



The National Flood Insurance Program: A Multi-Year Evaluation

— an invited comment

Sometimes change is good. Sometimes it makes no sense to fix what isn't broken. And sometimes external events force dramatic changes that, in the long run, make us stronger.

Since its formation in 1968, the National Flood Insurance Program (NFIP) has undergone many major changes, from moving to the unique public-private partnership through the Write Your Own program to the congressional mandate that all homes with federally guaranteed mortgages in the Special Flood Hazard Area (SFHA) have flood insurance. Throughout the program's evolution, the NFIP has taken a hard look at itself and made necessary

changes to benefit its policyholders and stakeholders—including you, the American public.

Some of the most dramatic changes come in times of crisis. No challenge to the program has been greater, perhaps, than the mammoth response needed to deal with more than 240,000 claims stemming from Hurricanes Katrina, Rita, and Wilma. In the days immediately following Hurricane Katrina, NFIP partners across government, insurance, floodplain management, and other sectors teamed to make changes that would expedite claims processing, enabling thousands of families to begin their recovery from catastrophic flooding much sooner. Those

changes included aerial surveying using reconnaissance aircraft to determine the extent of damage and waiving the proof-of-loss requirement for policyholders in affected areas.

Some changes are more gradual. For many years, the NFIP has fought to remove repetitive loss properties from the program's exposure. This year, it is taking larger steps to meet that goal. Through the Repetitive Flood Claims grant program, more than \$9 million will be used to acquire and demolish flood-prone homes, saving families continued heartache and saving the NFIP millions in repetitive loss claims. The NFIP is also involved in rulemaking on the Severe Repetitive Loss pilot program, which will remove even more flood-prone structures from harm's way.

In 2000, the NFIP embarked on a multi-year evaluation to ensure that the program is continuing to meet the express goals of Congress:

- Decrease the risk of future flood losses
- Reduce the costs and adverse consequences of flooding
- Reduce the demands and expectations for disaster assistance after floods
- Preserve and restore the natural and beneficial value of floodplains

It was the first time the NFIP had undergone such a thorough evaluation, and FEMA staff and I sincerely appreciate the thought and effort from scores of experts nationwide. Recently, the 191 recommendations contained in 14 reports were delivered to me. The 14 reports encompass six key areas:

- Summary and performance measures
- Actuarial soundness and the costs and consequences of flooding
- Compliance with NFIP floodplain management requirements
- Building standards and identifying flood risk
- Environmental and developmental impacts of the NFIP
- Insurance policy sales and the mandatory purchase requirement

The recommendations can be categorized into three key areas: floodplain management, flood hazard mapping, and flood insurance. Those areas also happen to be the three major parts of what we refer to as the "three-legged stool" that is the NFIP.

More than half the recommendations are related to floodplain management and cover floodplain management regulations, compliance, the Community Rating System, the Community Assistance Program, the role of the states, and how to handle existing buildings.

The flood hazard mapping-related recommendations address Letters of Map Change, mapping changes affecting floodways and SFHAs, natural floodplain functions, levees, and risk communications. The insurance-related recommendations deal with underwriting, claims, actuarial soundness of the NFIP, grandfathering of insurance rates, marketing, mandatory purchase, and the Coastal Barrier Resources Act.

FEMA staff are currently reviewing each recommendation in detail and assessing whether the recommendations should be accepted or rejected. Included in

the assessment are resources required for implementation and a priority ranking system to determine which recommendations to tackle first. As I continue to review the complete study, I intend to use the assessment as a tool for deciding which recommendations to incorporate into FEMA's short- and long-term planning.

Some of the 191 recommendations are already in the pipeline. Others will require more time and energy to accomplish, and their benefits may not be as great. But programmatic changes alone won't be enough to meet the mandate that Congress and the American people have set for the NFIP. Our policyholders and our country deserve more and better. To decrease the risk of future flood losses, reduce the costs and adverse consequences of flooding, reduce the demands and expectations for disaster assistance after floods, and preserve and restore the natural and beneficial value of floodplains, our nation must work together at every level to learn more about individual and community flood risk and to take appropriate protective action now.

States and communities must not sit back in contentment and simply rely on the federal minimum as the local maximum for managing risk; they must lean forward and proactively take steps to reduce risk based on their own knowledge of local risk. Although FEMA can make program changes at the federal level, it is the local implementation of risk reduction programs that makes the difference.

Last year, the field of flood mitigation lost a true giant in Gilbert White, who died in October. Dr. White made extraordinary contributions to educating governments about the full range of actions available to manage floodplains and mitigate flood losses. His persistence over several decades moved this country away from relying solely on engineering solutions to flood hazards. He convinced the nation to take a broader view of reducing flood risks, including the implementation of the NFIP, which encourages responsible floodplain management at the local level to create stronger, safer communities.

But as I write this, the city of Aberdeen, South Dakota, is flooding after receiving more than eight inches of rain in one 24-hour period. That horrific situation is compounded by local residents' decisions to drop their flood insurance after construction of a new levee eliminated the federal requirement. The levee was constructed to protect the town from the 1% annual chance event—the minimum federal requirement for flood protection—thereby removing areas behind the levee from the mandatory flood insurance purchase requirement. More than half the 260 affected policyholders voluntarily dropped their coverage when their insurance requirement changed, not realizing or understanding that removing an area from a designated floodplain does not mean the area is immune to flooding. Unfortunately, the May flood exceeded the levee's 1% annual chance height, and more than 100 families are learning the hard way that nature does not pay attention to human probability formulas.

In April, the cities of Grand Forks, North Dakota, and East Grand Forks, Minnesota, commemorated the 10th anniversary of the Red River Flood of 1997, which

sent murky waters some two miles outside of the river's banks. During the height of the flooding, a major fire also destroyed 11 buildings in downtown Grand Forks. The Red River rose a full five feet above where it was expected to crest, causing more than \$2 billion in damage.

Both cities, in a remarkable showing of federal-state-local and private partnerships, have almost entirely recovered. Many flood-damaged homes were removed from risky flood-prone areas, and while those areas may flood again, those homes never will.

But the story doesn't end there. As a massive new floodwall and levee system was erected to protect citizens, scores of them dropped their flood insurance coverage. My fear is that someday another flood will occur that exceeds the design standards of the city's flood control system, and those same residents will wish they still had their flood insurance to help them recover.

As the old saying goes, an ounce of prevention is worth a pound of cure. In the case of flood mitigation, Gilbert White taught us that it's an ounce of preparation that's worth a pound of flood cleanup. Flood hazard mitigation tools like flood insurance and floodplain management are low-cost, high-value methods of preventing costly damage and lost lives. Yet, too often, short-sighted decisions by local leaders to petition the federal government to shrink SFHAs lead to catastrophic results for the very people they have pledged to serve. And even shorter-sighted decisions to drop flood insurance coverage instead of converting it to lower-cost coverage when an area is removed from an SFHA amount to an incredibly expensive gamble—especially in areas with a prior history of flooding.

The NFIP and its partners in the federal government, insurance industry, and state and local governments can only do so much to effect the kinds of change necessary to ensure that all residents in flood-prone areas are protected.

When I assumed leadership of the flood insurance program in 2004, the NFIP had been stung by much criticism from its handling of claims from Hurricane Isabel in 2003. Some of that criticism was deserved. Much of it was

not. I told my staff then that the flood insurance program was not broken and that I had not given up on it. As an insurance agent, former mayor in a small (and flood-prone) city, and former lieutenant governor, I have a long history with the NFIP. I knew then, and I know now, that the program's strengths far outweigh its weaknesses, and I remain committed to that.

Following the 2005 hurricane season, the Department of Homeland Security, the Government Accountability Office, and various congressional committees initiated investigations into the NFIP's actions. I am proud of the way the NFIP has worked in recent years, especially given the catastrophic 1-2-3 punch of Katrina, Rita, and Wilma. And I am very proud to say that no investigative body has ever found any "smoking gun" or any indication of widespread problems. Throughout the investigations process, we have made changes where they were needed and appropriate, but on the whole, the NFIP works well for its customers.

Congress will again take a long look at the program as it hits its 40th birthday and comes up for reauthorization in 2008, and Congress is still considering reform legislation in the wake of the 2005 hurricane season. In testimony over the past 18 months and in future discussions about the NFIP, we will show that at age 40, the program is still responsive to the needs of its stakeholders—including the American public. We are working harder than ever to meet the stated goals of Congress since 1968: decrease the risk of future flood losses, reduce the costs and adverse consequences of flooding, reduce the demands and expectations for disaster assistance after floods, and preserve and restore the natural and beneficial value of floodplains.

But we cannot accomplish those goals alone. Our challenge now is to encourage all of our country's highest-risk property owners, as well as millions of others at moderate risk, that even though they may not be "required" to carry flood insurance, they most certainly "need" it. ➔

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Natural Hazards Center to Study Preparedness among Nonprofits

The Natural Hazards Center will participate in a groundbreaking study of disaster preparedness among nonprofit organizations in the San Francisco Bay Area as part of a \$1.3 million grant. The grant was awarded by the Fritz Institute, a San Francisco-based nonprofit organization dedicated to improving the effectiveness of disaster relief operations around the world. The funding is the result of a large, multiyear grant to the Fritz Institute from the William and Flora Hewlett Foundation, Walter and Elise Haas Fund, San Francisco Foundation, and Pacific Gas & Electric Co., all based in the San Francisco Bay Area.

The Natural Hazards Center will work with the Fritz Institute to collect and analyze data on the preparedness of community-based and faith-based organizations as part of the institute's efforts to strengthen critical "civic infrastructure" in the San Francisco Bay Area. The study will include developing prototype methods of gathering information on the organizations' needs, vulnerabilities, and ability to function during a disaster. The methods developed over the course of the study will later be made available by the Fritz Institute for use in communities throughout the country. For more information on the Fritz Institute's Bay Area Preparedness Initiative, see the organization's Web site at www.fritzinstitute.org.

Have Disaster Myths Become Legends?

The notion that misleading ideas about disasters are commonly spread and are often the basis for responder action was first articulated by youthful 1950s disaster researchers in the United States, closely followed by others elsewhere. The *Observer* series on disaster myths has enabled some of these now distinguished professors to comment on the current status of the idea. Aside from Kelly Frailing's counterpoint regarding looting, all articles restated the myths and argued that they are as strong and as relevant as ever.

Misconstruing what will happen during a disaster may result in policy and practice that addresses the wrong issues, information being withheld from those at risk, and, worse, the militarization of disaster response where the victims are seen as the problem. However, ignoring the perceptions and priorities of those at risk and those who represent them brings its own risks to emergency managers and their organizations. In considering disaster myths, I touch on the conditions under which they apply, the way that myths and the events they are applied to are defined, the relevance of the research base, and how well they mesh with the norms of contemporary society. In doing so, I examine whether the myths are themselves becoming myths.

