Science as a Public Good: Findings From a Survey of March for Science Participants

Ashley D. Ross¹, Rhonda Struminger², Jeffrey Winking², and Kathryn R. Wedemeyer-Strombel³

Abstract
On April 22, 2017, millions of people marched for science in response to a growing sense of urgency for preserving scientific funding and knowledge, both perceived as threatened by the Trump administration. This research note highlights data collected at three marches: Washington, D.C.; Los Angeles, California; and Austin, Texas. We examine marcher motivations for participation, finding the environment, current administration, and science funding were most prevalent. Furthermore, we find the majority of marchers support stances that position science as a public good, including the belief that science informs responsible government policies and the support of government investments in science.

Keywords
March for Science, public goods, science activists, Trump administration, climate change

Introduction
There have been times throughout the 20th century when scientists have organized and publicly advocated for a cause, often with great controversy.

¹Texas A&M University at Galveston, Galveston, TX, USA
²Texas A&M University, College Station, TX, USA
³University of Texas at El Paso, El Paso, TX, USA

Corresponding Author:
Ashley D. Ross, Texas A&M University at Galveston, P.O. Box 1675, Galveston, TX 77553, USA.
Email: ashleydross@tamug.edu
After World War II, scientists spoke out against the nuclear arms race, in the late 1950s they criticized pesticides, in the 1970s they turned their attention to chemical warfare, and in the 1980s climate issues began to take center stage for scientists concerned about the impact of global warming (Barrow & Mark, 2001; Boyer, 1984; Carson, 1962; Gay, 2012; Kuznick, 2004). These topics reflect scientific innovations in response to complex social problems only democratic political processes can solve (Pielke, 2007). Those scientists who recognize a need for advocacy and speak out on issues related to their work, however, risk hurting their scientific credibility. The main concerns are that activism could erode scientists’ status as impartial experts, reflect normative rather than positivist positions, and bring accusations that scientists are self-interested opportunists advocating for a cause to get more funding and prestige (Frickel, 2004; Horton, Peterson, Banerjee, & Peterson, 2015; Kotcher, Myers, Vraga, Stenhouse, & Maibach, 2017; Lackey, 2007, 2016). This research note explores what motivates scientists to take public action in the face of such concerns, and why, in April 2017, a million scientists and their supporters, according to march organizers, publicly took to the streets to march for the sake of science (“By the Numbers,” n.d.)—arguably the largest activist effort by scientists in history.

The Role of Scientists and Motivations for Protest

In 1998, prominent marine ecologist and environmental scientist Dr. Jane Lubchenco issued a call for a new social contract for scientists, arguing that scientists have a responsibility to “devote their energies and talents to the most pressing problems of the day, in proportion to their importance, in exchange for public funding” (Lubchenco, 1998). The following year, UNESCO hosted a World Conference on Science that attracted some 1,800 delegates and resulted in a Declaration on Science and the Use of Scientific Knowledge that pushes an agenda of scientific knowledge for progress, science for peace, science for development, and science in, as well as for, society (UNESCO, 1999). Today there are hundreds of scientific organizations around the world, including national science academies, the American Association of the Advancement of Science, and the Union of Concerned Scientists, all dedicated to advocating for science.

Advocacy, for some, creates a tension with credibility. Credibility is dynamic and multidimensional, co-constructed by the public and scientists (Horton et al., 2015). When scientists display goodwill (i.e., care for society) and expertise (i.e., specialized knowledge), they are considered credible and remain trusted by the general public (Horton et al., 2015; Kotcher et al., 2017). But Lackey (2007, 2016) warns that attention to social relevance may
undermine scientific credibility and advises scientists to focus foremost on
developing and providing technical information in ways that describe the
world accurately and transparently, independent of policy stances. Attaching
science to a specific policy stance can erode scientific credibility (Kotcher
et al., 2017; Pielke, 2007), which is why Pielke (2007) recommends an “hon-
est broker” role for scientists in public policy-making. Loss of credibility
becomes an acute risk among subgroups of the American population includ-
ing conservatives who have become increasingly distrustful of scientists and
their findings (Gauchat, 2012), and whose detachment from science may add
to the political polarization now prevalent in the United States.

