02)	<0.01	−0.01
Constant	−0.13 (0.17)			−0.68 (0.21)		
Observations	52,350			52,350		
Wald test χ^2 (df25)	3,730.07			2,329.55		
Prob > χ^2	<0.01			<0.01		

Note: Standard errors in parentheses. Models also include EPA region dummy variables and year fixed effects. Marginal effects calculated with variables at means.

although this effect was twice as large in the health model, with a one standard deviation increase resulting in an 8 percent decrease in the health model and a 4 percent decrease in the management model. In the enforcement model, higher minority and higher educated populations were found to be more likely to receive formal enforcement actions, while higher unemployment increased the probability of stringent enforcement.

Tribes vs. Race/Ethnicity and Class. In both the CWA and the SDWA analyses, tribal ownership more strongly predicts implementation disparities than the racial, ethnic, and socioeconomic status variables that are typically examined in research on environmental justice and implementation (e.g., Konisky, 2009). For the CWA, the marginal effect of tribal ownership on number of inspections (−0.59) and violations (+0.21) is far greater than the effects of a standard deviation increase in non-white population (−0.44, −0.02), median household income (−0.39, −0.09), or unemployment (−0.34, +0.17). Only facility size more strongly predicts enforcement and compliance for the CWA. Likewise, tribal ownership's marginal effects on SDWA formal enforcement and SDWA health violations is far greater than the effects of one standard deviation increases in non-white population, median household income, education, or unemployment.

Taken together, these results indicate that tribal communities' experiences of unequal environmental implementation generally mirror those of other racial and ethnic minority communities in the United States. However, the markedly lower enforcement and compliance findings for tribal facilities strongly suggests that either: (a) tribes' unique political and legal status lead to these greater disparities; (b) racial biases against Native populations in environmental implementation are stronger

than biases against other relatively poor, minority populations; or (c) tribes' political and legal status exacerbate the effects of racial and/or class bias on environmental implementation. The present analysis does not allow us to distinguish the degree to which of these possibilities is most likely.

Discussion

The present study offers at least two contributions. First, in examining implementation of federal environmental regulation for tribal versus nontribal facilities, we connect theories of environmental justice with theories of environmental federalism. Because many of America's most important pollution control laws rely upon federal–tribal joint implementation, compliance and enforcement on tribal land is a necessary component to include in analyses of environmental policy outcomes. Accordingly, by examining Indian Country this study takes important steps toward understanding federal environmental implementation more broadly. Second, at a substantive level, this study presents the first large-scale assessment of whether there are disparities in enforcement and compliance of tribal facilities regulated under U.S. environmental laws. To summarize our main empirical findings: for both CWA and SDWA our results are consistent with our hypothesis that tribal facilities experience less rigorous enforcement of environmental regulations than do nontribal facilities (hypothesis 1), and that tribal facilities are less compliant with environmental regulations than nontribal facilities (hypothesis 2).

Directions for Future Inquiry

Having established a broad disparity in environmental policy implementation for tribal and nontribal facilities, our findings point to several avenues for further research. First, to understand better if the findings in this study reflect a pattern of environmental implementation on tribal land, the present analysis might be expanded to additional federal programs such as the CAA and RCRA. Second, future research should illuminate the mechanisms that produce the disparities observed here. In particular, qualitative investigation would allow scholars to better understand tribal perceptions of federal programs and the decisions of tribal environmental administrators.

Third, a line of inquiry should attempt to isolate the effects that tribal governance arrangements, resources, administrative capacity, and other characteristics have on environmental policy outcomes. The 567 federally recognized Indian Tribes feature vast diversity of economic and demographic conditions, to say nothing of their cultural diversity. In particular, tribes vary in their administration of environmental programs. Between 1986 and 1987, Congress amended several of the major environmental pollution-control statutes by allowing tribes to assume primacy over environmental programs similar to the states. Tribes that opt for primacy are "treated as states," and so manage monitoring and enforcement on their lands just as state agencies do in their respective states (Royster,

1989). Some tribes have seized upon this opportunity and have adopted stringent environmental standards, with accompanying administrative capacity-building efforts (Zaferatos, 2015). The reasons why tribes opt for primacy and the consequences of primacy are clear avenues for future inquiry. Does direct tribal implementation (rather than EPA implementation) result in more or less rigorous enforcement and compliance? Evans's (2011) research on tribal efforts to build capacity and shape federal policy suggests that more politically assertive tribes might experience different outcomes when it comes to federal environmental policy. Similarly, Cornell and Kalt's (1998, 2000) research linking tribal authority and institution-building to social and economic development suggests that tribes might experience more effective environmental regulation when tribes hold greater administrative capacity and implementation authority.

