

# NATURAL HAZARDS Observer

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## Reconstructing the Collapse: The Final Report on the World Trade Center Towers

— an invited comment

The final report from the most detailed examination of a building failure ever conducted was released October 26, 2005, at a hearing of the U.S. House of Representatives Science Committee on the National Institute of Standards and Technology's (NIST) investigation of the fires and collapses of New York City's World Trade Center (WTC) towers following the terrorist attacks of September 11, 2001. Featured in the report are 30 recommendations designed to improve the safety of tall buildings, their occupants, and emergency responders.

The recommendations are based on the findings and conclusions contained within 43 separate reports (totaling some 10,000 pages) that cover:

- Specific improvements to building standards, codes, and practices;
- Changes to, or the establishment of, evacuation and emergency response procedures; and
- Research and other appropriate actions needed to help prevent future building failures.

Based on nearly 500 comments received during the six-week public review period following the release of the draft WTC towers report on June 23, 2005, the reports were amended and clarified.

The specific objectives of the investigation were:

1. Determine why and how WTC 1, 2, and 7 collapsed;
2. Determine why the injuries and fatalities were so high or low depending on location, including technical aspects of fire protection, occupant behavior, evacuation, and emergency response;
3. Determine what procedures and practices were used in the design, construction, operation, and maintenance of WTC 1, 2, and 7; and
4. Identify areas in current building and fire codes, standards, and practices that warrant revision.

### Summary of Findings

#### Objective 1: Determine why and how WTC 1, 2, and 7 collapsed.

- The two aircraft hit the towers at high speed and did considerable damage to principal structural components. However, the towers withstood the impacts and would



have remained standing if not for the dislodged insulation (fireproofing) and the subsequent multifloor fires. In each tower, a different combination of impact damage and heat-weakened structural components contributed to the abrupt structural collapse.

- In WTC 1, fires weakened the core columns and caused the floors on the south side of the building to sag. The floors pulled the heated south perimeter columns inward, reducing their capacity to support the building above. As columns on the south wall buckled, neighboring columns quickly became overloaded. The top section of the building tilted to the south and began its descent.
- In WTC 2, the core was damaged severely at the south-east corner and was restrained by the east and south walls. The steady burning fires on the east side of the building caused the floors there to sag. The floors pulled the heated east perimeter columns inward, reducing their capacity to support the building above. As columns on

the east wall buckled, neighboring columns quickly became overloaded. The top section of the building tilted to the east and to the south and began its descent. WTC 2 collapsed more quickly than WTC 1 because there was more aircraft damage to the core and there were early and persistent fires on the east side of the building, where the aircraft had extensively dislodged insulation from the structural steel.

- The WTC towers likely would not have collapsed under the combined effects of aircraft impact damage and the extensive, multifloor fires if the thermal insulation had not been widely dislodged or had been only minimally dislodged by aircraft impact.
- In the absence of structural and insulation damage, a conventional fire similar to or less intense than the fires of September 11 likely would not have led to collapse.

**Objective 2: Determine why injuries and fatalities were so high or low depending on location, including technical aspects of fire protection, occupant behavior, evacuation, and emergency response.**

- Approximately 87 percent of the estimated 17,400 occupants, and 99 percent of those located below the impact floors, evacuated successfully. In WTC 1, where the aircraft destroyed all escape routes, 1,355 people were trapped on upper floors when it collapsed. Of the people below the impact floors, 107 did not survive.
- In WTC 2, before impact, about 3,000 people got low enough to escape by a combination of self-evacuation and use of elevators. After impact, the elevators and two of the three stairways were unusable. Of the people above the impact zone, 18 found a passage through the damaged third stairway and escaped. The other 619 people in or above the impact zone and 11 people below it perished.
- About 6 percent of the survivors described themselves as mobility impaired; few, however, required a wheelchair. Among the 118 decedents below the impact floors, 7 were identified as mobility challenged. The mobility of the other 111 could not be determined.
- A principal factor limiting loss of life was that the buildings were one-third to one-half occupied at the time of the attacks. Since the flow of people from both buildings had slowed considerably before collapse, the stairwell capacity was adequate to evacuate the occupants on that morning. However, if the towers had been fully occupied with 20,000 occupants each, evacuation would have taken just over three hours. About 14,000 people might have perished because of insufficient stairwell capacity. Egress capacity required by current building codes is determined by single floor calculations that are independent of building height and does not consider the time for full building evacuation.
- Due to the assembly use spaces at the top of each tower, designed to accommodate over 1,000 occupants per floor, the New York City Building Code would have required a minimum of four independent means of egress (stairs), one more than were available. Given the low occupancy level on September 11, NIST found that egress capacity from these places of assembly, and from elsewhere in the buildings, was not a significant factor. If the build-

ings had been fully occupied, the required fourth stairway would likely have mitigated the insufficient egress capacity.

- Evacuation was assisted by participation in fire drills within the previous year by two-thirds of survivors and perhaps hindered by a local law that prevented employers from *requiring* occupants to practice using the stairways. The stairways were not easily navigated in some locations due to their design, which included “transfer hallways” that evacuees had to traverse to get from one stairway to another. Additionally, many occupants were unprepared for the physical challenge of full building evacuation.
- The functional integrity and survivability of the stairwells was affected by their separation and the structural integrity of their enclosures. In WTC 1’s impact region, the stairwell separation was the smallest over the building height, and all stairwells were destroyed by the impact. By contrast, the separation of stairwells in the impact region of WTC 2 was the largest over the building height, and one of three stairwells remained marginally passable. The shaft enclosures were fire rated but were not required to have structural integrity under typical accidental loads: there were numerous reports of stairwells obstructed by fallen debris from damaged enclosures.
- The fire safety systems (sprinklers, smoke purge, and fire alarms) were designed to meet or exceed current practice. However, they played no role in life safety on September 11. The water supplies to the sprinklers were fed by a single pipe that was damaged by the impact. The smoke purge systems, designed for use by the fire department after fires, were not turned on but would also have been ineffective due to aircraft damage. The violence of the aircraft impact served as its own alarm. In WTC 2, contradictory public address announcements contributed to confusion and evacuation delay.
- For the approximately 1,000 emergency responders on the scene, this was the largest disaster they had ever seen. Despite attempts by the responding agencies to work together and perform their own tasks, the extent of the incident was well beyond their capabilities. Communications were erratic due to the high number of calls and the inadequate performance of some of the gear. Even so, there was no way to digest, test for accuracy, and disseminate the vast amount of information being received. Their jobs were complicated by the loss of command centers in WTC 7 and then in the towers after WTC 2 collapsed. With nearly all elevator service disrupted and progress up the stairs taking about two minutes per floor, it would have taken hours for the responders to reach their destination, assist survivors, and escape had the towers not collapsed.

**Objective 3: Determine what procedures and practices were used in the design, construction, operation, and maintenance of WTC 1, 2, and 7.**

- Because of the Port Authority’s establishment under a clause of the U.S. Constitution, its buildings were not subject to state or local building regulations. The buildings were unlike any others, both in height and structural innovation. Nevertheless, the design and approval

process produced two buildings that were generally consistent with nearly all the provisions of the New York City Building Code and other building codes of the time that were reviewed by NIST. The loads for which the buildings were designed exceeded the New York City code requirements. The quality of the structural steels was consistent with building specifications. The departures from the building codes and standards did not have a significant effect on the outcome of September 11.

- For the floor systems, the fire rating and insulation thickness used on the floor trusses, which together with the concrete slab served as the main source of floor support, were of concern since the initial construction. The minimum specified thickness of the insulation was adequate to delay heating of the trusses; the amount of insulation dislodged by the aircraft impact, however, was sufficient to cause the structural steel to be heated to critical levels.
- Based on four standard fire resistance tests that were conducted under a range of insulation and test conditions, NIST found the fire rating of the floor system to vary between forty-five minutes and two hours. In all cases, the floors continued to support the full design load without collapse for over two hours.
- The wind loads, which governed the structural design of the external columns and provided the baseline capacity of the structures to withstand abnormal events, such as major fires or impact damage, significantly exceeded the requirements of the New York City Building Code and other building codes of the day.

## Recommendations

The tragic consequences of the attacks on September 11 were directly attributable to the fact that terrorists flew large jet-fuel laden commercial airliners into the WTC towers. Buildings for use by the general population are not designed to withstand attacks of such severity. Building codes do not require building designs to consider aircraft impact. In our cities, there has been no experience with a disaster of such magnitude, nor has there been any in which the total collapse of a high-rise building occurred so rapidly and with so little warning.

While there were unique aspects to the design of the WTC towers and the terrorist attacks, NIST has compiled a list of recommendations to improve the safety of tall buildings, their occupants, and emergency responders based on its investigation of the procedures and practices that were used for the WTC towers. These procedures and practices are commonly used in the design, construction, operation, and maintenance of buildings under normal all-hazards conditions. Public officials and building owners will need to determine appropriate performance requirements for those buildings that are at higher risk due to their iconic status, critical function, or design.

The report features eight major groups of recommendations:

- **Increased Structural Integrity:** The standards for estimating the load effects of potential hazards and the design of structural systems to mitigate their effects should be improved to enhance structural integrity.

- **Enhanced Fire Resistance of Structures:** The procedures and practices used to ensure the fire resistance of structures should be enhanced by improving the technical basis for construction classifications, fire resistance ratings, and standard fire resistance testing methods using the “structural frame” approach to fire resistance ratings and developing in-service performance requirements and conformance criteria for sprayed fire-resistive materials.
- **New Methods for Fire Resistance Design of Structures:** The procedures and practices used in designing fire resistant structures should require an objective that uncontrolled fires result in burnout without local or global collapse. This effort should include the development and evaluation of new fire resistive coating materials and technologies and evaluation of the fire performance of conventional and high-performance structural materials.
- **Improved Active Fire Protection:** Active fire protection systems (i.e., sprinklers, standpipes/hoses, fire alarms, and smoke management systems) should be enhanced through improvements to design, performance, reliability, and redundancy.
- **Improved Building Evacuation:** Building evacuation should include system designs that facilitate safe and rapid egress, methods for ensuring clear and timely emergency communications to occupants, better occupant preparedness for evacuation during emergencies, and incorporation of appropriate egress technologies.
- **Improved Emergency Response:** Technologies and procedures should enable better access to buildings, response operations, emergency communications, and command and control.
- **Improved Procedures and Practices:** Procedures and practices used in the design, construction, maintenance, and operation of buildings should include encouraging code compliance by nongovernmental and quasi-governmental entities, adoption and application of egress and sprinkler requirements in codes for existing buildings, and retention and availability of building documents.
- **Education and Training:** The professional skills of building and fire safety professionals should be upgraded through a national education and training effort for fire protection engineers, structural engineers, architects, and building regulatory and fire-service personnel.

NIST strongly urges that immediate and serious consideration be given to these recommendations, as they relate to both new and existing structures, by the building and fire safety communities to make buildings, their occupants, and emergency responders safer in future emergencies. The recommendations call for action by specific entities regarding standards, codes and regulations (their adoption and enforcement), professional practices, education and training, and research and development. Only when each of the entities carries out its role will the implementation of a recommendation be effective.

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Download the full report for free from <http://wtc.nist.gov/>.

## Call for Papers: Annual Hazards and Disasters Student Paper Competition

The Natural Hazards Center is pleased to announce its third Annual Hazards and Disasters Student Paper Competition for undergraduate and graduate students. Submissions may be theoretical arguments, case studies, literature reviews, or descriptions of research results on topics relevant to the social/behavioral aspects of hazards and disasters, natural, technological, or otherwise. Topics may include, but are not limited to, Hurricane Katrina, the South Asia earthquake, climate change, warning systems, natural hazards mitigation, land use, women and children in disasters, disaster myths, or the transport of hazardous materials. Papers will be judged on their originality, organization, and demonstrated knowledge of the topic. One undergraduate and one graduate winner will each receive \$100; a mention in the *Natural Hazards Observer*; publication on the Natural Hazards Center Web site; an invitation to the Annual Hazards Workshop in Boulder, Colorado, registration fees included; and the opportunity to present their work at the workshop's poster session.

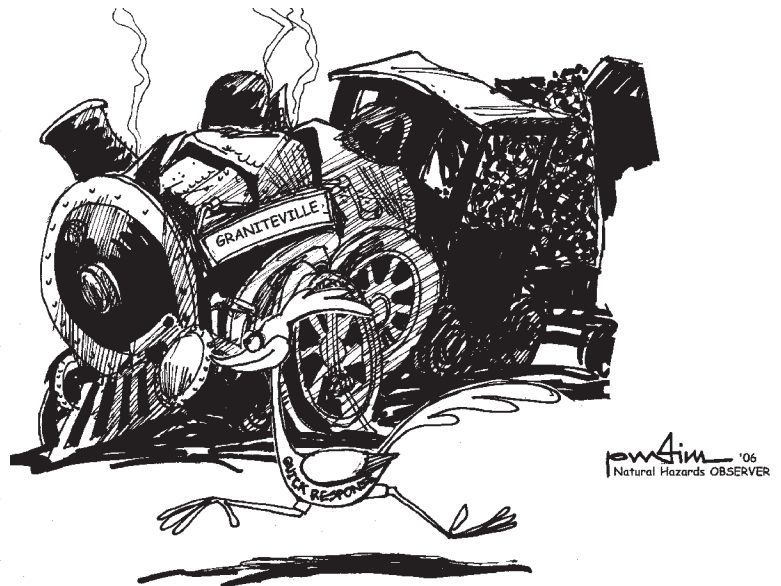
The deadline for submissions is Friday, April 7, 2006. Additional information, including eligibility criteria and submission guidelines, is available online at <http://www.colorado.edu/hazards/SPC/>. Any questions/inquiries should be directed to *Christine Bevc* at [christine.bevc@colorado.edu](mailto:christine.bevc@colorado.edu).

### New Quick Response Report from the Natural Hazards Center

The following Quick Response report is now available from the Natural Hazards Center. The report can be accessed online at <http://www.colorado.edu/hazards/qr/qrrpts.html>.

QR178 *Evacuation Behavior in Response to the Graniteville, South Carolina, Chlorine Spill*, by Jerry T. Mitchell, Andrew S. Edmonds, Susan L. Cutter, Mathew Schmittlein, Reggie McCarn, Michael E. Hodgson, and Sonya Duhé. 2005.

This research project focused on the evacuation behavior and media response following the Graniteville, South Carolina, train accident of January 6, 2005. Based on survey results, the researchers found that evacuation and notification disparities existed, there was some uncertainty about location in respect to the evacuation zone, there were a few differences in the timing and execution of the evacuation order in terms of household demographics, and a substantial evacuation shadow occurred. In regards to the media response, local and regional media coverage of the event, which emphasized personal stories over expert interviews, was found to be extensive; national coverage was more limited, both in print and on television.



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The Natural Hazards Center would like all hazards and disaster authors to remember to send us their published books and articles. We promise to give them a good home among the other works that comprise our extensive collection of documents on human adaptation to hazards and related events. As an added incentive, abstracts of works (and links to full text if available) will be included in our online bibliographic database, HazLit, for other researchers, practitioners, and individuals with an interest in hazards and disasters to access. If you are not sure if we have already included your publication in our collection, you can search for it on HazLit at <http://ibs.colorado.edu/hazards/Library/Hazlit/NatHazSearch.php>. For more information about the Natural Hazards Center's Library and how it can be of use to you, visit <http://www.colorado.edu/hazards/library/>.

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## The Paradox of Social Capital as a Liability in Disaster Management: Understanding the Evacuation Failure of Hurricane Katrina

As I drove around my hometown in Southern California, I listened intently to the radio newscaster's words: "category five hurricane . . . mandatory evacuation . . . breach in the levees." I imagined the citizens of New Orleans fleeing their homes in the face of such clear warnings of imminent danger. However, as the disaster unfolded, the nation was horrified to learn that a significant number of the citizens of New Orleans did not leave the city, and that many people had been trapped in their homes without the physical or financial resources to evacuate.<sup>1</sup>

Ten days later, as part of a research project, I found myself talking with Katrina evacuees living in the Houston Astrodome. I expected each one to tell me what I had heard on the radio—that he wanted to leave but did not have the means to do so. I was very surprised to hear from many people that they did have access to a car and enough money to leave but had consciously decided not to evacuate.

My initial reaction was disbelief. What could motivate someone to make such a seemingly unreasonable choice? Did they not hear the same warnings that had been coming from my radio? However, as I listened to their stories, I began to see the situation through their eyes and realized that staying in New Orleans was, to them, a very reasonable choice.

Imagine yourself as a single parent of three children, working forty hours a week at two part-time jobs and receiving just over a thousand dollars per month in income without benefits. You are able to make ends meet because you live with your mother and grandmother. Your grandmother has some health problems and has trouble getting around, so you help take care of her, too. With everything you have to do to hold it all together, you do not hear about the approaching hurricane until two days before it is predicted to arrive.

Over dinner you talk about the approaching storm. You mention that the news is saying that people should evacuate. Your mother says, "that's nothing new." It seems that every year or so a storm is predicted to be bad, and everyone is told to evacuate; then it turns at the last minute and everything is fine. Your grandmother says she has never evacuated for a storm in her life, including 1965's Hurricane Betsy, and she is not about to start now. She has lived in this house for 50 years and has never seen more than a little water come in the door—nothing that cannot be handled. Anyway, your neighborhood is not known for flooding. You are reassured by your mother and grandmother. Besides, evacuating would mean missing work tomorrow, and you cannot really afford to do that.

The next day, on the way home from work, you stop to get supplies for the storm. That night you are busy cooking up a small feast. The stove will probably be out for a few days, so it is best to prepare food beforehand. You cook extra because your sister and her children are coming to stay with you through the storm. It is in this fashion that

your family has been handling these storms for as long as you, your mother, or your grandmother can remember.

The next morning, with the hurricane less than 24 hours from expected landfall, your sister tells you that the newscasters are "trying to scare us" by calling the evacuation "mandatory." Mandatory? Now it actually does sound serious. Maybe evacuating would be a good idea. So you turn on the television and see the long line of cars stuck on the highway. Not everyone can fit in your car, so you and your sister would have to drive separately. Additionally, your sister does not really want to leave and would have to rely on you for gas money. You do not know anyone outside the city and have only left it a handful of times as an adult. You do not know where to go and the newscaster provides no directions except the order to leave your home. It appears that if you leave, you will be on your own.

