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Summary Report of the Tsunami Hazard Mitigation Steering Group Meeting, November 6-7, 2003 Seattle, Washington

Attendees: STEERING GROUP

Eddie Bernard - NOAA (Chair)
 Frank González - NOAA
 Jeff LaDouce- NOAA
 Jeff Partain - NOAA/NWS (Acting)
 Landry Bernard - NOAA/NDBC
 Chris Jonientz-Trisler - DHS/FEMA-X
 Michael Hornick - DHS/FEMA-IX
 Craig Weaver - USGS
 David Oppenheimer - USGS
 Richard Eisner - State of California
 Michael Reichle - CA State Geologist (Acting)
 Brian Yanagi - State of Hawaii
 Sterling Yong - State of Hawaii
 Roger Hansen - State of Alaska
 Gary Brown - State of Alaska (Alt.)
 Rodney Combellick - AK Geologist (Acting)
 Mark Darienzo - State of Oregon
 George Priest - State of Oregon
 George Crawford - State of Washington

Volume 6, Number 1, February 2004

Timothy Walsh - State of Washington

Attendees: GUESTS

Charles McCreery - NOAA/PTWC
 Bruce Knipe - FEMA
 Shannon McArthur - NOAA/NDBC
 Don Hoirup-CA Geological Survey
 Ervin Petty - State of Alaska (Alt.)
 Jonathan Allan - State of Oregon (Alt.)
 Steven Hammond - NOAA
 Jean Newman - NOAA/Tsunami Project
 Paul Whitmore - NOAA/WCATWC
 Steve Gallagher - NOAA/NWS
 Vasily Titov - NOAA/TIME Center
 Angie, Venturato - NOAA/TIME Center
 Marie Eble - NOAA/ Tsunami Project
 Mike Mahoney - DHS/FEMA
 Harold Mofjeld - NOAA/Tsunami Project

Introduction Members and Guests

Eddie Bernard welcomed everyone and had each member/guest introduce themselves.

Review of Action Items from the May 2003 Meeting:

1. ACTION ITEM: Craig Weaver, Chip McCreery, and Dave Oppenheimer are to identify a NOAA EMWIN specialist to work on the real-time earthquake display proposal.

ACTION: Craig Weaver, Chip McCreery, David Oppenheimer

STATUS: David Investigated and it was determined that an off -the-shelf product could provide the solution for the earthquake display proposal. The display has been linked to our web site. **CLOSED**

2. ACTION ITEM: Chip McCreery is to talk to Jeff LaDouce to request that a tsunami warning coordination meeting be held before November 2003. Frank González will put together a menu of options of tsunami warning products by July 1, 2003, and send out the URL of his report.

ACTION: Chip McCreery, Jeff LaDouce, Frank González (continued on page 3)

TsuInfo Alert

is prepared by the Washington State Department of Natural Resources
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a State/Federal Partnership funded through the National Oceanic and Atmospheric Administration (NOAA).

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Division of Geology and Earth Resources
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Olympia, WA 98504-7007
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The views expressed herein are those of the authors and not necessarily those of
NOAA, the Washington Department of Natural Resources, or other sponsors of
TsuInfo Alert.



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



(continued from page 1)

STATUS: Meeting is scheduled for March 2-4, 2004, in Honolulu, Hawaii. **CLOSED**

3. ACTION ITEM: Frank González will prepare a 1-pager on quality control for inundation mapping and distribute it to the states.

ACTION: Frank González

STATUS: This information is included in the TIME Report. **CLOSED**

4. ACTION ITEM: The Fall 2003 NTHMP Steering Group Meeting will be held November 6 and 7, 2003, at PMEL in Seattle. Each Steering Group Member was asked to supply names of people that we need to invite to the meeting. Invitees should be with organizations that have a vested interest in our program.

ACTION: All

STATUS: Members supplied the chairman with names of requested invitees. **CLOSED**

5. ACTION ITEM: Brian Yanagi (with the help of the Mitigation Subcommittee) will write a draft letter that can be sent to Congressional members requesting additional funds needed for the proposed data delivery system and for increasing the scope of the program to include Guam, Puerto Rico, etc., by June 15.

ACTION: Brian Yanagi, Mitigation Subcommittee

STATUS: Brian Yanagi drafted a letter that was sent to Senators Inouye and Akaka and Representatives Abercrombie and Case on July 16, 2003. **CLOSED**

6. ACTION ITEM: Charles McCreery will hold a CREST coordination meeting with WC/ATWC, David Oppenheimer, Roger Hansen (AEIC), and a representative from the Hawaii Volcano Observatory to review seismic system data communications efficiency improvements prior to November 2003. Charles will also hold a meeting of the water level specialists to review the present practices and recommend improvements before November 2003.

ACTION: Charles McCreery, David Oppenheimer, Roger Hansen

STATUS: Coordination has taken place toward a new 5-year plan. A formal meeting was not needed. **ONGOING**

7. ACTION ITEM: The Mitigation Subcommittee will decide on a mitigation budget structure and send to Eddie Bernard via e-mail by June 30. Eddie will include a Mitigation line item on his spreadsheet.

ACTION: Mitigation Subcommittee

STATUS: The budget structure was determined and e-mailed to Eddie Bernard. **CLOSED**

8. ACTION ITEM: Frank González will draft a letter for Jeff LaDouce (NWS) to send to NOS concerning upgrades to coastal tide gauges by July 1, 2003.

ACTION: Frank González, Jeff LaDouce

STATUS: Letter has been drafted. As part of NOAA's PPBS, 100% capacity for tide gauges has been identified. **CLOSED**

9. ACTION ITEM: The group wanted to know the makeup of the tsuhaz e-mail list. They also wanted to formulate a separate e-mail list for just steering group members with no additional interested parties included as

has been done in the tsuhaz e-mail list. Ann Thomason will e-mail the tsuhaz e-mail list components to each person attending this meeting. Eddie Bernard will have a separate members list formulated by June 30.

