

The Climate Movement's Impact on Technocratic Policymaking

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NOTE: This draft was prepared for the Climate Pipeline Project Conference. It currently includes the quantitative portion of a paper that will eventually include hand-coded coalitions and lobbying success. The theory and methods are more fully developed in my dissertation chapters on [public pressure campaigns](#) and the [environmental justice movement](#).

Abstract

Social movements play a critical role in advancing landmark statutes that recognize new rights and social values. Likewise, lack of movement pressure is a leading explanation for the failure of policy efforts. Yet, we have little systematic evidence about the impact of social movements on policy. To what extent do movements shape the thousands of policies that governments make every year? I examine how social movements affect policymaking by assessing the climate movement's impact on 20 thousand policy documents from 24 U.S. federal agencies. Leveraging a new dataset of 40 million public comments on these policies, I find that when public comments raise climate or climate justice concerns, these concerns are more likely to be addressed in the final rule. Effect sizes vary across agencies, possibly due to the alignment of climate and climate justice issue frames with agency missions. The magnitude of public pressure also matters. When more groups and individuals raise climate and climate justice concerns, policy texts are more likely to change, even when controlling for overall levels of public attention. These findings suggest that overall levels of public attention and specific public pressure for recognizing scientific and distributive justice claims all systematically affect policymaking. Finally, public comments offer a new lens to assess the rise and impact of the climate justice movement within the broader environmental justice movement.

*I will be grateful for any feedback: DevinJudgeLord@fas.harvard.edu. Slides and the most recent draft are available at <https://judgelord.github.io/research/cj>. This paper has benefited from funding from the National Science Foundation and American Political Science Association.

1 Introduction

The broad climate movement and the more specific climate justice movement aim to advance specific issue frames to reshape how governments make policy. Climate change affects nearly every aspect of life and policy, but many types of policy are inconsistently framed as “climate policy.” A major task for climate activists is thus to persuade government officials to see climate change as relevant to their work (from public health and agriculture policy to finance and trade policy). Likewise, nearly all policies have disparate effects, but climate policy is inconsistently framed as in distributive justice (“climate justice”) terms. Consider two policies made by the U.S. Environmental Protection Agency (EPA) under the authority of the Clean Air Act, one of the main policy tools for U.S. climate policy:

In 2013, the EPA under President Obama published a draft policy (a “proposed rule”) approving the Navajo Nation’s plan to to meet the Regional Haze Requirments of the Clean Air Act (including sulfur dioxide, nitrogen oxides, and particulate matter regulations that aim to limit to hazardous ozone pollution). EPA’s proposed rule mentioned neither “climate change” nor “environmental justice” (concerns about the uneven distribution of environmental harms). In response to 421 public comments citing science showing how rising temperatures would affect ozone formation and raising climate justice concerns, the final rule added nine paragraphs on how EPA was addressing environmental justice concerns but only a brief and dismissive mention of climate change: “climate change is an important issue. . . [but] regulation of greenhouse gases is conducted under separate statutory requirements from regional haze” (EPA 2013).

In 2017, the EPA under President Trump published a similar proposed rule approving of Texas’s plan to meet Regional Haze Requirments. This proposed rule also made no mention of climate change, but it did include a short paragraph on environmental justice concerns. This paragraph only discussed the sulfur dioxide part of the regulations, with no mention of how the policy would affect uneven exposure to pollution related to nitrogen oxides and particulate matter. Again, environmental groups submitted comments citing studies showing how climate change would affect outdoor air pollutant concentrations, especially ozone. While this rule only received 61 comments, this is many times the average level of public attention. This time, however, EPA made no modifications to the environmental justice section and no mention of climate change in the final rule.

These examples illustrate several ways in which the policy process may vary. Decades of research have shown that air pollution is unevenly distributed and that its effects will change with a changing climate (Bernard et al., 2001). Yet, policymakers may or may not see climatic changes or distributive effects as relevant to their particular tasks and regulations.

Many of these tasks are rooted in laws last modified many decades ago that address neither climate change nor environmental justice. Some policymakers and political conditions may be receptive to groups raising climate change or distributive justice concerns, and others may not. This variation in receptivity to scientific and legal claims may have several causes, including policy agendas, institutional cultures, and the scale of public pressure.

When a political leader’s policy agenda is hostile to a cause, they and their deputies may ignore demands. For example, the Obama EPA was responsive to climate and climate justice concerns while the Trump EPA ignored them. However, presidential agendas do not explain everything: despite the Obama administration’s concern for climate change, many policies that could have incorporated climate science did not. Conversely, despite the Trump administration’s draft rule raised environmental justice concerns before commenters demanded it.

With or without landmark legislation, most U.S. climate policy will continue to be made in dozens of federal agencies, some of which have a longer history of making “climate” policy than others. Officials at the EPA are exceptionally well-versed in climate change and environmental justice. The EPA makes a great deal of climate-relevant policy and has an entire office dedicated to environmental justice. How receptive are other agencies that have not historically been tasked with making climate policy?

Despite a growing scholarship on the politics of climate policy (e.g., Grumbach, 2015; Mildemberger, 2020; Stokes, 2020; Hughes and Hoffmann, 2020), we have little systematic data on the extent to which the issues of climate change and climate justice have gained traction across the vast U.S. bureaucracy. How large is a presidential administration’s effect on bureaucratic policymaking? To what extent do government officials respond to pressure to address climate change and environmental justice? To what extent does the scale of public pressure shape whether policymakers engage with or ignore activist demands?

To date, research on the politics of climate policy has focused on policies that are already framed as climate policy. Policy failures are critical to theory development and empirically neglected (Stokes, 2020). A lack of public pressure is a well-known cause of legislative failure (Skocpol, 2013), but few have looked at public pressure in bureaucratic policymaking. We also know that coalitions of businesses and unions have blocked legislative efforts on climate issues (Mildemberger, 2020). These same coalitions may also shape bureaucratic policymaking, but we lack systematic data on who lobbies and who wins in bureaucratic policymaking.

1.1 Technocratic policymaking is the terrain of U.S. climate policy

Whether or not it explicitly addresses climate change, nearly all U.S. federal policy relevant to climate change has been made in the executive branch. If the U.S. Congress passes major climate legislation, it will require a massive amount of agency rulemaking. A Green New Deal, carbon pricing scheme, or any other legislative initiative would undoubtedly task dozens of agencies with writing and implementing rules. Indeed, the specific legal requirements in agency rules often matter more than the statute itself. Alternatively, if legislative gridlock continues, U.S. climate policy will continue to be made as it has for decades: by the executive-branch agencies tasked with interpreting and reinterpreting landmark statutes (Freeman, 2014). For example, in just one of many climate-related executive orders, President Obama ordered 30 agencies, from the Army Corps of Engineers to the Department of Agriculture, to make “changes to policies, programs, and regulations...to manage climate risks”, leading to thousands of pages of new legal requirements.

Agency rulemaking is the primary vehicle by which the executive branch makes policy (Yackee and Yackee, 2009). Lobbying the bureaucracy is thus a major way to affect the content of public policy (Yackee, 2006, 2019) and thus a main avenue of policy advocacy for regulated interests (Gordon and Rashin, 2018; Yackee and Yackee, 2006), activists (Coglianese, 2001; Judge-Lord, 2019), and even legislators (Judge-Lord, Grimmer and Powell, 2018; Ritchie, 2018).

While rulemaking is a major focus of U.S. environmental law scholarship (e.g., Kysar, 2011; Ruhl, 2010), political scientists focused on national climate politics in the United States have focused on electoral politics and legislative policymaking. To the extent that American Politics scholars have answered calls to address the climate crisis (Levin et al., 2012; Javeline, 2014), they have focused on public opinion (Guber, 2013; Mildemberger and Tingley, 2017a; Boussalis and Coan, 2016; Mildemberger and Tingley, 2017b), the emergence of social movements (McAdam, 2017), explaining variation among states and local governments (Hughes, 2012; Stokes, 2020), and explaining the results of lobbying efforts in Congress (Skocpol, 2013; Grumbach, 2015; Brulle, 2018; Ganz and Soule, 2019; Mildemberger, 2020). The politics of federal agency rulemaking has been largely overlooked (Struthers et al., 2021).¹

This paper begins to fill this gap by providing a systematic look across thousands of policies that do and do not address climate change and climate justice. I exploit this variation to assess the extent to which policy documents change (or fail to change) in response to public comments raising climate and climate justice issues. I also assess the effect of the general level of public attention and scale of public pressure to address climate change and climate justice.

¹Notable exceptions include case studies by ?, ?, Cook (2017), and Rios (2020).

Assessing rates of responsiveness across agencies and over time, I provide novel estimates of the extent to which the climate and climate justice movements have gained traction in the policy process and the extent to which government responsiveness varies across institutions and presidential administrations.

In addition to statistical analysis of agency responsiveness to public comments, I offer a descriptive account of the groups that most often advance climate and climate justice policy demands and mobilize public pressure behind these demands. Who is engaging and mobilizing is essential context for any study of the effects of public input. Examining who participates tells us who is empowered by the policy process and who is left out.

