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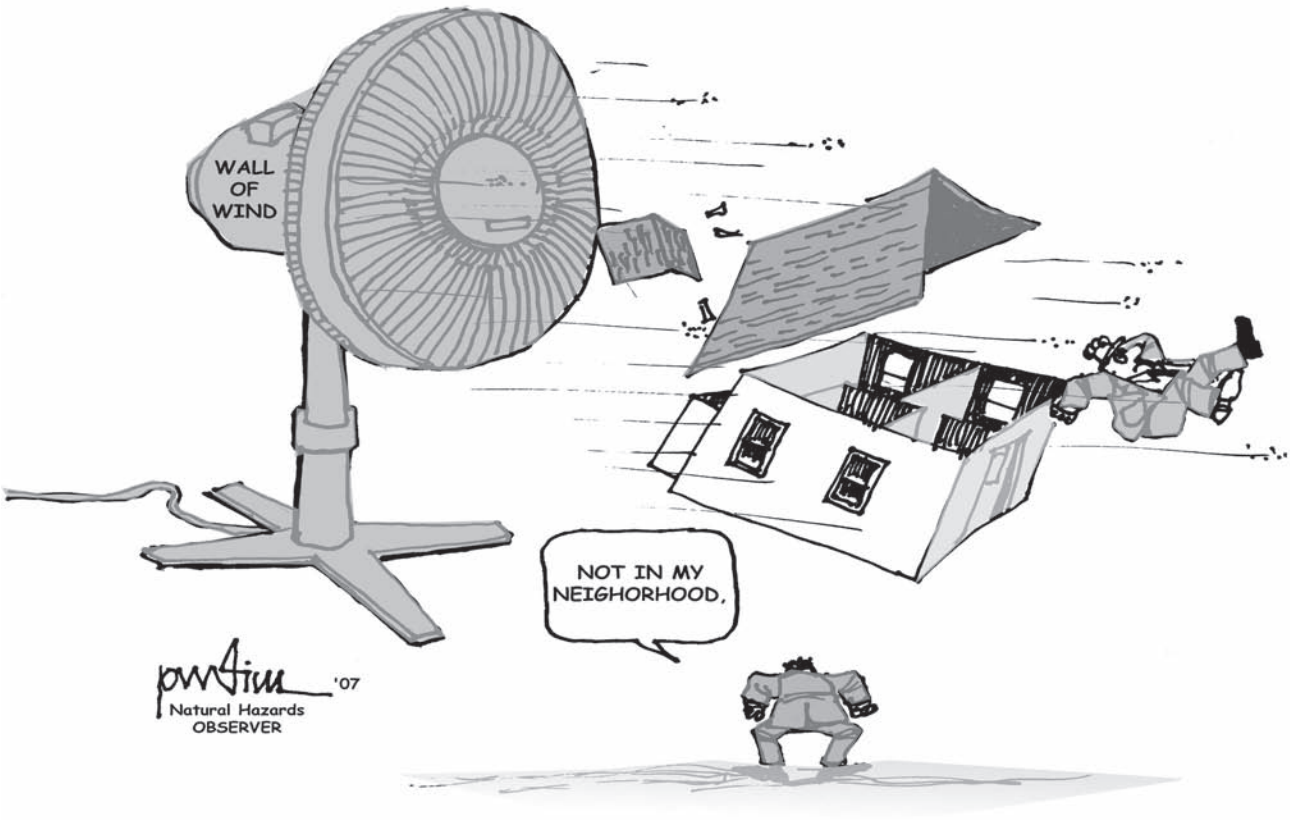

Taking Hurricane Research to the Next Level

– an invited comment

The ferocious hurricane seasons of 2004 and 2005 and the ensuing insurance crisis in Florida made it painfully clear that something had to be done to contain the damages caused by these storms. Recently, the International Hurricane Research Center (IHRC) received more than $18 million in funding for projects currently underway at Florida International University (FIU) in Miami. These new funds will help guarantee the viability and long-term success of research projects and programs aimed at saving lives, securing property, and providing a better understanding of hurricanes, which are the most costly of natural disasters.

The IHRC is a multidisciplinary center that focuses on impact forecasting and mitigation research. It was created in 1995 by the private sector in the wake of Hurricane Andrew, which caused more than $30 billion in damages in South Florida, only half of which were insured. The IHRC was established as the Type 1 Center for hurricane research in the state of Florida, and part of its charge is to organize and direct the Florida Hurricane Alliance, as funded by NOAA's National Weather Service.

In spring 2007, Florida Governor Charlie Crist signed a budget that included $15 million for a new IHRC building that will be located adjacent to the National Oceanic

and Atmospheric Administration's (NOAA's) National Hurricane Center at FIU's University Park campus. This building will include a media center and a training facility with satellite uplink, classrooms, offices, dormitories, and diesel generators to support 24/7 operations.

The 50,000-square-foot, state-of-the-art building will provide space for the IHRC's Laboratory for Coastal Research, Laboratory for Social Science Research, Laboratory for Insurance, Financial & Economic Research, and Laboratory for Wind Engineering Research. It will also serve as a hub for coordination with federal and state agencies, such as the National Hurricane Center, NOAA's Hurricane Research Division, the Federal Emergency Management Agency (FEMA), the National Aeronautics and Space Administration (NASA), and the Florida Division of Emergency Management.

The Wall of Wind

Another new facility, which is currently under construction at the nearby FIU Engineering campus, will be the site of innovative hurricane testing technology. The FIU Wall of Wind will subject houses and low-rise commercial buildings to Category 1-5 hurricane-force wind and rain, thereby revealing inherent structural weaknesses in buildings, which is not presently feasible from wind tunnel testing. This full-scale, destructive testing has the potential to revolutionize building construction and retrofitting practices through the development of new technologies, designs, and products.

In 2006, the IHRC team used the prototype 2-fan Wall of Wind against an unprotected (e.g., not shuttered) vacant home in Sweetwater, Florida, that had been slated for demolition (video available online at www.nbc6.net/newsnet/10062514/detail.html). For 10 minutes, Category 3 (120 mph) winds and rain generated by the hurricane simulator pummeled the home.

After the test, the two-bedroom, one-story home was deemed a total loss. The front door had blown in, the roof shingles were peeled off, and windows were shattered. Windows in the rear of the home were blown out due to the pressure that built up inside the house after the breach of the front windows and door. The simulated wind-driven rain saturated the inside of the house, and water seeped into the walls, causing the paint to bubble and paving the way for mold infestation. Huge pieces of the water-saturated ceiling tiles fell to the floor, sucked down by the negative pressure of the high velocity wind flowing through the house, and the joints of the roof trusses were knocked askew. Real-world experiments such as this can help researchers unlock the secrets of building safer and stronger houses in hurricane-prone areas.

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Presently, the IHRC is conducting a range of experiments using the 6-fan Wall of Wind, commissioned by RenaissanceRe, including the testing of patented designs for vortex suppression technology to better maintain roof stability. The final phase—a 24-fan Wall of Wind built inside the hangar-like facility—will test houses mounted on a turntable so they can be assaulted by hurricane-force winds, rain, and debris from every direction. This controlled testing environment within the hangar building will allow repeatable experiments with full instrumentation and high-speed videography.

The Wall of Wind will provide real data on actual wind speeds and the performance of various types of building construction, including exterior bearing walls (e.g., wood frame, concrete block, poured-reinforced concrete) and various roof types, such as shingle, clay tile, and metal. Essentially, the Wall of Wind is bringing the hurricane into the laboratory.

Catastrophic Models and Insurance Rates

Wall of Wind research has direct application to catastrophe (cat) models, which provide estimates of future losses that are used by insurance companies in determining homeowner's rates. Cat models rely largely on post-storm damage inspections and empiricism for the determination of engineering damage functions, which are a critical component of these computer models. The recently developed IHRC public hurricane loss (catastrophe) model is also used by regulators to help evaluate requests for rate changes in the state of Florida.

For coastal states to maintain sustainable economies by keeping insurance available and affordable, a change in public behavior must occur. Just as the effective visualization of car crashes dramatically changed automobile safety through the introduction of air bags, and the earthquake community improved building safety through shake table experiments, the Wall of Wind will alter the way the construction industry approaches building in hurricane-prone areas.

Creating a "Culture of Preparedness"

The IHRC Laboratory for Social Science Research has received substantial new funding this year from the state of Florida to promote hurricane mitigation and to develop a "culture of preparedness and mitigation." People typically purchase homes based on the number of bedrooms and bathrooms, location, and aesthetics (e.g., curb appeal). Realtors rarely discuss building safety and hurricane resiliency with their clients; therefore, the public has scant information or insight on these issues. Full-scale destructive testing of houses will change the public's perception of building safety.

The prototype 2-fan Wall of Wind will support public education about hurricanes and building structures. Because television is the most effective media for reaching the public, the IHRC plans to develop a series of public service announcements (PSAs) depicting "Hurricane Man" making surprise "inspections" and "certifications"

of a home's storm worthiness by submitting it to the Wall of Wind. In these 30-second and 1-minute PSAs, homeowners will be startled by the damage sustained.

The IHRC's overall objective is to develop disaster-resilient coastal communities, a goal that encompasses virtually the entire state of Florida. The Center is developing the scientific tools to improve prediction capabilities, enable technological innovations, make cost-effective improvements to building codes and standards, and develop a culture of preparedness and mitigation among the citizenry. This ambitious agenda is only possible by combining the talents of scientists, engineers, and sociologists.

The achievements of the IHRC research and outreach programs have received a tremendous vote of approval from the state of Florida Legislature and Governor this year. The influx of significant new funding is based on a track record of accomplishments that are of great value to citizens living in hurricane zones, and it has provided the opportunity for IHRC researchers to take the Center's research agenda to the next level.

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Director, International Hurricane Research Center
Professor, Florida International University

Resources

1. Leatherman, S. 2007. Ten Most Vulnerable U.S. Mainland Areas to Hurricanes. *Catastrophe Risk Management*. In press.
2. Leatherman, S., A. Gan Chowdhury, and C. Robertson. 2007. Wall of Wind Full-Scale Destructive Testing of Coastal Houses and Hurricane Damage. *Journal of Coastal Research*. In press.

Natural Hazards Center Seeks Program Manager

The Natural Hazards Center at the University of Colorado seeks applications for the position of Center Program Manager. Since 1976, the Natural Hazards Center has served as the nation's clearinghouse for knowledge on the societal aspects of hazards, disasters, and risk. The Program Manager will report to the Center director, and in cooperation with the director, oversee the development and operations of Center programs. In particular, the Program Manager will perform the following duties:

- Providing assistance to the director related to writing grant proposals and other fundraising activities
- Planning and coordinating the Center's annual July workshop
- Communicating and coordinating with the Center's national advisory committee, funding agencies, and the broader hazards loss-reduction community
- Managing the Center's budget
- Supervising staff activities in various areas, including (but not limited to) the Center's publications, Web site, library and information services, and Quick Response Research program
- Coordinating with professional staff who oversee the Center's research activities
- Managing day-to-day Center operations
- Representing the Center at meetings, conferences, and other events

Required Qualifications:

- A minimum of a Master's degree in a discipline related to hazards research and applications
- Knowledge of and experience with hazard-related policies, programs, research, and knowledge transfer
- Experience in project and budget management
- Experience in staff supervision
- Willingness to travel
- Demonstrated success in proposal writing and fundraising is highly desirable

Please send a letter of application for the position, a CV or resume, a sample of written work, and the names and contact information for three references to Kathleen Tierney, Natural Hazards Center Director, at tierneyk@colorado.edu. Review of candidates will begin on September 10, 2007, and will continue until a successful candidate has been identified. Salary for this position is commensurate with experience.

