



TsuInfo Alert

prepared on behalf of the

National Tsunami Hazard Mitigation Program

by the Washington State Department of Natural Resources

Contents

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SUMMARY REPORT OF THE TSUNAMI HAZARD MITIGATION STEERING GROUP MEETING

November 6-8, 2001, Seattle Washington

downloaded 12-28-01 from:

<http://www.pmel.noaa.gov/tsunami-hazard/nov01meetingsummary.html>

Attendees

Steering Group

Eddie Bernard - NOAA
 James Godfrey (Alt) - State of California
 Frank González - NOAA
 Lori Dengler - State of California
 James Weyman - NOAA
 Brian Yanagi - State of Hawaii
 Chris Jonient-Trisler - FEMA
 David Oppenheimer - USGS
 Gerard Fryer (Alt) - State of Hawaii
 Craig Weaver - USGS
 Mark Darienzo - State of Oregon
 Scott Simmons - State of Alaska
 George Priest - State of Oregon
 Taunie Boothby - State of Alaska
 George Crawford - State of Washington
 Roger Hansen - State of Alaska
 Tim Walsh - State of Washington

Guests

Tom Sokolowski - WC/ATWC
 Vasily Titov - NOAA
 Charles McCreery - PTWC
 Marie Eble - NOAA
 Hal Mofjeld - NOAA
 Angie Venturato - NOAA

Old Business:

Review of action items

Action items open prior to the May 17 meeting:

1. ACTION ITEM: Final Local Tsunami Warning Systems and Procedures: Guidance for Local Officials document to be placed on the Oregon web site prior to the May 14-15, 2001 Workshop and Steering Group meeting.

ACTION: Mark Darienzo

STATUS: Document is being refined and will go up on the web. OPEN

2. ACTION ITEM: For FY 2001, \$2.3 million has been appropriated for the Program. There is an add-on of \$1 million for the Tsunami Warning and Environmental Observatory for Alaska (TWEAK), a letter of intent by Ray Highsmith at the University of Alaska. It was suggested that Ray Highsmith include Roger Hansen and Zygmunt Kowalik in writing the proposal for TWEAK.

ACTION: Ray Highsmith, Roger Hansen, and Zygmunt Kowalik to write a proposal for TWEAK.

STATUS: Proposal has been written and reviewed by Steering Group members. Proposal was funded with the money going to the University of Alaska Fairbanks. Some bathymetry studies were done and a physicist was hired to help with modeling. CLOSED

Action items from the May 17, 2001 meeting:

1. ACTION ITEM: Find out what information customers want on earthquakes to NWS and USGS Regional Networks so the MOU can be updated in light of new technology so there will be a clarification of procedures and better coordination of warnings. Dick Hagemeyer suggested the following four steps: 1) find out what the customers want 2) agree to a standard format, 3) obtain headquarters approval to place on NOAA Weather Radio and EMWIN, and 4) determine how to get the information to those who will put

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e-mail: connie.manson@wadnr.gov or lee.walking@wadnr.gov

prepared by
Connie J. Manson, Senior Library Information Specialist
and
Lee Walking, Library Information Specialist

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WASHINGTON STATE DEPARTMENT OF
Natural Resources

Doug Sutherland - Commissioner of Public Lands

(continued from p. 1)

the messages on NOAA Weather Radio and EMWIN.

ACTION: Oppenheimer, Weyman, Hansen

STATUS: The feed from the University of Washington needs to be expanded. Reviewed text messages are to go onto EMWIN. The USGS is ready but needs a NOAA contact to proceed. Software needs to be developed. D. Oppenheimer will provide background to J. Weyman before proceeding. OPEN

2. ACTION ITEM: Update WC/ATWC, PTWC, and PMEL web sites showing buoy locations for better indication of events.

ACTION: WC/ATWC, PTWC, PMEL

STATUS: Completed. CLOSED

3. ACTION ITEM: Frank González to check on DART web site vulnerability to too many hits at one time. Cross reference with November 2001 Action Item number 6.

ACTION: Frank González

STATUS: A mirror or duplicate site needs to be established. J. Weyman and E. Bernard to work out an arrangement between NWS and NOAA. This item will be carried forward as November 2001 Action Item number 6. OPEN

4. ACTION ITEM: Each state is to plan their mapping strategy using either coarse grid or fine grid. The TIME Center is available to help with this process. Cross reference with November 2001 Action Item number 8.

ACTION: George Priest, Frank González to determine the grid issue

STATUS: Technical issues related to the coarse grid modeling are twofold:

1. Bathymetric and topographic data quality. The density of raw bathymetric and topographic data determines the details of the shoreline and numerical grids for the area of the inundation mapping project. Small-scale structures such as jetties, offshore reefs, even beach-breaks can affect tsunami inundation. If those features are not present in the raw data, an inundation model may produce inaccurate results, no matter how dense the numerical grid used.

2. Numerical model requirements. Any numerical model of tsunami inundation requires a certain amount of nodes per wavelength to produce accurate results. This problem has been the subject of many scientific studies. These results show that model inundation estimates compare well with observations if at least 100m grid size is used nearshore. A more coarse grid does not provide enough details of tsunami behavior near the shoreline, therefore can be used only to estimate offshore wave characteristics. The studies also suggest that it is essential to model tsunami inundation beyond the shoreline with moving boundaries--fixed boundaries yield substantially different results.

TIME Center Recommendations:

*inundation computations (moving, not solid boundaries) are essential for producing the inundation maps

*at least 150-100m cell size is required for inundation computations to produce useful guidance (regardless of raw bathy-topo data density)

*models with 50-30m cell size seem to capture most of the important local inundation features

*use the best resolution bathy-topo data available

F. González will chair a working group to prepare a draft of mapping certification procedures. Working group named includes: Rich Eisner, Tim Walsh, Gerard Fryer, Doug Luther, George Priest, Lori Dengler, Vasily Titov, Costas Synolakis, Elena Suleimani, and Antonio Baptista. This item will be carried forward as November 2001 Action Item number 8. OPEN

5. ACTION ITEM: The Subcommittee suggested that a dialogue with NOS on bathymetry/coastal zone management issues was needed.

ACTION: Eddie Bernard will contact the Acting Assistant Administrator for Ocean Services and Coastal Zone Management and initiate a dialogue on this issue.

STATUS: Eddie Bernard contacted NOS and instituted a dialogue. CLOSED

6. ACTION ITEM: States were asked for video and photos of the National Tsunami Hazard Mitigation Program in action including captions or explanations, as needed.

ACTION: states to send video and photos to Eddie Bernard NLT May 30, 2001. (Oregon to provide video clip on school evacuation)

STATUS: Videos and photos were sent for use at the August Review. CLOSED

7-9 ACTION ITEMS: were logistics for the August 7 Review.

ACTION: PMEL

STATUS: Completed. CLOSED

10. ACTION ITEM: Chris Jonientz-Trisler, Laura Kong, Frank González, Scott Simmons, David Oppenheimer, Richard Hagemeyer, Eddie Bernard, and Mike Hornick were named as the TWEAK Review Panel to review the proposal.

ACTION: TWEAK Review Panel to send their comments via e-mail to Eddie Bernard NLT May 25. A conference call with all Panel members is planned for 2 p.m. on May 30.

STATUS: The panel met and reviewed the TWEAK proposal. CLOSED

11. ACTION ITEM: Develop defensible matching funds divided into two categories: mapping and mitigation.

ACTION: States are to e-mail their figures to Eddie Bernard, Frank González, and Chris Jonientz-Trisler NLT May 25, 2001.

STATUS: Figures were sent and the items used at the August Review. CLOSED

12. ACTION ITEM: Develop procedures for use of buoy data by warning centers by July 1, 2001.

ACTION: Tom Sokolowski, Frank González, Eddie Bernard, PTWC/Chip McCreery

STATUS: Procedures have been developed. The FACTS DART interpretive aid prototype is being refined for use on the FACTS web site. SIFT is working on automated interactive algorithms for inversion modeling. ONGOING

13. ACTION ITEM: Produce isochrons prototype with elevations for likely events by July 1, 2001.

ACTION: Tom Sokolowski

STATUS: Isochrons have been created. CLOSED

Ongoing Items:

1. ACTION ITEM: There was considerable discussion on how to confirm the availability of resources after a disastrous event. The group formed an ad hoc subcommittee to formalize the next steps. The subcommittee consists of: Richard Przywarty, Frank González, Eddie Bernard, George Priest, and Costas Synolakis. Three new members were added to the subcommittee: Mike Hornick, Chris Jonientz-Trisler, and Richard Eisner. There was a discussion of what role the National Tsunami Hazard Mitigation Program Steering Group would have in tsunami disaster response. NOAA currently has no input in times of disaster. The current National Post-Storm Data Acquisition Plan provides only for data collection. Mike Hornick, FEMA Region IX proposed a 2-step action plan: 1) The Federal Response Plan needs a tsunami action plan. Mike Hornick and Chris Jonientz-Trisler and FEMA HQ need to develop this plan, and 2) the States need defined data collection activities. The subcommittee will review the NOAA Response Plan document and how it interacts with the states and report at the next meeting. Cross reference with November 2001 Action Item number 9.

ACTION: Subcommittee members named at the May 2001 meeting.

STATUS: As of the November 2001 meeting no interface with the Federal Response Plan had been drafted. Chris Jonientz-Trisler was tasked with writing the draft interface plan. This item will be carried forward as November 2001 Action Item number 9. OPEN

2. ACTION ITEM: A discussion of the question of how to report the mapping effort pointed out the difficulties of this issue and a method agreeable to all must be developed. Frank González and the States were asked to discuss and agree on the method of reporting the inundation mapping effort no later than March 2001. Cross reference with November 2001 Action Item number 7.

ACTION: Frank González and States

STATUS: Mapping reports should include inundation and evacuation, the number of map efforts, the number of communities mapped, and the population at risk. In addition: each map, brochure, etc., created must be provided in both electronic and hard copy to the TIME Center for the Mapping Archives. This item will be carried forward as November 2001 Action Item number 7. OPEN

Status Report of Program Elements

Develop NOAA/State Coordination and Technical Support

Chip McCreery reported the IOC/ITSU Eighteenth Session of the International Coordination Group for the Tsunami Warning System in the Pacific meeting was held in October in Cartagena, Colombia. The session focused on improvement of procedures and criteria for issuing warnings, watches, and cancellations. He reported that both the Historical Tsunami Database and the National Geophysical Data Center tsunami databases contain errors and omissions. An effort is underway to have the regional coordinator obtain missing information and to correct incorrect entries. One report at the IOC meeting showed that uniform signage and symbols are very important tools and the IOC has adopted the National Tsunami Hazard Mitigation Program (NTHMP) signs.

Dr. Bernard reported briefly on TROIKA, a proposal to expand the scope of the NTHMP approach globally. The U.S. and Chile agree that there is a need to expand the tide gauge network along the western Chilean and Peruvian coasts. In some cases gauges are in place but the U.S. does not have access to this data.

Improve Seismic Networks

There are now 43 of the 56 CREST stations installed. Over the past 6 months the participants of the CREST project installed 20 new seismic stations. The 13 stations that remain to be installed should be completed in early 2002 as weather and schedules permit. Three Alaska seismic stations will be installed in early 2002 and should be fully operational by summer 2002.

Deploy Tsunami Detection Buoys

The surface buoys at D171, D165, D157, were each be inspected, serviced, and subsequently re-deployed for another year of service. The sixth buoy was deployed in the Equatorial Pacific in August. The new generation of buoys is very robust, returning 99% of data. A transfer of the DART buoys to the National Data Buoy Center is underway. This process is expected to take approximately 2 years.

Produce Inundation Maps

Frank González reported on the status of mapping.

Mitigation

Discussions from the Mitigation meeting were brought forward. The major topics of discussion were actions to address Reviewer's comments and recommendations as well as plans for the next 5 years. See the Mitigation Meeting report (<http://www.pmel.noaa.gov/tsunami-hazard/MitigationSubcommitteeMeetingNov2001.pdf>) Alaska is planning a statewide earthquake/tsunami symposium for Alaska emergency managers in Anchorage in April 2002. Tentative

dates are April 15-19. Steering Group members were cordially invited to attend.

NEW BUSINESS

Establishment of the Richard H. Hagemeyer Tsunami Mitigation Memorial Award

Dick Hagemeyer, who passed away on October 25, was a member of the National Tsunami Hazard Mitigation Program (NTHMP) Steering Committee from its inception and we all deeply feel his loss. His staunch support for tsunami mitigation was a major force in the development and success of the program. He embraced this state/federal partnership and made it stronger by instilling a sense of public service to the program. He single-handedly managed one of the five elements of the program—Improve Coordination—with no budget! He managed this by working with Warning Centers and enlisting his cadre of Warning Center Meteorologists to include tsunamis in their duties. One of his most lasting legacies was compilation and dissemination of the Historical Tsunami Data Base, making global historic tsunami information readily available to U.S. coastal emergency managers.

In honor of Dick Hagemeyer the Steering Group unanimously agreed to establish a yearly tsunami mitigation award to recognize a particularly outstanding state mitigation activity. A volunteer was solicited to draft the award criteria. Dr. Bernard prepared a letter introducing the award to the NOAA Administrator, with copies to the Assistant Administrator for Oceanic and Atmospheric Research and the Assistant Administrator for Weather Services. Each Steering Group member present at the meeting signed the letter and it was mailed on November 9.

ACTION ITEM 1: Lori Dengler volunteered to draft the criteria for the award by December 1, 2001. OPEN

Introduction of New Member

James Weyman, Acting Director, NWS Pacific Region, was introduced. He will be replacing Dick Hagemeyer on the Steering Group. Mr. Weyman announced that the Pacific Tsunami Warning Center will be renamed the Richard H. Hagemeyer Tsunami Warning Center. The dedication is tentatively scheduled for December 1.

Discussion of August Program Review

The August 7 Program Review consisted of reports from each of the state and Federal partners on their accomplishments of the past 5 years as well as a presentation of plans for the next 5 years. Members of Congress as well as state and local emergency planners attended the public forum and the poster session/reception. International tsunami scientists who attended the follow-on meeting of the IUGG Tsunami Commission also attended the August 7 review and poster session/reception. The Steering Group discussed the comments made by the five reviewers and each of their recommendations for the National Tsunami

Hazard Mitigation Program. The five Reviewers were Richard J. McCarthy, Executive Director, California Seismic Safety Commission; Dennis S. Mileti, Director, Natural Hazards Research and Applications Information Center, University of Colorado, Boulder; Douglas S. Luther, Professor of Oceanography, University of Hawaii; Philip L.-F. Liu, Professor, School of Civil and Environmental Engineering, Cornell University; and Hiroo Kanamori, Seismological Laboratory, California Institute of Technology, Pasadena, California. One of the recommendations was to establish a 24-hour manned Tsunami Warning Center. There were differing opinions on this recommendation. Several issues must be addressed before a 24/7 operation could be implemented, including funding and additional manpower. It was pointed out that providing faster information increases the risk of error due to the lack of data and sufficient time to assess it. Even with a 24/7 on-site operation, states may not be able to act on the warnings quickly enough for the 24/7 operation to make a difference over the current manning. In addition, for a local tsunami in Alaska, time of the warning won't matter. The Steering Group's response to this recommendation was that the group feels the recommendation has merit but more data on user requirements is needed to determine if this recommendation is feasible. A draft of the recommendation letter to be sent to NOAA and USGS was prepared which states: "To effectively initiate state and local Emergency Management Plans, the five Pacific coastal states (Alaska, California, Hawaii, Oregon, Washington) of the National Tsunami Hazard Mitigation Program (NTHMP) require that the USGS, NOAA, and state agencies disseminate their automated, reviewed earthquake and tsunami notifications as rapidly as is scientifically and technologically possible. The NTHMP requests the USGS, NOAA, and states review data on response times and consider appropriate staffing and operational support to fulfill this requirement."

ACTION ITEM 2: The recommendation letter on Warning Center 24/7 operation drafted above is to be sent to NOAA and USGS in a timely manner.

ACTION: Bernard, Weyman, Przywarty. OPEN

Another recommendation from the review was to request more and support applied research. The response to this recommendation was to establish a Tsunami Research and Advisory Committee (TRAC). This committee is tasked to write a report on coordinating more applied research interests and funding. The committee consists of: Frank González (Chairperson), George Priest, Roger Hansen, Craig Weaver, Chip McCreery, Tom Sokolowski, Tim Walsh, Gerard Fryer, and Lori Dengler.

ACTION ITEM 3: Write a report on research interest, ranking priorities and identifying a list of representatives at other agencies. Draft is due by January 2002 to Eric Geist, USGS. Final report due April 2002 for review by the full NTHMP Steering Group.

