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## Editorial

### Reflections on Science and Policy

*"Some experts believe that science's influence in public policy matters has not been at such a low ebb since before World War I."*

— New York Times, 17 June 2001

On June 8, 2001, I participated in a forum on "Climate Change Science" organized by the National Academy of Sciences ([www.nas.edu](http://www.nas.edu)) at the request of Senator Larry Craig (R-ID) ([www.senate.gov/~craig/releases/pr060801a.htm](http://www.senate.gov/~craig/releases/pr060801a.htm)).

Three senators and a cabinet member (along with a dozen or so congressional staffers) spent a morning with about 10 scientists discussing various aspects of the climate change issue. Later that afternoon I had a chance to discuss "policy research" with participants at the American Meteorological Society's Atmospheric Policy Colloquium ([www.ametsoc.org/ams/atmospolicy/colloquiumsumme2001.html](http://www.ametsoc.org/ams/atmospolicy/colloquiumsumme2001.html)).

The juxtaposition of the Senate Forum and AMS Colloquium led me to conclude that I ought to reflect a bit on the experience of presenting research results directly to policy makers. The standard disclaimer applies: the reflections offered below are my own and are not necessarily endorsed or held by anyone (or any institution) connected with the WeatherZine. Some

views expressed below may be provocative or even contrary to conventional wisdom. The views are offered to stimulate thinking and (hopefully) debate about the role of science in policy. Consider yourself warned!

Two issues I'd like to raise relate to the role of the individual scientist in policy and the role of the science community in policy more generally.

Wag the Dog ([www.wag-the-dog.com](http://www.wag-the-dog.com))

As I prepared for the Senate Forum a number of colleagues expressed concern that my work might be used (or misused) in the political process to support particular positions. In a nutshell, my position, shared with a number of colleagues, is that the "global warming: yes or no?" debate has become an obstacle to effective policy action related to climate ([www.esig.ucar.edu/HP\\_roger/debate.html](http://www.esig.ucar.edu/HP_roger/debate.html)).

Several of these colleagues suggested that I should downplay the policy implications of my work showing that for a range of phenomena and places, future climate impacts depend much more on growing human vulnerability to climate than on projected changes in climate itself (under the assumptions of the Intergovernmental Panel on Climate Change) ([www.esig.ucar.edu/knob/index.html](http://www.esig.ucar.edu/knob/index.html)).

One colleague wrote, "I think we have a professional (or moral?) obligation to be very careful what we say and how we say it when the stakes are so high." In effect, some of these colleagues were intimating that ends justify means or, in other words, doing the "right thing" for the wrong reasons is OK.

For the AMS Policy Colloquium participants I likened this situation to the following hypothetical. Imagine that as policy makers are debating intervening militarily in a foreign country, the media report that 1,000 women and children were brutally murdered in that country. This report inflames passions and provides a very compelling justification for the military intervention. A journalist discovers that, contrary to the earlier reports, only 10 soldiers died. What is the journalist's obligation to report the "truth" knowing full well that it might affect political sentiments that were shaped by the earlier erroneous report? When science is used (and misused) in political advocacy, there are frequent opportunities for such situations to arise.

## Research as Policy

The quote from the New York Times highlighted at the beginning of this editorial suggests that science is playing a smaller and smaller role in policy. One reason for this may well lie in the actions of the scientific community itself. The climate issue provides a good example. Soon after the National Academy of Sciences released its recent report on Climate Change Science on June 6, ([books.nap.edu/html/climatechange/climatechange.pdf](http://books.nap.edu/html/climatechange/climatechange.pdf)), President George W. Bush recommended ([www.whitehouse.gov/news/releases/2001/06/20010611-2.html](http://www.whitehouse.gov/news/releases/2001/06/20010611-2.html)) increasing support for climate observations and computing power for modeling. Many of his recommendations were immediately criticized, such as in a commentary in the June 25 issue of Business Week titled "Global warming needs more than just another study" ([www.businessweek.com/magazine/toc/01\\_26/B3738magazine.htm](http://www.businessweek.com/magazine/toc/01_26/B3738magazine.htm)).

