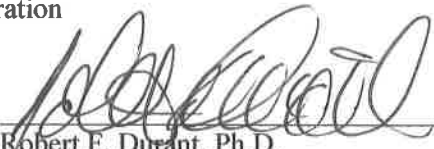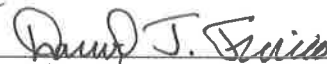UNMASKING COVERT INJUSTICE? A MULTILEVEL ANALYSIS OF

ENVIRONMENTAL INEQUALITIES AND REGULATORY

ENFORCEMENT IN THE UNITED STATES

By

Jiaqi Liang

Submitted to the

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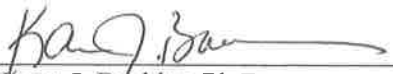
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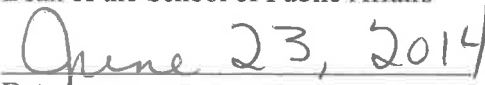_____

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UNMASKING COVERT INJUSTICE? A MULTILEVEL ANALYSIS OF

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ABSTRACT

Environmental justice (EJ) has increasingly drawn the attention of scholars in a variety of fields. Less studied has been the role of bureaucracies in ensuring equitable environmental policy implementation. Consequently, this dissertation aims to assess variations in state agencies' regulatory compliance monitoring and assurance activity patterns across racial/ethnic minority and majority populations. Four primary research questions drive the analysis: (1) whether race/ethnicity-related implementation inequalities exist; (2) what factors contribute to these inequities; (3) whether these phenomena are a product of attributes of multiple levels of locales (e.g., state and local); and (4) whether and how minority-group-associated variables play a role in this process.

This dissertation offers an integrated, multilevel framework to empirically evaluate the effects of a broad range of political, socioeconomic, task, and demographic factors on the inspection and enforcement patterns witnessed in the National Pollutant Discharge Elimination System permit program of the Clean Water Act (CWA-NPDES). The research time frame for the African American and Hispanic vulnerable populations is from 1996 to 2010 and from 2005 to 2010, respectively. The unit of analysis is county nationwide.

The empirical analysis, first, attests to the relevance of minority-group-related factors in the process of national wastewater management program implementation. For the socially marginalized, the patterns of agencies' inspection and enforcement activities are contingent on

different political contextual determinants. For example, state legislature partisanship and citizen ideology are related to the implementation activeness for the general populace but not for racial/ethnic minorities. Neither does passive representation of people of color in state legislatures necessarily translate into active representation in wastewater management policy. The degenerative policy context – meaning the dynamics pertaining to the negative social constructions of minority groups – is also found to dampen implementation activities, at least for African Americans. As such, the dissertation recommends several areas for future research, including getting more direct measures of social construction of minorities by implementers.

ACKNOWLEDGEMENTS

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CHAPTER 1

INTRODUCTION

High levels of environmental quality tremendously contribute to the well-being of all

individuals. Since the inception of the environmental justice (EJ) movement in the United States

in the early 1980s, significant environmental inequities have been identified in the U.S.,

primarily in terms of race/ethnicity (Anderton et al. 1994; Boer et al. 1997) and economic class

(Ash and Fetter 2004; Hird and Reese 1998). In turn, studies have consistently suggested

race/ethnicity to be a more significant demographic predictor than economic class in the

incidence of pollution threats (Boyce 2007; Cole and Foster 2001; Goldman 1994; Mohai and

Bryant 1992; Pastor 2007; Ringquist 2005; Szasz and Meuser 1997).

Specifically, racial/ethnic minority communities are more likely to live in the proximity

of noxious facilities, be exposed to higher levels of environmental hazards, and/or be afflicted

with adverse health impacts. Prior research suggests that race and ethnicity too often define the

distribution of environmental benefits and risks in the U.S. (Low and Gleeson 1998). Extant

research has also demonstrated that African American and Hispanic communities are persistently

subject to environmental inequalities with respect to policy implementation. The implications of

unbalanced levels of government outputs like these are profound, "partly because it

(implementation of environmental policy) inherently addresses activities posing possibly serious

and irreparable harm to the environment and public health." (Atlas 2001, 676)

What causes these disparities in environmental protection? Prior research has identified a

variety of political, economic, and social factors that may account for the uneven distribution of

environmental burdens and benefits. But in contrast to a considerable amount of studies on the

location of polluting facilities and the estimated unequal exposure to environmental hazards for

citizens of color and low socioeconomic status posed by their location, scholarship on the

program management and policy implementation activities of state agencies in the post-facility-siting period remains comparably underdeveloped (Walker 2012; see also Lester, Allen, and Hill 2001, 170). This is surprising, as government agencies are enforcing environmental regulations and implementing programs that are regarded as "our last resort to protect human health and the environment." (ECOS 2006, v) As Mennis (2005) maintains, "While it can be argued that poverty, land use, and other nonracial factors may lead to racial inequity in hazardous facility location, environmental enforcement is wholly dependent upon the actions of enforcement agencies." (p. 413) Potentially, inequitable policy implementation may deepen the risks that are inflicted on susceptible populations. Thus, inequitable provisions of protection and services by public agencies can have significant and far-reaching implications for the quality of life that citizens enjoy, as well as for citizen trust in government.

This study aims to evaluate whether the practices of regulation compliance monitoring and assurance by state agencies vary across racial/ethnic minority and majority populations, by specifically trying to answer the following research questions: (1) whether race/ethnicity-based implementation inequalities exist; (2) if so, what factors result in these phenomena; (3) whether these contributing factors stem from different geographical levels (e.g., state and local levels); and (4) alongside other conventionally considered determinants, what role the minority-group-related factors play in this process.

To these ends, this dissertation uses an integrated theoretical framework to investigate the effects of a wide array of political, socioeconomic, task, and demographic factors on states' administrative compliance monitoring and assurance activities (e.g., inspection and enforcement). Empirically, it employs a nationwide sample with a multilevel (or hierarchical) modeling design with longitudinal data at both the state and county levels. Specifically, this

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study estimates models for African-American and Hispanic environmentally vulnerable counties from 1996 to 2010 and from 2005 to 2010, respectively.

The analytical focus of this dissertation is the National Pollutant Discharge Elimination System (NPDES) permit program of the Clean Water Act (CWA). The CWA-NPDES permit program is an important area to concentrate on because government reports and scholarly studies have indicated that there are considerable inconsistencies and variations in the state inspection and enforcement practices under the CWA. In addition, empirical research has shown that the implementation disparities of the CWA have significant implications for race/ethnicity-based environmental inequalities.

In the remainder of this chapter, I first identify why environmental justice in general – and especially the research on state agency enforcement efforts and their impact on environmental justice – is a crucial issue today in the United States. In the process, I discuss some of the key concepts informing environmental equity issues. Next, I review what I see as the major contributions of this dissertation to the study of environmental justice issues in the United States. The chapter concludes by outlining what follows in subsequent chapters.

<u>Coming to Terms with Environmental Justice</u>

Environmental justice is a contemporary social phenomenon coinciding with the expansive production of toxic waste after World War II (Pellow 2000, 591). In 1982, the protests of the African American communities of Warren County, North Carolina against a polychlorinated biphenyl (PCB) landfill initiated the environmental justice movement in the U.S. This event changed the landscape of environmental rights and citizenship in this nation (Mohai,

Pellow, and Timmons 2009) by putting it on the policy agenda of federal, state, and local legislators[1].

In spite of the heightened attention to the issue domestically and internationally, consensus is absent as regards the meaning of several terms that are often interchangeably employed in the literature (Rosenbaum 2011, 148). While sharing the essential concerns about the distribution of environmental and health benefits and costs for human beings, these terms have different emphases on distinct aspects of this topic.

At the beginning of the movement, race-based environmental injustice was framed as *environmental racism*. Initially defined by Benjamin Chavis, one of the movement pioneers and then executive director of the Commission for Racial Justice of the United Church of Christ (UCC-CRJ), environmental racism is "racial discrimination in environmental policy making, the enforcement of regulations and laws, the deliberate targeting of communities of color for toxic waste facilities, the official sanctioning of the life-threatening presence of poisons and pollutants in our communities, and the history of excluding people of color from leadership of the ecology movements." (Quoted in Bullard 2000; see also Bryant 1995, 6; Bullard 1990; 2005[2]) Environmental racism conceptualizes the issue from the angle of observed disparities of environmental and related health benefits and burdens across social groups along the line of race or ethnicity (Pulido 2000, 12, 34, note 1). And to a certain extent, it links environmental justice to the civil rights movement (University of Washington 2013).

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[1] For a review of the history and trajectory of the environmental justice movement, see Chapter 1 "A History of the Environmental Justice Movement" in Cole and Foster (2001).

[2] It should be noted that some earlier movement activists downplayed the role of intended discrimination by defining environmental racism as "any policy, practice, or directive that differentially affects or disadvantages (whether intended or unintended) individuals, groups, or communities because of their race or color. Environmental racism is reinforced by government, legal, economic, political and military institutions." (Bullard 2005, 32; 1990, 98)

However, such a framing impedes an effective alliance of different issue advocacy. For instance, the challenges include the debates on whether the policymaking in environmental justice should focus on the environmental well-being of all social members or specific attention to particular subpopulations, whether and how to incorporate social justice into the mainstream environmentalism movement, and whether environmental protection is defined as a regulatory or a redistributive policy. Furthermore, this conceptualization complicates a viable empirical exploration of the underlying causal mechanisms, for example, whether environmental inequity is race/ethnicity- or class-based, how to identify and measure discriminatory consciousness, and what are possible contributing factors other than deliberate discrimination.

In comparison, *environmental equity* (or *equality*)[3] diagnoses the problem by encompassing the discrepancies in environmental and/or health outcomes faced by both racial/ethnic minorities and low-income individuals. Moreover, it highlights the distribution and allocation of environmental hazards and risks as a result of political, institutional, and sociological processes (Lester, Allen, and Hill 2001, 21; Pulido 2000). For instance, Cutter (1995) perceived environmental equity with respect to social, generational, and procedural equity; and Bryant (1995) maintained environmental equity as "the equal protection of environmental laws." (p. 5) As Pellow (2000) stated, "Environmental inequality focuses on broader dimensions of the intersection between environmental quality and social hierarchies. Environmental inequality addresses more structural questions that focus on social inequality (the unequal distribution of power and resources in society) and environmental burdens." (p. 582)

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[3] Environmental equity and equality are highly similar, with the former referring to "freedom from favoritism when referring to a system of law; the fulfillment of standards regarding environmental health," and the latter relating to "the same treatment and influence of all communities regarding environmental health." (University of Washington 2013)

More broadly adopted, *environmental justice* offers an explicitly normative and political paradigm. It also offers a more inclusive lens with respect to target populations (e.g., all social members regardless of race, color, national origin, or socioeconomic status), substantive focuses (e.g., policy interventions, empowering institutions for the affected)[4], and normative concerns (e.g., social justice)[5]. In terms of issue advocacy, environmental justice works as a master frame (Benford 2005). Currently, the U.S. Environmental Protection Agency (EPA) defines environmental justice as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies." (EPA 2012a)

Comparably speaking, environmental racism concentrates more on problem identification, whereas environmental justice revolves around problem solving (Pellow 2000, 582; Pellow 2002, 8; Bryant 1995, 6). Environmental inequality centers on an inquiry about the underlying mechanisms given the problems and serves as the basis for goal setting and future redress. In light of the theoretical and substantive interests of this study (i.e., whether and how various political, socioeconomic, task, and demographic factors impact agency policy implementation patterns), race/ethnicity-based environmental inequality or inequity will be primarily used. To be consistent with the research and advocacy communities on this issue, environmental justice will be interchangeably used on some occasions.

In the meantime, environmental justice can be evaluated from three interdependent facets (Bullard 1993; University of Washington 2013): (1) distributional justice (or geographical inequity) concerning the spatially proportionate allocation of environmental benefits and burdens; (2) procedural justice (or procedural inequity) relating to the provision of equitable

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[4] Bryant (1995, 6); Lester, Allen, and Hill (2001, 21); Pulido (2000); see also Pellow (2000).

[5] Bryant (1995, 6); Melosi (2000, 43); Mohai, Pellow, and Roberts (2009).

policy design and implementation in terms of protection from environmental harms; and (3) process justice (or social inequity) regarding the enabling institutions for a meaningful citizen engagement in government's environmental decision-making process.

As Paehlke (2013) suggested, one of the normative concerns and ethical challenges in environmental politics and policy is how to ensure all individuals have equal environmental rights. Against this backdrop, the theoretical exploration and intellectual discourse on environmental injustice and inequality have continued to be highly relevant and consequential, not only for environmental studies but also for research on American politics and public policy. Furthermore, evaluated from the perspective of democratic constitutionalism, conspicuous policy maltreatment for different groups of social members raises grave concerns and challenges regarding the role of democratic government at all levels – federal, state, and local – and their responsibility to protect its citizens from harms.

The Contributions of the Study

This study advances our understanding of environmental justice issues in the U.S. in three major ways. As noted, prior research largely finds significant disparities of one kind or another in government efforts to address environmental injustice issues. But relatively little research takes the analytical focus that I do in this study. Specifically, I focus on the regular environmental program monitoring and compliance assurance activities by public agencies across states over time in the post-facility-siting period (Lester, Allen, and Hill 2001, 170; Noonan 2008, 1164; Walker 2012; for exception, see Konisky 2009a; 2009b; Konisky and Schario 2010).

Second, in comparison to voluminous numbers of studies revolving around political, economic, and structural determinants of implementation regimes at the state level in

environmental policy (e.g., Hunter and Waterman 1996), sparse research examines from a multilevel perspective the state- and local-level attributes that influence agencies' inspection and enforcement activities. Therefore, in addition to a systematic investigation of a series of contributing factors, this study makes a methodological improvement by employing a multilevel modeling design with a more recent research time frame to evaluate both the independent and interactive effects of those factors that originate from different levels.

Thirdly, while conventional studies assess the impact of political variables such as the minority representation in legislatures – expecting to find that greater levels of representation will translate into greater efforts on behalf of those minorities in the policy process, I also test the possibility that the social construction of racial/ethnic minority populations by policy makers may also affect agency behavior when it comes to policy implementation (i.e., inspection and enforcement activities). Basically, I test for the influence of what proponents of social construction theory like Schneider and Ingram (2005) call "degenerative" politics and policy making. Degenerative politics and policy are characterized by "the exploitation of derogatory social constructions, manipulation of symbols or logic, and deceptive communication that marks the true purpose of policy." (Ingram and Schneider 2005, 11; see also Schneider and Ingram 1993; 1997) This is an elaborate way of saying that policy makers and implementers may tend to view some populations as deserving of their inspection and enforcement efforts and others as not so deserving. Minorities are often seen as less- or even-undeserving of government assistance to meet their needs in a wide variety of policy areas (e.g., Gilens 1995; 1996; Soss 1999; 2005; Soss, Hacker, and Mettler 2007; Soss and Schram 2008), but this has not been tested in the environmental justice literature.

While I cannot test directly for that relationship because I do not have survey data from agency policy makers and street-level administrators as to how they see the deservedness of minority target populations when it comes to environmental justice concerns, my analysis hinges on a second way that degenerative politics can affect levels of agency activities when it comes to environmental justice issues. Specially, this relationship concerns what scholars call the "interpretive effects" of existing policies on citizen perceptions of their own value and sense of political efficacy (Mettler and Soss 2004; see also Schneider and Ingram 2005; Soss, Hacker, and Mettler 2007). Thus, the negative valancing (i.e., the views of policy makers and implementers of the less-deserving worth) of racial/ethnic minorities for assistance has been found in many studies, especially those on social policies, to lead to a sense among those negatively valanced groups that political mobilization is not worth their time and effort. This, in turn, can mean that those groups put less pressure on legislators to respond to their needs as well when it comes to pushing agencies toward activities that advance environmental justice for them. The indirect measures of the negative valancing for minority populations generally that I use in this study regard the stringency of welfare policies toward blacks and immigration laws toward Hispanics. Both are arguably indicators of the negative valancing of minorities generally by citizens, with the assumption that the more stringent the requirements for each, the less deserving target populations are (with minorities perceived, correctly or incorrectly, as the primary targets of these efforts).

Finally, but relatedly, although cumulative evidence has indicated that administrative performance (e.g., inspection and punitive action) varies across two environmental justice target groups (i.e., African Americans and Hispanics), a research gap remains with respect to the disparate patterns and mechanisms of devaluation and disparagement. "The divergent results for

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facilities in large African-American and Hispanic areas highlight the importance of considering these minority groups separately, something that is not always done in the extant literature." (Konisky and Schario 2010, 845) This study seeks to address this gap in the literature by examining group-specific political variables (i.e., degenerative policies, and minority representation in state legislatures) in separate models for these two minority groups and estimating the potentially distinct implementation patterns.

An Overview of the Study

As noted, environmental justice theory argues for "fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations and policies." (Bullard and Johnson 2000, 558) And agency enforcement action has been long argued to be a "righting the wrong" remedy for environmental inequality (Cutter 2006, 257). But a developing albeit still sparse research has suggested that state environmental protection agencies perform less rigorous implementation activities in communities with a high percent of racial/ethnic minorities (Konisky 2009a; 2009b; Konisky and Schario 2010; see also Lynch, Stretesky, and Burns 2004; Malley, Scroggins, and Bohon 2012; Mennis 2005). This is a quite disturbing trend after almost twenty-five years of issue articulation to ensure environmental justice. In the long run, it plays a critical role in defining a sound environmental citizenship for all societal members, particularly for the socially marginalized and the economically disadvantaged.

To begin addressing these issues, the remainder of this dissertation proceeds as follows. Chapter 2 reviews in greater depth and scope the research literature on race/ethnicity-based environmental inequalities. This review includes the empirical evidence, government responses,

the potential causes for these phenomena, and both the issue and administrative contexts of environmental policy. Chapter 3 then develops an integrated theoretical framework for analyzing the variations in agencies' implementation practices of the NPDES permit program of the CWA, discusses the measurement of the key variables, develops hypotheses for testing, and explains in greater detail the research design for empirical analysis. This study uses a multilevel modeling design to examine the effects of both the state- and county-level explanatory variables (i.e., county at level one and state at level two in hierarchical models) on the outcome variables, which are the county-level inspection and enforcement activities of state agencies for African American communities from 1996 to 2010, and for Hispanic communities from 2005 to 2010, respectively. The county-level explanatory variables include median household income, residents living below the poverty level, residents with higher education attainment (i.e., bachelor's degree or higher), unemployment rate, labor employment in manufacturing sectors, EPA inspections in the previous year, the number of regulated facilities, total population, population density, and geographic land area. The state-level predictor variables include citizen ideology, the Democratic strength of state legislature, party identification of the governor, president party affiliation, state government spending on waste control and natural resources, as well as two group-related variables, including racial/ethnic minority state legislator, and minority-targeting degenerative policies. Specifically to assess the impact of two minority-group-oriented variables, I introduce interaction terms between those variables and the variable defining race/ethnicity-based environmentally vulnerable communities.

Chapter 4 presents the results of the analysis. For the cases of African Americans and Hispanics, the explanatory variables do not predict states' compliance monitoring and assurance activities in a uniform manner. Agencies' inspection and enforcement practices display disparate

patterns as well. Notably, political contextual factors at the state level shed significant light on the process. Specifically, state legislatures with higher levels of Democratic strength are prone to promote rigorous enforcement. Likewise, liberal citizen ideology is positively associated with a state's inspection practices. However, such implementation activeness pertains to the general populations, rather than specific segments of social members (i.e., racial/ethnic minorities). In addition, higher levels of minority state legislators do not necessarily advance administrative efforts for people of color. Both African Americans and Hispanics tend to get lower levels of enforcement activities in states where legislatures are more racially/ethnically inclusive. Importantly, however, another minority-related variable – degenerative policy context – consistently predicts both inspection and enforcement levels for African Americans. State welfare policy stringency dampens implementation activities for black communities. The dissertation then concludes in Chapter 5 with a discussion of the results, a summary of the implications of the findings, and a future research agenda based on the limitations of this study.

CHAPTER 2

ANATOMY OF THE ENIGMA OF RACE/ETHNICITY-BASED

ENVIRONMENTAL INEQUALITIES

This chapter provides a general overview of how and why environmental justice is

recognized as a public policy problem, policy makers' responses to it, and what prior research

tells us about what these efforts have produced. It begins by introducing the nature and scope of

the environmental justice (or injustice) problem in the United States, from a variety of social

science disciplines regarding the relations between the environmental hazards and/or adverse

health impact and racial/ethnic minorities. Next, the chapter places environmental justice within

the larger context of environmental policy, noting the important role of federalism in this policy

area. The chapter then reviews environmental justice policies at both the federal and state levels

that have been created to deal with the problem. Emphasized particularly are the half-way,

halting, and patch-worked nature of environmental justice policies and their implementation in

America. Following this section, the chapter continues with an overview of the empirical

evidence of inequitable environmental regulation enforcement for these vulnerable populations.

Furthermore, the chapter provides a discussion of the potential causes for race/ethnicity-based

environmental injustice and identifies the lingering questions this study aims to answer. Lastly,

the summary section highlights the contributions of this study to the research on race/ethnicity-

based implementation inequalities of environmental policy.

Race/Ethnicity-Based Environmental Inequality: Issues and Evidence

Over the past three decades, race/ethnicity-based environmental injustice has been

stimulating normative debates and empirical investigations (Walker 2012). Since the first

national-level quantitative study in 1987 (i.e., *Toxic Wastes and Race in the United States* by the

UCC-CRJ using zip code as the spatial unit), mounting evidence with increasingly sophisticated social science research methods has pointed to a disproportionate burden of environmental risks borne by people of color[6]. Studies have consistently suggested race/ethnicity to be a comparably more significant demographic predictor than economic class in the incidence of pollution hazard exposure (e.g., Goldman 1994; Mohai and Bryant 1992). While research on environmental justice has produced inconclusive findings[7], a meta-analysis by Ringquist (2005) concluded that compared to economic class, race/ethnicity is a much more important factor. Albeit with methodological variations (e.g., the type of potential environmental risk, the unit of aggregation, the type of comparison group, and confounding factors), the existence of uneven environmental hazards faced by racial/ethnic minorities is unambiguously verified. Twenty years after the groundbreaking report of the UCC-CRJ, Bullard et al. (2007) employed a distance-based approach (i.e., the proximity of racial/ethnic minorities to the sources of environmental hazards) to comprehensively re-examine the relationship between toxic wastes and racial/ethnic demographics. The study found that race/ethnicity-based environmental inequities (primarily African Americans, Hispanics/Latinos, and Asian Americans/Pacific Islanders) significantly persisted and were even stronger than the original study at several geographical levels of investigation. These levels include national, EPA region, state, metropolitan areas, and neighborhoods with clustered facilities, even controlling for socioeconomic status. Finally, this

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[6] For other reviews, see Boyce (2007), Cole and Foster (2001), Pastor (2007), and Szasz and Meuser (1997). For a discussion on the interdependency between race/ethnicity and economic class, see Ash and Fetter (2004), Downey (1998), Downey and Hawkins (2008), Liu (1998), and Wernette and Nieves (1992).

[7] Some studies suggest that economic class is a more important explanatory factor than race/ethnicity (e.g., Anderton et al. 1994; Been 1994b). Others find no evidence of race/ethnicity-based environmental inequities (e.g., Mitchell, Thomas, and Cutter 1999; Oakes, Anderton, and Anderson 1996; Yandle and Burton 1996). The seminal work of Pulido (1996) offered criticism against "competing racial projects" (i.e., either refuting or affirming the existence of environmental racism).

report questioned "the ability of current policies and institutions to adequately protect people of color and the poor from toxic threats." (p. xii)

At the same time, some noteworthy dimensions of the environmental vulnerability of particular segments of social groups have been observed in prior research as well. A vast majority of studies categorized as proximity-based approaches/assessments have shown that people of color are more likely to be proximate (i.e., live closely) to the sources of a variety of ecological risk (e.g., ambient air pollution, waste water, noxious materials) (Bowen and Wells 2002; Perlin et al. 1995; Pollock and Vittas 1995; Williams 1999b; for summary, see Ringquist 2004)[8]. More important, in terms of risk-based approach/assessments (Bowen and Wells 2002; Williams 1999b), racial/ethnic minorities are subject to higher levels of actual harms and poor environmental quality. Hird and Reese (1998) arrived at this conclusion using over two dozen pollution indicators reflecting industrial air emissions, air quality, industrial water discharges, water quality, and hazardous wastes (see also Ash et al. 2013; Perlin et al. 1995). Other scholars have further demonstrated the adverse health outcomes resulting from cumulative exposure to toxics (e.g., Kraft and Scheberle 1995; Morello-Frosch et al. 2002; Pastor, Sadd, and Morello-Frosch 2005). Geographically, environmentally overburdened circumstances confronted by minority communities have been identified in local (e.g., Baden and Coursey 2002; Boer et al. 1997; Bullard 1990; Mohai and Bryant 1992; Pastor, Sadd, and Morello-Frosch 2005), state (e.g., Cutter 1995; Downey 1998; Malley, Scroggins, and Bohon 2012; Pollock and Vittas 1995),

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[8] Studies of "site location patterns" are the "first wave" or "outcome-orientation" of empirical research; and the "second wave" is "process-orientation." (Williams 1999a; Walker 2012)

and national settings (e.g., Hird and Reese 1998; Liu 1998; Ringquist 1997; UCC-CRJ 1987; Wernette and Nieves 1992)[9].

As the racial/ethnic profiles in this nation have been diversifying over time, scholars have disaggregated the concept of minorities, extending their investigations to different racial/ethnic subgroups, primarily African Americans and Hispanics (e.g., Westra and Lawson 2001). Some research illustrated overburdened environmental risks in both minority groups (e.g., Been and Gupta 1997; Hird and Reese 1998; Kirk 1997; Peña 2003; Pulido 1994; 1996; 2000; Ringquist 1997). Nevertheless, scholars have also found that the environmental-demographic relationship is stronger in one group than the other (e.g., Baden and Coursey 2002; Hipp and Lakon 2010)[10]. For example, Sexton et al. (1993) revealed that although a disproportionate amount of African Americans and Hispanics lived in air pollutant nonattainment areas, Hispanic communities were more likely than African Americans to live in areas where ambient air quality standards were not met (e.g., four out of five pollutants). Higher proportions of Hispanic residents are positively associated with a higher possibility of hosting a hazardous waste treatment storage and disposal facility (TSDF) in a consistent way (Been 1995; see also Been and Gupta 1997). In the case of metropolitan Phoenix, Arizona, for example, Grineski, Bolin, and Boone (2007) found that Latino immigrants were susceptible to more severe criteria air pollutants (e.g., carbon monoxide, nitrogen dioxide, ozone) while African Americans were not (see also Baden and Coursey 2002, on the case of Chicago).

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[9] As early as the end of the 1990s, government agencies (e.g., the National Institute of Environmental Health Sciences) called for attention to public health and related scientific research, education, and health policies which could be part of explaining environmental injustice (Institute of Medicine of the National Academies 1999). However, the direct relationship between the distribution of environmentally hazardous facilities and the health impact on the affected populations has not been well established; thus, there may be a "large gap between the rhetoric and the reality." (Bowen and Wells 2002, 695; Bowen 2001; Foreman 1998, 65-66; but see Pastor, Sadd, and Morello-Frosch 2005)

[10] See also Baden, Noonan, and Turaga (2007) for a discussion of various combinations of scale and scope in the research on environmental justice (p. 177).

However, caution needs to be exercised in interpreting these findings. Like other research on establishing the possible connection between ecological hazards and community demographics, these conclusions may be contingent on the selection of various spatial scales (more discussion in Chapter 3). For instance, Been (1995) used a census-tract scale, whereas Grineski, Bolin, and Boone (2007) employed census-block-group data. Other studies may be susceptible to ecological fallacies (i.e., "reaching conclusions from a larger unit of analysis that do not hold true in analyses of smaller, more refined units." Anderton et al. 1994, 232)

<u>The Administrative Context of Environmental Justice</u>

Over the years, both the federal government and the states have adopted policies to try to ameliorate this situation. To fully appreciate the challenges posed to these efforts, it is important first to place environmental justice within the larger context of federalism in the U.S. Essentially, federalism "is best understood as a system of constitutionally derived and apportioned authority where state and national governments retain sovereignty yet at the same time are interdependent." (Scheberle 2013, 395)

In terms of regulation enforcement, the U.S. EPA fulfills its statutory responsibilities through Office of Enforcement and Compliance Assurance (OECA) at headquarters, ten regional offices[11], and partner states[12]. Under the federal partial preemption scheme, states with delegated

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[11] The ten regional offices of EPA are Region 1: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont, and 10 tribal nations; Region 2: New Jersey, New York, Puerto Rico, the U.S. Virgin Islands, and eight tribal nations; Region 3: Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia; Region 4: Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, and six tribes; Region 5: Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin, and 35 tribes; Region 6: Arkansas, Louisiana, New Mexico, Oklahoma, Texas, and 66 tribes; Region 7: Iowa, Kansas, Missouri, Nebraska, and nine tribal nations; Region 8: Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming, and 27 tribal nations; Region 9: Arizona, California, Hawaii, Nevada, Pacific Islands, and 148 tribal nations; and Region 10: Alaska, Idaho, Oregon, Washington, and 271 native tribes.

[12] For a comprehensive introduction and discussion of the legal and organizational framework of major national environmental regulations and statutory provisions, see Bearden et al. (2011); Chapter 2 of Eisner (2007); Esworthy (2010); Kraft (2011); Chapter 2 of O'Leary et al. (1999), and Rosenbaum (2011). Through its headquarters and the

regulatory authority are required to adopt environmental standards that are at least as stringent as those promulgated by the federal government, and to ensure adequate administrative resources to manage the delegated programs[13]. Primarily, regional offices of EPA exercise oversight authority over the state performance of program execution. If states fail their obligations, EPA reassumes enforcement actions and may withdraw its program delegation to a given state. In this circumstance, the federal government and its state counterparts have forged an interdependent relationship in the sense that states are keen to maintain more autonomy in administering environmental affairs in their jurisdictions. Meanwhile due to a lack of management resources, EPA and its regional offices rely on states' implementation to achieve policy goals (Esworthy 2010; Fiorino 2006; GAO 2009; Scheberle 2004; 2013).

The Reagan presidency substantially accelerated the devolution of environmental policy to the states. Since the passage of major national environmental laws in "the first environmental epoch" of the 1970s (Mazmanian and Kraft 2009, 18) and the first significant wave of program delegation in the early 1980s (Eisner, Worsham, and Ringquist 2006, 176), a steadily growing number of states have obtained primacy in managing federal environmental laws (Woods 2005). For states, policy devolution and decentralization have institutionalized a high degree of discretion and autonomy in crafting program implementation and regulation enforcement. Although EPA grants authority of program management to states in a piecemeal manner, as of December 2007, approximately 96 percent (compared to 75 percent in 2001)[14] of federal

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U.S. Attorneys' offices in the nation, the Department of Justice (DOJ) is primarily responsible for judicial enforcement in coordination with EPA. This interagency coordination constitutes an integral part of the environmental compliance assurance system.

[13] Local governments may be responsible for permitting and monitoring on some occasions, whereas they "generally act within the context of assuring states' requirements." (Esworthy 2010, 10)

[14] Eisner, Worsham, and Ringquist (2007) suggested that the Bush administration accelerated the process of delegation of enforcement authority (p. 185-186). Woods (2006) provided an empirical analysis regarding the

environmental programs of various issue domains (e.g., ambient air, wastewater, drinking water, solid and hazardous waste, toxic chemical release, pesticide use, etc.[15]) had been delegated to states; and these authorities include permit issuance, inspections, enforcement, compliance assistance provision, and some standard settings (ECOS 2012). Specifically, states conduct about 90 percent of all enforcement activities (informal and formal administrative actions combined; 70 percent of all formal actions) and they have been continuing to take on more enforcement workload (Blakeslee and Rong 2006; Brown and Green 2001, 32; ECOS 2013). Simply put, EPA relies on states as primary implementers to fulfill the responsibility for the routine operation of most of the major environmental programs (GAO 2002).

In recent years, the conventional wisdom assuming that state program latitude and autonomy is closely connected with its commitment to environmentalism has been challenged (Woods 2005). In other words, flexibility and discretion embedded in the state primacy paradigm does not necessarily translate into an encouraging or positive policy outcome (e.g., protection of the environment and human health). As Rabe (2006) observed, disparities in "overall regulatory capacity and commitment" have characterized the state-centric environmental policy paradigm and become part of the "pitfalls of decentralization." (p. 43)

Numerous studies in environmental or other policy domains also suggest that the federal government is likely to be a more stringent enforcer than its state counterparts (Hedge and Menzel 1985; Helland 1998; Hunter and Waterman 1996; Marvel 1982). States with a higher

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determinants of state primary assumption. State primacy assumption does not necessarily relate to its commitment to the environment ("greenness"). To measure state environmental commitment, the author utilized two indices: the FREE rankings by the Fund for Renewable Energy and the Environment, and the Green Index by the Institute for Southern Studies.

[15] Most delegable programs come from the following national environmental statutes: the Clean Air Act, Clean Water Act, Emergency Planning and Community Right to Know Act, Federal Insecticide, Fungicide, and Rodenticide Act, Oil Pollution Act, Resource Conservation and Recovery Act, Safe Drinking Water Act, and Toxic Substances Control Act. For a detailed description of each of these programs on a state-by-state basis, see ECOS (2012).

level of delegated authority may have worse pollution conditions and health outcomes (Woods, Konisky, and Bowman 2009). Furthermore, state's institutional leeway in the environmental area may be strategically utilized as a policy instrument to establish competitive advantage over peers. In the "race to the bottom" phenomenon, in order to promote its attractiveness to business, a state may have a tendency to reduce industries' compliance costs by relaxing its environmental enforcement (Konisky 2007; 2008; Woods 2006; but see also Konisky 2009c, for the mediation effects; Potoski 2001, for little evidence of "race to the bottom" found in state environmental standard setting and a "race to the top" in some instances).

More important, policy devolution and environmental regulatory federalism have far-reaching implications for the variations in the performance of regulatory compliance monitoring and assurance across the states (EPA/OIG 2011; GAO 2000; 2006; 2009; Scheberle 2013). A 2009 report released by the U.S. General Accounting Office (GAO; later as the Government Accountability Office) underscored the "longstanding," substantial inconsistencies and variations in regional and state inspection patterns under the CWA, which might partly result from the "differences in the philosophical approaches among enforcement staff about how to best achieve compliance with environment requirements" and "the flexibility afforded by EPA policies and guidance that allow states a degree of latitude in their enforcement programs." (GAO 2009, 4-5) Despite acknowledging some necessary variability and flexibility across regions and states due to their contextual and geographic heterogeneity, problematic inconsistencies and disparities in inspection coverage and enforcement activities have grown significant and far from negligible. For example, responses to similar violations differed dramatically across regions and states (GAO 2006, 6).

As government reports and empirical research suggest, there are remarkable variations in states' implementation practices of the CWA, and their implications are profound for environmental inequity. Dramatic disparities in the implementation of the CWA have drawn decades-long attention of the GAO. In addition, according to my interviews with Missouri environmental public administrators[16], front-line implementers who are responsible for compliance monitoring are faced with a difficult task environment in waste water and hazardous waste programs, primarily stemming from resource insufficiency. A systematic empirical investigation by Konisky (2009a) on enforcement inequities in environmentally vulnerable communities concluded that both inspection and enforcement activities were statistically lower in counties with more populations living below the poverty level under all three core federal environmental pollution management programs (i.e., the CAA, CWA, and RCRA). Notably, under the CWA and Resource Conservation and Recovery Act (RCRA), in regards to counties with a high level of nonwhite populations, inspections are lower while enforcements are not statistically different in the CWA; in the RCRA program, inspections are higher while enforcements are not statistically different (more discussion in the following sections).

<u>The Government Responses to Environmental Inequality Concerns</u>

Not surprisingly, questions of whether or not race/ethnicity-based environmental inequities exist in America have prompted a variety of federal and state government policy interventions in the hopes of redressing whatever inequities do exist. Still, these efforts have been largely halfway, halting, and patch-worked. To see how and why, it is worthwhile to examine what these efforts have entailed for a better understanding of the disparate results that have been produced.

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[16] The interviews were conducted with four administrators in the Division of Environmental Quality of the Missouri Department of Natural Resources in Jefferson City on August 17, 2012.

Heightened policy responses from the federal government are part of the aftermath of the expanding grassroots environmental justice movement and mobilization. The first government empirical study concerning the relationship between community demographics and noxious facility locations was conducted by the GAO in 1983[17] targeting Region 4 (covering eight southeastern states)[18] of EPA. It found that communities housing four offsite hazardous waste landfills under investigation in Alabama, South Carolina, and North Carolina predominantly are comprised of African Americans. To respond to the increased concerns, EPA created the Environmental Equity Workgroup in 1990. The Workgroup generated a recommendation report entitled *Environmental Equity: Reducing Risk for All Communities* and further facilitated the establishment of the Office of Environmental Equity in 1992 (renamed the Office of Environmental Justice in 1994) (EPA 2012a).

Executive Order 12898 *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* and an accompanying presidential memorandum signed by President Bill Clinton on February 11, 1994 substantially advanced the federal environmental justice strategy and policy. However, it is worth noting that "the order did not create any enforceable legal rights." (Lowry and Stephens 2001, 25; U.S. Commissions for Civil Rights 2003) Particularly, the Order integrated two key legal components: Title VI of the Civil Rights Act of 1964 (42 U.S.C 2000d to 2000d-7; hereinafter Title VI) and the National Environmental Policy Act of 1969 (Bullard 2005)[19]. The Order aims at promoting public

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[17] A report from the GAO in 1995 reviewed ten studies and concluded that there was no significant relationship between economic class, race, and location of noxious facilities.

[18] See footnote 11.

