



# Evaluating the perils and promises of academic climate advocacy

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## Abstract

What are the causes and consequences of academic climate advocacy in contemporary times? Should it be celebrated and pursued, or derided and eschewed? Does advocacy in various forms tarnish or enhance the reputation of science? This research examined conditions whereby some in academic communities facilitate various forms of engagement relating to their research while others shy away from applications of their work and avoid the “advocate” label. Through an exploratory survey of US-based natural and social science climate researchers/scholars and through analysis of interviews of US-based climate change academic researchers/scholars as part of an “Inside the Greenhouse” and “More than Scientists” collaboration, we explored academic advocacy in a twenty-first century climate communications environment. Among our findings, there was broad agreement that climate change is a pressing issue, yet among social scientists, women are more likely to agree that advocacy should not be criticized than their male social scientist counterparts. Younger respondents were more likely than older respondents to be compelled to change by advocacy from someone with a smaller carbon footprint. Meanwhile, social scientists were more likely than natural scientists to be compelled to change by someone with a smaller carbon footprint. The associated effect of age differences was stronger than the associated differences with profession. Together, we examined these dynamic conditions that animate advocacy opportunities and tensions in the context of contemporary climate change research and engagement. Through conflation

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between advocacy for evidence-based climate science and advocacy for particular policy outcomes (with coincident dangers of individualism and apolitical intellectualism), we found that academic climate advocacy remains an unresolved subject.

## 1 Introduction

What are the causes and consequences of academic climate advocacy in contemporary times? Should it be celebrated and pursued? Alternatively, should it be derided and eschewed? Does advocacy in its various forms tarnish or enhance the reputation of science? How does academic climate advocacy link professional commitments to everyday practices? More generally, these questions draw on fundamental considerations of what is a social contract for science in society. Over 20 years ago, then-American Association for the Advancement of Science (AAAS) President Jane Lubchenco posited that scientists needed to rethink their roles and responsibilities within society in order to capably to confront environmental challenges as they related to climate change, public health, security, social justice, and the economy (Lubchenco 1998). She revisited her call for a re-alignment of scientific engagement to meet the needs of society in 2017 when she named seven reasons why academics are ambivalent about public engagement. Among them, she argued that “We fear our colleagues will criticize us for seeking glory by having our names in the media or label us as (the dreaded) Advocate (That’s spelled with a scarlet letter A!)” (Lubchenco 2017, 100).

Distiguishing between advocacy for evidence-based science and advocacy for particular solutions, she continued, “Scientists are conflicted on the topic of advocacy. On the one hand, they feel a moral obligation to help society deal with important issues but are simultaneously cautioned that tainting science with bias will undermine the credibility of science. I can tell you that many scientists feel that they are not only scientists, but citizens, and that they have a right as citizens to express their opinions about the solutions that they think are the right ones based on both their information, but also their values” (2017, 106). Lubchenco then alluded to consequences of these various positions across a spectrum of advocacy. She commented that some scientists take up the view that “any scientists who voice their own opinions undermine the credibility of all scientists. They believe that any advocacy will compromise all of science” (2017, 106). She then observed, “many scientists choose a middle ground in which scientists offer useful, actionable input to policymakers without making overt recommendations...you can frame answers in the fashion of choices with consequences in which you are not making overt recommendation but are focusing mostly on the scientific understanding” (2017, 106–107).

This study delves into these rich considerations. It examines conditions where some choose to not reach beyond their own specialized research programs while others share outputs of their work as part of their scientific contract with society. The survey data and case-study examples here draw on the US context. However, these dynamics can provide insights into contexts in other places and scales. For instance, Makarovs and Achterberg (2018) have examined relationships between democratization, public engagement, and citizen participation in science-policy issues in 32 European countries. In movements between advocacy and activism, between evidence-based and policy prescriptive recommendations by relevant-experts, inevitably politics, values, and culture pervade. For example, Theda Skocpol has lamented a perceived passivity in climate activism, and has called for more grassroots mobilizations around climate change (2013). These are dynamic and contested spaces where various influencers construct and negotiate meaning while they shape and challenge public understanding and engagement. This is a place where formal climate science, policy, and politics operate at multiple scales permeate the spaces of the “everyday.”