Yet, public trust in scientists overall remains high (Pew Research
Center, 2016) and despite potential risks, many scientists are active in
politics and policy debates (Meyer, Frumhoff, Hamburg, & de la Rosa,
2010; National Academies of Sciences, Engineering, and Medicine, 2017).
On an individual level, scientists may be moved to activism by similar
influences on the general public. In their research on energy conservation
activism, Bolsen, Druckman, and Cook (2014) show that collective action
can be generated when individuals have a sense of responsibility for a
cause, as well as when they can foresee the possible impacts of their
actions. Additionally, if a peer group is participating in an activity, indi-
viduals are likely to demonstrate greater interest in the activity even if the
outcome is uncertain (Robison, 2016).

A group’s values and behavioral norms also influence political participa-
tion. Norms for the scientific community have been shifting for decades
(Lubchenco, 1998). There is a clear call for scientists to engage the public
more fully in their research (Lane, 1997) and for scientists as a group to be
more engaged in their communities—beyond their areas of expertise—to ful-
fill their civic duty (Greenwood & Riordan, 2001; Nelson & Vucetich, 2009).
Compounding these shifts in scientific culture are threats to the values of that
group.

Political activism can also be inspired when there is a threat that a valued
policy will be changed (Miller & Krosnick, 2004). In the model of protest
motivation developed by Van Stekelenburg, Klandermans, and Van Dijk
(2009, 2011), “the more people feel that interests of the group and/or prin-
ciples that the group values are threatened, the angrier they feel and the more
they are motivated to take part in protest to protect their interests and/or to
express their indignation” (Van Stekelenburg & Klandermans, 2017, p. 124).
The recent March for Science is a profound example of how threat has a
strong role to play in bringing a group together and inspiring action. Using
this event as a jumping off point, this study asks: What motivates individuals
to become politically active on issues related to science? What perceptions
do activists hold regarding the role of scientists and science in politics and policy?

The March for Science

On April 22, 2017—Earth Day—approximately one million people in more than 600 cities around the world participated in The March for Science (hereafter, “March”) to “improve science outreach and communication, advance science education and scientific literacy, and foster a diverse and inclusive scientific community” (“March for Science Mission,” n.d.). Scientists and their allies united to bring attention to the importance of science for social well-being in a nonpartisan, nonpolitical way (Smith-Spark & Hanna, 2017). The March also called for evidence-based policymaking, with many of these concerns focused on the Trump administration. Not explicitly partisan, criticisms were centered in “concern about valid information itself and its role in public policy, combined with a deep fear about the fate of federal science budgets, which Trump has targeted for sweeping cuts” (Mooney, 2017).

When conservatives took control of the White House and U.S. Congress after the 2016 elections, they put science skeptics and nonscientists in charge of government agencies designed to promote science and revealed plans to significantly cut funding for science—especially projects targeting climate change (Atkin, 2017; Bolton, 2017; Kahn & Magill, 2016; Reardon, Tollefson, Witze, & Ross, 2017). While the threat of budget cuts aimed at scientific endeavors, especially in the social sciences, is not a recent phenomenon (Rest & Halpern, 2007; Sides, 2015), there is a heightened sense of urgency as not only funding, but trust in science itself, appears to be waning and research is increasingly politicized. There is also a growing concern among scientists and their supporters that accessing basic data will become more difficult (Atkin, 2017).

This growing sense of urgency encouraged March organizers to take action in a way that would draw broad public attention to the role of science in our everyday lives (Sneed, 2017). To better understand those marching for science, our research team attended the March in Washington, D.C., as well as satellite marches in Los Angeles, California and Austin, Texas. Combined, these marches drew crowds of some 150,000 activists, per organizer estimates (March for Science, 2017), and provided a data-collecting opportunity to better understand science activism and the role of science in public policy.

Method

The study employed an intercept survey methodology at multiple sites to capture a targeted audience: participants at March for Science rallies. The research
teams in Washington, D.C. and Austin, Texas worked in three pairs to survey March participants; in Los Angeles, California there were two researchers who worked independently. Each location was set up differently in terms of pre-March activities and the March itself. To maximize participation in the survey and ensure that researchers did not canvas the same group of participants, each location leader geographically dispersed surveyors to different zones of the March area. In order to improve representative sampling, all surveyors were instructed to approach every fortieth individual—even if the individual did not look interested—to request participation in the survey (Walgrave & Verhulst, 2011). If the individual declined or was not eligible due to being a minor younger than 18 years, another 40 individuals were to be counted off before an individual was approached. Although individuals were systematically selected to request participation, the limitation of intercept surveys is that they create a nonprobability sample (Butler, 2008). While the random selection of participants in the study was not precise, it was chosen for ease of implementation as the March and its events present a challenging environment for fieldwork—participants are busy with other activities, it is crowded and loud, and the weather was less than ideal (i.e., rainy in D.C.).

