Most Americans Want to Learn More about Climate Change

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IF NOT US, WHO? IF NOT NOW, WHEN? American Meteorological Society (AMS) members have long played leading roles in climate science research in the United States and internationally. Many AMS members have served as authors of all five Intergovernmental Panel on Climate Change (IPCC) assessment reports, IPCC special reports, IPCC methodology reports, and all three U.S. National Climate Assessments. Moreover, the AMS and AMS members have also led in efforts to educate the American people about climate change. It is encouraging to see that such efforts are paying off: a majority of Americans now understand and accept the fact that our climate is changing.

In December 2015, leaders of 192 nations made specific pledges for a global effort to limit Earth's warming to no more than 2°C. Furthermore, they declared an even more ambitious aspiration of holding the warming to 1.5°C. While each nation is now responsible to meet its pledge in whatever ways it deems best, one thing is clear: if global warming is to be held to no more than 1.5°–2°C, there is much to be done and relatively little time to do it.

Delays in proactively managing climate change will only mean more difficult decisions and less effective adaptations in the future. AMS members' educational perspective on climate change carries the utmost value and significance in the public discussion today, which is why now is the time to share our science.

A PUBLIC DEMAND FOR CLIMATE SCIENCE. Despite polarizing climate change rhetoric one may hear from pundits, the reality of the American public's relationship with climate change is much more nuanced and much more optimistic. Two out of three Americans say they are interested in learning about climate change, and when the impacts of climate change are translated to local weather impacts, these experiences guide connections to climate change as being real and relatable to all.

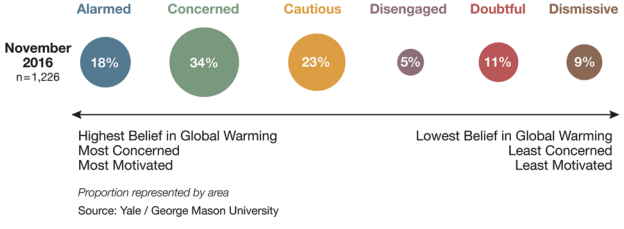

Fig 1. November 2016 Global Warming's Six Americas.

The latest "Global Warming's Six Americas" research by Yale University and George Mason University takes an in-depth view of opinions on global warming and finds even higher degrees of potential interest, indicating an American public amenable to learn more about climate change (Fig. 1). Only 9% of Americans are "dismissive"—that is, those who are strongly predisposed to not accept the findings of climate science. The remaining five segments of the public, even those identified as part of the "doubtful"

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segment, are still listening and willing to learn more about the topic of climate change.

We also note a key distinction frequently neglected in public discussion of climate change: while opinions are often regarded as varied and contentious, opinions are not science. Climate change science, as AMS members can attest, is more objective and far less reactionary than opinions of climate change. Further, and key, climate change science is much less polarized and much more in agreement (see Cook et al. 2016) than is public opinion.

SUPPLYING THE DEMAND: ROOM TO LEARN. If the public wants to hear more and learn about climate change, this naturally creates a demand for more public engagement efforts, particularly when there is room to learn. Though nearly all (97%) climate scientists affirm that human-caused climate change is happening, only around 1 in 7 (15%) Americans are aware of this percentage. In November 2016, a large nationally representative survey by Yale and George Mason Universities found that 7 in 10 (70%) Americans think global warming is happening, while only about 1 in 8 (13%) think it is not. Despite this plurality, there is need for additional educational outreach, as slightly less than half (45%) of Americans were "extremely" or "very" certain of their view that climate change is happening, and only slightly more than half (55%) think that global warming is caused mostly by human activities, a distinct departure from the climate science community.

This departure potentially could be because Americans tend to see harms due to climate change as distant problems—distant in space (i.e., not in my community), time (i.e., not yet), and species (i.e., not people). Thus, such public perceptions are at odds with the climate science community and the findings of the Third National Climate Assessment, which concluded that human-caused climate change is happening here and now and that its negative impacts are already being felt by people in every region of the United States (Fig. 2).

