

THE SON ALSO RISES

The two Roger Pielkes can be obstructionist pains in the neck, say their colleagues. So why is this likeable father-son pair such a welcome addition to the debate on global climate change? Kendall Powell clears the air.

Roger Pielke Senior and Roger Pielke Junior share a name, a profession and a reputation. Both are mathematics-trained history buffs. Both ski and play golf as part of their active Colorado lifestyles. And both are prominent scholars in the highly polarized field of climate science, where their name can provoke much eye-rolling.

The elder Pielke, 59, is professor of climatology at Colorado State University and the state's official climatologist. The younger Pielke, 37, is an expert in science policy at the University of Colorado, with a bumper sticker that declares 'Question Predictions' in his office. Father and son share a proclivity for contentious, if polite, debate, and they both antagonize their colleagues more often than their affable exteriors would suggest.

Yet there are notable differences. Pielke Sr is a true climate hound, steeped in decades of research on atmospheric science. By contrast, Pielke Jr is a self-described policy wonk, who claims he simply hasn't inherited his father's obsession with the weather.

Junior does, however, have the famous Pielke tenacity, and has put it to use in the world of science policy. He caught the bug after interning on Capitol Hill in 1991, when his adviser Rad Byerly became the chief of staff for the House Committee on Science. Pielke Jr then returned to the University of Colorado in Boulder to finish his master's degree, with a thesis that calculated the true cost of a space shuttle launch.

He concluded that each launch cost just over \$1 billion,

contrasting with NASA's estimate of \$400 million¹. Shortly after his numbers appeared in a 1993 article in *The New York Times*, Pielke Jr took a call from an official at NASA's Johnson Space Center, who asked him to retract his conclusions about the cost. He said he gladly would, if the official could only pinpoint what exactly was wrong. The person never called back.

The incident, says Byerly, demonstrates the younger Pielke's coolness under fire. "He knows right where the jugular is," says Byerly.

For his doctorate work, Pielke Jr turned to the stickiest problem he could think of. "I asked myself: what's the hardest possible evaluation problem that I could do, that's messy and involves politics?" In the early 1990s, the obvious choice was climate-change policy. And so he rigorously evaluated the US Global Climate Research Program, concluding that it was not meeting its mandate of providing useful information about climate science for decision-makers².

From that thesis arose an idea that Pielke Jr continues to push today, much to the discomfort of some climate scientists. He argues that the traditional relationship between science and policy, in which scientists do good science and hand the results to the policy-makers, is obsolete — particularly for complex modern issues such as stem-cell research and climate change. He advocates a two-way approach, in which policy-makers point scientists at the next set of questions to which answers would be useful.

In the example of climate change, Pielke Jr says, many

FROM THE ATMOSPHERE TO THE BLOGOSPHERE

Roger Pielke Junior and Senior each run a widely read climate weblog.

Here they tell *Nature* how blogging enhances their research.

ROGER PIELKE JR

Prometheus: The Science Policy Weblog
<http://sciencepolicy.colorado.edu/prometheus>



"It started as an experiment for our centre, and now it serves a number of different purposes. It is kind of like an extra hard drive for my brain. I can search for things that I've written, something I might want later, sort of like my professional notes in a public format.

"I'm surprised at the reach the blog has, which is rewarding for this centre with only eight of us here. We can put an argument on it and it shows up out there in the

real world. I get contacted by professionals in the United States or elsewhere that I would have never met otherwise.

"Blogs are also out there for the public, and it gives you an entirely different perspective on how well the public is getting your message."

"The blog is like an extra hard drive for my brain. I'm surprised at the reach it has."

ROGER PIELKE SR

Climate Science
<http://climatesci.atmos.colostate.edu>

"My weblog was completely motivated by my son's. I was sending all these e-mails out to people about committee reports and he said, 'Why don't you just do a weblog?'"

"With so many journals out there now, it is hard to keep track. When a peer-reviewed paper comes out, I can put up the abstract and a summary of key points on the blog.

