

# WeatherZine

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## Editorial

### Science, Sea Grant and the Slippery Slope

The President's 2003 Budget proposes to transfer (<http://www.whitehouse.gov/omb/budget/fy2003/bud28.html>) several science programs from their present homes in mission agencies to the National Science Foundation (NSF). These programs include the National Oceanic and Atmospheric Administration's (NOAA's) Sea Grant Program, U.S. Geological Survey's toxic substances hydrology research program, and the Smithsonian Institution's astrophysics and environment programs. With respect to Sea Grant, the Chronicle of Higher Education reported (2-1-02) that in response to this proposal "college lobbyists and scientists ... worry that a move would change the program's mission" and thus opposed the move. While this editorial focuses on Sea Grant, the White House proposal is worth paying attention to because it potentially has broad implications for research in NOAA and other federal mission agencies in which science is supported. (Note: The WeatherZine and the CIRES Center for Science and Technology Policy Research receive support from NOAA, NSF, and other federal agencies discussed in this editorial.)

According to news reports, the justification for the proposed transfer of Sea Grant is that the NSF could better manage the program. Mitchell Daniels, Director of the White House Office of Management and Budget, noted in a speech late last year ([http://www.whitehouse.gov/omb/transcripts/natl\\_press\\_club.html](http://www.whitehouse.gov/omb/transcripts/natl_press_club.html)) that NSF was one of the "true centers of excellence in

this government ... where more than 95 percent of the funds you provide as taxpayers go out on a competitive basis directly to researchers pursuing the frontiers of science, a very low overhead cost... Programs like this, and there are many, many others, that perform well, that are accountable to you as taxpayers for reaching for real results and measuring and attaining those results, deserve to be singled out, deserve to be fortified and strengthened."

Programmatic efficiency was a key element of the President's Management Plan, (<http://www.whitehouse.gov/omb/budget/fy2002/mgmt.pdf>) released last August, which observed of federal research and development:

- The federal government will spend approximately \$90 billion in 2001 on R&D, an investment representing 14 percent of all discretionary spending. The ultimate goals of this research need to be clear. For instance, the objective of NASA's space science program is to "chart our destiny in the solar system," and the goal of the U.S. Geological Survey is to "provide science for a changing world." Vague goals lead to perpetual programs achieving poor results.
- The federal government needs to measure whether its R&D investments are effective. We can rarely show what our R&D investments have produced, and we do not link information about

## Editorial Continued

performance to our decisions about funding. Without this information, decisions about programs tend to be made on the basis of anecdotes, last year's funding level, and the political clout of local interest groups.

And last year OMB gave NSF the government's highest marks for its administration of federal resources. Further, a 1994 National Research Council report ([http://www.nap.edu/catalog/9292.html?se\\_side](http://www.nap.edu/catalog/9292.html?se_side)) found that, within NOAA, Sea Grant was improperly located in the Office of Oceanic and Atmospheric Research, and was inefficient in grants administration as compared to other agencies. Given the oft-mentioned fact that Sea Grant began its programmatic life 35 years ago in NSF, the proposed move seems like a no-brainer, or does it?

Not all agree that moving Sea Grant makes good policy sense. For example, C. Peter McGrath, President of the National Association of State Universities and Land Grant Colleges (NASULGC), wrote ([http://www.nasulgc.org/washington\\_watch/letters2002/daniels011401\\_seagrant.pdf](http://www.nasulgc.org/washington_watch/letters2002/daniels011401_seagrant.pdf)) to Daniels at OMB in opposition to the proposed move, "The National Science Foundation has no stronger supporters than NASULGC, and we are aware that in its initial years Sea Grant was housed in NSF. But we are unconvinced that it would be a good fit to now relocate Sea Grant today." And Carolyn Thoroughgood, President of The Consortium for Oceanographic Research and Exploration (CORE), wrote to Daniels in opposition as well, (<http://www.coreocean.org/Dev2Go.web?id=218571&rnd=13977>) "CORE urges that you to [sic] reconsider the proposal to remove Sea Grant from NOAA and support its further growth and development as an integral component of NOAA."

One reason for such opposition is that the proposed move has broad implications for government-sponsored research and its connections to the needs of the so-called "mission agencies." The present debate is evocative of that over the periodic proposal for the creation of a "Department of Science" – within which virtually all government-funded science would be administered. This proposal has surfaced in various forms, in the words of Daniel Greenberg, "about 100 times" over the past century, most recently in the House led by Congressman Robert Walker. Central to this debate is the question how research is best conducted and connected to national needs.

