



Contents

Volume 8, Number 2, April 2006

<i>Special features</i>		<i>Departments</i>	
Addressing social vulnerability to hazards.....	1	Hazard Mitigation News	15
FEMA reorganizes to meet 21 st century demands.....	11	Publications	19
Off NW coast of North America, meteorological tsunami ?.....	12	Websites	23
NOAA names Indian Harbour Beach TsunamiReady.....	13	Classes, workshops.....	25
TsunamiReady sites	14	Conferences/ symposia.....	25
Exhibits	26	Material added to NTHMP Library	36
Other news briefs	28	NTHMP Steering Group Directory.....	37
Washington tsunami evacuation maps.....	28	State Emergency Management Offices.....	38
Eyewitness accounts of 1906 S.F. earthquake.....	29	Videos.....	39
Disability updates/responses to last issue.....	35	IAQ	40
Tsunami glossary.....	14		

ADDRESSING SOCIAL VULNERABILITY TO HAZARDS

By Lorelei Juntunen

Disaster Safety Review, v. 4, no. 2, p. 3-10

Published by the Institute for Business & Home Safety

Reprinted with permission

INTRODUCTION

Disasters occur as a predictable interaction among systems: natural systems (such as rivers and continental plates), the built environment (cities and roads), and social systems (community organization infrastructure that includes class, age, ethnic, and gender diversity). While significant research has been dedicated to all three of these areas, local mitigation efforts continue to focus on the more easily definable natural and built systems. Because they address vulnerabilities as infrastructure only, plans that inadequately address the social system component of the community implicitly assume that hazards strike demographically homogenous populations. This is very rarely the case. In fact, both in their initial impact and in recovery from them, disasters have been shown to disproportionately impact lower income groups, women, and ethnic minorities (Blaikie, et al., 1994, Wisner, 1998, Morrow, 1999, Fothergill, et al., 1999, Mileti, 1999, Klineberg, 2002). Furthermore, disasters can exacerbate poverty, leaving these populations with even fewer recovery resources.

Despite extensive documentation, the most appropriate method of addressing social vulnerability to hazards remains untested. This project fills the gap, linking research with local mitigation practice.

Through a case study in Clark County, Washington, this project explores the promise of GIS mapping as a means of creating mitigation strategies for vulnerable groups. Mapping has been suggested in part because it fits neatly into the prescribed risk assessment methodology; this project maps one vulnerable population and, using a traditional hazard planning methodology, derives mitigation strategies for that population. However, while maps serve an important planning function, a collaborative approach to addressing social vulnerability may also produce promising mitigation strategies. A focus group that includes both the service providers who work closely with vulnerable populations and the disaster response professionals who create mitigation plans tests the hypothesis. Focus group participants will discuss the causal factors that underlie social vulnerability, and brainstorm the mitigation strategies that will be most appropriate for those populations. The project

(continued on page 3)

TsuInfo Alert

is prepared by the Washington State Department of Natural Resources
on behalf of the National Tsunami Hazard Mitigation Program,
a State/Federal Partnership funded through the National Oceanic and Atmospheric Administration (NOAA).

It is assembled by
Lee Walkling, Librarian,
and is published bi-monthly by the
Washington Department of Natural Resources, Division of Geology and Earth Resources.

This publication is free upon request and is available in print (by surface mail),
electronically (by e-mail), and at <http://www.dnr.wa.gov/geology/tsuinfo/index.html>.
Participants in the TsuInfo program can request copies of reports listed in this issue from:

Washington Geology Library
Washington Department of Natural Resources
Division of Geology and Earth Resources
1111 Washington Street SE, MS 47007
Olympia, WA 98504-7007
360/902-1473; fax: 360/902-1785
e-mail: lee.walkling@wadnr.gov

Back issues are available at <http://www.dnr.wa.gov/geology/tsuinfo/>

The views expressed herein are those of the authors and not necessarily those of
NOAA, the Washington Department of Natural Resources, or other sponsors of
TsuInfo Alert.



WASHINGTON STATE DEPARTMENT OF
Natural Resources
Doug Sutherland - Commissioner of Public Lands



(continued from page 1)

records both mapping and discussion outcomes, and compares the utility of each.

SUMMARY OF LITERATURE

Disasters are not natural

Disaster research as it is currently known began in 1975, when Gilbert F. White and Eugene Haas published *Assessment of Research on Natural Hazards*, a report on the nation's hazard resiliency. White and Haas pointed out that researchers publishing on the subject prior to that time were primarily physical scientists (seismologists, geologists, etc.) and engineers. This research emphasis defined hazards as a function of the physical world; attempts to lessen risk were primarily structural and/or technological in nature, and little attention was given to the social, political, and economic effects of natural disasters.

Since White and Haas published their assessment, many researchers have focused explicitly on the social construction of disaster and vulnerability, noting that the demographics are an important indicator of everything from evacuation compliance during an event to successful long-term recovery after one. Many researchers have written that, while hazards themselves may be natural in origin (storms, earthquakes, etc.) the disasters that result from these hazards are primarily human-caused. People have developed towns and cities in hazard-prone locations, and are ill equipped to deal with hazards when they do occur. Vulnerability is therefore determined by social, economic, and political processes as much as by the hazard itself, though this important aspect is rarely considered in vulnerability analyses (Bolin and Stanford, 1991, Blaikie et al., 1994, Varley, 1994, Mitchell, 1998, Uitto, 1998, Wisner, 1998, Fothergill et al., 1999, Mileti, 1999, Morrow, 1999, Steinberg, 2000, Klineberg, 2002).

In some cases, increased vulnerability among populations is a simple function of where and how building occurs. As more and more people crowd into smaller places, many of which are hazard-prone, larger-scale disasters will occur (WHO, 1999, Steinberg, 2000, Mileti, 1999, Cannon, 1994). Loss resulting from disaster, in fact, has been on the rise for the past several decades, and current patterns of unsustainable development seem to suggest a continuation of this trend (Cochrane, 1975, Blaikie et al., 1994, Uitto, 1998, Mileti, 1999, Boyce, 2000, Steinberg, 2000, Klineberg, 2002).

However, there is a crucial difference between 'exposure,' or physical proximity to a hazard, and 'vulnerability,' which refers to a lack of ability to deal with a hazard's effects (Bolin and Stanford, 1991). Often, vulnerability to disaster is heightened by demographic trends; those with physical or mental disabilities, impoverished people, and people who do not speak English, for example, do not experience the same effects from disasters as the general population. They are more likely to die in a disaster event and less likely to recover after one (Blaikie et al., 1994, Wisner, 1998, Morrow, 1999, Fothergill et al., 1999, Mileti, 1999, Klineberg, 2002). The broad categories of those with fewer "human or personal resources (such as education), family and social resources (such as networks of reciprocity) and political resources (such as power and autonomy)" (Morrow, 1999) are useful for identifying the variety of ways in which vulnerability is incurred.

As a follow-up to White and Haas's 1975 assessment, Dennis Mileti and a number of other researchers collaborated to complete a second assessment of the state of mitigation work in the United States. They found that, despite research describing its importance, in practice, demographic differences still play a minimal role in the mitigation planning process. The issue of differential vulnerability is not likely to disappear without specific intervention; in fact, it is likely to become more pronounced. As Mileti points out,

"The socioeconomic, racial, and ethnic composition of the United States is not static. The number of poor is on the rise, and the nation is becoming more racially and ethnically diverse. Income disparity... continues to grow in almost every state. The process is strongest and fastest along the nation's coasts and in major urban areas—the very places that will face more natural disasters in the future," (p. 124-5, 1999).

The social vulnerability paradigm

The basic assumption of those researchers who study the connection between socio-demographics and vulnerability (what one writer has termed "the social vulnerability paradigm") is that vulnerability reduction is a public good that, in the past, has not been provided equally to all. While much of this research has considered international communities, many are also applying the concepts to communities in the United States.

Both exposure to hazards and reduced capacity to cope and recover will cause increased vulnerability. Lack of access to services and lack of resources will both increase exposure to hazards and reduce capacity to respond to them. Vulnerability is therefore intricately tied to the resources one can access, leading to unmet needs in every stage of emergency management. These unmet needs result from a combination of pre-existing social inequalities and inadequate institutionalized responses to disasters once they occur (Blaikie et al., 1994, Bolin and Stanford, 1998). Because there is unequal access to opportunity in pre-existing patterns of community settlement, and unequal exposure to risk due to the location of development, some people are inherently more vulnerable to disasters than others.

In the U.S., individual households are expected to use private resources to prepare for, respond to and, to a large extent, recover from disasters. This expectation means that households living in poverty are disadvantaged when confronting hazards. A number of other populations have also been shown to experience greater effects from disasters. They include elderly, ethnic minorities, homeless, disabled, women and female-headed households, children, renters, and those who live in rural areas.

Summary of methods

The question behind this research is: How should communities address social vulnerability using the existing tool of the hazard mitigation planning process? Using a case study of refugees in Clark County, Washington, the project explores the following two possible approaches:

1. The project maps one vulnerable population (refugees), and overlays that layer with hazard maps in a traditional risk assessment process as part of a natural hazard mitigation plan. Maps are then used to determine mitigation strategies.
2. The project also tests the viability of a more collaborative approach to mitigating for vulnerable populations. A focus group that included social service providers and emergency response/mitigation professionals was used to test the enthusiasm for and usefulness of a collaborative approach. Focus group participants discussed causal factors and brainstormed locally appropriate, implementable mitigation strategies that target vulnerable populations.

The project records both mapping and discussion outcomes, and compares the utility of

each approach. Recommendations for communities and for policy changes result from analysis of findings.

Mapping findings

All maps are printed in full-color on page 21. [*See note at end of article*] A longer version of this paper includes a risk assessment produced using the maps and results in specific mitigation measures that target the county's refugee populations (Juntunen, 2004). Discussion here is limited to the process of creating the maps and to their potential utility for other communities. The focus group findings and conclusions are discussed in whole.

Mapping discussion

The findings from the mapping section highlight both the strengths and the weaknesses of using GIS analysis and maps as a planning tool for socially vulnerable populations.

Strengths

Perhaps most importantly, mapping vulnerable populations allows for an easy comparison of the physical location of their neighborhoods with the area of impact from specific hazards. Data defining the impact of hazards are continually improving, and are nearly exclusively represented in map format. If communities choose to include vulnerable populations in their mitigation plans, locating them on maps is therefore quite important for the completion of accurate and consistent risk assessments.

From a planning perspective, maps are also extremely useful because they provide a solid fact base for mitigation action items in a visually appealing manner. Maps are probably the best tool available for representing spatial data; they are easily understandable and intuitive for most users. For those reasons, information presented in maps can be more persuasive than even the most eloquently written documents. This could be necessary to get buy-in from the community (including agency leads and decision makers) on mitigation strategies that deal specifically with vulnerable populations.

The maps from this section also produced some very interesting and useful findings about the general condition of refugee housing and, importantly, allowed for the quantification of these results. The ability to quantify the difference in vulnerability between the population in question and the general population could be the crucially important justification for the allocation of

mitigation resources toward vulnerable populations.

Maps can help to target limited resources toward those neighborhoods that truly need mitigation, regardless of the presence of a specific vulnerable population. In this case study for example, the Fruit Valley neighborhood is clearly at risk from multiple hazards and is also, as a whole, less well off than the remainder of the city. Residents of this neighborhood, refugee or not, are not likely to have the resources necessary to structurally retrofit their homes or even maintain a 72 hour supply of food, water, medication, etc. A community that is truly concerned about reducing loss might target this neighborhood to assure that mitigation resources are equitably distributed to reduce overall loss.

In short, once they have been produced, maps are a very useful planning tool that might even be necessary for communities interested in including socially vulnerable populations in their mitigation plans.

Weaknesses

Many of the weaknesses of using mapping as a tool relate to the difficulties of finding data and the limitations of that data once it has been produced. Finding specific locational information for subsets of the population is difficult for several reasons, including confidentiality of records, inappropriateness of scale (i.e. city-wide data rather than block-level data), and lack of specificity in demographics. If an acceptable set of data is found, it will only remain accurate as long as the neighborhood remains stable. Given the length of time that most mitigation planning processes require, the data set will be out of date before the plan is even adopted. These difficulties are very likely to be generalizable to other socially vulnerable groups, such as minorities or the elderly.

These data limitations also compromise some of the benefits gained through mapping. For example, quantifying percentages of populations at risk to particular disasters is a much less useful activity if the data defining that population is unreliable. Unless the data is good, the maps are not adequate planning tools.

Another very important consideration is the resource requirements crucial for the completion of maps. Unless jurisdictions have access to GIS software, data, and expertise, maps like the ones in this project may be prohibitively expensive to create. Additionally, their production requires large amounts of what might be the scarcest of all organizational resources: time. The Disaster

Management Act of 2000 (DMA2K) requires that all communities complete hazard mitigation plans that meet a laundry list of requirements for risk assessments, plan monitoring and updating, hazard profiling, etc. None of those requirements include the consideration of vulnerable populations. Many jurisdictions are struggling to meet even the basic requirements of DMA2K, and do not have the time, staff resources, or funding to create maps of socially vulnerable populations.

In addition to the difficulties of creating accurate maps, there is the question of how effective they will be once they are created. The maps in this case study clearly support the hypothesis that refugee neighborhoods are vulnerable to hazards, define which hazards are most likely to cause problems for which neighborhoods, and even provide some demographic information about the neighborhoods as a whole. However, the maps themselves won't actually assure that any mitigation occurs. All that maps can do is make the case that mitigation is necessary. It will take the commitment of people and resources on the ground to make a difference. This comes back to the central question: are jurisdictional resources better spent attempting to make accurate maps or working to actually mitigate against hazards?

Focus group findings

This section reports findings resulting from focused discussion among experts in the fields of refugee service provision and emergency management. The focus group, held on June 24, 2003, included representatives from several social service agencies that provide relocation assistance to refugee populations as well as emergency management professionals from Clark Regional Emergency Services Agency (CRESA) and the American Red Cross. The objectives of the focus group were to define special needs of refugees that might impact their ability to prepare for, respond to, and recover from disaster events; identify data sources for the mapping portion of the project; and discuss mitigation initiatives specific to refugee populations.

Summary of major findings

In general, there was strong consensus among meeting attendees that there is a need for improved outreach to refugee communities.

- Type of housing and other socio-economic factors place refugee communities at risk from hazards.

- Very little appropriate data is available to spatially locate refugee populations.
- Need exists for improved collaboration among CRESA, service providers, Red Cross, and other emergency response and mitigation planning professionals.
- CRESA is logical lead agency for instigating this collaboration.
- There is a need for preparedness materials in Russian and perhaps Vietnamese. The materials already exist, but should be translated into other languages. Red Cross does not currently have materials translated into either of these languages. Picture manuals could be included and/or incorporated with the Russian language materials.
- Participants suggested a larger meeting including more service providers and emergency preparedness officials, perhaps including fire and police as well, as a place to begin to really mitigate against disasters for refugee populations.

Given the enthusiastic agreement between emergency management professionals and service provider groups that it is important to include Clark County's significant refugee population when mitigating against hazards, the focus group concluded with a discussion of appropriate next steps. This discussion was very animated and needed very little direction. Without prompting from the facilitator, the group quickly came up with a number of mitigation ideas:

- The service providers in the group described the orientation process that they have organized for newly-arrived refugees, and invited CRESA and/or the Red Cross to put together a presentation or packet of materials that could be distributed to describe hazards in the area and explain some of the simple mitigation projects that might be undertaken in the home.
- Service providers asked if they could be trained to do some basic mitigation projects, so that as they are helping refugees move into their new homes, they can help make sure that their homes are as safe as possible.
- The representative from Red Cross mentioned that they do not currently have educational materials available that have been translated into Vietnamese or Russian, and some of the refugees could help with the translation.
- The Red Cross representative also mentioned that they could use the help of Russian and/or Vietnamese speakers to help

coordinate response if a major event (such as an earthquake) were to occur.

- Everyone agreed that a larger meeting that included representatives from all of the refugee resettlement agencies in the county would be an important next step. They could form a task force that would develop educational materials and discuss ways to present the information without overwhelming refugees who have just arrived in this country and have many pressing needs.

Focus group discussion

The findings from the focus group highlight both the strengths and weaknesses of a collaborative approach to mitigation for socially vulnerable populations. This section will discuss the implication of these findings for mitigation planning in general.

Strengths

The real strength of a collaborative approach to mitigation for socially vulnerable populations is two-fold: it involves the people who know the populations and the potential hazard impacts best, and it's comparatively inexpensive to implement. This focus group shows that the collective knowledge and energy of service providers and emergency managers put toward the goal of mitigation can accomplish the actual work of designing and implementing population-appropriate mitigation strategies. Perhaps most notably, the group was able to identify issues that are currently hindering mitigation for refugee populations, and begin to come up with solutions. In one and one-half hours, they came up with several low or no cost measures, including finding refugee volunteers to translate materials into needed languages, and training service providers on basic in-home mitigation against earthquakes (strapping water heaters to the wall, etc.) so that they can teach new arrivals about the necessity of mitigation when they are first moving into their new homes. This is a way to actually get things done.

The focus group also provided insight into the population itself. Service providers were able to describe neighborhoods and discuss hindrances with emergency response professionals that come from a knowledge of the population that emergency response professionals simply do not have. The list of capabilities that the service providers described was particularly robust and would be useful in making a long-term plan for assisting refugee populations.