ACTION: Eddie Bernard

STATUS: The tsuhaz e-mail list was sent to meeting participants. A members only list was also formulated and sent to members. **CLOSED**

Review of Action Items from the November 2002

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 co-ordination 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 will put the messages on NOAA Weather Radio and EMWIN.

ACTION: Oppenheimer, LaDouce, Hansen

STATUS: This item was replaced by Action Item 1 from the May 2003 meeting (above). The real-time earthquake display is up and running on the USGS web site.

CLOSED

2. ACTION ITEM: The recommendation letter on Warning Center 24/7 operation drafted in response to the August 2001 Review is to be sent to NOAA and USGS in a timely manner.

ACTION: Bernard, Weyman, Przywarty

STATUS: This item has been incorporated in the new Warning Guidance Goals Statement: "The USGS, NOAA, and state agencies disseminate their automated, reviewed earthquake and tsunami notifications as rapidly as is scientifically and technologically possible. Automated notification of preliminary hypocenter and magnitude should be provided within 2 minutes after receipt of sufficient seismological information at observing networks and reviewed information should be provided in 5 minutes."

CLOSED

3. ACTION ITEM: 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)

STATUS: Frank González attended NSF conference and reported on research needs. No written report produced. TRAC has been replaced by the NTHMP Technical Advisory Committee. **CLOSED**

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

ACTION: Bernard, González

STATUS: Frank González attended an NSF meeting and presented research needs. There is a new NSF Program Manager, Juan Pestana who comes on board January 2004. Funds are flowing and the new Tsunami Wave Simulator at Oregon State University is open for researchers' use. The latest NRC report on the NEES Project specifically specifies the link between NEES and the NTHM. **CLOSED**

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

ACTION: Frank 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.

STATUS: Draft of mapping certification has been prepared and is covered in the TIME report. **CLOSED**

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

ACTION: Chris Jonientz-Trisler to draft Strategic Plan, Subcommittee to report on review of the NOAA Response Plan and how it interacts with the states.

STATUS: James Partain forwarded name of the person responsible for the National Response Plan to Eddie Bernard and Chris Jonientz-Trisler. The concept of the National Response Plan has changed since the Department of Homeland Security has taken over. The subcommittee will continue to work on the draft Strategic Plan. **OPEN**

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

ACTION: Yanagi, Jonientz-Trisler

STATUS: Letter written, has not been sent however information has been conveyed verbally to some agencies. Eddie Bernard to check on status. **OPEN**

8. ACTION ITEM: Enhanced mitigation budgets need to be formulated and coordinated.

ACTION: States to formulate new enhanced mitigation budgets, Chris Jonientz-Trisler to co-ordinate enhanced mitigation budgets for discussion at the Spring 2003 meeting.

STATUS: Enhanced mitigation budgets were discussed and voted upon at the May 2003 meeting. **CLOSED.**

Progress Report of Program Elements

1. Develop State/NOAA Coordination and Technical Support

Steve Gallagher, NWS Chief Financial Officer, gave a brief overview of the new NOAA Planning, Programming, Budgeting System (PPBS). The objective of PPBS is to build better budget numbers into the President's Budget. The near-term goals for the tsunami group are to

smooth the transition of the NTHMP from the Office of Oceanic and Atmospheric Research (OAR) to the National Weather Service (NWS) and to get NTHMP full budget requirements into the President's Budget Request for FY 06 and beyond. Jeff LaDouce reported on the coordination efforts during FY 03 and said that he will continue efforts to consolidate the historical tsunami database in the Pacific into a non-copywrited CD for distribution. He also stated that he is working on a laptop version of the arrival time program. He stated that the earmarks in the works in the Senate are for an additional \$600K for additional Pacific observations and \$2m for the Tsunami Warning and Environmental Observatory for Alaska (TWEAK).

2. Tsunami Detection Buoys

Landry Bernard reported that the operational transition of the DART buoy network from the Pacific Marine Environmental Laboratory (PMEL) to the National Data Buoy Center (NDBC) has been completed. The DART network has been integrated into the NDBC web site. PMEL's Next Generation DART system has been deployed.

3. Produce Inundation Maps

Frank González gave a brief overview of the services that the TIME Center provides. He also reported on the mapping and modeling activities of the TIME Center during the past year, including a report on Tsunami Forecasting System Implementation.

4. Develop Hazard Mitigation Programs

Chris Jonientz-Trisler presented the mitigation subcommittee report which discussed the national Engineering Project, the publication cost increases of *TsuInfo Alert*, the Bridge concept proposal, incorporating tsunami into HAZUS, and the 2003 local warning system re-survey. The National Engineering Project core proposal is divided into phases. The first phase would include a workshop and data collection led by Washington State. The next phases would be lead by FEMA. NTHMP costs of \$100K would be matched by \$100K from FEMA. The product of the proposal would be a design guidance document for critical buildings and vertical evacuation use. Craig Weaver said that the earthquake response plan interaction with the NOAA response plan needs to be examined to be sure that tsunami is included.

5. Each State reported on their FY 03 activities:

Alaska report; California report; Hawaii report; Oregon report; Washington report.

6. Improve Seismic Networks

David Oppenheimer reported on the work done during FY 03 on the Consolidated Reporting of Earthquakes and Tsunamis (CREST) seismic project. The installation phase of the CREST project is nearly complete with 51 of 53 stations installed. The Remaining two stations are scheduled to be installed by the end of 2003, weather permitting.