Understanding why most Americans appear to see climate change as a distant problem, despite its immediacy, is an important consideration. A likely reason is how infrequently Americans are exposed to information—or even conversation—about climate change and its impacts. Research from the 2016 Climate Change in the American Mind (CCAM) reports shows that 56% of Americans hear about climate change in the media less than once a month, and 82% of Americans hear people they know talking about climate change less than once a month. This lack of public and interpersonal communication about the issue is quite prevalent, so much so that it is often referred to as the "climate silence." News coverage of the issue—which has always been relatively small—declined dramatically in 2010 and remained low until 2016. Moreover,

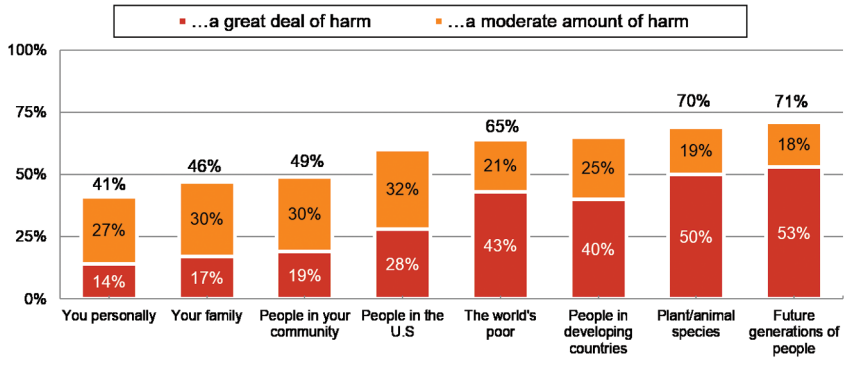

Fig 2. Many Americans see global warming as a distant threat (Leiserowitz et al. 2016).

the proportion of Americans who discuss climate change with their friends and family members has been declining steadily over most of the past decade: from 41% in 2008 to 33% in 2016. Infrequency often implies a lack of urgency; however, this could not be further from the truth.

So, if Americans are not currently hearing much about global warming but they appear interested, who supplies this information? Particularly, *who are Americans willing to listen to? Or, stated alternatively, who do Americans trust as a source of information about global warming?* The answer to this question should be important to AMS members because, according to the March 2015 CCAM report, three of the four most trusted sources are essentially us: climate scientists (70%), other kinds of scientists (64%), and TV weathercasters (60%) (Fig. 3). The only other group that shares equivalent levels of public trust about climate change includes people's friends and family members. However, because only 26% of Americans even address the issue of climate change with friends and family members and a majority of Americans

hear about climate change less than once a month, there is likely not much rich information shared in these conversations. Conversely, AMS members have rich science-based information to share on this topic.

TV weathercasters, one of the four most trusted sources regarding information about global warming, are uniquely positioned to educate the American public about climate change, particularly its local impacts. In brief, they are trusted sources who have extraordinary access to the public (via television, radio, social media, Internet, and community events) and who tend to be highly talented and well-engaged science communicators. In the new era of online and social media news consumption, TV weathercasters are very active and access new and effective communication platforms not often reached by climate science educators.