Including service providers in planning processes can have another added benefit for jurisdictions: increased public participation. This is beneficial for jurisdictions not just because it meets a FEMA planning requirement, but also because it raised awareness of risk among the population in general and ultimately leads to mitigation plans that more accurately reflect the needs of the community as a whole.

Weaknesses

Unless there is a convening body, the coordination of such a collaborative group may be difficult for communities. Some person or organization must own the collaborative process, to organize regular meetings and to follow up on work tasks that the group designates. In many communities, the emergency services agency is a natural home for the collaborative body, but some smaller communities may not have a mitigation officer (though Clark County does). Dedicating staff hours to collaboration could be a difficulty.

One key difficulty with using this approach exclusively is that it is difficult to write it into a formal, FEMA-approved mitigation plan. Under the current system, mitigation plans prioritize funding for mitigation projects; any projects that aren't listed in the plan are unlikely to receive federal or even local dollars for implementation. Collaborative strategies that target vulnerable populations are outside of the scope of FEMA requirements, and, additionally, such ideas may be foreign to the emergency managers who tend to write mitigation plans. Without a local champion, it is unlikely that collaborative approaches will be even considered for inclusion in local plans.

Including such approaches in a mitigation plan will be further complicated because, like any plan that will be formally adopted by a jurisdiction, a mitigation plan must be based in best available science. The need for collaboration is difficult to justify without very specific information about the population in question. Communities, decision makers, and public agencies will want to know that there is a reason to single out such groups if they are to agree to prioritize them for mitigation: this typically means numbers, maps and a solid argument.

Even if such approaches are included, they may fall to the bottom of the prioritization list when funding does become available. FEMA uses a very prescribed cost-benefit analysis to determine which projects should receive federal grant funding, and a collaborative process such

as this one is very difficult to analyze in this way. How can you quantify the benefit that will result from the translation of brochures into Russian? How much does it cost to coordinate an on-going collaborative effort?

It is very important to note, however, that collaborative approaches do not have to be included in mitigation plans in order to be successfully implemented and effect change for socially vulnerable populations. The key requirements for success are the commitment of service providers and mitigation professionals, and the resources necessary to coordinate the efforts of this group of people. The Clark County focus group showed that the commitment is certainly there, and even in a short discussion, the group brainstormed a good number of resources as well.

Conclusions & recommendation

Overall, this project emphasizes that communities can take either approach described in this research to include vulnerable populations when mitigating against and preparing for disasters. Depending on the resources available and the community itself, that approach can be simple and inexpensive or involved and technically complex. Either way, some benefit will be gained.

Focusing on socially vulnerable populations is important for local communities for a variety of reasons. In many ways, the issue at stake is one of social justice; responsible governance and ethical planning require a commitment to the fair allocation of resources and the protection of those portions of population that most need it. Natural hazard mitigation plans can be thought of as a way to prioritize mitigation resources. Each mitigation project that a plan recommends is competing against other projects for funding. Including socially vulnerable populations in such mitigation plans is a step in the direction of assuring that resources are allocated fairly.

Perhaps a more pragmatic reason to consider such populations, though, is that it may save jurisdictions money in the long run. Past research has clearly pointed out that certain populations are more likely to experience loss in disasters; targeting those homes for mitigation means that, overall, the community fares better during the recovery phase. Additionally, the same populations that experience greater loss are more likely to access social services and to need additional public assistance after a disaster if their homes and/or jobs are impacted. Since post-disaster federal assistance is generally available only for infrastructure repairs and not such community-

born expenses as increased numbers of welfare users, pre-disaster mitigation could reduce some of the budgetary strain that communities face when rebuilding their social infrastructure.

This research has sought to discover the best method of arriving at mitigation strategies that target socially vulnerable populations. Since the social aspect of hazards is almost completely absent from the current rules and regulations that require and guide mitigation planning, inclusion of vulnerable populations will require a commitment to seeking out and hearing voices that are typically left out of planning processes. From a jurisdictional standpoint, the question is centered in the overarching goal of their specific planning process. If they are interested primarily in adopting a FEMA approved plan that meets federal criteria, there is really no incentive to include socially vulnerable populations. However, if their goal is to create a more disaster resilient and sustainable community, the question of this research should be absolutely central to their planning process.

Overall, the type of demographic information that resulted from each method was quite similar. While the focus group participants said that refugees tend to live in poorer neighborhoods and older houses, the GIS method revealed how much poorer and how much older. The completion of many of the most simple and effective mitigation projects doesn't require us to know "how much;" it requires only that people committed to reducing loss for the community as a whole problem-solve and work together to implement basic projects. If the goal is to actually complete mitigation projects for vulnerable populations, the collaboration between service providers and mitigation planners is crucial. This cost-effective method actually gets things done and can help to meet the letter of the law by providing meaningful public participation in the mitigation planning process.

The real benefit of maps, on the other hand, is that, to the extent that their data is accurate, they result in the type of quantifiable, visually understandable results that are necessary to justify policy decisions. A map can show at a glance that a neighborhood is in a liquefaction zone and completely surrounded by potential toxic release hazards (as is the case in Vancouver). This is tangible motivation for decision makers to target the area for mitigation. It also greatly simplifies the analysis of vulnerability to specific hazards. Perhaps more importantly, maps are also powerful motivation for the community members themselves to become in-

involved in planning processes. Because the maps allow them to see their vulnerability to hazards, they can become an important community organizing tool for bringing individuals together around the issue of their own safety. Researchers interested in environmental justice have seen impoverished communities come together around public health issues resulting from pollution or noxious land uses (land fills, etc.) near their neighborhoods; in those cases, their vulnerability was obvious. They could see and smell the pollution, which is directly connected to increased incidence of such diseases as asthma. In this case, the area of impact from an earthquake or potential toxic release area is not readily visible, and its effects are often not completely known. It is therefore more difficult for a group of people to come together and focus on reducing loss from hazards. Maps help in this effort, because they visually represent a community's increased vulnerability. How are jurisdictional resources best spent then, on expensive yet very persuasive maps that may or may not accomplish any actual mitigation, or on collaborative efforts between service providers and emergency managers that may accomplish mitigation but can't bring any federal dollars?

Luckily, the two approaches are not mutually exclusive; in fact, even within the confines of this case study, the two supported and improved each other's results. The maps could not have been created without input from focus group participants, and the numbers from the maps supported the discussion that arose among service providers in the focus group. In an ideal world, communities would undertake a combination approach that includes maps of vulnerable populations and a set of recommendations within their hazard mitigation plan that specifically target them. They would simultaneously seek to meaningfully involve service providers in the planning process and engage them directly in mitigation implementation.

That having been said, most communities can probably successfully mitigate for vulnerable populations without maps of their spatial locations or even any mention of them in their mitigation plans. The Clark County focus group revealed great enthusiasm for collaboration and for mitigation. Given the mission of most emergency management agencies "to protect life and property," it makes sense for them to invest the comparatively minimal time and resources to coordinate occasional meetings to keep the lines of communication open between service providers and mitigation planners. If community resources

are so limited as to preclude mapping, collaboration becomes even more important.

One further consideration is the central importance of response and recovery efforts for socially vulnerable populations. Though this research deals primarily with mitigation activities, vulnerability in this case results from a lack of ability to prepare for and respond to disasters. In this situation, providing preparation and response education and assistance, though not a traditional 'mitigation' activity, may be a more appropriate place to being to reduce future loss.

One community level program that deals with preparedness and response is the Community Emergency Response Team (CERT) Program. This program, active in the City of Vancouver and in Clark County in general, educates people about disaster preparedness for hazards that may impact their area and trains them in basic disaster response skills, such as fire safety, basic search and rescue, team organization, and first aid. Using the training learned in the classroom and during exercises, CERT members can assist others in their neighborhood following an event if professional responders are not immediately available to help. CERT members also are encouraged to support emergency response agencies by taking a more active role in emergency preparedness projects in their community, a natural lead in to involvement in mitigation planning processes. CERT requires a partnership between community members, local government, emergency management, and response agencies. In many ways, the program is a model of the sort of collaborative process recommended through this research, though focused on response and preparation rather than mitigation. Given the lack of resources available, it is particularly important that CERT remain active in lower income or otherwise socially vulnerable neighborhoods.

The following recommendations for communities based upon the findings of this case study, provide some guidance for accounting for socially vulnerable populations both in formal mitigation plans and in general community outreach.

Recommendations to communities

1. All aspects of a community, including infrastructure and social make-up, should be considered when planning for a disaster resilient community. Mitigation planners should be thinking about vulnerable populations when coordinating planning processes.
2. Most communities in the nation were focused on meeting FEMA's deadline for

mitigation plans (November, 2004). One of the requirements for that plan is that it includes a plan maintenance and update schedule. These update periods, which typically occur on a five year cycle, would be ideal times to include socially vulnerable populations.

3. One of the most efficient ways to do this is to include service providers on hazard mitigation steering committees and other decision-making bodies that deal with preparation for and response to disasters. Even without maps, service providers can advocate for projects in appropriate neighborhoods or for educational programs that target the populations with whom they work. This will additionally constitute meaningful public involvement in the planning process that intentionally seeks out underrepresented groups for inclusion.
4. If the resources and that data are available, maps are very useful. They may even be necessary if federal funding is sought for mitigation projects that target socially vulnerable populations. Maps create a more complete vision of vulnerability for the community as a whole, and provide powerful justification for allocating resources to under-served neighborhoods.
5. Emergency management agencies should be connecting with social service providers, even if not as part of a formal collaborative body. Service providers can distribute educational materials to groups that might not otherwise have access to it, and be important conduits for response and recovery information.
6. Collaborative groups that include service providers and emergency managers can be an extremely effective means of creating and implementing community-appropriate, inexpensive mitigation strategies. It would be well within the mission of most emergency management agencies to provide outreach to service providers. These agencies should dedicate staff hours to the coordination and maintenance of collaborative groups to assure their sustainability over time. Another model is embodied in Oregon's approach to hazard mitigation. The Partners for Disaster Resistance: Oregon Showcase State program (PDR) provides a comprehensive framework for government and the private sector to collaboratively prepare for and minimize the risk and impact of natural hazards. Part of that preparation includes the provision of

mitigation training for local communities in the process of creating their hazard mitigation plans. PDR includes the importance of considering vulnerable populations in their risk assessment training; this has resulted in at least one Oregon community (the city of Medford) creating maps of vulnerable populations and mitigation measures that specifically address their special situations. Trainings like this greatly increase the likelihood that communities will consider vulnerable populations.

7. Community based programs that deal with response and preparedness (such as CERT) should be encouraged in underserved areas. These will also lead to increased community disaster resilience and will involve community members in disaster planning. Effective response and preparedness plans will increase the likelihood of effective mitigation in the future.

Additional recommendations

1. The cost-benefit formula that FEMA currently utilizes undervalues important mitigation projects that are non-structural in nature. This means that mitigation projects that are structural (such as dikes and seismic retrofits) are more likely to receive funding than mitigation measures such as the collaborative approach recommended here. This keeps communities from receiving funding for projects that would increase their overall resilience. The cost-benefit formula should be reassessed at the federal level. One potential solution is to set aside some federal money for structural projects and assess them using the current cost-benefit formula, and to set aside other funds for other strategies, such as collaboration, that focus on community capacity building
2. Currently, FEMA recommends that communities consider populations with differing abilities in natural hazard mitigation plans, but does not require it or provide any resources for doing so. One simple way for FEMA to more strongly encourage communities to include vulnerable populations without further requirements is to update and improve their "How-To" series.

[Editor's Note:

<http://www.fema.gov/fima/resources.shtm>]

This step-by-step manual addresses all aspects of the planning process, providing resources and recommendations for improving plans. The public participation sec-

tion describes the key players who should be involved (decision makers, long-range planners, neighborhood associations, etc.) but does not specify underserved populations or anyone who represents them. If the "How-To" series explicitly described the need for including these voices in the public process and outlined methods for doing so, communities would be much more likely to take these issues into consideration when writing their plans even if they aren't specifically required to do so. The "broad public participation" requirement should be defined as including traditionally underrepresented voices as well as key stakeholders and decision-makers.

Citations

- Alesch, Daniel J. "What Small Businesses and Municipalities Need to Know About Financial Survival Following an Extreme Event: Lessons From a Dozen Disasters." Partners in Emergency Preparedness Conference, Bellevue, Washington. April 22-23, 2003.
- Blaikie, Piers, Terry Cannon, Ian Davis, and Ben Wisner. *At Risk: Natural Hazards, People's Vulnerability, and Disasters*. NY: Routledge, 1994.
- Bolin, Robert. *Household and Community Recovery After Earthquakes*. Program on Environment and Behavior, Monograph No. 56. Institute of Behavioral Science, University of Colorado, 1993.
- Bolin, Robert. "Post Disaster Sheltering and Housing," *Disasters, Collective Behavior, and Social Organization*, Ed. Russell Dynes and Kathleen Tierney. Newark: University of Delaware Press, 1994.
- Bolin, Robert and Patricia Bolton. *Race, Religion, and Ethnicity in Disaster Recovery*. Program on Environment and Behavior, Monograph No. 42. Institute of Behavioral Science, University of Colorado, 1986.
- Bolin, Robert and Lois Stanford. "The Northridge Earthquake: Community-based Approaches to Unmet Recovery Needs," *Disasters* 22 (1): 21-38, 1998.
- Bolin, Robert and Lois Stanford. "Shelter, Housing and Recovery: A Comparison of U.S. Disasters." *Disasters*. 15 (1): 24-34, 1991.
- Boyce, James K. "Let Them Eat Risk? Wealth, Rights, and Disaster Vulnerability." *Disasters* 24 (3): 254-21, 2000.
- Cannon, Terry. "Vulnerability Analysis and the Explanation of 'Natural' Disasters," *Disasters, Development and Environment*.

- Ed. Ann Varley. New York: John Wiley & Sons, 1994.
- Cochrane, Harold C. *Natural Hazards and their Distributive Effects*. Springfield, VA, National Technical Information Service, 1975.
- Drabek, Thomas E. *Human System Responses to Disaster: An Inventory of Sociological Findings*. New York: Springer-Verlag, 1986.
- Dynes, Russell R. and Kathleen J. Tierney, eds. *Disasters, Collective Behavior, and Social Organization*. Newark: University of Delaware Press, 1994.
- Fitzpatrick, Colleen; Dennis Mileti. "Public Risk Communication," *Disasters, Collective Behavior, and Social Organization*, Ed. Russell Dynes and Kathleen Tierney. Newark: University of Delaware Press, 1994.
- Federal Emergency Management Institute. *State and Local Mitigation Planning How-To Guide: Understanding Your Risks*. FEMA document 386-2, August, 2001.
- Fothergill, Alice, Enrique Maestas, JoAnne Dalington. "Race, Ethnicity and Disasters in the U.S.: A Review of the Literature," *Disasters* 23 (2): 156-174, 1999.
- Juntunen, Lorelei. "Addressing Social Vulnerability to Hazards," Terminal Project. University of Oregon, Department of Planning, Public Policy, and Management. June, 2004.
- Klineberg, Eric. *Heatwave: A Social Autopsy of Disaster in Chicago*. Chicago: University of Chicago Press, 2002.
- Mileti, Dennis. *Disasters by Design: A Re-assessment of Natural Hazards in the U.S.* Washington, D.C.: Joseph Henry Press, 1999.
- Mitchell, J. K. "Hazards in Changing Cities." *Applied Geography* 18 (1): 7-16, 1998.
- Morrow, Betty Hearn. "Identifying and Mapping Community Vulnerability." *Disasters* 23 (1): 1-18, 1999.
- Steinberg, Ted. *Acts of God: The Unnatural History of Natural Disasters in America*. NY: Oxford University Press, 2000.
- White, Gilbert F. and Eugene Haas. *Assessment of Research on Natural Hazards*. Cambridge, Mass. MIT Press, 1975.
- Wisner, Ben. "Marginality and Vulnerability: Why the Homeless Don't 'Count' in Disaster Preparations." *Applied Geography* 18 (1): 7-16, 1998.
- World Health Organization. *Community Emergency Preparedness: A Manual for Managers and Policy Makers*. Geneva, 1999.

Editor's Note: There are six colored maps (2.25 x 3.25 inches each) that appear in the original print article that *TsuInfo Alert* has not included. Contact me (see page 2) for a photocopy. The maps are:

- Vancouver Refugee Neighborhoods
- Flood Problem Area
- Earthquake Vulnerability
- Hazardous Material Vulnerability
- Flood Vulnerability
- Hazardous Materials Problem Area ♦

FEMA reorganizes to meet 21st century demands

By: Simone Thigpen

On February 13, 2006, Homeland Security Secretary Michael Chertoff announced new goals designed to tackle issues and shortcomings revealed by Hurricane Katrina. Secretary Chertoff spoke to the National Emergency Management Association (NEMA) and outlined new plans to fortify the current structure of FEMA as it relates to preparation and response.

In his address he outlined areas that will be improved to meet current and future demands as they relate to natural and man-made disasters and the improvement of relationships between Federal, state, local and private sector entities. The four immediate areas tagged for improvement as a direct result of events that took place during and after Katrina are: Logistics, Claims Management, Debris Removal, and Communications.