[19] EPA's state partners are required to comply with the non-discrimination provisions. However, the processing practices of and responses to administrative complaints against violations of Title VI by EPA's Office of Civil Rights suggests that "it will never make a formal finding of a Title VI violation." Nevertheless, it still is a feasible

participation in and information access to the affairs of human health and environment among minority and low-income populations[20]. Moreover, it directs the federal departments and agencies to develop strategies to address the issues of environmental inequities as well as to ensure the full assessment of the environmental impact of federal programs on these highly affected communities (White House 1994). Simultaneously, the National Environmental Justice Advisory Council (NEJAC) and the Environmental Justice Interagency Working Group (IWG) were established to further buttress and sustain the federal engagement in environmental welfare of these disadvantaged groups of citizens (EPA 2012a).

Despite the high-profile policy initiative on race/ethnicity- and socioeconomic-based environmental injustice inaugurated by the Clinton administration, the federal government commitment has neither been consistent nor sufficient in the past two decades. The durability of the environmental justice issue in the national political arena is ephemeral due to a lack of public attention, unfavorable political climate, a divergence in opinion between environmental justice advocates and members of the established environmental policy subsystem, as well as ambiguities of problem definition, cause identification, and policy prescription (Ringquist 2006).

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mechanism to "coerce federally funded entities into choosing to implement reforms." (Gordon and Harley 2005, 159)

[20] It should be noted that there are subtle changes in the definition and framing language of environmental justice issues with respect to the target populations between Executive Order 12898 and the corresponding EPA practices. For instance, according to *The EPA's Environmental Justice Strategy of 1995*, EPA is committed to ensuring that "[n]o segment of the population, regardless of race, color, national origin, or income, as a result of EPA's policies, programs, and activities, suffers disproportionately from adverse human health or environmental effects, and all people live in clean, healthy, and sustainable communities." Also, it highlighted that "all Americans are important to the future of our nation and deserve to be protected from pollution, regardless of race, color, national origin, or economic circumstance." (EPA 1995) Currently, EPA defines environmental justice as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies." (EPA 2012a) But "[T]he EPA defines environmental equality as everyone sharing the same degree of environmental burdens and amenities [EPA 1993]. This is not the objective of the environmental justice movement, which is committed to pollution reduction [Roque and Tau Lee 1993]." (Pulido 1993, 921)

The presidency of George W. Bush witnessed an even more significant retrenchment of the nascent environmental justice agenda (Benford 2005). In 2004, EPA even tried to alter the issue interpretation of environmental justice in a way that downplayed the focal attention to specific vulnerable groups or communities which was underscored in Executive Order 12898. Instead, it emphasized that all communities, regardless of race and socioeconomic status, should be treated equally in terms of environmental justice and regulation/legal enforcement (EPA/OIG 2004).

Due to the difficulties in proving intentional discrimination and establishing claims based on Section 601 of Title VI, many civil rights plaintiffs have turned to the remedies that may be sought under Section 602, which pertains to directing agencies to promulgate regulations "effectuat[ing]" Section 601 and contains disparate impact provisions (U.S. Commissions for Civil Rights 2003, 79). However, in 2001, the Supreme Court in *Alexander v. Sandoval* denied the previously implied private right of action based on Section 602[21]. Instead, the majority ruled that discrimination needs to be proven through intent instead of disparate impact[22]; and without congressional intent to create a cause of action, a private right of action simply based on claims of disparate impact is prohibited (U.S. Commissions for Civil Rights 2003, 12, 81-83). Therefore, the prospect for applying Title VI as a substantive avenue for affected communities to

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[21] "This enforcement of disparate impact regulations promulgated under Title VI by private individuals was further narrowed by a Third Circuit ruling in *South Camden Citizens in Action v. New Jersey Department of Environmental Protection*. The Third Circuit Court of Appeals in *South Camden* held that in addition to the lack of standing for private individuals to bring claims of discrimination in violation of regulations promulgated under § 602 of Title VI, these regulations do not create free standing rights to be enforced through 42 U.S.C. § 1983 by private individuals …the Supreme Court in *Gonzaga v. Doe*, adopting the same test of implied right of action cases, held that there must be explicit congressional intent to confer a private right in spending clause legislation to be enforced through § 1983." (U.S. Commissions for Civil Rights 2003, 79-80)

[22] For a discussion of "judicially constructed 'racism'," see Chapter 3 of Cole and Foster (2001).

judicially address environmental inequalities becomes uncertain (Core 2002; Mohai, Pellow, and Timmons 2009).

Although the Supreme Court also ruled in *Alexander v. Sandoval* that, Section 602 authorizes federal agencies to implement Title VI through withdrawal of funding or other means, the administrative relief with respect to redressing the disproportionate environmental burdens faced by vulnerable populations does not seem as viable as it is assumed. Analogous to the regulatory practices of other federal agencies in implementing Section 602, through 40 C.F.R. Part 7 (*Nondiscrimination in Programs Receiving Federal Assistance from the Environmental Protection Agency*)[23], "EPA-funded agencies are prohibited from taking acts, including permitting actions, that are intentionally discriminatory or have a discriminatory *effect* based on race, color, or national origin." (EPA 2010b, emphasis in the original text) The aggrieved party can file administrative complaints concerning Title VI with EPA's Office of Civil Rights (OCR) and may further request a hearing before an EPA Administrative Law Judge (EPA 2010a; 2013a). Nevertheless, some obstacles have been observed in the administrative process regarding the agency's regulations implementing Title VI (i.e., 40 C.F.R. Part 7). In addition to case backlog, rarely have the alleged violations of Title VI been adjudicated by EPA; moreover, given a violation, seldom does EPA suspend or revoke a permit or withdraw financial support for the recipients of federal money at the state or local level (U.S. Commissions for Civil Rights 2003, iii; see also Deloitte Consulting LLP 2011[24]).

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[23] See 40 C.F.R. § 7.35(b) and (c).

[24] This report was a product based on EPA's contract to Deloitte Consulting LLP on program evaluation of the OCR that has three components: Employment Complaints Resolution (Title VII), External Complaints and Compliance (Title VI), and Affirmative Employment and Diversity (AED) (Deloitte Consulting LLP 2003, p. 11). This report comprehensively assesses three sections of civil rights programs, including Equal Employment Opportunity (EEO), External Civil Rights, and Affirmative Employment.

EPA also delayed the promulgation of guidelines and procedures for the meaningful

involvement of stakeholders and the general public in its external civil rights program, especially

in terms of environmental permitting[25]. This delay has been widely suggested to be one of the

main causes for vulnerable communities not being able to make the best of EPA's Title VI

program that is designed to administratively empower them on the environmental justice issue

(U.S. Commissions for Civil Rights 2003, iii)[26]. Other challenges include the absence of issue

incorporation into agency's core missions, a lack of agency leadership commitment, and failure

to construct an effective performance-based accountability system for program implementation

(ibid, 7-8). Equally important, EPA's limited resource investments[27] as well as its inadequate

outreach to state environmental protection departments to some extent preclude advanced actions

of the OCR on civil rights programs (Deloitte Consulting LLP 2011).

As a result of the lukewarm policy advocacy of national political leadership and the

inadequacy of efforts from Congress and the executive branch, EPA has been left to make

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[25] To facilitate the administrative processes for Executive Order 12898 and Title VI, EPA issued the *Interim Guidance for Investigating Title VI Administrative Complaints Challenging Permits* (*Interim Guidance*) in 1998; the OCR issued the *Draft Revised Investigating Title VI Administrative Complaints Challenging Permits* (*Draft Revised Investigation Guidance*) and the *Draft Title VI Guidance for EPA Assistance Recipients Administering Environmental Permitting Programs* (*Draft Recipient Guidance*) in 2000. However, during the public comment process, the NEJAC and many environmental groups suggested that the *Draft Revised Investigation Guidance* failed to redress the issues in a substantive and effective way (U.S. Commissions for Civil Rights 2003, 5-6). In 2005, the OCR published a revised version *Draft Final Title VI Public Involvement Guidance for EPA Assistance Recipients Administering Environmental Permitting Programs* (*Draft Final Recipient Guidance*). On March 21, 2006, EPA published the final version *Title VI Public Involvement Guidance for EPA Assistance Recipients Administering Environmental Permitting Programs* (*Recipient Guidance*) in the Federal Register (EPA 2013b).

[26] It has been suggested by EPA leadership that the "affirmative obligation" of the Agency under Title VI to some degree conflicts with its regulatory functions (U.S. Commissions for Civil Rights 2003, 30; see also Lazarus 1993). "The administrator testified that EPA has an affirmative obligation to ensure compliance with Title VI, but as a regulatory agency, it has 'a somewhat different set of problems' in attempting to take affirmative action to see that Title VI is enforced. For example, Administrator Ruckelshaus asserted that withdrawing funds from Title VI violators inhibits EPA's ability to regulate industry effectively." (U.S. Commissions for Civil Rights 2003, 30)

[27] The issue of limited resource allocation for Title VI programs may be intertwined with the delayed issuance of final guidance from 1998 to 2001. "A 1998 congressional restriction prohibits the use of EPA's appropriations to investigate and resolve Title VI complaints until the agency issued final guidance." (U.S. Commissions for Civil Rights 2003, 55)

"incremental administrative adaptations" on their own (Ringquist 2006, 266). Over the years, external and internal watchdogs of EPA have constantly evaluated the performance and progress of the federal environmental justice programs and policies[28]. The Office of Inspector General (OIG) of EPA in an evaluation report in 2004 suggested that, although EPA in general has been actively involved in the environmental justice agenda, results are not that encouraging. This is because of deficiencies in both the strategic planning and the establishment/standardization of values, goals, expectations, and performance measurements related to environmental justice enforcement (EPA/OIG 2004, i). In addition, environmental justice reviews or evaluations of potential negative environmental impacts, which lies at the policy core of Executive Order 12898, have not been adopted comprehensively by EPA programs or regional offices (EPA/OIG 2006).

A report by the GAO in 2007 revealed that in three programs under the Clean Air Act (CAA), the Office of Air and Radiation basically failed to address the concerns and suggestions by the GAO on environmental justice rulemaking processes in 2005 (GAO 2005; 2007). Possible improvements in rulemaking were hindered by three factors, including the absence of guidance on issue analysis, insufficiency of environmental justice training, and a lack of involvement of environmental justice coordinators of the Office. In 2011, the GAO concluded that EPA has achieved progress in the definition of missions and goals, leadership involvement and accountability, and interagency coordination. But it also lagged behind as regards a clear definition of key environmental justice terms, identification of necessary resources for

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[28] Programmatically, the federal agenda (e.g., primarily Executive Order 12898 and Title VI) on environmental justice is an interagency collaboration. For example, it may involve EPA, the U.S. Department of the Interior, the U.S. Department of Housing and Urban Development, and the U.S. Department of Transportation (U.S. Commissions on Civil Rights 2003). However, as this report by the U.S. Commissions on Civil Rights suggested, there is a general lack of meaningful commitment in agency missions or in accountability or performance schemes on an agency basis.

implementation, clear articulation of the roles of states in the planning and integration process, and development of performance measures for implementation (GAO 2011).

In some measure, the disappointing achievements of EPA in this respect are attributed to the obstacles it has been encountering in the course of executing environmental justice programs and Executive Order 12898 (Rosenbaum 2011, 152; see also Lester, Allen, and Hill 2001, 41). Notably, the federal-level separation of powers and institutional arrangements (i.e., EPA headquarters and ten regional offices) add one more complex factor to the agency's devoting attention to environmental justice (Foreman 1998).

Moreover, states differ dramatically in policy adoption and practices with respect to environmental justice. Although over 30 states have some form of legislative and/or administrative environmental justice policy, few of them have taken broad-based substantive steps (e.g., comprehensive legislation or administrative rule change, permitting, standard setting, or enforcement policies) to alter the course of environmental inequity (Hastings Public Law Research Institute 2010; Rechtschaffen, Gauna, and O'Neill 2008; Ringquist and Clark 1999; Targ 2005)[29]. Partly because of the variation in the content and form of state policy, it remains difficult to fully gauge their substantive effects.

Various reasons may account for this variation in state commitment. As noted, Ringquist and Clark (1999; 2002) suggest that there is a lack of consensus in state policymaking on the issue definition and measurement of environmental justice (i.e., environmental policy is simultaneously regarded as a protective/regulatory and social/redistributive policy) (more

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[29] Targ (2005) considered the state "comprehensive approach" to environmental justice issue as a promising solution because it "broadly integrates environmental justice into the work of a state government, rather than focusing on a specific facet (e.g., permitting, siting, brownfields, enforcement) that may raise issues associated with environmental justice." (p. 172) He acknowledged, however, that a lack of specific legal authority and standards of accountability as well as the broad scope of the "comprehensive approach" may encounter implementation and evaluation problems. He also added that a "successful, sustained, strong leadership" is needed (ibid, 174). The shortcomings identified in the "comprehensive approach" appear to be nontrivial and formidable to overcome.

discussion below). In a nontrivial way, the hostility to the expansion of government engagement in what some frame, and others perceive as a redistributive policy area – social justice – impedes an active pursuit of environmental justice policies, especially at the state and local level (Ringquist 2006; Ringquist and Clack 1999). In addition, the efficacies of state environmental justice initiatives vary because there is a lack of uniformity arising from "EPA's delay in issuing final guidance defining state responsibilities under Title VI of the Civil Rights Act of 1964." (Gordon and Harley 2005, 153) Furthermore, as discussed above, policy decentralization and devolution may complicate state's commitment to and involvement in environmental justice issue. Given the lack of consensus about issue definition and the omnipresent competition for issue priority, there always are possibilities that state governments compromise the efforts on environmental justice policymaking for policies with higher levels of issue salience. Administratively, variations in enforcement or compliance standards may create tremendous room for inequitable and uneven outcomes (Rhodes 2003, 116).

Taken together, the signal of policy commitment from the federal and state governments is inconsistent and ambiguous. As the subsequent sections suggest, the policy devolution paradigm and the intrinsic characteristics of bureaucratic organization may enable public agencies to exercise enormous discretion in the process of policy implementation. As such, they exert significant and substantive policymaking influences which may have profound implications for the development of environmental inequity.

<u>Inequality in Environmental Policy Implementation: Extant Research</u>

"Despite the existence of universal *formal* rights, not all communities have enjoyed either equal environmental protection or equal access to the regulatory process." (Pulido 1993, 918; emphasis in the original text) EPA's environmental justice strategies have emphasized the

importance of law enforcement and regulation compliance assurance since the outset of its issue

engagement in the 1990s. Specifically, such activities include a focus on the disproportionally

affected minority and low-income communities in terms of adverse human health and/or

environmental impacts (EPA 1995; 1996).

Given the important role of implementation activities in achieving the policy goals of

pollution control and management, a lack of consistent and substantive policy commitment of

EPA and other agencies, and varied state responses to the issue, environmental justice issues in

the process of regulatory enforcement have been drawing tremendous interest from grassroots

activists and the research community. As illustrated by the remarks of the early advocates (for

example, see the definition of environmental racism given by Benjamin Chavis) (Bullard 2000),

one of the alleged culprits for race/ethnicity-based environmental inequities is the discriminatory

enforcement of environmental regulations by government agencies (Collin 1993; Cutter 1995;

Pellow 2002; Walker 2012).

In the case of environmental inequalities toward Hispanic populations, Peña (2005a)

observed that "Not all states have adequate laws to protect farmworkers from exposure to toxins.

Even in the states with regulatory statutes, the laws are not readily or consistently enforced." (p.

190) In their review of environmental justice concerns, Mohai, Pellow, and Roberts (2009)

indicated that unequal clean-up enforcement by agencies is partly responsible for environmental

injustice. Attesting to the dramatic disparities in toxic waste hazard exposure faced by

communities of color, the twentieth anniversary report of the UCC-CRJ argued that should

current laws of environment, health, housing, land use, and civil rights [be] "vigorously enforced

in a nondiscriminatory way," many environmental injustice problems associated with people of

color can be remedied (Bullard et al. 2007, xiii).

The first wave of systematic investigation of this topic started from the inquiries concerning federal enforcement activities in the 1990s. The first empirical scrutiny of hypothetical environmental enforcement disparities in minority neighborhoods was conducted by Lavelle and Coyle (1992) and focused on EPA civil judicial penalties in air, water, and waste pollution from 1985 to 1991. This study found that rarely were "race-neutral decisions" made by EPA. This report was published in the *National Law Journal* and had been broadly cited (e.g., Been 1994b; Bullard 1994; Ferris and Hahn-Baker 1995), stirring lasting controversy regarding the federal government's inequitable protection of different racial/ethnic groups. However, Atlas (2001) later argued that the study's conclusions were substantially contaminated by substantive and methodological problems. These included double counting of penalties which were imposed in multilocation cases, implausible conceptual definitions of minorities, inaccurate interpretation of EPA penalty policies, unjustified selection of the unit of analysis (i.e., zip code), and severe omitted variable bias.

Ringquist (1998) performed a similar but far more advanced empirical examination of judicial decisions on violation penalties from 1974 to 1991. To consider other underlying intervening factors, he controlled for a series of political, institutional, and economic variables. The variables of race/ethnicity and economic class of affected neighborhoods were statistically significant in one out of four models; however, the estimate of the minority variable showed contradictory results to that of Lavelle and Coyle (1992). Ringquist concluded that no legitimate race/ethnicity-based discriminatory evidence had been found in the EPA penalties against environmental violations.

Akin to Ringquist's criticism of Lavelle and Coyle, Atlas (2001) was suspicious of the analysis by Ringquist (1998) for the same kind of substantive and methodological reasons. For

example, some of the control variables (e.g., judicial involvement, the advantageous position of government entities, the overstated role played by the headquarters attorneys in the Department of Justice) employed by the study were practically and theoretically ungrounded and the model was misestimated. Moreover, some measures either simply mirrored a truncated sample (e.g., prior civil judicial actions and severity of the case) or were incorrectly operationalized.

Atlas (2001) aimed to solve the identified issues in two prior studies. Taken from the perspective of a lawyer, the study did not account for multiple political or socioeconomic elements that concerned political or social scientists. Moreover, using the same database (i.e., EPA Civil Enforcement DOCKET) as Ringquist (1998), he found that the characteristics of individual cases[30] were the most potent determinants of the amount of penalties. Also, in contrast to the accusation of discrimination against minorities by Lavelle and Coyle, Atlas found the relationship between minority concentration and imposed penalties was significantly positive in both single-location and multi-location cases[31]. Furthermore, the magnitude of the impact of this variable was much smaller than that of the type of violation.

Nonetheless, Ringquist (2001) defended the reliability and validity of his previous work. More important, rather than simply being a rejoinder, he stressed some methodological strengths and insisted his approach was consistent with standard social science principles (p. 683). For instance, first, the selection of control variables (e.g., political and socioeconomic factors) was theoretically sound given extant research and empirical tests showed their significant predictive power. Second, "hypothetical scenarios or individual cases" suggested by Atlas could not negate the findings of the hypotheses derived from these control variables (p. 687). Third, and

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[30] For example, whether the case is a CWA permit violation, CAA SIP violation, RCRA violation, or CAA NSPS violation (Atlas 2001, 671).

[31] Multilocation cases refer to "individual cases in which violations occurred at more than one location." (Atlas 2001, 637)

statistically, erroneous exclusion of relevant predictors rendered a much worse case than the inclusion of irrelevant factors in terms of validity (ibid). Fourth, data errors of the sample from the EPA DOCKET did not threaten the validity or inference.

What is clear, however, in the context of environmental federalism and policy devolution (Lowry 1992; Rabe 2006) is that states are responsible for the majority of environmental compliance monitoring and assurance activities of this nation. A growing quantity of studies with multivariate analysis which consider various predictors have produced more insights into the environmental equity issue in the state policy implementation patterns. Disappointingly, state government implementation inequities have been increasingly observed in communities with high concentrations of people of color and the socioeconomically disadvantaged.

Considering a host of relevant factors (e.g., community demographics, enforcement history, case characteristics, company and facility, and political/economic climate) and using zip code as the spatial unit, Lynch, Stretesky, and Burns (2004) suggested that EPA and state monetary penalties against petroleum refineries were significantly lower in low-income and Hispanic communities. However, key variables of environmental inequity (i.e., race/ethnicity and economic class) lacked predictive power in census-tract models.

Two additional reports at an individual state level had similar findings. State agencies in New Jersey had a lower degree of enforcement stringency and rigorousness (measured by civil penalty amount and state administrative order issuance) in air polluting facilities that were located in minority communities, despite significant violations detected in the target facilities (Mennis 2005; using a unit of census tract). Also using census tract data in the case of Tennessee, Malley, Scroggins, and Bohon (2012) found that although the amount of penalties assessed for violations was not significantly different along the racial/ethnic line, EPA was less

prone to levy pecuniary fines on the facilities in the neighborhoods that were home to a higher percent of nonwhites[32].

Additional research has probed the direct, routine compliance monitoring and assurance activities of state environmental protection agencies. Konisky (2009a) found much stronger evidence of enforcement inequities based on economic class instead of race or ethnicity at the county level. His three multivariate models examined the CAA, CWA, and RCRA, and used aggregated numbers of inspections and formal and informal punitive actions as the dependent variables from 1985 to 2000. The only significant finding concerning race/ethnicity-based inequity was the enforcement of the CWA in high Hispanic concentration counties. Disaggregating the type of implementation activities, Konisky also found that inspections were negatively correlated with nonwhite communities in the case of CWA, but positive in the case of RCRA. Nevertheless, punitive actions had no discernible predictive power.

In another study, Konisky (2009b) indicated that rarely did federal policy commitment to environmental justice in the mid-1990s have positive impacts on state enforcement behavioral patterns in environmentally vulnerable communities at the county level. On one hand, inequitable administrative activities were notably severe and troublesome for the Hispanic population in the air program. On the other hand, African-American communities received distinct attention from state government agencies in different programs. For example, enforcement activities were more stringent in the CAA while significantly less rigorous in the CWA.

Conscious of the potential problems of aggregation errors using a large geospatial unit, Konisky and Schario (2010) employed a facility-level analysis (for both census tracts and block

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[32] However, as Malley, Scroggins, and Bohon (2012) stated, an alternative explanation to enforcement inequities was that there might be fewer regulatory violations in nonwhite communities.

groups) to examine federal and state enforcement actions in communities surrounding the target facilities from 2000 to 2005. Akin to prior studies (e.g., Konisky 2009a; 2009b), Konisky and Schario identified state enforcement variation impacts on minority groups in the course of implementing the CWA. Two of the most interesting findings in their article are the variations of government compliance monitoring and assurance behavior with respect to different racial/ethnic groups (i.e., African Americans and Hispanics) as well as different type of implementation actions across the two groups (i.e., inspection and punitive action). Black neighborhoods consistently and significantly witnessed an increased likelihood of both inspection and punitive action. To the contrary, states reduced inspection efforts in neighborhoods with a higher percentage of Latinos. However, such a trend was reversed when it came to punitive actions, as the results pointed to a positive relationship.

As described in the section covering the administrative context of environmental justice, longstanding and serious variations are observed in terms of the states' implementation practices in the CWA. These have drawn decades-long attention from the GAO (GAO 2000; 2006; 2009). Moreover, in comparison to the CAA and RCRA, implementation inequalities are particularly found with respect to the CWA in the empirical studies on environmental justice (e.g., Konisky 2009a; 2009b; Konisky and Schario 2010). Consequently, federal wastewater management programs are substantively relevant for the research questions of this study, regarding the circumstances of environmental implementation inequities for racial/ethnic minority populations. Therefore, this study focuses on the CWA, more specifically the National Pollutant Discharge Elimination System (NPDES) permit program.

The Federal Water Pollution Control Act Amendments of 1972 "establishes the basic structure for regulating discharges of pollutants into the waters of the United States and

regulating quality standards for surface waters." (EPA 2012b) Any industrial and municipal

facilities that "discharge pollutants from any point source into waters in the United States" are

required to obtain a NPDES permit (EPA 2012d). As the key component of the CWA, since its

establishment in 1972, the NPDES permit program has contributed to substantial reductions in

wastewater discharges to the nation's waters (EPA 2012f). The NPDES permit program and

system[33] have constituted a significant, substantive part of regulatory federalism in

environmental area, especially with respect to the control of water pollution in the nation (GAO

1984). As Table 2.1 presents, a substantial amount of states have obtained authorization from

EPA to administer the NPDES permit program (see also Chapter 3 for state organizational

structure of policy compliance monitoring and assurance).

<u>Probing the Underlying Mechanisms of Environmental Inequalities</u>

In conjunction with considerable empirical studies that aim to reveal and assess the

relations between environmental harms (and possible negative health impacts) and the socially

marginalized and the socioeconomically disadvantaged, an increasing amount of scholarship has

been probing the causes for this phenomenon. They look at this issue through different lenses

that help conceptualize the driving forces for the disparate patterns of the distribution of

environmental harms and their possible health effects.

As discussed above, racial discrimination has been argued prominently as the major

cause for the inequality circumstance of racial/ethnic minorities in the environmental realm,

largely due to the unique marginalization experience of the very groups. Nonetheless, the

contention of intentional discrimination meets empirical hurdles because it is difficult to identify,

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[33] The NPDES permit programs cover various areas, including concentrated animal feeding operations (CAFOs), pesticide discharges, combined sewer overflows (CSOs), pretreatment, sanitary sewer overflows (SSOs), stormwater and whole effluent toxicity (WET) (EPA 2012f).

Table 2.1. States with NPDES Permit Program Authorization under the CWA

State	Approved State NPDES Permit Program	State	Approved State NPDES Permit Program
Alabama	1979	Montana	1974
Alaska	2008	Nebraska	1974
Arizona	2002	Nevada	1975
Arkansas	1986	New Hampshire	NA
California	1973	New Jersey	1982
Colorado	1975	New Mexico	NA
Connecticut	1973	New York	1975
Delaware	1974	North Carolina	1975
Florida	1995	North Dakota	1975
Georgia	1974	Ohio	1974
Hawaii	1974	Oklahoma	1996
Idaho	NA	Oregon	1973
Illinois	1977	Pennsylvania	1978
Indiana	1975	Rhode Island	1984
Iowa	1978	South Carolina	1975
Kansas	1974	South Dakota	1993
Kentucky	1983	Tennessee	1977
Louisiana	1996	Texas	1998
Maine	2001	Utah	1987
Maryland	1974	Vermont	1974
Massachusetts	NA	Virginia	1975
Michigan	1973	Washington	1973
Minnesota	1974	West Virginia	1982
Mississippi	1974	Wisconsin	1974
Missouri	1974	Wyoming	1975

Source: EPA (2013b)

 "NA": states not obtaining NPDES permit program authorization.

measure, and substantiate overt and blatant discriminatory intent and/or behaviors (Walker 2012).

Alternatively, there exist a variety of potential causes that may not be related to deliberate discrimination (Ringquist 2004). First, the literature on scientific rationality asserts that certain areas or locations are chosen to locate waste or noxious facilities because they have been shown to be geographically or technically feasible. Analogously and relatedly, the second contention is market rationality, under which the distribution of environmental hazards or pollution levels is primarily driven by economic considerations (Been 1994b; Lester, Allen, and Hill 2001). In this scenario, market factors such as the costs of land and labor, the accessibility of raw materials, and the convenience of transportation in a large measure explain the decisions of the private sector to relocate their facilities and establishments in the same areas.

Furthermore, neighborhood transition poses a mutually causal dilemma (e.g., chicken-or-egg question, see Walker 2012). Areas that are home to polluting facilities are devalued by the potential environmental or health risks, and would further experience an outflow of original residents and an influx of the socially vulnerable strata. To ascertain whether deliberate discrimination is a determinant, one needs to inquire about the temporal relationships (i.e., "what came first") between the neighborhood demographic and/or socioeconomic characteristics (i.e., minority/low-income resident concentration) and the siting of noxious facilities (e.g., the dynamics of siting, migration, and exposure, Baden and Coursey 2002; Cutter 1995).

A related contention here is individuals' choices to reside closely to the facilities or areas which are environmentally hazardous because they offer occupational and other economic opportunities (e.g., "lifestyle choices," Cole and Foster 2001; Pollock and Vittas 1995) The empirical examination of this argument has produced mixed conclusions (Anderton et al. 1994;

Baden and Coursey 2002; Been 1994b; 1995; Been and Gupta 1997; Mitchell, Thomas, and Cutter 1999; Pollock and Vittas 1995). Although this type of research is a critical step to investigate the role of discriminatory intent, it is more methodologically complex to pursue since it involves historical tracing of contextual and structural processes and event sequencing in a given locale; meanwhile, the potential effects in this circumstance are more likely to be local (Baden and Coursey 2002; Walker 2012; Williams 1999b).

Lastly, unbalanced political power and resources matter in the decision-making process of facility siting (Lester, Allen, and Hill 2001). Groups with sufficient political resources or abilities (e.g., wealth, education, mobilization skills) are more prone to defend their interests against any imposition of unfair or discriminatory treatment. In contrast, the racial/ethnic minority and low-income communities generally lack such capacities to mobilize; and thus policymakers and business stakeholders encounter less opposition. Similar to the market-dynamics propositions, the empirical findings in this area are inconclusive (e.g., Hamilton 1995; Hird and Reese 1998; Ringquist 1997; but see Lester, Allen, and Hill 2001).

However, some scholars have proposed an institutional model (e.g., "institutional discrimination," Downey 1998) and pointed out that race/ethnicity-based environmental inequalities (including those resulting from market-dynamics factors) virtually are the consequences of the established structural process of previous marginalization and bias; in this circumstance, intentionality does not need to be a necessary condition for the environmental grievances of people of color (e.g., Cole and Foster 2001; Downey 1998; Pellow 2002; Peña 2005b, 131; Pulido 1994; 1996; 2000; Pulido, Sidawi, and Vos 1996; Walker 2012). These factors may include historical discriminatory rules and practices of land use, housing, real estate, division of labor, as well as other predominant cultural, ideological, and political-economic

institutions regarding these target populations. These have produced residential racial segregation and limited viable employment and residential choices for minority populations (see Cole and Foster's critiques of "lifestyle choices"). "[T]rying to prove intent through quantitative analysis is far too limiting, and … racism has to be understood instead as integral to collective social life in the U.S., part of the way in which private and public organizations work, infusing culture, politics, and economic structures." (Walker 2012, 92)

Partly because of their findings, a nascent body of scholarship has started to focus on the inequality issues in the process of environmental policy implementation. As Mennis (2005) writes, "Environmental enforcement, however, is a direct result of decisions made by environmental enforcement agencies." (p. 420) Explanations for inequitable policy implementation behaviors (i.e., compliance monitoring and assurance activities) by public agencies are generally inadequate, even though empirical research has substantiated such an implementation pattern for these susceptible subpopulations in the post-siting period. Therefore, to solve this puzzle, we need to comprehensively examine a wide array of political, socioeconomic, task, and demographic factors in multilevel environments which have been argued to influence the implementation patterns in regulatory policies in general and environmental policy specifically.

<u>Policy Types, Path Dependency, and the Bi-Dimensionality of Environmental Policy</u>

Issue framing is a major component of the public policy context. Classifications or typologies (e.g., regulatory, distributive, redistributive, constituent) of domestic public policies have been developed based on their distinct contents and mechanisms (Lowi 1964; 1972; Ripley and Franklin 1976). Conventionally, environmental policy belongs to the domain of protective regulatory policy which is behavior-oriented and responsibility-delineated (Buck 1996; Eisner,

Worsham, and Ringquist 2007; Meier and Bohte 2007; Ripley and Franklin 1976)[34].

Nevertheless, the implementation of environmental regulatory policy has a redistributive dimension; it can be framed or interpreted as having redistributive effects or outcomes (Lazarus 1993; Meier and Bohte 2007; Ringquist 2011; Ringquist and Clark 1999; 2002; Torres 1993). Environmental protection and management can produce winners and losers with respect to benefits and costs, even though the redistributive motive of environmental policy is much less prominent than in other areas (e.g., social and welfare policy, Sefton 2006, 607; Buck 1996)[35]. This means that redressing environmental inequalities may be framed, perceived, or result in an inequitable redistribution of protective benefits and even environmental burdens between minority and majority populations (Adebowale 2008; McClaren 2003).

Fundamentally, environmental justice reflects the notion of environmental rights to a clean environment and better health. This makes it a pivotal "ethically charged social-environmental linkage point" that speaks more of the access to environmental benefits than merely avoidance of harms (Paehlke 2013, 104-105). For instance, in his empirical study investigating race/ethnicity-related implementation inequities, Ringquist (1998) states that "at a minimum, such penalty disparities deny certain citizens equal protection under the law

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[34] Broadly speaking, regulations are "government restrictions of individual choice to keep conduct from transcending acceptable bounds" (Meier and Bohte 2007, 76) or "government actions that extend government control over particular behavior of private individuals or businesses." (Ripley and Franklin 1976, 18) In terms of their distinct features, economic regulations "govern conditions under which firms may enter and exit the market, competitive practices, the size of economic units, or the prices firms can charge." (Eisner, Worsham, and Ringquist 2007, 3) Social regulations "are designed to force corporations to accept greater responsibility for the safety and health of workers and consumers, as well as for the negative by-products of the production process." (ibid)

[35] Redistributive policies are those "through which the government taxes one group of people to provide benefits to another group." (Meier and Bohte 2007, 75) It is noteworthy that "policies with redistributive effects may have dominant objectives other than redistribution." (Sefton 2006, 608; but see also the definition of redistributive policy as "a conscious attempt by the government" in Ripley and Franklin 1976, 18) Inequities in environmental policy treatment should share a similar ground. Heinelt (2007) offered a succinct comparison of regulatory, distributive, and redistributive policy outcomes by maintaining that the costs and benefits of distributive and regulatory policy are either universal/unclear or hard to predict, whereas those of redistributive policy are discernibly unequal (p. 109-110).

guaranteed by the Fourteenth Amendment. At worst, such disparities may contribute to the unequal distribution of environmental risk." (p. 1148-1149)

Meanwhile, the repertoire of potential solutions to address environmental inequity constitutes additional barriers to governmental agenda setting and viable actions; these proposals can be framed by critics or perceived by others rather easily as either involving the redistribution of resources or imposition of new costs (Guber and Bosso 2013). Thus, the approaches to redressing environmental injustice are inevitably related to a core question of "who wins at whose expense" in redistributive politics (Ringquist and Clark 2002).

Ringquist and Clark (2002) also suggested that a state's social and political context is pertinent to whether it defines environmental justice as a protective regulatory (i.e., environmental protection) or redistributive policy (i.e., social justice) and what corresponding policy to adopt. In turn, issue definition is important insofar as it determines which relevant policy advocacy groups have more or less leverage in participating in policy development. Their empirical findings showed that, currently, environmental justice remains an issue with mixed and contested problem definition. Such an identity crisis and the lack of consensual framing lead to high levels of conflict and an ambiguous government response that clouds effective action at the state level, despite some awareness of this matter[36].

Predominantly, the environmental justice movement has historically centered on an issue framing that underscores procedural and distributive social justice (Benford 2005)[37]. This means

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[36] Gordon and Harley (2005) maintain that a paradox exists in the intergovernmental relationship with respect to compliance with the non-discrimination provisions of federal environmental laws (e.g., Title VI of Civil Rights Act of 1964). The legal responsibility of state environmental protection agencies (e.g., the permitting system) can be complicated when it encounters questions such as "how can a legally adequate permit containing terms and conditions to protect human health and the environment also create significant harm." (p. 160)

[37] See also ecologic justice in Schlosberg (2007). In addition, the environmental politics and policy literature that has wide concerns about global environmental justice has increasingly cast the environmental problems faced by the developing world as an issue of distributive justice (Dobson 1998, 17).

that it has been conceptualizing and framing the issue of equal shares of environmental benefits

and burdens for societal members from the Rawlsian perspective of distributional justice and

"justice as fairness." (Schlosberg 2007) Yet, articulating everyday life experience and issue

advocacy in terms of rights and justice within a civil rights context has gained broader resonance,

including the policymaking audience because of its redistributive dimensions (Benford 2005;

Capek 1993; Melosi 2000).

The conundrum and challenges in the development of policy response to environmental

inequity as a right – with the redistributional impressions this can create – can be comprehended

in the analytical framework of historical institutionalism. Scholars studying American Political

Development (APD) focus on path dependency, the "constitutive effects" of institutions, and the

sequencing of events, as well as their implications for policy selection and feedback (Orren and

Skowronek 2002; Pierson 2004; Thelen 1999). Path dependency essentially implies "the

dynamics of self-reinforcing or positive feedback processes in a political system." (Pierson and

Skocpol 2002, 699) As Pierson (2004) observes, it is not just "what" happens to affect given

social outcomes but also "when" they happen. This "amplification effect" occurs through causal

mechanisms of "self-reinforcement" and "reproduction of institutions." Premised on this notion,

APD scholars elaborate on the "constitutive power" of institutions that come earlier in a policy

arena. Such a power determines who has power, access, and influence in future policy debates.

Policy advocacy revolving around environmental justice infused with redistributive

undertones comes later in an environmental policy cycle that over the years has not focused on

equity issues. The assumption, as noted earlier, is that environmental protection is a regulatory

type of policy from which all social members benefited. As such, it is difficult to achieve

consensus on problem diagnosis, issue definition, and the approach to addressing environmental

justice issues; and altering the path of prior policies has proven formidable in EPA and across the states. Thus, as path dependency would suggest, environmental justice has had a tough time becoming institutionalized in the priorities of present program offices, and thus has generated uneven pressure from EPA on the states to implement environmental justice priorities. Buttressing resistance to these changes in focus at the federal and state levels are the constitutive effects of prior rules, norms, and regulations. Earlier policies, structures, and rules have marginalized the power, access, and influence of environmental justice advocates at all levels of government. This has occurred through causal mechanisms of "self-reinforcement" and "reproduction of institutions." Culprits here include constraints leading to what APD scholars call "lock-ins" such as sunk costs, reputational costs of admitting failure, and selective attention to good over bad results. Consequently, the "intercurrence" of conflicting regimes and principles occurs. This gives rise to conflict and bargaining among representatives of earlier and later regimes over how much authority and attention to shift to environmental justice issues. And this is always in the shadow of the amplifying effects of sequencing, path dependency, institutional reproduction, and constitutive properties that advantage the interests benefiting from earlier assumptions about the distributive and regulatory nature of environmental policy and implementation (Orren and Skowronek 2004). As a result, despite the increased awareness of the problem of environmental inequalities, policy efforts promoting environmental equality at the federal and state levels remain a "half-way, halting, and patch-worked" enterprise (Skowronek 1982).

