Natural Hazards Observer

NATURAL HAZARDS CENTER

Volume XXXII · Number 2 November 2007

Social Vulnerability and Capacity

– an invited comment

Increasingly, emergency managers are tasked with identifying vulnerable groups in their communities in order to target help and resources where they are most needed and to reduce major losses. So, who are the vulnerable groups, and what does it mean to be labeled 'vulnerable'? This article explores the need to recognize complex social relations in disaster risk reduction and response and the necessity to go beyond this potentially disempowering notion to acknowledge and develop people's co-existing capacities.

The priority for emergency managers is saving lives and reducing impacts to people and property. Adding the requirement to meet complex social needs to the obligation of saving lives and property has often been regarded as a luxury that diverts attention away from meeting the needs of victims. Gender and disaster researchers have identified this as the 'tyranny of the urgent' in the context of disaster response. It is not uncommon to hear: "Please don't raise gender now—we're in an emergency!" However, failing to recognize the diversity of needs and conditions may also lead to an ineffective response. For example, making the assumption that earthquake relief aid delivered in a public setting in Pakistan by male relief workers would necessarily reach widows and female heads of household is to misunderstand the cultural context that prohibits or discourages females from going out in public unaccompanied by male family members. After the earthquake, many women and girls failed to receive much-needed aid, or they suffered violence when transgressing village and tribal norms of honorable behavior. Similarly, in Hurricane Katrina, an evacuation call assumed erroneously that all victims had access to private transport, when in reality many people without vehicles were unable to escape and were left stranded on rooftops—or worse—during the ensuing floods.

Researchers have incorporated awareness of such factors into an analysis of the root causes of differential disaster susceptibility, known as the vulnerability paradigm or approach. This approach has informed, if not totally superseded, previously dominant approaches that

focused almost exclusively on the hazard trigger and/or individual psychology and behavior. Nevertheless, it remains a challenge to turn, what is for some, a highly abstract idea into concrete actions on the ground. Engaging with vulnerable groups can suggest difficult and problematic areas of identification and operation. Such groups are also termed 'difficult to reach', although much of the difficulty disappears if diversity and inclusiveness are recognized as the norm and not the exception. Diversity means strength and resilience, but too often it is treated as a 'problem'.

While a vulnerability approach is now more widely incorporated into emergency managers' policies, plans, and practices, there is no universally agreed-upon definition. Indeed, in her book *Components of Risk: A Comparative Glossary*, Katharina Thywissen provides 36 different examples of the use of the term *vulnerability* in disaster contexts. As commonly used by emergency managers, the term frequently carries an implied definition as fixed, immutable, and associated with external hazard events, rather than dynamic, open to challenge and change, and generated by structural inequalities in societies.

So, who is vulnerable to disasters? An internet search on this question quickly reveals the following groups:

- women
- indigenous peoples
- businesses
- children
- elderly people
- small island developing states
- disabled people
- poor and disempowered communities

Researchers and practitioners have developed more sophisticated and extensive lists—John Handmer has even suggested that, as mortals, we are all vulnerable—but certain groups commonly top most checklists. These groups include the elderly, children, the poor, and women. However, applying the label 'vulnerable' to broad social groupings can be misleading. Eric Klinenberg's study of the 1995 Chicago heat wave disputed the supposition that elderly women might be expected to be the main victims when he showed that elderly men were twice as likely to die. In this case, elderly women revealed greater resilience through continued links with the social networks that men had lost. This suggests that we must make a context-specific analysis before assigning groups the potentially stigmatizing label of 'vulnerable'. Furthermore, vulnerability must always be counterbalanced with capacity. People are never just vulnerable; they always have capacities to varying degrees.

Too often, emergency management fails women and girls when it represents them as helpless, needy, and passive. This portrayal places them at greater risk by denying them the opportunities to contribute to protection of themselves, their communities, and their households. Often, they are simply invisible while emergency management goes on around them.

Men face their own socially constructed roles and expectations, which may also place them at risk. Men and boys, irrespective of their individual characters and abilities, are expected to be risk-takers. Additionally, their emotional needs often go unmet. However, men do not face the same barriers and inequalities that many women do simply because they are women.

Understanding communities at risk should not end with the compilation (by external agencies) of a checklist. It is the communities themselves that generally know best who is most vulnerable and where the capacities are. Facilitating the sharing of community knowledge and the creation of hazard and vulnerability assessments is at least as important as stockpiling relief goods and planning evacuation routes; yet, it is far less frequently carried out. How many training programs or exercises focus on understanding the social dynamics of community engagement in hazardous locations? Emergency managers need support to develop the skills to help build truly community-wide risk reduction.

In my research focusing on issues related to gender and children in disasters, I visited many low-income communities in El Salvador in collaboration with Plan International. The research illustrates how people can sit within the vulnerable category but simultaneously demonstrate many capacities and much resilience. Plan International has been actively supporting low-income communities in El Salvador by providing training in disaster preparedness and community organizing. While Plan International's work is focused on children, it does this through a community-wide development approach. In visits to many communities previously hit by disasters such as earthquakes, landslides, storms, and floods, I found women and girls who were not just vulnerable victims, but also active managers and organizers.

Older women and young girls, although representative of those who are frequently vulnerable in disasters, benefited from training and found that they could make a positive contribution. In Hurricane Stan (2005), young people (girls and boys) worked together to run shelters. During training programs, older women and men in the community found a new sense of purpose, self-respect, and value.

The research identified women and girls whose self-esteem, confidence, and agency had been developed significantly, even though they remained relatively poor and uneducated by developed country standards. Thus, although for many reasons they remain vulnerable to disasters, women and girls can also be agents of their own rescue if their capacities are similarly recognized and acted upon.

Community-based vulnerability approaches have gone beyond the notion of external agents delivering aid to an undifferentiated population or locality at risk. They have provided conceptual frameworks for working with everyone affected by a hazard or disaster, and they have alerted disaster managers to those with special needs. The vulnerability approach has moved beyond a simple checklist of the helpless and the problematic towards a capacities and vulnerabilities approach. This enables groups formerly stigmatized as dependent to claim the protection against hazard and risk that should be available to all. Much of the thinking and the practical examples that

generated this work have come from developing countries and may not be immediately familiar to, or even acceptable to, emergency managers from highly developed and urbanized countries. However, the range of tools is wide and easily adapted to other cultural contexts once the basic principles of partnership and capacity building have been established.

We already have good models, tools, and examples of socially balanced partnerships to reduce social vulnerability through all stages of the disaster cycle. We still need to ensure that these models and tools are mainstreamed into training and professional cultures so that they become automatic in the future. Emergency managers must know their communities and work to support—not replace—them. In any emergency, it is local people who tend to respond first; the capacities and vulnerabilities approach helps build community capabilities to develop the tools and practices to support themselves. Effective disaster risk reduction is socially inclusive, grounded in the community at risk, and built on partnerships that recognize the needs and contributions of all.

Maureen Fordham (maureen.fordham@northumbria.ac.uk)
Programme Leader, MSc Disaster Management and Sustainable Development
Associate Director, Disaster and Development Centre
Northumbria University, Newcastle upon Tyne, UK

References

1. Fordham, M. 2007. "We can make things better for each other": Women and girls organize to reduce disasters in Central America. (Working paper). In *Women, Gender, and Disaster: Global Issues and Initiatives*. E. Enarson and C. Dhar (eds). Sage Publications.
2. Handmer, J. 2003. "We Are All Vulnerable." Radix (Radical Interpretations of Disaster). www.radixonline.org/resources/vulmeeting-pbmelbourne11.doc.
3. Klinenberg, E. 2002. Heat Wave: A Social Autopsy of Disaster in Chicago. Chicago: University of Chicago Press.
4. Thywissen, K. 2006. Components of Risk: A Comparative Glossary. United Nations University, Institute of Environment and Human Security. www.ehs.unu.edu/file.php?id=118.

Web Resources

Plan International
www.plan-international.org

ProVention Consortium
www.proventionconsortium.org

Gender and Disaster Sourcebook
www.gdnonline.org/sourcebook

Call for PERISHIP Applications

The Natural Hazards Center and the Public Entity Risk Institute (PERI), in partnership with the National Science Foundation and Swiss Re, are seeking applications for the National PERISHIP Fellowship Program, which will award dissertation fellowships for work related to natural and human-made hazards, risk, and disasters. The deadline for applications has been extended to February 1, 2008.

The PERISHIP program is intended to foster the advancement of knowledge in the interdisciplinary hazards field, which relies on scholars committed simultaneously to their own disciplines and to the more practical, applied aspects of the field.

Up to six grants of up to $10,000 each will be awarded to doctoral students to support their dissertation work in any relevant field of the natural and physical sciences, social and behavioral sciences, specialties in engineering, or interdisciplinary programs such as environmental studies. The grants are flexible and can be used for data collection, travel for field work, or for presentation of findings at meetings, purchase of software, data entry assistance, statistical analysis services, or a combination of these or other similar purposes (but, not for stipends or tuition). Applications should be sent to periship@riskinstitute.org. Hard-copy applications will not be accepted. Awards will be announced in May 2008. For complete information, go to www.cudenver.edu/periship/.

Call for Poster Abstracts

The 2008 Earthquake Engineering Research Institute (EERI) Annual Meeting will be held on February 6-9, 2008, in the French Quarter of New Orleans, Louisiana. 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.

Individuals interested in participating in one of the Annual Meeting poster sessions are invited to submit abstracts to the organizing committee. The abstracts for accepted poster presentations will be included in the Annual Meeting notebook and must be submitted in final form.

All abstracts should be prepared with one-inch margins on all sides and single-spaced in 11-point Times Roman or equivalent font. Text should be flush left. The title of the poster presentation should be in upper case letters and centered at the top of the page. Presenters should be identified by name, title, and organizational affiliation.

Abstracts should not exceed two pages in length. They should be submitted via email by December 1, 2007, to Juliane Lane at juliane@eeri.org. Presenters will be notified in early January of their acceptance.

Mutual Aid and State Plans are Key to Effective Emergency Management

– an invited comment

Recent events, including the May 4, 2007, tornado that devastated much of Greensburg, Kansas, have renewed concerns by some in the emergency management community that deployments of National Guard personnel and equipment overseas may hinder their ability to respond to large-scale disasters. Without question, National Guard personnel and their helicopters, trucks, and other assets are valuable resources in supporting many key emergency response activities, including firefighting, evacuations, mass care and sheltering, communications, traffic control, and hazardous materials spills.

Fortunately, the National Guard is just one of many tools available to emergency managers to carry out response activities. As emergency managers continue to prepare to meet the challenges of future emergencies, it is important that they consider all the options at their disposal that enable them to effectively respond and recover from large-scale emergencies.

In California, one key element of the emergency management toolkit is the Emergency Services Act (ESA). This legislation provides the general framework for the state's emergency response system and outlines the emergency powers of the governor, including the ability to proclaim a state of emergency and commandeer private property, if necessary. It also outlines the authorities and responsibilities of the Governor's Office of Emergency Services (OES) and other state agencies, and the ability of cities and counties to form local disaster councils and develop local emergency plans that are consistent with the State Emergency Plan.