Secretary Chertoff understands that DHS and FEMA are in need of some internal improvements in the area of everyday operations before these agencies can focus on external issues with handling disasters. One internal area mentioned is a need to integrate the incident command at DHS. According to Secretary Chertoff, the current design at DHS lacks a common operating picture and a clear chain of command. Another internal issue focuses on improving operational capabilities with regards, in particular, to technology. The third area mentioned was meeting the needs of the FEMA employee by providing improved tools to support them in their mission.

The four areas slated for immediate improvement areas that will strengthen how DHS and FEMA can accomplish their mission. The first, Logistics, was lacking during and after the Katrina hurricane. FEMA was unable to track shipments and manage the inventories of commodities sent to relieve the Gulf Coast. A logistics supply chain will be established by working with agencies like the Department of Trans-

portation who already has an established network of contacts to move items throughout the nation.

The second is the Claims Management that handles registration and intake procedures for disaster victims. The current process is overly burdensome and bureaucratic and is unable to meet the heightened demands imposed by a major disaster. An important aspect of this improvement will be the upgrading of FEMA's outdated information technology and computer systems.

The third area is Debris Removal. Even six months after the Katrina disaster there are tons of pounds of debris left to be removed. As Secretary Chertoff points out, debris is one of the bigger hindrances to rebuilding and reconstructing homes and infrastructure. In the future, FEMA will have pre-established contracts with debris removal companies to ensure cost effective removal.

The last area is Communications. Hurricane Katrina's ferocity was exacerbated by the lack of established communications among Federal, state and local partners. Because of this, situational awareness and shared information was near zero during the initial phases of the disaster. The process of establishing reconnaissance teams from other Homeland Security agencies to include the Coast guard and Border Patrol is imperative to improving the communications.

Secretary Chertoff hopes to be on the path to improvement by the start of the next hurricane season coming this May.

For more information please visit:

<http://www.dhs.gov/dhspublic/display?content=5414>

From: Crisis and Emergency Management Newsletter, v. 10, no. 2, March 2006
Institute for Crisis, Disaster, and Risk Management (The George Washington University)
http://www.seas.gwu.edu/%7Eemse232/march2006_13.html ♦

Off northwest coast of North America, 9 December 2005, 01:57 UTC – Rissaga, meteorological tsunami?

Summarized from Tsunami Bulletin Board postings between 14 and 23 December 2005 based on initial data posting by Dr. Alexander Rabinovich, Institute of Ocean Sciences (IOS), Sidney, B.C., Canada. From: Tsunami Newsletter, v. 37, no. 2, p. 13-14.

Unusual sea level measurements on 9 December 2005 along the entire coast of British Columbia (From Prince Rupert to Victoria, ~1000 km), and Washington State (from Neah

Bay and Tacoma to Toke Point) have been reported to the Tsunami Bulletin Board by Dr. Alexander Rabinovich. No seismic events were reported that could have generated any noticeable tsunami, and therefore the waves are ascribed to be of meteorological or atmospheric origin, and most probably a manifestation of high-frequency irregularities in atmospheric pressure as the weather was calm that day.

Examination of the sea level records showed that stations on both the open ocean and in the sheltered straits showed noticeable tsunami-like oscillations. In particular, Tofino, Bamfield, Winter Harbour off British Columbia, and Neah Bay and Toke Point in Washington are all located oceanside of the coast and are relatively open to waves arriving from the open ocean. On the other hand, Patricia Bay, Vancouver and Point Atkinson in British Columbia, and Bella Bella (mainland coast of Queen Charlotte Sound), Port Angeles and Port Townsend (Juan de Fuca Straits), Friday Harbor (San Juan Island between Juan de Fuca Straits and the Strait of Georgia), Cherry Point (Strait of Georgia near US/Canada border), and Seattle and Tacoma (Puget Sound) are all located in areas well-protected from tsunami coming from the open ocean. The wave oscillations continued for approximately 9-12 hours and had mainly irregular (polychromatic) characters with dominant periods of 10 to 60 minutes. A very clear time shift between oscillations observed at various sites suggests that the disturbance propagated from north to south.

In explaining the phenomenon, it was reported that Dr. Ivica Vilibic and others (J. Geophys. Res., 2004, 109, C10001, doi:10.1029/2004JC002279) have recently described destructive tsunami-like waves in the Adriatic Sea that were generated by an abrupt disturbance in atmospheric pressure. Catastrophic "rissaga waves," generated mainly by internal gravity atmospheric waves, are well known for the inlets and bays of the Balearic Islands (e.g., Gomis et al., J. Geophys. Res., 1993, 98, 14437-14445; Garcies et al., J. Geophys. Res., 1996, 101, 6453-6467; Rabinovich and Monserrat, Nat. Haz., 1996, 12, 55-90 and 1998, 18, 27-55).

"Rissaga" is a local Catalan name (in Spanish, Resaca) for destructive atmospherically-induced seiches that have been observed in some inlets of the Catalan coast of Spain and first of all, in Ciutadella Inlet, Menorca Islands, Balears. A number of papers have been written describing and analyzing this phenomenon in Ciutadella

(e.g., Sebastian Monserrat and Rabinovich, *Natural Hazards*, 1996, 13 (1), 55-90; *Natural Hazards*, 1998, 18(1), 27-55; and *GRL*, 1998, 25 (12), 2197-2200). Because "rissaga" is probably the best known example of such phenomena, this term became popularly-used to describe similar oscillations in some other parts of the World Ocean. There are, however, many other local names. For example, catastrophic seiches in Nagasaki Bay, Japan, are known as "abiki" (e.g., Hibiya and Kajiuura, *JOSJ*, 1982, 38 (3), 172-182) or "yota" in other Japan bays, as "mar-rubbio" on the coast of West Sicily, and "mil-ghuba" on the coast of Malta. In New Zealand, Derek Goring reported that ports on the eastern seaboard are often affected by these waves (1 cm in height, 20+ min period), which they are calling rissaga rather than meteorological tsunami. The generation mechanism is thought to be related to Proudman resonance resulting from low-pressure systems propagating rapidly southward from the tropics over the contorted seafloor of the Kermadecs northeast of New Zealand, and to date have caused the grounding of at least one oil tanker.

Dr. Rabinovich further noted that because many local terms are describing the same phenomena, it may be good for the international community to consider adopting a general term independent of geographic location to describe the oscillations. Nomitsu (1935) suggested the term "meteorological tsunami," and Dr. A. Defant has widely used this term in his book, "Physical Oceanography" (1961). It was noted that it was important to distinguish very clearly the difference between "meteorological tsunamis" and storm surges, since the latter have periods from several hours to several days, while the former have the same periods as ordinary tsunami waves (few minutes to two hours). He further noted that tsunami catalogs often contain a number of events described as "probably of meteorological origin." ♦

[**Correction:** In the last issue we noted that Norfolk, Virginia was the first East Coast city to achieve the TsunamiReady designation. Re-reading the press release, we see the distinction "first *major* East Coast city." Indian Harbour Beach, Florida, however, was the *first* East Coast community to become Tsunami-Ready.]

NOAA names Florida's Indian Harbour Beach the nation's first TsunamiReady community on the East Coast

July 7, 2005 — Officials from the NOAA National Weather Service today praised central Florida's Indian Harbour Beach for completing a set of rigorous criteria necessary to earn the distinction of being declared the first Tsunami-Ready community along the nation's East Coast.

"Indian Harbour Beach should take great pride in having gone the extra mile to provide its citizens with the measure of protection Tsunami Ready affords," said Brig. Gen. David L. Johnson, USAF (Ret.), director of NOAA National Weather Service. "We are continuing to expand the nation's tsunami detection, assessment and warning system, but a timely warning is meaningless if our citizens don't know how to respond to it. The TsunamiReady program is designed to help ensure that residents understand what actions to take.

While no community can be tsunami proof, Indian Harbour Beach now has the means to minimize the threat to the public," said Bill Proenza, director of NOAA National Weather Service's southern region.

"A tsunami may not strike for many generations, but then again, it could happen tomorrow. I expect this city to be just the first in a long list of Tsunami-Ready communities along our East and Gulf coasts. As a nation with warm water recreation and large coastal population centers, we are compelled to be prepared."

Located in Brevard County (one of 59 Storm Ready counties in Florida), Indian Harbour Beach is situated between the Atlantic Ocean and Indian River Lagoon. Currently home to nearly 9,000 citizens, it was established 50 years ago as a residential community in support of the growing space industry at nearby Kennedy Space Center.

From: <http://www.noaanews.noaa.gov/Stories2005/c2470.htm> ♦

As of March 21, 2006, there were 1034 Storm-Ready Sites in 50 states: 543 Counties, 470 Communities, 12 Universities, 2 Indian Nation, 5 Commercial Sites, 4 Military Sites; and 27 TsunamiReady Sites in 7 states and 11 StormReady Supporters

From: <http://www.stormready.noaa.gov/communities.htm> ♦

A complete list of TsunamiReady sites:

Alaska: Homer, Kodiak, Seward, Sitka

California: Crescent City, Dana Point, University of California at Santa Barbara

Florida: Indian Harbour Beach

Hawaii: Hawaii County, Honolulu, Honolulu County, Kauai County, Maui County

Oregon: Cannon Beach, Lincoln City, Coos County, Manzanita, Nehalem, Rockaway Beach, Tillamook, Wheeler.

Virginia: Norfolk

Washington: Clallam County, Long Beach, Ocean Shores, Pacific County, Quinault Indian Nation

Tsunami Glossary

N

Near-field or local tsunami....A tsunami from a nearby source, generally less than 200 km away. A local tsunami is generated by a small earthquake, a landslide or a pyroclastic flow.

O

Overflow.....A flowing over, inundation.

P

Pacific-wide tsunami.....A tsunami capable of widespread destruction, not only in the immediate region of its generation, but across the entire Pacific Ocean.

Paleotsunami.....Research on paleotsunamis, events occurring prior to the historical record, has recently been taking place in a few regions around the Pacific. This work is based primarily on the collection and analysis of tsunami deposits found in coastal areas, and other evidence related to the uplift or subsidence associated with nearby earthquakes. In one instance, the research has led to a new concern for the possible future occurrence of great earthquakes and tsunamis along the northwest coast of North America. In another instance, the record of tsunamis in the Kuril-Kamchatka region is being extended much further back in time. As work in this field continues it may provide a significant amount of new information about past tsunamis to aid in the assessment of the tsunami hazard.

Post-tsunami survey.....Tsunamis are relatively rare events and most of their evidence is perish-

able. Therefore, it is very important that reconnaissance surveys be organized and carried out quickly and thoroughly after each tsunami occurs, to collect detailed data valuable for hazard assessment, model validation, and other aspects of tsunami mitigation. In recent years, following each major destructive tsunami, a post-tsunami reconnaissance survey has been organized to make measurements of runups and inundation limits and to collect associated data from eyewitnesses such as the number of waves, arrival time of waves, and which wave was the largest. The surveys have been organized primarily on an ad-hoc basis by academic tsunami researchers, with participants often gathered from several of the ITSU member states. A *Post-Tsunami Survey Field Guide* (<http://www.prh.noaa.gov/itic/>) has been prepared by ITSU to help with preparations for surveys, to identify measurements and observations that should be taken, and to standardize data collection methods for increased consistency and accuracy.

Probable maximum water level.....A hypothetical water level (exclusive of wave runup from normal wind-generated waves) that might result from the most severe combination of hydrometeorological, geoseismic and other geophysical factors that is considered reasonably possible in the region involved, with each of these factors considered as affecting the locality in a maximum manner. This level represents the physical response of a body of water to maximum applied phenomena such as hurricanes, moving squall lines, other cyclonic meteorological events, tsunamis, and astronomical tide combined with maximum probable ambient hydrological conditions such as wave level with virtually no risk of being exceeded.

PTWC.....Pacific Tsunami Warning Center. PTWC is the headquarters of the operational Tsunami Warning System (TWS) in the Pacific and works closely with other regional national centers in monitoring seismological and tidal stations and instruments around the Pacific Ocean, to evaluate potentially tsunamigenic earthquakes. PTWC is operated by the United States National Weather Service (<http://www.nws.noaa.gov/pr/ptwc>). ♦



NEWS

2006 Homeland Security Appropriations

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

\$550 million for formula-based grants;

\$400 million for law enforcement terrorism prevention grants;

\$1.15 billion for discretionary spending (includes \$765 million for high-threat, high-density urban areas);

\$50 million for the Commercial Equipment Direct Assistance Program;

\$346.3 million for training, exercises, technical assistance, and other programs;

\$655 million for firefighter assistance grants;

\$185 million for Emergency Management Performance Grants;

\$625.5 million for infrastructure protection and information security; and

\$44.9 million for the U.S. Fire Administration.

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

\$204 million for preparedness, mitigation, response, and recovery operations;

\$1.77 billion for disaster relief;

\$153 million for emergency food and shelter;

\$200 million for flood map modernization;

\$50 million for the National Predisaster Mitigation Fund; and

\$34 million for the National Disaster Medical System.

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

From: Natural Hazards Observer, v. 30, no. 3, p. 10; or
<http://www.colorado.edu/hazards/o/jan06/jan06d.html#dhs>

AHAB funding

Washington's 2006 special session approved a significant expansion of the state's All-Hazard Alert Broadcasting (AHAB) network along Washington's Pacific coastline.

The 2006 supplemental budget, which now awaits the signature of Gov. Chris Gregoire, would allocate \$950,000 to install at least 20 AHAB loud-speaker systems. These 20 systems would be in addition to the 10 systems funded in the Fiscal Year 06 federal budget for the National Oceanic and Atmospheric Administration.

Reflecting pre-session discussions on improvements in both all-hazard and tsunami and alert warning for coastal residents, the governor asked legislators to appropriate \$450,000 to install upwards of 10 AHAB systems.

After the Senate budget had endorsed the governor's plan, House budget writers doubled the governor's AHAB budget request, calling for the installation of as many as 20 loudspeaker systems. A Senate-House Conference Committee approved the House action.

George Crawford, WEMD's earthquake program manager, said a private contractor already is selecting sites for the AHAB systems. He said he hopes installation work can be completed by the end of 2006.

He said the loudspeaker systems will be located in all four of the coastal counties—Clallam, Jefferson, Grays Harbor and Pacific—and will be concentrated towards the most populated beach and coast-line areas.

The AHAB systems, which are produced by Federal Signal, currently can be activated by local officials as well as by the National Oceanic and Atmospheric Administration.

From: Emergency Responder, January-February 2006, p. 4

National emergency responder credentialing system

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

The NIMS Integration Center (NIC) initiated the development of a national credentialing system to help governments at all levels identify,

request, and dispatch qualified emergency responders from other jurisdictions when needed. Such a system will ensure that personnel resources requested from another jurisdiction to assist in a response operation are adequately trained and skilled.

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

From: Natural Hazards Observer, v. 30, no. 3, p. 12; or <http://www.colorado.edu/hazards/o/jan06/jan06d.html#dhs>

Exercise Pacific Wave '06

The Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS) will be conducting its first end-to-end Pacific-wide tsunami exercise for the Pacific Ocean on 16-17 May 2006. Regional and national tsunami warning systems in the Pacific and globally must maintain a high level of readiness so as to be able to efficiently and effectively act to provide for the public's safety during fast-onset and rapidly-evolving natural disasters such as tsunamis. To maintain this high state of operational readiness, and especially for infrequent events such as tsunamis, emergency agencies should regularly practice their response procedures to ensure that vital communications links work seamlessly and that agencies and response personnel know the roles that they will need to play during an actual event.

The exercise will place all Pacific Basin countries into a Tsunami Warning that will require countries to practice its emergency response decision-making for the arrival of a destructive Pacific-wide tsunami upon its shores, and depending upon the country, be conducted to the step just prior to public notification. The exercise will take focus on two components of

the warning system: the evaluation and issuance of the warning message by tsunami warning centres, and the national and/or local response and warning dissemination mechanism once a warning is received by emergency authorities.

From: Tsunami Newsletter, v. 37, no. 2, p. 1-2.

Disaster office for Central America moves to Panama

PAHO has moved its Disaster Program for Central America from Costa Rica to Panama, where several UN agencies and major NGOs have regional disaster offices. For information on PAHO's disaster preparedness and mitigation activities in Central America, contact Dr. Alejandro Santander at santanda@paho.org; phone (507) 317-0971; fax (507) 317-0600.

From: Disasters—Preparedness and Mitigation in the Americas, issue 102, Jan. 2006, p. 2.

PAHO/WHO disaster videos now available in DVD format

The PAHO/WHO video library includes historic footage and edited documentaries on many major disasters of the 1980s and 1990s as well as shows on topics such as disaster mitigation, the SUMA system and international health relief assistance. Now, most PAHO/WHO video programs of the last 20 years have been converted to digital format and are available on DVD. Programs such as *Myths and Realities of Natural Disasters*, *Volcanoes—Protecting the Public's Health*, *The Earthquake in Mexico*, and *The Earthquake in El Salvador*, in addition to many other titles, are still sought after for use in training and awareness programs. Consult the PAHO/WHO online publications catalog for a list of available titles.

(See listing below for website URL.)

From: Disasters—Preparedness and Mitigation in the Americas, issue 102, Jan. 2006, p. 6.

National plan for tsunami risk reduction

In December, the White House released its national tsunami risk reduction plan, *Tsunami Risk Reduction for the United States: A Framework for Action*. Authored by a working group of the president's National Science and Technology Council in partnership with scientists and policy makers at local, state, and federal levels, it recognizes critical world-wide interdependencies, especially for Earth observations, and notes the opportunities for nations to work together to reduce vulnerabilities.

