

WeatherZine

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With this issue the WeatherZine will be saying farewell (see "WeatherZine to Call It Quits" <http://sciencepolicy.colorado.edu/zine/archives/34/news.html>) though the archives will remain online (<http://sciencepolicy.colorado.edu/zine/archives/>). The WeatherZine staff has greatly enjoyed producing this bimonthly publication since December 1996 and appreciates the support that its 750+ subscribers and other readers have provided over the years.

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Editorial

Homeland Security and the Atmospheric Sciences

On June 6, 2002 President George Bush proposed that the federal government reorganize its "homeland security" (<http://www.nytimes.com/2002/08/31/politics/31TALK.html>) activities into a single agency because his administration had "concluded that our government must be reorganized to deal more effectively with the new threats of the 21st century." Specifically, the President argued, "Right now, as many as a hundred different government agencies have some responsibilities for homeland security, and no one has final accountability. For example, the Coast Guard has several missions, from search and rescue to maritime treaty enforcement. It reports to the Transportation Department, whose primary responsibilities are roads, rails, bridges and the airways. The Customs Service, among other duties, collects tariffs and prevents smuggling -- and it is part of the Treasury Department, whose primary responsibility is fiscal policy, not security" (<http://www.whitehouse.gov/news/releases/2002/06/20020606-8.html>).

While there has been considerable discussion (<http://hsc.house.gov>) about the new Cabinet-level agency, as so often seems to occur in major discussions of policy, the atmospheric sciences have not been included in such discussions.

But if the new agency is indeed to serve as "a focal point regarding natural and manmade crises and emergency planning" (<http://hsc.house.gov/legislation/hr5005eh.pdf>), it is hard to imagine that the atmospheric sciences would not be part of homeland security

discussions

(<http://sciencepolicy.colorado.edu/zine/archives/30/editorial.html>) and perhaps even part of the new institutional arrangements.

Leaders in the atmospheric sciences community would appear to agree. For example, the University Corporation for Atmospheric Research (<http://www.ucar.edu>) argues in a pamphlet titled "National Security and the Essential Role of the Atmospheric Sciences" (http://www.ucar.edu/oga/security_doc.pdf) that "weather and climate information is of increasing value ... to military operations, and responses to terrorist attacks." And the National Research Council has created a committee to explore "Tools for Tracking Chemical/Biological/Nuclear Releases in the Atmosphere: Implications for Homeland Security" (<http://www4.nationalacademies.org/webcr/nsf/5c50571a75df494485256a95007a091e/a8f2346caf98e5fa85256b9d005abfbd?OpenDocument>).

While the issue of homeland security raises many questions about atmospheric science and technology, there is one question in particular that I'd like to focus on here: Should the National Weather Service (NWS), currently a part of the Department of Commerce, be considered for inclusion in the new Homeland Security Department? There would seem to be a number of reasons why such a move makes sense and a number of reasons why it does not.

Reasons why a move makes sense

1. Mission alignment.

Part of the National Weather Service mission

Editorial Continued

(<http://www.nws.noaa.gov/hdgrtr.html>) is to focus on protection of life and property. As such, if it makes sense to place the Federal Emergency Management Agency (FEMA) within the Department of Homeland Security, it would only seem logical to consider placing NWS there as well. And since the vast majority of FEMA's activities deal with weather disasters, not terrorism, any enhanced connection between FEMA and NWS would likely be of benefit to the nation's disaster policies.

2. Better use of Science and Technology.

The issue of effectively using science and technology (e.g., such as transferring knowledge from a research environment to an "operational" environment) is receiving considerable attention in both the world of weather and climate (<http://www4.nationalacademies.org/webcr.nsf/5c50571a75df494485256a95007a091e/d5faac9ed3e08b49852567670058a691?OpenDocument>) and in the world of homeland security (<http://www.house.gov/science/press/107/107-250.htm>). Perhaps placement of the NWS into the Homeland Security Department would provide additional impetus to turn research results into useful products and services (<http://sciencepolicy.colorado.edu/zine/archives/1-29/21/editorial.html>). If so, this would be a valuable boost to the nation's weather services.