You talk over the situation with your mother. She points out that you might get into an even worse situation if you evacuate. A few years ago your neighbor tried to evacuate, spending every nickel she had on gas and food for the road. Then, she got stuck in traffic, and all the hotel rooms that she could afford were full. She rode out the storm with her family in their car. And, it turned out the authorities were wrong; the hurricane missed New Orleans almost entirely. It would have been better for them to have stayed in their house and not wasted all that money.

The newscaster talks about going to the Superdome. Your sister immediately vetoes the idea. She heard that people got stuck in the Superdome for three days during the last hurricane. Then, your grandmother declares, "I'm not going anywhere." Well, that pretty much settles it. You are worried, but what are you going to do—hop in your car and leave your family behind? Besides, your family does not seem to think it is going to be that bad, and they are probably right. You turn off the television because it is only making you more nervous.

This story is illustrative of those I heard from the evacuees living in the Houston Astrodome. With the clarity of hindsight, the decision seems simple. But these stories made me realize how complex the situation really was. Financial concerns were a part of the problem, but not the entirety. Mixed in to the decisions were issues of shared norms, local cultures and traditions, responsibilities to social networks, and a collective history leading to trusting one's network rather than the authorities.

These nonfinancial elements are aptly described by the sociological construct of "social capital," defined by Pierre Bourdieu as the resources that can be derived through one's social network.<sup>2</sup> The public health community usually thinks of social capital as an important component of health promotion.<sup>3</sup> However, the management literature also points out that there are risks to social capital, namely "overembeddedness."<sup>4</sup> Although the sharing of resources is a key aspect of social capital, it may also lead to the

stretching of limited resources so thinly that the group cannot take effective action. Group decision making, with its inherent inefficiencies, replaces that of individuals.<sup>4</sup>

This paradox was previously documented in the disaster literature with the case of the 1997 Canadian Red River flood. In this instance, investigators found that strong social capital resulted in “decentralized decision making,” thereby inhibiting effective and efficient decisions.<sup>5</sup> In what can now be seen as foreshadowing of the current tragedy, the authors noted that this phenomenon “may have had serious negative consequences had the ring dike been breached.”

In addition to the issue of inefficient decision making, another problem of an overembedded social network is that of the individual relying on his network for information and directions rather than listening to external sources, such as the government or other authority figures.<sup>4</sup> This phenomenon was described in Mark Granovetter’s seminal 1973 paper, “The Strength of Weak Ties.”<sup>6</sup> Granovetter categorized social ties as either “strong,” in the case of family and close friends, or “weak,” in the case of casual acquaintances. Although a society may be rich in strong ties, the strength of those ties may actually result in a paucity of weak ties. Having few weak ties results in limiting one’s exposure to the breadth of information that is provided via a broader social network.<sup>7</sup> In the stories told to me by Hurricane Katrina victims, the potentially disastrous effects of lacking these weak ties were vividly illustrated.

In a 2002 World Bank Report, Ben Wisner discussed using the term social capital in a second way: “the extent that . . . CBOs (citizen-based organizations) can provide a bridge between the formal agencies of disaster management in governments and urban dwellers.”<sup>8</sup> As we seek lessons from the evacuation failure of Hurricane Katrina, it is important that we incorporate this view of social capital into our research and policy priorities. By engaging community-based organizations, such as religious institutions and grass roots social groups, we will establish the vitally needed “bridging” ties that will help us reach into the com-

munity and exchange information that is needed to prepare for and respond to future disasters.

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<sup>1</sup>Colton, C.E. 2005. Why wasn’t New Orleans better prepared? Interview with Craig E. Colton. By Renee Montagne. *Morning Edition*, National Public Radio September 2, 2005.

<sup>2</sup>Bourdieu P. 1985. The forms of capital. In *Handbook of theory and research for the sociology of education*, ed. J. Richardson. New York: Greenwood.

<sup>3</sup>Lomas J. 1998. Social capital and health: Implications for public health and epidemiology. *Social Science and Medicine* 47 (9): 1181-88.

<sup>4</sup>Adler P., and S.W. Kwon. 1999. Social capital: The good, the bad, and the ugly. Modified version of paper presented at the 1999 Academy of Management meeting, Chicago.

<sup>5</sup>Buckland J., and M. Rahman. 1999. Community-based disaster management during the 1997 Red River flood in Canada. *Disasters* 23 (2): 174-91.

<sup>6</sup>Granovetter, M. 1973. The strength of weak ties. *American Journal of Sociology* 78 (6): 1360-80.

<sup>7</sup>Granovetter, M. 1983. The strength of weak ties: A network theory revisited. *Sociological Theory* 1:201-33.

<sup>8</sup>Wisner, B. 2002. Disaster risk reduction in megacities: Making the most of human and social capital. In *Building safer cities: The future of disaster risk*, ed. Alcira Kreimer, Margaret Arnold, and Anne Carlin. Washington, DC: The World Bank.

## Disability and Aging Populations: Katrina’s Lessons for the Future

Although local, state, regional, and federal government agencies play a major role in disaster planning and response, traditional government response agencies are often ill equipped to meet the needs of disability and aging populations during emergencies. The typical approach to delivery of emergency services is not designed to provide the essential help required by these segments of our country’s population. To fill the gap, a network of disability and aging-specific organizations utilize government and private sector resources to serve their clientele. There is no single organization that is capable of serving everyone. This network of providers represents a vast array of national, state, regional, and local human and social service organizations; faith-based organizations; and neighborhood associations.

Compelled by the attacks of September 11, 2001, the National Organization on Disability (NOD) launched the

Emergency Preparedness Initiative to ensure that emergency managers address disability concerns and that people with disabilities are included in all levels of emergency preparedness, response, and recovery. When Hurricane Katrina provided the opportunity to examine the progress on this front, the NOD deployed four assessment teams to investigate the status of response and recovery for the disability and aging populations.

The Special Needs Assessment for Katrina Evacuees (SNAKE) project was conducted quickly to identify and review systemic points of weakness and opportunities for immediate actionable corrections to alleviate suffering during the response. It was an extremely time-sensitive operation as the opportunity to capture data and accounts would dissipate as shelters began to close. This article provides a brief glimpse into the findings and experiences of the teams.

## SNAKE Team Findings

SNAKE teams met with 26 individuals from 18 shelters (American Red Cross and others), 4 community-based organizations, and 8 emergency operations centers. The teams gathered data on gaps in short-term response efforts and on long-term recovery needs. They also collected information to support or disprove “stories” that emerged from the disability and aging communities.

Among other findings, the teams reported that:

- 54 percent of the shelters did not have working agreements with disability and aging-specific organizations prior to the event;
- 85.7 percent of the community-based groups did not know how to link with the emergency management system;
- Less than 30 percent of the shelters had access to American Sign Language interpreters;
- 80 percent of the shelters did not have TTYs (telecommunications devices for the deaf), 60 percent did not have televisions with open caption capability; and
- Only 56 percent of shelters had areas where oral announcements were posted for reading.

## Immediate and Long-Term Issues

Using an evaluation tool created by the SNAKE Analytical Team, the ground teams assessed shelter conditions as related to disability and aging populations. The survey was organized into four major areas: sheltering; management, policies, and training; resources; and community-based organizations. The following issues are based on the analysis and information available to the teams while conducting the assessments.

**Disability, Activity Limitations, and Aging Issues Addressed through Medical Model:** Assistance provided to disability and aging populations often over emphasizes medicine instead of independent living or advocacy models. This perspective caused some people to be separated from families and support networks and transferred unnecessarily to medical shelters or nursing homes. Other people with special needs were not identified because of the lack of trained eyes as well as the lack of or inadequate screening questions. As a result, some individuals’ conditions deteriorated to the point where they did require transfer to a hospital, nursing home, or medical shelter. Early response service coordination offered through disability literate organizations could have prevented many of these transfers.

**No Use and Under-Use of Disability and Aging Organizations:** The immediate Katrina response reflected poor use of disability and aging-specific organizations. There often is not a designated entity or individual responsible for coordinating disability and aging issues. Each community-based organization that was interviewed reported difficulty in gaining access to emergency management authorities to coordinate response and service delivery. This can lead to well intentioned but misguided actions that further complicate response and recovery activities.

**Emergency Information Needed in an Accessible Format:** Broadcasters and public emergency management

agencies continue to fall short in their responsibilities to modify their information procedures. The Federal Communications Commission (FCC) requires that information, including the critical details, be accessible by members of the disability community in times of emergency.

**Service Coordination:** Many people need assistance with activities of daily living (i.e., dressing, feeding, toileting, decision making, planning) and, in some cases, primary medical care. Additionally, some require help with arranging services and coordinating among multiple providers. Hurricane Katrina’s large-scale displacement interrupted the networks of support for individuals with disabilities. These individuals must now form new networks and find sources of knowledge in new environments with limited contacts and little awareness of local resources while also scrambling to meet other essential needs, such as housing and access to food.

**Cross Training:** Disability and aging-specific advocates and service providers need to strengthen their understanding of local and state emergency management systems. To improve effectiveness, they need a quick orientation to emergency management organizations and structure and the roles of traditional recovery organizations such as the Federal Emergency Management Agency (FEMA), the American Red Cross, and other voluntary agencies active in disaster. Likewise, emergency managers need to strengthen their understanding of disability and aging populations and how their needs are best met in an emergency.

The misguided impression that aging and disability issues are not of concern to general shelter managers was mentioned by several shelter managers. There must be a realization that all shelters, emergency managers, and disaster relief centers serve disability and aging populations even if this responsibility is not specifically articulated in their task assignment or mission statement. There are a number of disability-specific needs that are not burdensome that shelter staff can be trained to perform. Many people with disabilities do not need medical shelters or segregated services. However, many of them do need a variety of complex, and sometimes not well understood, community services to get their lives back on track.

**Durable Medical Equipment:** People with disabilities were sometimes forced to leave expensive durable medical equipment (e.g., augmentative communication devices, wheelchairs, walkers, respirators) at airports, bus loading areas, shelters, etc. Customized power chairs alone can cost up to \$40,000.

**Finding Accessible, Affordable, Safe Housing and Communities:** Finding accessible, affordable, safe housing and communities has never been easy for people who live with mobility and activity limitations. Even before Katrina, there was a serious shortage of housing options for people with disabilities. Post-Katrina, finding temporary and permanent housing and communities will be even more difficult.

To address the above issues, the SNAKE report makes the following recommendations:

- Utilize the skill sets and expertise of disability and aging-specific organizations.

- Assist people in quickly replacing critical durable medical equipment and essential medications to return them to their typical level of functioning as soon as possible so they can manage independently in a general population shelter and in temporary housing.
- Continue to provide services, support benefits, and programs, including Medicaid, to maintain the integrity of the family unit and to allow individuals to live in the community as they rebuild their lives.
- Add questions during all intake processes (e.g., shelter, American Red Cross, and FEMA applications) that help to identify needs and/or issues of disability and aging individuals. This will allow for more appropriate assistance, referrals, and long-term solutions.
- Ensure that disaster relief services include federal financing to provide *medically necessary* long-term services in community settings.
- Create a team that mirrors the management structure of the National Response Plan to be put in place to support disability and aging issues.<sup>1</sup>
- Issue fines to those who do not follow FCC regulations for providing accessible emergency information.
- Increase service coordination, cross training, accessible transportation, and housing options.
- Create a stockpile of durable medical equipment.

Additional recommendations and other issues, such as the fiscal impact on disability and aging-specific organizations involved in response, disaster recovery centers, and accessible transportation, can be found in the full 16-page report, which is available at <http://www.nod.org/emergency>.

## The Use of Incident Command during Hurricane Katrina

Following the terrorist attacks on September 11, 2001, the federal government mandated that all federal, state, and local governments adopt the Incident Command System (ICS) for disaster response. Today's Incident Command System stems primarily from two versions developed in the early 1970s, the Incident Command System, developed in California by the FIRESCOPE program for the purposes of fighting forest fires, and the Fire Ground Command System, developed by the Phoenix, Arizona, Fire Department to better manage structure fires. The ICS has five major functions: command, operations, planning, logistics, and finance and administration. Through the years, firefighters have promoted this systematic and standardized approach as the best way to manage a wide variety of fires as well as other types of disasters. Nevertheless, little if any objective evidence exists to support the effectiveness of the ICS during disaster response. Thus, it seems only logical that if the ICS now drives our disaster response system, we must assess what works and what does not.

The initial focus of this quick response research was the ICS and communication issues in response to Hurricane Katrina at the federal, state, and local levels. However, the scope of the impact, extreme social disruption, and massive destruction wrought by Katrina forced us to narrow our research objective. Ultimately, we chose to examine the use of the ICS by federal agencies within the structure of

All levels of government experienced systemic failures in their efforts to respond to the needs of the disability and aging populations following Hurricane Katrina. It is time now to move from lessons learned to lessons applied. Organizations with a history of specialized service delivery to the disability and aging populations have built their reputations on unique and credible connections trusted by the people they support. Their refined skill sets and expertise offer valuable, but often overlooked, sources of knowledge. Emergency professionals and response organizations must seek out and utilize these organizations during emergency planning, preparedness, response, recovery, and mitigation activities to eliminate barriers to effective service delivery. Additionally, members of the disability and aging populations must become familiar with emergency protocols to work effectively with emergency responders before, during, and after emergencies.

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National Organization on Disability

<sup>1</sup>There must be a designated person at the federal level, reporting to the principal federal officer, to handle these issues. This person must have operational emergency management experience and must be vested with the responsibility, authority, and resources for providing overall day-to-day leadership, guidance, and coordination of federal emergency preparedness, relief, and recovery operations on behalf of disability and aging populations.

the National Response Plan (NRP) in Louisiana. Since the federal response was coordinated by the Emergency Support Functions (ESFs), we looked specifically at how the ESFs applied the ICS. The Joint Field Office (JFO) in Baton Rouge, Louisiana, housed 15 ESFs, each staffed with at least 20-25 individuals. We focused on four of these ESFs for this study and found a wide variation of ICS use. In order to protect the confidentiality of our respondents, we will not identify these ESFs in our discussion.

### Observations

Of the four ESFs we studied:

- ESF-A did not use the ICS at all;
- ESF-B did not initially use the ICS, but a couple of weeks into the event it loosely adapted its terminology;
- ESF-C generally used the overall structure and approach of the ICS; and
- ESF-D took a “by the book approach.”

Thus, despite the heavy promotion and training mandates at the federal level to use the ICS during disaster, we found that different federal ESFs took different management approaches to handle their slice of the disaster response.

ESF-A is a long established part of the federal government that has been involved in disaster issues for decades. In their view, the organization successfully manages day-



to-day events and disasters using their own management model. During the response to Katrina, they determined that their own model would work as well if not better than the ICS, and as a result did not use the ICS. Nevertheless, members of ESF-A still had extensive ICS training as required by the federal government.

ESF-B initially did not use the ICS. However, a couple weeks into the event, the managers of ESF-B decided to implement ICS terms (e.g., incident commander, finance, logistics, operations, planning) to at least give the appearance that they were using the federally mandated response system. Still, it seemed the ESF-B members in the trenches continued working as they had in previous disasters. Some knew the ICS but chose not to use it, some thought it was a bit of a joke, and others were oblivious to its purpose and nomenclature. Upper management and others within ESF-B had extensive experience managing disasters and drew upon their experiences and established ways of doing business, rather than upon the ICS, to accomplish their primary tasks.

Both ESF-C and ESF-D used the ICS. Although ESF-C used it generally, it was ESF-D's strict approach that we found particularly interesting. Team leaders ensured that communications and paperwork flowed through the system appropriately. This was emphasized when it came to requesting resources and issuing purchase orders. To facilitate ICS use, signs were hung indicating where the different functions were being conducted. Not only did ESF-D employ the ICS in general, but they applied its structure to each of the individual functions. For example, within logistics the team had an incident commander along with a finance, logistics, operations, and planning person.

Our interviews revealed additional interesting information about the use of the ICS at the federal level. First, respondents from ESFs A, B, and D commented that the ICS did not provide a "plug-in" for the information technology (IT) experts at the JFO. The IT group assisted with setting up and maintaining phones, computers, networks, and other forms of communication, working with all the ESFs, consulting companies, and others. Perhaps the IT function could fit within logistics (we must credit Chris Neal, director of Fire Protection Publications at Oklahoma State University for this observation) or it could be a more formal part of the NRP. In short, a number of respondents felt that the ICS did not provide a proper mechanism for integrating IT into the system. Second, there were over 25 volunteer organizations working together at the JFO. In some cases, these organizations were working with ESFs but had no real connection or integration within the ICS or the NRP. In our view, we need further research to determine if these plug-in issues are attributable to the ICS or the NRP. Nonetheless, despite not having proper organizational places, IT and the volunteer organizations appeared to be accomplishing their tasks within the overall system.

## Implications

Certainly, problems arose with the overall response at all levels of government, but they should not and cannot be attributed to either the use or non-use of the ICS. This

short report highlights a few issues related to the use of the ICS during disaster response. Since only some ESFs used the ICS, we cannot make a firm clear assessment as to its effectiveness. However, the fact that it was not widely employed may in itself indicate that structural barriers exist for its adoption under the National Incident Management System. For example, some ESFs have their own way of doing business during disaster that they believe to be effective. Furthermore, organizations do not change their cultures overnight, and it may also be difficult for organizations to use one organizational structure during day-to-day operations and then a totally different one during a disaster. Nevertheless, despite the barriers and differences, we noted that ESFs using different response management structures were still able to communicate with each other and work together to accomplish tasks and meet victims' needs.

We must make one comment regarding the use (or non-use) of disaster research. The disaster research community has been studying organizational response during disasters for more than half a century. The results of these many studies clearly highlight that emergent, flexible organizational structures with the capability to improvise will respond much more successfully to disasters than standard rigid bureaucratic structures. Furthermore, we know that the development, maintenance, and use of predisaster social networks are key to creating an effective disaster response. We can only hope and continue to advocate that following a future catastrophe, when our leaders decide to once again create a new federal disaster response management system, that they explicitly integrate the scientific knowledge from disaster research that has proven its validity (recognized or not) repeatedly in disasters past and present.