The Real-time Earthquake Display project began activities in the last quarter of FY 03 and focused on two tasks: 1) Identifying sites for installing the prototype earthquake display systems, and 2) preparation of a contract to enhance the California Integrated Seismic Network (CISN)

Display software to facilitate its use by emergency responders in all regions of the U.S., Puerto Rico, and Guam.

7. FY 04 Budget

At meeting time, both the U.S. Senate and House has draft budget (marks) of \$4.3m for the Tsunami Hazard Mitigation Program (the Program) with some possible increases. Currently NOAA is under a Continuing Resolution. The bill is currently in conference and it appears that the appropriations bill may not be passed until mid to late December.

Based on the uncertainty of the amount of an FY04 budget as well as when the budget appropriations will be passed, each of the states and program elements were asked to submit proposals for core funding of \$4.3 m. This amount represents the funding currently available in the continuing resolution. The Steering Group unanimously approved the core budgets as submitted. Votes on the core proposals (with comments, if any) from the 5 states and 3 agencies were recorded on ballots, initialed, and provided to the Chairman. Discussions on possible additional funding were postponed until the Spring 2004 meeting awaiting a budget appropriation from Congress. Each program element was advised to have proposals for the remainder of the undedicated funding ready prior to the May 2004 meeting.

8. NOAA Transition

The National Tsunami Hazard Mitigation Program Steering Group Chair was transferred to Jeff LaDouce at the meeting. The funds transfer activities will remain with PMEL as well as the maintenance of the web site. Jeff LaDouce asked each state to write a proposal for \$35K, but scalable, for Administrative Funds for FY 04.

9. Technical Advisory Committee

November 2002 Meeting (above). The chair of this committee will be Eddie Bernard. It is anticipated that the panel members will be the reviewers from the 2001 Program Review. Eddie Bernard will contact each reviewer and request they serve on the Technical Advisory Panel.

10. Education of the Public and Social Issues

It was agreed by the group that more discussion is needed on the issues of educating the public about what to do in the event of a tsunami and the social issues involved in response to tsunami aftermaths. In order to do this Jeff LaDouce suggested bringing in two visiting experts at the next meeting, one a social scientist and one a science expert. He also suggested inviting a social scientist to the Coordination meeting in March. Jeff LaDouce asked the Steering Group to have a set of focused questions ready for discussion. It was also suggested that the media (national and local) be invited to attend the November meeting as well as local WCMs and an NSF presenter.

11. New Brochure Review

Ann Thomason presented copies of the proposed new program brochure to each attendee for critique. There were many suggestions for improving the brochure. A new draft, incorporating the changes, will be forwarded to the steering group members for comment when it has been revised by the PMEL Graphics Department.

NEW ACTION ITEM 1: The USGS earthquake response plan and the NOAA response plans need to be examined to be sure that tsunami is included in both plans.

ACTION: Craig Weaver

George Crawford briefed the group on his Proof of Concept proposal for the NOAA Weather Radio on a Pole for the City of Seattle. The City of Seattle wants to know if the NTHMP would be interested in funding the pilot as a proof on concept. There are currently six wind-powered All Hazards Alert Broadcast (AHAB) units installed in Washington State. This is an opportunity for the National Tsunami Hazard Mitigation Program to show that high population communities can deal with all hazards. It is also an opportunity to emphasize the use of NOAA Weather Radio for an application not originally envisioned by its designers. Steve Gallagher (NWS) and Craig Weaver (USGS) both said there is considerable Congressional and NOAA interest in the NOAA Weather Radio on a Pole project. The Steering Group agreed to provide \$90K to fund the proposal. The City of Seattle will match our funds with \$190K from other sources. Rich Eisner also pointed out that we need to begin work on a new strategic plan for 2005 and beyond. Eddie Bernard stated that the program is addressing the 14 goals set forth in the current 5-year plan, which ends in 2005. It was agreed that we should begin to take these goals and formulate a new 5-year plan.

NEW ACTION ITEM 2: Take the 14 program goals and formulate a new 5-year plan. Jeff LaDouce asked volunteers who would like to help develop the new 5-year plan to e-mail him. He will arrange a teleconference with all volunteers before the holidays to begin work on the plan. The May 2004 meeting will be dedicated to finalizing the 5-year plan including a schedule of accomplishment. At the end of the meeting, everyone should leave with a draft of the new plan.

ACTION: Jeff LaDouce, Rich Eisner, volunteers

NEW ACTION ITEM 3: Form a Technical Advisory Panel. The panel will be chaired by Eddie Bernard and consist of the reviewers from the 2001 Program Review and the NSF Advisor, Juan Pestana.

ACTION: Eddie Bernard will contact the reviewers (Prof. H. Kanamori, Prof. P.L.-F. Liu, Prof. D. Luther, Prof. D. Mileti, and Mr. R. J. McCarthy) from the 2001 Program Review concerning serving on the Technical Advisory Panel.

Eddie Bernard said the new NSF advisor, Juan Pestana, is a member of this body and will be in place January 1, 2004. In addition, the National Research Council report: *"Preventing Earthquake Disasters: The Grand Challenge in Earthquake Engineering, A Research Agenda for the Network for Earthquake Engineering Simulation (NEES)"*, states on page 89 of the report: "Work with the National Tsunami Hazard Mitigation Program, a three agency/five state partnership led by the National Oceanic and Atmospheric Administration (NOAA) to define research needs, so the NEES program can best support

NOAA's mission realizing that NOAA is responsible for the Nation's tsunami warning system."

NEW ACTION ITEM 4: Provide names of presenters for future meetings, e.g., social scientists, local emergency managers and WCMs, national and local media, and researchers. Jeff LaDouce will prepare the agendas and invite the presenters.

ACTION: All will provide names of possible presenters, Jeff LaDouce will invite.

NEW ACTION ITEM 5: Rework the brochure draft. Send to steering group for comment.

