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RESEARCH IN POLITICAL SOCIOLOGY VOLUME 25

ENVIRONMENT, POLITICS, AND SOCIETY

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PREFACE

Our interest in political sociology is influenced by a background in geography, an integrative discipline using a holistic approach to understand the human–environmental relationship. A key aspect of geography focuses on people and their environments and how people's activities/decisions shape the environment and subsequently impact the relationship between people and the environment. As geographers focusing on development, we welcome the opportunity to edit this special volume of *Research in Political Sociology* devoted to Environment, Politics, and Society. Human activities and decision-making have enormous impacts on the natural environment transforming it and human ability to prosper. This volume provides an opportunity to engage in critical conversations on Environment, Politics, and Society and how their interconnectedness and outcomes shape and impact natural environment and human activity.

In the midst of vigorous discussions on environmental sustainability and environmental crises that make global communities vulnerable more than ever before to environmental degradation on local, regional, and global scales, the papers in this volume offer a much-needed challenge. A better understanding of the depletion of natural resources, pollution, deforestation, and the impact of global warming and climate change on human existence is an important priority for all countries and all governments. Concerned citizens demand the undivided attention of politicians, policy makers, planners, and scientists to restore ecological balance and avoid further destruction of the planet.

Ensuring environmental sustainability is one of the 17 sustainable development goals proposed by the United Nations to be achieved by 2030. Three dimensions of sustainable development including social, economic, and environmental pay special attention to the relations of environment to peace, justice, and effective institutions (United Nations, 2015). Meeting these goals eventually depends on the political and policy agenda adopted by individual nations as well as on collective approaches and cross-national solidarity. Considering the current political climate in the United States of America and around the world, concurrent examination of environment, politics, and society make this volume pertinent and noteworthy. Adger et al. (2017) argue that analyses of environmental decision-making require interdisciplinary and a "more holistic" approach because of the complexities involved in the interaction of environment, politics, and society. It has been recognized as "a broad

social scientific approach to environmental decision-making which builds upon and combines perspectives from a number of disciplines and seeks to overcome the deficiencies of a narrow approach based on a single discipline" (Adger et al., 2017, p. 1097). The adverse outcome of any one of the three issues could jeopardize social, economic, political, and environmental sustainability. Consequently, this volume focuses on the shifting societal and political environment in the United States, Africa, South and Central Americas, South, Southeast and East Asia, and the Middle East. Mostly, the current environmental politics and policies are driven by long-term trends in economic growth, demographic change, and the degradation of natural systems. According to Brulle (2010) the response to the deterioration of the environment tends to be incremental and disconnected and a traditional explanation that has been advanced for environmental policy shifts is the classic "grievance." Currently, around the world there are numerous environmental movements defining distinct communication of environmental and political problems, strategies and methods of organization (Brulle, 2000; Brulle & Jenkins, 2005).

Though progress has been made in environmental, political, and societal sustainability, numerous other areas require urgent attention in the center of a biased political atmosphere in "environmental policies, planning, management" and "sustainable society" around the globe. They are the familiar concerns such as a decrease in environmental research funds, and shrinking environmental regulations at the same time as the build-up of greenhouse gases, acid rain, deforestation, population growth, water pollution, loss of biodiversity, depletion of the stratospheric ozone layers, increased CO_2 production, coastal erosion, mining and urban pollution, and soil loss. Meantime, events and issues threaten social stability by increasing tension over nuclear proliferation, separation in regional cooperation, intensifying transnational terrorism, hunger and food security, gender disparity, and income inequality and poverty. Addressing these unprecedented and staggering challenges requires firm commitment from citizens, leaders, and organizations from the local to global scale. Yet, lack of confidence of facts-based scientific evidence of environmental crisis among groups, politicians, and individuals could hinder the ability to act promptly. Thus, it is more important than ever to address environmental crises taking responsibility at the political and societal level.

This volume initiates a broad conversation on a series of themes in environment, society, and politics. Two chapters discuss politics and environment in the US context. Dana R. Fisher and her co-authors of University of Maryland contributed a timely discussion and debate on current political polarization around the issue of climate change in the United States. Kate Pride Brown of the Georgia Institute of Technology discusses a dynamic and current dialogue on the relationship between multilevel governance and urban water conservation policy in the United States. Two chapters examine governance over resource management and policy formulation from international perspectives. Eric Spears from Columbus State University discusses a catastrophic failure of

a dam in Brazil and social and environmental issues. Yashpal Malik, Nirupama Prakash, and Ajay Kapoor explore a green transportation as a way forward for environmental sustainability in India.

From a societal, education, and policy perspective, this volume provides three research studies. Sharon Lindhorst Everhardt of Troy University and Brenda Gill of Alabama State University provide a solid contribution in engaging school children in sustainable projects such as food security and green school gardening in Alabama. Marcia Rossi of Alabama State University studies how college students comprehend behavior under environmental conditions which are detrimental day by day due to increased human influences. Rossi's chapter explores African-American college students' attitudes and beliefs about pro-environmental behavior using environmental psychology perspective. Yew Wah Chow and Lorena Mathien of Buffalo State provide a dual (US and international) focus on policy, brain drain, and dual citizenship aspects of discussion in the United States. This chapter argues the recognition of dual citizenship as an appropriate prescription in reducing the "great brain drain" problem afflicting the local labor market with a special focus on the Malaysian example.

While environmental, societal, education, and policy perspective engagements are underscored, other substantial contributions encompassed in this volume focus on civil rights struggles, gender, and politics. Ram Alagan, Robert White, and Seela Aladuwaka of Alabama State University underline the usefulness of Civil Rights Geographic Information Systems for understanding the African-American social struggles and assessing the critical needs of the disempowered population of Alabama's "Black Belt." The final two chapters investigate gender, politics, and land resources. Mohammed Bani Salameh studies the features and characteristics of feminist elites as well as their circulation rate in official political positions in Jordon while Deborah Naybor in the other chapter examines the role of gender in the changing use of hukou in the development of China, focusing on the impact of women's patterns of migration on land tenure.

