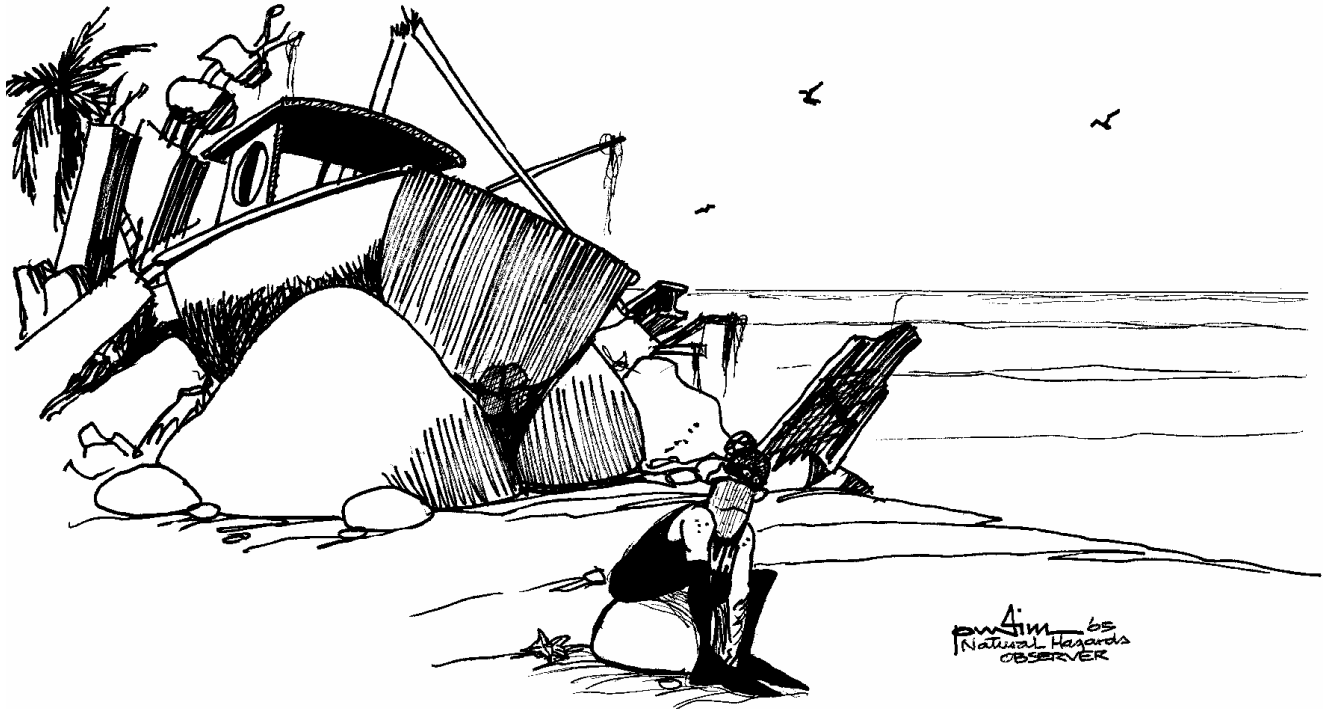


# NATURAL HAZARDS Observer

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## More Than a Wave: Exploring the Social Impacts of the Indian Ocean Tsunami

— an invited comment

Within a month of the Sumatra earthquake and the tsunami it generated, researchers from the University of Delaware's Disaster Research Center and the Emergency Administration and Planning Program at the University of North Texas participated in a social science reconnaissance trip to some of the areas of India and Sri Lanka that were hardest hit by this disaster. With funds for the two-week field trip (January 20-February 3, 2005) provided by the Earthquake Engineering Research Institute and the Sea Grant College Program at the University of Puerto Rico-Mayagüez, the team collected perishable data, gathered first-hand impressions of the damage, explored some of the major social science implications of the event, identified important issues for long-term research, and fostered existing and new relationships in the impacted regions. Once in the field, team members gained a better understanding of the concerns that affected communities will

face, in both the short and long term. This essay features some of our preliminary observations on issues related to these concerns, such as response capability, community characteristics, relocation, and the persistent state of uncertainty that coastal residents were experiencing (and continue to experience).

### Response and Relief Capability

Preliminary data indicates that the geographic scope, magnitude, and unexpectedness of the tsunami overwhelmed the response capacity in both India and Sri Lanka. In particular, the lack of an integrated warning system and the absence of experience with tsunamis—which may have enabled some residents to recognize preliminary warning signs—hindered the rapid inland evacuation that could have potentially saved many lives.

We noted significant contrasts in the organizational capabilities of the Indian and Sri Lankan governments. At the time of our visit, it appeared that the government of India had activated a system to coordinate the nongovernmental organizations (NGOs) in the provision of aid, while Sri Lanka was still in the process of developing its coordination system. In India, standard government assistance packages had been developed that proved to be helpful despite victims' perceptions that such relief was either insufficient to meet their needs or not appropriate for their family situation. Concerns about disaster aid seemed to be a more pressing issue in Sri Lanka, where victims we spoke with were quite uncertain regarding the extent to which government aid would be provided. We heard reports that some communities were receiving substantial assistance while nearby communities reported receiving little or no disaster relief from either the government or NGOs. In both countries, we encountered instances where NGOs had duplicated efforts or provided assistance not suited to the needs of the population. Nevertheless, many community residents expressed appreciation for the physical and financial assistance provided by NGOs, which were viewed as extremely important in the meeting of the populations' basic and secondary needs, such as the repair or replacement of damaged boats. Local NGOs and those international NGOs that had long-standing development experience in the impacted communities were particularly well suited to supporting community-based efforts, such as debris removal and recovery initiatives, and to working with community leaders and residents to provide assistance in ways that best met their emerging needs.

As previous disaster research has shown, ongoing and effective communication and coordination of local and international NGOs and local, district, state, and national government organizations are key to effective disaster response and recovery. Further research in this area should focus on the different recovery strategies employed in the impacted countries; the extent to which organizations in the region are able to learn from their experiences; the challenges in providing immediate assistance given unique political, economic, cultural, and geographic contexts; and the extent to which early warning strategies can be developed in ways that will prove effective for different types of communities.

### **Community Characteristics and Needs**

We visited small fishing villages, towns, urban areas, and communities with mixed land uses and noted that community characteristics affected disaster resilience in several important ways. The impact to these communities varied widely; some sustained significantly higher casualty rates and property damage than others. We noted economic variations among these communities. Where some were heavily reliant on one industry, others were involved in several. In villages that were totally dependent on fishing, most economic activity had ceased following the tsunami. Fishermen repeatedly informed us that their most important needs were boats, nets, and motors to replace those that had been destroyed. Local media in India reported that the government compensation program for destroyed or damaged boats will include both direct pay-

ments and low-interest loans. However, loans will exacerbate current economic problems, particularly for fishermen who already have outstanding loans on the boats that were lost.

In the wake of the tsunami, preexisting social tensions, economic hardships, and class differences were quite clear. The ongoing conflict between the Sri Lankan government and the Tamil Tigers (Liberation Tigers of Tamil Eelam) illustrates the coupling of disaster response with preexisting social context in that this political conflict generated challenges for response and recovery efforts. Further, in one Indian town, we encountered a demonstration staged by agricultural laborers protesting the lack of disaster aid. While fishermen and farm owners had been promised government assistance, agricultural laborers had not, despite the fact that their livelihoods were also dependent on tsunami-ravaged resources.

In some communities, individuals were actively engaged in immediate rehabilitation efforts, such as clean up and temporary shelter construction, while residents in other communities did not appear to take part in the recovery. Nevertheless, despite the destruction in many of the communities that we visited, social cohesion, solidarity, and altruistic behavior appeared to be the norm. This further reinforced the importance of developing strategies that foster community resilience to catastrophic events, strategies that improve upon the abilities of coastal populations to protect themselves. Future research is needed to understand the social relationships in these communities, the nature and extent of community conflict (if any) before the tsunami, and to what extent routine social patterns may have changed. Further research should also explore the factors that facilitated community-based participation in the immediate and short-term recovery efforts.

### **Relocation in the Coastal Zones**

Relocation issues also emerged as central to long-term disaster recovery and mitigation efforts in both India and Sri Lanka. Both countries had proposed either the creation or increased enforcement of coastal management regulations, calling into question the extent of possible reconstruction. Our observations suggest that implementing and enforcing these regulations would create conflict among a number of stakeholders. For example, national level concerns with coastal resource conservation and hazard mitigation would conflict with community-level desires to resume previous patterns of economic and residential activity. In some areas, especially in Sri Lanka, the density of existing coastal development limits relocation options that correspond with the fishing communities' desires to remain close to their work. In both countries there was a shortage of usable publicly owned land and land that would not simply shift vulnerability from tsunami-related risks to monsoon flooding related risks.

Research is needed to explore how these countries make decisions, prioritize risk, and balance risk management and disaster mitigation with other community needs. Issues related to the feasibility of relocation and community decision making transcend national boundaries and are relevant not only to the tsunami-impacted regions but also to the United States and many other countries.

## Persistent Uncertainty

Many community residents appeared to be living in states of persistent uncertainty that extended into many facets of their lives. They reported changed perceptions regarding the dangers of the sea, which led to fear of approaching the shoreline and concerns about previously unquestioned fishing practices, such as sleeping on boats while working at sea. Many expressed fear that another tsunami was imminent, particularly as the one month anniversary of the disaster approached. In India, we encountered victims who would return to their homes, or to the sites where their homes had once been, during the day, but would sleep away from the coast out of fear of another tsunami. Community residents were also uncertain as to when they would be able to resume their work, procure locations for new houses, build those houses, and resume "normal" community rhythms. As an additional indicator of uncertainty, there was a high level of skepticism regarding the extent to which the government will fulfill promises made regarding disaster relief. Victims described how these ongoing concerns had impacted sleeping patterns, increased stress levels, and interrupted daily activities. Research is needed to explore what strategies are being used to cope with this uncertainty and how it may impact communities over the short and long term.

## Closing Remarks: Building Collaborative Efforts

We have presented a synopsis regarding some of the emerging social science issues facing communities in India and Sri Lanka. It is quite evident that the complexity of these issues requires a multidisciplinary approach and collaboration, particularly if we are to improve our understanding of these issues and make contributions aimed at enhancing disaster preparedness, response, and recovery in these regions. The earthquake on March 28, 2005, along the Sumatra fault line also reemphasizes the need for long-term international commitment to this region, both in terms of recovery efforts as well as research.

There are many scholars and practitioners in these regions with long histories of respected work in the disaster field. There are many more who, while not working directly on disaster issues, have their own areas of expertise to contribute to our understanding of the impacts and implications of the tsunami in these countries and who could make substantial contributions to our field. We are working to foster these collaborative relationships with our colleagues in the region and would encourage others to do the same.

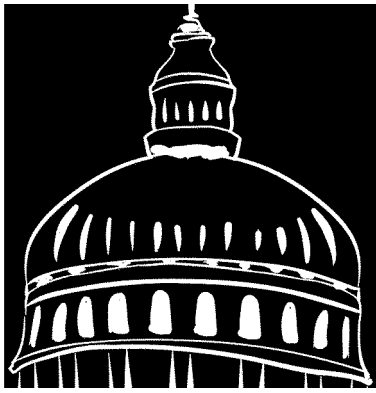
Joseph Trainor  
Havidán Rodríguez  
Tricia Wachtendorf  
Disaster Research Center, University of Delaware

James Kendra  
Emergency Administration and Planning Program,  
University of North Texas

## New Quick Response Reports from the Natural Hazards Center

The following Quick Response reports have been posted on the Natural Hazards Center's Web site at <http://www.colorado.edu/hazards/qr/qrrepts.html>.

- QR172 *Elderly Populations in Disasters: Recounting Evacuation Processes from Two Skilled-Care Facilities in Central Florida, August 2004*, by Michelle Kuba, Alina Dorian, Sarah Kuljian, and Kimberley Shoaf. 2004. The purpose of this research was to identify current evacuation procedures for the nursing home population and document the baseline status of facilities and the procedures utilized in evacuations. To do so, researchers conducted interviews at two long-term care facilities that were evacuated because of Hurricane Charley. This report describes the differences in the circumstances as well as the approaches taken to the evacuation along with the successes and challenges experienced by each of the facilities.
- QR173 *The 2003 Southern California Wildfires: Constructing Their Cause(s)*, by Richard Stuart Olson and Vincent T. Gawronski. 2005. The purpose of revisiting the 2003 Southern California wildfire disaster for this research project was to examine how the local media constructed its cause or causes: did they attribute the fires to failures of hazard reduction, mitigation, preparedness, and/or response or fundamental land use decisions? The authors hypothesized that the wildfires would be overwhelmingly defined as a technical/organizational problem and not the result of flawed basic strategies in rural, suburban, and exurban California land use. Quantitative as well as qualitative data supported the hypothesis, finding that, for the general public, the disaster was constructed as primarily the result of preparedness and response problems.
- QR174 *Colorado Resort Communities and the 2002-2003 Drought: Impacts and Lessons Learned*, by Olga V. Wilhelmi, Deborah S.K. Thomas, and Michael J. Hayes. 2005. This study focused on the impacts of the drought of 2002 on tourism in Colorado and on the mountain resort communities in particular. The researchers identified three main categories of lessons learned: the conflict of water supply versus demand, the importance of cooperation between local and state entities, and the need for balanced messages in the media that consider local populations as well as visitors. This report also contains eight recommendations developed by the researchers to help vulnerable resort communities prepare for, mitigate, and respond to drought.

