

Observer

Natural Hazards



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Becoming Firewise: A Neighborhood Approach

— an invited comment

As readers of this newsletter know very well, the occurrence of a natural hazard event—a hurricane, a flood, a wildfire—does not a disaster make. It is the people who are harmed, killed, displaced, or impoverished as a result of these natural events who complete the definition of a disaster. Because people are part of the disaster equation, changes in social behavior, particularly in how people behave in regard to preparedness and safety before the natural hazard event occurs, can change the results in many cases. Large-scale infrastructure improvements, sound building codes, and land use plans and patterns that take natural hazards into account are all extremely important to reducing losses, particularly over the long term. But for many places that are, right now, “disasters waiting to happen,” effective mitigation

can take place by convincing residents of their personal responsibility—and capability—to change for the safer.

As disaster educators and emergency managers, we know we cannot stop the rain from falling, the wind from blowing, or lightning from striking. Our more than century old determination to suppress nature’s fires in the United States is one exception, but history is proving that even when wildfire can be controlled in the short term, the impacts of excluding it from the landscape can make “the one that gets away” a catastrophic event. Rather than trying to prevent natural events from occurring, we can make great strides in reducing human losses and suffering by motivating behavioral change among those in harm’s way. While this may seem as daunting as an attempt to wrestle nature’s forces into submission, the

health and environmental fields have produced proven successes of changing human behavior through a process known as social marketing.

The national Firewise Communities program uses a particular form of this process, called Community-Based Social Marketing (CBSM) by its proponents, to work with residents of fire-prone areas to change how they prepare for wildfire in their neighborhoods. The Firewise Communities program vision is that wildland fires can occur in areas of residential development without causing disastrous loss. This can be achieved if communities are sited, designed, constructed, and maintained to be compatible with fire and resistant to its threats to life and property. A Firewise approach begins with the home's construction, landscaping, and maintenance, and incorporates the efforts of individual homeowners, neighborhoods, state and federal agencies, and tribal organizations.

The CBSM tools include commitment, prompts, norms, communication, incentives, and (most importantly) removal of barriers to behavior. But before we jump into CBSM, let's review a few principles of effective communication that move people from awareness to action. If you want to really understand it, read "Public Education for Earthquake Hazards" (see References below). Just as in effective public education for earthquakes, effective communication about wildfire helps raise questions in residents' minds, provides simple and clear answers, and reinforces messages from a variety of credible authorities over time. Firewise program staff and program proponents know that the complicated phenomena of homes burning down during wildfires must be explained in non-technical terms, that this information must come from various credible sources, and that consistent information should be repeated via many different media. The printed matter we create is helpful because people want to refer to a document as they think about their risk, but we should be sure that the information tells people what they should do before, during, and after a wildfire. We should also expect that they will discuss the issue with their peers before they will accept and act upon the information we provide. People will consistently search for more information to validate what they've already heard.

The reward for disaster safety advocates is to know that when clearly informed about risk, people comprehend the basics and remember what they read. When people understand that there is something they can do about reducing their vulnerability, they are more apt to act. This is a very important basic concept for our disaster-hardened colleagues to understand and embrace. It is working in many arenas, including for residents of wildfire-prone areas.

The Firewise Communities/USA Recognition Program incorporates these important concepts along with another important social behavior theory—Rogers' Diffusion of Innovation Theory. This is the theory of how people accept and act on new ideas. Its premise is that **Innovators** are a very small number of people in any given group, with particular characteristics. Once they have tried out an idea and have seen results, a small

but significant percent of their peers—known as **Early Adopters**—will begin to take action. They are followed in turn by larger portions of the group, the **Early Majority** and the **Late Majority**. The **Laggards** are another significant part of the group with their own characteristics that will keep them from quickly—or perhaps ever—adopting the group's new behavior.

How does this process work in a Firewise Community? The USA Recognition Program is based on the idea that neighbors can work together, starting at the individual home level, to make their homes and communities safer from wildfire. In addition to the social behavior research discussed here, the program also relies on physical fire science research, which strongly indicates that modifications to home construction and landscaping within 100 to 200 feet of the home can minimize the risk of ignition from wildfire. The program begins with excellent communication and education about these important scientific findings to help residents understand that there is indeed something they can do to reduce their vulnerability. It starts with fire-resistant construction, especially for roofs, siding, windows, and openings, as well as for decks, porches, and fences. It proceeds to the backyard, the woodlot, and the common areas of the community. Because homes that are spaced 100 to 200 feet apart can be potential ignition risks for one another, mitigation must happen on a neighborly basis to be effective in developments where homes are built close together.

Once residents are convinced of their risk and that they can do something about it, the Firewise Communities/USA template provides them with the next steps. An expert on wildland-urban interface fire provides a community-level assessment to help residents understand the most important areas to address for wildfire safety. Residents form a board or committee, accept the assessment, and create an action plan based on the assessment's findings. They perform mitigation work to begin addressing the wildfire risks. Communities must commit to work that is valued at a minimum of \$2 per capita each year. This is usually easy to achieve through volunteer labor (currently valued at almost \$19 per hour), in-kind services from local fire departments or forestry staffs, loaned equipment, or small grants. The community must hold a Firewise Day or similar event, which helps the Early Adopters reach the majority they need to change community behavior, and then document its annual activity on a simple application form.

For their efforts, these small neighborhoods and subdivisions are rewarded with road signs proclaiming their recognition status, a customized plaque, an opportunity for their story to appear on the Firewise Web site, and myriad networking and educational opportunities. Each year as the community renews its status by documenting its annual mitigation activity and Firewise Day, it receives a decal with the current year to show that it is continuing its commitment to wildfire safety. A biennial Firewise conference also provides opportunities for residents to share their successes with their peers around the nation.

The Firewise Communities/USA Recognition Program uses CBSM tools throughout the spectrum of

resident awareness, understanding, and acceptance. Commitment is achieved when a local Firewise board is formed and a plan created, and it is strengthened when the application is complete and annual renewals come in. Prompts from the national program in the form of seasonal reminders (monthly e-mail alerts and quarterly newsletters), as well as from state Firewise liaisons and community leaders, are effective in maintaining interest in Firewise activity. Norms are established as Firewise activity becomes a regular—and neighborly—form of behavior. When community residents contact the national program office looking for their current-year decal, they are now people who see themselves as Firewise and proudly proclaim their new behavior as the right thing to do. Communication is constant through the national Web site, the state liaisons, email and written updates, and press releases about new products, programs, and successes of local communities. Incentives include the powerful motivator of national fame, continued annually with updates and opportunities to share successes. Communities have an increased chance of obtaining grants, particularly Pre-Disaster Mitigation Planning or Project Grants, for which recognized communities receive a higher ranking.

Personal responsibility for wildfire safety is achieved through this national program, and community-building often occurs as a result of the group effort required by Firewise. The education and communication by the national program and its partners in state forestry and the local fire service help to remove the potential barriers to changing behavior—perhaps the most powerful tool in the CBSM toolbox. Much effort is applied to help residents see that becoming Firewise will not harm their local environment nor damage the natural beauty or aesthetics of the community. Firewise action at the local level can often improve wildlife habitats as well as local property values.

As of the end of 2007, the sixth year of life for the Firewise Communities/USA Recognition Program, more than 300 communities in 36 states actively participate in the program. Ninety percent of communities have remained active and renewed their status, and a large proportion of the earliest adopters are celebrating their fifth and sixth anniversaries of participation. Since 2003, residents of these communities have invested more than \$20 million in their own wildfire safety (far exceed-

ing their \$2 per capita minimum requirement). Nearly 400,000 residents of fire-prone communities are touched by this program. A very few of the participating communities have been tested by fire to date, but there is already evidence that the principles of community-wide Firewise action are working to protect homes and lives.

A Russian proverb states, “Perfection is the enemy of good enough.” It reminds me that the goal is to make every community Firewise, but that we can only achieve that goal by persuasion—one community at a time, at their own pace, in their own place. The “Laggards” will always be with us, according to Rogers’ theory—all the more reason to use the powerful tools of social behavior change to work with the “sparkplugs” who move their neighborhoods from awareness to understanding, from acceptance to action.

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3. Rogers, E.M. 1995. *Diffusion of Innovations*, 4th Edition. New York: The Free Press/Simon & Schuster, Inc.

Web Resources

Firewise Communities/USA

www.firewise.org/usa

Social Marketing

www.cbsm.com

www.toolsofchange.com

“Public Education for Earthquake Hazards”

www.colorado.edu/hazards/publications/informer/infrmr2/infrm2wb.htm

Welcome Zeke!

The Natural Hazards Center welcomes Ezekiel (Zeke) Peters, who joined the staff at the beginning of the year as the Center’s Program Manager. A licensed attorney and paramedic, Zeke holds a J.D. from the University of Colorado School of Law and a B.A. in wildlife and fisheries ecology and environmental policy from Hampshire College. He also served as editor-in-chief of the *Colorado Journal of International Environmental Law and Policy* and has worked in Alaska, New York, and Colorado, most recently serving at the Denver Paramedic Division.

Zeke is interested in information flow and decision making at all levels of local emergency medical response and in the tensions between preparing for infrequent catastrophic events and providing day-to-day services. He is also interested in the role that disasters play in calling attention to poor environmental planning and pre-existing social inequity, especially as they affect indigenous peoples.

Disaster Mitigation...First in a Series

Editor's Note: During the past several years, the increasing number of natural hazards and the rising cost of post-disaster recovery have underscored the need for hazard mitigation. Money spent before a hazard occurs can greatly reduce the impacts, resulting in substantial savings in life and property following the event. To foster awareness and promote discussion and action on the topic of mitigation, the next six issues of the Observer will each feature an article related to mitigation strategies currently in place or being tested in various regions of the world.

We begin this series with the article below, which explores the Australian approach to wildfires known as "Stay or Go." In the United States, there is an emphasis on evacuating residents during a wildfire, while Australia encourages those who are prepared to stay and defend their properties. The next article in this series (May 2008) will focus on the planning and warning system that was used to mitigate the 2007 lahar from Mount Ruapehu in New Zealand. It is our hope at the Natural Hazards Center that this series will aid in global information sharing related to international mitigation strategies and practices.

Stay or Go: An Australian Perspective on Community Response to the Threat of Wildfire

What should residents do when wildfire threatens? A limited range of options exists, none of which is risk free. Residents can either stay with their property or they can leave. If they stay, they can simply shelter or they can actively defend the property. If residents leave, they can depart at different times in relation to the approaching fire—well before the fire threatens, at some point during the fire's approach, or when the fire's impact is imminent. If they leave, they also have a choice of where they go—to nearby properties, to designated centers at the direction of authorities, or to some other location.

Different policies and practices have emerged in different countries, even though they may share similar severe rural and urban interface wildfire risks. In the United States, large-scale evacuation has been the preferred course of action, whereas in Australia a different approach has been adopted. Commonly referred to as "stay or go"—or more accurately as "prepare, stay and defend, or leave early"—this position has recently been endorsed by all Australian fire services and by most police forces.