## 2 Literature review

At present, interactions at the contemporary US science-policy interface are highly politicized. Dog-whistle discourses lurk just beneath stances taken for evidence- and science-based decisions. In part, these contentious circumstances have been fueled by the funding from carbon-based industry interests that put seemingly benign advocacy for science and evidence on edge (Brulle 2018). These present conditions are also products of past trends: over time, socially constructed narratives about climate “advocacy” (in its many forms) have woven their way into culture, ideology, politics, and society (Hammond 2017, Nissan and Conway 2018).<sup>1</sup> Furthermore, these influences have inhabited our psychology, where many relevant expert researchers choose to “self-silence” (Brysse et al. 2013, Lewandowsky et al. 2015). Together, we have arrived at a state of affairs in our everyday lives of decidedly or de facto pluralistic ignorance (Geiger and Swim 2016).

Recognizing that scientists are not the only authority on science (e.g., Scheitle et al. 2018), we have arrived at a state of affairs where researchers run the risk of harming their credibility with some audiences when engaging in advocacy for science (Nisbet and Markowitz 2016). Consequently, many climate researchers are wary of discussing climate change so as not to “rock the boat,” not to provoke feelings of jealousy in their colleagues,<sup>2</sup> not to jeopardize their career advancement, and/or to not potentially sacrifice perceptions of legitimacy, authority, and competence (Rapley et al. 2014, Schmidt 2015). As an example of scrutiny and critique on the public arena, Stewart Easterby lambasts scientists-as-advocates in an opinion piece called “Climate Activists are Lousy Salesmen” in the *Wall Street Journal* (2018). Among his critiques and recommendations, he opines, “enlist a convincing spokesman (sic) with a small carbon footprint, tone down the alarmism, and fix the computer models.” Simon Donner has pointed out that there are many risks and responsibilities associated with maintaining and enhancing reputation and power of scientists’ voices in the public arena (2017). Organizationally, the United Nations (UN) Intergovernmental Panel on Climate Change (IPCC) has taken the tact to provide “policy relevant, not policy prescriptive” information about climate change (IPCC 2010, 1). But such prudence and reluctance can run risks of squandering obligations to the public citizenry. Journalist Chris Mooney of the *Washington Post* has observed that present factors have contributed to a “vicious cycle” that has effectively dissuaded people—among them climate researchers—from needed everyday discussions and engagements with climate change (Mooney 2016). Yet, it is important to remember that meeting everyday people where they are requires with some semblance of advocacy and engagement. This advantageously comes from relevant experts who research various aspects of climate change challenges.

## 3 Methods

This study is an initial exploration of the ways the scientific community views its social obligations to advocate for evidence-based climate science as an input in public deliberations about climate change action. The research proceeded in two parts. First, we collected online

<sup>1</sup> Elsewhere, Boykoff has discussed how climate change narratives have emerged, been maintained, contested, amplified, and muffled in the public arena over time through various media portrayals and media representational practices (2011).

<sup>2</sup> Robert Wyss has observed, “Many scientists have not liked show-offs” (2008, 73).

survey data ( $N = 247$ )<sup>3</sup> from February to March 2018. In this survey, advocacy was defined as advocacy for evidence-based climate science rather than advocacy for a particular policy outcome.<sup>4</sup> While this definition does not resolve whether it is viewed positively or negatively in certain audiences (e.g., scientist, policy actors), the definition—and distinctions therein—are consistent with Lubchenco’s statements as well as previous research upon which we build. Responses were solicited from academic researchers and scholars (e.g., professors, postdoctoral researchers, graduate students) self-identified as natural or social scientists. Within these groups, 65.2% were natural scientists ( $N = 161$ ) and 34.8% were social scientists ( $N = 86$ ). Among respondents, 46.5% identified as male, and 53.4% identified as female. Meanwhile, 9.7% of respondents were 18–29 years old, 34.4% were 30–39 years old, 21.5% were 40–49 years old, 17.0% were 50–59 years old, 11.7% were 60–69 years old, 4.9% were 70–79 years old, and 0.8% were 80–89 years old. 44.6% ( $N = 110$ ) self-identified as “very liberal” while 35.7% ( $N = 88$ ) self-identified as “somewhat liberal (Democrat).” We assembled our sample similarly to approaches by Besley et al. (2017). In particular, Besley and colleagues invited participation from five scientific organizational groups: a geological, geophysical, ecological, biological, and a more general scientific society. We drew our convenience sample from societies that support both natural and social scientists, including the Association of American Geographers, the Anthropology & Environment Society of the American Anthropological Association, the Political Ecology Society, the Association for Environmental Studies and Sciences, and the American Institute of Physics.