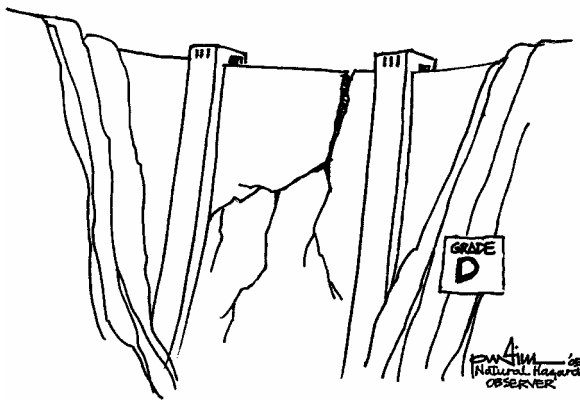


# WASHINGTON UPDATE

## America's Infrastructure Not Faring Well

In early March, the American Society of Civil Engineers released its *2005 Report Card for America's Infrastructure*, assigning a cumulative grade of D for the nation's infrastructure. The condition of America's roads, bridges, drinking water systems, and other public works have shown little to no improvement, while others have continued to decline, since they were graded an overall D+ in 2001. While there has been some improvement in aviation and schools, the analysis indicates that overall conditions have remained the same for bridges, dams, and solid waste, and worsened for roads, drinking water, transit, wastewater, hazardous waste, navigable waterways, and energy. Despite the direct threats that a crumbling infrastructure poses to American citizens, the poor state of the infrastructure makes it, and thus the people it supports, more vulnerable to natural, technological, and human-made disasters and further complicates homeland security initiatives to protect it.

The *2005 Report Card* was assessed by an advisory council of 24 civil engineers representing a broad spectrum of civil engineering disciplines. Each category was evaluated on the basis of condition and performance as reported by federal sources, capacity versus need, and current and pending investment of state, local, and federal funding versus need. For more information, including state infrastructure statistics and policy recommendations, visit <http://www.asce.org/reportcard/>.



## Interim National Preparedness Goal Released

As directed by the Homeland Security Presidential Directive 8 (HSPD-8), "National Preparedness," the U.S. Department of Homeland Security (DHS) has released the Interim National Preparedness Goal. The goal will guide federal departments and agencies; state, territorial, local, and tribal officials; the private sector; nongovernmental organizations; and the public in determining how to most effectively and efficiently strengthen preparedness for terrorist attacks, major disasters, and other emergencies.

The seven priorities for national preparedness are:

- Implement the National Incident Management System and National Response Plan;
- Expand regional collaboration;
- Implement the Interim National Infrastructure Protection Plan;
- Strengthen information sharing and collaboration capabilities;
- Strengthen interoperable communications capabilities;
- Strengthen chemical, biological, radiation, nuclear, and explosive weapons detection, response, and decontamination capabilities; and
- Strengthen medical surge and mass prophylaxis capabilities.

Beginning in fiscal year 2006, DHS expects state governments to update their homeland security preparedness strategies to reflect how they are addressing the seven national priorities in order to receive further federal assistance.

For more information about HSPD-8 and the National Preparedness Goal, visit <http://www.ojp.usdoj.gov/odp/assessments/hspd8.htm> or e-mail [hspd8@dhs.gov](mailto:hspd8@dhs.gov). The plan itself and a Target Capabilities List are available on the Lessons Learned Information Sharing Web site at <http://www.llis.gov/>, which is password protected and requires user registration.

## Digital EAS Pilot Tests Successful

The Federal Emergency Management Agency, the federal government's program manager for the national Emergency Alert System; the U.S. Department of Homeland Security's (DHS) Information Analysis and Infrastructure Protection Directorate; and the Association of Public Television Stations have joined other federal de-

partments and agencies and several private communication companies and broadcasters for a series of tests using digital technology to improve America's alert and warning system.

The tests are part of a pilot project designed to demonstrate how DHS can improve public alert and warning during times of national crisis through local public television's digital television broadcasts. Launched in October 2004 as part of DHS' Integrated Public Alert and Warning (IPAWS) initiative, the Digital Emergency Alert System National Capital Region Pilot has successfully demonstrated how DHS and the National Oceanic and Atmospheric Administration can disseminate alert and warning messages through public-private partnerships. Utilizing the digital capabilities of the nation's public television stations and the voluntary participation of cell phone service providers, public and commercial radio and television broadcasters, satellite radio, cable and internet providers, and equipment manufacturers, the tests represent the beginning of an IPAWS program designed to provide critical life-saving information to the nation in a timely and effective manner.

Read the press release at <http://www.aps.org/news/EAS-PILOT.cfm>.

### New Hand-Held Information System for Emergency Responders

The National Institutes of Health's National Library of Medicine (NLM) has announced the release of a personal digital assistant (PDA) software tool designed to help first responders when they arrive at a hazardous material (hazmat) incident, such as a chemical spill. The new tool, dubbed "WISER" (Wireless Information System for Emergency Responders), provides critical information on hazardous substances, including physical characteristics, human health data, and containment and suppression information. To aid decision making, users can specify the role they are currently performing at the scene of an incident, and WISER organizes the critical information in a sequence most relevant to a first responder on the scene, a hazmat specialist, or an emergency medical specialist.

Operational versions of WISER for Palm OS and Pocket PC as well as a desktop version for Windows are now available without charge for download. A Web-based version is also being developed, and the NLM is collaborating with regional and local emergency response organizations and using their feedback as input for future enhancements. Find out more and download a copy of the software at <http://WISER.nlm.nih.gov/>.

### EPA Launches Technology Testing and Evaluation Program

The U.S. Environmental Protection Agency's (EPA) National Homeland Security Research Center has developed the Technology Testing and Evaluation Program (TTEP) in an effort to provide reliable information regarding the performance of homeland security related technologies. TTEP is an outgrowth of the EPA's successful and internationally recognized Environmental Technology Verification program.

The primary focus of TTEP is the testing of commercially available technologies designed for protecting water infrastructure and decontaminating structures and the outdoor environment, specifically, detection, monitoring, treatment, decontamination, computer modeling, and design tools. TTEP aims to provide high quality information that is useful to decision makers in purchasing or applying the tested technologies. It provides potential users with unbiased, third-party information that can supplement vendor-provided information. Stakeholder involvement ensures that user needs and perspectives are incorporated into the test design so that useful performance information is produced for each of the tested technologies.

Summary reports will be made available at <http://www.epa.gov/nhsr/>. For more information, contact Eric Koglin at (702) 798-2332 or [koglin.eric@epa.gov](mailto:koglin.eric@epa.gov). A fact sheet is available at <http://www.epa.gov/ordnhsr/pubs/fsTTEP031005.pdf>.



### Reclamation and Army Join Forces

The Bureau of Reclamation and the Office of the Assistant Secretary of the Army (Civil Works) (OASA-CW) have signed a partnership agreement designed to increase the coordination, collaboration, and cooperation between the two agencies. This partnership agreement will enable Reclamation and OASA-CW, through the U.S. Army

Corps of Engineers (USACE) civil works mission, to collaborate in executing each agency's responsibilities for developing, managing, and protecting the nation's water and related land resources. Some of the areas of mutual interest in which the two agencies will be working together include water resources management issues, such as river management activities and water supply initiatives; hydropower management and technical assistance in research efforts and employee training; efforts to improve dam safety and security; emergency management procedures; water-related recreation management issues; and improvement of communications between field offices.

To learn more about the partnership goals, see the press release at <http://www.hq.usace.army.mil/cepa/releases/burec.htm>. For more information on Reclamation and USACE missions and partnerships, visit Reclamation's Web site at <http://www.usbr.gov/> and USACE's Web site at <http://www.usace.army.mil/>.

### More WTC News from NIST

On April 5, the National Institute of Standards and Technology (NIST) presented its latest findings from its building and fires safety investigation of the World Trade Center (WTC) disaster of September 11, 2001. The findings include the final probable collapse sequence for the towers, which updates and finalizes hypotheses released by NIST in October 2004, and lessons learned from three other projects: analysis of building and fire codes and practices; occupant behavior, egress, and emergency communications; and fire service technologies and guidelines.

Recommendations for improvements to building and fire codes, standards, and practices derived from these and the other five projects in the investigation will be released for public comment in June, along with drafts of reports from the remaining five projects and a draft of the final investigation report. NIST plans to release the final investigation report in September 2005. A copy of the April 5th presentation (including the complete probable collapse sequences for both towers), 15 new draft reports, and all previous WTC investigation findings are available at <http://wtc.nist.gov/>.

### CIP Information Sharing for Emergency Services Gets Boost

The U.S. Department of Homeland Security has announced a new initiative to promote critical infrastructure protection (CIP) information sharing among senior leaders of public and private organizations within the emergency services sector. The initiative, which defines critical infrastructure as the essential people, equipment, and systems needed to prevent or mitigate the catastrophic results of disasters, is located at the Emergency Management and Response-Information Sharing and Analysis Center (EMR-ISAC) at the National Emergency Training Center in Emmitsburg, Maryland. Its mission is to collect, analyze, and disseminate CIP information in support of federal initiatives and encourage emergency services sector leaders, owners, and operators nationwide to practice CIP.

Using an Internet-based, secure portal of DisasterHelp.gov, the EMR-ISAC distributes "For Official Use Only (FOUO)" information related to the threats against and the vulnerabilities of critical infrastructures to key federal, state, local, and tribal emergency services sector leaders nationwide (e.g., fire, police, and emergency medical services department chief and deputy/assistant chief officers; emergency managers; fire marshals; and the owners and operators of private emergency agencies). DisasterHelp.gov is part of the federal government's e-gov initiative, which strives to enhance disaster management on an interagency and intergovernmental basis.

To participate, sector personnel must register with DisasterHelp.gov at <https://disasterhelp.gov/usfacip.html>. More information about this critical infrastructure protection program can be found at <http://www.usfa.fema.gov/subjects/emr-isac/>.

### Guidance Released for New Forest Service Planning Rule

The Forest Service has issued the proposed administrative policy for implementing its new planning regulation for the management of national forests and grasslands. The 12 interim directives detail procedural requirements and responsibilities for managers to implement the new planning rule, which became effective January 5, 2005 (see the *Observer*, March 2005, pp. 9-10). The policy includes guidance on how to develop an environmental management system tool to improve performance and accountability, collaborate with the public, provide for species protection by taking into account the best available science, and develop guidelines on forest activities, such as hazardous fuels reduction.

The new rule and the proposed directives are available at <http://www.fs.fed.us/emc/nfma/>. The notice was published in the March 23, 2005, *Federal Register* (Vol. 70, No. 55, pp. 14637-14642), which can be found in any *federal repository library* or online at <http://www.access.gpo.gov/>. Public comment is invited and will be considered in developing final directives. Send written comments concerning these interim directives for receipt by June 21, 2005, to *Forest Service Planning Directives, c/o Content Analysis Group, PO Box 2000, Bountiful, UT 84011-2000; e-mail: planningdirectives@contentanalysis.group.com*. For more information, contact *Regis Terney* at (202) 205-1552.


### Citizen Corps Partners with the Association of Public Television Stations

The U.S. Department of Homeland Security's Citizen Corps has partnered with the Association of Public Television Stations to generate public awareness about emergency preparedness. The partners will work through state, county, local, and tribal Citizen Corps Councils and local public television stations, offering television programming, public events, and community outreach to engage citizens in making their communities safer and more prepared for emergencies of all kinds. Find out more about the partners online at <http://www.citizencorps.gov/> and <http://www.aptv.org/>.

## NSTC Examines Role of Social, Behavioral, and Economic Sciences in Fighting Terrorism

The National Science and Technology Council (NSTC) has released the report *Combating Terrorism: Research Priorities in the Social, Behavioral and Economic Sciences* (2005, 26 pp., free). Produced by the Subcommittee on Social, Behavioral, and Economic Sciences, this is the first NSTC report on the role of the social and behavioral sciences (which include psychology,

sociology, anthropology, geography, linguistics, statistics, and statistical and data mining) in helping the American public and its leaders to understand the causes of terrorism and how they can be countered. The focus of the report is on how these sciences can help us to predict, prevent, prepare for, and recover from a terrorist attack as well as ongoing terrorist threats. The report can be found at <http://www.ostp.gov/nstc/html/terror.pdf>.



**Mark Your Calendars**

National Hurricane Preparedness Week  
May 15-21, 2005  
<http://www.nhc.noaa.gov/HAW2/>

Lightning Safety Awareness Week  
June 19-25, 2005  
<http://www.lightningsafety.noaa.gov/week.htm>

## Dissolution of the Partnership for Public Warning

Nine months after scaling back operations pending funding for the implementation of its National Strategy for Integrated Public Warning Policy and Capability, the Board of Trustees of the Partnership for Public Warning (PPW) has announced the dissolution of the organization. The PPW was created as a nonprofit consortium in December 2001 by representatives from federal, state, and local government; emergency management; private industry; academia; and others who recognized the need to identify the major challenges to improving the nation's public warning capability and reach consensus on effective solutions and strategies.