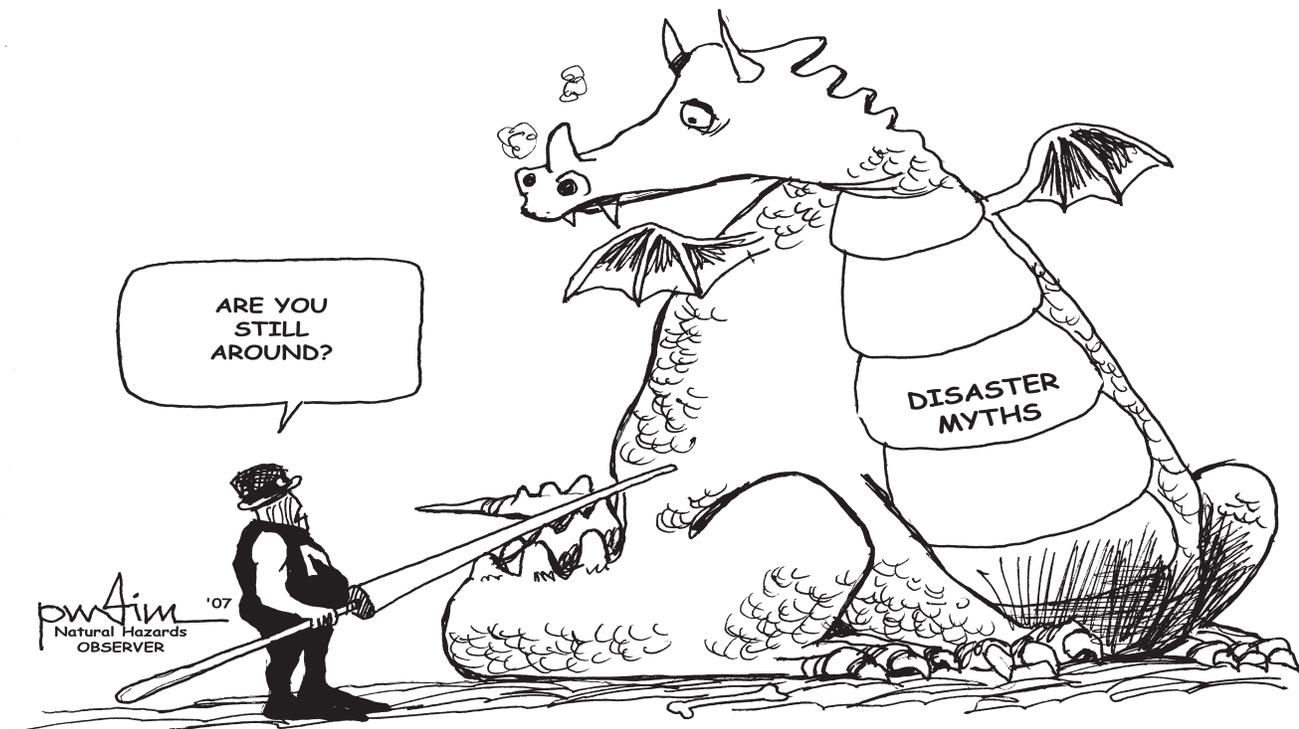
Most of the authors writing in the *Observer* myth series point out that the situations set out as "myths" actually do occur in specific circumstances. Henry Quarantelli reminded us that "important distinctions and qualifications about the phenomena [of looting] have sometimes

been ignored," such as the pervasiveness of looting in civil disturbances and the circumstances surrounding the looting that followed Hurricane Hugo on the Caribbean island of St. Croix. In the accompanying counterpoint, Kelly Frailing took a different view: "Looting after disasters is not a myth. It is a well documented phenomenon..." —suggesting that the conditions under which looting is most likely to actually occur are not resolved.

Like Quarantelli, Claude de Ville de Goyet asserted that "the risk of epidemics is overstated" —not that they never occur—and that the disease myth "should not be construed to show that there is no risk of disease transmission after disaster." He then outlined the conditions where epidemics are likely and called for focus on preventive action through attention to water supply and sanitation and avoidance of resource-intensive mass inoculation campaigns.

Writing on role abandonment, Jane Kushma qualified her statement that "role conflict is not a serious problem that creates a significant loss of manpower" by acknowledging that the idea is from a 30-year-old study. She also quoted recent research indicating that about 50% of U.S. health workers would not report to work during an influenza pandemic—raising the possibility that a health system struggling with day-to-day demands would collapse, and highlighting that the past may not be a sound guide to the future.

We can define myths and their accompanying circumstances in ways that ensure they retain currency. For



example, the problem of looting dissipates if, by definition, it excludes the taking of items that may be necessary, and such a list can be very expansive—extending well beyond sustenance. Alternatively, looting can be defined so that virtually all crime in the affected area is included. The media tend to apply the term “looting” to anti-social activity during a disaster when people’s normal capacity to protect their property is down and when opportunists become active. For example, the pilfering of equipment from a flood rescue boat occupied the front page of a 1986 Sydney tabloid screaming “looters,” while a small article buried inside the same paper quoted the local police chief as saying that the crime rate had fallen. Most of the paper’s readership would probably agree that theft from a rescue boat was particularly reprehensible. But unfortunately, the reporting might unintentionally give the impression that such behavior was widespread.

Disaster events may be defined as “catastrophes”—as with the impact of Hurricane Katrina on New Orleans—thereby allowing an exception to the general rules set out in the myths. However, the 2004 Indian Ocean tsunami was unquestionably catastrophic, yet reports of looting there were rare.

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The piece on panic by Russell Dynes is explicitly about definitions. People report feelings of panic and high levels of anxiety, especially connected with flight from danger. The fact that these lay expressions might not satisfy a clinical definition does not necessarily negate their validity. Following the tsunami in the Solomon Islands in April 2007, reports stated that a tsunami could affect the east coast of Australia, but there was no definite information. Politicians, the media, and emergency managers all got into the act, and beaches as far south as Sydney were closed. Many people fled the northern coastal city of Cairns. Although the response was widely viewed as serious overreaction, much of Cairns is just above sea level, and the reaction was probably quite sensible.

Much of the research on disaster myths drawn on by the *Observer* series took place decades ago, yet following normal research practice, it is often quoted as if perfectly applicable today. Our societies have changed enormously in many respects—our expectations of one another and governments; the idea of community; the meaning of work; and the great divisions of wealth, religion, opportunity, health care, and popular culture. We need to be confident that earlier research results remain relevant, or rather, under what conditions they remain relevant. In addition, much of the earlier work took place in rural areas and concerned distinct circumstances that may be unique rather than universal. Of course, this is an issue

with much social science research, not simply that concerning disasters.

Disaster research orthodoxy holds that existing social trends and problems will be exacerbated by disasters. As trends and problems vary greatly across countries and communities, it seems likely that disaster-related behavior will vary between places and events, and that there may not be a single universal set of rules. It may also set the disaster myths against fundamental assumptions in our society. It is, for example, a principle of western economics that price rises with demand. How does this mesh with Henry Fischer’s observation that “price gouging [is] ... exceedingly rare”?

All key assumptions and firmly held beliefs, whether by emergency managers, media, or researchers, should be subject to periodic critical examination and reality checks. The issue of wildfire evacuations comes to mind: Australian fire agencies advise that it is often safe to stay at home while a wildfire passes. This approach comes from a critical examination of experience and research evidence. But the majority of people and emergency managers elsewhere often cling to the myth that mass last-minute evacuation is the safest option—which it may of course be in particular circumstances.

In summary, disaster myths have not become legends, but there is danger that they may be gaining that status. We have worked for decades to eliminate myths from the mindsets of the media and disaster managers with limited success. Part of the difficulty comes down to linguistics, with different definitions and meanings used by different players. It also reflects the rather fuzzy boundaries and contingent nature of these concepts in dynamic societies. We should not give up on education, but is it still the panacea after decades of limited impact?

A more pragmatic approach is needed: we should work to accommodate the strong perceptions embodied in myths in a manner that reduces resource demands while satisfying, rather than denying, people’s emotional needs. We need to plan for the reality of people’s views—what people are likely to do rather than what might occur in an ideal situation. People expect looting, so we should argue that it is unlikely and say that precautions are being taken, as was done by the city manager quoted by Henry Fischer in this series.

To ignore perceptions is to increase anxiety among those affected, which may make them reluctant to evacuate. Emergency managers must deal with more than the numbers; they need to consider psychology and politics as they find them. Researchers, working in close cooperation with key practitioners, need to document more precisely the circumstances in which the myths apply in the contemporary world (as has already been done for epidemics). This would reduce the risk of overstatement and give others greater confidence in our assertions. 📌

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2007 Winners of Student Paper Competition

The Natural Hazards Center is pleased to announce the winners of this year's Hazards and Disasters Student Paper Competition. The Natural Hazards Center received submissions representing a variety of disciplines, including city and regional planning, disaster and emergency management, engineering sciences, applied psychology, sociology, public policy, communication, political science, and international relations.

Students were encouraged to submit their recent literature reviews, theoretical arguments, case studies, or descriptions of research results on topics relevant to the social/behavioral aspects of hazards and disasters. The topics included the impacts of Hurricanes Katrina and Rita, vulnerability assessment, social movements, media analysis, land use planning and mitigation, technological disaster case studies, and willful disasters.

The undergraduate and graduate paper categories were merged and judged on content, technical elements, and overall presentation. The two winning papers presented well-organized and logical arguments that were engaging and demonstrated the authors' knowledge and ability to integrate a broad scope of resources and references on a topic.

The winning papers were written by undergraduate students Alex Mitchell from Colorado State University and Brett Heeger from Brown University. Mitchell's paper, titled "Social Impacts of Fear: An Examination of the 2002 Washington, DC Sniper Shootings," examines newspaper media and interview data to explore how crime and terrorist events are reported and how individuals and communities react and respond. Heeger's paper, titled "Natural Disasters and CNN: The Importance of TV News Coverage for Provoking Private Donations for Disaster Relief," analyzes the role of television news in prompting individual response to disasters, including the Indian Ocean tsunami (2004), the Pakistan earthquake (2005), and Hurricane Katrina. Copies of these winning papers are available online at www.colorado.edu/hazards/awards/paper-competition.html.

Next year's call for papers will be announced in January 2008. The student paper competition was created in 2004 with the intent of recognizing the highly interdisciplinary nature of hazards and disaster research.

Call For PERISHIP Applications

The Natural Hazards Center and the Public Entity Risk Institute (PERI), in partnership with the National Science Foundation and Swiss Reinsurance Company (Swiss Re), will be awarding PhD dissertation fellowships to support research on any aspect of natural and human-made hazards, risks, and disasters. The goal of the program is to foster the development of the next generation of interdisciplinary hazards scholars who can offer wide-ranging contributions to the body of knowledge in hazards research. As a relatively small subset of many different disciplines, the interdisciplinary hazards field relies on an influx of young scholars committed simultaneously to their own disciplines and to the more practical, applied aspects of the field. This combination can be difficult to achieve in today's traditional academic climate; thus, this program helps solidify student interest in and commitment to hazards via financial support.

Applications for the third round of PERISHIP Awards are due September 1, 2007. Complete program information, including deadlines, eligibility, and application requirements, is available at www.cudenver.edu/periship. Specific questions can be directed to Audre Hoffman, PERI, 11350 Random Hills Road, #210, Fairfax, VA 22030; (703) 352-1846; periship@riskinstitute.org.

Natural Hazards Center Seeks Post-Doctoral Researcher

The Natural Hazards Center is seeking to hire a postdoctoral scholar to assist with the coordination of its research program. This soft-money appointment extends for one year with the possibility of extension to two or three years. The purpose of the position is to collaborate with the Natural Hazards Center director, program manager, research coordinator, and other staff on Center projects funded by NSF, the Department of Homeland Security, and others. The position will play a lead role in a newly funded Center project on preparedness among community-based and faith-based organizations and other nonprofits providing services to at-risk populations in the San Francisco Bay Area.

Minimum requirements include a PhD in a social/behavioral science discipline or closely related field (e.g., public health) and two or more years of experience in fieldwork related to hazards and disasters.

Applications will be considered beginning June 1, 2007, and will continue until the position is filled. For the full position announcement and submission instructions, please visit www.colorado.edu/hazards/PostDoc.pdf.