The University of Colorado at Boulder is committed to diversity and equality in education and employment. For more information about the Natural Hazards Center, go to www.colorado.edu/hazards/.

New Quick Response Reports from the Natural Hazards Center

With funds from the National Science Foundation, the Natural Hazards Center offers social scientists small grants to travel to the site of a disaster soon after it occurs to gather valuable information concerning immediate impact and response. Grant recipients are then required to submit reports of their findings, which the Center posts online. Three new Quick Response reports are now available at www.colorado.edu/hazards/qr/qrrepts.html.

QR191 Emergency Responses for High Plains Cattle Affected by the December 28-31, 2006, Blizzard, by Bimal Kanti Paul, Deborah Che, and Vicki L. Tinnon. 2007. Parts of six states in the Great Plains region of the United States experienced severe winter storms in late December 2006. This research explored the effect of the severe winter weather on the cattle industry in the Great Plains region of eastern Colorado and western Kansas. By surveying more than 60 farmers and ranchers, the researchers gathered information on industry-specific problems encountered during the storm, the effectiveness of the response to the blizzard, and what farmers and ranchers hope to see in future responses to severe weather.

QR192 Evaluation of Winter Storm Warnings: A Case Study of the Colorado Front Range December 20-21, 2006, Winter Storm, by Sheldon Drobot. 2007. This research aimed to improve understanding of decision making related to driving in hazardous winter weather conditions, using the December 2006 Colorado blizzard as a case study. By analyzing responses to a Web-based survey, the researcher examined respondents' main sources for obtaining weather information, concluding that local broadcast media was by far the preferred medium for most respondents. Respondents also felt that the forecast they received was generally accurate. In addition, this research explored factors that influenced respondents' decisions to drive or stay home.

QR193 The Groundhog Day Florida Tornadoes: A Case Study of High Vulnerability Tornadoes, by Kevin M. Simmons and Daniel Sutter. 2007. On February 2, 2007, a severe thunderstorm moving across central Florida spawned three tornadoes, resulting in 21 deaths in the second-worst tornado outbreak in state history. The outbreak exhibited three vulnerabilities for tornado casualties revealed by prior research: the tornadoes touched down at night, during a fall or winter month, and in an area with a large proportion of manufactured homes. This research combined property and damage characteristics to examine risk factors for fatalities in this high-vulnerability event. The research results indicated that all the fatalities occurred in mobile homes, and that 16 of the 17 fatalities occurred in homes that were leveled. The effects of home construction quality and warnings and sirens were also explored.

Active Hurricane Seasons May Be the Norm—Not the Exception

The increase in North Atlantic hurricane activity since the mid-1990s has been attributed to both human-induced climate change and natural variability, but observational data of this activity only cover the past few decades. Now, researchers have constructed a record of Atlantic hurricane frequency over the past 270 years using proxy records of vertical wind shear and sea surface temperature (which influence the formation of major hurricanes in the Atlantic region) from corals and a marine sediment core, an article in the June 7, 2007, issue of *Nature* reported.

The record constructed during the study indicates that the average frequency of major hurricanes decreased gradually from the 1760s until the early 1990s, reaching anomalously low values during the 1970s and 1980s. The analysis also indicates that the period of enhanced hurricane activity since 1995 is not unusual compared to other periods of high hurricane activity in the record; therefore, this phase appears to represent a recovery to normal hurricane activity, rather than a direct response to increasing sea surface temperature. To read the full abstract, or to access the entire article in *Nature*, visit www.nature.com/nature/journal/v447/n7145/abs/nature05895.html.

Washington Update

National Hurricane Center Director Placed on Leave Following Staff Mutiny

On July 9, 2007, National Hurricane Center (NHC) director Bill Proenza was placed on leave after nearly half of his staff signed a statement demanding his departure. Proenza replaced Max Mayfield last December, when Mayfield retired after 34 years of federal service at the NHC. Proenza's departure followed months of controversy, triggered largely by his open criticism of National Oceanic and Atmospheric Administration (NOAA) budget priorities and the agency's failure to replace the aging QuikSCAT satellite. Proenza began his career with the NOAA National Weather Service at its NHC and with NOAA's hurricane hunters in the mid-1960s and went on to serve in a number of field, headquarters, and leadership capacities across the nation. Ed Rappaport, a 20-year veteran of the NHC and its deputy director, has been appointed as interim director in the wake of Proenza's departure. Rappaport has served largely in an administrative role since becoming deputy director in 2000 after many years as a highly regarded hurricane forecaster. According to NOAA Administrator Conrad C. Lautenbacher, Jr., Proenza is now "on leave until further notice, which means that he will not be undertaking any official duties."

FEMA Reaches Staffing Milestone

Nearly two years after the Federal Emergency Management Agency (FEMA) drew criticism for its coordination of Hurricane Katrina recovery efforts, the agency says it has reached its goal of being 95% fully staffed. FEMA had 30% of its staff (about 500 positions) unfilled when Hurricane Katrina hit in 2005. FEMA Director David Paulison told Congress that this year there would be no repeat of the inadequate response to Katrina. For more information on FEMA's streamlined hiring processes, visit www.federaltimes.com/index.php?S=2761544.

September is National Preparedness Month

September 2007 marks the fourth annual National Preparedness Month, a nationwide effort held each September to encourage Americans to take simple steps to prepare for emergencies in their homes, businesses, and schools. National Preparedness Month 2007 is sponsored by the U.S. Department of Homeland Security (DHS). Throughout September, DHS will work with a wide variety of organizations, including local, state, and federal government agencies and the private sector, to highlight the importance of emergency preparedness and promote individual involvement through events and activities across the nation. These organizations will provide information, host events, and sponsor activities that disseminate emergency preparedness messages to, and encourage action by, their customers, members, employees, stakeholders, and communities across the country. Specifically, these activities will urge Americans to get emergency kits, make emergency plans, educate themselves about the threats to their communities, and get involved with their communities' preparedness efforts. For more information about National Preparedness Month, visit www.ready.gov/america/npm07/.

Most Americans Are Not Prepared for a Disaster

David Paulison, head of the Federal Emergency Management Agency (FEMA), is making it one of his top priorities to educate Americans about being prepared for a disaster. Paulison said he is more adamant than ever about spreading the message, because Americans still aren't listening—even in the aftermath of 9/11 and Hurricane Katrina. His mantra is simple: Have a disaster kit ready with food, water, medicine, and emergency supplies; have an evacuation plan in place; and know where to meet family members if disaster strikes.

A survey done by Citizen Corps revealed that almost one-third of Americans admit they have done nothing to prepare for an emergency. Of this group, the survey results indicated that:

- Nearly half (45%) simply have not thought about it
- One-third (34%) do not think an emergency will happen to them or their family
- One-quarter (25%) think that nothing they can do would be effective
- 24% do not want to think about it
- 21% say that not knowing what to do is a major reason for their lack of preparedness
- 18% say it takes too much time
- 16% percent say it costs too much money

To access the full survey results and report, visit www.citizencorps.gov/pdf/pri_report.pdf.

U.S. Departments of Commerce and Homeland Security to Fund Nearly $1 Billion in First Responder Communications Grants

The U.S. Departments of Commerce and Homeland Security (DHS) announced $968 million in Public Safety Interoperable Communications (PSIC) Grants to help state and local first responders improve public safety communications and coordination during a natural or human-caused disaster. The PSIC grant program will assist public safety agencies in the acquisition, deployment, and training of interoperable communications systems to enhance interoperable communications of voice, data, and/or video signals. Grants will be awarded by September 30, 2007, as required by the Call Home Act of 2006.

First responders from different jurisdictions and agencies use disparate communication technologies that impede critical communication among firefighters, police, and other emergency personnel during a disaster. Such differences can pose problems and impede the critical work of the nation's first responders. The U.S. Congress authorized $1 billion to establish the PSIC program as a one-time, formula-based, matching grant program in the Deficit Reduction Act of 2005. The program will fast track awards to all 50 states, the District of Columbia, and U.S. territories. Additional information can be found at www.ntia.doc.gov/psic.

DHS Announces $1.7 Billion in Homeland Security Grants

The Department of Homeland Security (DHS) announced final 2007 Fiscal Year (FY) Homeland Security Grant Program (HSGP) awards totaling $1.7 billion, including almost $411 million to the nation's six urban areas considered to be at highest risk of a terrorist attack: New York City/Northern New Jersey; the National Capital Region; Los Angeles/Long Beach; the California Bay Area; Houston; and Chicago. HSGP grants enhance the ability of states, territories, and urban areas to prevent, protect against, respond to, and recover from terrorist attacks and other disasters. Final FY 2007 HSGP awards include Urban Areas Security Initiative (UASI), $746.9 million; State Homeland Security Program (SHSP), $509.3 million; and Law Enforcement Terrorism Prevention Program (LETPP), $363.8 million.

The FY 2007 HSGP involved extensive collaboration with state and local homeland security and emergency management officials. In addition, approximately 150 state and local homeland security officials reviewed HSGP investment justifications to assess the effectiveness of proposed investments in addressing identified homeland security needs. To view the full press release, visit www.dhs.gov/xnews/releases/pr_1184781799950.shtm.

NOAA Satellite Fleet Ready for Active Hurricane Season

The National Oceanic and Atmospheric Administration (NOAA) says its high-powered satellites are ready to send forecasters a steady stream of crisp, detailed images and other important data related to any storm that develops in the Western Hemisphere during the 2007 hurricane season. The NOAA Satellite and Information Service operates a fleet of spacecraft that monitor the weather, including conditions that trigger hurricanes and the tornadoes and floods that accompany them. NOAA's Geostationary Operational Environmental Satellites (GOES), which operate from a fixed position 22,500 miles above the east and west coasts, take constant images of hurricanes and track their movement. GOES are the nation's primary hurricane spotters from space. In addition, NOAA's Polar-orbiting Operational Environmental Satellites (POES), which orbit the entire planet, keep an eye on storms and provide data that are incorporated into global weather models. During the 2005 Atlantic hurricane season, when a record 28 storms developed, NOAA satellites sent a total of 11,736 images to forecasters at the National Hurricane Center in Miami.

Additional Federal Assistance Made Available to States Impacted by the 2005 Hurricane Season

Under legislation signed by President Bush, the Federal Emergency Management Agency (FEMA) will deliver additional federal disaster assistance to supplement state and local recovery efforts in areas impacted by the 2005 hurricane season. The bill allows for additional funding to states specifically under the agency's Public Assistance and Other Needs Assistance programs. The increase in federal assistance is being made available to Louisiana, Texas, Mississippi, Florida, and Alabama to cover costs in connection with Hurricanes Katrina, Wilma, Dennis, and Rita.

To view the complete FEMA news release, visit **www.fema.gov/news/newsrelease.fema?id=37069**.