Bureaucratic Discretion, Policy Implementation, and Service Delivery for Citizens

Against the backdrop of environmental federalism, a relevant and critical issue is the behavior of bureaucratic organizations and particularly the concomitant discretion inherently

instituted within public agencies (see also Keiser 1999, for state variations in administrative outputs in Social Security Disability under policy devolution). To facilitate the flexibility needed to respond to specific circumstances in the regulatory process, environmental statutory frameworks often provide a high level of discretion to regulators (Esworthy 2010; Potoski and Woods 2002).

Bureaucracy[38], implementation, and discretion constitute one of the fundamental themes for the disciplines of public administration and political science (Eisner, Worsham, and Ringquist 2007; Meier and Bohte 2007). Administrative discretion can be defined as "the degree of latitude or flexibility exercised by public administrators when making decisions or conducting any agency business." (Warren 2003, 35) The "legally empowered" discretion to varying degrees is one of the distinct characteristics and necessities of public bureaucracy during implementation of any policy (Ripley and Franklin 1986, 45; see also Wilson 1989)[39], and environmental policy is no exception, as noted earlier. In stark contrast to a functional demarcation or separation of politics (e.g., devising and adopting policy) and administration (e.g., implementing and executing policy) (Goodnow 1900; Wilson 1887), the practices and behaviors of public bureaucracy are highly politicized. In some instances, bureaucracies actively express their policy preferences and shape the course of policy, instead of being passively subject to the influence of

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[38] Bureaucracy refers to government organizations and bureaucrat refers to government employees (Meier and Bohte 2007, 1, footnote 1). Specifically, it can span vertically as "an organization within the executive branch of government, whether at the federal, state, or local level." (Gormley and Balla 2008) Institutionally, it is "the formal, rational system of relations among persons vested with administrative authority to carry out public programs." (Kettl 2012)

[39] Administrative discretion may stem from multiple sources, including deference to bureaucratic technical expertise in substantive areas, information advantage, situational complexity, agency demand for a commodity (given its risk propensities in an uncertain setting and varying discretionary context), and legislative negotiation and compromise, or the separation of powers (e.g., Huber and Shipan 2002; Krause 2008; Weber 1946; Wood and Bohte 2004).

external political actors (e.g., democratic institutions, such as the president, Congress, and the judiciary, as well as constituent groups and the general public).

As a key player in the policy implementation process, especially at the front-line or street-level, public bureaucracies are predominantly and directly responsible for the administrative outputs in regulatory (e.g., compliance monitoring and assurance) and redistributive domains (e.g., determining eligibility for benefits or initiating sanctions for noncompliance). The seminal work of Lipsky (1980) formed the theoretical foundation regarding the policymaker status of street-level bureaucrats or front-line public workers, who interact with citizen-clients on a frequent, daily basis and possess institutionalized discretion and relative autonomy in service delivery or law enforcement. Street-level bureaucrats themselves are *de facto* policymakers (Bryner 2003; Lipsky 1980; Vinzant and Crothers 1998; Wilson 1989).

With discretion, public agencies are prominent driving forces that shape democratic citizenship and social membership in a far-reaching way. As Smith (2003) argues, we should emphasize "the crucial gatekeeper functions of street-level bureaucrats to the access of individuals to full citizenship rights," especially social rights (p. 354-355, 356). However, in the course of applying general policies to specific cases, selected application of laws is common phenomena of policymaking through implementation; in particular, law enforcement may be contingent on different classes of people (Meier and Bohte 2007, 86). Conventionally viewed as neutrally competent policy implementers, street-level public bureaucrats are ultimate policy makers, by redistributing and allocating benefits and sanctions, as well as determining policy priorities (Ripley and Franklin 1986)[40]. To summarize, the issue (i.e., environmental policy characterized by regulatory and redistributive politics) and administrative (i.e., public

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[40] Also, it should be noted that bureaucratic discretion can be constrained by structural and organizational context (Maynard-Moody and Portillo 2010; Wilson 1989).

bureaucracies with discretionary authority in a policy devolution setting) contexts jointly engender profound implications for policy implementation as well as output inequalities for distinct social members in environmental area.

Summary

This chapter has offered reviews of the empirical evidence of race/ethnicity-based environmental injustice, as regards the significant relations between the uneven exposure to environmental harms or negative health impacts and racial/ethnic minority populations, as well as the unequal environmental protection these groups receive from the government. More important, as we have seen, although environmental injustice has aroused policy concerns from the federal and state governments, these efforts are largely half-way, halting, and patch-worked. Meanwhile, scholars through interdisciplinary lenses have identified possible causes for these phenomena. These include intentional discrimination, scientific rationality, market dynamics, political power and resources, institutional discrimination, and bureaucratic discretion. As noted, while a substantial, rich, and informative literature exists on the topic of environmental justice, controversy remains the causes of the disparities in environmental justice that have been chronicled.

As you will see in the next chapter, my study shares the research interests of the previous scholarship in terms of the potential implementation inequalities of environmental policies for racial/ethnic minorities, while highlights its unique contributions in the following aspects: (1) it focuses on the routine administrative compliance monitoring and assurance activities performed by public agencies, which have been shown to be a substantive policymaker in the contemporary U.S. political context; (2) it employs a nationwide sample with a more recent research time frame (i.e., from 1996 to 2010 or from 2005 to 2010 depending on different target populations);

(3) it devises a multilevel modeling design to investigate both the independent and interactive effects of a wide array of contributing factors which originate from different levels; and (4) it examines group-specific political determinants in separate models for African Americans and Hispanics.

CHAPTER 3

THEORETICAL FRAMEWORK AND METHODOLOGICAL STRATEGY:

HYPOTHESES, MEASURES, DATA, AND MODELS

As discussed in Chapters 1 and 2, African Americans and Hispanics persistently fall

victim to disproportionate exposure to environmental hazards and unequal protective benefits.

While a substantial number of studies covered in those chapters have attempted to understand the

causal mechanisms involved in explaining or predicting the variations in facility siting, they have

focused relatively little on the effects of the potentially important political, socioeconomic, task,

bureaucratic, and demographic factors at different geographical levels on regulatory enforcement

practices in the post-siting period. To address these gaps in the literature, I offer in this chapter

an integrated conceptual framework incorporating these previously understudied aspects of

environmental policy implementation inequality in the states, derive hypotheses from it, and

devise methodological strategies to investigate the compliance monitoring and assurance

activities of the CWA-NPDES permit program across the nation. The remainder of the chapter

first offers the integrated conceptual framework culled from prior research. Presented next are

variable measurement, data sources, and model specifications.

A Conceptual Framework for Understanding Inequitable

Environmental Policy Implementation

This study offers and tests an interactive conceptual model for understanding

environmental policy implementation inequalities. Incorporating political, socioeconomic, task,

bureaucratic, and demographic factors, the conceptual model proposed in this study enables us to

analyze in a comprehensive way a series of pertinent variables that influence agency policy

implementation practices. Research on both general policy implementation and specific

environmental program enforcement has demonstrated that a wide array of political,

socioeconomic, bureaucratic, and cultural determinants may mold the implementation aggressiveness of state environmental protection agencies.

Notably, some of such factors are across multiple geographical scales. In other words, subnational enforcement and implementation, which can be conceptualized through administrative and bureaucratic behavior, are shaped by multilevel/multi-institutional factors or interactions between top-down and bottom-up political, economic, bureaucratic, and task environments (Haider-Markel 2002; Headrick, Serra, and Twombly 2002; Keiser 1999; Kim 2007; Konisky and Schario 2010). "Speaking theoretically, market-based explanations tend to emphasize the local scale, while simultaneously ignoring how social processes like class and racial oppression – so integral to the phenomenon of environmental inequity – are constituted across many scales, from the local to the national and international." (Williams 1999a, 50) Hence, a multivariate analysis with a multilevel modeling design is imperative for a rigorous empirical investigation to take into account rival arguments, alternative explanations, intervening factors, and background variables in the research on environmental justice specifically as well as environmental policy implementation in general (e.g., Noonan 2008; Pastor, Sadd, and Morello-Frosch 2005; Pollock and Vittas 1995; Potoski and Woods 2002; Szasz and Meuser 1997; Ringquist 1993; 2001; 2005; Wood 1992; see also the studies on policy implementation and environmental justice in Chapter 2).

Unit of Analysis

In this study, I select county as the primary unit of analysis. I do so while acknowledging that there is a need to consider a smaller spatial scale (e.g., census tract, block group, firm or polluting entity) as the unit of analysis in sensitivity tests to further evaluate the potential problems of aggregation bias and ecological fallacy, omitted variable bias, and endogeneity.

Why does this matter? The selection of a geographic unit of analysis, which can potentially affect the validity of the conclusions offered, is a salient and omnipresent methodological issue in the research on environmental justice (Anderton 1996; Baden and Coursey 2002; Baden, Noonan, and Turaga 2007; Lester, Allen, and Hill 2001; Pastor, Sadd, and Morello-Frosch 2005; Ringquist 2005). As discussed in Chapter 2, it is one of the causes for inconclusive findings in extant literature (e.g., Anderton et al. 1994; Bowen et al. 1995; Cutter, Holm, and Clark 1996; Downey 1998).

Essentially, the "unit of analysis" question reflects disagreements on the choice of an appropriate spatial scale (e.g., block group, census tract, zip code, and county[41]). Underlying this question are the problems of aggregation bias or ecological fallacy that may disguise intra-locality variations, assuming demographic homogeneity within the geographical unit (Anderton 1996; Hird and Reese 1998, 698-699, 711). These mean "errors committed by taking a relation between variables established at one level and transferring it to a different level without checking its validity for that level." (Snijders and Bosker 2012, 39)

This said, there are several reasons why using county as the unit of analysis makes sense. The first is quite practical. Data unavailability is a severe barrier to the employment of a smaller geographical scale as the analytical unit. EPA did not release in geospatial files a facility census block code until November 2012. This means that without a geographical identifier of this kind, a facility cannot be identified either in terms of census tract or block group, unless more

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[41] The U.S. Census Bureau defines *census tract* as "usually hav[ing] between 2,500 and 8,000 persons and, when first delineated, are designed to be homogeneous with respect to population characteristics, economic status, and living conditions. Census tracts do not cross county boundaries." (U.S. Census Bureau 2000) *Block groups* are "statistical divisions of census tracts, are generally defined to contain between 600 and 3,000 people, and are used to present data and control block numbering." (U.S. Census Bureau 2012) *ZIP codes* are "defined at the convenience of the U.S. Postal Service and may change from time to time." (U.S. Census Bureau 2013)

sophisticated geographic information system and mapping tools are applied[42]. In addition, except for the decennial census, the demographic and socioeconomic information (e.g., American Community Survey) at the census-tract (or block-group) level from the U.S. Census is a five-year estimate (e.g., 2005-2009). As such, if a five-year estimate is used, there will be some discontinuity in certain years in my research time frame and a compromise of the information from the readily accessible data. Technically, the census-tract (or block-group) demographic data combines a large number of mega files that need to be downloaded on a state-year basis. Furthermore, the Census separates the geographic files that require a further merging with the main demographic data files.

Second, as Williams (1999b) noted, "The political jurisdiction is typically responsible to the citizens for the hazardous site/facility via regulations and other means. Thus, it makes sense to define an analytical unit in terms of the entity that might have licensed the site in the first place, and/or has responsibility to monitor it in the public interest" in the studies of environmental justice (p. 317-318; see also Baden, Noonan, and Turaga 2007, 165) The research focus of this study is the government agencies' compliance monitoring and assurance activities. This implies that the methodological concerns with aggregation bias or the disguise of within-unit demographic heterogeneity in facility-siting-oriented research appear less relevant to the examination of agency outputs. Although the use of smaller geographic scales in prior research better takes into account the proximity-to-hazard problem in environmental inequity issues, rarely does it consider "the [regulatory] units capable of designing or implementing policy solutions below the federal level are state, county, and city governments" instead of zip code,

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[42] A facility- (or firm-) level analysis (e.g., using facility as the lowest level in multilevel modeling) is not substantially different from the analysis with other smaller geographical units, since the former needs to be based on an areal apportionment method which still relies on the demographic information at the census tract or block group level from the Census (see Konisky and Schario 2010).

census tract, or SMSA[43] (Lester, Allen, and Hill 2001, 17; see also Lynch, Stretesky, and Burns 2004, 345).

Third, it should be noted that the compliance monitoring and assurance structure of environmental law and regulation in the contemporary U.S. is primarily based on state-county level (Table 3.1). Environmental protection agencies in various states (i.e., approximately 40 states) have established general regional or field offices each of which is responsible for the inspection and enforcement activities in a varying number of counties. For instance, the Alabama Department of Environmental Management has four regional offices. The jurisdiction of the Birmingham Field Office covers 21 counties, and that of Decatur, Mobile, and Montgomery Field Office covers 15, 8, and 23 counties respectively. The average number of counties for which each regional office is responsible in the state is 14.27; specifically, Vermont has the lowest average number (i.e., 10 offices responsible for 14 counties in the state), and Oklahoma has the highest average value (i.e., one main office only responsible for 77 counties in the state).

The other widely adopted organizational structure of regional offices is based on functional division of issue area (e.g., air, water, solid and/or hazardous waste, etc.) as well as county-level jurisdiction (in approximately 10 states) (Table 3.2). The average number of counties for which each functional division regional office is responsible ranges from 1.66 to 64. Taken as an example, under the enforcement branch of the Solid Waste Management Division of the Arkansas Department of Environmental Quality, there are eight district regional offices and each of them covers a couple of counties. Similar organizational structures are applied to the divisions of air and water management (with 9 and 11 district regional offices respectively).

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[43] SMSA refers to Standard Metropolitan Statistical Area.

Table 3.1. State Compliance Monitoring and Assurance, General Regional Office Structure

State	Regional Offices[a]	County Number in State[b]	Average Number of Counties per Regional Office	State	Regional Offices[a]	County Number in State[b]	Average Number of Counties per Regional Office
Alabama	4	67	16.75	Montana	NA	56	56
Alaska	NA[c]	19	19	Nebraska	5	93	18.6
Arizona	2	15	7.5	New Hampshire	1	10	10
Connecticut	NA	8	8	New Mexico	3	33	11
Delaware	NA	3	3	New York	9	62	6.89
Florida	6	67	11.17	Ohio	5	88	17.6
Georgia	7	159	22.71	Oklahoma	NA	77	77
Hawaii	NA	5	5	Oregon	3	36	12
Idaho	6	44	7.33	Pennsylvania	6	67	11.17
Indiana	5	92	18.4	Rhode Island	1	5	5
Iowa	6	99	16.5	South Carolina	8	46	5.75
Kansas	6	105	17.5	South Dakota	5	66	13.2
Louisiana	6	64	10.67	Tennessee	8	95	11.88
Maine	4	16	4	Texas	16	254	15.88
Maryland	3	24	8	Utah	16	29	1.81
Massachusetts	5	14	2.8	Vermont	10	14	1.4
Michigan	8	83	10.38	Virginia	6	95	15.83
Minnesota	6	87	14.5	Washington	6	39	6.5
Mississippi	3	82	27.33	Wisconsin	5	72	14.4
Missouri	5	114	22.8	Wyoming	4	23	5.75

Data is collected from the websites of environmental protection or natural resource management agencies in the states and complemented by private communications between the author and the agencies.

a. Regional, district, or field offices.

b. Counties or county-equivalents.

c. "NA": Information unavailable, assuming only the main office in place.

Table 3.2. State Compliance Monitoring and Assurance,
Functional Division Regional Office Structure

State	Functional Division	Regional Offices[a]	County Number in State[b]	Average Number of Counties per Regional Office
Arkansas	Solid Waste[c]	8	75	9.38
	Air	9		8.33
	Water	11		6.82
California	Solid Waste	7	58	8.29
	Air	35		1.66
	Water	9		6.44
Colorado	Solid Waste	2	64	32
	Air	1		64
	Water	4		16
Illinois	Solid Waste	7	102	14.57
	Air	3		34
	Water	7		14.57
Kentucky	Solid Waste	10	120	12
	Air	8		15
	Water	10		12
Nevada	Solid Waste	2	16	8
	Air	1		16
	Water	2		8
New Jersey	Solid Waste	3	21	7
	Air	3		7
	Water	3		7
North Carolina	Solid Waste	7	100	14.29
	Air	7		14.29
	Water	7		14.29
North Dakota	Solid Waste	2	53	26.5
	Air	2		26.5
	Water	1		53
West Virginia	Solid Waste	4	55	13.75
	Air	10		5.5
	Water	4		13.75

Data is collected from the websites of environmental protection or natural resource management agencies in the states and complemented by private communications between the author and the agencies.

a. Regional, district, or field offices.

b. Counties or county-equivalents.

c. Solid or hazardous waste.

Definition of Environmentally Vulnerable Communities

The study defines environmentally vulnerable communities (or communities of concern) in terms of race/ethnicity as the highest 10th percentile of counties in terms of percent minority populations (Konisky 2009b). Further, it examines the black and Hispanic populations in separate models. Also, it will follow the threshold sensitivity tests in Konisky (2009b) by using two different thresholds (i.e., top 15th and 25th minority population percentiles) to define race/ethnicity-based environmentally vulnerable communities. Environmentally vulnerable counties are coded as 1 and otherwise as 0. The decennial and annually estimated information of racial/ethnic composition and total population at the county level is collected from the U.S. Census.

Dependent Variables

The research time frame of the study is from 1996 to 2010 for the African American model and 2005 through 2010 for the Hispanic model. The dependent variable in both models is a state agency's compliance monitoring and assurance activities in its water pollution control programs. It is measured by the aggregated number of inspections, as well as informal and formal civil administrative enforcement actions performed at the county level (see Blakeslee and Rong 2006; ENLC 2008; EPA 2007; 2011a; 2011b; 2012d; 2013a, for a detailed definition and types of inspection and civil administrative enforcement). Inspection and enforcement are widely employed measures for state implementation actions (e.g., Earnhart 2004; Konisky 2007; Ringquist 1993; 1995; Wood 1991; 1992; Woods 2006).

As described in Chapter 2, inspection and enforcement are typical activities of state front-line or street-level bureaucrats in environmental programs. Inspection and enforcement are inherently different in the sense that the former focuses on problem detecting (i.e., initiating

compliance monitoring, determination of compliance status) and the latter revolves around

problem solving (i.e., response to violation found during inspection)[44]. Inspections are a major

type of enforcement activities that are conducted by field staff (Hutter 1997, 107). As GAO

(2006) describes, "EPA's enforcement program depends heavily upon inspections by regional or

state enforcement staff as the primary means of detecting violations and evaluating overall

facility compliance." (p. 4) Related activities may include pre-inspection activities, interviewing

facility or site representatives, reviewing records and reports, taking photographs, collecting

samples, and observing facility or site operations (EPA 2012c)[45].

These kinds of activities constitute the compliance monitoring or "surveillance of

regulated facility sites." The role of monitoring, inspection, and evaluation cannot be negligible

in that these actions "all serve to identify violations and provide insights into potential priority

issue areas that may need to be addressed more broadly." (Esworthy 2010, 18) This is because

"the mere collection of information or threat of inspection itself often creates an awareness of the

regulators' interest, and can encourage compliance." (p. 19)

Enforcement actions ensue given a finding of violation in the process of inspection. The

enforcement stringency escalates from informal (e.g., oral warning) to formal tools (e.g.,

administrative order). As part of environmental enforcement mechanisms that account for the

majority of compliance assurance efforts (e.g., criminal/civil judicial enforcement, cleanup

enforcement, and federal facilities enforcement) in the nation, "civil administrative actions are

non-judicial enforcement actions taken by EPA or a state under its own authority, without

involving a judicial court process." (EPA 2013d) They may be in the form of "notice of violation

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[44] On some occasions, literature does not distinguish between inspection and enforcement but rather combines and describes them under an overarching concept of "enforcement." To be consistent with the definition and usage of the terms by EPA and environmental research, the study employs the term "inspection."

[45] Inspections may include citizen complaints (Blakeslee and Rong 2006, 2-9).

or a Superfund notice letter, and administrative order or order (either with or without sanctions and penalties) directing an individual, a business, or other entity to take action to come into compliance, or to clean up a site." (ibid)

Notably, there were disagreements between EPA and states concerning what compliance assurance actions constitute "enforcement" (e.g., informal and formal) (Brown and Green 2001, 17). For example, for EPA, "formal" enforcement action (e.g., penalty administrative order, compliance order) should be an independently enforceable, unilateral order in nature; in this situation, oral warning, warning letter, notice of violation, and consent orders are not categorized to be "formal," whereas states suggest that informal enforcement actions (e.g., notice of violation/noncompliance, warning letter) often are able to return regulated entities to compliance effectively (p. 31-35). In a nutshell, unless an imminent violation is determined, enforcement authorities (states in this case) first initiate an informal enforcement procedure that allows for adequate time for the self-correction of the regulated entities. Based on the response, agencies determine whether more intense and stringent actions (usually formal enforcement) are necessary to bring about full compliance (Esworthy 2010, 17).

The process of compliance monitoring and assurance at the state level implies somewhat distinct mechanisms underlying inspection and enforcement. For instance, in the Missouri Department of Natural Resources, inspectors at the regional offices (there are 22 regional and satellite offices) are the front-line or street-level bureaucrats ("field people") who are responsible for direct compliance monitoring and investigations. They are salient components of the state environmental protection system in a sense that they exercise inevitable discretion over the inspections, gather information for the central office, and prepare annual work plans for priority setting for compliance monitoring. However, regional offices do not have enforcement

authorities, which exclusively belong to the central office in Jefferson City. This occurs even though enforcement decisions and actions are made and conducted, based on the inspection outcomes and reports from regional offices. In this sense, inspection is more discretion-based, while enforcement action is more bound by problem severity, location of the decision-making authority within the agencies, and agencies' implementation strategies and protocols.

Literature on state policy implementation behavior as well as environmental policy also suggests that inspection, informal, and formal enforcement activities may not operate in a uniform way. Scholz and Wei (1986) identified symbolic and instrumental administrative activities in the regulatory process of the Occupational Safety and Health Administration (OSHA). The former (i.e., inspections and citations for minor violations) are relatively inexpensive but have few impacts on policy outcomes, whereas the latter (i.e., penalties and citations for serious violations) incur significant costs (e.g., resistance from interest groups) but they may considerably affect policy outcome.

The adoption of enforcement strategies by regulatory bureaucrats responds differently to political/ideological influences or task conditions. In the environmental regulatory area, inspection and enforcement may demonstrate differential patterns (Konisky 2009a). As Peña (2005a) asserted in the instances of implementation inequalities in the Hispanic communities, "In California, the law sets penalties for violations related to exposure of workers to toxins and failure to provide training and safety equipment to protect workers. Yet in more than half of all incidents, growers are not fined and instead faced meaningless 'notices of violation'." (p. 190) It is noteworthy that states also differ drastically with respect to the lexicon and terminology of

inspection and enforcement practices that are entered into EPA's national database[46]. This study tries to the greatest extent possible to classify and code informal and formal enforcement actions in accordance with EPA documents and the underlying rationale aforementioned. It tests separate models of inspection and enforcement (informal and formal combined) to evaluate whether there are differential patterns of implementation strategy.

The inspection and enforcement data are compiled from EPA's Integrated Data for Enforcement Analysis (IDEA), which is a longitudinal data archive of enforcement and compliance history[47]. Specifically, the data on facilities and enforcement activities governed by the NPDES permit program is organized from the Integrated Compliance Information System (ICIS-NPDES) and Permit Compliance System (PCS). The geographical information (e.g., state and county) of the regulated facilities is complemented with EPA's Facility Registry System (FRS) Geospatial Data. The unique registry identifier for each facility facilitates a matching between the geographical and inspection/enforcement record. Only active, major/federally-reportable facilities are included since EPA requires states to report the compliance and enforcement data of those entities (EPA 2011b; 2011c; 2013c). The annual sample of states is adjusted to the state authorization status of the NPDES permit program (Table 2.1).

This study only considers the counties that are home to at least one active, major NPDES facility. The sample is generated in the following sequence. (1) Major facilities account for a small fraction of all wastewater discharge facilities in the NPDES permit program across the nation. In addition, only active, major dischargers are considered in this study. According to the

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[46] The Environmental Council of the States (ECOS) observes variations in states' reports on enforcement mechanisms, because "each program (state and federal) has its own unique set of terms and/or definitions for enforcement mechanisms until April 2002 when the data standards were finalized." (Blakeslee and Rong 2006, 3-3)

[47] The Enforcement and Compliance History Online (ECHO) is a web interface that draws data from the IDEA and maintains a relatively limited profile of facilities and compliance monitoring and assurance activities.

records of the ICIS-NPDES and PCS permittee datasets, of 273,322 NPDES facilities, 6,797 (i.e., 2.487 percent) are active, major dischargers (excluding the facilities without effective geographical identification information). Using geographical identifiers, it yields a total 32,384 county-year sample of facilities from 1996 to 2010. (2) Furthermore, as noted later, this study only considers states with NPDES program authorization. Thus, Idaho, Massachusetts, New Hampshire, and New Mexico are excluded; similarly, part of data on Alaska (prior to 2008), Arizona (prior to 2002), Maine (prior to 2001), and Texas (prior to 1998) is excluded. The sample size reduces to 28,797. (3) Selected demographic and socioeconomic data of interest is unavailable in a number of counties; and Nebraska is further dropped due to its unicameral legislature system. This study finally generates in the African American sample a 28,326 county-year (approximately 1,888.4 counties per year) sample size for the multilevel analysis. It covers approximately 60.03 percent of the total counties in the country (3,146 counties in Census 2010). The data in the Hispanic sample is 11,314 county-year (approximately 1885.7 counties per year) and covers about 59.94 percent of the total counties in the country. Despite the seemingly moderate coverage, it does not necessarily pose a threat to external validity. As the definitions suggest previously, not all counties contain one or more active, major NDPES facilities. Only those hosting counties have a non-zero probability in terms of implementation activities.

<p style="text-align:center">Independent Variables</p>

This study considers four vectors of predictor variables that are closely related to state administrative implementation actions of environmental policy. They are political, socioeconomic, task, and demographic environments. Specifically, as opposed to political factors which cast a top-down relationship, socioeconomic, task, and demographic determinants help to

examine the bureaucratic responses to nonhierarchical influences (Hunter and Waterman 1996, 195)[48].

Political Environment

A number of political factors substantially shape state implementation environments. The study first takes into account the political power of minority populations. The political capacities and resources of the racial/ethnic minorities have been argued to be a latent salient factor influencing the distribution of environmental hazards in their communities (e.g., Hamilton 1995; Hird and Reese 1998; Ringquist 1997; but see Lester, Allen, and Hill 2001). As discussed in Chapter 2, although public administrators wield considerable institutionalized discretion in program management, especially in the implementation process, they do respond to the policy signals from the elected representatives.

In this study, the variable of minority political power is measured by the percentage of black or Latino state legislators (two chambers combined). I anticipate that strong minority representation in the law making body would counteract the unequal administrative activities. The information on African American state legislators is collected from the Legislator Data of the National Conference of State Legislatures (NCSL) (NCSL 2012b), and the National Roster of Black Elected Officials annual series of the Joint Center for Political and Economic Studies (Joint Center 2012). Data on Hispanic state lawmakers comes from the Legislator Data of the NCSL (NCSL 2012b), and the Directory of Latino Elected Officials of the National Association of Latino Elected and Appointed Officials (NALEO) (NALEO 2012)[49].

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[48] "Bureaucratic discretion is not simply the propensity of agents to respond to, or not to respond to, the goals of their political principals, but also the bureaucrat's need to respond to the level of diversity in their regulatory environment." (Hunter and Waterman 1996, 196)

[49] I thank Lilliard Richardson for sharing part of the state minority legislator profile data.

In the state politics and policy arena, ideology and partisanship play a significant role

(Keiser and Soss 1998; Scholz and Wei 1986; Wood and Waterman 1994; Wood 1992). Thus, I

include variables reflecting these factors accordingly. The first measure is citizen ideology, with

zero and 100 representing the most conservative and most liberal stance respectively (Berry et al.

1998; Berry et al. 2010; Fording 2012). The study also employs a dummy variable to indicate the

party identification of the governor (Democratic coded as 1 and Republican as 0) and a measure

of the Democratic strength in state legislatures (ranging from 0 to 1)[50] (Klarner 2012). Lastly, I

include a dummy variable for the party affiliation of the presidents (Democratic coded as 1 and

Republican as 0) to capture the potential impact of presidential administrations on the program

implementation behavior of state agencies. I exclude Nebraska from analysis since it has a

unicameral legislature.

As noted in Chapter 2, agencies – and street-level bureaucrats (in this case, enforcement

officials) may engage in the typifying or categorization of target populations into "deserving"

and "undeserving." (Gilens 1995; 1996; Ingram and Schneider 2005; Ingram, Schneider, and

deLeon 2007; Schneider and Ingram 1993; 1997; Soss 1999; 2005; Soss, Hacker, and Mettler

2007; Soss and Schram 2008) This is particularly the case for racial/ethnic minorities. Relatedly,

the term "degenerative politics" is used to characterize the value-laden role of government in

typifying target populations as "deserving" or "not deserving" of help, as well as the variations in

policy-crafting and administrative outputs across client groups based on this typifying.

Related to African Americans and Hispanics, welfare and immigration policies are

among the most notable degenerative policies and play a significant role in negatively

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[50] "1 = Democratic control of both chambers. 0 = Republican control of both chambers. .5 = Democratic control of one chamber, Republican control of the other. .25 = split control of one chamber, Republican control of the other chamber. .75 = split control of one chamber, Democratic control of the other." (Klarner 2012)

contextualizing the peculiar experiences of these racial/ethnic minority groups and producing

degenerative feedback effects (Bensonsmith 2005; Ingram and Schneider 2005; Ingram,

Schneider, and deLeon 2007, 113; Newton 2005; Soss, Hacker, and Mettler 2007; Soss and

Schram 2008). Equally important, blacks and Hispanics have been undergoing different, albeit

both negative, social categorizations (Kail and Dixon 2011; Schneider and Ingram 2005). In the

degenerative policy context, negatively valanced (i.e., less deserving) populations tend to receive

policy outputs that are more severe and less easy to take advantage of than do positively

valanced (i.e., more deserving) populations. Hence, this study develops two sets of state-level

explanatory variables to capture these distinctions of policy design elements. It operationalizes

the negative valancing of African Americans in terms of the stringency of state welfare policies

from 1996 to 2010, which have been longitudinally documented by the Welfare Rules Databooks

of the Urban Institute (Urban Institute 2012).

The first measure of state welfare policy stringency is time limit policies on the length of

receipt of welfare. The federal government sets a maximum 60-month (five-year) lifetime time

limit on the receipt of cash benefit under the Temporary Assistance for Needy Families (TANF)

program. A considerable number of states follow the federal policy, while some states continue

cash assistance using state funding beyond the 60-month limit; in addition, some states

promulgate their own intermittent limit policies regarding the restricted eligibility of receiving

cash assistance for a limited number of months within a specific period of time (Urban Institute

2004; 2012). As a result, this study generates a 6-point scale for this policy device, incorporating

both federally-mandated lifetime limit and state-innovated periodic limit. Specifically, no time

limit (i.e., expansion beyond the 60-month limit and no intermittent limit) is coded as 1,

intermittent limit only as 2, 60-month as 3, shorter than 60-month as 4, 60-month and

intermittent limit as 5, and shorter than 60-month and intermittent limit as 6 (Urban Institute

2004). The welfare policy stringency increases as the scores ascend.

Furthermore, the worse-case sanction policies for noncompliance with work requirements

include two components. The first is the reduction in benefits given the violation. Eliminating the

adult portion of the benefit or reducing the benefit by a specified dollar amount or percentage is

coded as 1 and the elimination of the entire benefit or closure of the case as 2. The second work-

related sanction element is the length of the punishment, which is measured by a 5-point scale

(i.e., until compliance as 1, one to three months as 2, six months as 3, twelve months or longer as

4, and must reapply or permanent as 5). Finally, the proxy variable for the state's ongoing

eligibility is the family cap policy, which stipulates whether states have special treatment of

additional children for the family's receipt of benefits. The presence of such a policy is coded as

1 and otherwise as 0. The average values of each of these welfare policies from 1996-2010 are

presented in Table 3.3. The principal-component factor method yields one factor for four

components of welfare policy stringency[51].

Related to Hispanics, one important measure of the degenerative political environment

(corresponding to the "deviant" categorization of "illegal immigrant") is the number of

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[51] Four variables are standardized (i.e., with a mean of zero and a standard deviation of one) prior to the principal-component factor analysis. But standardization is not necessary because it is a default option in the principal-component factor method in Stata and the results from both standardization and original values of variables are identical. The factor accounts for 41.63 percent of the total variance of four standardized variables (Hamilton 2009). The loadings are 0.67 for family cap, 0.65 for reduction in benefits, 0.42 for the length of sanction, and 0.78 for time limit. However, the individual factor loadings of the variables are not very strong and the uniqueness values for each are relatively high. For these variables respectively, the values of uniqueness, which measures "the percentage of variance for the variable that is not explained by the common factors," (StataCorp 2011, 317) are 0.55, 0.57, 0.82, and 0.39. In addition, the Cronbach's alpha coefficient of four standardized variables is 0.5166, which is much lower than a widely adopted "acceptable" value 0.70. In the welfare area, there may be multidimensional logics underlying distinct policy elements. For example, Soss et al. (2001) observed analogous results, and consequently performed a separate assessment. Given this indeterminacy, four components of welfare policy should be evaluated independently as well in future research.

immigration laws enacted by a state legislature[52]. Indexes are created to represent the stringency of state immigration policies (i.e., laws passed in the state legislatures) (Nicholson-Crotty and Nicholson-Crotty 2011) using the documents from the Immigrant Policy Project of the NCSL (NCSL 2012a). This variable will be tested from 2005 to 2010.

According to the NCSL, the laws and resolutions related to immigrant and immigration passed in state legislatures skyrocketed to approximately 346 (1400 bills introduced) in 2010, compared to around 45 (300 bills introduced) in 2005. Five key policy areas are under consideration, including education, employment, public benefits, identification/driver's licenses, and law enforcement, which are identified by the NCSL. Specifically, the employment policy incorporates the licensing requirements of professions/occupations. The original policy categories of health and public benefits in the NCSL database are aggregated as well. Policies restricting the benefits or imposing costs for immigrants (both legal and undocumented)[53] are coded as 1, no policy or policies with no discernible benefits or costs (e.g., symbolic) as 0, and conferral of benefits as -1. The average values of immigration policies for each state from 2005 to 2010 are described in Table 3.4. A summative index is created from five sub-indexes[54].

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[52] The issue of unauthorized immigrants of Hispanic origin has been essentially portrayed as "an illegitimate status hierarchy: those who are 'illegal' are trying to obtain rights or benefits reserved for legal Americans." (Branton et al. 2011, 668) The Illegal Immigration Reform and Immigrant Responsibility Act of 1996 (IIRAIRA) was a watershed for federal immigration reform as well as part of a degenerate political environment for unauthorized aliens (Newton 2005). The IIRAIRA ultimately reinforces the negative social categorization of its target groups (i.e., unauthorized immigrants) as "freeloaders" who garner benefits at the expense of hard-working, taxpaying citizens, and as "criminal aliens" who violate laws and come to this nation illegally (Newton 2005; 2008). Starting from the mid-2000s, an unprecedented level of state activism on the immigration issue has accompanied the historical peak of unauthorized immigrant populations. The related policy domains range from education to employment, health, public benefits, human trafficking, identification/driver's license, and law enforcement (NCSL 2005-2011; Newton 2012).

[53] Rarely do state policies distinguish these two groups of immigrants (Nicholson-Crotty and Nicholson-Crotty 2011).

[54] A factor analysis is also employed and it generates two factors which account for 48.49 percent of the total variance of five standardized variables. The loadings are 0.53 for license/identification, 0.62 for law enforcement, and 0.74 for employment for factor 1; and those are 0.63 for education, and 0.78 for benefits for factor 2. However, the uniqueness values for each variable are relatively high. In addition, the Cronbach's alpha coefficient of five

Table 3.3. State Welfare Policies (Mean), 1996-2010

State[a]	Family Cap[b]	Benefit Reduction[c]	Sanction Length[d]	Time Limit[e]
Alabama	0	1.93	3.27	3
Alaska	0	2	5	3
Arizona	1	2	2	3
Arkansas	1	1.73	1.27	4
California	0.87	1	2.6	2.93
Colorado	0	1.93	2.07	3
Connecticut	1	2	5	4
Delaware	1	2	4.2	4.07
Florida	0.93	1.93	2.07	4.8
Georgia	1	1.93	4.87	4
Hawaii	0	1.73	2.27	3
Illinois	0.53	1.93	2.07	3.2
Indiana	1	1.53	2.4	3.87
Iowa	0	2	3	3
Kansas	0	1.93	1.8	3
Kentucky	0	1.8	1.13	3
Louisiana	0	1.87	1.73	4.67
Maine	0	1	3	1
Maryland	0.53	1.93	1.13	3.2
Michigan	0	2	2.47	2
Minnesota	0.53	1.53	2.13	3
Mississippi	1	1.93	4.87	3.2
Missouri	0	1	2.2	3.13

standardized variables is 0.3144, which is much lower than a widely adopted "acceptable" value 0.70. Like the welfare area, there may be multidimensional components underlying distinct policy elements in the immigration realm (I thank Sean Nicholson-Crotty for this point).

