

# Context and Place Effects in Environmental Public

## Opinion

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Dissertation submitted in partial fulfillment of the requirements for the degree of  
Doctor of Philosophy in the Department of Political Science  
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ABSTRACT

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# Abstract

Environmental attitudes have interested scholars for decades, but researchers have insufficiently appreciated the low salience of the environment, and the enormous complexity of this issue area. In this dissertation, I investigate how these features influence the way ordinary citizens think about the environment.

Research into the dynamics of public opinion has found a generic relationship between policy change and public demands for activist government. Yet, less is known about the relationship between policy and attitudes in individual issue areas. In the first chapter, I investigate the influence of a variety of factors on public opinion in a particularly complex policy area—the environment. To study the short-run and long term dynamics of environmental public opinion, I generate an annual metric of environmental attitudes running from 1974 to 2011. Consistent with prior research, I find the economy and major environmental disasters play an important role in aggregate environmental opinion. However, actual policy innovations are found to play only a limited role in attitude formation. Instead, the party label of the president appears to affect demand for environmental activism, when other factors are held constant.

Scholarly research has found a weak and inconsistent role for self-interest in public opinion, and mixed evidence for a relationship between local pollution risks and support for environmental protection. In the second chapter, I argue that focusing events can induce self-interested responses from people living in communities whose

economies are implicated by the event. I leverage a unique 12-wave panel survey administered between 2008 and 2010 to analyze public opinion toward offshore oil drilling before and after the *Deepwater Horizon* oil spill. I find that residence in counties highly dependent upon the offshore drilling industry was predictive of pro-drilling attitudes following the spill, though not prior to the spill. In addition, there is no significant evidence that residence in a county afflicted by the spill influenced opinion. This chapter concludes that local support for drilling often arises only after focusing events make the issue salient.

Previous research into place effects has provided mixed evidence about the effect of geography on public opinion. Much of the work finding a relationship is susceptible to methodological criticisms of spuriouness or endogeneity. In the third chapter, I leverage a unique research design to examine the influence of residential setting on environmental attitudes regarding water use. The findings indicate that local drought conditions increase individuals' level of concern about the nation's water supply. In addition, drought conditions are related to public attitudes towards water use regulation, with those living in drought-afflicted counties more likely to support government regulation. This chapter provides a firm foundation for research attempting to demonstrate that local conditions have a causal effect on public opinion.

To Sara, who made all my grand adventures possible.

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# List of Abbreviations and Symbols

## Symbols

The following symbols appear in this dissertation:

$\Delta$	A differenced quantity ( $X_t - X_{t-1}$ )
$r$	Pearson correlation coefficient
$\chi^2$	A test of distributional independence.
$F_{k,df}$	F distribution, where k is the number of parameters used in model estimation, and df is the adjusted degrees of freedom.

## Abbreviations

The following abbreviations appear in this dissertation:

ADL	Autoregressive Distributed Lag, a time series regression technique.
ANES	American National Election Study, a series of academic surveys of the American public conducted every two or four years between 1952 and 2012.
AP	Associated Press, a news organization.
ECM	Error Correction Model, a time series regression technique.
EPA	Environmental Protection Agency, a federal agency charged with regulating pollution and the environment in the United States.
ICS	Index of Consumer Sentiment, a measure of the public's perceived economic security.

LRM	Long Run Multiplier, an estimate of the long-run effect on a dependent variable from a one-unit change in an independent variable.
NYT	New York Times, a newspaper.
OLS	Ordinary Least Squares, a linear regression technique.
TRI	Toxic Release Inventory, a record of site-specific industrial pollution maintained by the Environmental Protection Agency.
WCALC	Software developed by political scientist James A. Stimson. It is primarily used to execute Stimson's dyadic ratios algorithm.

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# 1

## Introduction

Scholarly analysis of environmental public opinion has largely mirrored the rise of the environment on the issue agenda in American national politics. Very little research into this dimension of opinion was conducted during the 1950s and 1960s, largely because environmental issues were infrequently contested in American politics and survey researchers rarely asked national samples for their views about the environment. With few exceptions (The Wilderness Act of 1964), environmental issues were considered largely parochial matters, best addressed by state and local political bodies.

The limited scholarly attention to the environment does not mean environmental issues were completely absent from the national conversation prior to the contemporary period. During the late 19<sup>th</sup> and early 20<sup>th</sup> centuries, controversies over the disposition of public lands periodically captured the attention of the public and mass media. Most famously, the city of San Francisco's application to dam Hetch Hetchy Valley within Yosemite National Park captivated the public for a brief period in the fall and early winter of 1913. The Hetch Hetchy controversy offered a preview of the debate between conservationists and preservationists that continues into the

contemporary era (Righter, 2005).

Several important changes occurred in American society and politics in the 1960s, and these changes coincided with a growing interest in environmental topics by social scientists working across traditional academic disciplines. First, an extended period of economic growth in the post-World War II American economy produced unprecedented affluence in American society. Many in the postwar cohort came of age in a world of relative plenty, and the absence of deprivation during their socialization may have directed their passions toward nonmaterial goals. Scholarly articles published in the 1970s and 1980s began to speculate the “baby boom” generation featured “post-material” values, or a primary emphasis on participation in political processes, combined with a heightened interest in personal growth and development (Inglehart, 1971, 1981). Concern about the environment was thought to be one attitudinal manifestation of this broader pattern of political orientation (Inglehart, 1995).

Second, several scholars wrote influential books about the environment, and these works captured the attention of the mass public and a number of social scientists. In 1962, marine biologist Rachel Carson published *Silent Spring*, a mass market book chronicling the (allegedly) harmful consequences of the pesticide DDT. Carson’s book blamed DDT for harming songbird populations, and speculated the pesticide may be responsible for higher cancer rates in the United States and other countries. While the book’s claims were controversial and probably overstated (e.g., Wildavsky, 1997), *Silent Spring* was read by millions and is credited as one of the major inspirations for the contemporary environmental movement (Smith, 2002). Five years later, historian Roderick Nash published *Wilderness and the American Mind*, which traced the development of the preservationist ethos in the United States from the founding to the middle part of the 20<sup>th</sup> century. While Nash’s work was not widely read by the public, the book introduced the idea that the public’s growing enthusiasm for

wilderness protection may have been a socially constructed product of contextual circumstances. Within a decade, scholars began regularly studying responses to survey items covering environmental topics.

Third, a number of high-profile environmental disasters occurred, and these events caused many Americans to contemplate a broader role for the federal government in protecting the environment. In January of 1969, a major oil spill took place near Santa Barbara, California, soaking the shoreline of Santa Barbara County with between 80,000 and 100,000 barrels of crude oil. The disaster was widely covered by the news media, particularly television news, which broadcast heartbreaking images of oil-soaked birds, elephant seals, and sea lions (Smith, 2002). Later in 1969, a section of the Cuyahoga River located between Cleveland and Akron, Ohio caught fire. The river had absorbed decades of industrial pollution, and had deteriorated to the point that it was incapable of sustaining an ecosystem of virtually any form (Stradling and Stradling, 2008). These major pollution events, combined with the social and intellectual ferment noted above, likely contributed to the development of a public amenable to federal environmental activism and a scholarly community that was interested in learning about the public's environmental views.

Much of the early research into environmental attitudes sought to explain the social basis for environmentalism. Scholars examined whether demographic features such as sex, race, age, and a person's economic and educational circumstances were predictive of environmental concern or support for environmental action (e.g., Kreger, 1973; Buttel and Flinn, 1974; Hershey and Hill, 1977; Van Liere and Dunlap, 1980; Blocker and Eckberg, 1997; Bord and O'Connor, 1997; Mohai, 1990). Much of this work produced inconclusive results, a product of small sample sizes and excessively simplistic statistical methodologies. However, several interesting conclusions emerged from public opinion research in the 1970s. First, party identification was implicated in environmental attitudes, as respondents who described themselves as



Democrats were more likely to favor environmental protection than those who affiliated with the Republican Party. These early correlations between party identification and environmentalism are of interest, since the Republican Party had been the more preservationist of the two parties prior to the Civil Rights era. In addition, the elite-level split on the environment between Democrats and Republicans did not become broadly evident until the 1980s (Shipan and Lowry, 2001; Gershtenson et al., 2006).

Second, scholars began to claim environmental policy attitudes were at least in part a function of universal values and ideologies. Dunlap and Van Liere (1978) suggested that contemporary responses to survey items measuring support for environmental protection was rooted in a ecocentric worldview, one that questioned the appropriateness of human domination of the physical environment. In an analysis of what they described as Cultural Theory, Douglas and Wildavsky (1983) argued that the impulse toward environmental protection was rooted in an egalitarian worldview. People who were more embedded in the norms and structures of their cultural community were more likely to be troubled by pollution and other environmental maladies. These perspectives were broadly superseded by a focus on political ideology (Paehlke, 1989; Smith, 2002; Guber, 2003) and universal human values (Schwartz, 1992, 1994), the latter of which is theorized to influence attitudes prior to the intermediate constructs proposed by Dunlap and Van Liere (1978) and Douglas and Wildavsky (1983).

Thus, scholars were beginning to assess the personal correlates with environmentalism, and they were developing an increasingly sophisticated understanding of why these attitudes develop in the first place. An early thread of the first few decades of research into environmental opinion concerned the perceived urban-rural divide in attitudes (Hendee, 1969; Lowe and Pinhey, 1982). Scholars speculated that rural residents should be more resistant to publicly sponsored efforts to protect the environment for several key reasons. First, rural residents were situated more closely to

undisturbed, pristine natural settings, and as such, they were less likely to recognize the novelty of pastoral scenes. In addition, rural culture contained within it a more utilitarian or materialistic attitudes toward nature. Urban residents, by contrast, were more directly and personally confronted with the pollution caused by industrial production, and were theorized to yearn for clean, natural environments (e.g., Tremblay and Dunlap, 1978).

The literature on the urban-rural divide never reached an unambiguous conclusion as to whether people who live in rural areas are less favorable toward environmental protection than their urban dwelling counterparts, largely because of disagreements over how to measure concepts such as “rural” or “urban.” However, the investigations into the urban-rural divide raised several key questions about nature of environmental attitudes which warrant further consideration. First, does a person’s residential setting influence his or her views toward environmental policymaking? And second, does one’s attachment to and dependence upon the local economy impact one’s level of support for polluting industries? Both of these are questions about the context of place, and answering them is a key analytical objective of this dissertation.

Before proceeding to describe my approach to the study of residential context in environmental public opinion, it is important to take a step back and consider the nature of environmental attitudes, particularly in comparison to other contemporary policy issues. One important analytical dimension of opinion concerns the extent to which the mass public considers environmental issues important. As others have reported, environmental issues are rarely at the top of the public’s agenda, and are less likely to be mentioned as one of the nation’s “most important problems” in an open-ended survey format than many or most competing issues (Guber, 2003). While some research has found that more people mention environmental issues when open-ended questions frame problems in a global or future-oriented context (Yeager et al., 2011), in a typical survey just a small percentage of respondents mention the

environment.

In addition, there is mixed evidence that environmental issues have much leverage on voting behavior, at least at the presidential level (Guber, 2001; Davis and Wurth, 2003; Davis et al., 2008). According to Guber (2003), the limited effect of the environment on vote choice is in part a function of the close alignment between environmentalism, liberalism, and Democratic Party politics. While there are certainly pro-environment Republicans, there are not enough of them to constitute a large issue public, and pro-environment Republicans usually vote Republican anyway based upon other issues.

This low level of salience and importance, an essential characteristic of environmental issues, suggests that when surveyed, many respondents have a small store of prior considerations in long-term memory pertinent to the environment. Thus, when surveyed about a particular environmental issue, the typical person may have fewer accessible considerations and may report a weakly reasoned attitude, or an attitude heavily influenced by recent experiences.

A second fundamental feature of environmental opinion is complexity. Perhaps the most difficult issue to comprehend in contemporary American politics concerns the “greenhouse effect” or climate change, the controversial warming trend scientists partly attribute to fossil fuel emissions. Despite the scientific consensus about the nature of the warming and its causes, considerable (and even growing) skepticism about the phenomenon exists in the mass public (Brulle et al., 2012; Guber, 2013; Scruggs and Benegal, 2012). This feature of opinion is partly caused by divergent signals sent by partisan elites, but it is also a function of complexity. As Sterman and Sweeney (2002) have shown, even highly educated, quantitatively sophisticated respondents have a very limited understanding of the systemic process that causes global warming.

This complexity is common to many environmental issues beyond climate change,

however. As an example, consider what a person would need to know in order to meaningfully engage with the issue of domestic offshore oil drilling. First, a person would have to know something about how levels of supply and demand influence price. Second, a person would need to know something about the international forces that affect the level of the international supply of oil, and then the person would need to know which forces impact demand. Third, a person would need to know something about how much oil was potentially recoverable in the United States. Fourth, a person would need to understand how much an injection of oil would impact prices in the short term, and in the long term. Finally, the person would need to know about the pollution risks presented by offshore oil drilling relative to some other source of energy generation. In short, for this environmental issue and most other issues like it, the policy debate concerns a choice of means rather than ends, a classic marker of a “hard” issue (Carmines and Stimson, 1980).

Given this complexity, it is not surprising that the public’s understanding of environmental and energy issues is extremely low. In an analysis of California voters, Smith (2002) identified the minimal level of knowledge a person would need in order to have an informed opinion about energy issues such as offshore oil drilling and nuclear power. He found only one third to one half of respondents were capable of engaging these issues with any level of sophistication—instead, their thinking was clouded by vivid misperceptions and outright falsehoods.

Taken together, the combination of the low salience and high complexity of environmental policy issues befuddles the typical respondent who is confronted with an environmental survey item. As a consequence, some of the detailed self-interested calculations certain respondents have been expected to make (e.g., urban residents’ reactions to local pollution rooted in personal experience) may not end up influencing the survey response. It is not surprising, then, that null or mixed findings have tended to characterize research into the influence of local residential characteristics

on environmental attitudes.

This dissertation includes three studies of environmental attitudes that are informed by an understanding of the high complexity and low salience of environmental issues. In the chapters that follow, I study three distinct questions about environmental opinion using research designs that allow for stronger causal inferences than have been reported in much of the existing correlational research.

In Chapter 2, I address a basic question about environmental public opinion: which period effects cause changes to the public's aggregate demand for environmental action? I show how the low salience and high complexity of environmental issues impacts the direction of individuals' responses to broadly defined environmental survey items. The traditional view among public opinion scholars is that individuals' demand for environmental protection is rooted in a reaction to the direction of recent policy (Dunlap, 1992; Wlezien, 2004). I demonstrate that ordinary citizens' demands for stronger environmental protection is based on *perceived* environmental stewardship by the current President, a judgment rooted in low-cost partisan heuristics. Because the public believes Democratic presidents are dedicated to protecting the environment and Republican presidents are not, when a Republican occupies the White House, the public assumes environmental conditions have worsened. In a longitudinal analysis, I show that when objective environmental conditions and real policy activism are held constant, partisan forces explain much of the variation in the public's environmental demands between 1974 and 2011.

In Chapter 3, I study the role of residential context in attitudes toward offshore oil drilling. Existing theoretical accounts suggest two possible avenues for contextual influence on environmental opinion. First, people who live in communities dependent on particular forms of industrial production may identify with local industry for self-interested reasons. As a result, they may be unusually supportive of these local industries, and resist regulations that could restrict local economic activity. Second,

people who are exposed to local pollution, may be unusually supportive of environmental regulations that address that specific form of pollution. Existing research into these hypotheses has been mixed, and I argue this pattern of findings arises from the two core features of environmental opinion noted above—high complexity and low salience. I hypothesize that after a major pollution event, individuals’ problems of low salience and limited understanding is solved by heavy issue-oriented media coverage. In Chapter 3, I study opinion before and after the 2010 *Deepwater Horizon* oil spill, leveraging a unique source of panel data. In an analysis of attitudes among the same respondents at two different time periods, I find no evidence of contextual relationships before the spill but strong evidence of community self-interest after the spill. There was no evidence of an effect on opinion from pollution exposure in either 2008 or 2010.

The findings of chapter 3 raise a fundamental question: does community self-interest arise from personal experiences with environmental problems at all? To answer this question, I sought a form of environmental malaise that has no association with local industrial activity, and which is assigned to respondents on a random basis. Conditions in the former category are unlikely to uncover relationships between context and opinion because the same respondents who experience environmental problems *also* benefit from the economic activity generated by local industry. Thus, while these respondents may experience self-interested, anti-industry reactions to pollution, they simultaneously experience pro-industry pressure because of concern about their local communities’ economies. Randomness is an important criteria because people who live in communities most likely to experience environmental harm also tend to favor regulation because of their underlying liberalism. Thus, finding a correlation between polluted communities and pro-regulatory attitudes could be an artifact of residential self-selection for reasons that have nothing to do with pollution attitudes.

In chapter 4, I study the effect of a form of environmental harm that comes close to fitting the “industrial absence” and “randomness” criteria—drought. I hypothesize that drought serves as a local “focusing event” by simultaneously informing the public about drought, and influencing the direction of local attitudes. Using two different sources of survey data, I find a consistent relationship between drought exposure and environmental opinion. I find that people who have experienced recent drought are more likely to express concern about the nation’s water supply, and more likely to support regulations that restrict water use. In short, I find evidence that environmental problems can induce a pro-environment survey response—but only in the absence of local industrial dependence.

## Thermostatic Environmentalism: The Dynamics of 'Natural Decline'

Study of the relationship between policymaking and citizen attitudes has intrigued public opinion scholars for decades. Research from the 1970s and 1980s found normatively reassuring evidence that the public's preferences were usually translated into policy changes (e.g., Erikson, 1976; Monroe, 1979; Page and Shapiro, 1983; Weissberg, 1976). Having found a strong connection between opinion and subsequent policy change, many researchers turned their attention in the opposite causal direction in the 1990s, attempting to determine whether opinion is influenced by policy (e.g., Page et al., 1987; Page and Shapiro, 1992). While research has uncovered considerable evidence of a causal relationship running from the actions of government to broadly defined policy demands by the public, less is known about the correspondence between policy and opinion in individual issue areas.

Scholars have investigated two broad categories of influence on public attitudes. First, research has examined the influence of exogenous, contextual forces on public opinion. Scholarship has uncovered relationships between public liberalism and various economic measures such as unemployment (Erikson et al., 2002), inflation (Kam



and Nam, 2008), consumer sentiment (Durr, 1993), and economic inequality (Kelly and Enns, 2010). Much of this research concludes that the public's policy preferences are predictable, and systematically responsive to changing structural forces in the economy.

A second source of opinion change has been found in the decisions made by political elites. Perhaps most famously, Wlezien (1995) argued that the public's preference for federal spending responds in "thermostatic" fashion to real spending decisions. When the government increases spending, the public reacts by reducing its demands for more such spending; conversely, when spending levels are cut, the public adjusts its preferences for spending upward. Recent research has extended these findings by concluding that public liberalism is reactive to the ideological nature of the spending (Ellis and Faricy, 2011).

This pattern of results suggests that, in the aggregate at least, the American public is aware of and responsive to the policy changes enacted by the federal government. A competent democratic public should demand policy changes that are rooted in the actual choices made by elected representatives—not just fluctuating economic circumstances. However, the observed correlation between policy and opinion may be caused by an additional mechanism: the public may respond to policy innovations it assumes have taken place, rather than the actual reforms enacted into law.

In this chapter, I hypothesize that public opinion often responds to the policy reputation of the governing party, not necessarily the way that party governs. I examine a complicated area of policy particularly likely to follow such a dynamic: the environment. As I discuss below, this issue area presents challenges for the mass public, because it is often hard to understand the content of environmental policy, and almost impossible to judge whether the federal government's policy response is improving the problematic environmental conditions. I demonstrate that environmental public opinion is systematically responsive to the party label of the president

and his administration, not necessarily the environmental conditions or the actions taken by Congress and the president.

## 2.1 Background

In their discussion of public opinion on energy policy, Konisky and Ansolabehere (2012) propose two core influences on individuals' support for particular forms of energy development. First, individuals incorporate concerns about the level of harm development imposes on the environment, preferring energy sources which carry fewer environmental consequences. Second, individuals weigh the cost of producing energy by various means, preferring cheaper energy alternatives to more expensive ones.

These twin values are not necessarily compatible, as the earliest scholars of environmental opinion were quick to emphasize. Downs (1972) conceived of environmentalism as an inevitable clash between leisured elites and the democratization of a consumption-oriented lifestyle made possible by more than two decades of postwar economic expansion. In Downs' view, environmental concern arose from encounters with increasingly visible air and water pollution, and the periodic occurrence of major pollution events such as the 1969 Santa Barbara oil spill. Downs argued most pollution was a by-product of behaviors fundamental to the American lifestyle, and attempts to mitigate them would require Americans to accept changes in that way of life. Consequently, he speculated the early 1970s surge in environmentalist enthusiasm would inevitably wane as the nation confronted the expense of underwriting a green agenda.

Downs' seminal perspective inspired a considerable volume of research exploring the implications of a rational choice, cost-benefit perspective imported from economics. When the costs of pollution appear worse, a rational public might be expected to increase its demand for environmental action. Public opinion research has uncovered evidence that after major pollution events, the public does become

more committed to the environment (Smith, 2002). However, there is mixed evidence about the magnitude and duration of these effects. Some research finds small short-run surges in environmental enthusiasm following major pollution events (e.g., Bishop, 2013). However, other evidence indicates environmental disasters have long term consequences for public opinion. For instance, the combination of the near-disaster at the Three Mile Island nuclear facility in 1979 and the 1986 Chernobyl meltdown in Ukraine appears to have permanently diminished the American public's willingness to invest in nuclear energy (Bolsen and Cook, 2008; Smith, 2002).

Scholars employing a similar rational choice perspective have speculated that changes in the country's economic situation influence the aggregate public's support for environmentalism by affecting the perceived cost of environmental action. Scholarship has found a consistent relationship between energy prices and support for public policies aimed at benefiting various energy industries (Farhar, 1994; Smith, 2002). Research has also established a positive relationship between real per capita GDP and support for environmental spending (Elliott et al., 1995; Guber, 2003). The relationship between the economy and environmentalism has counter-intuitive consequences: some research even suggests the public's willingness to accept the academic consensus of rising global temperatures caused by human activities is conditioned upon the business cycle (Kahn and Kotchen, 2011; Brulle et al., 2012; Scruggs and Benegal, 2012).