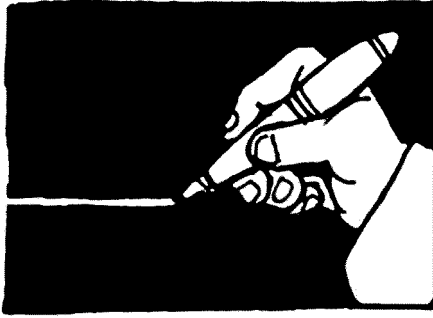
The PPW's accomplishments include the following:

- Establishing the only national collaborative, public-private partnership where government, industry, and the public could work together on public warning issues
- Focusing national attention on the need to improve America's public warning capability
- Developing and promoting the first standard message format for public warning—the Common Alerting Protocol
- Conducting an assessment of the Emergency Alert System and providing recommendations for improvement
- Evaluating the Homeland Security Advisory System and providing recommendations for developing a more effective way to communicate terrorist threat information to the public
- Producing a consensus-based national strategy and implementation plan for creating a more effective national capability to warn and inform citizens during times of emergency

While acknowledging that there is still a vital need for public-private partnerships in the area of public warnings, the board expects that other organizations will step forward and build upon the foundation laid by the PPW.

The board thanks all the organizations and individuals who worked with the partnership to improve America's public warning capability. The PPW's Web site will remain available until May 31, 2005: <http://ppw.us/ppw/>.





## ON THE LINE

# Learning from Sri Lanka: A Wake Up Call for Coastal Hazards Mitigation

The devastating tsunami generated by the Sumatra magnitude 9.3 earthquake on December 26, 2004, killed over 200,000 people in 12 countries around the perimeter of the Indian Ocean. Millions of housing units were damaged or destroyed, economies were decimated, and ecosystem disruption is still being assessed. The lessons from this catastrophic disaster have worldwide implications.

I visited Sri Lanka from January 30 through February 9, 2005, as part of a quick response reconnaissance team. Our local hosts organized a field reconnaissance to locations where large numbers of people died and/or where the impact was particularly significant. Additional insights were provided by interviews with representatives from the Ministry of Urban Development and Water Supply as well as with individual survivors, business owners, and investigators at the University of Moratuwa in Colombo.

### Tsunami: The Sri Lankan Experience

In Sri Lanka, the tsunami proved disastrous from many perspectives. Lives were lost, communities destroyed (housing, commercial entities, and infrastructure), and ecosystems damaged. Over 35,000 people were killed; at least 16,000 were injured. Almost one million people suddenly became homeless, and an estimated 350,000 lost their jobs, including fishermen, other informal traders, and microenterprise employees representing tourism as well as other small businesses.

High occupancy/high consequence facilities were also severely impacted. An estimated 30 hospitals and health care facilities were damaged or destroyed, making health care difficult to come by for the many injured. Additionally, 176 schools were either damaged or destroyed; luckily, since the disaster struck on a Sunday, school was not in session.

It is important to note that loss of life did not necessarily correlate with population density. In many cases it reflected inappropriate behavior and failure to evacuate. For example, when the first wave receded to expose the sea floor, large numbers of people followed the strange phenomenon to collect seashells and stranded fish. When the wave suddenly turned they were too far out to reach safety. Others died because they tried to climb onto buses or a train instead of taking refuge in nearby reinforced

concrete buildings. Low-density areas characterized by abundant opportunities for spontaneous pedestrian and nonmotorized evacuation generally had lower fatality rates. Conversely, high-density places with narrow discontinuous lanes and alleys (lack of evacuation routes) trapped many people.

The northeast and southern regions of the country were the most severely affected. High concentrations of fatalities were experienced in several communities characterized by densely spaced, poorly constructed residential/commercial buildings with very narrow paths for ingress and egress. Approximately 10,000 people died in one such community.

There were other impediments to evacuation besides the lack of access routes. Numerous victims were killed or lacerated by a species of palm tree with serrated bark and very sharp fronds. The risks created by this palm were compounded by its common use, in combination with barbed wire, for fencing. Many bodies were found in front of such fences.

In addition to the human casualties and the devastation of the built environment, geomorphic changes and other coastal ecosystem impacts have been noted (but not yet fully analyzed). In several bays the beaches became narrower and lower; many of the canals and lagoons that open to the sea have been altered. Both of these changes will enable the energy from high wave events such as storms and cyclones to be transferred farther inland, making them more dangerous and destructive.

Ecosystem damage caused by past practices also interacted with the settlement patterns to exacerbate the effects of the tsunami. For example, anecdotal evidence strongly indicates a direct correlation between coral reef mining, higher amplitude and wave energy, loss of life, and building damage. Tsunami waves also appear to have entered inland with greater force in the areas where sand dunes had been graded or where mangroves had been cut.

### Setting the Context

Underlying policies and regulations establish the context within which these losses occurred. A number of planning tools were identified that were notable because they were either enforced or not enforced and/or because



they represent opportunities to be built upon during recovery.

- **Coastal Enterprise Zone**—In the 1980s a one-kilometer zone around Sri Lanka was declared an urban development zone administered by the Urban Development Authority (UDA) to encourage economic activity, such as port expansion, international tourism, and fishing. The UDA, with jurisdiction over the entire area, can apply its legal authority and laws throughout.
- **Coastal Erosion Reduction Zone**—A 300-meter zone was created to reduce coastal erosion, which is particularly severe on the northeastern coast. The Department of Coastal Conservation, which administers the Coastal Erosion Reduction Zone, operates under a law that gives them the authority to control construction, including designation of a safety line beyond which development is not permitted. Currently, construction must remain a minimum of 50 meters inland from the vegetation line. Guidelines also mandate creation of vegetation buffers. In the few instances where such buffers were observed, they successfully reduced the effects of the tsunami.
- **Buildings codes and access standards**—A high percentage of damage occurred to residences and small businesses, the majority of which were constructed by the “informal” sector. Structures built by this sector tend not to comply with commonly accepted construction standards (e.g., there was a notable lack of good mortar and or reinforcing steel). Compounding the problem, setbacks in the coastal erosion zone have not been enforced. Thus, the poorly built structures could not benefit from the protective buffering and wave dampening that may have been provided by the zone. A similar lack of quality control also extended to access routes, which in the densest of areas were either non-existent or very narrow. Regularly spaced access to and from the ocean did not exist.
- **Temporary Safety Buffer Zone**—The Ministry of Urban Development and Water Supply has declared a 100-meter safety zone, which is temporarily a “no build” or a special review zone. A permanent zone will be defined to include subzones, the boundaries of which are expected to correlate scientific, site specific, and use-related variables. In some instances, areas with steeper topographic elevations may be removed from the safety zone or their setbacks may be reduced. But, where vulnerability to multiple hazards, such as cyclones and coastal erosion, is high, setbacks may be increased.

Once characteristics of the safety zone are more specifically defined, it will become scientifically feasible to define “appropriate” and “inappropriate” uses for the hazards zones. Some structures, built to international standards of resistance and capable of providing shelter-in-place for cyclone or tsunami events, may be allowed while high occupancy/high consequence facilities, such as schools and hospitals, may not be.

## Conclusions: Lessons from Sri Lanka

Coastal regions will always be focal points for commerce, tourism, recreation, and residential uses. As such,

it is inevitable that coastal regions will be subject to development pressures and population concentrations. With this vulnerability in mind, the lessons from the Indian Ocean tsunami are particularly relevant.

**Lesson #1: Education is essential to saving lives:** The role of public awareness cannot be overemphasized. A significant number of fatalities occurred because people did not know when to evacuate. In the few areas that benefited from formal education (as in the case of the British schoolgirl visiting Sri Lanka who had just studied tsunamis) or prior experience and oral history, there was a noticeable reduction in the number of casualties.

The following evacuation questions should be addressed in outreach education in preparation for an event:

- **Who should be educated?** Populations worldwide must be educated. Virtually anybody can find themselves on a coastal road, train, or in a port, coastal hotel, restaurant, or business. Many of the fatalities on December 26 were foreign tourists on winter holiday.
- **When should an evacuation take place?** Education should stress key indicators and emphasize the need for timely decision making.
- **What are the evacuation routes?** Access routes must be provided and maintained free of obstructions.
- **Where will evacuees go?** Sites to accommodate refugees for 12-24 hours must be identified within a 5 to 10 minute walk of the projected hazards area.

**Lesson #2: Multihazard-based decision making is key to risk reduction:** Patterns of loss indicate that in Sri Lanka, like many other coastal regions throughout the world, multiple geological and atmospheric hazards tend to be coterminous, which reinforces the risk of repetitive loss. This vulnerability highlights the value of applying predictable and science-based criteria to guide decision making for coastal regions. The importance of multihazard planning that considers reciprocal implications and risks of ecological disturbances, such as those caused by coral reef mining, and vulnerability to such hazards as tsunamis, earthquakes, cyclones, and storm waves is an essential aspect of loss reduction.

Clear identification of the risk factors is only the first step in establishing risk-based development criteria, including restrictions. Avoidance practices through mandated open space and setbacks may however be insufficient to both reduce ongoing erosion and encourage safer development patterns. Clearly, articulated goals must guide future development. Construction in compliance with enforced regulations is essential. The use of non-structural tools, such as vegetation management, to create energy reducing buffers is also necessary. By combining a variety of loss reduction mitigation strategies, communities can improve their coastal environments to withstand “unexpected” pressures from both nature and humans.

Jane Preuss AICP  
Planwest Partners

## Call for Submissions: 2005 Gender and Disaster Sourcebook

What is the link between gender equality and disaster risk management? What lessons have been learned in the field and through scientific study? How can this knowledge be applied in practice to reduce risk and respond equitably to disaster events?

A one-stop, user-friendly electronic guide is currently under development to help answer these questions with support from the Public Entity Risk Institute and the Pacific Disaster Center/East-West Center. The final product, written in English with reference to resources easily revised and adapted, will be available in December 2005 through the Gender and Disaster Network ([http://online.northumbria.ac.uk/geography\\_research/gdn/](http://online.northumbria.ac.uk/geography_research/gdn/)).

Submissions are encouraged from all regions and areas of expertise, particularly:

- Recent gender-sensitive case studies
- In-house reports or documents on gendered capacities, vulnerabilities, impacts, and responses in disaster contexts
- First-person accounts in disasters
- Research protocols
- Good practice models
- Gender-sensitive checklists and field guides
- Positive photographs of women and girls in action
- Ready-to-use guides to mainstreaming gender in mitigation
- Information about grassroots community and women's groups active in disaster response and risk reduction
- Good sources of information for the newcomer as well as the specialist on gender, development, and disaster
- Links to useful Web sites
- Training opportunities and materials with a strong gender focus
- Relevant college syllabi or modules
- Policy guides and sample practice protocols
- Topical bibliographies



To contribute ideas or materials to the *2005 Gender and Disaster Sourcebook*,  
e-mail Elaine Enarson at [eenarson@earthlink.net](mailto:eenarson@earthlink.net).

### New Emergency Alerting and Messaging Initiative

A group of National organizations representing a multitude of emergency response organizations has announced the launch of the National Emergency Alerting and Response Systems (NEARS) Initiative. NEARS, a nonprofit, cooperative effort, was launched to develop an effective approach to interagency messaging to better protect the public as well as first responders themselves.

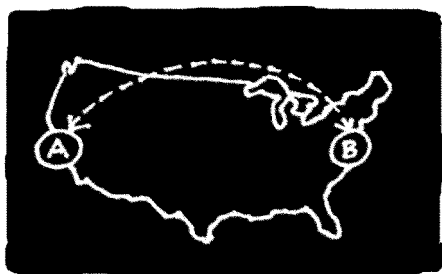
The NEARS partners plan to deploy interoperable emergency data messaging using national emergency message and data standards, commercial information technologies, and a shared, electronic directory of agencies called the Emergency Provider Access Directory (EPAD) that gives agencies the ability to register for emergency messages based on their geography, incident interest, and agency type.

Current NEARS partners include representatives from fire, law enforcement, 9-1-1, emergency medical services, emergency medicine, public health, emergency management, private infrastructure, and the media.

Upon completion, NEARS partners expect that:

- Every emergency agency that participates by registering in EPAD will be able to send an emergency data message to any other emergency agency in the directory;
- Agencies will benefit by improving their preparedness planning and emergency event coordination efforts;
- Agencies will be able to send and receive external information into their current technology tools, so they do not lose that investment; and
- NEARS will provide one approach for all-hazards emergency messaging.

More information about the NEARS initiative can be found at <http://comcare.org/nears/> or by calling (202) 429-0574. The Emergency Information Infrastructure Project Virtual Forum hosted an online discussion about NEARS on April 6. Read the transcript at <http://www.emforum.org/>.