The Australian position advocates that residents choose whether they will stay and defend their property or leave early before a fire threatens the area and road travel becomes dangerous. If they elect to stay, they are advised to prepare their property via a range of measures, including vegetation (fuel) management, undertaking house protection measures, and ensuring they have the resources, both physical and psychological, to actively defend the property. From this perspective, the onus is on residents to accept responsibility for their own safety and that of their property. To that end, they must plan their response well before a fire occurs and take appropriate measures to prepare themselves and their property. This plan needs to account for residents' capacity to carry out their intentions and allow for unexpected events; thus, it needs to include alternative actions.

The focus on resident responsibility is clearly articulated by fire services, many of which warn residents that fire trucks may not be available or able to protect properties and that they may not even receive an official warning of an approaching fire. These messages have at times been

difficult for some authorities to promote and for some residents to accept. However, the messages recognize that it is during severe wildfire events—when life and property are most at risk and when resources are most under strain—that residents need to be most self sufficient.

Although different legislative arrangements exist in various Australian states and territories, these provide no impediment to the national position.

The "stay or go" position is well supported by extensive research on how houses ignite and are destroyed in wildfire and on the circumstances in which people die in wildfire. Oral history evidence and research following major fires from as long ago as 1945 recognize that home ignition during wildfires results primarily from embers landing on the structure or being blown into roof spaces or under the house. Although direct flame attack and radiated heat from burning vegetation or structures play a role in breaching house defenses and increasing vulnerability to ember attack, evidence is consistent that the main mechanism of ignition is embers. What follows from this evidence is that the risk from embers can be reduced by advance preparation, and that when small fires are ignited by embers they can be extinguished if residents are present, prepared, and actively defending the property. It should be noted, however, that external materials on Australian houses tend to lower flammability, such as the use of iron roofing.

Ember attack is likely to start before the fire front arrives and to continue for several hours after the fire front passes. Because the front passes relatively quickly (5-20 minutes), residents can stay inside protected from radiant heat, emerge when conditions are safe to extinguish spot fires, and continue patrolling until the threat has passed. Australian evidence from many post-fire studies of major wildfires strongly supports the notion that when someone is present and actively defending the property, chances are much greater that the home will survive. Hence, the slogan "houses protect people and people protect houses" is often used to summarize the rationale for staying to defend a property. Note that the approach has not been driven by the possible economic benefits of saving property; it has been driven by the evidence related to human survival and how property is lost during wildfire.



People have died in wildfires when they remained with their home but lacked the capacity to protect themselves or their property, or when they passively sheltered in a building and failed to detect or prevent the spread of fires ignited by the passing wildfire. Active defense and adequate mental and physical preparation are critical elements in the decision to stay and defend.

If residents elect to leave, they must do so before the fire is in the immediate area and before travel on roads becomes dangerous. Evidence from some major fires in Australia strongly suggests that most people killed in wildfires die from the effects of radiant heat when caught in the open, often trying to flee at the last minute either on foot or in vehicles. When opting to leave, timing is critical, and on days of high wildfire risk, residents are urged to monitor the environment for signs of an approaching wildfire, listen to the radio, and stay in touch with neighbors.

It is important to appreciate that “stay or go” is not the same as “shelter in place.” If “shelter in place” means to stay in the structure passively sheltering from the fire, then it lacks the element of active defense. Similarly, if “shelter in place” is taken to mean moving to a nearby location in the immediate area, then again it differs from “stay or go” by removing residents from their property. This latter position is more akin to practices in some Australian states whereby local areas develop fire refuges or safe havens, although such measures are becoming less common. However, under the “stay or go” approach residents might plan to relocate to a better protected nearby structure and then return to their own property when the immediate threat has passed.

The term “stay or go” is shorthand for a complex policy position that requires residents to make difficult and challenging decisions about their personal risk. Fire management agencies face the complex task of ensuring that community members understand what is required, and they must recognize the importance of the partnership with the community in dealing with the wildfire hazard. Most states have significant education or outreach programs that explain the position to residents and that also seek to assist residents in developing their plans.

The extent and nature of these programs varies from state to state, with some relying on broad-based media campaigns and publications, and others conducting local meetings to promote the need for self reliance, planning, and preparation.

While the evidence underpinning “stay or go” is considered to be strong, it has focused more on aspects of the hazard event and its impact and less on the human dimensions of how people respond to wildfire. As the policy has been more widely adopted and as research on the position has increased, a number of implementation issues have been identified. These and other aspects of “stay or go” are examined in detail by Handmer and Haynes (2008), and some are briefly considered in the following discussion.

Not all residents choose one of the two recommended safer options. Recent research shows that the proportion of people who intend to stay and defend varies substantially across different locations, from as low as 20% in some locations to nearly 70% in others. Similarly, recent studies indicate that a significant minority of people intend to stay, either to protect their property or to see what will happen, but then plan to leave if they think the situation is becoming dangerous. Of course, leaving late when the fire is nearby is the most dangerous option. However, for some people this “wait and see” strategy seems logical because they do not understand the basis of the stay and defend message or the dangers of leaving late. Further, some people intend to stay but then find that they are inadequately prepared, either physically or mentally, and they then decide to flee at the last minute. The “stay or go” position poses significant challenges in understanding human motivation and behaviors in dangerous situations and in translating this understanding into programs that will increase community adoption of the advice.

The context in which the policy is implemented is also changing significantly. Climate change is expected to increase the number of high-fire-risk days that create the conditions for more frequent severe fires. Social and demographic changes also pose a number of challenges, such as increased urban development in high-risk areas, an aging population, and increasing numbers of people

who have limited understanding of wildfire. Although planning schemes and building regulations are in place in many areas, difficulties often arise related to ensuring compliance, and since many of these regulations have only recently been introduced, many existing buildings are poorly placed to withstand wildfire. These issues reduce the capacity of residents to effectively adopt the “stay or go” position.

Despite these implementation issues, evidence suggests that in states where the advice is widely and consistently promoted, increasing numbers of residents understand and adopt the advice. In a major fire in the southern state of Victoria in 2006-2007 that burned over one million hectares and threatened hundreds of properties in rural and remote areas, more than 80% of properties had someone present to actively defend the property while it was under threat. While this high level of active defense is probably less likely in interface areas, the evidence continues to accumulate that “stay or go” provides a realistic strategy in which the community can play a role in partnership with fire authorities to reduce loss of life and property from wildfire.

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4. Strahan Research. 2007. Research for CFA on Community Attitudes to Bushfire Safety Prior to the 2007/08 Season. Melbourne: Country Fire Authority (CFA).

Web Resources

Australasian Fire Authorities Council

www.afac.com.au/awsv2/publications/position_papers.htm

Bushfire Cooperative Research Centre

www.bushfirecrc.com

Wildfire Lessons Learned Center

www.wildfirelessons.net

Call for Nominations: 2008 Mary Fran Myers Award

The Gender and Disaster Network and the Natural Hazards Center invite nominations of those who should be recognized for their efforts to advance gender-sensitive policy, practice, or research in the area of disaster risk reduction.

Established in 2002, the Mary Fran Myers Award recognizes that vulnerability to disasters and mass emergencies is influenced by social, cultural, and economic structures that marginalize women and girls and may also expose boys and men to harm. The award was so named to recognize Myers’ sustained efforts as co-director of the Natural Hazards Center to launch a worldwide network promoting women’s opportunities in disaster-related professions and supporting research on gender issues, disasters, emergency management, and higher education.

The intent of this award is to recognize women and men whose advocacy, research, or management efforts have had a lasting, positive impact on reducing disaster vulnerability. All those whose work has added to the body of knowledge on gender and disasters, is significant for gender-theory or practice, or has furthered opportunities for women to succeed in the field are eligible.

The award committee is especially interested in soliciting nominations from outside the United States and strives to enable award recipients with high travel costs to attend the Natural Hazards Center workshop in Colorado. To nominate someone, please complete the following three steps and submit all materials electronically:

- Submit your full name and contact information (mailing address, e-mail, telephone, and fax) and that of the nominee
- Attach a current resume or curriculum vitae of the nominee
- Write a letter of nomination detailing specifically how this individual’s work fits the award criteria as described above
- Optional: Include a one-page letter of support from another person or organization

Please direct any questions and submit all materials to mfmawards2008@gdnonline.org or call +44 (0)191 227 3108 or fax +44 (0)191 227 4715. This announcement is also available online at www.gdnonline.org/mfm_award_nomination.htm.

The deadline for nominations is April 1, 2008. Our thanks in advance for passing this notice along so that we may recognize people in varied sectors, regions, networks, and contexts whose work on gender equality and disaster risk reduction should be recognized.

NOAA Confirms Beginning of New Solar Cycle

NOAA scientists say a new 11-year cycle of heightened solar activity began in January when the cycle's first sunspot appeared in the Sun's northern hemisphere. The new cycle brings increased risks to power grids; critical military, civilian, and airline communications; Global Positioning System (GPS) signals; and even cell phones and ATM transactions. Physicists at NOAA's Space Weather Prediction Center (SWPC) said the start of the cycle is an early omen of solar storms that will gradually increase over the next few years. A sunspot is an area of highly organized magnetic activity on the surface of the sun. The new 11-year cycle, called Solar Cycle 24, is expected to build gradually, with the number of sunspots and solar storms reaching a maximum by 2011 or 2012, though devastating storms can occur at any time.

During a solar storm, highly charged material ejected from the Sun may head toward Earth, where it can bring down power grids, disrupt critical communications, and threaten astronauts with harmful radiation. Storms can also knock out commercial communications satellites and swamp GPS signals. Routine activities such as talking on a cell phone or getting money from an ATM machine could suddenly halt over a large part of the globe. In April 2007, in coordination with an international panel of solar experts, NOAA issued a forecast that Solar Cycle 24 would begin in March 2008, plus or minus six months. Although the panel was evenly split between those predicting a strong or weak cycle, both camps agreed that the sooner the new cycle takes over the waning previous cycle, the more likely that it will be a strong season with many sunspots and major storms. To access the full press release, visit www.noaanews.noaa.gov/stories2008/20080104_sunspot.html.



American Geophysical Union Revises Position on Climate Change

In January, the American Geophysical Union (AGU), the world's largest scientific society of Earth and space scientists, released a statement that updated the organization's position on climate change: the evidence for it, potential consequences from it, and how to respond to it. In 2003, the AGU called for worldwide efforts to understand the impacts of climate change on the Earth. The revised statement goes a step further, stating that changes to the Earth's climate system are "best explained by the increased atmospheric abundances of greenhouse gases and aerosols generated by human activities in the twentieth century." It also calls for the reduction of carbon emissions by more than 50% by 2100 and warns that the world faces a tough challenge in the next 50 years. The update was developed over a period of seven months by a panel of experts who created drafts that underwent extensive critical review. According to AGU president Tim Killeen, the revision has fewer caveats than previous statements and represents more of a declaration that the climate is changing and that those changes are best explained by human effects due to greenhouse gases and aerosols. The AGU, which has a membership of 50,000 researchers, teachers, and students in 137 countries, adopted the statement at a meeting of the organization's leadership body, the AGU Council, in San Francisco, California, on December 14, 2007. AGU position statements expire in four years, unless extended by the Council. The full text of the revised statement can be found at www.agu.org/sci_soc/policy/positions/climate_change2008.shtml.