Table 3.3. State Welfare Policies (Mean), 1996-2010 (Continued)

State[a]	Family Cap[b]	Benefit Reduction[c]	Sanction Length[d]	Time Limit[e]
Montana	0	1.87	2.73	3.13
Nevada	0	1.87	2.8	4.47
New Jersey	1	1.93	3.8	3.2
New York	0	1	3	1.8
North Carolina	1	1.73	4.53	4.8
North Dakota	0.87	1.87	1.87	3.2
Ohio	0	2	3	4.53
Oklahoma	0.8	1.87	1.13	3
Oregon	0	1.93	2.33	2.4
Pennsylvania	0	1.93	4.87	3
Rhode Island	0	1.4	2.73	3.33
South Carolina	0.93	1.93	4.07	4.8
South Dakota	0	1.87	4.47	3
Tennessee	0.93	1.93	2	4.27
Texas	0	1.54	4.08	4.85
Utah	0	2	2.33	3.8
Vermont	0	1	1.67	1.4
Virginia	1	2	3	4.8
Washington	0	1.27	2.33	1.93
West Virginia	0	1.93	2.8	3
Wisconsin	0.13	2	4.73	3.2
Wyoming	0.87	1.87	1.27	3.2

a. Idaho, Massachusetts, Nebraska, New Hampshire, and New Mexico are not included.

b. 1: family cap policy, 0: no family cap policy.

c. 1: eliminating the adult portion or reducing some portion of benefit; 2: eliminating the entire benefit or closure of the case.

d. 5-point scale (i.e., until compliance as 1, one to three months as 2, six months as 3, twelve months or longer as 4, and must reapply or permanent as 5).

e. 6-point scale (i.e., no time limit as 1, intermittent limit only as 2, 60-month as 3, shorter than 60-month as 4, 60-month and intermittent limit as 5, and shorter than 60-month and intermittent limit as 6).

Table 3.4. State Immigration Policies (Mean), 2005-2010

State[a]	Education[b]	Employment[b]	Public Benefits[b]	Identification or License[b]	Law Enforcement[b]
Alabama	0	1.67	0	0.33	0.17
Alaska	0	0.33	0	0	0
Arizona	0	0	1	0.67	1.5
Arkansas	0.33	0.33	0	0.67	0.33
California	-0.5	0.33	-1	0.5	-0.17
Colorado	0	1.83	0.17	0.33	0.67
Connecticut	0	0	-0.17	-0.17	0.33
Delaware	0	0	-0.17	0.33	0
Florida	-0.33	0.33	-0.33	0.67	0.17
Georgia	0.33	0.67	0.33	1	0.83
Hawaii	0	0.83	-0.5	0.33	0.17
Illinois	0.5	0	-1.33	0	0.5
Indiana	-0.17	0	-0.17	0.83	0
Iowa	0	0.33	-0.67	0.17	0.17
Kansas	0	0.83	0.17	0.33	0
Kentucky	0	0.17	0	0.67	0
Louisiana	0.17	1	-0.17	0.17	0.5
Maine	0	0.33	-0.5	0.83	0
Maryland	0	0	-0.17	0.5	0.33
Michigan	-0.17	0.17	-0.33	0.33	0.33
Minnesota	0.17	0.33	0.33	0	0
Mississippi	0	0.67	0	0.17	0.5
Missouri	0	1	0.17	0.5	0.17

Table 3.4. State Immigration Policies (Mean), 2005-2010 (Continued)

State[a]	Education[b]	Employment[b]	Public Benefits[b]	Identification or License[b]	Law Enforcement[b]
Montana	0	0.33	-0.17	0.33	0
Nevada	0.17	0	-0.17	0.33	0
New Jersey	0	0.17	0	0.17	0.17
New York	0.17	0.33	-0.17	0	0.17
North Carolina	0	0	0.17	0.17	0.33
North Dakota	-0.17	-0.17	0.17	0.5	0
Ohio	0	0	-0.17	0	0.17
Oklahoma	0.33	0.67	-0.50	0.17	1
Oregon	0	0	0	0.67	0.17
Pennsylvania	-0.17	0	0	0	-0.17
Rhode Island	0	0	0.5	0.17	0
South Carolina	0.33	0	0.17	0.5	0.5
South Dakota	0	-0.17	0	0.17	0.17
Tennessee	0	1.5	0	0.67	1.17
Texas	0	0.67	0.17	0.5	0.33
Utah	0.17	0.83	-0.17	0.5	1.5
Vermont	0	0	-0.17	0.17	0
Virginia	0.17	1	0	0.5	1.5
Washington	-0.33	-0.17	-0.5	0.17	0
West Virginia	0.33	0.17	0.17	0.17	0
Wisconsin	0	0	0	0	0
Wyoming	0.17	0.17	0	0.5	0.17

a. Idaho, Massachusetts, Nebraska, New Hampshire, and New Mexico are not included.
b. 1: restricting the benefits; 0: no policy or policies with no discernible benefits or costs; -1: conferral of benefits.

This study is substantively interested in the impacts of political environments on the administrative outputs for the susceptible racial/ethnic minorities[55]. Accordingly, interaction terms are employed to test the hypotheses.

Hypothesis 1: a large presence of minority state legislators is associated with a high level of state environmental compliance monitoring and assurance activities in race/ethnicity-based environmentally vulnerable counties, compared to counties that are not vulnerable.

Hypothesis 2: an ideologically liberal citizenry is associated with a high level of state environmental compliance monitoring and assurance activities in race/ethnicity-based environmentally vulnerable counties, compared to counties that are not vulnerable.

Hypothesis 3: stronger Democratic control of the state legislature is associated with a higher level of state environmental compliance monitoring and assurance activities in race/ethnicity-based environmentally vulnerable counties, compared to counties that are not vulnerable.

Hypothesis 4: Democratic governorship is associated with a high level of state environmental compliance monitoring and assurance activities in race/ethnicity-based environmentally vulnerable counties, compared to counties that are not vulnerable.

Hypothesis 5: a high level of degenerative policies is associated with a low level of state environmental compliance monitoring and assurance activities in race/ethnicity-based environmentally vulnerable counties, compared to counties that are not vulnerable.

Socioeconomic Environment

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[55] A measure of state-level policy on environmental justice is considered in alternative models, but the coefficients of the variable are statistically insignificant and its inclusion does not substantively improve the overall goodness of fit of the models (details not reported here). The variable is coded as 1 if a state has enacted an environmental justice policy or established a formal environmental justice program within the state's environmental protection agency, and it is coded as 0 otherwise (Hastings Public Law Research Institute 2010).

As demonstrated in Chapter 2, race/ethnicity and economic class are two prominent dimensions of environmental inequalities. Scholarship has contested the relationship of these two dimensions (Anderton et al. 1994; Downey 1998; Downey and Hawkins 2008; Goldman 1994; Mohai and Bryant 1992, 164; Pulido 1996; Wernette and Nieves 1992). Mounting empirical evidence has indicated that on many occasions both factors are significant in predicting environmental inequalities (e.g., Ash and Fetter 2004; Been 1994b; Konisky 2009b; Konisky and Schario 2010; but see Ringquist 2005). Moreover, in the political economy literature, economic factors also pay a crucial role in accounting for uneven environmental burdens due to their intertwining relationships with both political factors and task environment. On one hand, market rationality is one of the determinants for the siting of pollution-intensive or hazardous waste handling facilities in poor communities, where land and labor may be less expensive (Ringquist 2004; 2006). On the other hand, advantageous group socioeconomic status could easily translate into political resources supporting more inspection and enforcement actions, issue advocacy capacity, and the more aggressive assessment of pollution damages. To assess the impact of economic conditions on environmental program implementation with respect to class-based environmental inequalities, this study controls for county median household income (in dollars, inflation-adjusted in 1996 dollars, in logarithmic form) and percentage of residents living below the poverty level.

Relatedly, also included are the percentage of residents with higher education attainment (i.e., bachelor's degree or higher) and unemployment rate. In environmental justice studies, well-educated residents is a critical factor reflecting community socioeconomic status which simultaneously influences its political awareness and policy participation (Konisky 2009a; Konisky and Schario 2010, as a proxy of political mobilization capacity; Konisky and Reenock

2013, argued as part of economic class). The data on this variable is gleaned from the U.S. Census. Meanwhile, the county unemployment rate from the Local Area Unemployment Statistics of the Bureau of Labor Statistics is considered, as an unfavorable local economic circumstance may prompt a permissive stance in environmental regulatory activities (Dion, Lanoie, and Laplante 1998; Earnhart 2004).

Furthermore, state institutional capacity (e.g., government expenditures and financial allocation) considerably bears on program prioritization and administrative flexibility, and it constitutes a vital component of the implementation literature (Goggin et al. 1990). As Meyers and Vorsanger (2007) documented, "efforts to cope with limited resources may lead to either inconsistent and particularistic treatment of similar clients, or routinized treatment of clients with dissimilar needs." (p. 155; see also Brodkin 1997; Weatherley and Lipsky 1977) Consequently, this study controls for state government spending (in thousand dollars, inflation-adjusted in 1996 dollars, in logarithmic form) on waste control and natural resources as a proxy of public resource availability in the environmental protection area. Furthermore, an interaction term between vulnerable communities and state environmental spending is introduced to evaluate whether a state's fiscal constraint impacts its implementation outputs for these disadvantaged populations. The data is derived from the State & Local Government Finance reports in the U.S. Census.

Finally, the study includes data on county labor employment in the manufacturing sector (in logarithmic form). This is a proxy measure for the power of organized interests, which is pertinent to regulatory and redistributive policies (Bryner 2003; Potoski and Woods 2002; Ringquist and Clark 2002). Equally plausible, this political economic variable largely reflects the local economic conditions associated with water pollution intensive industries and constitutes a regulation task or demand for the enforcement authority (Konisky 2009b). This information is

garnered from the North American Industry Classification System (NAICS) and Standard

Industrial Classification (SIC) from the Bureau of Economic Analysis of U.S. Department of

Commerce and the County Business Patterns of the U.S. Census[56].

Task Environment

As mentioned in Chapter 2, states with delegated program authority may produce mixed

policy outcomes. At the same time, federal engagement may signal a larger degree of pressure

for a state's regulatory agenda (Earnhart 2004). This study uses the number of EPA inspections

of the previous year as a proxy for the responses of state agencies to the signals sent by the

federal government in water pollution control program in the enforcement model.

The second task environment variable is the number of regulated facilities at the county

level under the NPDES permit program. Hypothetically, problem severity should result in a more

aggressive policy response which in this case is inspection and enforcement. Unfortunately, the

current datasets either of the ICIS-NPDES, PCS or the FRS do not record the information on the

amount of regulated facilities, and several sets of databases maintained by EPA do not report the

estimates in a consistent manner (Esworthy 2010, 14). Such a problem may originate from the

state level, and information on the regulated universe is far from complete and varies across

states (Blakeslee and Rong 2006, 1-4). To operationalize this variable, the study follows the

practice of Konisky (2009a) by using the number of active, major facilities (p. 110). The

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[56] The information for counties with missing values (e.g., primarily a number of counties of Virginia and one county in Hawaii) in the dataset of the Bureau of Economic Analysis is complemented with the County Business Patterns. According to the notes of the Bureau of Economic Analysis, "Virginia combination areas consist of one or two independent cities with 1980 populations of less than 100,000 combined with an adjacent county. Separate estimates for the jurisdictions making up the combination area are not available." In comparison, as for the Census data, "the independent cities in Virginia are treated as separate counties." To be compatible with the geospatial practice of other variables in this study, the data on manufacturing employment of Virginia is based on County Business Patterns.

universe of regulated entities is estimated from the currently active, major facilities recorded in

the ICIS-NPDES and PCS permittee datasets for the wastewater management program[57].

Lastly, the models also employ a lagged dependent variable. In methodological terms, this practice takes into account the temporal correlation of implementation activities and "program inertia" patterns (Wood 1992, 46). Substantively, facilities that receive more implementation activities in the previous year should draw correspondingly more follow-up attention from state agencies to ensure that the problems detected have been solved and the facilities have come into full compliance.

<center>Demographic Environment</center>

The following county-level demographic information from the U.S. Census, including total population (in persons, in logarithmic form), population density (in persons per square mile, in logarithmic form), and geographic land area (in square miles, in logarithmic form), are considered as well. Blakeslee and Rong (2006) suggested that larger states or more populous states should have more compliance inspections (p. 2-10). Konisky (2009a) observed consistent, positive directions for the county land area in the models of the CAA, CWA, and RCRA. In addition, population has a negative sign for the CWA, but positive signs for the CAA and RCRA. Nonetheless, population density has a positive sign for the CWA, but negative signs for the CAA and RCRA (Konisky 2009a). Potoski and Woods (2002) found a negative relationship between the size of the state and the enforcement actions. Therefore, this study specifies the expected signs of population, population density, and land area to be not determined. Finally, the study includes a year trend variable by coding it from 1 to 15 corresponding to the years 1996 to 2010 in the African American model, and 1 through 6 for the years 2005 to 2010 in the Hispanic

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[57] I am grateful to David Konisky for this point.

model (Hirsh and Kornrich 2008). The summary of dependent and independent variables is presented in Table 3.5.

Multilevel Model Specifications

Both county- and state-level factors that potentially influence administrative outputs in environmental protection are under consideration in this study. From both a theoretical and statistical perspective, the assumption of observation independence for a valid analytic inference is often violated in a data structure reflecting "relations between variables at different layers in a hierarchical system" that are frequently observed in the social world (Snijders and Bosker 2012, 6)[58]. The relation between outcome variables and explanatory variables is jointly defined by the within- and between-group correlations in a multilevel model[59]. These two relations may mirror distinct mechanisms and processes (Snijders and Bosker 2012). In this study, with respect to organizational structure, counties are nested within states hierarchically (Rabe-Hesketh and Skrondal 2012, 386). More important, substantively, the former are situated within higher and broader social, political, and institutional contexts (Baumer, Wolff, and Arnio 2012, 581; see also Snijders and Bosker 2012, 9; "structural" variables in the aggregate term and "contextual" variables in the disaggregate term, Hox 2010, 2) (for example, the compliance monitoring and

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[58] In an example raised in Hox (2010), "the average correlation (expressed in the so-called *intraclass correlation*) between variables measured on pupils from the same school will be higher than the average correlation between variables measured on pupils from different schools." (p. 4)

[59] Specifically, the within-group regression deals with the relation between the dependent variable and the independent variable at the micro level (county-level) within each single group (i.e., state), "assuming that the regression coefficient has the same value in each group." (Snijders and Bosker 2012, 28) The between-group regression is for the relation between the group mean of the dependent variable (macro-unit, state-level) and the group mean of the independent variable (macro-unit) (ibid).

Table 3.5. Summary of Variables

Variable Category	Variable	Description	Level
Administrative Outputs	Implementation	Aggregate number of county inspections/enforcements	County
Environmentally Vulnerable Communities	EJ_Community	Dummy variable for a high percent (e.g., 90th percentile) of county African American or Hispanic residents	County
Political Environment	Politics	State welfare policies, including five sub-policies	State
	Politics	State immigration policies, including five sub-policies	State
	Politics	Percentage of Black/Hispanic state legislators	State
	Politics	State citizenry ideology (ranging from 0 to 100, 0 as most conservative and 100 as most liberal)	State
	Politics	Democratic strength of state legislature (ranging from 0 to 1, 0 as full Republican strength and 1 as full Democratic strength)	State
	Politics	Governor partisanship (Democratic = 1)	State
	Politics	Presidential partisanship (Democratic = 1)	National
Economic Environment	Economics	County median household income (dollars, log)	County
	Economics	Percentage of county residents below poverty level	County
	Economics	Percentage of county resident higher education attainment	County
	Economics	County unemployment rate	County
	Economics	Number of county manufacturing labor employment (log)	County
	Economics	State government environmental spending (thousand dollars, log)	State
Task Environment	Task	Number of previous EPA inspection (*t-1*)	County
	Task	Number of regulated facilities	County
Demographic Characteristics	Demographics	County population (persons, log)	County
	Demographics	County population density (persons per square mile, log)	County
	Demographics	County land area (square miles, log)	County

assurance structure of environmental law and regulation in the contemporary U.S., as described

earlier)[60]. In particular, county-level variables center on socioeconomic and demographic

features and state-level variables revolve around policy and political environment[61].

Statistically speaking, ignoring the intrinsic characteristics of a multilevel data structure

or model misspecification may bring about "possibly incorrect standard errors and inflated Type

I error rates." (Steenbergen and Jones 2002, 219; see also Duncan, Jones, and Moon 1998)

Though broadly employed, some conventional approaches have demonstrated varied limitations

in terms of substantive and statistical aspects (e.g., least squares dummy variable "LSDV" model

failing to explain causal heterogeneity; or cross-level interactive model only incorporating lower-

level random errors and assuming higher-level error components to be zero) (Steenbergen and

Jones 2002, 220). Multilevel modeling is particularly useful in addressing issues arising from

clustering and non-constant variance (ibid).

In this study, state political environments should be highly pertinent to the vulnerable

communities concerning environmental inequalities (i.e., African Americans and Hispanics).

Cross-level interactions between environmentally vulnerable counties and state-level political

variables are used to account for the policy interventions that "often occur at the level of

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[60] Understood in terms of a multistage sampling (i.e., subpopulations nested within a population), observation dependency in a multilevel data structure occurs when a secondary/micro-level/level-one unit (e.g., county in this case) is selected from a primary/macro-level/level-two unit (e.g., state in this case; "cluster", "group") (Snijders and Bosker 2012, 7).

[61] To a certain extent, political factors arising from the local level may play a role in the policy implementation process. It is anticipated that such factors largely come from the political economy dimensions, which have been captured by the variables of residents' socioeconomic status and local economic conditions in this study. Local governments may be responsible for permitting and monitoring on some occasions, whereas they "generally act within the context of assuring states' requirements." (Esworthy 2010, 10) As state agencies (e.g., headquarters, regional offices covering a varying number of counties) predominantly retain the statutory and legal authority of the environmental policy implementation, the policy and political variables at the state level should account for most of the variations. Nonetheless, this study recognizes that, there is a need for a further investigation of the effects of local policy and political variables, should richer data sources become accessible.

institutions and it is important to understand how such higher-level variables affect the response variable." (Rabe-Hesketh and Skrondal 2012, 2)

In this study, the observed outcome variables, compliance monitoring and assurance activities (i.e., inspections, formal/informal enforcements), are counts of events (Long 1997). The use of an ordinary least squares (OLS) model to analyze the count outcome variable would violate several assumptions (e.g., heteroscedasticity, normality, nonsensical predictions, and functional form) of the linear regression model, leading to "statistically inefficient and substantively biased conclusions." (King 1988, 845-846; see also Long 1997, 38-39) To analyze the event count data, regular Poisson regression model is often analytically inappropriate since over-dispersion (i.e., the variance of the counts is larger than the mean), instead of Poisson distribution (i.e., the mean of the counts equates with the variance[62]), holds in most empirical cases. Previous research on agency implementation and environmental inequity, which primarily reflects a multilevel data structure, adopts alternative count outcome models (e.g., negative binomial regression model or zero modified count model) with robust standard errors clustered at the state level (e.g., Konisky 2009a). Cluster-robust standard errors at the highest-level unit (e.g., group, state) facilitate an alleviation of the violation of the independent homoscedastic residual assumption (Snijders and Bosker 2012, 197). However, it may not help answer the substantive questions related to the effects of hierarchical and nesting structure (p. 329).

As discussed above, this study is substantively and empirically interested in the effects of the political environment on the administrative outputs for race/ethnicity-based vulnerable communities. The interaction terms allow for the assessment of the marginal effect of one explanatory variable being contingent on another explanatory variable (Wooldridge 2013).

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[62] It describes "the standard deviation equals the square root of the mean." (Gelman and Hill 2007, 114) In a two-level model, over-dispersion of the level-one variance should be controlled for accordingly (Krivo, Peterson, and Kuhl 2009).

Therefore, alongside the evaluations of the independent effects of political factors, it introduces and assesses the interaction terms between racial/ethnic vulnerable counties and the following state-level variables: minority state legislators, minority-related degenerative policies, citizen ideology, Democratic strength of state legislature, party identification of the governor, and state environmental spending (Figure 3.1).

This study employs multilevel over-dispersed Poisson regression models (analogous to a negative binomial model)[63]. The baseline two-level over-dispersed Poisson regression models (i.e., time-varying variables on either county-year or state-year basis; no time-invariant independent variables for each level; see model specification details in the Appendices)[64] (Hox 2010; Snijders and Bosker 2012; SSI 2013d; Raudenbush and Bryk 2002; Raudenbush et al. 2011) are specified as:

$$E(Y_{ij} \mid \lambda_{ij}) = \lambda_{ij}$$
$$\eta_{ij} = \log(\lambda_{ij})$$

$$\eta_{ij} = \beta_{0j} + \beta_{1j}x_{1ij} + \beta_{2j}x_{2ij} + \ldots + \beta_{hj}x_{hij} + \varepsilon_{ij}$$
$$= \delta_{00} + \sum_{p=1}^{P} \delta_{0p}w_{pj} + \sum_{h=1}^{H} \delta_{h0}x_{hij} + \sum_{s=1}^{S} \delta_{1s}w_{sj}x_{1ij} + \sum_{h=1}^{H} u_{hj}x_{hij} + u_{0j} + \varepsilon_{ij}$$

where:

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[63] The empirical analysis (with a Poisson sampling model and a log link function) of hierarchical generalized linear models (HGLM) will be performed with statistical programs HLM 7.01 and Stata 13 (see Raudenbush et al. 2011). The estimation method is penalized quasi-likelihood (PQL) instead of maximum likelihood (ML), in which Laplace and adaptive Gaussian Quadrature (AGQ) approximations are available. In HGLM, LaPlace and AGQ are able to produce more accurate or less biased approximation when the level-two variance is large. Unfortunately, the specification of over-dispersion is unavailable in either of these two cases (SSI 2013a; author's personal communication with the SSI staff). In addition, the deviance statistics for model fit and comparison are unavailable in the PQL estimation.

[64] A difference-in-differences design is less applicable in this study. The difference-in-differences approach in essence is a natural experiment (or a quasi-experiment) that compares the distinct effects of some exogenous event for treatment and control groups (e.g., the same group before and after the event; or one group before and after the event, the other group before and after the event) (Wooldridge 2013, 454-458). However, in this study, there is a lack of such an exogenous shock (e.g., events that are related to racial/ethnic minority population composition, or policy interventions which are relevant to agencies' implementation practices for these social groups). In addition, as described in the preceding sections in the research design, this study has taken advantage of the available data on the annual changes in the predictor variables, which include racial/ethnic composition at the county level.

Y_{ij}: aggregated number of implementation activities in county i ($i = 1, 2, ..., n_j$) within state j ($j = 1, 2, ..., J$);

λ_{ij}: event rate;

η_{ij}: the log of the event rate[65];

$\beta_{0j}, ..., \beta_{hj}$: level-one coefficients (i.e., fixed effects);

β_{0j}: each level-two unit j's mean on outcome variable (the mean level of outcome variable in state j);

β_{hj}: the main effect of level-one predictor x_{hij};

$\delta_{h0}, ..., \delta_{hp}$: level-two coefficients (i.e., fixed effects);

δ_{00}: grand or overall mean on outcome variable (the mean across units of two levels);

δ_{h0}: intercept for level-two unit j in modeling the level-one effect β_{hj};

δ_{hp}: the main effect of level-two predictor w_{pj};

x_{hij}: $h = 1 ... H$ level-one/county-dependent/between-county variables x;

w_{pj}: $p = 1 ... P$ level-two/state-dependent/between-state variables w;

w_{sj}: $s = 1 ... S$ state-level independent variables interacting with racial/ethnic communities;

ε_{ij}: residual at level one, $\varepsilon_{tij} \sim N(0, \sigma^2)$, level-one random effect representing the deviation of level-one unit n_j's value from the predicted value based on the level-one model[66], representing the within-group variability (variance);

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[65] Or $\lambda_{ij} = \exp(\eta_{ij})$.

[66] The key assumption in multilevel models is that all residuals (i.e., ε_{ij} and u_{0j}) are mutually independent and normally distributed with a mean of zero and variance (σ^2 and τ^2 respectively) given the explanatory variables. The residuals represent the unexplained variability of the corresponding level in the model (Raudenbush and Bryk 2002, 229; Snijders and Bosker 2012). The expression of disturbance terms implies "no assumption that these predictors [at each level] fully account for the variation in outcome variable at the different levels." (Steenbergen and Jones 2002, 229)

u_{hj}: residual at level two, $u_{hj} \sim N(0, \tau^2)$, level-two random effect representing the deviation of level-two unit j's level-one coefficient β_{hj} from the predicted value based on the level-two model and the between-group variability (variance).

Summary

This chapter has offered an integrated theoretical model to investigate the factors that influence distinct policy implementation activities for race/ethnicity minority groups. To test the hypotheses, it devises a methodological strategy to examine the state compliance monitoring and assurance activities of the NPDES permit program under the CWA with a unit of analysis at the county level from 1996 to 2010 for African Americans and from 2005 to 2010 for Hispanics, respectively. Developing an interactive conceptual framework, the study proposes to evaluate the effects of four vectors of independent variables (i.e., political, socioeconomic, task, and demographic factors) on state environmental policy implementation practices. Additionally, it assesses the interactive relations between political environments and racial/ethnic minority communities in terms of administrative outputs. Based on the substantive interests of the study and the consideration of related statistical effectiveness and efficiency, I adopt multilevel over-dispersed Poisson regression models to analyze the research questions. We are now ready to present the empirical results of the study in Chapter 4.

Figure 3.1. The Structure of Macro-Micro Propositions
(Adapted from Snijders and Bosker 2012)
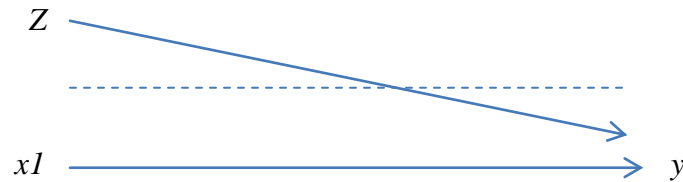
(a) Macro-to-Micro Proposition
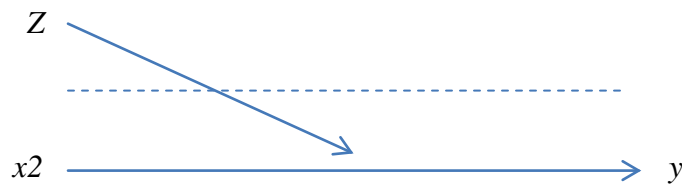
(b) Macro-Micro Interaction

y: outcome variable (micro-level) - county-level environmental compliance monitoring and assurance activities;

$x1$: micro-level variables - county-level socioeconomic, task, and demographic control variables;

$x2$: environmentally vulnerable counties (micro-level);

Z: macro-level variables – state-level policy explanatory variables and political control variables;

Dashed line: indicating two levels (above as macro-level and below as micro-level).

CHAPTER 4

EMPIRICAL RESULTS

As described in Chapter 2, a substantial body of multidisciplinary research has

substantiated that communities of color are more likely to reside in the proximity of the facilities

producing environmental harm, and these circumstances potentially have substantive impacts on

the health of these populations. Furthermore, with a focus on the role of government in

environmental inequalities, a growing number of studies have suggested that these citizens

receive relatively less attention and fewer efforts from state agencies in terms of the

implementation of environmental laws and regulations. Chapter 3 provided a multilevel analysis

for evaluating the effects of a wide array of political, socioeconomic, task, and demographic

determinants on states' environmental implementation practices. This chapter reports the

empirical results of the multilevel modeling analysis. Specifically, the next two sections present

the findings of African American and Hispanic models respectively. The third section

summarizes the findings. The last section concludes with a chapter summary.

Results of African American Models

Descriptive Statistics

The descriptive statistics of two-levels of variables in African American models are

summarized in Table 4.1. From 1996 to 2010 for 45 states (i.e., Idaho, Massachusetts, Nebraska,

New Hampshire, New Mexico excluded), the sample size is 28,326 and 650 at the county and

state level respectively. The average number of inspection and enforcement (informal and formal

combined) activities at the county level is 5.08 and 0.93 respectively. Related to the research

questions of central concern, Figure 4.1 compares the average inspections performed nationwide

and for counties with varying percentiles of African Americans.

Table 4.1. Descriptive Statistics, Implementation for African American Communities, 1996-2010

Variable	Mean	Std. Dev.	Min	Max
Dependent variable				
Inspection	5.079	9.493	0	174
Enforcement	0.934	2.976	0	82
Independent variable				
Level-1 (county) (N = 28,326)				
Lag_inspection	5.215	9.604	0	174
Lag_enforcement	0.923	2.981	0	82
Black community (90th percentile)	0.100	0.300	0	1
Residents below poverty level (percent)	14.197	6.004	2.1	52.716
Resident higher education attainment (percent)	15.069	7.471	3.3	70.1
Unemployment rate	5.910	2.591	0.7	29.9
Regulated facility	3.326	5.260	1	178
Lag_EPA inspection	0.363	1.392	0	39
Median household income (log)	10.143	0.331	8.899	11.233
Manufacturing labor employment (log)	7.912	1.483	-9.210	13.457
Population (log)	10.897	1.183	7.404	16.107
Population density (log)	4.482	1.397	-9.210	11.149
Land area (log)	6.420	0.815	0.912	11.889
Time	8.099	4.293	1	15
Level-2 (state) (N = 650)				
Welfare stringency	0.000	1	-2.421	1.826
Black state legislator (percent)	8.405	7.456	0	29
Democratic strength of state legislature	0.529	0.433	0	1
Democratic governor	0.451	0.498	0	1
Citizen ideology	51.723	14.884	8.450	95.972
Democratic president	0.458	0.499	0	1
Environmental spending (log)	13.061	0.918	11.183	15.851

Speaking generally, the overall trends of inspections conducted over the time frames reviewed are upward in the Clinton Administration, but on the decline during the Bush Administration. Specifically, the inspection trend of African American counties of the highest 20th percentile (i.e., blacks accounting for approximately 19.19 percent of the total county population) primarily matches that for all counties combined (i.e., 5.21 vs. 5.08). The average of inspections for counties with a national average black population (i.e., approximately 10.54 percent of total population being blacks) is 6.11. However, descriptively, the average inspections decrease as the presence of African Americans grows more visible (e.g., 5.67 for the top 25th percentile, 4.75 for the top 15th percentile, 3.36 for the top 5th percentile). For the baseline environmentally vulnerable communities defined in this study (i.e., the highest 10th percentile with approximately 33.09 percent of blacks), the number is 4.29 (Table 4.2).

It is noteworthy that the patterns of enforcement activities slightly differ from inspections (Figure 4.2). The increased trends of enforcement are reversed in the intersection of two presidencies in the early-2000s. Overall, there are more enforcement activities in the counties with high levels of African American populations than the national average (i.e., 0.93). For example, the amount of enforcement activities for the counties with average black populations, the highest 20th, and 10th percentile is 1.52, 1.49, and 1.42 respectively (Table 4.2). Despite the generally higher degree of greater enforcement actions taken than the national average, the administrative outputs in this regard share a race-related characteristic with inspection activities. The increased predominance of black populations dampens states' enforcement activities for these locales, even though the extent of change in enforcement is smaller than inspection across counties with different levels of African American populations. For instance, the average outputs over 15 years for counties with black populations at the top 25th, 15th, and 5th percentile are 1.58,

Figure 4.1. Average Inspections for African American Communities, 1996-2010
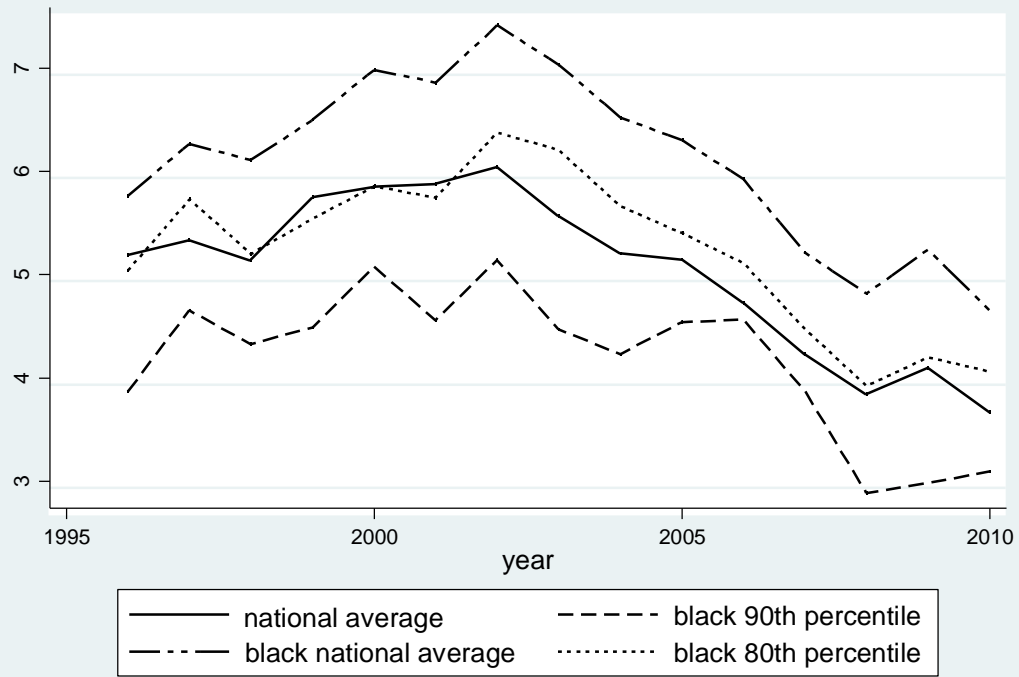
Table 4.2. Average Implementation Activities for
Selected African American Communities, 1996-2010

Variable	Mean	Std. Dev.	Min	Max
Inspection				
National average	5.079	9.493	0	174
Black national average	6.108	10.553	0	151
Black 95th percentile	3.357	4.141	0	39
Black 90th percentile	4.291	6.482	0	112
Black 85th percentile	4.752	8.012	0	112
Black 80th percentile	5.212	8.664	0	151
Black 75th percentile	5.670	9.604	0	151
Enforcement				
National average	0.934	2.976	0	82
Black national average	1.517	4.466	0	82
Black 95th percentile	1.250	3.081	0	45
Black 90th percentile	1.424	3.679	0	46
Black 85th percentile	1.430	3.596	0	46
Black 80th percentile	1.487	3.839	0	66
Black 75th percentile	1.580	4.707	0	82

Figure 4.2. Average Enforcements for African American Communities, 1996-2010

national average

black national average

black 90th percentile

black 80th percentile
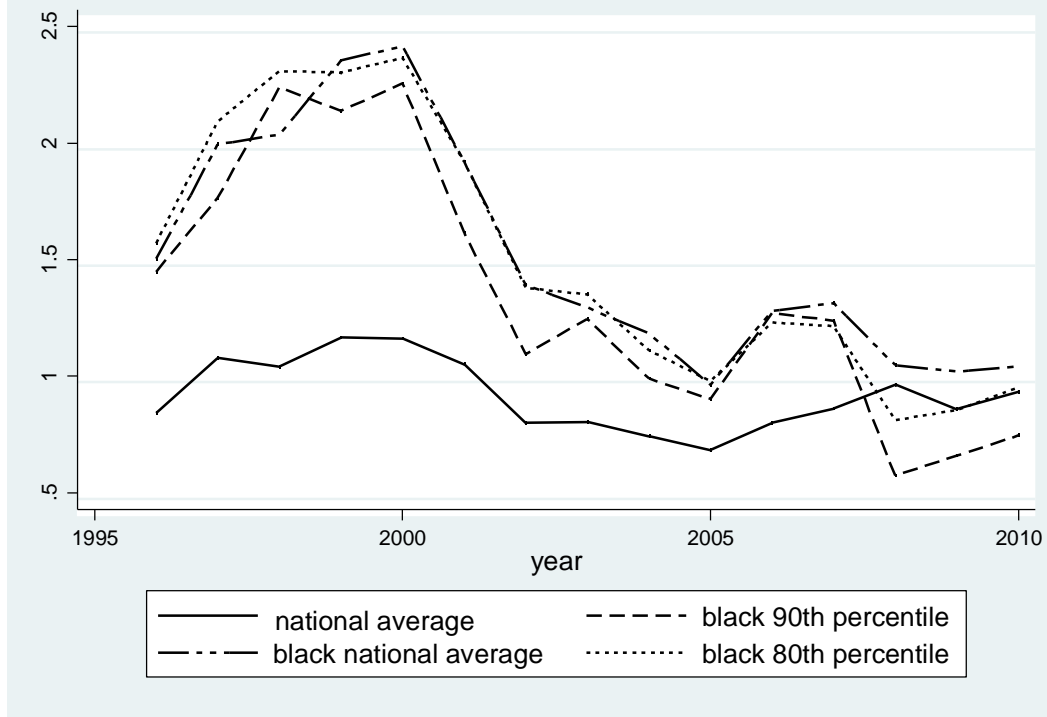
1.43, and 1.25 respectively.

Empirical Results: Inspection Activities

To be consistent with the model specifications in the research design (Chapter 3), in all

the models estimated below, the coefficients are reported as the log of the rate of agencies'

implementation activities (i.e., inspection or enforcement; η_{ij}). For a meaningful and substantive

interpretation, the coefficients should be transformed back to an event rate ratio (i.e., $\exp[\eta_{ij}] =$

λ_{ij}). This section reports the analysis and results of the African American population models[67].

First, two simpler models are estimated to demonstrate the specification of the more

sophisticated models. In the unconditional model (the null model, or the intercept-only or the

one-way ANOVA model with random effects) (Model 1), the intraclass correlation coefficient

(ICC) ρ is .1006, implying that approximately 10.06 percent of the total variation in the outcome

variable (inspection) can be explained between states[68], and multilevel modeling should be

employed (Garson 2013, 62) (Table 4.3). In the next step, a random-effect model is developed to

include several level-one predictors (Model 2, Table 4.3). Specifically, the slope of

environmentally vulnerable communities is specified as having a random part, while other level-

one variables are specified as having fixed components[69]. Several county-level variables predict

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[67] Models estimated with the 75th and 85th percentiles of African American counties representing black vulnerable communities for inspection and enforcement activities are presented in the Appendices.