# 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>.

**First Regional Training Course on Disaster Mental Health.** Organizer: Asian Disaster Preparedness Center (ADPC). **Bangkok, Thailand: May 23-27, 2005.** This course aims to provide mental health professionals with the skills and understanding to begin to develop, implement, supervise, and manage psychological support programs in preparation for and in response to disaster. For more information, contact the *Training and Education Division, ADPC, Asian Institute of Technology, PO Box 4, Klong Luang, Pathumthani 12120, Thailand; e-mail: tedadpc@adpc.net; http://www.adpc.net/.*

**Third International Symposium on Flood Defence (ISFD3).** **Nijmegen, The Netherlands: May 25-27, 2005.** Combining presentations; discussions between scientists, managers, and representatives from flood management authorities; and field trips, this event will focus on floods from rivers, the disciplines needed to manage them (hydraulics as well as socioeconomics), and administrative aspects. For more information, contact *Bureau Routine, Congress Office, PO Box 31 249, 6503 CE Nijmegen, The Netherlands; 31 (0)24 355 55 03; e-mail: info@isfd3.nl; http://www.isfd3.nl/.*

**12th Pacific Regional Disaster Management Meeting: Investment for Sustainable Development; Building the Resilience of Nations and Communities to Disasters.** Sponsors: South Pacific Applied Geoscience Commission (SOPAC), National Disaster Centre. **Madang, Papua New Guinea: June 6-8, 2005.** The purpose of this meeting is to bring together disaster management stakeholders and partners to discuss the Draft Pacific Islands Framework for Action 2005-2015. Themes include governance, hazards identification and assessment, early warning systems, development of risk reduction tools, and preparedness for effective response. For more information, contact *SOPAC, Private Mail Bag, GPO, Suva, Fiji Islands; +679 338 1377; e-mail: kata@sopac.org; http://www.sopac.org/tiki/ (12th PRDMM).*

**FEMA Emergency Management Higher Education Conference.** Host: Federal Emergency Management Agency (FEMA) Emergency Management Institute (EMI). **Emmitsburg, Maryland: June 7-9, 2005.** This conference is designed for representatives of colleges and universities that have existing hazards, disaster, or emer-

gency management programs in place or are attempting to develop and implement one. Its primary goal is to provide a forum for academics to discuss problems and issues surrounding hazards, disaster, emergency management, and homeland security educational programs. For more information, contact *Wayne Blanchard, EMI, 16825 South Seton, N-430, Emmitsburg, MD 21727; (301) 447-1262; e-mail: wayne.blanchard@dhs.gov; http://training.fema.gov/EMIWeb/edu/educonference05.asp.*

**GAREC-2005: The First Global Amateur Radio Emergency Communications Conference.** Organizers: International Amateur Radio Union, Finnish National Amateur Radio Society. **Tampere, Finland: June 13-14, 2005.** The focus of this event will be on the role of the amateur radio service in emergency response and disaster management. In addition to members of amateur radio societies, attendees will also include representatives from national and international humanitarian institutions, governmental and nongovernmental organizations, and the private and academic sectors. For more information, e-mail *seppo.sisatto@uta.fi* or *hb9aqs@arrl.org; http://www.iaru.org/emergency/.*

**13th Annual VOAD Conference.** Hosts: National and Colorado Voluntary Organizations Active in Disaster (VOAD). **Denver, Colorado: June 21-24, 2005.** This year's conference theme is "Ascending to New Heights" and will focus on the hurricane season of 2004, the National Response Plan, the National Incident Management System, volunteer management, donations management, recovery, government relations and legislation, emotional and spiritual care, and response, recovery, and relief. For more information, contact *Cathy Kissner, COVOAD; (970) 254-1011; http://www.nvoad.org/annualconf1.php.*

**Intensive Training Programme on Disaster Reduction with Focus on Floods and Droughts.** Sponsors: Czech Republic Government, Central European Disaster Prevention Forum, United Nations International Strategy for Disaster Reduction. **Prague, Czech Republic: June 24-July 1, 2005.** This course is designed for students and professionals who want to enhance their knowledge of disaster risk reduction and will have a focus on disasters triggered by hydrometeorological hazards. Lectures will be delivered by professors from the Czech Republic and

Austria and experts from the United States and the United Nations. For more information, contact Ms. Michalkova; +420224 382147; e-mail: [michalkova@fle.czu.cz](mailto:michalkova@fle.czu.cz).

**13th Community-Based Disaster Risk Management.** Organizer: Asian Disaster Preparedness Center (ADPC). **Bangkok, Thailand: July 4-15, 2005.** This course is an opportunity for practitioners to acquire tools and learn how to design and implement programs for reducing disaster risks and vulnerability and building community capacity to promote a culture of safety. Through exercises and simulations, participants will practice risk assessment and risk management planning. For more information, contact the *Training and Education Division, ADPC, Asian Institute of Technology, PO Box 4, Klong Luang, Pathumthani 12120, Thailand*; e-mail: [tedadpc@adpc.net](mailto:tedadpc@adpc.net); <http://www.adpc.net/>.

**16th International Disaster Management Course.** Organizer: Defence Academy of the United Kingdom, Cranfield University. **Shrivenham, Wiltshire, United Kingdom: July 18-August 5, 2005.** The aim of this course is to support the building of disaster management capacity within departments, agencies, organizations, and communities to improve their ability to manage disasters. The course is designed for individuals with, or who anticipate having, disaster management responsibilities and who wish to improve their working knowledge of both theory and practice. For more information, contact *Tony Moore, Cranfield University*; e-mail: [t.m.moore@cranfield.ac.uk](mailto:t.m.moore@cranfield.ac.uk); <http://www.rmcs.cranfield.ac.uk/ddmsa/dmc/dm.pdf>.

**11th International Conference and Field Trip on Landslides (ICFL 2005).** Organizers: Norwegian Public Roads Administration, Norwegian University of Science and Technology, Geological Survey of Norway, Norwegian Geotechnical Institute, Sintef. **Tromsø, Norway: September 1-10, 2005.** This event will bring together scientists, engineers, and planners concerned about landslides to discuss landslide processes, investigations, and monitoring. Topics will include landslides in quick clay, snow and slush avalanches, slides in other types of soils, impact of climate change, rock slides, risk evaluations, and landslide generated flood waves. For more information, contact *ICFL05 Secretariat, Department of Civil and Transport Engineering, Høgskoleringen 7A, NO-7491 Trondheim, Norway*; (+47) 73 59 46 02; e-mail: [ICFL05@ivt.ntnu.no](mailto:ICFL05@ivt.ntnu.no); <http://www.ivt.ntnu.no/ICFL05/>.

**5th Annual Meeting of the European Meteorological Society (EMS), 7th European Conference on Applications of Meteorology (ECAM).** Organizers: EMS, KNMI, MeteoConsult. **Utrecht, The Netherlands: September 12-16, 2005.** Themes of the EMS meeting will cover a variety of subjects related to applied atmospheric sciences. The central theme of ECAM is meteorology and customer value with the intent of providing a platform where meteorological institutions and providers and users of meteorological services can exchange ideas, results, needs, and demands. For more information, contact the *EMS Secretariat, Institute of Meteorology, Free University*

*of Berlin, Carl-Heinrich-Becker-Weg 6-10, 12165 Berlin, Germany*; +49 30 7970 8328; e-mail: [ems-sec@met.fu-berlin.de](mailto:ems-sec@met.fu-berlin.de); <http://www.copernicus.org/ems/2005/>.

**Seventh Regional Training Course on Flood Disaster Risk Management.** Organizer: Asian Disaster Preparedness Center (ADPC). **Bangkok, Thailand: September 12-23, 2005.** This course offers an integrated approach to the development of flood risk reduction strategies that involves engineering, settlement, development, public administration, community-based strategies, and land use planning (with environmental considerations). For more information, contact the *Training and Education Division, ADPC, Asian Institute of Technology, PO Box 4 Klong Luang, Pathumthani 12120, Thailand*; e-mail: [tedadpc@adpc.net](mailto:tedadpc@adpc.net); <http://www.adpc.net/>.

**Fall World 2005.** Organizer: *Disaster Recovery Journal*. **San Diego, California: September 18-21, 2005.** This conference will focus on all aspects of disaster recovery, contingency planning, and business continuity. Attendees will gain knowledge and information through sessions, workshops, exercises, and networking opportunities. An exhibit hall will showcase the latest industry trends, products, and services. Among other things, attendees can participate in a real-time disaster simulation (limited to 200 participants). For more information, visit <http://www.drj.com/conferences/sd2005/> or call (314) 894-0276.

**Probabilistic Risk Analysis: Assessment, Management, and Communication.** Sponsor: Harvard School of Public Health: Center for Continuing Professional Education. **Boston, Massachusetts: September 19-22, 2005.** Nationally and internationally known experts from different disciplines teach this course using a practical and integrated approach that combines lectures with case examples and hands-on computer exercises. For more information, contact the *Harvard School of Public Health Center for Continuing Professional Education, CCPE Department A, 677 Huntington Avenue, Boston, MA 02115*; (617) 384-8692; e-mail: [contedu@hsph.harvard.edu](mailto:contedu@hsph.harvard.edu); <http://www.hsph.harvard.edu/ccpe/programs/APRA.shtml>.

**2005 International Code Council Annual Conference.** **Detroit, Michigan: September 25-October 2, 2005.** This conference will feature the Final Action Hearings, the Education Program, the Annual Business Meeting, the International Code Council Expo, and networking opportunities among peers from the building safety and fire prevention fields. For more information, visit <http://www.iccsafe.org/news/annual/2005Conference/>.

**Information Security Convention 2005 (ISC2005).** **Kuala Lumpur, Malaysia: September 29-October 1, 2005.** ISC2005 is Malaysia's first information security exhibition and conference, offering cutting-edge security technologies, products, and services, as well as the latest know-hows and global trends. ISC2005 is organized by the Ministry of Science, Technology, and Innovations Malaysia under the banner of its information security arm, National ICT Security and Emergency Response Centre.

For more information, contact *Karen Dass*; e-mail: [karen.dass@protemp.com.my](mailto:karen.dass@protemp.com.my).

**IASPEI2005.** Organizers: University of Chile, Military Geographical Institute. **Santiago, Chile: October 2-8, 2005.** This General Assembly of the International Association of Seismology and Physics of the Earth's Interior (IASPEI) will provide an opportunity for geoscientists from all fields to present and discuss the recent advances in the Andean environment. For more information, contact *Diana Comte*, *Department of Geophysics, University of Chile*; e-mail: [dcomte@dgf.uchile.cl](mailto:dcomte@dgf.uchile.cl); <http://www.igm.cl/iaspei/iaspei.htm>.

**Fire-Related Research and Developments—Annual Conference.** Sponsor: Fire Service College. **Moreton-in-Marsh, United Kingdom: October 11-13, 2005.** This annual event attracts researchers and practitioners across the fire community to discuss research projects on fire-related issues. The 2005 event includes a special U.S.-U.K. symposium with international panels discussing management and leadership issues within fire services. For more information, contact *Anne Eyre*; e-mail: [anne.eyre@traumatraining.com](mailto:anne.eyre@traumatraining.com); [http://www.fireservicecollege.ac.uk/research/re05/RE05\\_home.htm](http://www.fireservicecollege.ac.uk/research/re05/RE05_home.htm).

**250th Anniversary of the 1755 Lisbon Earthquake.** **Lisbon, Portugal: November 1-4, 2005.** The 250th anniversary of the 1755 earthquake and tsunami is an opportunity to bring together scientists, engineers, historians, urban planners, architects, economists, and policy makers to foster an integrated view of the global perception of natural disasters and how society must deal with them. For more information, contact *Mundiconvenius*, *Rua do Embaixador, 13-2, 1300-215 Lisboa, Portugal*; +351 21 364 94 98; e-mail: [info@mundiconvenius.pt](mailto:info@mundiconvenius.pt); <http://www.mundiconvenius.pt/2005/lisbon1755/>.

**American Water Resources Association (AWRA) 2005 Annual Conference.** **Seattle, Washington: November 7-10, 2005.** In addition to this conference's traditional focus on multidisciplinary subjects, this year's event will offer sessions that address a mix of contemporary issues, such as the effects of natural catastrophes on water supplies and human health, the renewed interest in large water projects, dam decommissioning, and the increased risk to the nation's water supplies from terrorism and the steps taken to counteract it. For more information, contact *Patricia Reid*, *AWRA, PO Box 1626, Middleburg, VA 20118-1626*; (540) 687-8390; e-mail: [pat@awra.org](mailto:pat@awra.org); <http://www.awra.org/meetings/Seattle2005/>.

**32nd Regional Course on Disaster Management.** Organizer: Asian Disaster Preparedness Center (ADPC). **Bangkok, Thailand: November 7-25, 2005.** The purpose of this course is to provide comprehensive disaster management knowledge and skills to enhance the capabilities of professionals working in disaster management, development, and donor agencies to effectively integrate disaster management into development programs and policies. For more information, contact the *Training and Education*

*Division, ADPC, Asian Institute of Technology, PO Box 4, Klong Luang, Pathumthani 12120, Thailand*; e-mail: [tedadpc@adpc.net](mailto:tedadpc@adpc.net); <http://www.adpc.net/>.

**6th International Disaster and Emergency Resilience (IDER) Conference and Exhibition.** Sponsors: Fire Service College, Institute of Civil Defence and Disaster Studies, European Training and Simulation Association. **Moreton-in-Marsh, United Kingdom: November 9-10, 2005.** IDER is the conference and exhibition where best practices for readiness, response, and recovery for disasters and major emergencies are identified and implemented. For more information, contact *Andrich International*, *51 Market Place, Warminster, BA12 9AZ, UK*; +44 1985 846181; e-mail: [ider@andrich.com](mailto:ider@andrich.com); <http://www.andrich.com/ider/>.

