SOCIOLOGICAL INQUIRY

*Networks of Opposition: A Structural Analysis of U.S. Climate Change Countermovement Coalitions 1989–2015**

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The climate change countermovement (CCCM) in the United States has exerted an important influence on delaying efforts to address climate change. Analyses of this countermovement have primarily focused on the role of conservative think tanks. Expanding this research, this article initiates an examination of the structure of key political coalitions that worked to oppose climate action. In conjunction with their allied trade associations, these coalitions have served as a central coordination mechanism in efforts opposed to mandatory limits on carbon emissions. These coalitions pool resources from a large number of corporations and execute sophisticated political and cultural campaigns designed to oppose efforts to address climate change. Through an analysis of twelve prominent CCCM coalitions from 1989 to 2015, I show that over 2,000 organizations were members of these coalitions and that a core of 179 organizations belonged to multiple coalitions. Organizations from the coal and electrical utility sectors were the most numerous and influential organizations in these coalitions. The article concludes with suggestions for further research to expand understanding of complex social movements and countermovements.

Introduction

1988 was a critical year for climate change politics in the United States. The dramatic testimony of James Hansen (Hansen 1988:401) established the reality and dangers of continued increases in carbon emissions in the public arena. Additionally, the formation of the Intergovernmental Panel on Climate Change (IPCC) that year institutionalized and set in motion a continuous process of review and promulgation of climate science. These two events marked the emergence of climate change as a major public issue, and initiated calls for government action to reign in carbon emissions. In response, corporations with strong ties to the production and use of fossil fuels, acting in coordination with allied trade associations, conservative think tanks, philanthropic foundations, and public relations firms, mounted a series of efforts opposed to action to mitigate carbon emissions (Dunlap and McCright 2015; Plehwe 2014; Young and Coutinho 2013). These efforts form an amalgam of loosely coordinated groups that can be understood as the climate change countermovement (CCCM) (Brulle 2014).

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A number of analyses have shown that one major effort of the CCCM was to carry out a deliberate and organized effort to misdirect the public understanding of this issue through the promotion of uncertainty over mainstream climate science (Brulle 2014; Dunlap and McCright 2015; Jacques, Dunlap, and Freeman 2008; National Research Council 2011:35; Oreskes and Conway 2010; Plehwe 2014). This research shows that a number of conservative think tanks (CTT) were key organizational components of this effort. These organizations developed and promulgated scientific misinformation via a wide range of distribution channels, including mass media appearances, Web sites, publication of books, and providing testimony in congressional hearings. Additionally, these organizations harassed climate scientists through open record campaigns and selective release of this material. These analyses have shown the important role that CTT have had in the efforts to cast doubt on the veracity of climate science.

In addition to the activities of think tanks, there also was a large effort to build and maintain coordinated political and cultural opposition to proposed climate change mitigation actions through the creation of coalitions of fossil fuel-related corporations and their affiliated trade associations. These coalitions played a critical role in the development of organized opposition to climate change (Downie 2019). The first such effort was the formation of the Global Climate Coalition by the National Association of Manufacturers in 1989 to coordinate efforts by a large group of corporations to oppose mandatory limits on carbon emissions. Subsequently, a number of political coalitions were formed with the same mission.

Despite their importance, there has been very little systematic literature on the nature or structure of these coalitions (See Downie 2018 for an exception). The focus on CTT is limited in that it only examines one component of a larger social movement. Social movements, and in this case, countermovements, involve large numbers of organizations, including corporations, advocacy organizations, public relations firms, trade associations, and philanthropic organizations, all working in a loosely coordinated manner to advance a particular political agenda. Organizational activities in a particular field cannot be fully understood by an examination of particular organizations or a single key coalition. Rather, organizations are embedded and act within a larger organizational field.

This article initiates an examination of the CCCM through the use of field frame and network analysis. The objective of this article was to provide an initial description of the organizational structure of these coalitions to provide an empirical basis for further research into how these CCCM coalitions have influenced government policy toward climate change. To carry out this analysis, this article is organized into five sections. In the first section, I frame the analysis of these opposition coalitions through a summary of the literature on cultural hegemony, field framing conflicts, network analysis, and the formation of countermovements. I then turn to a discussion of climate change opposition coalitions. After summarizing the existing literature on this topic, I then provide a brief overview of the methodology utilized to examine the structure of climate countermovement coalitions. The analysis in the next section provides an analysis of structure of twelve climate change countermovement coalitions over a 26-year time period. It then focuses on further analysis of the 179 organizations that form the core of these coalitions. Utilizing a series of network analyses, I identify both the major sectors and major organizations involved in these coalitions. I conclude with a discussion of how this analysis amplifies our understanding of the climate change countermovement, and identifies avenues for further research.

Coalitions and the Struggle for Political and Cultural Power

The conflict over how to address climate change can be seen as a symbolic political and cultural struggle over the dominant cultural understanding of this issue. Seeing social order as regularized patterns of social interaction constituted by acceptance of a common situational definition (Fligstein and McAdam 2012:9), political conflicts center on the shared cultural definitions "that identify categories of social actors and their appropriate activities or relationships (Lounsbury, Ventresca, and Hirsch 2003:75)."