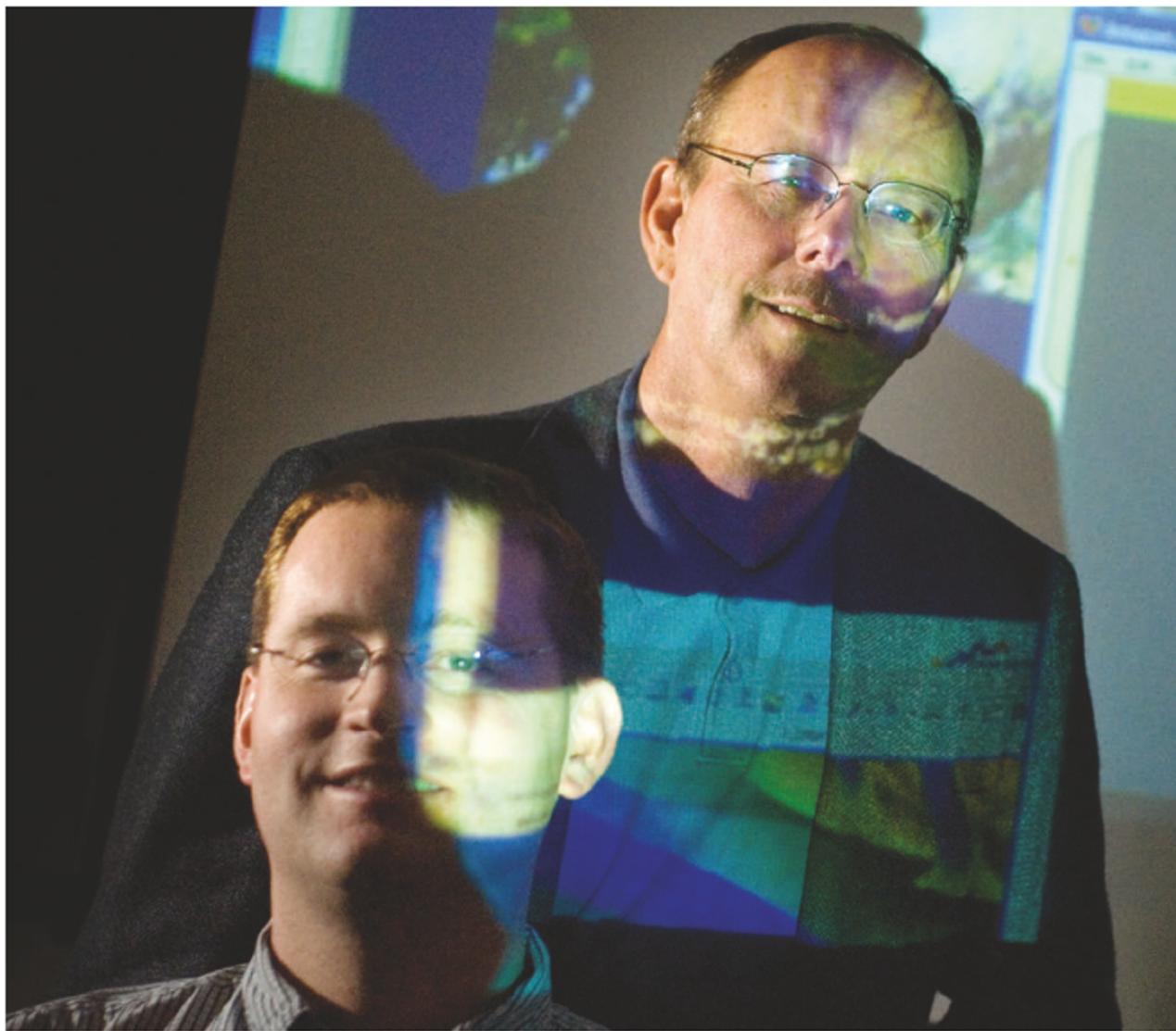


"Now I'm making my arguments to a broader community to see how well they stand up. I also use it as a professional diary and it has increased my network.

"The feedback has been wonderful."

“In science, you should come up with ways to resolve a conflict, not ignore it.”
— Pielke Senior

Look out for the next generation: the Pielkes study different aspects of climate change with a similar intensity.



researchers have taken one of two sides: backing either mitigation policies to reduce greenhouse-gas emissions, or adaptation policies to deal with climate change as it occurs. “One of the most important roles science can play is to invent new options and introduce them to decision-makers,” he says. “When scientists take sides, they are giving up that role.” He persistently challenges scientists who he thinks are acting as advocates for a particular position, including members of the Intergovernmental Panel on Climate Change and scientists who run a blog called RealClimate.