FEMA Announces National Advisory Council Membership

The Federal Emergency Management Agency (FEMA) announced the 30-person membership of its newly formed National Advisory Council. According to FEMA, the council advises Administrator David Paulison on "all aspects of preparedness and emergency management in an effort to ensure close coordination with its partners across the country." The Post-Katrina Emergency Management Reform Act of 2006 called for the creation of this council, whose members are appointed by the FEMA administrator and "represent a geographic and significant cross section of officials from emergency management and law enforcement." Members include homeland security directors; adjutants general; emergency response providers from state, local, and tribal governments; and private sector and nongovernmental organization representatives.

The council will focus its attention on the development and revision of the National Preparedness Goal, the National Preparedness System, the National Incident Management System, the National Response Plan, and other related plans and strategies. The complete list of members can be found at **www.fema.gov/news/newsrelease.fema?id=37154**.

USFA Announces New Online Training System

The U.S. Fire Administration (USFA) launched a new Web-based training system. NFAOnline provides an easy, one-stop Web site where fire and emergency services personnel, first responders, emergency management personnel, and the general public will find free training and education programs that they can complete at their own pace. The user-friendly, state-of-the-art training system with technical support makes training and materials available for those unable to attend resident courses in Emmitsburg, Maryland. Currently, eight courses are available on the new NFAOnline. Additional courses are in development and will be added in coming weeks. Course subjects include fire prevention, fire service supervision, incident management (ICS 100 and ICS 200), emergency response to terrorist incidents, and emergency medical services. For more information, visit **www.usfa.dhs.gov**.

USGS Pilot Program Makes Landsat Data Available Via the Web

Beginning on June 4, 2007, the U.S. Geological Survey (USGS) began releasing selected Landsat 7 satellite imagery of the United States via the Internet. Landsat 7 data are of high quality with limited cloud cover. The Web-enabled distribution of new and recently acquired data is a pilot project for the Landsat Data Continuity Mission (LDCM), currently projected for launch in 2011. The project will allow Landsat data users to help refine the distribution system planned for the upcoming LDCM. Each scene will be registered to the terrain, or "ortho-rectified," prior to being placed on the Web. Copies of these data will also be available on CD or DVD at the cost of reproduction. Landsat data have proven useful for a wide range of applications, including disaster monitoring after Hurricane Katrina and the Indian Ocean tsunami. Customer response to the pilot project will be evaluated and will influence the future distribution system. The selected image data are available at **http://glovis.usgs.gov**.

The Role of IT in Improving Disaster Management: Conclusions from a National Research Council Report

Reducing the harm disasters cause to society, the economy, and the lives of individuals and communities requires disaster managers to reduce uncertainty, to calculate and compare costs and benefits, and to manage resources, often on a much larger scale and at a much faster pace than are supported by ordinary methods and means for solving problems. Information and communication technology (IT) provides capabilities that can help people cope with the myriad details, grasp the dynamic realities of a disaster more clearly, and formulate and execute better decisions more quickly.

To examine opportunities for applying IT to disaster management, the Computer Science and Telecommunications Board of the National Research Council established the Committee on Using Information Technology to Enhance Disaster Management, which recently published its final report, *Improving Disaster Management: The Role of IT in Mitigation, Preparedness, Response, and Recovery*. The committee's study was requested by the Federal Emergency Management Agency (FEMA) to fulfill the requirements of section 214 of the E-Government Act of 2002, which called on FEMA to "ensure that a study is conducted on using information technology to enhance crisis preparedness, response, and consequence management of natural and manmade disasters."

The report, which is summarized in this article, establishes a framework for considering the range and nature of information and communication needs; presents a vision of the potential for IT to improve disaster management; provides an analysis of structural, organizational, and other non-technical barriers to the acquisition, adoption, and effective use of IT in disaster; and offers an outline of a research program aimed at strengthening IT-enabled capabilities for disaster management.

The committee's vision for the use of IT centers around six key areas of IT-enabled capability:

- more robust, interoperable, and priority-sensitive communications;
- better situational awareness and a common operating picture;
- improved decision support and resource tracking and allocation;
- greater organizational agility for disaster management;
- better engagement of the public; and
- enhanced infrastructure survivability and continuity of societal functions.

The report goes on to describe both short- and long-term opportunities in each of these areas for enhancing responsiveness and increasing resilience by using IT as a point of leverage to enhance disaster management in all its phases (mitigation, preparedness, response, and recovery). In the short term, the report notes a number of opportunities for investment in specific areas. Some of these technologies, such as laptops with wireless local area network cards, may already be in the hands of users but not fully exploited in disasters because they may not have been identified as useful tools, policies and procedures for their use have not been established, and they have not been incorporated into training and exercises.

To make the sort of long-term IT-enabled progress in disaster management that is envisioned, the report concludes that significant attention and investment in long-term research programs will be needed, much as has been the case in other vital government mission areas, such as defense and energy. Roadmapping—an agreed-on, coordinated vision that can help organizations to plan development and investment strategies that can bring technologies together at the right time—is recommended as a tool to engage diverse stakeholders and inform research and development (R&D) investments. The report also notes that such R&D activities will need to be well connected to the parts of the Department of Homeland Security (DHS) and state and local agencies that are responsible for mitigation, preparedness, response, and recovery activities to ensure that requirements are grounded in operational needs and that solutions can be transferred into operations. R&D directions and results also should be considered as a vital element of policy formulation to ensure that technological and organizational questions are considered together.

The report highlights several reasons that acquisition and adoption of IT for disaster management are challenging, including the distributed responsibility for disaster management inherent in the U.S. federal system, the uncertain and unstable nature of the environment in a disaster, and the effect that the infrequency and relative unpredictability of disasters has on investment decisions, collaboration, and skills development.

The report identifies a number of ways disaster management organizations can address these challenges. For example, a diversified acquisition strategy that includes increased use of commercial information technology and greater use of open source software and open standards development is one means of overcoming existing barriers. This approach will require many organizations to enhance their technical and technology management capabilities and to work more closely with technology providers to define, shape, and integrate new technologies as a coherent part of their overall IT systems.

IT acquisition can also be enhanced through a set of "best practices" and design principles identified by the committee. Best practices include an emphasis on iterative development, increased opportunities to test and evaluate technology in practice together with realistic concepts of operations, and design and evaluation processes that allow for strong coupling among practitioners, researchers, and industry. Four design principles have particular importance for disaster management systems: design for effective scaling from routine to disaster operation; exploitation of redundancy and diversity (and not just hardening) to achieve resilience; design systems with flexibility, composability, and interoperability as core guiding principles; and distinguish between the user interface and the underlying technologies used to deliver a capability.

Another issue related to effective use of IT in disasters cited by the committee is training and routine use. Only through routine use can the competence and confidence required to successfully use a technological capability, especially in the high-stress situation of disasters, be developed. Unfortunately, too much IT in place today for disaster management is not integrated into day-to-day operations, with the result that it remains underutilized.

According to the report, a solid understanding of context and user needs is critical to effective development, use, and deployment of IT. Moreover, the introduction of new IT often presents opportunities for new organizational approaches, and these opportunities should be considered in reorganization efforts. Similarly, successful technology development requires consideration of organizational context. This issue of co-development of technology and organizational practice seems especially important at present. In the wake of Hurricane Katrina, a number of organizational structures, policies, and procedures are being examined. Also, a number of relevant technologies have reached a sufficient level of maturity to allow innovative organizational approaches to disaster management.

The interdependence of technology and practice, and the significant non-technical factors that affect adoption of IT, also suggests that developing a cadre of people with expertise in both disaster management and IT is likely to yield significant payoffs. The report identifies a number of mechanisms through which deeper expertise spanning both domains could be fostered.

The committee suggests that multidisciplinary research centers would be an especially useful mechanism for the following:

- developing a shared understanding of the challenges in all phases of disaster management from both a technological and an organizational perspective;
- evaluating the application of technology advances to disaster management practice;
- developing a culture and processes for transitioning knowledge and technology to the operational communities on a sustained basis;

- building human capital at the intersection of IT and disaster management, serving as repositories for data and for lessons learned from past disasters and disaster management efforts; and
- providing forward-looking analysis to inform the development of technology capabilities, associated organizational processes, and roadmap development.

A number of academic centers already exist that offer a capacity for at least some of these efforts.

Practitioners in multiple disciplines, including scientists, engineers, and hazard and disaster researchers, should participate in such centers, and centers should include partnerships with federal, state, and local disaster management agencies. Indeed, it is critical that experienced and capable officials and operational elements of disaster management organizations are deeply involved in the work of these centers. Research centers could also act as a resource for agencies seeking to implement a diversified acquisition strategy and could incorporate the latest best practices and a mechanism for disaster managers and responders to share experiences and communicate requirements to guide further technology developments.

Finally, the report highlights the role of systematic collection of data, measurement, and assessment to provide the feedback necessary to drive improvements in disaster management. The emphasis should be on measuring the resulting net effectiveness of disaster management activities, not the performance of the IT per se (which is too often the case today). Moreover, the committee concluded, independent mechanisms for assessing the effectiveness of disaster management operations, including the use of IT, and for disseminating lessons learned and best practices, could prove valuable to improving the effectiveness of IT use in disaster management.

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Global Warming May Bring Hurricanes to the Mediterranean

Warming global temperatures could cause hurricanes to develop over the Mediterranean Sea, threatening one of the world's most densely populated coastal regions, a Reuters article reported on July 16, 2007. Hurricanes currently form in the tropical Atlantic Ocean and rarely reach Europe, but a new study by European scientists indicates that an increase of 3 degrees Celsius (5.4 degrees Fahrenheit) in average temperatures could trigger future hurricanes in the enclosed Mediterranean area. Factors influencing hurricane development include warm sea surface temperatures and atmospheric instability. In the past, hurricanes have been confined to a limited number of regions; recently, however, they have been forming in unusual places, which scientists see as a clear danger signal. In 2004, Hurricane Catarina formed in the south Atlantic and hit land in southern Brazil. A year later, Hurricane Vince formed next to the Madeira Islands and became the first to make landfall in Spain. In a paper published in the American Geophysical Union Journal, scientists from the University of Castilla-La Mancha in Toledo, Spain, and the Max Planck Institute for Meteorology in Hamburg, Germany, used a range of regional climate models to assess the chance of similar events in the Mediterranean. They found that rising temperatures pointed to increasing storm intensity and, in the case of the most sensitive computer model, a likelihood of strong hurricanes. The full article on Reuters AlertNet is available at www.alertnet.org/thenews/newsdesk/L16665979.htm.

2007 Mary Fran Myers Scholarship Winners

Mary Fran Myers served as the co-director of the Natural Hazards Center for 16 years, and reducing disaster losses was her life's work. Her efforts helped to bring about a fundamental change in national and international perspectives regarding hazards and helped institute a new, more far-sighted and sustainable way of dealing with extreme environmental events. The Mary Fran Myers Scholarship recognizes outstanding individuals who share Mary Fran's commitment to disaster research and practice and who have the potential to make a lasting contribution to reducing disaster vulnerability.

Each summer, the Natural Hazards Center hosts an invitational Hazards Research and Applications Workshop in Boulder, Colorado. The workshop brings together more than 400 members of the hazards community who are working to alleviate the pain and loss inflicted by disasters. One of Mary Fran's primary concerns was ensuring that all age groups, professions, and communities be represented at the workshop. She recognized that many people and organizations who could greatly benefit from and contribute to workshop activities, including local practitioners, students, and international professionals, were often the least likely to be able to afford to attend the meeting.