Twenty-two questions were then asked about their views of climate change advocacy, soliciting responses based on the extent to which they agree or disagree with each statement. These are 7-point semantic differential statements or fixed choices response formats to measure attitudes and opinions. This is adapted from Paulhus (1984) and Likert (1932). These questions allowed us to test the following hypotheses:

H1: Natural scientists and social scientists agree that climate change is a pressing issue in 2018.

H2: Both natural scientists and social scientists agree that climate advocacy can and should be carried out while (1) ensuring optimal use of scientific knowledge in policy, (2) without distorting truth(s), and (3) without endangering long-term credibility and integrity of the academic climate advocates.

H3: Both natural scientists and social scientists are (1) more likely to take advocacy advice from a climate researcher if the climate researchers personally had small carbon footprints, and (2) climate researchers with small carbon footprints are more likely to compel respondents to make changes in their own energy consumption.

H4: Both natural scientists and social scientists agree that academic climate advocacy should not be criticized in these contemporary times.

H5: Both natural scientists and social scientists agree that it is negative that many academic researchers shy away from applications of their work, at times in fear of being labeled an “advocate.”

H6: Younger respondents across natural and social scientist agree that relevant expert researchers should shy away from advocacy.

<sup>3</sup> The survey was conducted through Qualtrics with Human Research and Institutional Review Board (IRB) approval (IRB #18–0111) from the University of Colorado.

<sup>4</sup> This distinction was made in each portion of the Likert scale questions on the survey.

Statements included “academic climate advocacy *can* be carried out while ensuring optimal use of scientific knowledge in policy,” “academic climate advocacy *should* be carried out without endangering long-term credibility and integrity of the academic climate advocates” and “I find it appropriate for relevant expert academic researchers to engage in advocacy for evidence-based climate science” (see Appendix for full list of survey prompts). Following these responses, we offered respondents the chance to provide additional comments that they had in relation to these issues.

Second, to supplement the survey work and to unpack the perspectives and motivations of natural as well as social scientists studying climate change, we analyzed 38 interviews as part of an “Inside the Greenhouse” (ITG)<sup>5</sup> and “More than Scientists” (MTS) collaboration ( $N = 38$ ). More than Scientists is a collaborative activity of the non-profit Climate Change Education Project organization. Led by Eric Michelman, the campaign works to profile motivations, hopes, concerns, and aspirations that prop up the work of climate researchers around the world. ITG principally helps students build competence and confidence to re-tell stories of climate change in ways that are resonant and meaningful for target audiences. The MTS campaign is primarily operationalized through a set of interviews conducted on a growing community of climate scientists sharing their personal views and feelings about climate change. These interviews were then shared publicly through short videos that feature their personal lives and views along with their research. The ITG-MTS interviews analyzed were conducted by undergraduate students at the University of Colorado, and interviewees were climate researchers from the natural and social sciences who work in institutions in the Boulder area. ITG and MTS conducted these interviews and then produced these videos over a 2-year period from 2015 to 2017. These interview data then help to enhance and texture our understanding of advocacy about climate change from scientists’ perspectives.

## 4 Findings and analysis

To analyze survey results, we ran linear regression models and significance tests on the dependent response variables to test for main effects and interactive effects of responses with gender, age categories, and self-identification of professions in the social or natural sciences.<sup>6</sup> We have selected these independent variables to build upon work by Kotcher et al. (2017) and Attari et al. (2016). Due to the non-randomized sampling methodology, sample size, and variance (especially in analysis of sub-group effects [e.g., effect of gender among social scientists]), these quantitative survey findings require further research and contextualization to increase their explanatory value. To provide more texture here, we also analyze the ITG-MTS interviews through a Critical Discourse Analysis (CDA) approach. CDA helps examine the framing of climate narratives in a spatial and temporal context, as well as account for subtle factors that shape their

<sup>5</sup> Inside the Greenhouse was co-founded and is co-directed by three professors at the University of Colorado Boulder (one of whom is also a co-author of this paper): Professor Rebecca Safran (in the Department of Ecology and Evolutionary Biology), Professor Beth Osnes (in the Department of Theater and Dance), and Maxwell Boykoff (in the Environmental Studies program).