Washington Update

FDA Approves First U.S. Vaccine Against Avian Influenza Virus H5N1

In April, the U.S. Food and Drug Administration (FDA) announced approval of the first U.S. vaccine for humans against the H5N1 influenza virus, commonly known as avian or bird flu.

The vaccine could be used if the current H5N1 avian virus were to develop the capability to efficiently spread from human to human, resulting in the rapid spread of the disease across the globe. Should such an influenza pandemic emerge, the vaccine may provide limited protection during the months before a vaccine tailored to the pandemic strain of the virus could be developed and produced.

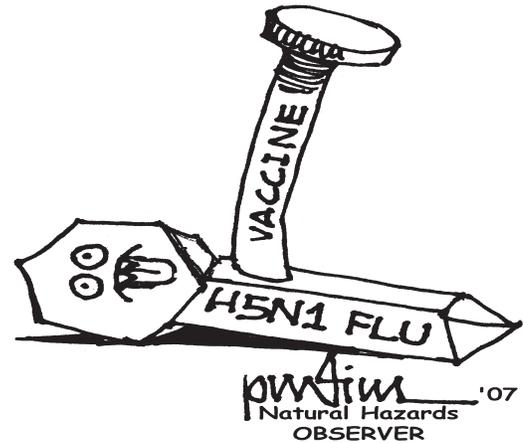
The vaccine was obtained from a human strain and is intended for immunization of humans 18 to 64 years of age who could be at increased risk of exposure to the H5N1 influenza virus contained in the vaccine. H5N1 influenza vaccine immunization consists of two intramuscular injections, given approximately one month apart. The manufacturer, sanofi pasteur, will not sell the vaccine commercially. Instead, the vaccine has been purchased by the federal government for inclusion within the Strategic National Stockpile for distribution by public health officials if needed.

A clinical study was conducted to collect information on safety, recipients' immune responses, and appropriate dosage levels. A total of 103 healthy adults received a 90-microgram dose of the vaccine by injection, followed by another 90-microgram dose 28 days later. In addition, approximately 300 healthy adults received the vaccine at doses lower than 90 micrograms, and 48 received a placebo injection. The vaccine was generally well tolerated, with the most common side effects reported as pain at the injection site, headache, general ill feeling, and muscle pain.

The study showed that 45% of individuals who received the two-dose regimen developed antibodies at a level that is expected to reduce the risk of getting influenza. Although the level of antibodies seen in the remaining individuals did not reach that level, current scientific information on other influenza vaccines suggests that less-than-optimal antibody levels may still have the potential to help reduce disease severity and influenza-related hospitalizations and deaths.

While there have been no reported human cases of H5N1 infection in the United States, almost 300 people worldwide have been infected since 2003, and more than half of these have died. With the support of the FDA, the U.S. National Institutes of Health, and other government agencies, sanofi pasteur and other manufacturers are working to develop a next generation of influenza vaccines for enhanced immune responses at lower doses. Meanwhile, the approval and availability of this vaccine

will enhance national readiness and the nation's ability to protect those at increased risk of exposure. For more information on the government's preparedness efforts, visit www.pandemicflu.gov.



USGS Teams with Commercial Satellite Imagery Companies to Support "Space and Disasters"

Two U.S. commercial satellite imagery firms have teamed up with the U.S. Geological Survey (USGS) in support of the International Charter, "Space and Major Disasters." The Charter works to provide emergency response satellite data free of charge to those affected by disasters anywhere in the world. DigitalGlobe, headquartered in Longmont, Colorado, and GeoEye, based in Dulles, Virginia, are remote sensing companies renowned for acquiring and delivering map-accurate, high-resolution satellite imagery using state-of-the-art Earth-imaging technology. The USGS will act as the interface between GeoEye and DigitalGlobe and International Charter operations to advance the goal of getting imagery for disaster response into the hands of the people who need it.

Many satellites capture images at relatively moderate resolutions, making them useful for large-area applications, but precise, smaller-scale analysis of a disaster's impact, such as assessing damage to buildings and infrastructure following an earthquake, requires a more detailed view. DigitalGlobe's QUICKBIRD and GeoEye's IKONOS satellites capture panchromatic images with a resolution of one meter or less. While there is normally a cost associated with obtaining high-resolution commercial satellite images, the two companies have agreed to donate some archived imagery and also provide newly tasked imagery at a reduced cost to the USGS and the International Charter. First responders and end users of the Charter's system will then have access to these data.

FEMA to Replace Red Cross as Coordinator of Disaster Aid Provisions

The Federal Emergency Management Agency (FEMA) will replace the American Red Cross in administering the coordination of aid to disaster victims, an article in *The Washington Post* reported. According to David Garrett, FEMA's acting director of recovery, the Red Cross was the only private organization assigned a lead role in the National Response Plan. However, federal officials are currently revising this plan, and the Red Cross would be unable to carry out the duties assigned in the new version, Garrett told *The Washington Post*. FEMA's new role as administrator will not affect the Red Cross's traditional disaster relief operations (i.e., opening shelters, providing food, and raising money). The change in leadership comes after a June 2006 Government Accountability Office report stated that FEMA and the Red Cross had trouble coordinating aid for the millions of 2005 Gulf Coast storm victims.



President Bush Signs Bill to Overhaul Red Cross Governance

On May 11, President Bush signed a bill into law that will modernize the governance structure of the American Red Cross and enhance the Red Cross Board of Governors' ability to support the critical mission of the Red Cross in the 21st century. Last year, the Red Cross initiated a comprehensive assessment of its governance structure that culminated in the publication of a 156-page report titled, "American Red Cross Governance for the 21st Century." Based on this report and its unanimously approved recommendations, the Board sought urgent congressional approval of its recommendations, which included downsizing the 50-member Red Cross Board to 12-25 members by 2009 and to 12-20 members by 2012; creating a Red Cross Cabinet Advisory Council; clarifying the role of the Board to focus solely on governance and

strategic oversight; clarifying the three categories of board members into a single category of membership; and establishing a new Office of the Ombudsman that will provide annual reports to Congress. The full Red Cross report can be found at www.redcross.org/report/bogoct2006/.

Pandemic Preparedness Act Passed

On December 19, 2006, President Bush signed into law the "Pandemic and All-Hazards Preparedness Act" (S. 3678), which authorizes appropriations through 2011 to improve bioterrorism and other public health emergency planning and preparedness activities. The Act also establishes the Biomedical Advanced Research and Development Authority for the advanced research and development of medical countermeasures. The legislation will help advance and improve public health preparedness and has the potential to address ongoing vulnerabilities.

Among the law's key provisions is consolidation of federal public health and medical emergency preparedness and response under the new Office of the Assistant Secretary for Preparedness and Response within the U.S. Department of Health and Human Services. The assistant secretary will provide guidance to public health agencies on incorporating the needs of at-risk individuals in federal, state, and local strategies and will prepare and submit to Congress the National Health Security Strategy for coordinated public health preparedness and response.

For links to the full text of S. 3678, see <http://thomas.loc.gov>.

NOAA Deploys New Hurricane Buoys off Puerto Rico Coast

NOAA has deployed the first two of eight new hurricane buoys off the coast of Puerto Rico in an effort to fill a gap in important weather data coming from warm, storm-generating waters there. Six more hurricane buoys will be placed in the southwestern Atlantic Ocean before the hurricane season ends in November. The buoys measure wind, waves, barometric pressure, and air and sea temperatures to determine hurricane formation or dissipation, extent of wind circulation, maximum intensity, and center location. Hurricane buoys provide year-round data for analysis and forecasts of other marine disturbances, but are more robust than other weather buoys because they contain an internal back-up system.

The first of the new hurricane buoys is also the 100th weather buoy maintained by NOAA's National Data Buoy Center and is part of NOAA's National Weather Service. The center has increased the number of weather buoys by 54% over the last seven years. Beyond the six forthcoming hurricane buoys, the National Data Buoy Center is funded to deploy another weather buoy for Alaska and 11 new tsunami stations between now and March 2008.

U.S. Greenhouse Gas Inventory Available

The U.S. Environmental Protection Agency (EPA) has released the national greenhouse gas inventory, which shows that overall emissions during 2005 increased by less than one percent compared to 2004. The report, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005*, was published after gathering comments from a broad range of stakeholders across the country. In 2005, total emissions of the six main greenhouse gases, including carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, were equivalent to 7,260 million metric tons of carbon dioxide. The report indicates that overall emissions increased by 16% from 1990 to 2005, while the U.S. economy grew by 55% during the same period.

The report is the latest in an annual set of reports that the United States submits to the Secretariat of the United Nations Framework Convention on Climate Change, which sets an overall framework for intergovernmental efforts to tackle the challenge posed by climate change. To view the full report, see www.epa.gov/climatechange/emissions/usinventoryreport.html.

FEMA Extends Housing Assistance for Gulf Coast Hurricane Victims

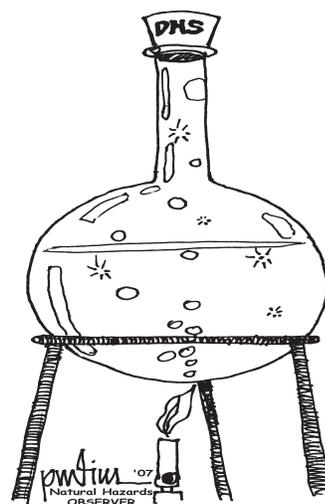
The Federal Emergency Management Agency (FEMA) has extended the temporary housing assistance programs for Gulf Coast hurricane victims until March 1, 2009. The current FEMA extension ends on August 31, 2007. Housing and Urban Development (HUD) and FEMA are also working on a plan whereby HUD would take over management of the rental housing program on behalf of FEMA beginning on September 1, 2007. Beginning in March 2008, individuals in both the rental housing and travel trailer and mobile home programs will pay a portion of the cost, which will begin at \$50 per month and incrementally increase each month thereafter until the program concludes on March 1, 2009. In addition, beginning immediately, FEMA will allow residents of its mobile homes and travel trailers to purchase their dwellings at a fair and equitable price. Seniors and the disabled whose primary source of income is Supplemental Security Income (SSI) or other fixed income that makes them eligible to receive assistance under existing HUD programs will be protected. HUD will actively work to transition these individuals into its properties or programs for seniors and the disabled. The full news release is available at www.fema.gov/news/newsrelease.fema?id=35729.

DHS Releases Regulations for Securing High-Risk Chemical Facilities

The U.S. Department of Homeland Security (DHS) released an interim final rule that imposes comprehensive federal security regulations for high-risk chemical facilities. The DHS sought and reviewed comments from state and local partners, Congress, private industry, and the

public to develop consistent guidelines using a risk-based approach. The new rule grants the DHS the authority to seek compliance by imposing civil penalties of up to \$25,000 per day and the ability to shut down facilities that are non-compliant.

DHS will require owners of chemical facilities that house certain quantities of specified chemicals to complete a preliminary screening assessment, which will determine the level of risk associated with the facility. If a chemical facility qualifies as high risk, its owners will be required to prepare and submit a security vulnerability assessment and site security plan. Submissions will be validated through audits and site inspections. Security standards will be required to achieve specific outcomes, such as securing the perimeter and critical targets, controlling access, deterring theft of potentially dangerous chemicals, and preventing internal sabotage. To read the full text of the final regulation, see www.dhs.gov/xprevprot/laws/gc_1166796969417.shtm.



