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The role of belief, trust and values in communicating controversial geoscience topics

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Conceptual understanding is an important goal for many geoscience educators. However, several potentially controversial topics, such as evolution, climate change and energy extraction, also require an understanding of how the role of belief, trust and values determine whether non-scientists believe scientific consensus. When the value of science is pitted against values, such as family, religion, and jobs, we find that many in the general public align with those who deny or minimize the consensus scientific view. This is despite nationwide polls in the United States which show that scientists are highly trusted and believed, with values of trustworthiness exceeding 80%. However, there is a glaring disconnect when this is applied to some controversial topics. For example, less than half of the US population agrees with the consensus scientific view on climate change. A majority of people are currently putting their trust in other sources, suggesting that the general public is aligning more with the values of those who deny or minimize the consensus scientific view rather than with the scientists that have the best knowledge and credentials.

Effective strategies for communicating controversial topics share common pedagogical approaches:

1) Show the public that we share their values. A colleague who routinely speaks to groups of US farmers and ranchers, a group known for their skepticism on climate change, says the first thing they want to know is what values are important to him. Once they know that he cares about the same things that they do he establishes a level of trust that enables him to more effectively speak to the human value of the science. This is consistent with what we know from research. For example, Kahan et al. [1] found that the degree to which people believed scientific experts was more dependent upon on perceived sharing of similar values than on the credentials of the expert.

2) Show that understanding science consensus is consistent with core values, and therefore it is not necessary to diminish science to have a non-threatening discussion on scientific discussion. For example, it is possible to demonstrate how a knowledge of evolution is used to develop vaccines such as flu shots, or show that believing in climate science is the best thing for the economy, our family, and how well we treat our brothers and sisters both here and abroad. There is ample evidence that scare tactics and negative messages only serve to reinforce that the public has to choose between science over jobs, the economy, and even religion (see Nesbit [2] for a more thorough review) so we have to craft positive arguments and educational materials to reflect how science is compatible with their core beliefs (Leiserowitz et al. [3]).

3) We need to develop geoscience education materials that not only contain the language of science, but the language of values. Anderson and Hatheway [4] evaluated over 100 climate change education projects funded by NASA, NSF and NOAA, and found that none contained any substantive language pertaining to values. Scientists are generally comfortable communicating science concepts because we are comfortable with scientific language, but few have experience with communicating values.

References:

- [1] Kahan, D. M., Jenkins-Smith, H. and Braman, D., 2011. Cultural Cognition of Scientific Consensus. *Journal of Risk Research*, Vol. 14, pp. 147-74,
- [2] Nisbet, M.C., 2009. Communicating Climate Change: Why Frames Matter for Public Engagement; *Environment: Science and Policy for Sustainable Development* Volume 5, 112 – 23.
- [3]. Leiserowitz, A., Maibach, E., & Roser-Renouf, C., 2010. *Climate change in the American Mind: Americans' global warming beliefs and attitudes in January 2010*. Yale University and George Mason University. New Haven, CT; <http://environment.yale.edu/uploads/AmericansGlobalWarmingBeliefs2010.pdf>
- [4] Anderson, S.W., and Hatheway, B., 2011. The role of belief, trust and values in climate change science education efforts; *Transactions of the American Geophysical Union*.

