Political and Social Issues

Is it possible to make environmental science relevant to society at-large?

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Abstract

Over the last five U.S. presidential election cycles, public concern about environmental issues has seemingly declined while concerns about national security and economic issues have remained steady or increased. These changes in public attitudes have been associated with decreased attention to environmental issues amongst policymakers, a situation that contrasts strongly with the 1970s when public concern about environmental issues was high and environmental legislation was a U.S. federal government priority. "Framing" has been proposed as a tool that environmental scientists could use to increase the relevancy of their research to U.S. society at-large, thereby helping to change public attitudes and influence policymaking. However, if done haphazardly, some framing efforts can actually have the opposite effect. To combat this weakness, environmental scientists should join with experts in psychology, decision science, and social science to create interdisciplinary teams that can effectively communicate with the public, positively affect public opinion, and make environmental science more relevant and meaningful to society at-large.

Key words: climate change, economy, environmentalism, framing, public policy.

Environmental science is objectively important to humans because we rely on the physical, chemical, and biological qualities of Earth's environment for survival. Through environmental science we learn about how interconnected environmental systems work, how they can affect us and other forms of life, and how we in turn can affect the environment. Given our complete dependence on the environment it would be natural to assume that public policy agendas would mostly, if not always, support both scientific research related to the environment and domestic and international policies to safeguard its overall health. However, recent political developments at the national level in the U.S., including the election of Donald Trump as president, his stated intention to remove the U.S. from the Paris climate agreement, and his push to discard environmental regulations, have made it clear that this is not always the case. Here I compare current prevailing public attitudes about environmental issues in the U.S. to historical public attitudes, discuss how environmental scientists may be able to affect the current situation, and provide some ideas for a path toward enhancing the relevancy of environmental science to U.S. voters and public policy.

Over the past five presidential election cycles (2000-2016), two core values have dominated the public consciousness in the U.S.: national security and economic vitality (Figure 1). In contrast, concerns about environmental issues appear to have somewhat receded into the background (Figure 1). Along with other factors, this shift in public opinion has allowed many politicians to devote their energy to legislating economic and national security issues, while environmental issues have received less attention. For example, in President Trump's first budget outline he proposed cutting the Environmental Protection Agency (EPA) workforce by 20% and the EPA budget by 25% as part of a concerted effort to curtail the implementation and enforcement of environmental regulations (Eilperin and Dennis 2017). These proposed actions have been cheered by supporters who claim they
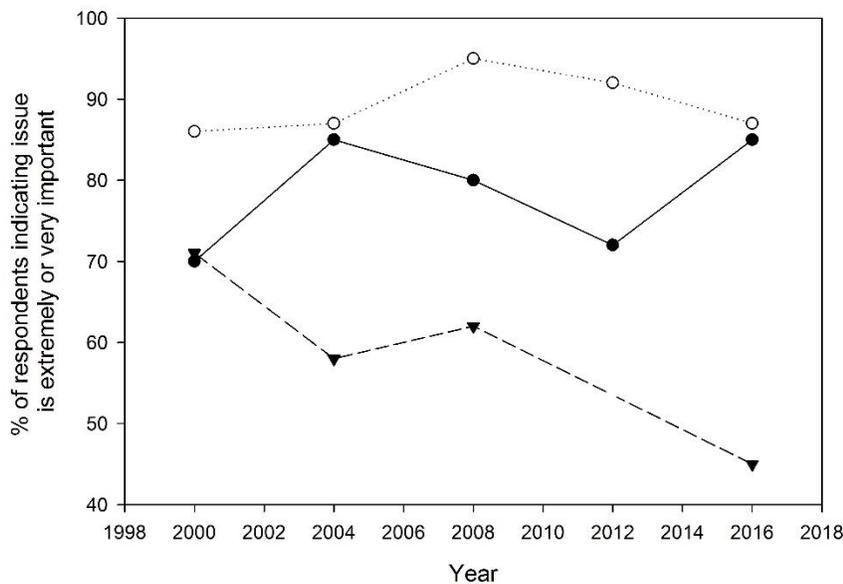
Figure 1. The percentage of respondents to polling by Gallup indicating that the economy (open circles, dotted line), national security (closed circles, solid line) or the environment (triangles, dashed line) are either "extremely important" or "very important" issues across five presidential election cycles. Environment was not part of the poll in 2012. Gallup did not use the exact same terminology across each poll for questions about national security or the environment, so the national security data also includes questions about "national defense" (2000) and "terrorism" (2004, 2008), while the environment data also includes questions about "climate change" (2016).