[68] The intraclass correlation coefficient (ICC) ρ is expressed as the ratio of level-two ("group") error variance and the total error variance, measuring "the proportion of the variance in the outcome that is between the level-2 units." (Raudenbush and Bryk 2002, 24) It implies "the amount of variation *unexplained* by any predictors in the model that can be attributed to the grouping variable, as compared to the overall unexplained variance (within and between variance)." (University of Texas at Austin 2012b, 4) Adding level-one variables to the model should increase the ICC. However, the ICC should decrease when level-two factors are included, since it helps reduce the unexplained variance at level two (τ^2) (University of Texas at Austin 2012b, 34-35). It is calculated as follows:
$\rho = \text{Var}(u_{0j})/\text{Var}(Y_{ij}) = \text{Var}(u_{0j})/\text{Var}(u_{0j} + \varepsilon_{ij})$
$= \tau^2/(\tau^2 + \sigma^2) = 0.748/(0.748 + 6.684) = .1006.$

[69] It implies that the u_{hj} for environmentally vulnerable communities $\neq 0$, while the u_{hj} for other level-one variables = 0. It is anticipated that the effects of level-one variables other than environmentally vulnerable communities on the

Table 4.3. Unconditional and Level-One-Predictor-Only Models for Inspections for African American Communities

Variable	Model 1		Model 2	
	Coefficient	Std. Err.	Coefficient	Std. Err.
Intercept	1.768***	0.053	1.384***	0.033
Time	---	---	-0.026*	0.010
Lag_Inspection	---	---	0.015***	0.003
Black community (90th percentile)	---	---	0.045	0.033
Residents below poverty level	---	---	-0.013***	0.003
Resident higher education attainment	---	---	-0.004*	0.002
Unemployment rate	---	---	-0.005	0.006
Regulated facility	---	---	0.010***	0.001
Median household income	---	---	-0.323*	0.130
Manufacturing labor employment	---	---	0.105***	0.012
Population	---	---	-0.155	0.266
Population density	---	---	0.387	0.265
Land area	---	---	0.403	0.269
Residual	Variance	χ^2	Variance	χ^2
Level-2 u_{0j}	0.748	25330.91***	0.421	25123.04***
Slope for minority communities u_{3j}	---	---	0.138	692.6126***
Level-1 ε_{ij}	6.684	---	2.292	---

Population-average model; robust standard errors reported

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

outcome variable do not vary across level-two units (i.e., as fixed rather than random effects) and the error terms are considered as zero and not included in the models.

states' implementation patterns in the expected direction, pointing to the importance of local socioeconomic and task environments. These include the amount of regulated facilities and labor employment in the manufacturing sector.

The findings of this model suggest no evidence of race-based environmental inequities (i.e., gauged by the dichotomous variable of the 90th percentile of black counties), and lend mixed support for the arguments of class-related environmental injustice. For example, state agencies are prone to have lax inspections in the counties with more residents living below the poverty level, whereas similar patterns are also observed in the counties with higher levels of resident higher education attainment and median household income.

As the variance components in Model 2 show, the variance of the level-one residual (ε_{ij}) decreases to 2.292 from 6.684 (in the unconditional model) and approximately 65.71 percent of the level-one variance in the outcome variable can be explained by the predictors added at this level (SSI 2013c)[70]. In addition, the error term of the level-two intercept (u_{0j}) is significantly different from zero (chi square value χ^2 of 25123.04, $p < .001$); thus, there is considerable variability across level-two units (i.e., states) in terms of the average inspection activities.

To further account for the variance across level-two units, state-level variables (i.e., political environment factors) are included to predict the level-one intercept and the slope of black communities, leading to three full two-level models. Models 3 to 5[71] estimate the effects of

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[70] The proportion of variance explained at level-one is calculated as: (σ^2 in Model 1 – σ^2 in Model 2)/(σ^2 in Model 1) = (6.684-2.892)/6.682 = 0.657.

[71] The estimates reported are based on population-average instead of unit-specific models, as such a choice depends on the research questions at issue. "If one were primarily interested in how a change in (a level-two variable) can be expected to affect a particular (level-two unit's) mean, one would use the unit-specific model. If one were interested in how a change in (a level-two variable) can be expected to affect the overall population mean, one would use the population-average model." (Raudenbush et al. 2011, 119) Also, coefficients with robust standard errors are reported if they are computable and preferable (e.g., in the circumstances of low degrees of freedom at the higher level of the model, robust standard errors are not computable) (SSI 2013a).

various political, socioeconomic, task, and demographic factors on the inspection activities of state environmental agencies in the baseline scenario using the highest 10th percentile of the percent black populations (Table 4.4).

In particular, Model 3 is an intercept-as-outcome model and akin to the empirical assessment strategies in the conventional environmental inequality research. The latter do not consider the racial minority-related explanatory variables (i.e., degenerative policies for African Americans and black state legislators) and the corresponding interactive effects with the black vulnerable communities[72]. Models 4 and 5 are intercepts- and slopes-as-outcomes models. Model 4 additionally controls for the group-related variables and includes two interaction terms between two race-related political factors and the environmentally vulnerable communities[73]. Lastly in a more comprehensive way, Model 5 further takes into account the moderating effects of the following political variables: degenerative policy, black state legislator, strength of partisanship in state legislature, citizen ideology, governor party affiliation, and state environmental spending. For better interpretations, all continuous explanatory variables are grand-mean centered (Enders and Tofighi 2007; Krivo, Peterson, and Kuhl 2009; Snedker, Herting, and Walton 2009;

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[72] It is a randomly-varying-intercept model (i.e., each state has a different mean outcome level).

[73] It is a partial randomly-varying-slope model (i.e., selected state-level effects give rise to the differences in the effects of relevant county-level variables).

Table 4.4. Estimates of Predictors for Inspections for African American Communities

Variable	Model 3 Coefficient	Model 3 Std. Err.	Model 4 Coefficient	Model 4 Std. Err.	Model 5 Coefficient	Model 5 Std. Err.
Intercept	1.416***	0.042	1.354***	0.039	1.353***	0.039
Black state legislator	---	---	0.022***	0.003	0.022***	0.003
Democratic strength of state legislature	0.209***	0.048	0.102*	0.051	0.088	0.053
Democratic governor	-0.043	0.056	0.015	0.051	0.017	0.052
Citizen ideology	0.013***	0.002	0.017***	0.002	0.016***	0.002
Democratic president	-0.079	0.060	-0.053	0.056	-0.052	0.056
Environmental spending	0.078*	0.036	-0.015	0.032	-0.017	0.033
Welfare stringency	---	---	0.132***	0.035	0.130***	0.035
Time	-0.039***	0.010	-0.045***	0.011	-0.045***	0.011
Lag_Inspection	0.015***	0.002	0.015***	0.002	0.015***	0.002
Black community (90th percentile)	0.056	0.032	0.102	0.063	0.111	0.070
× Black state legislator	---	---	-0.002	0.005	-0.003	0.005
× Democratic strength of state legislature	---	---	---	---	0.085	0.074
× Democratic governor	---	---	---	---	-0.028	0.060
× Citizen ideology	---	---	---	---	0.002	0.002
× Environmental spending	---	---	---	---	0.003	0.053
× Welfare stringency	---	---	-0.161***	0.033	-0.142***	0.031
Residents below poverty level	-0.013***	0.003	-0.013***	0.003	-0.013***	0.003
Resident higher education attainment	-0.004*	0.002	-0.003	0.002	-0.003	0.002
Unemployment rate	-0.005	0.006	-0.005	0.006	-0.005	0.006
Regulated facility	0.010***	0.001	0.010***	0.001	0.010***	0.001
Median household income	-0.336**	0.123	-0.348**	0.123	-0.347**	0.123
Manufacturing labor employment	0.106***	0.012	0.107***	0.012	0.108***	0.012
Population	-0.151	0.270	-0.156	0.262	-0.151	0.262
Population density	0.380	0.270	0.380	0.262	0.375	0.262
Land area	0.400	0.273	0.406	0.265	0.401	0.265

Residual	Variance	χ^2	Variance	χ^2	Variance	χ^2
Level-2 u_{0j}	0.373	19431.24***	0.315	15421.21***	0.315	15422.33***
Slope for minority communities u_{3j}	0.144	702.566***	0.104	581.8662***	0.107	577.895***
Level-1 ε_{ij}	2.293	---	2.296	---	2.296	---

Population-average model; robust standard errors reported

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Steenbergen and Jones 2002)[74].

Consistent with the descriptive statistics, over the years, states have fewer inspections. The proportion reduction in level-two intercept variance from Model 2 to Model 3 is approximately 11.381 percent (SSI 2013c)[75]. Several conventionally considered variables are statistically significant. Like other policy areas in the U.S. context, state's political environments are a salient factor. In general, states with an ideologically liberal citizenry actively pursue environmental compliance monitoring actions. Likewise, a high degree of Democratic strength in state legislatures facilitates the rigorousness of agency inspection activities. Similar to Model 2, the variable of environmentally vulnerable communities is insignificant.

Also in terms of socioeconomic environments, findings are compatible with the preceding model. States are slightly less active in inspection efforts in the counties with more residents living below the poverty level. Nonetheless, counties with higher median household income levels or more residents with higher education degrees receive less inspection attention. Meanwhile three predictors of task environment produce estimates in the expected direction.

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[74] The advantages of centering the predictor variable include removal of correlations between the random intercepts and slopes as well as those between two-level variables and cross-level interactions, and interpretations of the predictor variables that have no meaningful zero values (Enders and Tofighi 2007; University of Texas at Austin, 2012a). The adoption of specific methods of level-one variable centering (e.g., the predictors transformed to the deviations from the grand or group mean) should depend on the substantive research questions, as they influence the interpretation of intercepts, intercept variance, and the intercept-slope covariance (grand-mean centering is the only option for the level-two variable) (Snijders and Bosker 2012, 87; Raudenbush and Bryk 2002, 31-35, 134-149). Enders and Tofighi (2007) provided some general recommendations for the centering of level-one predictors, and continuous and dichotomous predictors follow a similar logic. For example, if one is interested in the effects of level-one (e.g., individual) predictors, a group-mean centering (i.e., subtracting the mean of the group to which an individual belongs from each individual value on that variable) should be employed. If the level-two (e.g., contextual) predictors are of substantive interest, a grand-mean centering (i.e., subtracting the mean of the variable across the mean of all individual observations in the sample, from each individual value on that variable) is preferred. If the effects of cross-level interaction effects are the focus, a group-mean centering is recommended. However, some suggest that a binary variable should be un-centered (i.e., in its original metric) (University of Texas at Austin 2012a). This study has a substantive interest in the effects of level-two predictors (i.e., political contextual factors) and thus adopts a grand-mean centering. In addition, it employs an un-centered binary variable of environmentally vulnerable community as the default form. Meanwhile, estimates using group-mean centering are performed, and the results primarily remain the same and are reported in footnotes accordingly.

[75] The proportion reduction in level-two intercept variance is calculated as: (τ^2 in Model 2 – τ^2 in Model 3)/(τ^2 in Model 2) = (0.421-0.373)/0.421 = .113805.

State fiscal commitment to waste control and natural resources, counties with a large amount of regulated facilities, and higher levels of manufacturing employment are more likely to have higher levels of inspections.

Model 4 incorporates a measure of contemporary degenerative policy targeting African Americans, as well as the state legislative representation of this group. As noted earlier, welfare policy has been argued to be a contributor to the degenerative political environment which reinforces the negative categorization of blacks and undermines the perceptions of their deserving government assistance and attention. As such, this model evaluates the stringency of state welfare policy (i.e., representing four dimensions of policy design). Relatedly, a visible presence of African American state legislators is expected to foster issue advocacy and attention to this socially marginalized group. It should be noted that since both welfare policy and black state lawmaker are group-associated factors, when being gauged independently (i.e., direct or main effect), these two variables do not necessarily have theoretical implications for state environmental policy implementation and there are no *a priori* hypotheses for the main effects of these variables. Nonetheless, they are anticipated to have moderating (or interactive) effects on the relationship between black environmentally vulnerable communities and administrative outputs, as is the research interest of the study (i.e., how the environmental implementation treatment for particular social members are contingent on group-related political/contextual factors). Therefore, the interaction effects are of central concern and aim to assess whether the influence of degenerative policy significantly varies between (non-) communities of concern; in particular, the interaction effects of the degenerative policy are expected to decrease inspection and enforcement, and those of minority state legislator should increase them.

As illustrated, the intercept variance at level two is reduced by 15.651 percent from

Model 3 to 4; also, the variance in the slope of African American vulnerable counties (u_{3j}) is

reduced by 27.336 percent[76]. It implies that the inclusion of two minority-group-related variables

and corresponding interaction terms not only helps account for the differences between the state

intercepts, but also those between the slopes of minority communities (SSI 2013b). The results

show that states which have more black state legislators have higher levels of inspections in

general, but such impacts are not statistically discernible in the minority vulnerable communities.

Minority state legislators may be aware of the importance of compliance monitoring

rigorousness and environmental equity for all social members, rather than for particular segments

of populations. A one percent increase in the lawmakers of color in state legislatures is

associated with a 2.204 percent increase in state inspections, holding all other variables constant.

Welfare policy stringency is statistically significant in the positive direction, implying

that states with stricter welfare policies tend to have more inspections activities (i.e., $\hat{\beta}$ of 0.132).

However, the interaction term is statistically negative (i.e., $\hat{\beta}$ of -0.161) and the slope turns

downward for the counties positioned at the 90th percentile of percent African American

populations (Figure 4.3). This means that significant differences exist in the relationship between

welfare policy stringency and state inspection efforts across predominantly minority counties and

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[76] The reduction is calculated as: ($u_{hj}{}^2$ in Model 2 – $u_{hj}{}^2$ in Model 3)/($u_{hj}{}^2$ in Model 2) = (0.144-0.104)/0.144 =
.273359. In terms of the grand-mean centering, the level-one intercept, as the adjusted mean outcome for the level-
two unit j, is the expected value of implementation activities given the expected value of a county i from state j with
a level-one predictor equating with the grand mean of all values on that variable (for example, the expected value of
implementation activities for a county with average value of a predictor of interest, see Snijders and Bosker 2012,
88). It is interpreted as the mean outcome for the jth level-two unit adjusted for differences in a level-one predictor
within this level-two unit (SSI 2013d).

Figure 4.3. Interactions between Black_90th Communities and Welfare Stringency, Inspections
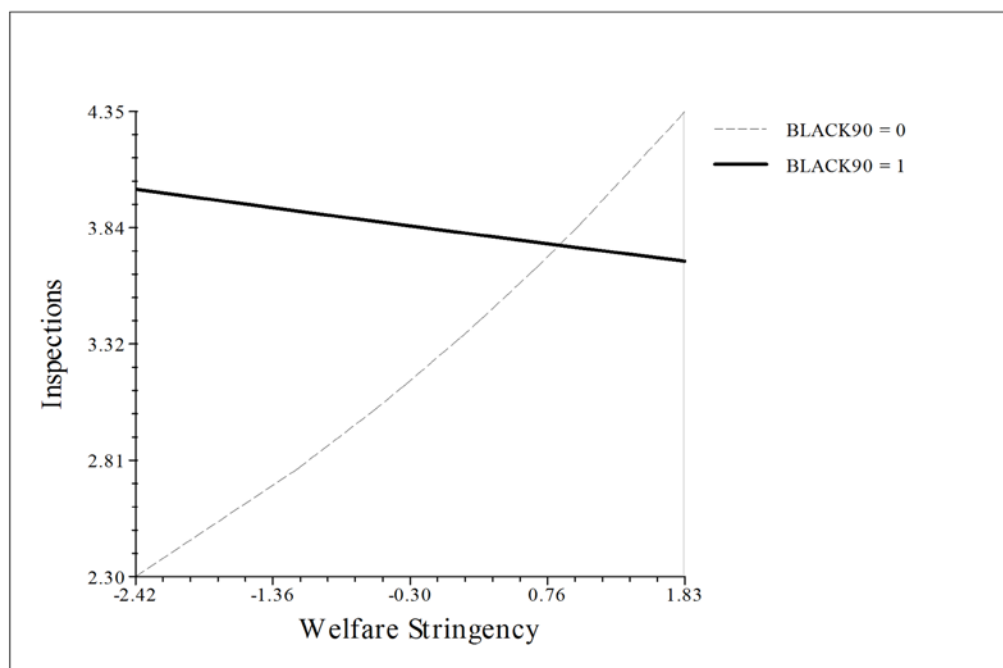
those that are not. *Ceteris paribus,* for the race-based vulnerable counties, for each one unit

increase in the state's welfare policy stringency, environmental agencies reduce inspections by

2.857 percent[77].

As regards other factors of political environments, citizen ideology remains statistically

significant and its size is comparable. Albeit significant and positive, the magnitude of the effect

of Democratic strength in the state legislature substantially decreases in comparison to Model 3.

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[77] Based on the model specification and output of the HLM program (Chapter 3; Raudenbush and Bryk 2002, 314-316; Raudenbush et al. 2011), $\hat{\beta}$ is the estimated effect of the explanatory variable x on the log of event rate ratio (η) of the outcome variable. Substantively, the marginal effect of the explanatory variable x on the event rate ratio (λ) of the outcome variable is interpreted as: for a one unit increase in x, the estimated count of implementation activities increases by a factor of $\exp(\hat{\beta})$ (when $\hat{\beta} > 0$; decreases by a factor of $\exp[\hat{\beta}]$ if $\hat{\beta} < 0$). Relatedly, the percentage change in the outcome variable given a δ unit change in the explanatory variable x is calculated as: $[\exp(\hat{\beta} \times \delta) - 1] \times 100$ (Hirsh and Kornrich 2008, 1416; Long 1997, 225). Due to the use of interaction term, the effect of state welfare policy stringency on agencies' implementation activities is calculated as $\hat{\beta}$_stringency + ($\hat{\beta}$_interaction $\times$ x_minority).

In Model 4, if two states differ by one unit in welfare policy stringency (x), the estimated inspection activities for the *non-vulnerable* counties (i.e., x_minority = 0) that are in a state with more stringent welfare policy would be $\exp[\hat{\beta}$_stringency + ($\hat{\beta}$_interaction $\times$ x_minority)$] = \exp[0.131953+ (-0.160935) \times 0] = 1.141$ times higher than the *non-vulnerable* counties that are in a state with less stringent welfare policy. Or in other words, for the *non-vulnerable* counties, for every one unit increase in the state welfare policy stringency, there is an increase in inspection activities by approximately 14.105 percent (i.e., $\exp[0.131953+ (-0.160935) \times 0] - 1 = .1410547$). However, the estimated inspection activities for the *vulnerable* counties (i.e., x_minority = 1) that are in a state with more stringent welfare policy would be $\exp[0.131953+ (-0.160935) \times 1] = .971$ times smaller than the *vulnerable* counties that are in a state with less stringent welfare policy. Put another way, for the *vulnerable* counties, for every one unit increase in state welfare policy stringency, there is a decrease in inspection activities by approximately 2.857 percent (i.e., $\exp[0.131953+ (-0.160935) \times 1] - 1 = -.02856605$).

As grand-mean centering is used, the coefficient of the slope is the "pooled-within regression coefficient" for the variable of interest, adjusted for differences in this variable (SSI 2013d). In the words of Krivo, Peterson, and Kuhl (2009), the coefficients of the state-level variables can be interpreted as the effects on the average county-level implementation activities within the state net of the county conditions included in the model (p. 1781).
In addition to the default models using an un-centered variable of black vulnerable community, estimates with a group-mean centered variable are performed and reported as follows: (1) inspection (corresponding to Model 4): the coefficients of the main and interactive effect (both significant) are 0.124021 and -0.149276 respectively. The effects of welfare policy on inspections for vulnerable communities are -2.493876; (2) inspection (corresponding to Model 5): the coefficients of the main and interactive effect (both significant) are 0.123633 and -0.134891 respectively. The effects of welfare policy on inspections for vulnerable communities are -1.119487; (3) enforcement (corresponding to Model 9): the interaction term is not significant; and (4) enforcement (corresponding to Model 10): the coefficients of the main and interactive effect (both significant) are 0.173749 and -0.132163 respectively. The effects of welfare policy on enforcements for vulnerable communities are 4.24628, and those for non-vulnerable communities are 18.97569. It substantively implies that for each unit increase of welfare policy stringency, there is a 18.97569 increase in enforcement practices for non-vulnerable communities, whereas their vulnerable peers have a 4.24628 increase.

Several socioeconomic and task setting variables in Model 4 have effects that are analogous to Model 3, except that environmental spending and resident education levels become insignificant.

Lastly, Model 5 takes into account the interactive relations between racial minority community and political environments (except presidency) in a more comprehensive manner. Except for the significance of the state legislature partisanship measure disappearing, the results of the other factors in the model are pretty similar to those in Model 4. Specifically, the size of the coefficient of the moderating effects of welfare policy stringency is slightly smaller than that of Model 4 (i.e., translating into a reduction of 1.214 percent in inspections for black vulnerable counties) (Figure 4.4). But the impact of African American representation in the state legislature is comparable. It is noteworthy that the variances of level-one and -two residuals and that of the slope of black vulnerable communities barely change. This means that additional interaction effects of general political factors other than minority-group-oriented variables do not add explanatory strength to either the slopes of minority group as well as states' average performance of inspections.

Empirical Results: Enforcement Activities

Model 6 to 10 examine the effects of the same sets of variables on enforcement activities in ways that correspond to the specifications of Model 1 to 5. As opposed to the decreased trends in inspections, states' enforcement patterns do not significantly change over time across models. The ICC ρ of the unconditional model in the case of enforcement (i.e., 0.3474) (Model 6, Table 4.5) is much larger than that in inspection (i.e., 0.1006), demonstrating in comparison to inspection activities, more total variation in enforcement actions can be explained between state-level units. In Model 7 (Table 4.5), the results concerning higher education attainment and

Figure 4.4. Interactions between Black_90[th] Communities and Welfare Stringency, Inspections (Full Model)
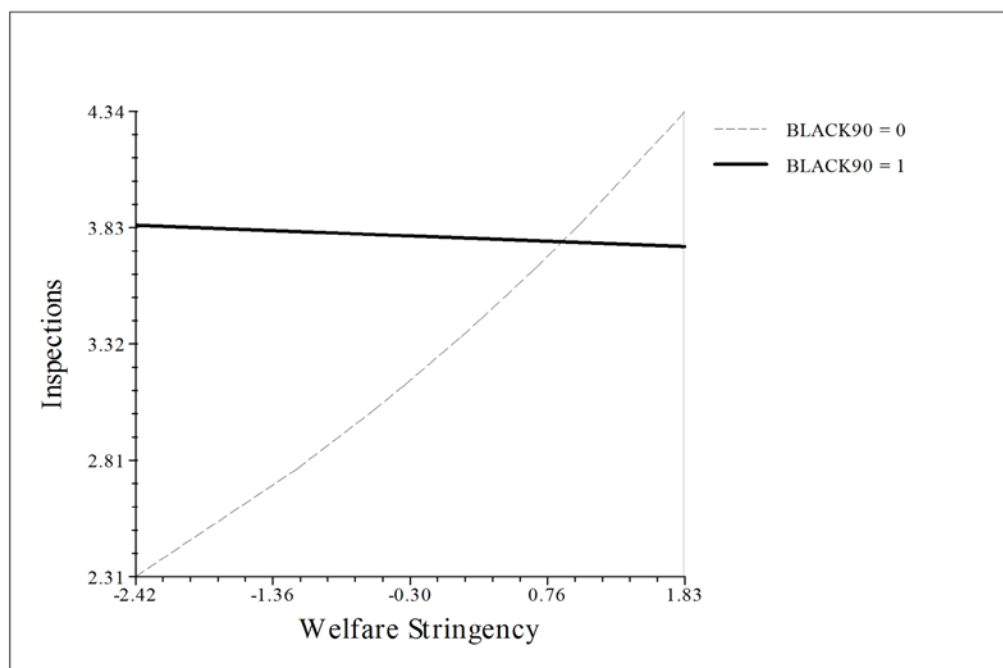
Table 4.5. Unconditional and Level-One-Predictor-Only Models for Enforcements for African American Communities

Variable	Model 6		Model 7	
	Coefficient	Std. Err.	Coefficient	Std. Err.
Intercept	-0.110	0.075	-0.385***	0.056
Time	---	---	0.018	0.017
Lag_Enforcement	---	---	0.040*	0.017
Black community (90th percentile)	---	---	0.155*	0.061
Residents below poverty level	---	---	-0.005	0.005
Resident higher education attainment	---	---	-0.007*	0.003
Unemployment rate	---	---	0.073***	0.008
Regulated facility	---	---	0.004	0.007
Lag_EPA_inspection	---	---	0.006	0.012
Median household income	---	---	0.501**	0.181
Manufacturing labor employment	---	---	0.075***	0.021
Population	---	---	-0.211	0.551
Population density	---	---	0.498	0.550
Land area	---	---	0.489	0.552
Residual	Variance	χ^2	Variance	χ^2
Level-2 u_{0j}	1.657	34871.18***	1.696	26554.89***
Slope for minority communities u_{3j}	---	---	0.167	456.6494***
Level-1 ε_{ij}	3.113	---	1.683	---

Population-average model; robust standard errors reported

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

manufacturing labor employment are analogous to Model 2 (Table 4.3). Nonetheless, the sign of median household income is positive, and is consistent with the class-based environmental injustice argument. Furthermore, state agencies perform more enforcement in the counties with high unemployment rates. On balance, the overall findings of class-associated environmental injustice are inconclusive. In contrast to the statistical insignificance in inspections, black vulnerable communities receive more state enforcement efforts by 16.79 percent.

In Model 8 (Table 4.6), the proportion reduction in level-two intercept variance is approximately 5.837 percent, which is about half of that in the inspection model (i.e., Model 3, Table 4.4). Two political factors are statistically significant. A state legislature with more Democratic strength contributes to higher levels of enforcements; however, counter-intuitively, states with a more liberal citizenry have less enforcement, but the effect size is small.

In addition, like Model 7, socioeconomic variables have mixed results. On one hand, higher education attainment and unemployment rate predict enforcement activities in ways that are not consistent with the conventional environmental justice hypotheses. Specifically, state agencies are more likely to under-enforce in the counties with more residents with higher degrees of education, while producing more enforcement actions in counties with higher unemployment rates. On the other hand, county median household income is positively associated with environmental enforcement activities. A one unit increase in the log of income is related to an increase by 64.755 percent in enforcement actions, holding other variables constant. Moreover, higher levels of manufacturing labor employment in a county lead to more enforcement.

Model 9 includes two sets of target-group-related political variables and interaction terms and helps explain the differences between the slopes of black communities by 28.959 percent (Table 4.6). The effects of higher Democratic Party strength in state legislatures, citizen ideology,

Table 4.6. Estimates of Predictors for Enforcements for African American Communities

Variable	Model 8 Coefficient	Model 8 Std. Err.	Model 9 Coefficient	Model 9 Std. Err.	Model 10 Coefficient	Model 10 Std. Err.
Intercept	-0.402***	0.081	-0.442***	0.083	-0.443***	0.082
Black state legislator	---	---	0.009	0.008	0.009	0.008
Democratic strength of state legislature	0.591***	0.117	0.561***	0.120	0.588***	0.120
Democratic governor	-0.120	0.117	-0.078	0.114	-0.086	0.112
Citizen ideology	-0.023***	0.003	-0.020***	0.004	-0.020***	0.004
Democratic president	0.012	0.129	0.022	0.130	0.025	0.130
Environmental spending	-0.013	0.047	-0.059	0.055	-0.059	0.054
Welfare stringency	---	---	0.165**	0.054	0.165**	0.053
Time	0.029	0.019	0.024	0.021	0.026	0.021
Lag_Enforcement	0.041**	0.016	0.037*	0.016	0.038*	0.016
Black community (90th percentile)	0.154**	0.052	0.533***	0.088	0.598***	0.136
× Black state legislator	---	---	-0.032***	0.005	-0.025***	0.007
× Democratic strength of state legislature	---	---	---	---	-0.430***	0.125
× Democratic governor	---	---	---	---	0.152	0.091
× Citizen ideology	---	---	---	---	0.010*	0.005
× Environmental spending	---	---	---	---	-0.102	0.100
× Welfare stringency	---	---	-0.110	0.062	-0.174**	0.057
Residents below poverty level	-0.005	0.005	-0.007	0.005	-0.006	0.005
Resident higher education attainment	-0.007*	0.003	-0.006	0.003	-0.005	0.003
Unemployment rate	0.073***	0.007	0.074***	0.007	0.074***	0.007
Regulated facility	0.003	0.006	0.005	0.006	0.004	0.006
Lag_EPA_inspection	0.006	0.012	0.005	0.012	0.005	0.012
Median household income	0.499**	0.175	0.453**	0.172	0.490**	0.174
Manufacturing labor employment	0.074***	0.020	0.074***	0.020	0.077***	0.020
Population	-0.197	0.500	-0.132	0.466	-0.196	0.483
Population density	0.487	0.498	0.417	0.464	0.472	0.480

Land area	0.476	0.501	0.414	0.468	0.480	0.485
Residual	Variance	χ^2	Variance	χ^2	Variance	χ^2
Level-2 u_{0j}	1.597	23242.99***	1.584	20360.49***	1.581	20237.5***
Slope for minority communities u_{3j}	0.169	455.6561***	0.120	445.78***	0.095	380.7151***
Level-1 ε_{ij}	1.682	---	1.685	---	1.687	---

Population-average model; robust standard errors reported

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

unemployment rates, median household income, and manufacturing employment are similar to Model 8. Higher education attainment is no longer significant.

Although welfare policy stringency significantly predicts agencies' enforcement activities, its effect does not vary across counties with different levels of African American residents at a .05 level of significance, but it is significant in the negative direction at .10 level. It is also noteworthy that the interaction term between minority state legislator and vulnerable minority communities is significant, while the main effect for this political factor is insignificant. Lastly, there is no *prima facie* evidence of race-based environmental inequalities; instead, state agencies have more aggressive enforcement patterns in the counties with high levels of black residents.

In the full model (Model 10), four variables – minority state legislator, Democratic strength in the state legislature, citizen ideology, and welfare policy stringency – have distinct effects for vulnerable minority counties (Table 4.6). First, a state legislature with more Democratic strength generally promotes agency's enforcement outputs, while the effect magnitude decreases by 34.937 percent in the counties with high levels of black residents (i.e., $\hat{\beta}$ of 0.588 and -0.430 in the main and interaction effect, respectively). In addition, an ideologically liberal citizenry does not advance enforcement efforts while the reduction magnitude is smaller in the counties with high levels of racial minority composition.

Surprisingly, the presence of African American state legislators reduces the enforcement activities for the counties with high percentages of black residents, despite a small magnitude. Furthermore, consistent with the findings in inspection cases (Models 4 and 5), a stringent welfare policy environment impacts states' environmental protection outputs in an unfavorable manner and, its effect size diminishes compared to inspections. Holding other factors constant, the counties with higher levels of African American residents witness a reduction in enforcement

efforts by 0.953 percent, when the state welfare policy stringency goes up by one unit (see also

Figure 4.5). It is worth mentioning that the number of regulated facilities is relevant in inspection

instead of enforcement activities.

Results of Hispanic Models

Descriptive Statistics

Table 4.7 presents descriptive statistics from the Hispanic models. The sample is 11,314

and 267 at the county and state level respectively from 2005 to 2010. The average number of

inspection and enforcement (informal and formal combined) activities at the county level is 4.33

and 0.87 respectively. Table 4.8 reports the average inspection and enforcement activities for

counties of varying levels of Hispanic populations. Overall, implementation efforts for counties

with different thresholds representing the composition of Hispanics are more frequent than the

national average. As opposed to the case of African Americans, there are little discernible

disparities across counties of different Latino composition thresholds in terms of inspections.

Descriptively, enforcements are positively associated with the levels of ethnic minority

populations. Figures 4.6 and 4.7 display the general trends of average implementation actions. In

comparison to the overall descending patterns of inspections in 2005 through 2010, the trends of

enforcements are slightly upward.

Empirical Results: Inspection Activities

This section presents the results of empirical analysis with the baseline scenario of the

counties of the 90th percentile of Hispanic populations (i.e., with approximately 17.44 percent of

Figure 4.5. Interactions between Black_90th Communities and Welfare Stringency, Enforcements (Full Model)
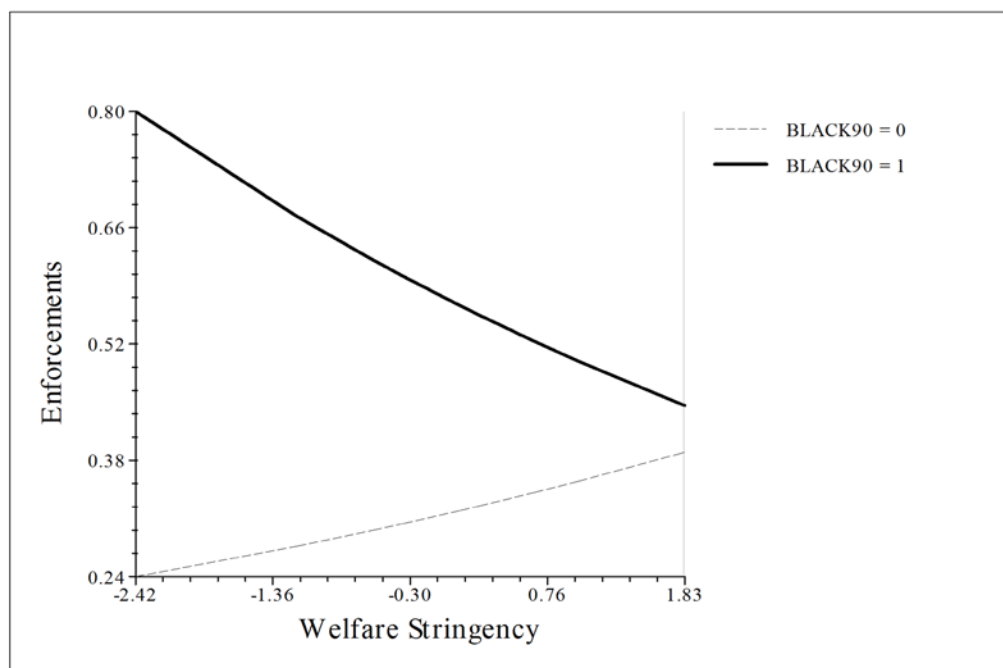
Table 4.7. Descriptive Statistics, Implementation for Hispanic Communities, 2005-2010

Variable	Mean	Std. Dev.	Min	Max
Dependent variable				
Inspection	4.331	7.886	0	172
Enforcement	0.872	2.479	0	67
Independent variable				
Level-1 (county) (N = 11,314)				
Lag_inspection	4.580	8.586	0	172
Lag_enforcement	0.838	2.423	0	67
Hispanic community (90th percentile)	0.100	0.301	0	1
Residents below poverty level (percent)	14.833	5.857	2.5	44.45
Resident higher education attainment (percent)	18.159	8.238	4.8	70.1
Unemployment rate	6.769	2.909	1.7	29.9
Regulated facility	3.369	5.498	1	178
Lag_EPA inspection	0.326	1.367	0	36
Median household income (log)	9.877	0.251	8.899	10.851
Manufacturing labor employment (log)	7.774	1.514	-9.210	13.118
Population (log)	10.935	1.203	7.404	16.107
Population density (log)	4.466	1.423	-9.210	11.149
Land area (log)	6.472	0.763	2.710	11.889
Time	3.509	1.707	1	6
Level-2 (state) (N = 267)				
Immigration stringency	0.966	1.856	-5	7
Hispanic state legislator (percent)	3.018	5.294	0	24.167
Democratic strength of state legislature	0.561	0.439	0	1
Democratic governor	0.521	0.501	0	1
Citizen ideology	55.456	15.220	18.070	93.248
Democratic president	0.337	0.474	0	1
Environmental spending (log)	13.116	0.910	11.330	15.851

Table 4.8. Average Implementation Activities for
Selected Hispanic Communities, 2005-2010

Variable	Mean	Std. Dev.	Min	Max
Inspection				
National average	4.331	7.886	0	172
Hispanic national average	5.399	10.765	0	172
Hispanic 95th percentile	4.388	10.267	0	122
Hispanic 90th percentile	5.489	11.664	0	122
Hispanic 85th percentile	5.855	12.033	0	131
Hispanic 80th percentile	5.657	11.593	0	172
Hispanic 75th percentile	5.381	10.786	0	172
Enforcement				
National average	0.872	2.479	0	67
Hispanic national average	1.339	3.836	0	67
Hispanic 95th percentile	1.885	6.073	0	67
Hispanic 90th percentile	1.832	5.114	0	67
Hispanic 85th percentile	1.551	4.373	0	67
Hispanic 80th percentile	1.480	4.216	0	67
Hispanic 75th percentile	1.343	3.880	0	67

Figure 4.6. Average Inspections for Hispanic Communities, 2005-2010
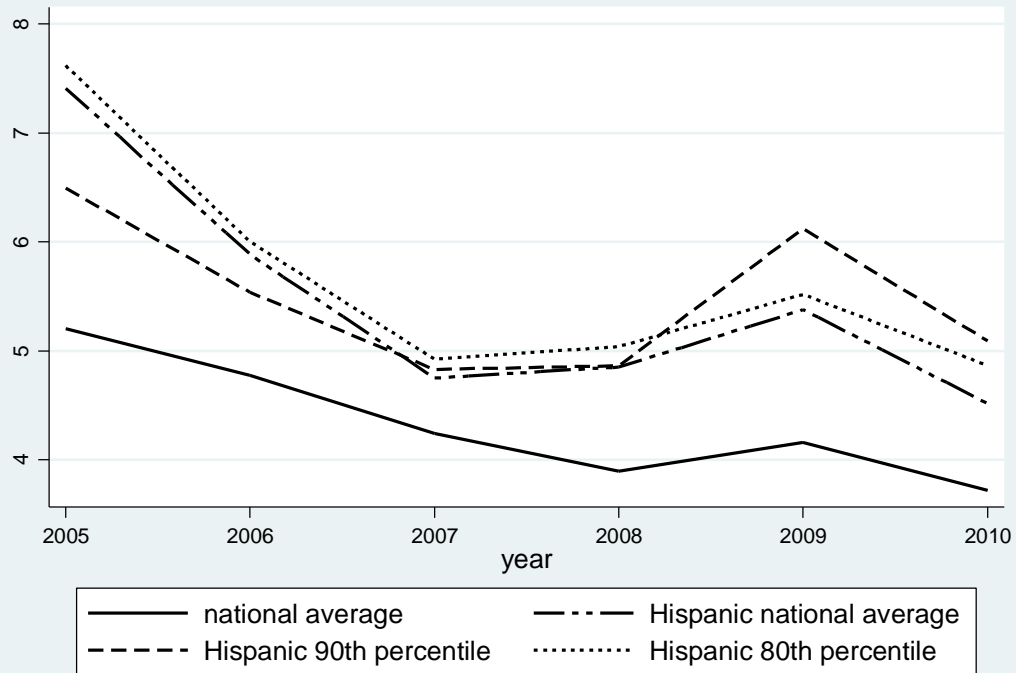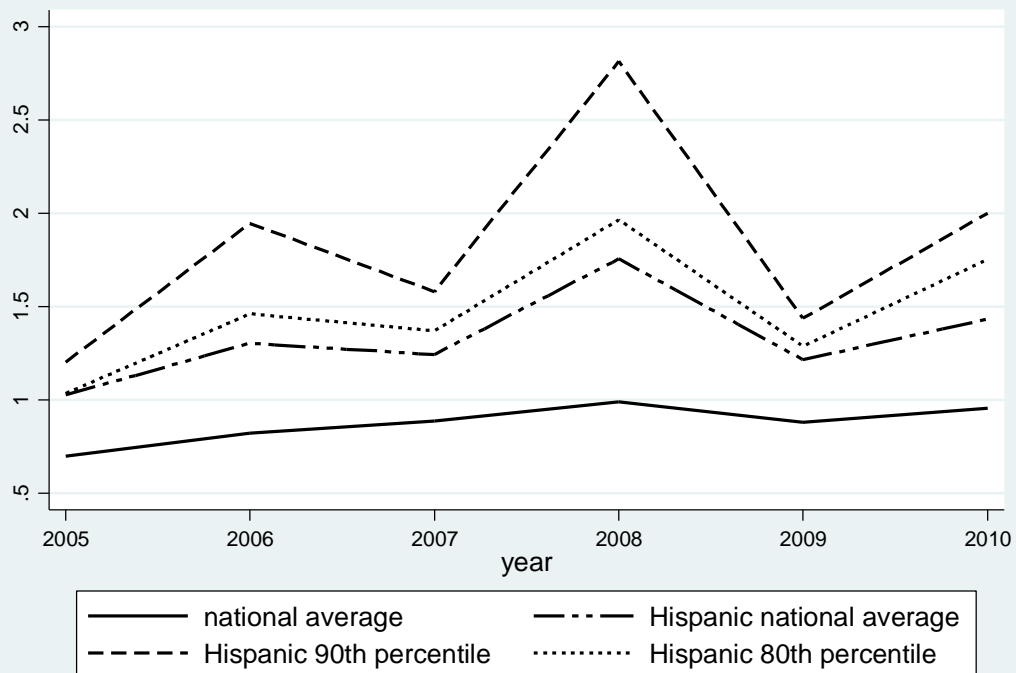

Figure 4.7. Average Enforcements for Hispanic Communities, 2005-2010

Hispanics)[78]. The models specified for Hispanic populations are analogous to those of African American communities. In the unconditional model (Model 11), the ICC ρ is 0.0991, meaning that about 9.91 percent of the total variation in the dependent variable can be explained at the second (state) level (Table 4.9). The random-effect model (Model 12) considers county-level independent variables only and reduces the level-one intercept variance by 69.198 percent (Table 4.9). Several task and demographic factors are significant. Larger numbers of regulated facilities and higher levels of employment in manufacturing are associated with state agencies conducting more inspections. Geographic area and population density are positively associated with states' regulation compliance monitoring actions, and there is a negative relation between population and inspections. Counties with the 90th percentile of Hispanic populations receive fewer inspections by 22.290 percent. Similar to the cases of African Americans, higher education attainment is negatively and significantly related.

