

# AN EROSION OF TRUST?

Many climate researchers worry that scepticism about global warming is on the rise.

**Jeff Tollefson** investigates the basis for that concern and what scientists are doing about it.

Last November, a catchy music video popped up on YouTube and attracted thousands of fans. Called 'Hide the Decline', the video featured a caricature of climate researcher Michael Mann admitting that he had committed fraud while creating his famous 'hockey-stick' graph of temperatures over the past millennium. Accompanied by a kitten playing the guitar, the cartoon image of Mann joyfully sings, "Making up data the old hard way, fudging the numbers day by day."

The video wasn't funny to the real Mann, director of the Earth System Science Center at Pennsylvania State University in University Park. A lawyer wrote to the group responsible for it, threatening to sue them for defamation and for using a copyrighted image. The video was promptly taken down and a new version — without the copyrighted photo — appeared on YouTube.

Mann has grown weary of dealing with the various groups that are criticizing him. "In reality, these groups are guilty over and over again of defamation, slander and libel, but that is far more difficult to fight legally," Mann says. "Even if you were to prevail, you would have invested potentially several years of your career, and frankly those of us who love doing science are not willing to do that."

Mann isn't alone in wondering how to respond to the wave of attacks that followed November's leak of e-mails from climate researchers at the University of East Anglia in Norwich, UK. Beyond the satire and vitriol appearing on blogs, researchers have endured threatening phone messages and other forms of harassment. And they're frustrated that governments have yet to mobilize in the face of solid evidence for global warming. All of this has spread fear among climate scientists that they

are losing the war over public opinion, just a few years after a swell of support followed the most recent report from the Intergovernmental Panel on Climate Change (IPCC) in Geneva, Switzerland, which garnered a Nobel Peace Prize in 2007.

However, polling data suggest that the situation is not as dire as many researchers suspect. Studies in the United States and the United Kingdom show that belief in global warming has dropped in recent years, but a majority of people still trust climate scientists. There are also signs that public support for actions on global warming have grown in recent months.

Still, scientists and scientific societies have decided that they need to fight back against the proliferating misinformation. They are using novel approaches to get their message across, such as trying to humanize climate scientists. "We're trying to see if we can inoculate against

M. MIGNANELLI



some of the distrust in climate scientists,” says Brenda Ekwurzel, head of the climate-science education group at the Union of Concerned Scientists in Cambridge, Massachusetts, which is seeking to make individual scientists more accessible by introducing them to the media and the public.

But will these efforts work? And are they even necessary? Better communication never hurts, but some social scientists say that it won't be nearly enough to resolve the problems facing climate experts.

**Critical climate**

The e-mail scandal in November started a string of revelations that have kept climate researchers on the defensive. Just a few weeks later, the IPCC came under fire for a flaw in its forecasts about the future of Himalayan glaciers, and another error was discovered in its statements about how much of the Netherlands is below sea level. The problems have prompted several reviews of the IPCC, including one commissioned by the Dutch parliament, which is due imminently. Meanwhile, panels have investigated the Climate Research Unit at East Anglia and individual researchers to see whether they have improperly withheld data from the public.

The recent bad publicity has exacerbated a several-year decline in public confidence about climate science. A poll in January by Yale University in New Haven, Connecticut, and George Mason University in Fairfax, Virginia, found that the number of Americans who believe in global warming dropped from 71% to 57% between 2008 and 2010. The proportion who trust scientists for information about global warming dipped from 83% to 74%.

In both cases, the decline is concentrated more among Republican supporters than among liberals and independents, says Anthony Leiserowitz, who headed the poll as director of the Yale Project on Climate Change. He suggests that the trend reflects a change in US politics: when Congress began talking seriously about steps to reduce greenhouse-gas emissions, conservatives didn't like it. Debates on those issues often focused on how pollution controls would harm or benefit different sectors of the economy.

“As soon as the discussion hits the level of people drafting legislation and making political choices about who is going to win and who is going to lose, the discussion is inevitably politicized,” says Leiserowitz. The same trends contributed to the way people responded to the recent scandals, he adds. “Certain groups in society were much more predisposed to think

the worst of climate science than others.”

Jon Krosnick, a social psychologist who studies public perceptions of climate change at Stanford University in California, has also seen a slight erosion in public belief in global warming over recent years, although he stresses that overall support remains high. He thinks that the cool weather of 2008 helps to explain why the population changed its opinion. “The way they decide whether climate change is happening is by sticking their finger out the window,” he says. “If we get another hot year, those numbers will go up again.”

In the United Kingdom, too, polls indicate that public confidence in climate research has declined over the long term. A survey this year by researchers at Cardiff University found that 78% of UK residents believed that the climate was changing, compared with 91% in 2005. And the trend continued early this year. A BBC study found that the proportion of people who believe that global warming is largely caused by human activity dropped from 41% in November to 26% in February.