Lockheed Martin to Develop New Satellite-Based Lightning Detection Instrument

NOAA and NASA have selected Lockheed Martin Space Systems Company for a \$96.7 million contract award to design and develop a new instrument that will detect patterns in lightning flashes that give forecasters an early indicator of severe thunderstorms and tornadoes. Called the Geostationary Lightning Mapper, the instrument will monitor all lightning flashes occurring anytime and anywhere in the Western Hemisphere, including the United States. It will fly on NOAA's next geostationary satellite series known as GOES-R (Geostationary Operational Environmental Satellite-Series R), which is scheduled to launch in December 2014. Lightning is the second highest storm-related killer in the United States and causes \$4 to \$5 billion in losses each year in the civilian sector. Lightning costs about \$2 billion annually in airline operating expenses and passenger delays and is also a frequent cause of wildfires. Today's ground-based national lightning detection networks are designed to

locate mostly cloud-to-ground lightning, which only represents a small fraction of total lightning. From space, the Geostationary Lightning Mapper will provide continuous and near-uniform coverage of total lightning activity across the globe—from New Zealand to the west coast of Africa. When launched, the GOES-R series will upgrade existing weather and environmental monitoring capabilities and will introduce a new era for U.S. geostationary remote sensing. To read the full NOAA press release, visit www.noaanews.noaa.gov/stories2007/20071219_contract.html.



DHS Releases National Response Framework

On January 22, 2008, the Department of Homeland Security (DHS) released the National Response Framework (NRF). The framework replaces the National Response Plan, which was focused on responding to terrorist attacks when Hurricanes Katrina and Rita struck the U.S. Gulf Coast in 2005. The NRF, which focuses on response and short-term recovery, articulates the doctrine, principles, and architecture by which the United States prepares for and responds to all-hazard disasters across all levels of government and all sectors of communities. The NRF was released following an extensive process of outreach and coordination between DHS and key stakeholders representing federal, tribal, state, and local governments; non-governmental agencies and associations; and the private sector. The final documents reflect the nearly 5,700 comments received from participants of the process. The NRF is intended for senior elected and appointed leaders, such as federal department and agency heads, state governors, mayors, tribal leaders, city managers, and the private sector. It also informs emergency management practitioners by explaining the operating structures and tools routinely used by first responders and emergency managers at all levels of government.

According to the new framework, the Federal Emergency Management Agency (FEMA) will again take the lead in responding to disasters. FEMA's advisory role in disaster response was diminished after it was placed under the umbrella of DHS after the September 11 attacks on

the World Trade Center. In addition, a rule that required DHS to identify a disaster as an incident of national significance before a federal response could occur has now been eliminated. So that the NRF can be revised and updated in a more nimble, transparent fashion, an online repository of the NRF components was developed. This NRF Resource Center will allow for on-going revisions as necessary to reflect real-world events and lessons learned. The NRF and accompanying annexes will go into effect on March 22, 2008. To access the full text of the NRF, visit www.fema.gov/emergency/nrf/.

Digital Elevation Models Developed for U.S. Coastal Cities at Risk from Tsunamis

A team of scientists took a crucial step forward in NOAA's effort to prepare U.S. coastal communities, including Long Island, Atlantic City, and Daytona Beach, for potentially deadly tsunamis and storm-driven flooding. Scientists with NOAA's National Geophysical Data Center and the Cooperative Institute for Research in Environmental Sciences, both based in Boulder, Colorado, recently created high-resolution digital elevation models (DEMs), for the three cities.

The DEMs are constructed from near-shore seafloor depth and land elevation data to create a detailed representation of coastal relief. They provide the underlying framework necessary to accurately forecast the magnitude and extent of coastal flooding during a tsunami or storm surge event. The team expects to build more than 50 additional DEMs for U.S. coastal communities in the coming years. Once a DEM is developed, it is sent to the NOAA Pacific Marine Environmental Laboratory in Seattle, Washington, where it is incorporated into tsunami model scenarios that simulate offshore earthquakes, the resulting tsunami movement across the ocean, and the magnitude and location of coastal flooding caused when the tsunami reaches the shore. With these results, NOAA Tsunami Warning Centers can issue more accurate flooding forecasts if an earthquake triggers an actual tsunami. To read the full NOAA press release, visit www.noaanews.noaa.gov/stories2007/20071203_eastcoastsunami.html.



USGS Recaps 2007 Earthquake Activity

At least 709 deaths resulted from earthquake activity worldwide in 2007, according to the U.S. Geological Survey (USGS) and confirmed by the United Nations Office for Coordination of Humanitarian Affairs. Most of the fatalities for the year, at least 514, occurred when a magnitude 8.0 earthquake struck Pisco, Peru, on August 15. Earthquakes caused casualties or damage in 23 countries during 2007, including Barbados, Brazil, Chile, China, Colombia, Ecuador, France (Martinique), Guatemala, India, Indonesia, Iran, Japan, New Zealand, Papua New Guinea, Peru, Russia, Solomon Islands, Tajikistan, Tanzania, Turkey, United Kingdom, United States, and Vanuatu. The largest earthquake of the year occurred in Sumatra, Indonesia, where a magnitude 8.4 event struck on September 12 and caused 25 fatalities. A magnitude 8.1 quake hit the Solomon Islands on April 2, causing 54 fatalities, and another magnitude 8.1 event occurred east of the Kuril Islands (Russia) on January 13. Because of the sparse population on those islands, no casualties and only minor damage were reported, showing that the location of an earthquake is as important as magnitude in determining potential impacts. The largest earthquake of the year in the United States was a magnitude 7.2 event that struck the Andreanof Islands of Alaska on December 19.

The USGS's National Earthquake Information Center (NEIC) locates about 30,000 earthquakes per year worldwide, about 10,000 of which have magnitudes of 4.5 or greater. Several million earthquakes occur in the world each year, but many go undetected because they occur in remote areas or have very small magnitudes. The NEIC relies on the 138-station Global Seismographic Network, which is jointly supported by the USGS and the National Science Foundation. Although significant progress has been achieved in earthquake research and mitigation, earthquake risk is still high, especially in places where population growth and lack of earthquake-resistant structural design standards have put an increasing number of people at risk. To read the full press release, visit www.usgs.gov/newsroom/article.asp?ID=1846. For more information about earthquakes, visit the USGS Earthquake Hazards Program Web site at <http://earthquake.usgs.gov>.

FEMA Offers Refunds for Travel Trailers in Wake of Health Concerns

The Federal Emergency Management Agency (FEMA) announced in January that it will refund the purchase price of travel trailers or park models to individuals who wish to return units purchased directly from FEMA or through the General Services Administration (GSA). This initiative is part of an ongoing effort to address concerns about possible adverse health effects of formaldehyde associated with recreational vehicles. Refunds for the purchase price of travel trailers and park models will be offered for units purchased through GSA auctions on or after July 24, 2006, until such sales were suspended in July 2007. Individuals who want to return their travel trailer or park model unit must contact FEMA within a

60-day period beginning January 17, 2008. For units sold by FEMA directly to disaster assistance applicants occupying the unit, FEMA will offer to refund the purchase price of any travel trailer or park model sold on or after July 31, 2006, until such sales were suspended in July 2007. The refunds option applies to disasters declared on or after August 29, 2005. Occupants will have 60 days from the date of notification to request a refund. Buyers must have purchased the units directly from FEMA or GSA. The refunds will be provided upon repossession of the units. To read the full press release, visit www.fema.gov/news/newsrelease.fema?id=42317.

NOAA Seasonal Drought Outlook

On January 17, NOAA updated its seasonal drought outlook for the United States, predicting some degree of improved conditions for the entire southeastern drought area outside of Florida. The improvement will likely be more limited from southern Alabama into central and southern Georgia and the Carolinas due to below-normal rainfall forecast during February-April. The expected drier weather means that conditions could deteriorate following initial improvement, especially in areas near the Gulf and Atlantic coasts. Also, even with several inches of rain, many reservoirs and wells will remain low due to lingering impacts from the extreme rainfall deficits incurred during 2007. Elsewhere, the odds favor drought expansion by the end of April in central Texas toward Oklahoma and from western Kansas into eastern New Mexico. To the north, some improvement is likely for most of the northern Plains from the Dakotas into central Montana, while more significant improvement is expected in the interior Northwest and Great Basin. The Pacific storm in early January boosted snow pack in California and other parts of the West, but below-normal precipitation is expected during February-April for the Southwest, so the odds favor limited improvement for this region. To access a color graphic and map, visit www.cpc.noaa.gov/products/expert_assessment/seasonal_drought.html.



Seven Western States Sign Colorado River Pact

Officials from seven western states signed an historic Colorado River water-sharing agreement on December 13, 2007. The decision will implement innovative strategies for management of the Colorado River, reflecting a consensus among stakeholders about sharing water during the current drought and charting a water management course for the future. Department of the Interior Secretary Dirk Kempthorne said the decision is the most important agreement among the seven basin states since the original Colorado River Compact of 1922.

Signed at the Colorado River Water Users Association's annual meeting in Las Vegas, Nevada, the Record of Decision activates a legal agreement among the basin states that contains a provision in which they firmly commit to address future controversies on the river through consultation and negotiation before initiating any litigation. The decision implements new, interim operational guidelines to meet the challenges of the current eight-year drought in the basin and, potentially, low-water conditions caused by continued drought or other causes in the future. The rules, which take effect immediately, will be in place through 2026. The Record of Decision adopts four key elements of river management: (1) new rules for water shortages (i.e., who will take reductions and when they will take them); (2) new operational rules for Lake Powell and Lake Mead that will allow the two reservoirs to rise and fall in tandem, thereby better sharing the risk of drought; (3) new rules for surpluses; and (4) new rules that will address the ongoing drought by encouraging new initiatives for water conservation.

More than 30 million people in California, Arizona, Nevada, Wyoming, Utah, Colorado, and New Mexico are affected by the historic agreement. For more information and to access the Record of Decision, see www.usbr.gov/lc/region/programs/strategies.html.



