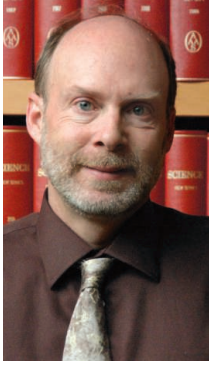
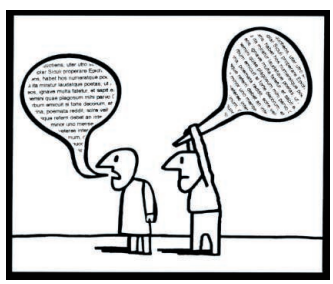


Brooks Hanson is Deputy Editor for physical sciences at *Science*.

Stepping Back; Moving Forward

THE CONTROVERSIAL E-MAILS RELATED TO CLIMATE CHANGE, PLUS REPORTED ERRORS IN THE Intergovernmental Panel on Climate Change (IPCC) reports, have spurred a dangerous deterioration in the rational relation between science and society. One U.S. senator has called 17 prominent climate scientists criminals, and pundits have suggested that climate scientists should commit suicide. Fourteen U.S. states have filed lawsuits opposing the federal regulation of greenhouse gas emissions, some asserting that "climate change science is a conspiracy." South Dakota even resolved that there are other "astrological" forcings on climate. Scientists have been barraged by hateful e-mails. The debate has become polarized, and the distrust of scientists and their findings extends well beyond climate science. What can be done to repair society's trust in science? A broader perspective is needed on all sides.

The main societal challenges—global energy supply, growing the food supply, and improving public health, among others—depend intimately on science, and for this reason society requires a vigorous scientific enterprise. Our expanding global economy is taxing resources and the environment in ways that cannot be sustained. Science provides a deep understanding of these impacts and, as a result, the ability to predict consequences and assess risks.



Addressing anthropogenic climate change exemplifies the challenges inherent in providing critical scientific advice to society (see the Policy Forum on p. 695 and Letter on p. 689). Climate is as global as today's economy; we know from archaeological and historical records that an unstable climate has disrupted societies. For these reasons, scientists and governments are jointly committed to understanding the impacts of climate change. Thousands of scientists have volunteered for the IPCC or other assessments. Governments have a vested interest in the success of these assessments, and the stakes are high.

We thus must move beyond polarizing arguments in ways that strengthen this joint commitment. The scientific community must recognize that the recent attacks stem in part from its culture and scientists' behavior. In turn, it is time to focus on the main problem: The IPCC reports have underestimated the pace of climate change while overestimating societies' abilities to curb greenhouse gas emissions.

Scientists must meet other responsibilities. The ability to collect, model, and analyze huge data sets is one of the great recent advances in science and has made possible our understanding of global impacts. But developing the infrastructure and practices required for handling data, and a commitment to collect it systematically, have lagged. Scientists have struggled to address standardizing, storing, and sharing data, and privacy concerns. Funding must be directed not only toward basic science but toward facilitating better decisions made with the data and analyses that are produced. As a start, research grants should specify a data curation plan, and there should be a greater focus on long-term monitoring of the environment.

Because society's major problems are complex, generating useful scientific advice requires synthesizing knowledge from diverse disciplines. As the need for synthesis grows, the avenues of communication are changing rapidly. Unfortunately, many news organizations have eviscerated their science staffs. As a result, stories derived from press releases on specific results are crowding out the thoughtful syntheses that are needed.

If the scientific community does not aggressively address these issues, including communicating its process of discovery and recognizing its modern data responsibilities, and if society does not constructively engage science, then the scientific enterprise and the whole of society are in danger of losing their crucial rational relationship. Carl Sagan's warnings are especially apt today: "We live in a society exquisitely dependent on science and technology, in which hardly anyone knows anything about science and technology." "This is a prescription for disaster. We might get away with it for a while, but sooner or later this combustible mixture of ignorance and power is going to blow up in our faces."

– Brooks Hanson

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