But researchers warn against ascribing the decline to the recent events. In the BBC poll, nearly three-quarters of people who had heard about the controversies said that their views on climate change had not altered as a result. Moreover, those who reported shifting their positions were likely to be more convinced of global warming, not less. Some scientists suggest that the recent results reflect the abnormally cold winter more than anything else (see ‘UK responses to climate change’).

Even with the recent erosion of belief in global warming, researchers point out that confidence in climate science and in the scientists remains strong. In the Cardiff poll, more than three-quarters of respondents attributed global warming at least in part to human activity. Just 18% said that it is mostly due to natural causes.

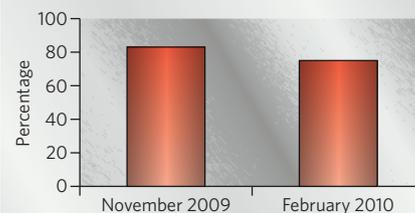
Barring further scandals, many researchers expect the current controversies to register as just a short-term blip in public opinion. There is evidence to back up that idea. In a second poll, conducted in May, the Yale–George Mason team found that support for climate legislation had grown across the board. Approval of carbon dioxide regulation increased from 71% to 77%, and support for an international treaty committing the United States to reducing emissions by 90% by the year 2050 increased from 61% to 65% (see ‘US support for carbon dioxide regulation’).

For the most prominent scientists, widespread support for climate research is easy to overlook in the face of mounting attacks. After

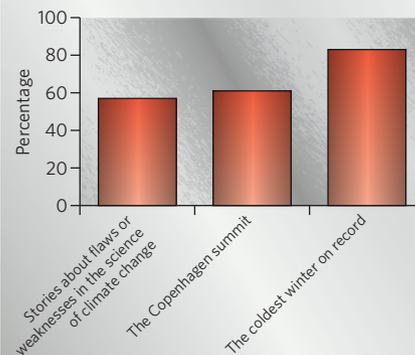
**Despite a recent decline, support for climate scientists remains strong.**

**UK RESPONSES TO CLIMATE CHANGE**

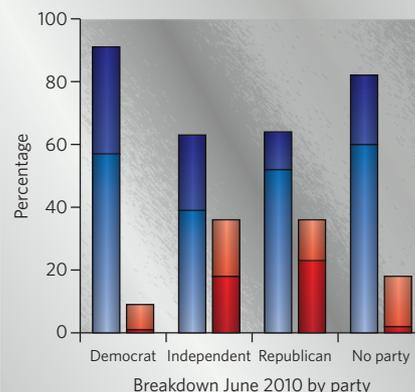
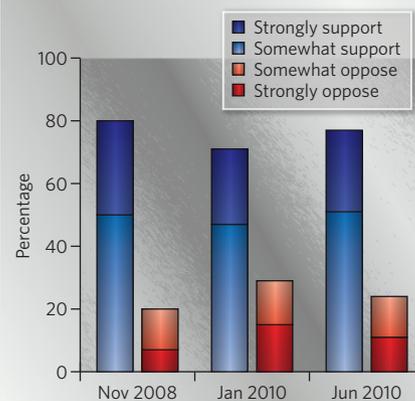
Respondents who think that global warming is taking place.



Which of these events have you heard about in the news recently?



**US SUPPORT FOR CARBON DIOXIDE REGULATION**



SOURCE: BBC

SOURCE: YALE/GEORGE MASON

the release of the East Anglia e-mails, researchers say that they saw an increase in threatening e-mails and phone calls. In February, US Senator James Inhofe (Republican, Oklahoma) released a report accusing at least 17 climate scientists of potentially criminal behaviour. Two weeks later, when an internal e-mail conversation at the US National Academy of Sciences in Washington DC was leaked to a conservative media outlet, it sparked another round of harassing messages against those involved. Paul Ehrlich, a biologist at Stanford University, received a voicemail labelling him a communist bent on "destroying America". In April, Kenneth Cuccinelli, attorney-general of Virginia, launched an investigation into correspondence from Mann's time at the University of Virginia in Charlottesville, seeking to determine whether he had violated any laws or conditions of his grants.

These events have prompted scientists to rethink the way in which they address critics and engage the public. That has sometimes translated into an aggressive personal response. In April, for example, Andrew Weaver, a climate modeller at the University of Victoria in British Columbia, Canada, filed a libel lawsuit against the *National Post* newspaper, alleging that it had misrepresented his work and the facts about global warming.

Some scientists have begun to push for more coordinated action. Scientific societies elected not to comment on Inhofe's report, but on 18 May the American Association for the Advancement of Science's board of directors, based in Washington DC, called on Cuccinelli to withdraw his subpoena, saying that such investigations "could have a long-lasting and chilling effect on a broad spectrum of research fields". The University of Virginia has elected to challenge Cuccinelli in court.

