

After the vote: Climate policy decision-making in the administrative state

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Abstract

While the science-policy interface has been a major focus of recent climate policy research, the role of agency practices and bureaucratic behavior has been largely overlooked. With a focus on U.S. federal agencies and similar bureaucratic contexts, we review the literature on how administrative decision-making influences the acquisition and application of climate evidence, including information provided by both scientists and stakeholders. We show that administrative procedures (requirements for gathering and analyzing information), agency characteristics (such as mission and institutional design), and bureaucrat attributes (an individual's expertise and values) shape agencies' use of climate evidence. Given the key role of the administrative state in policy-making, our review calls for greater attention to public administration and its consequences for climate responsiveness.

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1. INTRODUCTION

The science-policy interface is a major focus of climate policy research (Beck & Mahony, 2018; Kythreotis et al., 2019). Much of this work focuses on public perceptions of climate science (Howe et al. 2015), organized opposition to climate science (Mildenberger 2020; Stokes 2020), or the usability of climate science in granular application (Moss et al. 2019; Porter and Dessai 2017; Kirchhoff et al. 2015). Despite a wealth of evidence showing that administrative decisions mediate how science is used in policy implementation -- two timely examples being the Trump-era U.S. Environmental Protection Agency (EPA) decision to limit the science the agency could consider in regulatory analyses (Lavelle, 2020) and the Council of Environmental Quality's (CEQ) decision to eliminate "cumulative impacts" analyses from National Environmental Policy Act (NEPA) regulations (Glicksman & Camacho, 2020) -- the role of agency practices and civil servant behaviors is largely overlooked in discussions of climate policy-making.

We review relevant literature, focusing on decision-making in U.S. federal agencies and similar contexts. The U.S. context is useful because it is a well-studied bureaucracy (Meier et al., 2017) and important aspects of U.S. administrative decision-making, such as the requirement for environmental impact analysis, exist in many other countries and subnational contexts (Morgan, 2012). Further, U.S. agencies make many substantively important climate policy decisions, including evaluating climate impacts of planned projects, implementing targeted interventions to address wildfire and pest outbreaks, updating pollutant standards, and monitoring environmental conditions to support adaptation to sea level rise and increasing temperatures (Olander et al., 2012; Wentz et al., 2016). Finally, U.S. agencies operate under elaborate procedural constraints which require them to use scientific evidence in decision-making, making them a best-case scenario for incorporating science into policy.

Agencies must consider evidence produced through scientific methods as well as information stakeholders contribute (Cairney 2016). Thus, we consider how agencies acquire and apply ("use") both types of inputs -- what we term *climate evidence*. We show that *administrative procedures* (i.e., requirements for gathering and analyzing evidence), *agency characteristics* (e.g., mission and institutional design), and *bureaucrat attributes* (e.g., an individual's expertise and values) shape agencies' use of climate evidence -- and therefore their climate policy actions. Our review suggests the climate policy community should pay greater attention to public administration and its consequences.

2. ADMINISTRATIVE PROCEDURES

Administrative procedures typically require U.S. agencies to justify their decisions based on scientific evidence and after public disclosure and consultation (i.e., "notice and comment").

Examples include cost-benefit analyses of new regulations (Dudley, 2020) and environmental impact assessments of agency actions (Fleischman et al., 2020). Bureaucrats typically grapple with diverse, competing perspectives and sources of evidence. Given the multifaceted nature of climate change and tradeoffs involved in major infrastructure decisions, how agencies synthesize competing perspectives is important to understanding climate policy.

Administrative procedures are classically viewed as tools for facilitating regularity and objectivity in decision-making (Porter, 1995). In practice, consultation procedures often yield irregularity in what and how information is factored into decisions. Scholarship highlights three primary sources of variance: (1) efforts by elected officials to use administrative procedures to shape agency considerations; (2) differential access and capacity to participate amongst external stakeholders; and (3) discrepancies in what evidence participants contribute and how agencies use it.