Conclusion

One consequence of the U.S. federal government's long history of paternalistic control over Indian nations is a legacy of institutional dependency, in which tribes rely heavily on federal agencies to govern and manage tribal affairs. The "trust doctrine" that defines the federal–tribal relationship is a legal principle, but practical implementation of federal regulations is as much a matter of institutional politics as of legal rights. With their isolated locations, high poverty rates, and low levels of human capital, tribes face serious obstacles to successful implementation of complex programs like the CWA and SDWA. Given tribal governments' limited political influence over the federal government and the EPA's ample incentives to skimp on enforcement against tribal facilities, it is perhaps unsurprising that the data reveal apparent systemic regulatory neglect of environmental implementation in Indian country. The quality of drinking water and control of water pollution in Indian country lags far behind the rest of the United States. These disparities carry troubling implications for environmental justice, since tribal governance is inexorably caught up in racial conflicts past and present—conflicts that often have centered on environmental resources.

Manuel P. Teodoro is associate professor, Texas A&M University. His research lies at the intersection of public policy, politics, and public administration, with a substantive emphasis on water management and environmental protection in the United States.
Mellie Haider is a doctoral student in the Department of Political Science at Texas A&M University. Her research interests include environmental policy, race and ethnic politics, and regulatory enforcement.
David Switzer is a doctoral candidate in the Department of Political Science at Texas A&M University. His research focuses on how political, administrative, and community characteristics shape the implementation of United States environmental policy.

Notes

We thank Traci Morris, Maria Escobar-Lemmon, Ken Meier, Sassan Zadeh, three anonymous reviewers, and participants in seminars at Arizona State University and Texas A&M University for feedback on earlier versions of this paper. Scholarly sins of commission and omission remain with the authors.

1. See Ringquist (1998) and Atlas (2001) for methodological critiques and substantive refutations of Lavelle and Coyle (1992).
2. Data on facilities regulated under the CWA are available here: http://echo.epa.gov/facilities/facility-search?mediaSelected=cwa.
3. The EPA uses county-level data to report demographic and economic correlates of program compliance and enforcement. The unit mismatch between facility-level data and the community demographic and economic controls raises a specter of inefficient and possibly biased estimation. Separately, we estimated models without these demographic controls; they are reported in the Supporting Information. The effects of tribal governance in these analyses were substantively and statistically similar.

References

Atlas, Mark. 2001. "Rush to Judgment: An Empirical Analysis of Environmental Equity in U.S. Environmental Protection Agency Enforcement Actions." *Law & Society Review* 35: 633–82.

Been, Vicki. 1994. "Locally Undesirable Land Uses in Minority Neighborhoods: Disproportionate Siting or Market Dynamics?" *The Yale Law Journal* 103 (6): 1383–422.

Boer, J. Tom, Manuel Pastor, Jr., James L. Sadd, and Lori D. Snyder. 1997. "Is there Environmental Racism? The Demographics of Hazardous Waste in Los Angeles County." *Social Science Quarterly* 78 (4): 793–810.

Brady, Henry E., Sidney Verba, and Kay Lehman Schlozman. 1995. "Beyond SES: A Resource Model of Political Participation." *The American Political Science Review* 89 (2): 271–94.

Bryant, Bunyan. 1995. *Environmental Justice: Issues, Policies, and Solutions*. Washington, DC: Island Press.

Bullard, Robert D. 1993. "Anatomy of Environmental Racism and the Environmental Justice Movement." In *Confronting Environmental Racism: Voices from the Grassroots*, ed. Robert D. Bullard. Boston, MA: South End Press.

Chartier, Karen, and Raul Caetano. 2010. "Ethnicity and Health Disparities in Alcohol Research." *Alcohol Research and Health* 33 (1–2): 152.

Congressional Budget Office (CBO). 2015, March. *Public Spending on Transportation and Water Infrastructure, 1956–2014* (CBO Publication 49910). Washington, DC: Author.

Cornell, Stephen, and Joseph P. Kalt. 1998. "Sovereignty and Nation-Building: The Development Challenge in Indian Country Today." *American Indian Culture and Research Journal* 22 (3): 187–214.

———. 2000. "Where's the Glue? Institutional and Cultural Foundations of American Indian Economic Development." *The Journal of Socio-Economics* 29: 443–70.

Crotty, Patricia McGee. 1987. "The New Federalism Game: Primacy Implementation of Environmental Policy." *Publius* 17 (2): 53–67.