It is important to note that in both the Academy's Climate Change Science report and in the Senate Forum, the only recommendations offered by the scientific community were for more climate observations and faster computers! Thus, in one sense the quote from the New York Times is incorrect: at least in the case of climate, policy makers *are* listening to scientists and acting on their recommendations. But in another sense the quote is very accurate: the advice on climate scientists are giving policy makers is largely irrelevant to effective action, and arguably part of the problem ([www.theatlantic.com/cgi-bin/o/issues/2000/07/sarewitz.htm](http://www.theatlantic.com/cgi-bin/o/issues/2000/07/sarewitz.htm)).

I believe there is more to this than just the scientific community acting in its own narrow self-interests (though to be sure, there is some of that!). My experience in the Senate Forum reinforced my perceptions that there are institutional and intellectual obstacles at the interface of science and policy with which the scientific community has yet to grapple ([www.nap.edu/issues/17.2/stalk.htm](http://www.nap.edu/issues/17.2/stalk.htm)).

For example, in 1991 the National Academy of Sciences published a report titled Policy Implications of Greenhouse Warming ([www.nap.edu/catalog/1794.html](http://www.nap.edu/catalog/1794.html)).

Much of this report remains current, valuable, completely nonpartisan, and yet utterly neglected. Surely after more than \$18 billion has been invested in global change research since 1990, the scientific community can do more than simply recommend "more research"! Given that scientific knowledge is in some way relevant to most important policy decisions, organizations like the National Academies have a

responsibility to increase their ability to place science into policy contexts while avoiding partisan politics.

Because the climate issue is so topical and raises people's passions, it provides an opportunity to discuss, debate, and ultimately improve the inter-connections of science and policy more generally. My experience with policy makers in the Senate Forum was positive. I was very impressed by the engagement and interest of the policy makers present (half a day is indeed a big commitment for these folks). At the same time, I was left with the feeling that we in the research community can and should do more – much more – to ensure effective connections of research and action.

– Roger A. Pielke, Jr.

Comments? [thunder@ucar.edu](mailto:thunder@ucar.edu)

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## Guest Editorial

### *A Clear-Eyed View of Flood Insurance Policy*

Policy evaluations matter because they inform decision makers about the success or failure of government programs. Ideally, they help legislators and program administrators know whether to keep, change, or eliminate expensive programs. Too often, though, legislative oversight is lacking. As big programs become institutionalized, the evaluation task becomes extraordinarily challenging, both technically and politically.

The U.S. National Flood Insurance Program (NFIP) dramatically illustrates these challenges. Since 1968 the NFIP has enabled the federal government to provide flood insurance to residents in communities that regulate land use in floodplains. The NFIP, like all governmental insurance programs, uses insurance to meet broad social objectives—unlike private insurance, which is designed to be financially profitable and actuarially sound. With commitments to policyholders of \$325 billion (1997\$), the program is the sixth largest of 12 federal insurance programs. The scope of the program is enormous: 19,000 communities are members ([www.fema.gov/nfip/myth.htm](http://www.fema.gov/nfip/myth.htm)), and as of September 1999, there were over 4 million flood insurance contracts in force.

In the 32 years of NFIP implementation, it has never been comprehensively evaluated. This is surprising, especially in light of the following facts:

1. As of May 1999, the NFIP owed \$738 million (1999\$) to the U.S. Treasury. The program must borrow from the treasury periodically when programmatic outlays exceed premium payments because the program is subsidized by the government and is, by design, actuarially unsound. The program deficit has led to calls to make flood insurance actuarially sound. Most notably of late, the Bush Administration's 2002 budget calls for removal of the subsidy for non-primary residences.
2. The flood insurance program pays for losses that occur at different times to the same structure. The General Accounting Office (GAO) reported that the program paid 36% of all historical claims to multiple loss properties—about \$200 million annually. The National Wildlife Federation reported that over the period 1978 to 1995, repetitive loss properties were 2% of all NFIP properties, but these properties experienced 25% of all NFIP losses, resulting in 40% of flood insurance payments.
3. In spite of efforts to encourage U.S. citizens to purchase flood insurance, market penetration is low. Although the Federal Insurance Administration estimates that there are 8 million structures in the floodplain, only about 4 million flood insurance contracts are in force.
4. The Federal Emergency Management Agency (FEMA oversees the NFIP), in contrast with some critics, claims that the NFIP plays a major role in reducing flood damage, stating that it "helps reduce flood damage by nearly \$800 million a year. Further, buildings constructed in compliance with NFIP building standards suffer 77% less damage annually than those not built in compliance. And, every \$3 paid in flood insurance claims saves \$1 in disaster assistance payments" ([www.fema.gov/nfip/summary.htm](http://www.fema.gov/nfip/summary.htm)).