**Out in the open**  
Scientists are also trying to take a proactive approach, designed to counter charges that they are a cabal that won't share data and that blocks dissenting views. Ralph Cicerone, president of the US National Academy of Sciences, says that the climate-science community must find ways to open up. He plans to talk to editors of science journals about setting standards for how much and what kind of raw data should be made available when climate studies are published. In addition to making the field more transparent, he says, standards will help scientists to separate legitimate requests for data from harassment. "In fields where we don't have standards on how much data is enough,

### Out in the open

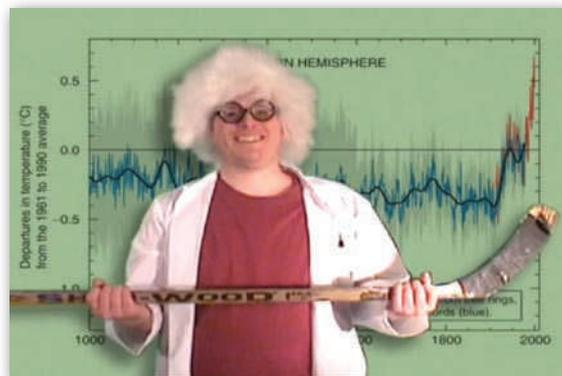
we have to create them, and climate science is such a field," says Cicerone.

Other groups are experimenting with new methods for introducing climate science to the public. The Union of Concerned Scientists has begun profiling individual researchers on its website in an effort to put a face on the IPCC, which has been an easy target for critics in part because of its status as an impersonal international entity. One of the profiles focuses on Julia Cole, a geologist at the University of Arizona, Tucson, who contributed to the last IPCC assessment and studies palaeoclimate data extracted from stalagmites in an Arizonan cave.

At Climate Central, a non-profit organization based in Princeton, New Jersey, scientists work with journalists and writers to develop climate stories in partnership with media outlets.

The idea came together in 2008, backed by high-profile scientists such as Jane Lubchenco, who oversees much of the nation's climate science as head the US National Oceanic and Atmospheric Administration. Climate Central has published work in major magazines and newspapers as well as on broadcast television; one story in *Time* magazine (see [go.nature.com/BgyVSP](http://go.nature.com/BgyVSP)) covered a *Nature* paper documenting increasing ocean temperatures (J. M. Lyman *et al. Nature* 465, 334–337; 2009).

Researchers at George Mason University have teamed up with Climate Central on a project to see whether meteorologists on television can change the way people think about climate issues by making global warming into a local phenomenon. Beginning this summer on the television network WLTX in Columbia, South Carolina, weather forecaster Jim Gandy will integrate global warming into his coverage. Topics might include projections for increasing weather extremes over the next century, and how local gardeners are adapting to climate change. The George Mason team will use



A music video parodied the 'hockey-stick' temperature graph.

### Public doubts can't be erased by simply transferring knowledge.

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surveys at the start and end of the project to see whether it has any effect on public opinion.

It is no coincidence that the team is starting with weather forecasters: a recent poll found that, after scientists, they are the most trusted source of information on global warming, despite their lack of formal training in climate science. "The nation's weather forecasters are basically standing by, ready to teach their local populations," says Edward Maibach, director of George Mason University's Center for Climate Change Communication. "We feel that we know them and trust them, and that means that they actually have greater potential to engage the public and teach them about climate change than do climate scientists, as a profession."

Similar discussions have unfolded in the United Kingdom. In March, the Science Media Centre in London brought together a number of climate researchers in an effort to expand the roster of scientists talking to the media, which has tended to consult only a few high-profile researchers.

Sheila Jasanoff, a science-policy expert at Harvard University in Cambridge, Massachusetts, says that more communication is good, particularly if scientists can help people to understand the local effects of a global phenomenon. But she warns against the assumption that public doubts and the lack of political action on climate change reflect a problem that can be solved simply by transferring knowledge.

Even though a large fraction of the US public has believed for several years that humans are causing the globe to warm up, "it was never clear that people were lined up to take painful action on the basis of what was said by the IPCC," says Jasanoff.

As a model for how to move forward, Jasanoff points to the US government's health and environmental regulatory process, which seeks public input through comments on proposed actions and includes non-scientists on advisory boards. She says that researchers should look for ways to build trust by taking on board the concerns of the public.

Leiserowitz agrees that scientists should engage with the public, but he also urges researchers to be realistic about their influence. "Even if climate-change scientists suddenly had the abilities of Carl Sagan to bring complex ideas to the public, there's only so much they can do," says Leiserowitz. "It's hubristic to think that if we could just communicate better, suddenly we would change the world."

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Jeff Tollefson is a reporter for *Nature* in Washington DC.

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