will encourage economic growth and allow U.S. businesses to thrive (Lipton and Appelbaum 2017) and aligns with polling that shows 68% of potential voters view the EPA unfavorably (Cama 2014). Importantly, Mr. Trump's Republican base is more strongly opposed to environmental regulations than Democrats (Anderson 2017).

The recent lack of concern about environmental protection in the U.S. stands in stark contrast to the 1970s, the period when environmental science saw the greatest public policy successes. The 1970s brought about the birth of the EPA and the creation of many environmental laws, including the Clean Water Act, Federal Environmental Pesticides Control Act, Coastal Zone Management Act, National Forest Management Act, Endangered Species Act, and Toxic Substances Control Act, among many others (Schlosberg and Dryzek 2002). One of the main reasons for this flood of laws and regulations was that polls suggested the environment was the second most important issue to voters (Switzer 1998), helping to spur policymakers into action.

Public concern for environmental issues actually increased in the U.S. during the 1980s (Agnone 2007; Daniels et al. 2012), but the environmental movement stalled politically against concerns about energy security, economic growth, and national security, fueled in part by oil and gas industry lobbying (Schlosberg and Dryzek 2002). Passage of environmental legislation largely continued to decline through the 1990s (Agnone 2007), accompanied by growing polarization between Republicans and Democrats on environmental issues into the 21st century. The percentage of Democrats who said "the country should do whatever it takes to protect the environment" increased between 1994 and 2016, from 85% to 90%, while the percentage of Republicans who held the same view decreased from 71% to 52% (Anderson 2017). Conversely, the percentage of Republicans who said "stricter environmental laws and regulations cost too many jobs and hurt the economy" increased between 1994 and 2016, from 39% to 58%, while the percentage of Democrats who held the same view decreased from 29% to 18% (Anderson 2017). Current polarization amongst voters is similarly reflected in politicians. In the 1960s and 1970s polarization between conservative and liberal politicians was relatively low, but since then the ideological distance between the two groups has approximately doubled (Hare et al. 2014). Indeed, according to some metrics political polarization in Congress is more extreme now than at any time since 1879 (Hare et al. 2014). This shift in ideology and partisanship has undoubtedly made it more difficult to pass any major legislation, let alone environmental legislation.

Given the current state of affairs, it would seem logical for environmental science to strive to re-align itself with the core values of the society and state of which it is a part. This is not to say that certain kinds of science or scientific questions should only be pursued when the cultural currents of society are favorable, but rather that environmental science might benefit from being appropriately contextualized. One popular idea for accomplishing this feat is "framing," a process whereby environmental issues are explicitly presented within a larger context, such as economic, national security, and public health concerns, rather than as environmental concerns alone (Nisbet 2009). Framing is a logical

strategy because theoretically it allows skeptical members of the public to engage with an environmental issue in ways that they find personally meaningful.

One potentially useful frame is economic vitality and opportunity, a core U.S. societal value that cuts across political party lines. Economic framing of environmental issues has already been occurring with the push to monetarily value "ecosystem services," those functions performed by ecosystems that humans rely on such as food production, carbon sequestration, pollination, flood protection, nutrient recycling, and pest control (Daily et al. 1997). By quantifying this natural capital in economic terms, advocates of the ecosystem services approach are attempting to show policymakers and the public how much money can be lost as the environment is degraded. Efforts to understand and improve the valuation of ecosystem services have been ongoing since the 1990s (Daily 1997), and now natural capital is regularly discussed across public and private sectors (Guerry et al. 2015). Though incorporation of the value of ecosystem services into actual policymaking and business plans has been slow, steady progress is being made (Guerry et al. 2015).