A second major perspective on environmental opinion concerns reactions to public efforts to improve environmental quality. Broader public opinion research has established considerable correspondence between the public's desire for more expansive government action and changes in public policy in response to such demands (Stimson et al., 1995; Erikson et al., 2002). Less attention has been devoted to causal arrows pointed in the opposite direction—from policy innovation to opinion change. Wlezien (1995) found the public reacts to policy reform in a “thermostatic” fashion,

lowering its demand for additional public action in the face of liberal policy enactments. The mechanism is straightforward: when the public gets liberal policies, it recognizes the change in the policy status quo and adjusts its demands for additional changes in a liberal direction.

Such an opinion dynamic makes sense in many areas of public policy. If tax rates are increased, the public can easily recognize the change, relate the change to the prior status quo, and adjust its preferences accordingly. However, the thermostatic perspective encounters difficulties in complicated policy arenas such as the environment. For instance, how does such a public assess progress in solving environmental problems? Should it adjust its demands for additional environmental policymaking based upon changes in the federal effort to protect the environment? Or does a thermostatic public respond to improvements in actual environmental quality? It is easy to imagine a public that receives mixed signals from these indicators. In one period, the federal government may eliminate environmental regulations or cut the EPA budget, while indicators of environmental quality show considerable improvement. In another period, Congress could enact new landmark environmental legislation at the same time a major oil spill takes place in U.S. waters. In each instance, it is not clear how a thermostatic public should adjust its demands based upon the new policy status quo. This wrinkle in environmental opinion dynamics may help explain why, in later work, Wlezien (2004) found the public's preference for environmental spending was influenced primarily by changes to the *overall* patterns of federal spending rather than specific environmental spending levels.

Longitudinal study of environmental opinion has been rare, in part because of limited data availability and concerns about dimensionality (see below). However, the most prominent scholarly perspective emphasizes the role of executive policy activism. In his theory of "natural decline," Dunlap (1992) argued that the public's surge in support for environmental protection during the mid and late 1980s was a re-

action to President Reagan’s low level of perceived stewardship of the environment—particularly when contrasted with his predecessor Jimmy Carter, who was perceived to be an environmentalist. According to Dunlap, when the public is more satisfied that the executive is looking out for the environment, it lowers its demands for environmental action. Thus, research has tended to emphasize the public’s responsiveness to explicit actions taken by elected representatives rather than the underlying environmental problems these actions are intended to ameliorate.<sup>1</sup>

Given the limited evidence of a systematic relationship between government action on the environment and environmental public opinion, it is important to understand whether the public responds to the actual policy reforms undertaken by government, or the mere *perception* of environmental stewardship. Existing accounts of environmental opinion change sometimes acknowledge this important distinction (Guber, 2003), but have yet to investigate it in depth.

## 2.2 Party Reputations and Environmental Stewardship

According to Dunlap’s (1992) account, an important source of the public’s increasing environmentalism in the 1980s was its assumption of poor environmental stewardship by the Reagan administration. However, environmental issues typically do not occupy a central role on the public’s issue agenda. The average citizen rarely identifies environmental issues as the “most important problem” facing the nation<sup>2</sup>, and there is mixed evidence that environmental issues have much of an influence on voting behavior (e.g., Guber, 2001; Davis and Wurth, 2003). Thus, the typical citizen probably

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<sup>1</sup> It should be noted that Dunlap (1992) argues that a pattern of “worsening” environmental problems broader in scope than the nuisance pollution issues of the 1970s played a role in the spike observed in the public’s desire to protect the environment. However, as will be discussed below, it is not necessarily clear that environmental conditions actually have been worsening, and in any case Dunlap’s analysis does not include “objective” measures of environmental quality.

<sup>2</sup> However, when question wordings prompt respondents to think about future problems, environmental issues such as global warming are mentioned much more frequently (Yeager et al., 2011)

does not carefully monitor low-visibility or incremental changes to the environmental policy status quo.

In absence of regular monitoring of elected officials and federal agencies, individuals must rely on cognitive shortcuts to assess government action in complex policy settings such as the environment. Party labels have been theorized to provide a substantial amount of information for otherwise ill-informed voters (Downs, 1957). Research has also found considerable evidence that voters rely on the partisan heuristic to infer the issue positions taken by candidates (Feldman and Conover, 1983; Conover and Feldman, 1989; Grynaviski, 2010). In a carefully designed experiment, Rahn (1993) investigated how ordinary citizens infer issue stances when confronted with partisan stereotypes and individuating information about politicians. She concluded that “when voters have both particular information and party stereotypes available, these results show that they prefer to rely on heuristic-based processing” (Rahn, 1993, p. 92). In short, when they have both information about a politician’s views *and* a partisan stereotype accessible to them, individuals are more likely to rely on the latter to infer the politician’s policy positions.

It is likely that individuals also rely on the partisan heuristic to infer current governing practices and priorities, particularly in complex policy settings such as the environment (Kam, 2005). While ordinary citizens may learn important information about environmental policy controversies when these considerations periodically become salient in the mass media, in most circumstances individuals must make use of the limited information that is available to them. In many complex public policy areas, the scholarly evidence suggests the party label may offer the most available and useful cue.

In the area of environmental policy, the partisan heuristic is unambiguous. In Congress, Democrats have always amassed a more pro-environment record than Republicans, and the magnitude of the difference in terms of partisan roll calls has grown

sharply since 1980 (Shipan and Lowry, 2001). By 1996, respondents to the American National Election Study (ANES) overwhelmingly thought the Democratic Party would do a better job of handling “pollution and the environment.” Of those willing to offer a partisan preference on the issue, nearly four in five chose the Democrats. Thus, the party label offers a strong directional cue about partisan performance on the environment—one that previous scholarship suggests may be far more important than counter-stereotypical evidence.

Three broad hypotheses of influence on public attitudes toward environmental activism are suggested by the foregoing discussion:

- *Economy-based* hypothesis: When economic conditions improve (worse), the public will demand higher levels of government action to improve the environment.
- *Conditions-based* hypothesis: When environmental conditions worsen (improve), the public will demand higher (lower) levels of government action to improve the environment.
- *Policy-based* hypothesis: When the government changes policy in a pro-environment (anti-environment) direction, the public will demand lower (higher) levels of government action to improve the environment.
- *Party-based* hypothesis: When the White House is occupied by a Republican (Democrat), the public will demand higher (lower) levels of government action to improve the environment.

More than one of these hypotheses could theoretically be supported by the evidence—in fact, it is reasonable to expect support for each of them. Less clear are questions of dynamics and magnitude: which of these causal accounts exerts a stronger influence on environmental opinion, and are the effects felt immediately, or

do they influence environmental opinion over the long run? In what follows, I generate measures of environmental opinion, government activism, and environmental quality, and develop a model designed to unpack the factors that influence environmental attitudes.

## 2.3 Data and Measures

In this paper, I estimate models covering two time periods: models predicting environmental opinion between 1974 and 2011, and a second group of models covering the period between 1989 and 2011. As will become clear below, the availability of data for many key variables—particularly measures of environmental quality—is far better from 1990 onward. In addition, since the presidency of Ronald Reagan looms so large in the established literature on environmental attitudes, it is important to ensure that the relationships analyzed in this study are not simply artifacts of the controversial Reagan presidency.

### *2.3.1 Dimensionality*

Before producing a longitudinal measure of aggregate environmentalism, it is necessary to consider whether such a generic concept genuinely exists. Some scholars have argued that many environmental survey items can be usefully distilled into a single, underlying latent dimension (Pierce and Lovrich, 1980; Guber, 1996; Xiao and Dunlap, 2007). Others argue that survey questions covering the varied topics often lumped together in an “environment” category, such as preferences for spending on the environment, jobs-environment trade-offs, and energy-price tradeoffs, have their own internal dynamics and should be analyzed in isolation (e.g., deHaven Smith, 1988; Klineberg et al., 1998). In a thorough analysis of a wide variety of environmental attitude dimensions, Daniels et al. (2012) report that the individual survey items they analyze demonstrate unique patterns both cross-sectionally and over time.



They conclude “the fact that a number of items may all be facially relevant to environmental concern in general should not be enough to warrant their inclusion on the same index” (Daniels et al., 2012, p. 485).

The argument that each distinct survey item has its own integrity does not preclude the possibility that a latent concept may influence each of them. It is reasonable to suppose that a person’s generic demand for government activism on the environment will have some influence on her response to questions about whether she thinks the federal government is spending too much on the environment, whether she thinks offshore oil drilling should be expanded in U.S. waters, or whether environmental regulations have gone “too far.” If a person’s broad enthusiasm for activist environmental protection is relatively high, we can expect more “liberal” responses to each of these questions. And in the aggregate, when public support for environmental action is lower, we can expect marginal responses to a wide variety of survey items to be more “conservative.” The fact that many individual items exhibit variation around a shared trend of environmental sentiment simply demonstrates these items do have distinct systematic components over and above the usual sampling error associated with survey research.

Consider Fig. 2.1, which presents aggregate responses to three environmental survey items that have been asked at repeated intervals between the 1970s and the present.<sup>3</sup> The items were fielded by three different pollsters, here standardized for the purpose of an over-time comparison. While each of the items clearly has its own

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<sup>3</sup> Princeton Survey Research Associates: “Do you think there is too much, too little, or about the right amount of government regulation and involvement in the area of environmental protection?” NORC: “We are faced with many problems in this country, none of which can be solved easily or inexpensively. I’m going to name some of these problems, and for each one I’d like you to tell me whether you think we’re spending too much money on it, too little money, or about the right amount... Improving and protecting the environment.” *New York Times*: “Do you agree or disagree with the following statement: Protecting the environment is so important that requirements and standards cannot be too high, and continuing environmental improvements must be made regardless of cost.”

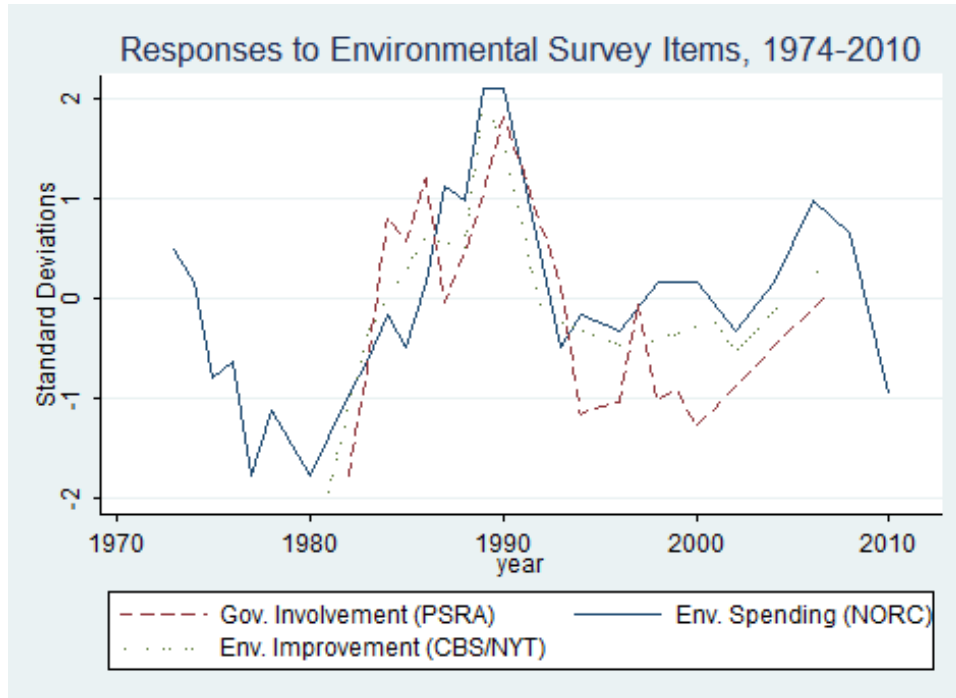


FIGURE 2.1: A longitudinal comparison of three long-running survey items concerning government action on environmental policy.

unique systematic component, there is an obvious trend common to each of them. All series contain very conservative values around 1980, a liberal period that peaks in shortly after 1990, a noisy period that is neither liberal nor conservative in the 2000s, and then another conservative trend toward the end of the time series. While these survey items are clearly not mirror images of one another, they exhibit systematic movement at various points in the series, perhaps in response to the same stimuli.

Despite the availability of these survey items and a few other items frequently employed by pollsters, no single environmental question has been asked to national samples at regular enough intervals to generate a continuous time series. However, numerous scholars have aggregated related items into a latent series using the dyadic ratios algorithm developed and analyzed by Stimson (1999). I collected numerous survey items asking respondents whether they supported government action to pro-

Table 2.1: Correlations between Survey Items and Environmental Mood

	Involvement	Improvements	Spending	Mood
<b>1974-2011</b>				
Involvement	1	.85	.66	.69
Improvements	.85	1	.95	.93
Spending	.66	.95	1	.92
<b>1989-2011</b>				
Involvement	1	.80	.84	.76
Improvements	.80	1	.98	.93
Spending	.84	.98	1	.97
<b>Unique Mood Measure, 1974-2011</b>				
Involvement				.65
Improvements				.87
Spending				.84

tect the environment, and used Stimson’s WCALC software<sup>4</sup> to generate a single, latent metric of environmental “mood” that runs from 1974 to 2011.<sup>5</sup> The series is presented in a graph form below in Figure 2.<sup>6</sup>

On Table 2.1, I present a correlation matrix depicting relationships between each of the three long-running time series presented on Fig. 2.1, and the latent environment

<sup>4</sup> The software and supporting documentation can be obtained at <http://www.unc.edu/~jstimson/Software.html>.

<sup>5</sup> The items were obtained using the Roper Center’s iPoll databank, which archives survey questions asked by commercial and academic survey organizations. To obtain the items, I used the Roper Center search function to retrieve all questions in the “Environment” category between 1974 and 2011. All questions asked in an identical question format more than once by the same pollster were collected. After further analysis, I selected only items which explicitly asked respondents about their level of support for government action to protect the environment. Items meeting the above criteria were included in the dataset used to generate the latent series.

<sup>6</sup> In addition, I generated two additional latent series—one measuring the public’s overall concern about the environment, and another for survey items measuring the public’s support for the environment in contrast to a trade-off of some kind (e.g., jobs, economic growth, prices). The government demand measure is highly related to the tradeoff measure ( $r=.81$ ), and also highly related to the concern measure after 1989, when the concern data is sufficiently dense ( $r=.75$ ). In this paper, the analysis focuses on the government demand measure, in part because of the legitimate concerns raised by Daniels et al. (2012). However, there does appear to be a relationship between government demands, trade-off calculations, and generic concern about environmental quality.

mood metric. As is clear from the table, all series are strongly related to the latent metric, exhibiting correlations between .69 and .97. However, to ensure that the presence of each item in the data used to produce the series is not entirely driving these correlations, I also assessed the relationship between each series and a unique version of the environment mood index estimated without those respective series included in the parent data. As can be seen in the table, the relationship between each series and the mood metric is slightly weaker in all cases, but correlations between the individual survey items and the latent series remain strong, ranging between .65 and .89. Thus, while responses to each question do appear to have systematic characteristics distinct from the other items and the latent series, they exhibit a common trend captured by the environment mood metric.

If some observers object to the idea that latent environmentalism influences responses to a wide range of distinct survey items, others may argue that the environment “mood” metric is not conceptually distinct from trends in the public’s attitude toward liberalism more broadly. To assess this possibility, consider Fig. 2.2, which presents annual measures of liberal-conservative policy mood compared with the environmentalism index.<sup>7</sup>

As Fig. 2.2 makes clear, the two measures are strongly related to one another, particularly from the 1970s until the mid 1990s. After this period, the series diverge and share very few common movements. Both series show an increasingly conservative environmental orientation peaking around 1980, increasing liberalism that peaks after 1990, and then considerable divergence thereafter. The overall correlation between mood liberalism and the environment mood index is about  $r=.55$ , but very strong between 1974 and 1988 ( $r=.80$ ). After 1988, there is a weak relationship between mood liberalism and environment mood ( $r=.23$ ). This same pattern is evident

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<sup>7</sup> The mood liberalism index was generated by Stimson (1999), who provides measures of annual and quarterly mood at [http://www.unc.edu/~cogginse/Policy\\_Mood.html](http://www.unc.edu/~cogginse/Policy_Mood.html).

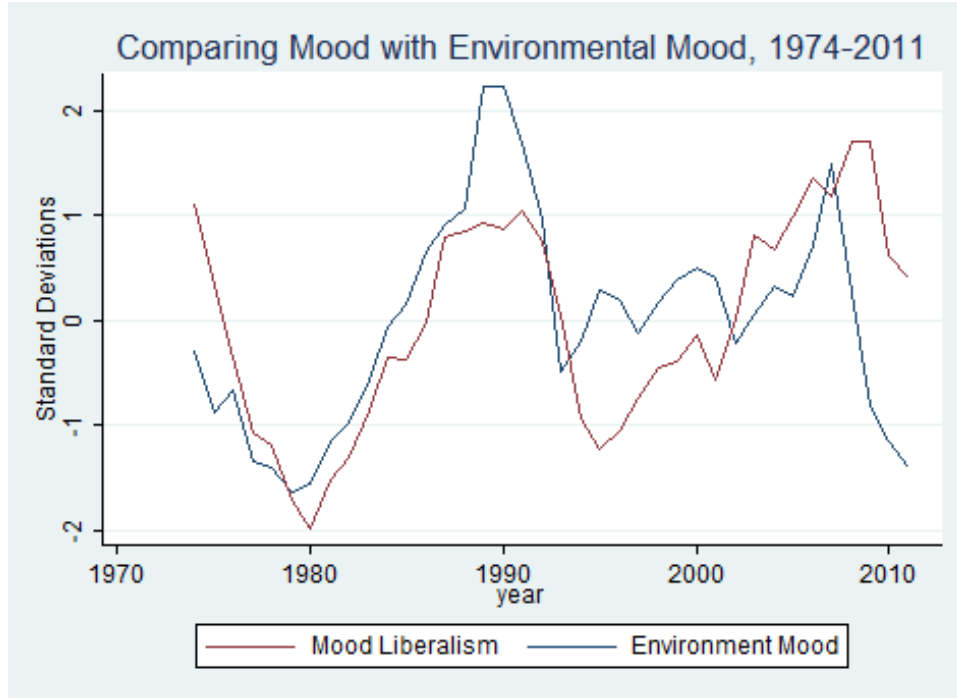


FIGURE 2.2: A comparison between Mood Liberalism (Stimson 1999) and the Environmental Mood measure developed in this study.

within the mood liberalism metric itself; a version of the index that contains only environmental survey items and is highly related to the environment mood metric I use here ( $r=.93$ ) also does not appear to be related to the mood liberalism index after 1988 ( $r=-.07$ ). These summary measures suggest that environment mood captures a distinct latent attitude, particularly after the presidency of Ronald Reagan. Thus, environmental mood is common enough to the individual environmental survey items to offer a meaningful measure of the public’s demand for government action on the environment, while measuring a concept that is analytically distinct from aggregate liberalism.

In order to analyze environmental mood as a dependent variable, it is first necessary to assess its statistical properties. First, because the items used to construct the measure vary widely in the percent of the public reporting a “liberal” response, the

specific value for each year should not be interpreted as substantively meaningful. Here, I study changes in the mood metric over time, so the analytically important quantity is changes from one year to the next.

Second, consistent with research into the time series properties of policy mood (e.g., Kelly and Enns, 2010), I am unable to reject the possibility that the series contains a unit root.<sup>8</sup> However it is highly unlikely the environmentalism index is an integrated series (meaning that any given value in the series constitutes the sum of all previous changes); for instance, if environmental mood is genuinely integrated, the surge in green enthusiasm following the Exxon *Valdez* oil spill would have the same effect on today's aggregate environmental demands that it did in 1990. Simple cohort replacement, combined with the public's imperfect memory, ensures that such events eventually diminish in importance, even though they may influence people's thinking about the environment for a long time afterward. More likely is that environment mood is a "long memoried" series in the sense that shocks to the series' trajectory influence future values, but are slowly "forgotten" over time.<sup>9</sup> I explore the implications of the environmentalism series' dynamics when I develop a multivariate model below.

### 2.3.2 *Independent Variables*

*The economy.* A key influence on environmental opinion, according to previous scholarly work, concerns variation in the costs and benefits of environmental policymaking. If we assume, as scholars such as Downs (1972) did, that attitudes toward environmental policymaking are fundamentally rooted in trade-offs between environmental values and the economic costs needed to pay for them, variation in the national

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<sup>8</sup> Test statistic of -1.46 is well below standard and McKinnon critical values ( $p$  value for  $Z(t)=.55$ )

<sup>9</sup> Using Robinson's semi-parametric estimator (Robinson, 1995), I estimate the  $d$  statistic for the series at .84 (s.e.=.17), above the .5 threshold usually associated with stationary series, and statistically indistinguishable from an integrated series.

economy should be predictive of the public's demand for environmental protection. In the environmental policy arena, the relevant economic influences could concern overall economic activity, employment, or prices. However, these variables are ordinarily quite highly related to one another, particularly when measured on an annual basis. From the perspective of the environment, these three concepts may be interchangeable since they collectively influence the core concept theorized to affect the public's desire to protect the environment—the public's sense of economic well-being. To measure generic economic well-being, I use annual measures of the University of Michigan's Index of Consumer Sentiment (*ICS*). It is expected that when the *ICS* is high, the public will demand more environmental protection, while lower readings of *ICS* will be predictive of lower levels of public support for environmental action.

*Major environmental events.* As discussed earlier, environmental disasters have been implicated in pro-environment and anti-industry changes in public attitudes toward energy and the environment. In a multivariate setting, it is important to account for the potential influence of these contextual events. I generated an annual binary “events” measure that captures the years affected by four major environmental disasters (or near disasters): the 1979 Three Mile Island nuclear meltdown, the 1986 Chernobyl disaster in the Ukraine, the 1990 Exxon *Valdez* oil spill, and the 2010 *Deepwater Horizon* explosion and subsequent oil spill. Each of these events is expected to nudge environmental attitudes in a more liberal or activist direction in the year they occurred.

*Policy.* The logic of a thermostatic attitudinal response to policy reform is that new government action in the area of the environment causes the public to regard the policy temperature as “too hot,” and subsequently leads the public to adjust its demands for new environmental action downward. In previous research, scholars have focused on the relationship between federal spending and public demand for additional spending. However, the environment implicates numerous federal agencies

and policy arenas. In assessing whether the public's preference for environmental action is impacted by policy change, it is necessary to consider additional policy levers, such as legislative action and executive prerogative on the environment.