There were two versions of the survey—scientist and nonscientist. Both versions of the survey included questions about level of political activity, attitudes toward science and scientists, and perceptions of the media in order to capture attitudes and beliefs relevant to understanding science advocacy and the role of scientists in public policy (Horton et al., 2015; Kotcher et al., 2017). Some questions replicated validated items from the World Values Survey, a 2014 PEW American Association for the Advancement of Science survey, and the General Social Survey. Additionally, scientists were asked a unique set of questions about their research and funding, while nonscientists were asked about their exposure to science and scientists’ work.

**Survey Findings**

We surveyed a total of 203 March for Science participants—93 nonscientists and 110 scientists. Surveyed marchers came from 23 states and Washington, D.C. While 64% of the Washington, D.C. March participants were from Maryland, Virginia, Pennsylvania, or D.C., participants came from 17 other states. At the Los Angeles March for Science, 100% were from California, and 95% of the participants in Austin were from Texas.

We observed many similarities in the background of the respondents (Table 1). The overwhelming majority affiliated with the Democratic Party (72.28%) and reported that they subscribe to no religion (61.22%). Not surprisingly, the majority also cited being “moderately” (56.65%) and “very” (28.08%)
Table 1. Background of Marchers Surveyed.

<table>
<thead>
<tr>
<th>Political and religious beliefs</th>
<th>All, % (n)</th>
<th>Scientists, % (n)</th>
<th>Nonscientists, % (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N = 203</td>
<td>54.19% (N = 110)</td>
<td>45.81% (N = 93)</td>
</tr>
<tr>
<td>Republican</td>
<td>2.48 (5)</td>
<td>0.92 (1)</td>
<td>4.30 (4)</td>
</tr>
<tr>
<td>Democrat</td>
<td>72.28 (146)</td>
<td>71.56 (78)</td>
<td>73.12 (68)</td>
</tr>
<tr>
<td>Independent</td>
<td>10.89 (22)</td>
<td>11.01 (12)</td>
<td>10.75 (10)</td>
</tr>
<tr>
<td>No religion</td>
<td>61.22 (120)</td>
<td>62.26 (66)</td>
<td>60.00 (54)</td>
</tr>
<tr>
<td>Protestant</td>
<td>13.27 (26)</td>
<td>13.21 (14)</td>
<td>13.33 (12)</td>
</tr>
<tr>
<td>Buddhist</td>
<td>6.12 (12)</td>
<td>5.66 (6)</td>
<td>6.67 (6)</td>
</tr>
<tr>
<td>Political activity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very active</td>
<td>28.08 (57)</td>
<td>25.45 (28)</td>
<td>31.18 (29)</td>
</tr>
<tr>
<td>Moderately active</td>
<td>56.65 (115)</td>
<td>58.18 (64)</td>
<td>54.84 (51)</td>
</tr>
<tr>
<td>Voted 2016 presidential election</td>
<td>96.06 (195)</td>
<td>93.64 (103)</td>
<td>98.92 (92)</td>
</tr>
<tr>
<td>Voted 2014 midterm election</td>
<td>81.77 (166)</td>
<td>82.73 (91)</td>
<td>80.65 (75)</td>
</tr>
<tr>
<td>Race and ethnicity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>86.36 (171)</td>
<td>85.85 (91)</td>
<td>86.96 (80)</td>
</tr>
<tr>
<td>African American</td>
<td>3.03 (6)</td>
<td>1.89 (2)</td>
<td>4.35 (4)</td>
</tr>
<tr>
<td>Asian American</td>
<td>3.03 (6)</td>
<td>2.83 (3)</td>
<td>3.26 (3)</td>
</tr>
<tr>
<td>Latino</td>
<td>12.56 (25)</td>
<td>14.15 (15)</td>
<td>10.75 (10)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Associate’s degree or less</td>
<td>17.91 (36)</td>
<td>6.42 (7)</td>
<td>31.52 (29)</td>
</tr>
<tr>
<td>Bachelor’s degree</td>
<td>31.34 (63)</td>
<td>21.10 (23)</td>
<td>43.48 (40)</td>
</tr>
<tr>
<td>Postgraduate degree</td>
<td>50.75 (102)</td>
<td>72.48 (79)</td>
<td>25.00 (23)</td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-24</td>
<td>9.45 (19)</td>
<td>7.34 (8)</td>
<td>11.96 (11)</td>
</tr>
<tr>
<td>25-44</td>
<td>39.80 (80)</td>
<td>41.28 (45)</td>
<td>38.04 (35)</td>
</tr>
<tr>
<td>45-64</td>
<td>41.79 (84)</td>
<td>44.04 (48)</td>
<td>39.13 (36)</td>
</tr>
<tr>
<td>≥65</td>
<td>8.96 (18)</td>
<td>7.34 (8)</td>
<td>10.87 (10)</td>
</tr>
<tr>
<td>Field of work</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture, farming, and fishing</td>
<td>1.12 (1)</td>
<td>3.37 (3)</td>
<td></td>
</tr>
<tr>
<td>Arts and music</td>
<td>3.37 (3)</td>
<td>3.37 (3)</td>
<td></td>
</tr>
<tr>
<td>Banking, finance, real estate, insurance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community and social services</td>
<td>2.25 (2)</td>
<td>12.36 (11)</td>
<td></td>
</tr>
<tr>
<td>Computer programming, information technology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>16.85 (15)</td>
<td>1.12 (1)</td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td>11.24 (10)</td>
<td>11.24 (10)</td>
<td></td>
</tr>
<tr>
<td>Government, public administration, military</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health care</td>
<td>11.24 (10)</td>
<td>11.24 (10)</td>
<td></td>
</tr>
</tbody>
</table>
| Manufacturing, mining, and construction | | | (continued)
politically active. Ninety-six percent said they voted in the 2016 presidential election, and 81.77% reportedly voted in the 2014 midterm election—much higher than national averages. The majority was non-Hispanic White (86.36%), college educated (82.09%), and middle-aged (average age: 44 years). Among scientists, 93.58% had a bachelor’s degree or higher, compared with 68.48% of nonscientists. Furthermore, 81.59% of all respondents were aged 25 to 64 years. Most scientists were from the fields of biology and medical sciences (50.00%), but the earth sciences (11.11%), social and behavioral sciences (11.11%), and engineering (10.19%) were also notably represented. Among nonscientists, those employed in the field of education constituted the largest group (16.85%), followed by computer programming/information technology (11.24%), health care (11.24%), government/public administration/military (11.24%), and media, publishing, and communications (11.24%).