Model 13 is an intercept-as-outcome model that further takes into account state-level explanatory variables. The level-two residual variance is reduced by 7.047 percent (Table 4.10). Alongside the significant variables in Model 12, one political context variable is significant. Holding other factors constant, states with an ideologically liberal citizenry have more aggressive inspection efforts. In the intercept- and slope-as-outcome model which adds two group-related political variables and associated interaction terms, the results are primarily identical while the residual of the slope of Hispanic vulnerable communities rarely changes. Immigration policy stringency does not predict states' inspection outputs[79]. The presence of

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[78] Models estimated with the 75th and 85th percentiles of Hispanic counties representing the Latino vulnerable communities for inspection and enforcement activities are presented in the Appendices.

[79] In addition to the default models using an un-centered variable of Hispanic vulnerable community, estimates with a group-mean centered variable are performed. The results are consistent and both the main and interactive effects of immigration policy are statistically insignificant.

Table 4.9. Unconditional and Level-One-Predictor-Only Models for Inspections for Hispanic Communities

Variable	Model 11		Model 12	
	Coefficient	Std. Err.	Coefficient	Std. Err.
Intercept	1.575***	0.053	1.248***	0.043
Time	---	---	-0.010	0.027
Lag_Inspection	---	---	0.015***	0.001
Hispanic community (90th percentile)	---	---	-0.233***	0.052
Residents below poverty level	---	---	-0.001	0.003
Resident higher education attainment	---	---	-0.008***	0.002
Unemployment rate	---	---	-0.002	0.006
Regulated facility	---	---	0.009***	0.000
Median household income	---	---	-0.024	0.116
Manufacturing labor employment	---	---	0.101***	0.011
Population	---	---	-1.752***	0.280
Population density	---	---	2.045***	0.282
Land area	---	---	2.061***	0.282
Residual	Variance	χ^2	Variance	χ^2
Level-2 u_{0j}	0.695	7746.874***	0.459	7639.972***
Slope for minority communities u_{3j}	---	---	0.160	472.1764***
Level-1 ε_{ij}	6.318	---	1.946	---

Population-average model; robust standard errors reported

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Table 4.10. Estimates of Predictors for Inspections for Hispanic Communities

Variable	Model 13 Coefficient	Std. Err.	Model 14 Coefficient	Std. Err.	Model 15 Coefficient	Std. Err.
Intercept	1.107***	0.061	1.109***	0.062	1.090***	0.060
Hispanic state legislator	---	---	-0.007	0.007	-0.001	0.008
Democratic strength of state legislature	0.038	0.080	0.048	0.082	0.083	0.087
Democratic governor	0.065	0.067	0.064	0.073	0.090	0.078
Citizen ideology	0.017***	0.003	0.017***	0.003	0.015***	0.003
Democratic president	0.244	0.147	0.242	0.149	0.268	0.148
Environmental spending	0.057	0.040	0.066	0.054	0.031	0.061
Immigration stringency	---	---	-0.006	0.019	-0.011	0.019
Time	-0.062	0.045	-0.060	0.046	-0.067	0.047
Lag_Inspection	0.015**	0.005	0.015**	0.005	0.015**	0.005
Hispanic community (90th percentile)	-0.267***	0.059	-0.327***	0.073	-0.356**	0.113
× Hispanic state legislator	---	---	0.013***	0.004	0.002	0.008
× Democratic strength of state legislature	---	---	---	---	-0.290*	0.140
× Democratic governor	---	---	---	---	-0.067	0.137
× Citizen ideology	---	---	---	---	0.020***	0.006
× Environmental spending	---	---	---	---	0.093	0.069
× Immigration stringency	---	---	0.019	0.023	0.042	0.024
Residents below poverty level	-0.001	0.005	-0.001	0.005	-0.001	0.005
Resident higher education attainment	-0.008**	0.003	-0.008**	0.003	-0.008**	0.003
Unemployment rate	-0.004	0.010	-0.004	0.010	-0.004	0.010
Regulated facility	0.009***	0.002	0.009***	0.002	0.009***	0.002
Median household income	-0.039	0.167	-0.035	0.167	-0.035	0.171
Manufacturing labor employment	0.103***	0.020	0.103***	0.020	0.105***	0.020
Population	-1.723***	0.385	-1.716***	0.378	-1.721***	0.379
Population density	2.013***	0.387	2.006***	0.380	2.007***	0.381
Land area	2.035***	0.394	2.028***	0.387	2.032***	0.387

Residual	Variance	χ^2	Variance	χ^2	Variance	χ^2
Level-2 u_{0j}	0.426	6303.79***	0.429	6583.966***	0.429	6567.269***
Slope for minority communities u_{3j}	0.162	472.1258***	0.165	472.1793***	0.149	361.07***
Level-1 ε_{ij}	1.948	---	1.947	---	1.948	---

Population-average model; robust standard errors reported

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Hispanic state legislators is positively associated with environmental regulation inspections for the Latino vulnerable communities (Model 14, Table 4.10).

When a full set of interaction terms of political variables are introduced (Model 15), the proportion reduction in the variance of the slopes of minority communities is approximately 9.697 percent (Table 4.10). This implies that as opposed to African American cases, general political environments, instead of minority-group-related variables, are more able to account for the variability in the effects of the minority community variable in the cases of Hispanics.

In Model 15, citizen ideology is shown to be more relevant in Hispanic environmentally vulnerable communities, as the variable is statistically significant in both the main and interaction effects. State inspection efforts are more rigorous in the counties with higher percentages of Hispanic residents when citizens are more ideologically liberal. Substantively, with other variables being the same, if the citizen ideology increases by one unit, state inspections grow in those vulnerable communities by 3.559 percent, compared to the size of increase (i.e., 1.489 percent) in non-vulnerable communities. The state immigration policy environment remains insignificant and the explanatory power of Hispanic state legislators drops. However, state legislatures with more Democratic strength are correlated with fewer inspection activities in vulnerable communities. Furthermore, in both Models 14 and 15, counties with a higher percent of Hispanic residents have significantly fewer inspections.

<center>Empirical Results: Enforcement Activities</center>

Models 16 through 20 examine state enforcement activities. The ICC ρ of the unconditional model (Model 16, Table 4.11) is larger than that in the corresponding enforcement model for African Americans. When county-level variables are introduced, the level-one

Table 4.11. Unconditional and Level-One-Predictor-Only Models for Enforcements for Hispanic Communities

Variable	Model 16		Model 17	
	Coefficient	Std. Err.	Coefficient	Std. Err.
Intercept	-0.227**	0.083	-0.436***	0.075
Time	---	---	0.027	0.049
Lag_Enforcement	---	---	0.075***	0.014
Hispanic community (90th percentile)	---	---	-0.046	0.077
Residents below poverty level	---	---	-0.010	0.009
Resident higher education attainment	---	---	-0.004	0.005
Unemployment rate	---	---	0.054***	0.009
Regulated facility	---	---	-0.008	0.006
Lag_EPA_inspection	---	---	0.030	0.017
Median household income	---	---	0.191	0.293
Manufacturing labor employment	---	---	0.061*	0.026
Population	---	---	-0.489	0.755
Population density	---	---	0.790	0.757
Land area	---	---	0.791	0.762
Residual	Variance	χ^2	Variance	χ^2
Level-2 u_{0j}	1.522	8970.227***	1.650	7527.22***
Slope for minority communities u_{3j}	---	---	0.352	259.5403***
Level-1 ε_{ij}	3.007	---	1.553	---

Population-average model; robust standard errors reported

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

intercept variance is reduced by 1.828 percent (Model 17, Table 4.11). Unemployment rate and manufacturing labor employment are significant predictors in the positive direction.

In Model 18 which includes level-two variables, in terms of county-level factors, both unemployment rate and employment in the manufacturing sector remain statistically significant (Table 4.12). As for the level-two variables, state legislatures with high levels of Democratic strength have higher levels of enforcement efforts. Nonetheless, in contrast to inspection models, citizen ideology shows a negative sign, indicating that states with a more liberal citizenry have a less stringent enforcement agenda, albeit with a small magnitude (i.e., $\hat{\beta}$ of -0.034). Results of two full models are consistent (Model 19 and 20, Table 4.12).

In addition to unemployment rate, counties with higher levels of manufacturing employment and more regulated facilities are more likely to receive higher levels of enforcement. Also, a visible presence of Hispanic state legislators is positively associated with general enforcement efforts. However, when it comes to environmentally vulnerable communities, the effects of minority political power decrease by 1.733 percent. Also, state legislatures with greater Democratic strength have greater levels of enforcement. The corresponding interaction term in Model 20 is statistically insignificant, implying that legislatures with Democratic strength are attentive to the importance of regulation enforcements in general, irrespective of ethnic composition. Across the conditional models estimated, unlike inspections, Hispanic vulnerable community itself is not a significant predictor. Likewise, the degenerative policy context pertaining to Hispanics (i.e., immigration policy) is not significant either.

Table 4.12. Estimates of Predictors for Enforcements for Hispanic Communities

Variable	Model 18 Coefficient	Std. Err.	Model 19 Coefficient	Std. Err.	Model 20 Coefficient	Std. Err.
Intercept	-0.270	0.139	-0.305*	0.127	-0.443*	0.082
Hispanic state legislator	---	---	0.037**	0.013	0.009**	0.008
Democratic strength of state legislature	0.995***	0.175	1.021***	0.176	0.588***	0.120
Democratic governor	-0.117	0.162	-0.038	0.156	-0.086	0.112
Citizen ideology	-0.034***	0.005	-0.038***	0.005	-0.020***	0.004
Democratic president	-0.616	0.315	-0.671*	0.290	0.025*	0.130
Environmental spending	-0.041	0.096	-0.174	0.116	-0.059	0.054
Immigration stringency	---	---	-0.071	0.046	0.165	0.053
Time	0.180*	0.076	0.198**	0.077	0.026**	0.021
Lag_Enforcement	0.075***	0.010	0.075***	0.010	0.038***	0.016
Hispanic community (90th percentile)	-0.004	0.070	0.098	0.087	0.598	0.136
× Hispanic state legislator	---	---	-0.017*	0.008	-0.025**	0.007
× Democratic strength of state legislature	---	---	---	---	-0.430	0.125
× Democratic governor	---	---	---	---	0.152	0.091
× Citizen ideology	---	---	---	---	0.010	0.005
× Environmental spending	---	---	---	---	-0.102	0.100
× Immigration stringency	---	---	-0.012	0.032	-0.174	0.057
Residents below poverty level	-0.011	0.008	-0.012	0.008	-0.006	0.005
Resident higher education attainment	-0.003	0.004	-0.003	0.004	-0.005	0.003
Unemployment rate	0.056***	0.007	0.056***	0.007	0.074***	0.007
Regulated facility	-0.008	0.005	-0.008*	0.004	0.004	0.006
Lag_EPA_inspection	0.030	0.018	0.030	0.017	0.005	0.012
Median household income	0.166	0.275	0.150	0.277	0.490	0.174
Manufacturing labor employment	0.057*	0.024	0.058*	0.024	0.077*	0.020
Population	-0.457	0.665	-0.462	0.685	-0.196	0.483
Population density	0.760	0.666	0.766	0.686	0.472	0.480

Land area	0.762	0.672	0.763	0.692	0.480	0.485
Residual	Variance	χ^2	Variance	χ^2	Variance	χ^2
Level-2 u_{0j}	1.444	4988.52***	1.415	4853.835***	1.581	20237.5***
Slope for minority communities u_{3j}	0.353	252.9208***	0.337	232.1799***	0.095	380.7151***
Level-1 ε_{ij}	1.555	---	1.560	---	1.687	---

Population-average model; robust standard errors reported

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

<u>Summary of Results</u>

The empirical findings of the models concerning the implementation practices of the NPDES permit program under the CWA, with a focus on African Americans and Hispanics, share common ground in certain aspects while they differ in others. But there are also some distinct patterns between different types of implementation activities (i.e., inspection and enforcement).

State political environments are critical factors for agencies' regulation compliance monitoring and assurance agenda. Generally speaking, Democratic strength of state legislatures is conducive to environmental regulation enforcement, but not to inspection. In addition, an ideologically liberal citizenry promotes the rigorousness of inspection; nonetheless, it weakens enforcement. However, both factors do not necessarily shed light on the environmental equalities of minority groups in particular. Also, there is some evidence indicating a positive relationship between the presence of racial/ethnic minority state lawmakers and implementation practices (i.e., inspections in the African American models and enforcements in the Hispanic models). But counter-intuitively, with respect to enforcement in both African American and Hispanic cases, minority vulnerable counties receive fewer enforcement actions when the states have more minority legislators.

Furthermore, findings in terms of class-based environmental inequalities vary across models and are inconsistent. With respect to African American models, class-based environmental inequities are found for the variable of median household income in enforcement models, and the variable of residents living below poverty level in inspection models. However, no such evidence (i.e., all variables are insignificant) is observed in the Hispanic models. Furthermore, general political mobilization capacity, which is measured by residents with higher

education, is significant but with an unexpected sign for the inspection models in the Hispanic case. Also, contrary to expectations, unemployment rate predicts enforcements in the positive direction.

In addition, African American vulnerable counties receive more enforcement attention, and their Hispanic counterparts have fewer inspection activities. Put another way, when counties with the top 10th percentile of percent minorities are employed as a proxy for race/ethnicity factors, findings for environmental inequities are distinct for different minority groups, depending on the types of implementation. However, race-based environmental inequalities are consistently observed in the states with a more degenerative policy context targeting African Americans. The group-related degenerative policies are a strong predictor regarding environmental inequalities in policy implementation (both inspection and enforcement) for blacks, but not for Hispanics. Welfare policy stringency in the states adversely impacts the environmental protection benefits of the black vulnerable counties.

Summary

This chapter has empirically analyzed the effects of a broad range of political, socioeconomic, task, and demographic factors on environmental regulation compliance monitoring and assurance activities across states, using a multilevel modeling design. The findings suggest that the explanatory variables do not predict states' inspection and enforcement practices in the same way for two minority groups. In addition, the effects (i.e., significance and size) of these factors differ across the cases of African Americans and Hispanics. One of the most notable observations is the significant impact of the group-related degenerative policy for blacks, whereas such an effect is absent for Latinos. The next chapter discusses the findings and

their implications for environmental inequality issues, the limitations of this study, and directions

for future research.

CHAPTER 5

PRINCIPLED AGENTS? RESEARCH IMPLICATIONS AND PROSPECTS

As reviewed in Chapter 2, since the onset of the environmental justice movement in the 1980s, burgeoning numbers of studies have demonstrated that black and Latino communities have persistently been subject to environmental inequalities in terms of both exposures to risks and government implementation efforts in the United States. In Chapter 3, a theoretical framework was developed for studying factors that might account for race/ethnicity-based inequalities in administrative outputs of regulatory compliance monitoring and assurance activities in the CWA-NPDES permit program. Included were a broad range of political, socioeconomic, task, and demographic factors derived from the literature on agency implementation as well as environmental justice to date. Of particular note, the theoretical framework incorporated the interactions of two unexplored, minority-group-related variables in prior research: the interactions between racial/ethnic demographics and degenerative policies as well as legislative representation. Chapter 4 then tested hypotheses derived from the framework using a multilevel modeling analysis to estimate the effects of both the state- and county-level determinants for two different minority groups (blacks and Hispanics). This analysis confirmed some aspects of prior research, qualified some prior findings, and identified reasons for exploring new variables, especially the social construction of target populations. This concluding chapter proceeds as follows. First, it reviews and interprets the findings of this study in terms of race/ethnicity-based environmental inequalities in America. The next section reviews the limitations of the study, and the chapter then concludes by discussing what the current study suggests about future research directions on this important topic.

<u>Discussion</u>

Tables 5.1 and 5.2 present the theoretical hypotheses and empirical findings regarding the relations between inspection and enforcement activities and the explanatory variables. For the sake of brevity, only the key, full models (i.e., Models 5, 10, 15, and 20) are displayed. The first critical finding of the study is that state political context matters. It has discernible impacts on compliance monitoring and assurance activities in general. However, its influence is less important for accounting for the attention paid to race/ethnicity-based vulnerable populations. The findings indicate that state legislatures with more Democratic strength are more likely to pursue an active regulation enforcement agenda. Also, there is a clear positive relationship between liberal citizen ideology and state's inspection patterns. However, sparse and inconsistent evidence is found in this regard for the socially marginalized groups. As discussed in Chapter 2, environmental policy has been increasingly characterized by bi-dimensionality (i.e., regulatory and redistributive), and this has considerable implications for the environmental equality issue. As suggested by the results, the Democratic strength of state legislatures and a liberal citizenry contribute to greater implementation rigor in ways that promote the environmental well-being for all instead of particular segments of social members. In this sense, environmental protective benefits are more considered as a universal right for social members, irrespective of race and ethnicity.

Second, and surprisingly, in both of the cases of African Americans and Hispanics, higher levels of minority state legislators are associated with fewer enforcement activities for the predominantly minority counties. This implies that the passive representation of racial/ethnic

Table 5.1. Hypotheses and Findings of Independent Variables (African American, Full Model)			
Variable Name	Hypothesis	Finding (Inspection)	Finding (Enforcement)
Black vulnerable community	-	*	+
Stringency of welfare policy	?	+	+
Stringency of welfare policy × black vulnerable community	-	-	-
Black state legislators	?	+	*
Black state legislators × black vulnerable community	+	*	-
Democratic strength of state legislature	+	*	+
Democratic strength of state legislature × black vulnerable community	+	*	-
Democratic governor	+	*	*
Democratic governor × black vulnerable community	+	*	*
Liberal ideology of citizenry	+	+	-
Liberal ideology of citizenry × black vulnerable community	+	*	+
Democratic president	+	*	*
Environmental spending	+	*	*
Environmental spending × black vulnerable community	?	*	*
Median household income	+	-	+
Residents below poverty level	-	-	*
Unemployment rate	-	*	+
Resident higher education attainment	+	*	*
Manufacturing labor employment	?	+	+
EPA inspection (*t-1*)	+	NA	*
Regulated facilities	+	+	*
Population	?	*	*
Population density	?	*	*
Land area	?	*	*

"+": significant, positive association; "-": significant, negative association; "?": not determined; "*": statistically insignificant;
"NA": not available.

Table 5.2. Hypotheses and Findings of Independent Variables (Hispanic, Full Model)			
Variable Name	Hypothesis	Finding (Inspection)	Finding (Enforcement)
Hispanic vulnerable community	-	-	*
Stringency of immigration policy	?	*	*
Stringency of immigration policy × Hispanic vulnerable community	-	*	*
Hispanic state legislators	?	*	+
Hispanic state legislators × Hispanic vulnerable community	+	*	-
Democratic strength of state legislature	+	*	+
Democratic strength of state legislature × Hispanic vulnerable community	+	-	*
Democratic governor	+	*	*
Democratic governor × Hispanic vulnerable community	+	*	*
Liberal ideology of citizenry	+	+	-
Liberal ideology of citizenry × Hispanic vulnerable community	+	+	*
Democratic president	+	*	+
Environmental spending	+	*	*
Environmental spending × Hispanic vulnerable community	?	*	*
Median household income	+	*	*
Residents below poverty level	-	*	*
Unemployment rate	-	*	+
Resident higher education attainment	+	-	*
Manufacturing labor employment	?	+	+
EPA inspection (*t-1*)	+	NA	*
Regulated facilities	+	+	*
Population	?	-	*
Population density	?	+	*
Land area	?	+	*

"+": significant, positive association; "-": significant, negative association; "?": not determined; "*": statistically insignificant;
"NA": not available.

minorities in state legislative bodies does not necessarily translate into active representation (i.e., advocacy of interests or concrete benefits) for people of color in environmental policy implementation. One plausible explanation is that alongside the uniqueness of the racial/ethnic dimension, other political attributes (e.g., party affiliation and political ideology) play an equally critical role in the policy stance and decision-making of minority officeholders. Regarding the transformation between minority passive and active representation, traditional theories argue that lawmakers or bureaucrats who share racial/ethnic experiences, backgrounds, and "linked fate" (Dawnson 1994) should identify with the concerns of their co-ethnic populations, and thus support and advocate for the policy interests of minority populations.

However, an emerging scholarship has increasingly challenged the underlying mechanisms of this automatic transformation. Speaking theoretically, scholars raise questions on how the racial/ethnic dimension interacts with other dimensions (e.g., class or economic). "If minority descriptive representatives are unique, they may not only provide 'more' voting support on one end of an established ideological spectrum but should also exhibit a different 'kind' of representation than nonminority lawmakers." (Preuhs and Hero 2011, 159) Related questions include whether the performances of distinct dimensions vary across policy domains. For instance, racial/ethnic dimensions may be more salient in the issue areas which are group-specific or in which minority groups are long disadvantaged (ibid, p. 158, 160). In addition, few empirical studies have validly distinguished and evaluated the separate effects of these components (Baker and Cook 2005; Hero and Tolbert 1995). Therefore, as the results reveal, descriptive representation of a racial/ethnic minority which is often considered as a sign of political power of the marginalized populations, does not necessarily lead to actual policy benefits for these groups. Instead, other vital political factors need to be taken into account.

This study does not devise an empirical strategy to ascertain the distinct and interactive effects regarding racial/ethnic, partisan, and ideological dimensions. Therefore, caution should be exercised in the interpretation of the current results of the effects of minority descriptive representation on state's environmental policy implementation patterns for racial/ethnic vulnerable populations, as they potentially capture the impacts of other political determinants.

Furthermore, tested with a conventionally adopted proxy variable measuring the presence of minority populations (e.g., percent minority in a given locale), results of race/ethnicity-based environmental inequalities are inconclusive (i.e., significantly increased enforcement for blacks and decreased inspection for Hispanics; insignificance in other cases). However, the interaction effects between African American vulnerable counties and state degenerative policy context are statistically significant in a consistent way. Confirming the hypothesis, the case of African Americans suggests welfare policy stringency, which contributes to the degenerative policy environment pertaining to this particular social group, has significant moderating effects on the environmental policy implementation outputs for these subpopulations. Specifically, the racial minority vulnerable counties receive less implementation attention and effort (i.e., both inspection and enforcement) from environmental protection agencies in the states where welfare policies are stringent. This implementation conundrum may stem from the feedback effects of the degenerative policy context that negatively categorizes minority populations and potentially devalues their deservedness of government's attention. As such, implementation inequalities in the environmental area may be part of the institutional reproduction of the politics of categorization and deservedness in the contemporary U.S., at least for blacks.

Degenerative politics and policies manifest the circumstances in which "policies of government are powerful perpetrators of inequality and creators of an 'underclass'." (Ingram

2007, 245) As part of institutional identities (Loseke 2007), these widely perceived positive or

negative categorizations, stereotypes, and beliefs are closely relevant to the groups' receipt of

beneficial or burdensome policies from government (Schneider and Ingram 1997; 2008). The

more deserving the target populations are perceived to be, the more benefits or fewer burdens the

groups are expected to receive from government (Ingram and Schneider 2006; Ingram,

Schneider, and deLeon 2007). It is noteworthy that the degenerative institutional configuration

targeting minority populations has contributed significantly to the politics of race (for example,

symbolic racism). As Massey (2008) argued, in the post-civil rights era, discriminatory practices

have become subtle while remaining "quite effective in perpetuating racial stratification." (p.

109) To a certain degree, degenerative policies constitute part of the driving forces which

"exacerbate divisiveness around differences" in race and ethnicity and deepen inequality and

injustice (Ingram and Schneider 2005, 26-27). Among others, the experiences of African

Americans have powerfully illustrated the evolution and entrenchment of the categorization of

target populations; and welfare is one of the most notable policies in the context of degenerative

politics (Bensonsmith 2005; Ingram and Schneider 2005; Ingram, Schneider, and deLeon 2007,

113; Newton 2005).

Both historical and sociological institutionalism stresses the importance of the feedback

effects of institutions[80] (e.g., rules, norms, structures, procedures, policies, programs, and

administrative reforms) in a modern polity (Ingram and Schneider 2005; Ingram, Schneider, and

deLeon 2007; March and Olsen 1989; Pierson 1993). Scholars from a policy-centered stance

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[80] Institution is a multifaceted concept adopted and analyzed by multiple disciplines (e.g., political science, sociology, economics, organization studies) and can include formal organizations, formal structures, practices, and formal or informal rules (Hult 2003, 149-150; see also Zucker 1987, 444). Schneider and Ingram (1997) define institutions as "persistent patterns of relationships and interactions including legislatures, courts, administrative agencies, nongovernmental organizations, and the like." (p. 76) As the dissertation illustrates, an interdisciplinary literature exists regarding institution and institutionalism. Consequently, it adopts an "omnibus conception of institutions" and defines institutions as "comprised of regulative, normative and cultural-cognitive elements that, together with associated activities and resources, provide stability and meaning to social life." (Scott 2008, 48)

have argued that public policies are a crucial endogenous force in politics, as "strategies for achieving political goals, structures shaping political exchanges, and symbolic objects conveying status and identity." (Ingram 2007, 246) Given that public bureaucracies wield broad swaths of discretion and leeway in the process of administering policies and programs in a policy devolution setting, the discretion-based power of public bureaucracies could lead to discrimination against particular groups of clients as a result of administrators' "moral or political judgments." (Keiser and Soss 1998, 1134; see also Loyens and Maesschalck 2010; Maynard-Moody and Musheno 2003; Maynard-Moody and Portillo 2010)

In terms of the feedback effects of race-associated degenerative policies on public organizations, on one hand, agencies may see racial or ethnic minorities as less capable or likely of mounting political opposition precisely because of their marginalization (but see Konisky and Reenock 2013). For those disadvantaged or marginalized, the implications of how policy and its implementation have occurred earlier are profound (Soss, Hacker, and Mettler 2007; Soss and Schram 2006). Campbell (2003), for example, illustrated how the erosion of direct service provision has "interpretive effects" that undermine citizen perceptions of self-efficacy and political involvement (Mettler and Soss 2004; see also Berry, Portney, and Thompson 1993). The less citizens perceive policies affecting themselves directly or working in their favor, the less citizens participate in decision making processes or the less likely they are to see support for these programs as important to their lives. Minority populations who have been negatively categorized in the political process may suffer from a low sense of political efficacy themselves, and thus become less engaged in seeking higher levels of environmental policy implementation in the political realm, making lower efforts by enforcement agencies less subject to political pressures to act otherwise.

On the other hand, subtly but plausibly, implementation inequalities can be part of the aftermath of the "institutionalization of bias" created by degenerative policies (Ingram and Schneider 2005, 19). Degenerative policies essentially are the products of the politics of categorization in terms of different social members. "Policy teaches lessons about the type of groups people belong to, what they deserve from government, and what is expected of them. The messages indicate whether the problems of the target population are legitimate ones for government attention." (Schneider and Ingram 1993, 340) Public bureaucracies, which are a proactive and responsive institution as well as a value-laden actor in their own right in the political arena, could be informed by degenerative policies and produce policy treatment in accordance with its underlying logic and "informational content." (Pierson 1993, 622) As such, plausibly, they may see the minority populations which have been negatively categorized by degenerative policies as less deserving of environmental protective benefits or attention from government and then make redistributive decisions. Consequently, the aggressiveness of implementation efforts can be a function of political pressures (part of which may be mounted by the marginalized) and responses to the feedback effects of degenerative policies.

Nonetheless, no evidence is observed regarding the effects of degenerative policy on inspections or enforcement when it comes to Latino communities of concern. One explanation for these results is faulty measurement of the stringency level of state immigration policies. Currently, there is no readily analyzable data set concerning whether immigration policies in a given state restrict or expand benefits to immigrants. The widely adopted practice is content analysis and coding of a wide array of policy documents, which is also the research technique used in this dissertation. To further examine this issue and to check the robustness of the present analysis, this study employs an alternative coding of the Immigrant Policy Project of the NCSL,

which is developed by Monogan (2013a; 2013b), to perform the sensitivity tests. Specifically, two inspection models and two enforcement models are run (corresponding to Models 14, 15, 19, and 20). The results of the alternative models are consistent with the original models and remain largely unchanged (details not reported here).

Two other possible explanations exist. The first is the relatively short research time frame. As described in Chapter 3, the surge of state activeness in policymaking in immigration area started from the mid-2000s and the longitudinal data of this study covers only six years (i.e., 2005 through 2010). This short time period more or less constrains the capacity of this study to investigate temporal variation in this variable.

The other possibility is omitted variable bias, which is a potential limitation of this study. As noted in the empirical results, in contrast to general political environments, inclusion of two minority-group-related variables (both the direct and moderating effects considered) does not help reduce the residual of the slope of the variable for the Hispanic communities of concern. However, these relative effects are opposite in the case of blacks. This implies that, on one hand, the degenerative policy context for Latinos, at least from 2005 to 2010, is not so salient as that for African Americans. On the other side, some other factors (local- and/or state-level) may better account for variation in states' implementation for the Hispanic vulnerable counties, and probably to a certain extent, counteract the impact of the degenerative policy context. For instance, Konisky and Reenock (2013) demonstrated that in the case of the CAA, bias in bureaucrats' propensity of non-compliance reporting can be alleviated by the political mobilization of communities of color for Hispanics (but the relationship is not statistically significant for African Americans).

Fourth, in the area of wastewater management during the research period, the evidence of class-based environmental inequalities varies across models, particularly with respect to different types of implementation activities (i.e., inspection and enforcement). As conventionally argued, communities of low-socioeconomic status are more vulnerable in terms of the proximity to noxious facilities, the adverse health impact, or inequitable regulation enforcement. Three measures in this respect predict policy implementation in an inconsistent way. For instance, variables of residents living below poverty level are only significant in inspection models of blacks. Although median household income is statistically significant in both inspection and enforcement of African American case, the sign is not identical across models, with the latter confirming the hypothesis of class-related environmental injustice. In addition, unemployment rate, which is a related variable, is significant with a positive sign in enforcement models, implying that state agencies have a more active enforcement pattern in the counties with high unemployment rate. Taken together, class-based environmental inequity is inconsistent. It is worth mentioning that communities with more residents with higher education attainment, which are perceived to be more politically conscious and have more political mobilization capacity, receive less implementation attention.

Fifth, task environment is highly relevant to state's environmental policy implementation, which is compatible with the literature of public administration. Specifically, it is understandable that the amount of regulated facilities is more likely to make a difference in agency's inspection agenda that aims to identify problems, while rarely is such an effect found in enforcement. Likewise, generally, regulation inspections and enforcements are more rigorous in counties with more manufacturing labor employment.

Lastly, it is worth noting that the findings concerning several key variables at the local

level (e.g., measure of racial/ethnic minority composition, residents living below poverty level,

residents with higher education attainment, lagged EPA inspections, population density, and

unemployment rate), as well as at the state level (e.g., the relative strength of partisanship in state

legislatures, citizen ideology) are largely consistent with those of Konisky and Schario (2010) as

well as those of Konisky (2009a). The former employed a facility-level analysis with an areal

apportionment method in terms of census tract and block group, and the latter performed a

county-level analysis. That said, the potential aggregation bias issues, due to the use of county as

the primary unit of analysis, do not pose a distinctly severe threat to the validity of inferences of

the local-level predictors in the current study[81].

Limitations of the Study

Several limitations of this study merit attention. First, as discussed above, this study may

not disentangle the effects of minority descriptive representation and other important political

factors. As such, the effects of the former to a certain extent may absorb those of the latter. To

comprehensively understand these interactive mechanisms, on one hand, quantitative analysis

needs to be expanded to consider the joint role of state legislators' party affiliation and political

ideology in the transformation process from higher levels of inclusion of minorities in states'

lawmaking bodies to concrete policy attention to and advocacy for the socially marginalized. On

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[81] The consistency with these two previous studies does not undermine the unique contributions of this study. First and foremost, the contributions and major research interests of this study are the moderating effects of key political/contextual variables (level-two predictors) on the implementation activities for the communities of concern. Although some research considers several key political, contextual factors (Konisky and Schario 2010; no state-level variables in Konisky 2009a), it does so by simply examining the direct effects of these variables but not their moderating effects. These scholars are more interested in assessing the relation between racial/ethnic minority demographics and agencies' enforcement activities. Their concerns are whether agencies have more or fewer enforcement activities for the communities of concern, or whether agencies' actions vary across different percent minority populations, controlling for selected political and contextual variables. They do not assess whether, and the extent to which, these variables affect agencies' outputs for the communities of concern. Second, this study adopts a more recent research time frame: 1996-2010. Konisky (2009a) focused on 1985 through 2000, while Konisky and Schario (2010) focused on 2000 through 2005.

the other hand, qualitative studies also can help examine minority officeholders' perception of and commitment to environmental equality issue, as well as the dynamics with a broader political context.

The second limitation comes from the focus on a macro-level study of the feedback effects of degenerative policy context pertaining to racial/ethnic minority populations, instead of a micro-level examination of a more direct mechanism of depreciation and disparagement against those subpopulations by front-line – i.e., street-level enforcement agents. "The social construction of target populations refers to the cultural characterizations or popular images of the persons or groups whose behavior and well-being are affected by public policy." (Schneider and Ingram 1993, 334) Although degenerative policy design is an inherent, potent reflection of such a mechanism, it does not directly measure the social construction of or public attitudes toward target populations held by street-level, enforcement bureaucrats.

This study does not have direct survey data testing the attitudes of street-level bureaucrats. Of course, questions of how honest they would be in reporting biases are real and, thus, survey results would be dubious unless couched in ways that more indirectly test those attitudes. Perhaps survey data tapping into liberal-conservative ideology might be helpful in this regard, and should be pursued in future research. Consequently, despite taking an important, exploratory step to investigate the effects of degenerative policies, this study cannot fully tap into the social stereotyping and valancing of target groups like racial/ethnic minorities. Given its explanatory strength in several of the models, however, this dynamic certainly warrants further investigation.