I find that most U.S. Federal Agencies rarely addressed climate change and almost never addressed climate justice concerns. From 2005 to 2020, less than 8% of relevant agency rules addressed climate change, and only 2% addressed climate justice, despite growing activist demand. In contrast, nearly half of all public comments received by the 24 in this study mentioned climate change. Among climate activism targeting federal agencies, however, the climate justice movement is small. Only 8% of comments mentioning climate change also mention climate justice or environmental justice. Furthermore, nearly all public comments raising climate justice concerns were mobilized by just five national advocacy groups.

Assessing responsiveness across thousands of draft and final agency rules, I find that raising climate change or climate justice concerns increases the probability that they will be addressed in the final rule. Greater levels of public pressure behind climate advocacy efforts and general public attention both increase the likelihood of that climate change and climate justice will be addressed in final rules. However, policymakers are much more responsive to concerns about climate change than environmental justice or climate justice. Across specifications, low-profile policies are more likely to change in response to public pressure.

These results have implications for policy and advocacy. First, these findings highlight low compliance executive orders instructing agencies to incorporate climate and environmental justice into agency decisions. Baseline levels of attention to climate change and climate justice at most agencies are extremely low. Rates of responsiveness to comments raising these concerns are also low. For advocates, these results highlight opportunities to shape policymaking both by providing technical information and by mobilizing political pressure.

2 Theory

My analysis of the politics of climate policymaking focuses on organized groups and the information they provide to policymakers.

2.1 Interest Groups

Organized groups are the key actors in American politics, especially technocratic policymaking. As Hacker et al. (2021) observe,

“[The United States’] institutional terrain advantages political actors with the capacity to work across multiple venues, over extended periods, and in a political environment where coordinated government action is difficult, and strategies of evasion and exit from regulatory constraints are often successful. These capacities are characteristic of organized groups, not individual voters.”

While scholars have made significant progress in studying the determinants and evolution of public opinion on climate change (Mildenberger and Tingley, 2017a; Boussalis and Coan, 2016), to study particular policy fights, organized groups are the key actors that shape policy proposals, mobilize support, and pressure policymakers.

2.2 Technical Information

Dominant theories of bureaucratic policymaking focus on how agencies learn about policy problems and solutions (Kerwin and Furlong, 2011). Leading formal models are information-based models where sophisticated lobbying groups affect policy by revealing information to the agency (Gailmard and Patty, 2017; Libgober, 2018), and empirical studies support the conclusion that information is the currency of lobbying in rulemaking (Yackee, 2012; Cook, 2017; Gordon and Rashin, 2018; Walters, 2019).

Agency rulemaking is an especially technocratic and legalistic form of policymaking that explicitly privileges scientific and legal facts as the appropriate basis for decisions. Procedural requirements to consider relevant information create incentives for lobbying groups to overwhelm agencies with complex technical information, making rulemaking obscure to all but the most well-informed insiders (Wagner, 2010). Influence in rulemaking generally requires resources and technical expertise (Yackee, 2019).

One result of the power of technical information is that technocratic policymaking is dominated by sophisticated and well-resourced interest groups capable of providing new technical or legal information. Empirical scholarship finds that economic elites and business groups dominate American politics in general (Jacobs and Skocpol, 2005; Soss, Hacker and Mettler, 2007; Hertel-Fernandez, 2019; Hacker, 2003; Gilens and Page, 2014) and rulemaking in particular (Seifter, 2016; Crow, Albright and Koebele, 2015; Wagner, Barnes and Peters, 2011; West, 2009; Yackee and Yackee, 2006; Yackee, 2006; Golden, 1998; Haeder and Yackee, 2015; Cook, 2017; Libgober and Carpenter, 2018; Carpenter et al., 2021).

A second result is that bureaucratic policymakers tend to be most receptive to claims rooted in particular forms of science that fit with their professional training and institutional cultures. This means that some agencies are likely more receptive to climate science than others. It also means that claims about climate science and climate change as an issue frame may be more likely to be adopted than moral claims about who deserves government support and protection, like “climate justice” claims.

2.3 Political Information

Existing information-based theories of bureaucratic policymaking have little room for social movements and political pressure. While social movement organizations do engage in fights over technical reports and scientific studies, the information that activists provide is often more overtly political. Nelson and Yackee (2012) identify political information as a potentially influential result of groups expanding their lobbying coalition. While they focus on mobilizing experts, they describe a dynamic that can be extended to mobilizing public pressure as well:

coalition lobbying can generate new information and new actors—beyond simply the ‘usual suspects’ —relevant to policy decisionmakers. (p. 343)

Mobilizing broader public support behind a call to account for climate science provides no additional technical information. It does, however, inform policymakers about the scale of public attention and mobilization. For groups that aim to convince policymakers to consider climate change, public pressure may be a political resource, potentially allowing groups to change policymakers’ perceptions of their political environment and the political consequences of their decisions.

2.3.1 Information About a Policy’s Disparate Effects

Mobilizing new groups and people to comment on climate justice implications of policy may yield new information about a policy’s disparate effects. Information about a policy’s disparate effects is an additional form of political information. Like levels of public attention and pressure, the normative appeal of distributive justice claims can be a political resource, potentially affecting policymakers’ perceptions of which policies achieve their mission. For example, climate justice claims may assert new groups deserving of protection. To the extent that these claims are persuasive in re-framing analysis about who policy should aim to protect, they may shift policymakers’ perceptions of their desired policy.

The politics and outcomes of policymaking depend on how the relevant groups are defined (Lowi, 1964). While specific *data* on disparate impacts of policy may require expertise (Ganz

and Soule, 2019), anyone can highlight a community of concern or potential distributive effects of a policy. Identifying communities of concern is a political statement that does not require technical expertise. Just as Nelson and Yackee (2012) found regarding mobilizing diverse experts, mobilizing diverse communities affected by a policy may introduce new claims from new actors about how the communities that a policy may benefit or harm should be constructed.

Informing policymakers about how a particular set of stakeholders will be affected can be a lobbying tactic. Distributive justice claims simultaneously assert that a particular group deserves specific attention and demand that the policymaker account for how that group may be impacted, both of which may require revisions to the policy. Likewise, an organization may tell policymakers what a key constituency or affected groups think about the proposed policy—for example, whether they support or oppose the policy. Instead of bolstering *scientific* claims, such comments that focus on a policy’s disparate impacts bolster *political* claims about who counts and even *who exists* as a distinct, potentially affected group that deserves policymakers’ attention.

The political construction of policy-relevant groups through the policy process has long interested administrative law scholars. Gellhorn (1972) argues that “individuals and groups willing to assist administrative agencies in identifying interests deserving protection” (p. 403) improve the policy process. Seifter (2016) argues that policymakers’ beliefs about who is lobbying them and who those groups represent ought to be (and likely is) key to how they respond.

The power of groups to affect policy depends on their recognition by formal and informal institutions. All organizations systematically privilege some policy problems, solutions, and types of information over others.

All forms of political organization have a bias in favor of the exploitation of some kinds of conflict and the suppression of others because organization is the mobilization of bias. Some issues are organized into politics, while others are organized out. (Schattschneider, 1975, p. 71)

Public comment periods in agency rulemaking are formally more “identity neutral” than policy processes with procedural rights reserved for certain interests (Feinstein, 2021). This means that the political construction of relevant groups depends on who participates and the identities they mobilize or claim to represent. As Yackee (2019) and others note, the information costs mean that individuals rarely participate (on their own, at least). Instead, groups claim to represent various constituencies. “Because the costs of individualized participation in policy decision making are often excessive, informal representatives are prevalent

as a form of participation in agency decisions” (Rossi, 1997, p. 194). Who participates in policymaking matters because it shapes who government serves and protects.

Bureaucratic policymaking in the United States is dominated by cost-benefit analysis, which requires defining groups that are benefited or harmed by a policy and may even weigh or prioritize benefits or costs to certain groups. Agencies have many reasons to consider the distributional effects of policy and often do. For example, President Biden issued a memorandum instructing the Director of the Office of Management and Budget to propose recommendations for “procedures that take into account the distributional consequences of regulations.” Thus, comments raising distributive concerns provide potentially influential political information.

This distributive information raises claims of distributive justice. Public comment periods are celebrated as “a crucial way to ensure that agency decisions are legitimate, accountable, and just” (Bierschbach and Bibas, 2012, p. 20). “Public participation can force agencies to rethink initial inclinations” (Seifter, 2016, p. 1329)—such as which social groups are relevant or deserve special attention. Courts purportedly review policy decisions made through rule-making with a particular eye toward whether they foster “fairness and deliberation” (*United States v. Mead Corp.*, 2001) and occasionally note the volume or diversity of participants in the public comment process (e.g., *Vermont Yankee v. NRDC*, 1978). While there is mixed empirical evidence about the importance of policy processes for judicial review, the number of public comments received on a draft policy is associated with courts letting the final agency policy stand (Judge-Lord, 2016). Despite the dominance of business groups and seeming lack of success for public pressure campaigns in general, claims of distributive justice may have a unique role in bureaucratic policymaking.