ACTION: Tsunami Research and Advisory Committee (TRAC)

One reviewer commented that the program is out of balance. The program's current emphasis is on detection and risk mapping but does not address the sociological issues of dealing with the behavior of human beings. Also the program does not include anyone trained in disciplines that study human behavior. The reviewer also noted that more of a team approach is needed not just federal-state or state-local.

ACTION ITEM 4: To address this recommendation, the group plans to identify where the social science community can advise the NTHMP on the usefulness of its activities.

ACTION: Chris Jonientz-Trisler and each state.

Tsunami data collected by seismic networks and the buoy system should all be provided and archived in one location where it is easily available to the scientific community. The group agreed that there should be a requirement to provide this data to a central source. Collecting post-event data is a function of the International Tsunami Information Center (ITIC).

ACTION ITEM 5: Encourage ITIC to be the archive for all tsunami event data. The Steering Group will offer cooperation and some resources.

ACTION: Bernard to write a letter to NWS/Weyman by January 1, 2002.

Program Recognition

The review will help us plan the next 5 years based on program impacts. Linking actions to impacts will keep the momentum going. Recognition awards are a tool to that will help us keep the momentum and funding going. Possibilities for program recognition and possible grants were discussed. Eddie Bernard has written a nomination for the public Service Excellence Awards which is sponsored by the Public Employees Roundtable. The award has been sent to the NOAA Assistant Administrator for OAR to review and submit on our behalf. The California Seismic Safety Commission has nominated NTHMP for the William A. Nierenberg Prize for Science in the Public Interest which carries with it a prize of \$25,000. James Weyman suggested that the Steering Group be nominated for a Department of Commerce Gold or Silver Medal. Eddie offered to nominate or help states with awards submissions.

Real-Time Web Site Vulnerability

This issue was brought forward from the previous open items (#3 above) for further discussion. The possibility of duplicate or mirror real-time web sites was discussed.

ACTION ITEM 6: Prepare an arrangement between NWS and OAR on mirror or duplicate real-time web sites.

ACTION: Weyman, Bernard

A discussion of the question of how to report the mapping effort pointed out the difficulties of this issue and a method agreeable to all must be developed. At the May 2001 meeting Frank González and the States were asked to discuss and agree on the method of reporting the inundation mapping effort no later than March 2001. The method agreed upon was that mapping reports should include inundation and evacuation, the number of map efforts, the number of communities mapped, and the population at risk. In addition: each map, brochure, etc., created must be provided in both electronic and hard copy to the TIME Center for the Mapping Archives.

ACTION ITEM 7: States to include in their Statements of Work a requirement to provide electronic and hard copies of mapping products to TIME.

ACTION: States

Mapping Quality Control and Certification

The quality of the mapping products is an important mapping issue that needs to be addressed. Cross reference with previous meeting open item #4.

ACTION ITEM 8: A working group needs to develop a draft document on mapping certification procedures by May 2002.

ACTION: F. González will chair a working group to prepare a draft of mapping certification procedures. Working group named includes: Rich Eisner, Tim Walsh, Gerard Fryer, Doug Luther, George Priest, Lori Dengler, Vasily Titov, Costas Synolakis, Elena Suleimani, and Antonio Baptista.

Response and Recovery

There is a new emphasis on promoting response and recovery. The Nisqually earthquake helped FEMA management to know of the NTHMP modeling experience. Chris Jonientz-Trisler and Michael Hornick (FEMA Regions 10 and 9 respectively) gained first-hand experience during the earthquake and response operations. To build infrastructure for Response and Recovery, one of the NTHMP Steering Group members should be an advisor for the Disaster Coordination Advisor. States should have plans in state mitigation in place prior to an event. Examples of these state plans can help build the federal response and recovery plan. Also, the NTHMP should be a clearing house for tsunami information (data collection). A Tsunami Research Institute should be pursued.

ACTION ITEM 9: Draft a Strategic Plan on how to interface with the Federal Response Plan in case of an event.

ACTION: Chris Jonientz-Trisler to draft Strategic Plan

ACTION ITEM 10: Begin interaction with National Science Foundation and NWS to draft a Tsunami Research Institute Plan and find funding sources.

ACTION: Bernard, González

TsunamiReady Update

The documentation and application for TsunamiReady are posted on the WC/ATWC web site. The WC/ATWC brochure has been updated. The WC/ATWC now has a mirror site (<http://wcatwc.gov/main.htm>). The following communities have been certified as TsunamiReady: Ocean Shores, Washington, and Seward, Alaska. Long Beach, Washington, will be dedicated as TsunamiReady on January 10, 2002. Communities with pending applications are: Quinault Tribal Nation, Washington; Cannon Beach, Oregon; and Kodiak, Homer/Seldovia, Sitka, and Whittier, Alaska.

U.S. Affiliated Pacific Islands (USAPI) Membership Application to join the NTHMP

Brian Yanagi presented for discussion the membership application of the USAPI. After much discussion about what specific needs the USAPI have and what manpower and infrastructure is already available/in place, the Steering Group decided to query them on their specific needs.

ACTION ITEM 11: Draft a letter to USAPI to request a specific needs assessment before membership in the NTHMP.

ACTION: Yanagi, Jonientz-Trisler

FY 2002 Budget

Statements of Work and budget requests for each state, mapping, seismic, and mitigation were discussed at length. At the present time, NOAA is under a Continuing Resolution and does not have a budget appropriation. Budgets for FY 2002 were based on the same appropriation as last year as a starting point (\$2.3 million plus a \$1 million TWEAK add-on), there was a surplus of approximately \$120,000. After a good deal of discussion, it was decided to divide this

surplus 5 ways among the states and to let the states decide the best use of the additional funds. There was one unfunded activity of a possible Technology Infusion Workshop.

FY 2003 Budget

Using a draft of a budget initiative originally drafted by Dick Hagemeyer, the Steering Group worked through realistic figures to maintain the current five elements of the program as well as expand the scope of NTHMP. The proposed budget drafted for FY 2003 proposed budget needs of \$7.8 million.

ACTION ITEM 12: Bernard to e-mail to all Steering Group members the spreadsheet with FY 03 budget numbers as discussed during the meeting. Yanagi to send letters to Congressional members in Hawaii for support for the proposed FY 03 budget. States to also send letters of support to their state Congressional members.

ACTION: Bernard, Yanagi, States.

FY 2002 Meeting

Eddie Bernard proposed one meeting for next year to be held at PMEL in late October or early November. To avoid the duplicate discussions of mitigation issues, the format will be changed so that the Mitigation Meeting and Mapping Meetings would each meet for 1/2 day on Tuesday. The Steering Group would meet for one day on Wednesday. All budget and other proposals would be prepared in advance and brought to the meeting for discussion as was done this year. Additional conference calls, small group meetings, or e-mails would be used during the rest of the year to transact any business necessary. The group endorsed this plan and added that there should be an additional Mitigation meeting during the year.

DISASTER PREPAREDNESS NEWS

Earthquakes, Volcanoes, & Tsunamis calendar

It's not too late to order your *2002 Earthquakes, Volcanoes, & Tsunamis calendar!* The glossy, color calendar features photomicrographs (pictures of rocks through a microscope), while the calendar pages list historical earthquakes, volcanoes, or tsunami events by date. Included with each calendar is a set of earthquakes, volcanoes, and tsunami questions whose answers can be found within the calendar's pages. There is also a Modified Mercalli Intensity Scale of 1931 page which describes the difference between magnitude and intensity. The calendars are \$12.00 each, with shipping \$1.50 per \$15 or less order. Mail order to Cedrick's Enterprise, PO Box 373, Fields Landing, California 95537. E-mail: cedrick@humboldt1.com. A portion of the proceeds from calendar sales is used to support the Humboldt State University Geology Club, Arcata, California.

Earthquake and Tsunami Damage Assessment in Port Vila, Vanuatu

"On Thursday 3rd January 2002, a magnitude Mw 7.1 earthquake, the largest recorded so far in the vicinity, struck Port Vila.

A tsunami generated with the earthquake struck Port Vila Harbour some 15 minutes later according to records of the National Tidal Facility supplied by Bill Mitchell through the Acting Director of the Vanuatu Meteorological Office.

Although the tsunami only registered on the tide gauge as having a crest to trough amplitude of 0.8 m, eyewitness accounts in different parts of the harbour put the maximum effect at around 3.0 m, several times that of the recorded height, making it large enough to cause significant damage.

Fortunately, the tsunami occurred at a time close to one of the very lowest tides of the year (predicted CD+0.15m), when the tide was close to Chart Datum. If the earthquake had occurred four hours later at high tide (CD+1.35m),

flooding would have reached up to 1 metre over the top of the sea wall in the CBD area. A much smaller tsunami occurred following the major aftershock that night, but passed unnoticed." The full report is available online, complete with color charts and photos, at <http://www.sopac.org.fj/Data/virlib/LR/LR0135.pdf>

FEMA Launches New Mitigation Series

In an effort to improve natural hazards mitigation planning capabilities in states and communities, the Federal Emergency Management Agency's Federal Insurance and Mitigation Administration has started a new series of mitigation planning "how-to" guides, and released the first entry in the series. The new document, *Understanding Your Risks—Identifying Hazards and Estimating Losses*, provides step-by-step guidance for estimating the physical damage and economic losses a community could suffer from natural hazards.

Using the fictitious town of Hazardville ("a small town with big problems") as an illustration, the guide takes readers through a series of general and hazard-specific instructions and worksheets to help them decide: 1) which hazards could affect them, 2) what local areas are vulnerable to the hazards, 3) what structures and infrastructure could be affected, and 4) what the dollar losses are likely to be. The guide covers seven hazards (flood, earthquake, **tsunami**, tornado, coastal storm, landslide, and wildfire) and tells readers how to use historic records, newspapers, and other resources to figure out which hazards their community would face.

Graphics, tables, checklists, and worksheets help answer the question, "How bad can it get?" A key step demonstrated in the guide is developing a base map and investigating how to superimpose additional data on it, such as parts of the community that would be affected or the return frequency of the hazard. Examples are given of ways to inventory and assign a value to such local assets as buildings, critical facilities, historic or cultural resources, communications or transportation infrastructure, public recreation areas, and natural resources. The examples illustrate techniques ranging from computer models to spreadsheets to simple paper-and-pencil charts. The last section of the guide shows how to assess the overall level of damage from a given hazard event by combining the losses to structures, contents, and functions for each type of asset expected to be affected.

The loss estimate that is reached as a result of following the steps in the guide should serve as a basis for developing a local mitigation plan. Subsequent guides will explain the process of developing and implementing such a plan.

Copies of *Understanding Your Risks*, FEMA 386-2, are available free by calling the FEMA Publications Warehouse: (800) 480-2520.

from: Natural Hazards Observer, v. 26, no. 3, p. 4.

Congress Creates Demonstration Program for Minority Emergency Preparedness

Congress wants to ensure that minority communities, particularly African American and Hispanic communities, are better prepared for emergencies. As a result, while passing a recent appropriations bill, the legislators amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act to include a new Minority Emergency Preparedness Demonstration Program. President Bush signed the bill, Public Law 107-73, which includes appropriations for FEMA for fiscal year 2002, into law on November 26, 2001.

The demonstration program will "research and promote the capacity of minority communities to provide data, information, and awareness education by providing grants to or executing contracts or cooperative agreements with eligible nonprofit organizations to establish and conduct such programs." It will support activities that research the status of emergency preparedness and disaster response awareness in African American and Hispanic households, particularly those states and regions most affected by disasters and emergencies. It will also work to develop and promote awareness of emergency preparedness education programs within minority communities, including the creation of materials that can be used to disseminate information to minority organizations and institutions. Congress provided \$1.5 million for 2002 "and such funds as may be necessary" for fiscal years 2003 through 2007.

from: Natural Hazards Observer, v. 26, no. 3, p. 5.

President Issues Executive Order on Critical Infrastructure Protection

In order to ensure protection of information systems for critical infrastructure, including emergency preparedness communications, President Bush issued Executive Order 13231 on October 16, 2001. Because information technology has changed the way business is transacted, government operates, and national defense is conducted, these systems now rely on an interdependent network of critical information infrastructures. The protection program authorized by this order "shall consist of continuous efforts to secure information systems for critical infrastructure, including emergency preparedness communications, and the physical assets that support such systems."

The order states that it is the policy of the United States to protect against disruption of these systems, thus helping to protect the people, economy, essential human and government systems, and national security of the United States, and to ensure that any disruptions are infrequent, of minimal duration, manageable, and cause the least damage possible. The implementation of this policy will include establishment of a voluntary public-private partnership that involves corporate and nongovernmental organizations.

The order creates the "President's Critical Infrastructure Protection Board" to coordinate federal efforts and

facilitate cooperation with the private sector, state and local governments, academic organizations, and federal agencies. The director of the Office of Management and Budget will oversee the implementation of government-wide policies, principles, standards, and guidelines for the security of executive branch information systems. The Secretary of Defense and the Director of Central Intelligence will perform similar functions for the operations under their respective control. The heads of executive branch departments and agencies are responsible and accountable for providing and maintaining adequate levels of security for information systems under their control.

The newly established board will coordinate outreach to the private sector and state and local governments; academia; and the private sector, particularly businesses involved in telecommunications, transportation, energy, water, health care, and financial services. The board will also assist in the development of voluntary standards and best practices, as well as consult with potentially affected communities and sectors. It will also work on policies and programs related to information sharing; incident coordination and crisis response; recruitment, retention, and training of security professionals for the executive branch; research and development; law enforcement coordination with national security components; international infrastructure protection; legislation; and coordination with the recently established Office of Homeland Security.

The order also establishes the National Infrastructure Advisory Council (NIAC) to advise the president on the security of information systems in banking and finance, transportation, energy, manufacturing, and emergency government services. Thirty members will be appointed by the president and will represent the private sector, academia, and state and local government.

Executive Order 13231 appeared in the October 16, 2001, Federal Register (V. 66, No. 202, pp. 53063-53071). Copies of the Federal Register can be found in any federal repository library or on-line at www.access.gpo.gov.

from: Natural Hazards Observer, v. 26, no.3, p. 5-6.

Building a Safer World Foundation Established

The International Code Council (ICC), a nonprofit organization dedicated to developing a single set of national model building codes, has established the "Building a Safer World Foundation" to support its mission to protect lives and property through safer building construction. The foundation will enable the ICC to expand its charitable offerings of education, disaster relief, and research related to the building industry.

The foundation will sponsor International Building Safety Week, promote national awareness of building safety through public education, serve as a resource for building safety information, promote the use of building regulations that serve the public interest, and enhance training and education in the safe and appropriate use of building materials

and methods.

For further information about this new foundation, contact William J. Tangye, ICC, 5203 Leesburg Pike, Suite 600, Falls Church, VA 22041; (703) 931-4533; www.intlcode.org.

from: Natural Hazards Observer, v. 26, no. 3, January 2002, p. 11.

Gender and Disasters

Many experts and practitioners in the development and disaster reduction arena seem to agree that a focus on gender is a key ingredient of successful community development and disaster management programs. There is no doubt that the absence of gender awareness on the part of project planners can explain why some community development and disaster prevention initiatives fail, in spite of substantial investments of time and money. Following natural disasters, most assistance is directed toward providing roofs or food or controlling disease epidemics. This is, of course extremely important. However, gender-based mitigation responses can also help in the reconstruction of a healthy social fabric and increase the community's resilience. Gender-tailored actions are just as important during complex disasters, such as the displacement of large segments of the population, which fosters an increase in domestic violence and alcoholism.

There is an urgent need to bring this approach closer to all involved actors, local NGO's and government agencies. One way to do this is to make information available from anywhere, to anyone through free web-based services such as those offered by CRID.

The Regional Disaster Information Center (CRID) has assembled an international collection of documents on their web site: <http://www.crid.or.cr/>. [*Editor's note: the home page is in Spanish; click on the "English" button to get to the English-language version.*] To access these documents, click on "Other topics of interest" on the right hand side of the home page. Do you have other documents on gender and disasters to add to this collection? Please send them to CRID at Apdo. 3745-1000, San Jose, Costa Rica.

from: Disasters---Preparedness and Mitigation in the Americas, issue no. 85, October 2001, p. 1, 3.

See also: Websites for the ISDR "Environmental Management and the Mitigation of Natural Disasters: A Gender Perspective" conference reports, on p. 29 of this issue.