In 2003, members of the hazards community established the Mary Fran Myers Scholarship to fulfill Mary Fran's explicit request that qualified and talented individuals receive support to attend the workshop. The intent of the scholarship is to bring new and fresh perspectives—and otherwise unheard voices—to the workshop. The scholarship's financial support covers all or part of the costs of transportation, hotel accommodations, meals, and workshop registration fees.

The Natural Hazards Center is pleased to announce the 2007 winners of the Mary Fran Myers Scholarship:

Steve Samuelson works as Zoning Administrator, Floodplain Manager, Residential Data Collector for the Appraiser, and Grant Writer for Lyon County, Kansas. Steve began working for Lyon County in December of 2005. Since then, his many accomplishments have included rewriting the floodplain regulations for Lyon County, enrolling Lyon County in the Community Ratings System, writing a comprehensive hazard mitigation plan for all the jurisdictions within Lyon County, successfully appealing problems in new Flood Insurance Rate Maps, and negotiating for certification of the levee that protects Hartford, Kansas.

Saeed Ashraf Siddiqi is Program Manager (social protection) at the Earthquake Reconstruction and Rehabilitation Authority (ERRA) in Islamabad, Pakistan. Following the most debilitating earthquake in Pakistan's history on October 5, 2005, the Government of Pakistan established ERRA with the mandate to work on a comprehensive response to devastation caused by the earthquake.

Yu Xiao is a PhD candidate in the Department of Urban and Regional Planning at the University of Illinois at Urbana-Champaign. She has education in planning, regional science, computer simulation modeling, and applied econometrics. She worked for the Mid-America Earthquake Center on economic impact analysis of disasters. Her current research focuses on empirically assessing the short- to long-term social and economic impacts of the 1993 Midwest Flood on various types of communities.

The complete biographies of the winners, along with more information about the Mary Fran Myers Scholarship, are available at www.colorado.edu/hazards/awards/myers-scholarship.html.

The Natural Hazards Center wishes to extend a special thank you to the Public Entity Risk Institute (PERI) for sponsoring the 2007 Challenge Grant Campaign to increase the Mary Fran Myers Scholarship Fund. We are pleased to report that the Center reached its $10,000 goal by July 1, 2007.

2007 Mary Fran Myers Award Winner

The Gender and Disaster Network and the Natural Hazards Center are pleased to present the 2007 Mary Fran Myers Award to Prema Gopalan. As the Executive Director of Swayam Shikshan Prayog (SSP) for over 15 years, Prema Gopalan has supported women in earthquake and tsunami areas who mobilized to organize their communities to restore housing, livelihoods, community infrastructure, and basic services. Under Prema's leadership, the SSP has partnered with GROOTS International, an international network of grassroots women, and served as its secretariat. In this role, Prema has facilitated the creation of training teams of expert grassroots community women leaders. These women-led teams are now available to support and build the capacity of women's groups in high-risk and disaster-impacted, low-income communities across the globe.

The Mary Fran Myers Award was established in 2002 to recognize individuals whose program-related activities, advocacy efforts, or research has had a lasting, positive impact on reducing hazards vulnerability for women and girls. Individuals whose work adds to the body of knowledge on gender and disasters, is significant for the theory and/or practice of gender and disasters, or has furthered opportunities for women to succeed in hazards fields are eligible to receive the award. To learn more about the Mary Fran Myers Award or to read Prema Gopalan's complete biography, visit www.colorado.edu/hazards/awards/myers-award.html.

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/**.

Exploring the Dynamics of Individual Pedestrian and Crowd Behavior in Dense Urban Settings: A Computational Approach. Funding Organization: National Science Foundation, $89,671. One year. Principal Investigator: Paul Torrens, Arizona State University, (480) 965-5479, torrens@geosimulation.com.

Modeling and simulation occupy a pivotal role in the research of crowd behavior as synthetic laboratories for exploring ideas and hypotheses that are simply not amenable to investigation by other means. Major advances have been made in modeling crowd dynamics, but challenges remain. The goal of this Faculty Early-Career Development (CAREER) award is to support research, education, and related activities that will develop a reusable and behaviorally founded computer model of pedestrian movement and crowd behavior amid dense urban environments. The research will seek to advance the state-of-the-art in crowd modeling by representing individuals, crowds, and the ambient city with rich detail. Models will be built with theory-informed algorithms that capture the intricacies of human behavior. The model will be realized as a fully immersive three-dimensional environment that engages both the public and students, and it will convey intuitively complicated ideas about human movement and crowd behavior. A robust calibration and validation scheme will be employed to facilitate evaluation of policies and plans in simulation and mapping of models to real-world scenarios in public health, downtown revitalization, public safety, defense, large-scale event planning, escape, evacuation, and emergencies. The work will broaden the behavioral base for computational modeling of human movement, contribute to the development of dynamic geographic information science, and produce a novel validation scheme that combines GIS analytics based on time geography with spatial analysis, landscape metrics, and spatial statistics. Moreover, the model will serve as an experimental but wholly realistic environment for exploring "what-if" and unforeseen scenarios of relevance to cities and their citizens.

Exploring Earth's Volcanic Environment: Development of Virtual Reality Education Modules (Phase 2). Funding Organization: National Science Foundation, $222,823. Three years. Principal Investigator: Steven Carey, University of Rhode Island, (401) 874-5138, scarey@gso.uri.edu.

An integral part of earth and environmental science education at the undergraduate level is the opportunity for students to explore the natural world through fieldtrips and to make primary observations about geological processes. Web-based virtual fieldtrips to Vesuvius volcano in Italy, Kilauea volcano in Hawaii, and Laki volcano in Iceland are being developed to explore the hazards and impacts of explosive and effusive volcanism. The modules utilize Quicktime Virtual Reality (QTVR) panoramic images, digital video clips, interactive Flash animations, and inquiry-based exercises. The main intellectual objective of the project is to engage students as explorers and observers, enabling them to learn about volcanic processes and hazards, collect virtual field information, and formulate hypotheses about the effects of explosive volcanic eruptions and the deposits that they produce. The exercises are being tested on a diverse set of users participating in geoscience courses at five academic institutions including the University of Rhode Island, Tulsa University, Southern Indiana University, Community College of Rhode Island, and Tallahassee Community College. The modules can be used in a variety of undergraduate geoscience courses, such as physical and environmental geology, geologic hazards, igneous petrology, and volcanology. They can also be used outside of academia to increase public awareness of volcanic hazards to those living in areas adjacent to volcanoes.

Integrating Household Decision Making and Transportation Simulation under No-Notice Evacuation Conditions. Funding Organization: National Science Foundation, $439,313. Three years. Principal Investigator: Pamela Murray-Tuite, Virginia Polytechnic Institute and State University, (540) 231-5281, murraytu@vt.edu.

This grant provides funding for the development of an approach that more accurately predicts evacuation time for no-notice events by explicitly integrating household interactions and characteristics with transportation modeling and simulation. Original data on household decision making will be gathered through in-depth personal interviews, which will reveal household evacuation planning, decision-making processes, the degree to which households optimize their plans, and their transportation needs, reliance on communications technology, and dependence on schools to evacuate children. Additional interviews with schools will identify their evacuation plans and coordination with parents. The data will inform new behavior models of household member interactions and decision making in a no-notice evacuation. These new models will then be integrated with transportation simulation to examine effects on traffic and evacuation times. Finally, using the traffic information, an original mathematical program and solution methodology will be developed for schools and other entities to select optimal relocation sites for people within their care that facilitate collection by family members. The models will be tested for three hazardous materials incidents and evaluated for home evacuation and workplace evacuation with and without home clearance.

Knowledge, Attitudes and Behavioral Intentions of Essential Personnel with Respect to Avian Influenza and SARS. Funding Organization: National Science Foundation, $150,000. One year. Principal Investigators: Robyn Gershon ($75,000), Columbia University, (212) 854-6851, rg405@columbia.edu; Kristine Qureshi ($75,000), University of Hawaii, (808) 956-7800, kqureshi@hawaii.edu.

This collaborative research grant provides funding that will enable a better understanding of the factors that influence the attitudes and behavioral intentions of essential workers (police, fire, EMS, public health, hospital intensive care unit, and emergency department personnel), with respect to reporting to work, assuming assigned duties, and complying with infection control protocols during outbreaks of avian influenza (AI), sudden acute respiratory distress syndrome (SARS), or other infectious disease epidemics. The study will take place in two strategically located settings: the New York City metropolitan area and Honolulu County, Hawaii. The project will be organized into four phases: Phase 1: a series of focus groups will be conducted to collect qualitative data regarding factors that influence readiness, ability, and willingness to report to work during an AI or SARS outbreak; Phase 2: the survey will be administered to 3,000 essential workers; Phase 3: the survey results will be analyzed and presented to a variety of personnel from the participating agencies; and Phase 4: participatory action research teams will be formed for the purpose of validating the findings and for developing strategies to address issues or barriers identified by the survey. The findings will provide key information that can be used to optimize essential workers' readiness, ability, and willingness to report to work and perform their duties competently during an infectious disease epidemic such as AI or SARS.

Natural Hazards and Related Health Issues in Bangladesh: Standards and Issues Based Geography Curricular Project for Grades K-16. Funding Organization: Fulbright-Hays Group Projects Abroad, $64,000. One year. Principal Investigator: Kay Weller, University of Northern Iowa, (319) 273-7343, kay.weller@uni.edu.

As one of the most disaster-prone regions in the world, nearly every year Bangladesh experiences natural events such as floods, tropical cyclones, and associated surges, droughts, and tornadoes. The University of Northern Iowa (UNI) proposed Bangladesh for development of an issues- and standards-based geography curricular project focusing on how humans living in Bangladesh cope with natural hazards and health-related issues. This project involves three distinct phases: (1) work conducted prior to going to Bangladesh, (2) work conducted in Bangladesh, and (3) work conducted upon returning to the United States, including a professional development program enabling educators to integrate the developed materials into their curriculum. The project will take 15 team members to four primary destinations: Dhaka, Chittagong, Sylhet, and Rajshahi, Bangladesh. These destinations provide accessibility for field trips to observe locations where drought, monsoon floods, tropical cyclones, flash floods, landslides, and arsenic contamination occur.

Prediction of MCS Hazards and Simulations of Aerosol Influences on Severe Convective Storms. Funding Organization: National Science Foundation, $194,492. One year. Principal Investigator: William Cotton, Colorado State University, (970) 491-8593, cotton@atmos.colostate.edu.

This project focuses on investigations of hazardous weather from mesoscale convective systems (MCS) and will address two research objectives: (1) modeling studies of the effects of dust and pollution-produced aerosol on severe storms with an emphasis on tornado outbreaks; and (2) implementing a three-moment hail model and applying it to studies of impacts of aerosol on hail size and severe storm dynamics. Thus, it will explore relationships between aerosols and the severity of convective storms. The broader impacts involve investigating a causal relationship between dust and storm severity, which potentially could lead to a modification of severe storm forecasting techniques to include aerosol variability. These techniques could include nowcasting of severe weather using satellite-derived dust and pollution products, as well as development of a new infrastructure in numerical weather prediction centers for implementation of aerosol physics into models, the retrieval of quantitative aerosol products, and models for dust and pollution sources and transport. This improvement in forecasting could lead to a reduction in storm damage and loss of life.