ACTION: PMEL

NEW ACTION ITEM 6: Explore issues and challenges of developing a concept called "Bridge for Disseminating Real Time Technical Assistance and Coordinating Community Protective Action Recommendations" at the March 2004 Warning Coordination Workshop. First step: FEMA will bring a member of the Hurricane Liaison Team (HLT) to present their "lessons learned." Second step: discuss potential adaptation of elements. Third step: capture future directions and recommendations.

FEMA Presentation by Bruce Knipe

The Bridge for Disseminating Real Time Technical Assistance and Coordinating Community Protective Action Recommendations concept proposal seeks to incorporate the NTHMP and NOAA into the National Response Plan using an approach based on the Hurricane Liaison Team. The Steering Group was asked if they had an interest in pursuing this concept and to designate a venue for further exploration. Bruce Knipe, FEMA, explained this operational communications proposal in detail on Friday and it was agreed that the group would like more information. The Hurricane Liaison Team (HLT) will be asked to make a presentation to the Steering Group either at the March 2004 Coordination Meeting in Honolulu or at the Fall 2004 Steering Group meeting. Following the HLT presentation, the Steering Group will hold a workshop to discuss preparing a proposal and determining who would champion that proposal.

ACTION: Jeff LaDouce and Chris Jonientz-Trisler

Report on International Tsunami Information Center Activities for FY 2003

Dates and Locations for next three meetings

1. The Tsunami Coordination Meeting will be held in Honolulu, HI, March 2-4, 2004
2. The spring Steering Group Meeting will be held in Anchorage, AK, May 18-20, 2004. Focus of the meeting will be to finalize the new 5-year plan and to distribute any additional funds.
3. The fall Steering Group Meeting will be held in Honolulu, HI, in November 2004--exact dates to be determined at the spring meeting.

Richard H. Hagemeyer Award

There was no Hagemeyer Award presented this year as those chosen to review the two award nominations felt the

nominations were not proper. It was decided that a nomination committee should be formed for next year.

Status of Natural Hazards Special Issue on the National Tsunami Hazard Mitigation Program

There have been 11 papers submitted for this special issue. One paper is still due from Charles McCreery. Eddie Bernard hopes to be able to submit to the publisher by the end of November. ♦

Editor's Note: NTHMP steering group minutes can be accessed at <http://www.pmel.noaa.gov/tsunami-hazard/nov03summaryreport.html>. That version of this report contains additional links.

HAZARD MITIGATION NEWS

Congratulations to Disaster Research!

A Slice of History to Commemorate 400th DR (Reprinted from the 200th edition in 1996 . . .)

"The Disaster Research e-mail newsletter was created in January 1989 by Bruce Crawford, an enterprising young graduate student at the Disaster Research Center, at the University of Delaware. Bruce managed the newsletter in various experimental forms (moderated and unmoderated) until November of that year. However, like Dr. Frankenstein's creation, Bruce's wonderful innovation soon took on a life of its own, and Bruce found that graduate school and list management required 36hours/day of work - i.e., he had to give up one or the other. Hence, in November 1989 the Natural Hazards Center at the University of Colorado assumed responsibility for DR, and we have been publishing this newsletter ever since.

In that time, we have seen the readership grow at an almost constant geometric rate of over 50%/year from about 100 individuals to almost 1,500, and we have watched as the Internet reached new corners of the globe and subscriptions rolled in from ever more exotic places.

However, in the end, the most rewarding part of this work has been meeting new, interesting, dedicated hazards managers of all stripes from around the world. It has been their work and contributions that not only have made DR a [hopefully] useful publication, but, more importantly, have gone a long way toward making their regions, countries, districts, and local communities safer places to live."

We're now up to almost 3,000 subscribers and look forward to many more years of publication! Keep sending us your queries, comments, perspectives, and information! Thanks to you all for your support thus far -

The DR Management

Ed. note: To subscribe send this one-line command in the body of your e-mail message (don't include <>)

SUBSCRIBE HAZARDS <Your Name>. Mail to listproc@lists.Colorado.edu

From: Disaster Research 400, January 21, 2004

Puget Sound gets first loudspeaker alert system

The Port of Port Townsend now features a new 800-decibel all-hazard broadcast alert system to warn marina residents and workers of tsunamis and other hazards.

The loudspeaker system, which is the first of its kind in Puget Sound, is mounted on a 40-ft. pole and is powered by a rechargeable battery. Installed in late October, the system includes a blue flashing strobe on top as a visual alert.

Washington Emergency Management Division served as coordinator for the project, which was funded by an \$18,000 grant from the National Tsunami Hazard Mitigation Program.

From: Emergency Responder, November-December 2003

Editor's Note: The August 2003 (v. 5, no. 4, p. 1, 3) issue of *TsuInfo Alert* reported on the Ocean Shores' wind-powered tsunami warning device called the "Radio on a Stick." It also broadcasts warnings over a loud speaker and flashed a blue light.

Tsunami Grant Announced

Cooperative Research: Coastal Tsunami Effects: Mitigation Component. Funding: National Science Foundation, \$128,000, four years. Principal Investigator: Jane Preuss, GeoEngineers, Inc., 8410 154th Avenue, N.E., Redmond, WA 98052; e-mail: jpreuss@geoengineers.com.

This award supports a group research project focusing on specific aspects of tsunami coastal hazards mitigation. In this work, the first priority is to accurately identify the tsunami inundation zone. Recently, the National Oceanic and Atmospheric Administration launched a comprehensive program to estimate potential inundation zones along the Pacific Coast (California, Oregon, Washington, Alaska, and Hawaii; see <http://www.pmel.noaa.gov/tsunami/time>). The next priority is to reduce loss of life and property damage within the identified inundation zones. This project will address several aspects of the dynamics of tsunami inundation resulting in scenarios of flooding.