2.3.2 Public Pressure as a Political Resource

The chances that an agency will address climate science or distributive justice claims may be affected by other political factors, including the overall levels of public attention or public pressure. As theorized in (Judge-Lord, 2021*b*), the number of supporters may matter because it indicates support among relevant communities or the broader public. Again, instead of bolstering *scientific* claims themselves, perceived levels of public support bolster *political* reasons for including climate science in policy decisions. An organization’s ability to expand the scope of conflict by mobilizing a large number of people can be a valuable political resource (Schattschneider, 1975).

Because many politically active groups are “memberless” or run by professionals who lobby with little input from their members (Baumgartner and Leech, 2001; Skocpol, 2003; Schlozman, Verba and Brady, 2012), evidence of an actual constituency is valuable political

information. Petition signatures and form letters are among the only ways a pressure group can demonstrate an engaged and issue-specific constituency on whose behalf they claim to advocate. While lobbying disclosure requirements could provide other information about how well groups represent the constituencies they claim to represent (Seifter, 2016), letter-writing campaigns are one of the only strategies currently available to demonstrate issue-specific congruence between the positions of groups and the people they claim to represent.

Finally, expanding the scope of conflict by mobilizing public attention to rulemaking may shift policymakers’ attention away from the technical information provided by the “usual suspects” and toward the distributive effects of policy. The “fire alarm” role that interest groups play in the policy process (McCubbins and Schwartz, 1984) may have different effects when sounding the alarm also involves “going public.”

3 Data, Research Design, and Descriptive Results

To assess the extent to which technical and distributive justice claims related to climate change have gained traction in the policy process, I conduct parallel analyses of two subsets of data. First, I identify all U.S. federal agencies that published one or more final rules that addressed climate change and collect all draft and final policies that each agency published between 2005 and 2020. I then collect all public comments submitted on these draft policies. Second, I identify a narrower subset of agencies that published one or more federal rules that addressed “climate justice” (including policies that mentioned both “climate change” and “environmental justice”).

This approach yields 21,190 policy documents (7,819 proposed and final rule pairs) from 24 agencies. I collected all 39,392,957 public comments filed on these draft policies, many of which are duplicates, more akin to petition signatures (more on this below).

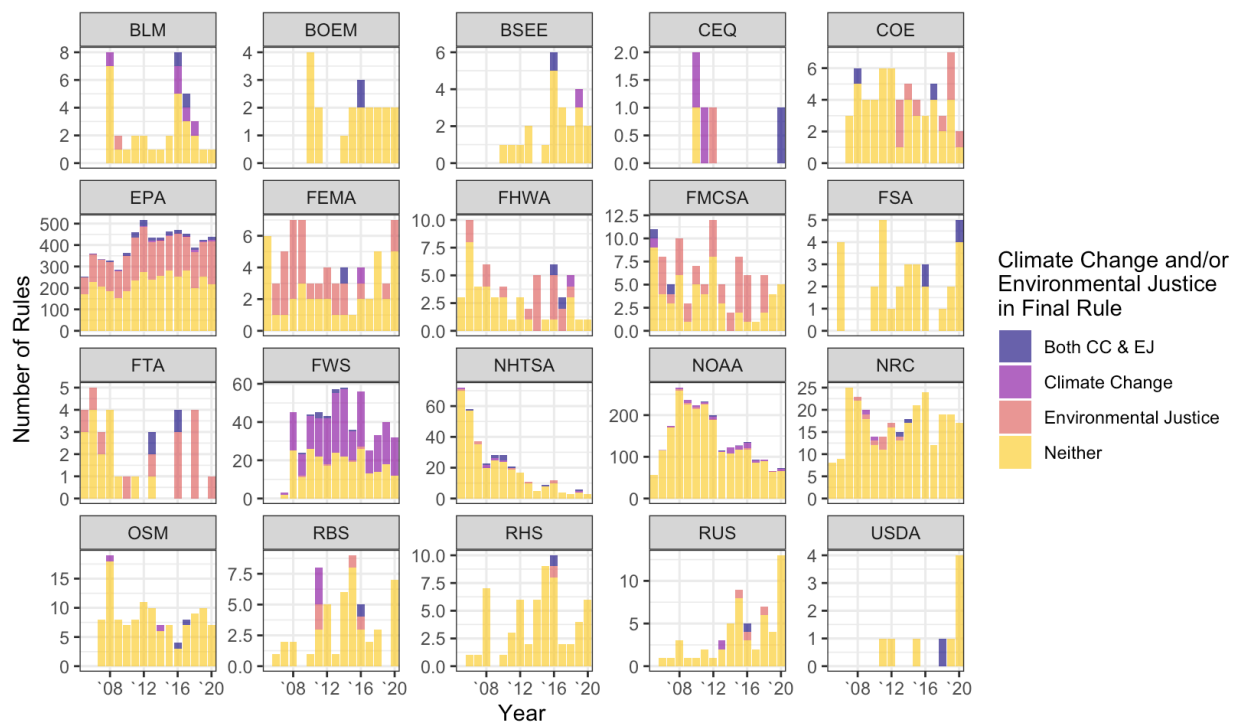
This dataset allows several types of analysis. First, I descriptively compare the portion of policies that address climate change and climate justice across agencies and presidential administrations. Second, I select proposed and final rule pairs where the draft rule did not address climate change (or climate justice) and estimate the probability that the final rule does when comments do and do not raise climate or climate justice concerns. Finally [and not yet in this draft], I hand-code public comments, grouping them into coalitions and assessing the extent to which each coalition got what they wanted in the change between draft and final rule.

3.1 Attention to climate change and climate justice across institutions and time

Figure 1 shows the extent to which final rules published at various federal agencies addressed climate change, environmental justice, or both (i.e., climate justice). As one of the few agencies with an office dedicated to environmental justice, the Environmental Protection Agency (EPA) has an exceptionally high rate of addressing environmental justice, but surprisingly few policies address climate change. In contrast, the Fish and Wildlife Service (FWS) has published an exceptionally large share of policies that mention climate change but almost never includes an analysis of environmental justice. Still, the modal policy at both of these agencies mentions neither climate change nor environmental justice. Most other agencies that make significant volumes of policy rarely address either.

Surprisingly, Figure 1 does not show dramatic differences across presidential administrations. The Nuclear Regulatory Commission (NRC) appears to have completely ceased what little attention it did pay to climate and justice issues when Trump took office, but many other agencies continued a pattern of occasionally but rarely attending to climate change and environmental justice.

Figure 1: Final Agency Rules that Did and Did Not Address Climate Change and/or Climate Justice



3.2 Measuring Coalitions, Public Pressure, and Political Information Using Text Reuse

This section describes methods developed in Judge-Lord (2021*c*) to identify public pressure campaigns and measure the kinds of political information they create. These measures capture similar statistics to questions posed by Verba and Nie (1987, p. 9): “How much participation is there, what kind is it, and from what segments of society does it come?” Specifically, I assess the extent to which public comments are mobilized by pressure campaigns, which organizations are behind these campaigns, and which campaigns are more successful in mobilizing.

The primary unit of analysis is a lobbying coalition—a group of organizations advocating for the same policy changes in their comments on a draft rule. Advocacy organizations work together on campaigns. For example, Save our Environment submitted sophisticated comments and collected signatures from hundreds of thousands of people on several rulemaking dockets. Save our Environment is a small nonprofit with a simple WordPress website almost entirely dedicated to mobilizing public comments. It is run by The Partnership Project, a coalition of 20 of the largest environmental advocacy organizations in the United States, including the Sierra Club, Natural Resources Defense Council, Greenpeace, and the World Wildlife Fund, with the aim of “harnessing the power of the internet to increase public awareness and activism on today’s most important environmental issues” (Saveourevironment.org, 2021). Several Partnership Project members, including the Sierra Club, EarthJustice, and NRDC, also submitted technical comments and mobilized hundreds of thousands of their supporters to comment separately on the same rules. These lobbying and mobilizing activities are not independent campaigns. These organizations and the people they mobilize are a coalition.

To mobilize broader support, advocacy organizations often engage smaller organizations, which, in turn, mobilize their own members and supporters, often with logistical support and funding from the larger national organization. For example, for the same campaign where the Gulf Restoration Network mobilized hundreds of restaurants that serve sustainable seafood, one of their larger coalition partners, the Pew Charitable Trusts, mobilized thousands of individuals, including members of the New York Underwater Photography Society. These smaller organizations did not identify themselves as part of Pew’s campaign, but their letters used almost identical language.

Identifying which people and organizations belong to which coalition is thus a crucial first task for any study of public pressure campaigns. To identify whether a pressure campaign mobilizes a given comment, I use several strategies. I first use textual similarity to identify clusters of similar comments, reflecting formal and informal coalitions. Comments with

identical text indicate a coordinated campaign.