Canadian Centre for Emergency Preparedness

The creation of Canada's Centre for Emergency Preparedness and Response has brought together activities and information that range from laboratory safety to counterterrorism. The Centre is devoted to the promotion of disaster management to individuals, communities and organizations, in both government and the private sector, with the aim of reducing the risk, impact and cost of natural, human-induced and technological disasters. CCEP's objectives are to raise awareness of the increasing risks of disasters, pro-

mote the need for sound disaster management practices and disseminate information on the availability of professional expertise and resources, including technology. CCEP's web site offers a wide variety of information on disaster management principles and practices, education and training, and research results. The Centre is also actively involved in the surveillance of international disease outbreaks and in medical intelligence. Visit the web site at www.ccep.ca.

from: Disasters---Preparedness and Mitigation in the Americas, issue no. 85, October 2001, p. 3.

New Guide on Labs and Blood Banks in Disaster Situations

Emergencies and disasters require a quick and opportune response from the health services. Recent disasters in Central America, such as the 1998 hurricanes Mitch and Georges or the earthquakes in El Salvador earlier this year (2001), strengthened the need to integrate public health and clinical laboratories and blood banks into health sector disaster contingency plans.

This guide, published by PAHO/WHO, seeks to sensitize and guide health authorities, and directors and technicians of laboratories and blood banks in the identification of responsibilities and functions of these services in disaster situations, based on priorities, needs and the capacity of the local immediate response. The incorporation of disaster mitigation and vulnerability reduction measures and the reorganization of health services into contingency plans will allow a better response by the health sector in a disaster.

Web users can download a full-text copy of this guide at <http://www.paho.org/Spanish/HSP/HSE/laboratorios.htm> (available only in Spanish).

from: Disasters---Preparedness and Mitigation in the Americas, issue no. 85, October 2001, p. 6.

Call for Papers: 2002 ASPEP Journal

The American Society of Professional Emergency Planners (ASPEP) needs articles and papers discussing new ideas in emergency management for the November 2002 edition of the organization's peer-reviewed journal. Papers should be 1,500 to 4,500 words, formatted in Microsoft Word, if possible, and submitted via e-mail (preferred) to bbinder@myexcel.com or on a computer disk. Papers are due by *June 15, 2002*. Authors of selected papers will be notified by July 15. For more information, contact Bruce Binder, (503) 590-2953; e-mail: bbinder@myexcel.com.

from: Disaster Research 359, December 21, 2001

The Partnership for Public Warning (PPW) is being formed to improve public warning systems in the United States (<http://www.partnershipforpublicwarning.org/>)

Disaster warnings, response, and losses are issues having primarily local impact, but a properly functioning national infrastructure to enable the generation and delivery of timely warnings and critical information is a national

responsibility. To be effective, a public warning system must combine the efforts of government at the federal, state and local levels; businesses, including manufacturers, and service providers; and the media.

The Partnership for Public Warning seeks to add value to the work of so many different people and organizations involved with emergency warning and information. Our goal is to foster better coordination and cooperation through consensus on what could and should be done, how it can be phased in with existing systems, and what standards should apply. We need to develop a coherent framework where all the diverse stakeholders can contribute their expertise and have it work well with others. In this way, business will be better able to seek and evaluate business opportunities to provide disaster information.

Additional information about the national need for an organization such as PPW and particular issues and concerns is available on this site.

Center's 2001 Annual Report Available

The Natural Hazards Center's 2001 Annual Report is now on the Center's web site. The report details the Center's activities, publications, information programs, research initiatives, and more during fiscal year 2000 to 2001. The document is available in hypertext format at <http://www.colorado.edu/IBS/hazards/annrpt/01annrpt.html> and PDF format at <http://www.colorado.edu/IBS/hazards/annrpt/01annrpt.pdf>.

from: Disaster Research 360, January 22, 2002

NASA's Newest Web Site Features Natural Hazards Images

A new web site offers a unique view of worldwide natural hazards events. The National Aeronautics and Space Administration's (NASA) newest addition to its Earth Observatory section features satellite images-in near real time-of five types of hazards: wildfires, severe storms, floods, volcanic eruptions, and major air pollution events (dust storms, smog, and smoke). Future categories may include earthquakes, coastal erosion, and landslides. An icon highlights each current hazard on a world map.

Selecting an icon brings up the fast-loading image and a brief explanation of the potentially hazardous event. The web site, located at <http://earthobservatory.nasa.gov/NaturalHazards/>, is managed by the Earth Observing System (EOS) Project Science Office and funded by NASA's Earth Science Enterprise, a long-term research program investigating how human-induced and natural changes affect the global environment. Images are freely available to the public, educators, and the news media. NASA hopes sharing these images will increase understanding of natural events that could be dangerous to human populations, will help everyone visualize where and when natural hazards occur, and will possibly help mitigate effects.

from: Disaster Research 360, January 22, 2002

Risk Assessment Tools for Diagnosis of Urban Areas Against Seismic Disasters (RADIUS)

A report evaluating the impact of the Risk Assessment Tools for Diagnosis of Urban Areas Against Seismic Disasters (RADIUS) project is available on the ISDR web site at <http://www.unisdr.org/unisdr/Revaluationreport.htm>. RADIUS evaluated risk and potential damage from earthquakes in nine case-study cities, then prepared action plans the cities could implement to reduce risk. This report evalu-

ates if and how each city implemented the action plan, the implementation process used, and the city's success in promoting seismic risk reduction and raising of public awareness. Results suggest cities started some implementation based on available funding, widely disseminated results throughout city government and the public sector, and significantly raised awareness of earthquake risk.

from: Disaster Research 360, January 22, 2002

NEW TSUNAMI MITIGATION MATERIALS

(see page 2 for ordering instructions)

- Dengler, L. A., 2001, Impacts of the June 23, 2001 Peru tsunami [abstract]: *Eos (American Geophysical Union Transactions)*, v. 82, no. 47, Supplement, p. F923.
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- Servicio Hidrografico y Oceanografico de la Armada de Chile, 2000, Como sobrevivir a un maremoto--11 lecciones del tsunami ocurrido en el sur de Chile el 22 de mayo de 1960: Servicio Hidrografico y Oceanografico de la Armada de Chile, 14 p.
- Tappin, D. R.; McMurtry, G. M.; Matsumoto, Takeshi, 2001, Relationships between sea bed morphology, chemosynthetic biota and fluid flow in the source area of the 1998 Papua New Guinea tsunami [abstract]: *Eos (American Geophysical Union Transactions)*, v. 82, no. 47, Supplement, p. F431.
- Terrinha, Pedro; Pinheiro, L. M.; Matias, L. M.; and others, 2001, A multidisciplinary approach for the investigation of tsunamigenic and seismogenic structures--The source for the 1755 Lisbon earthquake [abstract]: *Eos (American Geophysical Union Transactions)*, v. 82, no. 47, Supplement, p. F916.
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- Witter, R. C.; Kelsey, H. M.; Hemphill-Haley, Eileen, 2001, Pacific storms, El Nino and tsunamis--Competing mechanisms for sand deposition in a coastal marsh, Euchre Creek, Oregon: *Journal of Coastal Research*, v. 17, no. 3, p. 563-583.

A. NEWS

CREW workshop, Seattle, WA., Nov. 27-28, 2001

"What Businesses Learned from the Nisqually Earthquake of February 28, 2001," the CREW (Cascadia Regional Earthquake Workgroup) conference, was a well-planned and well-run program, with an excellent variety of speakers and topics, giving breadth and depth to the subject.

Several themes were repeated in many of the talks: do *one* multi-hazard mitigation plan rather than many mitigation plans; emergency drills work if they are practiced often enough; each person and each business needs to be responsible for themselves for 3-6 days after a disaster hits.

It was pointed out that the public is being inundated with messages to be prepared for terrorists, to be prepared for floods, and to be prepared for earthquakes...all from different sources. It is a daunting prospect to feel that a different plan is needed for each type of situation that could be encountered. It would be more reassuring, more effective, and less stressful if the public got the message that being prepared for one type of emergency usually means they're prepared for all types. Disaster impacts are much the same no matter what the specific cause.

Another message was the need for more public education about what both citizens and businesses can expect from government agencies and how soon. Currently, the public expects immediate help with everything, without realizing that staffing and budget cannot possibly meet such expectations, particularly in the first 3 to 6 days after a disaster when critical services will be overwhelmed.

Businesses reported that after the Nisqually earthquake, employees' first concern was their families' safety. Businesses must allow time for employees to contact or find family members, before business recovery can begin, with employees' full concentration. However, the speakers reported that employees dealt with the disaster trauma better if allowed to continue their normal work as soon as was safely possible.

Businesses were told to prepare pre-existing conditions documentation to speed insurance and FEMA claims. Individuals also need to do household inventories, with copies of important documents, to be held in a secondary location, in case the originals are destroyed in the disaster.

CREW is an association of members of the local infrastructure: scientists, academics, government agencies, public utilities, and businesses. Its goals are: to promote efforts to reduce the loss of life and property; to conduct education efforts to motivate key decision makers to reduce risks associated with earthquakes; and to foster productive linkages between scientists, critical infrastructure providers, businesses and governmental agencies in order to improve the viability of communities after an earthquake event. Its homepage is <http://www.crew.org/index.html>. (See page 22 for the Executive Summary by Barry McDonnell.)

Financial Assistance Programs

When a disaster strikes, businesses are often in need of assistance to finance rebuilding and resume operations. The U.S. Small Business Administration Disaster Assistance Loan Program (<http://www.sbaonline.sba.gov/disaster/>) offers loans to those trying to rebuild businesses and homes. Disaster loans from SBA are available to help fund rebuilding for businesses of all sizes as well as homeowners, renters, and nonprofit organizations. SBA's disaster loans are a "critical source of economic stimulation in disaster ravaged communities, helping to spur employment and stabilize tax bases."

The Farm Service Agency (FSA) (<http://www.fema.gov/fema/farmhome.htm>) provides emergency loans where property loss or economic injury occur due to a natural disaster that affects farming, ranching or aquaculture operations.

Congress Approves SBA Pilot Program

Congress recently took a step forward in disaster mitigation by funding a Disaster Mitigation Pilot Program for the Small Business Administration (Public Law 106-24; 113 STAT.39). Signed into law on April 27, 1999, the legislation guarantees loans "to enable small businesses to use mitigation techniques in support of a formal mitigation program established by the Federal Emergency Management Agency." It sets aside \$15 million for fiscal years 2000 through 2004, and requires a report on the program's effectiveness be submitted to Congress in 2003.

Copies of the legislation can be obtained from any federal repository library or via the Internet at <http://thomas.loc.gov>. Further information about the program can be obtained from your local Small Business Administration servicing office (phone book, Government Pages - Federal) or via the Internet at <http://www.sba.gov>.

from: Natural Hazards Observer, July 1999, p. 6

B. PUBLICATIONS

Disaster-Induced Employee Evacuation

The final volume in sociologist Tom Drabek's disaster evacuation trilogy: *Disaster-Induced Employee Evacuation* is now available (Monograph #60, 1999, 270 pp.).

Released July 1 by the Natural Hazards Center, *Disaster-Induced Employee Evacuation* asks the fundamental question: When people are at work and they learn that disaster is imminent, what are their responses? To find answers, Drabek interviewed 406 employees of 118 businesses and 23 emergency managers following seven disasters involving hurricanes or flooding. He documented employee information sources, judgments, and actions, and, in so doing, discovered that many businesses were ill-prepared to provide the guidance their employees expected or needed. Thus,

many employees experienced stress because of inadequate managerial leadership and acute tension because of conflicting demands between work and family. Collectively, Drabek's findings suggest that business owners must make significant investments in disaster preparedness or risk significant costs in both material losses and employee morale and effectiveness.

Not only does Drabek examine numerous dimensions of employee evacuation behavior, he also surveys the effects on that behavior of various event characteristics, organizational size, and organizational mission. He then develops models to explain and predict evacuation behavior and risk perception.

Finally, Drabek identifies specific policy gaps that must be addressed to improve business and employee response to impending disaster and offers suggestions for future research that would both clarify and improve that process. He concludes with an "Action Agenda," in which he calls for employee initiatives to improve business preparedness, employer audits of current practices and resources, and promotion of disaster planning throughout the business community by local emergency managers.

Disaster-Induced Employee Evacuation, Monograph 60, costs \$20.00, plus postage; copies can be ordered from the Publications Clerk, Natural Hazards Research and Applications Information Center, Campus Box 482, University of Colorado, Boulder, CO 80309-0482; (303) 492-6819; fax: (303) 492-2151; e-mail: jclark@spot.colorado.edu.

from: Natural Hazards Observer July 1999
(<http://www.colorado.edu/hazards/o/julyo99/julyo99a.htm#drabek>)

Paper Reviews Corporate Role in Disaster Reduction

A research paper just published on the Internet focuses on the little -- if ever -- studied topic of a corporation's role and responsibility in reducing natural disasters. The 84-page report is a first attempt to research and document the private sector's role in international development and disaster reduction. As such, it discusses many aspects of corporate social responsibility (CSR) programs in reducing natural disasters around the world, especially in developing countries. *Corporate Social Responsibility and Disaster Reduction: A Global Overview* reviews opportunities and challenges of CSR in disaster reduction, presents evidence of global CSR efforts, and contains six CSR case studies. In the end, collaborative CSR programs among private, public, and non-profit sectors are little understood, rarely put into practice outside of North America, focus on immediate unsafe conditions rather than underlying causes of the events, and are hampered by corporate profit goals and philosophical differences.

This paper is one of the first published from a research project that is managed by the Benfield Greig Hazard Research Centre at University College London and funded by the Department for International Development. The project aims to understand the extent, nature, and potential

of CSR in natural disaster reduction, especially in developing countries. Further studies of CSR in Bangladesh, India, Nepal, Pakistan, and Sri Lanka have just begun. For a PDF copy of the research paper, go to Benfield's web site at <http://www.bghrc.com> and select Disaster Management. Send any comments to John Twigg, Project Manager; e-mail: j.twigg@ucl.ac.uk.

from: Disaster Research 358, December 5, 2001

FEMA Issues Second Report on Costs and Benefits of Mitigation

American businesses are increasingly recognizing that, while they cannot prevent natural disasters, they can prevent many of their impacts, including business interruption, lost production, and lost supplies. In an effort to highlight successful mitigation efforts by businesses, FEMA recently issued *Protecting Business Operations: Second Report on Costs and Benefits of Natural Hazard Mitigation* (FEMA 331, 1998, 41 p., free).

With competitive markets, tight overhead, and slim profit margins, losses due to natural hazards can make the critical difference in a business' ability to maintain profitability, or even survive. Fortunately, mitigation is a cost-effective method to reduce or prevent losses, especially when it is integrated into the way a business operates. This report provides 10 case studies of successful mitigation in the private sector, including the programs of Warners Bros. Studios, Bell-South, Hewlett-Packard, and other businesses that have taken an active role in preventing business losses from disasters.

Copies of the report can be requested from FEMA Publications Distribution Facility, PO Box 2012, Jessup, MD 20794-2012; (800) 480-2520 and is also available electronically, online at www.fema.gov/library/haz_pbo.pdf (50 p.)

from: Natural Hazards Observer, May 1999.

Professional Practices for Business Continuity Planners <http://www.dr.org/ppcont.htm>

DRI International, an organization specializing in education for business continuity and disaster planning, has placed an entire manual--*Professional Practices for Business Continuity Planners*--on-line at this URL. The document includes "subject areas" covering project initiation and management, risk evaluation and control, business impact analysis, developing business continuity strategies, emergency response and operations, developing and implementing business continuity plans, awareness and training programs, maintaining and exercising business continuity plans, public relations and crisis coordination, and coordination with public authorities. Each subject area provides a description of the area, information on the role of the professional, and an outline of the knowledge a professional should possess within that area.

from: Natural Hazards Observer, March 1999, p. 10, also available at <http://www.colorado.edu/hazards/o/maro99/maro99b.htm#netpage>

Disaster Resistant Business Scorecard

To get a copy, contact your state or local emergency management agency, or FEMA Region 10 at (425)487-4600

Top 10 Damage Prevention Strategies for Surviving the Unexpected

To get a copy, contact your state or local emergency management agency, or FEMA Region 10 at (425)487-4600

FEMA's Standard Checklist Criteria For Business Recovery

The intent of this "Checklist" is to provide a means of creating a "Business Recovery" manual for your business. The manual would be used by you in the event that you had to execute a recovery of your business due to a natural or man-made disaster. This "Checklist" can be used by manufacturers, corporate offices, retailers, utilities or any organization where a sizeable number of people work or gather.

Whether you operate from a high-rise building or an industrial complex; whether you own, rent or lease your property; whether you are a large or small company; the contents of this checklist will apply.

To begin, you needn't have in-depth knowledge of emergency management. What you need is the authority to create a plan and a commitment from the chief executive officer or principal(s) of your company to make emergency management part of your company culture.

