

# Scientists take steps to defend climate work

*Following the 'climategate' fiasco, researchers are enhancing transparency in an effort to quell public criticism*

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For months, climate scientists have taken a vicious beating in the media and on the Internet, accused of hiding data, covering up errors and suppressing alternate views. Their response until now has been largely to assert the legitimacy of the vast body of climate science and to mock their critics as cranks and know-nothings.

But the volume of criticism and the depth of doubt have only grown, and many scientists now realize they are facing a crisis of public confidence and have to fight back. Tentatively and grudgingly, they are beginning to engage their critics, admit mistakes, open up their data and reshape the way they conduct their work.

The unauthorized release last fall of hundreds of e-mail messages from a major climate research center in England, and more recent revelations of a handful of errors in a supposedly authoritative UN report on climate change, have created what a number of top scientists say is a major breach of faith in their research. They say the uproar threatens to undermine decades of work and has badly damaged public trust in the scientific enterprise.

The e-mail episode, dubbed "climategate" by critics, revealed arrogance and what one top climate researcher called "tribalism" among some scientists. The correspondence appears to show efforts to limit publication of contrary opinion and to evade Freedom of Information Act requests. The content of the messages opened some well-known scientists to charges of concealing temperature data from rival researchers and manipulating results to conform to precooked conclusions.

"I have obviously written some very awful e-mails," Phil Jones, the British climate scientist at the center of the controversy, confessed to a special committee of Parliament on Monday. But he sharply disputed charges that he had hidden data or faked results.

Some of the most serious allegations against Jones, director of the climate research unit at the University of East Anglia, and other researchers have been debunked, while several investigations are still under way to determine whether others hold up.

But serious damage has already been done. A survey conducted in late December by Yale University and George Mason University found that the number of Americans who believed that climate change was a hoax or scientific conspiracy had more than doubled since 2008, to 16 percent of the population from 7 percent. An additional 13 percent of Americans said they thought that even if the planet was warming, it was a result solely of natural factors and was not a significant concern.

Climate scientists have been shaken by the criticism and are beginning to look for ways to recover their reputation. They are learning a little humility and trying to make sure they avoid crossing a line into policy advocacy.

"It's clear that the climate science community was just not prepared for the scale and ferocity of the attacks and they simply have not responded swiftly and appropriately," said Peter



Top: A cow stands in a dried-up pond last month in the Philippines, where an El Nino-induced drought is destroying crops and reducing the country's water supply. PHOTO: BLOOMBERG

Above: Houses sit above the smog-filled valley of Salt Lake City, Utah, where in winter atmospheric inversions can trap pollutants such as ozone and carbon monoxide near ground level, producing a dense smoglike cover. PHOTO: BLOOMBERG

Frumhoff, an ecologist and chief scientist at the Union of Concerned Scientists. "We need to acknowledge the errors and help turn attention from what's happening in the blogosphere to what's happening in the atmosphere."

A number of institutions are beginning efforts to improve the quality of their science and to make their work more transparent. The official British climate agency is undertaking a complete review of its temperature data and will make its records and analysis fully public for the first time, allowing outside scrutiny of methods and conclusions. The UN panel on climate change will accept external oversight of its research practices, also for the first time.

Two universities are investigating the work of top climate scientists to determine whether they have violated academic standards and undermined faith in science. The National Academy of Sciences is preparing to publish a nontechnical paper outlining what is known — and not known — about changes to the global climate. And a vigorous debate is under way among climate scientists on how to make their work more transparent and regain public confidence.

Some critics think these are merely cosmetic efforts that do not address the real problem, however.

"I'll let you in on a very dark, ugly secret — I don't want trust in climate science to be restored," Willis Eschenbach, an engineer and climate contrarian who posts frequently on climate skeptic blogs, wrote in response to one climate scientist's proposal to share more research. "I don't want you learning better ways to propagandize for shoddy science. I don't want you to figure out how to inspire trust by camouflaging your unethical practices in new and innovative ways."

"The solution," he concluded, "is for you to stop trying to pass off garbage as science."

Ralph Cicerone, president of the National Academy of Sciences, the most prestigious scientific body in the US, said that there was a danger that the distrust of climate science could mushroom into doubts about scientific inquiry more broadly. He said that scientists must do a better job of policing themselves and trying to be heard over the loudest voices on cable news, talk radio and the Internet. "This is a pursuit that scientists have not had much experience in," said Cicerone, a specialist in atmospheric chemistry.

The battle is asymmetric, in the sense that scientists feel compelled to support their findings with careful observation and replicable analysis, while their critics are free to make sweeping statements condemning their work as fraudulent.

"We have to do a better job of explaining that there is always more to learn, always uncertainties to be addressed," said John Holdren, an environmental scientist and the White House science adviser. "But we also need to remind people that the occasions where a large consensus is overturned by a scientific heretic are very, very rare."

No scientific body is under more hostile scrutiny than the UN Intergovernmental Panel on Climate Change, which compiles the climate research of hundreds of scientists around the globe into periodic reports intended to be the definitive statement of the science and a guide for policy makers. Critics, citing several relatively minor errors in its most recent report and charges of conflict of interest against its leader, Rajendra K. Pachauri, are calling for the IPCC to be disbanded or radically reformed.

On Saturday, after weeks of refusing to engage critics, the IPCC announced that it was asking for the creation of an independent panel to review its research procedures to try to eliminate bias and errors from future reports. But even while allowing for some external oversight, Pachauri insisted that panel stood behind its previous work.

"Scientists must continually earn the public's trust or we risk descending into a new Dark Age where ideology trumps reason," Pachauri said in an e-mail message.

But some scientists said that responding to climate change skeptics was a fool's errand.

"Climate scientists are paid to do climate science," said Gavin Schmidt, a senior climatologist with NASA's Goddard Institute of Space Studies. "Their job is not persuading the public."

He said that the recent flurry of hostility to climate science had been driven as much by the cold winter as by any real or perceived scientific sins.

"There have always been people accusing us of being fraudulent criminals, of the IPCC being corrupt," Schmidt said. "What is new is this paranoia combined with a spell of cold weather in the US and the 'climategate' release. It's a perfect storm that has allowed the nutters to control the agenda."

The answer is simple, he said.

"Good science," he said, "is the best revenge."

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— Peter Frumhoff, chief scientist at the Union of Concerned Scientists