To link individual comments and public pressure campaigns to the more sophisticated lobbying efforts that they support (if any), I identify the lobbying coalition(s) (if any) to which each comment belongs. Some individual commenters and organizations are unaffiliated with a broader lobbying coalition, but, as I show below, most people and organizations lobby in broader coalitions.

Importantly, even campaigns that achieve very low public response rates appear in these data. Because campaigns aim to collect many thousands of comments, it is implausible that even the most unpopular position would achieve no supportive responses. For example, Potter (2017) found Poultry Producers averaging only 319 comments per campaign. While this is far from the Sierra Club’s average of 17,325 comments per campaign, it is also far from zero. (These numbers are from Potter’s sample of EPA rules.)

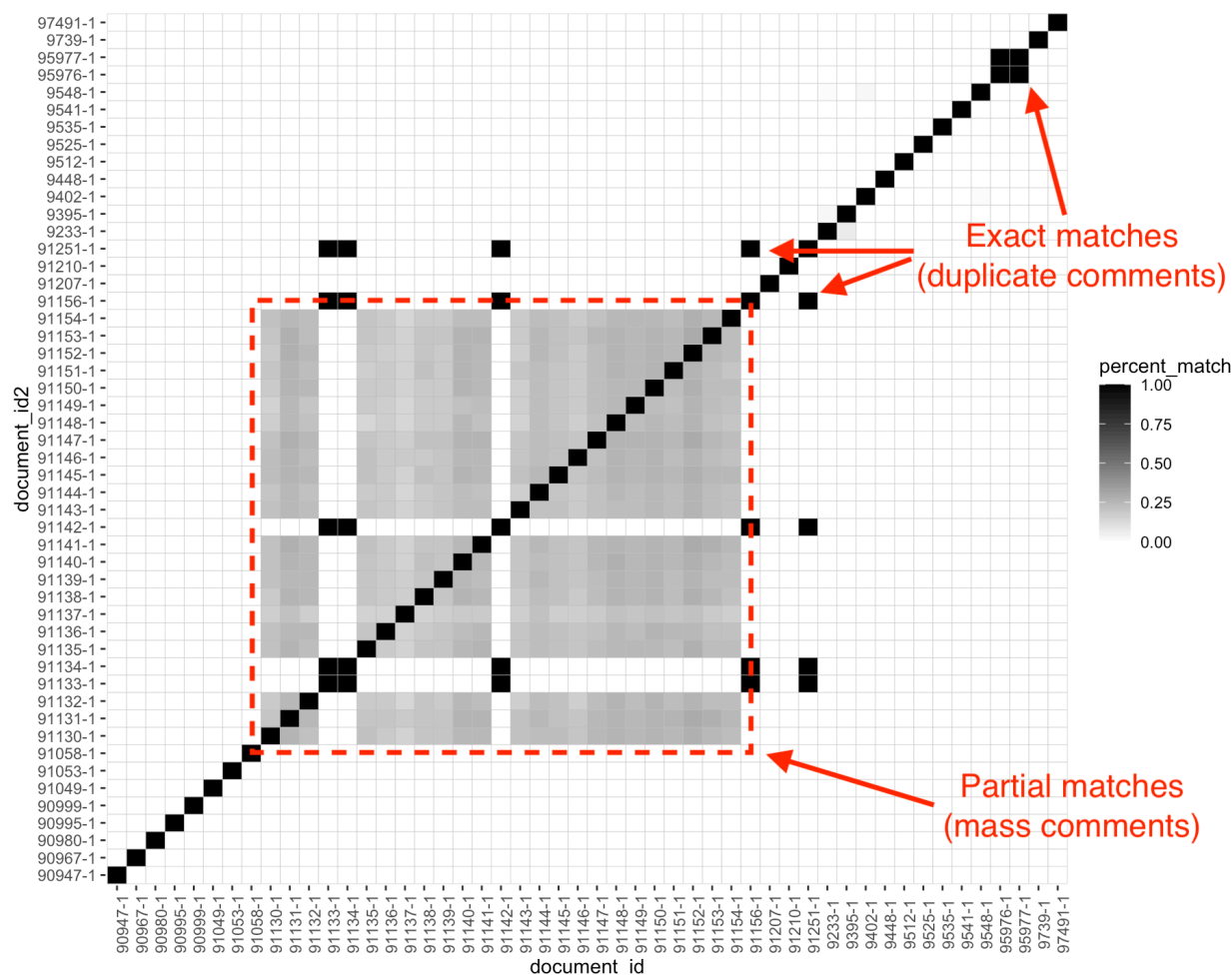
For each comment on a rulemaking docket, I identify the percent of words it shares with other comments using a 10-word (or “10-gram”) moving window function, looping over each possible pair of texts to identify matches.² When actors sign onto the same comment, it is clear that they are lobbying together. However, various businesses, advocacy groups, and citizens often comment separately, even when they are aligned. Text-reuse (using the same ten-word phrases) captures this alignment. When individuals use identical wording, I interpret that to mean they’re endorsing the same policy position as part of a lobbying coalition.

Figure 2 shows the percent of shared text for a sample of 50 comments on the same rule. Comments are arranged by the document identifier assigned by regulations.gov on both axes. The black on the diagonal indicates that each document has a perfect overlap with itself. Black squares off the diagonal indicate additional pairs of identical documents. For example, 100 percent of the words from Comment 95976 are part of some tengram that also appears in 95977 because the exact same comment was uploaded twice. The cluster of grey tiles indicates a coalition of commenters using some identical text. Comments 91130 through 91156 are all partial or exact matches. All are part of a mass comment campaign. The percent of identical text is lower than many mass-comment campaigns because these are hand-written comments, but the n-gram method still picks up overlap in the OCR’d text in the header and footer. Tengrams that appear in 100 or more comments indicate a mass comment campaign. Some agencies use similar “de-duping” software (Rinfret et al., 2021) and only provide a representative sample comment. In these cases, my linking method assumes that the example comment is representative, and I link these comments to others

²For more about n-gram window functions and comparisons with related partial matching methods such as the Smith-Waterman algorithm, see Casas, Denny and Wilkerson (2019) and Judge-Lord (2017).

based on the text of the sample comment provided.

Figure 2: Example: Identifying Coalitions by the Percent of Matching Text in a Sample of Public Comments



Where a new presidential administration solicited comments on a proposed rule tied to a docket number that a previous administration also used to solicit comments on a different previous rule, I count these as separate rulemaking dockets. I do so because the second policy is usually reversing or going in the opposite direction as the policy on which the previous administration solicited comments. Many of the same organizations comment but with the opposite positions; support becomes opposition and vice versa.

3.3 Attention to climate change and climate justice in public comments

In sharp contrast to the proportion of policies addressing climate change, an astounding 45% (17,857,018) of all public comments received by these 24 agencies mention climate change. In part, this reflects the interests of the small number of interest groups that organize public

Table 1: Organizations Mobilizing the Most Comments Raising Climate Change

Organization	Dockets	Unique Climate Comments	Total Climate Comments
Center For Biological Diversity	319	32,290	2,088,142
NRDC	166	249	948,490
Sierra Club	144	525	847,164
CREDO	27	42	473,117
Earthjustice	92	154	447,982
Friends Of The Earth	45	53	360,973
Humane Society	63	92	329,160
World Wildlife Fund	29	120	272,012
Greenpeace	22	65	253,473
Endangered Species Coalition	7	10	218,696
Mandate Media	1	1	186,544
AUDUBON	83	165	159,051
Defenders Of Wildlife	81	185	145,037
Wildlife Conservation Society	17	21	133,680
Park County Environmental Council	1	1	127,014
Heal The Bay	1	2	126,052
Food & Water Watch	10	11	100,155
Food And Water Watch	1	10	99,421
350.ORG	8	11	94,483
OCEANA	74	113	90,047

pressure campaigns (see Judge-Lord (2021c)). However, this sample of comments mentioning climate change also includes 421,880 unique comments (comments that did not repeat 10-word phrases with other comments).

Table 1 shows the top mobilizers of public comments raising climate change. The “Dockets” column indicates the number of rulemakings on which each group commented. The “Unique Climate Comments” column shows the number of comments submitted or explicitly mobilized by each organization that do not copy text from other comments. The “Total Climate Comments” column shows the total number of comments, including duplicates. The Center for Biological Diversity, a national nonprofit advocacy organization, raised climate change on hundreds of rulemaking dockets and mobilized thousands of supporters to comment, both independently and through petition-like form-letter campaigns.

Public comments raising concerns about climate change rarely discuss environmental justice. Only 8% of all comments mentioning climate change (3,248,697) and less than 1% of

unique comments mentioning climate change (2,138) also mention environmental justice or climate justice.

As noted in Judge-Lord (2021*a*), the vast majority of public comments raising environmental justice concerns were mobilized by national environmental groups, not from frontline community groups. Likely because of this, mass comments raising EJ concerns also raise climate change. 82% of all comments raising EJ also mention climate change. However, unique (non-mass) comments show a different pattern: only 14% of unique comments that raise EJ also mention climate change. This difference reflects differences in capacities and interests between local EJ groups and national environmental organizations: national organizations have the resources and capacity to mobilize pressure campaigns while local EJ groups do not. National environmental groups are also much more likely to discuss climate change than local groups.