Another key component of California's emergency toolkit is the State Emergency Plan, which sets forth the policies, concepts, and protocols for implementing the Standardized Emergency Management System (SEMS). Fundamental to a successful emergency response is the recognition that all emergencies begin as local events and

that local agencies are best positioned to meet the immediate needs of those living in their community. With this in mind, what would happen if a disaster overwhelmed the assets of a local jurisdiction?

More than 50 years ago, California's leaders realized that it is impossible for every city or county to have all the resources necessary for responding to every conceivable emergency, so they established the state's mutual aid system. Two things are critical to the success of this neighbor-helping-neighbor system, which allows local responding agencies to obtain additional resources they need as quickly as possible: (1) the participation of agencies from all 58 counties in California, and (2) having a clearly defined system in place for requesting and obtaining mutual aid.

Time and time again, this mutual aid system has proven its value, such as during the 1993 and 2003 firestorms in Southern California when more than 1,000 fire engines from 56 of California's 58 counties were deployed to support the firefighting efforts.

Role of State Primarily One of Support

In California, the state's primary role is to support the efforts of city and county resources, except when a state agency has a specific statutory responsibility. For example, the California Department of Transportation (CalTrans) is responsible for maintaining the state's highway system. After earthquakes, fires, floods, and other emergencies, CalTrans crews automatically check state bridges, overpasses, and roads to ensure their integrity and take appropriate action. The primary responsibility of CAL FIRE, formerly known as the California Department of Forestry and Fire Protection (CDF), is to provide fire protection and suppression services on state lands.

As Governor Schwarzenegger's Director of Emergency Services, I am fortunate to have the delegated authority to "task" state agencies to provide their services in missions outside their normal areas of responsibility when lives, property, and the environment are at risk. My capacity to utilize the combined forces of all state agencies ensures our ability to effectively respond to disaster without taxing any single state agency.

Learning from the Past

During the past four decades, California has experienced numerous large-scale disasters, including 55 events that qualified for major disaster declarations. After each major disaster, emergency managers evaluated their response efforts to determine what went well and what needs improvement. These after-action reports provide valuable information to help us refine our systems and improve future response efforts.

One of the lessons learned as a result of the 1989 San Francisco Bay Area Loma Prieta earthquake was the need for specialized personnel to conduct search and rescue operations in an urban setting. Based on a concept developed by OES, the National Urban Search & Rescue program was developed. Since then, task forces from California and many other states have been deployed to several major emergencies.

Likewise, after the East (San Francisco) Bay Hills fire in 1991, the need for a standardized emergency management system for responders throughout California was apparent. To enhance coordination among fire, law enforcement, public works, and other responding agencies at all levels of government in California, we adopted and implemented SEMS.

> "The combination of SEMS and the emergency powers specifically granted to leaders at each level of government in California clearly provides us with 'someone in charge' at every level of response."

SEMS is based on several sound emergency management concepts. It has proven to be an effective tool in efforts to implement a coordinated response to natural, technological, and human-caused emergencies. The concepts that form the foundation of SEMS include the Incident Command System (ICS), the Multi-Agency Coordination system (MACs), management of incidents by objective, and common terminology. It is no coincidence that this system was used as a model for the new National Incident Management System (NIMS).

The combination of SEMS and the emergency powers specifically granted to leaders at each level of government in California clearly provides us with "someone in charge" at every level of response. Leadership begins with the incident commander at the scene and continues up to the governor's office.

Tapping the Resources of the Private Sector

Even with the significant resources available through this mutual aid system, California's leaders recognize that government agencies will not be able to respond alone in a truly catastrophic event. The private sector will be an integral part of our emergency response effort and will operate alongside local and state government officials to help respond and rebuild. Under the direction of Governor Schwarzenegger, we have been strengthening our relationship with the private sector.

In April, I was joined by representatives of key state agencies, including Secretary of State and Consumer Services Rosario Marin, and more than 100 individuals representing private-sector business associations and non-profit organizations for the inaugural meeting of the state's new Emergency Partnership Advisory Workgroup (EPAW).

Major goals of the Workgroup include sharing best practices and incorporating these activities into existing efforts where possible, rather than inventing new systems; engaging the private sector as a full partner; and ensuring comprehensive coordination during all four phases of emergency management.

In addition, we are working closely with the Cali-

fornia Public Utilities Commission and the office of Lt. Governor John Garamendi to bring telecommunications industry leaders together to discuss the establishment of a wireless statewide alert and warning system based on cellular technology. These efforts, I believe, will further enhance our response capability.

Putting Everything into Place

There is no doubt that the men and women who serve in the National Guard play a key role in emergency response here in California and throughout the nation. As we continue to face the challenges posed by natural disasters, we are also confronted with the ongoing challenge of combating terrorism, which ultimately impacts the availability of National Guard resources.

Although our states will never be able to replace all the resources available through the National Guard, tools such as a state plan that serves as a model for local jurisdictions; a mutual aid system that includes the participation of city, county, and state agencies; and a standardized emergency response system are helping California maintain a state of preparedness for future emergencies.

More than five decades ago, California's leaders set the stage for the state's rise to its current position among the nation's leaders in emergency response and management by laying a foundation that remains strong and effective today.

Henry R. Renteria (henry.renteria@oes.ca.gov)
Director, California Governor's Office of Emergency Services

Arctic Warming Opens the Famed Northwest Passage

The Northwest Passage, a long-sought shortcut between Europe and Asia that eluded early explorers, has opened up due to melting Arctic sea ice. As of September 14, 2007, sea ice extent had shrunk to its lowest level since satellite measurements began nearly 30 years ago. Arctic sea ice naturally extends its surface coverage each northern winter and recedes each northern summer, but the rate of overall loss since 1978 when satellite records began has accelerated dramatically. Researchers at the National Snow and Ice Data Center at the University of Colorado at Boulder, said the new minimum extent was lower by about 1 million square miles—an area about the size of Alaska and Texas combined, or 10 United Kingdoms.

The most direct route of the Northwest Passage across northern Canada is now fully navigable, while the Northeast Passage along the Siberian coast remains only partially blocked. The previous record low was in 2005 when the Arctic area covered by sea ice was just 4 million square kilometers. Even then, the most direct Northwest Passage did not fully open. According to the United Nations' Intergovernmental Panel on Climate Change, the polar regions are highly vulnerable to rising temperatures, and the Arctic will likely be virtually ice free by the summer of 2070. Other scientists predict it could become ice free as early as 2040 due to rising temperatures and sea ice decline. To read the full press release on the new Arctic sea ice minimum, visit **www.colorado.edu/news/releases/2007/362.html**.

Natural Hazards Center Welcomes New Staff

This fall, the Natural Hazards Center welcomed a new visiting scholar and a research associate...

RoseMarie Perez Foster is a research and clinical psychologist who is a visiting scholar with the Institute of Behavioral Science's Environment and Society program and the Natural Hazards Center. Her previous appointments at the New York University School of Social Work and New York University (NYU) School of Medicine, Department of Psychiatry, focused on immigrant mental health and the interface between pre-migration traumatic exposures and host country adjustment. Her current investigation of Chernobyl disaster survivors from the former Soviet Union explores the impact of long-term post disaster psychological sequelae. RoseMarie received her PhD in psychology from St. John's University and post-doctoral training at NYU. She is on the international roster of Fulbright senior specialists in mental health and a recipient of the Frantz Fanon Award for contributions to the immigrant mental health and racial issues literature.

Liesel A. Ritchie holds joint appointments with the University of Colorado's Natural Hazards Center and the Evaluation Center at Western Michigan University. She has served as Principal Investigator or senior researcher on more than 50 projects since 1996. Her dissertation on social impacts of the 1989 Exxon Valdez oil spill was the first study to examine the relationship between technological disasters and social capital. In 2005, she spearheaded efforts to establish an American Evaluation Association topical interest group on Disaster and Emergency Management Evaluation and is currently chair of that group. Liesel is currently studying tsunami awareness and preparedness in Alaska through a National Science Foundation grant. She recently led a study of three New Orleans communities hit by tornadoes in February 2007, and she has also been involved with evaluation of long-term recovery organization responses to disasters, as well as studies of social impacts of Hurricane Katrina. She will be working on the Bay Area Disaster Preparedness Initiative project at the Natural Hazards Center.

...and two new graduate research assistants

Brandi Gilbert is a PhD student in the Department of Sociology at the University of Colorado. She graduated from the University of Delaware with a bachelor's degree in elementary education and a minor in Spanish studies. She is currently working on the Bay Area Disaster Preparedness Initiative project at the Natural Hazards Center. Her research interests are the role of educational, community, and religious organizations in disaster preparedness and recovery initiatives.

Alexandra (Ali) Jordan is a graduate student in the Department of Sociology's PhD program. She earned her bachelor's degree in political science, with an emphasis on terrorism and genocide, at the University of Southern California. Before coming to the University of Colorado, Ali worked for the U.S. Senate Sergeant at Arms Office of Security and Emergency Preparedness as a government contractor. She is currently working on the Consortium for the Study of Terrorism and Response to Terrorism (START) project at the Natural Hazards Center. She is also interested in perceptions of risk, community resilience, terrorism, and using GIS as a tool for analysis in disaster research.

Call for Session Ideas: 2008 Hazards Research and Applications Workshop

The Natural Hazards Center invites proposals for session topics for the 2008 Annual Hazards Research and Applications Workshop, to be held at the Omni Interlocken Resort near Boulder, Colorado, on July 12-15. Proposed session topics will provide guidance to the Center as it plans and prepares next year's program. Session ideas may be modified, combined, or otherwise altered by the Center, and submission of a topic does not guarantee inclusion in the program.

The annual workshop is designed to bring members of the research and applications communities together for face-to-face networking and discussion of cutting-edge issues related to hazards and disasters and society's efforts to deal with them. It provides a dynamic, provocative, and challenging forum for the diverse opinions and perspectives of the hazards community.

To submit a session idea, go to **www.colorado.edu/hazards/workshop/current.html**. Session topics must be submitted by November 16, 2007, to be considered.

Washington Update

HHS Announces $75 Million in Supplemental Funding to States for Pandemic Flu Preparedness

The Department of Health and Human Services (HHS) has announced the availability of another $75 million to states, territories, and metropolitan areas to help strengthen their capacity to respond to a pandemic influenza outbreak. The supplemental funding will be used to establish or enhance stockpiles of critical medical equipment and supplies; continue development of plans for maintenance, distribution, and sharing of those resources; plan for and develop pandemic alternate care sites; and conduct medical surge exercises. The one-time pandemic influenza response planning grants will supplement the $430 million announced by HHS on June 28, 2007, to strengthen the ability of hospitals and other health care facilities to respond to bioterrorism attacks, infectious diseases, and natural disasters that have the potential to cause mass casualties. More information on state and local funding allocations is available at **www.pandemicflu.gov/news/allocation.html**.

FEMA Funds Relocation of Residents Displaced by Katrina and Rita

The Federal Emergency Management Agency (FEMA) announced a reimbursement program that will provide relocation assistance to disaster victims displaced by Hurricanes Katrina and Rita. The damage and destruction caused by the hurricanes resulted in temporary relocation of many of Louisiana's residents to various locations within and outside the state of Louisiana. To be eligible for the program, applicants must have been displaced from their primary residence in a disaster-declared area as a result of Hurricanes Katrina and Rita and have incurred, or will incur, relocation travel expenses within the defined period. To view the full FEMA press release, visit **www.fema.gov/news/newsrelease.fema?id=39210**.