Reasons why a move does not make sense

1. Lack of mission alignment.

The NWS also has a mission to enhance the nation's economy. The dual missions of the NWS historically have wreaked havoc in the area of public and private sector roles and responsibilities ([http://sciencepolicy.colorado.edu/zine/archives/1-](http://sciencepolicy.colorado.edu/zine/archives/1-29/21/editorial.html)

[29/26/editorial.html](http://www.theatlantic.com/issues/2002/09/mann.htm)). This focus on the economy suggests that the Department of Commerce is indeed the proper institutional home for the NWS. In any case, consideration of NWS' placement within a homeland security department would be valuable if it were to lead to a discussion about how the NWS might reconcile the challenges posed by the inherent conflicts of its dual mission.

Bigger questions.

Some have questioned whether the creation of a Department of Homeland Security will accomplish its intended goals (<http://www.theatlantic.com/issues/2002/09/mann.htm>). Before addressing whether it makes sense to move the NWS, isn't a logical prior step to get some understanding of whether the new organization can actually work? Further, the nation has built its weather, climate and water services over more than 100 years. Whatever opportunities exist for their improvement exist in the context of a track record of success. If it's not broken, don't fix it.

Ultimately, what matters most is how the NWS might better benefit the nation. Broad institutional change occurs infrequently enough in government that it would be worth asking whether the nation's weather, water, and climate services might better serve the needs of the nation under a new structure. If nothing else, simply raising the question might lead to proposals for change that make sense irrespective of any ultimate reorganization.

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Guest Editorial

Déjà vu All Over Again ... But It Doesn't Have to Be That Way

Nothing generates interest in the weather more than a weather or climate extreme. This year is one of those years when droughts, floods, bush and forest fires, and vector-borne diseases are capturing the headlines on a daily basis in the United States and abroad. It is interesting to note that missing from headlines this year (so far) are news stories about ice storms, tornadoes, and hurricanes.

Twenty-five years ago, I wrote an editorial entitled "Render unto weather ...". Admittedly, this title was then a play on words, an attempt to get people to stop blaming specific weather anomalies for all the damage that happened to occur during those anomalies. In those days, there was a tendency for governments at all levels to blame nature for the damage that occurs during an extreme event. That way decision makers can blame the heavens for loss of life and

property and by doing so convince others that the anomalies were not their responsibility and the damage was beyond their control.

Since the late 1970s, however, an increasing number of social scientists have questioned "blaming nature" for disasters. They set out to devise ways to separate what could legitimately be blamed on a specific weather or climate anomaly from what could legitimately be blamed on societal decisions. Sadly, governments continue to blame nature whenever an extreme event turns into a societal disaster.

For example, in the late 1980s a Congressional bill was put forth in order to "end famine" by deploying a monitoring satellite over drought-prone parts of Africa. The truth of the matter is that droughts often have much less to do with

Guest Editorial Continued

famine than the various underlying political, social, and economic conditions existing in a region at the time of the drought.

As another example, Hurricane Andrew was a very damaging and expensive extreme event. Although damage was of course caused by this hurricane, studies have since shown that a considerable amount of damage could have been avoided, had the construction companies simply adhered to southern Florida's building codes. As another example, floods along the Mississippi in the summer of 1993 were very damaging to "protected" settlements in the floodplain. In retrospect, it became clear that decisions to allow for development in the natural floodplain bore as much responsibility for the damage as did the heavy rains and resulting high water in the river system.

Despite the obvious need to identify what to blame on nature and what to blame on the arrogance or ignorance of decision makers, weather and climate impacts researchers remain poorly funded, often ignored by the physical science research community.

In the late 1990s, meteorologists discussed weather-proofing the United States – a laudable goal, but a very difficult if not impossible task to achieve. Such talk misleads the public about the ability of the scientific community to protect society from weather-related harm. I would argue that most social scientists would have cautioned against talk of "weather- or climate-proofing" society.