**Motivations to March: Coupled Concerns of the Environment, Current Administration, and Science Funding**

To assess motivations to march, survey respondents were asked: “Name one or two things that inspired you to come to the march today.” Responses to this
open-ended question were recorded in writing by interviewers and later entered into the database. Using a semigrounded theory approach (Glaser & Strauss, 2017), categories were created from emergent themes by the coders. Responses could be assigned multiple categories. Nine categories emerged for which there were adequate intercoder agreement with a Fleiss’ Kappas > 0.6 (range: 0.60-0.98, mean Kappa = 0.74). In order of prevalence of mention, these included: the environment (37.44%), the current administration (30.54%), importance of science in general (25.62%), science funding (19.21%), facts and alternative facts (18.23%), social network (15.27%), the future (13.30%), science and policy (9.85%), and science education (5.42%).

While individuals reported a wide range of motivations for attending the March for Science, including concerns over reduced research funding and the growth of “alternative facts,” three dominant themes emerged from the responses. More than a third of respondents cited concern for the environment (37.44%), followed by concern for the current presidential administration (30.54%). Another quarter of respondents (25.62%) cited motivation to show support for science—to raise awareness of the importance of science or to get people excited about it.

Scientists and nonscientists had slightly different motivations for marching (Table 2). Among scientists, the most common motivators were concern about the current administration (30.00%) and a desire to promote science in general (28.18%). Slightly less frequently than those were three issues: the