In 2000, FEMA began planning for an evaluation of the NFIP and contracted with a private vendor to complete a research design for the evaluation. The design will be complete this year. If all goes according to the plan established before the end of Clinton's term, the actual evaluation will be completed by a non-government entity in two to five years.

The evaluators of the NFIP have a difficult task ahead. First they will have to choose baselines against which to measure the program's success. From its outset, the program's purpose was to "minimize exposure" of property to flood damage. But the NFIP's enacting legislation never clarified whether exposure should be measured from 1969, another date, or against a counterfactual scenario in which the NFIP was not implemented. Another technical challenge is that of data collection. A lack of systematic data concerning

the level of societal vulnerability to floods currently hampers evaluation of flood policy because there is no single agency in the United States whose mission is to collect these data. For example, the GAO reported recently that although participation rates should be used as one of the gauges to measure program success, "better data are needed on the total number of structures in flood-prone areas. FIA tracks the number of insurance policies in these areas, but data on the overall number of structures are incomplete and inaccurate."

But an even bigger challenge for the NFIP evaluation is political. A comprehensive evaluation will be a waste of taxpayer money if, when complete, it is left on a shelf to collect dust. Officials in FEMA must ensure that the results of the evaluation make it onto Congress' agenda. Congressional decision makers should use the results of the evaluation to improve the program. Making changes to the NFIP may require great political will since the NFIP affects so many constituents.

In the near-term, the Bush Administration must ensure that the evaluation is completed, that it is independent and accessible, that it is comprehensive, and that it provides a clear view of the successes and failures of the program. Although the impetus for the evaluation came from an administration with a different political ideology than that of the current administration, the motivation for an evaluation of the NFIP should be nonpartisan. An evaluation is needed to provide for the best use of taxpayer money, while ensuring the wisest possible use of floodplain land.

Finally, politicians and pundits should resist the urge to make assumptions about the success of the program before the evaluation is completed. For example, current political wisdom seems to be that the NFIP would be successful if it paid for itself every year, in spite of the fact that the program is by design dependent on taxpayer money in heavy loss years and programmatic goals do not depend on financial stability. The Bush Administration's 2002 budget suggests certain reforms to the program to fix the design, "which undermines the financial stability of the insurance program" ([www.whitehouse.gov/news/usbudget/blueprint/budtoc.html](http://www.whitehouse.gov/news/usbudget/blueprint/budtoc.html)). Before changes are made to the NFIP, an evaluation is needed to determine whether the legislative goals laid out in 1968 make sense given the current context, or whether they should be changed. If changes to the program are indeed needed, then policy success will be enhanced with the insight provided by a rigorous, independent evaluation of NFIP performance to date.

— Zoe Miller  
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## Correspondence

**Dear WeatherZine,**

I do applaud the "grave images" in ([www.esig.ucar.edu/socasp/zine/27/editorial.html](http://www.esig.ucar.edu/socasp/zine/27/editorial.html)) "Who Lives and Who Dies" (April 2001 WeatherZine) and hope you can maybe get more specific. One of the most appalling elements is the frequent crisis threatening the sonde network. Most meteorologists of nearly all persuasions still regard that as the foundation for operational and research science, and cheap at twice the price, but it always seems to have less political friends than various satellite and other high tech options. And, of course, they are seldom compared objectively, or even considered out of the same budget. I would really like to see some straight talk and clear evidence on things like this. Scientists are often pressed to give support for various activities, like the NSF or NOAA budgets in general, but are seldom invited to offer opinions on priorities between programs. Admittedly opinions and strengths of viewpoints would differ, but congresspersons are fairly good at counting heads – although lately they seem more preoccupied in counting campaign contributions.