<sup>6</sup> See Appendix for the full 22 survey questions asked of participants, hypotheses, linear regression models, and tests of significance.

storytelling practices in context.<sup>7</sup> We therefore examined the context underlying these interviews while paying attention to framing, salience, ideology, tone, and tenor in the interviews themselves (Carvalho 2008). Through these analyses, the paper traces the contours of what has been referred to as an “engagement gap” in climate change advocacy as it relates to natural and social scientists. Variants of this general notion have also been called a research-practice gap (Han and Stenhouse 2014) or a “science-action gap” (Moser and Dilling 2011).

Table 1 highlights linear regression results from the survey respondents. Survey respondents also provided additional general comments and insights relating to climate advocacy. It was clear from these statements that while evidence-based climate advocacy is viewed as outside of one’s professional responsibilities to some, others view it as a part of the fabric of climate scientific research. For example, a respondent mused, “If you aren’t willing to have your research used for advocacy and practical application, then why are you doing the research?” Other comments delved into the importance of effective public engagement by considering target audiences and communication goals. One scholar noted, “I think that those who are advocating need not only be experts but also be good communicators. Scientists need training to speak with lay audiences.”

Table 1 is a selection of questions and results from the survey that highlight notable findings that relate to our hypothesis. While further analyses follow below, Table 1 generally indicates that there is broad agreement among respondents that climate change is a pressing issue in 2018, that climate advocacy should not be criticized, that it is appropriate for academic researchers to advocate for specific policies, and that small carbon footprints are associated with a positive effect on influencing change. However, results suggest important variation based on profession (natural scientist versus social scientist), age, and political affiliation.

Supplementary qualitative analyses of ITG-MTS videos helped then reveal how interviewees chose storytelling and personal narratives to describe how they view the significance of their professional work. For example, Professor Mark Serreze discussed his first research trip to the Arctic in 1982 on northern Ellesmere Island as both an inspirational and catalyzing experience. He recounted, “It was within one minute that I stepped outside the plane I knew this is what I wanted to do.” As another example, interviewee Professor Waleed Abdalati brought climate change “home” when he responded to a question about his research on glacial melt in Greenland and the Arctic, saying, “we all care about our kids. How do we ensure the best future?” He then shows a “Best Dad Ever!” poster made for him by his two daughters that he keeps beside his desk.

This approach of personal storytelling and attention to audience is consistent with what has been found to be effective communication approaches. Van der Linden and colleagues have recommended that effective communication involves, “emphasiz[ing] climate change as a present, local, and personal risk” (van der Linden et al. 2015, 758). These recommendations,

<sup>7</sup> CDA considers artifacts (e.g. texts, representations) as they are situated in context (van Dijk 1988), pays attention to how the constitution of certain discursive frames privileges (and marginalizes) particular ways of knowing, as well as how they structure spaces of interaction (Fairclough 1995). Anabela Carvalho has pointed out that CDA “allows for a richer examination of the resource used in any type of text for producing meaning. It shares with framing analysis an interest in the variable social construction of the world but puts a stronger emphasis on language and on the relation between discourse and particular social, political, and cultural contexts” (2007, 227). Thus, CDA accounts for how meanings are partially fixed as well as negotiated as they are constructed over time (Laclau and Mouffe 2001). The approach captures how representations contribute to discursive narratives that—while anchored to social, economic, and cultural norms—dynamically shape ongoing considerations and actions (Phillips and Hardy 2002).