If you already have a plan, use this "Checklist" as a resource to apply business controls to the plan, if needed, or to assess the overall readiness and maintenance of your plan documentation.

The "Checklist" is presented in four sections:

- * LEVEL 1: Executive Awareness/Authority
- * LEVEL 2: Plan Development and Documentation
- * LEVEL 3: Management and Recovery Team Assessment and Evaluation for Effectiveness
- * LEVEL 4: Management and Recovery Team Assessment of Readiness and Plan Maintenance

Available online at <http://www.fema.gov/ofm/brecov.htm>

Open for Business Toolkit: A Disaster Planning Toolkit for the Small Business Owner

"*Open for Business: A Disaster Planning Toolkit for the Small Business Owner*" was developed by IBHS and the U.S. Small Business Administration to help control the possible impacts of a natural disaster. This kit helps owners assess risk for a variety of natural disasters, conduct a business impact analysis, and develop a recovery plan.

The *Open for Business* brochure is available in PDF format at http://www.ibhs.org/business_protection/.

FEMA's Online Library

These titles, plus many others, are available from the library's website at <http://www.fema.gov/library/lib07.htm>: *Business and Industry Guide For Emergency Management*; *Checklist for Emergency Preparedness*; *Emergency Management Guide For Business and Industry*; and *Financial Preparedness*

FEMA Publications

Visit FEMA's internet site at www.fema.gov or contact the FEMA Publication Warehouse (1(800) 480-2520) for the following publications:

- * "Emergency Management Guide for Business and Industry, FEMA 141
- * "Disaster Mitigation Guide for Business and Industry, FEMA 190
- * "Reducing the Risks of Nonstructural Earthquake Damage, FEMA 74
- * "Emergency Safety Checklist, FEMA 46
- * "Family Disaster Supplies Kit, FEMA L-189

Not Business As Usual: Emergency Planning for Small Businesses VIDEO

Sponsored by CREW, 2001

Prepared for Utah with Project Impact partners, about multi-hazard preparedness in the business community, with good advice for small and medium-size businesses. This video is a thorough discussion of all the issues businesses need to consider when making emergency plans. It also discusses employee CERT training to aid personal survival for the first three days after any disaster. Included is the website for the downloadable *Business Manual for Emergency Preparedness*. Recommended for Chamber of Commerce and business safety meetings.

(*Editors' note:* TsuInfo has a lending copy. See video reservation, page 34.)

Business Continuity Planning and HAZUS, by Wayne Brown, Wells Fargo & Company, EQ, Summer 2001, p. 4-6. Available online at: <http://www.wsspc.org/pubs/news/eq2001summer.pdf>

* EQ (Earthquake Quarterly, published by the Western States Seismic Policy Council)

* (HAZUS: The FEMA HAZUS loss estimation methodology is a software program that uses mathematical formulas and information about building stock, local geology and the location and size of potential earthquakes, economic data, and other information to estimate losses from a potential earthquake. <http://www.fema.gov/hazus/hazus2a.htm>).

Encyclopedia of Disaster Recovery, Security, & Risk Management, by Tari Schreider. First edition, 1998; Crucible Publishing Works, Atlanta, GA. 276 p. with index.

C. WEBSITES

<http://www.crew.org/mitigation/busmit.html>

Steps to Make Your Business Earthquake Resistant
highly recommended

<http://web.mit.edu/security/www/pubplan.htm>

MIT Business Continuity Plan (sample business contingency plan)

<http://www.trauma-pages.com/pg5.htm>

Business Continuity after a Disaster websites

* *Disaster Resource Guide* at <http://www.disaster-resource.com/> Online information includes articles and other resources to facilitate business continuity after a disaster.

* *Disaster Recovery Journal* at <http://www.drj.com/> Articles, products, subscription information, and links to other sites specializing in disaster contingency planning.

* Global Continuity at <http://www.globalcontinuity.com/> "A global portal for business continuity management"--extensive site has news and services.

* Rothstein Catalog on Disaster Recovery at <http://www.globalcontinuity.com/> Online catalog of videos and other products of particular interest to the disaster recovery industry.

<http://disastercenter.com/abrgoals.htm>

Business Continuity Planning Preparation for Disasters (List of books, manuals, handbooks). Has links to:

- * Preparing for Disaster (given below)
 - * Procedures for Disaster
 - * Facility planning for Disaster
 - * Telecommunications and Computers in Disasters
 - * Insurance and Disaster
 - * Community Right to Know
 - * Other Disaster Books
 - * Standard Checklist Criteria for Business Recovery
- "Preparing for Disaster" has links to each individual title for more information:
- * *Business Continuity Planning: A Step-by-Step Guide with Planning Forms & Diskette*, by Kenneth L. Fulmer; ring-bound, 1999
 - * *Contingency Planning and Disaster Recovery: Protecting Your Organization's Resources*, by Janet G. Butler, Poul Badura, paperback, 1997
 - * *The Definitive Handbook of Business Continuity Management*, by Andrew Hiles, Peter Barnes; 1999
 - * *Disaster Preparedness: Simple Steps for Businesses*, by Julie Freestone, Rudi Raab; 1998
 - * *Effective Succession Planning: Ensuring Leadership Continuity and Building Talent from Within*, by William J. Rothwell; 1994
 - * *Emergency and Disaster Planning Manual*, by Laura G. Kaplan; 1996

* *Emergency Exercise Handbook Evaluate and Integrate Your Company's Plan*, by Tracy Knippenburg Gillis, 1999

* *Emergency Management Planning Handbook*, by Geary W. Sikich, 1995

* *Emergency Planning and Management: Ensuring Your Company's Survival in the Event of a Disaster*, by William H. Stringfield, 1995

* *Emergency Planning for Industrial Hazards--* European Conference on Emergency Planning for Industrial Hazards, 1989

* *Exercise Planning and Evaluation, Disaster Drill Today*, by Lavalla, 1991

* *500 Vital Points to Ensure Foolproof Contingency and Disaster Resumption Plans*, by Contingency Planning & Recovery Institute Consulting Staff, 1995

* *How To Prepare Critical Business Process Contingency and Contingency Planning*; ring-bound, 2000

* *Is Your Business Ready for the Next Disaster?*, by Douglas M. Henderson, 1997

* *The Leadership Moment: Nine True Stories of Triumph and Disaster and Their Lessons for Us All*, by Michael Useem, 1999

* *Lessons from Disaster: How Organizations Have No Memory and Accidents Recur*, ed. by Trevor Kletz, 1993

* *Total Contingency Planning for Disasters: Managing Risk...Minimizing Loss...Ensuring Business Continuity*, by Kenneth N. Myers

<http://www.acp-international.com/drba.html>

Disaster Recovery Business Alliance - Overview

Public sector emergency authorities, utility service providers, emergency medical teams and other first responders have well developed emergency response procedures, and they generally coordinate well with disaster relief organizations. However, the recovery of essential commerce and trade is traditionally left to chance, market forces, or ad hoc liaisons created in the chaotic aftermath of the event. Quick and coordinated recovery of basic commercial networks --electric and other utilities, food and water distribution, telecommunications, financial services, transportation and fuels, and broadcast media--is the key to timely recovery of other businesses, the viability of neighborhoods, and the continuity of government.

Businesses play a key role in both the Disaster Resistant Community and Showcase Community programs. The reasons are clear. If businesses do not survive a disaster, people are out of work, a community's revenue stream is severely disrupted, and the impact prolongs the recovery process. An increasing number of communities are examining the feasibility of establishing a "business recovery alliance." The objective is to bring together the leadership and expertise of business, emergency preparedness, the engineering and scientific community, and others to develop a public/ private partnership approach to reducing the vulnerability of businesses and the community's marketplace to

flooding, tornadoes and severe weather, earthquakes and other hazards.

A Disaster Recovery Business Alliance (DRBA) offers a tested model to assist local leaders in forming and facilitating a lifeline-based planning organization to serve a local community. It was established and funded by the Electric Power Research Institute (EPRI) and co-founded by the Department of Energy and the Association of Contingency Planners (ACP). DRBA has formed partnerships with many public and private sector organizations such as the Central United States Earthquake Consortium (CUSEC), National Emergency Management Association (NEMA), the Institute for Business and Home Safety (IBHS), and many others. The purposes of a (DRBA) include:

- * Before emergencies, to provide a forum within which local leaders and planning experts can identify and mitigate risks to essential channels of commerce serving the community and surrounding counties. In addition to this basic planning, the DRBA may develop unique shareable expertise related to a particular earthquakes, tornadoes, ice storms or floods.

- * Before, during, and following emergencies, to provide members with access to proven and emerging technologies in support of loss mitigation, disaster monitoring, geographic information applications, and sustainable energy and communications.

- * During and following emergencies, to accelerate socio-economic recovery through coordinated exchange of status and resource information between business members, public sector emergency authorities, and Volunteer Organizations Active in Disasters.

Several years ago, an initiative was conceived by the three founding directors of the current Disaster Recovery Business Alliance program to provide a means to get the private sector involved in a relationship with the public sector to focus on the economic sustainability of a region or community when hit by a major disaster. The three co-founders, the Electric Power Research Institute (EPRI), the Department of Energy (DOE) and the Association of Contingency Planners (ACP), formally started the initiative. Since 1995, EPRI has provided exploratory research funds and program dollars in support of the project. Since the initiation of the DRBA program, several other initiatives of a much broader scale have been established. Two prominent initiatives are the Disaster Resistant Community program driven by the Federal Emergency Management Agency (FEMA) and another is the Showcase Community driven by the Institute for Business and Home Safety (IBHS). Both these programs have a need for the DRBA concept to meet their goals and objectives. Because of common terminology and shared objectives, the DRBA concept is often viewed as being the same thing as these other two programs and not as a key element of them for achieving their broader objectives.

For the complete report, go to <http://www.acp-international.com/drba.html>

<http://webcenter.hp.com/brma/>

The Business Recovery Managers Association (BRMA), located in the greater San Francisco Bay area, is devoted to the advancement of the theory and practice of business recovery planning, disaster recovery planning, and emergency response management.

BRMA provides an environment where members can keep informed about the latest trends and technologies available in recovery planning and emergency response. BRMA members are recovery professionals in the private and public sectors. Members receive educational and professional development opportunities and a forum in which to share experiences, to resolve common problems and to address common needs.

BRMA's focus is in Northern California. Most of their more than 175 members are in the extended San Francisco Bay Area. They meet in various locations throughout the greater Bay Area.

<http://www.wa.gov/wsem/3-peet/pubed/business-prep/business-prep-idx.htm>

Business Preparedness (Washington State Emergency Management Division) (Note: reports are available in both PDF and MSWord)

- * *Emergency Preparedness for Business--What to Do after the Shaking Stops.*

- * *Preparedness is the Key to Business Survival*

- * *Prepare Your Office*

- * *How to Return to Work Safely*

<http://www.ibhs.org>

<http://www.ibhs.org/ibhs1197/html/informationcenter.htm>

The Institute for Business and Home Safety (IBHS) Information Center has a large collection of books, periodicals, videos, slides, and other resources regarding the mitigation of natural hazard damage to structures. These materials are available on loan to members, associate members, and the general public. The subject areas of the IBHS collection include: Insurance and Natural Disasters, Business Interruption, Disaster Preparedness, Retrofitting Structures, Building Codes, and Emergency Management. The information center can also research questions concerning all of these areas and provide information via e-mail, phone, fax, or postal mail. The IBHS Web site now includes a searchable *Annotated Planning and Hazards Bibliography* at the second URL above.

from: Natural Hazards Observer, 1999

<http://mceer.buffalo.edu/infoservice/bibs/bibmay96.asp>

Disaster Preparedness for Businesses, A bibliography prepared by Marsha Flett for the MCEER Information Service News May 1996

OPINION: PROJECT IMPACT IS ONLY ONE STEP IN A LONG PROCESS

by

Robert F. Shea, Acting Administrator,

Federal Insurance and Mitigation Administration, Federal Emergency Management Agency

(originally published as a letter to the editor in *Natural Hazards Observer*, v. 26, no. 2, p. 4, November 2001.

Reprinted with permission. Issue is also available online at <http://www.colorado.edu/hazards/o/novo01/toc.htm>)

"Community participation is essential in creating an enduring culture of hazards awareness and responsibility"

What saved Seattle during the February 28, 2001, Nisqually earthquake? About 30 miles of dirt and rock, a bit of luck, a decades-long practice of building code adoption and enforcement, and significant community involvement.

While the 1994 Northridge, California, and 2001 Nisqually, Washington, earthquakes had similar magnitudes (6.7 and 6.8, respectively), the greater depth of the Washington shock (52 km) resulted in more moderate surface intensities over a wider area than the shallower (18 km) California event. Had an event of similar magnitude occurred on a shallower fault, closer to Seattle, the consequences would have been an order of magnitude greater than the approximately \$2 billion currently estimated. Had the historic Pioneer Square and Sodo districts (sites of many pre-1950 unreinforced masonry parapet collapses) not been cordoned off following the Mardi Gras riots that had occurred just days earlier, casualties would have been significantly higher as well.

In many ways, Seattle was already a leading example of community earthquake mitigation. Prior to the 1949 magnitude 7.2 Olympia earthquake, few structures had been built to resist strong seismic forces. The 1949 shock resulted in the strengthening of building ordinances and the adoption of the Pacific Coast Building Officials Code (later replaced by the Uniform Building Code) by the state legislature in 1950. It is important to note that until the 1970s, both California and Washington were classified in the same seismic zone (UBC Zone 3). Changes to the building code brought about by experience in the California earthquakes affected construction practice in both Washington and California. As a result, newer construction performed within the life-safety design specifications given the moderate levels of ground motion experienced last February. Many older, nonresidential structures benefitted from requirements enacted 30 years ago for substantial renovations to include seismic upgrades.

Stricter seismic standards for post-1980 bridges, and an active upgrade and repair program by the Washington Department of Transportation, limited the majority of significant damage to a few pre-1980 structures that were scheduled for replacement at the time of the earthquake. All of these examples represent the successes of long-term incremental changes toward seismic safety in the Puget Sound area.

The Nisqually earthquake was both a confirmation and a wake up call. While it served to reinforce many of the lessons learned from prior earthquakes, both here and abroad, and demonstrated the value of mitigation, it also raised some questions. Are we better prepared for the next earthquake? While the building structures performed well given the levels of ground shaking, significant nonstructural damage occurred in buildings of all types and ages—demonstrating our continued vulnerability to these kinds of losses, which run three to four times the structural losses and pose a threat to life safety. What is clearly needed is design, engineering, and construction practices that take into account all aspects of a building's performance, especially the nonstructural elements.

There is no doubt that the Project Impact prototype raised awareness about the earthquake problem in the Puget Sound area, and that many activities, as described in Bob Freitag's article in the May *Natural Hazards Observer* (v. 25, no. 5, p. 1) will limit future losses. Community participation is essential in creating an enduring culture of hazards awareness and responsibility. But it is important to remember that Project Impact represents one more step in a long-term process, represented by significant state and local investment in building codes and retrofits.

*(Editors' note: Freitag's article was reprinted in *TsuInfo Alert*, v. 3, no. 4, p. 7-8.)*

Editors' Delight!!

The *entire* TsuInfo bibliography-- including **ALL** the tsunami materials we've been gathering for the last 7 years-- is now searchable online! It's all included in our library database at, <http://www2.wadnr.gov/dbtw-wpd/washbib.htm> If you just want to search on the newest materials, you can do that, too!

DO WARNING AND MITIGATION CONFLICT?

A conversation from Cal-EPI, compiled by Lee Walkling
reprinted with participants' permission

"Cal-EPI" is an email community for information officers, journalists and others interested in Emergency Public Information in California and beyond. To subscribe, send email to "Cal-EPI-request@incident.com" with the word "subscribe" in the message body.

Message from Art Botterell, November 5, 2001

I was shocked, awhile back, to encounter the idea that the development of warning systems might actually be in some sort of inherent conflict with the goals of hazard mitigation. The existence of warning systems, this argument seemed to run, tends to seduce people into making high-risk choices on the theory that having warning will allow them to escape predictable losses.

Now, frankly, this struck me as a little silly. Warnings may save lives, but only rarely do they save property... and avoidance of property losses is the economic basis for most mitigation projects. Mitigation and warning projects exist side by side but overlap relatively little, as though they existed in parallel universes.

But the appearance of this notion in a serious academic publication made me wonder, "How is such a profound misunderstanding even possible?" At first I imagined it was just an excess of zeal, a single-minded fixation on mitigation as the answer to every emergency-management problem. But after thinking about recent events, I think the blame has to be spread a little wider than that.