NASA Data Reveal that Earthquakes May Trigger Immediate Increase in Volcanic Activity

Scientists using NASA satellite data have found strong evidence that a major earthquake can lead to a nearly immediate increase in regional volcanic activity. In May 2006, the intensity of two ongoing volcanic eruptions on Indonesia's Java Island increased sharply three days after a 6.4-magnitude earthquake on the island and persisted for about nine days. While scientists have long debated whether earthquakes can trigger new volcanic eruptions, this study linked an earthquake to enhanced volcanic activity at two ongoing eruptions that were being closely monitored by satellite-based sensors on a daily basis. At the time of the earthquake, each volcano was being checked for changes in heat output by satellite sensors as part of a routine global "hot spot" monitoring effort that uses near real-time satellite data from NASA's Terra and Aqua satellites.

Maps of worldwide hot spot activity are created with data from the Moderate Resolution Imaging Spectroradiometer (MODIS) instrument on these satellites, pinpointing locations where surface temperatures are much hotter than their surroundings. The scientists combined these data with other details about the Indonesian volcanoes gathered by the satellites to analyze temperature and lava output rates at both volcanoes over a 35-day period spanning the earthquake. The two volcanoes, Merapi and Semeru, are about 260 kilometers (162 miles) apart and roughly 50 kilometers (31 miles) north and 280 kilometers (174 miles) east of the earthquake epicenter, respectively. Given these distances, the researchers believe underground stresses from the earthquake's seismic waves likely acted to pump magma into the conduit to the surface, ultimately increasing eruption rates. The research team is currently reviewing older MODIS hot spot data in hope of identifying patterns that might be used to build a predictive model for forecasting earthquake-induced changes in activity at erupting volcanoes. For the full news release and accompanying images, visit www.nasa.gov/vision/earth/lookingatearth/earthquake_volcano.html.

National Hurricane Center Director Critical of NOAA Budget Priorities

The new director of the National Hurricane Center (NHC) charged that the National Oceanic and Atmospheric Administration (NOAA) is squandering millions on image-building campaigns while front-line forecasters wrestle with budget shortfalls, *The Miami Herald* reported on May 17, 2007. Bill Proenza, who assumed the post of director at the NHC in January, said top officials at NOAA are spending \$4 million on a "bogus" 200-year NOAA anniversary celebration. NOAA officials rejected the criticisms, countering that the anniversary campaign is costing \$1.5 million over two years and helps explain the agency's mission to the public.

Proenza also said NOAA has cut \$700,000 from a crucial hurricane research program and allowed inflation to erode the hurricane center's budget, and it wants to spend more money to change the widely recognized center's name to the "NOAA Hurricane Center" and the National Weather Service's name to the "NOAA Weather Service." The NHC is part of the National Weather Service (NWS), which is part of NOAA.

According to Proenza, NOAA's effort to deemphasize the NWS's identity intensified right after Hurricane Katrina devastated New Orleans and the upper Gulf Coast in 2005. While forecasters struggled to cope with the storm and its aftermath, NOAA headquarters ordered them to remove the NWS logo from tracking maps that were being viewed by millions of people. Max Mayfield, then the director of the hurricane center, and Proenza, then in charge of the NWS southern district, which includes the stricken Gulf Coast areas, refused to comply.

The 2007 six-month hurricane season began on June 1, and scientists have predicted that it will be an unusu-

ally active year. The statements from Proenza and other high-ranking officials suggest that potentially disruptive battles are underway in the sprawling NOAA bureaucracy that Americans depend on for crucial information about hurricanes and other natural phenomena, according to *The Miami Herald* article.

New Radar Satellite Offers Promising Disaster Management Applications

A new Canadian satellite will soon provide the most advanced, commercially available Synthetic Aperture Radar (SAR) imagery in the world. RADARSAT-2 is Canada's next-generation commercial SAR satellite and represents a collaboration between the Canadian Space Agency and MacDonald, Dettwiler and Associates Ltd. (MDA).

Because of their ability to collect imagery even in darkness or inclement atmospheric conditions, SAR satellites are excellent resources for operational use in a variety of disaster management scenarios. RADARSAT-1 data have been used effectively in the management of disasters such as floods and oil spills. The capability to deliver data in near-real time has been essential for relief agencies that require timely data for monitoring and mapping damage, as well as for assessing the impact on future planning.

As the follow-on to RADARSAT-1, launched in 1995, the new satellite will be launched in the summer of 2007 from Russia's Baikonur Cosmodrome in Kazakhstan. RADARSAT-2's new design features powerful technical advancements, including high-resolution imaging, flexibility in selection of polarization, left- and right-looking imaging options, superior data storage, and more precise measurements of spacecraft position and attitude.

For more information on the satellite's applications to disaster management, including links to case studies, visit the RADARSAT-2 Web site at www.radarsat2.info.





What Does Climate Change Mean for the Hazards Community?

The Intergovernmental Panel on Climate Change (IPCC) released its Working Group II (WG II) Fourth Assessment Report on Impacts, Adaptation and Vulnerability on April 6, 2007. The report predicts elevated hazard risks, including droughts, floods, sea-level rise, and heat waves. The increased risks typically result from a cascade of effects that, in turn, unleash another cascade of impacts. For example, in Asia and parts of Latin America the retreat of alpine glaciers is expected to enlarge glacial lakes, threatening downstream communities with natural dam bursts and causing summer water shortages for agriculture, industry, and human settlements. Rising sea levels may be accompanied by more intense tropical cyclones, resulting in heightened storm surges dangerous to coastal communities. And existing hazards—such as forest fires and air pollution in cities—may become more widespread, frequent, and intense due to higher average temperatures and heat waves.

In today's densely settled world with production and consumption systems that are increasingly interconnected, perturbations to these systems will most certainly pose risks. Even the proliferation of invasive species, a seemingly "manageable" though widespread problem, is causing major unforeseen ecosystem impacts in many parts of the world.

Climate, however, is so crucial that any changes to it are likely to simultaneously impact all other systems—from ecosystems to agricultural, water supply, energy, and transportation systems—and the human communities that depend upon them. That is why *The Stern Review*, Al Gore's documentary *An Inconvenient Truth*, and an increasing number of articles in the popular press speak in stark terms about the challenge to civilization presented by climate change and about the urgent need to reduce our reliance on fossil fuels.

Although WG II strives to provide a balanced picture—listing both the benefits and costs of climate change—the summary report nevertheless reads like a laundry list of "natural" hazards. Working from the WG I predictions, the following projections and associated impacts are presented from higher to lower levels of confidence:

Warmer and more frequent hot days and nights over most land areas (virtually certain):

- Decreased agricultural yields in warmer environments and increased likelihood of pest outbreaks
- Higher evapotranspiration leading to increased risk of drought
- Declining air quality in cities

Increases in warm spell/heat wave frequency over most land areas (very likely):

- Wildfire danger
- Water quality problems and algal blooms
- Risk of heat-related mortality, especially for elderly, infirm, and very young populations

Increases in heavy precipitation events over most areas (very likely):

- Agricultural soil erosion
- Contamination of water supplies
- Mortality risk from flooding
- Disruption of settlements, commerce, and transport due to flooding and landslides

Increases in areas affected by drought (likely):

- Crop damage and failure, lower yields, livestock deaths, and wildfires
- Water stress
- Food and water shortages, risk of malnutrition, risk of water- and food-borne diseases
- Water shortages for settlements and industry, reduced hydropower generation, increased population migrations

Increasingly intense tropical cyclone activity (likely):

- Damage to crops
- Risk of deaths and injuries from wind and floods
- Power outages that affect water supplies
- Withdrawal of risk coverage by insurers

Rising sea level (likely):

- Salinization of irrigation water
- Saltwater intrusion of aquifers and coastal water sources
- Risk of death from drowning
- Movements of populations and infrastructure; high costs of relocation or armaments

Predicted impacts vary substantially by geographic location. Lower latitudes are expected to experience declines in agricultural yields, while low-lying coastal areas are vulnerable to sea-level rise and storm surges. The great agricultural basins of the Indus and Yangtze Rivers are threatened by reduced summer flows from dwindling glaciers and winter snow pack, which will reduce water availability for Pakistani agriculture (where 90% of crops are irrigated) and China's growing industries.



Of course, to understand future hazards, it is important to have a baseline. Data compiled by Columbia University, the World Bank, and the United Nations show that among six major hazards (earthquakes, volcanoes, drought, floods, cyclones, and landslides), flood risk is the most widespread, affecting roughly one-tenth of the world's land area, but two-thirds of the global population and more than half of global Gross Domestic Product (GDP). Cyclone risk affects only about 2% of total land area, but about one-fifth of world population and GDP. Earthquake risk also affects only 2% of total land area, containing about one-seventh of world population and one-eighth of GDP. Droughts impact large swaths of Africa and globally are the second most geographically extensive hazard after floods—covering 7.5% of the global land area and affecting nearly 10% of world population but only 2.5% of GDP. Volcano and landslide risks are generally lower and more concentrated. In summary, meteorological hazards trump all others in terms of current impacts and are very likely, according to the IPCC, to increase in extent, severity, and frequency.

The WG II report points out that poor populations will suffer most from these changes. Research at the Center for International Earth Science Information Network (CIESIN) for the Millennium Ecosystem Assessment project revealed that populations living in the world's

drylands have higher levels of poverty than those living in any other ecosystem, and they also have the fastest rates of population growth. In 2000, an estimated 855 million people lived in the semi-arid drylands—precisely the regions that are likely to experience increases in drought frequency. Frequency of drought from 1980-2000 is itself associated with higher infant mortality rates and is significantly correlated with increased incidence of child malnutrition (controlling for a number of other risk factors).

Poverty rates are also higher in mountainous regions, which are at relatively high risk from landslides and floods, and poverty is high in regions suffering from endemic malaria, the range of which is likely to expand over the coming century. From the climate-risk perspective, perhaps the only thing that the poorest rural populations have to be thankful for is that they mostly reside at some distance from coasts—in landlocked regions or mountain ranges. However, the same is not true of their poor urban counterparts, who are often at great risk of coastal flooding, landslides, and wind damage.

Urban slums and shanty towns are typically situated in low-lying flood-prone areas or on steep slopes that are considered least desirable for settlement. A recent analysis of populations in the low elevation coastal zone found that among the least developed countries—such as

Bangladesh, India, and Egypt—nearly 100 million people currently live in coastal areas below 10 meters above mean sea level. Coastal areas have the highest rates of increase in population density (the increase in population density in the coastal zone during the 1990s alone was greater than the level of population density in 75% of the world's populated land area). Therefore, these regions are experiencing serious increases in human exposure to coastal hazards, even without taking into account the effects of climate change.

A critical issue for hazards researchers is the way in which climate change, as well as mitigation and adaptation measures, will most certainly drive major changes in the underlying systems on which human beings, whether rich or poor, depend. In a world more reliant on biomass fuels and wind, solar, and hydro power, how will changes in cloudiness, wind patterns, precipitation, runoff, and other climatic factors combine with changes in energy and transportation systems and human settlement patterns to affect hazard exposure, vulnerability, and response capacity? How might increased reliance on dams, levees, and other protective works affect the magnitude and distribution of disaster risks due to severe storms, earthquakes, tsunamis, and landslides? Will increased climate variability in semi-arid areas lead to increased migration to disaster-prone urban slums? Will increased human appropriation of water and biomass limit the ability of ecosystems to function, adapt, and/or shift in the face of more widespread drought, wildfires, and soil erosion?