*Spending.* I generated two important (and highly related) measures of environmental spending: the overall level of spending on the environment (federal budget category 700) and the level of federal spending on the Environmental Protection Agency (EPA), perhaps the most important federal regulatory agency concerning the environment. Both of these measures were adjusted for inflation using the Consumer Price Index (CPI). In both cases, thermostatic dynamics would predict that preference for environmental action should be lower when spending is higher, and vice versa.

*Major laws.* To measure legislative activity on the environment, it is necessary to identify the most meaningful and visible actions taken by the Congress. In order to accomplish this task, I rely on a qualitative assessment by two experienced scholars of environmental policy (Kraft and Vig, 2009a). I generate a measure of legislative activism that computes the number of major environmental laws enacted in a particular year.<sup>10</sup> As above, when the government enacts a major environmental law, a thermostatic public should respond by lowering its demands for more environmental protection.

*Executive orders.* While the executive is involved in bargaining with Congress on important legislation and establishing spending levels for the environment, the institutional nature of the American presidency offers independent opportunities to influence federal environmental policy. An important aspect of presidential power in the area of environmental policy is the executive order. Over the years, presidents have influenced the efficiency of energy use by federal employees (Carter), imposed

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<sup>10</sup> To identify the year a major legislative reform was enacted, I rely on the date the legislation was signed into law by the president.



cost-benefit calculation as an overriding standard for new regulations (Reagan), and required departments and agencies to consider racial equity on the environment when evaluating potential federal action (Clinton). I reviewed all executive actions involving the environment from 1974 to the present, and coded each action as “pro-environment,” “anti-environment,” or “neither.” For each year, I summed executive actions on the environment. Activist years should be associated with lower levels of demand for environmental action, under the thermostatic opinion framework.

The Antiquities Act of 1906 empowers the president to convert tracts of land owned by the federal government into national monuments by executive order. The Act has been regularly used by presidents through the period under analysis, often stirring considerable controversy. For each year, I summed the number of times presidents created new national monuments by executive order. The measure ranges from zero in several years to 11 for the year 2000, when President Clinton leaned heavily on the Act to create new national monuments on his way out of office.

Fig. 2.3 presents a plot of environmental policy activism from 1974 to the present, capturing executive activism on the environment and the passage of major environmental laws. It also includes a factor score derived from these executive measures, the overall level of environmental spending, and spending on the EPA. This latent factor score is used in the models estimated below. Overall, the plot shows considerable environmental policy activism during the late 1970s and into the early 1980s, before the conservative environmental policy reforms associated with the Reagan era. Environmental policy activism increased during the Clinton years, but not by an enormous amount. In addition, the Presidency of George W. Bush, despite its reputation for conservative stances on environmental issues, saw only modest decreases in environmental activism. Meanwhile, in his first term Barack Obama supported several pieces of pro-environment legislation, and supported increased EPA funding.

A key question analyzed by this study is whether the public is responsive to gov-

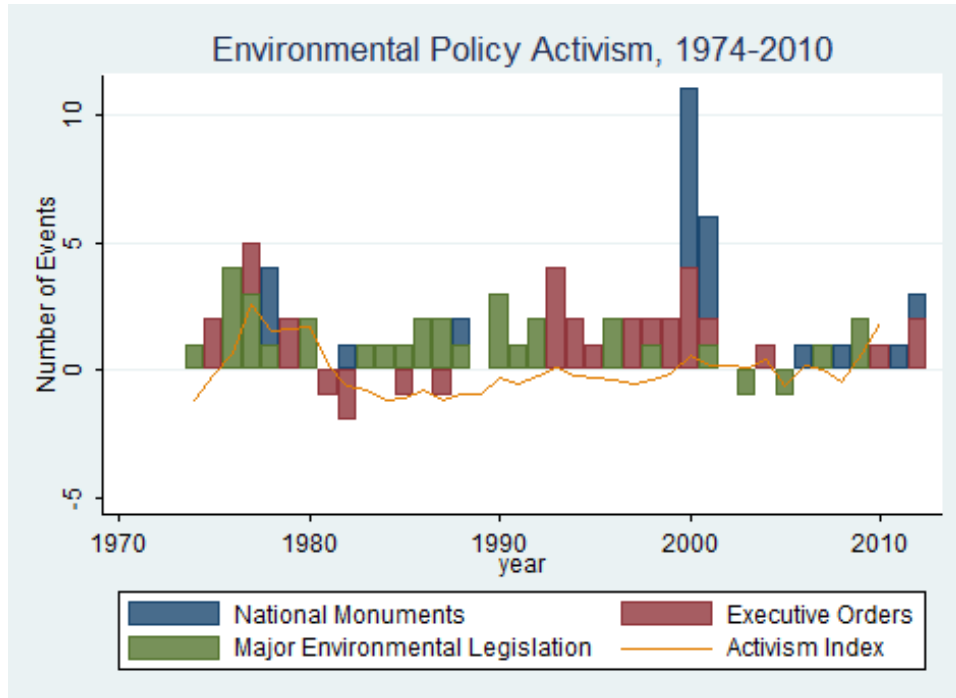


FIGURE 2.3: A longitudinal comparison of various acts of environmental policy activism between 1974 and 2010.

ernment actions to improve the environment, or whether the public’s demand for environmental protection is rooted in its reactions to measurable changes in environmental quality. The availability of government-produced statistics allows for some assessment of the level of environmental activism the federal government engages in. However, measurement of the overall quality of the environment is a difficult analytical problem that bedevils both lawmakers and policy experts. Many analysts regard environmental data collected prior to the mid-1970s as unreliable, and the limited data that exists paints an inconclusive portrait of the state of the national environment (Kraft and Vig, 2009b).

It is challenging to assess national environmental quality for a variety of reasons. First, environmental problems vary widely by region, and are tied to disparate factors such as climate, local industrial activity, and numerous regional geographic

characteristics. Second, the specific forms of pollution that preoccupy the policy community frequently change over time. For instance, today's air pollution analysts are increasingly focused upon carbon dioxide emissions because of worries about climate change, while concerns were more concentrated upon chemicals responsible for depleting the ozone layer in the 1980s. Third, longitudinal measures of pollution are only available for the forms of environmental malaise lawmakers have authorized federal agencies to study.

The EPA offers a few trend measures covering the time period of this study that are considered valid and reliable. First, the EPA has archived measures of air pollutants since 1990, and some pollutants have been measured since 1970.<sup>11</sup> These trend data present an unambiguous pattern of success. Over time the amount of sulfur dioxide, ammonia, fine particulates, and other forms of air pollution have steadily diminished, even while the national population and its concomitant economic activity has increased. At the same time, the number of days in which air quality levels were considered unhealthy decreased between 1990 and the present. In the analysis below, I generate air quality factor scores using this data. If the public's demand for environmental protection is responsive to measurable changes in environmental quality, decreasing pollution levels should diminish public enthusiasm for additional environmental protection.

The EPA has also collected trend data for toxic releases of chemicals since 1988. The Toxic Release Inventory (TRI) tells a somewhat different story, as toxic releases have generally decreased since 1988, with several peaks and troughs. However, the trend data may not be reliable, since new chemicals have been added to reporting requirements, and many industries that were once exempt from filing TRI data with the EPA are now required to report releases. Worse, the data is self-reported by

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<sup>11</sup> The data used in the analysis can be obtained at <http://www.epa.gov/airtrends/aqtrends.html>.

plants, and there is persuasive evidence that the reported figures systematically depart from the EPA's objective measures (De Marchi and Hamilton, 2006). Nonetheless, I present estimates of models using TRI data because they are publicly available, and the reported figures could conceivably influence the public's *perception* of the nation's overall environmental quality. In the models reported below, I rely on a measure of the total on and off site release data to provide an alternative measure of environmental quality.<sup>12</sup>

Finally, a dummy variable for Republican Party control of the executive was produced. In several models, I also difference this variable. If perceived partisan stewardship influences environmental opinion, these effects should be evident immediately after a president of one party replaces a president of the opposite party.

## 2.4 Models

In this study, I examine whether changes in economic conditions, policy activity, environmental quality, and party brands influence the public's demand for environmental action. Such an analysis requires a multivariate approach. However, in a longitudinal analytical setting, linear models are vulnerable to several inferential threats not always present in cross-sectional data. First, the presence of a unit root or deterministic trend can lead the analyst to falsely identify the existence of a relationship between two variables. In the present case, the possibility of a unit root in the dependent variable cannot be rejected, so the so-called "spurious" regression

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<sup>12</sup> The data used in the analysis can be obtained at [http://iaspub.epa.gov/triexplorer/tri\\_release.trends](http://iaspub.epa.gov/triexplorer/tri_release.trends). I produced one additional measure of environmental quality—the annual level of greenhouse gas emissions in the United States. The EPA now releases annual estimates of such emissions on the web (see <http://www.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2011-Chapter-2-Trends.pdf>). While this data was not always available to the public during the period being analyzed, it offers another opportunity to assess whether objective nationwide pollution is predictive of environmental attitudes. Models estimated using this environmental quality measure did not change inferences about the party variables, and the coefficients for the greenhouse gas emissions variables were not significantly different from zero.

problem looms as an inferential threat (Granger and Newbold, 1974; Durr, 1994).

Second, as is evident from an examination of the trends in Fig. 2.1 and Fig. 2.2, new observations on the dependent variable are dependent upon the previous ones. This property violates the independence assumption of the standard OLS estimator. More importantly, the process of explaining variation in a dynamic dependent variable requires specification of a dynamic model. A solution to both considerations is addressed by estimating an Error Correction Model (ECM), which is mathematically equivalent to the more familiar autoregressive distributed lag model (ADL), but allows for a simpler estimation of the long and short run effects associated with changes to independent variables. De Boef and Keele (2008) recommend the ECM as a general solution for empirical analyses confronting concerns about potentially integrated series and autocorrelated errors.

The ECM involves regression of a differenced dependent variable on a lagged dependent variable, along with differenced and lagged level independent variables. A simple single equation ECM specification used in the present analysis is shown formally below:

$$\begin{aligned} \Delta ENV_t = & \beta_0 + \beta_1 ENV_{t-1} + \beta_2 \Delta ICS_t + \beta_3 ICS_{t-1} \\ & + \beta_4 \Delta POLICY_t + \beta_5 POLICY_{t-1} + \beta_6 EVENTS_t + \beta_7 REP_t + \epsilon_t \end{aligned} \quad (2.1)$$

In this model, the public's aggregate environmental demand at time  $t$  is captured by  $ENV$ . The national economic situation is measured using the Index of Consumer Sentiment ( $ICS$ ), as noted above, while policy changes are represented by  $POLICY$ .  $EVENTS$  is a dummy variable for one of the major environmental incidents discussed above, and  $REP$  is a dummy variable reflecting whether the White House was occupied by the Republican Party. The differenced terms in the equation capture the short-run effect of a one-unit change for each independent variable on the dependent variable. Long Run Multipliers (LRM) are directly estimated in an ECM;

for instance, the total long-run effect of a one-point increase in the *ICS* is found by calculating  $\frac{\hat{\beta}_3}{-(\hat{\beta}_1)}$ .

Estimation of both short and long run effects is essential to the present analysis, since it is necessary to understand the dynamic process that governs public preferences on environmental policy. If we find, for instance, a strong short-run effect when the level of government activism increases, this tells us that the public adjusts its demands for policy activism very quickly upon learning about the policy changes. On the other hand, if we find no short run effect from policy activism but uncover evidence of a longer term effect, this suggests the public adjusts its demands for environmental activism only after time has passed and the impact of these changes is noticed (either because people notice the policy changes or the changes become incorporated into elite political dialogue).

## 2.5 Analysis

In Table 2.2, I present a series of models predicting environmental mood between 1974 and 2011. Readers should recall that the ECM models predict *changes* to the dependent variable rather than levels. I begin with a simple model including the *ICS*, *EVENTS*, and *POLICY*, and report the parameter estimates on column 1 of Table 2.2. First, in this specification, the economy does not appear to have an immediate influence on environmental demand at time  $t$ , as the coefficient estimate for  $\Delta ICS$  is statistically indistinguishable from zero. However, changes in the economy have a substantial effect on environmental mood over time. As is evident from Table 2.2, the LRM is about .43 (s.e.=.06)<sup>13</sup>, meaning a one point increase in consumer sentiment eventually increases environmental mood by almost a half point. To better understand this effect, consider that an increase of one standard deviation in the

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<sup>13</sup> Point estimates and standard errors for the LRM are computed using the Bewley transformation (Bewley, 1979; De Boef and Keele, 2008).

*ICS* series (about 12 points) predicts a total increase in environmental mood of more than five points, or about one standard deviation.

The *EVENTS* variable is positively signed and statistically significant, as expected. Major environmental events appears to nudge the public's environmental mood in a liberal direction. During the years in which a major pollution event occurred, environmental demand was about 2.5 points higher, holding all else equal.

*POLICY* also appears to influence environmental mood, according to the coefficient estimate in column 1 of Table 2.2. There is an immediate decrease of about 1.7 points of mood for every one-unit increase of activism. In addition, there is a significant long-run effect: a one-unit increase of activism (roughly one standard deviation on that metric) eventually lowers environmental demand by just over four points. Thus, both the economic and political factors discussed in this paper appear to influence the public's aggregate level of environmentalism.

An important task of this analysis is to explore whether the observed effect of policy on opinion arises from the actions taken by government, or from the public's simple reaction to the party label of the president. Columns 2 and 3 present parameter estimates from two different models predicting the effects from the president's partisan brand on aggregate environmentalism. First, in Column 2 I present a model identical to the one presented on Column 1, with the addition of a dummy variable indicating the party of the president. Second, in Column 3 I present a differenced and lagged measure of the same dummy variable; this effectively allows for a test of whether the *change* in the party of the president affects the public's demand for environmental protection. In addition, the long-run effect of a change in the party of the president can be estimated.

Looking at column 3 of Table 2.2, we see the effect of the *ICS* variable is comparable to the previous models, although in this specification the short-run effect is of borderline statistical significance ( $p < .10$ , one tailed). The *EVENTS* coefficient

remains positive and essentially identical to the parameter estimate in the previous model. However, the short-run effect of *POLICY* small in magnitude and no longer statistically different from zero. In addition, the long-run effect of *POLICY* is considerably attenuated, as the LRM is now a little more than one fourth the size that was estimated in the previous model. The LRM for *POLICY* is also of borderline statistical significance in this model ( $p < .10$ , one tailed). Meanwhile, the coefficient for the Republican dummy variable is large in magnitude and statistically significant. For each year a Republican occupies the White House, according to the model, environment mood increases by about 2.4 points, or nearly one half of a standard deviation.

More evidence supports the hypothesis of a partisan influence on environmental attitudes in the model presented on column 3 of Table 2.2. This model captures the effect of a change in the party of the president on environmental attitudes. In this specification, changes in the *ICS* variable are predictive of a short-run increase in the dependent variable. Consumer sentiment also appears to have a considerable long-run effect on environmental mood. The coefficient for the *EVENTS* variable remains positive and statistically significant. The short-run effect of the *POLICY* variable is statistically indistinguishable from zero, and while the LRM is now statistically significant, it is much weaker than we observed in the simple model. Most importantly, the *change* in the party of the president has a large effect on environmental mood: changing from a Democrat to a Republican is predictive of an immediate increase of about 3.5 points of mood, nearly three quarters of a standard deviation. The LRM for the party change variable is considerable; the partisan change of a Democrat to a Republican eventually increases public environmental demand by nearly 7 points, or almost 1.5 standard deviations.

Taken together, the models presented on Table 2.2 support the *Party-based* hypothesis, as they indicate the party of the president has an immediate and continuing



influence on the public's demand for environmental action. There is only limited support for the *Policy-based* hypothesis; there is no evidence from these models that policy innovations are immediately noticed by the public and translated into an adjusted level of demand as postulated by a purely thermostatic model of environmental opinion. The effects that were found appear to influence environmental opinion only after time has passed.

Other results support conclusions reached by existing research. The models support the *Conditions-based* hypothesis: major environmental incidents are predictive of an immediate increase in the public's aggregate level of environmental demand. In addition, all models concur with the longstanding conclusion of the environmental opinion literature regarding the national economy: a stronger economy is predictive of increasing demands for environmental protection. This finding is supportive of the *Economy-based* hypothesis. The results presented on Table 2 suggest the economy impacts opinion by a considerable amount, but changes in economic conditions are translated into higher levels of aggregate environmentalism quite slowly.

### *2.5.1 Post-Reagan Models*

In this section, I consider models predicting environmental demand over the past two decades, for two important reasons. First, the presidency of Ronald Reagan loomed large in scholarly research into environmental attitudes published during the 1990s, and for good reason. The Reagan presidency was initially associated with the Sagebrush Rebellion, a western land rights movement hostile to some federal efforts to protect the environment. Moreover, key Reagan appointees such as Interior Secretary James Watt and EPA Chief Administrator Ann Gorsuch were bitterly criticized by environmentalists and eventually forced out of their posts. Given the controversial nature of the Reagan administration, it is important to assess whether the partisan

factors discussed above are an artifact of the Reagan years.<sup>14</sup> Second, the availability of more and better data from 1990 onward may allow for more precise measurement of several key independent variables, including measurable environmental quality.

On Table 2.3, I present model diagnostics and estimates of parameters fitted on data covering the period from 1989-2011; LRMs are presented on Table 2.4. Column 1 reports estimates for a model comparable to column 2 of Table 2.2. First, the coefficient for the *ICS* variable is largely comparable to the results reported earlier; there is weak evidence of a short-run effect on environment mood from a change to consumer sentiment. The magnitude of the LRM is smaller than the models covering a longer time period, but it is statistically significant at conventional levels. The *EVENTS* variable predicts an increase of more than 3.6 points of environmental mood during years experiencing major environmental incidents. In this specification, *POLICY* does not appear to have an immediate effect on environmental attitudes, but there is a substantial over-time effect; a one-unit increase of *POLICY* eventually predicts more than a standard deviation change of more conservative environmental mood. The effect of the Republican president dummy variable is large and statistically significant; each year the White House is occupied by a Republican, mood is predicted to increase by 3.7 points, nearly two thirds of a standard deviation change in environmental mood. This result suggests the partisan effects reported earlier are not simply an artifact of the controversial Reagan presidency.

Column 2 of Table 2.3 reports estimates for a “party change” model comparable to column 3 of Table 2.2. The coefficient estimates for *ICS* and *POLICY* are largely the same as we observed for the earlier model. The effect of the economy, measured immediately and over the long run, is of borderline statistical significance. The coefficient for the *EVENTS* variable is positive and statistically significant. Meanwhile,

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<sup>14</sup> A Chow test (Chow, 1960) of parameter stability using 1989 as a structural break point was not statistically significant ( $F_{7,24} = 1.53$ , n.s.). I nonetheless proceed with the analysis in this section because some of the measurements of key concepts were unavailable prior to 1990.

*POLICY* does not appear to have an effect on environmental mood in the short run, but a change of one standard deviation lowers environmental demand by more than a standard deviation over time. A change in the party label of the president has a large and immediate influence of aggregate environmentalism: change from a Democrat to a Republican increases mood by well over one standard deviation, and the LRM estimate suggests the partisan change eventually predicts nearly 6 points of more liberal mood.

In columns 3 and 4, I present models including trend data for environmental quality. Column 3 presents a model including differenced and lagged, level measures of the air quality index, while column 4 includes estimates from a model including the TRI data discussed above. Not surprisingly, the standard errors for most parameters are large, and few of the variables have statistically significant relationships with environmental mood. However, the model still shows a long-run relationship between *ICS* and mood; it also continues to demonstrate the relationship between the party of the president and environmental demand. The Republican president dummy variable predicts more liberal environmental mood by a half standard deviation or more each year, consistent with the previous models.

The environmental quality measures do not appear to have a short-run statistical relationship with environmental demand in the models presented on Table 2.3. The coefficient estimates for these variables are statistically indistinguishable from zero. However, the LRM for the TRI variable indicates that changes in environmental quality appear to have a long-run relationship with environment mood in the opposite direction of the *Conditions-based* prediction; a one standard deviation increase on the TRI variable is associated with a long-run *decrease* in environmental mood.

Overall, the model estimates summarized on Table 2.3 reinforce the conclusions reached in the earlier set of models, while contributing three additional generalizations. First, the models continue to support the *Party-based* hypothesis, as the

president's party brand is predictive of environmental attitudes immediately and in the long run, and this relationship is not an artifact of the Reagan era. Second, there continues to be weak support for the *Policy-based* hypothesis. To the extent a relationship between policy change and aggregate environmentalism exists, it is translated to environmental mood slowly. Finally, the models did not find much influence from measurable pollution on environmental attitudes. While the LRM for the TRI variable is statistically significant, the effect is signed in the opposite direction to the one predicted by theory. Taken together with the significant relationship major environmental incidents have with environmental mood, the results reported on Table 2.3 provide conditional support for the *Conditions-based* hypothesis.

## 2.6 Conclusion

This chapter investigated three important hypotheses about influences on the public's demands for environmental protection. First, the analysis found strong support for the *Economy-based* hypothesis. There is considerable evidence of a relationship between the economic security and environmental mood: when consumer sentiment increases, the public is more supportive of an activist, pro-environment government. The models provided mixed evidence about the dynamics of the relationship. There is some evidence that changes in consumer sentiment immediately influence aggregate environmentalism, but the strongest effects percolate through the opinion process over the long term. The models indicate that higher levels of consumer confidence today have consequences for the public's support for environmental protection in the years ahead.

Second, the analysis uncovered a conditional relationship between environmental quality and environmental attitudes, offering mixed support for the *Conditions-based* hypothesis. The results do suggest the public's support for environmental action is influenced by perceptions of environmental quality; when highly salient pollution-

related incidents occur, the public reacts by demanding more environmental protection. However, more subtle changes in measurable environmental conditions do not appear to influence environmental attitudes. The steady improvement of air quality measured by the EPA over the past two decades is not statistically related to environmental attitudes in the models analyzed here. Thus, to the extent public demands for environmental protection are rooted in the actual condition of the environment, only rare high profile pollution events predict systematic movements in opinion.