According to public law, only two agencies – NSF and the National Aeronautics and Space Administration – have a legal mandate to conduct "basic research," that is, research designed to advance knowledge for knowledge's sake. All other agencies that support science do so to further an agency mission. Such research serves the needs of the agency mission and is not supported only to create new knowledge. Critics of the notion of a "Department of Science" emphasize the distinction between the role of

research in NSF and NASA and its role in the mission agencies. Similarly, a concern that Sea Grant would lose its practical focus at NSF underlies the positions of NASULGC, CORE, and others. Effective management of the science grants process is not the same as getting useful science done and into the hands of decision makers. Resolving this issue is difficult because administration and usability are both clearly important.

As Congress now debates whether Sea Grant is indeed to be transferred to NSF, an opportunity exists to raise some issues worth considering:

- What would a transfer of Sea Grant imply for other NOAA research efforts (and similarly for USGS, DOE, EPA, NIH ....)? NOAA supports a great deal of research related to oceans and the atmosphere; is Sea Grant just the first of many programs that might be transferred to NSF?
- In making such institutional decisions, there is a need to better understand the relationship of government institutional structure and the performance of research conducted in support of national needs. Is science more readily made useful under some structures than others? Can we learn from NOAA's vast experience in this area?
- For NSF, would a transfer of Sea Grant imply a need to enhance the agency's ability to connect NSF-sponsored research with managers in NOAA, and the mission agencies more generally? What mechanisms would be used to make such connections? How would they be evaluated?

These are difficult questions of science policy with the answers neither straightforward nor obvious. And it is not clear if anyone, other than government budget analysts and affected advocacy groups, is even considering these issues. The bottom line of this editorial is that it is uncertain whether the proposed transfer of Sea Grant from NOAA to NSF is good for science or the nation, and this uncertainty is a problem for policy makers. The proposed Sea Grant transfer is yet another example in a growing list ([http://sciencepolicy.colorado.edu/ogmius/current/quest\\_editorial.html](http://sciencepolicy.colorado.edu/ogmius/current/quest_editorial.html)) of how national science policy suffers due to a lack of independent analysis of alternative policy choices. So consider this an early warning of the need for such independent analysis, as in the future a research program near you may find itself in the situation now faced by Sea Grant.

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## Guest Editorial

### Mitigating Severe Weather Impacts in Urban Areas

**W**hat happens when severe weather strikes a major urban area such as Houston, Texas? The answer to this question depends on your perspective. In an ideal world, strong winds would have no effect on buildings or the city's infrastructure, and flooding would pass through without damage or loss of life. This scenario is very different from what actually happens. For example, Tropical Storm Allison last year proved to be the most expensive tropical storm in U.S. history. One reason that Houston experienced \$5 billion in damage is that more people and industry have moved to areas of increased risk from tropical storms and other natural hazards. Another reason is that an unusually prolonged, intense rainfall over a large spatial extent fell over urbanized watersheds, causing some of the worst flooding of any storm to hit Houston to date.

Floods are the most common natural disaster, accounting for 80% of all Presidential Disaster Declarations. However, 90% of flood disasters do not receive this declaration. Vulnerability to flooding has increased due to development in and around floodplains, increasing vulnerability of civil infrastructure to flood waters. Flood damage is estimated to cost the U.S. from \$5 to \$8 billion annually. We can do little to change the weather, but we can change the way communities and their supporting infrastructure are planned and designed. Better construction and planning could mean that intense rainfall or strong winds would have little impact on communities. Achieving this goal requires better education of the public, government officials, and professionals involved in the planning, design, and construction of our engineered environment.

Will we see another Tropical Storm Allison of equal or greater magnitude? Probably. Will we be better prepared? That is the desired outcome of The National Symposium on Mitigating Severe Weather Impacts in Urban Areas. The conference will be held at the Hornberger Center of the Texas Medical Center in Houston, Texas, on April 15-17, 2002. The goal of this conference is to bring together specialists in societal impacts, hydrology, meteorology, civil engineering, city planning, and related technologies to identify how to cope with the ever-increasing insured

losses, damage, and loss of life that occur when severe weather strikes an urban area.