– Doug Lilly  
[DLilly6@aol.com](mailto:DLilly6@aol.com)

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## Weather-Related News

### **House Science Committee Hearing NOAA's FY2002 Budget: Predicting Weather and Climate May 9, 2001**

On Wednesday, May 9, 2001, the House Science Committee's Subcommittee on Environment, Technology, and Standards held a hearing on the Administration's Fiscal Year (FY) 2002 budget request for the National Oceanic and Atmospheric Administration (NOAA). Witnesses discussed NOAA's overall budget and programs with emphasis on issues relating to weather and climate prediction.

For background information see:

[www.house.gov/science/ets/may09/ets\\_charter\\_050901.htm](http://www.house.gov/science/ets/may09/ets_charter_050901.htm)

Witness list:

[www.house.gov/science/ets/may09/ets\\_witness\\_050901.htm](http://www.house.gov/science/ets/may09/ets_witness_050901.htm)

Webcast:

[www.house.gov/science/ets/may09/ets050901.ram](http://www.house.gov/science/ets/may09/ets050901.ram)

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## Arid Lands Newsletter

The Arid Lands Newsletter is a twice-yearly publication of the Office of Arid Lands Studies at the University of Arizona; each issue focuses on a different theme. The theme of ALN No. 49 is ([ag.arizona.edu/OALS/ALN/aln49/aln49toc.html](http://ag.arizona.edu/OALS/ALN/aln49/aln49toc.html)) "Linkages between climate change and desertification." Articles include topics such as "Smoke and desert dust stifle rainfall, contribute to drought and desertification," by Daniel Rosenfeld.

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### **Holistic Disaster Recovery: Ideas for Building Local Sustainability after a Natural Disaster**

The Natural Hazards Research and Applications Information Center, University of Colorado, announces a new training course entitled "Holistic Disaster Recovery: Ideas for Building Local Sustainability after a Natural Disaster," to be held in Boulder, Colorado, August 27-30, 2001.

The course is intended for local, state, federal, and private sector decision makers, planners, emergency managers, building officials, economic development directors, environmental specialists, and others who may be involved in recovery by a disaster-stricken community. It is designed to help them prepare and implement holistic recovery that results in a more sustainable community. By juxtaposing the components of sustainability (economic vitality, livability, environmental quality, disaster resilience, social equity, and participatory decision making) with likely postdisaster problems (damaged infrastructure, inadequate housing, ecosystem degradation, business disruption, etc.), participants will explore opportunities to enhance a town, city, or county during disaster recovery. For each opportunity, the course will consider various options for planning and taking action, funding strategies, and sources of expertise. The fee for the training course is \$985.

More information is available from Jacki Monday, Program Manager, Natural Hazards Center, 482 UCB, University of Colorado, Boulder, CO 80309-0482; (303) 492-2149; fax: (303) 492-2151; email: [jacque.monday@colorado.edu](mailto:jacque.monday@colorado.edu).



## ***Job Opportunities***

### ***Meteorologist / Weather Risk Analyst / Statistical Climatologist***

There is a growing awareness of the high importance of improved weather and climate information to energy companies. e-Acumen is a software and consulting firm that provides physical risk management products to electricity and gas marketers. We currently serve many of the top-50 power marketers in the United States. The weather derivatives / weather risk business unit of e-Acumen is looking for a meteorologist or climatologist with an interest in applying his/her expertise to helping energy firms more effectively manage their exposure to weather. Experience in commercial forecasting services would be an advantage but is not a necessity. Interest in business and a dedication to showing economic value-added of improved weather and climate information is crucial.