New Global Satellite System Could Cut Disaster Losses

Over the next decade, a new global satellite system could save billions of dollars and thousands of lives by increasing preparedness for natural disasters. When disaster strikes, rapid access to data on land and ocean conditions, maps of transport links and hospitals, weather forecasts, and information on socio-economic variables can save uncounted lives. The Global Earth Observation System of Systems (GEOSS) will integrate Earth observations with other information to help planners reduce vulnerability, strengthen preparedness and early-warning measures, and, after disaster strikes, rebuild housing and infrastructure in ways that limit future risks. It will also help reduce long-term risk by providing a better understanding of the relationship between natural disasters and climate change. By making it possible to integrate different types of disaster-related data and information from diverse sources, GEOSS will strengthen analysis and decision making for disaster response and risk reduction. GEOSS may also help authorities control outbreaks of contagious diseases by monitoring environmental conditions in the area where the outbreaks occurred. To learn more about GEOSS, visit www.earthobservations.org/geoss.shtml.

DHS "Ready Campaign" Outlines Top Ten Items to Include in Emergency Supply Kit

Through its Ready Campaign, the U.S. Department of Homeland Security (DHS) has outlined the top 10 items for a basic emergency supply kit so that Americans can be prepared for all types of emergencies, including natural disasters and terrorist attacks. According to DHS Secretary Michael Chertoff, having a plan can make all the difference, as the recent flooding and ice storms across the country have shown. Americans can successfully prepare for emergencies by following the Ready Campaign's three easy steps: prepare an emergency supply kit, make a family emergency plan, and be informed about the kinds of emergencies that can happen in your area and about the appropriate responses.

To help get started, the Ready Campaign has issued a checklist of the leading items needed in a basic emergency supply kit for the home or business. These items include water, food, radio, flashlight, first-aid kit, whistle, moist towelettes, garbage bags and plastic ties, wrench or pliers, local maps, and personal items.

For the complete list of recommended items, visit the Ready Campaign Web site at www.ready.gov or call 1-800-BE-READY. The Web site also includes free information, checklists, and guidelines about the two other key components of preparedness—developing a family emergency plan and being informed.



Hazards around the World

Below are brief descriptions of some of the most recent natural hazards and disasters that have occurred around the world. The list is not intended to be all-inclusive, but rather a representation of those hazards that have generated significant impacts, whether physical, social, or both.

Cyclones and Hurricanes

Cyclones Daman and Gene—Fiji Islands

In early December 2007, Category 4 Cyclone Daman struck Fiji's small island of Cikobia with winds up to 155 miles per hour. Many homes were destroyed, but the island's 65 residents escaped harm by hiding in caves. On January 28, 2008, Cyclone Gene caused widespread damage on Fiji's main islands Viti Levu and Vanua Levu, as well as on Taveuni, Yasawa, Mamanuca, and other outlying island groups. Seven people were reportedly killed, and both storms caused widespread damage to crops.

Tropical Storm Olga—Caribbean

Tropical Storm Olga swept through the Caribbean nearly two weeks after the end of the 2007 Atlantic hurricane season. Olga, the 15th named storm of the 2007 season, claimed at least 38 lives due to storm-related flooding across the region. The hardest hit area was the northern province of Santiago in the Dominican Republic, where at least 35 people were killed by floods and landslides. Much of the flooding occurred when the Yaque River overflowed its banks and flooded several villages.

Typhoon Mitag—Philippines

In late November 2007, Typhoon Mitag tore through the Philippines, causing mass evacuations across the entire archipelago. Approximately 200,000 people who live on or near the slopes of the Mayon volcano were evacuated from Bicol before the storm made landfall, as officials were concerned about the potential for dangerous mudslides to be triggered from the volcano's base. As of late November, the death toll had climbed to 19. The storm also caused \$3.8 million in damage to infrastructure, houses, and farmland.

Earthquakes

Earthquakes—Alaska and Pacific Northwest

A magnitude 7.2 earthquake struck Alaska's Aleutian Islands on December 19, 2007. The U.S. Geological Survey reported that the quake's epicenter was located 124 miles west of Adak and about 1,300 miles west-southwest of Anchorage. It occurred between the boundary of the North American and Pacific Plates and was followed by a 5.5 magnitude aftershock about one hour later. The quake triggered a tsunami warning in some coastal areas of Alaska, which was later retracted. Two weeks later on January 5, a magnitude 6.5 earthquake occurred off the coast of Canada, approximately 150 miles southeast of Sandspit, British Columbia. No damage or casualties were reported for either quake.

Earthquake—Kyrgyzstan

On January 1, 2008, three separate earthquakes hit southern Kyrgyzstan in Central Asia. The quakes occurred in a remote area approximately 18 miles from the city of Osh, and the strongest was magnitude 5.6. As of mid-January, officials were still assessing damage to homes and infrastructures, but initial reports indicated that more than 5,000 homes had been damaged and 5,500 people had been displaced by the quakes. The hardest hit areas were the Kara-Suu, Kookat, and Alai Districts.

Earthquake—New Zealand

Several buildings collapsed when a magnitude 6.6 earthquake struck the North Island of New Zealand on December 20, 2007. The quake, which was centered in the Hikurangi undersea trench off the North Island, caused extensive damage to the infrastructure in the city of Gisborne, including collapsed buildings. No casualties were reported, but at least 10 people were treated for minor injuries.

Floods and Landslides

Flooding—Australia

In early January, thousands of people in eastern Australia were isolated by what has been described as the worst flooding in 20 years. Parts of New South Wales, which includes the city of Sydney, were cut off by heavy rain and declared disaster zones; similar conditions occurred farther north in Queensland. When thunderstorms dumped torrential rains on Australia's east coast, many rivers burst their banks, washing away bridges and cutting off entire towns. The heavy rains followed months of drought in Australia. No deaths or injuries were reported.

Flooding and Landslides—Indonesia

Beginning in mid-December 2007, heavy rains throughout Indonesia caused numerous landslides in central Java and extensive flooding in most of Java, West Sumatra, and West Nusa Tenggara. The landslides struck nine villages in the Karanganyar District on December 26 and killed 65 people, according to the National Coordination Board for Disaster Management. Landslides also occurred in the district of Wonogiri, where seven people were killed and ten were reported missing. Overflow from the Bengawan Solo River resulting from days of heavy rain also caused extensive flooding in Surakarta City, Central Java Province. According to reports, water levels rose above six feet in most of the city, inundating about 6,616 homes.

Contracts and Grants

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

Building a New Minority Geoscience Awareness Program in an Area Impacted by the Relocation of Residents after Hurricane Katrina. Funding Organization: National Science Foundation, \$149,080. Two years. Principal Investigator: Laura Serpa, University of Texas at El Paso, (915) 747-6085, lserpa@utep.edu.

This SGER-funded project is establishing a new pipeline for minority student recruitment into the geosciences in the Houston-New Orleans corridor, in response to the catastrophic disruptions for the New Orleans educational systems brought on by Hurricane Katrina. The project is exploring the portability of a model program for student recruitment operated at the University of New Orleans for 35 years by recreating its essential elements at the University of Texas at El Paso (UTEP), but working with students and teachers from the Houston area. Of particular interest is whether the model is still effective for students who have been displaced from New Orleans to Texas and for students in an environment where the demographic profile is very different from that of New Orleans, which was more homogeneously African-American. Through this project, minority high school students and teachers from Houston to El Paso will be engaged in activities and field trips that will open their eyes to educational and career pathways in the geosciences. A network of secondary school science teachers from New Orleans, Houston, and El Paso will be developed through joint professional development and graduate degree programs. Displaced participants from the University of New Orleans (UNO) geoscience programs who have not yet been able to find alternative academic programs will be sought out and supported for study at UTEP.

Enabling Earthquake System Science through Petascale Calculations. Funding Organization: National Science Foundation, \$900,000. One year. Principal Investigator: Thomas Jordan, University of Southern California, (213) 821-1237, tjordan@usc.edu.

The goal of this project is developing PetaShake, an advanced computational research platform designed to support high-resolution earthquake simulations on a regional (< 1000 km) scale. PetaShake will extend two high-performance, open-source scientific modeling codes—the finite-difference Olsen code and the finite-element Hercules code—toward petascale capability. These operational codes scale efficiently on thousands of processors, and they are being widely applied to wave propagation simulations, dynamic fault rupture studies, physics-based seismic hazard analysis, and full 3D tomography. The researchers will improve single-processor performance through better cache usage, data localization, and platform-dependent optimizations. They will

also improve fault tolerance and fault detection capabilities, and incorporate an on-demand verification and validation capability into the PetaShake platform to support rapid development and enhanced flexibility while maintaining scientific validity. Southern California, the natural laboratory for the proposed project, comprises 23 million people and about half the total national earthquake risk. The Southern California Earthquake Center (SCEC) coordinates a comprehensive program of earthquake system science that involves over 500 scientists at more than 50 research institutions, and it incorporates the results into practical seismic hazard analysis. The cyberinfrastructure and simulation results will be used by the SCEC community and its partners in earthquake engineering and disaster management.

Sensitivity of Extreme Hurricane Winds to Climate Change. Funding Organization: National Science Foundation, \$143,008. Two years. Principal Investigator: James Elsner, Florida State University, (850) 877-4039, jelsner@fsu.edu.

Advances have been made in modeling extreme hurricane winds regionally. For example, the return period of a Katrina-like storm is 14 years along the entire U.S. coast, as estimated from an extreme-value model derived from reliable landfall reports. But what are the return periods of hurricane winds at specific locations, like New York City? This question is more difficult to answer, because storms with sufficient intensity that affect this location are historically rare. In this project, extreme hurricane winds will be modeled locally based on new insights into the scaling behavior of the parameters of the extreme value distribution. This technology will allow users to condition wind exceedance probabilities on climate variables, such as ocean temperatures and steering currents, in order to quantitatively assess which cities are most sensitive to climate variations, in terms of their risk from hurricanes. The goal is to understand how and to what extent local hurricane risk is affected by climate. The objectives are to develop and implement the technologies for anticipating extreme winds along the U.S. coast. The technical problems to be solved include (1) determining the proper model for the available data, and (2) accounting for the variable levels of uncertainty in the data records. The scientific problem is to understand how sensitive local extreme hurricane activity is to climate. A systematic approach to data modeling will be taken, and the models will be made available to scientific and risk management communities. The broader impacts of the work include a better understanding of hurricane threats to the United States and elsewhere, a new tool kit for data modeling in the climate sciences, and estimates of hurricane return periods for any intensity at any location.

Fire Prevention and Safety Grant. Funding Organization: Emergency Preparedness Directorate of the Federal Emergency Management Agency, \$990,000. Two years. Investigator: The Fire Protection Research Foundation, (617) 770-3000, nfparesfdn@nfpa.org.