Over the last 35 years, the costs of weather-related disasters across the United States have doubled or tripled each decade. Hardening our engineered environment to meet this threat requires more research on how to build better infrastructure to withstand severe weather. Increased population and wealth places the U.S. at greater risk than ever before. Planning for flood hazards fall into three categories: 1) more accurate predictions, forecasts, and warnings, 2) improved construction standards and siting of structures in ways that minimize wind or water damage, and 3) carefully planned protocols for responses that mitigate impacts of imminent flooding.

Better methods of predicting natural hazards will help recovery plans by enabling cities to organize and mobilize relief agencies. A good disaster recovery plan also takes into account the effect of economic hardships that follow a disaster, and it includes creative ways to overcome those hardships and reestablish the vitality of the community. In the end, a natural disaster can be turned into an opportunity for communities to rebuild while reducing vulnerability. Facility redesign, improved drainage infrastructure, warning systems, and a better plan of action in the face of disaster can reduce future losses.

Examples of improved infrastructure design that prepares us for future storm events can be found in the aftermath of Tropical Storm Allison in Houston. Figure 1 shows newly installed flood doors at the Texas Medical Center (TMC) that retrofit the facility to withstand higher flood levels. Structural engineers and architects in the early phases of TMC development in the 1950s scarcely envisioned the need for designing flood doors and gates



Figure 1.

Protecting power generation equipment using a flood door, Texas Medical Center, Houston, TX.

To submit an item to the WeatherZine, use the on-line form at:

[http://sciencepolicy.colorado.edu/cgi-bin/feedback.pl?site\\_id=1](http://sciencepolicy.colorado.edu/cgi-bin/feedback.pl?site_id=1)

Or send an email to:

[weatherzine-admin@sciencepolicy.colorado.edu](mailto:weatherzine-admin@sciencepolicy.colorado.edu)

and include your name, organization, and email address.

## Guest Editorial Continued

that restrict the flow of floodwaters entering tunnels and parking garages in the TMC campus. Yet this is just what is needed in light of increased development upstream and land subsidence in coastal areas such as Houston due to groundwater withdrawal. Isolation of backup electrical equipment, automatic floodgates, flood doors, and a warning system giving advance notice reduce flood damage. While waiting for the flood to arrive, measures can be taken to prevent or reduce floodwaters from entering facilities. Given advanced notice, personnel and operational logistics can be marshaled in order to continue critical medical services to the community.

New radar detection and flood warning systems can be put into place to help reduce losses. Technological advances in weather detection, warning systems, and advanced hydrologic model predictions improve the accuracy of flood warnings. Simply detecting rainfall does not indicate whether or where it will flood. Coupling of radar and distributed hydrologic models offers improved information about timing and expected flood levels. More timely and accurate predictions of severe weather together with information and decision-support systems help reduce societal impacts by providing the most useful information to stakeholders.

Planned sessions for the symposium focus on various severe weather impacts in urban areas, particularly

flooding. Several keynote presentations are planned including one from John Snow, Dean of the College of Geosciences and Director of National Weather Center Programs at the University of Oklahoma, and another from the Director of the National Academy of Sciences Board of Atmospheric Sciences Committee, Joe (Elbert) Friday, Jr. (former Director of the National Weather Service). Several organizations are joining efforts to host this symposium: The International Center for Natural Hazards and Disaster Research (ICNHDR) at the University of Oklahoma, the Energy and Environmental Systems Institute, and the Department of Civil and Environmental Engineering, both at Rice University, and the Texas Medical Center.

For more information on the National Symposium, see the news item in this issue of the WeatherZine entitled Symposium on Mitigating Severe Weather Impacts In Urban Areas.

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## Student Editorial

### *Ends and Means in Science for Policy: One Scientist's Perspective*

I have heard more than one scientist state, "I do not believe that the Kyoto Protocol will do anything to curb global warming, but I feel it is important that we do something, so I support its ratification." This issue is representative of choices that all scientists, particularly those asked to provide guidance to policy making, must be prepared to face: Should one support a policy that will not achieve its stated goals, but may yield some other benefit to society? I believe the answer to this question is no for three reasons.

First, the purpose of science is to acquire knowledge. When a scientist supports a policy, it can be inferred that he or she believes that the state of knowledge in his or her area of expertise is such that the policy will achieve its stated goal. Suggesting something will achieve its stated goal when one truly believes it will not is contrary to the knowledge-seeking purpose of science. Second, if one supports an ineffective policy in the name of a "greater good," such as protection of our environment, at what point does a societal benefit justify policy? Third, supporting a policy that does not achieve its stated goal may inhibit further research.