**Table 1** Coefficients for regression models for responses to climate change advocacy (\* $p < 0.05$ ; \*\* $p < 0.01$ )

Coefficient	Scale of variable	Q1	Q2	Q3	Q4
Intercept	Logit scale	2.99** (0.119)	-1.495** (0.372)	1.740** (0.369)	2.981** (0.264)
Profession	0 = natural scientist, 1 = social scientist	0.104 (0.074)	-0.707** (0.231)	0.525* (0.227)	-0.451** (0.162)
Age	18–89 years, 1–7 segments	-0.015 (0.026)	-0.061 (0.797)	-0.256** (0.788)	-0.092 (0.057)
Gender	0 = male, 1 = female	0.165* (0.071)	-0.249 (0.220)	0.040 (0.218)	-0.095 (0.156)
Political affiliation	Very liberal – very conservative, 1–5 segments	-0.124** (0.040)	0.186 (0.126)	-0.158 (0.125)	-0.263** (0.089)

Table 1 Question 1 (Q1): Climate change is an important issue in 2018 (3 strongly agree, -3 strongly disagree); Q2: Climate advocacy should be criticized in 2018 (3 strongly agree, -3 strongly disagree); Q3: Advocacy from person with small footprint would compel me to change (3 strongly agree, -3 strongly disagree); Q4: I find it appropriate for relevant expert academic researchers to engage in advocacy for particular policies and actions (3 strongly agree, -3 strongly disagree)

emanating from social science research, are consistent with Markowitz et al. (2014) call to carefully consider audience, bring climate impacts “home,” and tell meaningful stories. These approaches then foster a view that, at a minimum, climate change is important. Furthermore, an editorial in *Nature Climate Change* made the case that “protecting science-based policymaking requires engaging the public, not politicians. Cultural institutions and the arts provide non-partisan platforms for communication that can connect scientific climate change data to people’s lives” (2017, 159).

#### 4.1 Support for “talking the talk”

As Table 1 indicates, survey responses pointed to the notion that climate change is an important contemporary issue and that evidence-based climate advocacy can and should be pursued by natural and social science researchers. However, we found differences in levels of agreement based on gender and self-identified professional roles. In other words, women are more likely to agree that climate change is a pressing issue, and social scientists are more likely to agree that climate advocacy should not be criticized. Through additional linear regression analysis, we found that women social scientists are more likely than their male counterparts to agree that advocacy should not be criticized (see Table 1). This finding that female climate researchers are more supportive of advocacy is consistent with previous survey work of female ecologists (Reiners et al. 2013). We also found that while social scientists are more likely to agree that advocacy should not be criticized, they were less likely to agree if the advocacy was for specific policies. Providing further insights, one social scientist respondent called for people to “listen with open minds to evidence” while a natural scientist commented, “I’d much rather have expert academic researchers influencing climate policy rather than career politicians who lack expertise in climate science.”

This evidence is consistent with Kotcher and colleagues who found that “climate scientists can safely engage in public dialogue about policy matters...” “and in certain forms of advocacy without directly harming their credibility or the credibility of the scientific community” (2017, 9). This research also supports their argument that “it is a mistake to assume that *all* normative

statements made by scientists are detrimental to their credibility” (2017, 9–10) and that “climate scientists advocating for action broadly may not harm their credibility” (2017, 12).

This active engagement was consistently illustrated in the ITG-MTS interviews. For example, interviewee social scientist Dr. Paty Romero-Lankao talked about why she conducts her work on preparedness and resilience of cities around the world dealing with the effects of climate change. The ITG-MTS video portrayed this Mexican born and educated scientist as she expressed concern for social justice, where “safety nets are being eroded as we face cascading effects from climate and other challenges.” Corner and colleagues have argued that “accepting that scientists are inevitably advocates for their work helps humanize them. Bringing science out of its academic bubble and into the public discourse allows the people in lab coats and behind data sets to be seen and heard directly; a vital step for rebuilding trust and understanding across society” (Corner et al. 2018, 25).

## 4.2 Support for “walking the walk”

A recent survey by Myers and colleagues documented climate researcher participation in the 2017 March for Science, taking “steps” from talk to action. They found that 89% marched because they wanted more evidence in policy decisions, and most scientist participants stated that they engaged in other science advocacy following the march (e.g., contacting elected officials) (Myers et al. 2018). Exemplification theory holds that concrete cases of influential actors grappling with issues like climate change can significantly influence citizens’ awareness and inclination to act themselves (Gibson and Zillmann 1994). This is the case because such exertions have been found to lower the psychological barriers to engagement (Zillmann 2006). Pro-environmental behavioral engagement though inspirational leadership has been evidenced in numerous studies (e.g., Lin 2013). Furthermore, it has been found that researchers’ understanding of given issues along with the perception of their relevant expertise are strong predictors of their legitimacy in the public sphere (Gauchat et al. 2017). Gauchat and colleagues argued, “Given that polarization extends beyond claims about climate change to perceptions of the scientists themselves, science communication strategies...may require direct engagement by *scientists themselves* rather than relying on the surrogates in the news media or elected officials” (2017, 303, italics in original).