From: Natural Hazards Observer, v. 28, no. 3, p. 19 (January 2004)

Reviewers Wanted

The Federal Emergency Management Agency (FEMA) Emergency Management Higher Education Project is seeking volunteer reviewers (i.e. no honorarium can be provided) for a draft of a course titled "New Directions in Hazard Mitigation - Breaking The Disaster Cycle," an approximately 260-page instructor guide that has been developed as a classroom-based graduate seminar.

The course is an opportunity for students to analyze U.S. disaster policy and think critically about ways to break the disaster cycle in which repetitive damage occurs from repeated disasters. It stresses the concept of hazard mitigation, in which state and local governments take action before disaster events to reduce their impacts. The course is designed to enhance students' knowledge and understanding about hazard mitigation policy and

practice, and enable them to relate hazard mitigation to sustainable development and smart growth initiatives.

For those willing to commit to review and comment upon this draft, 30 days will be provided after receipt of a priority-mailed CD ROM to review and return comments. Reviewers should familiarize themselves with other FEMA courses at

<http://training.fema.gov/emiweb/edu/completeCourses.asp> prior to agreeing to review this course. It is requested that no one seek a review copy for information purposes only as within a few months a final version of this course will be uploaded to the FEMA Emergency Management Higher Education web-site at <http://training.fema.gov/emiweb/edu> and will be available for downloading free of charge.

For more details, contact Wayne Blanchard, Higher Education Project, Emergency Management Institute, Federal Emergency Management Agency Department of Homeland Security, e-mail: wayne.blanchard@dhs.gov.

From: Disaster Research 399, December 30, 2003

Hazards and GIS: Help Spread the Word!

During the 2003 Natural Hazards Workshop held in Boulder, Colorado, this past summer, a group of 50 participants met to discuss common interests in hazards applications of geographic information systems/sciences (GIS). Acting on a recommendation from the group, a new web site has recently been launched to encourage sharing of information about how the hazards community is using GIS for hazards-related activities and to provide useful and easily accessible resources for everyone. The web site can be found at <http://hazards.lsu.edu>.

The site is active, and the managers have issued a general call to all those who are interested in GIS and hazards, encouraging them to link to the web page and provide suggestions, pertinent links, comments, or anything else they consider useful. There are countless potential cosponsors and participants for this effort from the various public, private, and nonprofit agencies and organizations currently working with hazards and GIS.

Specifically, site organizers are looking for the following input: information on any available GIS resources for hazards-related data, hazards research that is using GIS, and any other general suggestions. Please contact either Lavanya Gandluru, lgand1@lsu.edu; or John C. Pine, Department of Environmental Studies, 42 Atkinson Hall, Louisiana State University, Baton Rouge, LA 70803; (225) 578-1075; e-mail: jpine@lsu.edu; <http://hazards.lsu.edu>.

From: Disaster Research 399, December 30, 2003

Integrated Earth Observation System

An international system is being developed to monitor the Earth, in the hope of reducing the impact of natural hazards and bringing Earth scientists together. A workshop was held in Washington, DC on October 22 to develop an integrated Earth observation system.

Conrad Lautenbacher, NOAA, is co-chairman of the ad hoc intergovernmental Group on Earth Observations which is working on the 10-year implementation plan. He also heads the U.S. delegation to the group. "If we are going to succeed, we have to be recognized on a political level. It has to be important to the governments, the elected leaders, the people who are in charge of making major resource decisions, policy decisions within government." (EOS, v. 84, no. 44, 4 Nov. 2003)

Draft plans were presented at the November 2003 meeting in Baveno, Italy. Final approval is expected at the third ministerial meeting in late 2004.

PUBLICATIONS

"An Operational Framework for Mainstreaming Disaster Risk Reduction"

"An Operational Framework for Mainstreaming Disaster Risk Reduction," a new working paper by Tom Mitchell, introduces an operational disaster risk reduction (DRR) mainstreaming framework for application at a national level. Disaster risk reduction frameworks must be flexible enough to be modified through a participatory process and have locally derived benchmarks.

Both the framework and the participatory process will help to generate political will and a sense of ownership, which are seen as vital to achieving disaster risk reduction gains. This paper places the framework in the context of other similar initiatives and discusses disaster risk reduction as a precursor to formulating a framework.

"An Operational Framework for Mainstreaming Disaster Risk Reduction," can be downloaded from the Benfield Hazard Research Centre website http://www.benfieldhrc.org/SiteRoot/disaster_studies/working_papers/workingpaper8.pdf.

From: Disaster Research 399, December 30, 2003

"Building Safer Cities: The Future of Disaster Risk"

"Building Safer Cities: The Future of Disaster Risk," by Alcira Kreimer, Margaret Arnold, and Anne Carlin, editors. World Bank Disaster Risk Management Series No. 3. ISBN 0-8213-5497-3. 2003. 320 pp. \$35.00. Available from World Bank Publications, P.O. Box 960, Herndon, VA 20172-0960; (800) 645-7247; (703) 661-1580; fax: (703) 661-1501. The book can also be purchased on-line from <http://publications.worldbank.org/ecommerce/>; specifically, see http://publications.worldbank.org/ecommerce/catalog/product?item_id=2337355.

Disaster impacts are becoming more severe. Annual direct losses for weather-related events have increased from \$3.9 million in the 1950s to \$63 million in the 1990s. Moreover, a number of ongoing trends such as population growth, environmental degradation, climate change and its correlative effects, and globalization have the potential to cause broader and more severe impacts than ever before. At the same time, relative to events in wealthier nations, disasters in developing countries can inflict massive casualties and cause major setbacks to economic and social development by diverting

development funds to emergency relief and recovery. By empowering communities and individuals to implement effective disaster risk reduction strategies, families, communities, and entire countries can become more resilient when disasters strike. This volume, comprising papers presented at a 2002 meeting to promote awareness among development agencies regarding the urgent need to address urban vulnerability to hazards, presents a variety of perspectives on this topic.