Davies, Terry, and Kate Probst. 2001. *Regulating Government*. Washington, DC: Resources for the Future.

Dion, Catherine, Paul Lanoie, and Benoit Laplante. 1998. "Monitoring of Pollution Regulation: Do Local Conditions Matter?" *Journal of Regulatory Economics* 13: 5–18.

Downey, Liam. 1998. "Environmental Injustice: Is Race or Income a Better Predictor?" *Social Science Quarterly* 79 (4): 766–78.

Durant, Robert F. 1985. *When Government Regulates Itself*. Knoxville, TN: University of Tennessee Press.

Environmental Protection Agency (EPA). 2013. *Drinking Water Infrastructure Grants Tribal Set-Aside Program, Revised Guidelines* (EPA Office of Water 816-B-13-015). Washington, DC: Author.

Evans, Laura E. 2011. *Power from Powerlessness: Tribal Governments, Institutional Niches, & American Federalism*. New York: Oxford University Press.

Grogger, Jeffrey T., and Richard T. Carson. 1991. "Models for Truncated Counts." *Journal of Applied Econometrics* 6 (3): 225–38.

Hamilton, James T. 1995. "Testing for Environmental Racism: Prejudice, Profits, and Political Power?" *Journal of Policy Analysis and Management* 14 (1): 107–32.

Hanford, Priscilla L., and Alvin D. Sokolow. 1987. "Mandates as Both Hardship and Benefit: The Clean Water Program in Small Communities." *Publius* 17 (4): 131–46.

Helland, Eric. 1998. "Environmental Protection in the Federalist System: The Political Economy of NPDES Inspections." *Economic Inquiry* 36 (2): 305–19.

Hird, John A., and Michael Reese. 1998. "The Distribution of Environmental Quality: An Empirical Analysis." *Science Quarterly* 79 (4): 693–716.

Hunter, Susan, and Richard W. Waterman. 1992. "Determining an Agency's Regulatory Style: How Does the EPA Water Office Enforce the Law?" *The Western Political Quarterly* 45 (2): 403–17.

Jones, Charles O. 1974. "Speculative Augmentation in Federal Air Pollution Policy-Making." *Journal of Politics* 36 (2): 438–64.

———. 1975. *Clean Air: The Policies and Politics of Pollution Control*. Pittsburgh, PA: University of Pittsburgh Press.

Kena, Grace, Susan Aud, and Frank Johnson. 2014. *The Condition of Education 2014*. Washington, DC: US Department of Education.

Konisky, David M. 2007. "Regulatory Competition and Environmental Enforcement: Is There a Race to the Bottom?" *American Journal of Political Science* 51 (4): 853–72.

———. 2009. "Inequities in Enforcement? Environmental Justice and Government Performance." *Journal of Policy Analysis and Management* 28 (1): 102–21.

Konisky, David M., and Christopher Reenock. 2013. "Compliance Bias and Environmental (In)Justice." *The Journal of Politics* 75 (2): 506–19.

Konisky, David M., and Tyler S. Schario. 2010. "Examining Environmental Justice in Facility-Level Regulatory Enforcement." *Social Science Quarterly* 91 (3): 835–55.

Konisky, David M., and Manuel P. Teodoro. 2016. "When Governments Regulate Governments." *American Journal of Political Science* 60: 559–74.

Konisky, David M., and Neal D. Woods. 2010. "Exporting Air Pollution? Regulatory Enforcement and Environmental Free Riding in the United States." *Political Research Quarterly* 63 (4): 771–83.

Lanoie, Paul, Benoît Laplante, and Maité Roy. 1998. "Can Capital Markets Create Incentives for Pollution Control?" *Ecological Economics* 26 (1): 31–41.

Lavelle, Marianne, and Marcia Coyle. 1992. "Unequal Protection: The Racial Divide in Environmental Law." *National Law Journal* 15 (3): S1–S12.

Lowry, William. 1992. *The Dimensions of Federalism*. Durham, NC: Duke University Press.

McCartney, Suzanne, Alemayehu Bishaw, and Kayla Fontenot. 2013. "Poverty Rates for Selected Detailed Race and Hispanic Groups by State and Place, 2007-2011." February, ACSBR/11-17. Washington, DC: U.S. Census Bureau.

Mohai, Paul, and Bunyan Bryant. 1992. "Environmental Racism: Reviewing the Evidence." In *Race and the Incidence of Environmental Hazards: A Time for Discourse*. Boulder, CO: Westview Press.

Oates, Wallace E. 2001. *A Reconsideration of Environmental Federalism* (RFF Discussion Paper 01-54). Washington, DC: Resources for the Future.