Table 2 shows the top mobilizers of public comments raising climate justice issues (including “climate change” + “environmental justice”). Despite the small portion of comments mentioning climate change that these comments represent, many of these organizations are the same as the top climate mobilizers seen in 1. Only nine organizations, all large national advocacy organizations, are responsible for all public pressure campaigns raising climate justice. CREDO Action, a generic progressive advocacy organization, mobilized the most comments raising climate justice issues. The Center for Biological Diversity, which primarily focuses on endangered species, is the organization that raised climate justice concerns on the most rulemaking dockets. Indeed, a large number of these comments are on draft rules on endangered species published by the Fish and Wildlife Service. While the ecological protections through Endangered Species Act listings often have disparate effects, these are not the policies typically highlighted by frontline environmental justice and climate justice communities.

Despite being dwarfed by large national advocacy organizations, local environmental justice groups are active participants in agency rulemaking (Judge-Lord, 2021*a*). Assessing public input regarding climate change and climate justice, however, frontline groups are distinctly absent. Of the top 20 organizations most frequently raising climate justice issues (Table 2, only the Southern Environmental Law Center has a sub-national environmental justice focus. The Sierra Club, EarthJustice, and others have program arms and often partner with frontline community groups on campaigns. The American Petroleum Institute (the main industry association for the oil and gas industry) and Edison Electric Institute (a major industry association for electric utilities) appear in Table 2 because their long and sophisticated technical comments opposing climate policy occasionally quote policy texts that mention climate change and environmental justice.

Table 2: Organizations Mobilizing the Most Comments Raising Climate Justice Concerns

Organization	Dockets	Unique Climate Justice Comments	Total Climate Justice Comments
CREDO	2	2	221,557
Sierra Club	10	29	149,621
Earthjustice	8	9	144,559
NRDC	5	5	99,813
PEW	3	3	63,771
Defenders Of Wildlife	3	3	14,700
Democracy For America	1	1	4,426
Center For Biological Diversity	30	33	150
Interfaith	1	1	132
Environmental Defense Fund	2	26	26
Center For Food Safety	3	5	5
American Petroleum Institute	2	4	4
Friends Of The Earth	3	3	3
Southern Environmental Law Center	3	3	3
California Air Resources Board	2	3	3
Consumer Federation Of America	2	2	3
Edison Electric Institute	2	3	3
Oxfam America	2	3	3
American Lung Association	2	2	2
Humane Society	2	2	2

3.3.1 Astroturf

Astroturf campaigns mentioning climate change were rare. None of the top 50 organizations that mobilized comments on behalf of carbon-intensive industry, and only a few of the top 100 mobilizing organizations opposed climate policy. The largest campaign opposing climate policy to use the phrase “climate change” was organized by Energy Citizens, a front group for the American Petroleum Institute. Energy Citizens mobilized only seven thousand comments, a relatively small number compared to campaigns sponsored by public interest groups that often mobilized hundreds of thousands of comments (see Judge-Lord (2021*c*) for more on Energy Citizens advocacy tactics and why public interest campaigns often mobilize more people).

The lack of astroturf in these data has at least two causes. First, groups opposing climate policy are less likely to use the “climate change” issue frame. Indeed, my research design aims to capture advocates of policymaking with a climate change or climate justice frame. It is unlikely to capture campaigns opposing climate policy. Second, astroturf campaigns account for a very small portion of public comments in federal agency rulemaking (Judge-Lord, 2021*c*).

3.4 Comments on draft rules that did and did not address climate

The statistical results in the following section leverage variation in whether final rules mention climate change or climate justice. Specifically, I select draft and final rule pairs where the draft rule did not address climate change (or climate justice) and compare cases where the final rule did or did not. Figures 3 and 4 show draft and final rule pairs over time, faceted by whether climate (or climate justice) is addressed in the final but not the draft (the top row), in both the draft and the final (the middle row), or in neither the draft nor the final (the bottom row). The statistical analyses compare cases in the top and bottom rows to assess whether groups raising climate (or climate justice) issues or the number of public comments makes agencies more likely to add responsive language to the final rule.

4 Results: Changes in How Policy Documents Address Distributive Justice

4.1 Are final rules more likely to address climate change or climate justice after comments do so?

Where climate change or climate justice is not addressed in the draft rule, a higher percent of rules add climate justice language when comments raise climate justice concerns. Descrip-

Figure 3: Agency Rules that Did and Did Not Address Climate Change in Their Draft and Final Form

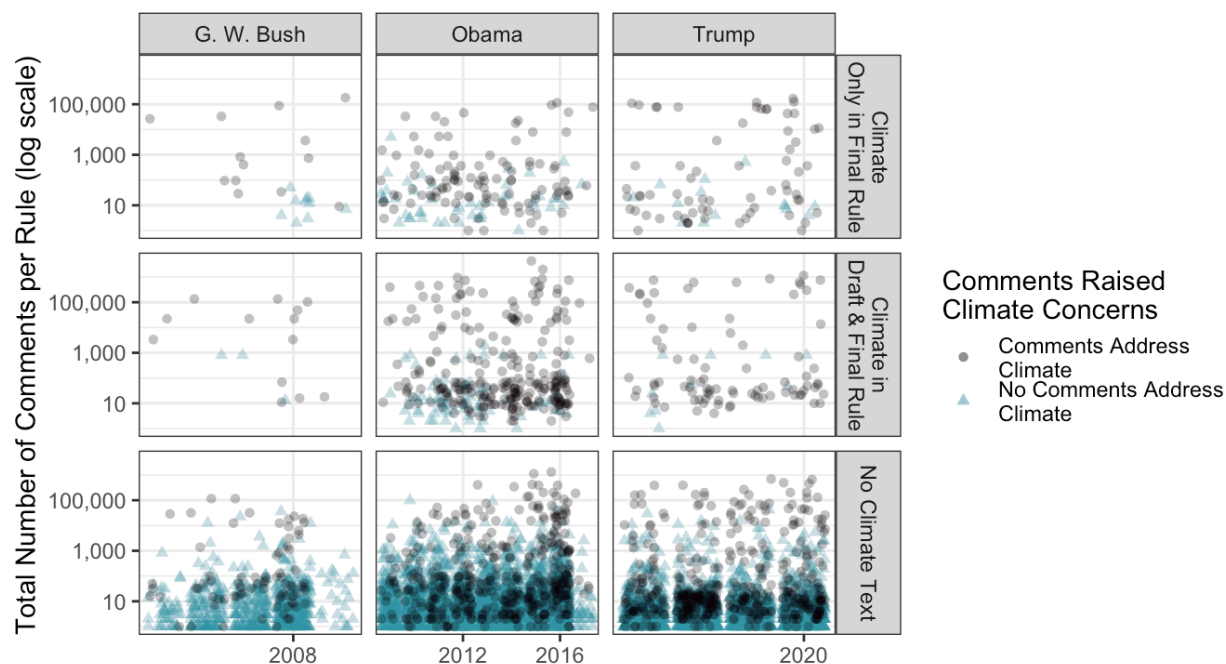
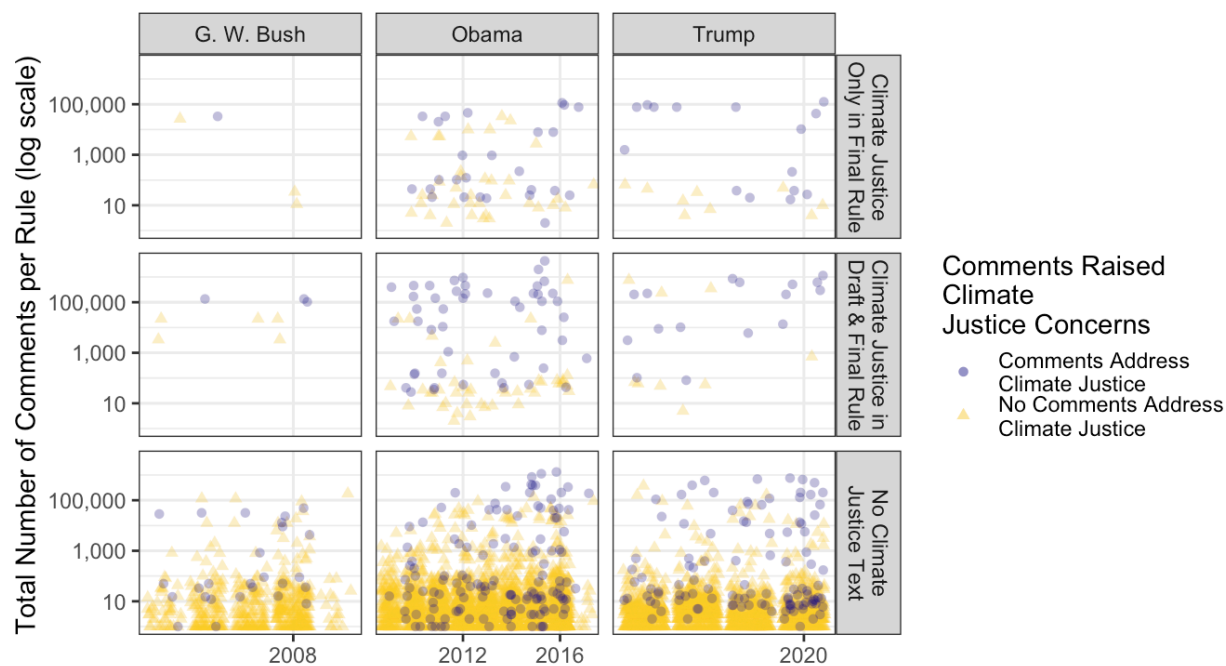


Figure 4: Agency Rules that Did and Did Not Address Climate Justice in Their Draft and Final Form



tively, there is a large difference in the rate of addressing climate change between rules where commenters did (17 percent) and did not raise climate change (1 percent). There is a similar difference in the rate of addressing climate justice between rules where commenters did (14 percent) and did not raise climate or climate justice (1 percent). However, in most cases (86 percent), agencies did not respond at all when commenters raised climate justice concerns.