The National Tsunami Hazard Mitigation Program (NTHMP), a partnership of federal agencies and coastal states, will execute the plan by facilitating the following:

- Develop standardized and coordinated tsunami hazard and risk assessments for all U.S. coastal regions
- Enhance tsunami forecast and warning capabilities along the nation's coastlines
- Ensure interoperability between the U.S. national system and other regional tsunami warning systems
- Provide technical expertise and assistance to facilitate development of international warning systems
- Promote development of model mitigation measures and encourage communities to adopt construction, critical facilities protection, and land use planning practices to reduce the impact of future tsunamis
- Increase outreach to all communities at risk to raise awareness, improve preparedness, and encourage the development of tsunami response plans
- Conduct an annual review of tsunami research and develop a strategic plan for U.S. tsunami research

The framework is available for download at <http://sdr.gov/>. For more information about the NTHMP, visit <http://www.pmel.noaa.gov/tsunami-hazard/>.

From: Natural Hazards Observer, v. 30, no. 4, p. 5; also available at <http://www.colorado.edu/hazards/o/mar06/mar06c.html#tsunami>

DHS Wants kids to get ready!

The U.S. Department of Homeland Security (DHS) and the Advertising Council have launched "Ready Kids" to help parents and teachers educate children about emergencies. A new Web site features games and puzzles as well as age-appropriate, step-by-step instructions on what families can do to better prepare for emergencies and the role kids can play in that effort. In-school materials developed by Scholastic Inc. offer lessons that meet national standards for language arts, social studies, and geography while providing teachers and parents with a vehicle to explain important emergency preparedness information to children.

To ensure that program information is presented in a way that is understandable and appropriate for kids, DHS consulted with a number

of organizations experienced in education and children's health, including the American Psychological Association, American Red Cross, National Association of Elementary School Principals, National Association of School Psychologists, National Parent Teacher Association, National Center for Child Traumatic Stress, U.S. Department of Education, and U.S. Department of Health and Human Services.

"Ready Kids" is the newest addition to the "Ready" campaign, a national public service advertising campaign designed to educate and empower Americans to prepare for and respond to emergencies. Find out more about the program and meet Rex, the mountain lion mascot, and his family at <http://www.ready.gov/kids/>.

From: Natural Hazards Observer, v. 30, no. 4, p. 5-6; also available at <http://www.colorado.edu/hazards/o/mar06/mar06c.html#ready>

Profile of the FEMA for Kids website - <http://www.fema.gov/kids/index.htm>

The FEMA for Kids website is designed to teach children about FEMA and provide them a tools to learn more about what FEMA does and what they can do. The website is hosted by Herman the Spokescrab and is designed to be visually stimulating to kids with bright colors and animated graphics.

The website is broken down into several sections:

- Ready Kids: Provides tools for kids and parents to prepare and plan for a disaster. The section includes quizzes, games, facts and more.
- Become a Disaster Action Kid: Provides the tools and checklists to assist kids in preparing for disasters. It also provides children an opportunity to receive a certificate of completion for going through the exercise. There also links and information to various freebies that assist in the Become and Disaster Action Kid process.
- The Disaster Area: This section provides graphics, animations and descriptions of disasters that FEMA supports.
- Get Ready, Get Set . . . This section provides various tools and short articles that to help support children there the preparation process.
- About FEMA: Provides children a short description of FEMA at a reading level that they will understand describing

how FEMA helps individuals before and after a disaster.

- Games and Quizzes: The title says it all. Nearly 2 dozen games or quizzes to help children learn about FEMA, preparation and readiness.
- Disaster Connection, Kids to Kids: Artwork and letters of disasters created by kids for other kids.
- What's happen now? A state-by-state guide of recently declared emergencies.
- The Library. Links, pictures, maps, books, videos, photos, etc.

The website also contains training guides and other useful guides for parents and teachers to assist them in teaching children about disasters and preparedness. Overall, the website is well-designed to help engage children in emergency preparedness. The website is part of the kids.gov initiative.

By Mark Phillips

From: Crisis and Emergency Management Newsletter, v. 10, no. 2, March 2006
Institute for Crisis, Disaster, and Risk Management (The George Washington University)
http://www.seas.gwu.edu/%7Eemse232/march2006_14.html

USGS National Earthquake Center goes 24/7

The U.S. Geological Survey (USGS) National Earthquake Center is strengthening its operations with round-the-clock, on-site personnel and a new seismic event processing system that identifies, locates, and measures earthquakes, cutting in half the time required to report earthquake information. The system will become fully operational in March 2006. Other software and hardware enhancements are also being implemented, including Prompt Assessment of Global Earthquakes for Response (PAGER), which is designed to predict damage from major earthquakes worldwide based on estimates of people and property exposed to potentially damaging levels of ground motion. The system is being developed as a tool for emergency relief organizations such as the U.S. Agency for International Development. Additionally, in January, the USGS debuted a new Web site and notification service at <http://earthquake.usgs.gov/>. The site's earthquake center section has information on the latest earthquakes, past earthquakes, and earthquake lists and statistics.

From: Natural Hazards Observer, v. 30, no. 4, p. 8; also available at <http://www.colorado.edu/hazards/o/mar06/mar06c.html#ready>

► **[Editor's note:** to see the article about the West Coast and Alaska Tsunami Warning Center going to around-the-clock staffing, go to <http://www.casperstartribune.net/articles/2006/01/02/news/regional/087bb5eafe8e886e872570e80026a03c.txt>]

Smart buildings to guide future first responders

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

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

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

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

From: Natural Hazards Observer, v. 30, no. 3, p. 11-12; or <http://www.colorado.edu/hazards/o/jan06/jan06d.html#dhs>

Shocked scientists find tsunami legacy: a dead sea

The Sumatra-Andaman earthquake/tsunami created an ocean floor area with no signs of life.

"Normally, when you go to the bottom of the sea anywhere and take a sample or look around, there's always something alive," Professor O'Dor (Dalhousie University, Canada) said. "But five months after the earthquake, this entire

plain, created by the collapse of the cliff, was essentially devoid of life.”

The complete Sydney Morning Herald article is online:
<http://www.smh.com.au/articles/2005/12/13/1134236063754.html>

Submitted by Wayne Johnston

Officials to test Alaska tsunami warning system--"Live" warnings part of Tsunami Awareness Week

The NOAA National Weather Service and Alaska's Division of Homeland Security and Emergency Management, in cooperation with local emergency management offices and the Alaska Broadcasters Association, will conduct a statewide test of the tsunami warning communications system on March 29 at 9:45 a.m., Alaska Standard Time. Live tsunami warning codes, rather than a test code, will be broadcast on radio and television stations statewide.

The test is part of Tsunami Awareness Week, proclaimed by Governor Frank Murkowski as March 26 - April 1. The week coincides with the anniversary of the Great Alaskan Earthquake—a devastating 9.2 magnitude earthquake that triggered deadly tsunamis in Alaska on Good Friday, March 27, 1964.

From:
<http://www.myday.com.tw/guest/product.php?http://www.noaa.gov/index.html>

PUBLICATIONS

Disaster Publications Catalog

With the publication of a new print edition of its *Disaster Publications Catalog*, PAHO/WHO renews its commitment to disseminating, as widely as possible, information on the Organization's publications, training materials and other information resources on emergencies and disasters. PAHO is nearing its 30th year of working with Member States to prepare for and mitigate the effects of disasters on health. Access to this type of information continues to have tremendous technical and strategic value, both in terms of building capacity among the Region's health professionals and by advancing political and institutional commitments to disaster reduction. The new English edition of the catalog will be ready by April 2006 and the Spanish version will be ready in February. Both versions have been up-dated to include all material produced or revised in the last three years.

As soon as any print catalog is issued, it's safe to assume it will quickly become outdated. That is why the print catalog is published much less frequently and much more emphasis is placed on the online *Disaster Publications Catalog*, which contain up-to-the-minute reviews of all new materials. The Internet-based catalog has served users well for several years by offering full-text access to a wide variety of materials. However, as the number of publications grows and the scope of the collection broadens, it is becoming more necessary to revamp the catalog and improve its search engine. This process has already begun and readers are invited to watch for the new user-friendly e-catalog on our website (www.paho.org/disasters) in late March or early April. The power of the Internet allows us to multiply and improve access to information. We ask all disaster-related organizations to support this effort by creating links to the online catalog or to specific documents on their own websites. For more information, please write to rperez@paho.org.

From: Disasters—Preparedness and Mitigation in the Americas, issue 102, Jan. 2006, p. 6.

Catalog:
http://publications.paho.org/english/2006_Cat_eng.pdf

Science for a safer, stronger America

In the United States each year, natural hazards will cause hundreds of deaths and cost tens of billions of dollars in disaster aid, disruption of commerce, and destruction of homes and critical infrastructure. This series of fact sheets will educate citizens, emergency managers, and lawmakers on seven natural hazards facing the Nation – earthquakes, floods, hurricanes, landslides, tsunamis, volcanoes, and wildfires -- and show how USGS science helps mitigate disasters and build resilient communities.

FS 2005-3121. Hurricanes
<http://pubs.usgs.gov/fs/2005/3121/>
FS 2005-3156. Landslides
<http://pubs.usgs.gov/fs/2005/3156/>
FS 2006-3014. Volcanoes
<http://pubs.usgs.gov/fs/2006/3014/>
FS 2006-3015. Wildfires
<http://pubs.usgs.gov/fs/2006/3015/>
FS 2006-3016 Earthquakes
<http://pubs.usgs.gov/fs/2006/3016/>
FS 2006-3023. Tsunamis
<http://pubs.usgs.gov/fs/2006/3023/>
FS 2006-3026. Floods
<http://pubs.usgs.gov/fs/2006/3026/>

From: SILS Information Bulletin, Number: 06-05 Hazard Fact Sheets, March 1, 2006

Tsunami Escape Map Atlas of Long Beach Peninsula, Southwest Washington

Pacific County Department of Public Works
300 Memorial Avenue, P O Box 66, South Bend,
WA 98586; (360) 875-9368

From: Proceedings of the Oregon Academy
of Science, v. 42, p. 26.

Natural Hazard Mitigation Saves—An independent Study to Assess the Future Savings from Mitigation Activities

By the Multihazard Mitigation Council of
the National Institute of Building Sciences,
December 2005.

The two-volume study report is available for
free download at

<http://www.nibs.org/MMC/mmchome.html>.

To read an article about the study, “*Mitigation
generates savings of four to one and enhances
community resilience--MMC releases study on
savings from mitigation,*” go to

<http://www.colorado.edu/hazards/o/mar06/>.

Women’s Participation in Disaster Relief and Recovery

By Ayse Yonder. SEEDS No. 22. ISSN 073-
6833. 2005. 42 pp. Available free online from
the Population Council, One Dag Hammarskjold
Plaza, New York, NY 10017; (212) 339-0500; e-
mail: seeds@popcouncil.org;
<http://www.popcouncil.org/pdfs/seeds/Seeds22.pdf>.

This publication features detailed case
studies from three earthquake-stricken areas in
India and Turkey that exemplify how low-in-
come women who have lost everything can form
groups and become active participants in the
relief and recovery process. It discusses how
women became involved in housing, created
businesses, mobilized funds, and provided cru-
cial community services. It also examines the
roles that nongovernmental organizations and
government policy and procedures play in facil-
itating (or impeding) women’s involvement.

From: Natural Hazards Observer, v. 30, no.
4, p. 24.

Natural Hazards

By Edward Bryant. 2nd Edition. ISBN 0-
521-53743-6. 2005. 328 pp. \$36.99. Available
from Cambridge University Press, 100 Brook
Hill Drive, West Nyack, NY 10994; (845) 353-
7500; e-mail: orders@cup.org;
<http://www.cambridge.org/>.

This updated edition of *Natural Hazards*
offers a comprehensive, interdisciplinary anal-
ysis of a multitude of natural hazards. The author
describes and explains how hazards occur, exam-
ines prediction methods, considers recent and
historical hazard events, and explores the social
impact of such disasters.

From: Natural Hazards Observer, v. 30, no.
4, p. 24.

Edwards Disaster Recovery Directory, 2006

15th Edition. ISBN 0-9759662-2-7. 2005.
400 pp. \$149.00. Available from Edwards In-
formation, PO Box 1600, Brookline, MA 02446;
(617) 264-2300, (800) 990-9936; e-mail:
Info@edwardsinformation.com;
<http://www.edwardsinformation.com/>.

This business-to-business directory is de-
signed to help businesses and organizations plan
for and cope with disaster by providing informa-
tion for recovery services throughout the United
States and Canada. Available in both hardcopy
and on CD-ROM, the directory contains thou-
sands of vendor listings organized into more than
400 categories, such as data recovery, drying and
dehumidification, smoke odor counteracting ser-
vices, trauma counselors, salvage, emergency
rentals, storm damage restoration, and disaster
planning software.

From: Natural Hazards Observer, v. 30, no.
4, p. 24.

After the Tsunami: Human Rights of Vulnerable Populations

The East-West Center has published this
document related to the 2004 Indian Ocean tsu-
nami. It is available from the East-West Center,
1601 East West Road, Honolulu, HI 96848;
(808) 944-7111; <http://www.eastwestcenter.org/>.
ISBN 0-9760677-1-4. 2005. 110 pp. Free.

Published in conjunction with the Human
Rights Center at the University of California,
Berkeley, this report is based on interviews with
tsunami survivors, government officials, human
rights activists, and aid workers in India, Indo-
nesia, Sri Lanka, the Maldives, and Thailand. It
concludes that survivors continue to suffer from
inequities in aid distribution and sub-standard
shelter and documents numerous violations of
human rights following the tsunami. The study
recommends that governments in tsunami-af-
fected countries should commission an indepen-
dent investigation of reports of inequities in aid
distribution; increase accountability and trans-
parency of aid providers; and develop mechan-
isms that will enable tsunami survivors to

participate in reconstruction planning and implementation.

From: *Natural Hazards Observer*, v. 30, no. 4, p. 26.

Hope for Renewal: Photographs from Indonesia after the Tsunami

By Marco Garcia, photographer. ISBN 978-0-86638-202-1. 2005. 52 pp. \$19.95. The East-West Center has published this document related to the 2004 Indian Ocean tsunami. It is available from the East-West Center, 1601 East West Road, Honolulu, HI 96848; (808) 944-7111; <http://www.eastwestcenter.org/>.

This book of photographs was published as a tribute to those who died during the Indian Ocean tsunami and to the survivors of the disaster. It features color images from Aceh Province in Indonesia and chronicles important stages in the aftermath of the disaster, from rescue and recovery to the rebuilding of communities that continues today. Also included is a first-hand account of surviving the tsunami by a resident of Banda Aceh.

From: *Natural Hazards Observer*, v. 30, no. 4, p. 26.

Voices of Hope: Adolescents and the Tsunami

ISBN 92-806-3909-9. 2005. 40 pp. \$10.00. Available free online from the United Nations Children's Fund (UNICEF), Adolescent Development and Participation Unit, 3 UN Plaza, New York, NY 10017; e-mail: vkaranan@unicef.org; http://www.unicef.org/publications/index_28137.html.

Adolescents and young people have repeatedly proven that they can provide innovative solutions in complex humanitarian crises. Soon after the December 2004 tsunami, they mobilized, helping to distribute aid, assisting with cleanup and rebuilding, and caring for those younger than themselves. Yet, their enthusiasm, creativity, and energy are not fully utilized in rehabilitation and development efforts. This publication highlights the helpful, analytical, and compassionate comments they made on UNICEF's Voices of Youth Web site and states that it is time to listen to these young people and engage them as key partners.

From: *Natural Hazards Observer*, v. 30, no. 4, p. 26.

***Holistic Disaster Recovery* (Updated)**

The Natural Hazards Center has revised the 2001 handbook *Holistic Disaster Recovery: Ideas for Building Local Sustainability after a*

Natural Disaster. The new version contains updated resources, including a more specific focus on the Hurricane Katrina recovery, and new examples of recovery success stories. The document's text was streamlined to make it easier to use and more practical for those managing recovery decisions and activities on the ground.

With funding from the Public Entity Risk Institute (PERI), the Center originally created the handbook to communicate the idea that for effective, long-term disaster recovery, communities must incorporate as many principles of sustainability—environmental quality, economic vitality, quality of life, social equity, citizen participation, and disaster resiliency—into their recovery processes as possible. The handbook is intended for local government officials and staff, state planners, activists, emergency management professionals, disaster recovery experts, mitigation specialists, and others who help communities recover from disaster.

The 2006 version of *Holistic Disaster Recovery* (140 pp., \$35.00) is currently only available from PERI, 11350 Random Hills Road, Fairfax, VA 22030; (703) 352-1846; e-mail: ahoffman@riskinstitute.org; <http://www.riskinstitute.org/>.

From: *Natural Hazards Observer*, v. 30, no. 4, p. 27.

Mitigation of Natural Hazards and Disaster

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

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

From: *Natural Hazards Observer*, v. 30, no. 3, p. 28; or

<http://www.colorado.edu/hazards/o/jan06/jan06i.html>

The Role of Science in Physical Natural Hazard Assessment: Report to the UK Government by the Natural Hazard Working Group

2005. 44 pp. Available free online from the Office of Science & Technology, Department of Trade and Industry, 1 Victoria Street, London SW1H 0ET, UK; 020 7215 3910; <http://www.ost.gov.uk/policy/bodies/nhwg/>.