“To be frank, that irritates the hell out of me,” says Gavin Schmidt, co-founder of the RealClimate site and a climate researcher at NASA’s Goddard Institute for Space Studies in New York. “What he considers to be advocacy, to me, that’s just interacting in the public realm.” Schmidt and Pielke Jr have never met in person, but have had heated exchanges in the world of blogs (see ‘From the atmosphere to the blogosphere’).

Winds of change

While the younger Pielke ruffles feathers in the climate community, his father has been fighting the same battle on a different front. Pielke Sr studied the human impacts on climate long before it was a trendy field.

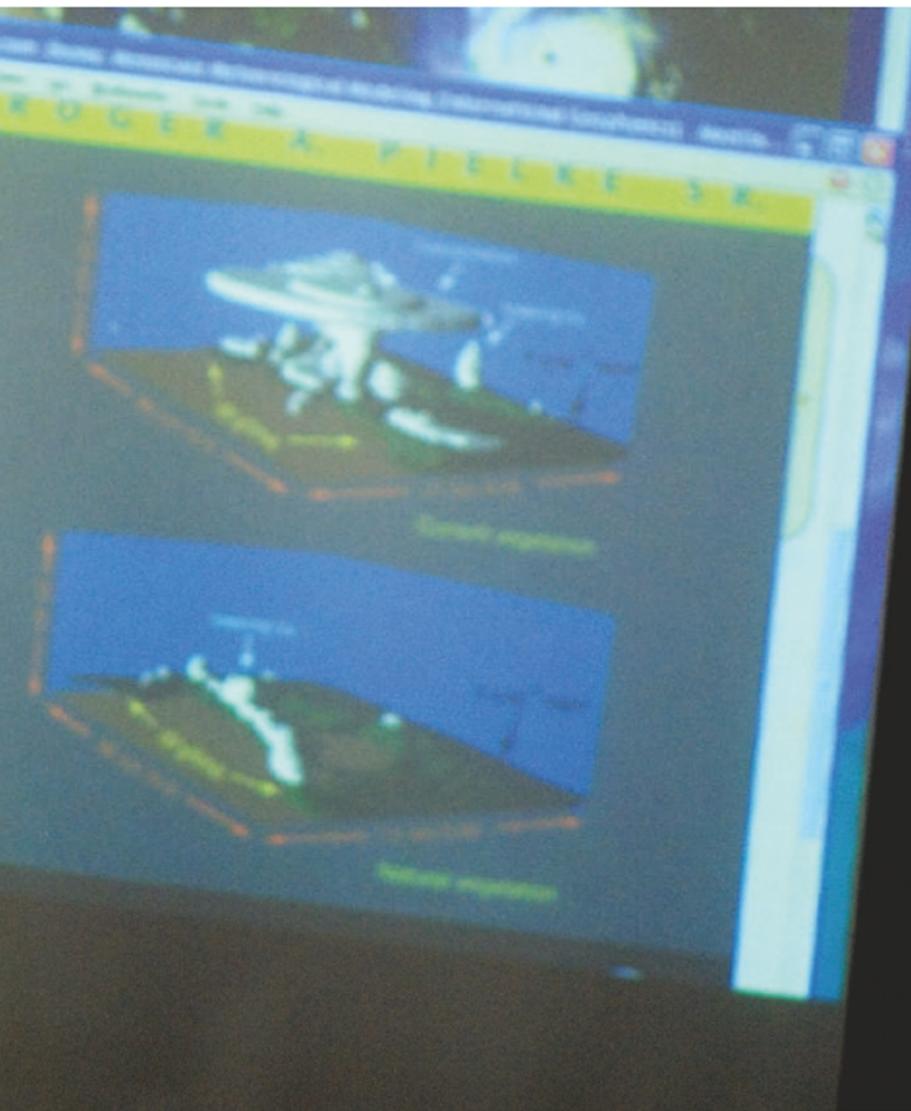
His PhD thesis, in the early 1970s, dealt with three-dimensional modelling of the Florida sea breeze and its

effects on severe thunderstorms. By the mid-1970s he was a professor at the University of Virginia, where he added the wetlands of the Everglades to his climate model and asked what would happen to regional climate if they were paved over³. By 1981 he had moved to Colorado State University in Fort Collins, where his group made breakthroughs in mesoscale atmospheric modelling, helping to develop the Regional Atmospheric Modeling System⁴.