Applying this approach to public policy centers around how legitimate practices in a specific policy domain are defined. The definitions of these appropriate practices in a specific policy arena are defined as field frames. Field frames are "political constructions that provide order and meaning to fields of activity by creating a status ordering for practices that deem some practices more appropriate than others (Lounsbury, Ventresca, and Hirsch 2003:76–77)." These ideas define a collective and binding definition in that particular field. Creating and maintaining a particular field frame constitutes the locus of political contests and involves the active creation and maintenance of this frame through the exercise of intellectual leadership, compromise, material incentives, and coercion (Gramsci 1971, Levy and Egan 2003). Accordingly, the struggle for social change involves a competition between the dominant worldview upheld by the incumbents, and alternative frames, developed and championed by challengers (Fontana 2004:96). The maintenance of the status quo and thus a stable social order is in the interests of the incumbents who seek to protect their vested interests (Moe 2015). Thus, they seek to maintain or stabilize the field, whereas challengers seek to transform the field frame (Fligstein and McAdam 2012; Levy and Egan 2003:810).

In this contestation, organizations play a critical role in the advocacy of different field frames. Organizations based on the alternative or challenging field frame seek to both spread familiarity and acceptance of the alternative discursive frame, and to generate political pressure to implement institutional change based on this new frame (Rochon 1998:51). These efforts take the form of social movements. Additionally, the rise of social change efforts also gives rise to attempts to maintain or restore the previously unquestioned field frame in the form of countermovements (Lo 1982). Countermovements are "networks of individuals and organizations that share many of the same objects of concern as the social movements that they oppose. By advocating an alternative discourse and challenging the established field frame, social movements create conditions for mobilization of their opposition. Countermovements originate as the change movement starts to show signs of success by influencing public policy, and threatening established interests (Meyer and Staggenbord 1996:1635–1640)". The elite of these interests then responds to this threat by fostering countermovement to protect their interests by opposing or containing the challenging social movements (Pichardo 1997:23). As noted by Gale (1986:207), these countermovements "typically represent economic interests directly challenged by the emergent social movement." The countermovement organizations that emerge take the form of elite-driven efforts to mobilize economically impacted populations, or populations that share similar interests or ideologies (Gale 1986:207; Pichardo 1997). From this viewpoint, social movements are attempts to alter social structures through the promotion of an alternative field frame, and countermovements are efforts to maintain the currently dominant field frame. Each of these efforts aims to define the cultural orientation of civil society to maintain or change the common sense of society regarding a particular field frame. These take the form of policy narratives that either support or oppose change to the status quo (Stone 1997). In the case of the CCCM, one key tactic is to support non-decision making, thus deferring change and preserving the status quo (McCright and Dunlap 2010).

A key analytic technique to understanding the overall structure and dynamics of a political conflict is network analysis. Organizations are embedded and act within a larger organizational field (Ferguson 1998:598; Lounsbury, Ventresca, and Hirsch 2003; Minkoff and McCarthy 2005:291). Network analysis allows for an analysis of the structural relations of interactions between organizations. This type of analysis is predicated on the belief that social ties exert a powerful influence over organizational activities (Kilduff and Tsai 2003; Knoke 1990; Knoke and Yang 2008; Wasserman and Faust 1994). It is these relationships that affect the nature of perceptions, beliefs, and reciprocal behavioral expectations of collective behavior. By channeling resources, communications, influence, and legitimacy, social networks create shared identities and collective interests, and thus promote a common cultural orientation (Knoke and Yang 2008:6; Gulati and Gargiulo 1999:1440). The creation of a network of organizations is a critical step in the generation of collective action. Power in this network is based on the ability to control the flow of information or other critical resources. Positions are stratified according to the dependence of other positions on them for access to these essential resources (Cook and Whitmeyer 1992; Knoke 1990:9). Most interorganizational networks are composed of a core group of dominant organizations, which garners the majority of resources and peripheral organizations that are marginally linked to the network. This network of organizational interactions creates a shared worldview that defies a series of community expectations. These interactions define the boundaries of the network and create a unique system of interaction that takes the form of a coherent and well-demarcated community (Fuchs 2001:272–275). In the case of climate change, this takes the form of the CCCM.

The examination of the structure and dynamics of organizational fields in politics was taken up by Laumann and Knoke (1987). In their book, *The Organizational State*, they adopt an organizational perspective, in which the "assume that corporate entities – such as trade associations, professional societies, labor unions, public interest groups, government bureaus, and congressional committees – are the key state policy-domain actors (Laumann and Knoke 1987:9)." Accordingly, they focus on the interorganizational networks of action. To chart these networks of action, a number of scholars have focused on the structure and activities of political coalitions (Adams et al. 2008; Beamish and Luebbers 2009; Grossmann 2014; Lichterman 1995; Murphy 2005; Poloni-Staudinger 2009; Shaffer 2000; Van Dyke 2003). Coalitions define formalized and regular patterns of cooperation in the development of collective action. So they can be seen as providing an empirical indicator of the extent and boundaries of an organizational field (Murphy 2005:237). Coalitions are key components in the creation and maintenance of collective action (Van Dyke and McCammon 2010; : xii). These studies have shown the importance of coalition formation by organizations in the development and coordination of political action and the adoption of specific policies by governments (Downie 2019:16; Rhodes 2006; Sabatier 1998; Sabatier and Jenkins-Smith 1993) . In addition, there have been several studies that attempt to examine coalitions across an entire organizational field (Meyer and Corrigall-Brown 2005; Murphy 2005; Park and Thelwall 2008). What these approaches illustrate is the emergence of a conceptual approach based on the use of coalitions to map an entire political movement.