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and

Fire and Emergency Management Program

Department of Political Science

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For those interested in some of the more technical aspects of our data gathering, when we submitted this report, we had interviewed 19 organizational respondents who represented one of the four ESFs or who had interacted with one of them. We used semistructured open-ended questions that focused on the use of the ICS during the disaster response. We also gathered extensive documents and made observations about the ICS at the JFO. The Quick Response grant from the Natural Hazards Center provided the foundation to study more comprehensively the use of the ICS at the local, state, and federal levels following Hurricane Katrina. In October, The National Science Foundation awarded Gary Webb (also of Oklahoma State University) and David Neal a Small Grant for Exploratory Research to look more broadly at the issue of the ICS in the context of Katrina. At the time of this publication, our field team has made additional field trips to Louisiana and we are currently in the process of analyzing our data. More details of our initial research and its outcomes will be available in a forthcoming Quick Response report, which will be available from the Natural Hazards Center.



# WASHINGTON UPDATE

## 2006 Homeland Security Appropriations

On October 18, the president signed the Fiscal Year 2006 Homeland Security Appropriations Act (Public Law 109-90), providing approximately \$31.9 billion for the U.S. Department of Homeland Security (DHS) and adopting many of the organizational changes proposed by the department in July (see the September 2005 *Observer*, p. 5). Among the appropriations, the law provides \$4 billion for a new Preparedness Directorate (the president has nominated George Foresman, former assistant to the governor of Virginia for commonwealth preparedness, to lead this directorate), including:

- \$550 million for formula-based grants;
- \$400 million for law enforcement terrorism prevention grants;
- \$1.15 billion for discretionary spending (includes \$765 million for high-threat, high-density urban areas);
- \$50 million for the Commercial Equipment Direct Assistance Program;
- \$346.3 million for training, exercises, technical assistance, and other programs;
- \$655 million for firefighter assistance grants;
- \$185 million for Emergency Management Performance Grants;
- \$625.5 million for infrastructure protection and information security; and
- \$44.9 million for the U.S. Fire Administration.

For response and recovery programs and activities, the Federal Emergency Management Agency will receive \$2.6 billion, including:

- \$204 million for preparedness, mitigation, response, and recovery operations;
- \$1.77 billion for disaster relief;
- \$153 million for emergency food and shelter;
- \$200 million for flood map modernization;
- \$50 million for the National Predisaster Mitigation Fund; and
- \$34 million for the National Disaster Medical System.

The appropriations act and the accompanying conference report (109-241), which contains more details, are available in any federal repository library and on the Library of Congress Web site at <http://thomas.loc.gov/>.

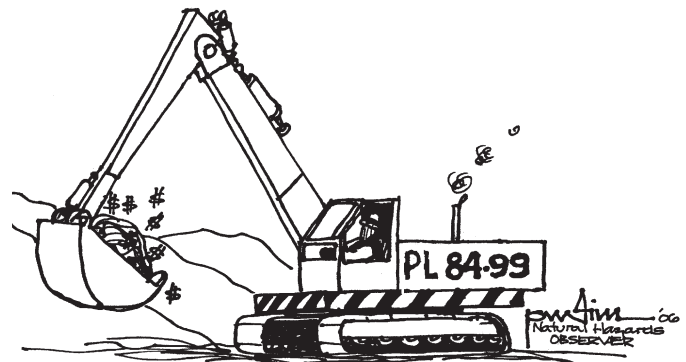
## Laws Increase Borrowing Authority for NFIP

On November 21, the president signed the National Flood Insurance Program Further Enhanced Borrowing Authority Act of 2005 (Public Law 109-106), temporarily allowing the National Flood Insurance Program (NFIP) to borrow up to \$18.5 billion to settle flood insurance claims during the unprecedented 2005 claims year. An amendment made to the National Flood Insurance Act of 1968 in September (Public Law 109-65) increased the borrowing authority from \$1.5 billion to \$3.5 billion through fiscal year 2008. The new law further increases this authority, the total amount that the director of the Federal Emergency Management Agency may borrow from the Treasury, with the president's approval, to carry out the flood insurance program, to \$18.5 billion. Both laws can be found in any federal repository library and on the Library of Congress Web site at <http://thomas.loc.gov/>.

## Corps to Fully Fund Rebuilding of New Orleans Levees

According to a decision from the assistant secretary of the Army for Civil Works, the rebuilding of the New Orleans levees will move forward at full federal expense. The restoration will be accomplished under the emergency authority of Public Law 84-99 and will provide for the coordinated restoration of the hurricane, flood, and storm damage reduction projects to prestorm conditions.

Under normal cost sharing, nonfederal sponsors, who in this case are the levee boards for each parish, would be required to pay a total of approximately \$249 million to repair these facilities. In light of the devastation to the city of New Orleans, this decision will relieve the burden from the



local sponsors of providing funding and will allow the U.S. Army Corps of Engineers to move expeditiously toward restoring a prestorm level of protection.

In related news, the Corps is releasing available data relevant to the performance of the hurricane and storm protection system around New Orleans during Hurricane Katrina. This data is available at <https://ipet.wes.army.mil/>. Additional data will be added as it becomes available.

### **FY 2006 PDM Grant Applications Now Being Accepted**

The application period for the Federal Emergency Management Agency's (FEMA) Predisaster Mitigation (PDM) program for fiscal year (FY) 2006 is open as of November 21, 2005. The deadline for FY 2006 PDM grant applications to be submitted to FEMA is 11:59:59 p.m. Eastern Standard Time on March 3, 2006.

The PDM program provides funds to states, territories, Indian tribal governments, and communities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. Funding these plans and projects reduces overall risks to the population and structures while also reducing reliance on funding from actual disaster declarations. PDM grants are awarded on a competitive basis and without reference to state allocations, quotas, or other formula-based allocation(s) of funds. Congress has appropriated \$50 million for competitive grants, technical assistance, and program support for the FY 2006 PDM program.

Availability of PDM funds is dependent upon congressional reauthorization of the program, expected by December 31, 2005. The deadline for having a FEMA-approved mitigation plan to be eligible to receive an FY 2006 PDM program project grant is April 14, 2006.

Applicants must use the electronic grants (eGrants) management system at <https://portal.fema.gov/> to submit a PDM grant application. The FY 2006 PDM program guidance documents provide information and guidance on implementing the PDM program in FY 2006, including program requirements, eligibility, and grants management. These guidance documents may be downloaded at <http://www.fema.gov/fima/pdm.shtm>.

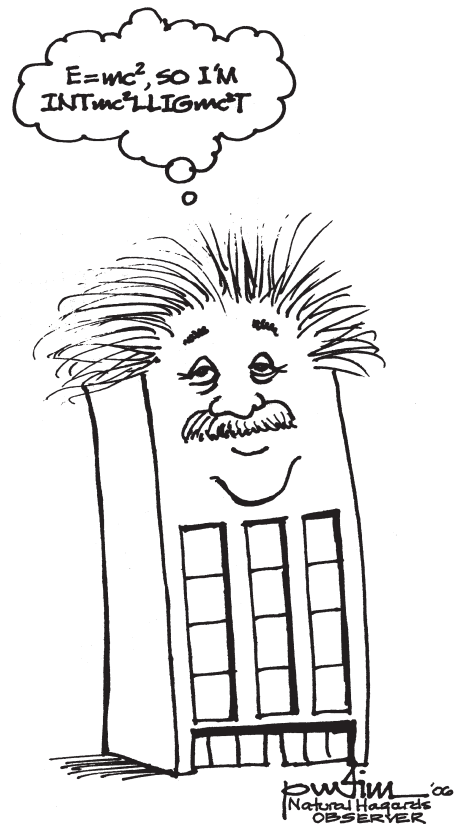
### **FDIC Chairman to Lead Gulf Coast Federal Recovery and Rebuilding**

On November 1, Michael Chertoff, secretary of the U.S. Department of Homeland Security, in consultation with the president, appointed Federal Deposit Insurance Corporation (FDIC) chairman Donald E. Powell as coordinator of recovery and rebuilding in the Gulf Coast region. As coordinator, Powell will report to the president through Chertoff and be responsible for developing specific goals and coordinating policies and programs for mid- to long-term federal recovery and rebuilding efforts in response to Hurricanes Katrina and Rita. He will serve as the administration's primary point of contact regarding these efforts with Congress, state and local governments, the private sector, and community leaders and is expected to coordinate federal involvement in support of state and local gov-

ernments on issues ranging from economic development to infrastructure rebuilding.

### **Smart Buildings to Guide Future First Responders**

The best response to a building emergency is a fast and informed one. To achieve these objectives, the National Institute of Standards and Technology (NIST) is working with the building industry and the public safety and information technology communities to determine how "intelligent" building systems can be used by firefighters, police, and other responders to accurately assess emergency conditions in real time.



NIST is working with industry to develop standards to allow manufacturers to create intelligent building systems that use various types of communication networks (including wireless networks) to assist responders in assessing and mitigating emergencies. The systems would send information, such as building floor plans and data from motion, heat, biochemical, and other sensors and video cameras, directly to fire and police dispatchers who can then communicate detailed information about the scene to the responders. Building sensor information includes the status of a specific building's mechanical systems, elevators, lighting, security system, and fire systems as well as the locations of building occupants and temperature and smoke conditions.

NIST has released video presentations that demonstrate how an intelligent building response program would work. The videos outline team efforts to create a system of interoperable data content and communications standards linking responders with the building systems. Information

on the program and the downloadable video presentations are available at <http://www.bfrl.nist.gov/ibr/>.

## Annual Stafford Act Updates

Under the authority of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, each year the Federal Emergency Management Agency (FEMA) adjusts the statewide per capita impact indicator (per capita cost of a disaster that qualifies a state for disaster assistance) and reexamines the maximum dollar amounts available for assistance under the Individuals and Households Program (IHP) and for Small Project Grants to state and local governments and private facilities. This year's adjustments are based on an increase in the Consumer Price Index for All Urban Consumers, as published by the U.S. Department of Labor, of 3.6 percent. For any single disaster or major emergency declared on or after October 1, 2005, the statewide impact indicator is \$1.18 (the countywide indicator is \$2.94), the maximum amount of IHP financial assistance provided to an individual or household is \$27,200, the maximum amount of repair assistance is \$5,400, the maximum amount of replacement assistance is \$10,900, and the maximum amount of any Small Project Grant is \$57,500.

Details about these revisions are available in the October 7, 2005, *Federal Register*, Vol. 70, No. 194, pp. 58734-58735, which can be found in any federal repository library or online at <http://www.access.gpo.gov/>. To learn more about the maximum amount of IHP assistance, contact Berl Jones at (202) 646-4235. For information about the other adjustments, contact James A. Walke at (202) 646-3834. Send written correspondence to FEMA, 500 C Street SW, Washington, DC 20472.

## DHS Issues Further Guidance as NIMS Compliance Deadline Approaches

In October, the U.S. Department of Homeland Security (DHS) sent Fiscal Year (FY) 2006 National Incident Management Systems (NIMS) Compliance Requirements packages to U.S. governors. The packages, intended to provide information on the NIMS FY 2006 implementation requirements, included a letter, a summary of the NIMS implementation schedule, NIMS state and territory compliance activities, and NIMS tribal government and local jurisdiction compliance activities.

The letter and the accompanying matrices outline the important steps that state, territorial, tribal, and local entities must take during FY 2006 (October 1, 2005–September 30, 2006) to become fully compliant with NIMS. Jurisdictions will be required to meet the FY 2006 NIMS implementation requirements as a condition of receiving federal preparedness funding assistance in FY 2007.

These documents and additional information about NIMS implementation and resources for achieving compliance are available through the NIMS Integration Center (NIC). The NIC Web page, <http://www.fema.gov/nims/>, is updated regularly with information about NIMS and guidance for implementation. Other recent additions to the site include an updated *NIMS National Standard Curriculum Training Development Guidance* and the new

*FY06 NIMS Training Requirements*. For more information, contact Gil Jamieson, NIMS Integration Center, 500 C Street SW, Washington, DC 20472; (202) 646-3850; e-mail: [NIMS-Integration-Center@dhs.gov](mailto:NIMS-Integration-Center@dhs.gov).

## National Emergency Responder Credentialing System

The development of a national credentialing system is a fundamental component of the National Incident Management System (NIMS). According to NIMS, "credentialing involves providing documentation that can authenticate and verify the certification and identity of designated incident managers and emergency responders" to ensure that response personnel "possess a minimum common level of training, currency, experience, physical and medical fitness, and capability" for the roles they are tasked to fill.

The NIMS Integration Center (NIC) initiated the development of a national credentialing system to help governments at all levels identify, request, and dispatch qualified emergency responders from other jurisdictions when needed. Such a system will ensure that personnel resources requested from another jurisdiction to assist in a response operation are adequately trained and skilled.



The NIC will work with existing state, territorial, and discipline-specific credentialing bodies toward national recognition for multijurisdictional response under mutual aid agreements. To support this initiative, the NIC is using working groups to identify job titles that should be credentialled as well as the minimum qualification, certification, training, education, licensing, and physical fitness requirements for each position. Working groups will represent incident management, emergency medical services, fire/hazmat, law enforcement, medical and public health, public works, and search and rescue. For more information, read the frequently asked questions at [http://www.fema.gov/pdf/nims/credent\\_faq.pdf](http://www.fema.gov/pdf/nims/credent_faq.pdf) or send an e-mail to [NIMS-Integration-Center@dhs.gov](mailto:NIMS-Integration-Center@dhs.gov).

## FCC Expands EAS Rules and Seeks Comments on Next Generation

In November, the Federal Communications Commission (FCC) issued a first report and order to help ensure

that consumers using digital broadcast and subscription television and radio services have access to emergency alert and warning information. Noting the ever-increasing use of digital technologies by Americans, the first report and order expands the commission's current Emergency Alert System's (EAS) rules to include providers of digital broadcast and cable television, digital audio broadcasting, satellite radio, and direct broadcast satellite services. With the exception of Direct Broadcast Satellite (DBS) service, all affected entities must comply with these new requirements by December 31, 2006. DBS services must comply no later than May 31, 2007.

The commission also adopted a further notice of proposed rulemaking that seeks comments on how it can best help develop a next-generation alert and warning system that takes full advantage of digital media's potential. The commission seeks comments on the type of system architecture and common protocols that would be required in such a system and asks questions regarding specific technologies. In addition, the further notice seeks comments on issues relating to the participation of state and local authorities in the EAS system and how a next-generation EAS could more effectively reach individuals with hearing and vision disabilities and non-English speaking individuals. Comments are due by January 24, 2006.

To find out more, read the notice of proposed rulemaking in the November 25, 2005, *Federal Register*, Vol. 70, No. 276, pp. 71072-71077, which can be found in any federal repository library or online at <http://www.access.gpo.gov/>, or contact Jean Ann Collins, FCC, Office of Homeland Security, Enforcement Bureau at (202) 418-1199. The 98-page first report and order and further notice of proposed rulemaking is available at [http://hraunfoss.fcc.gov/edocs\\_public/attachmatch/FCC-05-191A1.pdf](http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-05-191A1.pdf).

### **DOE Web Site Supports Energy-Saving Reconstruction in the Gulf Coast**

The U.S. Department of Energy (DOE) has launched a Disaster Recovery and Building Reconstruction Web site at <http://www.eere.energy.gov/buildings/> as part of its continuing effort to support hurricane victims in the Gulf Coast region. The site provides relevant resources and information for consumers, state and local officials, and builders and contractors and encourages cost-effective, durable, and energy-efficient reconstruction in areas devastated by recent hurricanes. It includes information on training opportunities and a wide range of guidelines, fact sheets, and case studies developed by the DOE, the Federal Emergency Management Agency, the Environmental Protection Agency, the U.S. Department of Housing and Urban Development, and other organizations.

### **DHS Launches Program to Decentralize First Responder Training**

The U.S. Department of Homeland Security (DHS) announced that it will begin implementing a new Cooperative Training Outreach Program (CO-OP) designed to expand first responder preparedness training across the country by permitting the states to identify and approve

institutions within their states, territories, or tribal entities that can adopt and deliver the department's standardized training courses. It will enable state administrative agencies (SAAs) to better manage and track terrorism preparedness training within their states, territories, or tribal entities based on their individual requirements and homeland security strategies.

CO-OP will be implemented in three phases throughout fiscal year 2006. During the first phase, the SAAs will be able to identify and approve state institutions, such as community colleges, public safety academies, and state universities that can deliver the Office of State and Local Government Coordination and Preparedness' (SLGCP) curricula for first responder training. During the second phase, the SLGCP will provide the SAAs with electronic toolkits that list the training courses, the full course curriculum, and the training support materials. CO-OP will be institutionalized during the third phase of the program, as state sponsored, certified instructors begin delivering the courses.

For more information, read the Office for Domestic Preparedness Information Bulletin (No. 193, October 20, 2005) at <http://www.ojp.usdoj.gov/odp/docs/info193.pdf>.

### **Program Aims to Strengthen Banks' Role in Accelerating Small Business Recovery**

Small businesses in areas affected by Hurricanes Katrina and Rita will be eligible for a unique new Small Business Administration-backed loan of up to \$150,000. The one year Gulf Opportunity Pilot Loan (GO Loan) Program was launched to help speed financing for recovery and rebuilding. The loans will be delivered through local banks and will be handled under an expedited process that can deliver a response in 24 hours or less. GO Loans will be available through September 30, 2006, to small businesses in the counties and parishes of Texas, Louisiana, Mississippi, Alabama, and western Florida that are included in the presidential disaster declarations for Hurricanes Katrina and Rita and the contiguous counties and parishes. For more information about the program, visit <http://www.sba.gov/financing/goloans/>.

### **FEMA's Response to 2005 Hurricane Season**

The 2005 hurricane season was the most active in U.S. history with a total of 26 named storms. The Federal Emergency Management Agency (FEMA) responded in record ways to six storms that made landfall along the U.S. coast. In addition to Katrina, FEMA also responded to Hurricanes Dennis, Ophelia, Rita, and Wilma and Tropical Storm Cindy. Combined, the six storms represent the most widespread and catastrophic series of disasters in U.S. history. Hurricane and tropical storm damage in 2005 spurred emergency and disaster declarations in a record 44 states and the District of Columbia to address the expense of sheltering millions of evacuees forced from their homes by Katrina and Rita.