We have, I think, been guilty as a profession of overselling our warning systems. There are lots of incentives for doing so... political pressures, a desire to have our programs seen as effective and relevant, and, frequently, a genuine enthusiasm for the service we hope to provide. And these systems get put to the test infrequently enough that we easily can slip into the same sort of denial about the weaknesses of our systems as the public adopts about infrequent hazards.

So maybe some of these mitigators' reaction against warning systems is just a baby-with-the-bath-water over-response to a very legitimate sense that a lot of those systems have a strong smoke-and-mirrors component... or at least fall far short of public expectations.

And so, once again... and please forgive me for harping on this point, but I really do think it's important... I think we need to broaden our perspective on warning systems. Technology isn't enough. We need to look at the whole cycle, from hazard analysis to long-term outcomes, and measure honestly the overall returns on our warning investments.

When we do that, I believe we'll find that warning can be a legitimate component of emergency management... but only if we engage the whole problem and not just the parts that can be solved by buying hardware.

Response from William Gross, November 5, 2001

This may be true of technological hazards, but less so for natural hazards. While improved construction can miti-

gate the affects of some natural hazards, the need to warn still exists.

The economics of mitigation are not always that easy. I believe that some members of the engineering profession and NWS appeared before Congress after the OKC May '99 Tornado. They were pushing changes in home construction standards that would improve the ability of individuals to survive even if the home sustained major damage. While the cost to each home was minor, under \$1,000 per home, the consensus of those on the Hill being briefed was that for the industry as a whole this was too expensive when the chance of any one home being involved with a tornado was small.

Similarly for technological hazards. For example chemical plants can be better built including more and more levels of safety and redundancy. There will be the ongoing friction between additional cost vs. increased safety. Given an infinite source of money you can built an infinitely safe chemical plant. Since there is no infinite source of money the battle goes on as to what constitutes adequate levels of safety and what is the complementary form of warning. Always trade offs, just have to make sure we make the right ones.

Response from Herb Presley, Disaster Services Officer, Alberta Municipal Affairs, November 5, 2001 (*abridged*)

Let me just say that the major weakness that I have observed in wide area warning systems all over North America, whether based on the EAS/EPWS model of using broadcast media or not, is the reluctance of officials to use them. I have had plenty of opportunity to study many warning systems including the EAS and it seems to me that most persons who are authorized to use them feel they must wait until they see bodies flying through the air before they can "pull the trigger", so to speak. I have noted that this can be attributed to several conservative values. First, the reluctance to make a "big thing about nothing". It's easy to justify alerting (or alarming) a few ten thousand people if the warning is actually followed by a disaster impact--"See, I told you it was going to happen...." but most, I find, are reluctant to use a warning system when it should be used--when there is a threat that may or MAY NOT result in a disaster impact. Our national weather people who have access to the system are constantly faced with this scenario. They handle it very well, but local government officials--many of them concerned about their image in a smaller community--do not.

Second, the tendency of the human mind to discount the severity of what might occur, right up to the moment of impact in many cases. "Don't worry--it's probably going the other way....." I find that people, when faced with a poten-

tial threat that could result in a devastating disaster, tend to deal with such an experience that falls outside their personal experience, by pretending that it won't or couldn't be as serious as it seems.

Third, the tendency of officials is to let the news media handle information related to high profile events. When I took a tour in one of the US States located in tornado alley, I had the opportunity to ask if, during a particularly devastating event, the EAS had been used to warn people (I believe over 70 people died in total), to which the response was that the local TV stations had started tracking the storm(s) long before they hit the area and therefore the EAS wasn't needed, since everybody already knew about it. Not to hold this example up as the only fault--we have experienced similar stories here in Alberta, where the EPWS wasn't used because the "media was right on top of it". However, news media reporting requires someone other than the source of the warning to write the story, and in many instances officials do not get to give totally accurate information since it is coming through a secondary source.

In any case, I want to say that I enjoy the discussions held on warning systems from time to time in this discussion group. I hope this contribution is helpful.

Response from Art Botterell, November 13, 2001

Right on, as usual. There's a pervasive fear of warning, and perhaps too little fear of not warning. Maybe the problem has to do with unclear expectations.

Medical professionals, for example, have explicit "standards of care" that specify what they're expected to do and when. Without those standards they'd be in constant fear of being sued for every decision they make. Having a standard doesn't eliminate that stress, of course, but at least it gives them half a chance of getting through the night with their careers and finances intact.

With only a few exceptions, public and corporate officials responsible for issuing warnings have no such standard to guide them. Not only is there no standard of care for warning, but in many cases there isn't even an unambiguous duty to warn. About the only thing officials can count on is that, whatever they choose to do or not do, they're bound to be criticized by somebody.

So maybe, in addition to a technical and procedural framework for binding our current patchwork of technologies into a coherent national system, we also need some sort of Code of Good Warning Practice that responsible officials can refer to.

Response from Richard A. Rudman, EAS National Advisory Committee Chair, November 13, 2001

Answer to Phil Cogan and others on EAS, and on point to issues Art is raising now.... Phil's Question: Are public safety officials in the continental U.S. afraid to use warning systems for events short of nuclear attack?

Part 11 of the FCC's rules has set in stone that the National level of EAS is designed for one thing and one

thing only. That "thing" is to provide a last ditch link from the President to as large a segment of the population as possible when normal means to reach the public are not available and there is need for communication about a dire emergency. Because National level EAS comes straight out of a World War II heritage, it is the only level of EAS that stations remaining on the air MUST carry.

All other levels of EAS below National participation by broadcasters are by comparison and definition only voluntary. I also serve on the EAS Primary Entry Point Advisory Committee Board of Directors. We have and continue to give FEMA and others at the National level guidance on how to make sure that component is always ready if needed and called upon. Built into the EAS hardware in all participating broadcast and cable outlets is a way to make sure all stations with EAS equipment properly installed will relay specially authorized and secure Presidential EAS messages they receive. The FCC heavily sanctions broadcasters and cable system operators who fail to comply with their basic rules for EAS equipment and operations practices.

Local government comes to the party if invited to participate and they volunteer. In a handful of cases, local government drives the process and involves broadcasters and they volunteer.

At all levels of EAS and all levels of participation, EAS has not solved what we might call "Warning Avoidance" or "Warning Constipation" Fact of Life: There are greater fears than the immediate emergency for many if not most emergency managers and politicians that eat up the fleeting clock moments during which a warning will be most meaningful and effective. There also may be hesitation when a broadcast or cable system does receive a warning and decides to forward it, or not. And, not to single out bureaucrats, politicians and emergency managers, we all hesitate a moment when we have to "break the glass."

That's why communications models like EDIS can be effective. The EDIS model can be used every day for "government-to-media" messages that are too important to go the mail or FAX route, but not of a level that constitute a true warning for a clear and present immediate danger to life and property. That every day EDIS tool is in place, tested and ready for the day of the emergency

My favorite model for overall government-to-media communications is the one NASA uses during space missions -- NASA Mission Control. This model has been designed to tell the ongoing unfolding story of an event. When we have an emergency and tell people, "The dam has broken, head for the hills!", you have to then tell people which hills to head for, what roads to take, what to do when they get there, and how long you think they may have to stay. You also have to provide realistic reassurance that someone will either fix the dam, pay for extraordinary damage and/or mitigate by moving those in the path of destruction to new and higher ground.

On 9/11 no one, including the President, had enough good information within what I would call the "warning phase" to have been effective, meaningful, helpful or constructive. Could an EAS activation without the proper elements have added to fears and terror? Answer that one for yourselves.

As Chair of the FCC's EAS National Advisory Committee I will be making recommendations that touch on forming or expanding public/private partnerships (PPP's) that are needed before you can talk in a meaningful way about making EAS, as it is currently flavored, more effective. Going further, the right kind of PPP's must be in place before you can use EDIS-like and NASA Mission Control-like models to complement and supplement EAS.

One footnote: The primary source of EAS warnings and EBS before is NOAA's National Weather Service. The EAS SAME protocol came out of this world and is firmly embedded into EAS. As we journey to what we are calling "advanced warning systems" we will have to work closely with existing key players, especially NWS. Their own embedded mandate to warn people when weather can kill, injure or destroy is perhaps the most clear and straightforward of all federal agencies, and perhaps local ones as well.

Response from William Gross

November 13, 2001

Oh, I don't think it is all that simple. Warnings are a local issue and I don't believe that you can paint the problem with the same brush nationwide. In some parts of the country the commercial broadcasters are belly aching because there are too many warnings issued. In some instances, it is not the emergency manager who makes the decision but some other public safety official. Those cases often happen when an incident commander wants to closely control the message that goes out from his incident... mainly in hazmat incidents when evacuations are required. Incident Commanders in some organizations want such information delivered by on-scene forces. In this case, national guidelines would help convince some of these types that using electronic warning means might be a better tool that door to door notifications.

Then there is the classic case of Galveston in the 1980s and miscommunications between the State EOC and the City. State said "you ought to think about evacuation" when a hurricane was active in the Gulf. City heard only "evacuation" and issued an evacuation order when one was not needed. Here the decision was not held too late, but made too early and the evacuation order was issued. No hurricane arrived.

The threat you need to warn for further complicates the issue. My favorite in North Texas is not quite a warning situation, but the challenge faced by the NWS when predicting freezing precip. The meteorological science is still far from exact, the confluence of several conditions in North Texas make predicting freezing precip very difficult. The poor guys at the NWS get beat up by local broadcast

weather folks when they predict freezing precip and it doesn't. Yet, from the people who have to keep the streets open, they much rather gear up and have it not happen, than get caught behind the power curve.

Unfortunately, it doesn't work that way with the public. Tornado warnings are a difficult beast; you have about 12 minutes warning time according to the NWS. Making the decision to pull the trigger when conditions are damned close to creating a funnel, but not actually doing so is not an easy one. Over warning with no actual event can cause the public to become insensitive to them.

There is a whole universe of problems involved with the warning process. I challenge the assumption that the problem is the same nation wide. There may be some common elements affecting warning issues locally, but there are regional problems as well.

There is also a bigger problem, and that is crafting a message that gets people to do what they need to do when the warnings are issued. If you want to see an example of this just turn on a news broadcast from any Southwestern City in time of flash flooding. There will always be a live broadcast of Fire Departments doing a rescue of someone who has driven into high water. This in spite of all the flash flood warnings and public education.

So, how would you craft a standard of care that included slowly developing events like hurricanes or riverine flooding, against a rapidly occurring event such as a catastrophic failure at a chemical plant or a tornado? You'd have to be able to build one of them there broad tents, but in doing so, would it be so broad as to really do nothing? All questions we'll have to work through in building a better warning system.

Response from William Gross, November 13, 2001

(excerpt)

If you have problems with the way the emergency management community uses the tools, it might be worthwhile to have a good cross section of local emergency managers involved in the next design of the system.

Response from Phil Cogan, APR, Executive Vice President, Bernstein Communications, Inc., November 13, 2001

(excerpt)

... on the one hand you (Richard Rudman) point to EDIS as a great tool for government to media communications, [EDIS IS a great model] and on the other hand you say that on 9/11 government didn't have enough "good" information to have been effective, meaningful, helpful or constructive."

Having lived through that event in downtown Washington I disagree. While they may not have had enough information to tell us if another attack was imminent, they DID have enough information to tell the public things like the status of the Metro subway system (some people walked home 10 to 20 miles because they didn't know or were afraid to use it), the best routes out of DC (if there were any

"best" routes), whether the State Department or other D.C. buildings had been bombed (a rumor that floated around for hours), and so on.

Let's look beyond the events of 9/11. Except for the hurricane, tornado and earthquake prone regions of the country most local officials are afraid to activate EAS, voluntarily, for precisely the reasons that you cite and for precisely the reasons it should be activated... there are many questions and few answers.... But the public doesn't expect ALL of the answers... they expect to hear from those in authority, at least to let them know they ARE in authority. Let all the details come later. EAS, or EDIS, can play an important role in establishing the fact that what little that is known is being shared with the population, and that officials who are charged with dealing with emergencies are doing their job and will report as more information becomes available.

Whether it be EDIS or EAS, local officials have to start communicating sooner than they currently do... because we all know that nature abhors an information vacuum, and that vacuum WILL be filled by one or more probably unreliable sources.

Response from Kevin Farrell, Aberdeen Proving Ground Rescue, November 14, 2001 (excerpt)

Now for an observation....

During the events of September 11th, how did most of us keep up on the developing stories? Most of us were probably glued to the live TV images of the WTC, Pentagon, and Pennsylvania disaster sites from wherever we were at the time.

Once we became aware of the event (by whatever means), most of us tuned into the live feeds. In our EOC, we got the developing information faster by watching CNN than we did through 'official' channels... and I'll bet everyone on this list did the same.

Use the warning system for what it was designed for, that is... to warn. Beyond that, let the media infrastructure take over the informing. If the local EM folks want their particular message to be heard, partner with the media to get

that message out.

As always... the comments expressed here are mine, and not necessarily those of my employer.

Response from Richard A. Rudman

November 14, 2001 (excerpt)

On to an "Advanced Warning System (AWS)! Set top converters and wireless PDA's with imbedded "E Chips" (EAS aware circuitry) are some of the elements I think need to be part of an AWS. The FCC has no control over receiver specs much beyond RF emissions. We need to talk to the Electronic Industry Association (EIA) and other market forces to make our case.

Response from William Gross, November 14, 2001 (excerpt)

In this vigorous, worthwhile discussion, I figure I ought to mention, oh by the way, as Direct Satellite TV and Satellite Radio begin to gain favor, guess what. Even though the technology exists, these new devices are not required to have any EAS overrides. So, we have new systems coming online which will isolate the users from local warnings.

Response from Richard A. Rudman, November 14, 2001

I have brought the issue of satellite delivery services up with the FCC on several occasions. I will continue to raise it. Their only value in the current system, due to the nature of satellite distribution, would be for national warnings. They can do that right now if they wanted to by monitoring any PEP station.

This issue is one more reason (if we need more) for an AWS that does its work out of the program stream. The receivers for such services could have local receivers built in for local EAS, or an input for an external local EAS receiver/decoder.

Remember: The goal is to get people to tune to a source of local news once they are warned.

Oh, yes. In 1 to 3 years we will have IBOC (in Band On Channel) digital for existing AM and FM stations. I have been in contact with the license holder for the technology, Ibiquity, to try to get them on board.

GLOSSARY

AWS	Advanced Warning System; Area Warning System
EAS	Emergency Alerting System
EBS	Emergency Broadcast System (predecessor to EAS)
EDIS	Emergency Digital Information Service (California)
EOC	Emergency Operations Center
EPWS	Emergency Public Warning System (Alberta's adaptation of EAS)
IBOC	In Band On Channel (radio)
NWS	National Weather Service
PEP	Primary entry point
PPP	public/private partnership
PPW	partnership for public warning

CREW WORKSHOP, "WHAT BUSINESSES LEARNED FROM THE NISQUALLY EARTHQUAKE"-- EXECUTIVE SUMMARY

by Barry McDonnell
reprinted with permission

SEISMIC RESTRAINTS PAID OFF: Inexpensive earthquake straps and quake mats saved a lot of equipment and downtime. Seismic retrofits were proven in several companies. *Those who had retrofitted (or built to seismic specifications) couldn't stop talking about how well it paid off.*

CEILING GRIDS AND LIGHT FIXTURES: Many suspended ceilings and light fixtures that weren't seismically restrained dropped, endangering people and sprinkler systems.

SHELVING SECURING & BRACING: Freestanding shelving should be secured to the wall and/or floor. Tall shelving, like in warehouses and warehouse clubs, should be secured to the floor, and from the top, and/or be diagonally braced.

DON'T GET RED TAGGED NEEDLESSLY! Simple nonstructural hazards could red tag a building, even if no significant structural damage occurred.

DISASTER/CONTINGENCY PLANS: Simple is better! *A hospital supervisor said it best... "Our disaster script needs to be rewritten with the highlights on ONE page at the beginning of the plan – we missed the highlights and got lost in the huge volume of words in the plan!"*

EARTHQUAKE TRAINING: Trained employees immediately dropped under desks or tables and hung on ("Drop, Cover & Hold"). They emerged uninjured and ready to help after the quaking stopped.

EMERGENCY DRILLS: Whether fire drills, evacuation drills or disaster testing... **practice, practice, practice:** When a disaster hits, many people go into "shock," so knowing where to go/what to do has to be automatic. *Heard from companies many times... "you can not practice too often!" To be effective, drills must be a mandate of management... and management must participate.*

EXPECTATIONS: Fright and panic are reduced when employees know what to expect. Document what you learned during this quake to advise future employees of things like: how long to expect your building to sway after the shaking stops, what they might expect to hear (creaks, rumbles), how elevators might behave, what it might be like getting home, etc.