DHS Releases National Preparedness Guidelines

The U.S. Department of Homeland Security (DHS) announced publication of two important tools to organize and synchronize national efforts to strengthen preparedness: (1) the National Preparedness Guidelines, which establish a vision for national preparedness and provide a systematic approach for prioritizing preparedness efforts across the nation; and (2) the Target Capabilities List, which describes the collective national capabilities required to prevent, protect against, respond to, and recover from terrorist attacks, major disasters, and other emergencies. DHS Secretary Michael Chertoff said the documents will help focus policy, planning, and investments at all levels of government and the private sector in order to strengthen collective capabilities and better prepare for major incidents. Publication of the Guidelines and Target Capabilities List fulfills a major component of Homeland Security Presidential Directive 8, "National Preparedness," and establishes a framework for understanding what it means for the nation to be prepared for all hazards. Developed through an extensive process that involved more than 1,500 federal, state, and local officials and more than 120 national associations, the Guidelines replace the Interim National Preparedness Goal issued on March 31, 2005. They also integrate lessons learned following Hurricane Katrina and a 2006 review of states' and major cities' emergency operations and evacuation plans. To access the National Preparedness Guidelines, visit **www.dhs.gov/xlibrary/assets/National_Preparedness_Guidelines.pdf**.

President Bush Signs 9/11 Recommendations

On August 3, 2007, President Bush signed the "Implementing Recommendations of the 9/11 Commission Act of 2007" Act (Public Law 110-053). The law authorizes more than $4 billion over four years for rail, transit, and bus security; gives protections for employees of railroad, trucking, public transit, bus, and other land transportation providers; strengthens the Public Interest Declassification Board; and requires the president and Congress to disclose total spending requested and approved for the intelligence community. Title IX of the bill, which addresses private sector preparedness, says the Department of Homeland Security (DHS) "in consultation with the private sector, may develop guidance or recommendations and identify best practices to assist or foster action by the private sector" in identifying, preparing for, and recovering from various risks. The bill also says DHS "shall establish and implement" a voluntary private sector preparedness and certification program. DHS is directed to begin, no later than 210 days after enactment, developing voluntary preparedness standards "through appropriate organizations that coordinate or

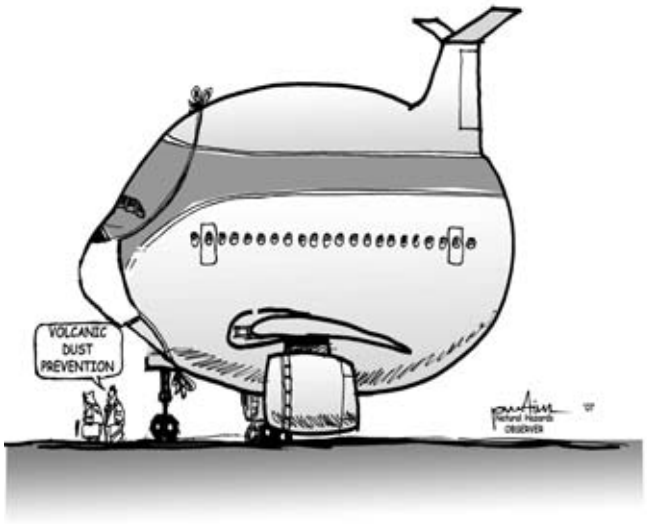
facilitate the development and use of voluntary consensus standards." In addition, the department is to develop a program to certify compliance with those standards, in cooperation with representatives of organizations involved in standard setting, state and local governments, and appropriate private sector advisory groups. Title X of the law mandates that DHS will establish and maintain a prioritized national database of critical infrastructure assets to help the department develop and implement its programs. DHS is also to report to Congress annually on the risks and preparedness of specific infrastructure sectors. To access the full document, visit **http://thomas.loc.gov/bss/d110/d110laws.html**.

NASA Partners with U.S. Forest Service on Wildfire Imaging Mission

In August and September 2007, NASA and the U.S. Forest Service tested a remotely piloted, unmanned aircraft to demonstrate the system's usefulness in improving wildfire imaging and mapping capabilities. The first flight of the series, which took place on August 16, captured images of California wildfires, including the Zaca Fire in Santa Barbara County. The aircraft carried instruments that collected data while flying more than 1,200 miles during a 10-hour period. NASA's Ikhana, a Predator B remotely piloted aircraft adapted for civil missions, collects detailed thermal-infrared imagery of wildfires and is demonstrating the ability of unmanned aircraft systems to collect data continuously for 12 to 24 hours. A satellite data link allows real-time transfer of fire imagery to any location on Earth. The Autonomous Modular Scanner sensor onboard the Ikhana aircraft is configured to observe fires and other high-temperature sources and can detect temperature differences from less than one-half degree to approximately 1,000 degrees Fahrenheit—temperature discrimination capabilities that are important to improving fire mapping. NASA Dryden Flight Research Center obtained a Certificate of Authorization from the Federal Aviation Administration (FAA) to allow an unmanned aircraft to fly wildfire-sensing missions in the national air space of the western United States. Pilots from NASA and Ikhana manufacturer General Atomics Aeronautical Systems, Inc., operate the aircraft from a ground control station at Dryden, located at Edwards Air Force Base in California. To access photos and illustrations supporting the wildfire imaging mission, visit **www.nasa.gov/centers/dryden/news/newsphotos/index.html**.

New Federal Plan to Protect Air Passengers from Volcanic Ash

The United States has 169 active and dormant volcanoes, many of which are capable of erupting explosively and ejecting volcanic ash high into busy air traffic routes. Volcanic ash can cause aircraft engines to fail and can damage navigational instruments. When a volcanic hazard looms, coordinated information-sharing among scientists, air traffic controllers, dispatchers, and pilots can make a crucial difference in saving lives and protecting property. Federal agencies involved with aviation, volcanoes, and weather have now created a new way to work together to track volcanic ash plumes and report the risks to the aviation community to keep air travelers out of harm's way. The plan, called *National Volcanic Ash Operations Plan for Aviation*, will help forecasters detect and track hazardous ash clouds and adequately warn the aviation community on the present and future location of the cloud. The plan defines agency responsibilities and provides a comprehensive description of an interagency standard for volcanic ash-related observations, advisories, warnings, notices, and forecasts. It also describes the agency backup procedures for operational products and outlines the actions each agency will follow during a volcanic eruption that subsequently affects aviation services. The plan was prepared and published by the Federal Coordinator for Meteorological Services and Supporting Research after a series of working group meetings among the Federal Aviation Administration, U.S. Air Force, National Oceanic and Atmospheric Administration, U.S. Geological Survey, National Aeronautics and Space Administration, the Smithsonian Institution's National Museum of Natural History, and the Air Line Pilots Association. To access the plan, visit **www.ofcm.gov/p35-nvaopa/fcm-p35.htm**.



Lawmakers Push for Changes in FEMA's Level of Post-Disaster Responsibility

Senator Mary Landrieu (D-LA) and other lawmakers are pushing for a proposal to strip the Federal Emergency Management Agency (FEMA) of responsibilities for certain long-term recovery efforts following large-scale natural disasters and terrorist attacks. The legislation would still allow FEMA to stabilize an area affected by a catastrophic disaster by establishing shelters and short-term recovery services for victims, but recovery efforts lasting longer than a few months would be handed over to specialists in departments such as Labor, Transportation, Commerce, and Housing and Urban Development. Presumably, the experts in these agencies would be able to provide specialized multi-agency coordination and authority to accomplish specific tasks such as rebuilding

houses, fixing roads, and cleaning up hazardous spills. This proposal is in response to the agency's deficiencies in responding to Hurricanes Katrina and Rita in 2005. Landrieu chairs the Senate Homeland Security Disaster Recovery Committee and has held a number of hearings to discuss the central problems that inundated the Gulf Coast during the response and recovery. Embarrassing media reports and complaints continue to persist, two years later, regarding delays in the rebuilding process due to FEMA's red-taped bureaucracy.

Earthquake Scenarios Reveal Devastating Effects for Southern California

On August 9, 2007, Lucy Jones, a seismologist at the U.S. Geological Survey (USGS), presented a scenario event—a magnitude 7.8 earthquake with an epicenter near the Salton Sea—and its devastating effects to members of the California Seismic Safety Commission. Experts met with local officials to discuss how Coachella Valley would handle such a catastrophe. This area of southern California is located between the San Andreas and San Jacinto Faults and is 150 years overdue for a major temblor. Historically, Coachella Valley is struck by a large earthquake approximately every 150 years, but the faults in this area have been quiet now for nearly 300 years. Scientists from the Southern California Earthquake Center (SCEC) and the USGS have been using super computers to simulate scenario events to examine how waves would propagate during such an event. These scenarios enable seismologists to estimate the pattern of ground motions across Southern California. Scenario calculations show that earthquakes located on the southern San Andreas fault can cause larger ground motions in Los Angeles than was previously thought. In particular, the simulations show how ground motions can be amplified in sedimentary basins (for example, Coachella Valley and Los Angeles). If a large earthquake were to hit these areas, the damage incurred would have devastating long-term effects.

Senate Proposes Global Warming Plan while Safeguarding U.S. Economy

In early August, Senators Lieberman (I-CT) and Warner (R-VA) laid out a new global warming plan that proposed an obligatory, market-based, cap-and-trade program that would reverse the worst-case effects of climate change by reducing greenhouse gas emissions to 70 percent by 2050. The proposal is said to protect both the U.S. economy and the environment. An example of measures taken to protect American jobs and sustain economic growth is the establishment of a Climate Change Credit Corporation, which would allow industry sectors to buy emissions allowances to standardize the quantity of greenhouse gas emissions released into the environment. Environmentalists have criticized the Bush administration for ignoring alarming evidence of global warming and for doing little to sustain current levels of greenhouse pollutants.

State and Local Officials Feel Shut Out of the Disaster Planning Process

On September 10, 2007, the Department of Homeland Security (DHS) released the draft National Response Framework, successor to the National Response Plan, for a 30-day public comment period. The Framework, which focuses on response and short-term recovery, articulates the doctrine, principles, and architecture by which the United States prepares for and responds to all-hazard disasters across all levels of government and all sectors of communities. The latest document was revised to improve upon the previous plan, which was criticized for taking a unilateral approach to disaster response, and to include state and local officials in the planning process. However, the draft that circulated in August showed no signs of collaboration, and state and local emergency officials were angered by its apparent "secret" rewrite and release. Local and state officials had worked with DHS and the Federal Emergency Management Agency (FEMA) to create a new version reflecting these collaborative efforts, though the drafts they originally drew up were not included in the new document because expectations had not been met by the May deadline. Federal officials familiar with the process said that the version drafted by state and local officials was not an improvement, but rather an equally long-winded document that called to satisfy the needs of too many constituencies. The original National Response Plan was criticized as being unworkable and convoluted, with conflicting command roles that led to a poor response to Hurricane Katrina in 2005. Federal officials say this newly released draft is a step in the right direction and creates an outline for state and local officials to work from as they review the plan before its formal release. The documents are available at the newly-created NRF Resource Center at **www.fema.gov/nrf/**.