From: Natural Hazards Observer, v. 28, no. 3, p. 22
(January 2004)

"Emergency Response and Emergency Management Law"

"Emergency Response and Emergency Management Law," by William C. Nicholson. ISBN 0-398-07406-2. 2003. 345 pp. \$79.95. Available from Charles C. Thomas, Publisher, Ltd., 2600 South First Street, Springfield, IL 62704; (800) 258-8980; http://www.ccthomas.com/details.cfm?P_ISBN=0398074062.

Emergency response law is not often considered in either the legal or emergency response literature. In addition, very few attorneys are current in emergency management law. This volume begins by examining the duty to respond and continues through the wide range of legal issues that arise during response. Chapters cover the responsibility to act, vehicle and dispatch issues, scene management, hazardous materials, use of volunteer resources, local and federal government responsibilities, and the broader issues of emergency management. A variety of relevant legal cases are profiled.

From: Natural Hazards Observer, v. 28, no. 3, p. 23
(January 2004)

New International Journal of Disaster Medicine

The "International Journal of Disaster Medicine" is the first international journal devoted exclusively to the field of disaster medicine. Practitioners and researchers in health-care, academia, industry, and government around the world will find analyses, ideas, new application of knowledge, and discussions of topical issues to help enhance the efficiency and effectiveness of policies in disaster medicine. The journal will focus on the following themes: experiences from major accidents and disasters; vulnerability assessment and risk analyses; planning and preparedness; practical management and organization in major accident and disasters; and research within all fields of disaster medicine.

The journal is currently soliciting papers that encompass field reports from major accidents and disasters in all parts of the world, written in a standardized format to allow for comparison of experience and results; reviews and editorials on recent development and methodology within all fields of disaster medicine; original scientific papers on research, development and education; book reviews; short information on meetings and courses for a meeting calendar.

All submitted papers are reviewed by an international advisory board of well recognized experts within the field. Editorial-related questions may be directed to Sten Lennquist, Secretary General, International Society of Disaster Medicine and Traumatology, University Hospital, 581 85 Linköping, Sweden. For general information about the journal, including submission guidelines and subscription information, visit <http://www.tandf.co.uk/journals/titles/15031438.asp>.

From: Disaster Research 400, January 21, 2004

International Journal of Mass Emergencies and Disasters

The International Research Committee on Disasters (IRCD), publisher of the "*International Journal of Mass Emergencies and Disasters*," is currently offering significant savings to individuals, libraries, and organizations on available back issues. IRCD is also offering additional reduced rates to students and readers in developing nations. Three issues are published per volume/year; back issues are available beginning with Volume 1 published in 1983 through Volume 20 published in 2002. Reduced prices are available through April 1, 2004.

More information about the journal can be found at <http://www.usc.edu/schools/sppd/ijmed/>. To order back issues, contact Brenda Phillips, IRCD, Jacksonville State University, 700 Pelham Road North, Jacksonville AL 36265; (256) 782-8053; e-mail: Brenda@jsucc.jsu.edu.

From: Disaster Research 400, January 21, 2004

WEBSITES

<http://www.csc.noaa.gov/rvat/>

The National Oceanic and Atmospheric Association (NOAA)'s Coastal Services Center provides an on-line risk and vulnerability assessment tool (RVAT) to help identify people, property, and resources that are at risk of injury, damage, or loss from hazardous incidents or natural hazards. The site includes a community vulnerability assessment tool designed to help determine and prioritize the precautionary measures that can make a community more disaster-resistant.

From: Disaster Research 400, January 21, 2004

http://www.fema.gov/preparedness/mutual_aid.shtm

This initiative, undertaken by FEMA, is designed to enhance the functionality of interstate and intrastate mutual aid agreements to assist emergency managers in acquiring those resources necessary to prepare for, respond to and recover from any emergency.

From: Disaster Research 400, January 21, 2004

<http://www.cbsnews.com/digitaldan/disaster/disasters.shtml>

This site, maintained by Dan Dubno of CBS news, contains a very comprehensive list of hazards-related web sites.

From: Disaster Research 400, January 21, 2004

<http://www.cdc.gov/nceh/hsb/disaster/default.htm>

TsuInfo Alert, v. 6, no. 1, February 2004

This web site from the Centers for Disease Control and Prevention highlights the agency's disaster efforts, including epidemiology, a series of publications on extreme weather, and other disaster-related activities.

From: Disaster Research 400, January 21, 2004

<http://www.earthscope.org>

EarthScope is a new initiative sponsored by the National Science Foundation to launch observatory systems to monitor the physical elements of earth. EarthScope includes the following components: USArray (U.S. Seismic Array), SAFOD (San Andreas Fault Observatory at Depth), PBO (Plate Boundary Observatory), InSAR (Interferometric Synthetic Aperture Radar), and is a partnership between these organizations, the U.S. Geological Survey, the National Aeronautics and Space Administration, the Department of Energy and many universities, seismic networks, and states.

From: Disaster Research 399, December 30, 2003

<http://www.training.fema.gov/emiweb/is/is317.asp>

The Department of Homeland Security's Federal Emergency Management Agency (FEMA) recently unveiled an on-line, independent study course that can serve as either an introduction to those joining Community Emergency Response Teams (CERTs) or as a refresher for current volunteer team members.

From: Disaster Research 399, December 30, 2003

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

The web site of the United Nations International Strategy for Disaster Reduction has been recently revised and many new features have been added.

From: Disaster Research 399, December 30, 2003

<http://www.disaster-info.net/newsletter/92/helid.htm>

The 2003 edition of the *Health Library for Disasters*, an on-line collection of information resources on public health in disasters and complex emergencies, has just been released by the World Health Organization and the Pan American Health Organization. The library is fully searchable with a variety of key terms.