2.1. Elected officials' strategic design and use of administrative procedures

Elected officials often establish administrative procedures in legislation addressing complex, controversial, and uncertain issues like climate change (Gormley, 1986; Waterman & Meier, 1998). They can design these procedures so agencies must at least consider, if not prioritize, interests of particular constituents (McCubbins et al., 1987, 1989). Procedures may require agencies to show conclusive scientific evidence, consult with certain stakeholders, or restrict opportunities for public input so that some players are better positioned to present evidence supporting their case (Hill & Brazier, 1991; McCubbins et al., 1987, 1989; Obar & Schejter, 2010)¹. Elected officials also directly involve themselves in administrative procedures; for instance, Lowande and Potter (2021) show legislators are more likely to submit requests (for information and Congressional hearings) through EPA notice-and-comment periods when ideologically opposed to an EPA-proposed rule. Agencies' ability to make decisions consistent with climate science is likely shaped by how political principals craft and use administrative procedures for oversight.

2.2. Differential capacity to participate in decision-making procedures

The burdens of navigating the rulemaking process (Bryer, 2013) and deficits in expertise and professionalization necessary to grasp technical issues (Ebdon, 2002; Gormley, 1986) often make public participation less than egalitarian. For instance, fishers and other stakeholders attributed their minimal participation in a U.S. regional ocean planning initiative to lack of outreach, meetings held at inconvenient times and places, and perception that their engagement was only intended to be *pro forma* in a process favoring offshore energy interests (Flannery et al., 2018). More generally, older people and white males are more likely than other

¹ The 1948 Administrative Procedure Act and 1970 National Environmental Policy Act (NEPA) are examples of major procedural laws governing agencies' environmental decision-making in the US.

demographics to contribute in public decision-making fora (Einstein et al. 2019; Kittilson 2016). Business groups are more than twice as likely as government entities to comment on federal agency rulemakings, and roughly nine times more likely than public interest groups (Golden, 1998; Yackee & Yackee, 2006).

In contrast, historically disenfranchised groups (Black, Latino, tribal, immigrant, and low-income communities) are more vulnerable to climate impacts (Chakraborty et al., 2019; Rappold et al., 2017; Wilson & Chakraborty, 2019) and more impacted by climate mitigation and adaptation policies (Anderson et al., 2018; Carley & Konisky, 2020)--yet also less likely to participate in procedural processes (Baker et al., 2005; Checkoway, 1981). Extreme weather and disasters caused by climate change can exacerbate existing barriers to participation, further eroding the ability of affected communities to participate in bureaucratic processes (Hamideh, 2020).

2.3. Discrepancies in stakeholders' information provision and uptake

Finally, notice-and-comment procedures provide opportunities for parties to strategically leverage information to sway agency decision-making, essentially constituting a “persuasion game” between regulators and external interests (Libgober, 2020). Accordingly, decision-making processes vary greatly in what and how information is deployed (Costa et al., 2016; Desmarais & Hird, 2014).

Sometimes, notice-and-comment procedures yield local and experiential knowledge (Latulippe & Klenk, 2020; Reyes-García & Benyei, 2019) and scientific expertise (Fleischman & Briske, 2016) that agencies do not have “in-house”. For example, Scholz et al. (2004) describe how understanding California fishers' socioeconomic valuations for different potential marine protected areas helped reduce siting conflicts. However, notice-and-comment procedures can advantage well-resourced (particularly, business) interest groups (Kelleher & Yackee, 2006; Nelson & Yackee, 2012; Yackee, 2006, 2014). Many stakeholders struggle to bring high-quality information to bear. Bryer (2013, p. 263) finds that public comments on federal rulemakings tend to be “emotional, illogical, and lacking in credibility.” Jewell and Bero (2006) show that citizen and health organizations were less likely than business groups to comment on a controversial California public health rulemaking, or to offer technical and legal evidence. In contrast, large firms regularly spend extensively to have comment letters expertly drafted (Libgober & Carpenter, 2018). Diffuse interest groups can seek to overcome their lack of expertise and resources by developing form letters that individual participants can submit, but form letters provide regulators with no new information and can obscure substantive concerns (Balla et al., 2020). The technical nature of climate policy discussions likely exacerbates inequities in participants' ability to weigh in authoritatively.