Comments on the National Flood Insurance Program (NFIP) Evaluation Final Report

Editor's Note: In 2002, the first comprehensive evaluation of the National Flood Insurance Program (NFIP) was conducted. It included 13 individual studies covering the range of NFIP activities, from insurance ratings to construction standards to resource preservation. The final evaluation was completed in late 2006, and during a session at the 2007 Natural Hazards Research and Applications Workshop in Boulder, Colorado, a panel discussed the evaluation's major findings and also debated its recommendations and prospects for enhancing the program. The article below reflects the comments of Rutherford Platt, one of the panel discussants. Other panel members included David Conrad, National Wildlife Federation; Larry Larson, Association of State Floodplain Managers; and David Maurstad, DHS/FEMA Mitigation Division. To read David Maurstad's full article on the NFIP evaluation, please see the July 2007 issue of the *Observer*.

One fall day in late 1968, during a seminar I was auditing with Gilbert White at the University of Chicago, I first heard him ask "The Question": Will the National Flood Insurance Program (NFIP) reduce or increase average annual flood losses in the United States? Little did he reveal that he was by then the nation's most respected expert and outspoken critic of federal control policy, and the lead author two years earlier of "A Unified National Program for Managing Flood Losses," also known as House Document 465 (HD 465). This question would become Gilbert's mantra as he lobbied tirelessly for an adequate assessment of the NFIP, consistent with his broader quest for "post-audits" of the effectiveness of governmental programs and policies concerning hazards, water resources, energy, and other environmental challenges: Namely, do they work as they were intended to work?

The question raised in the seminar that fall afternoon echoed Gilbert's misgivings expressed in HD 465, where he wrote:

> *A flood insurance program is a tool that should be used expertly or not at all. Correctly applied, it could promote wise use of flood plains. Incorrectly applied, it could exacerbate the whole problem of flood losses. . . . to the extent that insurance were used to subsidize new capital investment, it would aggravate flood damages and constitute gross public irresponsibility.*

This concern was shared by resource economist Marion Clawson in his parallel report on flood insurance for the new Department of Housing and Urban Development. It boiled down to this: Does the NFIP defeat its own purposes by stimulating new development in floodplains that would locate elsewhere in the absence of affordable flood insurance (since coverage against flood losses is generally not available from the private sector)?

Both White and Clawson urged that to avoid that result, an NFIP must include effective land use planning and building regulations. In Gilbert's words:

> *Planning and coordinating the development of the flood plain is required as part of any significant effort to break the pattern being fostered by present federal policies concerning flood damage prevention, namely the continuing sequence of losses, protection, and more losses.*

Congress listened. The 1968 act embraced an unusual "carrot and stick" bargain: availability of flood insurance is tied to community adoption and enforcement of floodplain management pursuant to federal criteria, and "post-FIRM (Flood Insurance Rate Map)" construction is insurable at actuarial rates commensurate with risk. There is no doubt that floodplain management on the "stick" side of the bargain meant land use regulation in mapped flood hazard areas. In testimony to Congress in 1973, George Bernstein, the first NFIP administrator (and member of the Final Evaluation Report Working Group), forcefully stated:

> *It is the combination of effective land use controls and full actuarial rates for new construction that makes the national flood insurance program an insurance program rather than a reckless and unjustifiable giveaway program that could impose an enormous burden on the vast majority of the Nation's taxpayers without giving them anything in return.*

However, contrary to the urging of White, Clawson, Bernstein, and other architects of the NFIP, land use regulation (meaning floodplain zoning without compensation) has receded as an explicit tool of floodplain management. This reflects the wariness of planners and public officials to grasp the "takings" nettle, fearful of being sued by property owners denied permission to use their properties as they see fit.

In my 1999 book *Disasters and Democracy*, I tracked the dwindling mandate for land use control in successive versions of the "Unified National Program" between 1966 and 1994. In 1966 the language was unequivocal: "The key to resolving the problem lies above all else, in the intelligent planning for and state and local regulation of the use of lands exposed to flood hazard." By 1994, it had been watered down to: "Develop and implement a process to encourage positive attitudes toward floodplain management."

To be sure, much has been accomplished in the last four decades to promote "hazard mitigation," in large

part due to the Association of State Floodplain Managers. Tools for improved floodplain management include technical advice, improved public information and mapping, greater market penetration for flood insurance, building and elevation requirements, hazard mitigation grants, and incentives under the Community Rating System. Certainly some states and localities stand out as models for the rest of the country. One also hopes—without hard evidence—that actuarial rates are effective deterrents to unwise new growth in floodplains.

But Gilbert's question still hangs in the air (as paraphrased by me): "Has the NFIP made vulnerability to floods better or worse? Or, in George Bernstein's terms, has the NFIP been an "unjustified giveaway program?" While losses due to smaller events are undoubtedly reduced through elevation, flood proofing, etc., does the NFIP—as Gilbert argued was the case with federal flood control structures—create a false sense of security that encourages new construction in harm's way, albeit elevated and insured actuarially?

"But Gilbert's question still hangs in the air: Has the NFIP made vulnerability to floods better or worse? Or, in George Bernstein's terms, has the NFIP been an 'unjustified giveaway program'?"

Unfortunately, the Final Evaluation Report and its antecedent working papers (as far as I could tell) say very little about this central and overriding question. I do not see any discussion of the current status of "takings" litigation concerning floodplain regulation. In the 1970s and 1980s, courts generally upheld community land use regulations based on best available estimates of flood risk. Has this changed? If there have not been any recent cases, why not? If communities are making tough decisions, there should be challenges.

Even more important is the question of whether present levels of flood mitigation will prove inadequate in light of future changes in flood risk. There are at least four major sources of rising flood risk: (1) upstream urbanization in small watersheds, (2) coastal erosion, (3) degradation of flood control structures, and (4) climate change. The report makes only passing mention that current estimated 1 percent flood boundaries in many places are or will soon be obsolete due to upstream land use changes in smaller watersheds. Regarding erosion, despite two major studies funded by FEMA—by the National Research Council in 1989 and the Heinz Center in the late 1990s—the NFIP has totally failed to incorporate erosion data into its maps, rate structure, and land use regulations. Property rights interest groups, such as the Fire Island Association, succeeded in derailing incorporation of erosion into the program, while they simultaneously lobbied for federally funded beach nourishment and shore protection projects to alleviate that very threat.

The third threat became all too evident in Hurricane Katrina, namely the gradual degradation of flood control structures due to subsidence and lack of maintenance. Finally, the threat of climate change overshadows everything we are doing, but it is barely mentioned in the Report (under Goal 4: "Lofty Targets").

The Report cites an estimate by Pricewaterhouse-Coopers that total structures in special flood hazard areas will increase from 6.6 million in 1997 to 8.7 million in 2022. One wonders how much of this increase is due to unrestrained new development in floodplains as presently mapped, and how much is due to expansion of those floodplains or increased risk due to the factors listed above. In either case, it is not a prospect that should gladden the hearts of floodplain managers, nor is it one that would persuade Gilbert to stop asking that never-ending question[1].

Rutherford Platt (platt@geo.umass.edu)
Director, Ecological Cities Project; Northampton, Massachusetts
Former member of the NFIP Final Summary Working Group

References

1. U.S. Congress. 1966. A Unified National Program for Managing Flood Losses. House Doc. 465, 89th Cong., 2d Sess. Washington, DC., p. 17-18.
2. U.S. Congress. 1973. Flood Insurance and Disaster Assistance. Hearings before the Subcommittee on Housing and Urban Affairs of the Senate Committee on Banking, Housing, and Urban Affairs. 93rd Cong., 1st Sess., p. 28.
3. Platt, R.H. 1999. Disasters and Democracy: The Politics of Extreme Natural Events. Washington, D.C.: Island Press, p. 95.
4. NFIP Evaluation Final Report Working Group. 2006. The Evaluation of the National Flood Insurance Program: Final Report. U.S. Department of Homeland Security and Federal Emergency Management Agency.

Notes

1. In 1989, Gilbert White prepared a set of comments (unpublished mimeo) on the "Interim Status Report on the Nation's Floodplain Management Activity" (prepared for the Federal Interagency Floodplain Management Task Force). Among those comments, the following reveals how he might respond today: "The test of how well the management activities are being carried out is in what happens at the level of individual farms, households, and local communities...**The present status of floodplain management does not encourage complacency. The record is mixed.** There are encouraging trends, as with the number of communities having some form of floodplain regulations, but the rising toll of average annual flood losses has not been stopped or reversed. Some activities look more productive on paper than on the ground or in the real vulnerability of people. On balance, **progress has been far short of what is desirable or possible, or what was envisaged at times when the current policies and activities were initiated**." (emphasis added)

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/**.

Modeling of Catastrophic Failures in Power and Communication Systems: Supporting Design, Preparation, and Recovery. Funding Organization: National Science Foundation, $299,842. Three years. Principal Investigator: Chanan Singh, Texas Engineering Experiment Station, (979) 862-1696, singh@ee.tamu.edu.

The objective of this research is to develop tools for understanding and improving the reliability and performance of interdependent power and communication systems during catastrophic events such as hurricanes. Analytical and simulation approaches for analyzing reliability, survivability, and performance of these critical systems during catastrophic events will be developed. These tools will allow probabilistic prediction of the performance of these systems during natural catastrophes; efficient allocation of critical resources for improving survivability; development of techniques for failure localization; and fast recovery and system restoration. The project will provide tools that can be used by government agencies and private utilities to minimize the impact of loss of power and communications on both immediate post-event emergency response and longer-term economic and social recovery.

Hurricane Wind Simulation and Testing to Develop Damage Mitigation Techniques. Funding Organization: National Science Foundation, $149,997. Three years. Principal Investigator: Arindam Chowdhury, Florida International University, (305) 554-2000, arindam.chowdhury@fiu.edu.

During the last few years, thousands of lives have been lost and billions of dollars worth of property have been destroyed by hurricanes. More importantly, the public's belief in the effectiveness of its built environment and its ability to withstand the brutal forces of nature has been shattered. Engineered structures are vulnerable to damage from hurricane-induced wind, rain, and debris, though the combined impacts are not well understood. Damages during these extreme wind events highlight the weaknesses inherent in coastal residential building construction and underscore the need for improving their structural performance. This research will advance knowledge pertaining to hurricane-structure interaction in full-scale by capturing some of the intricate flow separation, vortex generation, and re-attachment phenomena and their effects on structures and components built with real materials. Combined effects of hurricane wind, rain, and debris will be studied to improve safety and serviceability conditions through performance-based engineering. The work will address the need to understand extreme windstorm effects on structures and improve the resiliency of coastal construction in a manner similar to the way that the automobile industry tackled the crash worthiness issue and the earthquake engineering community approached building safety. Integration of this research project with education will be accomplished by assigning various aspects of the research to undergraduate and graduate students. Wall of Wind Contests, with student and industry participations, will be held to brainstorm and test innovative mitigation concepts, thus transferring the technology from academia to field applications. These activities will help in developing a trained workforce of students and professionals with needed expertise. Research results will be disseminated widely through peer-reviewed journal and conference publications, and reports to policy makers and building code committees to improve current standards. The research is expected to benefit society as a whole by developing hurricane mitigation techniques that will lead to human safety, property loss reduction, insurance cost reduction, and a "culture of preparedness" for natural disasters.