From a policy perspective, there are few easy prescriptions for reducing vulnerability and better preparing for future climate hazards, at least in the case of the low-income countries (see de Sherbinin et al. 2007). Among other things, this may be attributed to the following factors:

- Disaster risks are an unequally distributed public “bad” that are more likely to affect poorer, more vulnerable sub-populations with the least political influence. Mitigation measures, by contrast, are a public “good” that require substantial investment and adequately functioning institutions.
- Low tax collection capacity and low incomes constrain the resources available to government to make necessary infrastructural or institutional investments. Government resources themselves may become highly contested in situations where risks are uncertain and dynamic.
- The wealthy and more influential classes may simply choose to “opt out” of public decision making and investments and, instead, invest in their own protection (e.g., a well-built home in a safe location, insurance policies, and private education and health care).
- Adaptation measures are difficult to implement because they require long time horizons, whereas politicians typically operate on short-term horizons. Few incentives exist for politicians, officials, and the private sector to plan for climate change. Given uncertainties in future impacts, it may make more sense for governments to “wait and see” if disaster strikes, rather than

committing scarce public resources for medium- or low-probability future events. Indeed, decision makers in developing countries may assume that the international relief community will come to their assistance in the event of a significant natural disaster.

The harsh reality is that residents of some of the world's poorest nations are expected to suffer most as climate change renders the ecosystems upon which they depend for livelihoods less productive or more precarious. At the same time, developed countries also stand to lose a lot through the increased prevalence and severity of hazards, and the United States seems to be slowly waking up to this fact. Thus, there is hope that this will spur action at the highest levels, as well as the needed awareness among the electorate to support difficult decisions with respect to the emissions reduction targets and adaptation planning that are so urgently needed. 

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Contracts and Grants

Below are descriptions of recently awarded contracts and grants related to hazards and disasters.
An inventory of awards from 1995 to the present is available at www.colorado.edu/hazards/resources/grants/.

Heat and Death in France: History and the Social Ecology of Catastrophe. Funding Organization: National Science Foundation, \$32,383. One year. Principal Investigator: Richard Keller, University of Wisconsin-Madison, (608) 263-7378, rckeller@wisc.edu.

Described as a meteorological catastrophe, the heat wave that struck France in August 2003 resulted in nearly 15,000 deaths. Yet, to frame the crisis in the language of natural disaster misses a crucial point. Significant disparities in mortality—the disproportional selection of the elderly, the poor, and city-dwellers for death—indicate patterns of risk that resulted as much from the social ecology of modern France as from the “natural” causes of disaster, calling attention to the intersection of society, nature, and environmental security. Central to this project is an analysis of the political, social, and cultural factors that placed France, and particularly Paris, at such inordinate risk. The project scrutinizes the place of the elderly in modern society by questioning social, political, and scientific representations of the elderly and their effects on social citizenship.

Finally, the project explores the rise of a voluble discourse of “insecurity” since the 1980s and its role in shaping an urban landscape of vulnerability. Linked to uneasiness around immigration and social disorder, a climate of fear has contributed to an elevation of risk by encouraging many elderly French city-dwellers to remain in their apartments, at heightened danger for heat stroke, but spared from the perceived dangers of urban public space. This project will examine these and other phenomena that played essential roles in shaping the 2003 catastrophe. Interviews with citizens, government officials, epidemiologists, and social scientists, along with close analysis of media coverage of the heat wave as it unfolded and in its aftermath, will illuminate the critical social dimensions of this crisis of environmental health and social ecology.

How Institutions Think about the Unthinkable: Organizational Learning and Communication about Catastrophic Events. Funding Organization: National Science Foundation, \$749,446. Three years. Principal Investigator: Karlene Roberts, University of California-Berkeley, (510) 642-5221, karlene@haas.berkeley.edu.

During and after Hurricane Katrina, some organizations responded miserably despite experience with other major hurricanes, while other organizations performed well. Why do some organizations learn from past disasters while others apparently suffer from amnesia? How do organizations learn from their own past involvement in catastrophes—or fail to do so? Even when individual organizations have the necessary knowledge, they may not communicate it to those who need it. It is important

to understand how organizations learn or fail to learn from others’ experiences. This project draws on the fields of organizational behavior, economics, engineering, and legal policy and includes five interlinked studies to investigate one actual disaster (Hurricane Katrina) and one potential disaster (grave earthquake and flood threats to the California Delta area). Study One shows how gaps between agencies and organizations prevented learning in the New Orleans and California flood control communities. Study Two addresses behavioral organizational learning from crises. Study Three examines how disasters like Hurricane Katrina affect other citizens, as measured by sales of emergency supplies in other localities. Study Four asks how to design legal and institutional relationships that will foster organizational learning and effective information management. Study Five uses a laboratory for social science experiments to analyze how incentives drive information exchange and learning. The knowledge gained from these studies should help organizations learn from past disasters rather than repeating the same mistakes that have already been so costly to society.

Modeling Tsunami Effects on Mangrove Ecosystems and the Role They Play in Saving Lives and Properties. Funding Organization: National Science Foundation, \$49,997. Eighteen months. Principal Investigator: Soe Win Myint, Arizona State University, (480) 965-6514, soe.myint@asu.edu.

Some observers have posited that mangrove forests act as a bio-shield to protect people and property from natural disasters, such as tsunamis and hurricanes. The loss and degradation of mangroves may make coastal regions more vulnerable to tsunamis and hurricanes, thereby leading to the loss of hundreds of thousands of lives and billions of dollars in property. When the highly destructive Indian Ocean tsunami hit India’s southern state of Tamil Nadu in December 2004, some areas with dense mangroves suffered fewer human casualties and less damage than areas without mangroves. Loss of coastal vegetation along the Mississippi Delta may have also contributed to the enormous devastation caused by Hurricane Katrina in 2005. Although many scientists have emphasized the importance and role of mangrove forests in saving lives and property, only sparse data exist to support this claim, and the protective function of mangroves has never been scientifically and systematically investigated. The long-term goal of this project is to explore the role that mangrove forests play in saving lives and property from natural disasters. The investigators will conduct field surveys in tsunami-hit areas in South and Southeast Asia and collect remotely sensed data and other ancillary data. The assessment techniques, indices, or composites developed in the proposed plan will have a

significant impact on disaster management and planning, because all hazard mitigation, planning, and preparedness programs need to begin with an estimate of the number of people and structures that would be affected by a disaster event.

National Earthquake Hazards Reduction Program (NEHRP).

Funding Organization: National Science Foundation, \$85,000. One year. Principal Investigator: John Hayes, National Institute of Standards and Technology, (301) 975-5639, jack.hayes@nist.gov.

The National Earthquake Hazards Reduction Program (NEHRP) includes the Federal Emergency Management Agency (FEMA), National Institute of Standards and Technology (NIST), National Science Foundation (NSF), and U.S. Geological Survey (USGS). The 2004 reauthorization (PL 108-360) established NIST as the lead agency for NEHRP. In order to coordinate NEHRP activities among the four agencies as required by this reauthorization, NIST has established the NEHRP secretariat. This award provides partial support for the NEHRP secretariat housed at NIST. The secretariat will help facilitate the intellectual merit of NEHRP through coordinating various interagency activities, updating the NEHRP strategic plan, publishing the annual NEHRP report, and facilitating the NEHRP advisory committee. The broader impacts of NEHRP are to advance knowledge and understanding for earthquake hazards reduction. FEMA, NIST, NSF, and USGS work together through NEHRP to improve understanding, characterization, and assessment of hazards and vulnerabilities; improve model building codes and land use practices; reduce risks

through post-earthquake investigations and education; improve design and construction techniques; improve the capacity of government at all levels and the private sector to reduce and manage earthquake risk; and accelerate the application of research results.

Protective Action Decision Making in Wildfires. Funding Organization: National Science Foundation, \$96,146. One year. Principal Investigator: Thomas Cova, University of Utah, (801) 581-7930, cova@geog.utah.edu.

Emergency managers recommend protective actions in the face of many threats to minimize loss of life and property and to maximize use of limited resources. In the context of wildfire, two common recommendations are to evacuate or shelter those at risk. Given these two options, questions arise as to which protective action is best in a given scenario and when it should be issued. This project will examine the factors that are important in determining which protective action is best in a given wildfire, the strategies that decision makers use to combine the factors, and the effect of uncertainty on the decision-making process. The research is based on a three-step experimental approach that relies on interviews, static information boards, and an interactive wildfire simulator to elicit knowledge from both expert and novice decision makers in wildfire management. Causal models of the decision-making process will be developed and tested, which include the relevant factors and their importance, the method by which they are combined, and the effect of uncertainty. The results of this research will advance protective-action decision theory and provide a basis for improving the quality of decision making in emergencies.

USGS Releases Documentary Video on Landslides

The U.S. Geological Survey (USGS) has released a new documentary film based on true-life landslide events in the San Francisco Bay Area. *Riding the Storm—Landslide Danger in the San Francisco Bay Area*, produced by former USGS geologist Karen Adams, tells the dramatic stories of some of the region's most significant landslide events and explores the science behind the hazard with USGS researchers Raymond Wilson and Ray Wells.

In January 1982, a catastrophic rainstorm triggered 18,000 landslides throughout the San Francisco Bay Area, claiming 25 lives and causing \$66 million in property damage. During the drenching winter of 1997-98, the strongest El Niño of the 20th century triggered a range of landslides in the Bay Area, from deadly debris flows to destructive deep-seated slides. One of the El Niño-driven slides underlies an entire neighborhood in the La Honda area and had destroyed eight homes by the end of 1998. The slide reactivated in 2005 and is still on the move, displacing a county road and threatening two more homes.

The film provides viewers with information about what USGS scientists have discovered about landslide dynamics, which slopes are most susceptible to sliding,

and how to recognize the warning signs of an impending landslide. It also covers the devastating stories of some Bay Area residents who have been affected by landslides. The movie was shown on PBS in the San Francisco Bay area on February 19, 2007, and copies of the film in DVD format will be available to the public in summer 2007. The entire movie and its accompanying trailer are also available for download via the USGS Landslide Web site at <http://landslides.usgs.gov>.



Resources

Below are brief descriptions of some of the resources on hazards and disasters that have recently come to the attention of the Natural Hazards Center. Direct Web links are provided for items that are available free online. Other materials can be purchased through the publisher and/or local and online booksellers.

Publications, Reports, and More

All-Hazards

Disaster Management Canada. Vol. 1, Issue 1. Free online. Canadian Centre for Emergency Preparedness; www.ccep.ca/dmcv1i1.pdf.

The inaugural issue of the official magazine of the Canadian Centre for Emergency Preparedness presents articles on all aspects of emergency management in Canada, including an update on tsunami warning systems and information on business continuity and insurance. The magazine, which replaces *Emergency Management Canada*, is published quarterly and is available in hard copy and online.

Disaster Timeline: Major Focusing Events and U.S. Outcomes (1978-2006), Version 4, and Terrorism Time Line: Major Focusing Events and U.S. Outcomes (1993-2006), Version 6. Claire B. Rubin & Associates. 2007. One copy free online, additional copies \$10.00. www.disaster-timeline.com.

Sponsored by the Public Entity Risk Institute (PERI), these timeline charts measure 13" x 40." The Disaster Timeline contains information on natural, industrial/technological, and biological events in the United States and their outcomes. The Terrorism Timeline shows major focusing events by year and the influences that each event had on major outcomes, such as reports and analyses; federal statutes, regulations, and executive orders; federal response plans; and major federal organizational changes.

Stop Disasters Game. United Nations/International Strategy for Disaster Reduction (UN/ISDR). Free online. www.stopdisastersgame.org.

This online game is a new educational tool to promote disaster risk reduction among children who are most vulnerable when disasters occur. With three levels of difficulty, the object of the game is to save lives and livelihoods by preparing for a tsunami, earthquake, hurricane, flood, and wildfire. For example, within a specific budget and time limit, players have upgrading options, such as building more resilient houses or setting up early warning systems. Although the game is targeted to children aged 9 to 16, anyone can play and learn more about preventing disasters. The game was developed as part of the 2006-2007 Disaster Risk Reduction Begins at School Campaign, which aims to ensure that disaster risk reduction is fully integrated into school curricula in disaster-prone countries and that school buildings are built or retrofitted to withstand natural disasters.