The Development of Climate Change Countermovement Coalitions

Applying this perspective to the political and cultural conflict over climate change enables us to view this contest as a political and cultural dispute over the appropriate field frame that governs energy policy (Knight and Greenberg 2011, McCright and Dunlap 2000:503). Although the CCCM is comprised of actors with multiple interpretations of how best address climate change, the defining characteristic is a focus on opposing any legislative attempts to enact mandatory restrictions on carbon emissions (Brulle 2014). Advocacy of this field frame animates and defines the CCCM.

The CCCM first emerged in 1989, just after the formation of the Intergovernmental Panel on Climate Change (Antonio and Brulle 2011). Conservative think tanks (CTT) began addressing climate change. A growing body of literature has extensively documented the role of CTT in the development and promulgation of arguments designed to "support the conservatives' advocacy of inaction" (McCright and Dunlap 2000:510) on climate change. These arguments are promulgated by many means including the provision of Congressional testimony, publication of documents on these organizations web, the publication of conservative anticlimate change editorials, and writing books critical of the need to address climate change sites (Dunlap and Jacques 2013; Elsasser and Dunlap 2013; Jacques, Dunlap, and Freeman 2008; McCright and Dunlap 2000, 2003; Neubauer 2011).

In the following thirty years, the CCCM has grown to include a number of organizations, including corporations, trade associations, conservative think tanks, philanthropic foundations, advocacy groups, lobby groups, and public relations firms, with their viewpoints being promulgated by a network of blogs and media outlets (Dunlap and McCright 2015). These various organizations act in different political and cultural arenas and employ different time horizons to achieve a range of objectives. For these reasons, we cannot refer to the organized efforts to block or delay climate action in monolithic terms. Rather, these efforts form an amalgam of loosely coordinated groups that can be understood as a countermovement. This integrated network of organizational relationships (sometimes termed the "denial machine") exists to influence the public, media, and political arenas to slow or stop climate action (Barley 2010; Brulle 2014; Brulle 2018; Covington 1997; Dunlap & McCright 2011; Farrell 2016a, 2016b).

Political coalitions form a crucial element in creating the institutional capacity of the CCCM to develop and carry out political activities. Downie (2019:235) shows that these coalitions "act as a command center bringing together members of different organizations to pool resources, share wider information and mediate conflicts to achieve a common purpose within a wider network." Some of the first activities of the CCCM were led by the Global Climate Coalition. The Global Climate Coalition was founded in 1989 and immediately engaged in actions opposed to mandatory carbon emissions, and started to cast doubt on the veracity of climate science. This was quickly followed in

1991 by the formation of the ill-fated Information Council on the Environment, and the Coalition for Vehicle Choice. Since that time, at least twelve similar coalitions have emerged. Table S2 in the Supplemental Material provides a short description of each coalition.[2] These coalitions and the time span in which they were active are provided in Figure 1.

These coalitions have played an important role in shaping public discourse about climate change through the funding of advertising campaigns and coordinating member organization advocacy efforts (Downie 2019:28). Overall, creating and utilizing coalitions is a key strategy of corporations and their affiliated trade associations to influence the policy decision process. Creating a coalition enhances the legitimacy of a given policy position by demonstrating wide organizational support for that position. Additionally, by pooling resources in a coalition, the overall influence of the member organizations is significantly enhanced (Downie 2019:32). In his detailed analysis of four coalitions that were active in the energy policy arena, Downie (2018) shows that these coalitions played an important role in facilitating policy outcomes favored by fossil fuel interests.

Yet for the most part, these coalitions remained unexamined, or only single coalitions are identified as important actors in a particular policy contest. What is absent from these analyses is an overall picture of the structure of how the coalitional structure of the CCCM has developed. As the following analysis shows, many organizations belonged to multiple coalitions over the twenty-

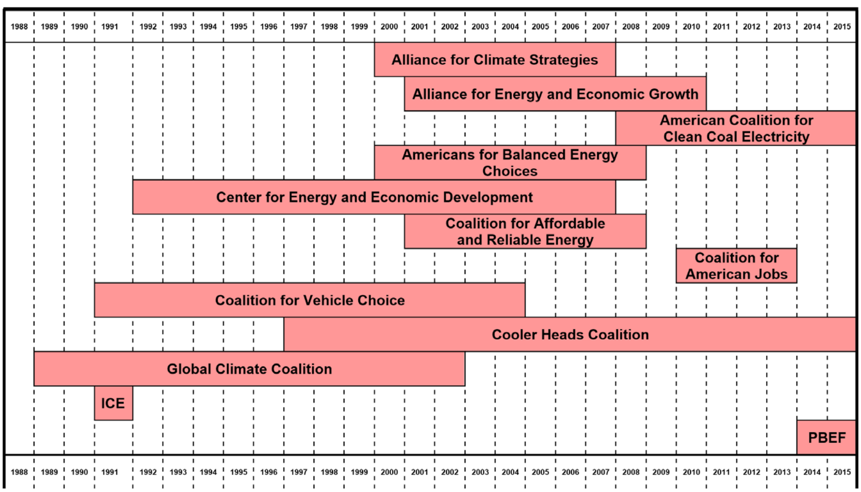

Figure 1 U.S. Climate Change Countermovement Coalitions 1989–2015. [Color figure can be viewed at wileyonlinelibrary.com]

seven-year time period examined, and these various coalitions provide an empirical measure of the extent and structure of the institutional dimension of the CCCM.