Another weakness of this study involves the use of county-level data as the primary unit of analysis. Albeit theoretically and substantively justified given the research questions, a county-level examination may be subject to the ecological fallacy (or aggregation bias), which

Chapter 3 has discussed extensively. Therefore, sensitivity tests with a lower geographical level (e.g., census tract, block group, facility) need to be performed in the future to gauge the potential variations due to using different spatial scales. In order to further analyze these research questions, I have already begun the collection and management of block-group-level facility geographical data. Specifically, facility census block code that is recently made available by EPA enables a matching with the 2000 Census, as regards the information of the racial/ethnic composition, resident socioeconomic status, and local economic circumstance in a given geographical locale.

<div align="center">Directions for Future Research</div>

Over the years, the normative goal of protecting all social members regardless of race or ethnicity from environmental harms has proven controversial and difficult in practice. Research on race/ethnicity-oriented environmental justice is an ongoing, multidisciplinary agenda. In addition to further investigations of the problems identified in the preceding section, there are more pertinent issues to be probed on the environmental policy implementation patterns related to the socially marginalized populations.

First, as noted, the findings of this study attest to the relevance of minority-group-related factors in the national wastewater management program. Research scope should be extended in future studies to other environmental pollution regulations (e.g., the CAA and RCRA), in which scholars have raised analogous concerns of environmental inequality. Also, for those programs, it is of empirical importance to examine the potential variations between inspection and enforcement practices, as have been observed in the case of the CWA-NPDES permit program (Konisky 2009a).

In addition, research strategies should be diversified to examine the environmental regulatory process and implementation styles of state agencies for minority-specific vulnerable communities. This study predominantly relies on large-N quantitative designs to reveal the general patterns concerning the effects of a number of political, socioeconomic, task, and demographic determinants. However, these techniques are comparably weak in terms of process tracing, contextual investigation, and identification of underlying causal mechanisms (Brady and Collier 2004; Goertz and Mahoney 2012). As a result, prior research needs to be complemented with mixed-method research designs to address these issues.

As discussed in Chapters 2 and 3, state agencies wield substantial discretion and autonomy in the process of environmental policy implementation and street-level bureaucrats play a particularly noteworthy role. Currently, scholarship has been growing with respect to employing surveys to examine frontline implementation styles in general, as well as the interactions between public administrators and the regulated community (e.g., Fineman 1998; May and Winter 1999; Pautz 2012; Pautz and Rinfret 2011; Rinfret and Pautz 2013). Given the heightened attention to environmental inequality issues at the state level, surveys of public administrators (specifically the frontline agents) should be conducted with focuses on issues such as the implementation practices and styles that are related to the communities with visible presence of racial/ethnic minorities, how minority stakeholders are involved in the regulatory process, and the role of public agents in the policy agenda of environmental equity. Such research endeavors potentially contribute to extant scholarship in which social perceptions of target populations lead to distinct policy implementation outputs by street-level bureaucrats (e.g., Keiser, Mueser, and Choi 2004; Maynard-Moody and Musheno 2003; Nicholson-Crotty and Nicholson-Crotty 2004).

Likewise, despite increased issue awareness, states' policy intervention remains patchy and their strength varies significantly (see Hastings Public Law Research Institute 2010; U.S. Commissions for Civil Rights 2003). In this circumstance, within-case studies are conducive to the understanding of the issue diagnosis, intervention trajectory, as well as program characteristics in the realm of environmental equality. More importantly, in-depth case studies help ascertain whether in a given state there is a relation between specific policy designs (e.g., siting and permitting procedure, compliance monitoring and assurance practices, geographic information systems, re-organization of agencies, public-private collaborations, and language assistance for individuals of limited English proficiency) and the policy outcomes (e.g., environmental outcomes or meaningful issue engagement of minority communities). To a certain extent, a descriptive and/or exploratory case study can help set in motion viable quantitative probes into the potential influence of state's environmental justice policies and programs.

Furthermore, minority vulnerable communities need to be incorporated into the research on the political dynamics of agencies' implementation practices in a more thorough way. Environmental justice scholars have called for a better connection between minority grassroots activism and government's responses to the issue, from the process of policy formulation to implementation (Pellow and Brulle 2005; Peña 2005b). Over the years, a burgeoning number of empirical studies with high-quality data and sophisticated methodological designs have helped depict the role of minority mobilization in promoting environmental benefits for these segments of populations. Especially well-researched are the levels of their mobilizability in terms of different environmental issue areas (e.g., air, water, hazardous waste). As a significant move in advancing the robustness of empirical research on environmental justice, Konisky and Reenock

(2013) showed that the bottom-up political resources and activism of racial/ethnic minorities have drawn higher levels of agency implementation attention.

More important, research of this kind (e.g., Konisky and Reenock 2013) facilitates the study of the empirical puzzles of social construction theories which argue that government policy benefits/costs are a function of political resources and socially perceived deservedness of target populations. Also, there may be interactive relations between both. Therefore, future investigations in this regard should be undertaken. For instance, political participation of target populations constitutes a pivotal part of the feedback effects of the degenerative policy context or broader valancing environment. Following both social constructivist and historical institutionalist perspectives, and as noted earlier, scholars have demonstrated how and why the constitutive effects of degenerative policies can influence the perceptions of target populations concerning their ability to influence policies and their implementation (Mettler and Soss 2004). Degenerative policies can adversely affect the perception of minorities' political efficacy, particularly with respect to the definition of problems, orientation toward government, as well as political and policy participation (Mettler and Soss 2004; Soss 1999). Political scientists have connected the design of administrative structures, policies, and procedures with citizens' negative perceptions of themselves and their sense of political efficacy (Cook 1996; Ingram and Smith 1993; Ingram, Schneider, and deLeon 2007; Mettler 1998; 2011; Pierson 2004; Skocpol 2003; Soss and Schram 2006; Soss, Hacker, and Mettler 2007; Stone 2012). These negative perceptions, in turn, have been shown to reduce the propensity of citizens to pay attention to government, value what it does for them, participate in the political process, and be mobilizable for political action.

Finally, related to the issue of passive (demographic) and active (substantive) representation of state minority legislators is whether representative bureaucracies (e.g., managers, street-level public administrators) in state agencies contribute to active policy implementation and improved government service delivery for racial/ethnic minorities in the environmental realm (e.g., Dolan and Rosenbloom 2003). As far as this study is concerned, no empirical study has been undertaken in this area, in stark contrast to the fruitful research on a host of policies, such as education, social service, and criminal justice.

Although this is a promising research direction, a series of challenges remain formidable. First, the variations in the racial/ethnic composition of the agency workforce in a given state may not be sufficient to enable a viable empirical examination. Given that the workforce composition of a state agency is relatively stable over time, one may need to take advantage of the inter-state heterogeneity of the public workforce by conducting a cross-sectional study to discern the effects of bureaucratic representation on environmental implementation activities for minority populations. A second issue arises, however. Access to comprehensive profile information for public administrators in a state environmental protection agency, or among units, is generally difficult in the states.

As opposed to the distribution effects of health and risk impacts related to facility location for people of color, those resulting from government implementation practices are much more obscure. Considerable studies of site location patterns underscore the distribution of pollution costs (e.g., fewer opportunities to get access to good environment quality which eventually bear on individuals' health conditions). However, relatively little research has examined possible contributing factors to the phenomena of environmental implementation

inequities for the vulnerable communities, especially racial/ethnic minority groups, and how a state's political, contextual attributes exert influence in the process.

As Frederickson (1990) maintained, social equity is the "third pillar" of public administration, which stands as importantly as economy and efficiency. Currently, research on inequitable implementation practices across social members of distinct demographics raises concerns about the uneven distribution of protective benefits (e.g., regulatory and legal compliance monitoring and assurance activities) for which government agencies have primary responsibilities. These circumstances challenge the "convenient assumption" that citizens receive government services and support on an equitable basis (Frederickson 1990). Sharing these concerns, this study indicates that there is a need for us to move beyond a research agenda which simply concentrates on the demographic context of populations of color. A more important question is what factors are responsible for the varied government service outputs between minority and majority populations. As suggested by this study, political contexts, particularly those that are minority-related, can play a critical role in race/ethnicity-based environmental inequalities in the process of policy implementation.

APPENDICES

Multilevel Model Specifications

General Multilevel Models

General two-level models (Hox 2010; Raudenbush and Bryk 2002; Snijders and Bosker 2012) are specified as follows:

Level-One:

$$Y_{ij} = \beta_{0j} + \beta_{1j}x_{1ij} + \beta_{2j}x_{2ij} + \ldots + \beta_{hj}x_{hij} + \varepsilon_{ij}$$

Level-Two:

$$\beta_{0j} = \delta_{00} + \delta_{01}w_{1j} + \delta_{02}w_{2j} + \ldots + \delta_{0p}w_{pj} + u_{0j}$$
$$\beta_{1j} = \delta_{10} + \delta_{11}w_{1j} + \delta_{12}w_{2j} + \ldots + \delta_{1p}w_{pj} + u_{1j}$$
$$\vdots$$
$$\beta_{hj} = \delta_{h0} + \delta_{h1}w_{1j} + \delta_{h2}w_{2j} + \ldots + \delta_{hp}w_{pj} + u_{hj}$$

where:

Y_{ij}: outcome variable, in level-one unit i ($i = 1, 2, \ldots, n_j$) nested within level-two unit j ($j = 1, 2, \ldots, J$);

x_{hij}: $h = 1 \ldots H$ level-one variables x;

w_{pj}: $p = 1 \ldots P$ level-two variables w;

$\beta_{0j}, \ldots, \beta_{hj}$: level-one coefficients (i.e., fixed effects);

β_{0j}: each level-two unit j's mean on outcome variable (the mean level of outcome variable in state j);

β_{hj}: the main effect of level-one predictor x_{hij};

$\delta_{h0}, \ldots, \delta_{hp}$: level-two coefficients (i.e., fixed effects);

δ_{00}: grand or overall mean on outcome variable (the mean across units of two levels);

δ_{h0}: intercept for level-two unit j in modeling the level-one effect β_{hj};

δ_{hp}: the main effect of level-two predictor w_{pj};

ε_{ij}: residual at level one, $\varepsilon_{tij} \sim N(0, \sigma^2)$, level-one random effect representing the deviation

of level-one unit n_j's value from the predicted value based on the level-one model[82];

u_{hj}: residual at level two, $u_{hj} \sim N(0, \tau^2)$, level-two random effect representing the

deviation of level-two unit j's level-one coefficient β_{hj} from the predicted value based on the

level-two model.

Intercepts-and Slopes-as-Outcomes Models in this Study

Taking a general two-level regression model as an example, a simple random coefficients

regression model considers both level-one intercept and level-one slope(s) as "varying randomly

over the population of level-2 units." (Raudenbush and Bryk 2002, 26)[83]

Full models:

$$Y_{ij} = \beta_{0j} + \beta_{1j}x_{ij} + \varepsilon_{ij}$$
$$\beta_{0j} = \delta_{00} + u_{0j}$$
$$\beta_{1j} = \delta_{10} + u_{1j}$$

Combined model:

$$Y_{ij} = \delta_{00} + \delta_{10}x_{ij} + u_{1j}x_{ij} + u_{0j} + \varepsilon_{ij}$$

Furthermore, in random coefficients models, level-one regression coefficients (intercept,

slope, or both) can be estimated by level-two variables to reduce the unexplained variability in

multilevel models (e.g., level-one residual can be diminished by introducing level-one variables

(Raudenbush and Bryk 2002, 27). Level-two variables help reduce level-two error term; and so

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[82] The key assumption in multilevel models is that all residuals (i.e., ε_{ij} and u_{0j}) are mutually independent and normally distributed with a mean of zero and variance (σ^2 and τ^2 respectively) given the explanatory variables. The residuals represent the unexplained variability of corresponding level in the model (Raudenbush and Bryk 2002, 229; Snijders and Bosker 2012). The expression of disturbance terms implies "no assumption that these predictors [at each level] fully account for the variation in outcome variable at the different levels." (Steenbergen and Jones 2002, 229)

[83] In a random intercept model, intercept is the only random effect. In a random slope model, both intercept and slope(s) vary randomly.

on) (Snijders and Bosker 2012, 80). To be specific, in an intercept-as-outcome model, the level-one regression intercept is predicted by level-two variables. For example,

$$Y_{ij} = \beta_{0j} + \beta_{1j}x_{1ij} + \beta_{2j}x_{2ij} + \ldots + \beta_{hj}x_{hij} + \varepsilon_{ij}$$
$$\beta_{0j} = \delta_{00} + \delta_{01}w_{1j} + \delta_{02}w_{2j} + \ldots + \delta_{0p}w_{pj} + u_{0j}$$
$$\beta_{1j} = \delta_{10} + u_{1j}$$

If one or more random slopes are expected to be explained by level-two variables (ibid, p. 80, 92; in the case that we expect the slope of x_{hij} varies by level-two unit or the effects of x_{hij} varies at the level-two basis), a model involves a number of cross-level interaction terms. For instance,

$$Y_{ij} = \beta_{0j} + \beta_{1j}x_{1ij} + \beta_{2j}x_{2ij} + \ldots + \beta_{hj}x_{hij} + \varepsilon_{ij}$$
$$\beta_{0j} = \delta_{00} + \delta_{01}w_{1j} + \delta_{02}w_{2j} + \ldots + \delta_{0p}w_{pj} + u_{0j}$$
$$\beta_{1j} = \delta_{10} + \delta_{11}w_{1j} + \delta_{12}w_{2j} + \ldots + \delta_{1p}w_{pj} + u_{1j}$$
$$\beta_{2j} = \delta_{20} + \delta_{21}w_{1j} + \delta_{22}w_{2j} + \ldots + \delta_{2p}w_{pj} + u_{2j}$$
$$\vdots$$
$$\beta_{hj} = \delta_{h0} + \delta_{h1}w_{1j} + \delta_{h2}w_{2j} + \ldots + \delta_{hp}w_{pj} + u_{hj}$$

Related to this study, it is theoretically anticipated that political environments are particularly relevant to race/ethnicity-based policy implementation inequalities. Therefore, interaction effects between the community variable and variables of political environment are of substantive interest. Since it is theoretically ungrounded and empirically complicated to have a full set of interaction terms between all level-one and level-two variables (Snijders and Bosker 2012, 90-91; see also Franzen and Vogl 2012, 17), this study concentrates on those which make sense in the environmental inequity sphere, as suggested above. Also, theoretically speaking, in terms of the effects of level-one (i.e., county) predictors, only those of environmentally vulnerable communities (i.e., counties with high percent of racial/ethnic minorities) are randomly varying (i.e., affected by level-two predictors or varies as a function of selected level-two predictors), and the effects of remaining predictors are modeled as fixed (Steenbergen and Jones

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2002, 229). In sum, the inclusion of interaction effects is a theoretically-driven decision, implying that one or more level-two variables are able to moderate the effects (slopes) of selected level-one variables on the outcome.

Thus, the general two-level models are tailored to the research questions as intercepts-and slopes-as-outcomes models (e.g., county-year and state-year):

Level-One (county-year, i):

$$Y_{ij} = \beta_{0j} + \beta_{1j}x_{1ij} + \beta_{2j}x_{2ij} + \ldots + \beta_{hj}x_{hij} + \varepsilon_{ij}$$

Level-Two (state-year, j):

$$\beta_{0j} = \delta_{00} + \delta_{01}w_{1j} + \delta_{02}w_{2j} + \ldots + \delta_{0p}w_{pj} + u_{0j}$$
$$\beta_{1j} = \delta_{10} + \delta_{11}w_{1j} + \delta_{12}w_{2j} + \ldots + \delta_{16}w_{6j} + u_{1j}$$
$$\beta_{2j} = \delta_{20} + u_{2j}$$
$$\vdots$$
$$\beta_{hj} = \delta_{h0} + u_{hj}$$

Two-level models are combined as:

$$Y_{ij} = \beta_{0j} + \beta_{1j}x_{1ij} + \beta_{2j}x_{2ij} + \ldots + \beta_{hj}x_{hij} + \varepsilon_{ij}$$
$$= \delta_{00} + \delta_{01}w_{1j} + \delta_{02}w_{2j} + \ldots + \delta_{0p}w_{pj} + u_{0j} + \delta_{10}x_{1ij} + \delta_{11}w_{1j}x_{1ij} + \ldots + \delta_{16}w_{6j}x_{1ij} + u_{1j}x_{1ij}$$
$$+ \delta_{20}x_{2ij} + u_{2j}x_{2ij} + \ldots + \delta_{h0}x_{hij} + u_{hj}x_{hij} + \varepsilon_{ij}$$
$$= \delta_{00} + \sum_{p=1}^{P}\delta_{0p}w_{pj} + \sum_{h=1}^{H}\delta_{h0}x_{hij} + \sum_{s=1}^{S}\delta_{1s}w_{sj}x_{1ij} + \sum_{h=1}^{H}u_{hj}x_{hij} + u_{0j} + \varepsilon_{ij}$$

where:

Y_{ij}: aggregated number of implementation activities in county i ($i = 1, 2, \ldots, n_j$) within state j ($j = 1, 2, \ldots, J$);

x_{hij}: $h = 1 \ldots H$ level-one/county-dependent/between-county variables x;

w_{pj}: $p = 1 \ldots P$ level-two/state-dependent/between-state variables w;

w_{sj}: $s = 1 \ldots S$ state-level independent variables interacting with racial/ethnic communities.

<u>Models with Different Thresholds of Racial/Ethnic Minority Percentile</u>

This section reports the results of the sensitivity tests using different thresholds of racial/ethnic minority percentile (i.e., the top 15th and 25th). Two sets of full models (i.e., intercept- and slope-as-outcome) are performed. One includes the interaction terms with minority-group-related variables only and the other includes interactive effects of other related political variables. Detailed results are not presented.

African American Models

Models are estimated for the scenario of counties with the top 15th and 25th percentile of percent of African Americans. The results of the top 15th are primarily similar to the baseline model (i.e., with the top 10th percentile). An exception is that higher education attainment is significantly negative in a consistent way in terms of both inspections and enforcements. The results of the top 25th percentile differ in some aspects. For instance, the variable of residents with higher education attainment is significantly negative in two types of implementation activities. In inspection models, the sign of year trend reverses, implying an increased trend. Also, the interaction terms between minority state legislator and vulnerable communities are insignificant in enforcement models. It is noteworthy that for both inspection and enforcement activities, the main and interaction effects of degenerative policy are consistently, statistically significant (Table A1).

Hispanic Models

With respect to the models with the top 15th percentile, the results are largely compatible with those of the baseline models. However, there is a negative relation between higher education attainment and implementation practices. Furthermore, the interaction terms regarding Hispanic state legislator in enforcement models turn insignificant. As for the top 25th percentile

scenario, there are two notable differences. First, higher education attainment becomes significantly negative, like in the African American cases. In addition, the main effects of Hispanic state legislators in three out of four models and interaction terms in all models are statistically significant, with positive and negative signs respectively. This means that states with higher levels of Hispanic lawmakers are prone to promote implementation activities in general; nonetheless, those effects are smaller in the ethnic-minority vulnerable counties.

Table A.1. Effects of Welfare Policy Stringency for Counties with Selected Percentile Thresholds of African Americans

Implementation	Percentile	Model	Main Effects	Interaction Effects
Inspection	75th	A	0.138184	-0.04928
		B	0.137112	-0.05282
	85th	A	0.133256	-0.09802
		B	0.132114	-0.09054
Enforcement	75th	A	0.182378	-0.08159
		B	0.178303	-0.06434†
	85th	A	0.156209	*
		B	0.154272	-0.08648

Model A: including interaction terms with minority-group-related variables.

Model B: including interaction terms with other related political variables.

Significant at .05 level unless indicated otherwise.

† significant at .10 level.

* not statistically significant.

REFERENCES

Adebowale, Maria. 2008. "Understanding Environmental Justice: Making the Connection between Sustainable Development and Social Justice." In *Social Justice and Public Policy: Seeking Fairness in Diverse Societies*, ed., Gary Craig, Tania Burchardt and David Gordon. Bristol: The Policy Press: 251-276.

Anderton, Douglas L. 1996. "Methodological Issues in the Spatiotemporal Analysis of Environmental Equity." *Social Science Quarterly* 77(3): 508-515.

Anderton, Douglas L., Andy B. Anderson, John M. Oakes, and Michael R. Fraser, 1994. "Environmental Equity: The Demographics of Dumping." *Demography* 31(2): 229-48.

Ash, Michael, and T. Robert Fetter. 2004. "Who Lives on the Wrong Side of the Environmental Tracks? Evidence from the EPA's Risk-Screening Environmental Indicators Model." *Social Science Quarterly* 85(2):441-462.

Ash, Michael, James K. Boyce, Grace Chang, and Helen Scharber. 2013. "Is Environmental Justice Good for White Folks? Industrial Air Toxics Exposure in Urban America." *Social Science Quarterly* 94(3): 616-636.

Atlas, Mark. 2001. "Rush to Judgment: An Empirical Analysis of Environmental Equity in U.S. Environmental Protection Agency Enforcement Actions." *Law & Society Review* 35(3): 633-682.

Baden, Brett M., and Don L. Coursey. 2002. "The Locality of Waste Sites within the City of Chicago: A Demographic, Social, and Economic Analysis." *Resource and Energy Economics* 24(1-2): 53-93.

Baden, Brett M., Douglas S. Noonan, and Rama Mohana R. Turaga. 2007. "Scales of Justice: Is There a Geographic Bias in Environmental Equity Analysis." *Journal of Environmental Planning and Management* 50(2): 163-185.

Baker, Andy, and Corey Cook. 2005. "Representing Black Interests and Promoting Black Culture: The Importance of African American Descriptive Representation in the U.S. House." *Du Bois Review* 2(2): 1-20.

Baumer, Eric P., Kevin T. Wolff, and Ashley N. Arnio. 2012. "A Multicity Neighborhood Analysis of Foreclosure and Crime." *Social Science Quarterly* 93(3): 577-601.

Bearden, David M., Claudia Copeland, Linda Luther, James E. McCarthy, Linda-Jo Schierow, and Mary Tiemann. 2011. *Environmental Laws: Summaries of Major Statutes Administered by the Environmental Protection Agency*. Washington, DC: Congressional Research Service.

Been, Vicki. 1994a. "Unpopular Neighbors: Are Dumps and Landfills Sited Equitably?" *Resources* 115: 16-19.

———. 1994b. "Locally Undesirable Land Uses in Minority Neighborhoods: Disproportionate Siting or Market Dynamics?" *Yale Law Journal* 103: 1383-1422.

———. 1995. "Analyzing Evidence of Environmental Justice." *Journal of Land Use and Environmental Law* 11: 1-36.

Been, Vicki, and Francis Gupta. 1997. "Coming to the Nuisance or Going to the Barrios? A Longitudinal Analysis of Environmental Justice Claims." *Ecology Law Quarterly* 24(1):1-56.

Benford, Robert. 2005. "The Half-Life of the Environmental Justice Frame: Innovation, Diffusion, and Stagnation." In *Power, Justice, and the Environment: A Critical Appraisal of the Environmental Justice Movement*, ed., David Naguib Pellow and Robert J. Brulle. Cambridge: The MIT Press: 37-53.

Bensonsmith, Dionne. 2005. "Jezebels, Matriarchs, and Welfare Queens: The Moynihan Report of 1965 and the Social Construction of African-American Women in Welfare Policy." In *Deserving and Entitled: Social Constructions and Public Policy*, ed., Anne L. Schneider and Helen M. Ingram. Albany: State University of New York Press. 243-259.

Berry, Jeffrey M., Portney, Kent E., and Ken Thompson. 1993. *The Rebirth of Urban Democracy*. Washington, DC: Brookings Institution Press.

Berry, William D., Evan J. Ringquist, Richard C. Fording, and Russell L. Hanson. 1998. "Measuring Citizen and Government Ideology in the American States, 1960-93." *American Journal of Political Science* 42(1): 327-348.

Berry, William D., Richard C. Fording, Evan J. Ringquist, Russell L. Hanson, and Carl Klarner. 2010. "Measuring Citizen and Government Ideology in the American States: A Re-appraisal." *State Politics and Policy Quarterly* 10(2): 117-135.

Blakeslee, Mary E., and Fang Rong. 2006. *State Environmental Agency Contributions to Enforcement and Compliance*. Washington, DC: Environmental Council of the States.

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

Bowen, William M. 2001. *Environmental Justice through Research-Based Decision Making*. New York: Garland Publishing.

Bowen, William M., Mark J. Sailing, Kingsley E. Haynes, and Ellen J. Cyran. 1995. "Toward Environmental justice: Spatial Equity in Ohio and Cleveland." *Annals of the Association of American Geographers* 85: 641-63.

Bowen, William M., and Michael V. Wells, 2002. "The Politics and Reality of Environmental Justice: A History and Considerations for Public Administrators and Policy Makers." *Public Administration Review* 62 (6): 688-698.

Boyce, James K. 2007. "Inequality, and Environmental Protection." In *Inequality, Collective Action, and Environmental Sustainability*, ed., J. M. Baland, P. Bardhan, and S. Bowles. Princeton: Princeton University Press: 314-348.

Brady, Henry E., and David Collier (ed.). 2004. *Rethinking Social Inquiry: Diverse Tools, Sared Standards*. Lanham: Rowman & Littlefield Publishers, Inc.

Branton, Regina, Erin C. Cassese, Bradford S. Jones, and Chad Westerland. 2011. "All Along the Watchtower: Acculturation Fear, Anti-Latino Affect, and Immigration." *The Journal of Politics* 73(3): 664-679.

Brodkin, Evelyn Z. 1997. "Inside the Welfare Contract: Discretion and Accountability in State Welfare Administration." *Social Service Review* 71(1): 1-33.

Brown, R. Steven, and Valerie Green. 2001. *Report to Congress: State Environmental Agency Contributions to Enforcement and Compliance*. Washington, DC: Environmental Council of the States.

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

Bryner, Gary C. 2003. "Public Organizations and Public Policies." In *The Handbook of Public Administration*, ed., B. Guy Peters, and Jon Pierre. Los Angeles: Sage Publications. 300-309.

Buck, Susan J. 1996. *Understanding Environmental Administration and Law*. Second edition. Washington, DC: Island Press.

Bullard, Robert D. 1990. *Dumping in Dixie: Race, Class, and Environmental Quality*. Boulder: Westview.

———. 1993. "Waste and Racism: A Stacked Deck?" *Forum for Applied Research and Public Policy* 8: 29-35.

———. 1994. The Legacy of American Apartheid and Environmental Racism. *St. John's Journal of Legal Commentary* 9: 445–474.

———. 2000. *Dumping in Dixie: Race, Class, and Environmental Quality*. Third Edition. Boulder, Colorado: Westview.

———. 2005. "Environmental Justice in the Twenty-first Century." In *The Quest for Environmental Justice: Human Rights and the Politics of Pollution*, ed., Robert D. Bullard. San Francisco: Sierra Club Books: 19-42.

Bullard, Robert D., and Glenn S. Johnson. 2000. "Environmental Justice: Grassroots Activism and Its Impact on Public Policy Decision Making." *Journal of Social Issues* 56(3):555-78.

Bullard Robert D., Mohai Paul, Saha Robin, Wright Beverly. 2007. *Toxic Wastes and Race at Twenty 1987–2007: Grassroots Struggles to Dismantle Environmental Racism in the United States*. Cleveland: United Church Christ Justice & Witness Ministries.

Campbell, Andrea Louise. 2003. *How Policies Make Citizens: Senior Political Activism and the Welfare State*. Princeton, NJ: Princeton University Press.

Capek, Stella M. 1993. "The 'Environmental Justice' Frame: A Conceptual Discussion and an Application," *Social Problems* 40(1): 5-24.

Cole, Luke W., and Sheila R. Foster. 2001. *From the Ground Up: Environmental Racism and the Rise of the Environmental Justice Movement*. New York: New York University Press.

Collin, Robert W. 1993. "Environmental Equity and the Need for Government Intervention: Two Proposals." *Environment* 35(9): 41-43.

Cook, Brian J. 1996. *Bureaucracy and Self-Government: Reconsidering the Role of Public Administration in American Politics*. Baltimore: Johns Hopkins University Press.

Core, Lisa S. 2002. Alexander v. Sandoval: Why a Supreme Court Case About Driver's Licenses Matters to Environmental Justice Advocates. *Boston College Environmental Affairs Law Review* 30(1): 191-242.

Cutter, Susan L. 1995. "Race, Class, and Environmental Justice." *Progress in Human Geography* 19(1): 111-122.

———. 2006. "Race, Class and Environmental Justice." In *Hazards, Vulnerability and Environmental Justice*, ed., Susan L. Cutter. Sterling: Earthscan: 249-261.

Cutter, Susan L., Danika Holm, and Lloyd Clark. 1996. "The Role of Geographic Scale in Monitoring Environmental Justice." *Risk Analysis* 16: 517-525.

Dawnson, Michael C. 1994. *Behind the Mule: Race and Class in African-American Politics*. Princeton: Princeton University Press.

Deloitte Consulting LLP. 2011. *Environmental Protection Agency Evaluation of the EPA Office of Civil Rights, Final Report*. Washington, DC: Deloitte Consulting LLP.

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

Dobson, Andrew. 1998. *Justice and the Environment: Conceptions of Environmental Sustainability and Dimensions of Social Justice*. New York: Oxford University Press.

Dolan, Julie A., and David H. Rosenbloom. 2003. *Representative Bureaucracy: Classic Readings and Continuing Controversies*. Armonk: M. E. Sharpe.

Downey, Liam. 1998. Environmental Injustice: Is Race or Income a Better Predictor? *Social Science Quarterly* 79(4): 766-778.

Downey, Liam, and Brian Hawkins. 2008. "Race, Income, and Environmental Inequality in the United States." Sociological Perspectives 51(4):759-781.

Duncan, Greg J., Kathleen Mullan Harris, and Johanne Boisjoly. 2000. "Time Limits and Welfare Reform: New Estimates of the Number and Characteristics of Affected Families." *Social Service Review* 74(1): 55-75.

Earnhart, Dietrich. 2004. "Regulatory Factors Shaping Environmental Performance at Publicly-Owned Treatment Plants." *Journal of Environmental Economics and Management* 48 (2004) 655-681.

Eisner, Marc Allen. 2007. *Governing the Environment: the Transformation of Environmental Regulation*. Boulder: Lynne Rienner Publishers, Inc.

Eisner, Marc Allen, Jeff Worsham, and Evan J. Ringquist. 2006. *Contemporary Regulatory Policy*. Second Edition. Boulder: Lynne Rienner Publishers, Inc.

Enders, Craig K., and Davood Tofighi. 2007. "Centering Predictor Variables in Cross-Sectional Multilevel Models: A New Look at an Old Issue." *Psychological Methods* 12(2): 121-138.

Environmental Council of the States (ECOS). 2012. *Delegation by Environmental Act*. Washington, DC: ECOS. Available at http://www.ecos.org/section/states/enviro_actlist (accessed April 2, 2012).

———. 2013. *Enforcement*. Available at http://www.ecos.org/section/states/enforcement (accessed February 17, 2013).

Esworthy, Robert. 2010. *Federal Pollution Control Laws: How Are They Enforced?* Washington, DC: Congressional Research Service.

Exchange Network Leadership Council (ENLC). 2008. *Enforcement and Compliance Data Standard*. Standard No.:EX000026.2. Available at http://www.exchangenetwork.net/data-standards-list/ (accessed February 22, 2013).

Ferris, Deeohn, and David Hahn-Baker. 1995. "Environmentalists and Environmental Justice Policy." In *Environmental Justice: Issues, Policies, and Solutions*, ed., Bunyan Bryant. Washington, DC: Island Press 66-75.

Fineman, Stephen. 1998. "Street-level Bureaucrats and the Social Construction of Environmentai Control." *Organization Studies* 19(6): 953-974.

Fiorino, Daniel J. 2006. *The New Environmental Regulation*. Cambridge: MIT Press.

Fording, Richard C. 2012. *State Citizen and Government Ideology Data: Revised 1960-2008 Citizen Ideology Series*. Available at http://www.bama.ua.edu/~rcfording/stateideology.html (accessed August 16, 2012).

Foreman, Christopher H. 1998. *The Promise and Peril of Environmental Justice*. Washington, DC: Brookings Institution Press.

Franzen, Axel, and Dominikus Vogl. 2013. "Acquiescence and the Willingness to Pay for Environmental Protection: A Comparison of the ISSP, WVS, and EVS." *Social Science Quarterly* 94(3): 637-659.

Frederickson, H. George. 1990. "Public Administration and Social Equity." *Public Administration Review* 50(2): 228-237.

Garson, G. David. 2013. "Introductory Guide to HLM With HLM 7 Software." In *Hierarchical Linear Modeling: Guide and Applications*, ed., G. David Garson. Thousand Oaks: SAGE Publications, Inc 55-96.

Gelman, Andrew, and Jennifer Hill. 2007. *Data Analysis Using Regression and Multilevel/Hierarchical Models*. New York: Cambridge University Press.

Gilens, Martin. 1995. "Racial Attitudes and Opposition to Welfare." *Journal of Politics* 57(4): 994-1014.

———. 1996. "'Race Coding' and White Opposition to Welfare." *American Political Science Review* 90(3): 593-604.

Goertz, Gary, and James Mahoney. 2012. *A Tale of Two Cultures: Qualitative and Quantitative Research in the Social Sciences*. Princeton: Princeton University.

Goggin, Malcolm L., Ann O'M. Bowman, James P. Lester, and Laurence O'Toole. 1990. *Implementation Theory and Practice: toward a Third Generation*. Glenview: Scott Foresman & Co.

Goldman, Benjamin A. 1994. *Not Just Prosperity: Achieving Sustainability With Environmental Justice*. Washington, DC: National Wildlife Federation.

Goodnow, Frank J. 1900/2007. "Politics and Administration." In *Classics of Public Administration*, ad., Jay M. Shafritz and Albert C. Hyde. Sixth Edition. Boston: Wadsworth, Cengage Learning.

Gordon, Holly D., and Keith I. Harley 2005. "Environmental Justice and the Legal System." In *Power, Justice, and the Environment: A Critical Appraisal of the Environmental Justice Movement*, ed., David N. Pellow and Robert J. Brulle. Cambridge: The MIT Press: 153-170.

Gormley, William T., and Steven J. Balla. 2008. *Bureaucracy and Democracy: Accountability and Performance*. Second Edition. Washington, D.C.: CQ Press.

Grineski, Sara, Bob Bolin, and Christopher Boone. 2007. "Criteria Air Pollution and Marginalized Populations: Environmental Inequity in Metropolitan Phoenix, Arizona" *Social Science Quarterly* 88(2): 535-554.

Guber, Deborah Lynn, and Christopher J. Bosso 2013. "Issue Framing, Agenda Setting, and Environmental Discourse." In *The Oxford Handbook of U.S. Environmental Policy*, ed., Sheldon Kamieniecki and Michael E. Kraft. New York: Oxford University Press. 437-460.

Haider-Markel, Donald P. 2002. "Regulating Hate: State and Local Influences on Hate Crime Law Enforcement." *State Politics and Policy Quarterly* 2(2): 126-160.

Hamilton, James T. 1995. "Testing for Environmental Racism: Prejudice, Profits, Political Power." *Journal of Policy Analysis and Management* 14(1): 107-132.

Hamilton, Lawrence C. 2009. *Statistics with Stata: Updated for Version 10*. Belmont: Brooks/Cole, Cengage Learning.

Hastings Public Law Research Institute. 2010. *Environmental Justice for All: A Fifty State Survey of Legislation, Policies and Cases*. Fourth edition. University of California Hastings College of the Law.

Headrick, Barbara, George Serra, and Jim Twombly. 2002. "Enforcement and Oversight: Using Congressional Oversight to Shape OSHA Bureaucratic Behavior." *American Politics Research* 30(6): 608-629.

Hedge, David M., and Donald C. Menzel. 1985. "Loosening the Regulatory Ratchet: A Grassroots View of Environmental Deregulation." *Policy Studies Journal* 13(3): 599-606.

Heinelt, Hubert. 2007. "Do Policies Determine Politics?" In *Handbook of Public Policy Analysis: Theory, Politics, and Methods*, ed., Frank Fischer, Gerald J. Miller, and Mara S. Sidney. Boca Raton: CRC Press: 109-122.

Helland, Eric. 1998. "Environmental Protection in the Federalist System: The Political Economy of NPDES Inspections." *Economic Inquiry* 36(2): 305-319.

Hero, Rodney E., and Caroline J. Tolbert. 1995. "Latinos and Substantive Representation in the U.S. House of Representatives: Direct, Indirect or Nonexistent?" *American Journal of Political Science* 39(3): 640-52.

Hipp, John R., Cynthia M. Lakon. 2010. "Social Disparities in Health: Disproportionate Toxicity Proximity in Minority Communities over a Decade." *Health & Place* 16: 674–683.

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

Hirsh, C. Elizabeth, and Sabino Kornrich. 2008. "The Context of Discrimination: Workplace Conditions, Institutional Environments, and Sex and Race Discrimination Charges." *American Journal of Sociology* 113(5): 1394-1432.

Hox, Joop J. 2010. *Multilevel Analysis: Techniques and Applications*. Second Edition. New York: Routledge.

Huber, John D., and Charles R. Shipan. 2002. *Deliberate Discretion? The Institutional Foundations of Bureaucratic Autonomy*. New York: Cambridge University Press.

Hult, Karen M. 2003. "Environmental Perspectives on Public Institutions." In *The Handbook of Public Administration*, ed., B. Guy Peters, and Jon Pierre. Los Angeles: Sage Publications. 149-159.

Hutter, Bridget M. 1997. *Compliance: Regulation and Environment*. Oxford: Oxford University Press.

Hunter, Susan, and Richard W. Waterman. 1996. *Enforcing the Law: The Case of the Clean Water Acts*. Armonk: M.E. Sharpe.

Ingram, Helen. 2007. "Poverty, Policy, and the Social Construction of Target Groups." In *Remaking America: Democracy and Public Policy in an Age of Inequality*, ed., Joe Soss, Jacob S. Hacker, and Suzanne Mettler. New York: Russell Sage Foundation. 245-253.