Ram Alagan
Seela Aladuwaka
Editors

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POLARIZING CLIMATE POLITICS IN AMERICA

Dana R. Fisher, Anya M. Galli Robertson, Joseph McCartney Waggle, Amanda M. Dewey, Ann H. Dubin and William Yagatich

ABSTRACT

How do we understand political polarization around the issue of climate change in the United States? Using a mixed-methods approach, this paper unpacks the components of the debate over climate science and policy between 2015 and 2017 to understand the sources of divisiveness that have come to characterize climate politics in the United States. Data in our analysis include the content of Congressional hearings and open-ended, semi-structured interviews with the most influential climate policy actors at the federal level. We find high levels of polarization around two specific components of this debate: the type of policy instrument and the role of the federal government in regulating carbon dioxide emissions. This paper concludes by exploring how patterns of polarization preceding the 2016 election help us to understand the expected political debate over federal climate policy in the years to come.

Keywords: Climate policy; political polarization; US Congress

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INTRODUCTION

Political polarization has been common in the United States since well before Donald Trump was inaugurated as the 45th President of the United States. In the first half of 2017, Democrats and Republicans sparred regularly in Congress, on national television and on social media; at the same time, demonstrators numbering in hundreds of thousands took part in a variety of protests and marches all across the country (see Fisher, Dow, & Ray, 2017). Although it took almost a year for President Trump to pass any sweeping policies through the US Congress, he took full advantage of the Congressional Review Act (CRA) and the Republican majority in both houses of the Congress to cancel a number of policies enacted by the Obama administration (for details on the CRA, see Beth, 2001).

The polarized nature of politics in the United States is particularly evident relative to the issue of climate change and the regulation of greenhouse gasses. On June 1, 2017, President Trump announced that he would withdraw the United States from the Paris Agreement, making the nation one of few in the world to reject the international climate agreement. In May 2017, he proposed a budget for 2018 that would institute radical cuts in funding (about 40%) for the Environmental Protection Agency – the agency tasked with domestic enforcement of environmental regulations (Davenport, 2017). Although Congress is likely to reduce these proposed cuts (Science Magazine Staff, 2017), the aggressive stance of the Trump administration toward climate policy is clear.

The Trump administration's actions are in sharp contrast to those of the previous Obama administration. In addition to negotiating and signing the Paris Agreement in 2015, President Obama signed a sweeping set of executive orders that increased the scope and power of the federal government in regulatory affairs, particularly as it pertains to ecological health and emissions standards (Korte, 2017). As we will discuss in this paper, the hallmark of the Obama administration's Climate Action Plan was the Clean Power Plan, an EPA regulation that sought to reduce carbon dioxide emissions from electric power generation. This policy instrument became a key nexus of contention among branches of the US federal government, the states and between the Democrat and Republican parties.

Climate change (and the adjacent debates over regulation, legislation, and economic impacts) is an especially polarizing – and polarized – issue in the United States. As Dunlap and McCright (2008) noted, "nowhere is the partisan gap on environmental issues more apparent than on climate change" (p. 28). This point is true even as scientific knowledge gaps related to the causes and consequences of climate change are closing (Cook et al., 2013). Despite the recent turbulence in the US political sphere, the status of scientific consensus surrounding the issue of climate change has remained quite stable (IPCC, n.d.).

Variation exists within this consensus, but this variation exists mostly within the scope and severity of consequences of unchecked climate change, and what the best practical and political responses should be to a changing climate (NASA, n.d.). The small minority of atmospheric and geological scientists who do not support the scientific consensus are publicly framed as either betrayers to their professional ethics or as modern-day Galileos, willing to risk a pillorying from the orthodoxy in the name of scientific integrity (Gauchat, 2012). Leaders within the climate change denial camp, such as Republican Senator James Inhofe of Oklahoma (2012), believe that climate change is a hoax that is either not occurring at all or, if it is, is happening in accordance with the planet's natural climate patterns. This perspective perceives efforts to legislate climate policy as a conspiracy to impose more regulations, raise taxes, and push the economy toward collapse (Inhofe, 2012).

How, then, do we make sense of this particular political moment, wherein we see high levels of polarization around what is considered by most scientists (Leiserowitz, Maibach, Roser-Renouf, Rosenthal, & Cutler, 2017) to be a settled scientific issue? This paper explores political polarization around the issue of climate change prior to the inauguration of Donald Trump as President. First, we review the main perspectives on polarization around the climate issue. Second, we describe the data and methods employed in this paper. Third, we present results from our analysis of policy actor networks during the 114th Session of the US Congress and of data collected through open-ended semi-structured interviews with 57 of the most influential climate policy actors during that time period. We conclude by discussing the ways in which the patterns of polarization we observe contribute to broader understandings of the ongoing political debate over federal climate policy.

CLIMATE, CONFLICT, AND US POLITICS

In general, the social, political, and cultural aspects of climate change – as well as the urgency of the issue – have made climate change a central topic of study in the social sciences (e.g., Fisher, 2004, 2006; Fisher, Leifeld, & Iwaki, 2013; Fisher, Waggle, & Leifeld, 2013; Guber, 2013; Jacques, Dunlap, & Freeman, 2008; Johnson & Frickel, 2011; McCright & Dunlap, 2000, 2003, 2011; Rabe, 2004; Rudel, Roberts, & Carmin, 2011; Selin & VanDeveer, 2009). Much of this work aims to (a) understand the continuing absence of a federal policy on climate change in the United States and (b) describe how the lack of a national climate policy is related to the emergence of subnational policy efforts (see particularly Arimura, Burtraw, Krupnick, & Palmer, 2007; Christiansen, 2003; Fisher, 2013; Kramer & Schreurs, 2007; Krane, 2007; Lutzenhiser, 2001; see also the collection by Selin & VanDeveer, 2009). The more specific research on polarization in environmental politics has examined different aspects of this

divisive issue. On the one hand, substantial research has explored polarization within the media coverage of climate debates (Boykoff & Boykoff, 2007; Boykoff & Rajan, 2007; Deryugina & Shurchkov, 2016; Freudenberg & Muselli, 2010; Perrin & McFarland, 2011; see also Jasper, 2011). On the other hand, a growing area of inquiry has analyzed the so-called "climate countermovement" (e.g., Gross, Medvetz, & Russell, 2011; Hoffman, 2011; Jacques et al., 2008; Mottl, 1980).