Survey responses across gender, natural/social scientist professions and ages consistently supported our hypotheses that the smaller the known carbon footprint of the natural or social science researcher-as-claims-maker, the more persuasive and inspiring is the evidence-based climate advocacy from them (see Table 1). The effect of low carbon footprint appears to be more pronounced for social scientists than natural scientists and for younger respondents than older respondents. Within the social scientist respondents, we found that the age effect is even more pronounced. However, unlike the associated effect seen for small carbon footprints, larger carbon footprints are not associated with a negative effect on the researcher-as-claims-maker’s evidence-based climate advocacy. Only political affiliations (those self-identified as “very liberal” or “somewhat liberal (Democrat)”) are associated with a negative effect of advocacy from large carbon footprints. These findings cohere in part with Attari and colleagues who examined personal choices by use of public transportation, not intentions to fly (or home energy conservation) (2016). Our research here supported their finding that “differences in perceived credibility strongly affect participants’ reported intentions to change personal energy consumption” (2016, 325). However, they also found that “alleged large carbon footprints can greatly reduce the researcher’s credibility compared to low carbon



footprints” (Attari et al. 2016, 325) while our survey research found unidirectional influence (through low carbon footprints). While self-assessments of behavior may be lacking among climate researchers at times (Bleys et al. 2018), external assessments of how relevant-expert climate researchers taking up advocacy roles clearly remain relevant and important.

Meanwhile, qualitative content analyses found that ITG-MTS videos sought to operationalize exemplification theory by showing how prominent natural and social scientists “walk the walk” in bridging their personal and professional commitments in regard to climate change. For instance, research glaciologist Dr. Mike MacFerrin described extraordinary ice melt in Greenland and exclaimed, “I wish I could just scream and let everybody know how big this is!”

Younger respondents also reported more concern with impacts that advocacy may have on expert authority and reputation. The findings do not then support hypotheses that seniority (and by extension, possibly job security and tenure) provides greater engagement. A survey response from a 20–29-year-old elaborated that “understanding basic climate science and the social, economic, and environmental impacts of climate change is not “advocacy.” It’s our job.” This latter comment is consistent with Hoffman, who observes that “young scholars are seeking more impact from their work” (Hoffman 2016, 89) while it also supports Jane Lubchenco’s remark that “as a senior scientist, I don’t believe that my students should follow the path that I took: establish your scientific credentials first and then begin to be more public” (Lubchenco 2017, 108). This also supports work that identifies the next generation or wave of natural and social sciences “boundary spanning” interdisciplinary researchers (Meyer et al. 2016).

## 5 Discussion

Some in academic communities encourage various forms of engagement relating to their research while many shy away from (creative) applications of their work, at times in fear of being labeled an “advocate.” Others engage in advocacy as what they see as part of their responsibility as twenty-first century climate researchers or because they seek to shift public conversations (Schifeling and Hoffman 2017). In this contemporary US context, particularly on this subject of climate change, choices are made because of a number of interlinked reasons. Among them, many—who already feel overwhelmed by the time-pressures involved in other aspects of their roles as researchers—deprioritize the importance of communication efforts. Others do so at the sacrifice of their core duties of research (Nelson and Vucetich 2009). However, as many relevant-expert researchers calculate both the time investment and value into reaching beyond their academic circles to communicate the relevance and importance of their climate change research, there are consequential and often deleterious impacts on wider public understanding and engagement. Hoffman has argued that “increased engagement is unavoidable in an emerging educational context where the caliber of public discourse has become so degraded and social media is changing the nature of science and scientific discourse within society” (2016, 77).