Ingram, Helen, and Anne L. Schneider. 2005. "Public Policy and the Social Construction of Deservedness." *Deserving and Entitled: Social Constructions and Public Policy*, ed., Anne L. Schneider and Helen M. Ingram. Albany: State University of New York Press. 1-28.

———. 2006. "Policy Analysis for Democracy." In *The Oxford Handbook of Public Policy*, ed., Michael Moran, Martin Rein, and Robert E. Goodin. New York: Oxford University Press. 169-189.

Ingram, Helen, Anne L. Schneider, and Peter deLeon. 2007. "Social Construction and Policy Design." In *Theories of the Policy Process*, ed., Paul A. Sabatier. Second edition. Boulder: Westview Press. 93-126.

Institute of Medicine of the National Academies. 1999. *Toward Environmental Justice: Research, Education, and Health Policy Needs*. Washington, DC.

Joint Center for Political and Economic Studies. 2012. *National Roster of Black Elected Officials (various years)*. Washington, DC.

Kail, Ben Lennox, and Marc Dixon. 2011. "The Uneven Patterning of Welfare Benefits at the Twilight of AFDC: Assessing the Influence of Institutions, Race, and Citizen Preferences." *Sociological Quarterly* 52: 376-399.

Keiser, Lael R. 1999. "State Bureaucratic Discretion and the Administration of Social Welfare Programs: The Case of Social Security Disability." *Journal of Public Administration Research and Theory* 9(1): 87-106.

Keiser, Lael R., and Joe Soss. 1998. "With Good Cause: Bureaucratic Discretion and the Politics of Child Support Enforcement." *American Journal of Political Science* 42(4): 1133-1156.

Keiser, Lael R., Peter R. Mueser, and Seung-Whan Choi. 2004. "Race, Bureaucratic Discretion, and the Implementation of Welfare Reform." *American Journal of Political Science* 48(2): 314-327.

Kettl, Donald F. 2012. *The Politics of the Administrative Process*. Fifth Edition. Washington, D.C.: CQ Press.

Kim, Doo-Dae. 2007. "Political Control and Bureaucratic Autonomy Revisited: A Multi-Institutional Analysis of OSHA Enforcement." *Journal of Public Administration Research and Theory* 18: 33-55.

King, Gary. 1988. "Statistical Models for Political Science Event Counts: Bias in Conventional Procedures and Evidence for the Exponential Poisson Regression Model." *American Journal of Political Science* 32: 838-863.

Kirk, Gwyn. 1997. "Ecofeminism and Environmental Justice: Bridges across Gender, Race, and Class." *Frontiers: A Journal of Women Studies* 18(2):2-20.

Klarner, Carl. 2012. *State Partisan Balance Data & Codebook*. Available at http://www.indstate.edu/polisci/klarnerpolitics.htm (accessed August 16, 2012).

Konisky, David M. 2007. "Regulatory Competition and Environmental Enforcement: Is There a Race to the Bottom?" *American Journal of Political Science* 51(4): 853-872.

———. 2008. "Regulator Attitudes and the Environmental Race to the Bottom Argument." *Journal of Public Administration Research and Theory* 18(2): 321-344.

———. 2009a. "Inequities in Enforcement? Environmental Justice and Government Performance." *Journal of Policy Analysis and Management* 28(1):102-121.

———. 2009b. "The Limited Effects of Federal Environmental Justice Policy on State Enforcement." *Policy Studies Journal* 37(3): 475-496.

———. 2009c. "Assessing U.S. State Susceptibility to Environmental Regulatory Competition." *State Politics and Policy Quarterly* 9(4): 404-428.

Konisky, David M., and Tyler S. Schario. 2010. "Examining Environmental Justice in Facility-Level Regulatory Enforcement." *Social Science Quarterly* 91(3): 835-855.

Konisky, David M., and Christopher Reenock. 2013. "Compliance Bias and Environmental (In)Justice." *Journal of Politics* 75(2): 506-519.

Kraft, Michael E. 2011. *Environmental Policy and Politics*. Fifth Edition. New York: Pearson.

Kraft, Michael E., and Denise Scheberle 1995. "Environmental Justice and the Allocation of Risk: The Case of Lead and Public Health." *Policy Studies Journal* 23(1): 113-122.

Krause, George A. 2008. "Agency Risk Propensities Involving the Demand for Bureaucratic Discretion." In *Politics, Policy, and Organizations: Frontiers in the Scientific Study of Bureaucracy*, ed., George A. Krause and Kenneth J. Meier. Ann Arbor: The University of Michigan Press: 41-72.

Krivo, Lauren J., Ruth D. Peterson, and Danielle C. Kuhl. 2009. "Segregation, Racial Structure, and Neighborhood Violent Crime." *American Journal of Sociology* 114(6): 1765-1802.

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

Lazarus, Richard J. 1993. "Pursuing 'Environmental Justice': The Distributional Effects of Environmental Protection." *Northwestern University Law Review* 87: 787-857.

Lester, James P., David W. Allen, and Kelly M. Hill. 2001. *Environmental Injustice in the United States: Myths and Realities*. Boulder: Westview Press.

Lipsky, Michael. 1980. *Street-Level Bureaucracy: Dilemmas of the Individual in Public Services*. New York: Russell Sage Foundation.

Liu, Feng. 1998. "Who will be Protected by the EPA's New Ozone and Particulate Matter Standards?" *Environmental Science and Technology* 32(1): 32A-39A.

Long, J. Scott. 1997. *Regression Models for Categorical and Limited Dependent Variables*. Thousand Oaks: Sage Publications, Inc.

Loseke, Donileen R. 2007. "The Study of Identity as Cultural, Institutional, Organizational, and Personal Narratives: Theoretical and Empirical Integrations." *Sociological Quarterly* 48: 661–688.

Low, Nicholas, and Brendan Gleeson. 1998. *Justice, Society and Nature: An Exploration of Political Ecology*. London: Routledge.

Lowi, Theodore J. 1964. "American Business, Public Policy, Case Studies, and Political Theory." *World Politics* 16: 677-715.

———. 1972. "Four Systems of Policy, Politics, and Choice." *Public Administration Review* 32: 298-310.

Lowry, William R. 1992. *The Dimensions of Federalism: State Governments and Pollution Control Policies*. Durham: Duke University Press.

Lowry, Alma, and Tom Stephens. 2001. "Environmental Justice." *Michigan Bar Journal* (December 2001): 24-27.

Loyens, Kim, and Jeroen Maesschalck. 2010. "Toward a Theoretical Framework for Ethical Decision Making of Street-Level Bureaucracy Existing Models Reconsidered." *Administration & Society* 42(1): 66-100.

Lynch, Michael J., Paul B. Stretesky, and Ronald G. Burns. 2004. "Determinants of Environmental Law Violation Fines Against Petroleum Refineries: Race, Ethnicity, Income, and Aggregation Effects." *Society & Natural Resources: An International Journal* 17(4): 333-347.

Malley, Sara, Jennifer Scroggins, and Stephanie A. Bohon. 2012. "U.S. EPA Enforcement of Environmental Regulations in Tennessee: 2005–2008." *Society & Natural Resources: An International Journal* 25(1): 87-96.

March, James G., and Johan P. Olsen. 1989. *Rediscovering Institutions: The Organizational Basis of Politics*. New York: The Free Press.

Marvel, Mary K. 1982. "Implementation and Safety Regulation Variations in Federal and State Administration under OSHA." *Administration and Society* 14:15-33.

Massey, Douglas S. 2008. *Categorically Unequal: The American Stratification System*. New York: Russell Sage Foundation.

May, Peter J., and Søren Winter. 1999. "Regulatory Enforcement and Compliance: Examining Danish Agro-Environmental Policy." *Journal of Policy Analysis and Management* 18(4): 625-651.

Maynard-Moody, Steven, and Michael Musheno. 2003. *Cops, Teachers, Counselors: Stories from the Front Lines of Public Service*. Ann Arbor: The University of Michigan Press.

Maynard-Moody, Steven, and Shannon Portillo. 2010. "Street-Level Bureaucracy Theory." In *The Oxford Handbook of American Bureaucracy*, ed., Robert F. Durant. New York: Oxford University Press. 252-277.

Mazmanian, Daniel A., and Michael E. Kraft. 2009. "The Three Epochs of the Environmental Movement." In Toward Sustainable Communities: Transition and Transformations in Environmental Policy, ed., Daniel A. Mazmanian and Michael E. Kraft. Second Edition. Cambridge: The MIT Press: 3-32.

Meyers, Marcia K., and Susan Vorsanger. 2003. "Street-Level Bureaucrats and the Implementation of Public Policy." In *The Handbook of Public Administration*, ed., B. Guy Peters, and Jon Pierre. Los Angeles: Sage Publications. 153-163.

McClaren, Duncan. 2003. "Environmental Space and Ecological Debt." In *Just Sustainabilities: Development in an Unequal World*, ed., Julian Agyeman, Robert D. Bullard, and Bob Evans. London: Earthscan: 19-37.

Melosi, Martin V. 2000. "Environmental Justice, Political Agenda Setting, and the Myths of History." *Journal of Policy History* 12(1): 43-71.

Meier, Kenneth J., and John Bohte. 2007. *Politics and the Bureaucracy: Policymaking in the Fourth Branch of Government*. Fifth Edition. Belmont: Thomson Wadsworth.

Mennis, Jeremy L. 2005. "The Distribution and Enforcement of Air Polluting Facilities in New Jersey." *Professional Geographer* 57(3): 411-422.

Mettler, Suzanne. 1998. *Dividing Citizens: Gender and Federalism in New Deal Public Policy*. Ithaca: Cornell University Press.

———. 2011. *The Submerged State: How Invisible Government Policies Undermine American Democracy*. Chicago: University of Chicago Press.

Mettler, Suzanne, and Joe Soss. 2004. "The Consequences of Public Policy for Democratic Citizenship: Bridging Policy Studies and Mass Politics." *Perspectives on Politics* 2(1): 55-73.

Mitchell, Jerry T., Deborah S.K. Thomas, and Susan L. Cutter. 1999. "Dumping in Dixie Revisited: The Evolution of Environmental Inequities in South Carolina*." Social Science Quarterly* 80: 229-243.

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

Mohai, Paul, Pellow, David, and Roberts, J. Timmons. 2009. "Environmental Justice." *Annual Review of Environment and Resources* 34: 405-430.

Monogan, James E., III. 2013a. "The Politics of Immigrant Policy in the 50 U.S. States, 2005-2011." *Journal of Public Policy* 33(1):35-64.

———. 2013b. "Replication data for: The Politics of Immigrant Policy in the 50 U.S. States, 2005-2011," http://hdl.handle.net/1902.1/16471 UNF:5:qLaTezDgrRwoVoc2fG8Amg== V4 [Version] (access March 6, 2014).

Morello-Frosch, R., M. Pastor, C. Porras, and J. Sadd. 2002. "Environmental Justice and Regional Inequality in Southern California: Implications for Future Research." *Environmental Health Perspectives* 110(2):149-154.

National Association of Latino Elected and Appointed Officials. 2012. *Directory of Latino Elected Officials (various years)*. Washington, DC.

National Conference of State Legislatures (NCSL). 2005-2011. *State Laws Related to Immigrants and Immigration*. Immigration Policy Project. Washington, DC. Available at http://www.ncsl.org/issues-research/immig/state-laws-related-to-immigration-and-immigrants.aspx.

———. 2012a. *Immigrant Policy Project*. Washington, DC.

———. 2012b. *Legislator Data*. Washington, DC.

Newton, Lina. 2005. "'It is Not a Question of Being Anti-Immigration': Categories of Deservedness in Immigration Policy Making". In *Deserving and Entitled: Social Constructions and Public Policy*, ed., Anne L. Schneider and Helen M. Ingram. Albany: State University of New York Press. 139-167.

———. 2008. *Illegal, Alien, or Immigrant: The Politics of Immigration Reform*. New York: New York University Press.

———. 2012. *"Policy Innovation or Vertical Integration? A View of Immigration Federalism from the States." Law & Policy* 34(2): 113-137.

Nicholson-Crotty, Jill, and Sean Nicholson-Crotty. 2004. "Social Construction and Policy Implementation: Inmate Health as a Public Health Issue." *Social Science Quarterly* 85(2): 240-256.

Nicholson-Crotty, Jill, and Sean Nicholson-Crotty. 2011. "Industry Strength and Immigrant Policy in the American States." *Political Research Quarterly* 64(3): 612-624.

Noonan, Douglas S. 2008. "Evidence of Environmental Justice: A Critical Perspective on the Practice of EJ Research and Lessons for Policy Design." *Social Science Quarterly* 89(5): 1153-1174.

Oakes, John M., Douglas L. Anderton, Andy B. Anderson. 1996. "A longitudinal Analysis of Environmental Equity in Communities with Hazardous Waste Facilities." *Social Science Research* 25: 125–48.

O'Leary, Rosemary, Robert F. Durant, Denial J. Fiorino, and Paul S. Weiland. 1999. *Managing for the Environment: Understanding the Legal, Organizational, and Policy Challenges*. San Francisco: Jossey-Bass Publishers.

Orren, Karen, and Stephen Skowronek. 2002. "The Study of American Political Development." In *Political Science: The State of the Discipline*, ed., Ira Katznelson and HelenV. Milner. New York: W.W. Norton & Company: 722-754.

Paehlke, Robert C. 2013. "Ethnical Challenges in Environmental Policy." In *The Oxford Handbook of U.S. Environmental Policy*, ed., Sheldon Kamieniecki and Michael E. Kraft. New York: Oxford University Press. 93-113.

Pastor, Manuel. 2007. "Environmental Justice: Reflections from the United States." Pp. 351–78 in James K. Boyce, Sunita Narain, and Elizabeth A. Stanton, eds., *Reclaiming Nature: Environmental Justice and Ecological Restoration*. London: Anthem Press.

Pastor, Manuel, James L. Sadd, and Rachel Morello-Frosch. 2005. "Environmental Inequity in Metropolitan Los Angeles." In *The Quest for Environmental Justice: Human Rights and the Politics of Pollution*, ed., Robert D. Bullard. San Francisco: Sierra Club Books: 108-124.

Pautz, Michelle C. 2012. "Their Views Matter: Frontline Regulators' Perceptions of the Regulated Community in Ohio." *Policy Studies Journal* 40(2): 302–323.

Pautz, Michelle C., and Sara R. Rinfret. 2011. "Making Sense of the Front Lines: Environmental Regulators in Ohio and Wisconsin." *Journal of Environmental Studies and Sciences* 1: 277-288.

Pellow, David N. 2000. "Environmental Inequality Formation: Toward a Theory of Environmental Injustice." *American Behavioral Scientist* 43(4): 581-601.

———. 2002. *Garbage Wars: The Struggle for Environmental Justice in Chicago*. Cambridge: The MIT Press.

Pellow, David N., and Robert J. Brulle (ed). 2005. *Power, Justice, and the Environment: A Critical Appraisal of the Environmental Justice Movement*. Cambridge: The MIT Press.

Peña Devon G. 2003. "The Scope of Latino/a Environmental Studies." *Latino Studies* 1:47-78.

———. 2005a. "Tierra y Vida: Chicano Environmental Justice Struggles in the Southwest." In *The Quest for Environmental Justice: Human Rights and the Politics of Pollution*, ed., Robert D. Bullard. San Francisco: Sierra Club Books: 188-206.

———. 2005b. "Autonomy, Equity, and Environmental Justice." In *Power, Justice, and the Environment: A Critical Appraisal of the Environmental Justice Movement*, ed., David Naguib Pellow and Robert J. Brulle. Cambridge: The MIT Press: 131-152.

Perlin, Susan, R. Woodrow Setzer, John Creason, and Ken Sexton. 1995. "Distribution of Industrial Air Emissions by Income and Race in the United States." *Environmental Science and Technology* 29: 69-80.

Pierson, Paul. 1993. "When Effect Becomes Cause: Policy Feedback and Political Change." *World Politics* 45: 595-628.

———. 2004. *Politics in Time: History, Institutions, and Social Analysis*. Princeton: Princeton University Press.

Pollock, Philip H., and M. Elliot Vittas. 1995, "Who Bears the Burdens of Environmental Pollution? Race, Ethnicity, and Environmental Equity in Florida." Social Science Quarterly 76 (June): 294-310.

Potoski, Matthew. 2001. "Clean Air Federalism: Do States Race to the Bottom?" *Public Administration Review* 61(3): 335-342.

Potoski, Matthew, and Neal D. Woods. 2002. "Dimensions of State Environmental Policies: Air Pollution Regulation in the United States." *Policy Studies Journal* 30(2): 208-227.

Preuhs, Robert R. and Rodney E. Hero. 2011. "A Different Kind of Representation: Black and Latino Descriptive Representation and the Role of Ideological Cuing." *Political Research Quarterly* 64(1): 157-171.

Pulido, Laura. 1994. "Restructuring and the Contraction and Expansion of Environmental Rights in the United States." *Environment and Planning A* 26(6): 915-936.

———. 1996. "A Critical Review of the Methodology of Environmental Racism Research." *Antipode* 28(2): 142-159.

———. 2000. "Rethinking Environmental Racism: White Privilege and Urban Development in Southern California." *Annals of the Association of American Geographers* 90(1): 12-40.

Pulido, Laura, S. Sidawi, and R. O. Vos. 1996. "An Archaeology of Environmental Racism in Los Angeles." *Urban Geography* 17:419-439.

Rabe, Barry G. 2006. "Power to the States: The Promise and Pitfalls of Decentralization." In *Environmental Policy: New Directions for the Twenty-First Century*, ed., Norman J. Vig, and Michael E. Kraft. Sixth edition. Washington, DC: CQ Press. 35-56.

Rabe-Hesketh, Sophia, and Anders Skrondal. 2012. *Multilevel and Longitudinal Modeling Using Stata: Volume I: Continuous Responses & Volume II: Categorical Responses, Counts, and Survival*. Third Edition. College Station: StataCorp LP.

Raudenbush, Stephen W., and Anthony S. Bryk, 2002. *Hierarchical Linear Models: Applications and Data Analysis Methods*. Second Edition. Thousand Oaks: Sage Publications.

Raudenbush, Stephen W., Anthony S. Bryk, Yuk Fai Cheong, Richard T. Congdon, Jr., and Mathilda du Toit. 2011. *HLM 7: Hierarchical Linear and Nonlinear Modeling (Manual)*. Lincolnwood: Scientific Software International, Inc.

Rosenbaum, Walter A. 2011. *Environmental Politics and Policy*. 8th edition. Washington, DC: CQ Press.

Rechtschaffen, Clifford, Eileen Gauna, and Catherine A. O'Neill. 2008. *Environmental Justice: Law, Policy & Regulation*. Second edition. Durham: Carolina Academic Press.

Rhodes, Edwardo Lao. 2003. *Environmental Justice in America: A New Paradigm*. Bloomington: Indiana University Press.

Rinfret, Sara R., and Michelle C. Pautz. 2013. "Attitudes and Perspectives of Frontline Workers in Environmental Policy: A Case Study of Ohio's Environmental Protection Agency and Wisconsin's Department of Natural Resources." *Journal of Public Affairs* 13(1): 111-122.

Ringquist, Evan J. 1993. *Environmental Protection at the State Level: Politics and Progress in Controlling Pollution*. New York: M.E. Sharpe.

———. 1997. "Equity and the Distribution of Environmental Risk: The Case of TRI Facilities." *Social Science Quarterly* 78: 811-829.

———. 1998. "A Question of Justice: Equity in Environmental Litigation, 1974-91." *Journal of Politics* 60: 1148-1165.

———. 2001. "The Need for Sound Judgment in Analyzing U.S. Environmental Protection Agency Enforcement Actions." *Law & Society Review* 35(3): 683-698.

———. 2004. "Environmental Justice." In *Environmental Governance Reconsidered: Challenges, Choices, and Opportunities*, ed., Robert F. Durant, Daniel J. Fiorino, and Rosemary O'Leary. Cambridge: The MIT Press. 256-287.

———. 2005. Assessing Evidence of Environmental Inequities: A Meta-Analysis. *Journal of Policy Analysis and Management* 24(2): 223-247.

———. 2006. "Environmental Justice: Normative Concerns, Empirical Evidence, and Government Action." In *Environmental Policy: New Directions for the Twenty-First Century*, ed., Norman J. Vig, and Michael E. Kraft. Sixth edition. Washington, DC: CQ Press. 239-263.

———. 2011. "Trading Equity for Efficiency in Environmental Protection? Environmental Justice Effects from the SO2 Allowance Trading Program." *Social Science Quarterly* 92(2): 297-323.

Ringquist, Evan J., and David H. Clark. 1999. "Local Risks, States' Rights, and Federal Mandates: Remedying Environmental Inequities in the U.S. Federal System." *Publius: The Journal of Federalism* 29(2): 73-93.

———. 2002. "Issue Definition and the Politics of State Envrionmental Justice Policy Adoption." *International Journal of Public Administration* 25(2&3): 351-389.

Ripley, Randall B., and Grace A. Franklin. 1976. *Congress, the Bureaucracy, and Public Policy*. Homewood: The Dorsey Press.

———. 1986. *Policy Implementation and Bureaucracy*. Second Edition. Chicago: The Dorsey Press.

Roque, J., and P. Tau Lee. 1993. Environmental Justice and Comparative Risk: A Report of the Environmental Justice Workgroup of the California Comparative Risk Project. Berkeley: Department of Health Services of California.

Rosenbaum, Walter A. 2011. *Environmental Politics and Policy*. 8th edition. Washington, DC: CQ Press.

Scheberle, Denise. 2004. *Federalism and Environmental Policy: Trust and the Politics of Implementation*. Second Edition. Washington, DC: Georgetown University Press.

———. 2013. "Environmental Federalism and the Role of State and Local Governments." In *The Oxford Handbook of U.S. Environmental Policy*, ed., Sheldon Kamieniecki and Michael E. Kraft. New York: Oxford University Press. 394-412.

Schlosberg, David. 2007. *Defining Environmental Justice: Theories, Movements and Nature*. Oxford: Oxford University Press.

Schneider, Anne L., and Helen Ingram. 1993. "Social Construction of Target Populations: Implications for Politics and Policy." *American Political Science Review* 87(2): 334-347.

———. 1997. *Policy Design for Democracy*. Lawrence: University Press of Kansas.

———. 2005a. *Deserving and Entitled: Social Constructions and Public Policy*. Albany: State University of New York Press.

———. 2008. "Social Constructions in the Study of Public Policy". In *Handbook of Constructionist Research*, ed., James A. Holstein, and Jaber F. Gubrium. New York: The Guilford Press. 189-211.

———. 2008. "Social Constructions in the Study of Public Policy". In *Handbook of Constructionist Research*, ed., James A. Holstein, and Jaber F. Gubrium. New York: The Guilford Press. 189-211.

Scholz, John T., and Feng Heng Wei. 1986. "Regulatory Enforcement in a Federalist System." *American Political Science Review* 80(4): 1250-1270.

Scientific Software International (SSI). 2013a. *Error Messages of HLM 7*. Skokie, IL: Scientific Software International, Inc. Available at http://www.ssicentral.com/hlm/faqs7.html (access October 9, 2013).

———. 2013b. "Estimation of Non-Linear Models." *FAQs of HLM 7*. Skokie, IL: Scientific Software International, Inc. Available at http://www.ssicentral.com/hlm/faqs7.html (access November 26, 2013).

———. 2013c. "Proportion Variance Explained: Two-level Models." *FAQs of HLM 7*. Skokie, IL: Scientific Software International, Inc. Available at http://www.ssicentral.com/hlm/faqs7.html (access November 26, 2013).

———. 2013d. "Centering." *FAQs of HLM 7*. Skokie, IL: Scientific Software International, Inc. Available at http://www.ssicentral.com/hlm/faqs7.html (access May 6, 2014).

Scott, W. Richard. 2008. *Institutions and Organizations: Ideas and Interests*. Third Edition. Thousand Oaks: Sage Publications.

Sefton, Tom. 2006. "Distributive and Redistributive Policy." In *The Oxford Handbook of Public Policy*, ed., Michael Moran, Martin Rein, and Robert E. Goodin. New York: Oxford University Press: 607-623.

Sexton, K., H Gong, JC Bailar, JG Ford, DR Gold, WE Lambert, and MJ Utell. 1993. "Air Pollution Health Risks: Do Class and Race Matter?" *Toxicology and Industrial Health* 9(5): 843-78.

Skocpol, Theda. 2003. *Diminished Democracy: From Membership to Management in American Civic Life*. Norman: University Of Oklahoma Press.

Smith, Steven Rathgeb. 2003. "Street-Level Bureaucracy and Public Policy." In *The Handbook of Public Administration*, ed., B. Guy Peters, and Jon Pierre. Los Angeles: Sage Publications. 354-365.

Snedker, Karen A., Herting, Jerald R., and Emily Walton. 2009. "Contextual Effects and Adolescent Substance Use: Exploring the Role of Neighborhoods." *Social Science Quarterly* 90(5): 1272-1297.

Snijders, Tom A B, and Roel J Bosker. 2012. *Multilevel Analysis: An Introduction to Basic and Advanced Multilevel Modeling*. Second Edition. Washington, DC: SAGE Publications.

Soss, Joe. 1999. "Lessons of Welfare: Policy Design, Political Learning, and Political Action." *American Political Science Review* 93(2): 363-380.

———. 2005. "Making Clients and Citizens: Welfare Policy as a Source of Status, Belief, and Action." In *Deserving and Entitled: Social Construction and Public Policy*, edited by Anne L. Schneider and Helen Ingram. Stony Brook: State University of New York: 291-328.

Soss, Joe, and Sanford F. Schram. 2006. "Welfare Reform as a Failed Political Strategy: Evidence and Explanations for the Stability of Public Opinion." *Focus*: 24: 17-23.

———. 2008. "Coloring the Terms of Membership." In *The Colors of Poverty: Why Racial and Ethnic Disparities Persist*, ed., Ann Chin Lin and David R. Harris. New York: Russell Sage Foundation. 293-322.

Soss, Joe, Sanford F. Schram, Thomas P. Vartanian, and Erin O'Brien. 2001. "Setting the Terms of Relief: Explaining State Policy Choices in the Devolution Revolution." *American Journal of Political Science* 45(2): 378-395.

Soss, Joe, Jacob S. Hacker, and Suzanne Mettler (ed.). 2007. *Remaking America: Democracy and Public Policy in an Age of Inequality*. New York: Russell Sage Foundation.

StataCorp. 2011. *Stata: Release 12, Multivariate Statistics Manual*. College Station: StataCorp LP.

Steenbergen, Marco R. and Bradford S. Jones. 2002. "Modeling Multilevel Data Structures." *American Journal of Political Science* 46(1): 218-237.

Stone, Deborah. 2012. *Policy Paradox: The Art of Political Decision Making*. Third Edition. New York: W. W. Norton & Company.

Szasz, Andrew, and Michael Meuser. 1997. "Environmental Inequalities: Literature Review and Proposals for New Directions in Research and Theory." *Current Sociology* 45:99-120.

Targ, Nicholas. 2005. "The States' Comprehensive Approach to Environmental Justice." In *Power, Justice, and the Environment: A Critical Appraisal of the Environmental Justice Movement*, ed., David N. Pellow and Robert J. Brulle. Cambridge: The MIT Press: 171-184.

Thelen, Kathleen. 1999. "Historical Institutionalism and Comparative Politics." *Annual Review of Political Science* 2: 369-404.

Torres, Gerald. 1993. "Environmental Burdens and Democratic Justice." *Fordham Urban Law Journal* 21(3): 431-1107.

United Church of Christ Commission for Racial Justice. 1987. *Toxic Wastes and Race in the United States: A National Report on the Racial and Social Economic Characteristics of Communities of Hazardous Waste Sites*.

University of Texas at Austin. 2012a. *Getting Started with HLM 5: For Windows*. Division of Statistics + Scientific Computation.

———. 2012b. *Two-Level Hierarchical Linear Models: Using SAS, Stata, HLM, R, SPSS, and Mplus*. Division of Statistics + Scientific Computation.

University of Washington. 2013. *Environmental Justice*. Department of Environmental & Occupational Health Sciences, School of Public Health. Available at http://deohs.washington.edu/business-labor-resources/topics-z/environmental-justice (access June 24, 2013).

Urban Institute. 2004. *State Time Limit Policies*. Available at http://www.urban.org/publications/900769.html (access October 13, 2013). Washington, DC: Urban Institute.

———. 2012. *Welfare Rules Databooks (1996-2010)*. Washington, DC: Urban Institute.

U.S. Census Bureau. 2000. *Census Tracts and Block Numbering Areas*. Washington, DC: U.S. Census.

———. 2012. *Geographic Terms and Concepts - Block Groups*. Washington, DC: U.S. Census.

———. 2013. *ZIP Code Statistics*. Washington, DC: U.S. Census.

U.S. Commissions for Civil Rights. 2003. *Not in My Backyard: Executive Order 12,898 and Title VI as Tools for Achieving Environmental Justice*. Washington, DC: U.S. Commissions for Civil Rights.

U.S. Environmental Protection Agency (EPA). 1993. *Environmental Equity: Reducing Risk for All Communities*. Washington, DC: U.S. EPA.

———. 1995. *The EPA's Environmental Justice Strategy*. Washington, DC: U.S. EPA.

———. 1996. *1996 Environmental Justice Implementation Plan*. EPA/300-R-96-004. Washington, DC: U.S. EPA.

———. 2007. *Clean Water Act National Pollutant Discharge Elimination System Compliance Monitoring Strategy for the Core Program and Wet Weather Sources*. Washington, DC: U.S. EPA.

———. 2010a. *Procedures for Hearings Conducted Pursuant to 40 CFR Part 7 – Nondiscrimination in Programs and Activities Receiving Federal Assistance from the U.S. Environmental Protection Agency*. Washington, DC: U.S. EPA.

———. 2010b. *Title VI - Law and EPA's Regulations*. Available at http://www.epa.gov/ocr/t6lawrg.htm (access May 2, 2013).

———. 2011a. *Plan EJ 2014: Advancing Environmental Justice Though Compliance and Enforcement*. Washington, DC: U.S. EPA.

———. 2011b. *ICIS-NPDES Data Elements Included in the ECHO Data Download*. Washington, DC: U.S. EPA.

———. 2011c. *PCS Data Elements Included in the IDEA Data Download*. Washington, DC: U.S. EPA.

———. 2012a. Environmental Justice: Basic Information. Available at http://www.epa.gov/environmentaljustice/basics/ejbackground.html (access September 15, 2012).

———. 2012b. *Summary of the Clean Water Act*. Washington, DC: U.S. EPA. Available at http://www.epa.gov/lawsregs/laws/cwa.html (accessed February 16, 2013).

———. 2012c. *Inspections and Evaluations of Compliance Monitoring*. Washington, DC: U.S. EPA. Available at http://www.epa.gov/compliance/monitoring/inspections/index.html (accessed February 18, 2013).

———. 2012d. *Facilities and Enforcement Activities related to the Clean Water Act National Pollutant Discharge Elimination System (NPDES) Program*. Washington, DC: U.S. EPA.

Available at http://www.epa.gov/compliance/data/results/performance/cwa/index.html (accessed February 18, 2013).

———. 2012e. *OTIS Facility Reports - Data Dictionary for Detailed Facility Reports*. Washington, DC: U.S. EPA. Available at http://www.epa-otis.gov/otis/dfr_data_dictionary.html (accessed February 22, 2013).

———. 2012f. *NPDES Permit Program Basics*. Washington, DC: U.S. EPA. Available http://cfpub.epa.gov/npdes/home.cfm?program_id=45 (accessed June 4, 2014).

———. 2013a. *Detailed Facility Report: Data Dictionary of Enforcement and Compliance History Online (ECHO)*. Washington, DC: U.S. EPA. Available at http://www.epa-echo.gov/echo/dfr_data_dictionary.html (accessed February 18, 2013).

———. 2013b. *NPDES State and Tribal Program Authorization Status*. Washington, DC: U.S. EPA. Available at http://cfpub.epa.gov/npdes/statestribes/astatus.cfm (accessed February 18, 2013).

———. 2013c. *ECHO Users Guide -- Understanding Federal and State Data Entry Requirements*. Washington, DC: U.S. EPA. Available at http://www.epa-echo.gov/echo/data_entry_requirements_table.html (accessed February 18, 2013).

———. 2013d. *Basic Information of Enforcement*. Washington, DC: U.S. EPA. Available at http://www.epa.gov/enforcement/basics.html (accessed February 18, 2013).

U.S. Environmental Protection Agency, Office of Inspector General (EPA/OIG). 2004. *Evaluation Report*: *EPA Needs to Consistently Implement the Intent of the Executive Order on Environmental Justice*. Report No. 2004-P-00007. Washington, DC: U.S. EPA.

———. 2005. *Limited Knowledge of the Universe of Regulated Entities Impedes EPA's Ability to Demonstrate Changes in Regulatory Compliance*. Report No. 2005-P-00024. Washington, DC: U.S. EPA.

———. 2006. *Evaluation Report*: *EPA Needs to Conduct Environmental Justice Reviews of Its Programs, Policies, and Activities*. Report No. 2006-P-00034. Washington, DC: U.S. EPA.

———. 2011. *EPA Must Improve Oversight of State Enforcement*. Report No. 12-P-0113. Washington, DC: U.S. EPA.

U.S. Government Accountability Office (GAO). 1984. *Natural Resources and Environment: EPA and State Progress in Administering the National Pollutant Discharge Elimination System Permit Program*. Washington, DC: U.S. GAO.

———. 1991. *Water Pollution: Observations on Compliance and Enforcement Activities under the Clean Water Act*. T-RCED-91-80. Washington, DC: U.S. GAO.

———. 2000. *Environmental Protection: More Consistency Needed Among EPA Regions in Approach to Enforcement*. GAO/RCED-00-108. Washington, DC: U.S. GAO.

———. 2002. *Environmental Protection: Overcoming Obstacles to Innovative State Regulatory Programs*. GAO-02-268. Washington, DC: U.S. GAO.

———. 2005. *Environmental Justice: EPA Should Devote More Attention to Environmental Justice When Developing Clair Air Act Rules*. GAO-05-289. Washington, DC: U.S. GAO.

———. 2006. *Environmental Compliance and Enforcement: EPA's Effort to Improve and Make More Consistent Its Compliance and Enforcement Activities*. GAO-06-840T. Washington, DC: U.S. GAO.

———. 2007. *Environmental Justice: Measurable Benchmarks Needed to Gauge EPA Progress in Correcting Past Problems*. GAO-07-1140T. Washington, DC: U.S. GAO.

———. 2009. *Clean Water Act: Longstanding Issues Impact EPA's and States' Enforcement Efforts*. GAO-10-165T. Washington, DC: U.S. GAO.

———. 2011. *Environmental Justice: EPA Needs to Take Additional Actions to Help Ensure Effective Implementation*. GAO-12-77. Washington, DC: U.S. GAO.

Vinzant, Janet Coble, and Lane Crothers. 1998. *Street-Level Leadership: Discretion and Legitimacy in Front-Line Public Service*. Washington, DC: Georgetown University Press.

Walker, Gordon. 2012. *Environmental Justice: Concepts, Evidence and Politics*. London and New York: Routledge: Taylor & Francis Group.

Warren, Kenneth F. 2003. "Administrative Discretion." In *The Encyclopedia of Public Administration and Public Policy*, ed., Jack Rabin. New York: Marcel Dekker: 35-38.

Weatherley, Richard, and Michael Lipsky. 1977. "Street-Level Bureaucrats and Institutional Innovation: Implementing Special-Education Reform." *Harvard Educational Review* 47(2): 171-197.

Weber, Max. 1946. "Bureaucracy." In *From Max Weber: Essays in Sociology*, ed., H. H. Gerth and C. Wright Mills. New York: Oxford University Press.

Wernette, Dee R., and Leslie A. Nieves. 1992. "Breathing Polluted Air: Minorities are Disproportionately Exposed." *EPA Journal* 18: 16-17.

Westra, Laura, and Bill E. Lawson (ed.). 2001. *Faces of Environmental Racism: Confronting Issues of Global Justice*. Second Edition. Lanham: Rowman & Littlefield Publishers.

White House. 1994. *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. Executive Order 12898 and the Presidential Memorandum.

Williams, Robert W. 1999a. "Environmental Injustice in America and Its Politics of Scale." *Political Geography* 18: 49-73.

———. 1999b. "The Contested Terrain of Environmental Justice Research: Community as Unit of Analysis" *Social Science Journal* 36(2): 313-328.

Wilson, Woodrow. 1887. "The Study of Administration." *Political Science Quarterly* 2(2): 197-222.

Wilson, James Q. 1989. *Bureaucracy: What Government Agencies Do And Why They Do It*. Basic Books.

Wood, B. Dan. 1991. "Federalism and Policy Responsiveness: The Clean Air Case." *Journal of Politics* 53(3): 851-859.

———. 1992. "Modeling Federal Implementation as a System: The Clean Air Case." *American Journal of Political Science* 36(1): 40–67.

Wood, B. Dan and John Bohte. 2004. "Political Transaction Costs and the Politics of Administrative Design." *Journal of Politics* 66(1): 176-202.

Woods, Neal D. 2005. "Primary Implementation of Environmental Policy in the U.S. States." *Publius: The Journal of Federalism* 36(2): 259-276.

———. 2006. "Interstate Competition and Environmental Regulation: A Test of the Race-to-the-Bottom Thesis." *Social Science Quarterly* 87(1): 174-189.

Woods, Neal, D., David M. Konisky, and Ann O'M. Bowman. 2009. "You Get What You Pay For: Environmental Policy and Public Health." *Publius: The Journal of Federalism* 39(1): 95-116.

Wooldridge, Jeffrey M. 2013. *Introductory Econometrics: A Modern Approach*. Fifth Edition. Mason: Cengage Learning.

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 (September): 477-92.

Zucker, Lynne G. 1987. "Institutional Theories of Organization." *Annual Review of Sociology* 13: 443-464.