The Forest Service and Fish and Wildlife Service were the only agencies to ultimately address climate change in the majority of their policies. Most other agencies also added climate justice at a higher rate when comments raised climate justice concerns; indeed, most agencies almost never added mentions of climate change or climate justice when comments did not raise climate justice concerns.

To account for differences across presidents, agencies, and the number of comments, I estimate logit regressions. For models 1 and 2 in Table ??, the outcome is whether the agency added climate change to the final rule. The predictors are whether comments raised climate justice concerns, the number of unique (non-form letter) comments addressing climate justice, the total number of comments (including form letters), and the interaction between the total number of comments and whether any comments raised climate justice concerns. Models 3 and 4 are the same as models 1 and 2, except that the predictors relate to comments addressing climate justice, and the outcome is whether the policy text addressed climate justice. All models include fixed effects for the presidential administration and errors clustered by president. Models 2 and 4 also include fixed effects for each agency. Thus, estimates in Models 1 and 3 include variation *across* agencies, whereas estimates in models 2 and 4 only rely on variation *within* agencies. All estimates rely on variation *within* each presidential administration. All predicted probabilities shown below include agency fixed effects, models 2 and 4.

4.1.1 The Predicted Probability of Added Text

As logit coefficients are not easily interpretable, Figures 5, 6, and 8 show the predicted probability of a final rule addressing climate change/justice when the draft rule did not.

By President Controlling for average rates of policy change per agency and the number of comments, Figure 5 shows a large increase in the probability of policy change when comments raise climate justice concerns. When comments raise distributive justice concerns, they are more likely to be addressed in the final policy. Rates of adding climate justice language decrease in the Trump Administration, but differences between presidents are small compared to the difference between rules that did and did not receive climate justice comments. Other variables are held at their modal values: the EPA, zero additional climate justice comments,

	1	2	3	4
Dependent Variable	Climate Change Text Added	Climate Change Text Added	Climate Justice Text Added	Climate Justice Text Added
CC Comment	3.639*** (0.292)	3.138*** (0.372)		
CJ Comment			3.147*** (0.194)	3.180*** (0.038)
Log(Unique CC Comments+1)	0.604* (0.258)	0.526+ (0.287)		
Log(Unique CJ Comments+1)			0.457*** (0.046)	0.323** (0.117)
Log(Comments+1)	0.336*** (0.021)	0.351*** (0.090)	0.375*** (0.022)	0.441*** (0.022)
CC Comment * Log(Comments+1)	-0.410*** (0.102)	-0.415** (0.150)		
CJ Comment * Log(Comments+1)			-0.301*** (0.044)	-0.325*** (0.037)
Num.Obs.	13111	7680	7350	7245
AIC	1836.9	1627.5	787.8	765.1
BIC	1889.2	1856.7	836.1	889.1
Log.Lik.	-911.429	-780.733	-386.899	-364.556
Std. Errors	Clustered (president)	Two-way (president & agency)	Clustered (president)	Two-way (president & agency)
FE: agency		X		X
FE: president	X	X	X	X

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

and one comment total.³

By Total Number of Comments Figure 6 shows the probability that an agency will add climate justice language given different total numbers of comments. At low numbers of total comments (i.e., low levels of public attention), a single comment raising climate change or climate justice is a strong predictor that language mentioning climate change or climate justice will be added to the final rule. For rules with less than ten comments (most rules), one comment mentioning climate justice is associated with a 10 percent increase in the probability that climate justice will be addressed in the final rule. The probability that an agency will add climate change or climate justice language is still below 80 percent—even when comments raise climate justice concerns, agencies tend not to address them.

As the number of comments increases, the probability that a rule will add text addressing climate justice increases. Policy change is more likely when there is more public attention to a policy process. However, for both climate change and climate justice, the effect of public attention is limited to cases where commentators are not raising these concerns. Put differently, there is a negative interaction between the number of comments and climate justice comments—the more comments, the smaller the relationship between comments raising climate justice and agencies addressing climate justice in the rule. In the small portion (less than one percent) of highly salient rules with 1,000 or more comments, the presence of comments raising climate or climate justice concerns no longer has a statistically significant relationship with agencies adding climate justice to the text. With or without climate justice comments, these rules have about the same probability of change as those with just one climate justice comment, between 10 and 20 percent. The total number of comments (i.e., the scale of public attention) matters regardless of whether these comments explicitly raise climate justice concerns. However, as shown in Figure 4, few rules with 10,000 or more comments do not have at least one comment mentioning climate justice, so we are highly uncertain about estimates of the impact of climate justice comments with high levels of public attention. We can be much more confident about the relationship between comments raising climate justice concerns and rule change at lower, more typical levels of public attention.

The probability of “climate change” or “climate justice” appearing in the final rule also increases with the number of unique comments mentioning “climate change” or “climate justice” in models 2, 3, and 4. The more comments raising climate change or climate justice, the more likely policymakers are to engage with and use this language.

³All predicted probability plots below also show probabilities at the modal values for other variables: President Obama, the EPA, zero additional climate justice comments, and the median number of total comments (one comment) unless otherwise specified.

Figure 5: Probability that "Climate Change/Justice" is Added Between Draft and Final Rules by President