TELEPHONE SYSTEM QUICKLY BECAME OVERLOADED: We need to save this resource for emergency calls only for the first 90 minutes after any major event. This means:

- don't use the phone unless you have an emergency,
- don't call 911 to ask "was that an earthquake we just had?", and
- hang up any phones that may have shaken off the hook.

FAMILY NOTIFICATION: Your employees need to let their families know they are OK... but ask them to wait 90 minutes before calling (to accommodate emergency calls). Encourage them to arrange an out-of-state contact for family to call to say they're OK.

PLACEMENT OF BUSINESS CONTINUITY RESPONSIBILITY: *Some businesses shared that they've moved their Business Continuity function to report very high up in the management chain.* This is where it belongs, because it needs senior management clout, and it supports the survival of the entire business. Any Contingency Planner or Business Continuity professional who reports several management layers down will confirm their efforts to be "futile". Their existence may satisfy a regulation of having a contingency plan, but it's unlikely the plan will be understood, tested or effective.

See also

<http://www.crew.org/Papers/nisqually%20lessons.html>
for more information about the CREW workshop.

Earthquake Safety

The U.S. earthquake slogan is *Drop, Cover, and Hold*. It's catchy, easy to remember. However, the British Columbia earthquake wallet card that was given out at the CREW conference in Seattle (Nov. 27 & 28, 2001) gives more thorough advice:

Duck, Count, Aftershocks, Injured, First Aid, and Safe Area.

U.S. CRISIS OFFICIALS SEEK EMERGENCY ALERT SYSTEM

by August Gribbin

The Washington Times, January 22, 2002

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The nation's emergency managers--the specialists who direct efforts to cope with catastrophes--say the country lacks an efficient warning system, and they intend to create one that quickly alerts those in harm's way but doesn't needlessly alarm others. They envision adding to palm pilots, cell phones and other built-in consumer electronics devices that perpetually monitor a warning network and automatically broadcast a bulletin when needed.

"If, for instance, a tornado warning is appropriate to the owner of a radio, it will automatically turn on and transmit the alert. The warning message will give specific information so the person can avoid trouble," said Peter Ward, spokesman for Partnership for Public Warning. Currently, emergency alerts are broadcast over AMS radio and television, which cover very large geographic areas and are only useful to those "listening to radio or television at the time," said Mr. Ward.

Formed last month, the partnership is made up of 120 federal, state and local emergency managers and interested industry representatives such as cell-phone makers and federal agencies including the Federal Emergency Management Administration and the Federal Communication Commission. The McLean-based group has received "a strong endorsement" from the White House, Mr. Ward said.

Inexpensive technology exists for incorporating automatic warning devices in television sets, palm pilots, pagers, regular telephones, cell phones, computers and other consumer products, said Mr. Ward, a former U.S. Geological Survey official and chairman of a White House group studying natural disaster information systems.

What's more, he says, there are entrepreneurs eager to back what they foresee will be a lucrative market for the gadgets. "What's missing are national standards and agreement on formats for collecting and relaying the alerts," Mr. Ward says. Without standards and government involvement, business people have been reluctant to fund warning system ventures, he said.

Few who have studied the issue deny a state-of-the-art emergency alert system is needed. And in fact the need is easy to illustrate:

* In Xenia, Ohio, on April 3, 1974, 30 persons died when a tornado swirled into town. National Weather Service meteorologists had clear radar indications that the tornado would hit, but they had no way to warn the community in time.

* In Richmond, Calif., on March 25, 1999, 600 people were injured when a fire at the Chevron Refinery caused the release of noxious fumes. Telephone warnings failed to alert people in the area who were most at risk, and warning sirens didn't sound until 14 minutes after the gas discharge.

* In Oregon, on Sept. 25, 1999, 6 died and 20 were injured when 42 cars collided on a stretch of Interstate Highway 84. The cars crashed because of swirling dust during a wind-storm. State police were unable to warn highway users heading into the windy area.

A new nationwide system would help prevent such death and destruction, says Mr. Ward. He said the group's mission is especially clear since the September 11 attacks.

See also the Partnership's website at
<http://www.partnershipforpublicwarning.org>.

GRANTS AWARDED

Oregon Showcase State Initiative for Natural Disaster Resistance and Resilience. Funding: Public Entity Risk Institute, 12 months. Contact: André LeDuc, Oregon Natural Hazards Workshop, Community Service Center, 1209 University of Oregon, Eugene, OR 97403-1209; (541) 346-3889; fax: (541) 346-2040; e-mail: crux@darkwing.uoregon.edu; WWW: www.uoregon.edu/~onhw.

On December 12, 2000, Oregon Governor John Kitzhaber signed an Executive Order designating Oregon a "Showcase State for Natural Disaster Risk Reduction." The Showcase State program, a model program created by the Institute for Business and Home Safety (see the *Natural Hazards Observer*, v. 23, no. 5, p. 11), provides a comprehensive framework for government and the private sector to prevent injuries and deaths, protect public and private property, and create a disaster-ready statewide economy through public and private partnerships. The Oregon project will work to create partnerships among communities, private businesses, state agencies, and local governments; create a directory of participants; coordinate the development of regional workshops for Oregon communities, regional organizations, and the public and private sectors; and develop a clearinghouse for dissemination of natural hazards planning, risk reduction, and sustainability information.

A DESCRIPTION OF A COMMUNITY EMERGENCY RESPONSE TEAMS PROGRAM: BAY AREA NEIGHBORHOOD EMERGENCY TRAININGS (BAYNET): EVOLUTION, ROLE, AND PURPOSE

(an excerpt)

by David M. Simpson, Albany Fire Department,
Albany, California

(the full report is at http://www.nertnews.com/bay_net_white_paper.htm; reprinted with permission)

Mission: The mission of BayNET is simple and direct: to seek to provide disaster preparedness education and training for as much of the community as possible. The BayNET mission statement, developed in September of 1994, reads: "BayNET is an organization dedicated to the advancement of the emergency readiness of the Bay Area communities through networking, resource sharing and education." The rationale that drives the mission is one that has proven itself time and time again in any number of large-scale disasters, namely; that local governments are not equipped to deal with all of the short-term needs of a disaster-stricken community.

The inability for immediate local government response is certainly not because of a lack of desire on the part of local officials, or on the part of emergency response providers. Rather, it is a problem of coordination and storage of the immense amount of resources that would be necessary to meet all of the needs in a catastrophic event.

As an example, to be fully prepared to meet all possible needs following a major earthquake, a community could conceivably need to have a fire station and ambulances with trained paramedics on every street corner. This is not feasible from a cost perspective or from an efficiency perspective. The primary consideration is the logistical problem of matching the resources to the needs in the affected area. From a broader perspective, regional, state, and federal resources are able to meet even the most demanding of natural disasters, given enough mobilization time. These logistical operations, however, do take time to conduct, and are often hampered by impassable roads, downed bridges and damaged rail lines, or other infrastructure impediments.

In the past, there has always been the admonition from the emergency preparedness profession that individuals

should take it upon themselves to be prepared for at least 72 hours following a major disaster, and in California specifically, an earthquake. Some individuals do heed the recommendation, but in general there has not been a very high success rate for prompting individuals to take preparedness actions on their own.

The newest approach, and one that appears to have a more significant impact and effect on the local community, is one in which there is a partnership of volunteer and public institution involvement. In the most generic form, this program model is one that teaches individuals and groups the disaster survival skills, as well as disaster preparedness and response information, that will help reduce property damage and hopefully save lives. A simple example is the teaching of "light search- and- rescue" techniques to neighborhood residents. While these classes do not delve into the more complex structural collapse rescues (typically requiring heavy equipment, search dogs, and extensively trained personnel), they do provide basic skills that will assist the individuals in their own neighborhoods in a wide range of situations that will be within their capabilities.

The idea is to provide "first- responder" training at a very basic level, and thereby make local neighborhoods and communities as self-sufficient as possible. The local self-sufficiency concept is the driving force behind the community programs, and behind BayNET as well.

Thus, the mission of BayNET is to assist in the development of local community-based programs that are designed to encourage self-sufficiency through the provision of skills training and education. In addition, BayNET provides a forum for the exchange of ideas, strategies, and the promotion of this new wave of preparedness activity as it continues to grow and evolve in the Bay Area.

TRAINING

The California Specialized Training Institute (CSTI) is the training arm of the California Governor's Office of Emergency Preparedness. It provides extensive training on emergency management - to people and organizations outside the state as well as to California residents. For more information, contact: California Specialized Training Institute P.O. Box 8123 San Luis Obispo, CA 93404-8123; (805) 549-3535.

CREATING A CARIBBEAN DISASTER INFORMATION NETWORK

by Beverley Lashley

Project Coordinator, CARDIN

University of the West Indies, Kingston, Jamaica

Through initial funding from the European Community Humanitarian Office (ECHO) in June 1999, CARDIN (Caribbean Disaster Information Network) was established with the major objective of strengthening the capacity within the Caribbean Community for the collection, indexing, dissemination and use of disaster-related information while serving as a sub-regional disaster information centre. This article describes how members within a network have been able to successfully develop CARDIN.

The need for a Caribbean-focussed disaster network was discussed as far back as December 1997 by the International Decade for Natural Disaster Reduction (IDNDR), now known as the International Strategy for Disaster Reduction (ISDR); the Pan American Health Organization (PAHO); and the University of the West Indies Library, Mona, Jamaica (UWI). The original idea was to make CARDIN a node of the Regional Disaster Information Centre for Latin America and the Caribbean (CRID). A decision was made to develop a more Caribbean-focussed network; and the University of the West Indies Library undertook the development of this initiative. The UWI is well placed for this project as it is a regional institution with three campuses (Mona, Jamaica; St Augustine, Trinidad and Tobago; Cave Hill, Barbados), as well as having a presence and programmes in other countries in the Caribbean. The Library also has a cadre of highly trained and experienced librarians and has undertaken similar projects: for example the MED-CARIB. (The MEDCARIB Network is a sub-regional network within the Latin American and Caribbean Center on Health Sciences (BIREME) and is based at the Medical Library, UWI Mona.)

Against this background, CARDIN was established. Its goal is not to collect disaster information but to provide information about the location of disaster information within the Caribbean region. Funding was sought from European Commission Humanitarian Aid Office (ECHO) who made an initial commitment for a year funding from June 1999 to 2000 and subsequently provided a grant from July 2000 to October 2001.

One of the earliest tasks was to design a model within which the structures and functions of CARDIN could be developed. The model basically has the UWI Library as the hub of a network linked with other disaster organizations. These organizations were identified based on technical capability or expressed interest. Organizations include the Caribbean Disaster and Emergency Response Agency (CDERA) based in Barbados; Latin American Center for Disaster Medicine (Centro Latinoamericano de medicina de desastres -CLAMED) based in Cuba; International Federation of Red Cross and Red Crescent Societies (IFRC)

through its office in Jamaica; Pan American Health Organization (PAHO); Université Antille Guyane (UAG) representing the French speaking Caribbean; Stichting Rampenbes-strijding Nederlandse Antillen (STIRANA) representing the Dutch speaking Caribbean; and other national disaster organizations. This model has been effective as it can expand to incorporate any new disaster organization that may want to become a member of CARDIN. The agreed-upon model is available from the CARDIN Secretariat, in the printed work *Organizational and Operational Manual*, which includes the objectives, structure and functions of the network.

A project coordinator was employed with support staff from the UWI Library and additional staff (data entry, Senior Library Assistant). The Systems Department at the UWI Library, Mona Campus also offered technical support. An agreement was signed between CLAMED and CARDIN in November 1999 whereby CLAMED would undertake the translation of abstracts and titles from English to Spanish and vice versa.

The UWI Library designed a Needs Assessment Questionnaire which was distributed between June 1999 and June 2000 to identified disaster organizations. The *Needs Assessment Survey* tried to identify the prospective members of the network, the level of assistance required for participation in the network, the state of telecommunication and email capabilities, access to computers and the level of training that would be required. Only 108 of 530 organizations responded, although much effort went into the distribution of the questionnaires during visibility seminars throughout the Caribbean. The sparse response led to the production of a report, which stated the situation in the countries visited and the findings. This report is available online at CARDIN's website.

CARDIN's first goal is to improve the accessibility and quality of the disaster information within the English, Dutch, French and Spanish speaking Caribbean. In the initial phase, this was accomplished through the development of the database and a gateway through the website (<http://wwwcardin.uwimona.edu.jm:1104>). The database was designed using the LILACS methodology, developed by the Latin America and the Caribbean Centre on Health Sciences Information (BIREME). Records to be included in the database were based on CARDIN's *Document Selection Guidelines* to ensure quality, relevance and control. CARDIN produced *A Controlled Vocabulary on Disaster Information* to use as the indexing tool for the database. This text was first developed in Spanish by CRID in collaboration with BIREME and has since been translated by CARDIN into English. The web interface, WWWis, is powered by iah

software, from BIREME, making CARDIN's database searchable online. Information can be found on various aspects of disaster management in the Caribbean using key words. The website provides links to other Caribbean disaster organizations. The interactive map allows the user to click on the country of choice to reach directory information on each organization in that location. This is useful for making contact with resource personnel within the Caribbean.

A second goal was to deliver user education and training. To strengthen the network and build links with the various disaster information units in Jamaica, a pilot training workshop was held in November 1999 in Jamaica. Its goals were to introduce the use of LILACS methodology and to provide a practical approach to organizing and managing disaster information units. Feedback from the workshop assisted in the design of a training manual, (*Organizing Disaster Information Units: a Training Manual*) which instructs individuals in organizing disaster information units while introducing the basic concepts of disaster information management. Visibility seminars were held in fourteen of the Caribbean islands including all the four language groups.

A third goal was to disseminate disaster information. CARDIN was able to provide disaster-related information to the general public via the WWW, CARDIN's newsletter, and document delivery. The CARDIN newsletter is the official organ of CARDIN and disseminates news on the network's activities. It is published January, May and September of each year. It is also made available on the CARDIN website. CARDIN offers document delivery services to the general public on any Caribbean disaster information request.

Another goal is to establish mechanisms for self promotion. The visibility of the activities of the project through the contribution of ECHO has been one of the accomplished tasks. The website has allowed CARDIN to be its own publicity agent. All the promotional information on CARDIN's activities, packaged in brochures, memorabilia etc., have contributed significantly to the level of awareness of the project. Numerous televised interviews were conducted throughout the Caribbean after the visibility seminars were conducted. A special interview was conducted by the Radio Education Unit, UWI Mona, which was sent via satellite around the Caribbean. Presentations were made at major conferences within the region. A presentation was also made at the International Conference on "*Preservation of Archives in Tropical Climates*" that was held in Jakarta, Indonesia, November 2001.

PROJECT EVALUATION

An internal consultant was employed by CARDIN to evaluate the project in June 2000. A short questionnaire was designed to be used as a verification tool, to provide feedback on the implementation of the project, and to garner suggestions for the next phase. The questionnaires were

distributed via e-mail to 40 institutions throughout the Caribbean. The response rate to the questionnaire was very poor 34.28%, which was too few to justify an analysis. However 72% of the respondents felt that CARDIN had strengthened their service, 84.7% felt that contributing documents to CARDIN had assisted the dissemination of disaster information and 71.4% felt that CARDIN had assisted them with the use of disaster-related information. Other benefits mentioned were those derived from the training workshops; the website links which had increased the awareness of CDERA and its Documentation Centre; and an enhanced hardware capacity which assisted the ability to access and disseminate information and also benefitted the work of an internal Hurricane Committee.

An external evaluator, commissioned by ECHO, also evaluated the project. The evaluator visited the CARDIN Secretariat and interviewed the administrators of the project as well as persons who work in disaster management throughout the Caribbean. The score achieved was based on a five point scale (from point 1=very weak to point 5=very strong). Scores received were 3.5 for impact, 3 for objectives, 4 for relevance, 4 for management, 5 for consistency and coordination and 5 for relief development. The evaluation was conducted in May 2000 with one more month left for the project deadline.

The project has achieved its set objectives. It has established a recognized regional presence in the form of CARDIN, which has been incorporated into the wider UWI Library system.

LESSONS LEARNED

There is a need for a disaster information network within the Caribbean. Librarians and Information Managers can fill this gap. The submission of records by disaster agencies in the Caribbean to CARDIN's database has demonstrated that the major players value the services which CARDIN offers.

Long term funding is needed for sustaining a dynamic project such as this. ECHO has provided the initial funding for two years. However, to achieve long term goals such as regional training and the development of collections, CARDIN will have to secure funding to cover the substantial costs involved. One area of significant need is Disaster Plans within the countries. This will require substantial funding for training and simulation exercises.