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

From: Natural Hazards Observer, v. 30, no 3, p. 28; or <http://www.colorado.edu/hazards/o/jan06/jan06i.html>

Standing Together: An Emergency Planning Guide for America's Communities

2005. 114 pp. Available free online from the Joint Commission on Accreditation of Healthcare Organizations, One Renaissance Boulevard, Oakbrook Terrace, IL 60181; (630) 792-5000; http://www.jcaho.org/about+us/public+policy+initiatives/planning_guide.pdf.

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

preparedness planners; and public health and hospital community leaders, among others, the guide outlines 13 essential components of an effective community-based emergency management planning process and provides multiple planning strategies addressing each component.

From: Natural Hazards Observer, v. 30, no 3, p. 28; or <http://www.colorado.edu/hazards/o/jan06/jan06i.html>

Catastrophic Event Prevention Planning

ISBN 0-536-94155-6. 2005. 404 pp. ~\$50.00.

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

From: Natural Hazards Observer, v. 30, no 3, p. 29; or <http://www.colorado.edu/hazards/o/jan06/jan06i.html>

Sharing and Reducing the Financial Risks of Future "Mega-Catastrophes"

Robert E. Litan. Working Paper. 2005. 45 pp. Available free online from The Brookings Institution, 1775 Massachusetts Avenue NW, Washington, DC 20036; (202) 797-6000; e-mail: escomment@brookings.edu; <http://www.brookings.edu/views/papers/litan/20051111.htm>.

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

malizing the current de facto federal disaster insurance program.

From: *Natural Hazards Observer*, v. 30, no. 3, p. 29; or
<http://www.colorado.edu/hazards/o/jan06/jan06i.html>

WEBSITES

<http://www.st.hirosaki-u.ac.jp/~tamao/Images/Fireofrice/Ina1.html>

Fire in the Haystacks, a picture story about tsunamis, by Tsunezuo Nakai, Lafcadio Hearn, and Yokumo Koizumi: Hirosaki University, Department of Earth and Environmental Sciences (English or Japanese). Grade level: K-5

<http://www.unisdr.org/eng/library/biblio/isdr-%20biblio-1-tsunami-09-2005.pdf>

ISDR Biblio 1—Tsunamis: Selected bibliography on tsunamis: UN International Strategy for Disaster Reduction

<http://www.fema.gov/fima/resources.shtm>

FEMA developed this series of mitigation planning "How-To" guides to assist States, Tribes, and communities in enhancing their hazard mitigation planning capabilities. These guides are designed to provide the type of information state and local governments need to initiate and maintain a planning process that will result in safer communities. These guides are applicable to states and communities of various sizes and varying ranges of financial and technical resources.

http://www.redcross.org/services/prepare/0,1082,0_239_00.html

This American Red Cross Web Portal titled "Get Prepared" encourages preparation at home, at school, at work, and in the community and offers preparedness tips for a variety of disasters.

From: *Natural Hazards Observer*, v. 30, no. 4, p. 16.

http://www.opencrs.com/rpts/RL33174_20051205.pdf

FEMA's Community Disaster Loan Program, a Congressional Research Service report, examines the Community Disaster Loan Program, which assists local governments that experience revenue losses and/or increased municipal operating expenses due to a presidentially declared major disaster.

From: *Natural Hazards Observer*, v. 30, no. 4, p. 16.

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

The mission of ProtectingAmerica is "to raise awareness, educate the public and policy makers, and offer solutions that will better prepare and protect America from major catastrophe in a sensible, cost-effective fashion." The website features information on understanding risks, preparedness and mitigation, legislation, and more.

From: *Natural Hazards Observer*, v. 30, no. 4, p. 16.

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

Ready Campus is a partnership among Pennsylvania's colleges, universities, and communities designed to strengthen preparation for and response to regional or national emergencies by using campus facilities, training campus volunteers, and providing college students with service learning opportunities. Among the resources is the 124-page *Ready Campus Manual*.

From: *Natural Hazards Observer*, v. 30, no. 4, p. 16.

<http://www.ready.gov/america/index.html>

From the U.S. Department of Homeland Security, this page has links to multiple sites under three headings: Get a Kit, Make a Plan, and Be Informed. The Get a Kit links are water and food, clean air, first aid kit, portable kit, supply checklists, and special needs items. The Make a Plan links are creating a family plan, deciding to stay or go, at work and school, in a moving vehicle, and in a high-rise building. The Be Informed links include biological threat, chemical threat, explosions, and natural disasters.

<http://www.globalfundforwomen.org/downloads/disaster-report.pdf>

In Caught in the Storm: The Impact of Natural Disasters on Women, the Global Fund for Women shares learnings from direct grant making to women's rights groups during and after emergency situations, highlighting how women are disproportionately affected by disasters.

From: *Natural Hazards Observer*, v. 30, no. 4, p. 17.

<http://www.seismic.ca.gov/pub/CSSC%2005-03%20Tsunami%20Findings.pdf>

The Tsunami Threat to California: Findings and Recommendations on Tsunami Hazards and Risks is the result of an evaluation of tsunami readiness in California by the State of California Seismic Safety Commission's Tsunami Safety Committee.

From: *Natural Hazards Observer*, v. 30, no. 4, p. 18.

http://www.tsunamispecialenvoy.org/pdf/OSE_anniversary.pdf

This report from the United Nations' Office of the Secretary-General Special Envoy for Tsunami Recovery, *Tsunami Recovery: Taking Stock after 12 Months*, documents the status of the recovery efforts one year later.

From: *Natural Hazards Observer*, v. 30, no. 4, p. 18.

<http://www.unicef.org/emerg/disasterinasia/24615.html>

This Web site provides a one-year update of the efforts of the United Nations Children's Fund (UNICEF) in areas affected by the 2004 Indian Ocean tsunami. The report *Building Back Better: A 12-Month Update on UNICEF's Work to Rebuild Children's Lives and Restore Hope since the Tsunami and Children and the Tsunami, A Year On: A Draft UNICEF Summary of What Worked* are also available for download.

From: *Natural Hazards Observer*, v. 30, no. 4, p. 18-19.

http://www.oxfamamerica.org/newsandpublications/publications/briefing_papers/briefing_note.2005-12-14.7726023050

A Place to Stay, a Place to Live: The Oxfam Shelter Report documents the challenges and successes of Oxfam's shelter work in the first year of the organization's 2004 Indian Ocean tsunami response in India, Indonesia, and Sri Lanka.

From: *Natural Hazards Observer*, v. 30, no. 4, p. 19.

<http://www.d-trac.org/>

In the aftermath of the 2004 Indian Ocean tsunami, the Disaster Tracking Recovery Assistance Center of Thailand developed this Web site, which provides details on the status of and progress made in tsunami relief activities in Thailand.

From: *Natural Hazards Observer*, v. 30, no. 4, p. 19.

<http://www.rand.org/health/projects/php/>

This Web site was recently launched by the RAND Corporation to support state and local public health emergency preparedness activities. It includes a searchable database of public health emergency preparedness exercises that have been evaluated by a team of RAND researchers.

From: *Natural Hazards Observer*, v. 30, no. 4, p. 19.

http://www.nsf.gov/news/special_reports/disasters/

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

From: *Natural Hazards Observer*, v. 30, no. 3, p. 22

http://www.unisdr.org/eng/about_isdr/basic_docs/SG-report/SG-report-60-180-eng.pdf

This report to the United Nations secretary-general provides an overview of the implementation of the International Strategy for Disaster Reduction and the follow-up to the World Conference on Disaster Reduction held in January [2006] in Kobe, Japan.

From: *Natural Hazards Observer*, v. 30, no. 3, p. 22

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

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

From: *Natural Hazards Observer*, v. 30, no. 3, p. 22

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

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

From: *Natural Hazards Observer*, v. 30, no. 3, p. 22; or
<http://www.colorado.edu/hazards/o/jan06/jan06g.html>

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

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

From: *Natural Hazards Observer*, v. 30, no. 3, p. 22; or
<http://www.colorado.edu/hazards/o/jan06/jan06g.html>

► <http://pubs.usgs.gov/fs/2006/3023/>

The insert in this issue, Fact Sheet 2006-3023, can be downloaded and printed from this URL.

CLASSES, WORKSHOPS

Risk Communication Challenge: Proven Strategies for Effective Risk Communication.

Presenter: Harvard School of Public Health. Boston, Massachusetts: May 22-24, 2006. This program uses a combination of lectures, discussion, case studies, and exercises to ensure participants understand the key concepts of risk communication and acquire practical experience in how to apply them. Topics will include risk perception theory, mental modeling, crisis communication, and media preparation. To learn more, contact the Harvard School of Public Health, Center for Continuing Professional Education, CCPE Department A, 677 Huntington Avenue, Boston, MA 02115; (617) 384-8692; e-mail: contedu@hsph.harvard.edu; <http://www.hsph.harvard.edu/ccpe/programs/RCC.shtml>.

From: *Natural Hazards Observer*, v. 30, no. 4, p. 14; also available at <http://www.colorado.edu/hazards/o/mar06/mar06f.html>

Free Online Training Courses Offered by PERI

Delivering effective training on an array of risk management subjects has always been a goal of the Public Entity Risk Institute (PERI). But, reaching all the relevant leaders and employees at thousands of small organizations is nearly impossible to accomplish using traditional methods of training delivery.

Now, PERI is rolling out the first of its new collection of e-training courses, which features a range of risk management topics that can be accessed on the PERI Web site. Recognizing the need to expand opportunities for critical training to a broader audience, PERI developed this online initiative to afford greater access to organizations with limited resources. These risk management courses will initially be offered at no charge. PERI plans to offer both free and reasonably-priced online courses in the future.

New training courses will be added throughout 2006 on topics such as risk management for small business, levee vulnerability, and terrorism prevention. For more information about the e-training initiative, contact Claire Reiss at creiss@riskinstitute.org or (703) 352-1846. Access the courses at <http://www.riskinstitute.org/test.php?pid=page&tid=88>.

From: *Natural Hazards Observer*, v. 30, no. 4, p. 11; also available at

<http://www.colorado.edu/hazards/o/mar06/mar06e.html#peri>

International Workshop on Standardization for Emergency Preparedness.

Sponsors: American National Standards Institute (ANSI) and New York University International Center for Enterprise Preparedness (INTERCEP). Florence, Italy: April 24-26, 2006. The purpose of this meeting is to reach an international workshop agreement for emergency preparedness and operational continuity that will be published by the International Standards Organization (ISO). It is anticipated that the agreement will evolve into an ISO standard. Organizations involved with emergency preparedness and operational continuity are encouraged to attend. To learn more, contact Bill Raisch, INTERCEP; (212) 998-2000; e-mail: intercep@nyu.edu or Matt Deane, ANSI; (212) 642-4992; e-mail: mdeane@ansi.org; <http://www.ansi.org/iwa/>.

From: *Natural Hazards Observer*, v. 30, no. 4, p. 13; also available at <http://www.colorado.edu/hazards/o/mar06/mar06f.html>

CONFERENCES, SYMPOSIA

14th Annual Voluntary Organizations Active in Disasters (VOAD) Conference

Raleigh, North Carolina: May 9-12, 2006. This conference includes national VOAD committee meetings as well as workshops and opportunities to exchange ideas on disaster response. To learn more, visit <http://www.nvoad.org/annualconf1.php>.

From: *Natural Hazards Observer*, v. 30, no. 4, p. 13; also available at <http://www.colorado.edu/hazards/o/mar06/mar06f.html>

2006 International Symposium on Technology and Society (ISTAS '06)

Sponsor: Institute of Electrical and Electronics Engineers Society on Social Implications of Technology. New York, New York: June 8-10, 2006. With a theme of "Disaster Preparedness and Recovery," this symposium will discuss social, economic, and ethical issues of technology and disaster preparedness and recovery; social implications of usability; environmental, health, safety, and peace-related implications of technology; and social, economic, and ethical issues involving energy, information, and telecommunications technologies. To learn more,

contact Roberta Brody; (718) 997-3766; e-mail: Roberta.Brody@QC.cuny.edu; http://ieeesit.org/conferences_sub.asp?Level2ItemID=12&Level3ItemID=10.

From: Natural Hazards Observer, v. 30, no. 4, p. 14, also available at <http://www.colorado.edu/hazards/o/mar06/mar06f.html>

16th World Conference on Disaster Management

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

From: Natural Hazards Observer, v. 30, no. 3, p. 21; or <http://www.colorado.edu/hazards/o/jan06/jan06f.html>

International Disaster Reduction Conference (IDRC) Davos 2006

Organizers: Global Alliance for Disaster Reduction; Global Disaster Information Network; United Nations Education, Scientific, and Cultural Organization; United Nations International Strategy for Disaster Reduction. Davos, Switzerland: August 26-September 1, 2006. A global gathering of leading experts from science, government, business, civil society, international organizations, nongovernmental organizations, and risk management organizations, this event will address different kinds of risks with an integrated and participatory approach. The program will include topical plenary sessions and panel debates; scientific and policy-oriented thematic sessions; special regional sessions; side events organized by different international and national organizations; and special recognition of pioneers in risk reduction. To learn more, contact IDRC Davos 2006, Flüelastrasse 11, CH-7260 Davos, Switzerland; +41 (0)81 417 02 25; e-mail: davos2006@slf.ch; <http://www.davos2006.ch/>.

From: Natural Hazards Observer, v. 30, no. 4, p. 14, also available at

<http://www.colorado.edu/hazards/o/mar06/mar06f.html>

EXHIBITS

Springfield Science Museum, February 18 through September 3, 2006

The special exhibition, *Earth Attacks: Volcanoes, Earthquakes and Tsunamis*, will explore the causes and effects of some of the disastrous events that plague our planet. Earth Attacks uses interactive components, simulations, three-dimensional models, photographs, video, and computer games to explain the science behind natural disasters, how experts predict natural events, and how these forces affect our lives. Springfield, Massachusetts.

From:

http://www.springfieldmuseums.org/museums/science/exhibits/?page_function=view&exhibit_id=25

NOAA's Science on a Sphere

[This exhibit is housed at the National Maritime Center, Nauticus, a maritime-themed science center that features hands-on exhibits, interactive theaters, aquaria, digital high-definition films, and an extensive variety of educational programs, in Norfolk, Virginia]

Imagine gazing upon Earth as you are suspended in orbit 22,000 miles above its surface. You can watch a hurricane form, as a small storm slowly gathers strength, traveling westward from Africa, across the Atlantic Ocean, toward the Gulf of Mexico. You can see the colorful infrared images of cloud tops meet, join, grow, collapse and disperse. The prevailing westerly winds and the easterly trade winds materialize before your eyes. You can see the Earth's scorching desert expanses in contrast to the below-zero temperature of cloud tops. Our dynamic atmosphere roils as you watch with the help of infrared satellite imagery projected onto a movie screen-like, white sphere. Called "Science On A Sphere", this spectacular vision of our Earth is the brainchild of Alexander (Sandy) MacDonald, Director of the National Oceanic and Atmospheric Administration's (NOAA) Forecast Systems Laboratory in Boulder, Colorado. Four projectors cast rotating images onto a sphere, approximately six feet in diameter to create the effect of Earth in space.

Because the images originate from data collected by satellites, researchers refer to the projected images as "data sets." The possible data sets that can be projected using Science On a

Sphere seem limited only by imagination. Already, there are data sets where you can see the dry, brown deserts of Australia, Asia, Africa as well as both North and South American in contrast to the adjacent verdant plains and forests. You can trace Earth's continuous plates from ocean depths to mountain chains.

Imagine future data sets where you can see Pangaea, the super-continent that included all the landmasses of Earth, breaking up and carried by Earth's crustal plates to form the continents that we recognize today. Imagine data sets where you can see the climate of the past and present. And then...be able to project into the future, what the climate would be like. Imagine...we could plan for the future. Imagine...the many possibilities.

Science On a Sphere provides dramatic visualization of complex information in an understandable form for the public; a unique instrument for teaching students science, math, and geography; and a handy scientific tool to translate numerical information into visual images. Science On a Sphere! A spectacular look at our world and at the universe.

Information provided by NOAA.

From: <http://www.thenmc.org/sos.html>
(more below)



High Visibility for Science On a Sphere

NOAA's Science on a Sphere (SOS) has seen a busy January. A team from the Global Systems Division's Technology Outreach Branch set up an installation at the Science Museum of Minnesota in St. Paul, MN the week of January 9th. This is the first of five scheduled installations to follow nationwide over the next several months.

► Additionally, SOS was featured at the National Maritime Center (Nauticus) Tsunami-Ready event in Norfolk, VA on January 24th that recognized Norfolk as being the first major East

Coast city to attain that designation. Science On A Sphere exhibited a model representation from the Pacific Marine Environmental Laboratory (PMEL) of the 12/26/04 Indonesian Tsunami event. Another dramatic simulation, also prepared by PMEL, of a hypothetical Atlantic coast tsunami due to a large earthquake in the Puerto Rican Trench provided viewers with an experiential understanding of the dangers of tsunamis and the need for community preparedness.

From:

<http://www.fsl.noaa.gov/happening/hotitems/2006/06Feb08.html> ♦

Disaster officials need schooling in law, expert says

Government officials who are responsible for keeping us safe from disaster need to learn homeland security law, say a group of industry experts. Are public officials "ignorant" about their role in disaster relief?