**2nd Annual Canadian Risk and Hazard Network Symposium.** **Toronto, Ontario: November 17-19, 2005.** This symposium will bring together national and international scholars, researchers, and practitioners in a multidisciplinary partnership to share risk knowledge, practice, and policy information in the Canadian context. A major aim of the 2005 program will be to work towards creating a Canadian Platform on Disaster Reduction to submit to the United Nations International Strategy for Disaster Reduction, thus allowing Canada to join the many other countries of the world that have thus far achieved this goal. For more information, contact *David Etkin*; e-mail: [david.etkin@rogers.com](mailto:david.etkin@rogers.com); <http://www.crhnet.ca/>.

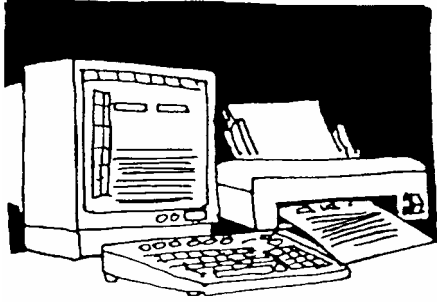
## Training to Help Animals Survive Disasters

Noah's Wish is a national disaster response team solely dedicated to rescuing and sheltering animals in disasters that offers volunteer in-field training. This training is for experienced volunteers, new volunteers, and individuals who want to be more aware of how disasters affect animals.

This comprehensive three-day in-field exercise combines instructional teaching, team building, and hands-on experience. Participants will stay on-site during the training to give them a realistic experience of the physical challenges of responding to a disaster.

Once a participant completes the volunteer in-field training, they will become part of the Noah's Wish National Disaster Response Team and be placed on an active call-out list to be alerted and possibly mobilized to future disaster sites.

For more information about the training, including dates and locations, or Noah's Wish and the services they provide, visit <http://www.noahswish.org/> or contact *Sheri Thompson* at (405) 621-9616 or [sherithompson@cox.net](mailto:sherithompson@cox.net).



# 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/>

The National Science Foundation (NSF) has introduced a new Web site, entirely redesigned to better serve the research and education community and the general public. Through the new site, the NSF hopes to more effectively explain its use of public funds and the results derived from it, while offering a user-friendly interface for its grantees and contractors.

<http://www.nod.org/epiconference2004/index.html>

The National Organization on Disability's Emergency Preparedness Initiative has released this "virtual binder" of materials related to the National Capital Region Conference on Emergency Preparedness for People with Disabilities.

<http://www.washington.edu/admin/business/oem/symposium/>

Presentations from Symposium 2005: Best Practices in Risk Reduction for Colleges and Universities, a two-day symposium/workshop for emergency professionals serving colleges and universities, are posted here.

<http://www.illinoishomelandsecurity.org/pdf/spontvol.pdf>

This document from Illinois Homeland Security, *Community Guidelines for Developing a Spontaneous Volunteer Plan*, was created to help Illinois communities develop and execute a community spontaneous volunteer plan.

<http://www.unisdr.org/disaster-statistics/introduction.htm>

These Web pages from the United Nations International Strategy for Disaster Reduction feature statistics, tables, graphics, and maps on disaster occurrence and their impacts for the period 1994-2003.

<http://www.science.gov/alerts/alertmain.shtml>

Science.gov, the Web portal for federal science information, now provides this free "alert" service that sends subscribers customized weekly e-mails about the most recent developments in science.

<http://www.ops.fhwa.dot.gov/OpsSecurity/>

The Federal Highway Administration has reengineered and expanded its emergency transportation operations and homeland security Web site with the continued purpose of providing state and local agencies with valuable information to help them make wise decisions to improve the security of roadway operations. Resources are organized based on prevention, preparedness, response, and recovery classifications. New content includes sections on cybersecurity and funding.

<http://www.ideo.columbia.edu/chrr/research/hotspots/>

The World Bank has published a report entitled *Natural Disaster Hotspots: A Global Risk Analysis* that presents a global view of disaster risks associated with some major natural hazards: drought, floods, cyclones, earthquakes, volcanoes, and landslides. The report identifies high-risk geographic regions so that development efforts can be better informed and designed to reduce disaster-related losses. Access the 29-page synthesis report and more at this Web site.

## Tsunamis

<http://www.pmel.noaa.gov/tsunami/sumatra20041226.html>

The National Oceanic and Atmospheric Administration's Pacific Marine Environmental Laboratory has put together this list of Web links related to the tsunami in the Indian Ocean on December 26, 2004.

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

Within days of the massive tsunami in the Indian Ocean in late 2004, teams of researchers rushed to survey the disaster, hoping to learn how such loss of life, property, and ecosystems can be prevented in the future. This special report from the National Science Foundation describes some of the findings.

<http://www.asce.org/page/?id=53>

Technical assessment teams comprised of members of the American Society of Civil Engineers and the Institution of Civil Engineers traveled to South Asia to study the catastrophic damage resulting from the recent earthquake and tsunami. Read their field reports here.

<http://www.fas.org/sgp/crs/RL32739.pdf>

**Tsunamis: Monitoring, Detection, and Early Warning Systems**, a report from the Congressional Research Service, was released in the wake of the Indian Ocean tsunami.

[http://ioc.unesco.org/indotsunami/paris\\_march05.htm](http://ioc.unesco.org/indotsunami/paris_march05.htm)

The 1st International Coordination Meeting for the Development of a Tsunami Warning and Mitigation System for the Indian Ocean Within a Global Framework concluded on March 8, 2005, with the adoption of a communiqué outlining the proposed arrangements for the establishment of a Tsunami Warning and Mitigation System for the Indian Ocean region (IOTWS) and terms of reference for the Intergovernmental Coordination Group for the IOTWS. Access the communiqué, the terms of reference, and the meeting presentations here.

<http://www.swissre.com/> (Research and Publications)

This new Focus report from Swiss Re, **Tsunami in South Asia: Building Financial Protection**, examines how the insurance industry should respond to tsunamis and other natural catastrophes occurring in developing countries.

<http://walrus.wr.usgs.gov/tsunami/srilanka05/>

**The December 26, 2004 Indian Ocean Tsunami: Initial Findings on Tsunami Sand Deposits, Damage, and Inundation in Sri Lanka** is a cooperative study by the U.S. Geological Survey, Earthquake Engineering Research Institute, National Science Foundation, Geological Survey and Mines Bureau of Sri Lanka, and GeoEnvironmental Consultants of New Zealand.

<http://www.pbs.org/wgbh/nova/tsunami/>

PBS debuted *Nova*'s "Wave That Shook the World" on March 29. This episode-dedicated Web site features a transcript, links and books, a teacher's guide, and more information about tsunamis past and present.

## Earthquakes and Landslides

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

The U.S. Geological Survey's preliminary report on the magnitude 6.4 earthquake that occurred in central Iran on February 22, 2005, is available here.

[http://www.eeri.org/lfe/iran\\_kerman.html](http://www.eeri.org/lfe/iran_kerman.html)

This Web page from the Earthquake Engineering Research Institute features information about reconnaissance activities associated with the magnitude 6.4 earthquake in central Iran on February 22, 2005.

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

The U.S. Geological Survey's preliminary earthquake report for the magnitude 8.7 quake that occurred off Indonesia on March 28, 2005, is available here.

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

This special report from the National Science Foundation introduces the George E. Brown, Jr. Network for Earthquake Engineering Simulation, which was created to give researchers tools to learn how earthquakes and tsunamis impact the buildings, bridges, utility systems, and other critical components of today's society.

<http://eqint.cr.usgs.gov/eq/html/eqprob.html>

The U.S. Geological Survey's (USGS) Geologic Hazards Team in Golden, Colorado, has developed this new earthquake probability mapping Web site to, in part, acquaint the general public with earthquake hazards in their neighborhoods. The site allows visitors to calculate estimates of the probability of future earthquakes in a particular part of the United States (e.g., a zip code), based on the earthquake rate, location, and magnitude data used by the USGS' National Seismic Hazard Mapping Project.

<http://www.curee.org/CV/>

The Consortium of Universities for Research in Earthquake Engineering (CUREE) has posted its membership database on its Web site. CUREE has 320 professor members in addition to its 28 member universities. The database can be searched based on specialty area and provides curriculum vitae and other information.

<http://pubs.usgs.gov/of/2005/1067/>

On January 10, 2005, a landslide struck the community of La Conchita, California, destroying or seriously damaging 36 houses and killing 10 people. This report from the U.S. Geological Survey provides a description of the La Conchita area and its landslide history, a comparison of the 1995 and 2005 landslides, and a discussion of continuing landslide hazards in the La Conchita area.

## **Hurricanes, Coastal Management, and Floods**

[http://books.nap.edu/html/ndr/flood\\_losses.pdf](http://books.nap.edu/html/ndr/flood_losses.pdf)

A summary of the March 2, 2004, Disasters Roundtable Workshop Reducing Future Flood Losses: The Role of Human Actions is available here.

<http://marineeconomics.noaa.gov/socioeconomics/>

The primary objective of this Web site from the National Oceanic and Atmospheric Administration's National Ocean Service, "Spatial Trends in Coastal Socioeconomics," is to increase awareness and improve access for the coastal stewardship community to socioeconomic information in a timely fashion. The site includes information for all 50 states and provides a set of Web-based data analysis and display tools to facilitate data retrieval, mapping, analysis, assessments, and comparative studies and also offers query tools to retrieve data by individual or multiple counties or watersheds.

<http://dels.nas.edu/dr/f13.html>

Presentations from the March 8, 2005, Disasters Roundtable Workshop Lessons Learned between Hurricanes: From Hugo to Charley, Frances, Ivan, and Jeanne are posted on this site.

## **Climate Change**

<http://ealert.pewclimate.org/ctt.asp?u=2965528&l=78466>

The Pew Center on Global Climate Change has created this special section on their Web site to examine the implications of the Kyoto Protocol's entry into force, including history, related issues, and reports and analyses. The section devotes significant space to the question of what happens next.

## **Health**

<http://www.bt.cdc.gov/agent/smallpox/disease/movies.asp>

This new site from the Centers for Disease Control and Preparedness (CDC) addresses some of the most noticeable misconceptions that might be derived about smallpox from fictional film and television programs. It also features links to more detailed CDC smallpox information.

<http://www.cdc.gov/nceh/ehs/ETP/>

This Web site from the Environmental Health Services Branch of the Centers for Disease Control and Prevention National Center for Environmental Health serves as a clearinghouse of information resources related to emergency and terrorism preparedness for environmental health practitioners.

## **Homeland Security**

<http://www.nyu.edu/ccpr/pubs/NYUEMSreport.pdf>

This report from New York University's Center for Catastrophe Preparedness and Response identifies critical deficits in the role and organization of emergency medical services (EMS) in homeland security preparedness and provides recommendations to improve the ability of EMS to respond to a terrorist attack.

<http://www.bepress.com/jhsem/>

For its first issue of 2005, the *Journal of Homeland Security and Emergency Management* has published the "Special Issue on Information Systems for Emergency Preparedness and Response." It provides four feature articles in addition to the regular content of the journal. Nonsubscribers can browse the index page for the five issues available to date and may request sample articles to download. For more information, contact *Claire B. Rubin* at [cbrubin@gwu.edu](mailto:cbrubin@gwu.edu).





# 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/>.

**Physical and Social Infrastructure Impacts and Interdependencies in the December 2004 Tsunami in Southern Thailand.** Funding: National Science Foundation, one year. Principal Investigator: *Thomas A. Birkland, Center for Policy Research, Nelson A. Rockefeller College of Public Affairs and Policy, University at Albany, State University of New York, Milne 300, 135 Western Avenue, Albany, NY 12222; (518) 442-5243; e-mail: birkland@albany.edu.*

This grant funded the collection of perishable data regarding the recovery of coastal southern Thailand following the December 2004 tsunami. The data will be used to apply the principles of systems science to complex socio-technological relationships. This interdisciplinary approach will allow direct observation of the interrelationships between the physical and social infrastructures during the recovery phase of a natural disaster. This research will assist in the development of basic knowledge about individual, group, and organizational behaviors and how they interplay with physical infrastructures in a formal systems context and will provide a foundation for future research on disasters of this magnitude.

**Cross-Cultural Analysis of Responses to Mass Fatalities Following the Indian Ocean Tsunami of December 26, 2004.** Funding: National Science Foundation, one year. Principal Investigators: *Henry W. Fischer (Erik Auf der Heide, Arthur A. Oyola-Yemaiel), Millersville University of Pennsylvania, PO Box 1002, Millersville, PA 17551; (717) 872-3568; e-mail: hfischer@millersville.edu.*

This study aims to identify mechanisms employed posttsunami in India, Sri Lanka, and Thailand for body recovery, identification, and disposal; notification of relatives of the deceased; and repatriation of remains of foreign victims. In particular, this team will study the impact of ethnicity, socioeconomic status, and nationality on the response to the mass fatalities. It will also examine the procedures currently in place in western countries such as the United States, Canada, France, Sweden, and the United Kingdom. Comparisons will be made to responses to smaller incidents in Western industrialized countries, such as the Estonia ferry incident, the Lockerbie crash, and the Oklahoma City bombing, among others.