<table>
<thead>
<tr>
<th>Scientists % (n)</th>
<th>Nonscientists % (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The current administration 30.00 (33)</td>
<td>The environment 49.46 (46)</td>
</tr>
<tr>
<td>Importance of science in general 28.18 (31)</td>
<td>The current administration 31.18 (29)</td>
</tr>
<tr>
<td>The environment 27.27 (30)</td>
<td>Importance of science in general 22.58 (21)</td>
</tr>
<tr>
<td>Science funding 26.36 (29)</td>
<td>Social reasons 18.28 (17)</td>
</tr>
<tr>
<td>Facts, alt-facts, and misperceptions 23.64 (26)</td>
<td>Facts, alt-facts, and misperceptions 11.83 (11)</td>
</tr>
<tr>
<td>The future 17.27 (19)</td>
<td>Science funding 10.75 (10)</td>
</tr>
<tr>
<td>Science and policy 13.64 (15)</td>
<td>The future 8.60 (8)</td>
</tr>
</tbody>
</table>

Note. Frequency of response shown with number of observations in parentheses. Total number of scientists is 110; total number of nonscientists is 93.
environment (27.27%), scientific funding (26.36%), and the rise of alternative facts (23.64%). For nonscientist respondents, concerns about the environment (49.46%) and the current administration (31.18%) also ran high.

Because respondents were asked to cite one or two motivations to march, it is possible to examine the connections between concerns that motivated individuals to participate in the march. We find important linkages between concerns for the environment, current administration, and science funding. One scientist explained that he feels like

science is not being appreciated for values it provides to society. [I’m] concerned that the government is ignoring contributions of science particularly in how it tells us what’s going on in the natural world and impacts we have on the environment.

Another scientist said that she was motivated to come to the March because of the “denial of climate change [and] rhetoric among the campaigns [as well as the] cutting off of scientific funding.” A nonscientist expressed her motivation as “funding cuts for NSF, funding cuts for [the] EPA, [and] climate change deniers in the White House.” Overall, among scientists who cited the environment as a motivation to march, 43.33% also named the current administration. An equal percentage of environmentally motivated scientists also cited funding for science. Among nonscientists who named the environment as a motivator to march, nearly the same percentage—41.30%—cited the current administration but only 15.22% named science funding.

In all, we find that 60.10% of all respondents cited the environment, the current administration, or funding for science as their top one or two motivations for marching. This indicates that while the March was designed to be nonpolitical, marchers were acting in response to current politics. Their motivations may be interpreted as reaction to an administration that has threatened values and policies they value; President Trump has stripped funding for the Environmental Protection Agency (Letzter, 2017), removed the United States from international climate agreements (Liptak & Acosta, 2017), and appointed individuals to key environmental cabinet positions who reject the scientific consensus regarding anthropogenic causes of climate change (Mooney, Dennis, & Mufson, 2016) and support environmental deregulation (DiChristopher, 2017). The marchers’ motivations may also be interpreted as action to protect science as a public good.

Science as a Public Good

Marchers who participated in our survey were asked if science and technology: (1) make our lives better and (2) create opportunities for future generations. Additionally, we asked if scientific data informs responsible government
policies that serve “the best interests of the people.” Together these questions inform our understanding of how science serves as a public good in the minds of our respondents. Figure 1 shows that on all three questions, more than 89% of both nonscientists and scientists agreed that science benefits our society in these ways. More remarkable is that nearly all respondents (more than 97%) agreed that scientific data is critical for good governance.

Examination of government funding for science is another angle by which to gauge marchers’ perceptions of science as a public good. Participants were asked a series of questions to assess their perceptions of government funding of science (Table 3); overwhelmingly, they supported government investment in science. Approximately 9 of 10 respondents agreed that government investment in research is essential for scientific progress and that the government should spend more on scientific research. Concern for future levels of government support of scientific endeavors were equally high. Interestingly, survey respondents did not see private investment as a substitute for government funding; 54.84% of nonscientists and 61.47% of scientists disagreed with the idea that private investment could ensure scientific progress in the absence of government investment. This underscores that support for science is perceived as a role of government, not the private domain, thereby positioning it in the domain of public goods.

Figure 1. Perceptions of science as public good across scientists and nonscientists. Note. Frequency of agreement with the statement shown is reported by profession. Due to missing data, the sample analyzed for the questions on science making lives healthier and more opportunities for the next generation included 93 nonscientists and 109 scientists. The sample for the question on making responsible policy included 92 nonscientists and 108 scientists.
Perceptions of the Role of Scientists