As of November 30, 2005, FEMA had provided more than \$22 billion dollars in relief funds in response to the six storms, and that figure is expected to rise significantly over the coming months and years as relief operations continue.

The \$22 billion dollars is the most granted during a single year by FEMA and represents the fastest delivery of relief funds in FEMA's history.

The agency's data processing centers collected a record three million applications for assistance throughout the 2005 hurricane season, almost triple the number of applications received after four hurricanes hit the Florida coast in 2004. Until last year, FEMA had never taken more than a million applications for any single year.

For the first time ever, the National Disaster Medical System (NDMS) utilized all three of its components at the same time: medical response teams, patient evacuation, and definitive hospital care. The NDMS deployed more than 5,000 health care professionals and treated more than 160,000 patients during the hurricane season, 16 times more patients than treated in any other single year.

FEMA's Urban Search and Rescue teams also responded in record numbers, dispatching 68 teams consisting of more than 3,000 personnel. More than 6,500 rescues were made during the hurricane season by these teams. Thirty-eight of these teams were deployed to assist in the rescue efforts for Hurricane Katrina, marking the largest deployment of search and rescue teams for any single event.

In all, FEMA set records for the number of commodities distributed, the number of personnel deployed, the number of patients treated, the number of people rescued, and the number of families and governments assisted during the 2005 hurricane season. FEMA expects additional records will be broken as work with state and local officials continues to rebuild the Gulf Coast region.

Read the press release at <http://www.fema.gov/news/newsrelease.fema?id=20982>.

## Hurricane Season 2005 Tops the Charts

On November 29, one day before the end of hurricane season, and three days before Tropical Storm Epsilon strengthened into 2005's 14th hurricane in the Atlantic Ocean (only the fifth December hurricane recorded in more than 120 years), the National Oceanic and Atmospheric Association (NOAA) released the storm stats for 2005 and predicted additional active hurricane seasons in the years to come. According to NOAA, the 2005 Atlantic hurricane season was the busiest on record. Breaking records that stood for decades, the season was the first to see 26 named storms, 13 hurricanes (excluding Epsilon), 3 category 5 hurricanes, and 4 major hurricanes (category 3 or higher) hitting the United States.

NOAA scientists had predicted that 2005 would be an extremely active hurricane season, forecasting near-record activity in an early August report. The 26 named storms topped the forecast range of 18 to 21, the 13 hurricanes inched above the forecast of 9 to 11 and the 7 major hurricanes fell within the forecast range of 5 to 7. Five hurricanes (Dennis, Katrina, Ophelia, Rita, and Wilma) and three tropical storms (Arlene, Cindy, and Tammy) directly affected the United States.

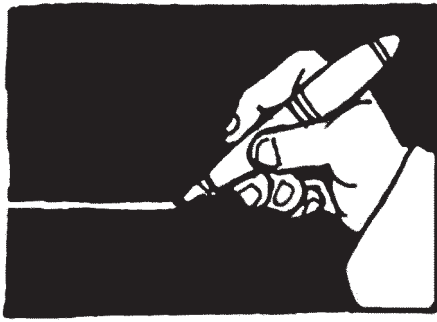
Letters of the Greek alphabet were used to name storms for the first time since storms began acquiring names in 1953, as Hurricane Wilma exhausted the original list of 21 names. Tropical Storm Alpha and Hurricane Beta hit the Dominican Republic and Nicaragua, respectively. Tropical Storm Gamma brought deadly flooding to parts of Central America. Tropical Storm Delta largely stayed over open water then moved across the Canary Islands off the northwest coast of Africa. Tropical Storm Epsilon formed on the next to last day of the Atlantic hurricane season over the central Atlantic Ocean and gained hurricane strength days later.

The Atlantic Basin is in the active phase of a multidecadal cycle in which optimal conditions in the ocean and atmosphere, including warmer-than-average sea-surface temperatures and low wind shear, enhance hurricane activity. This increase in the number and intensity of tropical storms and hurricanes can span multiple decades (approximately 20 to 30 years). NOAA will make its official 2006 season forecast in May, prior to the June 1 start to the season, and urges hurricane-prone residents to take proactive measures now.

Read the press release, download graphic and audio files from the news conference, or link to additional information, including more noteworthy records set in 2005, at <http://www.noaaneews.noaa.gov/stories2005/s2540.htm>.

## NSF Summer Institute for Undergraduates in Hazards and Disaster Research

The National Science Foundation (NSF) awarded the Disaster Research Center (DRC) at the University of Delaware funding for the establishment of a Research Experience for Undergraduates (REU) site to provide hands-on research training and mentoring on the social science aspects of disasters. Each year, ten students from a wide variety of social science disciplines will be selected to participate in a nine-week summer institute. All transportation and lodging expenses will be covered for the students, who will also receive a generous stipend for the summer. If selected, students must have completed their sophomore year by the time they enter the DRC-REU program. Minorities, women, and students from poorer regions of the country are especially encouraged to apply. The 2006 summer program will begin on June 5. Applications are due February 1, 2006, and students admitted to the REU program will be notified by March 1, 2006. Program details, guidelines, and application materials can be found online at <http://www.udel.edu/DRC/>.



## ON THE LINE

### **Collaborating for Risk Reduction: Building GIS Partnerships for Universities and State and Local Emergency Management**

Geographic information systems (GIS) have become indispensable tools for natural hazards planning and mitigation. No other technology can match GIS for visualizing vulnerabilities, opportunities, mitigation, and disaster response strategies, yet many state and local emergency management agencies lack GIS expertise or access. Furthermore, some emergency managers may be intimidated by the technical nature of GIS or fail to see its value for their work, and GIS experts themselves may not understand how to effectively communicate the value of their technology to emergency management officials. The Federal Emergency Management Agency (FEMA) has been working to facilitate collaborative relationships among state and local agencies and institutions of higher education to make better use of GIS resources.

Several such partnerships have emerged as a direct result of the 2005 Geospatial Workshop convened by FEMA's Mitigation Division in Indianapolis, Indiana, in April 2005. The workshop brought together a range of experts from the GIS and natural hazards fields who presented compelling examples of how GIS is being used in real-world hazards planning and mitigation. It also featured regional breakout discussions that created opportunities for state and local officials to meet GIS scholars from universities and colleges, form relationships with them, and develop joint activities. Those discussions led to the formation of a GIS consortium in Oklahoma, a regional effort in the Midwest to establish partnerships between emergency management agencies and GIS groups, and a number of other state and regional initiatives. To maintain the momentum and encourage participants to continue sharing information, Indiana University-Purdue University Indianapolis, the workshop's host, set up a dedicated listserv for the workshop attendees.

"The workshop was a great opportunity for us," says Connie Dill, state hazard mitigation officer for Oklahoma. Dill had been planning to contact the University of Oklahoma about opportunities to collaborate on GIS applications but was not sure where to begin. At the workshop's regional session she met May Yuan, director of the university's Center for Spatial Analysis, who agreed to participate in a new GIS consortium with Dill's agency and other Oklahoma institutions. The group held its first meeting in August 2005 and launched a plan to use the development

of the University of Oklahoma's Natural Hazard Mitigation Plan as an opportunity to build a GIS-based statewide emergency decision support system. "The university has facilities in every county in the state," explains Yuan, so while the university prepares its plan, it will be gathering and analyzing data that the state, counties, and communities can use as well. Ultimately, the plan is to create a user-friendly online tool that communities can use to run their own scenarios.

The Indianapolis workshop built on the success of a May 2004 FEMA workshop for representatives from historically black colleges and universities (HBCUs) in the mid-Atlantic region, their local communities, and their state emergency management offices. As a result of the workshop, which generated funding and training opportunities, a communications network, and enhanced awareness among the HBCUs of the need for emergency preparedness and mitigation in their own institutions, many of the participating colleges and universities have become involved in their counties' hazard mitigation plans. FEMA sponsored a similar conference for HBCUs in the southeastern United States, hosted by Florida A&M University in May 2005, which generated additional collaborative activities for HBCUs and their government partners in a region that suffered so much hurricane damage in the fall of 2004.

Unlike many conferences, where participants meet and then go back home to business as usual, the FEMA workshops focused on generating concrete activities with follow-up to track progress and ensure accountability. "This was not a once-and-done meeting," says Ladd Colston, associate vice president for commercialization and outreach at the University of Maryland, Eastern Shore, which hosted the mid-Atlantic HBCU workshop in 2004. "We proposed next steps at the workshop and called participants afterward to follow up on their progress. We wanted to keep the momentum going." Colston's team set up a listserv to keep participants informed of new opportunities, resources, and conferences, and is creating a Web site on mitigation and emergency management issues for HBCUs and emergency management agencies across the nation. After attending the 2005 HBCU workshop, many participating university officials met with their state and local emergency managers to assess hazards and mitigation opportunities.

## A Natural Alliance

Partnerships with colleges and universities allow state and local agencies to gain access to GIS expertise, technical resources, and research support. For their part, institutions of higher education can benefit from new funding opportunities, an enhanced role in their communities, and better access to data. Partnerships can leverage resources and increase the impact of efforts that otherwise would be undertaken individually. Communities that reduce their vulnerability to hazards and develop strong emergency management plans and alliances offer a safer and more secure environment for everyone.

One of the most promising efforts to bring universities and colleges together with emergency management agencies is underway in Indiana. Six of the state's universities have signed a memorandum of understanding to create an outreach network that will enhance GIS communication and data sharing among state government, political subdivisions, and the business community. The coalition intends to maintain an inventory of university faculty, skills, and research interests; promote GIS educational opportunities for students; and assist the state GIS office in collecting and distributing data from local governments.

"Universities have a long-standing commitment to serving the educational and analytical needs of communities and thus offer a logical network of content experts for providing this support," says Jan Crider, state hazard mitigation officer for the Indiana Department of Homeland Security. "Our projects with the universities in Indiana have created a way to tap into these resources to assist in mitigation planning and projects."

The coalition is coordinated by The Polis Center at Indiana University-Purdue University Indianapolis, which offers GIS education and training, outreach and user group support, and technical assistance, including development of customized applications, and undertakes special studies, such as the ongoing assessment of the earthquake risk to bridges in southwest Indiana.

## GIS in Action

"Geospatial data are a cornerstone of mitigation," says Michael Buckley, deputy director of FEMA's Mitigation Division. "GIS helps communities better understand their hazards and how to deal with them." Working with universities and colleges, state and local emergency management agencies can cost-effectively identify where hazards and vulnerabilities intersect. For example, GIS tools can be used to calculate damages, economic losses, and mitigation benefits, as well as to display risk scenarios to key decision makers and the public. The following examples illustrate GIS in action:

- The University of New Hampshire's Complex Systems Research Center (CSRC) partnered with FEMA in 1999 to develop 10 digital flood insurance rate maps for three New Hampshire communities under FEMA's Multi-Hazard Flood Map Modernization Program. The maps support floodplain management and preparedness programs, and the new digital format makes the maps easier

to obtain and use online. The project allowed CSRC to expand its expertise into new types of mapping for which it is now nationally recognized. CSRC has since been tasked with digitizing and updating an additional 151 map panels for counties in New Hampshire. For more information, visit <http://www.fema.gov/fhm/>.

- The North Central Texas Council of Governments coordinates a GIS system for the Dallas/Fort Worth area that includes severe weather maps linked to population data. Emergency managers can see instantly how many people are at risk, the percentage of people living in mobile homes versus multifamily units and single-family homes, and even whether the language spoken in the area is predominantly English or Spanish. Managers can use the information to assess vulnerability and decide which workers to deploy to an affected area. For access to the maps, visit <http://www.dfwinfo.com/weather/graphical/warnings/nwswarn.asp>.
- GIS tools can also help emergency management agencies assess the results of their efforts. After a devastating tornado tore through Oklahoma in 1999, the State of Oklahoma offered a rebate program to encourage the construction of residential safe rooms. More than 6,000 safe rooms were built through the program, all of which were geocoded and entered into a GIS database. In 2003, another powerful tornado followed nearly the same track as the earlier storm, and by superimposing the storm track on a map of the safe rooms, decision makers and residents could instantly appreciate how many lives had been saved by the program. To view the map, visit <http://www.fema.gov/mit/saferoom/map1.shtml>.

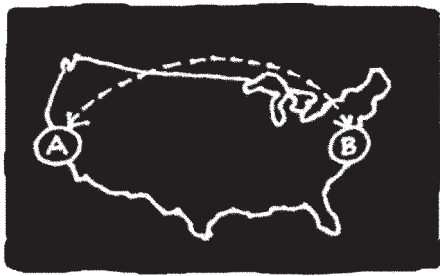
Collaboration with universities and other stakeholders can significantly reduce the cost of developing GIS databases. A group of stakeholders in north central Texas coordinated a bulk purchase of aerial photographs for the region's GIS, reducing their cost by nearly 95 percent. They also organized cooperative purchases of data sets. "The more that play, the less we pay," says John Hunt, GIS manager at the North Central Texas Council of Governments.

## Taking the First Step

How do GIS partnerships begin? Communities and states can start by contacting specific faculty, offices, or the president or chancellor of institutions in their area. Colleges and universities can initiate partnerships by contacting their state or local emergency management offices. According to research by the National Academy of Public Administration, partnerships should be approached as a strategic investment. They require a lot of up-front work and resources to get started, and they must be maintained through ongoing attention and oversight, but the results are worth it. "Partnerships are a key component of mitigation," says FEMA's Buckley. "You don't have to go through the mitigation process alone."

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# CONFERENCES AND TRAINING

Below are the most recent conference announcements received by the Natural Hazards Center. A comprehensive list of hazards/disaster meetings is available at <http://www.colorado.edu/hazards/conf.html>.

**International Joint Operations Command and Control Conference (IJOCC).** Host: London Fire Brigade. **London, England: January 17-19, 2006.** This conference seeks to gather together global experts in the areas of incident command and terrorism to find answers about how the world's emergency services and governments can work more closely to develop relationships and unified responses to terrorism and natural disasters. For more information, contact the *IJOCC 2006*; +44 (0) 1306 876 856; e-mail: [IJOCC@ijocc2006.com](mailto:IJOCC@ijocc2006.com); <http://www.ijocc2006.com/>.

**Workshop Series: Topics in Public Health Preparedness.** Sponsor: University of California at Los Angeles (UCLA) Center for Public Health and Disasters. **Costa Mesa, California: January 19-20, 2006.** The UCLA Center for Public Health and Disasters will be holding four new workshops as part of their Topics in Public Health Preparedness Series: Conducting a Hazard Risk Assessment, Risk Communication, Writing Incident Action Plans, and Keeping Your Workforce. Participants can register for one or more of the workshops. For more information, contact the *UCLA Center for Public Health and Disasters*, 1145 Gayley Avenue, Suite 304, Los Angeles, CA 90024; (310) 794-0864; e-mail: [cphdr@ucla.edu](mailto:cphdr@ucla.edu); <http://www.cphd.ucla.edu/>.

**Fire Rescue East 2006: Commitment to Leadership . . . Strength in Numbers.** Sponsors: Florida Fire and Emergency Services Foundation, Florida Society of Fire Service Instructors, and Florida State Fire College. **Jacksonville, Florida: January 25-29, 2006.** This conference will provide education and training for fire and emergency services professionals. For more information, contact the *Florida Fire Chiefs' Association*, 880 Airport Road, Suite 110, Ormond Beach, FL 32174; (386) 676-2744; <http://www.firerescueeast.org/>.

**Before Disaster Strikes: A Dialogue on Management Challenges.** Organizer: International City/County Management Association (ICMA). **Charleston, South Carolina: January 26-27, 2006.** Local governments across the country have faced substantial challenges over the past few years, particularly during this year's exceptionally brutal hurricane season. This conference will showcase successful approaches for preparedness, response, and recovery efforts. It is designed for a broad audience of local gov-

ernment professionals, including managers, assistants, and key department heads. ICMA encourages teams of local government staff to attend. Ideal teams comprise local government staff responsible for transportation, public safety, purchasing, telecommunications, public works, planning, and public information. For more information, contact *Sallie Burnett, ICMA*; (202) 962-3553; e-mail: [sburnett@icma.org](mailto:sburnett@icma.org); <http://icma.org/beforedisasterstrikes/>.

**National Emergency Management Association (NEMA) Mid-Year Conference.** **Washington, DC: February 11-16, 2006.** This conference will provide an opportunity to discuss challenges facing emergency managers today, share solutions, grow professionally, and network with peers. Participants will hear from those involved in shaping the future of homeland security and emergency management, strengthen relationships with partner organizations, and share NEMA's views on all-hazards emergency preparedness with the leadership in Washington. For more information, visit <http://www.nemaweb.org/?1508>.

**The Forum on Earth Observations II: Managing Risk in the 21st Century.** Organizer: Institute for Global Environmental Strategies. **La Jolla, California: February 15-16, 2006.** This event will bring together leaders from industry, academia, nongovernmental organizations, and government agencies to address key issues in the planning and implementation of a global Earth observation system and to discuss how Earth observations can be improved to promote better management of environmental and economic risks. For more information, contact *Judy Carrodeguas, Institute for Global Environmental Strategies*, 1600 Wilson Boulevard, Suite 901, Arlington, VA 22209; (703) 312-0823; e-mail: [judy\\_carrodeguas@strategies.org](mailto:judy_carrodeguas@strategies.org); <http://www.forumoneo.org/>.

**Fire Asia 2006 Exhibition and Conference.** Organizer: DMG World Media (*Fire* magazine). **Hong Kong, China: February 15-17, 2006.** This exhibition and conference will bring together over 1,600 fire and emergency service professionals from around the world to learn about new technology issues in a number of areas, including fire science research and development, fire safety management, firefighting, rescue, and protection in aviation. For more

information, contact *Jones C H Yeung*; +852 21 70 95 00; e-mail: [ch\\_yeung@hkfsd.gov.hk](mailto:ch_yeung@hkfsd.gov.hk); <http://www.fire-asia.com/>.