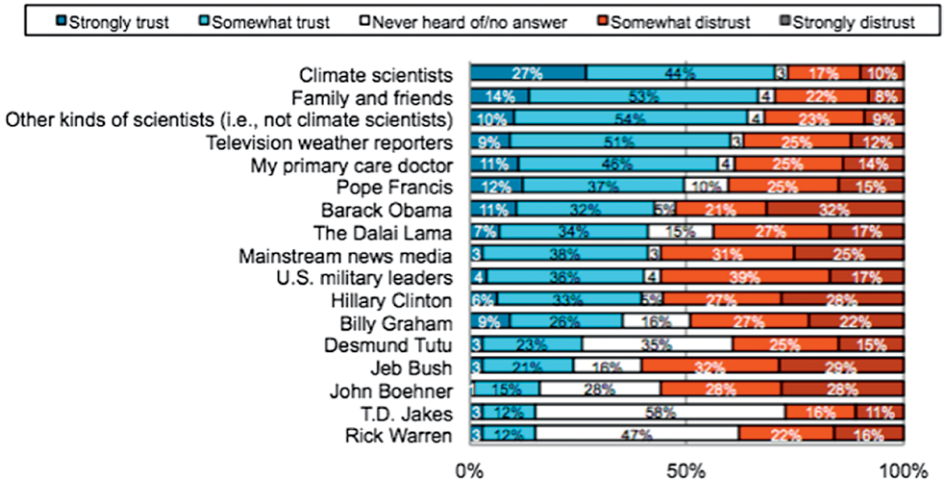

Fig 3. Public trust on the topic of global warming (Leiserowitz et al. 2015).

Here we wish to note that other AMS scientists, especially climate scientists (the public's most trusted sources of global warming information), are important sources of information about climate change topics. Their opportunities to educate the public may not be as obvious as those of TV weathercasters, but they may be equally important. Various organizations—including, but not limited to, the AMS, National Aeronautics and Space Administration (NASA), National Park Service (NPS), U.S. Geological Survey (USGS), National Oceanic and Atmospheric Administration (NOAA), and American Association for the Advancement of Science (AAAS)—are working to create opportunities for climate scientists and related experts to engage and share information with members of the public in various ways. The University Corporation for Atmospheric Research (UCAR), with its Climate Voices (www.climatevoices.org) project, is a notable example of a national organization that supports AMS members and others in sharing climate science through conversations with the broader public.

OUTREACH AND EDUCATION. Effective educational outreach and public engagement is as much about listening—and creating opportunities for people to ask questions—as it is about sharing information. That said, certain facts have been shown to be helpful in engaging members of the public and helping them improve their understanding of climate change. Psychologist Michael Ranney and his colleagues have shown that teaching a few basic facts about "how global warming works" (i.e., the basic mechanisms that influence the planet's energy balance) increases acceptance of climate change among people across the political spectrum. These basic facts have been produced into short animated videos of lengths from one to five minutes that are available at www.howglobalwarmingworks.org.

Van der Linden et al. (2015) have shown that providing quantitative information regarding the extent of the scientific consensus (97%) about human-caused climate change also increases acceptance of climate change among people across the political spectrum. Indeed, they call knowledge of the scientific consensus (i.e., knowledge about what experts know) a "gateway belief" because learning the extent of the scientific consensus positively influences a series of other important basic beliefs about climate change.

Ding et al. (2011) highlight research that has shown the importance of conveying four key ideas: 1) climate change is real, 2) it is human-caused, 3) it is causing serious harm to people, and 4) actions can be taken to limit it and protect against harm. Because Americans tend to see climate change as harming other species more than humans, revealing specific, concrete examples of harmful consequences of climate change (as is done in areas of human health, weather, agriculture, water, transportation, and energy systems