All science communication efforts are inherently framed, either intentionally or unintentionally, because it is impossible to entirely divorce a particular scientific issue from the culture and society in which the issue emerged. However, environmental scientists could be more mindful about intentionally framing specific issues to highlight particular narratives or drive public understanding in a desired direction. Such efforts, though, must be carried out with forethought and caution as they can sometimes produce unintended results. For example, in one study people were asked to read news articles that framed climate change as either an environmental, public health, or national security issue and then describe their emotional reactions to the content (Myers et al. 2012). The results showed that the public health frame elicited reactions suggesting support for climate change mitigation and adaptation, but the national security frame made people angry and possibly even more opposed to action on climate change than before. Additionally, word choice, audience demographics, and the structure of the communication technique are factors that always should be taken into consideration. Research suggests that Republican audiences react more negatively to the phrase "global warming" than "climate change" (Schuldt et al. 2011), while presenting environmental information in the context of broad cultural themes rather than individual responsibility may promote more support for a specific policy agenda and government action (Hart 2011).

It is also important to recognize that some people may be resistant to framing or other environmental science communication efforts because of "counter-framing," or organized efforts to subvert the legitimacy of scientific research. In one study, climate change action was positively framed in terms of economic opportunity, national security, Christian stewardship, or public health, but a climate change denial counter-frame was presented to subjects as well (McCright et al. 2016). The results showed that counter-framing reduced acceptance of the reality of climate change for a portion of the participants, likely because of their established political ideologies. This result makes sense in light of theory regarding framing within competitive environments, which predicts that ingrained beliefs and attitudes will weaken the effects of framing efforts (Chong and Druckman 2007).

Overcoming entrenched negative views about environmental action that are reinforced by cultural, ideological, and economic forces (Bernauer and McGrath 2016) will be difficult, and not every environmental scientist may want to take on such a task or even agree on appropriate policy priorities. However, for those who do want to take action it appears that framing will be a crucial tool. Such efforts will require presenting knowledge produced by environmental science to different sectors of the public in a variety of thoughtfully developed frames that are tailored to those specific audiences, each with their own unique values, concerns, and culture. At the same time, environmental science communication efforts cannot become so myopic that current scientific knowledge is presented as absolute certainty (Donner 2017); such efforts would be dishonest regarding the complexity of the scientific process and the plasticity of scientific concepts. This can be a daunting balancing act for individual environmental scientists to accomplish on their own; instead, teams of researchers from different backgrounds and with various areas of expertise (e.g., environmental scientists, psychologists, decision scientists, social scientists) should come together to craft appropriate and effective communication strategies that will reach target audiences and lead to measurable attitude changes on the environmental issue of interest (Fischhoff 2007). Such teams have proven to be effective in the recent past (e.g., Grorud-Colvert et al. 2010), but it is important to recognize that there is no universal template for building these teams, and that making environmental science relevant to society at-large requires an understanding that every audience is indeed unique (Grorud-Colvert et al. 2010).

It would also be wise not to forget the power of message repetition. Frank Luntz, a conservative political consultant, stated in 2003: "There's a simple rule: You say it again, and you say it again, and you say it again, and you say it again, and you say it again, and then again and again and again and again, and about the time that you're absolutely sick of saying it is about the time that your target audience has heard it for the first time" (Donner 2017). This axiom is itself supported by framing theory, which predicts that constant exposure to a particular frame will increase message accessibility within the minds of the target audience (Chong and Druckman

2007). The results of these efforts might not be immediately apparent, but sustained communication across a variety of platforms and audience-specific frames may be the best hope for increasing the relevancy of environmental science to the public and influencing policy agendas in specific ways.

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