**Firehouse World Conference and Exposition.** Organizer: Cygnus Public Safety Group. **San Diego, California: February 19-23, 2006.** This conference will provide five days of education and training for fire, rescue, and emergency medical services professionals. The program is being revised to address educational needs in the wake of Hurricane Katrina. For more information, contact *Firehouse World Conference and Exposition*, 801 Cliff Road East, Suite 201, Burnsville, MN 55337; (800) 827-8009; e-mail: [info@firehouseworld.com](mailto:info@firehouseworld.com); <http://firehouseworld.com/>.

**Environmental Connection '06.** Organizer: International Erosion Control Association (IECA). **Long Beach, California: February 20-24, 2006.** This conference for contractors, engineers, builders, and regulators will share information on the best solutions available for the stormwater and erosion control industry. The program will consist of two days of training courses and two days of expo and technical sessions. For more information, contact the *IECA*, 3001 South Lincoln Avenue, Suite A, Steamboat Springs, CO 80487; (970) 879-3010; e-mail: [ecinfo@ieca.org](mailto:ecinfo@ieca.org); <http://www.ieca.org/Conference/Annual/LongBeach06.asp>.

**2006 GeoCongress.** Sponsors: Geo-Institute and American Society of Civil Engineers (ASCE). **Atlanta, Georgia: February 26-March 1, 2006.** The objectives of the 2006 GeoCongress are to showcase recent advancements in all geo applications as a result of the adoption of information technologies, debate future opportunities for the geo industry that can result from even more widespread adoption of information technologies, and bring together participants from a broad range of groups within the geo community. For more information, contact *Lucy King*, *ASCE Conferences*, 1801 Alexander Drive, Reston, VA 20191; (703) 296-6300, (800) 548-2723; e-mail: [lking@asce.org](mailto:lking@asce.org); <http://www.asce.org/conferences/geocongress06/>.

**Conference on America's Beaches: Beach Management, Tourism, and the Coastal Environment.** Sponsor: International Hurricane Research Center. **Miami, Florida: March 2-3, 2006.** This summit will focus on social and scientific issues facing beach managers. Expected attendees include beach managers, environmental officials, emergency managers, coastal engineers, and geologists. Sessions will examine response techniques when disaster strikes, such as experiences from recent storms and how to deliver information to the public (e.g., when and how to invite tourists back). For more information, contact *Natalie Defraene*, *Laboratory for Coastal Research, Beach Management Conference*, Florida International University, University Park Campus, MARC 360, Miami, FL 33199; e-mail: [defraene@fiu.edu](mailto:defraene@fiu.edu); [http://www.ihrc.fiu.edu/lcr/news/conference\\_2005.htm](http://www.ihrc.fiu.edu/lcr/news/conference_2005.htm).

**Wildland Fire 2006.** Organizers: International Association of Fire Chiefs (IAFC) and *Wildland Firefighter* magazine. **Phoenix, Arizona: March 8-10, 2006.** This conference,

featuring general informational sessions, breakout sessions, and exhibits, will bring together leaders from the local, state, and federal levels to address the growing risk of the wildland-urban interface. For more information, contact the *IAFC*, 4025 Fair Ridge Drive, Fairfax, VA 22033; (703) 273-0911; <http://www.iafc.org/displaycommon.cfm?an=1&subarticlenbr=100>.

**The International Symposium on Management and Systems for Disaster Prevention (ISMD 2006).** Organizer: Center of Excellence for Social Management Systems Kochi University of Technology. **Kochi, Japan: March 9-11, 2006.** This symposium will review disaster prevention systems for better effectiveness and efficiency. Participants will discuss how to research and investigate causes of disaster, how to design and operate software and hardware infrastructures, and how to build systems. Disaster prevention as a system will also be discussed from a management point of view. For more information, contact *ISMD 2006 Secretariat*, *Center of Excellence for Social Management Systems*, Kochi University of Technology, Tosayamada-cho, Kochi, 782-8502, Japan; +81 887 57 2792; e-mail: [ismd@kochi-tech.ac.jp](mailto:ismd@kochi-tech.ac.jp); <http://www.kochi-tech.ac.jp/coe21/ismd/>.

**2006 Arizona Wildfire Academy.** **Prescott, Arizona: March 18-24, 2006.** The Arizona Wildfire Academy offers training and education for professional and safe responses to the wildland environment that meet National Wildfire Coordinating Group standards. For more information, contact *Kori Kirkpatrick*, PO Box 2554, Prescott, AZ 86302; (928) 442-3563; e-mail: [firecamp@localnet.com](mailto:firecamp@localnet.com); <http://www.azwildfireacademy.org/>.

**2006 National Oceanic and Atmospheric Administration Climate Prediction Applications Science Workshop: Research and Applications on Use and Impacts.** Organizers: National Weather Service Climate Services Division, University of Arizona Climate Assessment for the Southwest, and the Arizona Cooperative Extension. **Tucson, Arizona: March 21-24, 2006.** This workshop will bring together a diverse group of climate science producers and users to share and discuss developments in research and applications related to the use and impacts of climate predictions on societal decision making and resource management. The goals of the meeting are to identify new climate prediction applications research, promote interactions between climate-sensitive integrated research and service communities, and assess impacts of climate forecasts on environmental-societal interactions. For more information, contact *Mike Crimmins*; e-mail: [crimmins@u.arizona.edu](mailto:crimmins@u.arizona.edu) or *Diana Perfect*; e-mail: [diana.perfect@noaa.gov](mailto:diana.perfect@noaa.gov); <http://cals.arizona.edu/climate/CPASW2006/>.

**Complex Network and Infrastructure Protection 2006 International Workshop.** Organizers: The International Emergency Management Society and the Italian Agency for New Technologies, Energy, and the Environment (ENEA). **Rome, Italy: March 28-29, 2006.** The objective of this workshop is to bring together experts, emergency managers, infrastructure specialists, and stakeholders with differ-

ent cultural and scientific backgrounds to address and analyze the new threats, vulnerabilities, and suitable defense strategies related to complex networks and infrastructure protection. For more information, contact *Claudio Balducci*, ENEA CASACCIA, Via Anguillarese, 301, 00060 Rome, Italy; e-mail: [cnip06.info@casaccia.enea.it](mailto:cnip06.info@casaccia.enea.it); <http://ciip.casaccia.enea.it/cnip06/index.jsp?sel=main>.

**1st Fire Behavior and Fuels Conference.** Organizer: International Association of Wildland Fire. **Portland, Oregon: March 28-30, 2006.** The theme of this conference is "Fuels Management—How to Measure Success." The conference will address the development, implementation, and evaluation of fuels management programs that are designed to reduce risks to communities and to improve and maintain ecosystem health with a focus on how to measure success. For more information, contact the *International Association of Wildland Fire*, PO Box 261, Hot Springs, SD 57747-0261; (605) 890-2348; <http://www.iawfonline.org/fuels/overview.shtml>.

**2006 Annual Meeting of the Midwest Sociological Society.** **Omaha, Nebraska: March 30-April 2, 2006.** This conference will include a session on Innovations in Disaster Theory, Research, and Practice. For more information, contact *Peter or Patti Adler*, University of Colorado, 327 UCB, Boulder, CO 80309-0327; e-mail: [socyprof@hotmail.com](mailto:socyprof@hotmail.com); <http://www.themss.org/meetings.html>.

**Symposium on the Application of Geophysics to Engineering and Environmental Problems (SAGEEP) 19th Annual Meeting.** Sponsor: Environmental and Engineering Geophysical Society (EEGS). **Seattle, Washington: April 2-6, 2005.** The theme of this year's conference is "Geophysical Applications for Environmental and Engineering Hazards: Advances and Constraints." The program will consist of keynote lectures, technical sessions, exhibits, and special events that will provide participants opportunities to learn about recent developments in near surface geophysics. Special sessions include Geophysics in Land Use and Management, Geophysical Monitoring of Landslide Hazards, and Seismic Landstreamers. For more information, contact *EEGS/SAGEEP 2006*, 1720 South Bellaire Street, #110, Denver, CO 80222; (303) 531-7517; e-mail: [staff@eegs.org](mailto:staff@eegs.org); <http://www.eegs.org/sageep/>.

**European Geosciences Union General Assembly 2006.** **Vienna, Austria: April 2-7, 2006.** This conference will bring together geoscientists from Europe and around the world to present work and discuss ideas in all disciplines of the earth, planetary, and space sciences. For more information, contact the *Copernicus Meeting Office*, Max-Planck-Strasse 13, 37191 Katlenburg-Lindau, Germany; +49 5 556 1440; e-mail: [egu.meetings@copernicus.org](mailto:egu.meetings@copernicus.org); <http://meetings.copernicus.org/egu2006/>.

**7th Biennial Fire Service Women's Leadership Training Seminar.** Organizer: Women in the Fire Service (WFSI). **Phoenix, Arizona: April 7-9, 2006.** This event is hosted by the Phoenix Fire Department and supported by a local

committee of urban and wildland fire personnel. The seminar will include workshops and training sessions aimed at making participants better fire service leaders. For more information, contact the *WFSI*, PO Box 5446, Madison, WI 53705; (608) 233-4768; e-mail: [info@wfsi.org](mailto:info@wfsi.org); <http://www.wfsi.org/>.

**2006 National Hurricane Conference.** Organizer: Florida Shore and Beach Preservation Association. **Orlando, Florida: April 10-14, 2006.** This conference is sponsored by a number of international, federal, and state government and nonprofit organizations. Its primary goal is to improve hurricane preparedness, response, recovery, and mitigation to save lives and property in the United States and the islands of the Caribbean and the Pacific. It serves as a forum for federal, state, and local officials to exchange ideas and recommend policies to improve emergency management. For more information, contact the *National Hurricane Conference*, 2952 Wellington Circle, Tallahassee, FL 32309; (850) 906-9224; e-mail: [mail@hurricanemeeting.com](mailto:mail@hurricanemeeting.com); <http://www.hurricanemeeting.com/>.

**17th Global Warming International Conference and Expo (GWXVII).** Sponsor: Global Warming International Center. **Miami, Florida: April 20-21, 2006.** A sampling of the session topics at this conference include Sustainable Environment and Health for the 21st Century, Remote Sensing and Global Surveillance, Water Resources Management, Extreme Events and Impacts Assessment, and Global Warming and the Oceans. For more information, contact the *GWXVII Secretariat*, PO Box 50303, Palo Alto, CA 94303; e-mail: [gw17@globalwarming.net](mailto:gw17@globalwarming.net); <http://globalwarming.net/>.

**RIMS 2006: Expanding the Power of Risk Management.** Organizer: Risk Insurance and Management Society, Inc. (RIMS). **Honolulu, Hawaii: April 23-27, 2006.** This conference will provide an opportunity for risk managers and insurance professionals to expand their knowledge and network with industry experts. The conference will focus on enterprise risk management, as well as address strategic, business, financial, and operational risk. For more information, contact *RIMS*, 1065 Avenue of the Americas, 13th Floor, New York, NY 10018; (212) 286-9292; <http://RIMS.org/RIMS2006>.

**GIS and Water Resources IV.** Organizer: American Water Resources Association (AWRA). **Houston, Texas: May 8-10, 2006.** This conference will focus on innovation and application of geographic information systems (GIS) to water resources. Companies, government agencies, and nonprofit organizations involved in all facets of water resources are encouraged to attend. Presentation topics will include Hurricanes Katrina and Rita, homeland security, map modernization, climate and weather data integration, and more. For more information, contact *Patricia A. Reid*, AWRA, PO Box 1626, Middleburg, VA 20118; (540) 687-8390; e-mail: [pat@awra.org](mailto:pat@awra.org); <http://www.awra.org/meetings/Houston2006/>.

**Climate Change Technology Conference.** Organizer: Engineering Institute of Canada (EIC). **Ottawa, Ontario: May 9-12, 2006.** The theme of this conference is "Engineering Challenges and Solutions in the 21st Century." The purpose of the conference is to stimulate awareness and action for solutions that mitigate or adapt to climate change. In addition to potential technical solutions, it will address associated social and environmental consequences. For more information, contact the *EIC Climate Change Conference*, 1895 William Hodgins Lane, Carp, Ontario K0A 1L0, Canada; (613) 839-1108; e-mail: [EICCC2006@ieee.org](mailto:EICCC2006@ieee.org); <http://www.ccc2006.ca/eng/>.

**ISCRAM 06: Information Systems for Crisis Response and Management Conference.** Organizer: International Community on Information Systems for Crisis Response and Management (ISCRAM). **Newark, New Jersey: May 14-17, 2006.** The theme of this conference is information systems as the integration medium for the lifecycle of emergency preparedness and response (planning, training, mitigation, detection, alerting, response, recovery, and assessment). For more information, contact *Murray Turoff*; e-mail: [turoff@njit.edu](mailto:turoff@njit.edu) or *Bartel Van de Walle*; e-mail: [bartel@uvt.nl](mailto:bartel@uvt.nl); <http://www.iscram.org/>.

**3rd i-Rec International Conference on Postdisaster Reconstruction: Meeting Stakeholder Interests.** Organizers: University of Florence and i-Rec at the University of Montreal. **Florence, Italy: May 17-19, 2006.** This conference will focus on the development of effective and sustainable postdisaster reconstruction strategies and will be a forum for sharing research work and field experience on practical issues in affected areas. The i-Rec conferences bring together professionals and practitioners from various fields, such as housing, reconstruction, civil engineering, international development, humanitarian aid, architecture, urban planning, and environmental studies. For more information, contact *Cassidy Johnson*; e-mail: [cassidy.johnson@sympatico.ca](mailto:cassidy.johnson@sympatico.ca); <http://www.grif.umontreal.ca/pages/irechomepage.html>.

**5th University of California at Los Angeles (UCLA) Conference on Public Health and Disasters.** **Long Beach, California: May 21-24, 2006.** This conference 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. The diverse 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. For more information, contact the *UCLA Center for Public Health and Disasters*, 1145 Gayley Avenue, Suite 304, Los Angeles, CA 90024; (310) 794-0864; e-mail: [cphdr@ucla.edu](mailto:cphdr@ucla.edu); <http://www.cphd.ucla.edu/conferenceframe.htm>.

**American Institute of Hydrology Annual Meeting and International Conference: Challenges in Coastal Hydrology and Water Quality.** **Baton Rouge, Louisiana: May**

**21-24, 2006.** This conference will provide an international forum for the dissemination and exchange of information in coastal hydrology, hydraulics, and water quality. It will stimulate interdisciplinary research, education, management, and policy making from physical, biogeochemical, and socioeconomic perspectives related to complex environmental systems in coastal regions. For more information, contact the *American Institute of Hydrology*, 300 Village Green Circle, Suite 201, Smyrna, GA 30080; (770) 384-1634; e-mail: [aihydro@aol.com](mailto:aihydro@aol.com); <http://www.aihydro.org/conference.htm>.

**Third Tsunami Symposium.** Sponsor: The Tsunami Society. **Honolulu, Hawaii: May 23-25, 2006.** The Tsunami Society publishes the *Science of Tsunami Hazards* journal and conducts a Tsunami Symposium every three years. Abstracts of papers for presentation must be submitted by February 1, 2006. For more information, contact *Barbara Keating*; (808) 956-8143, e-mail: [Keating@soest.hawaii.edu](mailto:Keating@soest.hawaii.edu); <http://www.sthjournals.org/>.

**CPM 2006 West Conference and Exhibition.** Organizer: Contingency Planning and Management (CPM). **Las Vegas, Nevada: May 23-25, 2006.** This business continuity, emergency management, and security training event provides a risk management curriculum for business and government professionals. For more information, contact *CPM 2006 West*, WPC Expositions, 20 Commerce Street, Suite 2013, Flemington, NJ 08822; (908) 788 0343; e-mail: [CPMEvents@WitterPublishing.com](mailto:CPMEvents@WitterPublishing.com); <http://www.contingen cyplanning.com/events/west/>.

**TIEMS 13th Annual Conference 2006.** Hosts: Korean National Emergency Management Agency and the Korean Chapter of The International Emergency Management Society (TIEMS). **Seoul, South Korea: May 23-26, 2006.** This year's conference will include sessions on emergency management training and education, priorities for humanitarian aid, natural hazards, business continuity, and much more. For more information, contact *Young-Jai Lee*; e-mail: [yjlee@dgu.edu](mailto:yjlee@dgu.edu) or *TIEMS*, PO Box 1462, 8021 Zurich, Switzerland; <http://www.tiems.org/>.

**IAIA '06: Power, Poverty, and Sustainability 2006—The Role of Impact Assessment.** Sponsor: International Association for Impact Assessment (IAIA). **Stavanger, Norway: May 23-26, 2006.** Participants in this event will discuss how the various instruments of impact assessment—environmental impact assessment, strategic environmental assessment, sustainability assessment, health impact assessment, and social impact assessment—can help developers, decision makers, development cooperation providers, and the public to integrate environmental, social, and other concerns in a variety of fields. For more information, contact the *IAIA*, 1330 23rd Street South, Suite C, Fargo, ND 58103; (701) 297-7908; e-mail: [info@iaia.org](mailto:info@iaia.org); [http://www.iaia.org/Non\\_Members/Conference/IAIA06/Conf\\_main\\_page/](http://www.iaia.org/Non_Members/Conference/IAIA06/Conf_main_page/).