Consider the following example: A company called Unreal Energy claims it is close to developing a cold fusion engine. You are an expert in alternative energy sources, and the Secretary of Energy, motivated by Unreal's claims, asks you if the government should fund further research in this area. You have little confidence in the viability of cold fusion and the work coming out of Unreal's labs. However, you are encouraged by the federal government's sudden increased interest in alternative energy sources, and worry that if it chooses not to fund this research, it will invest in additional fossil fuel research instead. In providing advice to the government the scientist must take care to distinguish assessment of whether the concept of cold fusion has scientific merit from whether or not broader investments in research may be warranted.

Another issue arises when considerations of the greater good may justify ignoring scientific inaccuracies, or in other words in cases where ends justify means. One may feel that protecting the environment is reason enough to support a flawed policy, but consider the following example. Most scientists agree that with respect to obesity the United States has a public health problem. Would it be justifiable

## Student Editorial Continued

to publish a study that falsely reports people are suddenly dying from a preservative found in fat-filled foods? If it leads to people eating less high-fat snacks, and thus reduces obesity rates, it is arguably beneficial to our society. While this example is quite different from the Kyoto case, it raises the issue of once we take the first step of justifying unfounded science policies, when do we stop? Are we forced to determine a "benefits threshold" at which scientists will support policies in which the ends justify the means? One can see how a slippery slope could result. The only way to avoid this is to identify clearly the limits of science in guiding policy.

Ultimately implementation of any policy that is justified for reasons other than its stated goals may actually deter further scientific development. In the case of Unreal Energy, supporting the development of cold fusion technology, if it fails to yield results, may actually deflate expectations and in the end deter further funding of alternative energy research. In addition, implementation of policies may also prevent the consideration of alternatives which may achieve the formally-stated goals. Regardless of perceived societal benefits of a policy, a scientist being asked for a scientific opinion who supports a policy for non-scientific reasons risks misleading policy makers and the public, possibly leading to a loss of faith in science itself.

Returning to Kyoto, is this article just a roundabout way of criticizing the Kyoto Protocol? Hardly. If one believes that the scientific evidence suggests the Kyoto Protocol will achieve its intended goals, then by all means one should support it. However, if one believes that the scientific evidence suggests the Kyoto Protocol will not meet its goals, support of the policy will be based on factors that go well beyond science, and the scientist should acknowledge this. Recognize that this judgment goes beyond whether one thinks global warming is or is not a problem and involves judging the potential effectiveness of the Kyoto Protocol itself. I am by no means questioning the good intentions of scientists who support flawed policies because they feel those policies will provide some other benefit to society regardless of their ability to solve the given problem. However, scientists with expertise in an area of policy must carefully consider their special knowledge and whether their support of a particular policy results from this knowledge or other factors.

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## Correspondence

Re: The Need For Probabilistic Forecasting, December 2001 WeatherZine Student Editorial  
([http://sciencepolicy.colorado.edu/zine/archives/31/student\\_editorial.html](http://sciencepolicy.colorado.edu/zine/archives/31/student_editorial.html))

Dear WeatherZine,

As a broadcast meteorologist with 30+ years of experience in one of the top active weather markets, I wish to share a few insights with you. Yes, some indicator of forecast probability is desired, but it seems such notions have always confused those receiving the message. More importantly, weather forecasts promulgated by the broadcast media have been subjected to increased "showboating" by various outlets and individuals. This is where much of the blame lies, and I question whether it can ever be negated.

Those who have watched or listened to many newscasts soon come away from the barrage of advertisements, promotions, and hyperbole with the equivalent of information "shell shock". It's all for the bottom line, higher ratings, job security, and bragging rights. Flurries? They don't light up screens. Double super Doppler and doom and gloom do. And so does inexperience or ineptness.

Weathercasters, announcers, even the minority of true meteorologists who deliver weather information often

enable the feeding frenzy. It's particularly evident in younger broadcasters who lack forecasting experience or clout in the newsroom. If blood (or even the chance of it) is in the water, watch out. Producers, writers, anchors, and promotion people will gobble the young. Few can make a stand against this onslaught. And forget about any stance from those unwise in the ways of weather. Unfortunately, there are quite a few of them delivering the message from newsrooms across America. And look at the clowns who dominate national venues!