Sociological examinations of media coverage have served as a useful entrée for understanding climate politics in America in the recent past (e.g., Freudenberg & Muselli, 2010; Liu, Lindqvist, & Vedlitz, 2011; Mazur, 1998; McComas & Shanahan, 1999; Shanahan & Good, 2000; Trumbo, 1996; Weingart, Engels, & Pansegrau, 2000). This scholarship uniformly argues that the dominant model of balanced news reporting used by the American media today is poorly suited to representing multidimensional scientific topics (see especially Boykoff & Boykoff, 2007; Boykoff & Rajan, 2007; Freudenberg & Muselli, 2010). In his book *Science as a Contact Sport*, the late Stephen Schneider (2009) asserted, "there are rarely just two polar-opposite sides, but rather a spectrum of potential outcomes [in scientific research], which are often accompanied by a history of scientific assessment of the relative credibility of each possibility" (p. 203).

The practice of giving equal airtime and print space to figures who oppose action on climate change has created a general perception among laypeople – both in the general public and in positions of power – that the science of climate change is an unsettled and uncertain course of research (Brulle, Carmichael, & Jenkins, 2012; see also Liu et al., 2011). Under the paradigm of equal time for opposing views, Freudenberg and Muselli (2010) concluded that the news media consistently underestimate the severity of the climate problem. They explain that, "if reporters wish to discuss 'both sides' of the climate issue, the scientifically legitimate 'other side' is that, if anything, global climate disruption may prove to be significantly worse than has been suggested in scientific consensus to date" (p. 483). This equal time policy has also led the US media to present the issue of climate change as a debate with two legitimate sides – those who think climate change is a dire threat that must be addressed, pitted against those who think it is a liberal hoax – pushing the discussion into the realm of extremes at the cost of the nuance. These specifics have vital consequences when it comes to the ability of policy makers and policy instruments to address the climate issue (Freudenberg & Muselli, 2010).

Scholars have also documented the growing conservative backlash against climate policy and climate science, in many cases building upon the broader social-movements-focused literature on countermovements (e.g., Farrell, 2016; Jacques et al., 2008; McCright & Dunlap, 2003; for a review of this broader perspective see Meyer & Staggenborg, 1996; Mottl, 1980). These studies link media portrayals of contestation in the science of climate to what Jacques and colleagues (2008) have called an "anti-environmental countermovement"

(also see McCright & Dunlap, 2003). Moreover, they show that efforts to discredit the validity of the science of climate change are the backbone of the counter-movement against climate politics. In the words of a more recent paper: "The perceived threat to American values and interests posed by environmentalism helped justify the creation of a sustained anti-environmental countermovement, institutionalized in a network of influential conservative think tanks funded by wealthy conservative foundations and corporations" (Jacques et al., 2008, p. 352). This climate countermovement is thus stoked not only by anti-environmental sentiments, but also by deeply entrenched notions of nationalism, populism, and the defense of traditional values (see e.g., Inhofe, 2012).

The climate countermovement often utilizes the same lexicon as climate action advocates, but does so by applying novel meanings to existing terms. According to Hoffman (2011), this process creates cross-talk wherein each camp in the debate applies different meanings and values to the same conversations, arguing from completely different and often opaque logical frames. It is this science-adjacent, ideologically motivated cross-talk, Hoffman argues, that makes climate change one of the most active spaces for the struggle over political capital. Cross-talk is the key strategy of the climate countermovement, but is not unique to think tanks and industry-funded lobbyists. As Oreskes and Conway (2010) have illustrated, scientists themselves rely on raising scientific doubt as a weapon in ideological debates.

Researchers have also looked at polarization in the decision-making process in Congress (Fisher, Waggle, & Leifeld, 2013). They have found that political polarization is layered, taking the shape of disagreement over one aspect of a political issue while, in fact, being based on a completely different aspect of the issue. The outward appearance of disagreement on a political issue can mask internal coherence around some components. For example, Fisher and colleagues find that the polarized political discourse in US climate politics during previous sessions of Congress is due to disagreement about the policy instrument, not the science of the issue (Fisher, Waggle, & Leifeld, 2013; Fisher, Leifeld, & Iwaki, 2013; Jasny, Waggle, & Fisher, 2015; see also Liu et al., 2011; McCright & Dunlap, 2003; Park, Liu, & Vedlitz, 2010). A focus exclusively on policy outcomes – for example, which pieces of legislation are voted into law, or which regulatory proposals are brought into practice – is thus insufficient for understanding how polarization materializes around an ostensibly scientifically settled issue (Cook et al., 2013) like climate change.

Examining polarization in the very place where policy-based decision-making occurs is key to understanding how meaningful policy action is influenced by contentious environmental issues. One particularly powerful influence on this decision-making process is the role of television networks. They determine which political actors communicate with whom, which actors do not communicate at all, and how connections among those who are communicating can help explain policy outcomes. At the same time, a growing number of social scientists have recently applied social network analysis techniques to

understanding climate politics (Fisher, Waggle, & Leifeld, 2013; Jasny et al., 2015; Snijders, 2011; see also Schaefer, 2012).

It bears noting that none of the methods or mechanisms of polarization described here happen within an historical or cultural vacuum. Examining citation networks among scientists working on a set of "closed" and "open" scientific issues, Shwed and Bearman (2010, 2012) demonstrate that historical and political influences within scientific communities can influence how scientific debates move through polarization and into consensus. Studying multiple cases of scientific and social debate – including anthropogenic climate change, as well as tobacco carcinogenicity, the existence of gravitational waves, and the purported link between vaccines and autism – the authors show that polarized debates follow issue-specific arcs. Although these arcs tend toward consensus, each of these scientific issues follow their arc via unique socially and politically mediated pathways.