The key contribution of the chapter concerns the dynamics of the public's reaction to policy changes—or perceived policy changes. In the simplest model presented in Table 1, the public's demand for environmental action was strongly related to policy activism. As a thermostatic model of opinion would predict, broad government activism on environmental policy was predictive of an immediate decrease in the public's preference for pro-environmental policy reforms. However, when controls for the party of the president were applied, that short-term relationship disappears. More tellingly, modeling the simple change in the occupant of the White House from one party to the other is predictive of a large change in the public's environmental attitudes. The models support the theoretical proposition that the public's demand for more environmental policymaking is driven not by actual government activism on the environment, but the public's assumptions about the level of environmental stewardship provided by the two major parties. Thus, there is unequivocal support for the *Party-based* hypothesis, and only limited evidence supporting the *Policy-based* hypothesis.

The party-oriented effects uncovered here may simply reflect the overall usefulness of the partisan heuristic in understanding how government is behaving in individual policy areas. Party tells voters a great deal about the positions and priorities taken by individual political leaders, and voters rely on that information because it is usually correct (Grynaviski, 2010). On the other hand, as Lau and Redlawsk

(2001) warn, use of cognitive shortcuts can be problematic if they introduce biases between citizen perception and reality. For instance, Republican presidents who wish to signal moderation by establishing a pro-environment record may struggle to persuade the public they have pursued a green agenda. President George H.W. Bush, for instance, assumed office in 1989 hoping to be remembered as “the environmental president.” His appointees to key posts such as Interior and the EPA did not inflame environmentalists the way his copartisan predecessor Reagan did, and in 1990 Bush signed into law a landmark revision to the Clean Air Act that had been opposed by Reagan. Yet, when the public was asked which candidate would be better to handle “pollution and the environment,” only 29 percent of respondents to the 1992 ANES who were willing to report a preference chose Bush instead of Democrat Bill Clinton. And despite Bush’s modestly pro-environmental record as president, the public continued to demand the highest level of environmental activism from government that had been measured since the early 1970s (Dunlap, 1992). Consistent with the laboratory results reported by Rahn (1993), the counter-stereotypical partisan rebranding Bush attempted was no match for the public’s accumulated assumptions about partisan environmental stewardship.

Environmental policy is complex and abstruse, and most reforms contemplated by Congress and executive agencies are of a highly technical nature outside the knowledge and experience of the typical citizen. Environmental policy conundrums challenge even well-informed environmental policy elites, who grapple with difficult questions about scientific uncertainty, costs and benefits, and must make uncomfortable calculations about risk. When the inherent complexities of environmental policy interact with the well-known limitations of the ordinary citizen, we observe an opinion dynamic in which individuals reach for the low-cost partisan heuristic to infer not only what politicians *will do* in office, but what they *have done* while serving. To behave otherwise would require a level of government monitoring and

policy expertise that is well beyond the inclination and ability of most.

Table 2.2: Models predicting Environment Mood, 1974-2011

	(1)	(2)	(3)
	Policy only	Policy and Party	Policy & Party Change
$Mood_{t-1}$	-.26* (.13)	-.28* (.11)	-.25* (.10)
$\Delta Consumer Sentiment_t$ (ICS)	.09 (.07)	.13* (.06)	.13* (.06)
$Consumer Sentiment_{t-1}$	.11* (.03)	.14* (.03)	.13* (.03)
$\Delta Policy Activism_t$ (POLICY)	-1.66* (.45)	-.87 (.57)	-.50 (.66)
$Policy Activism_{t-1}$	-1.08* (.54)	-.26 (.62)	-.42 (.68)
$Major Environmental$ $Incidents_t$ (EVENTS)	2.48* (1.36)	2.54* (1.30)	2.28 (1.47)
$Republican$ $President_t$ (Dummy)	– (–)	2.36* (1.01)	– (–)
$\Delta Republican$ $President_t$	– (–)	– (–)	3.55* (1.38)
$Republican$ $President_{t-1}$	– (–)	– (–)	1.73 (1.02)
Intercept	4.89 (7.04)	1.71 (6.66)	1.99 (6.99)
<b>Long Run Multipliers</b>			
Consumer Sentiment	.43* (.06)	.51* (.06)	.50* (.06)
Policy Activism	-4.17* (.54)	-.94 (.68)	-1.69* (.66)
Republican Party Change	– (–)	– (–)	6.96* (1.99)
$N$	36	36	36
$R^2$	.49	.58	.61

Robust standard errors in parentheses

\*  $p < 0.05$ , one tailed



Table 2.3: Models predicting Environment Mood, 1989-2011

	(1)	(2)	(3)	(4)
	Rep. Dummy	Rep. Change	Air Poll.	TRI
$Mood_{t-1}$	-.47★ (.18)	-.46★ (.15)	-.43★ (.23)	-.21 (.14)
$\Delta ConsumerSentiment_t$ (ICS)	.11 (.10)	.12★ (.09)	.14 (.10)	.17★ (.08)
$ConsumerSentiment_{t-1}$	.16★ (.03)	.11★ (.06)	.15★ (.04)	.24★ (.08)
$\Delta PolicyActivism_t$ (POLICY)	-.43 (.89)	-.44 (.83)	– (–)	– (–)
$PolicyActivism_{t-1}$	-3.10★ (1.40)	-3.82★ (1.75)	– (–)	– (–)
$MajorEnvironmental$ $Incidents_t$ (EVENTS)	3.59★ (.57)	2.87★ (.77)	.52 (1.38)	4.22★ (1.19)
$Republican$ $President_t$ (Dummy)	3.71★ (1.20)	– (–)	2.95★ (1.22)	3.11★ (1.49)
$\Delta Republican$ $President_t$	– (–)	5.80★ (1.67)	– (–)	– (–)
$Republican$ $President_{t-1}$	– (–)	3.17★ (1.29)	– (–)	– (–)
$\Delta AirPollution_t$	– (–)	– (–)	-.53 (4.94)	– (–)
$AirPollution_{t-1}$	– (–)	– (–)	.14 (.92)	– (–)
$\Delta ToxicRelease$ $Inventory_t$ (TRI)	– (–)	– (–)	– (–)	-.14 (.59)
$ToxicRelease$ $Inventory_{t-1}$	– (–)	– (–)	– (–)	-.74 (.72)
Intercept	10.34 (11.32)	15.02 (11.46)	9.98 (15.82)	9.16 (9.10)
$N$	22	22	20	22
$R^2$	.68	.71	.61	.64

Robust standard errors in parentheses

★  $p < 0.05$ , one tailed

Table 2.4: Long Run Multipliers Derived from Table 2.3

	(1)	(2)	(3)	(4)
	Rep. Dummy	Rep. Change	Air Poll.	TRI
Consumer Sentiment	.34★ (.11)	.13 (.08)	.50★ (.06)	1.13★ (.21)
Policy Activism	-6.55★ (1.28)	-8.38★ (1.62)	— (—)	— (—)
Republican Party Change	— (—)	6.25★ (1.62)	— (—)	— (—)
Air Pollution	— (—)	— (—)	.32 (.84)	— (—)
Toxic Release Inventory	— (—)	— (—)	— (—)	★ (.92)

★  $p < 0.05$ , one tailed

## Focusing Events and Public Opinion: Evidence from the *Deepwater Horizon* Disaster

Since the publication of Anthony Downs' seminal study of the "issue attention cycle," (Downs, 1972) scholars of public opinion have recognized that costs (or perceived costs) are central to understanding environmental attitudes. Downs argued that the public's growing desire to protect the environment would be offset by an awareness that such protection may impose sacrifices on many people. Armed with this understanding, scholars have learned much about the nature of environmental opinion (e.g., Dunlap, 1992; Smith, 2002; Guber, 2003).

Despite their awareness of the importance of rational considerations of cost and benefit in environmental politics, scholars have found limited evidence of local influences on environmental opinion. Research investigating the effect of local industrial concentration on support for environmental protection has returned mixed results (Kahn and Matsuzaka, 1997; Press, 2003; Coan and Holman, 2008). Equally important for the present purpose, scholars have found inconsistent evidence that local environmental conditions affect environmental opinion. For instance, Smith (2002)

found no evidence of a relationship between residential proximity to oil drilling operations and attitudes toward domestic oil production. Similar conclusions have been reported by studies investigating place effects on support for nuclear energy (Smith, 2002) and wind power (Wolsink, 2000, 2007).

The absence of a relationship between local pollution and environmentalism in the literature buttresses the broader scholarly conclusion that self-interest has little influence on policy attitudes. Summarizing decades of research into self-interest and public opinion, Sears and Funk (1990) wrote, “Dimensions of self-interest such as unemployment or underemployment, inadequate medical insurance, vulnerability to inflation, economic discontent, service dependency, being a public employee, gender-related economic strains, and being elderly simply do not have strong effects on the appropriate policy preferences.” (251) To the extent self-interest is broadened to include identification with the interests of community, residential proximity to environmental pollution represents a useful test of the role of material self-interest in public opinion.

Previous scholarship has found evidence that self-interested responses may be induced when primed by the survey instrument (Sears and Lau, 1983) or by the content of media coverage (Mutz, 1994). Another exogenous force which carries the potential for inducing self-interested responses is the “focusing event”—a visible, unanticipated event which implicates a particular area of public policy and pushes such issues to the top of the public’s agenda (Kingdon, 2002). Such an event might activate latent forms of self-interest among citizens who do not ordinarily connect abstract debates over public policy to considerations relevant to their communities.

In this chapter, I examine contextual influences on environmental attitudes before and after a classic focusing event, analyzing whether community self-interest requires such an event before it will influence policy attitudes among ordinary citizens. In what follows, I investigate a unique source of panel data which was collected around

the time of the *Deepwater Horizon* oil spill in April 2010. Instead of assessing environmental opinion at one point in time, I am able to examine attitudinal changes following a highly visible and controversial disaster that had potential implications for the cost-benefit calculations ordinary citizens could be expected to make about a salient public policy issue. I find support for offshore oil drilling decreased considerably as a result of the disaster. However, individuals who had reason to believe they would bear the costs of diminished offshore oil exploration emerged as a distinct pro-drilling subset of the population.

### 3.1 Background

More than four decades after the influential Earth Day of 1970, scholars still lack an adequate understanding of who favors environmental protection—and why. It is frequently noted that, absent cost, support for environmental protection would be nearly universal. Even when costs are invoked, strong majorities support environmentalism. For instance, 63 percent of respondents to a CBS/*New York Times* survey in April 2007 agreed with the statement that “Protecting the environment is so important that requirements and standards cannot be too high and continuing environmental improvements must be made regardless of cost.”<sup>1</sup> However, a few short years later, after confronting more than two consecutive years of economic hardship, only 36 percent of respondents to a Gallup poll agreed with the statement that “protection of the environment should be given priority, even at the risk of curbing economic growth.”<sup>2</sup> Conflicting survey results such as these prompted one scholar to ask, “[i]s environmentalism a shallow consensus likely to soften in the face of ambivalence, as American voters and consumers experience the costs of reform

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<sup>1</sup> Figure taken from a CBS/NYT poll that was in the field between April 20 and 24, 2007. Results are weighted based on a national sample of 1,052 adults. Obtained from Roper iPoll on 12/31/2011.

<sup>2</sup> Figure taken from a Gallup poll in the field between March 3 and 6, 2011. Results are weighted based on a national sample of 1,021 adults. Obtained from Roper iPoll on 12/31/2011.

firsthand?” (Guber, 2003, p. 2)

As with attitudes toward related policy areas in the U.S. political system, there is reason to suspect responses to environmental survey items do not reflect deeply held views—instead, these responses may capture “doorstep opinions,” as early public opinion scholars characterized them (Converse, 1964). Scholarly analysis of offshore oil drilling attitudes (e.g., Smith, 2002) has usually considered data collected during a low-pollution, relatively spill-free period. For this reason, many respondents may have been asked to think about drilling policy for the first time when surveyed, and their responses may reflect a mere symbolic orientation toward industry regulation. However, when the full range of cost-benefit calculations is available to the public, as is often the case after a major pollution event, the survey instrument may do a better job of capturing the way the public incorporates self-interested considerations into its thinking about environmental policy.

In general, environmental opinion appears to be influenced by two key contextual forces. First, scholars have found a relationship between aggregate environmentalism and perceived political stewardship. In a study of environmental opinion from the 1970s through the 1990s, Dunlap (1992) found the mass public’s preference for environmental protection steadily decreased during the 1970s, and then rebounded during President Reagan’s years holding office. In a phenomenon he labeled “natural decline,” Dunlap argued the public believed environmental problems were being solved by the landmark environmental legislation enacted during the early 1970s, and adjusted its preferences for further environmental action downward. Later, Dunlap argued “at least some of the increased environmental concern (and activism) of the eighties seems attributable to the public’s belief that the two Republican administrations could not be counted on to protect the environment—just the opposite of what occurred during the staunchly proenvironmental Carter administration in the

late seventies” (Dunlap, 1992, p.94).<sup>3</sup>

A second key contextual influence on environmental opinion is the economy. Research consistently finds significant associations between a strong economy (variously defined) and support for environmental regulation and action (Elliott et al., 1995, 1997; Smith, 2002; Guber, 2003), a result which strongly supports the notion that public thinking about environmental policy is structured by a trade-off between environmental quality and the economy.

The logic of a rational cost-benefit perspective of environmental policymaking leads to the simple expectation that, all else being equal, those who are exposed to environmental pollution should demonstrate greater support for environmental protection than those whose local environment is unaffected by pollution. Yet, research into place effects has found limited evidence that local pollution is related to attitudes toward environmental policy. A few studies have reported correlations between regional environmental conditions and environmental attitudes (Hamilton et al., 2010; Johnson et al., 2005; Whitmarsh, 2008). However, Smith (2002) found no relationship between residence in oil-producing counties and support for offshore oil drilling. Wolsink (2000, 2007) concluded that residential proximity to wind turbines was unrelated to opposition to these facilities, which is surprising given that turbines are thought to negatively impact scenic qualities. Perhaps most strikingly, Smith (2002) found some evidence that residential proximity to nuclear energy facilities was associated with *higher* levels of support for nuclear energy. In short, people who live closer to pollution risks do not appear to report unusually pro-environmental views—if anything, research finds evidence of diminished environmental enthusiasm.

However, studies often assess environmentally-relevant place effects from a per-

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<sup>3</sup> This generalization about environmental opinion nicely complements Wlezien (1995), who argues mass opinion responds to policy changes in a “thermostatic” fashion. Enactment of liberal policies is associated with more conservative mood, and conservative policies are associated with more liberal mood. See also Erikson et al. (2002) and chapter 2 of this dissertation.

spective of risk, rather than direct and recent experience with pollution. It may be that once individuals' local environments experience real pollution rather than the mere threat of it, support for environmental protection will increase. In a case study of ordinary citizens subjected to severe toxic waste pollution, Adeola (2000) found the pollution had considerable consequences for individuals' quality of life and support for regulatory solutions.

A key concept in the public policy literature is the "focusing event" (Kingdon, 2002)—sudden, unanticipated occurrences which portend continuing or worsening similar problems in the future, and implicate potential government action. In an analysis of ecological disasters and other focusing events, Birkland (1997, 1998) finds these events change the mix of issues comprising the public's policy agenda. From this literature, there are reasons to believe that a major pollution event can change the criteria people use to evaluate environmental policy.

Importantly, in explaining how place may be relevant for understanding public policy outcomes, Birkland (1998) makes a key distinction between affected areas and "communities of interest." Residential proximity to the former category presents direct experience with pollution, and the industry which caused the harm, but residence in a community which offers the risk of suffering similar consequences may be more important for public opinion processes. According to Birkland, "these harms are usually concentrated in a particular geographical area, so that evidence of the harms done by an event is more obvious than when the harms are distributed throughout a region or nation. However, communities of interest are as important as geographically defined communities. An oil spill in Alaska, for example, will be of particular interest to people who live in coastal Washington State or even coastal Europe" (Birkland, 1998, 54-55).

Thus, focusing events may induce a relationship between residential features and policy attitudes that was previously submerged or did not exist. In the context of



pollution, one such relationship could be sympathy for victims from people who realize they could suffer a similar fate themselves. Another kind of “community of interest” concerns people whose communities are dependent on the industry responsible for the pollution. This type of community identification could invoke a form of economic self-interest, and increase a person’s likelihood of supporting the implicated industry in policy contexts defined by trade-offs between industry prosperity and environmental quality. However, most research finds surprisingly little evidence that personal circumstances linked to policy have much of an influence on public opinion in those areas. For instance, people who are unemployed, lack medical insurance, or are employed in industries directly affected by government action usually do not exhibit attitudes toward implicated policies that differ from what would otherwise be predicted about them (Sears and Funk, 1990).

The (largely) null relationship between self-interest and policy attitudes has been theorized to arise for two primary reasons. First, most people do not construct abstract generalizations based upon experiences drawn from their own lives (Lane, 1962). Even the more knowledgeable citizens who theoretically have the resources to connect their own experiences to policy typically do not, perhaps because they are less likely to project their own circumstances to broader conditions nationwide (Mutz, 1993). Second, individuals’ opinions about public policy are primarily influenced by symbolic attitudes, or affective preferences developed in preadult years which contain “little calculation about the future costs and benefits of these attitudes.” (Sears et al., 1980, p. 671). Examples of such attitudes include partisanship, nationalism, and other ideologies.

According to the established literature (Sears and Funk, 1990; Mutz, 1994), self-interest is more likely to influence policy attitudes when policies present clear and substantial costs and benefits, or when exogenous forces such as elites or the media politicize self-interest. High-profile environmental catastrophes such as the Exxon

*Valdez* oil spill or the 1986 Chernobyl nuclear meltdown offer stark evidence of cost in the form of devastating pollution. They may also encourage visible and influential activity by political and media elites.

Much of the work investigating self-interest and policy attitudes considers these concepts at the level of an isolated, atomized individual. By broadening the definition of self-interest to include groups, researchers may uncover a more meaningful role for self-interest in public opinion. Under the assumption of community self-interest, a number of studies have examined whether industrial concentration correlates with opposition to pro-environmental ballot initiatives, with inconclusive results (Coan and Holman, 2008; Kahn and Matsuzaka, 1997; Press, 2003). However, studies of public opinion following salient political and economic episodes have uncovered more evidence of a role for regional self-interest. For instance, work investigating vote choice in 2008 found people living in counties more severely afflicted by the housing crisis were more disapproving of President Bush and less likely to vote for his copartisan John McCain (Cho and Gimpel, 2009; Hill et al., 2010). Therefore, even while scholars find a small or nonexistent role for self-interest in public policy attitudes, there are reasons to suppose an individual's identification with regional economic interests may exert influence on public opinion. This may be particularly so following a focusing event, which can elevate the costs and benefits inherent to public policy debates in the minds of ordinary citizens.

In short, by examining public opinion after a focusing event, and expanding the definition of self-interest to include identification with a community's economy, we may find a stronger role for material self-interest in public policy attitudes.

### 3.2 Contextual Influence on Environmental Attitudes

The preceding discussion leads to heterogenous expectations about the consequences of a geographically concentrated "focusing event" in the form of environmental pol-

lution for public opinion. First, for ordinary citizens who are exposed to media coverage of the pollution event, but have no physical or conceptual connection to the place that has been affected by it, there is likely to be an increasing association between pollution risks and the particular form of industrial activity implicated by that pollution. For instance, recent exposure to news accounts of the 2011 Fukushima Dai-ichi nuclear meltdown in Japan probably increases the likelihood that individuals will think of accidents and radiation when prompted to decide whether they support nuclear energy. This increased focus on the “cost” side of the trade-off calculations inherent to environmental public policy should decrease support for the activity in question, whether offshore oil drilling, strip mining, fracking, or other such activities.

**H1:** Following a focusing event, individuals whose residential areas and local economies are unaffected by a pollution event will become *more opposed* to the form of industrial activity (offshore oil drilling) which generated the pollution.

Polluting industries, along with the jobs and economic opportunity they create, are not uniformly distributed across the country. Individuals whose local economies are more dependent on a particular industry may believe they benefit from the profitability of that industry. Importantly, these individuals may worry that extractive activity will become less profitable if new environmental regulations are imposed. Many may believe they will bear additional costs from regulatory action in the form of diminished economic activity, and in the process they may experience a cost consideration that unaffected ordinary citizens do not. Thus, residence in a place with an economy more dependent on industry (a “community of interest”) should induce additional support for industry—particularly after a focusing event reminds these citizens about the local *benefits* provided by a particular industry.

**H2:** Following a focusing event, individuals whose local economies are dependent upon a polluting industry will become *less opposed* to the form of industrial activity (offshore oil drilling) which generated the pollution, relative to those whose local

economies are not dependent upon the industry.

A number of researchers have supposed that people who live in close proximity to a pollution site should also be more likely to think about the costs involved from that form of industrial activity. Pollution can damage a local economy, and considerably diminish local quality of life. Thus, in places where individuals suffer from the cost of pollution, but obtain no local economic benefit from the industrial activity which produced it, people might be expected to become more opposed to the industry.<sup>4</sup>

However, those who live in close proximity to pollution probably also live in close proximity to the productive activity that caused the pollution. From a cost-benefit standpoint, this subset of population experiences costs from pollution, but also may also fear losing a key benefit if newly imposed regulation threatens to affect the local economy. In short, residential setting in a polluted area coupled with residential setting in a local economy dependent upon the pollution should *not* lead people to become more opposed to the relevant industry—even after these costs and benefits are made salient by a “focusing event.”

**H3:** Following a focusing event, individuals whose residential setting is proximate to pollution, but whose local economies are dependent upon a polluting industry, will *not* become more opposed to the implicated form of industrial activity (offshore oil drilling).

In essence, H3 predicts the null effect on attitudes toward drilling for people experiencing both industrial dependence and industrial pollution found so frequently by research into the determinants of environmental opinion.

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<sup>4</sup> Examples of people fitting this category might include residents of New England who suffer from air pollution caused by coal-fired power plants operating in Pennsylvania and Ohio. The present study is unable to assess this residential proximity effect, as the Gulf spill affected a small geographic area where the offshore oil drilling industry does not exist. Consequently, the survey I examine below sampled only a few individuals who lived in counties affected by pollution but not industry—not enough to make valid inferences about this type of residential proximity effect. The influence of pollution on the policy attitudes of people whose economies are not dependent on the source of the pollution is an understudied area of public opinion and warrants future attention.

In the following analysis, I examine these hypotheses using a unique panel survey which was collected before and after an environmentally-relevant focusing event—the *Deepwater Horizon* oil spill. I find that residence in counties with an active offshore oil drilling industry was not associated with attitudes toward drilling prior to the spill event, but became negatively related to these opinions after the event. Meanwhile, once controls for “communities of interest” are applied, residence in a county that was affected by the oil spill had no independent relationship with opinion about offshore oil drilling.