From: *Natural Hazards Observer*, v. 28, no. 3, p. 10 (January 2004)

<http://www.fema.gov/kids/games/board>

The Department of Homeland Security's Federal Emergency Management Agency (FEMA) has unveiled an interactive web-based board game for children as part of its commitment to educating young people about disaster preparedness and risk reduction. The board game is called "Disaster Discovery."

From: *Natural Hazards Observer*, v. 28, no. 3, p. 10 (January 2004)

http://www.fema.gov/tab_education.shtm

At this URL, FEMA offers a community-based predisaster mitigation curriculum designed to involve emergency management and community and faith-based

organizations (CBOs/FBOs) in predisaster mitigation at the local level.

Also through FEMA, the Department of Homeland Security (DHS) is introducing a new course to raise awareness of the need to reduce the consequences of disasters on small businesses. Small- to medium-sized businesses, which provide nearly 80% of the jobs in an average community, are at great risk for failure after a disaster. To help prevent business losses, this course, offered by FEMA's Emergency Management Institute (EMI), brings together state and local officials, economic development leaders, emergency managers, and other stakeholders to develop business loss prevention strategies, share concerns, and raise awareness of each other's priorities. Information about these classes, along with many others offered through EMI, can be found at <http://training.fema.gov/EMIWeb/>.

From: Natural Hazards Observer, v. 28, no. 3, p. 10 (January 2004)

CONFERENCES SYMPOSIA WORKSHOPS

March 1-3, 2004;

Disaster Recovery Planning: Insuring Business Continuity. Sponsor: American Management Association International. Atlanta, Georgia: March 1-3, 2004; New York, New York: April 21-23, 2004; Las Vegas, Nevada: May 17-19, 2004. These workshops are participant-oriented and will provide the knowledge and tools to develop a comprehensive program to mitigate against, prepare for, respond to, and recover from both large and small disasters. Topics include step-by-step project plans; methodologies for identifying and analyzing threats; processes for identifying essential business functions; how to develop and conduct a training and testing program; and how to plan for continued communication with stakeholders. Workshop details can be obtained from the American Management Association International, 1601 Broadway New York, NY 10019; (212)586-8100; e-mail: customerservice@amanet.org; <http://www.amanet.org/index2.htm>.

From: Disaster Research 399, December 30, 2003

May 3-5, 2004

Disaster-Resistant California. Sponsor: the California Governor's Office of Emergency Services (OES). Sacramento, California: May 3-5, 2004. With the goal of exploring disaster mitigation, planning, preparedness, response and recovery, this conference is designed to bring together emergency management professionals, local and state government representatives and private business partners to share ideas, technology and resources for the purpose of mitigating disasters. For more information, contact Victoria LaMar-Haas, CA OES, P.O. Box 419023, Rancho Cordova, CA 95741-9023; (916) 845- 8531; e-mail: victoria.la.mar-haas@oes.ca.gov; <http://www2.sjsu.edu/cdm/drc04/index.html>.

From: Disaster Research 399, December 30, 2003

May 18-24, 2004

TsuInfo Alert, v. 6, no. 1, February 2004

TIEMS 2004 Annual Conference. Sponsor: The International Emergency Management Society (TIEMS). Melbourne, Australia. Registration and agenda information are available from Norm Free, TIEMS, Shire of Yarra Ranges, PO Box 105 Lilydale, Victoria, Australia 314; tel 61 03 9294 6703; e-mail registration: registration@tiems.org; <http://www.tiems.org/>

From: Disaster Research 400, January 21, 2004

May 27-29, 2005

The Tsunami Society conducts a Tsunami Symposium every three years at the East-West Center on the University of Hawaii campus. The next Symposium will be May 27-29, 2005.

August 10-12, 2004

Gender Equality and Disaster Risk Reduction Workshop. Sponsors: US Agency for International Development (USAID) Office of Foreign Disaster Assistance, the US Department of Agriculture, the International Strategy for Disaster Reduction, the University of Hawaii, and members of the Gender and Disaster Network. Honolulu, Hawaii. This will be an action-oriented meeting for women and men working toward gender equity in all dimensions of disaster risk and response. This international meeting of practitioners, policy makers, planners academics, activists and community members will focus on practical and feasible strategies for gendering the risk reduction agenda. Information is available from Elaine Enarson, 33174 Bergen Mountain Road, Evergreen CO 80439; (303) 670-1834; e-mail: genderdisaster@yahoo.com; <http://www.ssri.hawaii.edu/research/GDWwebsite/index.html>.

From: Disaster Research 400, January 21, 2004♦

The following tsunami signs were adopted by the 19th Session of ITSU (2003)



ITSU-XIX said:

(Agenda Item 3.7 WORKING GROUP ON INTERNATIONAL TSUNAMI SIGNS AND SYMBOLS)

The Group accepted the "Tsunami Hazard Zone" and "Tsunami Evacuation Route" signs.

(continued on page 16)

Structural and personal social processes in disaster

By George Silberbauer

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The way in which we perceive and interpret our experience of the world around us is a cultural product. It is systematic, but selective, including some events and phenomena, and excluding others as irrelevant or false. It is, thus, an incomplete, somewhat inaccurate reflexion of reality.

Nevertheless, it is adequate for most of our 'normal' needs; it enables us to make enough sense of what happens for us to be able to live as reasonably competent members of the groups and society to which we belong.

This culturally-specific account of reality is a sort of combination of tribal myth and open conspiracy. Our beliefs, attitudes and expectations are guided by it, but we also participate in its formulation, maintenance and amendment. For these processes we are dependent on frequent social interaction with others to learn, and affirm and/or correct our personal versions of Received Wisdom about how to account for, and interpret our experience of reality, i.e. to provide us with sufficient information about the current construct of reality.