Another, more comprehensive Needs Assessment Survey will have to be undertaken to verify the training needs of the disaster organizations. Although an initial survey was undertaken, the response rate was poor as indicated above. This survey revealed that the collections of the disaster agencies were not organized; that there were no trained library staff; and that most of the agencies would need trained staff to undertake library functions. Organizations such as CDERA and CARDIN will have to undertake this task of assisting in training disaster personnel in library

management within the region.

FUTURE PLANS

There are several directions which CARDIN could take, including expanding on technological capabilities. A Caribbean Virtual Disaster Library will soon be made available on the internet. At the II Regional Meeting of the Virtual Health Library in Cuba 2001, it was recommended that the Regional Centre for Disaster Information for Latin America and the Caribbean would be responsible for the development a Virtual Disaster Library. The work of CARDIN on the Caribbean Virtual Disaster Library was recognized and would be incorporated into the work of CRID. The methodology of BIREME's Virtual Health Library would be used to develop this library. The inclusion of full text, sound and video could be included at a further stage. The immediate goal is to increase the records in the database to include all the language groups and to have titles and abstracts translated in at least two languages.

FUNDING

CARDIN has passed the developmental stage, through the initial funding from ECHO, and has created a viable Caribbean Disaster Information Network. The UWI Library

will be able to sustain the activities of the network, but any future expansion will require additional funding.

CONCLUSION

Further ongoing evaluation is to take place to ensure that CARDIN is meeting its objectives. Strategies will have to be developed so that there is built-in feedback to ensure that the needs of clients are being met. Avenues to be explored include an increase in funding from additional sources, the involvement of the private sector, the development of research projects to generate revenue, and partnerships with other institutions. A system to ascertain the needs of policy makers, practitioners and researchers will have to be explored. Support of Caribbean governments for the activities of CARDIN will be sought as this will strengthen the network and may also generate additional revenue from within the region. The CARDIN Secretariat will have to convince political leaders that the CARDIN database will provide a viable source of information which will support disaster management policymaking within the Caribbean and also improve the level of information which is now made available to the wider public on Caribbean Disaster Issues.

What is this?

(hint: see p. 33)



CONFERENCES

February 23-27, 2002

2002 NEMA Mid-year Conference. Sponsor: National Emergency Management Association. Washington, D.C.: Contact: NEMA, C/O The Council of State Governments, P.O. Box 11910, Lexington, KY 40578-1910; fax: (859) 244-8239. See the website <http://www.nemaweb.org/Meetings/Conference.cfm> for a PDF brochure and on-line registration information.

from: Disaster Research 360, January 22, 2002

February 26-27, 2002

Survivor 2002: Will Your Business Be the Weakest Link? Hosted by: Emergency Preparedness for Industry and Commerce Council (EPICC). Burnaby, British Columbia, Canada. The forum is designed to "inform; address current issues; and provide solutions." Contact: EPICC, (604) 687-5522. See <http://www.epicc.org> for brochure and registration information.

from: Disaster Research 358, December 5, 2001

March 10-13, 2002

Spring World 2002. 13th Annual Corporate Contingency Planning Seminar and Exhibition. Presented by: Disaster Recovery Journal (DRJ). San Diego, California. Contact: DRJ, PO Box 510110, St. Louis, MO 63151; (314) 894-0276; fax: (314) 894-7474; e-mail: drj@drj.com; <http://www.drj.com/conferences/sd2002/24pg/>.

from: Disaster Research 358, December 5, 2001

March 24-27, 2002

The 12th Annual Conference on Contingency Planning, Business Continuation, and Disaster Recovery using Telecommunications. Sponsored by: International Disaster Recovery Association (IDRA). West Springfield, Mass. Contact: IDRA, c/o BWT Associates, PO# 4515, Shrewsbury, MA 01545; (508) 845-6000; fax: (508) 842-258; <http://www.idra.com/>.

from: Disaster Research 358, December 5, 2001

April 4-7, 2002

IAEM 2002 Mid-year Workshop. Sponsor: International Association of Emergency Managers. Emmitsburg, Maryland: Register by March 11. Contact: IAEM, 111 Park Place, Falls Church, VA 22046; (703) 538-1795; fax: (703) 241-5603; e-mail: info@iaem.com; http://www.iaem.com/2002_mid-year_program.html.

April 15-19, 2002

Alaska is planning a statewide earthquake/tsunami symposium for Alaska emergency managers in Anchorage. Tentative dates are April 15-19. Steering Group members were cordially invited to attend.

April 17-20, 2002

Seismological Society of America Annual Meeting. Hosts: Pacific Geoscience Centre of the Geological Survey of Canada and by the University of Victoria School of Earth and Ocean Sciences. Victoria, British Columbia, Canada: April 17-20, 2002. Submit abstracts by January 25, 2002, at http://www2.seismosoc.org/absub_02/. Contact: SSA, 201 Plaza Professional Building, El Cerrito, California 94530; (510) 525-5474; fax: (510) 525-7204; e-mail: info@seismosoc.org; WWW: <http://www.seismosoc.org/index.html>.

April 29, 2002

Fires, Floods & Faults III. Sponsor: The Collaborative for Disaster Mitigation, San Jose State University. San Jose, California. The plenary session of this meeting will feature such topics as the latest best practices in mitigation, technology for multi-hazard mitigation, and the financial impacts of the September 11 terrorist attack. A series of workshops will explore different approaches to neighborhood organization, training for chief executive officers and chief financial officers of small businesses, ways to influence the political process, and dealing with the human side of disasters. Further information can be obtained by contacting Jessica Tran, The Collaborative for Disaster Mitigation, One Washington Square, San Jose, CA 95192-0082; (408) 924-3596; fax: (408) 924-3857; e-mail: jessica.tran@sjsu.edu; www.sjsu.edu/cdm.

from: Natural Hazards Observer, v. 26, no. 3, p. 18.

May 30-31, 2002

ATC-17-2 Seminar on Response Modification Technologies for Performance-Based Design. Sponsored by: Applied Technology Council (ATC) and the Multidisciplinary Center for Earthquake Engineering Research (MCEER). Los Angeles, California. Abstract deadline is January 1, 2002. Contact: Gerald Brady, Applied Technology Council, 555 Twin Dolphin Drive, Suite 550, Redwood City, California 94065; (650) 595-1542; fax: (650) 593-2320; e-mail: atc@atccouncil.org; <http://www.atccouncil.org/>.

from: Disaster Research 358, December 5, 2001

WEBSITES

<http://www.calcoast.org/events/conf2001/abstract.htm>

Abstracts from the recent CSBPA/CalCoast conference, "Restoring the Beach - Science, Policy and Funding" are now posted on this CalCoast website.

http://www.un.org/womenwatch/daw/csw/env_manage/

The International Strategy for Disaster Reduction (ISDR) recently hosted a meeting, "Environmental Management and the Mitigation of Natural Disasters: A Gender Perspective" in Ankara, Turkey. The meeting focused on women as part of the solution instead of emphasizing women's special vulnerabilities to disaster. A web site has been set up that displays background information about the meeting and also includes downloadable PDF formats of the discussion papers. The examples and case studies cited in the papers span the globe, and their topics include women's grassroots collectives for disaster mitigation; women's technological innovations and adaptations for disaster mitigation; emergency management for women as a tool for change; and gender perspectives on early warning, disaster management, earthquake preparedness, environmental issues, earthquake response, and recovery initiatives.

from: Natural Hazards Observer, v. 26, no. 3, p. 13.

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

Five research papers from the Canadian Natural Hazards Assessment Project (see DR #327) are available in PDF format from the publications section of the Institute for Catastrophic Loss Reduction (ICLR) web site. The articles identify and emphasize human aspects of response and recovery issues following natural disasters or emergencies. The "Human Element to Disasters and Their Impact: Issues Related to Response and Recovery: Five Articles From The Canadian Natural Hazards Assessment Project" was edited by David Etkin and includes the papers: 1) "Lessons Learned or Lessons Forgotten: The Canadian Disaster Experience," by Joe Scanlon; 2) "Psychosocial Aspects of Disaster Recovery: Integrating Communities into Disaster Planning and Policy Making," by David Hutton; 3) "Risk Assessment and Management in Local Government and Emergency Planning," by James Gordon; 4) "Disaster Response Systems in Canada," by Ron Kuban; and 5) "Dialogue on Crisis: The Need for 'Education,' Too," by Ron Kuban.

from: Disaster Research 358, December 5, 2001

<http://www.fema.gov/emanagers/>

Emergency Managers Professional Partners website (searchable). Find information about Current News, National Situation Update, Training, Useful Information, or Related Sites, as well as Hot Topics, FEMA by dept., Doing Business with FEMA, and Emergency Management links. The site also links to a list of state emergency management agency addresses and phone numbers, a list of disaster

declarations for the year, and the FEMA library.

<http://www.worldwatch.org>

secure.worldwatch.org/cgi-bin/wwinst/WWP0158

More and more of the devastation wrought by "natural" disasters worldwide is unnatural in origin—caused by ecologically destructive practices and an increasing number of people living in harm's way. That was a basic finding presented in a new study, "Unnatural Disasters," by Janet Abramovitz of the Worldwatch Institute, a Washington, D.C.-based environmental research organization. "By degrading forests, engineering rivers, filling in wetlands, and destabilizing the climate, we are unraveling the strands of a complex ecological safety net," according to the report. "We have altered so many natural systems so dramatically, their ability to protect us from disturbances is greatly diminished" Also contributing to the rising toll of disasters is the enormous expansion of the human population and the built environment, which put more people and more economic activities in harm's way.

Although "unnatural disasters" occur everywhere, their impact falls disproportionately on the poor, as they are more likely to live in vulnerable areas and they have fewer resources to deal with disasters. Between 1985 and 1999, 96% of recorded disaster fatalities were in developing countries. At the same time, economic losses from "unnatural disasters" are greater in the developed world. The earthquake that rocked Kobe, Japan, in 1995, for example, cost more than \$100 billion, making it the most expensive natural disaster in history. Still, smaller losses often hit poor countries harder, where they represent a larger share of the national economy. The damage from 1998's Hurricane Mitch in Central America was \$8.5 billion—higher than the combined gross domestic product of Honduras and Nicaragua, the two nations most impacted by the storm.

Besides presenting these issues, Abramovitz suggests measures that could lessen disasters' toll—from economic safety nets to ecological measures, promotion of community based disaster planning, wise land-use planning, and hazard mapping.

Copies of Unnatural Disasters (61 pp., \$5.00) can be downloaded in PDF format from the second URL above. They can also be ordered from the Worldwatch Institute, 1776 Massachusetts Ave, N.W., Washington, DC 20036; (800) 555-2028 (U.S.) or (301)567-9522 (outside the U.S.).

from: Natural Hazards Observer, v. 26, no. 3, p. 12-13.

<http://www.ibhs.org>

The Institute for Business and Home Safety (IBHS) has updated and improved its web site by expanding its information and incorporating a database driven server. The upgrades are part of the organization's effort to better serve the natural disaster community and the community at large.

from: Disaster Research 360, January 22, 2002

WEBSITE OF THE MONTH

Tsunami Community

www.tsunamicommunity.org/

Tsunami community activities are growing. Tsunami research is both maturing and studying new sources. Tsunami hazard mitigation and education are proving effective. Tsunami hazard assessment is becoming applied. Tsunami scenarios are becoming realistic.

This web site represents the breadth of research and knowledge in the tsunami community for both scientists and policy makers. The goals of this site are:

- * *To describe tsunami generation*
- * *To facilitate tsunami hazard mitigation*
- * *To document historical tsunamis*
- * *To provide tsunami benchmark problems*
- * *To distribute seafloor bathymetry*
- * *To showcase community models*
- * *To provide tsunami case studies*
- * *To simulate future tsunami scenarios*
- * *To gather tsunami links and tsongs*

The content of this web site is edited by the ad hoc committee on tsunami community research. Instructions for submitting new text and images via FTP are provided.

from: <http://www.tsunamicommunity.org/> (12-12-01)

The ad hoc committee on tsunami community research assembled for the first time in January, 2001 to establish a web site that represents the breadth of research and knowledge in the tsunami community.

Ad hoc committee members:

| Lori Dengler, Humboldt State University
| Gerard Fryer, University of Hawaii
| Jim Gardner, US Geological Survey
| Eric Geist, US Geological Survey
| Stephan Grilli, University of Rhode Island
| Slava Gusiakov, Russian Tsunami Center
| Fumi Imamura, Tohoku University
| Homa Lee, US Geological Survey
| Brian McAdoo, Vassar College
| Tad Murty, Baird Associates Coastal Engineers
| John Smith, University of Hawaii
| Dave Tappin, British Geological Survey
| Kelin Wang, Natural Resources Canada
| Phil Watts, Applied Fluids Engineering, Inc.

The contents of this web site are in the public domain to benefit tsunami research, tsunami hazard assessment, and disaster managers.

**April is usually Tsunami Awareness Month.
Plan some public education activities!
Schedule a tsunami evacuation drill!
Show a tsunami video at the City Council meeting!**

**April 8-14, 2001 was International Building Safety Week.
Watch for the event in April 2002. (<http://www.icbo.org/>)**

BOOK REVIEW

Tsunami: The Underrated Hazard, by Edward Bryant. Cambridge University Press, 350 p., ISBN 0-521-77599-X ; 2001.

reviewed by

Costas Synolakis, University of Southern California, Los Angeles, USA,

and Gerard J. Fryer, University of Hawaii, Honolulu, USA

Originally printed in *Eos* (American Geophysical Union Transactions), v. 82, no. 48, p. 588.

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Tsunami: the Underrated Hazard, by Edward Bryant, would appear to be a welcome addition to the scholarly tsunami literature. No book on tsunamis has the broad perspective of this work. The book looks attractive, with many high quality photographs. It looks comprehensive, with discussions of tsunami hydrodynamics, tsunami effects on coastal landscapes, and causes of tsunamis (earthquakes, landslides, volcanic eruptions, meteorite impacts). It looks practical, with a section on risk and mitigation. It also looks entertaining, with an opening chapter on tsunami legends and a closing chapter presenting fanciful descriptions of imagined events. Appearances are deceiving, though. Any initial enthusiasm for the work evaporates on even casual reading. The book is so flawed by errors, omissions, confusion, and unsupported conjecture that we cannot recommend it to anyone.

First are the errors. We are told that the leading wave of a tsunami is a solitary wave, that tectonic tsunamis are "very symmetrical close to the source," that the magnitude 7.3 Vanuatu earthquake of 1999 was "very small." We read that one can set the runup height 10 times the height of the approaching wave offshore, that thrust rupturing of sedimentary layers increases tsunami excitation by a factor of 100. All of these statements are false. The death toll of the 1975 Kilauea tsunami is claimed as 16, but was actually two. The death toll of the 1792 tsunami from Unzen is claimed at 4300, but was about 15,000. The 1923 great Tokyo earthquake is claimed to have been "cyclone-induced." Such errors, and there are dozens of them, make the book worthless to scholars and misleading to newcomers.

Second are the omissions. The slump source for the 1998 Papua New Guinea tsunami has been positively identified and widely reported, but Bryant seems unaware of it: "No individual slump can be associated with the tsunami." The Tambora tsunami of 1815 probably killed 30,000, but Bryant gives it no mention. Modern satellite-derived bathymetry has eliminated errors in travel-time charts, but Bryant claims such errors are still a problem. Bryant concentrates strongly on justifying a tsunami origin for questionable coastal features, yet completely ignores the modern geologic record as a guide for interpreting paleotsunami features. St. Armand's (1963) classic description of the coastal signatures of the 1960 Chilean tsunami is conspicuously absent. Similarly absent is Plafker's (1969) seminal work on the 1964 Alaska earthquake.

Third is the confusion. The shallow water wave equa-

tions become the Navier-Stokes equations. Mantle magnitude becomes mantle moment. Tide gauges, notorious for under-reporting tsunami wave heights, become reliable recorders of tsunami runup. Surface-wave magnitudes become Richter magnitudes. The roles of the International Tsunami Information Center and the Pacific Tsunami Warning Center are mixed up. Some statements are confused beyond comprehension: "Seismic waves with surface magnitude of 9-11 on the Richter scale caused faulting in shallow waters around the Gulf." The energy released by slow earthquakes is claimed not to be measured accurately by seismic-wave detection algorithms, though the opposite is true.