Mitigating Disaster and Terrorism Impacts to Critical Infrastructure. Funding Organization: National Science Foundation. One year. Principal Investigators: Timothy Matisziw, Ohio State University ($100,526), (614) 292-3732, matisziw.1@osu.edu; Tony Grubesic, Indiana University ($17,751), (812) 855-0516, tgrubesi@indiana.edu.

Critical network infrastructures, such as transportation, communication, and utility systems, are designed to facilitate the movement of essential goods and services over geographic space. Many of these vital infrastructures are geographically extensive; increasing vulnerability to disruption by natural disasters, accidents, and/or sabotage. Planning for and managing the vulnerability of critical infrastructure to extreme events is a challenging task, particularly given the uncertainty associated with the timing and severity of these events and the network components involved. Effective planning is reliant on the ability to rigorously characterize potential disruptions. This collaborative research project will develop several new approaches for assessing network vulnerability to interdiction, which is broadly defined as the debilitation of network elements due to disaster, accident, or intentional harm. The investigators will develop a general spatial optimization modeling framework for addressing the interdiction of system flow and will refine and further develop the general framework to address a number of practical planning concerns. The ultimate aim of modeling interdiction impact is to better inform mitigation and remediation efforts. A final goal of this research project will be the operationalization of a modeling framework to support system recovery in the event of interdiction. This research will be rooted in theoretical developments applicable to any networked system, with the analytical framework be-

ing designed for cross-cutting use over a broad spectrum of infrastructures. The results of this research will be of interest to the scientific community, as well as to governmental and private-sector agencies involved in planning for the continuity of critical infrastructures.

Displacement Due to Catastrophic Hurricanes: Assessing Potential Magnitude and Policy Implications for Housing and Land Development. Funding Organization: National Science Foundation, $301,643. Three years. Principal Investigator: Ann-Margaret Esnard, Florida Atlantic University, (561) 297-0777, aesnard@fau.edu.

This research examines populations predisposed to long-term displacement from catastrophic hurricanes. The examination is most critical in the coastal portions of the eight most hurricane-prone states—a band that stretches from Texas on the west along the Gulf Coast to Florida and then up the Atlantic Coast to North Carolina. The research will result in a variety of products including a new Displacement Index and related maps to estimate the magnitude of the potential displaced-persons problem, using indicators drawn from earlier studies of vulnerability as well as indicators specific to housing and policy conditions, and an analysis of how state-level policies associated with housing, emergency assistance, planning, and land development enhance or reduce vulnerability and displacement. Underrepresented populations (who are oftentimes the most vulnerable and predisposed to displacement) and society will benefit from identification and explication of the gaps found in both the emergency management model and in policies for housing and land development, specifically as they relate to catastrophic events and large-scale displacement. The research will also help clarify the role played by various political actors and institutions in their mitigation of and response to long-term displacement problems, and will serve to affirm or reject existing theories of the policy process.

Optimization Models and Algorithms for Emergency Response Planning. Funding Organization: National Science Foundation, $250,000. Three years. Principal Investigator: Fernando Ordonez, University of Southern California, (213) 740-7762, fordon@usc.edu.

This project will develop better plans for an effective deployment of medical supplies in response to a large-scale infectious disease outbreak. The multiple decisions involved in an efficient logistics response, compounded with the uncertainty present, leads to large-scale optimization/decision problems that are intractable using current methods. The proposed research will create models that provide robust solutions to uncertainty and develop algorithms that will use new results on sensitivity measures for problems under uncertainty. Recent events, such as the 2004 Indian Ocean tsunami and the 2005 Hurricane Katrina, have highlighted the massive impact that large-scale emergencies can inflict on society. Ultimately, improving preparedness can help save lives in emergencies. This project includes an outreach component to local, state, and federal stakeholders through the Governmental Advisory Committee of the CREATE Research Center, a Department of Homeland Security funded research center at the University of Southern California (USC). This project will lead to curricular developments in logistics and optimization and will involve minority undergraduate students in summer research projects through USC's McNair Scholar's Program.

Geographic Emergency Response Vehicle (GeoERV). Funding Organization: Americorps Vista, $80,000. One year. Principal Investigator: Juana Ibanez, University of New Orleans, in partnership with Global Map Aid, (504) 280-6294, jibanez@uno.edu.

Global Map Aid (GMA) and the University of New Orleans (UNO) propose to collaborate in the development of a mobile Geographic Emergency Response Vehicle (GeoERV)—a mobile office capable of being quickly deployed into disaster areas to produce maps for emergency service personnel, longer term aid workers, and evacuees. All necessary map production equipment will be housed within the GeoERV, as will simple living quarters to allow a small field team to quickly travel to critical locations and produce maps onsite for those who urgently need them. The goal of the GeoERV project is to build a team of highly qualified mappers with the skills to provide a critical resource (up-to-the-minute maps) in a time of disaster. The GeoERV will be focused on the southern coastline of the United States, but will also be able to drive to disaster zones in other states when called upon. The goal of the community mapping component of the GMA/UNO project is to support decision making and consensus building for improved program design, policy development, organizing, and advocacy in low-income and struggling communities recovering from the effects of Hurricane Katrina. Ultimately, the project will stand as an inspiration for future GeoERVs in other disaster-prone areas.

Disaster Research E-Newsletter

Every other Thursday, the Natural Hazards Center distributes the Disaster Research (DR) e-newsletter, which features timely announcements about new policies and programs, funding opportunities, calls for papers and presentations, upcoming conferences, Internet resources, job openings, and other information useful to researchers, practitioners, policy makers, and students in the field of hazards and disasters. The DR complements the *Observer*, and while there is some information overlap between the two publications, the DR often contains time-sensitive information that the *Observer* cannot distribute. The Center welcomes and encourages the submission of news, announcements, and questions or information requests for DR readers (who represent a readily available network of experts). All contributions and queries for the DR should be indicated as such and e-ailed to hazctr@colorado.edu. To receive the DR in your inbox or view it online, visit **www.colorado.edu/hazards/dr/**.

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

Communicating with the Public Using ATIS during Disasters: A Guide for Practitioners. U.S. Department of Transportation, Research and Innovative Technology Administration, Federal Highway Administration. 2007. 36 pp. Free online. www.ops.fhwa.dot.gov/publications/atis/atis_guidance.pdf.

Advanced Traveler Information Systems (ATIS) can play an important role in communicating essential information to the public during disasters. Variable message signs, 511 telephone systems, highway advisory radio, and Web sites are some of the dissemination devices of systems that collect, process, and disseminate information about travel conditions to the public for day-to-day transportation operations, and these same systems need to be effectively used during disaster situations. This document provides advice on use of ATIS during disasters and is intended not only for state and local transportation agencies, but also for their partners in public safety and emergency management agencies. It offers practical guidance to managers of transportation management centers and emergency operations centers and to public information officers who may be called on to staff joint information centers during disasters.

Emergency Evacuation Planning Guide for People with Disabilities. 2007. 60 pp. Free online. National Fire Protection Association (NFPA); www.nfpa.org/assets/files/PDF/Forms/EvacuationGuide.pdf.

This guide was developed in response to the emphasis placed on the need to properly address the emergency procedure needs of the disabled community. It outlines the four elements of evacuation information that occupants need: notification, way finding, use of the way, and assistance. Also included is a Personal Emergency Evacuation Planning Checklist that building services managers and people with disabilities can use to design a personalized evacuation plan.

Frontline Security. Summer 2007. Vol. 2, Issue 2. Beacon Publishing, Inc. (613) 747-1138; www.frontline-canada.com.

This issue of Frontline Security is devoted to the topic of natural disasters and what Emergency Preparedness means. Article titles include: Managing Your Next Natural Disaster, NATO's Disaster Response Exercise, Climate-Related Events and Cost Impacts, and Red Cross: Lessons Learned.

Healthcare Allocation in Disasters. Kenneth V. Iserson. 2007. 32-minute, 3-video set. Free online; www.crestaznm.org. Also available free of charge for video placement on non-commercial Web sites; send requests to Ken Iserson at kvi@u.arizona.edu.

Produced by a leader in medical ethics and emergency medicine, this dynamic educational program teaches leaders how to ethically allocate scarce resources during and after disasters. During and after disasters, vital resources invariably become scarce. To retain order and maintain the public's confidence, leaders must make allocation decisions ethically, providing resources to those most in need. In these situations, decision makers must decide how to prioritize between the needs of different patients and communities. The program addresses difficult allocation decisions in all types of disasters: at on-scene (multi-casualty incident), institutional, local, regional, and statewide levels.

Nobody Left Behind: Disaster Preparedness for Persons with Mobility Impairments. Glen W. White, Michael H. Fox, Catherine Rooney, and Jennifer Rowland; University of Kansas Research and Training Center on Independent Living. 2007. 14 pp. Free online. Centers for Disease Control and Prevention (CDC); Association for Prevention Teaching and Research. www.nobodyleftbehind2.org/findings/index.shtml.

The Nobody Left Behind research project began in 2002 in response to the lack of empirical data on emergency preparedness and response for persons with mobility impairments. The research team investigated 30 randomly selected U.S. counties, cities, parishes, and boroughs where a natural or human-caused disaster occurred between 1998 and 2003 to determine the state of preparedness at local levels for people with mobility impairments. Through phone surveys and reviews of local emergency management plans, the researchers examined whether local emergency management plans, guidelines, and procedures address the needs of persons with mobility impairments. The report includes research findings, emerging "best practices," and recommendations.

2007 Risk Management Resource Guide. 2007. 194 pp. $20.00 (paperback). Public Entity Risk Institute (PERI); (703) 352-1846; www.riskinstitute.org.

This guide is a comprehensive directory of sources for risk management information and training and replaces PERI's annual Risk Management Yearbook. It includes an extensive listing of publications and publishers,

as well as a wide range of organizations that offer valuable risk management educational and training materials. Categorized to cover the full range of risk management subject areas, resources can be found on benchmarking and performance measurement, disaster management and hazard mitigation, environmental liability, human resources and employment practices, risk financing and insurance, safety and health, and workers' compensation and occupational therapy.

Climate Change

Climate Change: Biological and Human Aspects. Jonathan Cowie. 2007. ISBN 978-0-521-69619-7. 504 pp. $52.00 (paperback). Cambridge University Press; (212) 924-3900; www.cambridge.org.

In recent years climate change has been recognized as the foremost environmental problem of the twenty-first century and a subject of considerable debate. Not only will climate change affect the multi-billion dollar energy strategies of countries worldwide, but it could also seriously affect many species, including our own. This textbook provides a broad review of past, present, and likely future climate change from the viewpoints of biology, ecology, and human ecology. Thorough references allow readers to embark on their own specialist studies. Book chapter topics include an introduction to the subject of climate change, a history of past climate change, current warming trends and future impacts, the impacts of human population on climate, and sustainability and policy.

Fragile Earth, Views of a Changing World. 2006. ISBN 978-0-06-113731-0. 272 pp. $55.00 (hardcover). HarperCollins Publishers; (212) 207-7000; www.harpercollins.com.

Natural disasters cause immediate change to a landscape, but humans can cause equally dramatic changes over longer periods of time. This collection of carefully selected 'before and after' color pictures is combined with detailed explanations to provide readers with an understanding of what has happened to our planet in the past, and what is likely to happen in the future. The book provides a stark look at the catastrophic effects that human actions can have on the planet, including melting Arctic ice, the effect of sea-level rise on the Pacific Islands, the recent disastrous floods and landslides in Europe, and the Indian Ocean tsunami in 2004.