Further, notice-and-comment processes on highly contested issues such as climate change can become a locus of scientific conflict that parties seek to leverage to their advantage (Yackee, 2019). This contestation may lead agencies to present competing evidence as if it had the same

validity ("bothsidesism") even if best available science suggests such equivalence is false (Kennedy, 2004; Michaels & Monforton, 2005). More generally, while entrenched interests are recognized to have disproportionate *informal* influence on rule drafting (Krawiec, 2013), recent evidence from financial rulemaking shows that businesses that comment during *formal* notice-and-comment procedures "obtain stock returns between 5 and 12 percentiles higher than those that abstained" (Libgober & Carpenter, 2018, p. 1). Given the financial implications of climate policy for industries such as insurance, transportation, and energy, we assume those industries are similarly engaged in rent-seeking efforts.

3. AGENCY CHARACTERISTICS

The characteristics of individual agencies condition the extent they are willing and able to translate climate evidence into policy action, via three drivers: (1) agency mission and its (mis)alignment with political actors' aims; (2) agency design features that shape relationships with stakeholders, and (3) agencies' formal operational practices and informal culture.

3.1. Agency mission and (mis)alignment with political actors

Agencies' actions are shaped by unique missions and mandates as well as how these aims comport with executive priorities, legislative and judicial oversight, and interest group preferences. First, recent work shows agencies produce more rules when their policy mandate aligns with presidential priorities (Potter & Shipan, 2019). Agencies perceived to have liberal missions are more likely to have proposed rules changed or softened during executive review (Bagley & Revesz, 2006; Steinzor et al., 2010), even under Democratic administrations (Haeder & Yackee, 2018). Thus the regulatory approaches environmental and public health agencies pursue based on climate evidence may be influenced by the president's preferences.

Second, agencies' climate actions are shaped by legislators, including congressional committees with oversight responsibility, and the courts (Clinton et al., 2014; Waterman et al., 1998; Whitford, 2005). Congress can pass laws requiring an agency to develop regulations or informally pressure agencies to make or revise rules (Wagner et al., 2010; West & Raso, 2012). Similarly, judicial rulings can shape agency climate analysis and actions (Burger & Wentz, 2019; Squillace & Hood, 2012). Requirements about what agencies must (not) consider about greenhouse gas emissions and other climate issues under existing statutes directly shape how agencies assess environmental impacts (Wentz et al., 2016) and support policy decisions (e.g., accounting for co-benefits of carbon emissions reductions) (Aldy et al., 2021; Thompson et al., 2014).

Finally, an agency's established policy mission can lead to "agency capture," wherein an agency specializes in particular issues and in doing so becomes closely aligned with the preferences of the regulated sectors. Because they may prioritize clientele specified in their original mandate (McCubbins et al., 1987; Ringquist, 1995), agencies that have long serviced

carbon-intensive and extractive industries may either resist or be less able to incorporate climate evidence into decision processes (Culhane, 2013).

3.2. Stakeholder relationships are shaped by agency design features

Organizational design also shapes agencies' relationships with stakeholders. Centralization, funding mechanisms, and method of leadership selection affect the degree of independence public organizations exercise (Eger, 2006; Hollibaugh, 2018; Krause & O'Connell, 2019; Whitford, 2020; Whitford & Miller, 2016). Agency missions further condition relationships with external stakeholders by shaping interest alignments (McCubbins et al., 1987; Ringquist, 1995).