In a new article in the *Washington Examiner*, writer Bill Myers says the experts were assembled for a panel discussion at the American Bar Association's first-ever conference on homeland security law.

"It seems to me and to others that what we really need is more education about the authorities that we do have - particularly the education of our senior leaders," RAND Corp. official Michael A. Wermuth told a crowd of about 150 lawyers at the event. Myers says Wermuth also told the crowd he has been surprised how great public officials' ignorance is when talking about their role in disaster relief.

As an example, Wermuth pointed to former FEMA director Michael Brown's public admission last week that he was responsible for the agency's fumbled response to hurricane Katrina. Brown said he should have "demanded the military sooner" in the crisis, but Wermuth says federal laws don't even allow FEMA to call in the military.

"The point I'm trying to make here is, if we've got people who have significant responsibilities in this area who are not even familiar with the authorities that are on the books, then we're probably starting off on the wrong foot," Wermuth told the crowd.

Myers says that Wemuth's "co-panelists" - including a public health official from Baltimore and an official from the National Governors Association - all hymned the virtues of open lines of communication betwixt and between govern-

ment agencies and all called for a lingua franca for disaster-relief officials.”















To read the full article, go to
http://www.dcxaminer.com/articles/2006/01/20/news/d_c_news/05newsdc22disaster.txt

From: Continuity e-Guide, January 25, 2006
<http://disaster-resource.com/newsletter/continuityv119.htm> ♦



Tsunami Evacuation Maps for Selected Washington Coastal Communities

DOWNLOAD A TSUNAMI BROCHURE

- [Aberdeen-Hoquiam](#) (Adobe PDF )
- [Bay Center and Vicinity](#) (Adobe PDF )
- [Clallam Bay](#) (Adobe PDF )
- [Copalis Beach](#) (Adobe PDF )
- [Cosmopolis](#) (Adobe PDF )
- [La Push](#) (Adobe PDF )
- [Long Beach and Ilwaco](#) (Adobe PDF )
- [Neah Bay](#) (Adobe PDF )
- [North Cove and Tokeland](#) (Adobe PDF )
- [Ocean Shores](#) (Adobe PDF )
- [Ocean Park and Vicinity](#) (Adobe PDF )
- [Port Angeles](#) (Adobe PDF )
- [Port Townsend](#) (Adobe PDF )
- [Raymond and South Bend](#) (Adobe PDF )
- [Sequim](#) (Adobe PDF )
- [Westport](#) (Adobe PDF )

These brochures can be viewed and downloaded using Adobe Acrobat PDF Viewer. Some files are 1MB in size and may take a while to open after Acrobat launches.

<http://emd.wa.gov/5-prog/prgms/eq-tsunami/tsunami-idx.htm>

OTHER NEWS BRIEFS

Tsunami warning system for the Indian Ocean

Australia's Government will take part in the installation of new tsunami warning buoys in the Indian Ocean as part of a deal with the United States.

The agreement was signed in Melbourne, and the Australian Bureau of Meteorology will oversee the extension system and the delivery of information to the tsunami warning centre based in Hawaii. In return, Australia will receive American software to improve weather forecasting.

From: ABC Asia Pacific TV / Radio Australia at
http://abcasiapacific.com/news/stories/asiapacific_stories_1600633.htm

Tsunami forum set for April 12

The Cannon Beach Emergency Preparedness Committee will sponsor a Tsunami Information Forum at 7 p.m. April 12 at the Coaster Theatre, First and Hemlock streets, Cannon Beach. The intent is to provide the latest scientific information on the threat of earthquake and tsunami, to share the emergency plans of the city, to point out evacuation routes and sites and to provide survival information. George Priest, of the Oregon Department of Geology and Mineral Industries, will discuss the geology of the Cascadia subduction zone fault and the tsunami that could be produced by an offshore quake. City officials will share the local emergency response plans.

From:
<http://www.dailyastorian.info/main.asp?Search=1&ArticleID=32038&SectionID=2&SubSectionID=&S=1>

Google Alerts

If you want Google to conduct daily or weekly searches for news on tsunamis, go to www.google.com/alerts. The dialog box will have you supply a Search Term (tsunami); Type (news, web, news and web, groups); How Often (daily, weekly, as it happens); and your email address. You will receive emails with links to the appropriate websites.

Thanks to Wayne Johnston for this information.

Eyewitness accounts of the 1906 S.F. earthquake 100th anniversary of April 18, 1906 earthquake

Enrico Caruso and the 1906 earthquake

Enrico Caruso (1873 - 1921) is considered by many music lovers to be the greatest operatic tenor of all time. He was on tour in San Francisco during the Great Earthquake, and appeared in *Carmen* at the Mission Opera House a few hours before the disaster.

This somewhat disjointed narrative of Caruso's experiences in San Francisco appeared in *The Sketch*, published in London, with drawings by Caruso to illustrate his experiences. The article was reprinted in the July 1906 edition of *The Theatre* magazine.

You ask me to say what I saw and what I did during the terrible days which witnessed the destruction of San Francisco? Well, there have been many accounts of my so-called adventures published in the American papers, and most of them have not been quite correct. Some of the papers said that I was terribly frightened, that I went half crazy with fear, that I dragged my valise out of the hotel into the square and sat upon it and wept; but all this is untrue. I was frightened, as many others were, but I did not lose my head. I was stopping at the [Palace] Hotel, where many of my fellow-artists were staying, and very comfortable it was. I had a room on the fifth floor, and on Tuesday evening, the night before the great catastrophe, I went to bed feeling very contented. I had sung in "Carmen" that night, and the opera had one with fine *eclat*. We were all pleased, and, as I said before, I went to bed that night feeling happy and contented.

But what an awakening! You must know that I am not a very heavy sleeper—I always wake early, and when I feel restless I get up and go for a walk. So on the Wednesday morning early I wake up about 5 o'clock, feeling my bed rocking as though I am in a ship on the ocean, and for a moment I think I am dreaming that I am crossing the water on my way to my beautiful country. And so I take no notice for the moment, and then, as the rocking continues, I get up and go to the window, raise the shade and look out. And what I see makes me tremble with fear. I see the buildings toppling over, big pieces of masonry falling, and from the street below I hear the cries and screams of men and women and children.

I remain speechless, thinking I am in some dreadful nightmare, and for something like forty seconds I stand there, while the buildings fall and my room still rocks like a boat on the sea. And during that forty seconds I think of forty thousand different things. All that I have ever done in my life passes before me, and I remember trivial things and important things. I think of my first appearance in grand opera, and I feel nervous as to my reception, and again I think I am going through last night's "Carmen."

And then I gather my faculties together and call for my valet. He comes rushing in quite cool, and, without any tremor in his voice, says: "It is nothing." But all the same he advises me to dress quickly and go into the open, lest the hotel fall and crush us to powder. By this time the plaster on the ceiling has fallen in a great shower, covering the bed and the carpet and the furniture, and I, to, begin to think it is time to "get busy." My valet gives me some clothes; I know not what the garments are but I get into a pair of trousers and into a coat and draw some socks on and my shoes, and every now and again the room trembles, so that I jump and feel very nervous. I do not deny that I feel nervous, for I still think the building will fall to the ground and crush us. And all the time we hear the sound of crashing masonry and the cries of frightened people.

Then we run down the stairs and into the street, and my valet, brave fellow that he is, goes back and bundles all my things into trunks and drags them down six flights of stairs and out into the open one by one. While he is gone for another and another, I watch those that have already arrived, and presently someone comes and tries to take my trunks saying they are his. I say, "no, they are mine"; but he does not go away. Then a soldier comes up to me; I tell him that this man wants to take my trunks, and that I am Caruso, the artist who sang in "Carmen" the night before. He remembers me and makes the man who takes an interest in my baggage "skiddoo" as Americans say.

Then I make my way to Union Square, where I see some of my friends, and one of them tells me he has lost everything except his voice, but he is thankful that he has still got that. And they tell me to come to a house that is still standing; but I say houses are not safe, nothing is safe but the open square, and I prefer to remain in a place where there is no fear of being buried by falling

buildings. So I lie down in the square for a little rest, while my valet goes and looks after the luggage, and soon I begin to see the flames and all the city seems to be on fire. All the day I wander about, and I tell my valet we must try and get away, but the soldiers will not let us pass. We can find no vehicle to find our luggage, and this night we are forced to sleep on the hard ground in the open. My limbs ache yet from so rough a bed.

Then my valet succeeds in getting a man with a cart, who says he will take us to the Oakland Ferry for a certain sum, and we agree to his terms. We pile the luggage into the cart and climb in after it, and the man whips up his horse and we start.

We pass terrible scenes on the way: buildings in ruins, and everywhere there seems to be smoke and dust. The driver seems in no hurry, which makes me impatient at times, for I am longing to return to New York, where I know I shall find a ship to take me to my beautiful Italy and my wife and my little boys.

When we arrive at Oakland we find a train there which is just about to start, and the officials are very polite, take charge of my luggage, and tell me go get on board, which I am very glad to do. The trip to New York seems very long and tedious, and I sleep very little, for I can still feel the terrible rocking which made me sick. Even now I can only sleep an hour at a time, for the experience was a terrible one.

The Sketch, London; reprinted in *The Theatre* Vol. VI., No. 65, July 1, 1906.

From:

<http://www.sfmuseum.net/1906/ew19.html>

Jack London and the great earthquake and fire

Jack and Charmian London were at their ranch in Glen Ellen at the time of the earthquake, and soon left on horseback to see the wreck of the nearby California Home for the Care and Training of Feeble-Minded Children, as dust rose from the ruins.

Mr. London said to his wife – as she wrote in 1921: "Why, Mate Woman, I shouldn't wonder if San Francisco had sunk. That was some earthquake. We don't know but the Atlantic may be washing up at the feet of the Rocky Mountains!"

In a note to a relative, London explained where he was, and how he traveled to San Francisco following the disaster:

"Routed out of bed at a quarter past five. Half an hour later Mrs. London and I were in the saddle. We rode miles over the surrounding country. An hour after the shock, from a high place in the mountains, we could see at the same time the smoke of burning San Francisco and of burning Santa Rosa. Caught a train to Santa Rosa – Santa Rosa got it worse than S.F. Then in the afternoon, Wednesday afternoon, we got into San Francisco and spent the whole night in the path of the flames – you bet, I saw it all."

When Jack and Charmian London arrived in San Francisco, she was stunned as she and Jack walked through the streets of the doomed city:

"In my eyes, there abides the face of a stricken man, perhaps a fireman, whom we saw carried into a lofty doorway in Union Square. His back had been broken, as the stretcher bore him past, out of a handsome, ashen young face, the dreadful darkening eyes looked right into mine. All the world was crashing about him, and he, a broken thing, with death awaiting him inside the granite portals, gazed upon the last woman of his race that he was to ever see. Jack, with tender hand, drew me away."

Writing about the earthquake and the fire were troublesome for Jack London. He told Charmian, "I'll never write about this for anybody, no, I'll never write a word about it. What use trying? Only could one string big words together and curse the futility of them."

However, when *Collier's* offered him the then-enormous sum of 25 cents per word for his story of the Great Earthquake and Fire, Jack London, in serious debt, wrote a 2500-word article for the magazine. It was the most money, per word, he was ever to be paid for his writings.

London was not happy with the results, but said, "It's the best stagger [money] I can make at an impossible thing."

Editors at *Collier's* held the presses as London's article was telegraphed to them in New York. It was published in the May 5, 1906, edition, just two weeks after the disaster.

THE STORY OF AN EYEWITNESS

By Jack London,
Collier's special Correspondent
Collier's, the National Weekly
May 5, 1906

Upon receipt of the first news of the earthquake, *Colliers* telegraphed to Mr. Jack London—who lives only forty miles from San Francisco—requesting him to go to the scene of the disaster and write the story of what he saw. Mr. London started at once, and he sent the following

dramatic description of the tragic events he witnessed in the burning city.

The earthquake shook down in San Francisco hundreds of thousands of dollars worth of walls and chimneys. But the conflagration that followed burned up hundreds of millions of dollars' worth of property. There is no estimating within hundreds of millions the actual damage wrought. Not in history has a modern imperial city been so completely destroyed. San Francisco is gone. Nothing remains of it but memories and a fringe of dwelling-houses on its outskirts. Its industrial section is wiped out. Its business section is wiped out. Its social and residential section is wiped out. The factories and warehouses, the great stores and newspaper buildings, the hotels and the palaces of the nabobs, are all gone. Remains only the fringe of dwelling houses on the outskirts of what was once San Francisco.

Within an hour after the earthquake shock the smoke of San Francisco's burning was a lurid tower visible a hundred miles away. And for three days and nights this lurid tower swayed in the sky, reddening the sun, darkening the day, and filling the land with smoke.

On Wednesday morning at a quarter past five came the earthquake. A minute later the flames were leaping upward. In a dozen different quarters south of Market Street, in the working-class ghetto, and in the factories, fires started. There was no opposing the flames. There was no organization, no communication. All the cunning adjustments of a twentieth century city had been smashed by the earthquake. The streets were humped into ridges and depressions, and piled with the debris of fallen walls. The steel rails were twisted into perpendicular and horizontal angles. The telephone and telegraph systems were disrupted. And the great water-mains had burst. All the shrewd contrivances and safeguards of man had been thrown out of gear by thirty seconds' twitching of the earth-crust.

The Fire Made its Own Draft

By Wednesday afternoon, inside of twelve hours, half the heart of the city was gone. At that time I watched the vast conflagration from out on the bay. It was dead calm. Not a flicker of wind stirred. Yet from every side wind was pouring in upon the city. East, west, north, and south, strong winds were blowing upon the doomed city. The heated air rising made an enormous suck. Thus did the fire of itself build its own colossal chimney through the atmosphere. Day and night this dead calm continued, and yet, near to

the flames, the wind was often half a gale, so mighty was the suck.

Wednesday night saw the destruction of the very heart of the city. Dynamite was lavishly used, and many of San Francisco's proudest structures were crumbled by man himself into ruins, but there was no withstanding the onrush of the flames. Time and again successful stands were made by the fire-fighters, and every time the flames flanked around on either side or came up from the rear, and turned to defeat the hard-won victory.

An enumeration of the buildings destroyed would be a directory of San Francisco. An enumeration of the buildings undestroyed would be a line and several addresses. An enumeration of the deeds of heroism would stock a library and bankrupt the Carnegie medal fund. An enumeration of the dead will never be made. All vestiges of them were destroyed by the flames. The number of the victims of the earthquake will never be known. South of Market Street, where the loss of life was particularly heavy, was the first to catch fire.

Remarkable as it may seem, Wednesday night while the whole city crashed and roared into ruin, was a quiet night. There were no crowds. There was no shouting and yelling. There was no hysteria, no disorder. I passed Wednesday night in the path of the advancing flames, and in all those terrible hours I saw not one woman who wept, not one man who was excited, not one person who was in the slightest degree panic stricken.

Before the flames, throughout the night, fled tens of thousands of homeless ones. Some were wrapped in blankets. Others carried bundles of bedding and dear household treasures. Sometimes a whole family was harnessed to a carriage or delivery wagon that was weighted down with their possessions. Baby buggies, toy wagons, and go-carts were used as trucks, while every other person was dragging a trunk. Yet everybody was gracious. The most perfect courtesy obtained. Never in all San Francisco's history, were her people so kind and courteous as on this night of terror.

A Caravan of Trunks

All night these tens of thousands fled before the flames. Many of them, the poor people from the labor ghetto, had fled all day as well. They had left their homes burdened with possessions. Now and again they lightened up, flinging out upon the street clothing and treasures they had dragged for miles.

They held on longest to their trunks, and over these trunks many a strong man broke his heart that night. The hills of San Francisco are steep, and up these hills, mile after mile, were the trunks dragged. Everywhere were trunks with across them lying their exhausted owners, men and women. Before the march of the flames were flung picket lines of soldiers. And a block at a time, as the flames advanced, these pickets retreated. One of their tasks was to keep the trunk-pullers moving. The exhausted creatures, stirred on by the menace of bayonets, would arise and struggle up the steep pavements, pausing from weakness every five or ten feet.

Often, after surmounting a heart-breaking hill, they would find another wall of flame advancing upon them at right angles and be compelled to change anew the line of their retreat. In the end, completely played out, after toiling for a dozen hours like giants, thousands of them were compelled to abandon their trunks. Here the shopkeepers and soft members of the middle class were at a disadvantage. But the workingmen dug holes in vacant lots and backyards and buried their trunks.

The Doomed City

At nine o'clock Wednesday evening I walked down through the very heart of the city. I walked through miles and miles of magnificent buildings and towering skyscrapers. Here was no fire. All was in perfect order. The police patrolled the streets. Every building had its watchman at the door. And yet it was doomed, all of it. There was no water. The dynamite was giving out. And at right angles two different conflagrations were sweeping down upon it.

At one o'clock in the morning I walked down through the same section. Everything still stood intact. There was no fire. And yet there was a change. A rain of ashes was falling. The watchmen at the doors were gone. The police had been withdrawn. There were no firemen, no fire-engines, no men fighting with dynamite. The district had been absolutely abandoned. I stood at the corner of Kearny and Market, in the very innermost heart of San Francisco. Kearny Street was deserted. Half a dozen blocks away it was burning on both sides. The street was a wall of flame. And against this wall of flame, silhouetted sharply, were two United States cavalymen sitting their horses, calming watching. That was all. Not another person was in sight. In the intact heart of the city two troopers sat their horses and watched.