Methods of Analysis

The objective of this article was to provide an initial description of the organizational structure of these coalitions. The analysis of the CCCM coalitions begins with a broad characterization of the overall structure of the coalition relationship and sector makeup. This is followed by an analysis of the core organizations that engage in two or more coalitions, including an analysis of the role and positions of individual organizations in the core of the network structure. In this analysis, a cross-sectional approach is taken, in which the sum of coalitional activity is treated as a single entity. This enables the analysis to identify the core organizations that have engaged in multiple coalitions over several years. It also allows for identification of the key sectors involved in this component of the CCCM. This defines two research questions:

1 *What is the overall structure and dimensions of the CCCM?* Included are questions such as: Which coalitions are most prominent? What is the sector makeup of these coalitions at both the individual and overall CCCM level?
2 *What organizations and sectors are most influential and engaged in the CCCM?* The second question focuses at the core level and seeks to answer the following questions: What organizations are most engaged in multiple coalitions? What is the nature of these core organizations? Which sectors are most prominent in the core? and finally Which organizations are the most influential?

To examine these interactions, I focused on a sample of twelve distinct CCCM coalitions. Following Levi and Murphy (2006:544), I define coalitions as "collaborative, means-oriented arrangements that permit distinct organizational entities to pool resources in order to effect change." Thus, coalition is formally defined entities composed of specific organizations. I adopted the widest possible empirical criteria to allow for the full range of coalitions to be examined. The structure of these coalitions ranges from formal organizations with bylaws and IRS 501C(6) status to informal organizations bound only by written agreements between organizations. The only criteria that were common to all of the coalitions were that the coalitions had engaged in efforts to oppose climate action, and there was a mechanism to identify its objectives and membership organizations. This effort resulted in the identification of twelve national/regional CCCM coalitions. To gather data on these organizations, I engaged in a detailed search utilizing several different data sources. A coding procedure was then developed, and each organization was coded into one of twenty-six different sectors. Descriptive data analysis was then conducted utilizing SPSS software, and network analysis was conducted using NodeXL and UCINET. A full description of the methodologies used to identify these coalitions, as well as descriptions and organizational membership of each coalition, coding procedures, and empirical analysis procedures are provided in the methodological Appendix S1.

The Organizational Structure of Climate Change Countermovement Coalitions

The first area of analysis of the organizational structure of the CCCM coalitions focuses on the aggregate network, which includes all organizations that were ever a member of any of the coalitions over the time period 1989–2015. Over this twenty-seven-year time period, a total of 2,020 organizations were members of one or more of the coalitions. These 2,020 organizations created 15,959 distinct yearly connections to the network. This network is illustrated by a sociogram in Figure 2.

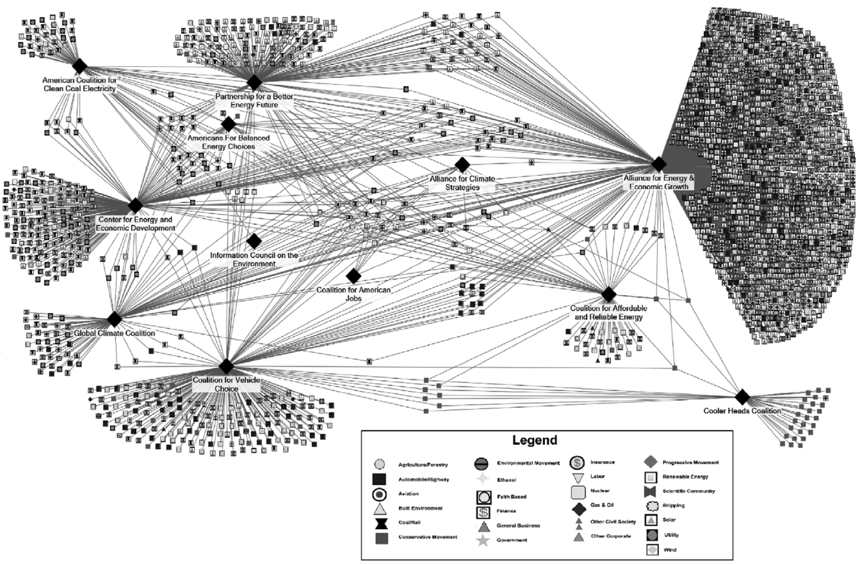

Figure 2 U.S. Climate Change Countermovement Coalitions: Cumulative Network of Organizational Membership 1989–2015.