In the business, they're called "cookie cutter" talent, and you are seeing plenty of them passing through revolving doors at many stations. Hell, they even move in front of and point at their graphics in the same way. They're the Stepford Wives of Weather and when one cries wolf, they ALL do. That's what led to the ludicrous March event that you describe. Few have the guts or the wherewithal to tell it like it is. And the beat goes on with a wink from the FCC while viewers flee the mayhem. Audiences have shrunk to half of what they were 10 years ago for this and other reasons.

Years ago, broadcasters had to comply with community standards and service as prescribed by the FCC. If not, they could lose their license for misuse of the public's airwaves. Today's toothless regulators demand little and encourage mediocrity. You can light up a channel with just about

## Correspondence Continued

anything and piggyback numerous commercials to fatten the bottom line with little or no challenge. Companies can also merge the quality beast to death by controlling multiple stations, even in the same market. Competition rewarding us with the best? Not anymore.

Sure, we all miss calls due to minute variations of one parameter or another, one model or another. But I submit that the message and the messengers are where much of

the problem lies. As one of the few who disputed what the March storm would bring and received the highest ratings while doing so, I suggest that quality can win. Unfortunately, the powers that be are dragging it down to the lowest common denominator.

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## WeatherZine News

### *The George Washington University EMSE 232 - Crisis and Emergency Management Newsletter*

**T**he EMGT 232 Disaster Newsletter (<http://www.seas.gwu.edu/~emse232/emse232>) is produced by the students in the Fall 2001 class EMGT 232: Crisis and Emergency Management at The George Washington University in Washington, DC. The purpose of The EMGT 232 Disaster Newsletter is to provide its readers with a current perspective of activities in the disaster management field in the United States and around the world. The Newsletter includes information on current

disaster management trends in the areas of research, funding, technology, legislation, and consulting. This information is provided in brief summaries of current activities accompanied by a computer link or reference to more detailed information.

Please forward any comments, inquiries or contributions to George Haddow ([george\\_haddow@hotmail.com](mailto:george_haddow@hotmail.com)).

## WeatherZine News

### *Symposium on Mitigating Severe Weather Impacts In Urban Areas April 15-17, 2002*

**T**his symposium is a follow-up to the one held in 2001 on the same subject: mitigating severe weather impacts. Topics will include best methods for reducing flood impacts through infrastructure design, advanced technology, and flood warning and information systems. Sessions will be organized with a special focus on the effects of Tropical Storm Allison, the most damaging urban flood in U.S. history. Communities vulnerable to natural hazards often have little control over severe weather impacts on infrastructure, energy, and

water supply systems. The goal is to develop public and private partnerships to create a disaster resilient society through improved planning, engineering design, and technology. The outcome is expected to be improved understanding of technology and better design for creating a disaster resilient community infrastructure. See the Guest Editorial in this issue of the WeatherZine for more information.

For more information and to register, click here (<http://hydrology.rice.edu/flood/>).

## WeatherZine News

### *CIRES Center for Science and Technology Policy Research Announces Publication of Newsletter*

**O**gmios, the Gallic god of Eloquence, is also the name of the new newsletter of the Center for Science and Technology Policy Research at the Cooperative Institute for Research in Environmental Sciences at the University of Colorado. Each issue of Ogmios will include an exchange among leading voices in the science and technology policy community, updates on Center projects and websites, synopses of recent Center publications, web and media resources,

information about educational and other science and technology policy opportunities and meetings, and other news and information of interest to the science and technology policy community. Ogmios will be available three times a year by subscription or online. Make sure you receive each issue of Ogmios by subscribing now (<http://sciencepolicy.colorado.edu/ogmios/subscriptions.html>). Or read Ogmios online at <http://sciencepolicy.colorado.edu/ogmios>.

## WeatherZine News

### ***NWA Debate: Should Public and Private Sector Weather Forecasters Present a United Front When Issuing Weather Warnings?***

The National Weather Association's (<http://www.nwas.org/index.html>) "Sound Off" column recently included a discussion about the role of the public and private sectors in issuing weather warnings. According to NWA President Les Lemon, weather broadcasters should never denigrate a NWS warning because if the public receives conflicting information, it generally will take no action in response. If the broadcaster believes a NWS warning (or failure to warn) is in error, the better response is to communicate with the

NWS to discuss the concern. Barry Lee Myers, Executive Vice President of AccuWeather, Inc., questions Lemon's approach. Myers maintains that accuracy should be the ultimate goal, not consistency. A private sector forecaster has an obligation to inform the public if s/he obtains information that conflicts with a NWS forecast. Lemon's suggestion that improved communications can resolve discrepancies is impractical because of time constraints and the need to act quickly. To read the debate in full, visit the Sound Off site (<http://www.nwas.org/soundoff.html>).

