The Pew Research Center for the People and the Press today released the results of a survey (full report here) of American scientists and the public. The survey lands at a time when both scientists and politicians are actively questioning how science can play a more effective role in the policy process, so it's not surprising that it's getting a lot of attention.

The survey, conducted in cooperation with the American Association for the Advancement of Science, found some interesting points of agreement and disagreement between the two groups. Politically, scientists (defined for the survey's purposes as members of the AAAS, a group that represents diverse fields of specialization, employment settings, and education levels, but which may be biased toward the biomedical sciences and toward academia), are more likely to identify themselves as Democrats and as liberals, and have a more favorable view of government than the general public.

On key issues, 87% of the scientists say they believe in evolution (I'm surprised the number was that low), and 84% believe that the earth is warming because of human activity. Only 32% of the public respondents believe in evolution, while 49% believe in anthropogenic global warming. Most of the scientists were aware of and believed claims that the Bush administration suppressed scientific findings. Those claims don't seem to have resonated with the public, however; less than half had heard them, and only 28% thought they were true.

Scientists overwhelmingly believe that the American public knows little about science, and that the media does a bad job of distinguishing between claims that are well-founded and those that are not. That view doesn't seem to gibe with the survey's findings on public knowledge: 10 of 12 "science quiz" questions were answered correctly by at least half the public respondents, including some of no particular relevance to people's lives, such as whether Pluto is a planet or water has been discovered on Mars. My view is that there's no inconsistency, because the scientists were talking about something the science quiz questions didn't (perhaps can't in this sort of survey) test. Scientists are not complaining that the public can't answer science trivia questions; they are complaining that the public doesn't understand the key principles behind scientific understanding, particularly (I think) the distinction between evidence-based and other sorts of belief and the distinctions between different types of evidence. If the scientists are right, that kind of knowledge gap would make it very difficult for the public to follow debates at the cutting edge of science, and perhaps easily confused by "manufactured" or exaggerated controversy.

In an interesting post on the blog *Framing Science*, Matthew Nisbet has another take. He thinks the problem lies not with the public, which has a pretty decent understanding of issues that are widely covered or important to their lives, but that scientists aren't getting their messages across because they aren't taking advantage of ways to reach the public through interactive dialogue and town meetings. It's undoubtedly true that research scientists could get their policy-relevant points across better if they engaged in such dialogues, but such efforts are time consuming, can expose one to personal attack, and don't bring professional rewards.

I think the many scientists who care deeply about policy issues related to their expertise are in a tough bind. Of course they want to communicate what they know to the public, something which cannot be done through the ordinary channels of scientific communication. And of course they are fully entitled to participate as citizens in the democratic process, advocating for their policy preferences. The trick is to clearly separate those two roles, so that they do not (and are not perceived to) shade their communication of the evidence to match their policy goals. That's an especially tough ask when others aren't doing it — lobbyists, politicians, talk show hosts, you name it, all kinds of participants in policy debates routinely shade, misrepresent, and otherwise trample all over the facts — and when it's all done outside the course of your (highly demanding) professional life. So I understand why Jim Hansen would go to West Virginia to get arrested protesting coal mining, but I don't think it helps his credibility when he wants to speak as the leading climate scientist he undoubtedly is.

There are no easy answers to this dilemma, but it can be attacked from multiple directions. For one thing, as Jane Lubchenco says in an interview today at Environment 360, in their professional work scientists can address questions that connect up with public concerns. She pointed to the recent report on the effects of climate change on the different regions of the U.S. as an example of information "that is credible and solidly-grounded in good measurements," but also connects to what people are experiencing. Government, the National Research Council, and a handful of non-profit organizations are probably best situated to produce these sorts of reports, but they can engage a large number of academic scientists. A second prong is that academic institutions (and the government research agencies that have adopted academic norms) need to provide appropriate professional credit for scientists who participate in this kind of effort. Ensuring that reports are appropriately peer reviewed helps, but norms may still need to be adjusted so that

reviews and syntheses of existing data, which can be at least as important for advancing knowledge as generating new data, count as important research. A third prong, and perhaps the most difficult to get a handle on, is that the general public does need to be better educated, not about the facts of science so much as about its basic principles and processes. That has to start in the public schools, and for that to happen there needs to be a shared appreciation that basic understanding of how science works is an essential foundation for effective citizenship.