Acquisition of a Large-Stroke, Piston-Type Wavemaker for Coastal Hazards Research and Education. Funding Organization: National Science Foundation, $1,132,800. Two years. Principal Investigator: Daniel Cox, Oregon State University, (541) 737-4933, dan.cox@oregonstate.edu.

This research seeks to acquire a new control system for the nation's largest coastal wave flume to enable precise, large-scale simulation of hurricane waves, tsunamis, and other coastal hazards under controlled conditions in a hydraulic laboratory wave flume. This new capability will allow the research community to study a range of engineering and scientific problems in constructed and natural coastal environments, including wave impacts on coastal infrastructure; development of wave energy systems; advances in numerical modeling of fluid-structure interaction with application to coastal systems, cross-shore sediment suspension, and transport related to coastal erosion and recovery after storms; dune erosion and overtopping; tsunami propagation over reefs; and environmental fluid-sediment dynamics. The high-performance wavemaker will provide a national asset for precision, large-scale studies enabling safer and more cost effective design of coastal infrastructure including bridges, levees, buildings, and lifelines. This project enhances the training of graduate students in the areas of coastal structures and coastal erosion. Research and education are integrated at the undergraduate level through a Research Experience for Undergraduates (REU) program established at the laboratory. Education and outreach activities are targeted to the recruitment and retention of women and minorities in engineering at the undergraduate level and to inspire K-12 students at the third through fifth-grade level through tours and hands-on activities.

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

Emergency Management: The American Experience 1900-2005. Claire B. Rubin, Editor. 2007. ISBN 978-0-9793722-0-9. 272 pp. $35.00 (paperback). Public Entity Risk Institute; (703) 352-1846; riskinstitute.org.

In autumn 2005, three massive hurricanes—Katrina, Rita, and Wilma—struck the United States with catastrophic results. Hurricane Katrina stood out as one of the worst disasters of the past 100 years. The emergency response to Katrina was so inadequate and problematic that the United States was humiliated both at home and abroad. These events prompted perhaps the deepest and most sustained examination of public emergency management functions and systems ever conducted in U.S. history. Citizens, the media, and public officials have questioned the effectiveness of U.S. emergency management systems. Using a unique analytic approach, this book focuses on the changes in public policies, administration, and organizations resulting from major disaster events in the United States.

Natural Disaster Reduction: South East Asian Realities, Risk Perception and Global Strategies. Dilip Kumar Sinha. 2007. ISBN 978-1-84331-704-3. 141 pp. $80.00 (hardcover). Anthem Press; (718) 312-8748; www.anthempress.com.

This book focuses on exposing the coastal vulnerability of the region affected by the Indian Ocean tsunami. The purpose of this treatise is to highlight the characteristics of disastrous events in the Southeast Asia region, presenting not only the continuing fatalities and fragilities of the area but also the possibilities of grappling with natural disasters. The layout of the chapters is specifically shaped by the nature of damage and threat caused by these disasters, particularly concerning the communities at risk and their responses.

Environmental Disasters, Natural Recovery and Human Responses. Roger del Moral and Lawrence R. Walker. 2007. ISBN 0-521-67766-1. 209 pp. $48.00 (paperback). Cambridge University Press; (845) 353-7500; www.cambridge.org.

Volcanic eruptions, earthquakes, hurricanes, tsunamis, floods, landslides, fires and other natural events are becoming more frequent and their consequences more devastating. In this book, biology professors del Moral and Walker provide a comprehensive summary of the diverse ways in which natural disasters disrupt humanity and how humans cope. Burgeoning human numbers, shrinking resources, and intensification of disaster consequences have produced a crisis of unparalleled proportions. Through this detailed study, the authors provide a template for improving restoration to show how relatively simple approaches can enhance human well-being and that of the other species on the planet. Detailed examples are presented throughout the text, providing a greater depth of coverage and creating stronger links between science, culture, and history.

Mitigation Success Stories in the United States, IV. Association of State Floodplain Managers (ASFPM) and the Federal Emergency Management Agency (FEMA). 100 pp. Free online. www.floods.org/PDF/Success%20Stories%20IV_Final.pdf.

This publication is a joint production of the ASFPM and FEMA and is the fourth in a series of Mitigation Success Stories. According to the ASFPM, this edition showcases examples of natural hazard mitigation activities and publicizes the benefits of mitigation successes across the country. Examples come from 39 communities in 24 states.

Climate Change

With Speed and Violence: Why Scientists Fear Tipping Points in Climate Change. Fred Pearce. 2007. ISBN 978-0-8070-8576-9. 304 pp. $24.95 (hardcover). Beacon Press; (617) 742-2110; www.beacon.org.

In this book, veteran science writer Fred Pearce reveals what the many scientists doing climate change research think about the changes they are seeing. In interviews with dozens of these scientists, Pearce shows that they are increasingly convinced that positive feedback loops within the climate system mean that change will happen more rapidly than was previously thought. Telling the story of scientists' findings across the globe, he looks at the possible implications of what they report, from a century-long drought in the American West, a weakened Asian monsoon, and a permanent El Niño effect in the Pacific, to the acidification of the oceans, a methane belch from the ocean depths, a collapse of the West Antarctic ice sheet, and sea levels rising by half a yard in a decade. The book includes an appendix covering Kyoto politics, a list of 12 technological changes that would significantly cut global emissions of carbon dioxide over the next 50 years, and a discussion of the costs of stabilizing—or choosing not to stabilize—greenhouse gases.

Earthquakes and Tsunamis

City of Heroes: The Great Charleston Earthquake of 1886. Richard N. Côté. 2006. ISBN 1-929175-46-9. 542 pp. $24.95 (paperback). Corinthian Books; (843) 881-6080; www.bookdoctor.com.

This heavily illustrated book is filled with first-hand accounts of the 1886 Charleston earthquake, drawn directly from newspapers, personal diaries, journals, and letters of the earthquake survivors. It also follows the earthquake sleuths who descended upon Charleston to discover what caused the disaster, but above all, it identifies the noble and heartwarming acts of numerous unsung heroes inspired and led by Charleston's extraordinary mayor, William A. Courtenay. Working together, they saved numerous lives, nursed the wounded, fed the hungry, sheltered the homeless, and enabled Charleston to make a full recovery from the massive disaster within 18 months.

Designing for Earthquakes: A Manual for Architects. Earthquake Engineering Research Institute (EERI) and Federal Emergency Management Agency (FEMA). Free online. www.fema.gov/library/viewRecord.do?id=2418.

This report fills a gap in up-to-date literature on natural hazard mitigation directed towards the architectural profession. Part of FEMA's Risk Management Series, the manual explains the principles of seismic design for those without a technical background in engineering and seismology, with each chapter authored by an expert in the field. Because of its nontechnical approach, it will be useful to anyone who has an interest in and concern for the seismic protection of buildings.

Floods

Large Floods in the United States; Where They Happen and Why. Jim E. O'Connor and John E. Costa. 19 pp. Free online. U.S. Geological Survey (USGS) Circular 1245. http://pubs.usgs.gov/circ/2003/circ1245/pdf/circ1245.pdf.

This USGS report shows that the locations of the country's largest floods are related to regional climatology, topography, and basin size. Using USGS flow data, the report's authors determined that the general northward trend of decreasing atmospheric moisture, the location's proximity to oceanic moisture sources such as the Pacific Ocean and the Gulf of Mexico, and the orientation of topographic features all play a role in determining where the nation's largest floods will occur.

Reducing Damage from Localized Flooding. Federal Emergency Management Agency (FEMA). 200 pp. Free online. FEMA Publication 511. www.fema.gov/hazard/flood/pubs/flood-damage.shtm.

This publication is designed to help local officials understand the options available to reduce the damage, costs, and disruption brought by localized, shallow flooding in areas that often are not mapped or subject to floodplain regulations. The handbook is especially helpful to communities wrestling with repetitive loss areas subject to localized flooding.

Transboundary Floods: Reducing Risks Through Flood Management. Jiri Marsalek, Gheorghe Stancalie, and Gabor Balint, Editors. 2006. ISBN 1-4020-4901-3. 336 pp. $169.00 (paperback). Springer; (212) 460-1500; www.springer.com.

Many flood management measures have been practiced in various jurisdictions, including living with floods, non-structural measures (e.g., regulations, flood forecasting and warning, evacuations, and flood insurance), and structural measures (e.g., land drainage modifications, reservoirs, dykes, and polders). Such flood management is difficult in river basins controlled by a single authority and becomes even more challenging when dealing with transboundary floods, which may originate in one country or jurisdiction and then propagate downstream to another country or jurisdiction. Under such circumstances, the demands on communications, information and data sharing, compatibility of forecasting methodologies, and close collaboration in all aspects of flood management are particularly strong and important. These issues are addressed in these edited proceedings of the NATO Advanced Research Workshop on Transboundary Floods: Reducing Risks and Enhancing Security through Improved Flood Management Planning, held in Baile Felix (Oradea), Romania, on May 4-8, 2005.

Homeland Security

Caught Off Guard: The Link between Our National Security and Our National Guard. Lawrence J. Korb and Sean E. Duggan. 2007. 15 pp. Free online. Center for American Progress; www.americanprogress.org/issues/2007/05/pdf/national_guard.pdf.

This report from the Center for American Progress examines the relationship of an expanded duty of the National Guard and its impact on the Guard's mission of homeland defense. The report offers recommendations on how the Guard can function as the "active Army's operational reserve" while also fulfilling its duties domestically and in homeland security.

Critical Infrastructure: Homeland Security and Emergency Preparedness. Robert Radvanovsky. 2006. ISBN 0-8493-7398-0. 336 pp. $89.95 (hardcover). Taylor & Francis; +44 (0) 20 7017 6000; www.taylorandfrancisgroup.com.

This book presents information pertaining to emergency preparedness and other homeland security-related topics, such as data classification and categorization, various definitions pertinent to critical infrastructure preparedness, and critical infrastructure information. Covered topics include regulations and legislation, National Response Plan, National Incident Management System, Incident Command System, security vulnerability assessments, standards and guidelines, and information sharing and analysis centers.

Hurricanes and Coastal Hazards

Hurricane Katrina: Lessons for Army Planning and Operations. Lynn E. Davis, Jill Rough, Gary Cecchine, Agnes Gereben Schaefer, and Laurinda L. Zeman. 2007. ISBN 978-0-8330-4167-8. 106 pp. $23.00 (paperback). RAND Corporation;

(877) 584-8642; www.rand.org. Also available free online at www.rand.org/pubs/monographs/2007/RAND_MG603.pdf.

The efforts undertaken by civilian and military organizations in response to Hurricane Katrina were historically unprecedented, but problems did arise in the military response that contributed to delays in accomplishing evacuations and relief operations across the storm-ravaged areas of Louisiana and Mississippi, particularly in New Orleans. This report from the RAND Corporation recommends that a number of steps be taken to enhance future military disaster-response efforts, including giving the National Guard the federal mission to conduct homeland security activities, making each National Guard unit capable of rapid deployment, preparing governors to call up Guard units to state active duty for out-of-state emergencies, and designing a regional approach in the National Guard.