Nonetheless, reticence can be explained in part by the confusion that surrounds advocacy in academia because of a failure to distinguish between and understand different types of engagement. Many within and outside of relevant-expert academic research communities are puzzled by rules and norms as they relate to individual stances and their representation of their research groups or universities. To date, some universities have innovated through new guides

and expectations relating to public engagement. However, this has entered into codified promotion and tenure incentives in only limited ways. Moreover, some faculty see this push to “responsibilisation” (Goodman 2013, Doyle et al. 2017) of academics-as-communicators as an undesirable new feature of expectations.

So for a number of reasons, many then choose to avoid the treacherous waters of advocacy, broadly construed, for fear of undertow. Others still respond to pressure from one’s scientific peer communities not to over-extend their outreach beyond their own specialized research programs and risk compromising their scientific credibility. They therefore largely avoid advocacy entanglements, especially with this highly contentious and highly politicized issue in the USA. Moreover, some just simply do not have an interest in being engaged with the outputs of their work and therefore shun advocacy, often treating it as a dirty word. Demonstrating this bewilderment and concern with conflation, amid these survey responses one scholar observed, “I think that the relationship between science and policy advocacy is incredibly sticky and fraught.”

Despite these pitfalls, in 2014, AAAS produced a report entitled “What We Know” to articulate where there are areas of common evidence-based understandings about climate change (Molina et al. 2014). At that time, *New York Times* journalist Justin Gillis called the report a “sharper, clearer, and more accessible” explanation of climate change “than perhaps anything the scientific community has put out to date” (Mock 2014). In 2018, as AAAS follows up with plans for a “How We Respond” report focusing on how communities are responding to climate change through adaptation and mitigation strategies, report authors appear to be keenly aware of the thickets of potential conflation between portrayal of varied approaches and advocacy for any one response in particular.

The themes addressed in this study are associated with fundamental challenges perceived and confronted when engaging in climate change advocacy. Among them, rather than treating advocacy as a vehicle to meet people where they are, some erroneously concoct visions of advocacy as an inappropriate exercise of telling others where this *should* be. As an outgrowth of the latter, there is then a tendency to be engaged in practices of naming, critiquing, and shaming instead of bridge-building through diversity and shared values.<sup>8</sup> Illustrating this formidable challenge, Professor Lisa Dilling commented in an ITG-MTS interview, “Let’s not treat climate change as a big fight. Let’s look for opportunities to speak across world views and look for common ground.” Moreover, rather than viewing advocacy as work to “smarten up” and increase sophistication to produce resonant communications, some mistakenly view these endeavors as exercises in “dumbing down” information for public audiences. A survey respondent observed that even determined advocates for evidence-based climate science “can make matters worse if we bring our evidence-based climate science to the general public and do a poor job communicating.” Together, these contradictions and competing approaches can generate attention but then also alienate people from intended engagement with the issues raised.

Furthermore, in championing or chastising advocates and advocacy, there is also a danger of over-individualizing these issues that are fundamentally failures of collective action. In some ways, the survey design and ITG-MTS interview settings provided logical extensions of the consideration that individuals remain the most commonly perceived locus of agency. However, this framing can become problematic when the gaze on the individual advocate actually displaces deeper structural or institutional considerations. Regarding connections between advocacy and advocates, Han and colleagues have commented that paths of engagement “are a function not only of whether people are willing and able to get involved, but also

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<sup>8</sup> See Kennedy et al. (2017) for an exploration of inclusive discursive bridge-building engagement through science festivals.

whether the structure of opportunities offered by a group is appealing to the people the group seeks to engage” (Han et al. 2017, 22). A survey respondent picked up on this when noting that there “are structural and political issues that cannot be reduced to individualistic considerations.” When these approaches overly focus on heartfelt stories of personal motivations and engagements, they run the risk of subsuming political economic and societal dimensions of climate change challenges. Videos like these from ITG-MTS therefore run the risk of reducing economic and environmental movements for change to individual and inadequate (though potentially sincere) acts of caring, commitment, and kindness.

Another set of challenges associated with this study has been the extent to which one can and should be active (but not necessarily activists) and political (but not necessarily politicized). For instance, one survey respondent offered, “Climate science is never advocacy-free. Even the choice of research topics is not value-free and implies the topic should be further understood and acted upon.” In review of effective roles of policy in air quality management in the USA, Sullivan and colleagues stated their explicit aim to enhance public understanding and discourse of the value of evidence-based interventions (through data gathering and analysis) over “partisan opinion and ideology” (2018, 69). They acknowledged these challenges of activism and politicization when they stated, “we increasingly hear public narratives that appear to be grounded in a post-truth world, where empirical evidence and science take a back seat to ideology...perhaps nowhere is this disregard for facts more evident than in discourse on environmental policy” (Sullivan et al. 2018, 72).