Agency centralization concerns the degree to which decision authority and accountability is concentrated among agents in national offices or delegated to lower-level officials and field offices. Centralized agencies tend to be responsive to national political interests (Wood, 1988). Policy implementation in agencies comprised of decentralized field offices is more responsive to local capacity and political demands (Clinton et al., 2014; Whitford, 2002). Field offices in decentralized agencies vary considerably in their ability and willingness to plan for localized climate impacts (Laatsch & Ma, 2016; Timberlake & Schultz, 2017), translate ambiguous concepts like "resilience" into routine operations (Rodriguez-Franco & Haan, 2015), and resist local political demand for natural resource extraction (Struthers et al., n.d.).

Funding mechanisms and leadership selection likewise affect the extent agencies operate as independent entities versus as extensions of other authorities. For example, Carlson (2012) argues that the California Air Resources Board is able to promulgate stringent air quality standards because its governance structure (an independent board of appointed professionals) and its funding stream (dedicated revenue from regulated entities) help insulate it from political and industry pressures. Similarly, Wood (2014) finds officials in state environmental agencies perceive themselves as more autonomous when their agency relies on revenue gathered through their own enforcement actions instead of state or federal funding.

Evidence from myriad contexts and levels of government highlight incentives arising from different forms of leadership appointment and removal (Hansen et al., 2021; Hessami, 2018; Teodoro et al., 2018). Appointed leaders are especially likely to experience pressure to make decisions consistent with the president's partisan orientation (Auer, 2008; Lowande, 2019; Wood, 1988). Removal protections for appointed leaders, typically linked to whether an agency is controlled by the executive branch or is an independent entity (Selin, 2015), may limit the ability of the executive branch to direct agency climate change decisions.

3.3. Formal operational practices and informal culture

Agencies' internal formal rules and informal norms also guide their decision-making and acculturate bureaucrats to organizational priorities (Oberfield, 2014; Selznick, 1948).

Standardized decision rules govern information flow and shape processing demands (Kaufman, 1957; Simon, 1976). The use of climate science can be limited when it does not readily comport with established decision-making protocols (e.g., time frame, performance measurement, certainty requirements) (Fletcher et al., 2019; Ulibarri & Scott, 2019).

Because formal procedures do not always provide the flexibility needed to accomplish necessary tasks, bureaucracies also develop informal, parallel procedures as heuristics enabling day-to-day functioning (Honig, 2006; Lipsky, 1980; Weatherley & Lipsky, 1977). Bureaucrats may also strategically frame and time proposed rules and consultation processes to maintain discretion (Potter 2019). For example, environmental officials within EPA and the U.S. Army Corps of Engineers used tacit, informal coordination mechanisms to resist externally imposed procedural changes in federal wetland permitting (Arnold and Fleischman 2013). While informal practices might support progressive climate action, they can also stifle innovation. For example, Howlett and Oliphant (2010), describe a case wherein informal decision processes giving greater weight to senior (versus junior) analysts decreased an agency's capacity to innovate in climate change response.

4. BUREAUCRAT ATTRIBUTES

Bureaucratic systems typically give individual civil servants some level of discretion in decision requests for scarce resources or responsive action they should prioritize, minimize, or reject (Maynard-Moody & Musheno, 2003; Riccucci, 2005). Thus, it is important to consider how individual-level constraints and motivations affect bureaucrats' use of climate evidence, along two dimensions: (1) expertise and professional networks as sources of innovative practices, and (2) personal motivations and values.

4.1. Professions as pipelines for innovation

Bureaucratic officials' professional affiliations (e.g., scientists, impact assessors, accountant) and expertise can affect the extent to which they consider climate evidence, and how. Bureaucrats implementing policy often look to one another for examples of correct behaviors (Arnold, 2014). A bureaucrat's profession can be a locus of accountability and source of identity and autonomy (Whitford & Miller, 2016). Professional organizations and networks can offer officials opportunities to learn of and embrace innovation (Teodoro, 2009, 2011, 2011; Siciliano, 2017). For instance, Arnold (2014) finds that wetland managers are more likely to apply best available science when they have greater communication with professional peers.