### 3.3 *Deepwater Horizon* and Aggregate Opinion

*Deepwater Horizon* was a deepwater oil drilling rig owned by Transocean and leased by British Petroleum and other oil companies. While drilling through nearly one mile of ocean water off the Gulf Coast, the rig suffered an explosion that killed 11 workers on April 20, 2010. After the rig sank two days later, an uncovered well began an uncontrolled release of crude oil that continued for at least three months. According to a federal report investigating the aftermath of the spill, “more than 650 miles of Gulf coastal habitats—salt marsh, mudflat, mangroves, and sand beaches—were oiled; more than 130 miles have been designated as moderately to heavily oiled.” By June 15, 2010, President Obama declared the spill was the “worst environmental disaster in U.S. History.” An estimated 4.9 million barrels of oil were released from the well, according to the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling.<sup>5</sup> In response to the spill, the Obama administration instituted a moratorium on further deepwater drilling in the Gulf while safety practices and new regulations were investigated. Interior Secretary Ken Salazar announced that the drilling ban was lifted on October 12, 2010, about six months after the *Deepwater*

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<sup>5</sup> The full report is available at <http://www.oilspillcommission.gov/final-report>. The preceding quotations are drawn from Part II of the report.

*Horizon* explosion.<sup>6</sup> The incident and its aftermath was covered by the media almost immediately after the April 20 explosion, and heavy coverage continued on television, print, radio, and online for weeks afterward.

Not surprisingly, an ecological disaster of this magnitude had important consequences for public opinion and political behavior. Fig. 3.1 presents time series plots following the period of time before and after the *Deepwater Horizon* explosion and spill.

The top half of Fig. 3.1 shows a density plot of Google searches for “offshore oil drilling” for the five year period running between January 1, 2007 and December 31, 2011.<sup>7</sup> The shaded area of the graph shows the period in which the uncapped oil well was releasing oil into the Gulf of Mexico in mid-2010. Two periods of unusual interest in drilling are evident on the graph. First, search activity spiked in early to mid 2008 as gas prices spiked (prior to the recession) and the U.S. presidential candidates brought energy issues to the top of the public agenda (Kenski et al., 2010). Second, search activity for “offshore oil drilling” increased in late April 2010 and continued until July 2010, as the *Deepwater Horizon* crisis became less frequently covered by the media. From the top half of Fig. 3.1, we can see that the oil spill acted as a classic focusing event by raising the salience of offshore oil drilling to the public.

The bottom half of Fig. 3.1 explores the directional consequences of the oil spill for environmental opinion. First, the dashed line captures a survey item asked by the Associated Press to a nationwide sample of U.S. adults between April 2009 and

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<sup>6</sup> Cohen, Tom. “Obama administration lifts deep-water drilling moratorium.” CNN, October 12, 2010, [http://articles.cnn.com/2010-10-12/us/drilling.moratorium\\_1\\_deep-water-drilling-drilling-rig-oil-drilling?\\_s=PM:US](http://articles.cnn.com/2010-10-12/us/drilling.moratorium_1_deep-water-drilling-drilling-rig-oil-drilling?_s=PM:US). Downloaded 1-23-12.

<sup>7</sup> This plot relies on data obtained using the Google Insight service, <http://www.google.com/insights/search/>. I downloaded weekly data and generated monthly estimates before creating the plot shown in Figure 1. Values have been suppressed on the Y-axis to avoid reader confusion, as Google Insight provides an index to measure search activity rather than a raw count of searches.

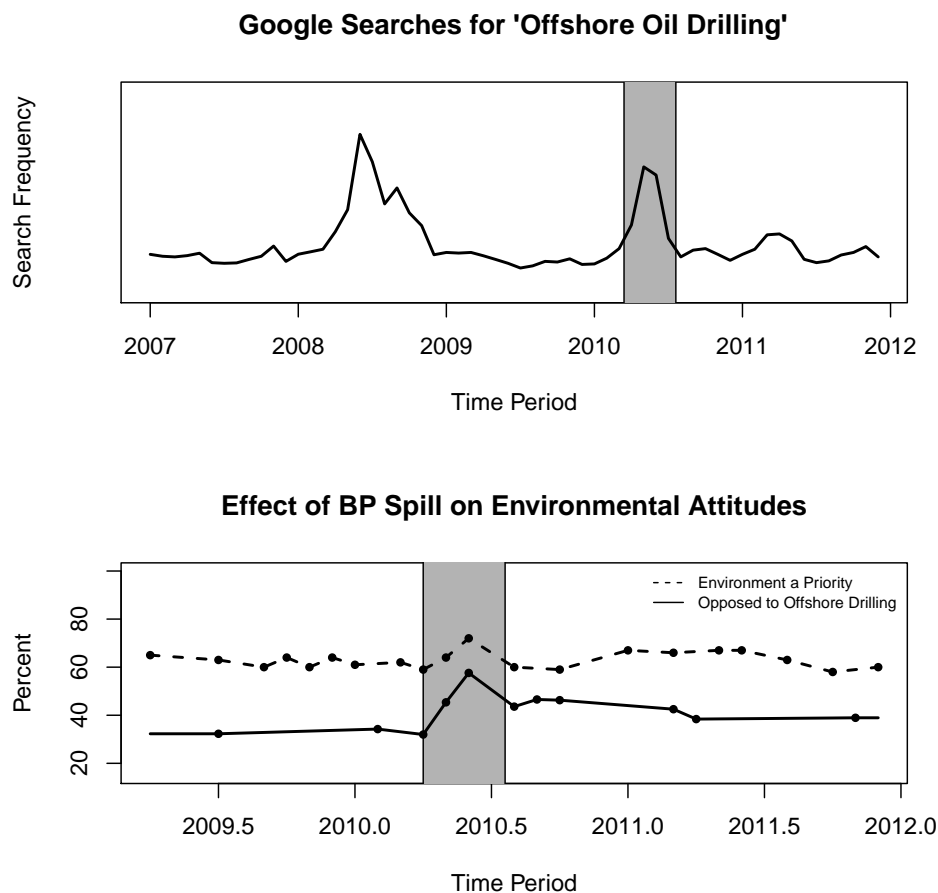


FIGURE 3.1: The impact of the *Deepwater Horizon* spill on the salience and direction of aggregate public opinion on offshore oil drilling. Shaded areas of the graph capture the period in which oil was being released into the Gulf of Mexico following the April 20, 2010 explosion.

December 2011.<sup>8</sup> In a grid format, the item asked respondents, “How important are the following issues to you personally?” One of the items included in this series of importance questions is “the environment.” The dashed line on the bottom of Figure 1 reports the percent of U.S. adults who chose “Extremely Important” or “Very Important” among five ordinal response categories. The solid line represents an averaged monthly summary of the percent of the U.S. public claiming to be opposed

<sup>8</sup> Survey marginals were obtained using Roper’s iPoll database, downloaded 1-4-12.

to offshore oil drilling.<sup>9</sup> Higher values on this measure therefore indicate greater levels of opposition to drilling.

Both directional time series demonstrate similar empirical patterns. Prior to the *Deepwater Horizon* disaster, both time series appear to be flat, without any meaningful trend in opinion. Then, in April and May of 2010, a sharply higher proportion of the public suddenly thought the environment was highly important and opposed offshore oil drilling. This spike in “green” enthusiasm was short-lived, however, as both series returned close to their pre-crisis levels by August 2010. While the environmental importance series in the year and a half following the crisis followed a trajectory roughly equivalent to the pre-crisis series, the drilling opposition series fell back to a level of opposition somewhat higher than the level of opposition prior to the crisis. In summary, Fig. 3.1 shows the *Deepwater Horizon* accident increased the salience of offshore oil drilling among the mass public, while temporarily nudging public opinion in a more pro-environment and anti-drilling direction.

In order to assess whether place effects interacted with these patterns of public opinion on offshore oil drilling, I turn to longitudinal cross-sectional analysis in the next section.

### 3.4 Data, Models, and Measures

Inferences about the effects of focusing events on public opinion require panel data, which is rarely available for environmental issues. Fortunately, the AP/ Yahoo 2008 Presidential Election Study, which was in the field as early as 2007, administered a follow-up wave beginning in September 2010. The AP/ Yahoo study was an online

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<sup>9</sup> No single survey item was asked at frequent intervals through the *Deepwater Horizon* crisis, but different pollsters measured support for offshore oil drilling using items with slightly different question wordings. I collected responses to these items using Roper’s iPoll database, and then employed the dyadic ratios algorithm (Stimson, 1999) to aggregate these survey responses into a monthly time series running between April 2009 and December 2011. The resulting measure can be roughly interpreted as the percent of the public reporting opposition to offshore oil drilling.



survey administered by Knowledge Networks using probability-based sampling methods. This panel consisted of 11 separate interviews with about 2,700 U.S. adults; each wave typically included interviews with between 1,800 and 2,200 participants. The 2010 wave, which was administered between September 17 and October 15, 2010, obtained responses from about 1,200 U.S. adults. This survey design allows for examination of opinion among (largely) the same respondents at multiple points in time, which in turn allows us to track opinion change on numerous survey items.

The AP/ Yahoo study asked several questions directly relevant to the hypotheses stated in the previous section. First, an item covering attitudes toward offshore oil drilling was asked in September 2008, and again in September 2010. The question asked respondents, “Do you favor or oppose allowing oil drilling off the coast of the United States?” Response options included strongly favor, somewhat favor, somewhat oppose, and strongly oppose. In the models that follow, this survey item serves as the dependent variable.

In order to study whether and how residence is related to offshore oil drilling attitudes, I estimate a logit model predicting opposition to drilling. This modeling strategy is appropriate since I code the dependent variable in binary fashion, with opposition to drilling coded “1” and support for drilling coded “0.”

Residential setting is captured with two separate place variables. First, to capture the direct place effects resulting from the *Deepwater Horizon* disaster, I generated a dummy variable for respondents whose address lies within counties with shorelines oiled by the spill.<sup>10</sup> Second, to capture the place effects of “communities of interest,” I generated a second dummy variable for subjects whose address lies within counties where offshore oil drilling is currently planned or taking place.<sup>11</sup>

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<sup>10</sup> Residence in affected counties was coded “1,” and “0” otherwise.

<sup>11</sup> This variable is coded in the same fashion as the preceding place variable. I include a list of such counties in the Appendix. Briefly, the offshore oil drilling industry exists in the Gulf of Mexico from the Alabama-Florida border extending west to the southern tip of Texas. Additional

To assess the extent to which the local economy is dependent on the oil industry, it is necessary to generate a measure of oil industry concentration. To accomplish this, I rely on data collected by the Occupational Employment Statistics (OES) program in the U.S. Department of Labor's Bureau of Labor Statistics.<sup>12</sup> The OES program produces local estimates of the number of people employed in various occupations at the level of Metropolitan Statistical Area (MSA). For each MSA, I summed the number of jobs per 1,000 which are accounted for by the oil drilling industry. The resulting measure understates the extent to which the oil industry is concentrated in a particular area, but since the goal of the measure was to distinguish between low-concentration areas and high-concentration areas cross-sectionally, only occupations uniquely related to oil drilling were selected.<sup>13</sup> Oil industry concentration ranged from zero to about 25.9 jobs per 1,000 for respondents living in the Odessa, Texas MSA.<sup>14</sup>

All models include an interaction between the drilling county dummy variable and the oil industry concentration variable, while including constitutive terms for both variables. The coefficient for the interaction allows for a direct test of the community self-interest hypothesis, as its coefficient tests whether residence in communities reliant on the *offshore* oil drilling industry is predictive of drilling attitudes. Inclusion

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offshore drilling currently takes place on a limited basis in southern California (centered off Santa Barbara County) and on a widespread basis in several locations in Alaska. For practical and legal reasons, no drilling is currently done along the Florida coast, the eastern seaboard, or the west coast north of Santa Barbara. Drilling is not permitted in the Great Lakes states, though some directional drilling is currently legal in Michigan. Data is drawn from the Minerals Management Service, <http://www.boemre.gov/mmshome.htm>.

<sup>12</sup> This data was released by the OES in May 2010.

<sup>13</sup> This measure includes the following categories, contained within the major category "Construction and Extraction Occupations": "Derrick Operators, Oil and Gas" (47-5012), "Rotary Drill Operators, Oil and Gas" (47-5013), and "Roustabouts, Oil and Gas" (47-5071). Several other occupations are related to the oil industry, such as "Service Unit Operators, Oil, Gas, and Mining" and "Helpers-Extraction Workers," but these categories capture other extraction operations such as mining.

<sup>14</sup> Summary statistics for all variables used in the analysis are presented in the Appendix.

of the interaction term and its constitutive elements also allows for inferences about the potential effect of a “community of interest” one step removed from the offshore oil drilling industry—the *onshore* domestic oil industry. It is possible a focusing event could activate community self-interest in the minds of individuals who reside in areas heavily dependent upon inland oil drilling.

In order to hold issue importance constant in the hypothesis tests that follow, I rely on a grid item included in numerous waves of the panel study. Respondents were asked, “How important is each of the following issues to you personally?” Between the initial 2007 wave and the 2008 post-election wave, respondents were asked about “the economy” eight times, “gas prices” seven times, and “the environment” eight times. Response options included five ordinal categories ranging from “not at all important” to “extremely important.” To capture the weight of these concerns between separate respondents, I computed respondents’ mean levels of concern for each of these items throughout the 2008 campaign. These measures may not capture the trade-off considerations inherent to cost-benefit reasoning in environmental policymaking, but will allow for inferences about the relationship between respondents’ personal issue agendas and their attitudes toward offshore oil drilling.

Figure 1 showed offshore oil drilling became increasingly salient to the public as a result of the *Deepwater Horizon* spill. However, a focusing event such as the Gulf spill is primarily transmitted to the general public through the news media, and it is likely that attitudes toward offshore drilling are influenced by the extent of a person’s exposure to the news. To capture media exposure, I relied on a self-reported news exposure item which asked respondents how many hours they spent consuming content from radio, internet sites, newspapers, television, and magazines. Responses for each media format ranged from “never” to “every day,” with four intermediate categories between these extremes. For each respondent, a sum was calculated based

on these five measures. Resulting scores ranged from 0 to 25.<sup>15</sup>

Partisan factors are important in any analysis of individual-level opinion, so I include a 3-category partisan self-identification item in the equation described below.<sup>16</sup> I also capture self-reported respondent ideology in a five-category ordinal variable, which ranges from “Very liberal” to “Very conservative,” which intermediate categories arranged in between these extremes.<sup>17</sup> I include a range of demographic controls in the equation for robustness purposes.<sup>18</sup>

### 3.4.1 Analysis

I estimate three separate equations predicting attitudes toward offshore oil drilling. First, I estimate a model predicting responses to drilling item which was asked in Wave 7 of the panel study, which was in the field in September 2008. Second, I estimate a similar model for the Wave 12 reinterview between September and October 2010.<sup>19</sup> Finally, I estimate a model predicting 2010 attitudes, adding the 2008 responses as a control. This final model allows inferences about the variables which predict opinion *change* between 2008 and 2010.

Model estimates are presented on Table 3.1 in the order described in the preceding paragraph, with standard errors in parentheses.<sup>20</sup>

Before getting to the results, it is worth noting at the outset that responses to the offshore oil drilling question changed in an anti-drilling direction between 2008 and 2010. Though the public remained broadly supportive of drilling in both years, the

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<sup>15</sup> A “latent” factor score of news exposure based upon these items was also generated and included in the models discussed below. The results were identical to those reported below.

<sup>16</sup> Democrats are coded “1,” Independents “2,” and Republicans “3.”

<sup>17</sup> “Very liberal” is coded “1,” while “Very conservative” is coded “5.” The middle category is “moderate,” which is coded “3.”

<sup>18</sup> Question wordings and coding decisions for all variables included in the analysis are listed in the Appendix.

<sup>19</sup> All analyses are conducted using survey items posed in an identical format.

<sup>20</sup> Standard errors are clustered by state of residence.

strength of this enthusiasm dwindled considerably. In 2008, 44 percent of respondents strongly favored increasing offshore drilling, but in 2010 that number had dropped to just 20 percent. Meanwhile, the weighted number of U.S. adults reporting outright opposition to drilling rose from 24 percent to 35 percent. The average respondent living in a county lacking an offshore oil industry became about a half-point less supportive of offshore oil drilling on the four point scale. Coupled with the descriptive analysis presented in the previous section, the evidence is supportive of H1.

Column 1 of Table 3.1 reports coefficient estimates for models predicting opposition to offshore oil drilling. First, attitudes toward drilling are strongly related to individuals' prioritization of several policy areas. The coefficient for average gas price importance is negative and significantly different from zero, meaning that higher perceived importance of gas prices was associated with less opposition to offshore oil drilling. Meanwhile, when holding other independent variables constant, the perceived importance of the economy was not predictive of offshore drilling attitudes. Thus, the more salient agenda item in the debate over offshore oil drilling appears to be gas prices rather than the economy—at least during the historically high price context of 2008. Not surprisingly, increased perceived importance of the environment predicts opposition to drilling.

We can assess the role of community self-interest by studying the coefficients for the contextual place variables described in the preceding section. Looking at the coefficients under column 1 of Table 3.1, we see that none of the residential variables were related to drilling attitudes in 2008. Individuals who live in high-industry concentration offshore areas did not have different views toward offshore drilling beyond what we could predict about them from their political predispositions and symbolic attitudes. In addition, neither the coefficients for the place dummy variables nor the constitutive industry concentration coefficient were significantly different from zero. These results match decades of scholarly conclusions about the

weak and inconsistent role of self-interest in policy attitudes. They also replicate most of the scholarly literature on environmental place effects, which rarely find much of a relationship between residential proximity to pollution risks and opinion on energy issues (Smith, 2002).

The coefficient for media use is not statistically significant, a result which suggests greater exposure to the media did not have a directional influence on attitudes toward drilling. Several of the political and demographic covariates had an independent relationship with drilling attitudes. Not surprisingly, both party identification and self-reported ideology were negatively related to drilling opposition, meaning that Republican and conservative identity was related to drilling support. The remaining statistically significant relationships are consistent with the extant literature.

Coefficient estimates for the model predicting 2010 drilling attitudes are presented in column 2. Once again, the issue importance variables are predictive of attitudes toward offshore oil drilling. Increased perceived importance of gas prices is associated with significantly less opposition to drilling, while perceived environmental importance predicts higher levels of opposition. The coefficient for perceived importance of the economy is negative, but falls just short of statistical significance.

Unlike the model of 2008 attitudes presented in column 1 of Table 3.1, the model predicting 2010 attitudes finds a strong predictive effect for the offshore industrial concentration variable. The coefficient for the interaction term is negative, large in magnitude, and efficiently estimated. Respondents living in a “community of interest” were considerably less likely to oppose offshore oil drilling, according to the coefficient presented in column 2 of Table 3.1. Meanwhile, the constitutive terms in the interaction are not significantly different from zero. This result suggests that residence in offshore areas where drilling is permitted, but where the local economy has no dependence on the oil industry, is not predictive of drilling attitudes. In addition, residence in high industry concentration onshore areas was not related to

drilling attitudes in 2010.

The dummy variable for residence in a county affected by the *Deepwater Horizon* spill is not statistically significant, once residential economic characteristics are held constant. The coefficient for the spill county dummy variable is negative, which suggests that local pollution from a major environmental disaster does not seem to induce a surge of pro-environmental or anti-industry sentiment.

Two inferences are clear from this model. First, the experience of locally relevant pollution is not the place effect that is implicated by the *Deepwater Horizon* focusing event. Instead, environmentally relevant focusing events appear to have consequences for public opinion among ordinary citizens who reside in “communities of interest.” Second, people whose residences are dependent on the offshore drilling industry did not become less opposed to drilling as a result of the focusing event; instead, these individuals emerged as a pro-drilling subset of the population, relative to people living in unaffected parts of the country.

To explicitly test whether this place effect is predictive of the *change* in attitudes toward drilling, I estimated a final model in column 3, which predicts attitudes toward 2010 attitudes while holding 2008 drilling attitudes constant. As we can see from the coefficient estimates, the “community of interest” effect is highly predictive of 2010 attitudes in this model specification. The coefficient for the offshore industry concentration term is negative and significantly different from zero, a result which suggests this residential proximity effect is predictive of the change in public opinion toward drilling between 2008 and 2010. This result, coupled with the findings from the model specification in column 2, is consistent with H2. Once again, the remaining contextual variables are not predictive of 2010 drilling attitudes in the model. The absence of an effect for the spill county dummy variable in the models is consistent with H3.

To explore the magnitude of offshore industry concentration effect, I simulated

the probability of opposing offshore oil drilling for several different hypothetical individuals. All simulations held demographic and attitudinal characteristics at population medians, using coefficients, variances, and covariances from the “change” model presented on Column 3 of Table 3.1.<sup>21</sup> For an “average,” moderate, political independent who “somewhat” favored offshore drilling in 2008, an increase of 2 jobs per 1,000 on the industry concentration variable decreases the likelihood of opposing drilling by about 17 percent (s.e.=.03). For a similar respondent who “somewhat” opposed drilling in 2008, the pro-drilling effect is estimated at more than 30 percentage points (s.e.=.05). Thus the size of the “community of interest” offshore industrial concentration effect is both statistically and substantively significant, according to the estimates reported in this study.

#### *3.4.2 An Alternative Account: Pollution Tolerance*

The results of Table 3.1 could be interpreted differently than the account presented here. Rather than being affected by a renewed identification with the economic self-interest of their local communities, environmental pollution from a focusing event such as the Gulf spill could be greeted with less shock and revulsion from residents conditioned to such risks. For instance, people who live in close proximity to ocean waters where oil fields exist frequently encounter the sight and smell of oil and tar washing ashore due to natural seepage (Smith, 2002).

The findings reported in Table 3.1 are inconsistent with this account, as the spill-induced relationship between residential context and drilling attitudes is conditioned upon industrial concentration. However, I explore this alternative explanation further by estimating models predicting responses to the environment importance vari-

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<sup>21</sup> More specifically, the simulations assume the following values: Party ID “Independent,” Ideology “Moderate,” Environment Importance roughly halfway between “Moderately Important” and “Very Important,” Economy Importance halfway between “Very Important” and “Extremely Important,” Gas Price Importance slightly above “Very Important,” Age 47, Sex “male,” Race “non-black,” Income “\$40,000 to \$50,000,” Education “Some College,” non-resident of a spill county.



able discussed in the models above. If residents of offshore oil-producing counties are more conditioned to pollution, they should be less likely to change in a pro-importance direction following the spill, when compared with respondents lacking such exposure to risk.