UNDERSTANDING POLITICAL POLARIZATION IN AMERICAN CLIMATE POLITICS

Although news reports and administrative records can illuminate some of the central topics around the climate policy debate (Farrell, 2016), data drawn from Congressional testimonies provide a direct account of the discourse related to US climate legislation, as well the spate of connected issues that crop up in discussions surrounding climate policies. As such, this paper locates political polarization around the climate issue by integrating pre-existing data from Congressional hearings in the 114th session of the US Congress (January 2015–January 2017) with qualitative interview data collected through open-ended semi-structured interviews with policy actors engaged in the issue during the same period. During the 114th session of Congress, discussions about federal climate policy focused on an Obama administration executive order, known as the Clean Power Plan, that aimed to regulate emissions from power plants. In the sections that follow, first, we will provide an overview of the Clean Power Plan, then, we outline the data and methods used for each data source.

Studying the Clean Power Plan

President Obama formally announced the Clean Power Plan (CPP) in 2015, calling the proposed regulation "the single most important step America has ever taken in the fight against global climate change" (Obama, 2015). The policy aimed to reduce carbon dioxide emissions from power plants through an executive order that would be enforced by the EPA and implemented through

various means on a state-by-state basis. By adopting the domestic emissions reduction goals included in the CPP (32% within 25 years relative to 2005 levels), the Obama administration was able to enter the international climate negotiations in Paris at COP-21 with the knowledge that it could follow through on its international commitments. Political opposition to the CPP was quickly apparent. In some cases, states had, independent of the CPP, already set standards for reducing emissions. Progress made by these states previous to the announcement of the CPP was not expected to be counted toward their mandated goals. Mere days after President Obama announced the plan, governors and attorney generals from 27 states signed a letter announcing their intention to oppose it on the grounds that it was federal overreach into state affairs (Harvard Law Review, 2016). In February 2016, the US Supreme Court stayed implementation of the plan until the legal challenges to the program could be concluded (Harris, 2016). It was during the period after the stay that our interview data were collected.

Studying Congressional Hearings

To understand political polarization in climate politics, we analyze data from Congressional hearings in the 114th US Congress. We build on the earlier studies by McCright and Dunlap (2003), Liu and colleagues (2011), as well as previous work by Fisher and colleagues (2013), all of which analyze Congressional hearings to understand climate politics in the United States.

Congressional hearings are an important part of the policymaking process in the United States. In the words of the United States Governmental Printing Office, Congressional hearings are the principal way that members of Congress "obtain information and opinions on proposed legislation, conduct an investigation, or evaluate/oversee the activities of a government department or the implementation of a Federal law" (US GPO, n.d.). The importance of such hearings as a source of information has been noted within the academic literature as well (see particularly Clifton, 2004; Gormley, 1998).

An array of experts give testimony at Congressional hearings, including governmental agency officials, interest groups, businesses, think tanks, and academic researchers, as well as members of the US Congress themselves (for a more general discussion of Congressional hearings see Burstein & Hirsh, 2007; DeGregorio, 1998). Congressional hearings provide a forum for different policy actors to achieve recognition for their interests and perspectives and to garner the attention and support of different political constituencies. Thus, testimonies are intended to inform decision makers about a range of topics germane to the policy issue at hand, ranging from science and technology to economics and the wording of policies. According to Burstein and Hirsh (2007), "members of Congress believe that hearings provide an efficient way to gather information

and exert influence. […] Interest organizations, too, see hearings as important venues for conveying information" (p. 179; see also Laumann & Knoke, 1987).

Congressional hearings, then, represent an opportunity to study the collision of science, politics, and economic interests and the influence of these interests on climate policy. As a result, the perspectives presented during Congressional hearings are an ideal data source for understanding a contentious issue such as climate policy. Building from the literature presented here, this paper analyzes the *content* of Congressional hearings on climate policy. In so doing, this paper sheds light, not just on *who* has a say in the climate debate in Congress, but also *what* they are saying.

DATA AND METHODS FOR CONGRESSIONAL DATA

This dataset includes testimonies from climate-related hearings during the 114th session of the US Congress, during which nearly 100 bills pertaining to issues about climate change were introduced (C2ES, n.d.). The Republican Party held a majority in both the Senate and the House of Representatives during the 114th Congress, representing 54% of the voting share in the Senate and 56% of the voting share in the House of Representatives.

We conducted a search for hearings that included discussions of climate change, climate science, or climate policy using the US GPO FDSys search engine (US GPO, n.d.), which archives transcripts from Congressional hearings and makes them available for the public record. Using search terms "global warming," "greenhouse gas," "Clean Power Plan," and "climate change," we identified all of the hearings that discussed these issues during the 114th Session of the US Congress. Although our primary resource for obtaining transcripts of testimonies is the GPO, the results of these searches were cross-referenced with two other document sources to ensure accuracy: the ProQuest Congressional search engine and The Catalogue of Government Publications, which is also maintained by the GPO but purports to be a resource independent from the FDSys search engine. In both cases, search results did not yield any additional hearings.

After comparing these findings, we reviewed the contents of each hearing to confirm that it was pertinent to the topic of climate change. Hearings held to nominate or confirm nominees to government positions, and hearings to evaluate or vote on appropriations and budgets were excluded from the sample. Also excluded were hearings that focused on unrelated topics, but in which the related search terms were merely mentioned. Overall, our searches yielded 825 testimonies delivered in 106 separate hearings in the 114th session of Congress. Only formal testimonies were included in the analysis; opening remarks and statements made during question-and-answer portions of hearings were excluded from the sample. Members of Congress who spoke to their own committees were captured only if they submitted their formal statements for the record.