Fourth is unsupported conjecture. The third blast of Krakatau was the "largest sound ever heard by humanity." "In the Pacific Region there have been sixteen tsunami events in the last 2000 years in which submarine landslides were triggered by earthquakes killing 68,832 people." In coastal geomorphology (Bryant's area of expertise), every enigma apparently has a tsunami explanation. The gullible reader will be left with the impression that tsunamis are as common as thunderstorms. Almost everyone of Bryant's examples is controversial. The motu-hoas of atolls are presented as carved by tsunamis. The motus of Rangiroa are presented as tsunami remnants, and its giant coral boulders are presented as emplaced by tsunamis. Rangiroa, however, is faulted from rising on Tahiti's flexural arch, so the island is presented presliced, with boulders prequarried, to any attacking storm waves. The sandstone flutes of Tura Point, whose friable nature is clear from the photographs, are presented as signatures of a prehistoric tsunami. However, when one learns (not from the book!) that nearby grave-stones of the same sandstone are decrepit and unreadable after less than a century, a prehistoric tsunami sounds far less convincing.

Bryant dedicates his book "to the memory of J.[sic] Harlen Bretz." Like that lonely hero of the Channeled Scablands, Bryant apparently sees himself as the lone tsunami catastrophist battling a uniformitarian establishment (predictably, his description of catastrophism versus uniformitarianism reflects the usual geologist's misreading of nineteenth century history). While no convincing alternative to Bretz's flood was ever offered, though, Bryant goes out of his way to avoid consideration of the one phenomenon that handily explains most coastal features without the need for anything more exciting than the odd storm: sea-level change. Bryant makes the tacit assumption that sea level has always been where it is now. However, lift coastlines the few meters de-

manded by local isostatic adjustment to postglacial sea-level rise, and most of Bryant's enigmas simply evaporate.

Maybe Bryant is right. Maybe there is a huge flux of bolides hitting the Earth to produce abundant "mega" tsunamis. A book as full of demonstrable errors as this one, however, is going to convince nobody and is a more underrated hazard than its title suggests.

Acknowledgments

C. Synolakis and G. J. Fryer acknowledge Brian Atwater, Emile Okal, and Anne Felton for insightful comments.

Editors' note: This succinct and articulate statement of scientific purposes and procedures is another terrific example of "how science works." While the Internet and electronic publishing are changing some of our methods, but it's important to remember that they haven't changed our intentions.

PRINCIPLES FOR SCIENCE IN THE INTERNET ERA

Prepared by the ICSU/CODATA Ad Hoc Group on Data and Information

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Scientists are both users and producers of databases. However, scientific databases are seldom static; in the course of their research, scientists frequently draw on several existing databases to create a new database tailored to specific research objectives. The synthesis of data from different sources to provide new insights and advance our understanding of nature is an essential part of the scientific process. The history of science is rich with examples of data collections that played a crucial part in a scientific revolution which in turn had a major impact on society. It may truly be said that data are the lifeblood of science.

The Group proposes the following set of principles for organizations and individuals to evaluate legislative proposals that affect the use of scientific databases.

1. ***Science is an investment in the public interest.*** Through research and education, scientists foster the creation and dissemination of knowledge. This can have profound effects on the well being of people and the economies of the world. Science is a critical public investment in our future, a resource with extraordinary dividends.
2. ***Scientific advances rely on full and open access to data.*** Both science and the public are well served by a system of scholarly research and communication with minimal constraints on the availability of data for further analysis. The tradition of full and open access to data has led to breakthroughs in scientific understanding, as well as to later economic and public policy benefits. The idea that an individual or organization can control access to or claim ownership of the facts of nature is foreign to science.
3. ***A market model for access to data is unsuitable for research and education.*** Science is a cooperative, rather than a competitive, enterprise. No individual, institution, or country can collect all the data it needs to address important scientific issues. Thus, practices that encourage data sharing are necessary to advance science and to achieve the resulting social benefits. Such data sharing is possible within tight research budgets only when data are affordable. If data are formally made available for scientific access, but the prices charged for such access are prohibitively high, the negative impact on science is the same as if access had been

References

- Saint-Armand, Pierre, editor, 1963, Special issue--Oceanographic, geologic, and engineering studies of the Chilean earthquakes of May 1960: Seismological Society of America Bulletin, v. 53, no. 6, p. 1123-1436.
- Plafker, George, 1969, The Alaska earthquake, March 27, 1964-- Regional effects; Tectonics of the March 27, 1964 Alaska earthquake: U.S. Geological Survey Professional Paper 543-I, 74 p., 2 plates.

legally denied. This is especially the case for scientists in developing countries.

4. ***Publication of data is essential to scientific research and the dissemination of knowledge.*** The credibility of research results depends on the publication of data that back them up and permit reproduction of the results by colleagues. A restriction on data publication or a requirement that colleagues recompile a database from original sources compromises the ability of scientists to advance knowledge.
5. ***The interests of database owners must be balanced with society's need for open exchange of ideas.*** Given the substantial investment in data collection and its importance to society, it is equally important that data are used to the maximum extent possible. Data that were collected for a variety of purposes may be useful to science. Legal foundations and societal attitudes should foster a balance between individual rights to data and the public good of shared data.
6. ***Legislators should take into account the impact intellectual property laws may have on research and education.*** The balance achieved in the current copyright laws, while imperfect, has allowed science to flourish. It has also supported a successful publishing industry. Any new legislation should strike a balance while continuing to ensure full and open access to data needed for scientific research and education.

Infrequently Asked Questions

compiled by Lee Walkling

What percentage of businesses that suffer a major disaster never reopen?

According to a flyer from the University of California, Berkeley, dated 1999, forty-three percent (43%) of businesses that experience a major disaster never reopen.

What are CERT, DART, NERT, SDART, AND SFNERT?

- A. breath mints
- B. cable stations
- C. disaster volunteer groups

The correct answer is C. The most commonly used term seems to be CERT, community emergency response teams. DART stands for disaster area response teams. SDART is the Seattle Disaster Aid and Response Team. NERT stands for neighborhood emergency response teams; therefore SFNERT is the San Francisco Neighborhood Response Teams. (For a brief description of community emergency response teams, see page 24.)

To find information about the *Association of Volunteer Emergency Response Teams*, go to <http://www.avertdisasters.org/>.

If you want to organize a CERT, there is information at <http://www.avertdisasters.org/html/CERTOrganize.html> and <http://www.fema.gov/emi/cert/> CERT student manuals can be downloaded from www.fema.gov/emi/cert/mtrls.htm

The SFNERT webpage is <http://www.nertnews.com/>
The SDART webpage is <http://www.cityofseattle.net/projectimpact/pages/interactive/sdart-over-int.htm> or http://www.cityofseattle.net/emergency_mgt/gettingPrepared/dartProgramSDART.htm

If you hiked Mt. St. Helens, could you find evidence of a tsunami?

Yes, according to the USGS: On 18 May 1980 the upper 1500 ft (460 m) including the former summit of Mount St. Helens suddenly detached as a gigantic landslide (debris avalanche). The great avalanche slipped off the volcano and slammed into Spirit Lake, raising the lake surface by 63 m (207 ft) and sending a cataclysmic tsunami surging around the lake basin as high as 250 m (820 ft) above the old lake level.

Hummocky debris avalanche deposits at the head of the west arm of Spirit Lake arrived by plowing through the lake. Displaced water ran up the valley head more than 200 m above the pre-eruption surface of Spirit Lake. This displaced, momentarily elevated water then swept back to the lake, rinsing the valley sides clean of timber and sediment, and jamming logs and boulders against the debris avalanche hummocks.

The tsunami also swept up the east arm of the lake. Its upper limit along the north side of Harmony Falls basin lies an amazing 225m (738 ft) above the old level of Spirit Lake. Above the limit trees lie where felled by a cataclysmic hot pyroclastic surge; below the limit the downed trees and the surge deposit were removed by the tsunami as it swept up the basin. This amazing area can be visited by hiking Harmony Falls trail in Mount St. Helens National Volcanic Monument. (For more information, see: Waitt, R. B.; Pierson, T. C., 1994, The 1980 (mostly) and earlier explosive eruptions of Mount St. Helens volcano. In Swanson, D. A.; Haugerud, R. A., editors, *Geologic field trips in the Pacific Northwest: University of Washington Department of Geological Sciences*, v. 2, p. 21 1 - 21 37.)

from: <http://vulcan.wr.usgs.gov/Projects/H2O+Volcanoes/Frozen/Geology/MSH/MSH.tsunami.html>
Geology of Interactions of Volcanoes, Snow, and Water:
Mount St. Helens, Washington
Tsunami on Spirit Lake early during 18 May 1980 eruption

Who made the first device for detecting earthquakes; and who founded modern seismology?

"The earliest instrument for detecting earth tremors dates from the second-century Han Dynasty in China, when in A.D. 132, the court astronomer, Chang Heng, invented a crude form of seismograph. Since that far-off day, there have been many improvements. But it was not until after the mid-nineteenth century that Palmieri, an Italian, and Milne, an Englishman, developed instruments of practical utility. Since his was the first device to actually measure ground movements, John Milne is credited with having founded the modern science of seismology."

from: Myles, Douglas, 1985, *The great waves*:
McGraw-Hill Book Company, p. 7.



for photographs of Heng's seismograph, go to
<http://www.seg.org/museum/VM/assets/china2.jpg>
<http://www.scecdc.scec.org/Module/sec3pg06.html>
<http://www.geo.mtu.edu/UPSeis/studying.html>

VIDEO RESERVATIONS

Place a check mark (T) beside the video(s) you want to reserve; write the date of the program behind the title. Mail to TsuInfo Alert Video Reservations, Lee Walkling, Division of Geology and Earth Resources Library, PO Box 47007, Olympia, WA 98504-7007; or email lee.walkling@wadnr.gov

- ___ **Cascadia: The Hidden Fire - An Earthquake Survival Guide;** Global Net Productions, 2001. 9.5 minutes. 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. (The full documentary is scheduled for broadcasting on a PBS station in April 2002.)
- ___ **Not Business as Usual: Emergency Planning for Small Businesses,** sponsored by CREW (Cascadia Regional Earthquake Workgroup), 2001. 10 min. 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.
- ___ **Adventures of Disaster Dudes** (14 min.) Preparedness for pre-teens
- ___ **The Alaska Earthquake, 1964** (20 min.) Includes data on the tsunamis generated by that event
- ___ **Cannon Beach Fire District Community Warning System (COWS)** (21 min.) Explains why Cannon Beach chose their particular system
- ___ **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
- ___ **Forum: Earthquakes & Tsunamis** (2 hrs.) CTV-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 the development of warning systems.
- ___ **Killer Wave: Power of the Tsunami** (60 min.) National Geographic video.
- ___ **Mitigation: Making Families and Communities Safer** (13 min.) American Red Cross
- ___ **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.)
- ___ **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. The Institute provides a booklet to use with the video. 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, discussing 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 in California.
- ___ **Tsunami and Earthquake Video** (60 min.) Includes "Tsunami: How Occur, How Protect," "Learning from Earthquakes," and "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.) Two versions, one with breaks inserted for discussion time.
- ___ **Tsunami Warning** (17 min.) San Mateo (California) Operational Area Office of Emergency Services. This is a good public service program, specifically made for San Mateo County. Citizens are told what to do in cases of tsunami watches or tsunami warnings, with specific inundation zones identified for the expected 20-foot tall tsunami. An evacuation checklist is provided, as well as locations of safe evacuation sites. This video gives the impression that all tsunamis are teletsunamis (generated at a source more than 1000 km from the coastline) which therefore provide time for warnings. Locally-generated tsunamis are not discussed.
- ___ **USGS Earthquake Videotapes "Pacific Northwest"** USGS Open-File Report 94-179-E
- ___ **Understanding Volcanic Hazards** (25 min.) Includes information about volcano-induced tsunamis and landslides.
- ___ **The Wave: a Japanese Folktale** (9 min.) Animated film to help 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 (Washington) Interpretive Center, this video deals with beach safety, including tsunamis.

Check the title(s) you would like and indicate the date of your program. The video(s) will be mailed one week before the program date. You will be responsible for return postage.

Name:
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Mailing address:
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email:

**DIRECTORIES:
NATIONAL TSUNAMI HAZARD MITIGATION PROGRAM STEERING GROUP**

FEDERAL

Eddie Bernard, Chairman of National
Tsunami Hazard Mitigation Program
NOAA/PMEL
7600 Sand Point Way NE
Seattle, WA 98115-0070
(206) 526-6800; Fax (206) 526-6815
email: bernard@pmel.noaa.gov

Frank Gonzalez, NOAA/PMEL
7600 Sand Point Way NE
Seattle, WA 98115-0070
(206) 526-6803; Fax (206) 526-6485
email: Gonzalez@pmel.noaa.gov

Richard Przywarty
NOAA/NWS, Alaska Region
222 W. 7th Ave. #23
Anchorage, AK 99513-7575
907-271-5136; fax 907-271-3711 email:
Richard.Przywarty@noaa.gov

Craig Weaver
U.S. Geological Survey
Box 351650
University of Washington
Seattle, WA 98195-1650
(206) 553-0627; Fax (206) 553-8350
email: craig@geophys.washington.edu

Chris Jonientz-Trisler
Earthquake Program Manager
FEMA, Region X
130 228th Street SW
Bothell, WA 98021-9796
(425) 487-4645; Fax (425) 487-4613
email: chris.jonientz-trisler@fema.gov

Clifford Astill
National Science Foundation
4201 Wilson Blvd, Room 545
Arlington, VA 22230
(703) 306-1362; Fax (703) 306-0291
email: castill@nsf.gov

ALASKA

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

R. Scott Simmons
Mitigation/Earthquake/Tsunami Specialist
Alaska Division of Emergency Services
P.O. Box 5750, Suite B-210, Bldg. 49000
Fort Richardson, AK 99505-5750
907-428-7016; fax 907-428-7009 email:
scott_simmons@ak-prepared.com

CALIFORNIA

Richard Eisner, Regional Administrator
Governor's Office of Emergency Services
Coastal Region
1300 Clay Street, Suite 400
Oakland, CA 94612-1425
(510) 286-0888 or 286-0895;
Fax (510) 286-0853
email: Rich_Eisner@oes.ca.gov

Lori Dengler
Department of Geology
Humboldt State University
#1 Harpst Street
Arcata, CA 95521
(707) 826-3115; Fax (707) 826-5241
email: lad1@axe.humboldt.edu

HAWAII

Brian Yanagi, Earthquake Program Manager
Civil Defense Division
3949 Diamond Head Road
Honolulu, HI 96816-4495
(808) 733-4300, ext. 552; Fax (808) 737-8197
email: byanagi@scd.state.hi.us

Laura Kong

Hawaii State Tsunami Advisor
c/o U.S. Federal Highways Administration
300 Ala Moana Blvd., Rm. 3306
Honolulu, HI 96850
(808) 541-2700, ext. 328; fax (808) 541-2704;
email: laura.kong@fhwa.dot.gov

OREGON

Mark Darienzo
Oregon Emergency Management
595 Cottage Street NE
Salem, OR 97310
(503) 378-2911, ext. 237; Fax (503) 588-1378
email: mdarien@oem.state.or.us

George Priest
Oregon Dept. of Geology & Mineral Industries
Suite 965
800 NE Oregon Street #28
Portland, OR 97232
503-731-4100, Ext. 225; fax 503-731-4066
email: george.priest@dogami.state.or.us

WASHINGTON

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

Tim Walsh
Division of Geology and Earth Resources
P.O. Box 47007
Olympia, WA 98504-7007
(360) 902-1432; Fax (360) 902-1785
email: tim.walsh@wadnr.gov

STATE EMERGENCY MANAGEMENT OFFICES

For general emergency management information, contact:

Alaska Division of Emergency Services
Department of Military & Veterans Affairs
P.O. Box 5750
Fort Richardson, Alaska 99505-5750
(907) 428-7039; Fax (907) 428-7009
<http://www.ak-prepared.com/>

California Office of Emergency Services
2800 Meadowview Road
Sacramento, California 95832
(916) 262-1816, Fax (916) 262-1677
<http://www.oes.ca.gov/>

Hawaii State Civil Defense
Department of Defense
3949 Diamond Head Road
Honolulu, Hawaii 96816-4495
(808) 734-2161; Fax (808) 733-4287
E-Mail: rprice@pdc.org <http://iao.pdc.org>

Oregon Division of Emergency Management
595 Cottage Street, NE
Salem, Oregon 97310
(503) 378-2911 ext 225, Fax (503) 588-1378
<http://www.osp.state.or.us/oem/oem.htm>

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

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

**Congratulations to these communities for
becoming TsunamiReady!**

June 30, 2001 Ocean Shores, Washington

January 10, 2002 Long Beach, Washington

January 18, 2001 Seward, Alaska



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

Library
Department of Natural Resources
Division of Geology and Earth Resources
P.O. Box 47007
Olympia, WA 98504-7007