Over the years, his research has looked at the effects of air pollution, aerosols and land-use changes on regional climate. It hasn’t always been an easy ride. Last August, he resigned from a committee sponsored by the Climate Change Science Program (CCSP), which was preparing a report about temperature trends on Earth’s surface and in its lower atmosphere, known as the troposphere.

Pielke Sr argued that members of the CCSP committee were focusing on their own work too much, and not including other perspectives that could explain possible discrepancies in the observed temperatures⁵. “If there is a disagreement in a science issue, you should come up with ways to resolve it, not ignore it,” he says. And when he felt that a reporter on *The New York Times* had not accurately described his reasons for resigning, he launched an open letter on his blog to make his opinions known.

Others say the row was about more than including a variety of perspectives. They say it reflects part of a larger



K. MOULONEY

tension in the climate community between those who do regional modelling, such as Pielke Sr, and those who work with global circulation models, which predict the planet's temperature for years to come. "The average global surface temperature is almost useless for what people care about — their growing season and where they live," says Pielke Sr. He argues that regional climate models that include climate forcings other than greenhouse gases, such as land-use changes, provide more useful information than the commonly used global circulation models.

Local heroes

In fact, neither father nor son thinks that predicting global average climate trends is possible or useful. Pielke Sr says that evaluating the sensitivities of local resources to climate change would be wiser — giving an idea of its effect on energy, water and the ability to respond to natural disasters, for example. Pielke Jr points out it that doesn't take precise climate predictions to begin assessing societal and economic vulnerabilities to climate change.

This may sound like common sense. But by questioning the global predictions that many climate scientists hold dear, the Pielkes often get mislabelled as climate sceptics. Their persistence inflames people's emotions, but it also wins them praise — sometimes from the same people.

Kerry Emanuel, a hurricane researcher at the Massachu-

"My father taught me how to disagree without being disagreeable."
— Pielke Junior

setts Institute of Technology, has worked with Pielke Jr. "I think pushing people is a very laudable aspect of what he is doing — it helps focus on the truth. We, as scientists collectively, have become rusty on that." Emanuel and Pielke Jr have both underscored a little-publicized point in Emanuel's recent *Nature* paper on how hurricane intensity increases with increasing sea surface temperature — that the link does not explain the unprecedented damage from Hurricane Katrina^{6,7}.

Even Schmidt of RealClimate admits he has learned some lessons from Pielke Jr about how science gets misused in policy discussions. "He hasn't been afraid to interact with scientists," Schmidt says. "That interaction has not always been pretty, but he gets some kudos."

Professional mixers

Colleagues of the elder Pielke see similar merit behind his prodding of the CCSP committee and others. Dev Niyogi, Indiana's state climatologist at Purdue University in West Lafayette, says debate helps the climate community. "Many streams of thought are being constrained for political correctness, and science may not benefit from lack of discussion," he says. "We need someone to stir up the whole thing."

Pielke Jr credits his father with teaching him how to "disagree without being disagreeable". Asking hard questions is not always well received, he says. "But I learned how to be professional and respectful. One may be pushing against some cherished ideas or notions, but I think that's what makes science stronger."

Together, the Pielkes have become close professional colleagues, each approaching climate science from his own direction. Over the years, Pielke Sr says, he has come to better understand the interactions between scientists and policy-makers that his son promotes. And Pielke Jr has acquired unique access to climate researchers, becoming something of an 'embedded anthropologist' through his father's connections.

Father and son have published together, on such topics as the behaviour of hurricanes and their impact on society⁸. They rarely disagree on fundamental professional issues, but they do squabble over how much candy the grandchildren should consume. Gloria Pielke, wife of one and mother of the other, says that heated arguments are common, but never turn personal. "If someone disagrees," she says, "we just share our reasoning and then go on to the next hole of golf."

Friendly competition runs deep in this close family. Informal bets are common, from golf games to the weather. As the best golfer, Gloria is the safest bet on the greens. But when gambling turns to the weather, it isn't predictions from the Colorado state climatologist you want. It's those of his son, the policy wonk.

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