Table 1
Coalition Composition by Organizational Count

Coalition	Frequency
Alliance for climate strategies	13
Alliance for energy & economic growth	1,416
American coalition for clean coal electricity	68
Americans for balanced energy choices	31
Center for energy and economic development	210
Coalition for affordable and reliable energy	62
Coalition for American jobs	6
Coalition for vehicle choice	206
Cooler heads coalition	36
Global climate coalition	86
Information council on the environment	4
Partnership for a better energy future (PBEF)	179
	2,317

In looking at the twelve specific coalitions, there is a wide variation in the number of organizations involved, ranging from four organizations in the aborted Information Council on the Environment coalition to 1,416 organizations in the Alliance for Energy and Economic Growth. Overall, the median size for the twelve coalitions is 65 organizations. This variation in size reflects the coalition. Smaller coalitions aim at strategic intervention in elite policy circles. Large coalitions, especially those with hundreds of members, seek to mobilize a large number of community business interests to maximize their overall political power (Table 1).

Organizations from multiple sectors were involved. Utilizing the total number of appearances of organizations while accounting for multiple years resulted in the distribution of membership in all twelve countermovement coalitions shown in Figure 3. The sector with the largest overall representation was Other Corporate Interests, closely followed by General Business organizations. This distribution reflects the large number of local organizations that were involved in coalitions that focused on the widespread mobilization of the business community, such as the Coalition for Vehicle Choice (CVC), and especially the Alliance for Energy & Economic Growth (AEEG). Organizations from sectors involved in the production or use of fossil fuels make up about one-third of the organizations involved in the coalitions. Conservative think

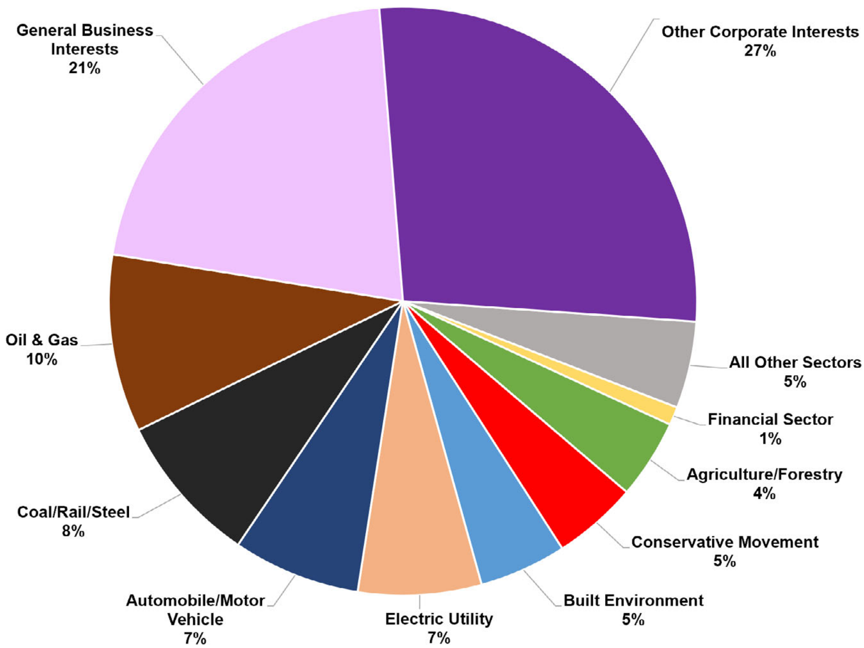

Figure 3 U.S. Climate Change Countermovement Coalitions: Organizational Distribution by Sector. [Color figure can be viewed at wileyonlinelibrary.com]

tanks only make up five percent of the organizations involved in these coalitions. Overall, these coalitions drew their membership from a broad cross section of the U.S. business community.

However, the picture changes when the analysis focuses on the nature of the sector representation within each coalition (Data provided in Tables S5 and S6). At this level of analysis, there is a clear preponderance of organizations from the Coal/Rail/Steel, Electric Utilities, and Oil & Gas Sectors. This is shown in Table 2. Especially notable is the prominence of the Coal/Rail/Steel sector, comprising a major component of eight coalitions. This is closely followed by Electrical Utilities, appearing as a major component in six coalitions, and the Oil & Gas sector in five. Thus, the overall composition of the coalitional structure shown in Figure 2 is driven by the two coalitions (AEEG and CVC). This analysis by particular coalitions shows a different image of the organizational structure of the overall climate countermovement. In this analysis, the fossil fuel-related organizational sectors are more prominent.

Table 2
Major Sector Composition

Coalition	Major sector composition (>10 percent of Coalition)
Alliance for climate strategies	Coal/Rail/Steel, electric utilities, oil & gas, and other corporate interests
Alliance for energy and economic growth	Oil & Gas, general business interests, and other corporate interests
American coalition for clean coal electricity	Coal/Rail/Steel, and electric utilities
Americans for balanced energy choices	Coal/Rail/Steel, Electric Utilities, Oil & Gas
Center for energy and economic development	Coal/Rail/Steel, electric utilities, and other corporate interests
Coalition for affordable and reliable energy	Agriculture/Forestry, coal/rail/steel, conservative movement, and other corporate interests
Coalition for American jobs	Agriculture/Forestry, coal/rail, steel, general business interests, oil & gas, and other corporate interests
Coalition for vehicle choice	Agriculture/Forestry, automobile/motor vehicle, conservative movement, and other corporate interests
Cooler heads coalition	Exclusively conservative movement think tanks and advocacy organizations
Global climate coalition	Coal/Rail/Steel, electric utilities, oil & gas, and other corporate interests
Information council on the environment	Exclusively utility sector organizations
Partnership for a better energy future (PBEF)	Coal/Rail/Steel, general business interests, other corporate interests