## WeatherZine News

### ***Andrew +10 Summit May 30-31, 2002***

This year marks the 10th anniversary of Hurricane Andrew. Many questions still linger: was Andrew really the big one? What if Andrew had hit 15 miles farther north? What was the true maximum sustained wind speed during Andrew? Were our communities really prepared for the impact of this natural hazard? Are we better prepared for the next big one? Hurricane Andrew became a focusing event fixing our attention on several critical issues, from the way we assess the vulnerability of our communities to the need for mitigation and education, at all levels, as tools for reducing the potential for damage from recurring hurricanes. To help address these issues, the International Hurricane Center and Florida International University, with support from the Broward County Office of Emergency Management, Miami-Dade County, FEMA, and the USF Center for Disaster Management and Humanitarian Assistance (CDMHA), are sponsoring a conference entitled Andrew +10 Summit May 30-31, 2002, at Graham Center, FIU University Park Campus, Miami, Florida.

The conference will provide a unique forum for researchers, educators, emergency management practitioners, professionals in many fields, policy-makers and the community at large to:

- Examine the latest research findings in an effort to answer some of the lingering questions.
- Assess the consequences of changes brought about by Andrew in the areas of science and technology, government response, engineering and design, the social and economic impact of hazards, vulnerability and mitigation, and education and outreach.
- Come together to gain a collective perspective of the true significance of Andrew, and to assess the larger scope of our vulnerability to hazards including those so shockingly illustrated by the September 11th, 2001 terrorist attack in the United States.
- Assess the level of federal and state funding and legislative support needed to implement a comprehensive and coordinated national effort of research, education and outreach to reduce the potential for damage from future hurricanes.

For more information and to register, click here (<http://www.ihc.fiu.edu/ihc/summit/pdf/announcement.pdf>).

## Education Highlight

### ***Columbia University's Master's Program in Earth Systems Science, Policy and Management***

The Master's Program in Earth Systems Science, Policy and Management at Columbia University trains sophisticated public managers and policymakers, who apply innovative, systems-based thinking to environmental issues. The program challenges students to think systemically and act pragmatically. To

meet this challenge, the program offers a top-quality graduate program in management and policy analysis, which emphasizes practical skills and is enriched by ecological and planetary science.

Columbia's approach reflects the system-level thinking that

## Education Highlight Continued

is needed to understand ecological interactions and maintain the health of the earth's interconnected ecological, institutional, economic, and social systems.

Graduates are creating a new profession of earth systems problem-solvers: individuals who are prepared for leadership positions in local, state, and federal government agencies, as well as in nonprofit organizations and the environmental divisions of private corporations. They are also well suited for designing cost-effective programs and implementing policies. Most importantly, a deep understanding of earth systems informs their work, allowing them to craft the kinds of solutions necessary for our increasingly complex environmental problems.

This twelve-month program takes place at Columbia University's Biosphere 2 campus, which is located amid the stunning beauty of Arizona's Sonoran Desert in Oracle, Arizona, a 25-minute drive from Tucson. Biosphere 2, a state-of-the-art earth systems laboratory, contains several biomes (a rainforest, a million-gallon saltwater ocean, a coastal fog desert, and four other wilderness ecosystems) that researchers use to experiment on earth systems.

For more information, see the program website (<http://www.columbia.edu/cu/mpabiosphere/pages/introduction.html>).