The Fire Protection Research Foundation, an affiliate of the National Fire Protection Association, will conduct three research projects in support of the fire service. The first project will measure the effectiveness of enforcement involving fire safety code compliance. Specifically, this project will develop a refined methodology to measure fire prevention inspection effectiveness to meet the needs of today's state and local fire prevention personnel. The anticipated result is a tool for fire safety enforcement organizations to measure how fire prevention activities can reduce fire risk in communities. The second project will look at firefighting tactics under wind-driven conditions. The results will help determine ways for firefighters to control structure fires under these challenging circumstances. This information will be especially useful when dealing with large structure fires, like those in high-rise buildings where firefighters often face specific challenges due to wind. The third project will study the thermal capacity of firefighter protective clothing. Firefighter protective clothing is designed with a series of layers and air gaps to prevent the energy of the fire environment from being transferred to the firefighter. When protective layers are compressed, the energy is sometimes transferred to the user and can cause burns. Information learned through this research will pave the way for future enhancements in the testing and design of protective clothing for firefighters. All three projects are slated to be completed by July 2008.

The Geography of Avian Influenza Evolution: Spatial and Temporal Relationships between Virus Genes and Human-Environment Factors. Funding Organization: National Science Foundation, \$133,214. One year. Principal Investigator: Michael Emch, University of North Carolina at Chapel Hill, (919) 843-1010, emch@email.unc.edu.

The influenza virus has been responsible for large economic losses and is a great public health challenge. Pandemic strains that emerge from genetic reassortment and recombination may cause a major disaster in the future. During the 20th century, three influenza pandemics killed millions of people during short outbreak periods. Recent human cases of H5N1 avian influenza in Asia have alerted public health workers, policy makers, and the population as a whole to the possibility of the emergence of a new influenza pandemic in the near future. This research project will use computational genetics and geographic approaches to build a public, spatially referenced avian influenza virus (AIV) genotype database and will investigate relationships between human-environment factors and AIV evolution. The investigators' specific objectives are (1) to classify influenza viral genotypes using their genomic sequence data, (2) to construct a public Influenza Genotype-Geographic Database (IGGD), and (3) to analyze the impacts of human-environment ecosystem factors on influenza viral evolution. This project will gen-

erate a systematic description of the spatial and temporal patterns of influenza viral genotypes and enhance basic understanding of ecosystem drivers of influenza viral evolution. The ultimate goal of the project is to enhance basic understanding of human-environment ecosystem drivers of influenza viral evolution. Most medical geographic studies are conducted at the population level, but this study will include scales from regional-level environmental data to molecular-level genetic information. The factors that influence the evolution of influenza are not well understood because previous studies have not jointly looked at both human and environmental ecosystem factors; this study will investigate them simultaneously.

Modeling Business Return amid Post-Disaster Uncertainties: New Orleans after Katrina. Funding Organization: National Science Foundation, \$622,412. Three years. Principal Investigators: Richard Campanella, Tulane University, rcampa2@lsu.edu (\$121,876); Nina Lam, Louisiana State University, nlam@lsu.edu (\$356,474); and James LeSage, Texas State University-San Marcos, james.lesage@txstate.edu (\$144,062).

Building on first-hand telephone and street survey data collected through a previous project on New Orleans businesses after Hurricane Katrina, this project develops models to quantify determinants of the decisions by businesses to return to their prior location after a disaster. Special attention is given to the spatial relations between a business, its neighborhood, and businesses located nearby. Specifically, this project has four goals: (1) extend current spatial statistical methods to address the ordinal nature of survey data information pertaining to important dependent variables that exhibit spatial dependence in underlying decisions, (2) use estimates and inferences from the statistical models to explore the relation between business recovery and various disaster-related problems that have confronted businesses, (3) compare alternative spatial strategies for aid distribution to examine approaches that will maximize recovery, and (4) produce estimates and inferences regarding optimal recovery approaches and measures of recovery potential for other locations that will generalize findings for the analysis of disasters in other locations. The project is the first attempt to formally model business connectivity and interdependence in decision making as it pertains to decisions about disaster recovery. The research has the potential to augment both methodological and substantive knowledge. Findings from this research will have major implications for planning, mitigation, and the recovery of business in New Orleans, as well as in other sites of future disasters.

Coming in the May Observer

Earthquake Early Warning Systems

Disaster Mitigation Series, Part 2: Use of an early warning system to mitigate the 2007 lahar from Mount Ruapehu, New Zealand

New PERI Online Training Series

The Public Entity Risk Institute (PERI) has launched a new training program focused on promoting understanding of the fundamentals of risk management and insurance and on teaching participants how to implement an effective program at the local government level. Developed by PERI and St. John's University in New York, Risk Management Basics for Local Governments takes an in-depth look at the essential elements of risk management and insurance through a series of nine online courses. The program gives local government leaders a foundation from which to direct development of risk management programs within their communities. Designed for local government officials with limited knowledge of risk management practices, each course goes step-by-step through the key components of a risk management and insurance program. The training will be conducted online at PERI's Web-based training site. At the conclusion of each course, students will take a short test and will receive a certificate once training has been successfully completed. To view details about the nine courses comprising the Risk Management Training for Local Governments, visit www.riskinstitute.org/peri/training. For more information, contact Audre Hoffman at ahoffman@riskinstitute.org.

Certification Course in Tsunami Science and Preparedness

The University of Washington Extension (UWE), in conjunction with the National Oceanographic and Atmospheric Administration (NOAA), has developed a professional certification course in tsunami science and preparedness. The next course offering will be June 16-27, 2008, at the University of Washington in Seattle, Washington. The certification program consists of three courses providing overviews of tsunami hazard assessment, tsunami warning systems, and tsunami resilient communities. Designed for planners, policy makers, emergency managers, scientists, and engineers, the curriculum trains professionals to develop, establish, and maintain tsunami warning and preparedness systems at national, regional, and local community levels. Program graduates receive UWE/NOAA Professional Certification in Tsunami Science and Preparedness, a DVD containing all instructional materials, templates for developing hazard assessments and community plans, and access to an Alumni Network that includes archives of additional tsunami information and educational tools. For more information on the program, visit www.extension.washington.edu/ext/certificates/tsp/tsp_gen.asp. Questions may be directed via email to tsunami@extn.washington.edu.

Analyzing Volcanic Ash Risk to Human Health

Particles from volcanic ash are sometimes small enough to get into human lungs, triggering a variety of respiratory problems. Until recently, emergency responders have struggled to understand exactly how small a particle needs to be to cause human health issues. Now, Claire Horwell, a researcher from Durham University, has developed a sieving technique that analyzes the grain size of volcanic ash to determine possible threats to human health. The study, funded by the Natural Environment Research Council, could help shape emergency response plans following a volcanic eruption and cut the possible risk to human health posed by breathing in fine particles of ash. Volcanic ash is thought to trigger attacks of acute respiratory diseases, such as asthma and bronchitis, in people who already have the diseases. Horwell used state-of-the-art laser technology to analyze the grain size of samples from around the world. She found a strong link between the ratios of different-sized particles present and used this link to develop a formula to estimate the amount of breathable particles, through sieving. The sieving technique could allow emergency response teams to quickly and cheaply measure the potential risk to health without the need for high-tech equipment. Depending on the risk, measures could be put in place to protect people living adjacent to volcanoes. An estimated 70 volcanic eruptions occur worldwide each year, and volcanic ash can be present in the air for many months following an eruption. Horwell has recommended that a network of ash collection sites be set up prior to an eruption so that a rapid assessment of health hazards can be made across a region. To access the abstract or order the full article published in the October 2007 issue of *Journal of Environmental Monitoring*, visit www.rsc.org/Publishing/Journals/EM/.



The Mary Fran Myers Scholarship Request for 2008 Applications

Mary Fran Myers was co-director of the Natural Hazards Research and Applications Information Center at the University of Colorado for 16 years until her untimely death in 2004. Reducing disaster losses, both nationally and internationally, was her life's work. During her tenure as co-director, Mary Fran was instrumental in maintaining the Center's international reputation as a driving force in hazards research and mitigation. Her work helped to bring about a fundamental change in national and international perspectives regarding hazards and helped institute new, more farsighted, and sustainable ways of dealing with extreme environmental events.

Mary Fran was much more than her job title. She provided leadership, guidance, grace, and laughter, and she established a standard of excellence that her colleagues both admired and strived to emulate. She was an innovator, a mentor, and a creative spirit who touched many lives and whose legacy has had a lasting impact on the global hazards community.

The Mary Fran Myers Scholarship

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

In 2003, members of the hazards community established the Mary Fran Myers Scholarship to fulfill Mary Fran's explicit request that qualified and talented individuals receive support to attend the Hazards Workshop. The intent of the scholarship is to bring new and fresh perspectives—and otherwise unheard voices—to the workshop. The Mary Fran Myers Scholarship provides financial support to recipients so that they can attend and participate in the Hazards Workshop and further their research or community work and careers. The scholarship covers part or all of the costs of transportation, hotel accommodations, meals, and workshop registration fees.

The Mary Fran Myers Scholarship is awarded annually to at least one potential workshop participant, who is then formally invited to the workshop. Each year, the recipient or recipients are recognized at the workshop and may be asked to serve as panel discussants, where they can highlight their research or practical experiences in the hazards and disasters field.

Eligibility and Application Procedure

All hazards researchers, students, and practitioners are eligible for the Mary Fran Myers Scholarship. However, preference is given to individuals with demonstrated financial need and those who have not previously attended the Hazards Workshop. Applicants must complete the Mary Fran Myers Scholarship 2008 Application Form, available at www.colorado.edu/hazards/awards/myers-scholarship.html. An application form can also be requested by calling the Natural Hazards Center at (303) 492-6818 or by e-mailing Lori Peek at lori.peek@colostate.edu. **Applications must be received by Friday, April 4, 2008.** Four typed copies of the completed application should be mailed to:

Mary Fran Myers Scholarship
c/o Lori Peek
Natural Hazards Center
University of Colorado at Boulder
482 UCB
Boulder, CO 80309-0482

Special Thanks

The Mary Fran Myers Scholarship was made possible by generous contributions from numerous individual donors, as well as support from the Association of State Floodplain Managers (ASFPM), the Extension Disaster Education Network (EDEN), the Public Entity Risk Institute (PERI), and the Red River, North Dakota, High School Classroom Teachers Association.

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

Publications, Reports, and More

All-Hazards

Global Risk Governance: Concept and Practice Using the IRGC Framework. O. Renn and K. Walker, Editors. 2008. ISBN: 978-1-4020-6798-3. 370 pp. \$149.00 (hardcover). Springer; (800) 777-4643; www.springer.com.

Global risks are not confined to national borders; they cannot be managed through the actions of a single sector. The International Risk Governance Council (IRGC) is an independent organization whose purpose is to promote the understanding and management of emerging global risks that have impacts on human health and safety, the environment, the economy, and society at large. This book presents IRGC's innovative risk governance framework, the careful reviews it received from internationally recognized scientists, and the results of several case studies in which the framework has been applied to a number of significant but different risks.

Handbook of Disaster and Emergency Policies and Institutions. John Handmer and Stephen Dovers. 2007. ISBN: 978-1-84407-359-7. 192 pp. \$55.00 (hardcover). Earthscan; +44 (0) 1256 302699; www.earthscan.co.uk.