To further analyze the relationships between sectors, a single node network analysis was conducted of the sector relationships with all of the coalitions (See Figure S1 and Table S7). This analysis shows that while all of the sectors share membership in coalitions, there is a large extent of shared membership between organizations in the Coal/Rail/Steel Sector and Electric Utilities. The core of the sector representation is comprised of the following sectors:

Coal/Rail/Steel, Electric Utilities, Oil & Gas, General Business Interests, and Other Corporate Interests. The sectors of Nuclear Power, Labor, Shipping, the Conservative Movement, Agriculture/Forestry, and the Built Environment are peripheral in the network. This aligns with the overall distribution of the coalitional structure.

Finally, a single node analysis was conducted to examine the coalition to coalition structure (See Figure S2 and Table S8). The connectivity of the coalition network and the relative position of the individual nodes (coalitions) is represented by the sociogram of coalition–coalition ties. The thickness of the links represents the number of organizations that share membership in both coalitions. As such, it is a measure of strength, with thicker lines representing stronger relations between any pair of coalitions, relative to thinner lines connecting others. The size of the nodes has been scaled to indicate their eigenvector centrality. Thus, larger nodes (coalitions) are those sharing more organizational linkages. The sociogram shows that the coalition–coalition ties center around a few core coalitions: the Alliance for Energy & Economic Growth, the Coalition for Vehicle Choice, the Global Climate Coalition, and the Coalition for Affordable and Reliable Energy. Substantively, the degree and eigenvector centrality scores indicate that these coalitions are central and powerful to the extent that they shared membership with other powerful and central coalitions. By contrast, coalitions such as the Information Council on the Environment, the Coalition for American Jobs, the Partnership for a Better Energy Future, and the Cooler Heads Coalition are peripheral: They share few organizations with other coalitions and have low eigenvector centralities. As such, the sociogram depicts a differentiated/heterogeneous structure of the climate countermovement.

Core Organizations in the CCCM

The second area of analysis of the organizational structure of the CCCM coalitions focuses on the core of the aggregate network. While the analysis of the entire coalitional membership provides important insights into the overall structure of the climate countermovement, it also provides a partial image. The overwhelming number of organizations was only members in one coalition. These organizations are peripheral to the overall organizational structure. In contrast, there are a small number of organizations that participate in multiple coalitions across multiple years. An examination of these core organizations allows for a further in-depth understanding of this countermovement. Accordingly, this section focuses on the 179 organizations that were a member of two or more coalitions over the time period 1989–2015. Utilizing the total number of appearances of these specific organizations while accounting for multiple years resulted in the distribution of membership in all twelve countermovement

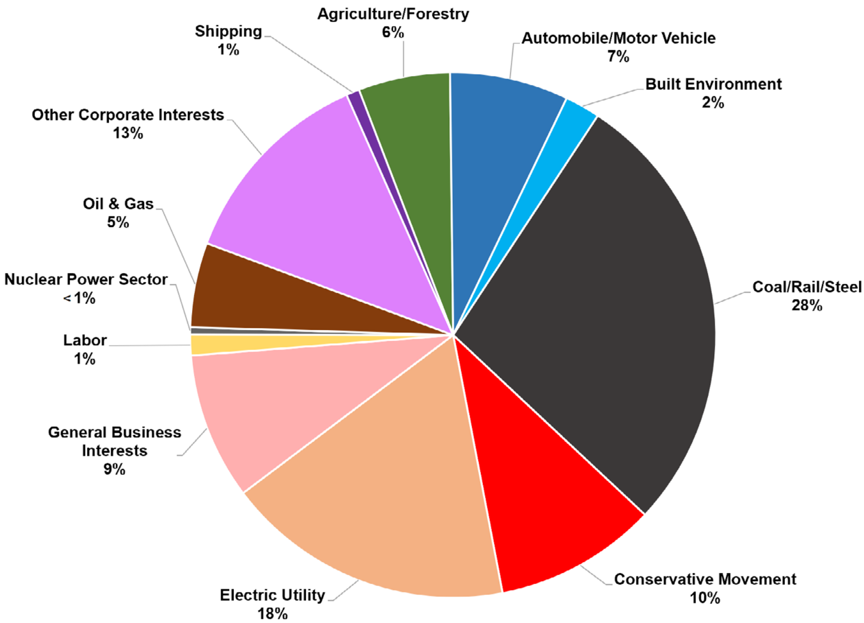

Figure 4 U.S. Climate Change Countermovement Coalitions: Network Core Organizational Distribution by Sector. [Color figure can be viewed at wileyonlinelibrary.com]

coalitions by sector as shown in Figure 4. This analysis presents a much different image of the climate countermovement sector representation than the overall aggregate analysis provided in Figure 3. Other Corporate Interests and General Business organizations drop from comprising 48 percent of the organizational population, to representing only 22 percent. Thus, this core analysis controls for the membership in coalitions that focused on the widespread mobilization of the business community, such as the Coalition for Vehicle Choice (CVC), and especially the Alliance for Energy & Economic Growth (AEEG). The organizational representation by sector increases in Coal/Rail/Steel (8 percent to 28 percent), Electric Utilities (7 percent to 18 percent), and the Conservative Movement (5 percent to 10 percent). Surprisingly, representation of the Oil & Gas decreases (10 percent to 5 percent). Thus, the core of the climate countermovement is made up of organizations from fossil fuel-related organizations, especially Coal/Rail/Steel and Electric Utilities, along with the Conservative Movement. The Oil & Gas Sector, while still represented, is more of a marginal player in the core organization.