However, the complexity and transdisciplinarity of climate change may make it hard for existing professions to centralize climate considerations as a core feature of their members' identity or practice. Thus, the emergence of "climate-centered" professional networks is probably necessary to realize the benefits of professionalization -- including finding new ways of accessing and integrating climate evidence. Such network strategies can enhance potential for

innovation through information exchange: for instance, agricultural extension agents can develop communities of practice around climate change adaptation by “boundary spanning,” engaging one another, producers, and researchers in “climate learning networks” (Diehl et al., 2015).

4.2. Personal motivations and values

Bureaucrats’ behavior is shaped by more than external incentives. Empirical evidence shows that most government workers are motivated to serve the public (Christensen et al., 2017; Perry et al., 2010) and seek programmatic effectiveness because their own preferences or professional backgrounds align with programmatic goals (Meier & O’Toole, 2006). Bureaucrats’ personal values and perceptions of clients shape discretionary choices (Baviskar & Winter, 2017; May & Winter, 2007; Fineman, 1998). Hoover and Stern (2013), for example, highlight how U.S. Forest Service officials’ personal (dis)inclination towards conflict affects the extent to which they engage the public when performing National Environmental Policy Act reviews. This literature suggests that officials are more apt to integrate climate evidence into decision-making when they believe doing so will produce better societal outcomes, personally value these actions, and view favorably clients who would benefit from this action.

Despite pressure from political principals and special interests, bureaucrats in agencies like the EPA exhibit strong commitments to principles when enforcing clean water and air standards (Ozymy & Jarrell, 2015; Ringquist, 1995; Wood, 1988). But motivations and values cut both ways. Regulatory capture, described earlier in the context of agency mission, can also occur at the individual level, wherein appointees and civil servants develop close relationships with stakeholders in particular sectors, and those ties substantially shape regulatory content (Furlong, 1997; West, 2004, 2009). Input provided through these relationships may not only affect the content of a specific decision, but may shape how decision-makers understand and tackle a concern (Amara et al., 2004; Beyer, 1997; Koontz, 2019).

5. DISCUSSION AND CONCLUSION

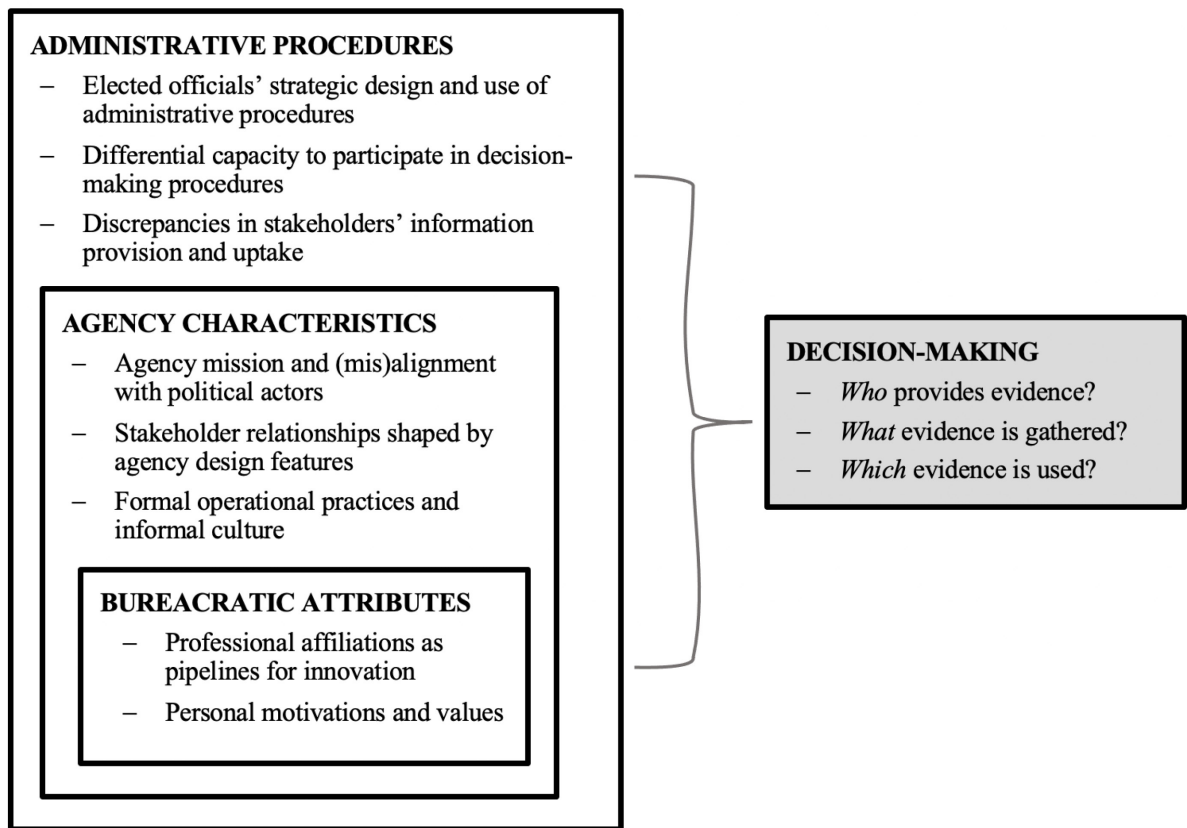
Federal agencies’ use of climate evidence is shaped by administrative control devices and by attributes of agencies and the civil servants who run them. Political demands and bureaucratic mandates affect how agencies compile, count, and deploy climate evidence, and arbitrate the policy preferences of scientists, politicians, interest groups, and the public. Measurement and counting are political exercises (Stone, 2002) and knowledge production is shaped by the institutions, organizations, and individuals involved in research and policy analysis (Ascher et al., 2010). This review reinforces the argument that actionable climate science is insufficient for mediating value-based disputes about legitimacy, fairness, equity, and other priorities (Sarewitz, 2004). By assessing the sociopolitical elements shaping agency decision-making, we identify an important yet overlooked research agenda concerning the constraints, judgment, and capacity of public agencies and public servants making everyday climate policy decisions. Making climate