By the act of marching, Marchers revealed their value of science activism. Their response to questions we posed also demonstrated their support of scientists taking an active role in public policy. When asked to indicate level of agreement with the statement—“scientists should focus on establishing sound scientific facts and stay out of public policy debates”—50.54% of non-scientists completely disagreed as did 44.40% of scientists. Another 33.33% of nonscientists and 36.7% of scientists indicated that they disagreed. Exploring the issue of areas of expertise, we posed a question framed around science and technology. We found that 77.42% of nonscientists and 70.64% of scientists completely agreed that “scientists should take an active role in public policy debates about issues related to science and technology.” Another 18.28% and 23.85% of nonscientists and scientists, respectively, replied they agreed. These responses indicate that most marchers surveyed see the role of scientists as engaging the public—and government—with information and evidence in efforts to promote the most informed policies possible. However, there are some who remain skeptical of this responsibility. Even among the group of respondents that are fully engaged in science advocacy, 16.13% and 18.9% of nonscientists and scientists, respectively, were neutral or agreed that scientists should stay out of public policy debates.

Table 3. Support for Government Funding of Science Across Scientists and Nonscientists.

<table>
<thead>
<tr>
<th>完全不同意</th>
<th>不同意</th>
<th>中立</th>
<th>同意</th>
<th>完全同意</th>
</tr>
</thead>
<tbody>
<tr>
<td>政府投资在研究中是科学进步的必要条件</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>普通人士</td>
<td>0.00 (0)</td>
<td>0.00 (0)</td>
<td>3.23 (3)</td>
<td>7.53 (7)</td>
</tr>
<tr>
<td>科学家</td>
<td>1.83 (2)</td>
<td>0.00 (0)</td>
<td>3.67 (4)</td>
<td>11.01 (12)</td>
</tr>
<tr>
<td>政府应该在科学研究上投入更多资金。</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>普通人士</td>
<td>0.00 (0)</td>
<td>0.00 (0)</td>
<td>3.23 (3)</td>
<td>13.98 (13)</td>
</tr>
<tr>
<td>科学家</td>
<td>0.92 (1)</td>
<td>0.92 (1)</td>
<td>4.59 (5)</td>
<td>16.51 (18)</td>
</tr>
<tr>
<td>我担心未来政府对科学研究的支持水平。</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>普通人士</td>
<td>0.00 (0)</td>
<td>1.08 (1)</td>
<td>1.08 (1)</td>
<td>10.75 (10)</td>
</tr>
<tr>
<td>科学家</td>
<td>0.92 (1)</td>
<td>0.92 (1)</td>
<td>3.67 (4)</td>
<td>2.75 (3)</td>
</tr>
<tr>
<td>私人投资将确保即使没有政府投资也能取得足够的科学进展。</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>普通人士</td>
<td>31.18 (29)</td>
<td>23.66 (22)</td>
<td>18.28 (17)</td>
<td>12.9 (12)</td>
</tr>
<tr>
<td>科学家</td>
<td>28.44 (31)</td>
<td>33.03 (36)</td>
<td>13.76 (15)</td>
<td>11.01 (12)</td>
</tr>
</tbody>
</table>

注：频率响应示例与括号中的观测数。由于缺失数据，样本中有93名普通人士和109名科学家。
This reminds us that despite changing norms of the scientific community, the role of scientists in the political arena is still not agreed upon.

**Discussion and Conclusion**

Based on these preliminary findings, scientists and those who value science were motivated to activism by the feeling that it was their responsibility to stand up and protect science for the good of the public. In doing so, scientist and nonscientist marchers recognize science as a public good that benefits our society and should be funded by the government. How populations understand science as a public good informs how willing they are to promote and defend funding for basic or applied science research as well as science education.

Scientific knowledge may not be an obvious public good but qualifies when it is accessible and available to everyone (Antonelli, 2005). Accessibility can be problematic; even when data collected is made public, information may not be usable or easily understood by nonexperts. Consequently, questions remain concerning the equitable distribution of scientific knowledge (Antonelli, 2005; Archibugi & Filippetti, 2015; Callon, 1994). To further complicate the matter, scientific knowledge is a mix of public and private investment. While the government pays for a great deal of its generation—some 56% of basic research in the United States is funded by federal, state, or local governments (Boroush, 2013)—businesses, universities and colleges, and other nonprofit organizations pay for the rest and protect this knowledge with patents or copyrights.