Heads Up! Early Warning Systems for Climate, Water and Weather. Michael H. Glantz, Editor. 2007. ISBN 978-7-302-14633-9. 173 pp. $10.00 (paperback). Tsinghua University Press; Place orders through the National Center for Atmospheric Research by sending email to jan@ucar.edu; www.ccb.ucar.edu/warning/headsup.html.

Many early warning systems (EWSs) are in operation today to warn the general public, governments, and businesses about impending climate, water, and weather-related hazards, along with other natural and human-made threats. The experiences and insights gained through the global use of EWSs can help to inform officials and other decision makers in various organizations about how to prepare and communicate effective early warnings. Sharing experiences and insights identified in the use of EWSs can also help to educate the media and the general pubic about how to interpret warnings and apply them to their own local needs. The purpose of this publication is to identify ways to make early warnings of potential "threats" to society and the environment more useful, usable, credible, and reliable.

Floods

Flood Insurance Claims Handbook. Federal Emergency Management Agency (FEMA), National Flood Insurance Program (NFIP). 2006. 12 pp. Free online. www.fema.gov/library/viewRecord.do?id=2187. To order print copies, call the FEMA Distribution Center at (800) 480-2520 and request FEMA Document F-687.

This handbook was created by FEMA to assist insured flood victims in the process of filing a claim. It contains several sections that explore what property owners can do before a flood to facilitate claims handling, as well as what steps to take after a flood to hasten claims processing. In November 2006, the handbook was revised to include additional information about the claims appeal process. The list of documentation that must accompany an appeal letter to FEMA has been expanded and now includes dozens of examples. Posted in the margins are "Tips" to help consumers make choices before, during, and after a flood.

Flood Preparation and Safety Brochure. 2007. Free online. National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS) and the Federal Emergency Management Agency (FEMA); www.weather.gov/os/water/ahps/pdfs/FloodSmartBrochure3.pdf.

This tri-fold brochure was created in partnership with FEMA's FloodSmart initiative and highlights actions that should be taken before and during a flood. It also provides information on how to establish an emergency plan.

Hurricanes and Coastal Hazards

The Best Laid Plans: The Story of How the Government Ignored Its Own Gulf Coast Hurricane Plan. 2007. 24 pp. Free online. Citizens for Responsibility and Ethics in Washington (CREW). www.citizensforethics.org/files/Katrina%20DHS%20Report.pdf.

This report, released by Citizens for Responsibility and Ethics in Washington (CREW), details the Federal Emergency Management Agency's (FEMA's) plan to respond to a hurricane of Katrina's magnitude and its subsequent failure to implement that plan. On September 7, 2005, CREW sent a Freedom of Information Act (FOIA) request to the Department of Homeland Security (DHS), of which FEMA is a component, seeking records related to the federal government's long-term planning for a hurricane on the Gulf Coast, as well as its immediate preparations for and response to Hurricane Katrina. In January 2006, CREW filed a lawsuit to force DHS to comply with the FOIA. The report is based on the 7,500 records DHS provided in response to CREW's lawsuit.

The Deadliest, Costliest, and Most Intense United States Tropical Cyclones from 1851 to 2006 (and Other Frequently Requested Hurricane Facts). Eric S. Blake, Edward N. Rappaport, and Christopher W. Landsea. 2007. 45 pp. Free online. National Weather Service, National Hurricane Center (NHC); NOAA Technical Memorandum NWS TPC-5. **www.nhc.noaa.gov/pdf/NWS-TPC-5.pdf**.

This report is a revision of the NHC's list of the costliest and deadliest hurricanes in the United States from 1861 to 2006. According to the NHC, 2004 and 2005 produced seven of the nine costliest hurricanes to strike the U.S. coastline since 1900, causing $167 billion in total damage. All seven of these storms struck Florida—Charley, Ivan, Frances, and Jeanne in 2004; and Katrina, Wilma, and Rita in 2005. The report ranks damage, as expressed in monetary losses, in three ways: (1) contemporary estimates, (2) contemporary estimates adjusted for inflation to 2006 dollars, and (3) contemporary estimates adjusted for inflation and the growth of population and personal wealth to 2006 dollars. In addition, a list of the most intense hurricanes to make landfall in the United States during the 156-year period is included.

Down in New Orleans, Reflections from a Drowned City. Billy Sothern. 2007. ISBN 978-0-520-25149-6. 349 pp. $21.95 (hardcover). University of California Press; (800) 777-4726; **www.ucpress.edu**.

In this insider's chronicle of the epic 2005 Hurricane Katrina disaster and the year that followed, Billy Sothern delivers a haunting, personal, and quintessentially American story. Writing with an idealist's passion, a journalist's eye for detail, and a lawyer's attention to injustice, Sothern recounts the struggle to come to terms with the enormity of the apocalyptic scenario he and his wife managed to live through. Aided by photos taken by his wife, photographer Nikki Page, he guides the reader on a journey through post-Katrina New Orleans and an array of indelible images, including prisoners abandoned in their cells with waters rising, a longtime New Orleans resident of Middle Eastern descent unfairly imprisoned in the days following the hurricane, trailer-bound New Orleanians struggling to make ends meet but celebrating with abandon during Mardi Gras, and Latino construction workers living in their trucks. As a lawyer-activist who has devoted his life to procuring justice for some of society's most disenfranchised citizens, Sothern offers a powerful vision of what Katrina has meant to New Orleans and what it still means to the nation at large.

Katrina: Unlearned Lessons. William R. Freudenburg, Robert Gramling, Shirley Laska, and Kai T. Erikson. 2007. In *World Watch*, Vol. 20, No. 5, pp. 14-19. **www.worldwatch.org**.

In this article from the September/October 2007 issue of *World Watch*, the authors assert that our institutions seem to have difficulty learning and applying the key lessons of Katrina—namely, that the storm had as much to do with what humans do to nature as with what nature does to humans. Beginning with a comparison of the effects of Hurricanes Betsy and Camille, which struck New Orleans in 1965 and 1969, and the impact of Hurricane Katrina in 2005, the authors illustrate how substantial changes to the environment by humans in a brief 40-year period can mean the difference between flooding 20 percent of the city and near-total devastation. The article concludes by pointing out that our technological capacities have evolved to the point where humans can create some spectacular environmental damage; unfortunately, we do not seem to have the same technological capacity to undo the damage we create.

Racing the Storm: Racial Implications and Lessons Learned from Hurricane Katrina. Hillary Potter, Editor. 2007. ISBN 978-0-7391-1973-0. 314 pp. $29.95 (paperback). Lexington Books; (800) 462-6420; **www.lexingtonbooks.com**.

Hurricane Katrina affected the lives of many people in the Gulf Coast states, but the storm went beyond demonstrating the devastating effects of a hurricane by exposing the continuing significance of race relations and racial stereotyping in U.S. society. This book highlights the race-based perceptions of and responses to Katrina survivors by governmental entities, volunteers, the media, and the general public. Scholars from a variety of disciplines take on the task of analyzing the social phenomena and racial implications surrounding Hurricane Katrina.

The Sociology of Katrina: Perspectives on a Modern Catastrophe. David L. Brunsma, David Overfelt, and J. Steven Picou, Editors. 2007. ISBN 978-0-7425-5929-5. 282 pp. $29.95 (paperback). Rowman & Littlefield Publishers, Inc.; (800) 462-6420; **www.rowmanlittlefield.com**.

Hurricane Katrina became the stimulus for devastating technological failures and widespread toxic contamination, causing the largest internal diaspora of displaced people in recent U.S. history. This book brings together the nation's top sociological researchers in an effort to catalogue the modern catastrophe that is Hurricane Katrina. Included are discussions of sociological perspectives of disaster literature, alternative views and analyses of early post-storm data collection efforts, and emerging social questions that have surfaced in the aftermath of Katrina. All royalties from the sale of this book go to the Disaster Relief Fund of the Southern Sociological Society.

The U.S. Hurricane Coasts: Increasingly Vulnerable? Susan L. Cutter, Laurie A. Johnson, Christina Finch, and Melissa Berry. 2007. In *Environment*, Vol. 49, No. 7, pp. 8-20. Heldref Publications; (800) 365-9753; **www.heldref.org**.

Two years after Hurricane Katrina devastated New Orleans and the Mississippi Gulf Coast, many communities in the region have seen little progress toward recovery. This article examines the consensus adaptation to climate change: retreat from an increasingly hazardous coast. With the escalating losses from common (erosion) and extreme (major hurricanes and earthquakes) hazards, it is time to think about a retreat from the coast. But, the authors add, the transition to a sustainable coastal future will not be easy, due to the many special interests, entrenched economic conflicts, and social inequalities that permeate the coastal region.

Pandemic Flu and Public Health

Effective Media Communication during Public Health Emergencies: A World Health Organization (WHO) Handbook. Randall N. Hyer and Vincent T. Covello. 2007. ISBN 92-4-154703-0. 138 pp. $31.50 (paperback). World Health Organization; **www.who.int/publications/en/**. Also available free online at **www.who.int/csr/resources/publications/WHO_CDS_2005_31/en/**.

Urgent, high-concern situations present a unique communication challenge. Recent outbreaks of severe acute respiratory syndrome (SARS) and avian influenza, releases of anthrax and sarin, and the tsunami disaster in Southeast Asia underline the importance of communication during public health emergencies. Effective communication can rally support, calm a nervous public, provide much-needed information, encourage cooperative behaviors, and help save lives. This handbook presents an integrated, principle-based approach to media communication for those dealing with public health emergencies. Topics covered include how journalists gather and process information about public health emergencies, steps for planning and implementing an effective media communication program, identifying and reaching target audiences, media interviews, avoiding traps and pitfalls, and preparing key messages. The accompanying Field Guide, produced as a separate book, summarizes the practical steps that can be taken to strengthen and enhance efforts made in this area.

North American Plan for Avian and Pandemic Influenza. U.S. Department of State. Developed as part of the Security and Prosperity Partnership of North America. 2007. 53 pp. Free online. **www.state.gov/g/avianflu/91242.htm** or **www.spp.gov/pdf/nap_flu07.pdf**.

Canada, Mexico, and the United States face a growing threat posed by the spread of avian influenza and the potential emergence of a human influenza pandemic. The highly pathogenic H5N1 virus, which re-emerged in Asia in late 2003, has already spread to Europe, the Middle East, and Africa. While the virus has not yet reached North America, the three countries must be prepared for the day when it—or some other highly contagious virus—does. The North American Plan for Avian and Pandemic Influenza was announced by the Presidents of the United States and Mexico and the Prime Minister of Canada on August 21, 2007, in Montebello, Canada, at the North American Leaders Summit. The Plan was developed as part of the Security and Prosperity Partnership of North America (SPP) and presents a collaborative North American approach that recognizes the importance of controlling the spread of avian influenza or a novel strain of human influenza with minimal economic disruption. It outlines how Canada, Mexico, and the United States intend to work together to prepare for and manage avian and pandemic influenza.

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**.

Small Business Administration: Response to the Gulf Coast Hurricanes Highlights Need for Enhanced Preparedness. July 25, 2007. GAO-07-1124T. 13 pp.