South Asia Disaster Report 2005. South Asia Programme and Rural Development Policy Institute. 2006. ISBN 969-9041-01-03. 148 pp. \$10.00 (paperback). Practical Action; www.practicalaction.org.

This report, produced by a group of researchers representing India, Pakistan, and Sri Lanka, provides a comprehensive view of natural disasters and their management in different countries, especially after the Indian Ocean tsunami in 2004 and the South Asian earthquake in 2005. It includes analyses of several major disasters that have occurred in the region and a description of disaster occurrence trends in South Asian countries during the 2005 reporting period. The final chapter critically evaluates the prospects of ongoing development programs in the region and suggests entry points for integrating disaster management with mainstream development planning.

Emergency Management: Concepts and Strategies for Effective Programs. Lucien G. Canton. 2007. ISBN 0-471-73487-X. 349 pp. \$79.95 (hardcover). John Wiley & Sons, Inc.; (877) 762-2974; www.wiley.com.

Drawing on social science and new national standards for emergency management programs, this book takes an all-hazards, multidisciplinary approach to emergency management. The text begins with historical and social science perspectives and then delves into the evolving roles of the emergency manager. It also explores the individual components of an effective emergency management program, including assessing risk, developing strategies, planning concepts, coordinating response, and managing crisis.

The Next Catastrophe: Reducing Our Vulnerabilities to Natural, Industrial, and Terrorist Disasters. Charles Perrow. 2007. ISBN 0-691-12997-5. 377 pp. \$29.95 (hardcover). Princeton University Press; (609) 258-4900; <http://press.princeton.edu>.

This book proposes a bold new way of thinking about disaster preparedness. The author argues that rather than laying exclusive emphasis on protecting targets, we should reduce their size to minimize damage and diminish their attractiveness to terrorists. Focusing on three causes of disaster—natural, organizational, and deliberate—he shows that our best hope lies in the deconcentration of high-risk populations, corporate power, and critical infrastructures. He also provides the first comprehensive history of the Federal Emergency Management Agency (FEMA) and the Department of Homeland Security (DHS) and examines why these agencies are so ill equipped to protect U.S. citizens.

Texas Disasters: True Stories of Tragedy and Survival. Mike Cox. 2006. ISBN 0-7627-3675-5. 242 pp. \$13.95 (paperback). Globe Pequot; (888) 249-7586; www.globepequot.com.

This book takes readers back to Texas' most catastrophic events, recreating the moments that changed that state forever. The author covers 19 true stories, including the 1867 yellow fever epidemic, the Galveston hurricane of 1900, Houston's Gulf Hotel fire in 1943, the crash of Delta flight 191 in 1985, and several historic flood and tornado events.

Topics Geo Natural Catastrophes 2006: Analyses, Assessments, Positions. 2007. 50 pp. Free online. Munich Re Group. www.munichre.com/publications/302-05217_en.pdf. A limited supply of hard copies (paperback) is available via Munich Re's online ordering system at www.munichre.com.

For the past 13 years, the Munich Re Group has presented the results of its annual worldwide survey of natural catastrophes in the Topics Geo series. Long-standing readers will notice that the approach is different for 2006. The new format, beginning with the subtitle—Analyses, Assessments, Positions—reflects this change of emphasis. Instead of constituting a statistical study of natural catastrophes, the focus is now on providing background analyses that are of practical application. Topics covered for the year 2006 include the relatively calm Atlantic hurricane season, the Northwest Pacific typhoon season, the July 17 tsunami in Java, and the Yogyakarta earthquake.

Climate Change

The Atlas of Climate Change: Mapping the World's Greatest Challenge. Kirstin Dow and Thomas E. Downing. 2006. ISBN 978-0-520-25023-9. 112 pp. \$19.95 (paperback). University of California Press; (800) 777-4726; www.ucpress.edu.

Through the medium of cartography, this new atlas gives shape and meaning to the key issues and debates surrounding climate change. With more than 50 color illustrations and maps, the book marks a radical departure from conventional cartography and provides a fast, effective way of conveying large amounts of information through maps.

The atlas examines the signs of climate change—glacial and polar melting, rising sea levels, erratic weather patterns—and explains how global warming is being driven by the greenhouse gas emissions. The authors discuss the serious implications of these changes for food and water supplies, human health, sensitive ecologies, vulnerable cities, and cultural treasures—especially in those countries lacking the resources to adapt. The book also includes a review of current response efforts: the progress being made in meeting Kyoto commitments, the development of emissions trading, patterns of funding, and the contributions being made by local action.

Climate Change, Coming Home: Global Warming's Effects on Population. Sarah DeWeerd. 2006. In *World Watch*, Vol. 20, No. 3, pp. 8-13.

In this article, science writer Sarah DeWeerd traces the real time impact of CO2 emissions on agriculture, public health, and weather patterns. Since the 1970s, rainfall has been scarce in the Sahel, the wide belt of semi-arid land that stretches across Africa on the southern edge of the Sahara Desert. One of the worst-affected areas has been the Tigray region of northern Ethiopia, where a series of prolonged droughts exacerbated by war caused widespread famine in the 1970s and 1980s. The people of this isolated rural region of Ethiopia offer a glimpse into the human future—a view of how global climate change can wreak havoc on populations and livelihoods, and how addressing one climate-related problem can sometimes cause another.

Drought

Dry: Life Without Water. Ehsan Masood and Daniel Schaffer, editors. 2006. ISBN 0-674-02224-6. 192 pp. \$29.95 (hardcover). Harvard University Press; (800) 405-1619; www.hup.harvard.edu.

For one billion people on Earth, there is such a thing as life without water. This book introduces the reader to these people—those who live in the dry lands of Africa, Asia, the Pacific, and the Americas—who eke out an existence between craggy mountains, near oases, or close to well springs surrounded by cracked earth or shifting sands. From the ingenuity of the highland people of Chile's Atacama Desert who use giant nets to capture water from clouds of fog, to the ancient wisdom that protects the grazing lands of Kenya's Masai, this illustrated book tells the diverse stories about people in very hot, very cold, or very high places who spend their lives collecting, chasing, piping, and trapping the water that life requires. These stories, which were collected over three years by photographers, writers, and scientists from four continents, contain a wealth of information and images that convey life as it is carried on in the Earth's driest regions.

Earthquakes and Tsunamis

Extreme Waves. Craig B. Smith. 2006. ISBN 0-309-10062-3. 267 pp. \$27.95 (paperback). Joseph Henry Press; (800) 624-6242; www.jhpress.org.

Most waves are simply rhythmic expressions of Earth's movement through space, and the changes they bring to shorelines are gradual. But given the right weather conditions and combination of natural forces, waves can be catastrophic. Extreme waves can stretch 100-feet high, posing an imminent threat to large sea vessels and coastal structures. The lessons of the 2004 Bay of Bengal tsunami and the damage wrought by recent tidal surges in New Orleans underscore the need for better tracking and prediction of extreme waves. Covering both the headline stories and incidents that are less known but equally startling, author and amateur sailor Craig B. Smith weaves a fascinating history of waves.

Floods

Extreme Hydrological Events: New Concepts for Security.

O.F. Vasiliev, P.H.A.J.M. van Gelder, E.J. Plate, and M.V. Bolgov, editors. 2007. ISBN 978-1-4020-5740-3. 499 pp. \$99.00 (paperback). Springer; (800) 777-4643; www.springer.com.

This proceedings contains the papers that were presented at the NATO Advanced Research Workshop on Extreme Hydrological Events: New Concepts for Security, which was held in Novosibirsk, Russia, in July 2005. The book addresses the development of advanced methods for predicting extreme hydrological events, estimating occurrence probabilities, and assessing risk related to these events. It also discusses the reduction of the vulnerability of social, economic, and engineering systems to extreme hydrologic events. Topics include basin case studies on extreme hydrological events; probabilistic estimation in flood studies; ice-induced floods; river low flows; climatic conditions and environmental issues; and risk assessment and management for floods, low water events, and damage vulnerability issues.

National Flood Mitigation Data Collection Tool. Federal Emergency Management Agency (FEMA). Free online. FEMA; www.fema.gov/plan/prevent/floodplain/data_tool.shtml.

This new FEMA software provides a tool to help floodplain managers track flood hazards and guide regional growth in a way that does not adversely impact communities or downstream residents and businesses. The National Flood Mitigation Data Collection Tool (referred to as the National Tool or "NT") software provides a step-by-step process for collecting and recording data on flood and building conditions in repetitive loss areas.

It was developed for nationwide use to gather information about flood-prone structures in order to determine potentially appropriate long-term mitigation measures. The ultimate goal of the NT is to provide a standardized, systematic approach to collecting and interpreting property data and mitigation project development. While the focus of the NT is on data collection for repetitive loss properties, it can be used to gather information related to flood risk, building construction, and building value for any structure.

Homeland Security

Disaster Response and Homeland Security: What Works, What Doesn't. James F. Miskel. 2006. ISBN 0-275-99211-X. 162 pp. \$49.95 (hardcover). Greenwood Publishing Group, Inc.; (800) 225-5800; www.greenwood.com.

The U.S. disaster relief program reflects a basic division of responsibility between federal, state, and local governments that has generally stood the test of time. But a successful disaster response requires three things: timely and effective coordination between state and federal governments; effective coordination among the federal agencies; and effective coordination between and among state and local government agencies. In

this book, Miskel, a former Deputy Assistant Associate Director of FEMA, examines the effects that operational failures after Hurricanes Agnes, Hugo, Andrew, and Katrina have had on the organizational design and operating principles of the disaster response system program. He also discusses the impact of 9/11 and the evolving role of the military, and he identifies reforms that should be implemented to improve the nation's ability to respond in the future.

Securing Utility and Energy Infrastructures. Larry Ness. 2006. ISBN 0-471-70525-X. 340 pp. \$79.95 (hardcover). John Wiley & Sons, Inc.; (877) 762-2974; www.wiley.com.

From a post-9/11 perspective, this comprehensive guide discusses how to protect the electric, oil and gas, nuclear, telecommunications, and water industries from a conventional or terrorist attack. Written for anyone who is charged with the safety of these industries, the book explains how to look for and monitor potential physical vulnerabilities at a plant or water facility, what contaminants might be introduced to cause a catastrophic event, and how to integrate and perform vulnerability assessments and emergency response plans. It also examines the differences between a terrorist attack and a conventional mode of attack and the economic impact of each. The authors stress the importance of a proactive rather than a reactive approach to the safety of utility and energy industries.

The State of Homeland Security 2007: Annual Report Card. 2007. Free online. 74 pp. Majority Staff of the Committee on Homeland Security; Congressman Bennie G. Thompson (D-MS), Chairman; <http://homeland.house.gov/SiteDocuments/20070413143439-12273.pdf>.

This report summarizes annual homeland security performance using a report card grading system. The report includes the following categories: border security, emergency preparedness/FEMA, emergency communications, aviation security, port security, surface transportation security, critical infrastructure, information sharing, science and technology, biosecurity, chemical plant security, nuclear security, employee morale, and civil liberties.

Water Infrastructure Protection and Homeland Security. Frank R. Spellman. 2007. ISBN 0-86587-418-2. 287 pp. \$79.00 (paperback). Government Institutes; (800) 462-6420; www.govinstpress.com.