Hurricane Preparedness: A Time for All Pet Owners to Get Ready. Kathy Covey. 2007. Free online. The Humane Society of the United States; www.hsus.org/hsus_field/hsus_disaster_center/hurricane_preparedness_week.html.

This online guide from The Humane Society of the United States reminds pet owners to get prepared for hurricane season by creating a plan and gathering supplies. The Humane Society is advising pet owners in hurricane-prone areas to create a kit for their pet that includes a three-day supply of food, bowls, photographs, medications, veterinary records, and other necessary supplies.

Katrina: Mississippi Women Remember. Sally Pfister, Editor; Melody Golding, Photographer. 2007. ISBN 978-1-57806-956-9. 176 pp. $32.00 (hardcover). University Press of Mississippi; (800) 737-7788; www.upress.state.ms.us.

On August 29, 2005, Hurricane Katrina pummeled Mississippi with fierce winds, a center more than 70 miles wide, and a tidal surge in excess of 20 feet. This book provides personal insights into life on the Mississippi Gulf Coast following Katrina. Members of the Mississippi State Committee (MSC) of the National Museum of Women in the Arts tell their stories of those awful days. Despite desperate circumstances but with great generosity of spirit, these witnesses to one of the greatest natural disasters in North American history recorded their experiences with a broad diversity of voices. Melody Golding's photographic journal of the days following the storm accompanies the text. Royalties from the sales of this book will aid MSC artist members.

Pandemic Flu and Public Health

Bird Flu: A Virus of Our Own Hatching. Michael Greger, MD. 2006. ISBN 1-59056-098-1. 416 pp. $30.00 (hardcover). Lantern Books; (800) 856-8664; www.lanternbooks.com.

The influenza virus has existed for millions of years as an innocuous intestinal virus of wild ducks. What turned a harmless waterborne duck virus into a killer? Leading public health authorities now predict that an influenza pandemic, triggered by bird flu, is inevitable and will likely lead to millions of deaths around the globe. In this book, Dr. Michael Greger traces the human role in the evolution of this virus, whose humble beginnings belie its transformation into a killer mutant strain with the potential to become as ferocious as the Ebola virus and as contagious as the common cold. In the face of the coming pandemic, Greger reveals what we can do to protect our families and what human society to can do to reduce the likelihood of such catastrophes in the future.

Centers for Disease Control and Prevention (CDC) Health Information for International Travel ("The Yellow Book") 2008. Paul M. Arguin, Phyllis E. Kozarsky, and Christie Reed, Editors. 2007. ISBN 0323048854. 648 pp. $24.95 (paperback). Elsevier; (800) 545-2522; www.us.elsevierhealth.com. Also available free online at www.cdc.gov/travel/.

The Centers for Disease Control and Prevention has released an updated version of "The Yellow Book," the definitive guide to healthy international travel. The newest edition provides information on a range of health risks. New features include recommendations on traveling to countries that have experienced limited, non-pandemic human avian influenza cases, updated immunization guidelines, new developments in the prevention and treatment of malaria, and health risks and recommendations for humanitarian workers.

Interventions Following Mass Violence and Disasters. Elspeth Cameron Ritchie, Patricia J. Watson, and Matthew J. Friedman, Editors. 2006. ISBN 1-59385-256-8. 430 pp. $26.00 (hardcover). The Guilford Press; (800) 365-7006; www.guilford.com.

This essential volume presents practical guidelines for effective clinical intervention in the immediate, intermediate, and long-term aftermath of large-scale traumatic events. Vital lessons learned from a variety of mass traumas and natural disasters are incorporated into the book's thorough review of strategies for helping specific victim and survivor populations. The editors and authors include over 40 leading experts in disaster mental health. Of crucial importance, they clearly summarize the empirical evidence supporting each intervention and provide other guidance based on experience and consensus recommendations. Topics include training and preparation, mental health interventions, and specific situations and populations.

Methods for Disaster Mental Health Research. Fran H. Norris, Sandro Galea, Matthew J. Friedman, and Patricia J. Watson, Editors. 2006. ISBN 1-59385-310-6. 317 pp. $43.00 (hardcover). The Guilford Press; (800) 365-7006; www.guilford.com.

Geared toward those involved in studying the mental health consequences of large-scale traumatic events or in measuring the effectiveness of post-disaster interventions, this book considers disasters from different perspectives and translates their chaotic aftermath into feasible research ideas and approaches. The contributing authors are experienced researchers and practitioners who present a wide range of methods and strategies used in epidemiology, program evaluation, and public mental health planning in the aftermath of natural or technologi-

cal disasters and terrorism. Descriptions of exemplary studies bring to life the associated logistical and scientific challenges and show how these challenges can be addressed using high-quality research designs.

Pandemic Planning Update IV. Department of Health and Human Services (HHS). 2007. Free online. HHS; www.pandemicflu.gov/plan/panflureport4.pdf.

This report is an overview of what actions the federal government has taken to date to prepare for a pandemic. It begins with a message from Secretary Michael O. Leavitt, followed by sections on monitoring and surveillance, vaccines and vaccine production capacity, antiviral drugs, state and local preparedness, and communications. The report concludes with a timeline of pandemic planning.

Surveillance for Waterborne Disease and Outbreaks Associated with Recreational Water—United States, 2003-2004. Centers for Disease Control and Prevention (CDC). 2006. Free online. CDC; www.cdc.gov/mmwr/preview/mmwrhtml/ss5512a1.htm.

This report summarizes data from the Waterborne Disease and Outbreak (WBDO) Surveillance System, which tracks the occurrences and causes of waterborne diseases and outbreaks associated with recreational water. Since 1971, the CDC, the U.S. Environmental Protection Agency, and the Council of State and Territorial Epidemiologists have collaboratively maintained the Waterborne Disease and Outbreak Surveillance System for collecting and reporting waterborne disease and outbreak-related data. Data presented in the report summarize WBDOs associated with recreational water that occurred from January 2003 to December 2004 and one previously unreported outbreak from 2002.

Wildfire

Wildfire Risk: Human Perceptions and Management Implications. Wade E. Martin, Carol Raish, and Brian Kent. 2007. ISBN 978-1-933115-51. 310 pp. $85.00 (unjacketed cloth) and $43.95 (paperback). Resources for the Future Press; (800) 537-5487; www.rffpress.org.

This book follows from an increasing awareness among fire experts that relying on fire behavior models from the physical sciences to design a risk management program is no longer sufficient, and that simply increasing public knowledge related to wildfire hazard does not necessarily lead to appropriate risk reduction behaviors. Public land managers, property developers, landowners, and politicians must ask more about the social and psychological factors that motivate people to respond appropriately to risk. Drawing heavily on health and risk communication, the contributors to *Wildfire Risk* highlight the different ways that individuals and communities respond to wildfire risk. They discuss how outreach and education can influence individual and community behavior, and they explore differences among ethnic/racial groups and between genders with regard to values, views, and attitudes about wildfire risk and management. They also explore the role of public participation in wildfire risk assessment and mitigation and in planning for evacuation and recovery after fire. The book concludes with a section on risk modeling, with perspectives from the decision sciences, geography, operations research, psychology experimental economics, and other social sciences.

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.

Emergency Management: Status of School Districts' Planning and Preparedness. May 17, 2007. GAO-07-821T. 25 pp.

U.S. Army Corps of Engineers' Procurement of Pumping Systems for the New Orleans Drainage Canals. May 23, 2007. GAO-07-908R. 48 pp.

Emergency Management Assistance Compact: Enhancing EMAC's Collaborative and Administrative Capacity Should Improve National Disaster Response. June 1, 2007. GAO-07-854. 52 pp.

Avian Influenza: USDA Has Taken Important Steps to Prepare for Outbreaks, but Better Planning Could Improve Response. June 11, 2007. GAO-07-652. 60 pp.

National Flood Insurance Program: Preliminary Views on FEMA's Ability to Ensure Accurate Payments on Hurricane-Damaged Properties. June 12, 2007. GAO-07-991T. 15 pp.

Most School Districts Have Developed Emergency Management Plans, but Would Benefit from Additional Federal Guidance. June 12, 2007. GAO-07-609. 80 pp.

Wildland Fire Management: A Cohesive Strategy and Clear Cost-Containment Goals Are Needed for Federal Agencies to Manage Wildland Fire Activities Effectively. June 19, 2007. GAO-07-1017T. 13 pp.

Influenza Pandemic: Efforts to Forestall Onset Are Under Way; Identifying Countries at Greatest Risk Entails Challenges. June 20, 2007. GAO-07-604. 78 pp.

Hurricane Katrina: EPA's Current and Future Environmental Protection Efforts Could Be Enhanced by Addressing Issues and Challenges Faced on the Gulf Coast. June 25, 2007. GAO-07-651. 102 pp.

Wildland Fire: Management Improvements Could Enhance Federal Agencies' Efforts to Contain the Costs of Fighting Fires. June 26, 2007. GAO-07-922T. 15 pp.

September 11: HHS Needs to Ensure the Availability of Health Screening and Monitoring for All Responders. July 23, 2007. GAO-07-892. 40 pp.

Web Sites of Interest

Planning Ahead
www.govtech.com/em/articles/118808

This article provides tips and useful advice on creating an effective emergency management Web site. Drawing on the results of a study conducted at the American University in Washington, D.C., author Sherry Watkins discusses how to provide user-friendly disaster information and communicate effectively with the public online.

Lessons Learned Information Sharing
www.llis.dhs.gov

This dedicated resource center for the FY07 Homeland Security Grant Program (HSGP) serves as a repository of guidance, forms, templates, and general information on the HSGP's Urban Areas Security Initiative, State Homeland Security, Law Enforcement Terrorism Prevention, Metropolitan Medical Response System, and Citizen Corps Programs. The site also features practices and guidelines from the Enhancing Grants Management Technical Assistance program and contains more than 150 documents.

SPIDER Network
www.spidernetwork.org

The Science and Policy Interfaces for Disaster Reduction (SPIDER) Network is composed of six UK-based academic departments from different universities and promotes the work of new researchers in the disaster field. The network lists a goal of re-examining the role of scientific knowledge for disaster risk reduction.

Personal Disaster Preparedness Guide
www.operationhope.org/pdpg/

Developed by Operation HOPE, this easy-to-use guide allows users to fill in important information, including emergency contacts, phone numbers, necessary medications, and meeting locations. The site then turns that information into a convenient "Personal Disaster Preparedness Guide" to be readily accessed during and after disaster.

First Responders Guide to Satellite Communications
www.sia.org/frg_files/

Produced by the Satellite Industry Association, this guide is a comprehensive overview and tutorial of satellite technology and its role in the response to natural and human-induced disasters. Included in the guide is a glossary of terms, an overview of satellite capabilities, and easy-to-follow steps for using satellite data.

Special Populations: Tips for First Responders
http://cdd.unm.edu/products/tips_web020205.pdf

This document, developed for first responders and emergency professionals by the University of New Mexico Center for Development and Disability, presents easy-to-understand tips on how to assist people with various types of disabilities, including mobility, visual, or hearing impairments; cognitive disabilities; and multiple chemical sensitivities.