Homeland Security: Observations on DHS and FEMA Efforts to Prepare for and Respond to Major and Catastrophic Disasters and Address Related Recommendations and Legislation. July 31, 2007. GAO-07-1142T. 38 pp.

Gulf Coast Rebuilding: Observations on Federal Financial Implications. August 2, 2007. GAO-07-1079T. 22 pp.

Climate Change: Agencies Should Develop Guidance for Addressing the Effects on Federal Land and Water Resources. August 7, 2007. GAO-07-863. 184 pp.

Department of Homeland Security: Progress Report on Implementation of Mission and Management Functions. August 17, 2007. GAO-07-454. 328 pp.

National Flood Insurance Program: FEMA's Management and Oversight of Payments for Insurance Company Services Should Be Improved. September 5, 2007. GAO-07-1078. 57 pp.

World Trade Center: EPA's Most Recent Test and Clean Program Raises Concerns That Need to Be Addressed to Better Prepare for Indoor Contamination Following Disasters. September 5, 2007. GAO-07-1091. 85 pp.

Maritime Transportation: Major Oil Spills Occur Infrequently, but Risks to the Federal Oil Spill Fund Remain. September 7, 2007. GAO-07-1085. 51 pp.

Influenza Pandemic: Opportunities Exist to Clarify Federal Leadership Roles and Improve Pandemic Planning. September 26, 2007. GAO-07-1257T. 12 pp.

Global Health: U.S. Agencies Support Programs to Build Overseas Capacity for Infectious Disease Surveillance. September 28, 2007. GAO-07-1186. 51 pp.

Influenza Pandemic: Federal Executive Boards' Ability to Contribute to Pandemic Preparedness. September 28, 2007. GAO-07-1259T. 12 pp.

Wildland Fire Management: Better Information and a Systematic Process Could Improve Agencies' Approach to Allocating Fuel Reduction Funds and Selecting Projects. September 28, 2007. GAO-07-1168. 103 pp.

Web Sites of Interest

The Societal Aspects of Weather (SOCASP)
www.sip.ucar.edu/socasp/

This remodeled Web site is the Societal Impacts Program's database of Internet resources on weather impacts and organizations that respond to those impacts. It presents a well-organized, easily accessible collection of resources related to the societal aspects of weather and weather forecasting.

Federal Emergency Management Agency (FEMA) Online Library
www.fema.gov/library

This library is a Web-based collection of all publicly accessible FEMA information resources, including CDs, DVDs, VHS tapes, audiotapes, PowerPoint presentations, posters and display items, brochures, guidance and policy papers, forms, and program regulations and guidelines. It allows users to locate, download, save, and print FEMA information from the Internet.

Annual Disaster Statistical Review 2006
www.em-dat.net/documents/Confpress%202006.pdf

Every year, the Centre for Research on the Epidemiology of Disasters (CRED) reports on the effects of disasters on human populations. This first Annual Disaster Statistical Review is an analysis of the disaster figures in 2006 compared to 2005 and 2000-04.

FEMA: Hurricane Katrina Two Years Later
www.fema.gov/hazard/hurricane/2005katrina/index.shtm

This Web site is devoted to matters of recovery from Hurricanes Katrina and Rita. The site offers information on the progress being made in the region, news and statistics, the latest reports, interactive maps, important phone numbers, and guidelines on preparedness and mitigation.

EMPOWER (Emergency Management Professional Organization for Women's Enrichment)
www.empower-women.com/mc/page.do

This emergency management organization for women was created to build a platform where professionals can come together to share experiences, build skills, and expand and deepen industry knowledge. EMPOWER helps facilitate the advancement and enrichment of women in emergency management.

Ready.gov: Instructional Videos
www.ready.gov/america/about/instructional.html

The U.S. Department of Homeland Security and The Advertising Council have created these instructional videos to help educate and empower Americans to prepare for and respond to all kinds of emergencies. The videos, available in English and Spanish, provide information on how to obtain an emergency supply kit, make a family emergency plan, and be informed about the different types of emergencies in the community.

Progress in Louisiana
www.ProgressInLouisiana.org

In honor of the second anniversary of Hurricanes Katrina and Rita, the state of Louisiana launched this Virtual Media Center to serve as a portal for journalists covering the state's recovery from the first and third most expensive natural disasters in the nation's history. Operating as the central online resource for anniversary-related news, the site will be continuously updated with recovery statistics, press releases, story ideas, and contact information. Members of the press can register to receive news alerts and press releases, identify spokespeople for issues related to recovery, and download documents and reports from governmental agencies, community groups, and other organizations.

Teaching the Levees
www.teachingthelevees.org

This site provides free curriculum for high school and college teachers wishing to use Spike Lee's documentary film *When the Levees Broke* in the classroom. The curriculum was funded by the Rockefeller Foundation and was created by educators from Teachers College at Columbia University.

Nature Reports Climate Change
www.nature.com/climate/index.html

Nature recently launched this new, free Web site dedicated to in-depth coverage of climate change, including authoritative information on current climate change research, news, in-depth features, research highlights, commentaries, and reviews.

National Flood Programs and Polices in Review
www.floods.org/PDF/ASFPM_NFPPR_2007.pdf

This document, prepared by the Association of State Floodplain Managers (ASFPM), identifies ways to improve national policies and programs for reducing flood damage and for protecting the natural resources and functions of our floodplains. According to the ASFPM, it contains hundreds of ideas and recommendations for making such improvements and for enhancing activities at all levels of government, by individuals, and in the private sector.

Gateway to the United Nations System's Work on Climate Change
www.un.org/climatechange/

This United Nations (UN) site provides access to climate change information from various agencies of the UN. The Web site features the most recent scientific reports from the UN, the latest developments on efforts to reach a new international climate change agreement, climate change events, news, Webcasts, projects in the field, and climate change information for youth.

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.

Impacts of Extreme Weather & Climate on Socio-economic Development in Africa—Akure, Nigeria: November 11-15, 2007. Organizer: Nigerian Meteorological Society. This international conference focuses on African weather-related disasters and their consequences. Its goal is to unite researchers who have been studying African weather and climate and the impacts of extreme weather. The conference will take place at the Federal University of Technology in Akure, Nigeria. Themes will include the impacts of extreme weather and climate on agriculture, water resources, healthcare, urban planning and tourism, transportation, and socio-economic development in Africa.

www.nmets.org/conference/index.html

Australian Earthquake Engineering Society (AEES) Conference—Wollongong, Australia: November 23-25, 2007. Organizer: Australian Earthquake Engineering Society (AEES). This conference will be held at Wollongong University and will consist of three half-days (Friday afternoon and Saturday and Sunday mornings), with each half day divided into two sessions. The conference is open to all researchers involved in earthquake engineering or engineering seismology in Australia. Potential topics will include those related to earthquake engineering and engineering seismology, as well as extreme event topics including blast, tsunami, critical infrastructure protection, emergency management, and insurance. The format will offer a blend of keynote speakers, oral presentations, and poster presentations.

srj@bigpond.net.au
www.aees.org.au

Asia-Pacific EcoHealth Conference: Sustaining People and Places in a Changing World—Basel, Switzerland: November 26-29, 2007. Organizer: Deakin University. This year's conference will explore some of the key issues surrounding the interdependent relationships of humans and their environments. It will showcase the latest research and contribute to the development of partnerships to create new strategies in addressing looming ecological crises. Potential themes include cultural change in environment and health, ecological literacies in health practice, systemic thinking in environment and healthcare, and indigenous and local perspectives.

marika.thomson@deakin.edu.au
www.deakin.edu.au/events/ecohealth2007/

8th Pacific Conference on Earthquake Engineering—Singapore: December 5-7, 2007. Organizer: New Zealand National Society for Earthquake Engineering. The Pacific Conference on Earthquake Engineering (PCEE) brings together professionals and researchers from a range of disciplines and a number of countries, principally from the Pacific Rim, but also beyond. This year's potential topics include earthquake response in dense urban environments, impact of earthquakes on businesses, engineering seismology, earthquake engineering practice, emerging seismic design and retrofit technologies, and lessons learned from recent earthquakes.

8PCEE@ntu.edu.sg
www.ntu.edu.sg/cee/8PCEE/

Innovative and Smart Structural Systems for Sustainable Habitat—Tamil Nadu, India: January 3-5, 2008. Organizer: Coimbatore Institute of Technology. In its examination of civil infrastructures, this conference will provide an opportunity to understand the latest development in the area of smart materials and smart structures, which can be used for providing sustainable structures. Conference themes include smart materials, smart structures, earthquake resistant structural systems, wind resistant systems, performance-based design, fast track construction, and use of nano materials.

inshab_2008@yahoo.com
www.citinshab2008.info

29th Annual International Disaster Management Conference—Orlando, Florida: January 31-February 3, 2008. Organizer: Emergency Medicine Learning and Resource Center. The 29th Annual International Disaster Management Conference has been designed to meet the educational needs of all persons and agencies involved with emergency preparedness, response, and disaster recovery. This year's Planning Committee acknowledges the unique role that the myriad of first responders, response agencies, and communities play in planning for, responding to, and mitigating disasters. All persons and agencies involved with emergency preparedness, management, and response are invited to attend.

info@emlrc.org
www.emlrc.org/disaster2008.htm

Cat Modeling 2008—Tampa, Florida: February 19-22, 2008. Organizer: The Reinsurance Association of America (RAA). The 2008 Catastrophe Modeling seminar explores the use of models, how their use impacts the decision-making process, and how past events impact both the primary and reinsurance markets in subsequent years. With an unbiased perspective of all catastrophe modeling applications, as well as an open forum for developing methods to confidently make modeling-based decisions, the 2008 seminar will provide attendees with a wealth of information to provide them with a greater level of confidence when using modeling technology to estimate

the financial impact of natural catastrophes and other extreme events.

meetings@reinsurance.org
www.reinsurance.org

2nd International Joint Topical Meeting on Emergency Preparedness and Response & Robotics and Remote Systems—Albuquerque, New Mexico: March 9-12, 2008. Organizer: American Nuclear Society. This bi-annual conference is a forum for the discussion of the social, regulatory, scientific, and technical aspects of emergency management and robotics for hazardous environment applications.

registrar@ans.org
http://cimar.mae.ufl.edu/rrsd

Search and Rescue (SAR) 2008—Bournemouth, UK: March 18-20, 2008. Organizer: The Shephard Group. This meeting brings together world leaders in Civil and Combat Search and Rescue and provides delegates with the opportunity to hear their perspectives and priorities for saving lives and for rescue mission success.

afh@shephard.co.uk
www.shephard.co.uk/Events

Spring World 2008—Orlando, Florida: March 30-April 2, 2008. Organizer: Disaster Recovery Journal (DRJ). The purpose of this conference is to guide planning professionals through the complications and challenges of contingency planning, focusing on resilience and recovery. Industry experts will share their expertise and knowledge. This year's meeting will offer attendees more than 40 sessions, workshops, and courses, as well as mock disaster exercises, an exhibit hall, receptions, and networking breakfasts and lunches.

drj@drj.com
www.drj.com/conferences/orl2008/

2008 National Hurricane Conference—Orlando, Florida: March 31-April 4, 2008. Organizer: National Hurricane Conference Planning Committee. The primary goal of this conference is to improve hurricane preparedness, response, recovery, and mitigation in order to save lives and property in the United States and the tropical islands of the Caribbean and Pacific. In addition, the conference serves as a national forum for federal, state, and local officials to exchange ideas and recommend new policies to improve emergency management.