As demonstrated in New Orleans, the vast human and financial costs of natural and human-induced disasters are often needlessly high as a result of poor planning and response stemming from inadequate disaster policy. This handbook shows policy makers, planners, managers, and governments how to construct a coherent, relevant, and effective policy framework. Authors John Handmer and Stephen Dovers, both authorities on disaster policy and management, bring together the insights of public policy, institutional design, and emergency and disaster management, stressing the cognate nature of policy and institutional challenges between disasters and sustainability.

Hazard Mitigation Investment Decision Making: Organizational Response to Legislative Mandate. Lucy A. Arendt, Daniel J. Alesch, and William J. Petak. 2007. 81 pp. \$25.00. Multi-disciplinary Center for Earthquake Engineering Research, Technical Report MCEER-07-0002; http://mceer.buffalo.edu/publications/bulletin/07/21-02/28_NewReports.asp.

This is the third in a series of reports on overcoming obstacles to implementing hazard mitigation policies against extreme events. It focuses on developing an organizational decision-making model that may be used to predict the conditions under which organizations will spend money to reduce the likelihood of damage to their

buildings from natural hazards. The report describes a theoretical framework of organizational decision making around hazard mitigation investments, primarily developed from theoretical literature and structured interviews with hospital executives and other stakeholders over a three-year period. Public, not-for-profit, and investor-owned acute care hospital facilities in California and their response to state legislation known colloquially as SB 1953 are examined.

World Disasters Report: Focus on Discrimination. International Federation of Red Cross and Red Crescent Societies; Yvonne Klynman, Nicholas Kouppari, and Mohammed Mukhier, Editors. 2007. ISBN: 92-9139-126-3. 238 pp. \$30.00 (paperback). Kumarian Press; (800) 289-2664; www.kpbooks.com. Electronic copy available online at www.ifrc.org/Docs/pubs/disasters/wdr2007/WDR2007-English.pdf.

Published annually since 1993 by the International Federation of Red Cross and Red Crescent Societies, the *World Disasters Reports* bring together the latest trends, facts, and analysis of contemporary crises. This report turns the spotlight on vulnerable groups in society and examines how and why they face discrimination when disaster strikes. It calls on communities, governments, and agencies to identify the most vulnerable and work together to ensure that their specific needs are addressed during an emergency. Chapter topics deal with discrimination against minorities, the elderly, women, and those with disabilities.

Geomatics Solutions for Disaster Management. Jonathan Li, Sisi Zlatanova, and Andrea Fabbri, Editors. 2007. ISBN: 978-3-540-72106-2. 444 pp. \$199.00 (hardcover). Springer; (800) 777-4643; www.springer.com.

Effective utilization of satellite positioning, remote sensing, and geographic information systems (GIS) in disaster monitoring and management requires research and development in numerous areas: data collection, access and delivery, information extraction and analysis, management and their integration with other data sources, data standardization, and organizational and legal aspects of sharing of remote sensing information. This book, written for researchers and practitioners in the fields of GIS and computer applications in the geosciences, provides an overview of what is being developed in this topical area.

Climate Change

Our Changing Planet: The View from Space. Michael D. King, Claire L. Parkinson, Kim C. Partington, and Robin G. Williams, Editors. 2007. ISBN: 978-0-521-82870-3. 400 pp. \$45.00 (hardcover). Cambridge University Press; (845) 353-7500; www.cambridge.org.

For over 40 years, satellites have been orbiting the Earth and quietly monitoring the state of our planet. Unseen by most of us, they provide information on the many changes taking place, from movements in the land and volcanic eruptions, to human-caused changes such as the growth of cities, deforestation, and the spread of pollutants in the atmosphere and oceans. In this book, led by four editors with support from a production team at NASA Goddard Space Flight Center, many of the world's top remote sensing scientists showcase some spectacular and beautiful satellite imagery accompanied by informed essays on the science behind these images and the implications of what is shown.

Human Impacts on Weather and Climate (Second Edition). William R. Cotton and Roger A. Pielke, Sr. 2007. ISBN: 978-0-521-60056-9. 330 pp. \$55.00 (paperback). Cambridge University Press; (212) 924-3900; www.cambridge.org.

The natural variability of weather and climate greatly complicates our ability to determine a clear cause-and-effect relationship to human activity. In this new edition, the authors, both atmospheric science professors and researchers, examine the scientific and political debates surrounding anthropogenic impacts on the Earth's climate and present the most recent theories, data, and modeling studies. They discuss the concepts behind deliberate human attempts to modify the weather through cloud seeding, as well as inadvertent modification of weather and climate on the regional scale.

Regional Climate Change and Variability: Impacts and Responses. Matthias Ruth, Kieran Donaghy, and Paul Kirshen. 2006. ISBN: 978-1-845-42599-9. 288 pp. \$115.00 (hardcover). Edward Elgar Publishing; (413) 584-5551; www.e-elgar.com.

This volume presents integrated assessments of the impacts of, and adaptation to, climate change and variability at urban and regional scales. Six thematically distinct and methodologically related projects illustrate 'horizontal' integration, which focuses on impacts and responses across different sectors, and 'vertical' integration, which traces changes from the climate system to economy and society. Areas of application include water resource allocation, wildfire management, agriculture, public health, and urban infrastructure in the United States.

Smart Growth and Climate Change: Regional Development, Infrastructure and Adaptation. Matthias Ruth, Editor. 2006. ISBN: 978-1-845-42509-8. 432 pp. \$140.00 (hardcover). Edward Elgar Publishing; (413) 584-5551; www.e-elgar.com.

This book brings together two strands of applied research: 'smart growth' research and research into adaptation to climate change and variability. Both entail similar concerns, draw on complementary modeling tools, and

are concerned with bridging the gaps that may exist between science and engineering stakeholder interests and policy implementation. By providing theory, models, and case studies from North America, Oceania, and Europe, this book helps create synergies and reconcile differences between the two research strands, and provide insights and possible future direction for decision makers at national and local levels.

Earthquakes

When the Earth Moves: Rogue Earthquakes, Tremors, and Aftershocks. Patricia Barnes-Svarney. 2007. ISBN: 978-1-56025-972-5. 272 pp. \$15.95 (paperback). Thunder's Mouth Press; (800) 343-4499; www.perseusbooks.com.

Although scientists can predict when and where a hurricane will make landfall, warn residents to take cover from approaching tornadoes, and detect potential volcanic eruptions, earthquakes are far more difficult to forecast. This book explores the basics of earthquakes, examines quakes that occurred in unusual locations, includes eyewitness accounts of the destructive shocks, and suggests how to prepare for the potential future earthquake.

Hurricanes and Floods

Extreme Weather: Understanding the Science of Hurricanes, Tornadoes, Floods, Heat Waves, Snow Storms, Global Warming, and Other Atmospheric Disturbances. H. Michael Mogil. 2007. ISBN: 978-1-57912-743-5. 304 pp. \$24.95 (hardcover). Black Dog & Leventhal Publishers, Inc.; (212) 647-9336; www.blackdogandleventhal.com.

This book presents an easy-to-understand exploration of extreme weather phenomena, complete with full-color photographs, descriptive illustrations, charts, and graphs. Organized by weather-related events including hurricanes, winter storms, lightning, tsunamis, tornadoes, floods, and heat waves, the book explores weather patterns and other factors that contribute to extreme climate conditions. It also offers a comprehensive picture of future weather trends.

Holding Out and Hanging On: Surviving Hurricane Katrina. Thomas Neff. 2008. ISBN: 978-0-8262-1774-5. 124 pp. \$29.95 (hardcover). University of Missouri Press; (573) 882-7641; <http://press.umsystem.edu>.

As a volunteer in New Orleans in the early days after the flood, author/photographer Thomas Neff witnessed firsthand the confusion and suffering that followed Hurricane Katrina. He subsequently spent 45 days interviewing and photographing the city's holdouts, and his record offers a compelling look at the true impact of the disaster. Neff's images and commentaries approach his subjects from a uniquely personal perspective. Readers will meet people from all walks of life who are exhausted by grief and shock but who are also determined to hold on to their culture and their city. Together, Neff's portraits and stories form a sensitive documentary of survival and stand as a testament to the extraordinary individuals who endured one of the most calamitous disasters of our time.

"The Troubled Roar of the Waters": Vermont in Flood and Recovery, 1927-1931. Deborah Pickman Clifford and Nicholas R. Clifford. 2007. ISBN: 1-58465-654-9. 229 pp. \$29.95 (hardcover). University Press of New England; (800) 421-1561; www.upne.com.

In this book Deborah Pickman Clifford and Nicholas R. Clifford revisit the devastating flood that wreaked unprecedented destruction on New England in November 1927. Vermont sustained the greatest damage by far, with 84 deaths (or three-quarters of the total casualties) and property losses totaling \$30-40 million in 1927 dollars (more than \$86 for every man, woman, and child then in the state). In these pre-FEMA years, Vermonters by and large had to confront the emergency on their own at a time when the boom of the mid- and late-1920s had largely bypassed Vermont, a rural state with little industry and a stagnant population. This book tells the story of the flood, the formation and work of emergency relief committees, the efforts to rebuild in a harsh climate, and the ways in which the disaster fundamentally affected the state's political and social development.

Wildfire

People, Fire, and Forests: A Synthesis of Wildfire Social Science. Terry C. Daniel, Matthew S. Carroll, Cassandra Moseley, and Carol Raish, Editors. 2007. ISBN: 978-0-87071-184-8. 226 pp. \$24.95 (paperback). Oregon State University Press; (800) 426-3797; <http://oregonstate.edu/dept/press>.

Forest settings are a magnet for recreation and for rapidly growing residential development, which places an increasing number of citizens and their property in the path of wildfires. To be effective, wildfire risk management must be informed not only by science, but also by social values, socioeconomic factors, demographic trends, institutional arrangements, and human behavior. This book presents a review of current studies from this broad, interdisciplinary field and synthesizes them into a rich body of knowledge with practical management implications. Topics include public perception of wildfire risk, acceptability of fire management policies, and community impacts of wildfire.

Wall of Flame: The Heroic Battle to Save Southern California. Erich Krauss. 2006. ISBN: 978-0-471-69656-8. 252 pp. \$24.95 (hard cover). John Wiley & Sons, Inc.; (877) 762-2974; www.wiley.com.

This book takes a dramatic look from the front lines at the most devastating fire siege in California history. With over seven miles of urban/wildland interface unburned for 30 years, Rancho Cucamonga was a powder keg—one that finally exploded in October 2003 with a ferocity no one could have expected. Erich Krauss recalls the unprecedented events surrounding the Grand Prix Fire, revealing the moments of apparent indecision, the lack of coordination, and even how local, state, and federal firefighters—each with missions that at times opposed one another—put their differences aside for the greater good in order to save Southern California.

Wildland Fire Fatalities in the United States: 1990-2006. Dick Mangan. 2007. 26 pp. Free online. National Wildfire Coordinating Group (NWCWG) Safety and Health Working Team and Missoula Technology and Development Center (MTDC) Fire and Aviation Program; www.nwcwg.gov/pms/pubs/pms841/pms841_all-72dpi.pdf.