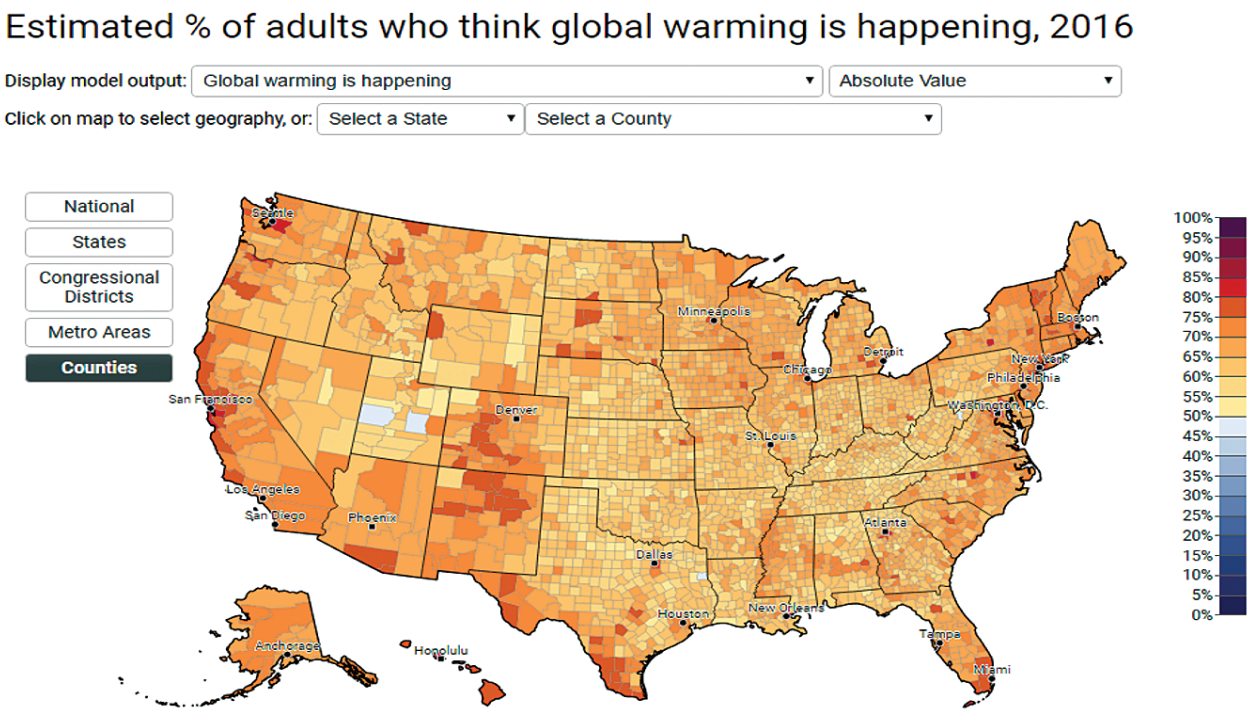

Fig 4. An example map obtained online from Yale Climate Opinion Maps concerning the estimated percentage of adults who think global warming is happening, by county.

in the Third National Climate Assessment) can help people understand climate change in ways that make it more personally relevant.

An intuitive but important thought to keep in mind is that if people do not believe a problem is solvable, they are unlikely to spend time solving it. Most AMS members are expert in matters meteorological, and many are expert in climate science, but they may or may not be expert in climate solutions or be comfortable publicly sharing their views regarding specific climate change mitigation solutions or adaptation strategies. Presenting the problem as solvable, however, can be achieved by sharing the simple message that because a majority of climate change of the past 50 or more years is human-caused, human actions then can be taken that will help limit climate change in the future.

An important new tool for understanding local audiences. Perhaps the most commonly offered piece of communication advice is "know your audience." Researchers at Yale University have given climate educators an important new tool they can use to know their audiences. Based on research published by Howe et al. (2015), the Yale Climate Opinion Maps provide local-level public opinion data—including climate beliefs, risk perceptions, and policy support—in the form of an online map tool (Fig. 4; YPCCC 2016). The mapping tool can be used to display the data at the national, state, congressional district, and county levels throughout the United States. Using these maps to understand local audience perspectives about climate change can help climate educators anticipate and adapt their outreach methods to local perspectives.

CONCLUSIONS. Large numbers of Americans are interested in learning more about climate change, yet the supply of educational outreach is not keeping up with public demand for information. AMS members have an opportunity to engage the public and to help supply accurate, unbiased climate change science, thereby lowering the potential "costs" for everyone.

This high degree of public trust in climate scientists, "other" scientists, and TV weathercasters as sources of information about global warming is something that should not be taken lightly. It is an honor that has not appeared overnight, but rather, something that has been earned through many careers dedicated to rigorous science. AMS members need to view this as an opportunity, if not an obligation, to try to help the public become more knowledgeable about an issue that is reshaping the physical and social world about them.

FOR FURTHER READING

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