We compiled the transcribed texts of each testimony using Discourse Network Analyzer (DNA) software (Leifeld, 2017), which was used for data management, coding, and conversion into network data (see also Leifeld & Haunss, 2012). DNA is a computer program that allows for the qualitative coding of articles and statements and prepares the data for network analysis and visualizations so that the ideological relationship among actors on a policy issue can be mapped and the strength of these ties can be quantified. Unlike other software packages for qualitative data analysis, DNA was specifically designed to encode the policy beliefs and preferences of political actors appearing somewhere within a text (as opposed to merely encoding variables related to a whole text document). Once the "statements" of political actors have been tagged in a body of testimonies, these structured data can be converted into networks of speakers (individuals, organizations, etc.) that illustrate their interconnection by commonly held policy beliefs or preferences.

Categories for testimony organization included hearing numbers and speakers (name and organization). In the cases where testimonies were submitted on behalf of an organization, but without a speaker actually testifying in person, the organization name was used. These speakers and organizations were then classified into 10 types: Congressional Democrats (we include the two Independents in the US Senate here since they caucus with the Democratic party); Congressional Republicans; representative from the US executive branch, which includes speakers from government agencies; subnational governmental representatives, including both legislators and executive representatives of state and local governments; non-governmental organizations, which includes professional associations and think tanks; environmental advocacy, research, and activist groups; media; businesses, which includes business interest groups and trade associations; university scientists and independent science research centers; and, "other," a residual category that includes policy actors who do not fall into the other categories, such as religious organizations.

We coded testimonies into normative statements (agree/disagree) based on 11 categories that are particularly relevant to discussions about climate policy in the United States. Two of the categories related to the science of climate change, which has been a central theme in debate in the United States: "climate change is real and anthropogenic" (capturing the debate over whether human actions do or do not cause climate change) and "climate change is caused by greenhouse gases" (capturing the debate over the specific contribution of greenhouse gasses to climate change). The other nine categories related to a variety of climate policy issues: "climate legislation will not hurt the economy"; "emissions legislation should regulate CO_2"; "legislation should include a carbon tax"; "legislation should include a carbon market/cap and trade"; "the Federal government should take the lead on climate policy"; "climate change poses a security threat"; "the US should meet or exceed the 26−28% emissions reduction target by 2025 against a 2005 baseline (per the Paris agreement)";

"states should accept the Clean Power Plan"; "climate change should be a key issue in the 2016 election."

Whenever a speaker made a statement falling under one of the eleven categories, researchers coded it based on whether the speaker agreed or disagreed. Many testimonies included multiple statements coded in the same category. In some of these cases, testimonies included statements on both sides of the category. We interpret such variation to mean that the speaker holds a moderate stance on the issue.

Because we coded these data by hand according to a pre-specified set of policy belief categories, the qualitative coding was deductive. Although there is no formal measure of intercoder reliability for this type of work, what could be and could not be considered a statement was clearly specified through the production of a coding protocol. We created this coding protocol as a collaborative team at the outset of the analysis. All members of the research team coded the same randomly selected testimonies, discussed their preliminary results, modified the coding protocol, and repeated the process until all were in agreement about how to code testimonies in the same way. All questions that arose during the coding process were addressed in the same collaborative manner to maintain consistency.

In this paper, we compare the results of two specific categories: policy statements that reflect perspectives on whether climate change is being caused by humans (normative statement "climate change is real and anthropogenic"), which is the focus of much scientific inquiry (see particularly Cook et al., 2013) and is the focus of much of the climate denial and skepticism (see particularly McCright & Dunlap, 2000), and policy statements that related to the Clean Power Plan (normative statement "states should accept the Clean Power Plan").

NETWORK ANALYSIS TECHNIQUE

The methodology and data collection follow the procedures outlined by Fisher, Waggle, and Leifeld (2013). In the network analysis, a "statement" is a portion of a testimony in which an actor reveals his or her beliefs or preferences within the text (Leifeld, 2012; Leifeld & Haunss, 2012). Each relevant statement by a political actor was coded for five variables: the name of the actor, name of the organization that the actor represents, the classification of the policy actor into one of the ten types listed above, the normative statement from the list upon which the actor is speaking, and whether the actor agreed or disagreed with the normative statement.

All policy statements were transformed into an actor-by-issue matrix where each issue occupies two distinct columns – one for positive statements where the actors support the claim and one for negative statements where the actors

oppose it – reflecting agreement and disagreement with each causal perception or policy instrument represented by the normative statements previously listed. In network terminology, this matrix can be understood as an affiliation matrix with two classes of nodes: actors and policy beliefs. To avoid confounding the quantity of an actor's statements and the actor's qualitative preferences, we dichotomized the affiliation matrix, retaining "0" values where present and replacing positive values by the value "1."

INTERVIEWING POLITICAL ACTORS

In addition to analyzing Congressional hearings data, we conducted open-ended, semi-structured interviews with influential policy actors to understand the political divide around climate change. No comprehensive dataset of elite US climate policy actors is maintained. To begin, we created a sample of policy actors based on their participation in the climate policy arena during the 114th Congress. This sampling is consistent with previous research on the subject (Fisher, Waggle, & Leifeld, 2013; Jasny et al., 2015) that uses three publicly available sources. We began with a list of all the policy actors who participated in climate-related hearings in Congress during the two sessions prior to when data collection began: the 112th session (3 January 2011–3 January 2013) and the 113th session (3 January 2013–3 January 2015). Next, we used the US House of Representatives (US House Lobby Disclosure Search, n.d.) and US Senate (US Senate Lobby Disclosure Database, n.d.). Lobbyist Disclosure Act databases to tabulate all lobbyists who were registered with Congress to lobby on climate during each session. Finally, we cross-referenced this list with a roster of all US participants in the COP-21 round of the international climate negotiations in Paris in December 2015 (UNFCCC, 2015). By drawing from these varied sources spanning the two sessions of Congress prior to our analysis, we were able to assemble a full list of policy actors that enabled us to measure sustained engagement in the climate policy network over the years leading up to our period of data collection. It would have been ideal to include a list of the speakers who were participating in the ongoing 114th session of the US Congress as well, but because data collection was taking place in the middle of that session, a complete list of hearings and participants was not available.