This report documents the 310 wildfire fatalities that occurred during 1990-2006, including causes, agencies, and geographic locations. The leading causes of death were aircraft and vehicle accidents, followed closely by heart attacks. Fatalities occurred in 41 states and included federal, state, and county employees; volunteers; contractors; military personnel; and private citizens. The report relies on data from the "Safety Gram," which is issued annually to document firefighter fatalities and entrapment events across the United States.

Disaster Safety Review. 2007. Vol. 6, No. 2. Institute for Business & Home Safety; www.disastersafety.org/resource/resmgr/pdfs/dsr_fall2007.pdf.

This special edition of Disaster Safety Review takes a broad look at the growing threat of wildfires to communities nationwide. Article topics include public and private roles, the combination of growing risk in relation to construction trends and personal responsibility, the role of community involvement, and why we must change how we live and how we build. Other articles include a look at current research into a homeowner's role in reducing risk, local education programs, and how internet mapping services can help manage disaster response.

Pandemic and Public Health

IASC Guidelines on Mental Health and Psychosocial Support in Emergency Settings. 2007. 182 pp. Free online. Inter-Agency Standing Committee (IASC); www.humanitarian-info.org/iasc.

In 2005, in the aftermath of the Indian Ocean tsunami, an IASC Task Force on Mental Health and Psychosocial Support in Emergency Settings was established to develop inter-sectoral guidelines on mental health and psychosocial support in emergency settings. The Guidelines, developed by 27 agencies, have been peer reviewed extensively in multiple languages and are intended to be a foundational reference and guide for policy leaders, agencies, practitioners, and donors worldwide.

Pandemic Influenza: Best Practices and Model Protocols. 2007. 37 pp. Free online. U.S. Department of Homeland Security; www.usfa.dhs.gov/downloads/pdf/PI_Best_Practices_Model.pdf.

This report issued by the U.S. Department of Homeland Security (DHS) presents best practices and model protocols to support local communities in preparing for a pandemic outbreak. The report provides model protocols for emergency management, 9-1-1 call centers, emergency medical services, law enforcement, public works, and fire service. In the foreword of the report, DHS explains that these best practices and model protocols are applicable to other emerging infectious disease outbreaks or an action of bioterrorism in a community.

Tsunami

From Relief to Recovery – The WHO Tsunami Operation. 2007. Free online. World Health Organization (WHO); www.searo.who.int/en/Section1257/Section2263/Section2304_13176.htm.

This report, published by the WHO's Regional Office for South-East Asia, describes the organization's efforts to respond to the health needs that emerged after the 2004 Indian Ocean tsunami. The publication shows the magnitude of the tragedy in Indonesia, Sri Lanka, Maldives, India, Thailand, and Myanmar.

Updates

Introduction to Emergency Management, Third Edition.

George D. Haddow, Jane A. Bullock, and Damon P. Coppola. 2008. ISBN: 978-0-7506-8514-6. 474 pp. \$59.95 (hardcover). Elsevier; (800) 545-2522; www.elsevier.com.

The third edition is fully updated to cover the continually changing role of the Federal Emergency Management Agency (FEMA) within the Department of Homeland Security and the impact and aftermath of Hurricane Katrina. Lessons including proper planning, mitigation, in-crisis decisions, evacuation, and recovery shed light on how managers can avoid devastating breakdowns in communication and leadership during an event.

Preparing Your Community for Tsunamis: A Guidebook for Local Advocates, Version 2. Laura Dwelley Samant, L. Thomas Tobin, and Brian Tucker. 2007. Free online. Geohazards International; www.geohaz.org/contents/projects/tsunamiguide.html.

This guidebook describes what to do to prepare communities for tsunamis. The updated version includes photographs and maps, as well as a more polished presentation than previous drafts.

Government Accountability Office Reports

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

Coastal Wetlands: Lessons Learned from Past Efforts in Louisiana Could Help Guide Future Restoration and Protection.

December 14, 2007. GAO-08-130. 57 pp.

Maritime Transportation: Major Oil Spills Occur Infrequently, but Risks Remain. December 18, 2007. GAO-08-357T. 29 pp.

Call for Abstracts: Hazards and Disasters Researchers Meeting

The 2008 Hazards and Disasters Researchers Meeting (HDRM) will take place on July 16, 2008, immediately following the 33rd Annual Hazards Research and Applications Workshop to be held at the Omni Interlocken Resort near Boulder, Colorado, on July 12-15. Submissions of scholarly research on all aspects of hazards/disaster research from all disciplinary perspectives are being accepted. Please submit extended abstracts for papers electronically to HDRMeeting@gmail.com with "HDRM Abstract" in the subject line.

The submission should include the following:

- Author's (and co-authors') name, address, telephone number, and email address. Indicate the person that will present the paper.
- Title of the paper
- Three or more keywords that signal the topic area of the paper
- An extended abstract of two pages, single-spaced, and not more than 1,000 words describing the research
- Indicate whether you are willing to serve as a chairperson and/or discussant

The deadline for abstracts is April 15, 2008, with notification of inclusion in the program by May 1, 2008. If an earlier decision is required to arrange travel, please indicate so with the submission.

Calling all Avalanche Workers and Thinkers: International Snow Science Workshop

The International Snow Science Workshop, an international symposium of snow science and avalanche practice, will be held on September 21-27, 2008, in Whistler, British Columbia, Canada. In addition to oral and poster presentations on research projects and findings, the workshop committee is encouraging submissions of virtual field trips, storm reports, or slide shows of remarkable events for inclusion in oral sessions. These case studies might be about practical problems faced by an operation or an observation that could benefit from investigation.

In an effort to encourage practitioners to give oral presentations, practitioners will not be required to submit a full paper to the Proceedings, although they are encouraged to do so. The ISSW is a unique opportunity to merge practice and theory. A variety of topics will be considered, including decision making and human factors; forecasting; hazard, risk, and danger; instrumentation; mitigation methods; rescue; snowpack modeling; and worker safety. **The abstract submission deadline is April 18, 2008.** For more information and to access Web-based registration, visit the ISSW Web site at www.isw2008.com.

Web Sites of Interest

USGS Responds to Southern California Fires

www.usgs.gov/hazards/wildfires/ca/

The U.S. Geological Survey (USGS) launched this Web site for public access to science information in the aftermath of the southern California wildfires. Those affected by the fires can find out how to prepare for and protect themselves from flash floods and debris flows, commonly known as mudflows; see satellite imagery of the burned areas; learn about real-time stream-flow/flood information; listen to interviews with scientists; and view a video and photo gallery.

Expect the Unexpected: Prepare Your Business for Disaster

www.sba.gov/idc/groups/public/documents/sba_homepage/serv_disprep_planningguide.pdf

The U.S. Small Business Administration and Nationwide Mutual Insurance Company have teamed up to launch this disaster planning guide for small business owners. The 10-page guide provides information business owners need to develop an effective plan to protect customers and employees in the event of a disaster. The guide provides key disaster preparedness strategies to help small businesses identify potential hazards, create plans to remain in operation if the office is unusable, and understand the limitations of their insurance coverage.

BounceBack

<http://igcr.blogspot.com>

BounceBack is the blog of the Institute for Global and Community Resilience at Western Washington University. Institute members regularly contribute to the blog, discussing a broad range of issues including food security, risk perceptions, and community resilience and sustainable development in the context of natural hazards. Comments and discussions are welcome; those who would like to contribute to BounceBack as guest bloggers should contact Rebekah Green at rebekah.green@wwu.edu.

FEMA for Kids

www.fema.gov/kids/index.htm

FEMA for Kids is presented by the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA). The Web site shows that disasters come in many shapes and sizes. Some are predictable, like a hurricane, and some can surprise us, like a tornado. Meet Herman the "spokescrab" and tag along on his search for a disaster-proof shell. Users will also meet Julia and Robbie, the Disaster Twins, and can watch brother and sister get into and out of all sorts of close calls, learning along the way how to be better prepared, or how to avoid danger altogether. Learning about the different kinds of disasters will help kids—and all of us—be better prepared.

BBC Climate Change

http://news.bbc.co.uk/2/hi/science/nature/portal/climate_change/default.stm

This BBC site serves as a portal for information and articles on climate change. The site includes the latest information on climate research, features from the BBC, video and audio clips, fact sheets, informational graphics, and much more.

Groots International

www.groots.org

Groots International is an international network of grassroots women's groups focused on disaster mitigation and management that facilitates peer-to-peer learning and capacity building. The goal of Groots is to develop a movement that gives voice and power to grassroots women's local visions and initiatives, attracting long-term partners and creating new policies to expand and strengthen their leadership.

National Hurricane Program

www.fema.gov/plan/prevent/nhp/index.shtml

FEMA's National Hurricane Program (NHP) site has been revamped, and now includes additional external links and more user-friendly navigation. The NHP helps protect communities and residents from hurricane hazards through various projects and activities. Established in 1985, the NHP also conducts assessments and provides tools and technical assistance to state and local agencies in developing hurricane evacuation plans.

EIIP Podcast: Top Ten Favorites for 2007

www.emforum.org/podcasts/071226.htm

This podcast features the top ten favorite virtual presentations given as part of the Emergency Information Infrastructure Partnership (EIIP) Virtual Forum series during 2007. This 10-minute review is provided as a recommendation for those who may have missed them earlier in the year. All transcripts are archived and available from the EIIP Virtual Forum homepage at www.emforum.org.

INEE Minimum Standards

<http://ineesite.org/page.asp?pid=1240>

The Inter-Agency Network for Education in Emergencies (INEE) has developed standards that present a global framework for coordinated action to enhance the quality of educational preparedness and response, increase access to relevant learning opportunities, and ensure humanitarian accountability in providing these services. The INEE Minimum Standards can be used to enhance preparedness, and while they do not address disaster risk reduction (DRR) explicitly, they can also be used to enhance DRR through areas such as establishing a safe and secure learning environment and providing essential survival and life skills information.



Conferences and Training

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

37th Regional Training Course on Disaster Management

(DMC-37)—Bangkok, Thailand: March 17-April 4, 2008. This course will enhance the capabilities of executive managers who have key disaster management responsibilities. It is designed to enable professionals to effectively integrate disaster management into their development programs and policies. Participants will be encouraged to develop key skills, adopt proactive attitudes through participation in interactive lectures, and reflect on a range of key issues raised during discussions and practical activities.

ted@adpc.net
www.adpc.net/v2007/

Natural Disasters in Small Communities: How Can We Help?—

Buffalo, New York: March 29-30, 2008. The University at Buffalo's Center for GeoHazards Studies is hosting its first annual conference. Sessions will focus on the following themes: modeling and uncertainty of geohazards, geohazard analysis and management using remote sensing and geographic information science, case studies of natural disasters, and communicating the danger to stakeholders.

mfs@geology.buffalo.edu
www.geohazards.buffalo.edu

URISA/NENA Addressing Conference (formerly GIPSC)—Portland, Oregon: April 7-10, 2008.