**National Conference on Animals in Disaster (NCAD) 2006: Learning from Katrina—A Commitment to the Future.** Organizer: The Humane Society of the United States (HSUS). **Arlington, Virginia: May 31-June 3, 2006.** The fourth biennial National Conference on Animals in Disaster will be dedicated to the lessons of Hurricanes Katrina and Rita. Participants will work to secure the improvements made in the disaster planning and response process and to re-create and reinvigorate approaches currently in process that will help in future preparedness and response efforts. Leaders from government, nonprofit and voluntary organizations, and the business community will all participate in NCAD 2006. For more information, contact the *HSUS, 2100 L Street NW, Washington, DC 20037; (202) 452-1100; <http://www.hsus.org/NCAD06>.*

**2006 National Main Streets Conference.** Organizer: National Trust for Historic Preservation. **New Orleans, Louisiana: June 4-7, 2006.** This conference will focus on commercial district revitalization and showcase projects and strategies used by small and rural towns, suburbanizing communities, large and mid-sized cities, and urban neighborhood business districts to revitalize their commercial districts. A major conference theme will be opportunities related to crisis management and disaster recovery for historic sites and commercial districts. The 2006 conference will also offer an opportunity to demonstrate how preservation-based revitalization can be used to rebuild the Gulf Coast region after the devastation of Hurricanes Katrina and Rita. For more information, contact the *National Trust for Historic Preservation, 1785 Massachusetts Avenue NW, Washington, DC 20036; (202) 588-6219; e-mail: [msconference@nthp.org](mailto:msconference@nthp.org); <http://conference.mainstreet.org/>.*

**Coastal Environment 2006: Sixth International Conference on Environmental Problems in Coastal Regions Including Oil and Chemical Spill Studies.** Organizer: Wessex Institute of Technology. **Rhodes, Greece: June 5-7, 2006.** Coastal Environment 2006 will address problems related to the monitoring, analysis, and modeling of coastal regions, including sea, land, and air phenomena. The conference will gather researchers, engineers, and professionals involved in the field of coastal environmental quality. For more information, contact *Charlotte Bartlett, Coastal Environment 2006, Wessex Institute of Technology, Ashurst Lodge, Ashurst, Southampton SO40 7AA, UK; +44 (0) 238 029 3223; e-mail: [cbartlett@wessex.ac.uk](mailto:cbartlett@wessex.ac.uk); <http://www.wessex.ac.uk/conferences/2006/coast06/>.*

**Australasian Bushfire Conference 2006.** Hosts: Griffith University and the South Queensland Fire and Diversity Consortium. **Brisbane, Australia: June 6-9, 2006.** The theme of this conference is “Life in a Fire-Prone Environment: Translating Science into Practice.” The conference will provide a forum to share new ideas on the complex issues of bushfire management, encourage communication between agencies and groups involved in bushfire management, build upon the lessons learned in previous bushfire campaigns, and facilitate a new understanding of the role of fire in the landscape. Topics will cover fire management in

the wildland-urban interface, development controls, bushfires in a changing climate, fuels management, community involvement and participation in fire management, fire ecology, remote sensing, mapping, and maintaining the balance between protection and conservation. For more information, contact *International Convention Management Services, 88 Merivale Street, South Bank, Queensland 4101, Australia; +61 7 3844 1138; e-mail: [bushfire2006@icms.com.au](mailto:bushfire2006@icms.com.au); <http://www.bushfire2006.com/>.*

**Association of State Floodplain Managers (ASFPM) 30th Annual Conference.** **Albuquerque, New Mexico: June 11-16, 2006.** This conference invites a broad range of professionals to address the many issues and problems associated with reducing flood damages, making communities more sustainable, and managing floodplain and fragile coastal resources. For more information, contact the *ASFPM, 2809 Fish Hatchery Road, Madison, WI 53713; (608) 274-0123; e-mail: [asfpm@floods.org](mailto:asfpm@floods.org); <http://www.floods.org/Conferences,%20Calendar/albuquerque.asp>.*

**Ethical Aspects of Risk Conference.** Host: Delft University of Technology. **Delft, The Netherlands: June 14-16, 2006.** This conference will bring together moral philosophers, sociologists, psychologists, and engineers to reflect on the ethical issues concerning “acceptable risk.” Cost-benefit analysis, the role of emotions, and the role of the public will all be discussed. For more information, contact the *Department of Philosophy, Faculty of Technology, Policy, and Management, Jaffalaan 5, 2628 BX Delft, The Netherlands; 0031 (0) 15 2783887; e-mail: [ethicsrisk@tbm.tudelft.nl](mailto:ethicsrisk@tbm.tudelft.nl); <http://www.ethicsrisk.tbm.tudelft.nl/>.*

**Geohazards: Technical, Economical, and Social Risk Evaluation.** Organizer: Engineering Conferences International. **Lillehammer, Norway: June 18-21, 2006.** The objective of this conference is to provide a roundtable for engineers, geoscientists, social scientists, public authorities, and insurance companies to discuss the human, environmental, and economic consequences of geohazards. A few of the main topics will include social and human dimensions, risk assessment and management, and the impacts of climate change. For more information, contact *Engineering Conferences International, 6 Metro Tech Center, Brooklyn, NY 11201; (718) 260-3743; e-mail: [info@eci.poly.edu](mailto:info@eci.poly.edu); <http://www.engconfintl.org/6ag.html>.*

**16th World Conference on Disaster Management.** Organizer: Canadian Centre for Emergency Preparedness (CCEP). **Toronto, Canada: June 18-21, 2006.** The purpose of this conference is to listen and learn, plan and prepare, educate, and exchange views on the lessons to be learned from all disciplines of disaster and emergency management. The theme of the 2006 conference is “The Changing Face of Disaster Management—A Global Perspective.” For more information, contact *Adrian Gordon, CCEP, 860 Harrington Court, Suite 211, Burlington, Ontario L7N 3N4, Canada; (905) 331-2552; e-mail: [agordon@ccep.ca](mailto:agordon@ccep.ca); <http://www.wcdm.org/>.*



# INTERNET PAGES

Below are new or updated Internet resources that Natural Hazards Center staff members have found to be informative and useful. Other valuable resources can be found throughout this newsletter. For a more complete list, visit <http://www.colorado.edu/hazards/resources/sites.html>.

## All Hazards

[http://www.nsf.gov/news/special\\_reports/disasters/](http://www.nsf.gov/news/special_reports/disasters/)

**Disasters**, a special online report series from the National Science Foundation (NSF) highlights some of the disaster research supported by NSF. The first two parts of the series are “Understanding Disasters” and “Preparing for the Worst.”

[http://www.unisdr.org/eng/about\\_isdr/basic\\_docs/SG-report/SG-report-60-180-eng.pdf](http://www.unisdr.org/eng/about_isdr/basic_docs/SG-report/SG-report-60-180-eng.pdf)

This report to the United Nations secretary-general provides an overview of the implementation of the International Strategy for Disaster Reduction and the follow-up to the World Conference on Disaster Reduction held in January in Kobe, Japan.

<http://www.avma.org/disaster/>

The Web site of the American Veterinary Medical Association provides educational materials to assist veterinarians, animal owners, and others interested in the well-being of animals in preparing for animal safety in the event of a disaster.

[http://www.benfieldhrc.org/disaster\\_studies/rea/rea\\_index.htm](http://www.benfieldhrc.org/disaster_studies/rea/rea_index.htm)

The Benfield Hazard Research Center’s rapid environmental assessment in disaster response Web page has been substantially updated and expanded. Visit the site for an updated training schedule, background papers, resources, and links to other information about environment and disasters.

<http://www.georgetown.edu/sfs/programs/isim/Publications/GrantReports/Disaster%20Management%20and%20Response.pdf>

**Disaster Management and Response: Capacity Building for Developing Country Institutions** by Georgetown University’s Institute for the Study of International Migration is the result of a project to identify and assess the effectiveness of capacity-building activities related to natural and human-induced disasters in developing countries and determine gaps in such activities, areas in need of strengthening, and opportunities for improvement. Based on the assessments, this report recommends actions that could be undertaken to enhance capacity to manage disasters in the most effective manner possible.

<http://www.psepc-sppcc.gc.ca/res/em/cdd/index-en.asp>

This database contains historical information on disasters that have directly affected Canadians, at home and abroad, over the past century. It includes references to all types of Canadian disasters, including those triggered by natural hazards, technological hazards, or conflict (not including war).

[http://www.raonline.org/info\\_guides/hurricane/](http://www.raonline.org/info_guides/hurricane/)

The Rural Assistance Center helps rural communities and other rural stakeholders access the full range of available programs, funding, and research to enable them to provide quality health and human services. This site includes tools, funding, news, and more related to emergency preparedness and hurricane relief.

<http://www.readycolorado.com/>

“READYColorado” is a public awareness campaign supported by public and private partners concerned with raising awareness about the importance of disaster preparedness among Colorado citizens. The Web site includes tools, checklists, strategies, and information for preparing, responding, and recovering from natural and human-induced disasters.

<http://www.envoyworldwide.com/pdf/PillarsWppr0805.pdf>

“The Five Pillars of Emergency Communications Planning,” a white paper produced by EnvoyWorldwide, discusses best practices for planning communications to key parties in times of crisis.

## Earthquakes

<http://earthquake.usgs.gov/eqinthenews/2005/usdya/>

This preliminary report on the magnitude 7.6 earthquake in Pakistan on October 8 is available from the U.S. Geological Survey National Earthquake Information Center.

<http://www.eeri.org/lfe/clearinghouse/kashmir/>

The Earthquake Engineering Research Institute has created this virtual clearinghouse to provide observations and resources for rebuilding as they relate to the October 8 South Asia earthquake.

[http://www.who.int/hac/crises/international/pakistan\\_earthquake/en/](http://www.who.int/hac/crises/international/pakistan_earthquake/en/)

This World Health Organization Web site provides situation reports and other information on the countries affected by October's South Asia earthquake.

## Hurricanes

<http://www.paho.org/english/dd/ped/ElSalvador-Floods1005.htm>

This Web site of the Pan American Health Organization includes reports and photographs from the countries impacted by Hurricane Stan and the related floods and landslides.

<http://www.cbo.gov/publications/collections/hurricanes.cfm>

The Congressional Budget Office created this page for publications and other documents related to the macroeconomic and budgetary effects of Hurricanes Katrina and Rita.

<http://coastal.er.usgs.gov/hurricanes/wilma/>

The U.S. Geological Survey Impact Studies for Hurricane Wilma are available here.

<http://www.hud.gov/offices/fbci/katrinatoolkit/intro.cfm>

This kit provides information about what the U.S. Department of Housing and Urban Development (HUD) is doing to assist faith-based and community organizations involved in coordinating relief activities related to Hurricane Katrina. It also provides useful contact information for HUD and others directly assisting the public.

<http://www.epa.gov/katrina/outreach/handouts.html>

The U.S. Environmental Protection Agency created these flyers on potential environmental and health issues for residents returning home to communities affected by recent hurricanes.

<http://www.epinet.org/briefingpapers/166/bp166.pdf>

The Economic Policy Institute published this briefing paper titled "Lessons for Post-Katrina Reconstruction: A High-Road vs. Low-Road Recovery."

<http://www.nvoad.org/>

The National Voluntary Organizations Active in Disaster has compiled a guide containing information for individuals and families affected by Katrina and Rita. ***Hurricanes Katrina and Rita Relief and Recovery Assistance Guide*** is available here and updated as new information becomes available.

<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5440a4.htm>

The October 24, 2005, issue of the Centers for Disease Control and Prevention's ***Morbidity and Mortality Weekly Report*** features "Surveillance for Illness and Injury after Hurricane Katrina—New Orleans, Louisiana, September 8-25, 2005."

<http://www.brookings.edu/comm/katrina.htm>

This Web page, ***Katrina: Disaster Preparedness and Response***, includes research on such topics as homeland security, disaster preparedness, transportation and infrastructure, terrorism, and metropolitan readiness contributed by scholars of the Brookings Institute.

[http://www.srh.noaa.gov/lix/Katrina\\_overview.html](http://www.srh.noaa.gov/lix/Katrina_overview.html)

The New Orleans/Baton Rouge Office of the National Weather Service has compiled this information related to Hurricane Katrina, including reports, maps, photos, and other products.



## Tsunamis

<http://www.who.int/hac/events/tsunami/conf/en/>

Proceedings and outcomes from the World Health Organization Conference on the Health Aspects of the Tsunami Disaster in Asia held in Phuket, Thailand, in May 2005 can be found here.



## Floods and Flood Insurance

<http://www.fas.org/sgp/crs/misc/RL33126.pdf>

This Congressional Research Service report, *Disaster Response and Appointment of a Recovery Czar: The Executive Branch's Response to the Flood of 1927*, describes the flood of 1927 and assesses the federal government's response.

[http://www.coffi.org/pubs\\_flood\\_insurance.html](http://www.coffi.org/pubs_flood_insurance.html)

Two short publications on flood insurance, *Federal Flood Insurance after Katrina* and *National Flood Insurance Program Summary*, developed by the Center on Federal Financial Institutions are available here.

[http://www.opencrs.com/rpts/RL33129\\_20051026.pdf](http://www.opencrs.com/rpts/RL33129_20051026.pdf)

*Flood Risk Management: Federal Role in Infrastructure* by the Congressional Research Service discusses federal investment decisions on flood control infrastructure, such as levees, floodwalls, and dams and analyzes flood risk as a composite of flood threat, consequence, and vulnerability.

## Weather

<http://www.ofcm.gov/fp-fy06/fedplan.htm>

The Office of the Federal Coordinator for Meteorological Services and Supporting Research has released its federal plan for fiscal year 2006, articulating the provision of meteorological services and the support for meteorological and related research by agencies of the federal government.

[http://www.crh.noaa.gov/crnews/display\\_story.php?wfo=pah&storyid=134&source=](http://www.crh.noaa.gov/crnews/display_story.php?wfo=pah&storyid=134&source=)

The preliminary damage assessment from the National Weather Service for the F3 tornado that struck the Evansville, Indiana, area on November 6 is available here.

## Fire

<http://fe.pennnet.com/about/links.cfm>

This site by *Fire Engineering* magazine, allows searches for paid, volunteer, and mixed fire agencies by state throughout the United States by clicking on a map. It also links to various levels of information about each fire organization.

<http://www.usfa.fema.gov/about/chiefs-corner/>

"Chiefs' Corner" on the U.S. Fire Administration Web site will showcase items of interest shared by fire prevention and fire safety individuals and will be used to spotlight new and innovative programs.

<http://www.fire.uni-freiburg.de/fwf/fwf.htm>

The Global Fire Monitoring Center serves as facilitator for the United Nations International Strategy for Disaster Reduction Global Wildland Fire Network and maintains this Web site with information on global fire weather and climate forecasts as well as other materials on early warnings of wildland fire.

## Health

<http://www.istss.org/guilford.htm>

Two chapters from a forthcoming book, *Interventions Following Mass Violence and Disasters: Strategies for Mental Health Practice*, offering guidelines for disaster mental health training and adult psychological first aid in immediate response to disaster, are available on the Web site of the International Society for Traumatic Stress Studies.





# 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 <http://www.colorado.edu/hazards/resources/grants/>.

**Who's to Blame? Public Perceptions of the Aftermath of Hurricane Katrina.** Funding Institution: National Science Foundation, one year. Principal Investigator(s): *Lonna Rae Atkeson, University of New Mexico, Department of Political Science, MSC05-3070, 1 University of New Mexico, Albuquerque, NM 87131-0001; (505) 277-7592; e-mail: atkeson@unm.edu and Cherie Maestas, Florida State University, Department of Political Science, 531 Bellamy Building, Tallahassee, FL 32306; (850) 644-7324; e-mail: cherie.maestas@fsu.edu.*

This project will investigate how citizens use media interpretations of the aftermath of Hurricane Katrina to help them develop a framework with which to attribute blame and interpret policy relevant information. The researchers will gather fundamental data on how different frameworks impact citizens' interpretations of natural disasters and governmental response, addressing the larger question of citizens' views of the capacity and effectiveness of government to deal with crisis.

**The Impact of Hurricane Katrina on Charitable Giving: An Experimental Study.** Funding Institution: National Science Foundation, two years. Principal Investigator(s): *Philip Grossman (Catherine Eckel), Saint Cloud State University, Department of Economics, Stewart Hall 386, 720 Fourth Avenue South, Saint Cloud, MN 56301; (320) 308-4232; e-mail: pgrossman@stcloudstate.edu.*

The devastation resulting from Hurricane Katrina has elicited unprecedented levels of charitable giving on the part of the general public. These researchers hypothesize that perceptions of the probability of disasters and their potential cost are critical to donation decisions. In this study, they will use an established task-based measure of charitable giving along with survey measures of sympathy, risk perception, and additional factors (e.g., experience) that might affect perceptions and/or charitable giving to examine the impact of natural disasters on the magnitude and distribution (across charitable causes) of donations and the mechanisms that affect them.

**Proximity to Extreme Events: The Effect of Katrina-Rita on Optimistic Bias in Gulf Coast Counties.** Funding Institution: National Science Foundation, one year. Principal Investigator: *Craig Trumbo, University of Vermont, Office of Health Promotion Research, 1 South Prospect*

*Street, Room 4426, Burlington, VT 05401; (802) 656-4109; e-mail: craig.trumbo@uvm.edu.*

One enduring problem with respect to human settlement and natural hazards in general is the tendency of individuals to underestimate the risk associated with where they live. One way to understand this is optimistic bias, which occurs when individuals see themselves as being less likely than others to be harmed by events in the future. This study will look at how individuals in Gulf Coast counties perceive hurricane risk in the wake of Hurricanes Katrina and Rita, examining optimistic bias for hurricane risk as a function of distance from the landfall zone. Ultimately, it will provide insight into individuals' orientation toward hurricane risk and will inform the development and implementation of risk communications designed to best inform individuals about impending and long-term hurricane risks.

**Cooperation among Evacuees in the Aftermath of Hurricane Katrina.** Funding Institution: National Science Foundation, one year. Principal Investigator: *Rick Wilson, Rice University, Department of Political Science, MS 24, PO Box 1892, Houston, TX 77251-1892; (713) 348-3352; e-mail: rkw@rice.edu.*

This project will investigate the levels of cooperation and conflict among strangers who were dislocated due to Hurricane Katrina. Additionally, it will examine evacuees' risk orientation and the levels of trust they have for others within their group and for agencies working with them and assess the effect of evacuation centers of different sizes on levels of in-group cooperation and trust and the way in which attitudes and behaviors change over time.

**Americans Respond to Hurricane Katrina.** Funding Institution: National Science Foundation, one year. Principal Investigator(s): *Leonie Huddy (Stanley Feldman), State University of New York at Stony Brook, Department of Political Science, Stony Brook, NY 11794-4392; (631) 632-7639; e-mail: Leonie.Huddy@sunysb.edu.*

Ultimately, Katrina's long-term political consequences will depend to a large degree on the underpinnings of public reactions to the disaster and its victims, views which are currently far from uniform. It is these political consequences that are the subject of this study. The investigators will focus specifically on Americans' beliefs about race as a possible defining factor in understanding public reactions

to the government's obligation to disaster victims and its performance in handling relief efforts. To more fully assess the possibly divisive role of racial attitudes in conditioning responses to government relief efforts in response to Katrina, the researchers will extend an ongoing National Science Foundation-funded research project into Americans' racial attitudes.