We ranked the actors in this dataset according to the degree to which they participated in hearings, international negotiations, and on lobbyist registries (if they were non-state actors). Congressional testimonies were weighted such that multiple appearances before Congress indicated greater participation. We included all actors who participated more than once in what we call the "climate policy arena." In some cases, policy actors participated in climate-related Congressional hearings more than once, but in other cases, the actors

not only participated in the Congress once but also participated in the international climate negotiations or were registered lobbyists on the issue.

In contrast to the sampling period for Jasny and colleague's previous study (2015), when climate-related legislation was working its way through the US Congress, climate-related Congressional action was more limited during the four-year sampling period for this study. In total, we identified 83 policy actors as central climate policy actors. Given this relatively small number, we then added into the sample four additional policy actors who were highly ranked in Jasny and colleague's 2010 sample and had also been active on the issue during the 114th session of the US Congress: US Senator James Inhofe of Oklahoma; the American Council for an Energy-Efficient Economy; World Resources Institute; and the Pew Center on Global Climate Change, which was renamed the Center for Climate and Energy Solutions in 2011. We also added the office of US Senator Sheldon Whitehouse, the Audubon Society, the Nature Conservancy, and Climate Central because, while they were less active in previous sessions of Congress, they were showing remarkable activity in the early parts of the 114th session. Finally, we added the Intergovernmental Panel on Climate Change, which was included in the 2010 sample developed by Jasny and colleagues (2015) and is the "international body for assessing the science related to climate change" (IPCC, n.d.). In total, our 2016 sample included 92 policy actors who were especially influential in the federal climate arena. By design, then, the method for sampling participants does not capture *all* actors who participated in the debate around climate issues in the 114th Congress; instead, it weights participation to capture the most active players in the climate policy area. Members of this core group of political elites have the most influence over the policy process.

Data collection was conducted in accordance with University of Maryland policies on Human Subjects research (IRB Protocol #878998). We contacted each actor in our sample – first via email and then via phone – to request their participation. We collected qualitative interview data through in-person meetings in the Washington, DC metropolitan area during the summer of 2016. For policy actors who were not available to meet or who were located outside of the DC area, interviews were conducted over the phone. The sample of organizations was divided up among the six members of the research team, with each being responsible for outreach to his or her sub-sample. In total, interviews were completed with 57 policy actors in our sample, representing a 62% response rate. To protect the identities of the policy actors who participated in this project, we provide general affiliations of the informants but do not identify individual respondents or organizations.

Interviews followed an open-ended, semi-structured format and were more conversational than scripted (Lofland & Lofland, 1995). Interviews followed a predetermined protocol, which focused on the status of climate and energy policy in the United States. This interview method allowed for flexibility, encouraging the interviewer to pursue follow-up questions and the interviewee to

express candid responses. Interviews lasted between 20 minutes and 2 hours, and were recorded digitally and transcribed prior to analysis. Transcripts of the interviews were coded by hand into 17 broad themes that included the speaker's background, his/her organization's political outlook, as well as a series of politically salient issues related to climate and energy policy in the United States. After hand coding the transcripts, data were entered into the qualitative data analysis software NVivo 11 for further analysis regarding each actor's perspectives on policy issues related to climate change and climate science more broadly.

Coding in NVivo yields groups of statements under each predetermined coding theme. Here, we define "statements" as portions of interview data related to a specific issue. Individual respondents may make multiple statements under the same code within an interview. For example, the topic of the Clean Power Plan might come up at the beginning of an interview, in response to a specific question, as well as during a tangential discussion around other policy measures. Each time a topic is discussed, it is coded and counted as a separate statement. This approach is similar to that taken by Ferree, Gamson, Gerhards, and Rucht (2002) in their comparative study of political discourse about abortion in the United States and Germany when the authors analyze newspaper coverage, counting "utterances" as their unit of analysis. In this paper, we present the interview data that specifically relate to the Clean Power Plan.

RESULTS

In the pages that follow, we present the results of our analyses of our multiple data sources. We begin by analyzing the frequencies of statements made in Congressional hearings in the 114th Congress to identify the specific components of the debate that were most polarized. Then, we present findings from our analysis of qualitative interview data with political elites to provide a more detailed discussion of the specific content around which policy actors are most divided.

Political Polarization in Congressional Hearings

The science of climate change has been presented as unsettled within both Congressional hearings during the 114th session of the US Congress and within the public sphere (for a discussion see Farrell, 2016; see also Liu et al., 2011). As a proxy for support for climate science, we look at the network of agreement and disagreement for the normative statement: *Climate change is real and anthropogenic*. Fig. 1 presents the overall frequency.

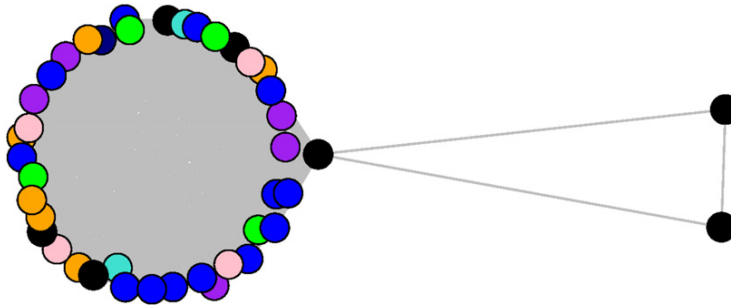

Fig. 1. Climate Change Is Real and Anthropogenic.

Nodes represent individual policy actors speaking during Congressional hearings, and the ties represent their connections to actors who agree with them on this one statement. Nodes are color coded based on the organizational affiliation of the speaker: blue nodes indicate Democrats and Independents in Congress, red indicates Republicans in Congress, pink indicates representatives from the executive branch of the government, green indicates environmental groups, purple indicates businesses or business and trade associations, black indicates scientists or members of the media, orange indicates think tanks, light blue indicates subnational policy actors who are Democrats, dark red indicates subnational policy actors who are Republicans, and gray indicates policy actors that fall into the "other" category. In cases where there were many speakers, the nodes may overlap. The right side of the diagram depicts actors who spoke in disagreement with the statement, and the left side represents agreement. Placement within the sides, however, holds no specific meaning.