**Factors Affecting Behavioral Response to Natural Warning Signs of Tsunami: The Case Study of the December 26, 2004, Earthquake.** Funding: National Science Foundation, one year. Principal Investigators: *Bruce Houghton (Roy Lachman), University of Hawaii, 2525 Correa Road, Honolulu, HI 96822; (808) 956-2561; e-mail: bhought@soest.hawaii.edu.*

Coastal communities at risk from tsunamis are often vulnerable to tsunamis from both distant and local sources. Detection and warning systems have been developed that can detect and report tsunamis, but their utility is greatest for distant tsunamis and at best limited for local tsunamis. Thus, communities must be aware of natural signs of tsunamis and be able to respond to both an official and a natural warning. This research team will collect social data from people in affected areas of the Andaman coast, Thailand, to understand human behavioral response to the events of December 26, 2004. Among other things, the research will investigate awareness of, and response to, the natural warning signs of the tsunami, and the factors that determined which responses were chosen.

**Indian Ocean Tsunami—Environmental and Socio-Economic Impacts on the Malay-Thai Peninsula.** Funding: National Science Foundation, one year. Principal Investigator: *Benjamin P. Horton, University of Pennsylvania, Department of Earth and Environmental Science, Hayden Hall, 240 South 33rd Street, Philadelphia, PA 19104; (215) 573-5388; e-mail: bphorton@sas.upenn.edu.*

A multinational team consisting of thirteen scientists and social scientists, including several members from the affected countries, has been assembled to better understand the causes and ramifications of the Indian Ocean tsunami of December 26, 2004. The team will use a suite of research methods drawn from science, engineering, and social science to collect data on height, velocity, extent, and effects of the tsunami at differentially affected stretches of the coastline along the Malay-Thai Peninsula. This study goes beyond the usual synthesis of either environmental or social scientific studies and will stimulate breakthroughs in knowledge about human action and development as well as organizational, cultural, and societal adaptation to catastrophic events.

**A Field Experiment on Rebuilding Sri Lankan Microenterprises After the Tsunami.** Funding: National Science Foundation, one year. Principal Investigator: *Christopher M. Woodruff, University of California–San Diego, 9500 Gilman Drive, La Jolla, CA 92093; (858) 534-3939; e-mail: cwoodruff@ucsd.edu.*

The intent of this project is to help microenterprises in Sri Lanka, one of the countries hardest hit by the December 2004 tsunami, recover and to learn about how to help businesses recover from disasters. The primary objective is to estimate returns to capital in microenterprises and to study the various determinants of firm investment decisions. Researchers propose to sample 350 microenterprises six times over the course of eighteen months, which will allow for information on the timeline of recovery.

**The Role of Coastal Ecosystem Degradation in Tsunami Damage.** Funding: National Science Foundation, one year. Principal Investigators: *Philip R. Berke, (William Rees, Beverley J. Adams, Stephanie E. Chang, Jacqueline Alder), University of North Carolina at Chapel Hill, Campus Box 3140, 308 New East, Chapel Hill, NC 27599; (919) 962-4765; e-mail: pberke@email.unc.edu.*

The massive destruction and loss of life caused by the recent tsunami disaster offers a significant opportunity to explore the links between ecosystem degradation and damage. While the disaster field has given limited attention to these links, even less attention has been given to the role of coastal ecosystems in mitigating tsunami impacts. This interdisciplinary reach team will examine the potential tsunami mitigation benefits of coastal ecosystems, providing insights into the effects of ecosystem degradation, remote sensing as a research tool, and environmental conservation as a mitigation strategy.

**Coseismic/Postseismic GPS Field Surveys in Response to the 26 December 2004 Mw 9.0 Sumatra Earthquake.** Funding: National Science Foundation, one year. Principal Investigator: *Yehuda Bock, Scripps Institution of Oceanography, University of California, San Diego, 9500 Gilman Drive, La Jolla, CA 92093; (858) 534-5292; e-mail: ybock@ucsd.edu.*

The purpose of this project is to resurvey a network of geodetic monuments in North Sumatra, the Mentawai Islands, and Banda Aceh to determine coseismic and postseismic deformation caused by the earthquake off Sumatra on December 26, 2004. These new data will provide critical geodetic constraints for the seismographic inversion of the earthquake source, to constrain models of the subsequent devastating tsunami, and to contribute to the study of the great earthquake cycle in that region.

**Tectonics of the Andaman Plate: Postseismic Response to the M9 Northern Sumatra Earthquake of 2004.** Funding: National Science Foundation, one year. Principal Investigators: *Robert Smalley (John P. Puchakayala), Center for Earthquake Research and Information, University of Memphis, Memphis, TN 38152; (901) 678-4929; e-mail: smalley@ceri.memphis.edu.*

These investigators plan to conduct both continuous and campaign GPS (global positioning system) measure-

ments of perishable, postseismic crustal deformation in the source region of December 2004's Sumatran earthquake, the largest earthquake to have occurred since the development of GPS. These activities will provide an unprecedented opportunity to observe the postseismic time evolution of Earth's response to large earthquakes and their effects on ongoing tectonic activity in this geologically active and complicated area and contribute to the updating of the region's seismic and tsunami hazards.

**Improvisation in Response to Extreme Events.** Funding: National Science Foundation, five years, \$400,000. Principal Investigator: *David J. Mendonça, Information Systems Department, GTC 4106, College of Computing Sciences, New Jersey Institute of Technology, 323 Martin Luther King Jr. Boulevard, Newark, NJ 07102; (973) 596-5212; e-mail: djm@njit.edu.*

Extreme events challenge society's capabilities for both planning and response. As indicated by the long history of extreme event decision making, a key to successful planning and effective response is flexibility. One approach to achieving flexibility is improvisation: a combined behavioral and cognitive activity that requires creativity under tight time constraints in order to meet performance objectives. Work under this Faculty Early Career Development (CAREER) grant consists of integrated research and education programs designed to improve how society understands, plans for, and supports improvisation in response to extreme events.

**Florida Hurricanes and Older Adults: Outcome/ Resiliency.** Funding: National Institute of Mental Health, two years, \$215,926. Principal Investigator: *Ronald E. Acierno, Medical University of South Carolina, PO Box 250861, Charleston, SC 29425; (843) 792-2945; e-mail: acierno@musc.edu.*

The purpose of this project is to assess mental health outcomes, protective and risk factors associated with these outcomes, and mental health service utilization patterns and unmet service needs in older adults (age 60 and over) and a comparison sample of younger adults in hurricane-impacted Florida communities. By doing so, researchers plan to document the acute impact of these repeated disasters on older adults while scientifically informing the development and improvement of services designed for them.

**Long-Term Impact of WTC Attacks in Primary Care.** Funding: National Institute of Mental Health, three years, \$619,800. Principal Investigator: *Yuval Y. Neria, New York State Psychiatric Institute, 1051 Riverside Drive, New York, NY 10032; (212) 543-6061; e-mail: ny126@columbia.edu.*

The primary goals of this project are to identify risk and protective factors for the development and persistence of postdisaster psychopathology in a low-income, urban, primary care population; to determine the role of ethnicity and acculturation in the expression of physical and mental symptoms and in seeking postdisaster mental health treatment; and to explore the role of postdisaster factors, such as social support and secondary stressors in mediating the disaster effects over time.



# RECENT PUBLICATIONS

Below are brief descriptions of a sampling of recent publications on hazards and disasters received by the Natural Hazards Center. Information on how to obtain copies is included.

## All Hazards

**Guide on the Special Needs of People with Disabilities for Emergency Managers, Planners, and Responders.** 2005. 32 pp. Pricing for bulk orders of printed copies will be available soon. Requests for bulk orders or three complimentary copies should be made in writing to [epi@nod.org](mailto:epi@nod.org). Available free online from the National Organization on Disability, 910 Sixteenth Street NW, Suite 600, Washington, DC 20006; (202) 293-5960; e-mail: [epi@nod.org](mailto:epi@nod.org); <http://www.nod.org/resources/PDFs/epiguide2005.pdf>.

This Guide highlights key disability concerns to officials and experts responsible for emergency planning in their communities and seeks to assist them in developing plans that will take into account the needs and insights of people with disabilities before, during, and after emergencies. It also is designed to help emergency managers, planners, and responders make the best use of resources, which include people with disabilities, in the emergency preparedness planning process. This revised edition has an expanded resource section and additional statistics from a 2004 survey of emergency managers.

**Megacities—Megarisks: Trends and Challenges for Insurance and Risk Management.** 2005. 79 pp. Free. Available from Münchener Rückversicherungs-Gesellschaft (Munich Re), Königstrasse 107, 80802 München, Germany; +49 (0) 89/3891-5291; [http://www.mu.nichre.com/publications/302-04271\\_en.pdf](http://www.mu.nichre.com/publications/302-04271_en.pdf).

Megacities are vulnerable not only to natural hazards, but also to technological risks, environmental hazards, and terrorist attacks. These vulnerabilities combined with populations exceeding ten million create huge challenges for the inhabitants of megacities, politicians, and the insurance industry. This publication presents an in-depth look at the risks faced by megacities from the insurance perspective.

**Visions of Risk: A Review of International Indicators of Disaster Risk and Its Management.** Mark Pelling. 2004. 73 pp. Available free online from the United Nations Development Programme (UNDP), Disaster Reduction and Recovery Unit, Bureau for Crisis Prevention and Recovery, 11-13 chemin des Anémones, CH-1219 Châtelaine, Geneva, Switzerland; +4122 917 8433; e-mail: [bcpr.disasters@undp.org](mailto:bcpr.disasters@undp.org); <http://www.undp.org/bcpr/disred/documents/publications/visionsofrisk.pdf>.

This report reviews the performance and future possibilities for disaster risk indexing drawing on three international indexing initiatives. These initiatives provide the first comprehensive global and regional assessments of disaster risk and point towards the ways in which indexing can contribute to enhanced transparency and effectiveness in development planning and disaster management.

**The Risk Management Yearbook 2005.** ISBN 1-893210-19-7. 2005. 166 pp. \$49.00. Available from the Public Entity Risk Institute (PERI), 11350 Random Hills Road, Suite 210, Fairfax, VA 22030; (703) 352-1846; <http://www.riskinstitute.org/>.

A joint effort by PERI and the Nonprofit Risk Management Center, this yearbook addresses risk management issues for the leaders of nonprofit community-serving organizations, small businesses, and small public entities. It does so by examining key trends of the past year that are likely to affect risk management in the future and identifying reliable sources of current risk management information and education.

**Catastrophe Modeling: A New Approach to Managing Risk.** Patricia Grossi and Howard Kunreuther, editors. ISBN 0-387-24105-1. Hiebner International Series on Risk, Insurance, and Economic Security, Vol. 25. 2005. 252 pp. \$34.95. 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/>.

This book systematically analyzes how catastrophe models can be used for assessing and managing risks of extreme events. It focuses on natural disaster risk, but also discusses the management of terrorism risk. Broken into four parts, the book provides an introduction to risk management and catastrophe models, delves into the complex process of linking the science of natural hazards to the output from catastrophe models, examines how catastrophe modeling currently aids insurers and other stakeholders in managing the risks from natural hazards, and illustrates how catastrophe models can be utilized in developing risk management strategies for natural disasters and terrorism.

**The First 72 Hours: A Community Approach to Disaster Preparedness.** Margaret O'Leary, editor. ISBN 0-595-31084-2. 2004. 582 pp. \$33.95. Available from iUniverse, 2021 Pine Lake Road, Suite 100, Lincoln, NE 68512; (402) 323-7800, (800) 288-4677; e-mail: [book.orders@iuniverse.com](mailto:book.orders@iuniverse.com); <http://www.iuniverse.com/>.

This book features a collection of perspectives of public- and private-sector leaders who came together after September 11, 2001, to design more disaster-resilient communities. Under the umbrella of the Suburban Emergency Management Project, these leaders learned from national experts and one another that all disasters are intensely local at first and that most communities are "on their own" immediately following disaster impact—often for as long as 72 hours. This new awareness mandated updating strategies to improve disaster preparedness, particularly in light of the threat of terrorism. **The First 72 Hours** is designed for professionals and private citizens alike who want to know what kinds of questions must be asked and answered to better prepare their communities to survive future disaster.

"Managing the Risks from Natural Hazards." Special Issue. **Building Research and Information.** September-October 2004. 87 pp. Single copies are available. For price information and to order, contact Taylor & Francis Group Journals, 325 Chestnut Street, Suite 800, Philadelphia, PA 19106; (800) 354-1420; <http://www.tandf.co.uk/journals/titles/09613218.asp>.

The authors of this special issue examine the broad issues related to managing risks to buildings from natural hazards, which include legal, political, social, economic, cultural, and aesthetic aspects. Collectively, the papers in this issue consider action at different levels of governance, public policy and strategy, professional practice, and investment mechanisms.

**Risk Analysis and Society: An Interdisciplinary Characterization of the Field.** Timothy McDaniels and Mitchell J. Small, editors. ISBN 0-521-53263-9. 2004. 478 pp. \$31.99. Available from Cambridge University Press, 100 Brook Hill Drive, West Nyack, NY 10994; (845) 353-7500; e-mail: [orders@cup.org](mailto:orders@cup.org); <http://us.cambridge.org/>.