Since the end of the Cold War in the early 1990s, the U.S. government has questioned scientific research's relevance

to addressing societal needs. Now, just about every scientific endeavor seeks to show such relevance, in part by claiming its value to society, at least in their opening paragraphs or colorful brochures. Yet, science budgets do not provide adequate funding to identify the societal aspects of these issues, even though many of the solutions to climate- and weather-related problems lie in the realm of social science research. A better forecast of the trajectory of Hurricane Andrew would likely have had little impact on the physical damage it caused; likewise for the floods in the Mississippi or the famines in Africa.

Since I wrote that editorial for *Climatic Change* in 1978, the physical side of our understanding of the atmosphere and its impacts on society has improved dramatically, as has the monitoring of the climate system. Social scientists whose interests in the weather-climate-society nexus have grown sharply are, however, still considerably short of the funds needed to better sort out the impacts of decisions from the impacts of anomalies. Justifications for climate research today invoke societal needs as the primary reason for public support. When can we expect funding trends to follow the new verbiage?

If I have one fear to express, it is that the next generation of researchers will decades hence be asking the same questions I am asking toward the end of my career in impacts research.

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Student Editorial

Reactions to the Changing Climate of K-12 Weather Education: Teacher Instruction

Like so many people in the field of meteorology, my interests in weather developed at a young age. By high school, I had read every weather book I could find and had learned much about basic atmospheric features. However, little to none of my pre-college education about the weather actually came from what I learned in the classroom. Perhaps I picked up a few meteorological facts and concepts scattered here and there, but never did my science teacher devote an entire unit (or course) to weather alone. In discussing this issue with my collegiate peers and elders, I have found that basic weather education had been scarce in their schooling as well.

Times are changing. More and more elementary, middle, and high schools are incorporating substantial weather units and, in some cases, even separate courses into the school curriculum content. This increase of weather content into school curricula is partially a result of the current emphasis placed upon standards-based education,

in which school administrators and teachers mold school educational content around learning and understanding fundamental concepts, facts, systems, and procedures.

Education Standards

Standards-based education has become a priority for school districts all over the country. This precedence is due much in part to the increased role of standardized testing at all grade levels in an attempt to normalize learning on a broader scale. Educational standards are important factors that teachers consider when developing class curricula and lesson plans. The National Science Education Standards for grades K-12 are quite general compared with individual state and local standards, but do include standards relating directly to atmospheric properties and phenomena, climate, and natural hazards. Usually, state and local standards are more detailed. For example, earth science standard 3.5.7C of the Pennsylvania Department of Education Academic Standards for Science and Technology states that upon completion of the 7th grade all students should be able to

Student Editorial Continued

do the following:

- Explain weather forecasts by interpreting weather data and symbols
- Explain the oceans' impact on local weather and the climate of a region
- Identify how cloud types, wind directions and barometric pressure changes are associated with weather patterns in different regions of the country
- Explain and illustrate the processes of cloud formation and precipitation
- Describe and illustrate the major layers of the earth's atmosphere
- Identify different air masses and global wind patterns and how they relate to the weather patterns in the different regions of the U.S.

Educators often hear that the goal of weather education is to teach young people how to become smart weather consumers. The word 'consumer' can be misleading to both teachers and students. Obviously, students will not be literally buying weather; however, they will be subject to the often unpredictable and destructive dynamics of the atmosphere. They need to know how to live with the effects of weather on nature, the economy, transportation, and society as a whole. This requires not only being able to distinguish between basic atmospheric features, but also appreciating the power of natural forces and understanding how humans change the natural environment. Naturally, weather education also involves informing young people about natural disaster safety and preparedness. The science education standards are also meant to encourage students to pursue careers in scientific and/or technological fields.

Unfortunately, the existence of these meteorological education standards does not guarantee that students are learning this material. Inadequate instructional materials, outdated classroom technology, and limited time within the school day and year are obstacles that science teachers must overcome. The educator's own lack of meteorological knowledge is perhaps the greatest barrier to the progression of meteorological education in the country's public school system. Presently, many of the nation's science teachers do not have the adequate educational background and basic meteorological knowledge necessary to effectively teach weather in the classroom. As the above example state standards indicate, much of this weather instruction is falling upon elementary and middle school teachers, most of whom have probably never taken a formal course in meteorology. While some educators are able to expand their meteorological knowledge through personal study on their own time, most teachers simply do not have the extra time or resources to do so.