mail@hurricanemeeting.com
www.hurricanemeeting.com

Resilience 2008: Resilience, Adaptation, and Transformation in Turbulent Times—Stockholm, Sweden: April 14-16, 2008. Organizers: Resilience Alliance, Royal Swedish Academy of Sciences, International Council for Science, Stockholm Resilience Centre, Stockholm Environment Institute, and Beijer Institute of Ecological Economics. The organizers of the Resilience 2008 conference agree with the findings of the Millennium Ecosystem Assessment that the capacities of societies to manage the earth's ecosystems are not evolving quickly enough. This conference aims to explore the extent to which human societies are adapting their capacity for learning and foresight to deal with new global challenges. The framework of the conference emphasizes the following: society and nature represent truly interdependent social-ecological systems; social-ecological systems are complex adaptive systems; and cross-scale and dynamic interactions represent new challenges for governance and management in relation to interdependent social-ecological systems and ecosystem services.

chris@beijer.kva.se
www.resilience2008.org

2008 Meeting of the AAG—Boston, Massachusetts: April 15-19, 2008. Organizer: Association of American Geographers (AAG). This annual meeting attracts more than 6,500 geographers and related professionals from the United States, Canada, and abroad and stimulates discussion about research, education, accomplishments, and developments in geography.

meeting@aag.org
www.aag.org/annualmeetings/2008/index.htm

Seismological Society of America (SSA) 2008 Annual Meeting—Santa Fe, New Mexico: April 16-18, 2008. Organizer: Los Alamos National Laboratory. The 2008 meeting will provide a stimulating exchange of research on a wide range of topics with professionals from all over the world. Oral presentations, poster sessions, exhibits, field trips, business meetings, and social gatherings will provide members the opportunity to meet and share with their peers. This year's meeting is being hosted by Los Alamos National Laboratory in cooperation with other Rio Grande institutions, including New Mexico Institute of Mining and Technology, Sandia National Laboratory, and the University of Texas at El Paso.

tabitha@seismosoc.org
www.seismosoc.org/meetings/2008/index.html

4th International i-Rec Conference—Christchurch, New Zealand: April 30-May 2, 2008. Organizer: University of Canterbury. Following the success of previous conferences in Montreal 2002, Coventry 2004, and Florence 2006, the 4th International i-Rec (International Group for Research and Information on Post-Disaster Reconstruction) Conference theme will be "Building Resilience: Achieving Effective Post-Disaster Reconstruction." The i-Rec Conference brings together researchers and practitioners from a diverse range of professional disciplines, including civil engineering, architecture, urban planning, international development, humanitarian aid, and sociology.

i-rec2008@uco.canterbury.ac.nz
www.resorgs.org.nz/irec2008/

4th International Geosphere-Biosphere Programme (IGBP) Congress 2008—Cape Town, South Africa: May 4-9, 2008. The theme for this congress will be Sustainable Livelihood in a Changing Earth System. The overall objectives are to seek advice in order to refine the IGBP scientific agenda for 2008–2013; to begin the mid-term synthesis in light of International Council for Sciences' (ICSU) IGBP review; to

broaden outreach efforts toward agencies, corporations, and civil society by developing communication tools that deal with risk and vulnerability in global change; and to question where IGBP work is contributing to the effort needed to address mitigation and adaptation, large-scale pilot projects on sustainability science, and specific institutional networking among its user communities.

www.igbp.net

16th Annual VOAD (Voluntary Organizations Active in Disaster) Conference—Little Rock, Arkansas: May 5-8, 2008. Organizer: National Voluntary Organizations Active in Disaster. The theme of this year's conference is "Pathways to Partnership." Preconference meetings will take place on Monday and Tuesday, and kick-off events begin on Tuesday night. The meeting will include "Talkshops"—facilitated discussions around topics of interest.

info@nvoad.org
www.nvoad.org/annualconf1.php

7th UCLA Conference on Public Health and Disasters—Torrance, California: May 18-21, 2008. Organizer: UCLA Center for Public Health and Disasters. This multidisciplinary conference will unite academicians, researchers, practitioners, and policy makers from public health, mental health, community disaster preparedness and response, social sciences, government, media, and non-governmental organizations to study the public health consequences of natural and intentional disasters. The conference seeks to provide an annual forum that promotes a dialogue and exchange of ideas between local health departments and others involved in improving emergency public health preparedness, mitigation, response, and recovery. It is designed for public health professionals as well as individuals and organizations from both the public and private sectors involved in emergency public health preparedness and response. Topics will be relevant to public health and medical practitioners, emergency medical services professionals, researchers, and managers involved in the wide range of emergency public health issues resulting from natural and human-generated disasters.

cphdevents@ucla.edu
www.cphd.ucla.edu

Association of State Floodplain Managers (ASFPM) Annual Conference—Reno-Sparks, Nevada: May 18-23, 2008. Organizer: Association of State Floodplain Managers. With the theme, "A Living River Approach to Floodplain Management," this comprehensive conference will showcase the state-of-the-art in techniques, programs, resources, materials, equipment, accessories, and services to accomplish flood mitigation and other community goals. Nonprofit, government, business, and academic sectors will share how they successfully integrate engineering, planning, open space, and environmental protection all over the nation and world to prepare for a better, sustainable future.

memberhelp@floods.org
www.floods.org/Reno-Sparks

6th National Seismic Conference on Bridges and Highways—Charleston, South Carolina: July 27-30, 2008. Organizers: Federal Highway Administration (FHWA), Transportation Research Board (TRB), South Carolina Department of Transportation (SCDOT), and the Multidisciplinary Center for Earthquake Engineering Research (MCEER). This conference aims to help others understand and mitigate damage to the nation's highway infrastructure caused by earthquakes and other natural hazards. Potential topics include lessons learned from recent earthquakes and other extreme events, seismic-induced earth pressure loads, liquefaction and mitigation strategies, international technologies and practices, emerging seismic design and retrofit technologies, and performance criteria and economic considerations.

jso7@buffalo.edu
www.scdot.org/events/6NSC/

2007 Workshop Materials Now Available Online

Each summer, hazards researchers and professionals from federal, state, and local government, nonprofit organizations, and private industry convene in Boulder, Colorado, for the Natural Hazards Center's Annual Hazards Research and Applications Workshop. Participants debate, explore, and share information on a wide range of issues. This year's workshop included discussion of the legacy of Gilbert F. White, social vulnerability, the National Flood Insurance Plan evaluation, pets in disasters, and much more.

Keynote and plenary presentations, brief session summaries, abstracts of research and projects presented, and photographs taken at the event are now available online at www.colorado.edu/hazards/workshop/archives/2007/.

Natural Hazards Center Unveils New Online Publication

The Natural Hazards Center is proud to announce a new electronic publication titled *Research Digest*—a quarterly online compilation of recent research related to hazards and disasters. The aim of *Research Digest* is to advance and communicate knowledge on hazard mitigation and disaster preparedness, response, and recovery within an all-hazards, interdisciplinary framework. It provides the complete references and abstracts (when available) for current research in the field.

The first issue includes more than 125 articles cataloged between April and mid-August. Additional issues will follow in December and March. The issues are compiled and edited by Center staff and include more than 35 peer-reviewed publications. Check out the first issue online at www.colorado.edu/hazards/rd.

Farewell Greg!

In early fall, the Natural Hazards Center said goodbye to Greg Guibert, the Center's program manager. During his three-and-a-half years at the Center, Greg planned and organized the annual workshop, oversaw the day-to-day operation of the Center, and supervised staff activities related to the Center's library, publications, and Web site. In addition to developing new and innovative information dissemination tools, Greg worked to bring critical social issues in hazards to the forefront of Congressional decision makers, hazards researchers, practitioners, and the community at-large. His dedication to the Center's program and information clearinghouse functions will not be forgotten.

We wish Greg well and good luck in his future endeavors!

World Climate Map Updated

Although it is now over 100 years old, the Köppen-Geiger system of climate classification is still widely used by teachers and researchers. Developed in the 1800s, it assigns the climate at any particular location to one of five general categories (tropical, arid, temperate, cold, or polar) and adds subdivisions based on annual temperature and precipitation. When this system was first created, the global distribution of weather stations was inconsistent, and mapping techniques were relatively crude.

Now, Murray C. Peel, a geographer at the University of Melbourne in Australia, has updated the Köppen-Geiger system and produced a new global climate map based on data from more than 4,200 weather stations that have been collecting precipitation and temperature data for at least 30 years. According to the new map, the most common climate type by land area is Hot desert (14.2% of total land area), followed by Tropical savannah (11.5% of total land area).

An article authored by Peel and co-authors Brian Finlayson and Tom McMahon on the updated system, titled *Updated World Map of the Köppen-Geiger Climate Classification*, was published in a recent issue of the journal *Hydrology and Earth System Sciences*. The paper discusses some problems related to dealing with sites that are not uniquely classified into one climate type by the Köppen-Geiger system and assesses the outcomes on a continent by continent basis. The abstract, full paper, and the updated map as an image file (.jpg) and as a raster file (ArcMap) can be downloaded for free at **www.hydrol-earth-syst-sci.net/11/1633/2007/hess-11-1633-2007.pdf**. Also available at this site are files containing the precipitation and temperature variables for all stations used in the construction of the updated map.

Natural Hazards Observer
ISSN 0737-5425
Printed in the USA.
Published bimonthly.

The *Observer* is free to subscribers within the United States. Subscriptions outside the United States cost $24.00 per year. Back issues of the *Observer* are available for $4.00 each, plus shipping and handling. Orders must be prepaid. Checks should be payable to the University of Colorado. Visa, MasterCard, and American Express cards are also accepted.

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/

Please:

- ☐ Add my name to the *Observer* mailing list
- ☐ Delete my name*
- ☐ Change my address*

*Return this original form (with address label on reverse)

Name: _____

Mailing Address: _____

_____

Phone: _____

Fax: _____

E-mail: _____

Affiliation: _____

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 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.

Staff

Duke W. Austin ..... Research Assistant
Christine Bevc ..... Research Assistant
RoseMarie Perez Foster ..... Visiting Scholar
Brandi Gilbert ..... Research Assistant
Wanda Headley ..... Library Manager
Alexandra Jordan ..... Research Assistant
Erica Kuligowski ..... Research Assistant
Dennis S. Mileti ..... Senior Research Scientist
Corey Reynolds ..... Program Associate
Liesel A. Ritchie ..... Research Associate
Laurie Schmidt ..... *Observer* Editor
Diane Smith ..... Office Manager
Jeannette Sutton ..... Research Coordinator
Kathleen Tierney ..... Director

Research Affiliates

Leysia Palen ..... University of Colorado at Boulder
Lori Peek ..... Colorado State University
Deborah Thomas ..... University of Colorado at Denver

Observer cartoons are drawn by Rob Pudim.

Send items of potential interest 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 **November 20, 2007**.

NATURAL HAZARDS CENTER
Natural Hazards Center
Institute of Behavioral Science
University of Colorado at Boulder
482 UCB
Boulder, Colorado 80309-0482

Change Service Requested

Non-Profit Org.
U.S. Postage
PAID
Boulder, CO 80309
Permit No. 257