Total organizational participation in the core across time is shown in Figure 5 (data provided in Table S9). These totals are shown in Figure 5. Because organizations belong to more than one coalition simultaneously, the total is higher than the number of organizations in the core. This graph clearly shows the buildup of the organizational structure of the core of the climate countermovement, starting very small in 1990, with only a few organizations involved, ramping up to an initial peak in 1997, which corresponds to the battle over the Kyoto Protocol. Then, there is a dramatic increase in the 2001–2004 time period, followed by a slow decline in the 2005–2010 time period. A major decline occurred in the 2007–2009 time period, as two large membership coalitions—the Alliance for Energy and Economic Growth, and the Center for Energy and Economic Development phased out of large membership mobilization efforts and centered on elite influence strategies. Finally, there is a dramatic decline in 2010, which corresponds to the shift in House control to Republicans. As predicted by the existing sociological perspectives on countermovements, once the threat of legislation had passed, the countermovement mobilization levels declined.

The participation by sector also varies across time. The number of appearances by organizations in each sector is shown in Figure 6. This figure clearly illustrates the overwhelming participation in the countermovement coalitions by organizations in the Coal/Rail/Steel sector. This sector's participation is only exceeded once by organizations in the Electric Utilities sector. Organizations from these two sectors constitute the largest component of the countermovement core. Participation by organizations representing Other Corporate Interests peaks from 2002 to 2008, which corresponds to the existence of AEEG, which

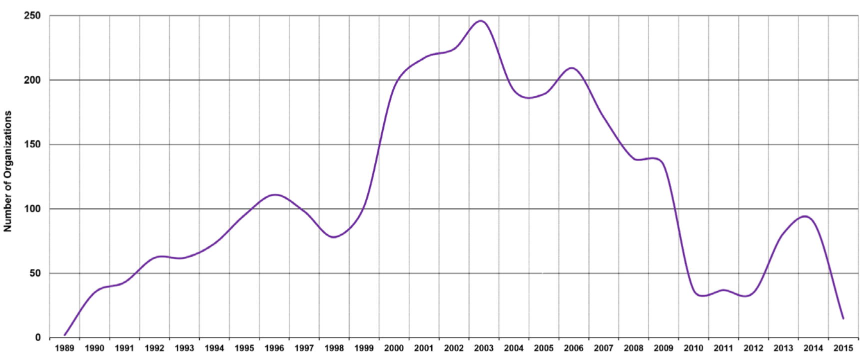

Figure 5 U.S. Climate Change Countermovement Coalitions: Total Organizational Appearances in Core 1989–2015. [Color figure can be viewed at wileyonlinelibrary.com]

followed a strategy of widespread mobilization of business organizations. All of the remaining sectors run roughly in parallel over time. Of particular note is the marginal level of participation of organizations in the Oil & Gas Sector. For most of the time period, this sector is either last or second to last in overall organizational participation in the core.

Finally, to focus on the influence of the 179 organizations in the core, a single node analysis utilizing UCINET (Borgatti, Everett, and Freeman 2002) for further analysis. To determine the relative influence and power of specific organizations within these coalitions, a series of organizational metrics were calculated (Data provided in Table S10). This network was then plotted and is shown in Figure 7. In this presentation, the size of the symbol for each organization is based on Bonacich's power measure beta centrality normalized (Bonacich 1987, 2007). This is based on the idea that both centrality and power are a function of the connections of the actors in an organization's neighborhood. It takes into account the number of other organizations that the specific organization is connected to and the number of connections those other organizations have. This measure combines both power and centrality, and provides an estimate of the overall influence of any organization in the overall network.

What this analysis shows is the strong influence of several organizations. First, there are several organizations in the Coal/Rail/Steel sector that are highly influential, including trade associations in this sector, such as the National Mining Association and the Association of American Railroads, as well as a number of rail and mining corporations, including Norfolk Southern and Peabody Energy. Additionally, there are some highly influential organizations in the electrical utility sector, including these sectors leading trade association, the

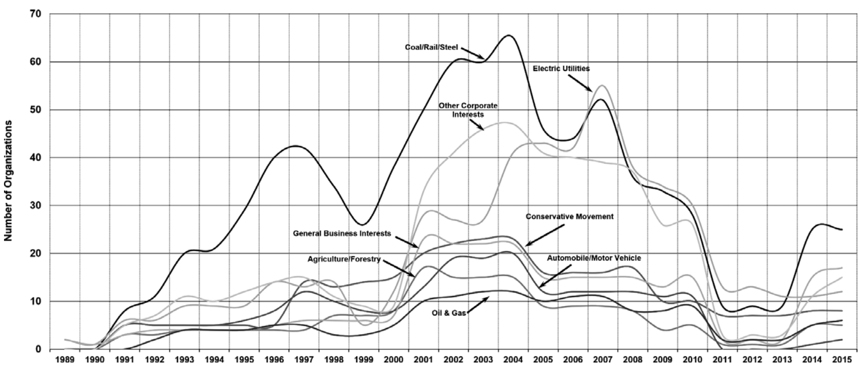

Figure 6 U.S. Climate Change Countermovement Coalitions: Sector Composition—Core Organizations 1989–2015.