Meteorological Training for K-12 Teachers

Fortunately, governmental agencies, universities, and

private businesses have recognized this need to "teach the teachers" about meteorology. These institutions host and sponsor courses aimed at providing scientifically accurate information, hands-on demonstrations, and other resources that teachers may take back their schools and apply in the classroom. The latest trend in weather education for teachers is courses that require the participants to reside on-campus for a week or two for the duration of the course. Generally, these 1-3 credit 400 or 500 level courses are condensed, yet intensive, and take place during the summer months. The Penn State Department of Meteorology hosted its first annual "Weather Camp for Teachers" in late June of 2002 with support from the National Science Foundation, Penn State Outreach, the Pennsylvania Space Grant Consortium and the College of Earth and Mineral Sciences. Twenty-five elementary, middle, and high school level teachers from Pennsylvania, New Jersey, New York, and the U.S. Department of Defense participated in the week-long program, which involved completing a set of pre-workshop assignments, attending lectures by university faculty, visiting local meteorological research, forecasting, and communication facilities, and developing meteorological lesson plans for use in their classrooms. Throughout the week, the eager participants also competed in a daily forecasting contest, debated over global warming, and each individual taped his/her own television weather broadcast. Surveys completed by the participating teachers indicate that this relatively small group of 25 science educators instructs at least 2,840 students each year. Imagine how many of the country's youth could be influenced if 500, 1,000, or more teachers had the opportunities to participate in weather education enrichment programs such as these.

The Forecast?

The development of meteorological teacher education resources is a promising advancement towards enhancing the knowledge of the next generation of students. Unfortunately, these resources are reaching only a small segment of the nation's educators and students. The need for meteorological teacher training is an incredible opportunity for atmospheric scientists to share our knowledge and enthusiasm about the atmosphere with the educational community.

The complete National Science Education Standards can be found at <http://www.nap.edu/html/nse/html/>.

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Editor's note: Ms. Kowalski received her bachelor's degree in meteorology from Valparaiso University, and is currently a master's student in the Penn State Department of Meteorology, where she is studying under Dr. Greg Jenkins.

WeatherZine News

Book release - How the weather affects your health

Weather and health (biometeorology) is the subject of the above title. The author is Manfred Kaiser and the book has been published by Michelle Anderson Publishing, Melbourne, Australia. It is distributed by

Bookwise International, ISBN 0-85572-329-7, and available at <http://www.manfredkaiser.com>. On this website you can also find more information about the book: the introduction, a sample, and the table of contents.

WeatherZine News

DISCCRS

Dissertations Initiative for the Advancement of Climate Change Research

<http://aslo.org/discrcs/discrcrposter.pdf>

DISCCRS catalyzes interdisciplinary understanding and peer networking among recent Ph.Ds across the full range of disciplines relevant to the understanding of climate change and its impacts. Jointly sponsored by the American Geophysical Union (AGU), American Society of Limnology and Oceanography (ASLO), American Meteorological Society (AMS) and Ecological Society of America (ESA) and supported by NASA and NOAA, the program includes:

◆ **DISSERTATION REGISTRY:**

An online, fully searchable Ph.D Dissertation Registry introduces graduates to the community and provides a concise overview of recent advances from around the world.

◆ **E-MAIL DISTRIBUTION LIST:**

Job and other announcements are transmitted electronically to recent grads. Messages targeting this group may be sent to phd@whitman.edu for distribution.

◆ **SYMPOSIUM:**

A capstone symposium fosters international, interdisciplinary understanding and peer networks. Grads have an opportunity to present their research, meet with agency representatives, and discuss emerging research, education and societal issues.

The first symposium will be held
March 10-15, 2003
Copamarina Resort, Puerto Rico.
APPLICATION DEADLINE is
October 6, 2002

Forty participants will be selected by committee based on the application materials submitted. Airfare and on-site expenses are subsidized by the supporting agencies (NASA and NSF).

For further information visit <http://aslo.org/phd.html>.

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Interesting Weather Factoid

True or False?

September historically has more major hurricanes than all other months combined.