Three logit models were estimated using an approach analogous to the model reported in Table 3.1. The importance variable was coded in binary fashion, with “very important” and “extremely important” responses coded as 1. The model predicts environment importance using two residential context variables—oil producing county and county affected by the spill. A number of demographic and social psychological variables are included as covariates.

First, it is noteworthy that the coefficient for spill county is positive and significant in the 2010 model reported in column 2 of Table 3.2. This suggests that residence in a county affected by the spill was predictive of an increased likelihood of considering the environment important. However, the coefficient for spill county is also positive and significant in the column 1, the model predicting environmental importance attitudes in 2008—nearly two years prior to the spill. When we turn to the “change” model reported in column 3 of Table 3.1, we see the coefficient for spill county is positive but not significant. Thus, there continues to be no significant evidence of a contextual pro-environment effect resulting from the spill in citizen attitudes.

More importantly for the present purpose, the oil industry county variable was not significantly related to environmental importance in 2008, 2010, or in the 2010 “change” model reported in column 3. Thus, there is no significant evidence people living in counties where the oil industry is present were less (or more) likely to regard the environment as important. There is also no evidence the post-spill residential context induced these respondents to regard the environment as less important than people living in counties without an offshore drilling industry. In short, while Table 2 does not refute the argument that people living in oil-producing regions are

more tolerant of pollution because of their acceptance of pollution risks, the results presented here are inconsistent with such an account.

### 3.5 Discussion and Conclusion

This chapter has investigated two important and related questions about the role of residential setting in environmental opinion. First, does regional economic self-interest influence attitudes toward environmental policy? And second, does local environmental damage cause local opposition to polluting industry?

On the first question, the findings are clear. Residence in counties dependent on the offshore oil drilling industry was not associated with attitudes toward the offshore oil drilling industry in 2008, nearly two years before the *Deepwater Horizon* spill. After an oil spill described as “the worst environmental disaster in U.S. history” by the sitting president, residence in a high industry concentration county was strongly related to drilling attitudes. Relative to people living in counties without an offshore oil drilling industry, people living in “communities of interest” became notably pro-drilling, but only *after* the spill. This pattern of results suggests that regional self-interest may play a weak or nonexistent role in many policy areas during normal times, but can become a powerful influence on public opinion following a focusing event.

Second, the analysis found no relationship between residence in a county afflicted by the oil spill and opposition to the offshore oil drilling industry. This result could be seen as surprising to some—after all, why would the people who bear the brunt of environmental pollution not rally against its source? The answer suggested by the analysis reported here is that while many people experience costs from industrial activity in the form of environmental pollution, they also frequently derive local economic benefits from the industrial activity that caused the pollution. While we might expect regional self-interest to emerge in the form of a pro-environment and

anti-industry backlash, the place effect that provides the strongest predictive leverage for environmental attitudes is local industrial dependence.

The conclusions reported here do not preclude the possibility that pollution can impact environmental attitudes. As noted above, scholarship has uncovered some evidence that pollution is correlated with pro-environmental attitudes (e.g., Johnson et al., 2005). Importantly, the nature of the case analyzed here—coupled with a survey containing an insufficiently large sample size—did not permit inferences about effects from residences affected by pollution while situated in an economy without an active offshore oil drilling industry. Once regional economic dependence is removed from the equation, it may be that local environmental harm generates a surge in pro-environment enthusiasm. For example, in the next chapter, we will see evidence that individuals living in counties recently afflicted by drought became more concerned about the nation’s water supply and more willing to accept local regulations on water use.

Though this analysis has emphasized the localized cost-benefit calculations that lead individuals to oppose environmental policymaking, readers should not forget that the overall effect of the *Deepwater Horizon* spill was a mass public more supportive of environmental protection, and more opposed to offshore oil drilling. Major pollution events affect the salience and direction of public opinion, and they can linger in the minds of ordinary citizens long after the event. For instance, a March 1999 Gallup poll asked the public whether they remembered the name of the nuclear facility that suffered a “nuclear breakdown” twenty years prior. Fully 38 percent correctly answered “Three Mile Island” in an open-ended question format, a result which suggests that major pollution events have the potential to influence public opinion long after they occur.<sup>22</sup>

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<sup>22</sup> Result obtained at Roper’s iPoll databank. The Gallup Poll which asked this particular question was in the field between March 19-21, 1999.

This observation leads to another question unresolved by this study—how long does the induced effect of local self-interest persist? In the analysis of aggregate opinion discussed earlier, we saw the spill caused the public to shift in a pro-environment direction on the drilling issue for 3-6 months before moving back to its pre-spill level, a pattern consistent with research into public attitudes toward nuclear energy following the 1986 Chernobyl disaster (De Boer and Catsburg, 1988; Bolsen and Cook, 2008). The residential effect suggested by this study is one of identification with the local economy rather than aversion to environmental pollution. It may be that such effects last for a comparable length of time, but future research should attempt to discern whether this is the case.

The pattern of results presented here suggests that focusing events may be a precondition for the activation of what V.O. Key called opinion latency (Key, 1961; Zaller, 2003). In the context of environmental policymaking, there may exist a subset of the population skeptical about environmental protection, but this opposition is not measurable until a focusing event brings previously submerged attitudes to the surface. A frequent observation about environmental opinion is that generic support for environmental protection appears very high, but when political leaders enact policies viewed as harmful to the environment, they rarely suffer at the ballot box or in the court of public opinion (e.g., Guber, 2003). This puzzle has led scholars to question whether environmental attitudes are genuine, or whether responses to environment-themed survey items (asked during innocuous times) represent simple “doorstep” opinions (Converse, 1964). Thus, a final unanswered question raised by the findings of this study is whether the regional self-interest activated by the *Deepwater Horizon* accident constitutes a latent pattern of opinion that always existed, or whether the results represent “more or less rational efforts of a public to make up its mind about new and great questions that thrust themselves forward for decision” (Key, 1961, p. 267).

Table 3.1: Logit models predicting attitudes toward Offshore Oil Drilling

	(1)	(2)	(3)
	2008 drilling	2010 drilling	2010 change
Party ID	-.60*	-.48*	-.34*
(D=1, I=2, R=3)	(.13)	(.12)	(.17)
Ideology (self-report)	-.53*	-.42*	-.27*
(Lib=1, Mod=3, Cons=5)	(.10)	(.12)	(.15)
Environment Importance	1.05*	.95*	.67*
	(.14)	(.17)	(.19)
Economy Importance	-.18	-.47*	-.40
	(.15)	(.26)	(.33)
Gas Price Importance	-.76*	-.29*	-.02
	(.10)	(.14)	(.17)
Age	-.01*	-.02*	-.01
	(.00)	(.01)	(.01)
Female	.17	.57*	.84*
	(.19)	(.18)	(.23)
African-American	-.19	-.85*	-.44
	(.18)	(.44)	(.44)
Income	-.01	-.06*	-.07*
	(.02)	(.02)	(.02)
Education	.11*	.00	-.02
	(.05)	(.04)	(.06)
News Exposure	.02	.03	.02
	(.01)	(.02)	(.03)
Drilling County	.49	.20	.24
	(.36)	(.24)	(.28)
Oil Jobs per 1,000	-.06	-.07	-.07
	(.07)	(.05)	(.06)
<b>Drilling County x</b>	<b>-.01</b>	<b>-1.12*</b>	<b>-1.59*</b>
<b>Oil Jobs per 1,000</b>	<b>(.19)</b>	<b>(.20)</b>	<b>(.26)</b>
Spill County	-.77	-2.08	-2.06
	(.76)	(1.41)	(1.46)
Drilling Opinion	–	–	1.09*
(Wave 7)	(–)	(–)	(.18)
Intercept	1.39*	2.05*	-1.53
	(.62)	(.74)	(1.25)
<i>N</i>	1914	1178	1047
pseudo <i>R</i> <sup>2</sup>	.27	.23	.35

Standard errors clustered by state in parentheses

\*  $p < 0.05$

Table 3.2: Logit models predicting environment importance

	(1)	(2)	(3)
	2008 importance	2010 importance	2010 change
Party ID	-.31*	-.40*	-.24
(D=1, I=2, R=3)	(.09)	(.10)	(.16)
Ideology (self-report)	-.62*	-.63*	-.29*
(Lib=1, Mod=3, Cons=5)	(.06)	(.08)	(.11)
Environment Importance	–	–	1.46*
(wave 7)	(–)	(–)	(.13)
Economy Importance	1.25*	.78*	-.15
	(.15)	(.20)	(.26)
Gas Price Importance	.01	.07	.20
	(.11)	(.14)	(.19)
Age	.01*	.01*	.01
	(.00)	(.01)	(.01)
Female	.26*	.24	.22
	(.13)	(.17)	(.20)
African-American	.48*	.23	.22
	(.26)	(.32)	(.37)
Income	-.04*	-.02	.02
	(.02)	(.02)	(.03)
Education	.07*	.05	-.01
	(.04)	(.07)	(.07)
News Exposure	-.00	.00	.01
	(.02)	(.02)	(.02)
Drilling County	.14	.09	.40
	(.18)	(.53)	(.55)
Spill County	.36*	.87*	.26
	(.19)	(.40)	(.38)
Intercept	-3.10*	-1.63*	-3.61
	(.52)	(.74)	(1.07)
<i>N</i>	1914	1188	1054
pseudo $R^2$	.19	.17	.34

Standard errors clustered by state in parentheses

\*  $p < 0.05$

## Drought and Environmental Opinion: A Study of Attitudes Toward Water Policy

Are citizens influenced by local environmental conditions when forming attitudes about environmental policy? Academic research into the question has provided surprisingly mixed answers, as some work concludes that the public adjusts its demands for policymaking in response to measurable changes in statewide pollution levels (Johnson et al., 2005). Other work has found scant evidence of heightened environmental concern or demand for environmental protection among people who live in close proximity to pollution threats such as oil spills or nuclear accidents (Smith, 2002).

Research into the effect of local conditions on public opinion offers evidence about the resources citizens deploy when they must choose among many competing policy choices. When confronted with complicated policy alternatives, citizens may weigh whether a particular approach will positively or negatively affect their immediate region. Or, as research into opinions toward economic policy has shown, citizens may exclusively consider what is best for the nation as a whole, without being influenced

by considerations about the local consequences of national policy choices.

An answer to questions about the influence of local structural variation on citizen attitudes is of value because it speaks to theoretical debates about the nature of public opinion. In particular, do citizens deploy the information they acquire in their own lives when reasoning about which problems government should solve—or how government should solve them? Or is individual-level opinion largely a function of “the pictures in our heads” (Lippmann, 1922), abstract attitudes shaped by ideology and anecdote, devoid of an independent contribution from personal experience? The former case presents a more rational and pragmatic public whose preferences are driven by self-interest, while the latter account describes a citizenry prone to misapplied ideological shortcuts, incapable of engaging in detailed thinking about public policy.

#### *4.0.1 Water Policy*

Among the many public policy arenas affected by environmental considerations, protection of community drinking water appears to attract the highest level of support from the American public (Konisky et al., 2008). Seventy-five percent of respondents to a March 2011 Gallup poll reported “a great deal” or a “fair amount” of concern about water availability, an aggregate level of concern more acute than virtually all competing environmental threats.<sup>1</sup> In recent years, concern over water availability has grown in salience, as demands on fresh water sources have continued to climb even while the overall supply remains constant. Aggregate public concern about maintaining the nation’s water supply exceeded concern about air pollution for the first time in 2002, and has remained salient to the public ever since (Mullin, 2009).

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<sup>1</sup> See Saad, Lydia. “Water Issues Worry Americans Most, Global Warming Least: Environmental concerns are flat since 2010, but down over past decade.” Gallup.com, summary available at <http://www.gallup.com/poll/146810/Water-Issues-Worry-Americans-Global-Warming-Least.aspx>. Retrieved 5/4/2011.



Local battles over access to water have long defined the political landscape in the West, but in recent years these conflicts have spread farther east—particularly during periods of severe drought. During an extreme drought that afflicted the Southeast in 2007, many communities were forced to impose water restrictions, and public water reserves dwindled to near zero in several particularly hard-hit areas (Mullin, 2009). The drought became so severe in Georgia that Gov. Sonny Perdue (R-GA) arranged for a prayer for rain in front of the capitol building in Atlanta.<sup>2</sup>

For these reasons, it is reasonable to suppose that water policy is visible, and that affected citizens have opportunities to develop real opinions about competing policy alternatives. Moreover, droughts are noticeable, and when they have occurred, they have led to both concrete policy responses by governments and symbolic gestures by politicians. Taken together, we would expect the presence (or absence) of drought to be relevant for citizens' thinking about water policy. Since water issues are of growing importance in today's political context, it is important to arrive at a better understanding of the way environmental factors influence attitudes toward water policy.

In this chapter, I investigate the relationship between drought and public opinion toward water policy. First, I examine Gallup survey data to study whether drought is associated with heightened concern about the water supply. Second, using data collected as part of the 2010 CCES, I examine whether drought is associated with greater support for government-imposed restrictions on water use. I find significant evidence that local drought conditions are related to both concern about water availability and support for regulation of water use. After presenting estimates from multivariate equations predicting attitudes using both data sources, I discuss the implications of the results for normative assessments of the typical citizen.

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<sup>2</sup> See “Dry Georgia Rallies, and Prays, for Rain.” *MSNBC.com*, <http://www.msnbc.msn.com/id/21767716/ns/weather/>.

## 4.1 Background and Theory

Self-interest is often taken as a given in political attitude formation, yet the evidence suggests citizens do not rely on their own personal experiences when forming policy opinions (with some dissent; see Duch et al., 2000). In their classic study of congressional voting behavior, Kinder and Kiewiet (1979) found that voters relied on their judgments about national economic policymaking rather than personal economic circumstances when deciding for whom to vote. Similarly, Sears et al. (1980) concluded symbolic beliefs were far stronger predictors of policy opinions than contextual circumstances in a variety of policy areas, a finding that was largely reaffirmed by Lau and Heldman (2009) nearly three decades later.

If narrow self-interest does not define political attitudes in general, scholars have uncovered some evidence that the local context can influence policy opinions. For example, recent work has shown that citizens living in cities afflicted by the 2008-10 housing crisis reported lower levels of presidential approval, and lower levels of support for the in-party candidate John McCain (Cho and Gimpel, 2009; Hill et al., 2010). This developing line of research offers persuasive evidence that citizens incorporate the information they acquire at the local level when thinking about politics at the national level.

The environmental politics literature has waded into this debate, but research finds mixed results about contextual influences on public opinion and political behavior. In a study of support for environmental ballot initiatives in California, Kahn and Matsuzaka (1997) found lower levels of support for environmentalism in counties whose economies are more dependent on industries affected by environmental regulation. The authors further argued that variables such as ideology or partisan preference were less important than economic factors in predicting county-level voting outcomes. This conclusion was challenged by Coan and Holman (2008), who

broadened their analysis of voting on environmental ballot initiatives to counties in several western states. Their analysis found very little contribution from the local economic factors analyzed by Kahn and Matsuzaka (1997), and found a stronger relationship between partisanship and voting.

Much of the earliest literature on environmental attitudes investigated the urban-rural divide, with scholars generally concluding that urban residence was associated with higher levels of concern about the environment and greater support for environmental action (Lowe and Pinhey, 1982). Tremblay and Dunlap (1978) explicitly argued that local experiences influence environmentalism. They argued that citizens who live in rural areas are less likely to encounter the air and water pollution that are readily evident to urban dwellers. Further, Tremblay and Dunlap (1978) suggested that rural life socializes residents to a more utilitarian view of the natural world, since local economies tend to be more dependent on resource extraction.

Perhaps the most extensive study of the influence of local factors on environmental opinion is Smith (2002), who assessed whether proximity to pollution risks leads to higher levels of support for environmental protection. From a representative sample of California citizens, Smith (2002) concluded that citizens whose residences are close to the shoreline do not report greater opposition to offshore oil drilling. In addition, those who live closer to nuclear power plants—and would therefore experience greater risks from a potential nuclear accident—demonstrated somewhat *less* opposition to nuclear energy. From these results, the author concluded, “the NIMBY [not in my backyard] syndrome completely failed to appear.” (Smith, 2002, p. 195)

Outside the United States, research evaluating the NIMBY phenomenon has found surprising evidence of counterintuitive place effects for the siting of windmills. Wolsink (2007), for instance, found that people who live in close proximity to wind turbines tend not to demonstrate anti-wind energy attitudes. In fact, this research suggests that abstract assessments about whether wind turbines disrupt

natural values is far more predictive of support for wind energy. Very little room is left for rational, self-interested reasoning caused by closer proximity to some of the unwanted qualities of wind power generation (noise, aesthetic values, and so forth).

These results point to a major research design problem that afflicts work on the urban-rural attitudinal distinction and geographic proximity effects. Such studies tend to analyze correlations between semi-permanent structural factors and environmental attitudes, but these factors may directly or indirectly influence people's decisions about where to live in the first place. In a world where individuals were sorted into residential settings entirely at random, correlations between geographic proximity to pollution and opposition to polluting economic activities would provide persuasive evidence of a causal relationship. Unfortunately for researchers, choice of residence is probably influenced by factors which are predictive of support for environmentalism, such as partisan attitudes or occupational choice (Bishop and Cushing, 2009). Thus, evidence of association between urbanity and support for environmental regulation may be spurious, as scholars falsely conclude that residential characteristics influenced opinion when an unmeasured third variable influenced both choice of residence and policy attitude.

In part responding to concerns about these confounding threats to inference, Egan and Mullin (2012) investigated whether recent exposure to extreme weather was associated with beliefs about global warming. The authors found that citizens whose recent weather had been unusually warm were more likely to believe in the existence of climate change, while those who were exposed to unseasonably cold weather were more skeptical about global warming. This result may arise due to recent physical encounters with extreme heat and cold. In a series of experiments which manipulated temperature conditions prior to administering survey questions about climate change, Risen and Critcher (2011) found warmer temperatures increased subjects' likelihood of believing that global warming is occurring.

The association between recent weather and opinion about global warming is relevant to normative debates over citizen competence, since this work provides evidence that opinion may be in part rooted in personal experience. However, the results in Egan and Mullin (2012) also present a dysfunctional mass public that bases its inferences about long-run weather patterns on observations of last week's temperatures. While this work is persuasive that people are incorporating new and personally acquired information into their thinking about questions of national importance, it is unclear whether this portrait of mass opinion depicts a rational and reasoning public, or one with only an ephemeral understanding of complex processes.

#### *4.1.1 The Impact of Drought on Environmental Opinion*

This study leverages the assignment of a naturally assigned "treatment" (drought) to investigate whether the context of place influences public opinion on an environmental policy issue of considerable salience (Konisky et al., 2008). An important advantage of this approach is that inferential threats from endogeneity and spuriousness are reduced, since it is unlikely the choice of residence is systematically related to the recent experience of drought. Thus, drought provides an unusually clean test for environmental place effects.

In addition to the pure theoretical basis for expecting a relationship between personal experiences and environmental policy attitudes set forth above, there are a number of reasons to expect that drought conditions, in particular, will shape attitudes toward water regulation.

First, drought may influence opinion through both indirect and direct means. For instance, when a place is afflicted by drought, the local media are more likely to draw attention to the issue. Previous research has found individuals are more likely to rely on personal experiences to form political judgments when prompted to do so by the mass media (Mutz, 1994). Thus, even if the effects of drought are

not noticeable to the ordinary citizen, it is possible individuals' attitudes could be influenced by exposure to the local news.

Second, drought is typically experienced over a relatively wide geographic area and its affects *are* noticeable; when an area is afflicted by drought, traces of its presence are visible to individuals—green grass becomes brown grass, trees lose their leaves, and creeks run dry. Previous searches for local influences on environmental opinion have often focused on the threat of pollution rather than physical exposure to environmental problems. First-hand encounters with an actual environmental predicament may be jarring enough to produce measurable place effects while exposure to hypothetical pollution risks may not.

Third, unlike other forms of environmental malaise, solutions to drought problems do not necessarily threaten local economic interests. One plausible reason why residential proximity to pollution does not seem to provoke widespread NIMBYism is that local pollution is often caused by industries which supply jobs and economic opportunity. Publicly imposed restrictions on water use may cause nuisances for people, but these regulations do not threaten diminished economic activity in the same way that new regulations on offshore oil drilling might.

For these reasons, drought is expected to increase concern about the water supply, and increase individuals' likelihood of supporting government action designed to regulate water use.

## 4.2 Data and Measures

I proceed as follows: first, I consider the data sources and modeling strategies I rely upon to measure drought. Next, I explain the data and models used to study the relationship between drought and concern about water availability. Finding the expected relationship, I proceed to a robustness check of the results using alternate measures of environmental concern as a dependent variable. Following this analysis,

I proceed to estimate a series of models predicting attitudes toward water policy, using a separate data source.

To measure drought, I collect data released from the United States Drought Monitor, which is a categorical indicator of local drought conditions. The index is updated each week, and historical data is archived at the NOAA's Climate Prediction Center.<sup>3</sup> The index is generated by a combination of regional measurements and field reports, and is a cooperative product produced by collaboration among several federal agencies. The five-category ordinal index ranges from D0 to D4, with drought severity indicated by higher levels on the index.<sup>4</sup> D0 indicates that weather conditions have been "abnormally dry," D1 indicates the presence of "moderate drought," D2 indicates "severe drought," D3 corresponds to "extreme drought," and finally D4 signals the presence of "exceptional drought."

The effect of drought on public opinion may occur suddenly, or drought may have to persist before it systematically affects citizen attitudes. Drought may not be noticed by citizens immediately, since news about weather conditions may take some time to circulate through the public; moreover, long periods without rain may not be inherently noticeable without some form of an exogenous prompt (Gould, 1993). On the other hand, the official arrival of drought may bring drought to the top of the news agenda, leading to a sudden transmission of information about drought into the public consciousness.