**Dynamic Use of Social Network and Leadership Theories in Disaster Recovery.** Funding Institution: National Science Foundation, one year. Principal Investigator(s): *Marya L. Doerfel (Ivan Marsic and John R. Aiello), Rutgers, The State University of New Jersey, Department of Communication, 4 Huntington Street, New Brunswick, NJ 08901; (732) 932-7500, x8112; e-mail: mdoerfel@scils.rutgers.edu.*

The information sources and accounts of the first people and organizations to return to the Gulf Coast region can play an integral role in how subsequent returnees make their own plans. Information, processes, and the how-tos of returning, rebuilding, and reconnecting should come from sources like the American Red Cross and the Federal Emergency Management Agency, but can also come from local leaders, organizations, and new network associations. This project is designed to track, distribute, and strategically manage such information and immediate resource needs to support the rebuilding of social networks and the overall infrastructure of the Gulf Coast region.

**Decision-Making among Businesses in Post-Catastrophe Uncertainty: How Economic Geographies Re-Form in New Orleans.** Funding Institution: National Science Foundation, one year. Principal Investigator(s): *Nina S. Lam (Kelley Pace and Richard Campanella), Louisiana State University, Department of Geography and Anthropology, E222 Howe-Russell Geoscience Complex, Baton Rouge, LA 70803; (225) 578-6197; e-mail: nlam@lsu.edu.*

This project seeks to understand the commercial side of resettlement of residents in urban environments after a catastrophe. The overarching research question centers on how businesses make spatial decisions regarding whether to return or relocate and how these decisions in turn impact the landscape and its economy. Specifically, the project will collect and analyze data on what, where, how, why, and when businesses return to New Orleans following the repopulation of the city after Hurricane Katrina.

**Establishment and Operation of Shelters Serving Socially Vulnerable Populations: A Socio-Spatial Analysis.** Funding Institution: National Science Foundation, one year. Principal Investigator(s): *Brenda D. Phillips (Lynn*

*B. Pike, Betty H. Morrow, and Thomas A. Wikle), Oklahoma State University, Department of Political Science, 536 Math Science Building, Stillwater, OK 74078; (405) 744-5298; e-mail: brenda.phillips@okstate.edu.*

This research will examine how emergency and temporary shelters were established and operated after Hurricane Katrina, focusing on shelters serving socially vulnerable populations, particularly those that had special needs. The researchers aim to understand the range of shelter types that opened to serve the hundreds of thousands of displaced persons, many of whom were low income, elderly, women and children, racial and ethnic minorities, or persons with disabilities with the ultimate intent of improving shelter operations and reducing human suffering in the future.

**Katrina Environmental Research and Restoration Network (KERNN).** Funding Institution: National Science Foundation, two years. Principal Investigator: *John A. McLachlan, Tulane University, 6823 St. Charles Avenue, New Orleans, LA 70118; e-mail: john.mclachlan@tulane.edu.*

The impact of Hurricane Katrina on the Gulf Coast environment and on processes for environmental change and recovery are being actively studied by researchers from across the country supported by a wide variety of governmental (federal, state, and local) and private entities. KERNN will serve as a central source of information about the wide range of environmental research efforts focused on understanding and responding to Hurricane Katrina. It will make scientists and other interested parties aware of the full range of related research activities to facilitate collaboration and coordination of efforts.

**Loss and Survival: Culture, Community, and Family following Hurricane Katrina.** Funding Institution: National Science Foundation, one year. Principal Investigator(s): *Katherine E. Browne (Lori Peek), Colorado State University, Department of Anthropology, C211 Andrew G. Clark Building, Fort Collins, CO 80523-1787; (970) 491-5813; e-mail: kbrowne@lamar.colostate.edu.*

How human beings respond to abrupt and profound loss varies. This project will investigate that variation among the 400-500 former residents of New Orleans' predominantly African American Ninth Ward who were temporarily housed at the Lowry Air Force Base in Denver, Colorado. The researchers will compare the coping strategies of middle class African American families to those of less affluent African American families with the aim of contributing to the development of better social policies for helping displaced populations.



**Evacuees Perceptions of Disaster Relief and Recovery: Analyzing the Importance of Social and Kinship Networks among Hurricane Evacuees on the Mississippi Gulf Coast.** Funding Institution: National Science Foundation, one year. Principal Investigator(s): *David A. Swanson (Mark V. Van Boening and Richard Forgette), University of Mississippi, Department of Sociology and Anthropology, 101 Leavell Hall, University, MS 38677; (662) 915-7430; e-mail: dswanson@olemiss.edu.*

The central question of this study is about the role that social (and kinship) networks play in determining an individual's success in the aftermath of a natural disaster such as Hurricane Katrina. "Success" refers to an individual's capacity to obtain physical and emotional relief as well as to maintain a strong perception of eventual community recovery in the immediate disaster aftermath. Social networks may protect individuals from disasters like Hurricane Katrina and they may act as an emergency response system to aid recovery after such disasters.

**Surviving Katrina and its Aftermath: A Comparative Analysis of Community Mobilization and Access to Emergency Relief by Vietnamese and African Americans.** Funding Institution: National Science Foundation, 20 months. Principal Investigator(s): *Wei Li (Karen Adams, Karen J. Leong, Verna Keith, and Angela Chia-Chen Chen), Arizona State University, Asian Pacific American Studies Program, PO Box 874401, Tempe, AZ 85287-4401; (480) 727-6556; e-mail: wei.li@asu.edu and Chris Airriess, Ball State University, Department of Geography, Cooper Life Science Building, Room CL 426J, Ball State University, Muncie, IN 47306; (765) 285-1614; e-mail: cairries@bsu.edu.*

This study will evaluate the mental and organizational decision-making processes used by Vietnamese American and African American communities in the face of uncertainty and produce policy recommendations to better serve the needs of such communities during the recovery period and prepare for similar disasters in the future.

**Governmental and Voluntary Association Coordination and Evacuees' Experience of Assistance in Colorado.** Funding Organization: National Science Foundation, one year. Principal Investigator(s): *Susan Sterett (Jennifer Reich and Martha Wadsworth), University of Denver, Department of Political Science, 2199 South University Boulevard, Denver, CO 80208; (303) 871-2136; e-mail: ssterett@du.edu.*

Hurricane Katrina required an extraordinary response from government and voluntary organizations. While the most devastating impact was in Gulf Coast and neighboring states, states throughout the country accepted evacuees and their needs for housing, medical care, cash assistance, and schooling. A significant portion of the efforts to address these needs came from private agencies. This research will examine how the delivery of services to evacuees was coordinated in Colorado as well as how evacuees experienced the trauma of fleeing their homes. In addition, it will look at the type, range, and depth of the information presented by the print and televised news media about the evacuees.

**Confronting Katrina: Socioculturally Divergent Models of Agency Shape Responses to Disaster.** Funding Institution: National Science Foundation, one year. Principal Investigator: *Hazel R. Markus, Stanford University, Department of Psychology, Jordan Hall, Building 420, 450 Serra Mall, Stanford, CA 94305; (650) 723-4404; e-mail: hmarkus@psych.stanford.edu.*

Coping with a disaster like Hurricane Katrina requires a framework of meaning, a set of shared understandings of what happened and why. The prevailing assumption of journalists, responders, and observers, was that any sensible person—taking appropriate personal responsibility, making choices based on official warnings, and acting to control the situation—would evacuate. The failure to understand that people in different sociocultural contexts may have had different understandings of what they should have done and why, and that they may have needed different types of relief, is likely to have been a critical element in the system failure that accompanied Katrina. This project will contrast the perspectives of those who stayed with those who fled prior to the disaster to demonstrate that differences in how people understand actions and events can affect their experiences as well as the policies and institutions that manage response and recovery efforts.

**Inferred and Experienced Intergroup Emotions as Predictors of Helping of Victim Groups: Helping When We—Not They—Need It Most.** Funding Organization: National Science Foundation, one year. Principal Investigator: *Amy Cuddy, Rutgers, The State University of New Jersey, Psychology Department, 53 Avenue E, Piscataway, NJ 08854; (609) 433-8078; e-mail: acuddy@rci.rutgers.edu.*

This research will explore how perceptions of the emotional suffering of Hurricane Katrina victims—many of whom are members of stigmatized groups—influence intentions to help or not to help. A growing body of evidence suggests that intergroup biases strongly influence people's inferences about the emotional states of others. This study will examine the hypothesis that "dehumanization" of Hurricane Katrina victims will decrease intentions to help them, in general.

**Katrina and the Built Environment: Spatial and Social Impacts.** Funding Institution: National Science Foundation, one year. Principal Investigator(s): *John R. Logan (Phil Brown, John F. Mustard, Steven P. Hamburg, and Rachel Morello-Frosch), Brown University, Department of Sociology, Box 1916, Providence, RI 02912-1916; (401) 863-2267; e-mail: john\_logan@brown.edu.*

Hurricanes Katrina and Rita are likely to have long-term effects on the cities and towns of the Gulf Coast. This project will identify which communities were most affected, which will be rebuilt, and how they will be different from before. It will integrate remotely sensed ecological data with environmental hazard information and demographic and socioeconomic data to understand the social and ecological vulnerabilities of impacted communities and how the posthurricane environment will affect redevelopment.



# RECENT PUBLICATIONS

Below are brief descriptions of some recent publications on hazards and disasters received by the Natural Hazards Center. Many of these publications are available through local and online booksellers, but information on how to obtain copies directly is also provided.

## All Hazards

***The Resilient City: How Modern Cities Recover from Disaster.*** Lawrence J. Vale and Thomas J. Campanella, editors. ISBN 0-19-517583-2. 2005. 392 pp. \$24.95. Available from Oxford University Press, 2001 Evans Road, Cary, NC 27513; (919) 677-0977, (800) 451-7556; e-mail: [custserv.us@oup.com](mailto:custserv.us@oup.com); <http://www.oup.com/>.

For as long as they have existed, cities have been destroyed—sacked, shaken, burnt, bombed, flooded, starved, irradiated, and pillaged—in almost every case they have risen again. Rarely in modern times has a city not been rebuilt following destruction, be it natural or otherwise. This book explores urban disasters from around the globe and the ongoing restoration of urban life. It examines why cities are rebuilt, how a vision for the future gets incorporated into a new urban landscape, and how disasters have been interpreted and commemorated in built form. Featured disasters include the Oklahoma City bombing, the Chicago Fire, San Francisco's 1906 earthquake, Mexico City's 1985 earthquake, China's Tangshan earthquake, and more.

***Mitigation of Natural Hazards and Disasters.*** C. Emdad Haque, editor. ISBN 1-4020-3112-2. 2005. 240 pp. \$99.00. Available from Springer New York, 233 Spring Street, New York, NY 10013; (212) 460-1500; e-mail: [service-ny@springer-sbm.com](mailto:service-ny@springer-sbm.com); <http://www.springeronline.com/>.

Written for researchers and policy makers in natural hazards studies, this book examines aspects of prevention, mitigation, and management of environmental hazards and disasters from an international perspective. In light of the recent debate on climate change and the possible effects of such a change upon increasing frequency and magnitude of extreme environmental events, this publication reviews various policy and response discourses. Several case studies from various countries and world regions depicting recent experience in mitigation policy and program development and implementation and establishing links between vulnerability and mitigation are presented to provide further insights.

***The Role of Science in Physical Natural Hazard Assessment: Report to the UK Government by the Natural Hazard Working Group.*** 2005. 44 pp. Available free online from the Office of Science and Technology, Department of Trade and Industry, 1 Victoria Street, London SW1H 0ET, UK; 020 7215 3910; <http://www.ost.gov.uk/policy/bodies/nhwg/>.

The Natural Hazard Working Group was established following the 2004 Indian Ocean tsunami as an ad hoc advisory group to advise the prime minister on the mechanisms that could and should be established for the detection and early warning of physical natural hazards. The group's report makes three recommendations: establish an International Science Panel for Natural Hazard Assessment, explore the possibility of extending the World Meteorological Organization early warning system to cover other natural hazards; and increase commitment at the national and international level to prioritize national capacity building for natural hazard assessment.

***Standing Together: An Emergency Planning Guide for America's Communities.*** 2005. 114 pp. Available free online from the Joint Commission on Accreditation of Healthcare Organizations, One Renaissance Boulevard, Oakbrook Terrace, IL 60181; (630) 792-5000;

[http://www.jccho.org/about+us/public+policy+initiatives/planning\\_guide.pdf](http://www.jccho.org/about+us/public+policy+initiatives/planning_guide.pdf).

This planning guide provides expert guidance on the emergency management planning process that is applicable to small, rural, and suburban communities. Its goal is to remove readiness barriers by providing all communities with strategies, processes, and tools for coordinated emergency management planning. The target audience is local leaders, including elected and appointed officials, health care providers and practitioners, public health leaders, and others who are responsible for initiating and coordinating the emergency management planning effort in towns, suburbs, and rural areas throughout the United States. Based on two expert roundtable sessions that included representatives from federal, state, and local agencies; emergency responders; emergency preparedness planners; and public health and hospital community leaders, among others, the guide outlines 13 essential components of an effective community-based emergency management planning process and provides multiple planning strategies addressing each component.

***Emergency Evacuation of People with Physical Disabilities from Buildings: 2004 Conference Proceedings.*** 2005. 72 pp. Published by the U.S. Department of Education, National Institute on Disability and Rehabilitation Research, Potomac Center Plaza, 550 12th Street SW, Room 6050, Washington, DC 20202; (202) 245-7386. Available free online from the Interagency Committee on Disability Research; <http://www.icdr.us/pubs.html>.

The result of an October 2004 conference, this report highlights research recommendations to improve available data, building and life safety codes, evacuation technologies, and evacuation practices for people with physical disabilities. It includes panel discussion summaries as well as breakout group recommendations and next steps.

***Public Transportation Emergency Mobilization and Emergency Operations Guide.*** Transit Cooperative Research Program. ISBN 0-309-08833-8. 2005. 124 pp. \$25.00. Available free online from the Transportation Research Board, Lockbox 289, Washington, DC 20055; (202) 334-3213; [http://trb.org/news/blurb\\_detail.asp?id=5259](http://trb.org/news/blurb_detail.asp?id=5259).

This report examines activities that may be taken by public transportation agencies working with their local communities to promote the early recognition of emergency events, expedite response to emergency events, establish multiagency coordination, and ensure that public transportation resources are available to support the response to an emergency event. Written for transit general managers; transit emergency response, law enforcement, and security officials; and operations, training, and human resources staffs, it may also be of interest to federal, state, and local emergency response and emergency management representatives.

***World Conference on Disaster Reduction 18-22 January 2005, Kobe, Hyogo, Japan: Proceedings of the Conference; Building the Resilience of Nations and Communities to Disasters.*** 2005. 147 pp. Available free online from the United Nations International Strategy for Disaster Reduction, Palais des Nations, CH 1211 Geneva 10, Switzerland; e-mail: [isdr@un.org](mailto:isdr@un.org); <http://www.unisdr.org/wcdr/the-matic-sessions/WCDR-proceedings-of-the-Conference.pdf>.

The purpose of this publication is to provide participants of the World Conference on Disaster Reduction and other interested readers with an easily accessible compendium of the main documents pre-

pared for and agreed to by the conference. It includes a compilation of the main preparatory and outcome documents, as well as a succinct summary on the thematic segment.

Intended to complement each other, the following emergency and disaster management textbooks were written by *Irmak Renda-Tanali* and *Claire B. Rubin* for students, newcomers, and practitioners. They are available from *Pearson Custom Publishing*, 75 Arlington Street, Suite 300, Boston, MA 02116; (800) 428-4466; <http://www.pearsoncustom.com/>.

***Managing Change through Post-Event Evaluations.*** ISBN 0-536-94156-4. 2005. 344 pp. ~\$50.00.

This textbook introduces the concepts of emergency and disaster management by looking at the history, definitions, and select past events that affected policy and planning for future disasters in the United States. The focus is on human-induced disasters and terrorism. Topics include types of hazards/threats/disasters—understanding risk; terrorism; transportation-related targets; critical infrastructure incidents; cyber and telecommunication security concerns; biological incidents; public, private, and nonprofit organizations response and preparedness activities; planning for future disasters; and recovery from disaster.

***Catastrophic Event Prevention Planning.*** ISBN 0-536-94155-6. 2005. 404 pp. ~\$50.00.

This textbook introduces the concepts of emergency and disaster management by using examples of major and catastrophic disaster scenarios and measures to mitigate and plan for them. The focus is on natural disasters. Topics include types of hazards/threats/disasters—understanding risks; risk assessment/risk communication; risk management/risk mitigation; the four phases of emergency management; evaluating mitigation alternatives using cost benefit analysis; governmental, private, and nonprofit organizations response and preparedness activities; disaster scenario exercises; and recovery from disaster.

***Sharing and Reducing the Financial Risks of Future “Mega-Catastrophes.”*** Robert E. Litan. Working Paper. 2005. 145 pp. Available free online from *The Brookings Institution*, 1775 Massachusetts Avenue NW, Washington, DC 20036; (202) 797-6000; e-mail: [escomment@brookings.edu](mailto:escomment@brookings.edu); <http://www.brookings.edu/views/papers/litan/20051111.htm>.

Written in response to the devastating hurricane season of 2005, this essay examines two fundamental questions relating to how society should prepare for and pay for future natural disasters: how can the government best prevent or mitigate losses from future natural megacatastrophes in a cost-effective manner and given that catastrophes, especially megacatastrophes, will continue to occur, who should pay for the damage, how, and when? The author argues that with the right policies, more can be done to minimize future losses to efficiently and fairly distribute the costs of those events. He concludes with a plan for addressing these issues by formalizing the current de facto federal disaster insurance program.

***Community Leadership in a Risky World.*** 2005. CD-ROM. \$25.00. Available from the *Public Entity Risk Institute (PERI)*, 11350 Random Hills Road, Suite 210, Fairfax, VA 22030; (703) 352-1846; <http://www.riskinstitute.org/>.

