

What Scientists Really Think About Global Warming

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These are hard times for climate scientists who want government action on global warming. Not only has the Copenhagen summit largely produced discord, but an embarrassing public release of private e-mails exposed attempts by a group of climate scientists to hide scientific evidence that didn't conform to their beliefs or pronouncements.

As CBS News put it, the scandal, called "Climategate," is "casting doubts on the very science on which this summit is based." In a widely noted Washington Post column, former vice presidential candidate Sarah Palin argued, "the documents show that there was no real consensus" among climate scientists. And a new ABC News poll finds that only 29% of the public now place "a lot" of trust in what scientists say about the environment.

The question of whether there is a scientific consensus on human-induced global warming has long inspired heated debate among both scientists and politicians. The most recent assessment by the Intergovernmental Panel on Climate Change describes global warming as "unequivocal" and "very likely" caused by human activity. But skeptics have argued that the IPCC, which is tasked by the United Nations with evaluating the risks of climate change, is itself influenced by political considerations and "pre-conceived agendas."

In a broader effort to measure scientific opinion, one scholar analyzed peer-reviewed journal articles on climate change and concluded that over 75% supported the notion of anthropogenic (human-induced) warming. But critics argued that the analysis was itself skewed toward finding such a consensus.

So how do you know what scientists really think about global warming? Well, you could always ask them. That's precisely what the Statistical Assessment Service (STATS), which I direct, did in 2007 when it hired Harris Interactive to survey American climate scientists. The results won't entirely please either the Climategate correspondents or their critics.

The STATS study polled nearly 500 randomly selected members of the American Meteorological Society and the American Geophysical Union listed in American Men and Women of Science, the longtime "Who's Who" directory of the scientific community. This provided the best glimpse into the views of prominent American scientists with expertise relevant to climate change. We asked them not only whether they thought global warming was occurring, but how severe the effects might be, and how certain they were about making such judgments.

As with all polls, the answers you get depend on the questions you ask. We found that almost all climate scientists believe that the world has been warming: 97% agree that "global average temperatures have increased" during the past century. But not everyone attributes that rise to human activity. A slight majority (52%) believe this warming was human-induced, 30% see it as the result of natural temperature fluctuations and the rest are unsure.

When it comes to current conditions, however, the consensus in favor of human warming reemerges: 84% believe "human-induced greenhouse warming" is now occurring, compared with only 5% who reject this conclusion. And 74% say the "currently available scientific evidence substantiates" its occurrence, while only 9% disagree. So global warming doubters are

a genuinely small minority among American climate scientists; it is difficult to believe that any transgressions against scientific procedures or the scientific ethos uncovered by Climategate are going to change that.

Going forward, the more interesting question is how great a danger current warming trends may pose to future generations. The IPCC as well as many environmental organizations have set temperature increases of two degrees Celsius (about 3.6 degrees Fahrenheit) as a threshold beyond which global warming poses grave dangers to the planet.

We asked the scientists to estimate the probability that human activity will raise global temperatures that much in the next 50 to 100 years. Just over half of these climate experts (56%) believe there is at least a 50-50 chance that global warming of this magnitude will occur. About one in five (19%) see less than a 50-50 chance, and one in four (26%) are unwilling to venture an opinion.

To get a more general sense of how climate experts feel about the risks of global warming, we asked them to rate the likely effects of climate change during the next 50 to 100 years along a spectrum ranging from "trivial" to "catastrophic." The result was widespread concern, along with considerable debate over how great that concern should be.

Only 13% saw relatively little danger (ratings of 1 to 3 on a 10-point scale); the rest were about evenly split between the 44% who see moderate to high danger (ratings of 4 to 7) and 41% who see very high or grave danger (ratings of 8 to 10). It is also notable that only 1% answered "don't know" to this question, a reminder that many scientists respond more cautiously about making specific scientific projections than about giving their personal opinions, a distinction that is sometimes lost on politicians.

In fact, scientists are often reluctant to rush to judgment, though you wouldn't know it from the mass media, which typically caricature scientific debates as involving two clearly defined, committed and opposed sides. The scientists' actual responses reflect a certain modesty about our capacity to predict the future. For example, when asked to rate the predictability of future climate change along the same 1-to-10 scale, 32% found its effects difficult to predict (ratings of 1 to 3), 51% found them moderately predictable (4 to 7), and only 17% found them easy to predict (8 to 10).

Such reticence reflects a modest appraisal of the scientific community's current understanding of climate change. For example, only 29% express a "great deal of confidence" in science's current understanding of the size and extent of human sources of greenhouse gases, and even fewer (23%) express great confidence in scientific understanding of their natural sources.

This is hardly surprising, in light of the relatively recent origins of this debate. Speculation about global cooling wasn't decisively rejected until the 1980s, and widespread scientific concern over global warming didn't happen until the 1990s. Little wonder that only 5% of the scientists we surveyed describe the study of climate change as a fully mature science--51% call it fairly mature and 39% still see it as an emerging science.

This doesn't mean that we should do nothing about climate change until everyone agrees about the details of its causes and effects. It's time for political leaders to admit that science can inform their policies on climate change but can't dictate them. As Climategate shows, the search

for certainty as political cover can backfire. The ABC poll cited above finds that 62% of the American public now see "a lot of disagreement" among scientists as to whether global warming is really happening. Scientific debate is open-ended, but at some point decision-makers must decide--and take responsibility for their decisions.

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