Edison Electric Institute, and several utility companies, notably Southern Company and Detroit Edison. Other influential organizations include Caterpillar, the U.S. Chamber of Commerce, the American Farm Bureau, the United Mine Workers, and the National Association of Manufacturers. Oil & Gas sector organizations are more peripheral in this network, with only the American Petroleum Institute achieving a high beta centrality score. Additionally, most of the Conservative Movement organizations are peripheral to the overall network.

Conclusion

By viewing the CCCM as a network of coalitions, this analysis provides a fuller picture of the organizational structure of the opposition to climate action. What this analysis shows is that the CCCM has developed an extensive coalition structure. Most of the organizations involved in these coalitions only belong to single coalition. However, there is a core of 179 organizations that participated in multiple coalitions and forms the organizational core of the CCCM. This organizational core is composed of several organizations that have

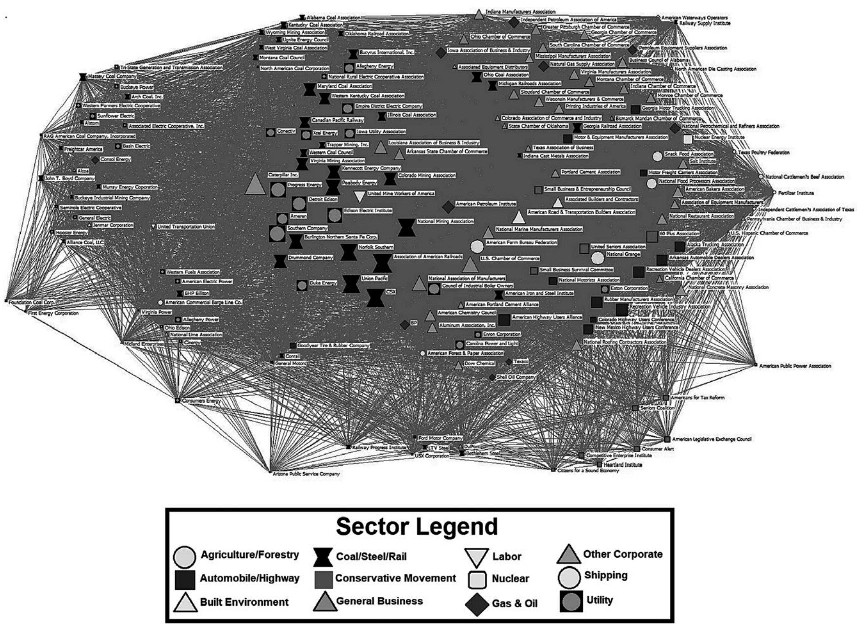

Figure 7 U.S. Climate Change Countermovement Coalitions: Cumulative Core Organizational Network 1989–2015.

participated in multiple CCCM coalitions over several years. The primary sectors involved in the core are organizations based on either the Coal/Rail/Steel or Electric Utilities sectors. Conservative think tanks (CTT) are certainly important participants. But they are significantly less prominent than organizations from the Coal and Utilities sectors. Additionally, the Oil & Gas sector is a more peripheral player in these coalitions than most of the other sectors examined. This is most likely due to the strong role played by the American Petroleum Institute in facilitating a coordinated political response from this sector.

This analysis opens up a wider perspective on the CCCM. The examination of CCTs has provided invaluable information on the role of these organizations in the overall countermovement. However, by adopting a field frame perspective and utilizing network analysis, a much fuller image of the structure of the entire CCCM can be developed. However, this is only a preliminary analysis of the overall structure of this countermovement. First, unanswered is how does this coalition network interact in the larger organizational fields in which these coalitions are embedded. There is another dimension to the CCCM, which includes foundations, public relations firms, and lobbying firms. Further examination of these interactions would start to fill in how this entire countermovement is structured. Additionally, the CCCM is embedded in a much larger political field, which includes government agencies, the climate change movement, renewable energy sector organizations, labor organizations, political parties, and the media. Analysis of the inter-relations between coalitions and these organizational entities would shed additional light on how the overall CCCM operates.

Viewing the political contest over climate change as a field framing dispute enables us to move beyond just seeing the effort to stop climate action as centered on attacking the credibility of climate science. The picture of the CCCM that emerges is one of great organizational complexity, with coalitions and trade associations playing a central role in the development and coordination of oppositional efforts. A fuller understanding of the institutional dynamics of opposition to climate action can enable a more comprehensive viewpoint into this movement. Further use of the theoretical perspectives of field framing and network analysis can inform these efforts.

ENDNOTES

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The Role of Information and Influence Campaigns in Structuring Responses to U.S. Policy 1988–2015."

[1]Detailed narrative descriptions of the actions of each coalition to obstruct climate action are provided at http://www.climatedevlab.brown.edu/uploads/2/8/4/0/28401609/covercountermovementcoalitions.2.2019.pdf

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Appendix S1. Methodological appendix.
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Table S2. Coalition descriptions.
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