Opp, M. 2012. "Expropriation Risk and Technology." *Journal of Financial Economics* 103 (1): 113–29.

Oxenford, Jeff L., and Joy M. Barrett. 2016. "Understanding Small Water System Violations and Deficiencies." *Journal AWWA* 108 (3): 31–37.

Paehlke, Robert. 1991. "Government Regulating Itself: A Canadian-American Comparison." *Administration and Society* 222 (4): 424–50.

Posner, Paul. 1998. *The Politics of Unfunded Mandates: Whither Federalism*? Washington, DC: Georgetown University Press.

Rabe, Barry G. 1999. "Federalism and Entrepreneurship: Explaining American and Canadian Innovation in Pollution Prevention and Regulatory Integration." *Policy Studies Journal* 27 (2): 288–306.

Ranco, Darren J. 2008. "The Trust Responsibility and Limited Sovereignty: What Can Environmental Justice Groups Learn from Indian Nations?" *Society & Natural Resources* 21 (4): 354–62.

Ringquist, Evan J. 1998. "A Question of Justice: Equity in Environmental Litigation 1974-1991." *Journal of Politics* 60 (4): 1148–65.

Ronquillo, John C. 2011. "American Indian Tribal Governance and Management: Public Administration Promise or Pretense?" *Public Administration Review* 71 (2): 285–92.

Royster, Judith. 1989. "Control of the Reservation Environment: Tribal Primacy, Federal Delegation, and the Limits of State Intrusion." *Washington Law Review* 64: 581.

Ruckelshaus, William D. 1984. "EPA Policy for the Administration of Environmental Programs on Indian Reservations." Policy Statement. Washington, DC: Environmental Protection Agency.

Scheberle, Denise. 2004. *Federalism and Environmental Policy*. Washington, DC: Georgetown University Press.

Spina, Francesca. 2015. "Environmental Justice and Patterns of State Inspections." *Social Science Quarterly* 96 (2): 417–29.

Teodoro, Manuel P. 2014. "When Professionals Lead: Executive Management, Normative Isomorphism, and Policy Implementation." *Journal of Public Administration Research and Theory* 24 (4): 983–1004.

Teodoro, Manuel P., and David Switzer. 2016. "Drinking from the Talent Pool: A Resource Endowment Theory of Human Capital and Agency Performance." *Public Administration Review* 76 (4): 564–75.

U.S. Department of Health and Human Services (HHS). 2014. *Results from the 2013 National Survey on Drug Use and Mental Health: Summary of National Findings* (HHS Publication 14-4863). NSDUH Series H-48. Rockville, MD: Substance Abuse and Mental Health Services Administration.

U.S. Government Accountability Office. 2011. "Unreliable State Data Limit EPA's Ability to Target Enforcement Priorities and Communicate Water Systems' Performance." GAO-11-381. Washington, DC: Author.

Wallsten, Scott, and Katrina Kosec. 2008. "The Effects of Ownership and Benchmark Competition: An Empirical Analysis of U.S. Water Systems." *International Journal of Industrial Organization* 62 (1): 186–205.

Weiland, Paul S. 1998. "Environmental Regulations and Local Government Institutional Capacity." *Public Administration Quarterly* 22 (2): 176–203.

Wilkins, David E., and Heidi K. Stark. 2011. *American Indian Politics and the American Political System*. Lanham, MD: Rowman and Littlefield.

Wilson, James Q., and Patricia Rachal. 1977. "Can the Government Regulate Itself?" *The Public Interest* 46 (1): 3–14.

Yandle, Tracy, and Dudley Burton. 1996. "Reexamining Environmental Justice: A Statistical Analysis of Historical Hazardous Waste Landfill Siting Patterns in Metropolitan Texas." *Social Science Quarterly* 77 (3): 477–92.

Zaferatos, Nicholas Christos. 2015. *Planning the American Indian Reservation: From Theory to Empowerment*. Syracuse, NY: Syracuse University Press.

Supporting Information

Additional Supporting Information may be found in the online version of this article.

Table A1: Negative Binomial Regression Predicting Enforcement (i.e., Inspections) of CWA 2010–15 Without Demographic Variables

Table A2: Zero-Inflated Negative Binomial Predicting Violations (i.e., Noncompliance) of CWA 2012-First Quarter of 2015 Without Demographic Variable

Table A3: Logistic Regression Predicting Formal Enforcement of SDWA 2010–15

Table A4: Negative Binomial Regression Predicting Violations of SDWA 2010–15—No Demographic