The 2006 and 2007 Geospatial Integration for Public Safety Conference (GIPSC) brought together GIS professionals, addressing coordinators, and emergency response specialists for opportunities in networking and learning. Following this conference, discussions were held about bringing an addressing focus back to the conference while maintaining the qualities of the GIPSC event. The three general program tracks for this year's conference are addressing basics, coordination, and standards; emergency response and 9-1-1; and case studies of GIS integration with public safety.

info@urisa.org
www.urisa.org/conferences/Addressing/Info

2008 Annual Emergency Preparedness Conference—Alexandria, Virginia: April 8-9, 2008.

This conference focuses on planning for circumstances in which health care facilities may be destroyed, rendered unusable, or stretched beyond capacity. Adequate instruction in disaster-specific content, as well as pertinent clinical topics, will be addressed. Because each health care organization and community are unique in the emergencies they face and the resources they possess, this conference will provide the foundation from which each participant can build and/or enhance their state of readiness through the knowledge they gain and the tools provided.

www.jcrinc.com/27006/Programs2008/28380/

Oceans '08 MTS/IEEE Kobe-Techno-Ocean '08—Kobe, Japan: April 8-11, 2008.

This event brings together scientists and engineers with a vast range of scientific knowledge and technological expertise. With the theme "Voyage toward the Future," this year's conference will provide a thematic umbrella under which attendees will discuss the problems and potential long-term solutions that concern the world's oceans.

info@oto08.org
www.oceans08mtsieeeekobe-technoocean08.org

2008 APWA North American Snow Conference—Louisville, Kentucky: April 13-16, 2008.

The American Public Works Association's North American Snow Conference combines four days of educational programs and technical tours with opportunities to network with manufacturers, distributors, consultants, and other public works professionals. More than 120 companies will showcase equipment, technology, products, and services needed for snow and ice removal. More than 40 educational sessions, roundtables, and technical tours are designed to help attendees stay abreast of the latest state-of-the-art practices and procedures in snow and ice control and winter road maintenance.

bshaver@apwa.net
www.apwa.net/Meetings/Snow/2008/

Disaster Management 2008: An Endeavour to Combat Disaster—Pragati Maidan, New Delhi, India: April 16-18, 2008.

This event focuses on several aspects of disaster management involving prevention, mitigation, and preparedness in the early phase of a disaster and in post-disaster relief, rehabilitation, and crisis management. The exhibition provides a platform where buyers and sellers in the disaster industry can plan, prepare, and update the latest techniques and technologies and exchange and share ideas to combat disasters.

info@servintonline.com
www.dmindiaexpo.com

National Earthquake Conference—Seattle, Washington: April 22-26, 2008.

Organized by FEMA, USGS, NIST, and NSF, this broad, multidisciplinary conference has five goals: (1) to develop a shared understanding of scientific, engineering, and social research; (2) to exchange ideas about tools for earthquake hazard and risk reduction; (3) to showcase successful programs; (4) to learn from past disasters; and (5) to build resiliency. The 2008 conference theme is "Understanding Earthquakes: From Research to Resilience."

www.earthquakeconference.org

Risk Analysis 2008: Sixth International Conference in Computer Simulation Risk Analysis and Hazard Mitigation—Cephalonia, Greece: May 5-7, 2008. Risk Analysis 2008 is the sixth in this conference series on “Computer Simulation in Risk Analysis and Hazard Mitigation.” The conference is concerned with all aspects of risk analysis and hazard mitigation, ranging from specific assessment of risk to mitigation associated with both natural and anthropogenic hazards. Engineers, managers involved in the development of simulated risk analysis, and researchers who are concerned with these problems are encouraged to attend.
rcreasey@wessex.ac.uk
www.wessex.ac.uk/conferences/2008/risk08/index.html

2008 FEMA National Flood Conference—Chicago, Illinois: May 7-10, 2008. This year’s conference marks the 40th anniversary of the National Flood Insurance Program and the 25th anniversary of the conference. The meeting will include workshops, general sessions, exhibits, and awards presentations.
ckking28@csc.com
www.fema.gov/business/nfip/natl_fldconf.shtm

World Environmental and Water Resources Congress 2008—Honolulu, Hawaii: May 12-16, 2008. This meeting is an opportunity for water and environmental professionals to convene and focus on key topics. The Congress will focus on sustainability issues related to water resources and the environment in 18 technical tracks covering local, national, and global issues, with a special focus on the Pacific Rim region.
<http://content.asce.org/conferences/ewri2008/>

18th Annual Nevada State GIS Conference—Las Vegas, Nevada: May 19-21, 2008. This conference will provide an opportunity to tap into the latest developments in the geographic information systems (GIS) field. The meeting will bring attention to topics such as GIS and health care, the use of spatial tools in hazard mapping and mitigation, the role of GIS in protecting critical infrastructure, the role of project management and GIS, issues concerning succession planning for future leaders in the GIS profession, and professional certification. Workshops, panel discussions, and educational sessions will be featured.
afaustin@co.clark.nv.us
www.ngis.org/portal/

Public Risk Management Association (PRIMA) 2008 Annual Conference—Anaheim, California: June 1-4, 2008. This conference features sessions on human resources, law, financing, public administration, risk management, schools, and terrorism. Attendees will have access to state-of-the-art risk management products and services at the trade show. The annual conference attracts companies featuring safety, workers’ compensation, finance, insurance, training, and software geared specifically toward risk management professionals.
info@primacentral.org
www.primacentral.org

11th Annual FEMA Emergency Management High Education Conference—Emmitsburg, Maryland: June 2-5, 2008. This conference is designed to provide a medium for academics to discuss problems and issues faced in the fields of hazards, disaster, emergency management, and homeland security educational programs. Representatives of colleges and universities that have such programs in place or are attempting to develop and implement programs in these fields are encouraged to attend.
barbara.l.johnson@dhs.gov
www.training.fema.gov/emiweb/edu/

Geo-Environment & Landscape Evolution 2008: Third International Conference on Evaluation, Monitoring, Simulation, Management, and Remediation of the Geological Environment and Landscape—The New Forest, United Kingdom: June 16-18, 2008. This conference aims to study the role of geosciences in environmental management. The meeting’s objective is to provide a forum for discussion of these topics among researchers, engineers, planners, decision makers, consultants, and other professionals interested in the contribution of geosciences and geo-information to environmental management, land preservation, remediation, and sustainable development.
rswinburn@wessex.ac.uk
www.wessex.ac.uk/conferences/2008/geoenv08/

Debris Flow 2008—The New Forest, United Kingdom: June 18-20, 2008. Population pressures on natural resources in hazard-prone areas and the development of activities that may increase the magnitude of hazards call for improved identification of debris flow risk areas. This conference will provide a forum for engineers, scientists, and managers from laboratories, industries, governments, and academia to exchange knowledge and expertise in the fields of erosion and slope instability, sediment transport, debris flow and debris flood data acquisition, debris flow phenomenology, and laboratory tests.
rswinburn@wessex.ac.uk
www.wessex.ac.uk/conferences/2008/debris08/index.html

Sixth Annual Network for Earthquake Engineering Simulation (NEES) Meeting—Portland, Oregon: June 18-20, 2008. The 6th Annual NEES Meeting will provide an opportunity for researchers, practitioners, and policy makers to discuss the past, present, and potential benefit of NEES research to the built environment. This conference features high-profile plenary sessions, informative breakout sessions, and networking opportunities. Session tracks include implementing research innovations, innovations in structural research, innovations in geotechnical research, next generation research and experimental techniques, information technology, and cyberinfrastructure applications.
annualmeeting@nees.org
www.nees.org/Education/AnnualMeeting/

74th Annual Association of Public-Safety Communications Officials (APCO) Annual Conference and Exposition—Kansas City, Missouri: August 3-7, 2008. This conference enables public safety communications professionals to update their knowledge, network with peers, and get the latest technology for public safety personnel. More than 90 sessions will address topics that enhance career effectiveness and advancement in the field of public safety.

galassol@apcointl.org
www.apco2008.org

2008 ESRI International User Conference—San Diego, California: August 4-8, 2008. This conference brings together more than 14,000 professionals who work with or are interested in geographic information systems (GIS) solutions for their organizations or communities. The central goal is to enhance learning and provide solutions across disciplines and on campuses. Users from more than 120 countries have the opportunity to learn new skills, share information, and discover best practices, tips, and tricks that can be used instantly.

educ@esri.com
www.esri.com/events/uc/index.html

2nd International Disaster Reduction Conference—Davos, Switzerland: August 25-29, 2008. This conference will address a broad range of risks including those related to pandemics, terrorism, climate change, and natural hazards. Risks of a technical, biological, and chemical nature will be featured at this gathering of leading experts, practitioners, academics, and policy makers from a broad range of interdisciplinary fields.

info@idrc.org
www.phree-way.org

13th World Water Congress—Montpellier, France: September 1-4, 2008. The objective of this congress is to raise global consciousness of the impact of global climate change on water resources. The Congress contributes to the study of the earth's water resources by opening the dialogue

between public and private partners, users and decision makers, and emerging and developed countries. Topics will include water availability, use, and management; climate change and disasters; development of water resources and infrastructure; water governance and water security; water conservation and demand management; and capacity building in developing countries.

wwc2008@msem.univ-montp2.fr
www.worldwatercongress2008.org

11th International Specialized Conference on Watershed and River Basin Management—Budapest, Hungary: September 4-5, 2008. This conference provides an opportunity to engage in innovative discussion on the subjects of water resource management, climate change, water supply protection, sustainable urban drainage, pollution sources, and monitoring and modeling. The 2008 themes include river basin management planning; river basin management practices in different continents; managing water resources in transboundary river basins; managing competing uses to protect water quality and quantity; watershed management methods; the impact of climate change on watersheds, river basins, estuaries, and reservoirs; flood control and prevention; and the economics of river basin management.

trivent@trivent.hu
www.eugris.info/DisplayNewsItem.asp?n=459

The '88 Fires: Yellowstone and Beyond—Jackson Hole, Wyoming: September 7-13, 2008. The purpose of this conference is to remember the events of the Yellowstone area fires of 1988. These history-making fires will provide springboards for discussions and presentations about lessons learned, fire effects, fire ecology, large fire management and policy, research related to the fires, the use of fire as a management tool, and other issues. Pre-conference and post-conference optional field trips will be scheduled for September 7 and 13.

paul.woodard@afhe.ualberta.ca
www.iawfonline.org

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

www.colorado.edu/hazards/

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

1. **Support Center Operations**—Provide support for core Center activities such as the *Disaster Research* e-newsletter, annual workshop, library, and the *Natural Hazards Observer*
2. **Build the Center Endowment**—Leave a charitable legacy for future generations
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