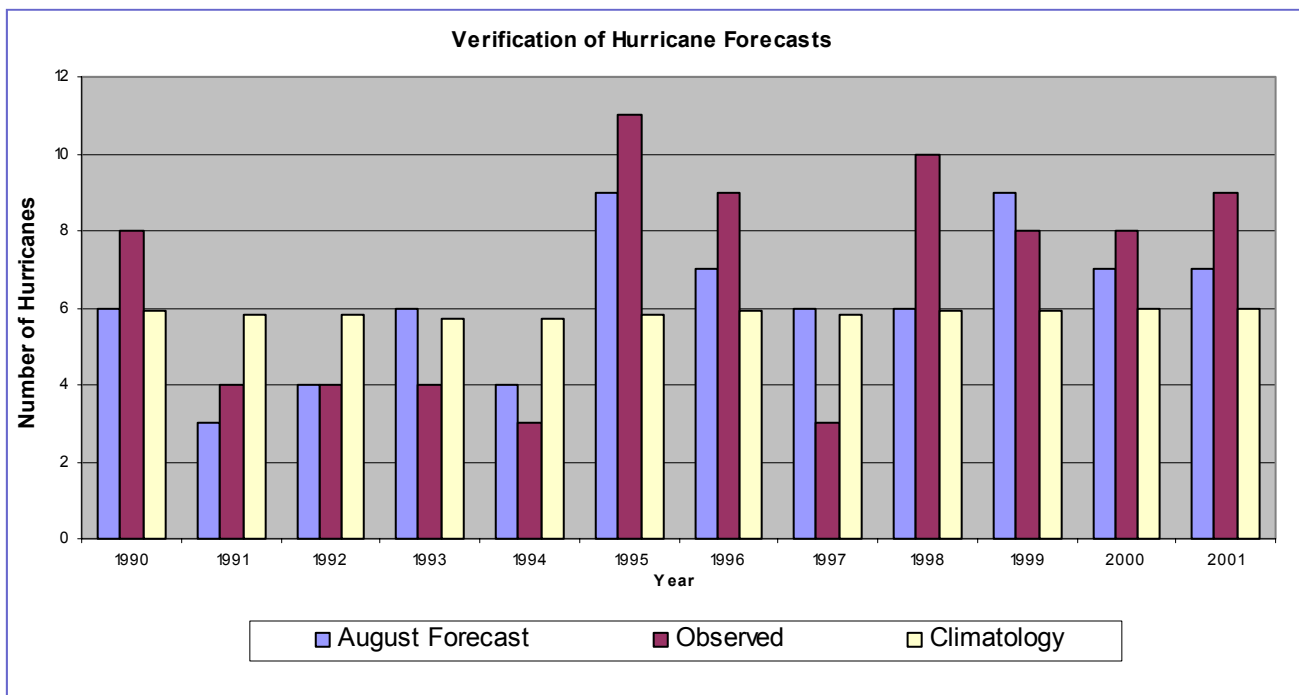
## Research Highlight

### *How Well Did the 2001 Hurricane Season Forecasters do? Once Again, Pretty Good!*

With the close of the 2001 hurricane season, the forecast team of William M. Gray, Christopher W. Landsea, Eric Blake, Paul W. Mielke, Jr., and Kenneth J. Berry (with advice and assistance from Philip Klotzbach and William Thorson) reports that its June and August forecasts verified quite well but December and April's predictions did not do as well. The 2001 season saw a total of 15 named storms and 9 hurricanes; the team's August forecast predicted 12 named storms and 7 hurricanes. The following chart illustrates the team's August track record since 1990 in predicting the annual number of hurricanes as compared to climatology.

For complete details see the team's report (<http://typhoon.atmos.colostate.edu/forecasts/2001/nov2001/>).

The team recently released its early season forecast for the 2002 hurricane season. It is predicting an active season with 13 named storms, 8 hurricanes, and 4 intense hurricanes. There is an 86% probability of a major hurricane making landfall for the entire U.S. coast line, which compares to an average of 52% over the last century. For more details see the forecast (<http://typhoon.atmos.colostate.edu/forecasts/2002/fcst2002/>).



## Jobs

### SCIENTIST I/II Societal Impacts Of Weather National Center for Atmospheric Research (NCAR)

The Environmental and Societal Impacts Group (ESIG) at the National Center for Atmospheric Research (NCAR) seeks an individual to work as an early- or mid-career scientist with primary interests in research on societal impacts of weather and management of weather-related risks, with a focus on extreme events. ESIG is an interdisciplinary community of social and environmental scientists working on the science of weather and climate impact assessment. See <http://www.esig.ucar.edu>.

ESIG seeks candidates with experience and interest to bridge the social and atmospheric sciences through fundamental research and applications of new knowledge to problems of national importance. The ideal candidate will have a record of significant research accomplishments and a strong commitment to collaborative problem solving. Examples of relevant research areas include: the use and value of improved forecasts, economic and social impacts of extreme weather, design and evaluation of innovative computer-aided assessment and decision support tools, organizational responses to weather disasters, and modeling and analysis of societal vulnerability to extreme

weather. Candidates should be familiar with the U.S. Weather Research Program (<http://uswrp.org/>).