Drought may also slowly accumulate in the public mind. Citizens may not notice short-term drought, but as drought conditions persist, or if a region repeatedly finds itself mired in drought conditions, residents may be more likely to notice drought. Conversely, one could imagine that repeated or persistent drought may lead

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<sup>3</sup> To access the weekly report, visit [http://www.cpc.ncep.noaa.gov/products/expert\\_assessment/droughtassessment.shtml](http://www.cpc.ncep.noaa.gov/products/expert_assessment/droughtassessment.shtml)

<sup>4</sup> The absence of drought is also captured in this measure, and is treated here as the "lowest" of the six categories.

to “drought fatigue,” or citizen indifference to drought that grows as the novelty of a drought wears off. People who have been repeatedly exposed to warnings about threats to the water supply—even though water continues to flow through the spigot at home—may simply lose interest in paying attention to current drought status.

Throughout the analysis I code individuals’ exposure to drought based on county-level drought status, but for the reasons stated above, I use two distinct coding strategies to capture drought effects. To capture the short-run effect of drought, I expect that drought must be worse than “abnormally dry” or “moderate.” Thus, if individuals reside in counties afflicted by drought at level D2 or worse (“severe drought”), I code those individuals as currently affected by drought. From this coding strategy, the drought variable is dichotomous.<sup>5</sup>

I generated a second drought coding to capture the long-run effect of drought conditions. To produce this variable, I obtained county-level drought status at the beginning of each month for the three years preceding a respondent’s interview date. For this variable, I elected to be conservative, relying the D0 (“abnormally dry”) standard.<sup>6</sup> Thus, this variable ranges from zero (for a small fraction of respondents) to a maximum of 36.

### 4.3 Concern about Water Availability

Studies of attitudes toward water policy by commercial survey organizations are rare. A search of Roper’s iPoll databank yields a few items asking respondents about water pollution and water quality, but most public opinion research on the environment has focused on other topics. Fortunately, each year since 2000, Gallup has commissioned an environment-themed poll, often repeating survey items with identical wordings

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<sup>5</sup> I explored a variety of codings for drought status. Results are robust to the choice of drought level as a cutoff, though when using the D0 classification as a cutoff—“abnormally dry”—respondents do not consistently demonstrate statistically significant levels of concern for water availability.

<sup>6</sup> Results are entirely robust to the “cutoff” choice for this variable.



in consecutive years. A grid item repeated several times over the last decade asks respondents whether they are concerned about a variety of potential environmental threats, with “personal worry” response categories including worried “a great deal,” “a fair amount,” “only a little,” and “not at all.” Most important for the present study, an item in the grid solicits respondent concern about “maintenance of the nation’s water supply for household needs.”

In this section, I focus analysis on the water availability item, since it is the environmental malaise most logically connected with drought. However, I also analyze models predicting concern levels for other environmental problems in order to determine whether associations between drought and concern about water availability are simply capturing correlations between weather conditions and an underlying, generic “environmental” dimension of public opinion. In all cases, the dependent variable is a four category item, with high levels of concern coded “3” and low concern coded “0.”

Fig. 4.1 presents a histogram depicting the duration of county-level “abnormally dry” conditions for respondents sampled for Gallup’s environment-themed polls between 2008 and 2010. From the graph we can see that virtually all respondents experienced some form of unusually dry conditions during the three years prior to being sampled by Gallup. In addition, the number of months respondent counties were drought-afflicted is fairly uniform between 0 and 36, with more than 100 respondents experiencing dry conditions for the entire three year period.

On Fig. 4.2, I present a map of the U.S. Drought Monitor for March 2008, 2009, and 2010. From the figure, we can see that extreme drought conditions were clustered in the southeast, running on a northeasterly line from northern Alabama along the southern Appalachians and extending into the North Carolina piedmont. Drought conditions were also evident in the northern plains states, central Texas, and in several swaths of the West. By 2009, drought conditions had improved in the South-

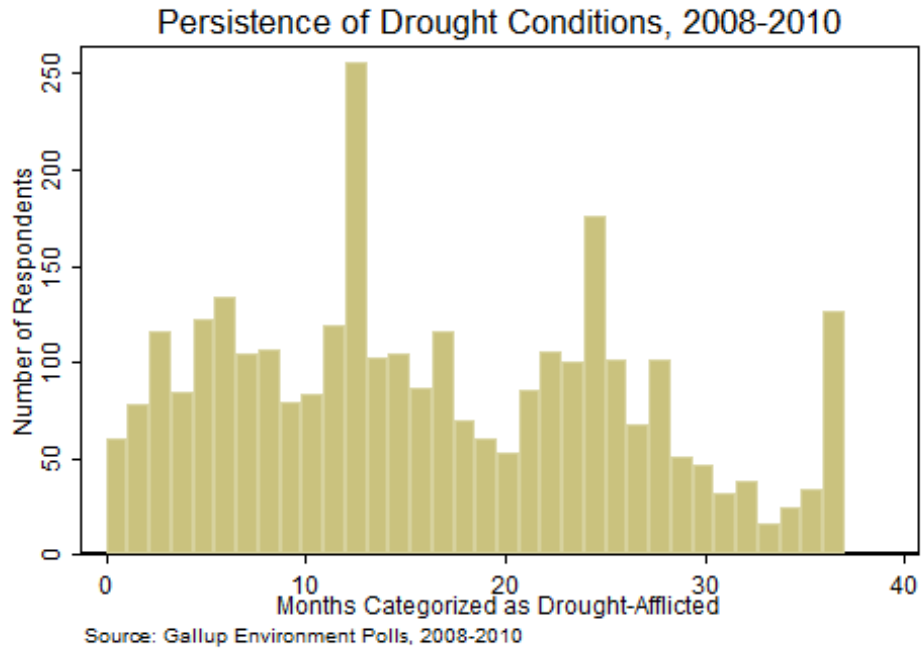


FIGURE 4.1: A histogram of the number of months respondents to Gallup surveys from 2008-10 had experienced “abnormally dry” conditions in the three years prior to being surveyed.

east, though extreme drought remained in northern Georgia and the South Carolina mountains. Meanwhile, the drought in central Texas had grown more severe, while extreme drought conditions spread into northern California. In March of 2010 virtually the entire U.S. east of the Rockies was free of drought, while severe drought existed in scattered locations across the West. Thus, across this three year period, we see considerable variation in terms of the regions of the country afflicted by drought. Especially in the East, most regions experienced both normal rainfall patterns and drought conditions.

Nonetheless, even though drought conditions from 2008-2010 appeared to strike randomly, it is possible that drought could be correlated with partisan or demographic factors that are predictive of environmentalism, which could threaten inferences about the relationship between drought and attitudes toward water policy. To

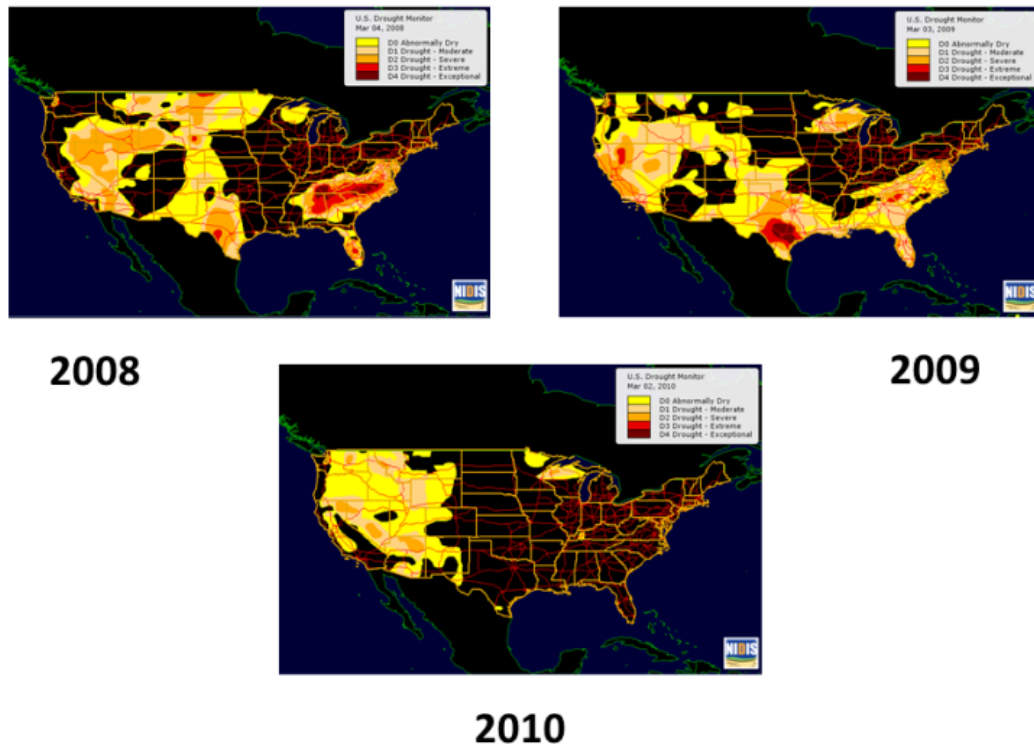


FIGURE 4.2: These maps indicate the drought status for various regions of the United States at the time Gallup’s surveys were in the field in 2008, 2009, and 2010.

see if this is the case, I pooled Gallup data from these periods, and assessed the partisan and demographic characteristics of citizens from drought-stricken counties versus those in non-drought counties.

Looking across the rows of Table 4.1, there are only a few meaningful differences between the drought-afflicted and non-drought respondents. Residents sampled from counties affected by drought were somewhat more Republican and somewhat less Democratic than counties not experiencing drought conditions. This means that, all else equal, we would expect residents of drought-afflicted counties to demonstrate *less* support for government efforts to restrict water use than their non-drought counterparts. Demographically, there are only minor differences between the populations

Table 4.1: Demographic Comparisons of Respondents Sampled by Gallup

Respondent Characteristic	Drought Cty.	Non-Drought Cty.	Diff.
Republican %	43.8 (1.3)	39.0 (1.2)	4.8*
Democrat %	46.7 (1.4)	50.4 (1.2)	-3.7*
Household Income	2.15 (.02)	2.13 (.02)	.02
Educational Attainment	2.39 (.02)	2.35 (.01)	.04
Age	53.5 (.46)	52.5 (.42)	1.0
Female %	48.4 (1.4)	48.1 (1.2)	.3

*Note:* Standard error of the mean in parentheses.

\* indicates statistically significant difference of  $p < .05$  using an unpaired  $t$ -test.

sampled from counties experiencing drought and non-drought counties. Age, sex, income, and education means are statistically indistinguishable. In sum, while the demographic and ideological characteristics of sampled populations from the county-level groupings are not identical, they are similar enough to compare provided appropriate controls are employed within statistical procedures.

Environmental concerns such as water availability are difficult for a person to detect without a reasonably high subject-area knowledge or interest. To a considerable extent, in order to experience concern, a person must believe scientists' and other experts' assessments about whether the local area is experiencing drought—and whether drought conditions could have any effect on the local water supply. For this reason, in a multivariate model predicting environmental concern, it is important to model a person's belief about the plausibility of objective environmental problems. One indirect way of capturing this attitudinal dimension is to include attitudes about climate change in a multiple regression model. In the analysis that

follows, I choose a 5-category survey item about the likelihood global warming will affect people’s lives in the future.<sup>7</sup> On this ordinal item, higher responses indicate less perceived concern about the immediacy of the climate change threat.

#### *4.3.1 Analysis*

I now proceed to directly estimate the relationship between drought and concern about water availability, using the Gallup item described above as a dependent variable. Since the dependent variable is a four-category, ordered variable, I use ordered logit. I include a range of individual-level covariates in the model, including the climate change variable noted above. Other covariates include party identification,<sup>8</sup> self-reported ideology,<sup>9</sup> age,<sup>10</sup> education,<sup>11</sup> income,<sup>12</sup> and female gender. The key independent variable is the binary county-level drought variable.

I present estimates for three separate ordered logit models predicting concern about water availability on Table 4.2.<sup>13</sup> Column 1 on Table 4.2 reports a model

<sup>7</sup> The specific question wording is “Which of the following statements reflects your view of when the effects of global warming will begin to happen—(1) They have already begun to happen; (2) They will start happening within a few years; (3) They will start happening in your lifetime; (4) They will not happen within your lifetime, but they will affect future generations; (5) They will never happen.” This item also included “don’t know” and refused categories. Respondents who were categorized in these latter two groups were dropped from the analysis (about 2–2.5 percent of the sample.)

<sup>8</sup> Democrats are coded “-1,” Independents “0,” and Republicans “1.” Leaners are coded as partisans.

<sup>9</sup> Liberals are coded “-1,” Moderates “0,” and Conservatives “1.” There was not a leaner prompt for the ideology question in Gallup’s E-polls.

<sup>10</sup> The coding for this variable is the respondent’s absolute age at the time of the survey.

<sup>11</sup> This is a four-category variable, with higher values indicating higher levels of educational attainment.

<sup>12</sup> This variable is a three-category variable, with higher values on the variable indicating higher levels of household income.

<sup>13</sup> I explored alternative specifications for this model. For instance, I recoded the concern variable as a binary dependent variable, and estimated a varying-intercept (by state) model, removing the year-level dummy variables. Estimates of the coefficient for the drought variable using this equation were comparable in magnitude and statistically significant. I also estimated a comparable model using fixed state level effects, and obtained a virtually identical coefficient estimate for the drought variable.

that includes both the short-term drought variable and the long-term variable in the equation. As is evident from the coefficient estimates, both variables are related to concern about water availability in the expected direction—respondents who live in drought-afflicted counties are more likely to demonstrate concern—and both coefficients are statistically significant at conventional levels using a one-tailed test.

Columns 2 and 3 demonstrate that, when included in an equation by themselves, both short-term drought conditions and long-term drought conditions appear to have an association with concern about water availability. Both variables are statistically significant at conventional levels. Thus, people whose residences were located in drought-stricken areas were more likely to express concern about water availability, controlling for partisan, ideological, and demographic characteristics.

Perceptions about the future consequences of climate change were strongly related to concern about water availability. The coefficient for the climate change variable is large in magnitude and statistically significant. According to the results presented on Table 4.2, people who believe global warming is already taking place were considerably more concerned about water availability than those who believe climate change will “not happen.”

To explore the magnitude of the effects, I simulated the probability of a “concerned” response to the water availability item for a typical respondent, holding all covariates constant.<sup>14</sup> Residence in a county currently afflicted by drought appears to increase the probability of a pro-concern response by about 5 percent, from about 75% to about 80%.<sup>15</sup> Persistent drought conditions are substantively significant as well; in an analogous substantive simulation, a “typical” person living in a county

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<sup>14</sup> This simulated person is male, 54 years old, independent of partisan affiliation, moderate ideologically, and at median population levels for income and education. Attitude on the climate change variable is simulated at the middle-level response (“will start happening in your lifetime”). The survey-year context for the simulation is 2010.

<sup>15</sup> This simulation is based upon the model presented in column 2, and I arrive at these figures by combining simulated probabilities for the two “concerned” responses.

which had been mired in some level of drought status for the last three years was nearly 10 percentage points more likely to express concern about water availability than a “typical” person whose county of residence had not experienced any level of drought conditions.<sup>16</sup>

To compare the effect of drought status with the effect of attitudes toward climate change, I simulated an additional theoretical respondent, with demographic and political variables held at the same levels as indicated above.<sup>17</sup> A person who believes global warming is “already happening” is more than 17 percent more likely to choose the “concerned” response than a person who believes the effects of climate change will “never happen.”<sup>18</sup> Thus, abstract beliefs about complex environmental threats have a very strong substantive relationship with concern about water availability.

Most of the remaining demographic variables are statistically significant, and are consistent with many of the results found in the literature on environmental opinion. One possible exception is the coefficient for the three-category income variable, which suggests that higher levels of household income are associated with lower levels of concern. Finally, given the relative absence of drought when Gallup was in the field in March 2010, the coefficients for the 2008 and 2009 year dummy variables indicate a higher probability of concern for respondents surveyed during those years.

It is reasonable to suppose that, despite the consistent relationship between drought-afflicted counties and concern about water availability, the models presented in Table 4.2 are simply capturing generic environmental concern. To demonstrate that drought affects concern about water availability in particular, I present esti-

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<sup>16</sup> This simulation is based upon the model presented in column 3, and I arrive at this figure by combining simulated probabilities for the two “concerned” responses.

<sup>17</sup> For this simulation, I assumed the “typical” individual resided in a county which was not affected by drought.

<sup>18</sup> Those who believe climate change will “never happen” were simulated to demonstrate a 63% probability of expressing concern about water availability (s.e. = .05); those who believe climate change is “already happening” were simulated to express concern with an 81% probability (s.e. = .03).

mates for equations predicting concern about other forms of environmental maladies on Table 4.3. As is evident from the coefficient estimates, residence in drought-afflicted counties was *not* related to concern about air pollution, global warming, or extinction of species. In all three columns, the coefficients are small in magnitude and their 95% confidence intervals include zero.<sup>19</sup> Thus, the relationship between drought and concern about water availability is not a spurious consequence of an unmeasured characteristic that predicts support for generic environmentalism and residence in a county affected by drought.

#### 4.4 Attitudes toward Water Policy

The preceding analysis provided evidence of an association between concern for water quality and county-level drought status. In this section I examine whether the heightened concern that results from drought is translated into higher levels of support for government action to restrict water use. Survey organizations have rarely sought to measure attitudes on this dimension of opinion, though Gallup did ask a few relevant questions during the comparatively extreme drought that afflicted the country in 2002.<sup>20</sup> For this reason, I inserted an item into the 2010 CCES which asked a national sample of U.S. adults about policies aimed at restricting water use.

The 2010 CCES was administered to a 30,000 person national stratified sample and included items surveying political attitudes during that year's congressional election cycle. Respondents completed pre-election surveys in September or October, and subjects were interviewed a second time during November, after the election results were known. All respondents answered a series of common content questions, but were then randomly assigned to topical modules such as the one employed in

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<sup>19</sup> These "other" forms of pollution are just a sub-sample of the alternate dependent variables I might have chosen for this analysis. In every single equation I estimated using the Gallup data, I find the same result—no relationship between county-level drought and environmental concern.

<sup>20</sup> Unfortunately, responses to these survey questions are not currently available to the public.



this study. In the module under consideration in this study, respondents answered a survey item about water policy.<sup>21</sup> With the exception of variation in the question stem, respondents were asked “Thinking about the issue of water conservation, do you favor or oppose government regulations that restrict water use in order to preserve the water supply?” Responses ranged from “strongly oppose” to “strongly favor,” with intermediate agreement and disagreement categories.<sup>22</sup>

The water policy question was asked to respondents in November 2010, which saw drought return to the eastern half of the country, as Fig. 4.3 shows.

As is evident from the graph, there were not as many areas experiencing exceptional drought conditions across the country in November 2010 as there were in 2007 and 2008. Thus, 2010 provides a conservative test for place effects on water policy attitudes, since drought was not widespread and not particularly severe. Nonetheless, serious drought did afflict a swath of the country extending from the Deep South into the Midwest. Drought conditions were generally mild across the West, though a large patch of the western half of the country was categorized as “abnormally dry.” However, the drought-afflicted parts of the country in November 2010 did tend to have more of a partisan character than the Gallup sample collected between 2008 and 2010. Table 4.4 shows the partisan and demographic characteristics of individuals sampled from drought-afflicted and non-drought areas.

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<sup>21</sup> The question included two treatment conditions that were intended to explore the mechanism by which drought affects attitudes toward water policy. The first treatment condition informed respondents, “Thinking about the issue of water conservation, a recent study found that [Local] County may face water shortages in coming years. Do you favor or oppose government regulations that restrict water use in order to preserve the water supply?” As will be seen below, this treatment did not have much impact on responses. The respondents’ local county name was inserted into the [Local] bracket. The second treatment informed respondents, “Thinking about the issue of water conservation, a recent survey found that many [Local] County residents support government regulation to maintain the size of the local water supply. Do you favor or oppose government regulations that restrict water use in order to preserve the water supply?” This treatment also was not related to responses to the water policy item. In the multivariate analysis that follows, I nonetheless include dummy variables to control for the treatments.

<sup>22</sup> A “don’t know” response option was offered, and those who chose this option were dropped from the analysis (about 9% of the sample).

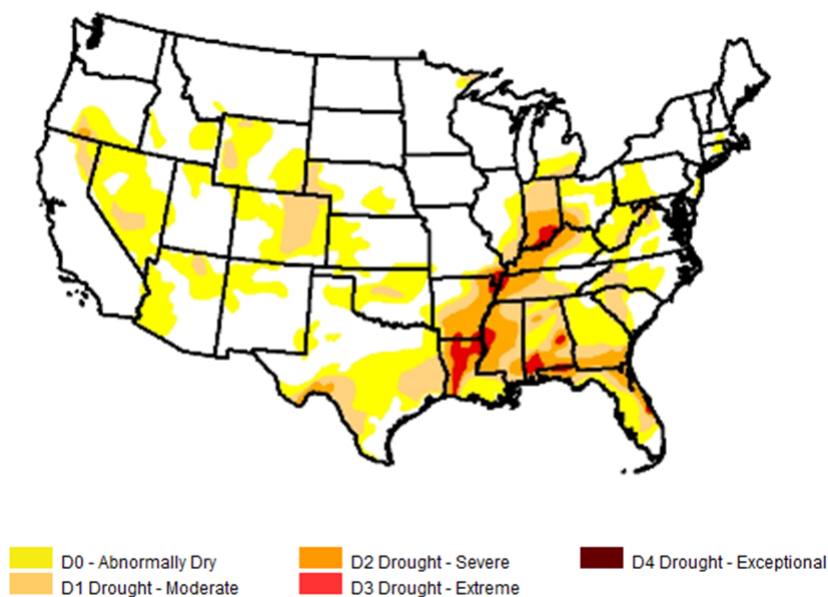


FIGURE 4.3: This map indicates the drought status for various regions of the United States at the time the CCES survey was in the field in November 2010.

Several comparisons on Table 4.4 bear mention. First, survey respondents sampled from drought-afflicted areas in November 2010 were slightly more Republican, and slightly less Democratic, in party affiliation. This sample characteristic is probably a consequence of drought being concentrated from the Deep South through the Midwest, an region of the country that has increasingly voted for Republican presidential candidates. However, because Republican partisan identification is likely to be associated with less support for government action to conserve water supply (e.g., Dunlap et al., 2001), I expect the partisan skew to produce an effect in the opposite direction expected from drought on water policy attitudes. Thus, the partisan imbalance of the sample provides a particularly conservative test of the hypothesis that drought is associated with water policy attitudes.