TRUE. September historically has more major hurricanes than all other months combined.

From The Institute for Business and Home Safety Website, <http://www.ibhs.org/>

WeatherZine News
Call for Papers:
Climate Prediction Assessments Workshop Research
and Applications on Use and Impacts - October 28-30, 2002

The National Weather Service Climate Services Division, in conjunction with the NOAA Office of Global Programs and the NOAA Climate Observations and Services Programs, is hosting a meeting in the fall of 2002 in the Washington, DC area to identify new research and applications on use and impacts of climate predictions. The meeting goals are to identify new climate applications research, promote interactions between climate-sensitive integrated research and service communities, and assess impact of climate forecasts on environmental-societal interactions.

Papers for this conference are solicited from the community on new research that uses climate forecasts, applications of climate forecasts, identifies needs for climate forecasts,

use and impacts of climate forecasts, and related topics. Please submit abstracts electronically to Ms. Jill Reisdorf at reisdorf@ucar.edu by September 23, 2002.

To assist in planning for your attendance and for more information, please contact Ms. Jill Reisdorf at reisdorf@ucar.edu or by phone at (303) 497-8636, or contact meeting co-chairpersons Fiona Horsfall (Fiona.Horsfall@noaa.gov) or Harvey Hill (Harvey.Hill@noaa.gov). Meeting details will follow shortly.

There is limited funding available to support non-federal employee participation in the workshop. Please contact Ms. Jill Reisdorf concerning your requirements for travel support to attend the workshop.

Education Highlight
Geoscience Education

The Directorate for Geosciences (GEO) and its Advisory Committee for Geosciences (AC/GEO) recognize that active support of geoscience education must be a significant element of GEO's mission to promote the overall health of the geoscience enterprise. This commitment extends beyond the familiar tradition of support for the training of graduate students to embrace geoscience education reform at the undergraduate and pre-college levels and active outreach to the public.

In addition to research programs in the atmospheric, earth, and ocean sciences, the Directorate supports a number of crosscutting and interdisciplinary programs:

- ◆ Global Change Research
- ◆ Biocomplexity in the Environment
- ◆ Programs to support Geosciences Education
- ◆ Opportunities for Enhancing Diversity in the Geosciences

For more information visit the Geosciences website at <http://www.geo.nsf.gov/adgeo/education.htm>.

Research Highlight
Risk Prediction Initiative (RPI)
<http://www.bbsr.edu/rpi/>

The Risk Prediction Initiative (RPI) is a research and educational program of the Bermuda Biological Station for Research. The goal of the RPI is to facilitate a working relationship between climate scientists and businesses that can benefit from climate-related information and predictions. The RPI currently focuses on the link between hurricane research and the (re)insurance industry. The focus of RPI activities is determined through a continuing series of RPI workshops in which insurers and climate scientists identify new directions for insurance-relevant climate research. The RPI uses funds contributed by its industry partners to support this research, and creates communication tools that translate the research results into a format that insurers

can use. Current RPI-funded research focuses on projects that improve hurricane landfall forecasts, use proxy signals to extend the documentary record of hurricane landfall, elucidate the link between tropical cyclones and climate variability, and promote development of a public risk model. Participation in the RPI provides climate scientists with funding and intellectual support for their work, and helps clarify how they can make their forecasts most useful to a business audience and to society. Insurers enhance their business via access to more accurate predictions of future hazards and catastrophes, and by gaining a better understanding of the science behind the predictions.

For more information, visit the RPI website at <http://www.bbsr.edu/rpi/>.

Additions to SOCASP
Historical Hurricane Tracks
http://www.csc.noaa.gov/hurricane_tracks

The Historical Hurricane Tracks site contains an interactive mapping application that allows users to query and display 150 years of Atlantic Basin tropical cyclone data from the National Hurricane Center's Tropical Cyclone Best Track data set. The ability to plot user-defined portions of the data set and

download credible and reliable data will enhance knowledge of hurricane climatology for any location within the Atlantic Basin. The web site includes text documents detailing particular storm events and graphs showing historical population data versus hurricane strikes for coastal counties from Texas to Maine.