Our principal products/services include:

- Weather risk consulting
- Weather derivative pricing and risk management (software and consulting)
- Weather forecasts from one day to seasonal time scales
- Analysis of forecast accuracy and determination of forecast model biases
- Simulation of the relationships between energy commodities and weather for trading and risk management

Our ideal candidate has an MS in atmospheric science or meteorology as well as knowledge or experience in trading. Understanding of basic financial contracts would be helpful (options, futures, etc.). Our clients use a wide range of financial contracts to manage their risk and to improve profitability, so the candidate should have an interest and a high level of motivation to learn financial instruments in energy markets. While research is a part of this position, the candidate will also be involved in presenting to clients and potential clients and must be able to motivate the importance of weather risk management in a financial context.

The position will be in our offices in our Broomfield, Colorado offices – close to Boulder and Denver. To learn more about e-Acumen, please visit our web site: [www.e-acumen.com](http://www.e-acumen.com)

Please send resume or questions to:  
[geoff.considine@e-acumen.com](mailto:geoff.considine@e-acumen.com)

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## ***Selected Web Site Additions***

### ***General Weather Resources***

*U.S. Weather Research Program*  
[uswrp.org](http://uswrp.org)

The USWRP is a partnership among NOAA, NASA, the National Science Foundation (NSF), the U.S. Navy, and the academic and commercial communities. The program's initial focus is on landfalling hurricanes; heavy precipitation and flooding, focusing on the optimal use of data and improved numerical precipitation guidance; and societal and economic impacts.

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### ***Hurricanes***

*Mapping Coastal Change Hazards*  
[coastal.er.usgs.gov/hurricanes/mappingchange/](http://coastal.er.usgs.gov/hurricanes/mappingchange/)

Resource managers must be able to predict where and how much coastal change will occur to locate new construction landward of coastal change hazards. Developing this predictive capability requires quantifying how coasts respond to extreme storms. U.S. Geological Survey (USGS) scientists, in partnership with NASA, have developed a new extreme-storm hazards map and a new scale that categorizes expected coastal change (erosion and accretion) that occurs during storms. Both are available on this site.

*Coastal Hazards Information Clearinghouse*  
[coastalhazards.wcu.edu](http://coastalhazards.wcu.edu)

This site contains a 10-chapter monograph on coastal hazards, detailed coastal hazard maps for all coastal states, photos of property damage from several recent hurricanes, and a list of coastal hazard links for each state.

*USGS Hurricanes and Coastal Storm Websites*  
[www.usgs.gov/hurricanes/stormsites.html](http://www.usgs.gov/hurricanes/stormsites.html)

This site includes links to other USGS sites that provide real-time data, background maps and studies, historical analyses of specific storms, and other reports about hurricanes.

This site includes videos, publications, and links to information about hurricane mitigation measures.

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### **Lightning**

*Lightning-Associated Deaths –  
United States, 1980-1995*

[wonder.cdc.gov/wonder/prevguid/m0052833/m0052833.asp](http://wonder.cdc.gov/wonder/prevguid/m0052833/m0052833.asp)

A lightning strike can cause death or various injuries to one or several persons. The mechanism of injury is unique, and the manifestations differ from those of other electrical injuries. In the United States, lightning causes more deaths than do most other natural hazards (e.g., hurricanes and tornadoes), although the incidence of lightning-related deaths have decreased since the 1950s. The cases described in this report illustrate diverse circumstances in which deaths attributable to lightning can occur. This report also summarizes data from the Compressed Mortality File of CDC's National Center for Health Statistics on lightning fatalities in the United States from 1980 through 1995, when 1318 deaths were attributed to lightning.

### **About Us**

*WeatherZine* is a bimonthly newsletter on the societal aspects of weather. It contains opinion pieces, news, and a brief summary of developments at the *Societal Aspects of Weather* Web site.

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On-Line version available at:

[www.esig.ucar.edu/socasp/zine/index.html](http://www.esig.ucar.edu/socasp/zine/index.html)

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### **Subscription Information**

The *WeatherZine* is produced as a Web page, a PDF newsletter, a plain text newsletter, and an email message. Subscribing to the *WeatherZine* will add you to our distribution list and you will receive email messages whenever the *WeatherZine* is released.

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