Our findings indicate the marchers surveyed position science as a public good. They support government, more than private, funding of science, and they perceive scientific knowledge as making lives better, providing opportunities for future generations, and providing information for sound policy making. While the latter perceptions are in line with trends among the general public, recent surveys by Pew Research indicate that there are deep ideological divides for support of government funding of science (Pew Research Center, 2015). This underscores the tension between science and government that often hinges on ideology and politics. Our findings regarding the role of scientists reveal even those engaged in science advocacy are not settled on the appropriate responsibility of scientists in public policy. For science to be a credible resource for society, scientists must be trusted to be without their own political agenda (Suhay & Druckman, 2015; Wilholt, 2010). Unfortunately, many scientific conclusions have become tied to ideological viewpoints (Pielke, 2007), such that the statement of a scientific fact (e.g., that climate change is occurring) becomes a de facto political claim.

The Trump administration’s skeptical approach to climate change and suggested cuts to science funding motivated most of those surveyed to
participate in the March. While our sample makes this connection, it is not clear how much of this group’s reaction is reflected in the broader population. We recognize the data collected are not generalizable; however, they are valuable as an in-depth account of the motivations and perceptions of science activists. Follow up surveys with this sample will allow us to evaluate how durable these perceptions are over time, and a survey of a representative group of American adults will permit us to explore these findings beyond scientists and science activists. It is critical to understand how the American public perceives science and the role of science in public policy as the complexity of the social issues faced and the value divisions (e.g., political polarization) attached to them have increased. In this climate, Pielke (2007) warns that science, on its own, has little capacity for resolving problems. The productive role for scientists, he argues, is as an “honest broker,” focused on the development of new and innovative policy options. The expansion of policy options allows for compromise and, thereby, leads to action in spite of value differences. As scientists grapple with being part of the democratic process, it will be important to identify how differences political engagement and ideology, experiences with citizen science, and perceptions of science and the role of scientists are associated with perceptions of—and advocacy for—science as a public good. The health of our scientific enterprise—and the public benefit gained from this knowledge—is at stake.

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Notes

1. The authors could not have collected data without the following team: Casey Tesfaye, Leanne Streja, Sarah Flanagan, Elizabeth Marchio, Aliyah Wakil, Jeremy Saenz, Mattie Squire, Rachel Martin, Jessica Raterman, and Dr. Tarla Rai Peterson.
2. These were assigned based on the participant’s self-identification as a professional scientist or not.
3. The full questionnaire is available at https://localdisresilience.com/contact/si/
4. For a map of the origins of respondents, see https://localdisresilience.com/contact/si/
5. The U.S. Census Bureau reports that 41.9% and 61.4% of the eligible population voted in the 2014 and 2016 elections, respectively.
6. These scores represent acceptable levels of agreement in all reported benchmark configurations but still warrants some caution in interpretation (Altman, 1991; Emam, 1999; Landis & Koch, 1977). For the analysis, categories were assigned to a response if at least two coders agreed on that category.
7. Due to missing data, the sample analyzed for these two questions on the role of scientists in public policy included 93 nonscientists and 109 scientists.

ORCID iD
Ashley D. Ross https://orcid.org/0000-0002-8415-3383

References


**Author Biographies**

**Ashley D. Ross**, PhD, is an assistant professor in the Marine Sciences Department at Texas A&M University at Galveston where she teaches coastal policy and environmental management courses in the Marine Resources Management master’s program. Her research examines the intersection of public opinion and policy; much of her work focuses on disaster resilience along the Gulf Coast. She is a fellow with the Center for Texas Beaches and Shores and discovery lead with the Institute for Sustainable Communities at Texas A&M University.

**Rhonda Struminger**, PhD, is an assistant professor of the practice at Texas A&M University where she teaches Spatial Project Management. Her current research
focuses on informal science learning at field stations, and on the role of science in a democratic society. She is also co-director of Centro de Investigaciones Científicas de las Huastecas “Aguazarca,” a field station in Calnali, Hidalgo, Mexico.

**Jeffrey Winking**, PhD, is an associate professor of anthropology at Texas A&M University. He has conducted fieldwork among populations in Bolivia, Nicaragua, and the United States. In his research, he employs quantitative ethnographic methods to explore the evolutionary underpinnings of parenting, marriage, and prosocial behaviors.

**Kathryn R. Wedemeyer-Strombel** is a PhD candidate and NSF Graduate Research Fellow in Environmental Sciences at the University of Texas at El Paso. She has a BS in ecology, behavior, and evolution from the University of California, San Diego. Her dissertation work focuses on behavioral ecology of marine vertebrates and the human dimensions of conservation.