Additions to SOCASP
Risk Frontiers: Mainstream flood risk rating and analysis
<http://www.es.mq.edu.au/nhrc/web/floodAUS/floodausbrochure.htm>

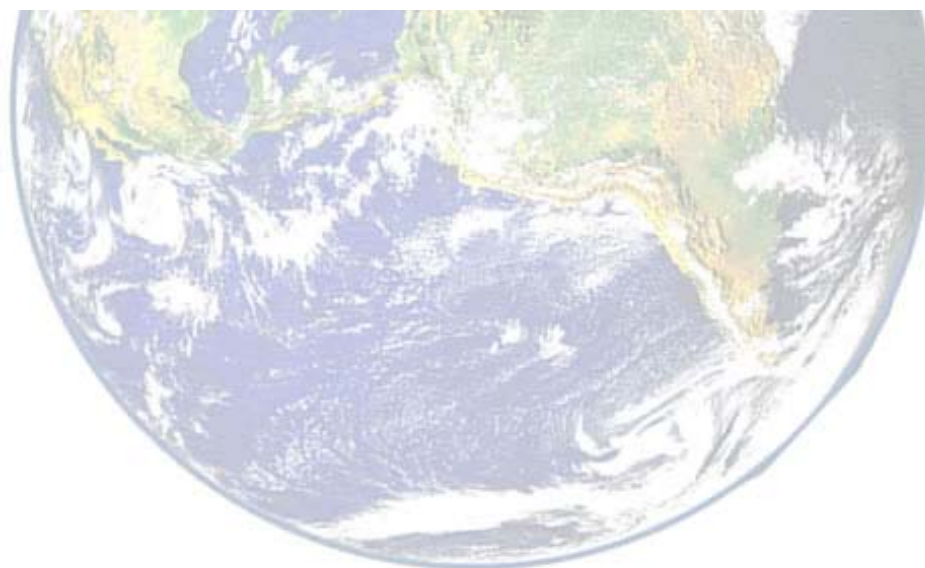
Included on this site is a GIS-based model for estimating mainstream flood risk in urban areas on a

per address basis. Users can determine risk according to zip code for certain areas in Australia.

Additions to SOCASP
Flood Damage in the U.S.
<http://www.flooddamagedata.org/>

Flood Damage in the United States, 1926-2000: A Reanalysis of National Weather Service Estimates, by Roger A. Pielke, Jr., Mary W. Downton, and J. Zoe Barnard Miller, is a reanalysis of flood damage estimates collected by the National Weather Service (NWS) between 1925 and 2000. The flood damage estimates presented in this website are compiled from NWS records and publications,

supplemented by reports of other federal and state agencies. The accompanying report includes an evaluation of the accuracy of the estimates and recommendations for users of the data. When properly used, the reanalyzed NWS damage estimates can be a valuable tool to aid researchers and decision makers in understanding the changing character of damaging floods in the U.S.



Job Opportunities

AAAS Science and Technology Policy Fellowships, 2003-04

Scientists and engineers are invited to apply for one-year science and technology policy fellowships in Washington, DC, beginning September 2003. Fellows serve in the Congress and several executive branch agencies including the U.S. Environmental Protection Agency, the U.S. Food and Drug Administration, the U.S. Department of Agriculture, the U.S. Agency for International Development and the U.S. Department of State.

These programs are designed to provide each Fellow with a unique public policy learning experience and to bring technical backgrounds and external perspectives to decision-making in the U.S. government.

Applicants must be U.S. citizens and must have a Ph.D. or an equivalent doctoral degree by the application deadline (January 10, 2003) from any physical, biological or social science, any field of engineering or any relevant

interdisciplinary field. Individuals with a master's degree in engineering and at least three years of post-degree professional experience also may apply. Federal employees are ineligible. Stipends begin at \$56,000.

For application instructions and further information about the AAAS Science and Technology Policy Fellowship Programs, contact:

1200 New York Avenue, NW
Washington, DC 20005
Phone: 202/326-6700

E-mail: science_policy@aaas.org

Web: <http://fellowships.aaas.org>

Underrepresented minorities and persons with disabilities are encouraged to apply.

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

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