Position requires a Ph.D. degree in a social science or interdisciplinary area related to societal impacts of weather (e.g., geography, social systems modeling, political science, decision science, risk assessment, organizational behavior). At the Scientist I level, postdoctoral experience is desired. Level II requires at least 3 years' research experience in an interdisciplinary setting.

View detailed job description at:

<http://www.fin.ucar.edu/hr/careers/jobs/2076PM.html>.

Initial consideration will be given to applications received prior to February 25, 2002. Thereafter, applications will be reviewed until the position is filled. Apply online or via email to: [ucar.ncar@rpc.webhire.com](mailto:ucar.ncar@rpc.webhire.com), or send a scannable resume to:

3450 Mitchell Lane  
Boulder, CO 80307  
(Reference job #2076)

UCAR's strength lies in the diversity of its people and the ways in which they contribute to the success and mission of the organization. AA/EOE

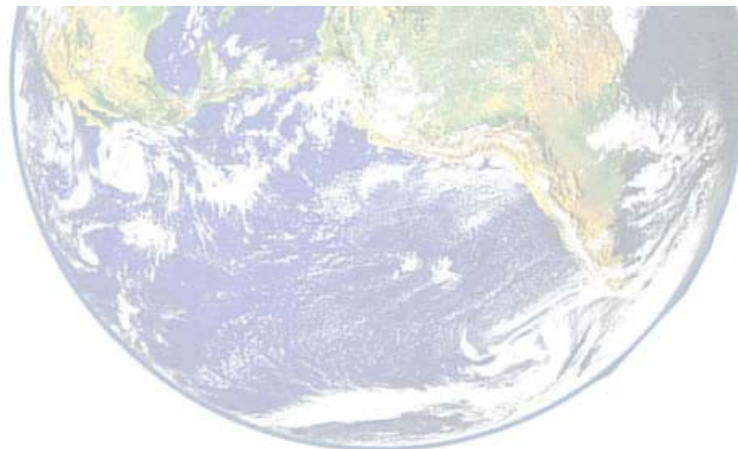
### Global Climate Change and Society Research Assistant

The Global Climate Change and Society program is seeking a research assistant for the summer of 2002. GCCS is an NSF-funded, 8-week summer program (June 17-August 9) for undergraduates that examines global climate change from scientific, political, and philosophical perspectives. The program is run through the Center for Science and Technology Policy Research, University of Colorado, and the National Center for Atmospheric Research (NCAR). More information on the program is available at: <http://sciencepolicy.colorado.edu/gccs>.

GCCS seeks a research assistant interested in program

themes, and available for close to full time for a 9-week period beginning June 10 (plus a small amount of time across the spring). Duties include but are not limited to: acting as liaison between faculty and students, and between GCCS and other organizations; making travel arrangements for guest speakers; program clerical support; attending and participating in lectures; and making transportation and logistics arrangements for various field activities.

Please contact Robert Frodeman ([frodeman@colorado.edu](mailto:frodeman@colorado.edu); 303-440-6776) or Mark Bullock ([bullock@boulder.swri.edu](mailto:bullock@boulder.swri.edu); 303-546-9027) for further information.



## Additions to Societal Aspects of Weather Website (<http://sciencepolicy.colorado.edu/socasp>)

### Floods, General Resources

[http://www.engga.uwo.ca/research/iclr/Post-  
ws/default.htm](http://www.engga.uwo.ca/research/iclr/Post-<br/>ws/default.htm)

### Non-structural Measures for Water Management Problems

Non-structural measures are an attractive alternative and addition to structural measures that may reduce the loss of

life and property caused by water-related problems. The main objective of this workshop was to identify the role of non-structural measures in a sustained set of actions that improve society's capacity to anticipate, mitigate, withstand, and recover from water-related problems. This site from the UNESCO workshop includes presentations, list of participants, comments, media response, and a photo gallery.

## Subscription Information

The *WeatherZine* is produced both as a web page and an email message. Subscribing to the *WeatherZine* will add you to our distribution list and you will receive the *WeatherZine* by email.

### To subscribe

(<http://sciencepolicy.colorado.edu/zine/subscriptions.html>)

## 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.

Primary support for the *WeatherZine* comes from the U.S. Weather Research Program.

### On-Line version

(<http://sciencepolicy.colorado.edu/zine/>)

Email: [weatherzine-admin@sciencepolicy.colorado.edu](mailto:weatherzine-admin@sciencepolicy.colorado.edu)



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