Produced and distributed by PERI and the National Center for Small Communities, this CD-ROM provides training tools and information to help small communities and local governments initiate effective risk management programs by simplifying and better directing developmental efforts. The tools are ready for use by trainers of leaders of small communities and include case studies, PowerPoint slides, background material, classroom activities, and manuals. A starter kit can be downloaded for free at <http://www.riskinstitute.org/test.php?pid=pubs&tid=1129>.

***Final Report for the Northeastern Local, Regional, and State RS/GIT Outreach Workshop.*** Lisa Warnecke, Kevin Neimond, Robert Brower, Matthew Mercurio, and Elizabeth Miller. 2005. 178 pp. Available free online from the *Institute for the Application of Geospatial Technology at Cayuga Community College*, James T. Walsh Regional Economic Center, 199 Franklin Street, Suite 300, Auburn, NY 13021; (315) 252-8669; e-mail: [info@iagt.org](mailto:info@iagt.org); [http://www.iagt.org/pdf/NEAF\\_04\\_Final\\_Report.pdf](http://www.iagt.org/pdf/NEAF_04_Final_Report.pdf).

In 2004, selected local and state leaders from 14 northeastern states participated in a federally funded workshop to discuss remote sensing (RS) and other geographic/geospatial information technology (GIT). A key conclusion was that intergovernmental GIT coordination and outreach must be elevated as a critical component of federal programs to leverage and maximize GIT investments, opportunities, and results across all levels of government to better serve the public. Discussions included water and natural resources management, planning and community growth management, and homeland security and disaster/emergency management. These findings provide a foundation for leaders to develop and implement action plans that advocate improved GIT outreach and intergovernmental collaboration and for federal and other GIT outreach providers to apply in evaluating current programs and designing future efforts.

## Hurricanes and Coastal Management

***EMAC After-Action Report, 2004: Hurricane Response.*** *Emergency Assistance Management Compact (EMAC)*. 2005. 88 pp. Available free online from the *National Emergency Management Association*, PO Box 11910, Lexington, KY 40578; (859) 244-8000; e-mail: [nema\\_admin@csg.org](mailto:nema_admin@csg.org); <http://www.emacweb.org/>.

The purpose of this report was to research the effectiveness of assistance obtained by states that requested aid through EMAC in response to the hurricanes of 2004. The report comprises two principle annexes: the first presents the views of representatives from the states that asked for assistance, and the second describes the perspective of the states that rendered assistance when it was requested. The principle annexes describe the roles and responsibilities of the subject organizations and the general nature of their engagement during response and recovery operations and discuss positive accomplishments and issues for improvement along with related recommendations organized under five categories: executing deployment, command and control, logistics, field operations, and mobilization and demobilization. A third annex offers a brief summary of federal emergency response activities as well as EMAC-related issues and recommendations.

***Hurricane Katrina: Profile of a Super Cat; Lessons and Implications for Catastrophe Risk Management.*** 2005. 31 pp. Available free online from *Risk Management Solutions (RMS)*, 7015 Gateway Boulevard, Newark, CA 94560; (510) 505-2500; e-mail: [info@rms.com](mailto:info@rms.com); [http://www.rms.com/Publications/KatrinaReport\\_LessonsandImplications.pdf](http://www.rms.com/Publications/KatrinaReport_LessonsandImplications.pdf).

One month after Hurricane Katrina and the Great New Orleans Flood, RMS released this special report summarizing these two events in the context of the insurance industry. It discusses the storm's impacts, modeling losses, and lessons learned. Additionally, it profiles a super catastrophe and outlines the consequences for risk management as a result of the great storm.

***Environmentally Friendly Coastal Protection.*** Claus Zimmermann, Robert G. Dean, Valeri Penchev, and Henk Jan Verhagen, editors. ISBN 1-4020-3300-1. 2005. 276 pp. \$74.95. Available from *Springer New York*, PO Box 2485, Secaucus, NJ 07094-2485; (212) 460-1500, (800) 777-4643; e-mail: [service-ny@springer-sbm.com](mailto:service-ny@springer-sbm.com); <http://www.springeronline.com/>.

This book is the result of the Advanced Research Workshop on Environmentally Friendly Coastal Structures. The objectives of the conference were to contribute to the critical assessment of existing knowledge in the field of coastal and environmental protection, identify directions for future research in that area, and promote close working relationships between scientists from different countries and with different professional experience. Written for civil engineers, environmental activists, and coastal zone managers, this book features the latest trends in research in coastal and environmental protection summarized in 17 papers that attempt to cover as completely as possible the many components associated with coastal protection—the coasts, engineering structures, water, sediments, and ecosystems—and their complicated interactions.

***An Unnatural Metropolis: Wrestling New Orleans from Nature.*** Craig E. Colten. ISBN 0-8071-2977-1. 2005. 245 pp. \$39.95. Available from the *Louisiana State University Press*, PO Box 25053, Baton Rouge, LA 70894-5053; (225) 578-8271, (800) 861-3477; e-mail: [lsupressorders@lsu.edu](mailto:lsupressorders@lsu.edu); <http://www.lsu.edu/lsupress/>.

Particularly relevant in the post-Katrina world, this book traces engineered modifications to New Orleans' natural environment over

the past two centuries. Before the city could swell in size and commercial importance as its nineteenth-century boosters envisioned, builders had to wrest it from its waterlogged site, protect it from floods, expel disease, and supply basic services using local resources. The author shows how every manipulation of the environment made an impact on the city's social geography as well—often with unequal, adverse consequences for minorities—and how each still requires maintenance and improvement today.

## Earthquakes and Landslides

***Learning from Earthquakes: The EERI Learning from Earthquakes Program: A Brief Synopsis of Major Contributions.*** 2005. 31 pp. Free. Available from the Earthquake Engineering Research Institute (EERI), 499 14th Street, Suite 320, Oakland, CA 94612; (510) 451-0905; e-mail: eeri@eeri.org; [http://www.eeri.org/lfe/pdf/Report\\_LFE\\_Contributions.pdf](http://www.eeri.org/lfe/pdf/Report_LFE_Contributions.pdf).

EERI's Learning from Earthquakes (LFE) program has been funded by the National Science Foundation since 1973. At the heart of this program are the multidisciplinary reconnaissance teams that conduct field research in the wake of damaging earthquakes around the world and bring back observations and lessons for the profession. In these 30+ years, many important advances in engineering, earth sciences, public policy, and the social sciences have resulted from initial observations made by these reconnaissance teams. The information in this report, provided by a broad group of researchers and practitioners representing the many disciplines in the LFE program, summarizes some of the LFE program's recent contributions and addresses its broader impacts.

***Landslide Hazards and Planning.*** James C. Schwab, Paula L. Gori, and Sanjay Jeer, editors. *Planning Advisory Service Report Number 533/534.* ISBN 1-932364-12-9. 2005. 175 pp. \$60.00. Available from the Planners Book Service, American Planning Association, 122 South Michigan Avenue, Suite 1600, Chicago, IL 60603; (312) 786-6344; e-mail: [bookservice@planning.org](mailto:bookservice@planning.org); <http://www.planning.org/bookservice/>.

Landslides occur primarily in mountainous regions, but flatter parts of the country are not immune. Landslides often occur with other natural disasters such as wildfires and floods, making them an important consideration in hazard mitigation planning and comprehensive plans. The intent of this report is to help planners minimize the risk landslides pose to life and property. It describes best practices that can mitigate losses, explaining remedial tactics for landslide areas where development already exists and regulatory tools for preventing development or ensuring the safest possible development.

***Landslide Hazard and Risk.*** Thomas Glade, Malcom Anderson, and Michael J. Crozier, editors. ISBN 0-471-48633-9. 2005. 824 pp. \$225.00. Available from John Wiley & Son, Inc., Customer Care Center, Consumer Accounts, 10475 Crosspoint Boulevard, Indianapolis, IN 46256; (877) 762-2974; <http://www.wiley.com/>.

With the increasing need to take a holistic view of landslide hazard and risk, this book provides an overview of the concept of risk research and addresses the sociological and psychological issues resulting from landslides. Its integrated approach offers understanding and ability for concerned organizations, landowners, land managers, insurance companies, and researchers to develop risk management solutions. Global case studies illustrate a variety of integrated approaches, and a concluding section provides specifications and contexts for the next generation of process models.

## Climate Change

***Climate Change Futures: Health, Ecological and Economic Dimensions.*** Paul R. Epstein and Evan Mills, editors. 2005. 142 pp. Available free online from Center for Health and the Global Environment, Harvard Medical School, 401 Park Drive, Second Floor East, Boston, MA 02215; (617) 384-8530, e-mail: [chge@hms.harvard.edu](mailto:chge@hms.harvard.edu); <http://www.climatechange-futures.org/>.

The Climate Change Futures project was developed from the concerns of three institutions, the Center for Health and the Global Environment at Harvard Medical School, Swiss Re, and the United Nations Development Programme. The study, which shows that climate change will significantly affect the health of humans and ecosystems and that these impacts will have economic consequences, is

comprised of three primary elements: trends, case studies, and scenarios, which detail and analyze current climate change related consequences.

## Health

***Writing a Disaster Plan: A Guide for Health Departments.*** 2005. 103 pp. Available free from the University of California at Los Angeles, Center for Public Health and Disasters, 145 Gayley Avenue, Suite 304, Los Angeles, CA 90024; (310) 794-0864; e-mail: [cphdr@ucla.edu](mailto:cphdr@ucla.edu); <http://www.cphd.ucla.edu/>.

This guide was developed to help emergency and public health planners design all-hazards disaster plans. It is organized into five sections: Staff Preparedness, Preparing to Write Your Plan, Components of a Disaster Plan, Preparing to Implement Your Disaster Plan, and Glossary of Acronyms. After reviewing this guide, readers should be able to understand the importance of an all-hazards approach to plan development, identify and prioritize the hazards affecting their community, gather appropriate personnel to write a disaster plan, develop a working draft, and evaluate the effectiveness of their plan through structured exercises and the incorporation of necessary changes.

***On the Ground after September 11: Mental Health Responses and Practical Knowledge Gained.*** Yael Danieli and Robert L. Dingman, editors. ISBN 0-7890-2907-3. 2005. 672 pp. \$69.95. Available from The Haworth Press, 10 Alice Street, Binghamton, NY 13904; (607) 722-5857, (800) 429-6784; e-mail: [orders@haworthpress.com](mailto:orders@haworthpress.com); <http://www.haworthpress.com/>.

This book is a compilation of over one hundred personal and professional first-hand accounts of September 11, 2001, from the moment the first plane struck to the months that mental health professionals worked to ease the pain and trauma of others, even while they themselves were traumatized. It provides insight into the damage the attack had on U.S. society, the failures and victories of the response systems, and the path of healing that mental health workers need to travel to be of service to their clients. These personal accounts reveal the broad range of responses to the event and illuminate how mental health services can most effectively be delivered. Recommendations describe ways to better finance assistance, adapt the training of mental health professionals, and modify organizations' response to the needs of victims in future events.

***Terrorism and Other Public Health Emergencies: A Reference Guide for Media.*** 2005. 269 pp. Free. Available from the U.S. Department of Health and Human Services (HHS), 200 Independence Avenue SW, Washington, DC 20201; (240) 629-3161; <http://www.hhs.gov/emergency/mediaguide/PDF/> (the online version will be updated as new information arises).

This media guide is intended to provide information about how the public health system is preparing for and will respond to previously unthinkable events, such as September 11. More specifically, it aims to offer the best possible information about worst-case scenarios. Through this effort, the HHS intends to provide the best available and most essential up-to-date health-related facts and background information that will be needed in the event of a terrorist attack or public health emergency. Topics include preparation and response in public health; biological, chemical, and radiological weapons; terrorism and the food supply; the role of the federal government; self-care for the media; the range of public reactions; risk communications; and the history of biological, chemical, and radiation emergencies.

## Terrorism

***Estimating Terrorism Risk.*** Henry H. Willis, Andrew R. Morral, Terrence K. Kelly, and Jamison Jo Medby. ISBN 0-8330-3834-6. 2005. 90 pp. \$20.00. Available free online from the RAND Corporation, Customer Service, PO Box 2138, Santa Monica, CA 90407-2138; (310) 451-7002, (877) 584-8642; e-mail: [order@rand.org](mailto:order@rand.org); <http://www.rand.org/publications/MG/MG388/>.

To help federal officials determine how to distribute billions of dollars in homeland security grants each year, this report examines how best to estimate terrorism risk in cities that receive funding through the U.S. Department of Homeland Security's Urban Areas Security Initiative. The initiative provides grants to help cities prepare for, respond to, and recover from acts of terrorism and most of its funds are currently allocated based on a formula that combines rough

indicators of the risk of terrorism, such as population size. This report offers a practical definition of terrorism risk and a method for estimating it that addresses inherent uncertainties. It also demonstrates a framework for evaluating alternative risk estimates. Finally, it makes five recommendations for improving resource allocation.

## GAO

The Government Accountability Office (GAO) reports provide background information and insight into key issues and concerns of the U.S. Congress. The office frequently publishes studies regarding hazards and disaster policy. Some recent GAO reports and testimonies that might interest *Observer* readers are listed below. Summaries and full text are available on the Web at <http://www.gao.gov/>. Printed copies are also available. The first copy is free. Additional copies are \$2.00 each. To order, contact the GAO, 441 G Street NW, Room LM, Washington, DC 20548; (202) 512-6000; TDD: (202) 512-2537; <http://www.gao.gov/cgi-bin/ordtab.pl>.

**Federal Emergency Management Agency: Improvements Needed to Enhance Oversight and Management of the National Flood Insurance Program.** GAO-06-119. 2005. 52 pp.

**Federal Emergency Management Agency: Challenges Facing the National Flood Insurance Program.** GAO-06-174T. 2005. 18 pp.

**Federal Emergency Management Agency: Oversight and Management of the National Flood Insurance Program.** GAO-06-183T. 2005. 22 pp.

**Hurricanes Katrina and Rita: Preliminary Observations on Contracting for Response and Recovery Efforts.** GAO-06-246T. 2005. 10 pp.

**Army Corps of Engineers: History of the Lake Ponchartrain and Vicinity Hurricane Protection Project.** GAO-06-244T. 2005. 13 pp.

## PERI Small Entity Scholarship Program

The Public Entity Risk Institute (PERI) will award \$1,000 scholarships to up to 40 individuals to attend the Public Risk Management Association (PRIMA) Annual Conference and Expo in Las Vegas, Nevada, June 11-14, 2006. The conference will bring together employees and local officials, vendors, and suppliers interested in improving risk management in the public sector.

PERI's Small Entity Scholarship Program provides financial assistance to help staff and officials of small public jurisdictions and community nonprofit organizations attend the PRIMA conference. Scholarship recipients will receive \$1,000 that can be used for any conference expense (air, hotel, registration, meals, etc.). The program is open to employees and elected officials of local governments and schools and staff and board members of a small community of nonprofit organizations.

Only one individual per organization may receive a scholarship in a single year. Eligibility is based on the size or operating budget of the organization and the scope of the applicant's risk management responsibilities. Applications must be postmarked no later than February 24, 2006, and sent via mail, e-mail, or fax. Applications should be sent to *Small Entity Scholarship Program, Attention: Audre Hoffman, PERI, 11350 Random Hills Road, Suite 210, Fairfax, VA 22030; fax: (703) 352-6339; e-mail: ahoffman@riskinstitute.org*. For eligibility guidelines and application procedures, visit <http://www.riskinstitute.org/test.php?pid=news&tid=1559>.

## IBHS and ACSP Scholarship in Planning and Natural Hazards

The Institute for Business and Home Safety (IBHS) and the Association of Collegiate Schools of Planning (ACSP) are requesting submissions for the annual scholarship award in planning and natural hazards.

Papers should address land use or other types of planning that incorporate natural hazards, including, but not limited to, flooding, coastal erosion, land subsidence, earthquakes, or other geologic or meteorological hazards whose risks can be minimized through community, regional, and state planning. Undergraduate, graduate, and joint faculty/student papers are eligible. For joint faculty/student papers, the student must be the first author and designated presenter of the paper.

Submit abstracts directly to the ACSP conference organizers between January 10 and February 28, 2006. Only papers accepted for presentation at the conference in Fort Worth, Texas, November 9-12, 2006, will be eligible for the award. Authors whose abstracts are accepted for presentation will be notified and expected to submit final papers, not to exceed 20 pages, electronically to the ACSP-IBHS committee chair by June 30, 2006. Final papers will be reviewed during the summer of 2006 with notification in September. One \$500 prize will be presented at the ACSP conference. The winner will agree to first publication rights by IBHS in its quarterly publication *Disaster Safety Review*.

Abstract submission procedures can be found at <http://www.acsp.org/>. Abstracts must be submitted directly to the ACSP conference organizers and to the ACSP-IBHS committee chair. For more information, contact *Diana McClure* at [dmcclure@ibhs.org](mailto:dmcclure@ibhs.org) or *Ann-Margaret Esnard* at [aesnard@fau.edu](mailto:aesnard@fau.edu).

## Graduate Research Assistant Earns Commerce Medals

Erica Kuligowski, a graduate research assistant at the Natural Hazards Center, is being recognized by the U.S. Department of Commerce with two prestigious awards: a bronze and a gold medal. The bronze medal recognizes the extraordinary support demonstrated by Erica and three of her colleagues at the National Institute of Standards and Technology (NIST) Fire Research Division to ensure the accuracy and quality of the analysis, simulations, final report, and recommendations of the investigation of the Station Nightclub Fire in West Warwick, Rhode Island. Erica is also a member of a team of 37 individuals awarded a gold medal for scientific and engineering achievement and administrative and technical support in conducting the three-year, \$16 million investigation of the World Trade Center disaster (see pp. 1-3 of this *Observer*), recognized to be the most complex and sophisticated building failure investigation in U.S. history. Final reports documenting both of these projects are available on the NIST Web site at <http://www.nist.gov/>. Congratulations Erica!

## The Natural Hazards Center

The mission of the Natural Hazards Center at the University of Colorado at Boulder is to advance and communicate knowledge on hazard 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. Please send information of potential interest to the Natural Hazards Center or the readers of this newsletter to the address below. The deadline for the next *Observer* is *January 25, 2006*.

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Copies of the *Observer* and the Natural Hazard Center's electronic newsletter, *Disaster Research*, are also available on the Center's Web site:

<http://www.colorado.edu/hazards/>

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