Children and Disasters: Preparedness, Response, and Recovery (EIIP transcript)
www.emforum.org/vforum/lc070725.htm

The Emergency Information Infrastructure Partnership (EIIP) hosted a live chat presentation and interactive Q&A session on July 25, 2007, with Dr. Lori Peek of Colorado State University. The topic was post-Katrina research findings on the experience of children and their caregivers in disasters. Dr. Peek's research showed that while children are both vulnerable in disasters and need assistance from adults, they are also resilient and can find ways to effectively cope. Dr. Peek also provided a bibliography, available at www.emforum.org/pub/eiip/KatrinaResearchBibliographyJuly2007.doc.

Hurricane Public Service Announcements
www.bt.cdc.gov/disasters/hurricanes/psa.asp

Nearly 20 public service announcements (PSAs) addressing hurricanes are available as Windows Media Player files from the Centers for Disease Control and Prevention (CDC). These PSAs address topics such as preparing for a storm, staying safe around dogs after a disaster, preventing chain saw injuries, coping with stress, and many others.

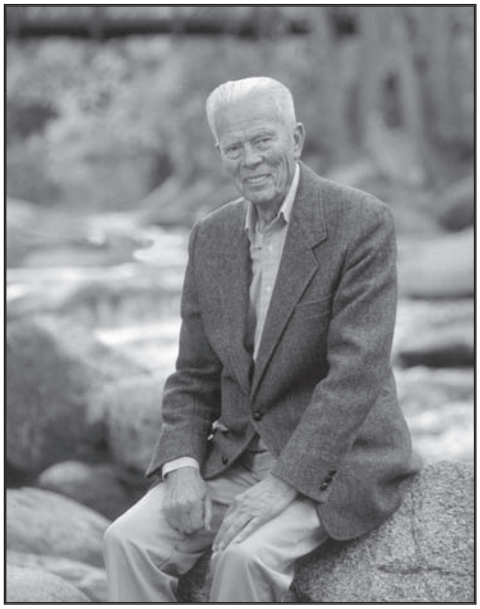
Earth Portal
www.earthportal.org

The Earth Portal, from the National Council for Science and the Environment, offers science-based, expert-reviewed information about the environment. It seeks to bring the global scientific community together to produce "the first free, expert-driven, massively scaleable information resource on the environment, and to "engage civil society in a public dialogue on the role of environmental issues in human affairs."

National Academy of Sciences Gilbert F. White Lecture in the Geographical Sciences
www.colorado.edu/hazards/gfw/NAS_lectures.html

In 2006, the Geographical Sciences Committee of the National Academy of Sciences established the Gilbert F. White lecture series, the aim of which is to examine connections between the geographical sciences and society. Developed with his blessing, it both honors Gilbert and uses his example to encourage and inspire geographers to share their work regarding the connections between science and society. The inaugural lecture was delivered on January 24, 2007, by Gilbert's eminent former student, Robert Kates. The complete text of that lecture, which surveys Gilbert's career as well as the methods, results, and long-term consequences of his work, is provided on this site.

The Gilbert F. White Flood Marker Memorial



As founder of the Natural Hazards Center and Gustafson Distinguished Professor Emeritus of geography at the University of Colorado, Gilbert F. White was widely recognized as a leader in the world environmental movement. Because of his life-long dedication to addressing the problem of flooding, he was known as the "Father of Floodplain Management." Gilbert recognized that flexible human adaptation to flood hazards, such as removing structures from floodways and opening up floodplains, was potentially a more effective approach to flood disaster reduction than rigid "structural" solutions, such as constructing dams and levees.

The Gilbert F. White Memorial Committee was established after Gilbert's death in 2006, at the request of the Boulder City Council and City Manager, to design and implement a memorial to Gilbert. The committee is made up of friends, family, colleagues, and students of Gilbert, as well as City staff. Early on, the committee agreed that Gilbert would have wanted a memorial that had some practical and educational use, so the members decided that a memorial promoting flood hazard education in Boulder would be most appropriate. Below is the resultant plan:

Incorporate a Flood Level Marker in the Memorial

A flood level marker provides viewers with a visual reminder of the powerful force of rushing flood waters. Mary White, an eco-artist and Gilbert's daughter, and Christian Muller, a local artisan who created Boulder's Sister City Plaza, collaborated on the design of the Gilbert White Memorial Flood Marker. The marker is made of sculpted granite and smoothed recycled transparent jade float glass, which was chosen for the top part of the marker because it reflects light and movement, like water. The stone base is an excellent surface for engraved text and also discourages climbing and vandalism. The marker will be very stable, supported by a central metal column and concrete foundation. LED lights, powered by water or solar energy, will illuminate the core of the glass obelisk.

Locate the Memorial near Broadway and Boulder Creek

The memorial location selected by the committee is at the nexus of a major transportation corridor and the major floodway in Boulder. It is also at the apex of the area where the greatest flood damage will occur in Boulder. This high traffic area provides an excellent opportunity to educate large numbers of people. The site will provide a comfortable, contemplative spot, information about Gilbert F. White and flood hazards in Boulder, and quotations from Gilbert. The cost of the memorial is approximately $100,000, including the monument, interpretive signs, landscaping, and seating.

Help Build Gilbert's Memorial!

Your tax-deductible donation to the Gilbert F. White Memorial Flood Marker Fund will build a lasting tribute to Gilbert and will educate thousands about flood risk in Boulder. All donations are fully tax-deductible. Questions? Call Molly Tayer at (303) 499-5444 or Elizabeth Black at (303) 449-7532. Please make your check payable to "Community Foundation, GFW Flood Marker" and mail to The Community Foundation, 1123 Spruce Street, Boulder, CO, 80302. Your generosity is greatly appreciated.

"Hazard always arises from the interplay of social and biological and physical systems; disasters are generated as much or more by human actions as by physical events. The present forms of government intervention in both traditional and industrial societies often exacerbate the social disruptions from extreme events. If we go on with the present public policy emphasis in many regions upon technical and narrow adjustments, society will become still less resilient and still more susceptible to catastrophes like the Sahelian drought."

-Gilbert F. White, 1978

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.

Innovations in Disaster Psychology 2007: Public Health Emergencies—Vermillion, South Dakota: September 6-8, 2007. Organized by the Disaster Mental Health Institute, the objective of this conference is to provide a forum to learn about and discuss the worldwide, intense preparation for the possibility of pandemic flu, the possibility of bioterrorism events, and the HIV/AIDS epidemic. This conference is intended for health and mental health professionals nationally and internationally. The overall objective is for the participants to learn more about how to apply disaster psychology to public health emergencies.

dmhi@usd.edu
www.usd.edu/dmhi/conference.cfm

Western States Seismic Policy Council (WSSPC) and International Code Council (ICC) Annual Conference: Risk Communication, Building Codes, and Consequences: The Future of Earthquake Safety in the U.S.—Reno, Nevada: September 30-October 3, 2007. Scientists and engineers will speak about the National Earthquake Hazards Reduction Program; earthquake provisions in the International Building Code; creating a new generation of effective earthquake safety, preparedness, and mitigation messages; performance-based engineering issues; and earthquake disaster scenarios for major cities in the United States, including San Francisco, Salt Lake City, and Seattle. The conference features a joint WSSPC-ICC education session that is eligible for continuing education credits, several WSSPC technical sessions with panel and audience discussions, and a WSSPC field trip.

wsspc@wsspc.org
www.wsspc.org/conference

Greenhouse 2007—Sydney, Australia: October 2-5, 2007. Organized by the World Climate Research Programme, the International Geosphere–Biosphere Program, and the Global Climate Observing System, this international event is designed for representatives from industry, research organizations, government, and communities. Greenhouse 2007 will present an opportunity for scientists and representatives from industry and all levels of government to learn about the latest findings in climate science and discuss the implications for Australia and the region. The conference will particularly focus on projections for the future, the use of probabilities for risk management, the impact of climate change on human activity, and changing perceptions of climate change. An international workshop examining future climate change research directions beyond the IPCC's Fourth Assessment Report will be held in association with Greenhouse 2007.

info@greenhouse2007.com
www.greenhouse2007.com

Disaster Risk Reduction 2007—Western Cape, South Africa: October 17-18, 2007. The Annual Conference of the Disaster Management Institute of Southern Africa is the largest disaster management conference in Africa and attracts more than 300 delegates. The meeting provides an annual opportunity for a diverse range of stakeholders in disaster risk management from across Africa to gather and share skills, knowledge, and experience. This year's conference is co-hosted by the Eastern Cape Provincial Government: Department of Housing, Local Government, and Traditional Affairs and the Cacadu District Municipality.

karin@disaster.co.za
www.disaster.co.za/conferences.htm

Climate Information: Responding to User Needs—College Park, Maryland: October 22-23, 2007. The theme of this meeting is "Bringing Observations, Data Management, Modeling, and Prediction into the Decision Process." The workshop will foster dialogue between the providers of climate information and its diverse user community to define specific measures needed to enhance the use of climate observations, data management, modeling, and predictions in support of business and policy decisions. Plenary and breakout panel sessions and a peer-reviewed poster session will be included.

csuplee@umd.edu
http://sciencepolicy.colorado.edu/sparc/

United Nations International UN-SPIDER Workshop: Space-based Information and Solutions for Disaster Management and Emergency Response—Bonn, Germany: October 29-31, 2007. The United Nations Office for Outer Space Affairs (UNOOSA), through its new program, the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER), and the German Aerospace Center (DLR) are organizing this workshop to promote the access and use of space-based technologies and solutions for disaster management and emergency response within the relevant communities. Topics will include identification of relevant space-based information for Disaster Management Support and Emergency Response, definition of a Knowledge Portal to ensure that relevant information is easily accessible to all interested end-users, identification of existing and planned Communities of Practice that contribute to bringing together the space-based technology and disaster management communities, and harmonization of the existing initiatives that are contributing to helping developing countries access and use space-based technologies for disaster management and risk reduction.

joerg.szarzynski@dlr.de, georg.magerl@unvienna.org
www.unoosa.org/oosa/en/unspider/index.html

HazMat Explo 2007 Conference and Exposition—Las Vegas, Nevada: November 5-8, 2007. This meeting focuses on strategies for dealing with hazardous materials issues. Through experienced instructors and demonstrations, the conference will feature educational tracks related to first responders, emergency planners, medical personnel, environmental workers, industry personnel, radiological and homeland security workers.

kinetix@hazmatexplo.org
www.hazmatexplo.org

2007 Mid-Atlantic All Hazards Forum (AHF)—Baltimore, Maryland: November 6-8, 2007. This forum is a public-private partnership of mid-Atlantic states and private corporations. It is sponsored by the All Hazards Consortium (AHC), a new 501(c)(3) organization formed by the mid-Atlantic states. This grassroots, first-of-its-kind initiative is a new regional model designed to improve regional preparedness in the broad areas of homeland security and emergency management by facilitating dialogue among state government leadership and increasing interaction between all of AHF's stakeholders:

alves@ejkrause.com
www.allhazardsforum.com

FireRescue Conference & Exposition—Las Vegas, Nevada: November 7-10, 2007. The FireRescue Conference & Exposition has proven to be a vital fire rescue event in the western United States. Produced in partnership with the International Association of Fire Chiefs (IAFC) and sponsored by FireRescue Magazine, it provides leading manufacturers and suppliers of fire-rescue products and services with the opportunity to network with both national and local fire-rescue decision makers. Targeting a diverse audience of fire-rescue professionals, such as company and training officers, firefighters, wildland firefighters, fire chiefs, and federal disaster responders, this event offers an innovative conference program with comprehensive training "academies" and a dynamic show floor with targeted specialty pavilions.