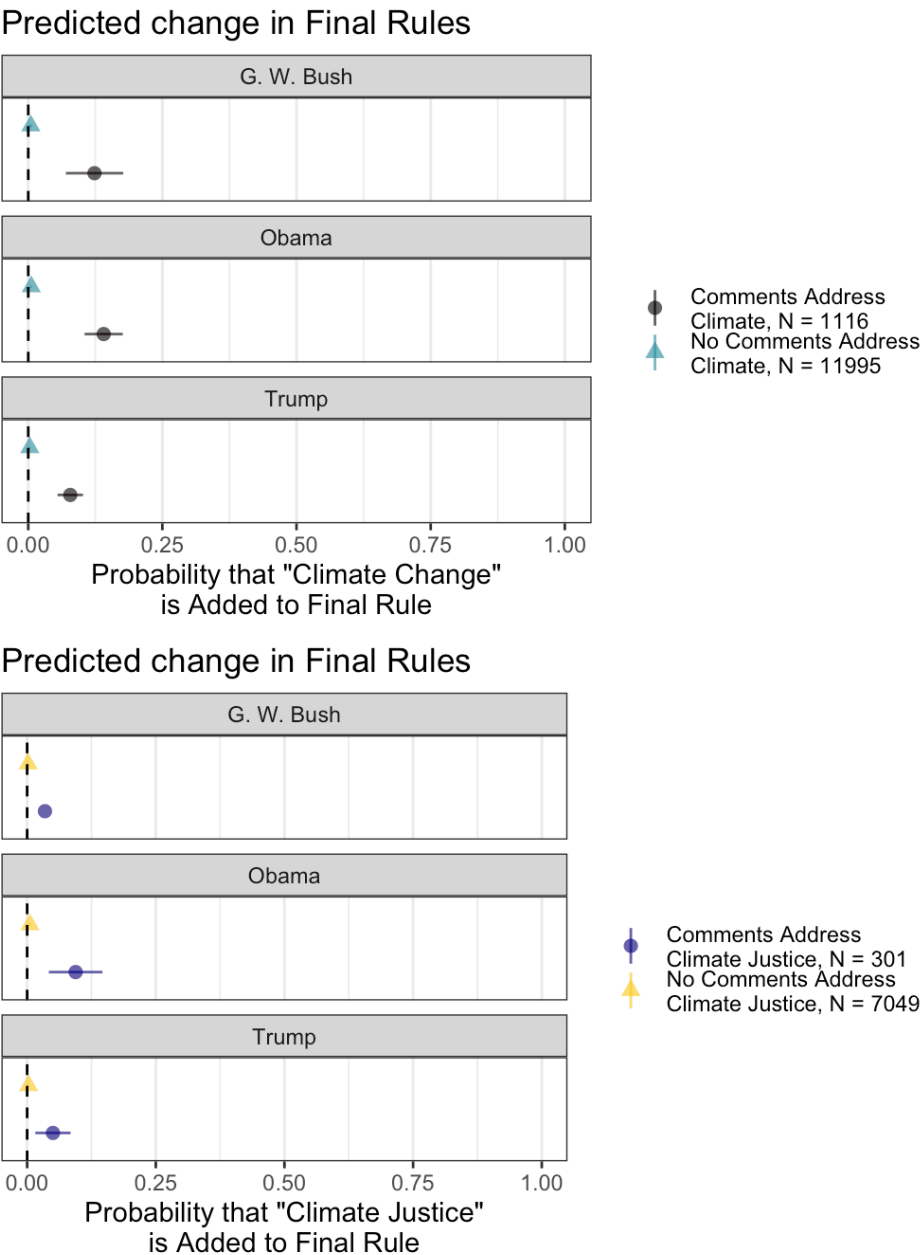
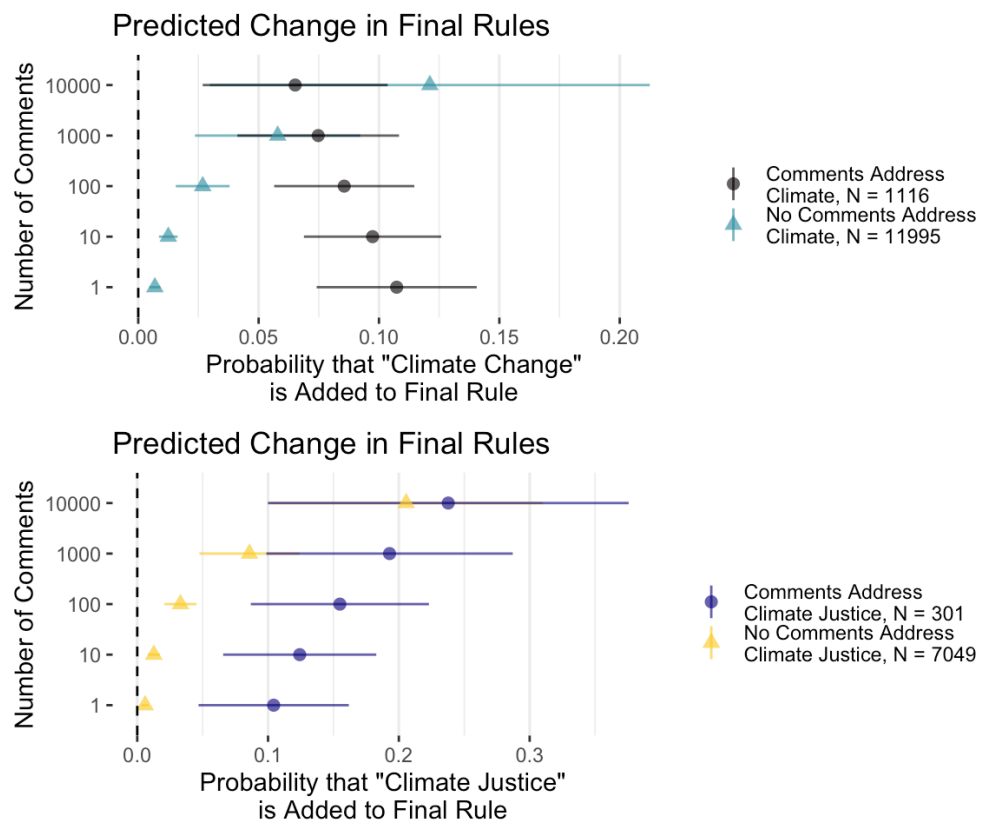


Figure 6: Probability That Climate Change/Justice is Added Between Draft and Final Rules by Number of Comments



By Number of Comments Raising Climate Concerns Figure 7 shows the probability that an agency will add climate justice language given the number of comments explicitly raising either climate change or climate justice. Controlling for the total number of comments (public attention or rule salience), more comments specifically raising climate change or climate justice concerns greatly increase the probability that a final rule will address climate change or climate justice. Given that many pressure campaigns mobilize over 1000 people, the difference between a rule with the modal number of comments (one) and one with a pressure campaign mobilizing 1000 people is an increase of 65% (from approximately 10 percent response rate with one comment to 75 percent with 1000 comments).

Figure 7: Probability That Climate Change/Justice is Added Between Draft and Final Rules by Number of Comments raising Climate or climate justice Concerns

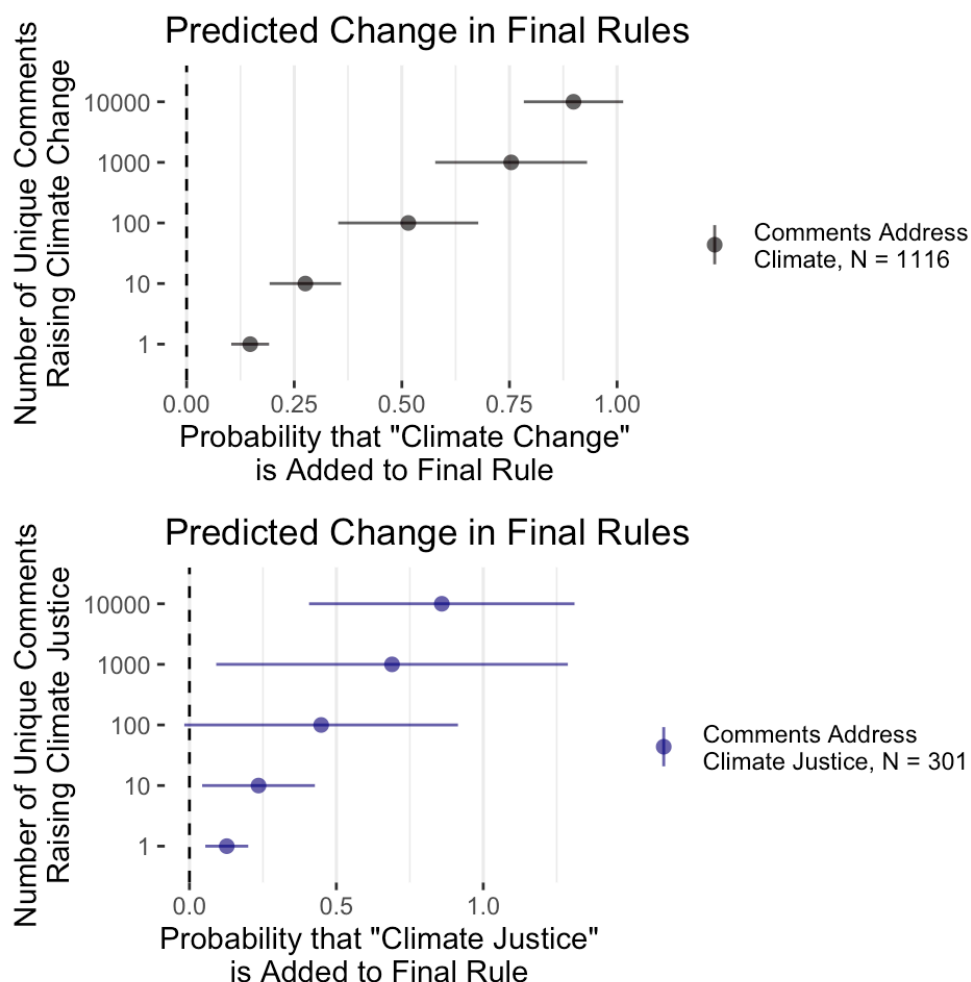


Figure 8 shows estimated variation in rates of adding climate change and climate justice to final rules across agencies (estimating models identical to 2 and 4, but with agency indicator variables rather than fixed effects). Most agencies publish too few rules to have statistical

confidence in the differences. In addition to the EPA, agencies with differences at the .05 level include the Office of Energy Efficiency & Renewable Energy (EERE), the Fish and Wildlife Service (FWS), and National Oceanic and Atmospheric Administration (NOAA).

Agencies with the largest average rates of adding climate justice language are the agencies we would expect to be more receptive to climate justice claims. While many agencies make policies that could be framed as “environmental,” and all policy decisions have distributive consequences, institutions have norms and procedures that lead policymakers to see problems in different ways. For example, some agencies have dedicated staff and prominent internal guidance on climate justice analysis in rulemaking, including the Environmental Protection Agency and the Department of Transportation (which includes the Federal Railroad Administration (FRA), Federal Motor Carrier Safety Administration (FMCSA), and Federal Highway Administration (FHWA)). These agencies are among the most responsive to commenters raising climate justice concerns. However, differences among agencies are extremely uncertain due to the small number of rules where climate justice was added at most agencies.