This book examines the vulnerabilities and security of U.S. water sources. Written as a result of 9/11 and in response to the critical needs of water/wastewater plant managers, plant engineers, design engineers, and utility managers, it addresses the need to incorporate security upgrades in existing facility systems and careful planning in all new construction sites. Each chapter provides professional guidance on designing, operating, maintaining, and mitigating threats to water/wastewater systems, including both treatment/distribution and treatment/collection systems, to ensure state-of-the-art security. The author covers all aspects of monitor-

ing, response, critical infrastructure redundancy, and recovery and provides other strategic information, including methodologies for vulnerability assessments, specialized remote monitoring equipment, and U.S. EPA security toolbox items.

Hurricanes and Coastal Hazards

Florida's Hurricane History. Jay Barnes. 2007. ISBN 978-0-8078-5809-7. 384 pp. \$19.95 (paperback). The University of North Carolina Press; (800) 848-6224; www.uncpress.unc.edu.

Vulnerable to storms that arise in the Atlantic, Caribbean, and Gulf of Mexico, Florida has been hit by far more hurricanes than any other state. In this book, Jay Barnes offers an informative look at Florida's hurricane history. Drawing on meteorological research, news reports, first-person accounts, maps, and historical photographs, he traces all of the notable hurricanes that have affected the state over the last four-and-a-half centuries, from the great storms that swept away settlements and sank ships during the early colonial period to the devastating Hurricanes Andrew (1992) and Opal (1995). In addition to providing a comprehensive chronology of over 100 individual storms, the book includes information on the basics of hurricane dynamics, formation, naming, and forecasting.

Giving Voice to the People of New Orleans: The Kaiser Post-Katrina Baseline Survey. 2007. Free online. 101 pp. The Henry J. Kaiser Family Foundation; www.kff.org/kaiser-polls/upload/7631.pdf.

One year after Hurricane Katrina and the devastating levee breaches that followed in its wake, the Kaiser Family Foundation sent a team to the New Orleans area to conduct an in-person survey. The project's goal was to offer residents a channel to express their views of the reconstruction effort as it moves forward. The survey was conducted house-to-house and face-to-face among 1,504 randomly selected adults living in Orleans, Jefferson, Plaquemines, and St. Bernard parishes. It is the first of three similar surveys to be conducted by the Kaiser Family Foundation at 18-month intervals.

There is No Such Thing as a Natural Disaster: Race, Class, and Hurricane Katrina. Chester Hartman and Gregory D. Squires, editors. 2006. ISBN 0-415-95487-8. 290 pp. \$24.95 (paperback). Routledge, Taylor & Francis Group, LLC; +44 (0)20 7017 6000 (UK); www.routledge.com.

This book covers the roles that race and class played in the response to Hurricane Katrina, the storm's impact on housing and redevelopment, the historical context of urban disasters in America, and the future of economic development in the New Orleans region. The authors assemble two dozen critical scholars and activists who present a multifaceted portrait of the social implications of the disaster. The book also offers strategic guidance for key actors in efforts to rebuild shattered communities, including government agencies, financial institutions, and neighborhood organizations.

Public Health

Community Engagement: Leadership Tool for Catastrophic Health Events. Monica Schoch-Spana, Crystal Franco, Jennifer B. Nuzzo, and Christiana Usenza on behalf of the Working Group on Community Engagement in Health Emergency Planning. 2007. Free online. Center for Biosecurity, University of Pittsburgh Medical Center; www.upmc-biosecurity.org/website/focus/community_engage/2007_working_group/full_report.html.

The Working Group on Community Engagement in Health Emergency Planning was an advisory body convened by the Center for Biosecurity of the University of Pittsburgh Medical Center with an aim to counsel government leaders and public health and safety professionals on the value and feasibility of active collaborations with citizens and civil society institutions in preparing for, responding to, and recovering from an extreme health event. This report of the Working Group concludes that citizen preparedness for health emergencies must look beyond the individual and the home, and it challenges the conventional wisdom that boils down citizen readiness to a checklist of canned goods, drinking water, medicine, and emergency phone numbers.

Modeling Community Containment for Pandemic Influenza: A Letter Report. Committee on Modeling Community Containment for Pandemic Influenza, Board on Population Health and Public Health Practice, Institute of Medicine. 2006. 47 pp. Free online. National Academies Press; (888) 624-8373; www.nap.edu/catalog/11800.html.

This letter report is the result of a workshop convened by the Institute of Medicine Committee on Modeling Community Containment for Pandemic Influenza to review existing models, available science, and the historical record of community interventions related to influenza pandemics. It includes a review of influenza epidemiology, an evaluation of mathematical models for containment strategies, analyses of strategies used in previous outbreaks, and an assessment of the role of community interventions for reducing influenza virus transmission.

Wildfire

Living on the Edge: Economic, Institutional and Management Perspectives on Wildfire Hazard in the Urban Interface. Austin Troy and Roger G. Kennedy, editors. 2007. ISBN 978-0-0804-5327-9. 253 pp. \$99.95 (hardcover). Elsevier; (800) 545-2522; <http://books.elsevier.com>.

This edited volume describes the problems of rapidly increasing development in wildfire hazard zones and explores potential solutions. It addresses some of the underlying market forces that drive both development and fire suppression, as well as policies that unintentionally exacerbate the problems. It also looks at policy and planning and addresses a range of ecological and management questions, including the effect of global climate change on fire activity, institutional structures for fire suppression, and geographic computer modeling tools for wildfire mitigation.

Government Accountability Office Reports

The following Government Accountability Office (GAO) reports are available free online at www.gao.gov. Printed copies are also available (first copy is free, additional copies are \$2.00 each). To order, contact the GAO: (202) 512-6000, TDD (202) 512-2537; www.gao.gov/cgi-bin/ordtab.pl.

First Responders: Much Work Remains to Improve Communications Interoperability. April 2, 2007. GAO-07-301. 75pp.

Gulf Coast Rebuilding: Preliminary Observations on Progress to Date and Challenges for the Future. April 12, 2007. GAO-07-574T. 20 pp.

Hurricane Katrina: Agency Contracting Data Should Be More Complete Regarding Subcontracting Opportunities for Small Business. April 12, 2007. GAO-07-698T. 16 pp.

Climate Change: Financial Risks to Federal and Private Insurers in Coming Decades are potentially Significant. April 19, 2007. GAO-07-760T. 22 pp.

Observations on DHS and FEMA Efforts to Prepare for and Respond to Major and Catastrophic Disasters and Address Related Recommendations and Legislation. May 15, 2007. GAO-07-835T. 46 pp.

Natural Hazards Center Staff News

On June 1, the Natural Hazards Center welcomed Duke W. Austin, a new graduate research assistant. Austin earned a Bachelor of Arts degree with honors in liberal arts from the University of Texas in 1998. Since then, he has worked in Paraguay as a teacher trainer for the Peace Corps, throughout the United States as a wilderness instructor for Outward Bound, and at the University of Colorado (CU) Department of Sociology as a graduate instructor. Duke also conducted research in New Orleans following Hurricane Katrina, looking at the impact of the storm on race, class, and gender, and he co-founded the group Students for Peace and Justice, a non-violent student activist organization on the CU campus.

The Natural Hazards Center also congratulates one of its undergraduate research assistants, Nick Passanante, on being selected as a summer intern at the William J. Clinton Foundation's New York City office. Nick was one of 90 students chosen from over 450 applicants and will serve in two capacities: as an Advance intern and a Domestic Policy intern. Former President Clinton established the William J. Clinton Foundation to continue the work of his presidency to strengthen the capacity of people in the United States and throughout the world to meet the challenges of global interdependence. We all wish Nick the best.

Web Sites of Interest

Hurricane Digital Memory Bank

www.hurricanearchive.org

The Hurricane Digital Memory Bank uses electronic media to collect, preserve, and present the stories and digital record of Hurricanes Katrina and Rita. Funded by the Alfred P. Sloan Foundation, the Bank contributes to the ongoing effort by historians and archivists to preserve the record of these storms by collecting first-hand accounts, on-scene images, blog postings, and podcasts. The Bank provides access to photographic collections, videos and documentary films, oral history interviews, and artwork.

ICDRM/GWU Emergency Management Glossary

www.gwu.edu/~icdrm/publications/PDF/GLOSSARY_Emergency_Management_ICDRM_19_FEB_07.pdf

The Institute for Crisis, Disaster, and Risk Management/George Washington University (ICDRM/GWU) established this glossary for the purpose of emergency management education and practice. The terminology, therefore, uses an emergency response and recovery context. Although the material is copyrighted, it is available for noncommercial use with proper citation. The glossary will be periodically revisited and revised as necessary.

Online Global Hazard Database

www.interragate.info

InTERRAgate, is a global online database that provides a framework for uploading natural hazard and risk data at a national level, together with in-country contact details for disaster first-responders. Launched in March 2007, it currently includes introductory information on natural hazard threats in ten of the world's most vulnerable nations (Azerbaijan, Bangladesh, Cameroon, Chile, El Salvador, Indonesia, Iran, Jamaica, Mexico, and the Philippines). Like the online encyclopedia, Wikipedia, inTERRAgate is designed to be "owned" by data suppliers and users who are able to upload information and influence content. Its ultimate success will, therefore, depend upon registered data suppliers from around the world uploading textual and graphical information to supplement initial data and to expand the country portfolio.

10 Tips to Boost Your Home's Wildfire Defense

www.ibhs.org/newsroom/view.asp?id=532

For residents in many areas, the summer months mean a rise in wildfire threat. The Institute for Business and Home Safety has provided this list of 10 steps to lower the threat of fire damage. Eliminating fuel sources (e.g., dry landscaping, woodpiles, and decks), pruning trees, regularly mowing the lawn, and moving firewood 50 feet away from the home are just a few of the tips.



Conferences and Training

Below are the most recent conference announcements received by the Natural Hazards Center. A comprehensive list of hazards and disasters meetings is available at www.colorado.edu/hazards/resources/conferences.html.

2007 China – U.S. Conference on Disaster Management: Natural and Technological Disasters—Beijing, People's Republic of China: August 1-4, 2007. Organizer: Global Interactions, Inc. The purpose of this conference is to accelerate the exchange of best practices, technologies, and research between professionals and specialists in the field of disaster management. Each participant is required to play an active role in the dialogue and communication centered around the topic areas. Presenters will be matched with Chinese presenters to speak on the same, or similar, topic.
educ@globalinteractions.org
www.globalinteractions.org

Doctors for Disaster Preparedness Annual Meeting—Oakland, California: August 3-5, 2007. Organizer: Doctors for Disaster Preparedness. This meeting promotes homeland defense and preparedness for all types of disasters. The annual meeting brings together prominent scientists and experts on strategic and civil defense to speak about real threats versus manufactured scares. The theme of this year's meeting is "Category V Denial v. Confronting the Real Threats to America."
www.ddponline.org/flyer07.htm

7th Emergency Management Conference: Essential Services & Infrastructure—Melbourne, Australia: August 21-22, 2007. Organizer: Emergency Services Foundation. This annual conference unites emergency management professionals from emergency services organizations; local, state, and federal governments; community groups; and industry. This year's focus will be on essential services and infrastructure.
info@hpe.com.au
www.hpe.com.au/contents/hpe.html

9th Plinius Conference on Mediterranean Storms—Varenna, Italy: September 10-13, 2007. Organizer: European Geosciences Union. Previous editions of the Plinius Conference on Mediterranean Storms have provided a crucial contribution to improving understanding of extreme rain events over the Mediterranean area. The objective of the 2007 conference is to provide a forum for discussion of the present state of knowledge, as well as of the necessary advances in research and application disciplines related to Mediterranean storms, such as the nature and physical processes of extreme storm events; expected changes in relationship to predicted climate changes; advanced techniques to observe, monitor, and forecast storms; storm relationships to coupled surface processes and effects; and the socio-economical implications of storms.
plinius9@artov.isac.cnr.it
<http://meetings.copernicus.org/plinius9/>