enichols@reedexpo.com
www.firerescueexpo.com

55th IAEM Annual Conference & EMEX 2007—Reno, Nevada: November 11-14, 2007. This annual conference provides a forum for current trends and topics, information about the latest tools and technology in emergency management and homeland security, and advances in International Association of Emergency Managers (IAEM) committee work. Sessions encourage stakeholders at all levels of government, the private sector, public health, and related professions to exchange ideas on collaborating to protect lives and property from disaster.

info@iaem.com
www.iaem.com/events/Annual/intro.htm

2007 Emergency Preparedness Conference—Vancouver, British Columbia: November 21-23, 2007. Sponsor: Pacific Northwest Preparedness Society. This conference supports the evolving disaster management field by inviting speakers from all jurisdictions across Canada and the United States to discuss new ideas, concepts, and technology and to share this knowledge with delegates from the region. This, in turn, provides an opportunity for community emergency practitioners to improve their knowledge and skill level and keep abreast of new and improving technology and concepts of operation.

epconference@vancouver.ca
www.jibc.ca/epconference/

Remembering When: Fire and Fall Prevention for Older Adults—Boston, Massachusetts: December 2-4, 2007. Sponsor: National Fire Protection Association (NFPA). NFPA's Center for High-Risk Outreach is committed to helping communities reduce fire and fall injuries and deaths among older adults. The Remembering When program is centered around 16 key safety messages—eight fire prevention and eight fall prevention—developed by experts and practitioners from national and local safety organizations, as well as through focus group testing in the high fire-risk states of Alaska, Arkansas, and Mississippi, and in Cleveland and Atlanta. To ensure that the program is reaching the most vulnerable of older adults, NFPA will select up to 40 communities to attend the first Remembering When Conference.

sgamache@nfpa.org
www.nfpa.org

Society for Risk Analysis (SRA) 2007 Annual Meeting—San Antonio, Texas: December 9-12, 2007. This annual meeting brings together nearly 1,000 international scientists and practitioners from a wide range of disciplines who share an interest in risk analysis. Representing academia, government, industry, NGOs, private firms, and themselves, SRA members recognize the value of diverse perspectives and a shared commitment to high quality risk analysis methodology and practice. This year's meeting will include several plenary sessions focused on the theme of Risk 007: Agents of Analysis. It will also include technical sessions in the form of oral presentations, posters, and poster-platforms.

sra@burkinc.com
www.sra.org/events_2007_meeting.php

8th National Conference on Science, Policy, and the Environment: Climate Change: Science and Solutions—Washington, DC: January 16-18, 2008. Organizer: National Council for Science and the Environment. This interactive conference focuses on developing and advancing science-based solutions to climate change. Approaches to climate stabilization, minimization, mitigation, and adaptation will be explored. Workshops, breakout sessions, and symposia will provide opportunities for institutions, organizations, and individuals to contribute ideas and innovations, visionary concepts, successful models and prototypes, and pragmatic recommendations on moving forward on solutions to climate change.

conference2008@ncseonline.org
www.ncseonline.org/2008conference/

88th American Meteorological Society (AMS) Annual Meeting—New Orleans, Louisiana: January 20-24, 2007. The broad theme of the 2008 meeting is "Enhancing the Connectivity between Research and Applications for the Benefit of Society." This is an important topic that will shape weather, ocean, climate, and environmental enterprise for many years to come. A Presidential Forum will consist of diverse presentations from the broad weather and climate enterprise on "Hurricanes—Research Priorities, Improving Forecasts, and Effective Response," surrounded by a two-day special session on hurricanes, climate, and policy, with emphasis on Hurricane Katrina as a case study. In addition to the annual showcase of outstanding exhibits, events, conferences, and symposia, this year's meeting will include a number of new and unique sessions, such as joint sessions between selectively grouped AMS scientific and technological conferences to identify societal impacts of their important work, an Educational Forum on Data Assimilation, special symposium on hurricanes, THORPEX symposium, GOES Users Conference, and First Colloquium on Industrial Meteorology and Certified Consulting Meteorologists.

amsinfo@ametsoc.org
www.ametsoc.org/meet/annual/

Earthquake Engineering Research Institute (EERI) Annual Meeting—New Orleans, Louisiana: February 6-9, 2008. The objective of EERI is to reduce earthquake risk by advancing the science and practice of earthquake engineering; improving understanding of the impact of earthquakes on the physical, social, economic, political, and cultural environment; and advocating comprehensive and realistic measures for reducing the harmful effects of earthquakes. EERI fulfills this role by fostering a sense of shared commitment among the diverse communities dedicated to earthquake risk management, promoting research, facilitating the exchange of information among members and others, and forging a consensus and speaking with a common voice to public forums and legislative bodies on behalf of the diverse risk management community. The EERI annual meeting addresses all of these goals. The format consists of a session dedicated to the discussion of the business affairs and a group of technical programs consisting of submitted and invited presentations on the various phases of earthquake engineering.

eeri@eeri.org
www.eeri.org/news/meetings.html

7th Annual New Partners for Smart Growth Conference: Building Safe, Healthy and Livable Communities—Washington, DC: February 7-9, 2008. Organizer: Local Government Commission. This conference draws a multidisciplinary audience of local elected officials, city and county staff, landscape architects, developers and builders, planners, transportation professionals and traffic engineers, public health professionals, and others committed to building safer, healthier, and more livable communities. The 2008 program will include a dynamic mix of plenaries, interactive breakouts, implementation workshops, specialized trainings, and optional tours of local model projects. It will also feature the latest on cutting-edge smart growth issues, implementation tools and strategies, best practices, interactive learning experiences, new partners, new projects, and new policies, as well as tours of local model projects and case studies in the DC area.

mkwarren@lgc.org
www.newpartners.org

Environmental Connection 2008—Orlando, Florida: February 18-21, 2008. Organizer: International Erosion Control Association. Billed as the world's largest soil and water event, this conference has served as the gathering place for the erosion and sediment control community for over 30 years. Over 2,500 professionals attended last year's conference in Reno, Nevada. The event combines full-day training courses, technical sessions (case studies, technical papers, forums, workshops, and poster presentations), and more than 165 vendors.

events@ieca.org
www.ieca.org/conference/annual/

Emergency Preparedness for Industry and Commerce Council (EPICC) Forum 2008—Richmond, British Columbia: February 25-27, 2008. This annual forum features presentations and workshops that provide information on how organizations can materially improve their chances of surviving a disaster. The theme of EPICC Forum 2008 is "Continuity of Business is Everybody's Business."

epicforum@venuewest.com
www.epiccforum.org

69th American Society for Public Administration (ASPA) National Conference—Dallas, Texas: March 7-11, 2008. Since 1939, the ASPA has been the nation's most respected society representing all forums in the public service arena. It subscribes to the belief that by embracing new ideas, addressing key public service issues, and promoting change at both the local and international levels, quality of lives can be enhanced worldwide. The 2008 conference theme is "Transformational Public Administration: A Call for Public Service."

info@aspanet.org
www.aspanet.org

GeoCongress 2008: The Challenge of Sustainability in the Geoenvironment—New Orleans, Louisiana: March 9-12, 2008. Organizer: Geo-Institute of the American Society of Civil Engineers (ASCE). This conference focuses on the role of geoengineers and geoscientists in protecting and preserving the environment and highlights the expansive and interdisciplinary nature of geoenvironmental issues. Practitioners, consultants, regulators, policymakers, researchers, educators, and students will have numerous opportunities to learn about innovative and emerging scientific advances and technologies that are needed to address a wide range of geoenvironmental issues. Topics will include sustainability, geohazard mitigation, waste management, and site assessment and remediation.

conferences@asce.org
http://content.asce.org/conferences/geocongress2008/

EMS Today Conference and Exposition—Baltimore, Maryland: March 25-29, 2008. EMS Today Conference and Expo 2008 will return to Baltimore, Maryland, to celebrate its 25th anniversary. As a leader in prehospital care education, EMS Today prides itself on bringing together the best national speakers with powerful, relevant topics and discussions, focused session tracks and an interactive exhibit hall. The 2008 meeting will include commemorative 25th anniversary events, powerful keynote addresses, and many networking opportunities.

inquiry@emstodayexpo.com
www.emstodayexpo.com

Partners in Emergency Preparedness Conference—Tacoma, Washington: April 1-2, 2008. This conference has grown into the largest emergency management conference in the Pacific Northwest, bringing together nonprofit organizations, public agencies, business and industry, military, healthcare, and schools to explore emergency management issues, principles, and practices. The theme for the 2008 conference is "It's a Different World: Looking to the Future."

PartnersCurriculum@gmail.com
http://capps.wsu.edu/conferences/emergencyprep/

National Earthquake Conference—Seattle, Washington: April 22-26, 2008. Organized by the Federal Emergency Management Agency (FEMA), U.S. Geological Survey (USGS), National Institute of Standards and Technology (NIST), and the National Science Foundation (NSF), this broad, multidisciplinary conference has five goals: (1) to develop a shared understanding of scientific, engineering, and social research; (2) to exchange ideas about tools for earthquake hazard and risk reduction; (3) to showcase successful programs; (4) to learn from past disasters; and (5) to build resiliency. The 2008 conference theme is "Understanding Earthquakes: From Research to Resilience."

bfreitag@mindspring.com
www.earthquakeconference.org

Call for Papers:

2008 International Geological Congress Outreach Session

The 33rd International Geological Congress (IGC), to be held in Oslo, Norway, on August 6-14, 2008, will convene a special session on education and outreach titled "Community Service by Geoscientists: Think Globally, Act Locally."

Educational outreach programs have become an integral and effective part of the geosciences, and many research projects have produced the tools and data required for a safer world and a sustainable environment. However, by aiming high at global problems, many scientists have forgotten what is perhaps the most effective venue for applying their expertise—our own communities. Effective communication at the community level requires geoscientists to adapt their traditional methods of communicating scientific results to user needs. Scientists also need to understand the structure and decision-making processes at work within their communities if their scientific results are to effectively influence policy decisions.

This symposium invites presentations by speakers who have transmitted the excitement and utility of the geosciences to the residents of their communities through service and education. Abstracts must be submitted by February 1, 2008. For more information, contact Grant Heiken at heiken@whidbey.com, or David Liverman at dliverman@gov.nl.ca. Details about the 33rd International Geological Congress, including links to the Scientific Program and daily schedule, are available at www.33igc.org.

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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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Support the Natural Hazards Center

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*
2. **Build the Center Endowment**—Leave a charitable legacy for future generations
3. **Help the Gilbert F. White Endowed Graduate Research Fellowship in Hazards Mitigation**—Ensure that mitigation remains a central concern of academic scholarship
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 Diane Smith at diane.smith@colorado.edu or (303) 492-6818 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 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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Send information of potential interest to the Center or to *Observer* readers to the Natural Hazards Center, University of Colorado at Boulder, 482 UCB, Boulder, CO 80309-0482; (303) 492-6818, (303) 492-2151 (fax); hazctr@colorado.edu. The deadline for the next *Observer* is **September 26, 2007**.

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