Spread of the Conflagration

Surrender was complete. There was no water. The sewers had long since been pumped dry. There was no dynamite. Another fire had broken out further uptown, and now from three sides conflagrations were sweeping down. The fourth side had been burned earlier in the day. In that direction stood the tottering walls of the Examiner building, the burned-out Call building, the smoldering ruins of the Grand Hotel, and the gutted, devastated, dynamited Palace Hotel.

The following will illustrate the sweep of the flames and the inability of men to calculate their spread. At eight o'clock Wednesday evening I passed through Union Square. It was packed with refugees. Thousands of them had gone to bed on the grass. Government tents had been set up, supper was being cooked, and the refugees were lining up for free meals.

At half past one in the morning three sides of Union Square were in flames. The fourth side, where stood the great St. Francis Hotel was still holding out. An hour later, ignited from top and sides the St. Francis was flaming heavenward. Union Square, heaped high with mountains of trunks, was deserted. Troops, refugees, and all had retreated.

A Fortune for a Horse!

It was at Union Square that I saw a man offering a thousand dollars for a team of horses. He was in charge of a truck piled high with trunks from some hotel. It had been hauled here into what was considered safety, and the horses had been taken out. The flames were on three sides of the Square and there were no horses.

Also, at this time, standing beside the truck, I urged a man to seek safety in flight. He was all but hemmed in by several conflagrations. He was an old man and he was on crutches. Said he: "Today is my birthday. Last night I was worth thirty-thousand dollars. I bought five bottles of wine, some delicate fish and other things for my birthday dinner. I have had no dinner, and all I own are these crutches."

I convinced him of his danger and started him limping on his way. An hour later, from a distance, I saw the truck-load of trunks burning merrily in the middle of the street.

On Thursday morning at a quarter past five, just twenty-four hours after the earthquake, I sat on the steps of a small residence on Nob Hill. With me sat Japanese, Italians, Chinese, and negroes—a bit of the cosmopolitan flotsam of the wreck of the city. All about were the palaces of the nabob pioneers of Forty-nine. To the east and

south at right angles, were advancing two mighty walls of flame

I went inside with the owner of the house on the steps of which I sat. He was cool and cheerful and hospitable. "Yesterday morning," he said, "I was worth six hundred thousand dollars. This morning this house is all I have left. It will go in fifteen minutes. He pointed to a large cabinet. "That is my wife's collection of china. This rug upon which we stand is a present. It cost fifteen hundred dollars. Try that piano. Listen to its tone. There are few like it. There are no horses. The flames will be here in fifteen minutes."

Outside the old Mark Hopkins residence a palace was just catching fire. The troops were falling back and driving the refugees before them. From every side came the roaring of flames, the crashing of walls, and the detonations of dynamite

The Dawn of the Second Day

I passed out of the house. Day was trying to dawn through the smoke-pall. A sickly light was creeping over the face of things. Once only the sun broke through the smoke-pall, blood-red, and showing quarter its usual size. The smoke-pall itself, viewed from beneath, was a rose color that pulsed and fluttered with lavender shades. Then it turned to mauve and yellow and dun. There was no sun. And so dawned the second day on stricken San Francisco.

An hour later I was creeping past the shattered dome of the City Hall. Than it there was no better exhibit of the destructive force of the earthquake. Most of the stone had been shaken from the great dome, leaving standing the naked framework of steel. Market Street was piled high with the wreckage, and across the wreckage lay the overthrown pillars of the City Hall shattered into short crosswise sections.

This section of the city with the exception of the Mint and the Post-Office, was already a waste of smoking ruins. Here and there through the smoke, creeping warily under the shadows of tottering walls, emerged occasional men and women. It was like the meeting of the handful of survivors after the day of the end of the world.

Beeves Slaughtered and Roasted

On Mission Street lay a dozen steers, in a neat row stretching across the street just as they had been struck down by the flying ruins of the earthquake. The fire had passed through afterward and roasted them. The human dead had been carried away before the fire came. At another place on Mission Street I saw a milk

wagon. A steel telegraph pole had smashed down sheer through the driver's seat and crushed the front wheels. The milk cans lay scattered around.

All day Thursday and all Thursday night, all day Friday and Friday night, the flames still raged on.

Friday night saw the flames finally conquered. through not until Russian Hill and Telegraph Hill had been swept and three-quarters of a mile of wharves and docks had been licked up.

The Last Stand

The great stand of the fire-fighters was made Thursday night on Van Ness Avenue. Had they failed here, the comparatively few remaining houses of the city would have been swept. Here were the magnificent residences of the second generation of San Francisco nabobs, and these, in a solid zone, were dynamited down across the path of the fire. Here and there the flames leaped the zone, but these fires were beaten out, principally by the use of wet blankets and rugs.

San Francisco, at the present time, is like the crater of a volcano, around which are camped tens of thousands of refugees. At the Presidio alone are at least twenty thousand. All the surrounding cities and towns are jammed with the homeless ones, where they are being cared for by the relief committees. The refugees were carried free by the railroads to any point they wished to go, and it is estimated that over one hundred thousand people have left the peninsula on which San Francisco stood. The Government has the situation in hand, and, thanks to the immediate relief given by the whole United States, there is not the slightest possibility of a famine. The bankers and business men have already set about making preparations to rebuild San Francisco.

From:

<http://www.sfmuseum.net/hist5/jlondon.html>

Written by Joaquin Miller

for the Oakland Tribune

May 6, 1906

I am too tired to think. I have been working on the stone wall all day, because the earthquake doesn't come this way and my walls will stand till the cows come home.

Earthquakes come like Christmas – once a year – or, rather, once a century. I have lived in Japan, Honolulu and Naples, and these are the earthquake countries. They quake only now and then, and as a rule more people die from stale fruit in the tropics than from earthquakes. An earthquake is as innocent as a kid. Keep out of the way of the kid. In truth I know nothing in nature quite so innocent as an earthquake. Look

around you in every little village here. Half a dozen houses, and half a dozen happy families, but everything built close down to the ground, with all California to build over. I don't see why we have to crowd into one little plot of land. House piled on house. Ten stories built as if we were walled in like Babel, of old, with such swift transportation, where everybody came and went. There is no sense in piling house on house, putting our time going up and down stairs.

Were I to rebuild San Francisco, I would put all that and San Mateo, Santa Clara, San Jose, Milpitas, Alameda, Oakland, and Berkeley, all in one broad city of one and two-story houses as in the City of Mexico, and I'd call the whole bunch San Francisco.

I despise these small towns, their multitudinous mayors, their egotisms, their vanities, their big houses and their small ideas. Like the old Spaniards we must suit ourselves to the climate and the conditions. Let New York go her way, but we must go ours if we expect to rival New York, and there is no half reason why we may not pass New York in the next ten years if we only use common sense and get over our vanities and our village notions and names that mean nothing. There's room for just one city, and that is San Francisco, because it has the most glorious bay on the globe. Of course the heart of it may be Oakland, but by name and nature, San Francisco, the Garden City, the University City [San Jose and Palo Alto] – all should be freezed into one.

I think that fires are good, especially in hell. San Francisco was not a clean city, like Chicago and Boston – she was nasty.

From what I can read the city is much healthier than it was before, and the people are much better behaved. Before the fire I was over-run here by bullies, egotists, adventurers – they were loud and vulgar. It was hard to keep them off my grounds – my grounds are graveyards, where my mother and children are buried, and should I go to Mountain View cemetery or San Francisco and yell and howl and roar, as these San Francisco people have done here for years, I would be in jail in less than an hour, but since the fire I've had quiet. The fire has done me good. I've had peace from this time on.

It seemed like a tremendous fire in Kit Carson's camp, when the plains were aflame, but there was one great difference – there was no wind. An earthquake is always quiet.

The birds hid when the earthquake came. My chapel was open at the time. It is always open except when strangers come and I have to

shut them out, but I was lying in bed after five and wide awake, for I always go to bed with the birds and get up with the birds, and the first I knew my cattle began to low and my cats came into my chapel, and I thought there might be a strange dog.

I got up, and looked out for the dog, but it was nothing of the sort. The cats were under my great brass bed and I never witnessed such stillness. I lay down again and then the sun burst over the hills and San Francisco was silver and gold.

The streets seemed wide, bright and steep, and I've never seen the city so large, but the stillness was terrible and the light was unnatural, and then two little talented birds came into the chapel and a humming bird out of the apple tree came in and there was a bump and a thump as if I were in a small boat bumping against a wharf.

I felt about four of these bumps and got up and went to my chapel door, and saw one of my Japanese boys at my right hand, and one at my left.

I said "Earthquake?" and they answered "earthquake," and we went back to bed. The cats went out and everything seemed satisfactory.

After breakfast I went out to work in my garden, then the smoke began to curl up, and it curled up high and strong, for there had never been such a rich city in the history of the world – rich in rye and bourbon from Kentucky – rich in all brands of wines. Never had there been a fire so richly fed.

From every corner you could see the flames bursting higher and higher from these costly stores which no city had ever had before, and the clouds for all three days and nights were most wonderful to behold.

California was great from the start, but she was never so entirely great as now. The main improvement in San Francisco will be turning all Nob Hill into a public park. Nob Hill was an affectation. Nobody ever liked it. Nobody ever liked to live there, and everybody who owned property got out after a brief experience.

Of course I am not a city man. I live in the country and I cultivate my cabbage, but I have no doubt that San Francisco will be restored to her people. The eyesores will be gone, and the place will be one of undimmed loveliness.

From:

<http://www.sfmuseum.net/1906/ew5.html> ♦

► For a full list of online eyewitness accounts of the 1906 San Francisco earthquake, go to <http://www.sfmuseum.org/1906/ew.html>

Disability updates/responses to last issue

WEBSITES

http://www.nod.org/EPIResources/interactive_map.html

This tool developed by the National Organization on Disability provides an interactive directory of regional, state, and local disability-related emergency management resources. The Interactive Map of Disability and Preparedness Resources is a work in progress, and as new resources are developed and discovered, they will be included.

http://www.disabilityworld.org/12-01_06/disasterneeds.shtml

Disability World, a bimonthly webzine on international disability news, hosts this summary of recent resources regarding the inclusion of people with disabilities in planning for and responding to emergencies and disasters.

<http://www.connectlive.com/events/samhsa/>

The archived webcast of “*Peer Support: Disaster Preparation for People with Psychiatric Disabilities*” is available here for free online viewing. The webcast is sponsored by the U.S. Department of Health and Human Services Substance Abuse and Mental Health Services Administration Center for Mental Health Services.

http://www.weather.gov/nwr/special_need.htm

The material provided in this document is general information on how you can use *NOAA Weather Radio* (NWR) as an alerting tool for the deaf and hard of hearing.

PUBLICATIONS

Emergency Evacuation of People with Physical Disabilities from Buildings: 2004 Conference Proceedings

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

The result of an October 2004 conference, this report highlights research recommendations

to improve available data, building and life safety codes, evacuation technologies, and evacuation practices for people with physical disabilities. It includes panel discussion summaries as well as breakout group recommendations and next steps.

From: *Natural Hazards Observer*, v. 30, no 3, p. 28; or
<http://www.colorado.edu/hazards/o/jan06/jan06i.html>

Public Transportation Emergency Mobilization and Emergency Operations Guide

Transit Cooperative Research Program. ISBN 0-309-08833-8. 2005. 124 pp. \$25.00. Available free online from the Transportation Research Board, Lockbox 289, Washington, DC 20055; (202) 334-3213; http://trb.org/news/blurbs_detail.asp?id=5259.

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

From: *Natural Hazards Observer*, v. 30, no 3, p. 28; or
<http://www.colorado.edu/hazards/o/jan06/jan06i.html> ♦



Added to the NTHMP Library

March-April 2006

Note: These, and all our tsunami materials, are included in the online (searchable) catalog at <http://www.dnr.wa.gov/geology/washbib.htm>. Type 'tsunamis' in the Subject field to get a full listing of all the tsunami reports and maps in the collection.

American Society of Civil Engineers; Institute for Business & Home Safety, 2001, The ten most wanted--A search for solutions to reduce recurring losses from natural hazards: Institute for Business & Home Safety?, 24 p.

Arai, Kohsaku; Kisimoto, Kiyoyuki; Ikehara, Ken; Joshima, Masato; Nishimura, Kiyokazu; Soh, Wonn, Machiyama, Hideaki, 2005, Deep tow sub-bottom profiler and side scan sonar records around the epicenter of the Sumatra earthquake, 26th December, 2004 [abstract]: Eos (American Geophysical Union Transactions), v. 86, no. 52, p. F1.

Cervelli, Peter, 2004, The threat of silent earthquakes: Scientific American, v. 290, no. 3, p. 86-91.

Dahdouh-Guebas, Farid; Koedam, Nico, 2006, Coastal vegetation and the Asian tsunami: Science, v. 311, no. 5757, p. 37.

Danielsen, Finn; Sorensen, Mikael K.; Olwig, Mette F.; Selvam, Vaithilingam; Parish, Faizal; Burgess, Neil D., 2006, Response to Coastal vegetation and the Asian tsunami: Science, v. 311, no. 5757, p. 37.

Gahalaut, V. K.; Nagarajan, B.; Catherine, J. K.; Kumar, S., 2006, Constraints on 2004 Sumatra-Andaman earthquake rupture from GPS measurements in Andaman-Nicobar Islands: Earth and Planetary Science Letters, v. 242, no. 3-4, p. 365-374.

Goff, J.; Dudley, W. C.; deMaintenon, M. J.; Cain, G.; Coney, J. P., 2006, The largest local tsunami in 20th century Hawaii: Marine Geology, v. 226, no. 1-2, p. 65-79.

Gower, J.; Gonzalez, F., 2006, U.S. warning system detected the Sumatra tsunami: Eos (American Geophysical Union Transactions), v. 87, no. 10, p. 105, 108.

Heaton, Thomas H.; Snavely, Parke D., Jr., 1985?, Possible tsunami along the coast of Washington inferred from Indian traditions: U.S. Geological Survey?, 11 p.

Jackson, Kelly L.; Amelung, Falk; Andres, Miriam S.; Eberli, Gregor; Jayasena, Chandra; Kehelpannala, K. V. Wilbert; Peterson, Larry; Rankey, Eugene, 2005, Comparative study of the sediment record of coastal lagoons, Sri Lanka--Implications for paleo-tsunamis [abstract]: Eos (American Geophysical Union Transactions), v. 86, no. 52, p. F1.

Kench, Paul S.; McLean, Roger F.; Brander, Robert W.; Nichol, Scott L.; Smithers, Scott G.; Ford, Murray R.; Parnell, Kevin E.; Aslam, Mohamed, 2006, Geological effects of tsunami on mid-ocean atoll islands--The Maldives before and after the Sumatran tsunami: Geology, v. 34, no. 3, p. 177-180.

Martin, Corinne Carlton, 2005, Tsunami Sue: BookSurge, LLC, [16 p.].

Masterlark, Timothy, 2005, Poroelastic coupling of the recent M9 and M8.7 earthquakes in the Sumatra-Andaman subduction zone [abstract]: Eos (American Geophysical Union Transactions), v. 86, no. 52, p. F1.

Melini, Daniele; Piersanti, Antonio; Florindo, Fabio; De Michelis, Paola, 2005, Core mantle boundary deformations triggered by the Sumatra earthquake [abstract]: Eos (American Geophysical Union Transactions), v. 86, no. 52, p. F1.

Meszaros, Jacqueline, 2003, Small businesses and earthquake mitigation: Disaster Safety Review, v. 2, no. 2, p. 5-7.

Meyer, Uwe; Ploethner, Dieter; Siemon, Bernhard; Roettger, Bernd; Rehli, Hans-Joachim, 2005, Post-tsunami helicopter-borne electromagnetics and surface hydrology along the coasts of Aceh, Indonesia [abstract]: Eos (American Geophysical Union Transactions), v. 86, no. 52, p. F867.

Morrissey, Wayne A., 2005, Tsunamis--Monitoring, detection, and early warning systems: Congressional Research Service RL 32739, 18 p.

Perez-Torrado, Francisco J.; Paris, Raphael; Cabrera, Maria C.; Schneider, Jean-Luc; Wassmer, Patrick; Carracedo, Juan-Carlos; Rodriguez-Santana, Angel; Santana, Francisco, 2006, Tsunami deposits related to flank collapse in oceanic volcanoes--The Agaete

Valley evidence, Gran Canaria, Canary Islands: *Marine Geology*, v. 227, no. 1-2, p. 135-149.

Robison, David; Kluge, Steve, 2006, The great Sumatra earthquake and tsunami--A comprehensive inquiry based lab [abstract]: *Geological Society of America Abstracts with Programs*, v. 38, no. 2, p. 15.

Subcommittee on Disaster Reduction; United States Group on Earth Observations, 2005, Tsunami risk reduction for the United States--A framework for action: National Science and Technology Council, [27 p.].

ten Brink, Uri; Geist, Eric L., 2005, Size distribution of submarine landslides and implications for tsunami probability in Puerto Rico [abstract]: *Eos (American Geophysical Union Transactions)*, v. 86, no. 52, p. F1035.

Tierney, Kathleen J.; Petak, William J.; Hahn, Harlan, 1988, Disabled persons and earthquake hazards [excerpts]: *Institute of Behavioral Science, University of Colorado*, p. 26-29, 36-37, 54-55, 58-69, 86-87, 92-93, 140-155.