evidence “usable” requires better, more specific knowledge about *users* and their institutional environment.

Figure 1 synthesizes our findings and sketches an overarching research agenda for administrative climate policy decision-making. Our outcome of interest (gray box) concerns *how climate evidence - including scientific evidence and information provided by stakeholders - is used in decision-making*. Who participates, what evidence is gathered, and which evidence is incorporated into climate policy decisions are key questions.

Figure 1 nests the processes driving agency decision-making. In the outermost box are *administrative procedures* such as evidentiary standards and public disclosure requirements; the middle box describes *agency characteristics*, and innermost are *bureaucratic attributes*. The nesting represents the strong tendency for broader policies and practices to condition or nullify agency-level (or office-level) behavior, and for the same policies and practices, along with agency characteristics, to condition or nullify an individual bureaucrat’s behavior. For example, a national law prescribing admissible evidence shapes a bureaucrat’s ability to defend decisions based on her professional expertise. It is likewise possible that a historically politicized agency or savvy lifelong bureaucrat has developed strategies to make decisions consistent with climate evidence despite higher-order conditions. The three drivers may influence one another as well as the outcome and should be considered together.

Figure 1: Drivers of administrative climate policy decision-making



In closing, we emphasize the need for more research on how bureaucrats’ incentives and constraints compel (repel) effective and inclusive climate action through the use of climate evidence. Although agencies around the world and across levels of government already play an important role in climate policy, we do not know enough about whether, how, and why bureaucrats use climate evidence in decision-making. Advancing public administration research on climate policy is critical because go-to solutions for responding to urgent climate impacts often have involved limiting disclosure and public involvement (Bragagnolo et al., 2017; Carter et al., 2017; Council on Environmental Quality, 2020). Moreover, future climate legislation will be implemented by public administrators. We need to understand how administrative procedures and bureaucratic behaviors shape climate policy outcomes, and design policies in light of this knowledge. We hope researchers and practitioners can use this review as a blueprint to better understand and advance climate policy in the administrative state.

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