4th European Conference on Severe Storms—Trieste, Italy: September 10-14, 2007. This conference is devoted to all aspects of convective severe weather phenomena. This year's topics will include convection theory, satellite and RADAR information, forecasting and nowcasting, climate change, and social impacts of severe storms. According to the global relevance of the conference themes, scientists from all over the world are encouraged to participate; those from developing countries are especially welcome. Registration is free-of-charge.
iannitti@ictp.it
www.essl.org/ECSS/2007/

11th Arid Regions Conference—Breckenridge, Colorado: September 11-14, 2007. This conference is co-sponsored by the Association of State Floodplain Managers, the Colorado Association of Stormwater and Floodplain Managers, the Arizona Floodplain Management Association, and the New Mexico Floodplain Managers Association. With the theme "Roundup in the High Country...Gather at the Source," this year's conference location is situated near the headwaters of the Colorado, South Platte, and Arkansas Rivers, which represent the water supply for over one-third of the United States.
kevin.houck@state.co.us
www.casfm.org/annual_conference/2007/annual_conf.htm

Fall World 2007—San Diego, California: September 16-19, 2007. Sponsor: *Disaster Recovery Journal*. The *Disaster Recovery Journal* bills this annual meeting as the largest business continuity conference in the industry. This year's conference theme is "Building a Better Business Continuity Program." Attendees will gain knowledge and information through sessions, workshops, exercises, and networking opportunities. An exhibit hall will showcase the latest industry trends, products, and services. Attendees can participate in mock disaster exercises.
drj@drj.com
www.drj.com/conferences/sd2007/

Symposium on Emerging Developments in Multi-Hazard Engineering—New York, New York: September 18, 2007. This symposium, organized jointly by the Architectural Engineering Institute of the American Society of Civil Engineers (AEI) and the Multidisciplinary Center for Earthquake Engineering Research (MCEER), is intended to highlight recent engineering advances in the new field of multi-hazards engineering. Nationally recognized researchers and practitioners will discuss a variety of solutions and applications, including adapting technologies that have been developed for a specific hazard to solve

multi-hazard problems, and developing new technologies to mitigate a variety of threats. Different fields of engineering, such as risk, reliability, design, analysis, cost-benefit, life-cycle costs, and structural health monitoring, will be addressed from a multi-hazard point of view. Specific hazards that impact the performance of the civil infrastructure, such as blast, earthquake, wind, flood, and wave surge, will be integrated into the discussions.

achaker@asce.org

<http://mceer.buffalo.edu/meetings/AEI/>

NEMA 2007 Annual Conference—Oklahoma City, Oklahoma: September 27-October 2, 2007. Organizer: National Emergency Management Association (NEMA). This conference provides an opportunity for emergency managers to meet and discuss the many challenges that face the community today, share solutions, grow professionally, and network with peers. Attendees will hear from those involved in shaping the future of homeland security and emergency management, strengthen relationships with partner organizations, and discuss NEMA's views on all-hazards emergency preparedness with the leadership in Washington.

www.nemaweb.org

FERMA Risk Management Forum—Geneva, Switzerland: September 30-October 3, 2007. Organizer: Federation of European Risk Management Associations (FERMA). This Forum is the major European conference designed to provide risk managers with an opportunity to improve their skills and knowledge, help influence business decisions, and ensure that good risk management standards are integrated into business processes. The Forum is attended by both practitioners and service providers.

info@ferma-asso.org

www.ferma.eu/Events/Conference/

7th Annual Meeting of the European Meteorological Society (EMS) and 8th European Conference on Applications of Meteorology (ECAM)—San Lorenzo de El Escorial, Spain: October 1-5, 2007. This year marks the fourth time that the EMS and ECAM are organizing their meeting together. These conferences are evolving as a forum for the exchange of ideas on future strategies in meteorology and climatology that involves the atmospheric and related communities, including scientists, service providers, manufacturers, and users. The focus of this year's meeting is high-impact weather.

ems-sec@met.fu-berlin.de

www.emetsoc.org/ems2007/

International Symposium on Strong Vrancea Earthquakes and Risk Mitigation—Bucharest, Romania: October 4-6, 2007. The Collaborative Research Center (CRC) 461 "Strong Earthquakes—A Challenge for Geosciences and Civil Engineering" at the Universität Karlsruhe (Germany), and the "Romanian Group for Strong Vrancea Earthquakes (RGVE)," Bucharest, is a multidisciplinary attempt to understand Vrancea seismicity and mitigating seismic risk in Romania. This symposium will feature research

presentations from scientists within those groups from 1996-2007. It will also provide opportunities for other scientists to present their research related to geodynamics and tectonic processes in Eastern Europe, seismic hazard assessment, site effects, early warning, shake maps, damage/loss estimation, and disaster management.

crc461.symposium2007@gpi.uka.de

www-sfb461.physik.uni-karlsruhe.de

8th International Disaster and Emergency Resilience (IDER) Conference and Exhibition—London, UK: October 9-10, 2007. Sponsors: International Association of Emergency Managers, the Institute of Civil Defence and Disaster Studies, and European Training and Simulation Association. This conference showcases best practices and solutions to ensure readiness for, response to, recovery from, and resilience for disasters or major emergencies, whether caused by nature, accident, or terrorism.

ider@andrich.com

www.iderweb.org

4th National Conference on Coastal and Estuarine Habitat Restoration—Providence, Rhode Island: October 11-15, 2007. Organizer: Restore America's Estuaries. This five-day conference will explore the state-of-the-art in all aspects and scales of coastal and estuarine habitat restoration and will include field sessions, plenary sessions, expert presentations, special evening events, workshops, a poster hall, and a Restoration Exposition.

sbosak@estuaries.org

www.estuaries.org/?id=4

Managing Alpine Future: Strategies for Sustainability in Times of Change—Congress Innsbruck, Austria: October 15-17, 2007. Due to climate change and the effects of globalization, increased dynamics in the natural and human environment are to be expected in mountain regions during the coming years and decades. At this conference, representatives from science, industry, and public administration will analyze the present state and expected future developments by means of eight core topics. Approaches, strategies, and solutions in dealing with these dynamic processes will be identified and discussed on both a transnational and multidisciplinary level.

alpinefuture@alps-gmbh.com

www.alps-gmbh.com/alpinefuture

American Shore and Beach Preservation Association and Texas General Land Office (ASBPA-GLO) Fall Conference—Galveston, Texas: October 21-24, 2007. This conference focuses on coastal science and policy and includes keynote speakers, plenary sessions, and a pre-conference field trip. The 2007 conference theme is "Caring for the Coast: Preserving, Enhancing, Protecting." Presentations will include topics on shoreline and marsh restoration design, coastal shoreline management, coastal ocean and weather observation and forecasting systems, effects of extreme storms and tsunamis, and flood protection.

www.asbpa.org

Corporate Security, Business Continuity and Crisis Management Conference—New York, New York: October 30-31, 2007. Organizer: The Conference Board. Attendees at the sixth annual conference will join senior executives from leading companies, renowned policy experts, and government officials to examine and evaluate cutting-edge solutions from strategic, operational, and tactical perspectives. Topics include terrorism, catastrophic disasters, and the New Business Resiliency Imperative; the anatomy of risk; global security; pandemics; and disaster, emergency, and business continuity.

www.conference-board.org/pdf_free/agendas/

2007 Gilbert F. White National Flood Policy Forum: Floodplain Management 2050—Washington, D.C.: November 6-7, 2007. "Floodplain Management 2050," the second assembly of the Gilbert F. White National Flood Policy Forum, is an invitational workshop of experts focusing on how to manage flood risk and floodplains given increasing population, the rise in housing demand, tight federal budgets, climate change, and other factors. The forum will provide insight to guide policy change and the research necessary to ensure that the nation's floodplains are properly managed by 2050 and that flood damages do not continue to escalate. Representatives from federal, state, and local government agencies; professional associations; academia; and the private sector are invited to participate.

www.floods.org/Foundation/Forum.asp

IBHS Annual Conference on Property Loss Reduction—Orlando, Florida: November 8-9, 2007. Sponsor: Institute for Business & Home Safety (IBHS). This year's conference theme is "Stronger Together." Scheduled speakers include Bob Hartwig, president and chief economist of the Insurance Information Institute, and Alex Soto, president of the Independent Insurance Agents & Brokers of America and president of InSource Inc., Miami, Florida.

info@ibhs.org
www.ibhs.org/congress/

6th Rocky Mountain Region Disaster Mental Health Conference—Cheyenne, Wyoming: November 8-10, 2007. Organizer: Rocky Mountain Region Disaster Mental Health Institute. This annual meeting focuses on the role of mental health in natural and human-caused disasters. This year's conference theme is "From Crisis to Recovery: Resilience and Strategic Planning for the Future." Topics will include cultural issues, ethnicity, political concerns, religious considerations, children, and mitigation.

rockymountain@mail2emergency.com
www.rmrinstitute.org

Emergency Preparedness and Prevention & Hazmat Spills Conference—Pittsburgh, Pennsylvania: December 2-5, 2007. Organizer: U.S. Environmental Protection Agency (EPA) Region III Chemical Emergency Preparedness and Prevention Office. This four-day conference, titled "Partnerships...Bridging the Gap between Preparedness and Response," will include educational workshops and training sessions. Topics include case studies and winning strategies, new regulations, and the latest technologies.

administrator@2005conference.org
www.2007conference.org

American Geophysical Union (AGU) Fall Meeting—San Francisco, California: December 10-14, 2007. This annual interdisciplinary meeting brings together more than 12,000 researchers, teachers, students, consultants, and media members to present and review the latest earth and space science issues. Fields included in topic sessions include seismology, volcanology, atmospheric science, hydrology, ocean sciences, planetary science, and education/outreach. The meeting also includes special activities, events, and special meetings cosponsored by other societies that wish to offer their members the chance to participate in programs that bring multidisciplinary attention to understanding the processes and structure of the Earth, planets, and space.

fm-help@agu.org
www.agu.org/meetings/fm07

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Copies of the *Observer* and the Natural Hazard Center's electronic newsletter, *Disaster Research*, can be downloaded free from the Center's Web site:

www.colorado.edu/hazards/

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The success of the Natural Hazards Center relies on the ongoing support and engagement of the entire hazards and disasters community. The Center welcomes and greatly appreciates all financial contributions. There are several ways you can help:

1. **Support Center Operations**—Provide support for core Center activities such as the *Disaster Research* e-newsletter, annual workshop, library, and the *Natural Hazards Observer*
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4. **Boost the Mary Fran Myers Scholarship Fund**—Enable representatives from all sectors of the hazards community to attend the Center’s annual workshop

To find out more about these and other opportunities for giving, visit:

www.colorado.edu/hazards/about/contribute.html

Contact Greg Guibert at greg.guibert@colorado.edu or (303) 492-2149 to discuss making a gift.

A U.S.-based organization, the Natural Hazards Center is a nonprofit, tax-exempt corporation under Section 501(c)(3) of the Internal Revenue Code.

The Natural Hazards Center

The mission of the Natural Hazards Center at the University of Colorado at Boulder is to advance and communicate knowledge on hazards mitigation and disaster preparedness, response, and recovery. Using an all hazards and interdisciplinary framework, the Center fosters information sharing and integration of activities among researchers, practitioners, and policy makers from around the world; supports and conducts research; and provides educational opportunities for the next generation of hazards scholars and professionals. The Natural Hazards Center is funded through a National Science Foundation grant and supplemented by contributions from a consortium of federal agencies and nonprofit organizations dedicated to reducing vulnerability to disasters.

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