## 6 Conclusions

This research works to better understand the contours of what may be a social contract for climate science in the twenty-first century communications environment. It examines these dynamics alongside everyday cultures and practices in the Anthropocene. We have sought to more effectively map out how advocacy for evidence-based science may be pursued in various forms as it operates in this high-stakes, high-profile and highly-contested milieu. In so doing, we have distinguished between advocacy for evidence-based climate science and advocacy for particular policy outcomes, as the conflation of these advocacy approaches has contributed to confusion, individualism, apolitical intellectualism, and restraint. As such, this research has interrogated the dynamic conditions of evidence-based climate advocacy, and has animated advocacy opportunities and tensions in the context of contemporary climate change research and engagement. When those recoiling from spaces of advocacy for evidence-based climate research are the relevant experts who hold insights for useful and informed commentary, these results show that they perhaps should be viewed as missed opportunities for further public engagement.

There are many reasons why academic researchers and scholars may be reticent to engage in forms of climate advocacy. However, additional general comments from survey respondents showed that both natural- and social-science researchers are hesitant to invest time and value into reaching beyond their academic circles to communicate the relevance and importance of their work. This hesitancy effectively contributes detrimentally through inaction to impaired public understanding and engagement. That said, these engagements are not for everyone. Some see these endeavors as new and extra burdens on an already demanding job as a climate scientist. Moreover, some climate scientists may simply be bad communicators. For these reasons and others, many natural and social scientists who conduct research on topics associated with climate change may then not want to step into these dynamic and contentious

arenas. While institutions and universities begin to address advocacy as a subset of public engagement, these complexities must be taken into account.

While science is often privileged as the dominant way by which climate change is thought to be articulated, public understanding and engagement is embedded within a matrix of cultural, social, political, and economic processes that make climate change meaningful in our everyday lives (Boykoff 2011). Evidence-based advocacy effectively takes into account intersecting ways in which experiential, emotional, and esthetic motivations and perspectives inform those scientific ways of researching and knowing about climate change.

This research has sought to advance research by Attari et al. (2016), Kotcher et al. (2017), Fahy (2015) and others, yet clearly more work still needs to be done. Moreover, research into views of climate advocacy are needed in populations of journalists and policy actors among others. Furthermore, while this study sought to understand gender and professional differences, more work could be done to account for relative and absolute numbers of non-male and non-natural sciences advocates for evidence-based climate science. In short, there remain many vagaries in the realm of value-action gaps that warrant further investigations. While survey analysis provided interested effects, the limitations in sampling, sample size, and variance call for further inquiry. Specifically, future research could provide greater resolution of the difference of views on advocacy between gender and political affiliation within academic professions. Additionally, because results suggest less support for advocacy for specific policies, more research could be conducted into specific policies and their advocacy.

Returning to Lubchenco, she closes her “Delivering on Science’s Social Contract” argument by commenting, “which level of engagement you choose is a personal choice, and that you need to think deeply about the issues and make a conscious decision” (2017, 107). Meanwhile, Nelson and Vucetich have argued, “advocacy is nearly unavoidable, and that scientists, by virtue of being citizens first and scientists second, have a responsibility to advocate to the best of their abilities, to improve their advocacy abilities, and to advocate in a justified and transparent manner” (2009, 1090). These ruminations have played out in other critical issues in the past, like advocacy and engagement from scientist who were concerned about implications of their atomic research on nuclear proliferation (Hart and Victor 1993). These are vexing challenges that endure at the interface of science and society. On the topic of climate change, many questions remain. These include, “how do we determine what are the (acceptable) elements of a ‘conscious decision?’,” “what is adequately ‘justified and transparent?’,” and “how we can or should navigate when personal values overlap with professional expertise?” Answers to these questions have tremendous implications on everyday practices, cultures, and communication. Given the stakes, it remains warranted and worthwhile to continue to pursue these considerations in contemporary society.

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