U.S. Geological Survey, 2006, Tsunami hazards--A national threat: U.S. Geological Survey Fact Sheet 2006-3023, 2 p.

U.S. House of Representatives Committee on Science, 2005, Tsunamis--Is the U.S. prepared?--Hearing before the Committee on Science, House of Representatives, 109th Congress, 1st session, January 26, 2005: U.S. Government Printing Office Serial 109-1, 130 p.

Venturato, Angie J.; Denbo, Donald W.; Titov, Vasily V.; McHugh, Kevin T.; Sorvik, Paul, 2005, Tsunami forecasting system design and development [abstract]: *Eos (American Geophysical Union Transactions)*, v. 86, no. 52, p. F953.

Wood, Nathan J.; Good, James W., 2005, Perceptions of earthquake and tsunami issues in the U.S. Pacific Northwest port and harbor communities: *International Journal of Mass Emergencies and Disasters*, v. 23, no. 3, p. 103-138.♦

STATE EMERGENCY MANAGEMENT OFFICES

Alaska Dept of Military & Veteran Affairs
Division of Homeland Security & Emergency Mgmt.
PO Box 5750
Fort Richardson, AK 99505-5750
(907) 428-7000; toll-free 800-478-2337
Fax (907) 428-7009
<http://www.ak-prepared.com/>

California Office of Emergency Services
3650 Schriever Ave.
Mather, CA 95655
(916) 845-8510; Fax (916) 845-8910
<http://www.oes.ca.gov/>

Hawaii State Civil Defense, Dept. of Defense
3949 Diamond Head Road
Honolulu, HI 96816-4495
(808) 733-4300; Fax (808) 733-4287
<http://www.scd.state.hi.us>

Oregon Division of Emergency Management
PO Box 14370
Salem, OR 97309-50620
(503) 378-2911; Fax (503) 373-7833
<http://www.oregon.gov/OOHS/OEM/>

Washington State Military Dept.
Emergency Management Division
Camp Murray, WA 98430-5122
(253) 512-7067; Fax (253) 512-7207
<http://emd.wa.gov>

Provincial Emergency Program
455 Boleskin Road
Victoria, BC V8Z 1E7 Canada
(250) 952-4913; Fax (250) 952-4888
<http://www.pep.bc.ca/>

updated 3-31-2006

NATIONAL TSUNAMI HAZARD MITIGATION PROGRAM STEERING GROUP

NOAA

Jeff LaDouce, Chairman
NOAA/NWS Pacific Region,
737 Bishop St., Suite 2200
Honolulu, HI 96813-3213
Ph: 808-532-6416; Fax: 808-532-5569
Jeff.Ladouce@noaa.gov

Landry Bernard, NOAA/NDBC
Bldg 1100 Room 361C
Stennis Space Center, MS 39529-6000
Ph: 228-688-2490; Fax: 228-688-3153
Landry.Bernard@noaa.gov

Eddie Bernard, NOAA/PMEL
7600 Sand Point Way NE
Seattle, WA 98115-6349
Ph: 206-526-6800; Fax: 206-526-6815
Eddie.N.Bernard@noaa.gov

Frank González, NOAA/PMEL
7600 Sand Point Way NE
Seattle, WA 98115-6349
Ph: 206-526-6803; Fax: 206-526-6485
Frank.I.Gonzalez@noaa.gov

Laura Furgione, Alaska Region Dir.
NOAA/NWS, Alaska Region HQ
222 W. 7th Ave. #23
Anchorage, AK 99513-7575
Ph: 907-271-5136; Fax: 907-271-3711
Laura.Furgione@noaa.gov

James Partain, Alaska Region NOAA/NWS,
222 W. 7th Ave., #23
Anchorage, AK 99513-7575
Ph: 907-271-5131; Fax: 907-271-3711
James.Partain@noaa.gov

Laura Kong, ITIC, Director
737 Bishop St., Suite 2200
Honolulu, HI 96813
Ph: 808-532-6423; Fax: 808-532-5576
Laura.Kong@noaa.gov

Brian Yanagi, ITIC
737 Bishop St., Suite 2200
Honolulu, HI 96813
Ph: 808-532-6422; Fax: 808-532-5576
Brian.Yanagi@noaa.gov

DHS/FEMA

Chris Jonientz-Trisler, DHS/FEMA
Region X,
130 228th St. SW
Bothell, WA 98021-9796
Ph: 425-487-4645; Fax: 425-487-4613
Chris.jonientztrisler@dhs.gov

Michael Hornick DHS/FEMA Region IX
1111 Broadway, Suite 1200
Oakland, CA 94607
Ph: 510-627-7260; Fax: 510-627-7147
michael.hornick@dhs.gov

USGS

David Oppenheimer, USGS

345 Middlefield Rd., MS 977
Menlo Park, CA 94025
Ph: 650-329-4792; Fax: 650-329-4732
oppen@usgs.gov

Craig Weaver, USGS
c/o Geophysics
Box 351650
University of Washington
Seattle, WA 98195-1650
Ph: 206-553-0627; Fax: 206-553-8350
craig@ess.washington.edu

NSF

Richard Fragaszy
The National Science Foundation
ENG/CMS
4201 Wilson Blvd., Room 545
Arlington, VA 22230
Ph: 703-292-7011; Fax: 703-292-9053
rfragasz@nsf.gov

Alaska

R. Scott Simmons
Alaska Division of Homeland Security and
Emergency Management
P.O. Box 5750, Suite B-210, Bldg. 49000
Fort Richardson, AK 99505-5750
Ph: 907-428-7016; Fax: 907-428-7009
scott_simmons@ak-prepared.com

Ervin Petty (Alt.), Alaska Division of
Homeland Security and Emergency
Management
P.O. Box 5750, Suite B-210, Bldg. 49000
Fort Richardson, AK 99505-5750
Ph: 907-428-7015; Fax: 907-428-7009
ervin_petty@ak-prepared.com

Roger Hansen, Geophysical Institute,
University of Alaska, P.O. Box 757320
903 Koyukuk Dr.
Fairbanks, AK 99775-7320
Ph: 907-474-5533; Fax: 907-474-5618
roger@GISEIS.alaska.edu

Rodney Combellick (Alt.)
Alaska Dept. of Natural Resources
Div. of Geological & Geophysical Surveys
3354 College Road
Fairbanks, AK 99709
Ph: 907-451-5007; Fax: 907-451-5050
rod@dnr.state.ak.us

California

Richard Eisner, FAIA
Governor's Office Of Emergency Services
1300 Clay St., Ste. 400
Oakland, California 94612
Ph: 510-286-0888; Fax: 510-663-5339
Rich_Eisner@oes.ca.gov

Michael S. Reichle, Chief Seismologist, Dept
of Conservation
California Geological Survey
801 "K" Street, MS 12-32
Sacramento CA 95814-3530

Ph: 916-327-1813; Fax 916-322-4765
Michael.Reichle@conservation.ca.gov

Don Hoirup, Jr., California Geological Survey,
Dept. of Conservation
801 K Street, MS 12-31
Sacramento, CA 95814-3531
Ph: 916-324-7354 ; Fax: 916-445-3334
dhoirup@consrv.ca.gov

Hawaii

Jeanne Johnston
Civil Defense Division, State of Hawaii
3949 Diamond Head Road
Honolulu, HI 96816-4495
Ph: 808-733-4301 ext. 552; Fax: 808-733-4287
jjohnston@scd.hawaii.gov

Walter C. Dudley
Civil Defense Division, State of Hawaii
Pacific Tsunami Museum,
200 W. Kawili St., Hilo, HI 96720
Ph.: 808-933-3905; Fax: 808974-7693
dudley@hawaii.edu

Oregon

Jay Wilson, Oregon Emergency Management,
P.O. Box 14370
Salem, OR 97309-5062
Ph: 503-378-2911 Ext. 22237;
Fax: 503-373-7833
jmwilson@oem.state.or.us

George Priest, Oregon Dept. of Geology &
Mineral Industries
Coastal Field Office
P.O. Box 1033
Newport, OR 97365
Ph: 541-574-6642; Fax: 541-265-5241
george.priest@dogami.state.or.us

Jonathan C. Allan (Alt.) Oregon Dept.
of Geology & Mineral Industries
Coastal Field Office, P.O.Box 1033
Newport, OR 97365
Ph: 541-574-6658; Fax: 541-265-5241
jonathan.allan@dogami.state.or.us

Washington

George Crawford, Washington. State Military
Dept., Emergency Management Division
Camp Murray, WA 98430-5122
Ph: 253-512-7067; Fax: 253-512-7207
g.crawford@emd.wa.gov

Timothy Walsh, Division of Geology & Earth
Resources
P.O. Box 47007
Olympia, WA 98504-7007
Ph: 360-902-1432; Fax: 360-902-1785
tim.walsh@wadnr.gov

From: <http://www.pmel.noaa.gov/tsunami-hazard/tsuhaz.htm>

Updated Mar. 31, 2006♦

VIDEO RESERVATIONS

To reserve tsunami videos, contact *TsuInfo Alert* Video Reservations, Lee Walkling, Division of Geology and Earth Resources Library, 1111 Washington St. SE, MS 47007, Olympia, WA 98504-7007; or e-mail lee.walkling@wadnr.gov

Adventures of Disaster Dudes (14 min.). Preparedness for preteens. American Red Cross.

The Alaska Earthquake, 1964 (20 min.) Includes data on the tsunamis generated by that event.

Business Survival Kit for Earthquakes & Other Disasters; What every business should know before disaster strikes (27 min.). Global Net Productions for the Cascadia Regional Earthquake Workgroup, 2003. With CD disaster planning toolkit & other data.

Cannon Beach Fire District Community Warning System (COWS) (21 min.) Explains why Cannon Beach chose their particular warning system.

Cascadia: The Hidden Fire—An Earthquake Survival Guide (10 min.). Global Net Productions, 2001. A promo for a documentary about the Cascadia subduction zone and the preparedness its existence demands of Alaska, Oregon and Washington states. Includes mention of tsunamis.

Disasters are Preventable (22 min.) Ways to reduce losses from various kinds of disasters through preparedness and prevention.

Disaster Mitigation Campaign (15 min.). American Red Cross; 2000 TV spots. Hurricanes, high winds, floods, earthquakes.

Earthquake... Drop, Cover & Hold (5 min.). Washington Emergency Management Division. 1998.

Forum: Earthquakes & Tsunamis (2 hrs.). CVTV-23, Vancouver, WA (January 24, 2000). 2 lectures: Brian Atwater describes the detective work and sources of information about the Jan. 1700 Cascadia earthquake and tsunami; Walter C. Dudley talks about Hawaiian tsunamis and warning systems.

International Tsunami Information Centre, 2004, Tsunami warning evacuation news clips and video footage, UNESCO/IOC International Tsunami Information Centre, 1 DVD, 12 min.

Killer Wave: Power of the Tsunami (60 min.). National Geographic video.

Mitigation: Making Families and Communities Safer (13 min.) American Red Cross.

Not Business as Usual: Emergency Planning for Small Businesses, sponsored by CREW (Cascadia Regional Earthquake Workgroup) (10 min.), 2001. Discusses disaster preparedness and business continuity. Although it was made for Utah, the multi-hazard issues remain valid for everyone. Websites are included at the end of the video for further information and for the source of a manual for emergency preparedness for businesses.

Numerical Model Aonae Tsunami—7-12-93 (animation by Dr. Vasily Titov) and Tsunami Early Warning by Glenn Farley, KING 5 News (The Glenn Farley portion cannot be rebroadcast.)

Ocean Fury—Tsunamis in Alaska (25 min.) VHS and DVD. Produced by Moving Images for NOAA Sea Grant College Program, 2004.

The Prediction Problem (58 min.) Episode 3 of the PBS series "Fire on the Rim." Explores earthquakes and tsunamis around the Pacific Rim

Protecting Our Kids from Disasters (15 min.) Gives good instructions to help parents and volunteers make effective but

low-cost, non-structural changes to child care facilities, in preparation for natural disasters. Accompanying booklet. Does NOT address problems specifically caused by tsunamis.

The Quake Hunters (45 min.) A good mystery story, explaining how a 300-year old Cascadia earthquake was finally dated by finding records in Japan about a rogue tsunami in January 1700

Raging Planet; Tidal Wave (50 min.) Produced for the Discovery Channel in 1997, this video shows a Japanese city that builds walls against tsunamis, talks with scientists about tsunami prediction, and has incredible survival stories.

Raging Sea: KGMB-TV Tsunami Special. (23.5 min.) Aired 4-17-99, tsunami preparedness in Hawaii.

The Restless Planet (60 min.) An episode of "Savage Earth" series. About earthquakes, with examples from Japan, Mexico, and the 1989 Loma Prieta earthquake.

Run to High Ground (14 min.). Produced by Global Net Productions for Washington Emergency Management Division and Provincial Emergency Program of British Columbia, 2004. Features storyteller Viola Riebe, Hoh Tribe. For K-6 grade levels. Have video and DVD versions.

Tsunami and Earthquake Video (60 min.). "Tsunami: How Occur, How Protect," "Learning from Earthquakes," "Computer modeling of alternative source scenarios."

Tsunami: Killer Wave, Born of Fire (10 min.). NOAA/PMEL. Features tsunami destruction and fires on Okushiri Island, Japan; good graphics, explanations, and safety information. Narrated by Dr. Eddie Bernard, (with Japanese subtitles).

Tsunami: Surviving the Killer Waves (13 min.). 2 versions, one with breaks inserted for discussion time.

Tsunami Chasers (52 min.). Costas Synolakis leads a research team to Papua New Guinea to study submarine landslide-induced tsunamis. Beyond Productions for the Discovery Channel.

Tsunami Evacuation PSA (30 sec.). DIS Interactive Technologies for WA Emergency Management Division. 2000.

Understanding Volcanic Hazards (25 min.). Includes information about volcano-induced tsunamis and landslides. UNESCO/IOC International Tsunami Information Centre, 2005, U.S. National Tsunami Hazard Mitigation Program public information products—B-roll footage, tsunami science, warnings, and preparedness: UNESCO/IOC International Tsunami Information Centre, 1 DVD, 57 min.

The Wave: a Japanese Folktale (9 min.) Animated film to start discussions of tsunami preparedness for children.

Waves of Destruction (60 min.) An episode of the "Savage Earth" series. Tsunamis around the Pacific Rim.

Who Wants to be Disaster Smart? (9 min.). Washington Military Department/Emergency Management Division. 2000. A game show format, along the lines of *Who Wants to be a Millionaire?*, for teens. Questions cover a range of different hazards.

The Wild Sea: Enjoy It... Safely (7 min.) Produced by the Ocean Shores Wash. Interpretive Center, this video deals with beach safety, including tsunamis. ♦

NOTE: The TsunamiReady Education CD included in the 2005 Earth Science Week kit is available for borrowing, too..

Updated Jan. 23, 2006

Infrequently Asked Questions

Compiled by Lee Walkling

What was the largest local tsunami in 20th century Hawaii?

The 1975 Kalapana tsunami.

From: Goff, J.; Dudley, W. C.; deMaintenon, M. J.; Cain, G.; Coney, J. P., 2006, The largest local tsunami in 20th century Hawaii: *Marine Geology*, v. 226, no. 1-2, p. 65-79.

► [Editor's note: There is more information at <http://www.soest.hawaii.edu/tsunami/kalapana/index.html> photos at: <http://www.tsunami.org/archives1975.htm>

Dr. George's page: <http://www.drgeorgepc.com/Tsunami1975.html>

Hawaiian Volcano Observatory page: http://hvo.wr.usgs.gov/volcanowatch/1995/95_11_24.html]

Can you name NOAA's ancestors?

Although the National Oceanic and Atmospheric Administration (NOAA) was formed in 1970, the agencies that came together at that time were among the oldest in the federal government. These agencies included the U.S. Coast and Geodetic Survey formed in 1807, the Weather Bureau formed in 1870, and the Bureau of Commercial Fisheries formed in 1871. These organizations represented America's first physical science agency, first agency dedicated specifically to the atmospheric sciences, and first conservation agency.

Today, NOAA is housed within the Department of Commerce and continues to focus on the condition of the oceans and the atmosphere. Six line offices exist within NOAA: the National Marine Fisheries Service, the National Ocean Service, the National Weather Service, the Office of Oceanic and Atmospheric Research, the National Environmental Satellite, Data, and Information Service, and Program Planning and Integration. These organizations play several distinct roles in the Department of Commerce:

- Supplier to environmental information products
- Provider of environmental stewardship services
- Leader in applied scientific research

NOAA is a trusted source of accurate and objective scientific information about ecosystems, climate, weather and water, and commerce and transportation.

From: "One NOAA serves state and local programs," *Coastal Services*, v. 9, no. 2, p. 1, excerpt.

What does April 18, 2006 commemorate?

The one hundredth anniversary of the great 1906 San Francisco earthquake. (See pages 29-34)



Above is a seismogram recorded in Gottingen, Germany, 9100 kilometers away. It shows how the ground moved in Germany as a result of the 1906 San Francisco earthquake. Time advances from left to right. Small wiggles, beginning 1/2 inch from left end, signal arrival of first compressional (P) waves. Large wiggles half way along represent arrival of slower-traveling shear (S) waves. The part of the record shown here spans about 1600 seconds or 26 minutes. The instrument subsequently went off-scale when surface waves arrived.

From: <http://quake.wr.usgs.gov/info/1906/seismogram.html> ♦

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

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