As made clear by Fig. 1, negative statements about whether climate change is anthropogenic were in the minority of statements in the 114th Congress. Only two policy actors made this claim in hearings during the 114th session of the Congress, both of whom were scientists from universities. Another scientist gave testimony that presented both perspectives on the science of climate change, which we see as a moderate position and is in the center of the diagram. By comparison, 55 policy actors were coded as stating that climate change was real and anthropogenic during this session of the US Congress. Consistent with the results of analysis of previous sessions of the US Congress (Fisher, Waggle, & Leifeld, 2013), we can conclude that, although a vocal minority testified that climate change was not anthropogenic, the vast majority of speakers during the 114th Session of the US Congress either agreed that human activity was causing climate change or did not speak on the issue at all. Moreover, this majority is composed of a diverse range of policy actor types. The largest group of actors not only comprised Congressional Democrats and left-leaning Independents (20), but also included business leaders (7), speakers from NGOs (7), scientists (7), environmental groups (6), and representatives of

Fig. 2. States Should Accept the Clean Power Plan.

subnational governments (2). Overall, this diagram shows relatively strong consensus around the science of climate change.

When we look at the results of the policy instrument under discussion at the time, the Clean Power Plan, there is much less consensus and much more polarization. Fig. 2 presents the analysis of the statement: *States should accept the Clean Power Plan*. Compared to discussion of the science of climate change, there is a higher frequency of negative statements about the CPP in the 114th Congress. Moreover, there are no moderate voices in the discussion at all. The result is two discrete clusters of policy actors. The cluster on the right represents 78 individuals who oppose the notion that states should accept the CPP. It is composed mostly of Congressional Republicans (30), business representatives (24), and representatives of subnational governmental bodies (17). The cluster on the left is made up of 40 speakers who support the notion that states should accept the CPP. This cluster is composed of a more diverse spread of organizational types, but the largest group is Congressional Democrats and left-leaning Independents (14).

These results are also consistent with the results of Fisher, Waggle, and Leifeld (2013), who find in their study of the 109th and 110th US Congresses that despite reports of scientific debate, "polarization is focused around, not the science of the issue, but perspectives on the policy instrument" (p. 87).

Political Polarization in Interviews with Policy Elites

Data from qualitative interviews with policy elites during the 114th session of the Congress add depth and context to the findings presented above. In particular, we find that discussions about the science of climate change are less polarized, while discussions about the CPP are characterized by diverging positions on the structure and implementation of the federal regulation. Here, we focus not just on the number of individual respondents who spoke about these issues, but also on the frequency with which they spoke. Analyzing the frequency of statements about climate science and the CPP, as well as the content of these statements, yields valuable insight into where disagreement is located, and where the politics are polarized within the climate debate.

Forty-four actors in our sample, which is made up of governmental agencies, congressional offices, or organizations that work on federal climate politics, mentioned the science of climate change in their interviews. Of the 180 statements related to science across these 44 interviews, nearly two-thirds (62% of statements that were spread across 30 respondents) support both the science of climate change and federal action to prevent or mitigate anthropogenic climate change. In these statements, respondents discuss science and policy as interrelated components of climate politics: science provides proof of anthropogenic climate change, its impacts, and its associated risks, whereas federal policies and regulations provide opportunities for action. This perspective is summarized in the words of a representative for a non-profit organization working on global climate issues: "the science doesn't tell us how to act on it; it just tells what the facts are. I think that most of that is apparent enough already. The risks are very clear on not acting on climate change." Many respondents were also adamant that opposition to climate science was blocking opportunities for meaningful policymaking. As one independent university researcher explained, "climate change politics in America is compromised by the fact that there's a large segment of government leaders who are unwilling to objectively look at what science has to tell us about climate change and its impacts."

Whereas there was considerable similarity among the statements supporting climate science and climate action, the remaining 38% of statements – made by 12 respondents – reflect lower levels of consensus among the respondents who rejected climate science, climate action, or both. Two additional informants discussed climate science generally without offering an opinion. Respondents who rejected climate action but not climate science expressed more moderate views, as did respondents who were skeptical about climate science but supported action to mitigate climate impacts.

It is notable that the minority (only 16%) of these statements present perspectives that reject *both* climate science and climate action. In these statements, respondents expressed skepticism about scientific arguments for human activity and greenhouse gases as factors in global temperature fluctuations and were, accordingly, opposed to federal policies trying to regulate these factors. Statements affirming the science of climate change but rejecting federal action make up a smaller 14% of the total discussion of climate science. For these respondents, climate change was a real problem with human causes, but respondents expressed that action on climate was meaningless, inappropriate, or premature. As one university researcher explained: "I believe in the changing climate. I believe in the need to do something about it. But I find the approach that we're taking sophomoric. People are declaring victory when we haven't won anything."

The remaining 8% of statements represent those respondents who had the most counterintuitive perspective. They rejected climate science but supported climate action. For example, one representative from a think tank noted that climate change posed a serious threat, but questioned whether federal policies could be effective if human activities did not play a role in warming global

temperatures: "if we are to develop a national policy that's going to impact climate change, some basic questions need to be answered about how much man-made contributions are impacting [the climate], so that you know how much weight to put on that." Even with this variety in perspectives, the majority of informants and their statements were very supportive of the science of climate change. Table 1 presents the distribution of interview respondents' perspectives on climate science vis-à-vis their perspective on federal climate action.

The subject of the CPP was the focus of 102 statements across 28 respondents. In contrast to our findings from the Congressional hearings – where more speakers disagreed with the notion that states should accept the policy instrument – more respondents spoke in support of the CPP than in opposition (17 vs. 10 speakers, respectively, with one informant discussing the regulation without offering an opinion). Despite coming from the smaller group of speakers, however there were substantially more statements made against the CPP than for it (60 statements vs. 42, or 59 statements vs. 41, respectively). Table 2 presents a breakdown of the different perspectives on the Clean Power Plan presented in our interview data.