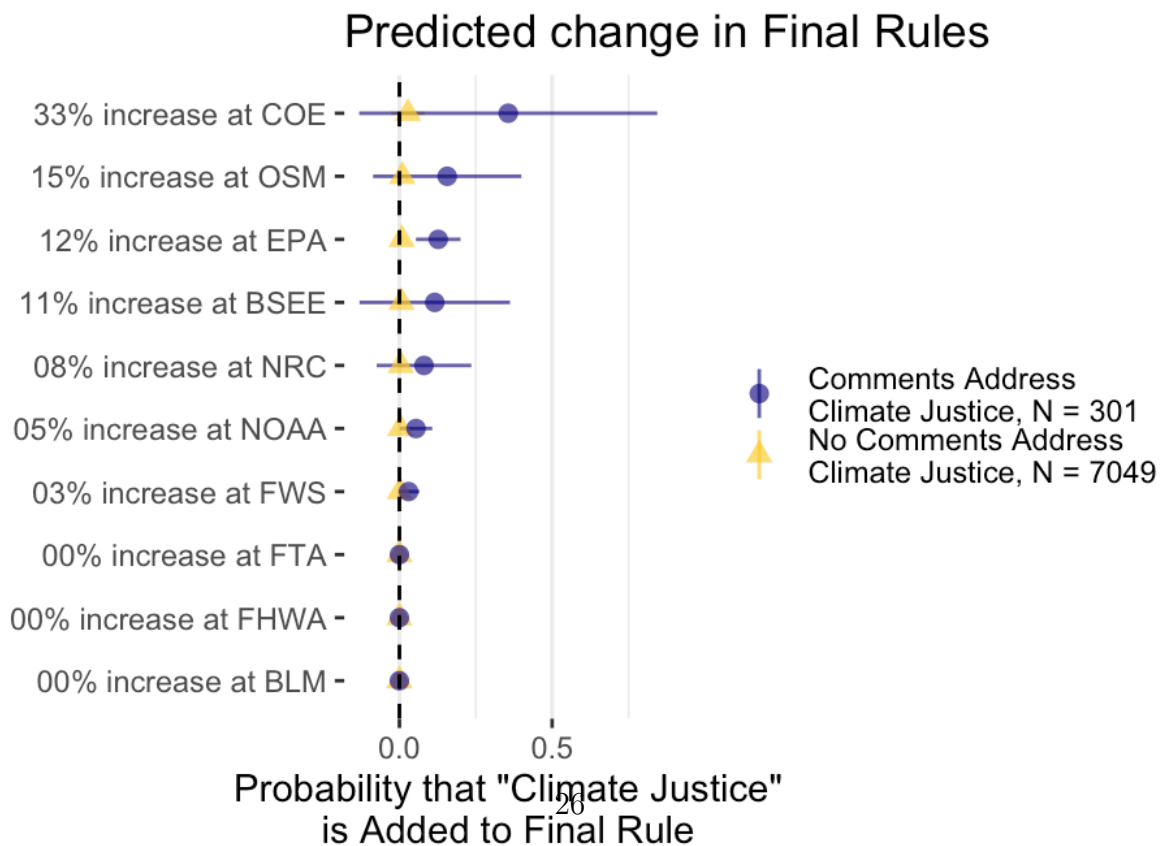
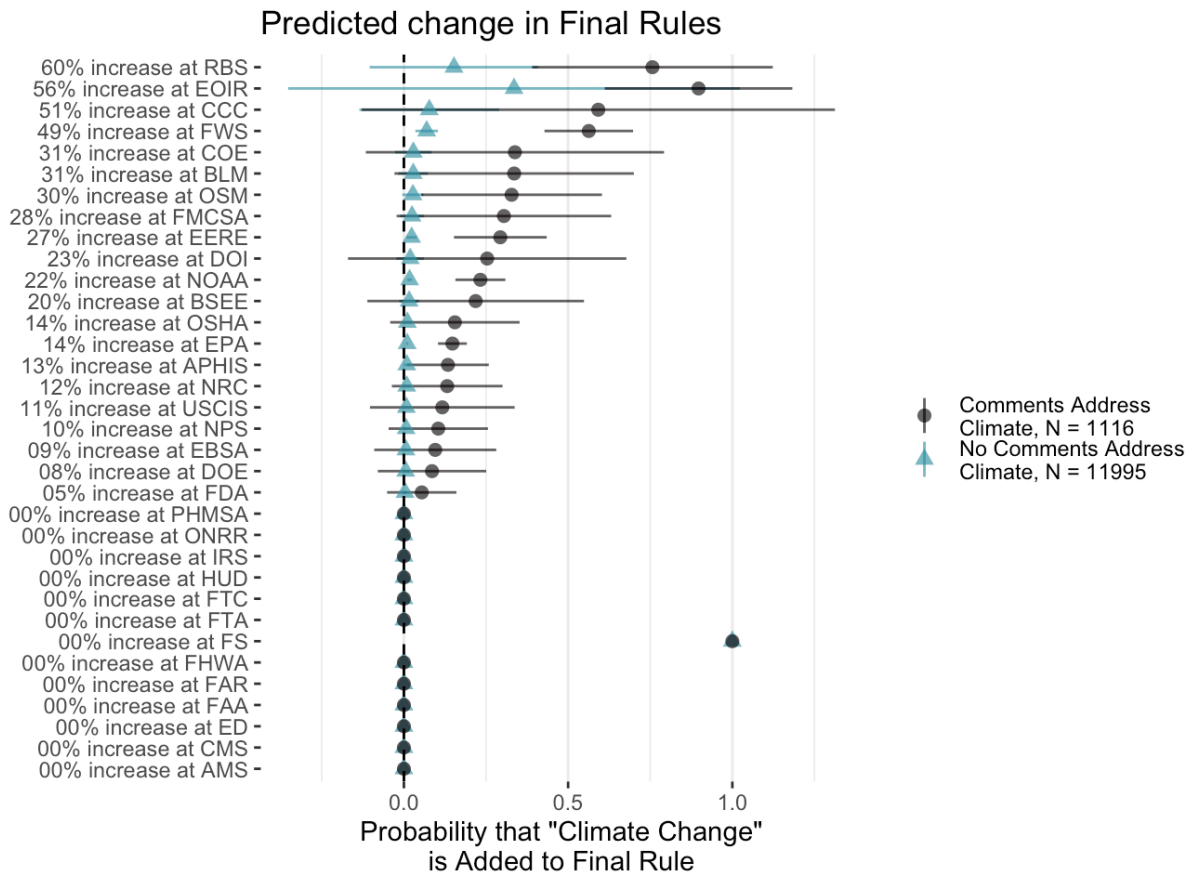
5 Conclusion

Social movements play a critical role in advancing landmark statutes that recognize new rights and social values. Likewise, lack of movement pressure is a leading explanation for the failure of policy efforts.

This paper provides uniquely systematic evidence about the impact of the climate and climate justice movements on the thousands of climate-relevant policies that governments make every year. Leveraging a new dataset of thousands of draft and final policies and millions of public comments on these policies, I show that when public comments raise climate change or climate justice concerns, these concerns are more likely to be addressed in the final rule. Effect sizes vary across agencies, possibly due to the extent that climate change as an issue frame aligns with the institutional histories and roles in which policymakers see themselves.

The magnitude of public pressure matters. When more groups and individuals raise climate and climate justice concerns, policy texts are more likely to change, even when controlling for overall levels of public attention. These findings suggest that distributive justice claims, levels of public attention, and levels of public pressure all systematically affect policymaking. Finally, public comments offer a new lens to assess the rise and impact of the climate justice movement within the broader environmental justice movement.

Figure 8: Probability Climate Change/Justice is Added Between Draft and Final Rules by Agency



5.1 Future research

Interest group lobbying in government agencies drives U.S. environmental policy. Yet, many leading theories of policy change remain untested in the context of agency rulemaking. Do coalitions between businesses and unions that have blocked legislative efforts on climate issues also block rulemaking? Are deregulatory interests systematically advantaged over environmental advocates in rulemaking? Does the scale of public pressure or the attention of legislators constrain interest group influence? This paper has made some initial steps toward addressing these questions. The new dataset will allow scholars to map interest groups' influence and policy ideas across agencies.

Climate policy has been fertile ground for studies of policy feedback (e.g., Stokes, 2020). Many feedback dynamics include bureaucratic policymaking, though often implicitly. When policy incentivizes groups to form or mobilize, the targets of pressure are often policymakers in the agencies tasked with crafting (and re-crafting) the specific legal requirements that give legislation specific meaning, thus distributing specific costs and benefits. Regardless of new legislation, most U.S. federal climate policy will continue to be made in the bureaucracy. The bureaucracy thus presents scholars of climate politics and policy feedback with terrain to further build and test theory.

Future work may systematically address who participates in environmental policymaking and the societal and ideological constituencies they represent, the legal and environmental ideas at stake, and the influence of competing coalitions and ideas on policy. The knowledge gained through a systematic study of climate-relevant rulemaking will inform policy, advocacy strategies, and ongoing reforms of the rulemaking process itself.

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