Second, respondents in counties affected by drought had lower mean family in-

come levels than respondents sampled from non-drought counties. Because higher incomes are expected to be associated with lower levels of support for government action to protect the water supply, this demographic skew is in the same expected direction as the hypothesized effect of drought. Thus, it will be important to include family income as a covariate in equations predicting support for water policy. Group comparisons for the remaining variables presented on Table 4.4 did not show significant differences between respondents sampled from drought-afflicted and non-drought counties.

#### *4.4.1 Analysis*

With these considerations in mind, I estimate an ordered logit model using attitudes toward water policy as a dependent variable. I expect that attitudes toward water policy will have comparable associations with the covariates discussed in the models predicting concern above. For this reason, I include opinions about climate change as a covariate. The climate item is a five category variable, with higher values associated with greater skepticism about global warming.<sup>23</sup> Disbelief in climate change is expected to be negatively associated with support for restrictions on water use. Other covariates include party identification, self-reported ideology, education, sex, self-reported African American racial identity, household income,<sup>24</sup> and two dummy variables which were included to capture question wording treatment effects. The key independent variable is residential setting in drought-stricken counties, which is measured as described above.<sup>25</sup>

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<sup>23</sup> The question wording for this item was “From what you know about global climate change or global warming, which one of the following statements comes closest to your opinion?” Responses ranged from “Global climate change has been established as a serious problem, and immediate action is necessary” on the low end to “Global climate change is not occurring; this is not a real issue” on the high end.

<sup>24</sup> This variable is a 14-category variable, with higher values indicating higher household income. Those who refused to report income levels were recoded to occupy values at the sample median.

<sup>25</sup> Drought status reflects measurements reported on November 2, 2010.

Estimates for the model described above are presented in three columns on Table 4.5. The first column presents a model with both short-term and long-term drought conditions included in the ordered logit equation, while the second and third columns include just one of the drought variables. Looking at all three columns, we see that people residing in counties affected by drought were more likely to favor government restrictions on water use. The coefficients for the drought variables are statistically significant at conventional levels.

Based on a simulation using the mean vector and variance-covariance matrix from the model estimated on Table 4.5, residential setting in a region stricken by drought through the entire period is estimated to increase the probability of a pro-regulatory attitude by about thirteen percent, relative to residence in a county entirely free of drought.<sup>26</sup> Meanwhile, the immediate effect of “severe” (level D2 or worse) drought increases the probability of regulatory support by nearly 12 percent.<sup>27</sup> These results, combined with the significant coefficient for drought in predicting concern about water availability, provides persuasive evidence that drought conditions affect citizen thinking about water policy.

However, the strongest predictors of support for government imposition of water regulation are predominantly ideological. The coefficient for the climate variable is large in magnitude and statistically significant. To put the substantive effect of this variable into perspective, consider the simulated effect of extreme differences in attitudes toward climate change. A citizen who is certain about the evidence in favor of climate change has an 68.7 percent change of favoring regulation of water

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<sup>26</sup> This simulation is based on a hypothetical white male with demographic characteristics held at the population medians, and political variables held at centrist positions. For this simulated individual, the probability of supporting regulation of water use from a non-drought county is about 56.6 percent, while residence in a drought-stricken county leads to a probability of supporting regulation at 69.0 percent.

<sup>27</sup> This simulation makes the same assumptions as those indicated above. The probability of a pro-regulatory attitude in a non-drought county was simulated to be about 57.1 percent, while residence in a drought-afflicted county was simulated at 66.7 percent.

use, while an extreme climate skeptic has only a 31.7 percent change of supporting regulation of water use.<sup>28</sup> Though the effects are not as large in magnitude as we observe with climate change opinions, the coefficients for self-reported ideology and partisan identification are substantively and statistically significant, as is evident on Table 4.5.

Thus, attitudes toward regulation of water use—a fairly narrow policy arena many respondents may not have spent much time thinking about before participating in the CCES—are overwhelmingly driven by broader ideological orientations. Liberal / conservative ideology, party identification, and especially beliefs about the existence of climate change predominantly drive public opinion toward water policy. Several other demographic variables are predictive of water regulation attitudes, but their overall effects are more substantively comparable to the county drought variable.

## 4.5 Discussion and Conclusion

Research into contextual influences on public opinion frequently confronts inferential threats from endogeneity and spuriousness. Scholars have long argued the laboratory setting offers a greater degree of internal validity in social science research (McDermott, 2002). The present chapter leveraged the assignment of a weather-related “treatment” to study the influence of local context on environmental opinion. Relative to most observational research, drought as a naturally assigned treatment is more plausibly analogized to the laboratory setting, and as such, offers the opportunity for stronger causal inferences (Dunning, 2008).

The results presented here are consistent with several basic conclusions. First, local weather conditions are related to a narrowly defined dimension of environmental attitudes. When local rainfall declines, and a person’s residential setting is

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<sup>28</sup> This simulation is based on a hypothetical white male with demographic characteristics held at the population medians, and political variables held at centrist positions.

threatened by drought, that person is more likely to express concern about water availability, and more likely to support government-imposed restrictions on water use. This result holds in the presence of individual-level controls for ideology and demographics, even though drought-afflicted areas in the period under investigation tended to be more strongly Republican. This result obtains from multiple data sources, and is robust to a variety of alternative modeling specifications.

At first glance, these results provide some evidence for the notion that citizens are using their own personal experiences to arrive at carefully considered orientations toward public policy matters. Moreover, the systematic inference that citizens appear to be making is rational and self-interested. A person who considers his or her region to be particularly threatened by an environmental malaise, and is enticed to support government intervention to resolve that threat, is basing his or her opinion on what is “good for us” as a regional population rather than what is “good for us” as a national population. While this is not an example of self-interested opinion at the narrowest level—such as the numerous attempts to find examples of pocketbook voting by public opinion scholars—it shows that self-interest may influence citizen thinking, if a definition of self-interest allows us to substitute “good for people around here” in place of “good for me.”

In comparison with the conclusions reached by Egan and Mullin (2012), the analysis suggests that not only are citizens applying their observations about local conditions in their thinking about policy, but they may be making more sophisticated and useful inferences from these observations. When citizens’ conclusions about global warming are rooted in reactions to statistical outliers rather than a long-term temperature trend, we are forced to conclude that the mass public’s reasoning is structurally dysfunctional. For thinkers interested in studying the extent to which U.S. citizens correspond to the normative democratic ideal, if the information that is influencing judgments about climate change contains no useful evidence about the

underlying phenomenon, analysis showing that citizens *are* using this information is troubling. In this study, on the other hand, we have evidence that citizens are relying upon information about their local environment to help them decide whether a particular policy approach is justified. Moreover, the policy course that citizens from drought-afflicted counties are being led to favor is one that would obtain at least some support among policy experts.<sup>29</sup> Thus, from one point of view, the results of this study present a more normatively reassuring portrait of the mass public than some previous work has shown.

However, as noted above, attitudes on water policy are overwhelmingly driven by ideological factors rather than commitments to what is thought to be good public policy for the nearby region. Concern about water availability is strongly driven by broader attitudes about the likely effects of climate change, partisan identity, and ideology. Likewise, attitudes toward climate change weigh more heavily in citizen thinking about government regulation of water use than any of the other variables included in the multivariate equation. These results suggest that ideological commitment may cause citizens to discount or disregard new information when thinking about water policy, whether because new information is swamped by strong priors in a Bayesian framework (Gerber and Green, 1999), or because new information is rejected through some sort of perceptual screen (e.g., Campbell et al., 1960) or via motivated reasoning (Taber and Lodge, 2006).

For this reason, I am more sanguine about the public's capability to engage in sophisticated reasoning about public policy based on the results of this analysis. While the public demonstrates some ability to incorporate local information into its thinking about narrow matters of policy, that brand of systematic, rationally-oriented thinking is overwhelmed by more abstract considerations. The irony here is that

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<sup>29</sup> Of course, there is robust debate among policy scholars over how best to resolve threats to common pool resources. See, for instance, Ostrom (1999).

ideological abstractions—long thought to provide evidence of sophistication among public opinion scholars—may be *preventing* citizens from thinking carefully about the utility of various water policies, and perhaps other analogous policy arenas. It is easy to imagine a scenario where a drought-stricken ideologically conservative majority rejects constraints over individual water use, even though such local regulations may resolve water shortages. Or, an activist liberal majority may embrace unnecessary or counterproductive constraints on water use despite the absence of drought conditions or water shortages.

Future research should continue to explore other local characteristics, and attempt to uncover the extent to which local factors affect citizen thinking about various public policy issues. In addition, scholars should investigate the extent to which ideology facilitates—or restricts—citizens' capability to incorporate new information in their thinking about public policy. In an increasingly polarized world, ideology could become an obstacle to citizen sophistication rather than the efficient heuristic it is often thought to be.

Finally, drought may influence attitudes toward water policy in two subtly different ways. First, citizens may become aware of drought by simply recognizing the absence of rain, and comparing recent precipitation patterns with recollections about previous weather conditions. Or, people may absorb information about drought through the media, as local television newscasts or newspapers may increasingly warn the public about a gathering drought. Previous research has found awareness of local pollution was much more likely when the local media publicized the existence of the pollution (Gould, 1993). It would be useful to revisit these findings for other dimensions of environmental opinion, to better determine the mechanism by which drought affects opinion.



Table 4.2: Ordered Logit Models predicting Concern about Water Availability

	(1)	(2)	(3)
	Both Drought Variables	Immediate	Long-term
Democrat	0.10 (0.14)	0.10 (0.14)	0.10 (0.14)
Republican	-0.36* (0.14)	-0.35* (0.14)	-0.36* (0.14)
Ideology	-0.00 (0.06)	-0.00 (0.06)	0.00 (0.06)
Climate Change Attitude	-0.23* (0.03)	-0.23* (0.03)	-0.23* (0.03)
“Dry Months” (“D0” or worse)	0.01 (0.00)		0.01* (0.00)
Current Drought (“D2” or worse)	0.17 (0.09)	0.24* (0.07)	
Female	0.15* (0.08)	0.15* (0.08)	0.16* (0.08)
Education	-0.13 (0.07)	-0.13 (0.07)	-0.13 (0.07)
HH Income	-0.31* (0.06)	-0.31* (0.06)	-0.31* (0.06)
Age	0.01* (0.00)	0.01* (0.00)	0.01* (0.00)
2008	0.14 (0.09)	0.13 (0.09)	0.14 (0.09)
2009	0.19* (0.09)	0.19* (0.09)	0.19* (0.09)
Cut1	-3.76* (0.30)	-3.85* (0.29)	-3.73* (0.29)
Cut2	-2.26* (0.28)	-2.35* (0.28)	-2.23* (0.28)
Cut3	-0.75* (0.28)	-0.85* (0.28)	-0.73* (0.28)
<i>N</i>	2679	2679	2679
pseudo $R^2$	0.045	0.045	0.044

Note: Robust standard errors in parentheses

\*  $p < 0.05$

Table 4.3: Alternate Models Predicting Concern about the Environment

	(1)	(2)	(3)
	Air Pollution	Global Warming	Extinction
Democrat	-0.03 (0.15)	0.78★ (0.24)	0.26 (0.14)
Republican	-0.62★ (0.15)	-0.07 (0.24)	-0.18 (0.14)
Ideology	0.18★ (0.06)	0.45★ (0.08)	0.22★ (0.06)
Climate Change Attitude	-0.33★ (0.03)	-0.72★ (0.04)	-0.35★ (0.03)
“Dry” Months (“D0” or worse)	0.00 (0.00)	-0.01 (0.01)	-0.00 (0.00)
Female	0.33★ (0.08)	0.15 (0.11)	0.17★ (0.07)
Education	-0.20★ (0.07)	-0.02 (0.10)	-0.09 (0.07)
HH Income	-0.25★ (0.06)	-0.37★ (0.08)	-0.30★ (0.05)
Age	-0.00 (0.00)	0.00 (0.00)	-0.01★ (0.00)
2008	0.16 (0.09)	0.16 (0.11)	0.10 (0.09)
2009	0.15 (0.09)		0.07 (0.09)
Cut1	-4.44★ (0.30)	-3.14★ (0.45)	-3.84★ (0.29)
Cut2	-2.71★ (0.29)	-1.69★ (0.44)	-2.30★ (0.28)
Cut3	-1.00★ (0.28)	-0.04 (0.44)	-0.85★ (0.28)
<i>N</i>	2679	1348	2674
pseudo $R^2$	0.082	0.197	0.078

Note: Robust standard errors in parentheses

★  $p < 0.05$

Table 4.4: Demographic Comparisons of Respondents Sampled by the CCES

Respondent Characteristic	Drought Cty.	Non-Drought Cty.	Diff.
Republican %	50.3 (3.6)	42.8 (1.7)	7.5*
Democrat %	37.7 (3.5)	44.6 (1.8)	-6.9*
Household Income	7.76 (.28)	8.42 (.13)	-.66*
Educational Attainment	3.81 (.10)	3.93 (.05)	-.08
Age	52.5 (1.03)	52.0 (.54)	.5
Female %	49.7 (3.6)	49.4 (1.8)	.3

*Note:* Standard error of the mean in parentheses.

\* indicates statistically significant difference of  $p < .05$  using an unpaired  $t$ -test.

Table 4.5: Ordered Logit Models predicting Support for Restrictions on Water Use

	(1)	(2)	(3)
	Both Drought Variables	Immediate	Long-term
Democrat	0.10 (0.14)	0.10 (0.14)	0.10 (0.14)
Republican	-0.36★ (0.14)	-0.35★ (0.14)	-0.36★ (0.14)
Ideology	-0.00 (0.06)	-0.00 (0.06)	0.00 (0.06)
Climate Change Attitude	-0.23★ (0.03)	-0.23★ (0.03)	-0.23★ (0.03)
“Dry Months” (“D0” or worse)	0.01 (0.00)		0.01★ (0.00)
Current Drought (“D2” or worse)	0.17 (0.09)	0.24★ (0.07)	
Female	0.15★ (0.08)	0.15★ (0.08)	0.16★ (0.08)
Education	-0.13 (0.07)	-0.13 (0.07)	-0.13 (0.07)
HH Income	-0.31★ (0.06)	-0.31★ (0.06)	-0.31★ (0.06)
Age	0.01★ (0.00)	0.01★ (0.00)	0.01★ (0.00)
2008	0.14 (0.09)	0.13 (0.09)	0.14 (0.09)
2009	0.19★ (0.09)	0.19★ (0.09)	0.19★ (0.09)
Cut1	-3.76★ (0.30)	-3.85★ (0.29)	-3.73★ (0.29)
Cut2	-2.26★ (0.28)	-2.35★ (0.28)	-2.23★ (0.28)
Cut3	-0.75★ (0.28)	-0.85★ (0.28)	-0.73★ (0.28)
<i>N</i>	2679	2679	2679
pseudo $R^2$	0.045	0.045	0.044

Note: Robust standard errors in parentheses

★ =  $p < 0.05$

# Appendix A

## Question Wordings and Variable Codings

Counties/ Parishes affected by the BP spill (ch.3)

*Louisiana*

Cameron

Vermilion

Iberia

St. Mary

Terrebonne

Lafourche

Jefferson

Plaquemines

St. Bernard

Orleans

St. Tammany

*Mississippi*

Hancock

Harrison

Jackson

*Alabama*

Mobile

Baldwin

*Florida*

Escambia

Santa Rosa

Okaloosa

Walton

Bay

Gulf

Counties/ Parishes Bordering Offshore Oil Drilling Activity (ch.3)

***Texas***

Willacy

Kenedy

Kleberg

Nueces

San Patricio

Arkansas

Refugio

Victoria

Calhoun

Jackson

Mata-Gorda

Brazoria

Galveston

Harris

Chambers

Jefferson

Orange

***Louisiana***

Cameron

Vermilion

Iberia

St. Mary

Terrebonne

Lafourche

Jefferson  
Plaquemines  
St. Bernard  
Orleans  
St. Tammany

***Mississippi***

Hancock  
Harrison  
Jackson

***Alabama***

Mobile  
Baldwin

***California***

Santa Barbara  
Ventura  
Orange

***Alaska***

North Slope  
Aleutians East  
Peninsula and Lake  
Kodiak Island  
Kenai Peninsula  
Anchorage



Matanuska-Susitna

### Question Wordings (ch.3)

- Offshore Oil Drilling (2008/ 2010): “Do you favor or oppose allowing oil drilling off the coast of the United States?”
  - Strongly Support
  - Somewhat Support
  - Somewhat Oppose
  - Strongly Oppose
  
- Party Identification (2008): “Do you consider yourself a Democrat, Republican, an Independent, a supporter of some other party, or none of these?”
  - Democrat
  - Republican
  - Supporter of Some Other Party
  - Independent
  - Not Sure
  
- Ideology (2008): “Generally speaking, do you consider yourself...”
  - Very Liberal
  - Somewhat Liberal
  - Moderate
  - Somewhat Conservative
  - Very Conservative

- Importance, “Environment,” “Gas Prices,” “Economy” (2008): “How important is each of the following issues to you personally?”
  - Not at all Important
  - Somewhat Important
  - Moderately Important
  - Very Important
  - Extremely Important

## Question Wordings and Variable Coding (ch.4)

Gallup data (ch.4)

- Concern about Water Availability: “I’m going to read you a list of environmental problems. As I read each one, please tell me if you personally worry about this problem a great deal, a fair amount, only a little, or not at all. First, how much do you personally worry about...” [Maintenance of the nation’s supply of fresh water for household needs]
  - 0. Not at all
  - 1. Only a little
  - 2. A fair amount
  - 3. A great deal
  
- Alternative concern items (Tables 8-10)
  - Pollution of rivers, lakes, and reservoirs
  - Air pollution
  - Damage to the earth’s ozone layer
  - The loss of tropical rain forests
  - Global warming
  - Contamination of soil and water by toxic waste
  - Acid rain
  - Pollution of drinking water
  - Extinction of plant and animal species
  - The loss of natural habitat for wildlife
  - Urban sprawl and loss of open spaces

- Party Identification: “In politics, as of today, do you consider yourself a Republican, a Democrat, or an Independent?”
  - -1: Democrat
  - 0: Independent
  - 1: Republican
  
- Ideology: “How would you describe your political views?”
  - -1: Liberal
  - 0: Moderate
  - 1: Conservative
  
- Climate Change: “Which of the following statements reflects your view of when the effects of global warming will begin to happen?”
  - -2: They have already begun to happen
  - -1: They will start happening within a few years
  - 0: They will start happening within your lifetime
  - 1: They will not happen within your lifetime, but they will affect future generations
  - 2: They will never happen
  
- Education: “What is the last grade or class that you completed in school?”
  - -1: Less than High School completed
  - 0: High School only
  - 1: More than High School
  
- Age: “Please tell me your age.”

- 18–98: Age in years
- 99: 99 year or older
- Income: “Is your total annual household income before taxes \$40,000 or more, or is it less than \$40,000?... (if under, ask: Is it over or under \$30,000?) ... (if under, ask: Is it over or under \$20,000?) ... (if under, ask: Is it over or under \$10,000?) ... (if over, ask: Is it over or under \$50,000?) ... (if over, ask: Is it over or under \$75,000?) ... (if over, ask: Is it over or under \$100,000?) ... (if over, ask: Is it over or under \$150,000?) ... (if over, ask: Is it over or under \$250,000?) ... (if over, ask: Is it over or under \$500,000?)”
  - 1: < \$10,000
  - 2: \$10,000–\$19,999
  - 3: \$20,000–\$29,999
  - 4: \$30,000–\$39,999
  - 5: \$40,000–\$49,999
  - 6: \$50,000–\$74,999
  - 7: \$75,000–\$99,999
  - 8: \$100,000–\$149,999
  - 9: \$150,000–\$249,999
  - 10: \$250,000–\$499,999
  - 11: > \$500,000

CCES data (ch.4)

- Support for regulating water use

- Control: Do you favor or oppose government regulations that restrict water use in order to preserve the water supply?
- Treatment #1: Thinking about the issue of water conservation, a recent study found that [Local] County may face water shortages in coming years. Do you favor or oppose government regulations that restrict water use in order to preserve the water supply?
- Treatment #2: Thinking about the issue of water conservation, a recent survey found that many [Local] County residents support government regulation to maintain the size of the local water supply. Do you favor or oppose government regulations that restrict water use in order to preserve the water supply?
- Response Options:
  - \* 0: Strongly Oppose
  - \* 1: Somewhat Oppose
  - \* 2: Somewhat Favor
  - \* 3: Strongly Favor
- Party ID: Generally speaking, do you think of yourself as a ...?
  - -1: Democrat
  - 0: Independent/ Other/ Not sure
  - 1: Republican
- Ideology: How would you rate each of the following individuals and groups? ... [Yourself]
  - -1: Very Liberal/ Liberal/ Somewhat Liberal (recoded)
  - 0: Middle of the Road

- 1: Somewhat Conservative/ Conservative/ Very Conservative (recoded)
- Climate Change: From what you know about global climate change or global warming, which one of the following statements comes closest to your opinion?
  - -2: Global climate change has been established as a serious problem, and immediate action is necessary.
  - -1: There is enough evidence that climate change is taking place and some action should be taken.
  - 0: We don't know enough about global climate change, and more research is necessary before we take any actions.
  - 1: Concern about global climate change is exaggerated. No action is necessary.
  - 2: Global climate change is not occurring; this is not a real issue.
- Education: What is the highest level of education you have completed?
  - 0: Did not graduate from high school
  - 1: High school graduate
  - 2: Some college, but no degree (yet)
  - 3: 2-year college degree
  - 4: 4-year college degree
  - 5: Postgraduate degree (MA, MBA, MD, JD, PhD, etc.)
- Income: Thinking back over the last year, what was your family's annual income?
  - 0: Less than \$10,000



- 1: \$10,000 - \$14,999
- 2: \$15,000 - \$19,999
- 3: \$20,000 - \$24,999
- 4: \$25,000 - \$29,999
- 5: \$30,000 - \$39,999
- 6: \$40,000 - \$49,999
- 7: \$50,000 - \$59,999
- 8: \$60,000 - \$69,999
- 9: \$70,000 - \$79,999
- 10: \$80,000 - \$99,999
- 11: \$100,000 - \$119,999
- 12: \$120,000 - \$149,999
- 13: \$150,000 or more

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# Biography

Bradford Harrison Bishop was born on January 10, 1977 in Presque Isle, Maine. After graduating from Presque Isle High School in 1995, he obtained a B.A. in Media Arts & Design from James Madison University in 1999, an M.A. in Political Science from Fordham University in 2007, and a Ph.D. in Political Science from Duke University in 2013.

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