There were considerable divisions within what could be described as the pro-CPP and anti-CPP camps, with a variety of arguments leveraged on each side of the debate. Nearly half of the statements made in support of the CPP (48%) focused on the proposed regulation as a small but necessary first step toward meaningful federal policy addressing climate change. For these respondents, the CPP was the only option for climate action given the "policy void" at the federal level in the United States (Krane, 2007; see also Fisher, 2013). In the words of a representative of an organization working on the public health impacts of greenhouse gas emissions: "[S]o far, there haven't been any other

Table 1. Interview Respondent Statements on Climate Science and Climate Action.

Climate Science	Climate Action	
	Support	Reject
Support	62% (111)	16% (29)
Reject	8% (15)	14% (25)

Table 2. Interview Respondent Statements Regarding the Clean Power Plan.

Support	41% (42)	Reject	59% (60)
First step policy	48% (20)	Bad policy	37% (22)
Emissions reductions	28% (12)	Economic costs	37% (22)
Other	24% (10)	No climate impact	10% (6)
		Other	16% (10)

opportunities or any other proposed legislation." Similarly, a representative of a think tank working on global climate issues called the CPP a "blunt instrument" that incorporated some aspects of cap-and-trade legislation but would not be "as efficient as a full carbon market."

Another 28% of statements focused on the ability of the CPP to reduce harmful emissions from coal-fired power plants, which framed the regulation as a necessary tool for reducing greenhouse gas emissions and improving public health. The final quarter of the supportive statements (24%) covered other positive aspects of the regulation, such as the flexibility it provided for state-level implementation and its ability to help the United States meet international climate agreements.

In contrast to those statements supporting the CPP, over one-third of the statements (37%) discuss the CPP as a legally, politically, or culturally bad policy. Another 37% focus on the outsized cost of the proposed regulation. Ten percent of anti-CPP statements connect opposition to skepticism about anthropogenic climate change in a direct way, arguing that the proposed regulation would have a negligible impact on global carbon emissions or temperatures. One think tank representative, for example, explained that his organization opposed the CPP from "a scientific standpoint" and took issue with the "unrealistic assumptions" of the Obama administration regarding the relationship between greenhouse gasses and climate change. The remaining statements that opposed the CPP (16%), criticized other aspects of the policy, including the uncertainty of how the regulation would be implemented. "There's no clarity, whatsoever," complained one trade association representative, "it's as clear as mud." In other words, responses to the Clean Power Plan provided a diversity of perspectives on the policy.

DISCUSSION AND CONCLUSION

Recent upheavals in federal US climate politics may have shifted the policy landscape, but the results of the present research suggest that the underlying nature of political polarization remains unchanged. Consistent with previous work by Fisher, Waggle, and Leifeld (2013), we have demonstrated empirically that, among the US climate policy elite, the scientific basis for climate policymaking is not the location of political polarization. However, the policy instruments proposed to address climate change continue to be highly contested. The specific policy instrument being discussed here – the Clean Power Plan – was stayed by the Supreme Court in February 2016. In October 2017, President Trump's EPA proposed to repeal the Clean Power Plan. The results of our analysis suggest that such debate over policy instruments is likely to continue as the Trump administration proceeds with its plans to roll back climate and environmental regulations of all sorts.

We have also demonstrated that polarization around the Clean Power Plan is not randomly distributed. Whereas the consensus around climate science included actors from across the broad spectrum of organizational types in our analysis, there was a clear division between types in discussion of the Clean Power Plan. Subnational governmental agencies and Congressional Republicans represented a high proportion of the opposition to the Plan. This finding reflects political arguments that the CPP constituted federal overreach into state affairs and unfairly punished states that had set their own standards toward emissions reductions. This finding also reflects the foundational Republican value for small government and limited regulation. The substantial number of businesses voicing opposition to the plan is reflective of broader fears that emissions regulations could have a negative impact on productivity and the economy. Support for the CPP, on the other hand, came from left-leaning Congressional offices and environmental organizations. This support is expected given that the plan was introduced as the executive order of a Democratic president. Consistent with previous work, arguments about the science of climate change are masking a hidden consensus around the issue, and diverting attention away from true source of polarization: the policy instrument that would actually regulate greenhouse gas emissions.

Putting these two debates in conversation with one another, we see that positions on climate science and positions on climate action are not independent of one another. As the results of our analysis of qualitative interview data show, most of the policy actors who support climate action also support the scientific consensus; and likewise, among those who do not support action, most do not support the science either. Our analysis of the qualitative foundations of these policy positions demonstrates how polarization around a policy instrument may appear on the surface to be polarization around scientific research.

Most of the respondents who supported the CPP did so because they found it to be a necessary first step in addressing a vital global environmental issue; a step that would also have positive implications for public health and security. On the other hand, those who did not support the CPP were opposed to the plan largely because they felt it was a hasty policy based on bad information, which would have negative economic impacts and a negligible impact on emissions themselves. However, both supporters and detractors cited scientific research as the basis of their argument for or against the CPP. When two sides of a policy debate can cite scientific research as the foundation for their position, their arguments consistently move away from the specific policy at hand and toward the underlying scientific assumptions.

Future research should examine how this process of polarization works in debates around other policy instruments. Given the Trump administration's stated position against climate action, as well as the willingness of the Republican-controlled Congress to defer action on climate in favor of debating the science, it is unlikely that new climate policies will emerge at the federal level. However, in the wake of President Trump's withdrawal from the Paris

Agreement, subnational actors at the state and city levels have committed to reducing emissions and cooperating with international partners to address climate change. Therefore, future research should also examine the process of polarization at the subnational level and compare this process to polarization within federal policy arenas. Similarly, situating this analysis among the most active participants overlooks the work being done by grassroots organizations on the ground. In a political atmosphere where the will to act on climate change seems to be dwindling, adapting this analysis to other arenas – for example, civil society and business interventions into addressing climate change – will also be important moving forward.

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