With a view of risk analysis as one important basis for informed debate, policy decisions, and governance regarding risk issues within societies, this book provides interdisciplinary insights about the fundamental issues in risk analysis for the beginning of a new century. The authors represent the broad fields that provide the basis for the risk analysis, including the social, natural, medical, engineering, and physical sciences. Chapters address a wide range of issues, including new perspectives on uncertainty and variability analysis, exposure analysis and the role of precaution, environmental risk and justice, risk valuation and citizen involvement, extreme events, the role of efficiency in risk management, and the assessment and governance of transboundary and global risks.

**Crisis Management in Japan and the United States: Creating Opportunities for Cooperation amid Dramatic Change.** James L. Schoff, editor. ISBN 1-57488-894-3. 2004. 174 pp. \$25.00. Published by Brassey's; <http://www.chrysalisbooks.co.uk/imprint/brasseys/>. Available from local and online booksellers (not from the publisher).

This book is the result of a multiyear study conducted by the Institute for Foreign Policy Analysis and the Osaka School of International Public Policy at Osaka University to examine ways to enhance U.S.-Japanese cooperation on crisis and consequence management. It examines case studies, including the Kobe earthquake, the Tokaimura nuclear accident, and the September 11 terrorist attacks, and analyzes the changes underway in the military and civilian areas of crisis and consequence management in both countries. The study then outlines steps that policy makers can take to promote effective, efficient cooperation and make the most of the U.S.-Japan alliance.

**Total Disaster Risk Management: Good Practices.** 2005. 89 pp. Available free online from the Asian Disaster Reduction Center (ADRC), Hitomiraikan 5F, 1-5-2 Wakihamaikagan-dori, Chuo-ku, Kobe 651-0073, Japan; +81 78 262 5540; e-mail: [rep@adrc.or.jp](mailto:rep@adrc.or.jp); [http://www.adrc.or.jp/publications/TDRM2005/TDRM\\_Good\\_Practices/Index.html](http://www.adrc.or.jp/publications/TDRM2005/TDRM_Good_Practices/Index.html).

The ADRC and the United Nations Office for the Coordination of Humanitarian Affairs (UN-OCHA) Kobe, Japan, in consultation with stakeholders in Asia, have formulated a holistic approach to disaster risk reduction known as Total Disaster Risk Management (TDRM). This TDRM handbook was published for the UN World Conference on Disaster Reduction held in Kobe in January. It describes the TDRM concept and related good practices, and is intended to facilitate an enhanced understanding of the TDRM approach and its applications.

**Measuring Mitigation: Methodologies for Assessing Natural Hazard Risks and the Net Benefits of Mitigation—A Scoping Study.** Charlotte Benson and John Twigg. 2004. 153 pp. Available free online from the ProVenton Consortium Secretariat, PO Box 372, 1211 Geneva 19, Switzerland; e-mail: [prevention@ifrc.org](mailto:prevention@ifrc.org); [http://www.proventionconsortium.org/files/measuring\\_mitigation/Measuring\\_Mitigation\\_report.pdf](http://www.proventionconsortium.org/files/measuring_mitigation/Measuring_Mitigation_report.pdf).

As the human and financial costs of disasters rise, there are increasing demands for evidence that mitigation 'pays.' Until this proof exists, however, many aid agencies remain reluctant to pursue risk reduction as a key objective, or even to protect their own projects against potential hazards. As part of an ongoing project exploring how such evidence could be obtained, this report examines existing standard tools already used by development organizations in designing and evaluating projects.

Munich Re and Swiss Re have released their annual catastrophe reviews for 2004:

**Topics Geo—Annual Review: Natural Catastrophes 2004.** 2005. 56 pp. Free. Available from Münchener Rückversicherungs-Gesellschaft, Königstrasse 107, 80802 München, Germany; +49 (0) 89/3891-5291; [http://www.munichre.com/publications/302-04321\\_en.pdf](http://www.munichre.com/publications/302-04321_en.pdf).

**Sigma: Natural Catastrophes and Man-Made Disasters in 2004.** No. 1/2005. 2005. 38 pp. Free. Available from Swiss Reinsurance Company, Economic Research and Consulting, Mythenquai 50/60, PO Box, 8022 Zurich, Switzerland; +41 43 285 2551; e-mail: [sigma@swissre.com](mailto:sigma@swissre.com); <http://www.swissre.com/>.

## Hurricanes and Coastal Management

**Hurricane Camille: Monster Storm of the Gulf Coast.** Philip D. Hearn. ISBN 1-57806-655-7. 2004. 176 pp. \$25.00. Available from the University Press of Mississippi, 3825 Ridgewood Road, Jackson, MS 39211; (601) 432-6246, (800) 737-7788; e-mail: [Press@ihl.state.ms.us](mailto:Press@ihl.state.ms.us); <http://www.upress.state.ms.us/>.

On August 17, 1969, Hurricane Camille, one of three category 5 hurricanes ever to hit the U.S. mainland, struck the coast of Mississippi with winds at more than 200 miles per hour, tidal waves that surged to nearly 35 feet, and a barometric pressure that neared an all-time low. The history of Hurricane Camille is told in this book through the eyes and the memories of those who survived the traumatic winds and tides.

**Population Trends Along the Coastal United States: 1980-2008.** Kristen M. Crossett, Thomas J. Culliton, Peter C. Wiley, and Timothy R. Goodspeed. 2004. 47 pp. Available free online from the National Ocean and Atmospheric Administration's (NOAA) National Ocean Service, Special Projects Office, 1305 East-West Highway, Silver Spring, MD 20910; e-mail: [Kristen.Crossett@noaa.gov](mailto:Kristen.Crossett@noaa.gov); [http://www.nos.noaa.gov/programs/mb/supp\\_cstl\\_population.html](http://www.nos.noaa.gov/programs/mb/supp_cstl_population.html).

This report presents an overview of coastal population trends from 1980 to 2003 and projected change in coastal population by 2008. This publication from the Special Projects Office of NOAA's National Ocean Service updates an earlier version of the report that was compiled over a decade ago as part of a Coastal Trends Report Series. The report provides coastal resource managers and stakeholders with information to enhance coastal management decision making.

## Earthquakes, Volcanoes, and Soil Hazards

**Design Decision, Methods, and Procedures: Oakland City Hall Repair and Upgrades.** Franz Steiner and Eric Elsesser. ISBN 1-932884-00-9. 2004. 40 pp. \$10.00. Available from the Earthquake Engineering Research Institute (EERI), 499 14th Street, Suite 320, Oakland, CA 94612; (510) 451-0905; e-mail: [eeri@eeri.org](mailto:eeri@eeri.org); [http://www.eeri.org/cds\\_publications/catalog/](http://www.eeri.org/cds_publications/catalog/).

New to EERI's series on Seismic Design of Buildings, this publication explains and illustrates the award-winning renovation and structural upgrading of Oakland City Hall, which was severely damaged in the 1989 Loma Prieta earthquake. The first high-rise building in California to be base isolated, the city hall served as a model for designers and resulted in the acceptance of base isolation as a cost-beneficial method of seismic risk reduction for historic buildings and led the way for funding for other seismically isolated public buildings damaged by the Loma Prieta earthquake.

**Earthquakes in Human History: The Far-Reaching Effects of Seismic Disruptions.** Jelle Zeilenga de Boer and Donald Theodore Sanders. ISBN 0-691-05070-8. 2005. 264 pp. \$24.95. Available from Princeton University Press, 41 William Street, Princeton, NJ 08540; (609) 883-1759, (800) 777-4726; email: [orders@cpfinc.com](mailto:orders@cpfinc.com); <http://pup.princeton.edu/>.

Through stories about epic earthquakes, the authors of this book explain the geological processes responsible for earthquakes and how they have had long-lasting aftereffects on human societies and cultures. Ranging from an examination of temblors mentioned in

the *Bible*, to accounts of the 1906 catastrophe in San Francisco, Japan's Great Kanto earthquake of 1923, and the Peruvian earthquake in 1970, this book reinforces the need to understand the origin of earthquakes, the devastation they can cause, and the aftereffects that can last for years.

**Volcanoes.** 2nd Edition. Peter Francis and Clive Oppenheimer. ISBN 0-19-925469-9. 2004. 536 pp. \$54.95. Available from Oxford University Press, 198 Madison Avenue, New York, NY 10016; (212) 726-6000, (800) 451-7556; e-mail: [cusserv.us@oup.com](mailto:cusserv.us@oup.com); <http://www.oup.com/>.

This second edition of *Volcanoes* discusses the impact of volcanic eruptions on the Earth's environment—a cause of debate and extensive research by leading academics worldwide. A new chapter on volcanic hazards looks at complex scientific and sociological issues surrounding risk mitigation. In addition, the book provides updated information on new eruptions, research findings, and planetary studies. The publisher recommends the book for undergraduate courses in geology, earth science, geography, environmental science, and planetary science.

**Understanding Soil Risk and Hazards: Using Soil to Identify Areas with Risks and Hazards to Human Life and Property.** Gary B. Muckel, editor. 2004. 93 pp. Available free online from the U.S. Department of Agriculture, Natural Resources Conservation Service, National Soil Survey Center, 100 Centennial Mall North, Room 152, Lincoln, NE 68508; (402) 437-5499; [ftp://ftp-fc.sc.egov.usda.gov/NSSC/Soil\\_Risks/risks\\_print\\_version.pdf](ftp://ftp-fc.sc.egov.usda.gov/NSSC/Soil_Risks/risks_print_version.pdf).

By drawing on local knowledge and experience, this publication aims to expand awareness of various soil risks and hazards to human life and property and encourage city and county officials, planners, developers, and others to consider the soil in their land use decisions.

## Floods

**No Adverse Impact Floodplain Management: Community Case Studies 2004.** 2005. 69 pp. Available free online from the Association of State Floodplain Managers (ASFPM), 2809 Fish Hatchery Road, Madison, WI 53713; (608) 274-0123; e-mail: [asfpm@floods.org](mailto:asfpm@floods.org); [http://www.floods.org/PDF/NAI\\_Case\\_Studies.pdf](http://www.floods.org/PDF/NAI_Case_Studies.pdf).

No adverse impact (NAI) floodplain management is a managing principle developed by the ASFPM to address the shortcomings of today's typical local floodplain management program. This document uses 11 case studies to analyze and report on specific programs, plans, and actions that communities are taking to implement NAI floodplain management. Each case study discusses the "adverse impacts" targeted by the community, the community's actions in support of its primary NAI building block (i.e., hazard identification and mapping, education and outreach, planning, regulations and development standards, mitigation, infrastructure, or emergency services), additional activities undertaken by the community, how community support for NAI floodplain management was generated, and background information about the community.

**Flood-Resistant Local Road Systems: A Report Based on Case Studies.** 2005. 235 pp. Available free online from the American Lifelines Alliance; (202) 289-7800 x130; e-mail: [jsteller@nibs.org](mailto:jsteller@nibs.org); <http://www.americanlifelinesalliance.org/> (new guidelines).

Prepared by the Association of State Floodplain Managers (ASFPM) in conjunction with the American Public Works Association (APWA), this report describes, through a series of case studies, how public works departments make decisions pertaining to the assessment and level of mitigation of flood risks to their local roadway transportation system. In particular, it addresses each department's economic, legal, and administrative operating environment; the extent of the flood risks to their local roadway system; and the extent to which each of these factors affect flood risk-reduction decisions and practices within that department. The report also includes ASFPM and APWA short- and long-term recommendations that will improve the flood resistance of local roads and bridges and help decision makers incorporate the concept of acceptable risk into their decision-making process.

**Hazardous Metropolis: Flooding and Urban Ecology in Los Angeles.** Jared Orsi. ISBN 0-520-23850-8. 2004. 289 pp. \$39.95. Available from California-Princeton Fulfillment Services, 1445 Lower Ferry Road, Ewing, NJ 08618; (609) 883-1759, (800) 777-4726; e-mail: [orders@cpfsinc.com](mailto:orders@cpfsinc.com); <http://www.ucpress.edu/>.

This book explores a fascinating and little-known chapter in the history of Los Angeles, California, the spectacular failures to control floods that occurred throughout the twentieth century. Despite the city's 114 debris dams, 5 flood control basins, and nearly 500 miles of paved river channels, Southern Californians have discovered that technologically engineered solutions to flooding are just as disaster prone as natural waterways. In telling the story of how engineering, politics, and nature have come together in Los Angeles to determine the flow of water, the author advances a new paradigm—the urban ecosystem—for understanding the city's complex and unpredictable waterways and other issues that are sure to play a large role in future planning.

## Wildfire

**Communicating with Wildland Interface Communities During Wildfire.** Jonathan G. Taylor, Shana C. Gillette, Ronald W. Hodgson, and Judith L. Downing. Open-File Report 2005-1061. 2005. 26 pp. Available free online from the U.S. Geological Survey, 2150 Centre Avenue, Building C, Fort Collins, CO 80526; (970) 226-9100; <http://www.fort.usgs.gov/products/publications/21411/21411.asp>. For printed copies, call (888) 275-8747 or visit <http://www.usgs.gov/pubprod/>.

This report details the findings of an interagency research team that studied communications during the small Bridge Fire in Southern California, as well as the before-, during-, and postfire communications of an extreme fire event (Old and Grand Prix Fires) in the same area in the fall of 2003. This quick-response research showed that prefire communication planning was particularly effective for small fire events and parts of such planning—especially the interagency coordination through the establishment and work of the Mountain Area Safety Taskforce—proved invaluable for the large fire event.

## General Weather

**Weather: A Visual Guide.** Bruce Buckley, Edward J. Hopkins, and Richard Whitaker. ISBN 1-55297-957-1. 2004. 304 pp. \$29.95. Available from Firefly Books; (800) 387-5085; e-mail: [service@fireflybooks.com](mailto:service@fireflybooks.com); <http://www.fireflybooks.com/>.

This book provides a comprehensive visual guide to weather in all its manifestations. Using photographs and illustrations to aid in the explanation of how weather works, it features hurricanes, tornadoes, floods, fires, and droughts. It also explains the effect of climate on plants, animals, and humans, and examines the latest research on changing climate, with particular reference to vital issues like global warming and ozone depletion.

**Reflections on 25 Years of Analysis, Diagnosis, and Prediction 1979-2004.** Robert W. Reeves and Daphne deJ. Gemmill, editors. 2004. 107 pp. Available free online from the National Oceanic and Atmospheric Administration's Climate Prediction Center, 5200 Auth Road, Camp Springs, MD 20746; (301)763-8000; <http://www.cpc.ncep.noaa.gov/products/outreach/anniversary.pdf>.

This publication provides a historic perspective on the creation of the Climate Prediction Center. The history includes reflections of the five directors who have guided the center over the past 25 years.

## Climate Change

**Climate Change Economics: Why International Accords Fail.** G. Cornelis van Kooten. ISBN 1-84376-812-7. 2004. 176 pp. \$75.00. Available from Edward Elgar Publishing, 136 West Street, Suite 202, Northampton, MA 01060; (413) 584-5551; e-mail: [kwight@e-elgar.com](mailto:kwight@e-elgar.com); <http://www.e-elgar.com/>.

This book examines the appropriate economic incentives for implementing policy to mitigate climate change and then exposes the flaws in current international agreements. It begins by providing the economic foundations for understanding climate change, examines

how Kyoto's flexibility mechanism departs from more efficient and less-costly approaches for reducing atmospheric carbon dioxide, highlights the problems that terrestrial carbon credits pose for emissions trading, uses case studies to demonstrate that most countries will be unable to meet their own Kyoto obligations, and uses an economic analysis of the potential damages to show that even though some countries will experience a detrimental effect from climate change, the majority will actually benefit.

The following reports were released at the Conference of the Parties to the United Nations Framework Convention on Climate Change (COP 10) meeting in Buenos Aires, Argentina, as part of the Pew Center on Global Climate Change's series Advancing the International Effort Against Climate Change. They are available from the Pew Center on Global Climate Change, 2101 Wilson Boulevard, Suite 550, Arlington, VA 22201; (703) 516-4146; [http://www.pewclimate.org/what\\_s\\_being\\_done/in\\_the\\_world/cop10/reports.cfm](http://www.pewclimate.org/what_s_being_done/in_the_world/cop10/reports.cfm).

**Climate Data: Insights and Observations.** Kevin Baumert, Jonathan Pershing, Timothy Herzog, and Matthew Markoff. 2004. 40 pp. Free. This paper presents insights and observations from an analysis of emissions, energy, and socioeconomic data from the world's largest greenhouse gas-emitting countries.

**International Climate Efforts Beyond 2012: A Survey of Approaches.** Daniel Bodansky, Sophie Chou, and Christie Jorge-Tresolini. 2004. 63 pp. Free. This paper surveys and synthesizes more than 40 proposed approaches for strengthening international climate efforts beyond 2012.

**The Long Summer: How Climate Changed Civilization.** Brian Fagan. ISBN 0-465-02282-0. 2004. 284 pp. \$26.00. Available from Perseus Books Group Customer Service, 2300 Chestnut Street, Philadelphia, PA 19103; (800) 371-1669; e-mail: [perseus.orders@perseusbooks.com](mailto:perseus.orders@perseusbooks.com); <http://www.perseusbooks.com/>.

The title of anthropologist Brian Fagan's book refers to the warming period that took place during the Holocene. Fagan argues that human relationships to the natural environment and short-term climatic change have always been in flux and that humanity is becoming more vulnerable to climate changes. This book chronicles the relationship between human civilization and climate change from 18,000 BC to modern times. For climate change researchers, the use of mathematical modeling and climatic framework provides many examples of the human-climate relationship over time. For natural hazards researchers, the book's narrative ties human civilization to droughts, bubonic plagues, volcanic eruptions, and other natural events to the short- and long-term climate change.

## Homeland Security/Terrorism/CBRNE

**Safe: The Race to Protect Ourselves in a Newly Dangerous World.** Martha Baer, Katrina Heron, Oliver Morton, and Evan Ratliff. ISBN 0-06-057715-0. 2005. 416 pp. \$24.95. Published by HarperCollins Publishers; <http://www.harpercollins.com/>. Available from local and online booksellers (not from the publisher). Also see <http://www.safethebook.com/>.

Problem solvers who are committed to protecting society from terrorists and other threats to safety and security—scientists, engineers, academics, entrepreneurs, and emergency workers—are featured in this examination of society's greatest vulnerabilities. Their stories show why the systems we rely on to protect ourselves can be exploited by others to create catastrophe and what can be done to outsmart terrorists. Among these problem solvers are a digital code breaker, communications technologist, bioweapons architect, structural examiner, security strategist, and software entrepreneur. This book aims to explain the unique challenges posed by technological progress in a networked, and newly dangerous, world.

**The Trauma of Terrorism: Sharing Knowledge and Shared Care; An International Handbook.** Yael Danieli, Danny Brom, and Joe Sills, editors. ISBN 0-7890-2773-9. 2005. 932 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/>.

In its analysis of the full scope of terrorism, this compendium explores numerous issues in detail, such as the nature and psychology of terrorism, how to foster a community's capacity for resilience, the psychosocial consequences of terrorism in children and adults, the centrality of traumatic grief, the need for multicultural understanding in services and treatment, interventions for children and adolescents, training programs for mental health professionals, and proactive community organization in the face of terrorism. Treatment options and services are explored and their effectiveness evaluated. Chapters are international in scope and geared to provide recommendations to lessen the effects of terrorism.

**Extreme Emergencies: Humanitarian Assistance to Civilian Populations Following Chemical, Biological, Radiological, Nuclear and Explosive Incidents—A Sourcebook.** Anthea Sanyasi. ISBN 1-85339-602-8. 2004. 222 pp. £24.95. Available from ITDG Publishing, Bourton Hall, Bourton-on-Dunsmore, Rugby, Warwickshire, CV23 9QZ, UK; +44 (0)1926 634 501; e-mail: [orders@itpubs.org](mailto:orders@itpubs.org); <http://www.developmentbookshop.com/>.

This sourcebook is designed to help international organizations providing humanitarian assistance to middle and low-income countries plan, prepare, and train for the worst case—a chemical, biological, radiological, nuclear, or enhanced explosive (CBRNE) disaster. It brings together key international expertise and experience to explain emergency planning, management and safety issues; give guidance on the range of hazards, their characteristics, clinical effects and required treatment; and offer detailed resource information from equipment to organizations and training issues.

## Misc.

**Voices of the Knox Mine Disaster: Stories, Remembrances, and Reflections on the Anthracite Coal Industry's Last Major Catastrophe, January 22, 1959.** Robert P. Wolensky, Kenneth C. Wolensky, and Nicole H. Wolensky. 2005. 268 pp. \$16.96. Available from the Publications Program, Pennsylvania Historical and Museum Commission, Commonwealth Keystone Building, Plaza Level, 400 North Street, Harrisburg, PA 17120; (800) 747-7790.

Published as a companion volume to 1999's *The Knox Mine Disaster: The Final Years of the Northern Anthracite Industry and the Effort to Rebuild a Regional Economy* (164 pp., \$12.95), this book tells the story of the 1959 Knox Mine disaster through the voices of survivors, victims' families, newspaper accounts, and literature and music generated by the tragedy. On the fateful day in January, the force of the icy water broke into the River Slope Mine near Wilkes-Barre, Pennsylvania, which was being illegally excavated per orders from the Knox Coal Company, trapping 81 workers, 12 of whom were never found.

## GAO Reports

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>.

**Homeland Security: Management of First Responder Grant Programs Has Improved, but Challenges Remain.** GAO-05-121. 2005. 49 pp.

**Catastrophe Risk: U.S. and European Approaches to Insure Natural Catastrophe and Terrorism Risks.** GAO-05-199. 2005. 74 pp.

**Protection of Chemical and Water Infrastructure: Federal Requirements, Actions of Selected Facilities, and Remaining Challenges.** GAO-05-327. 2005. 47 pp.

## New Disaster Time Line and Major Terrorism Events Report

Claire B. Rubin and Associates has released two new products:

**Disaster Time Line: Major Focusing Events and U.S. Outcomes (1969-2004)**, version 2. This recently updated chart, which measures 15" x 38", features natural, industrial/technological, and biological events and their outcomes. It shows not only key disaster events, but also the major outcomes, such as studies, policies, legislation, and organizational changes. Most important, the chart shows the causal relationships between events and outcomes. The chart delineates the origins and development of the two main federal response plans that have been in place until recently: the Federal Response Plan and the National Contingency Plan. Browse the time line online or purchase a copy for \$10.00.

**Major Terrorism Events and Their U.S. Outcomes (1988-2003)**. This new report provides new information about the major terrorism focusing events and outcomes, such as laws, regulations, and organizational changes that have occurred in the past 15 years. It is an explanatory narrative for the previously released **Terrorism Time Line** (2004, 125 pp., \$10.00). Copies of the report are \$25.00.

For information about these products and others, contact *Claire B. Rubin and Associates*, PO Box 2208, Arlington, VA 22202; (703) 920-7176; e-mail: [cbrubin@comcast.net](mailto:cbrubin@comcast.net); <http://www.disaster-timeline.com/>.

### Reminder: Survey of the Natural Hazards Library at the Natural Hazards Center

To better serve your needs, the Natural Hazards Center is conducting an assessment of the Natural Hazards Library (<http://www.colorado.edu/hazards/library/>). As part of this assessment, the Center is surveying both producers and users of research and knowledge on extreme events. The survey is extremely important and will provide answers to questions regarding user needs, library usage, and how the existing resources and services can be augmented and improved. It consists of eight questions and should take approximately two minutes to complete.

To make this as simple as possible, the Center has posted the survey on the Web, where it will remain through June 30, 2005, at <http://www.colorado.edu/hazards/library/survey/>. Please note that you do not have to be familiar with the Natural Hazards Library to take the survey. If you have any questions about the survey or the library, please contact the Natural Hazards Library at [hazlib@colorado.edu](mailto:hazlib@colorado.edu) or (303) 492-5787.

## Doctor Peek Moves On

In the summer of 1999, former Natural Hazards Center director Dennis Mileti hired, sight unseen, a new graduate student. He later commented that he could not **not** hire her—her recommendations were the strongest he had ever received. That new PhD student was Lori Peek.

To say that she has been valuable to the Center understates by orders of magnitude the many contributions Lori has made to the organization. During her tenure, she helped organize and run the Annual Hazards Workshop, she was the first assistant coeditor for the *Natural Hazards Review*, and she became a respected scholar, author, and speaker on the sociology of disasters—particularly with respect to race, gender, and religion. Lori also was a primary mover in the development of the Mary Fran Myers Scholarship and Award, both of which recognize practitioner contributions to reducing hazards and disaster vulnerability. She did much, much more.

Lori was a master at juggling graduate school, research, community, and academic service, while maintaining a deep commitment to the mission of the Center. Indeed, her integrity and remarkable dedication to the hazards community and, most importantly, to those whom it serves—the people endangered by natural hazards—should serve as a model for future generations of students, researchers, and practitioners. Lori not only contributed time, sweat, and tears far beyond what anyone could expect, but she did all this with an infectious enthusiasm, joy, and optimism that invariably buoyed the rest of the Center staff.

Needless to say, we are sorry to see her go, but we recognize that it is time for her to move on. Happily, she is moving just up the road to Fort Collins, Colorado, where she will join the faculty at Colorado State University. All of us at the Natural Hazards Center will miss Lori and her little dog Max; the Center will not be the same without Lori Peek.

Thank you Lori, for all you have done. CU's loss is CSU's gain. Don't be a stranger!



## The Natural Hazards Center

The NATURAL HAZARDS RESEARCH AND APPLICATIONS INFORMATION CENTER was founded to strengthen communication among researchers and the individuals and organizations concerned with mitigating natural disasters. The Hazards Center is funded by the National Science Foundation, the Federal Emergency Management Agency, the National Oceanic and Atmospheric Administration, the U.S. Geological Survey, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Department of Transportation, the U.S. Bureau of Reclamation, the U.S. Forest Service, the National Aeronautics and Space Administration, the Centers for Disease Control and Prevention, the Institute for Business & Home Safety, and the Public Entity Risk Institute. Please send information of potential interest to the Hazards Center or the readers of this newsletter to the address below. The deadline for the next *Observer* is *May 25, 2005*.

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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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