As well as the physical damage a disaster does, it also causes critical disruption of the victims' customary relationships and patterns of social interaction. Not only is this emotionally distressing but it also contradicts their expectations of normality, thereby invalidating much of their Received Wisdom, leaving them in a state of painful uncertainty.

Furthermore, a disaster impedes the normal flow of information as well as that which the unexpected, novel and unprepared-for post-disaster circumstances require. Victims are thus precipitated into a crippling information-deficit that increasingly inflicts psychologically damaging diminution of sense of identify, highly stressful uncertainty about future action and prospects, and difficulty in reaching decisions because of the imponderability of key factors. Consequently the processes of recovery and rehabilitation are greatly hindered.

Post-disaster information-deficit can be ameliorated by appropriate preparation. Relevant prior experience, whether personal or vicarious, is of the highest value and can be imparted through appropriate training and publish education (To illustrate: the Victorian Country Fire Authority's programmes of Bushfire Blitz and Community Fireguard have proven value in post-disaster recovery as well as in preventing, or mitigating bushfire damage.) In the absence of adequate preparation, victims will be principally, perhaps wholly reliant for information on those who render them assistance. In either case a copious flow of relevant, timely and understandable information is an essential element of assistance and its provision should form part of any disaster preparation. As the harm done by information-deficit progresses in a

quasi-exponential manner, early and effective mitigation of post-disaster information-deficit is an urgent priority.

1. Introduction

There is reasonably clear comprehension (but indifferent quantitative assessment) of the physical and economic harm that disasters do to their victims. However, the psychological problems are less well understood, and we are only beginning to grasp the nature and extent of the social consequences. These various aspects of disasters are interrelated and are mutually compounding. Some psychological reactions are manifestations of, and responses to critical social dislocations occasioned by the disaster. In that sense, social factors are causal vectors of some of the psychological harm. Unless they are remedied, accurate identification and alleviation of those mental and emotional disturbances will be impeded.

The organizing principle of this paper is the concept, information (see definition included in this paper). It relates to the psychological, social and cultural aspects of what happens to disaster victims and is the theme that connects these logically and coherently. In an operational context, this approach enables disaster managers to identify, make sense, and keep track of the psycho-social and cultural harm done to victims, and of their progress towards recovery and rehabilitation. If understood by victims, it ameliorates some of their confusion and distress and points the way to their further recovery.

What is lost in a disaster cannot be restored. Victims are forever changed by their experience and, if they are to recover, must adapt to their changed circumstances by building a new set of functional equivalents of what previously existed. The more coherently and completely they can replace the lost old with the accessible new, the more successful is their recovery and rehabilitation.

This paper describes the shock of dissolution of victims' identity, sense of Self and customary and socially-constructed perception of reality following disruption of accustomed social structures, and discusses recovery processes that facilitate victims' construction of substitute functional equivalents.

What is a disaster?

Whatever its agency, a disaster is something that happens to *people*, affecting their persons, emotions, perceptions, expectations and capacity to lead their lives in their usual manner. Depending on the role of the individual during, and after the event, there are different perceptions of it. What is relevant here is the *victim's* perception that a disaster brings about radical and intolerable disruption of the order and functions to which she or he is accustomed but, temporarily or permanently, does not have the capacity to adapt to the changes caused by the event.

Recovery and rehabilitation lie in developing adaptive capability.

What does it do?

Most disasters cause personal *physical harm* people are killed or injured and survivors are shocked by the experience. Many suffer progressively worsening exhaustion as increased workloads, physical deprivation and emotional strain take their toll. *Economic loss* is suffered when property and other assets are destroyed or damaged and their utility or enjoyment diminished, and when the organizational framework of normal economic activity is disrupted. *Psychological traumata* include impaired cognitive, intellectual and emotional competence and control. Victims suffer emotional distress, e.g. grief, anger, confusion, anxiety, and the uncertainty about identity and sense of Self that follows social dislocation.

Although a sudden disaster is an event, many of its effects are the results of processes set in train by the event. Depending on their level of personal and institutional resilience, victims will have greater or lesser autonomous capacity to halt, and reverse these processes. However, early, appropriate assistance from competent and capable others will help to limit the damage and, where resilience is low, will be essential to initiate and maintain victims' own counter-measures.

Mechanistic *social disruption* is caused by the unforeseen absence of key personnel in relationship networks and by survivors' inability to perform their customary roles because of loss of, or damage to property and other assets, including infrastructure essential to communication, and interruption to the delivery of normal goods and services. Such disruption may extend beyond the geographical area of the disaster, increasing its total impact-space. Causation is linear and it is an empirical phenomenon that can be objectively assessed. Recovery is a matter of replacing the missing personnel and restoring assets.

The inability of victims to make the exchanges that are expected of them leads to structural dissolution. This is a more pervasive and intractable form of social disruption than Mechanistic Social Disruption, as it interferes with the victims' accustomed means of expressing their personal and social identities. Further, it is incorporeal, non-mechanistic and subjective, non-empirical and non-linear in its causation and its effects. If unchecked, Structural Dissolution may worsen in quasi-exponential fashion with the passage of time. Mechanistic disruption and structural dissolution are mutually causal and compounding. However, it is heuristically convenient to distinguish them. Both arise from psychological, cultural and social predispositions endemic in the affected population, aspects of which are discussed below.

2. Culture and society

Having few instincts to guide behaviour, humans depend, instead, on learning, most of which comes from others. If we are to interact coherently with one another, it

is essential that we do so in a context of shared knowledge, beliefs, values, meanings and mutually-comprehensible aspirations. We need not share these with complete uniformity, but with enough in common for each to understand where the other is 'coming from' and 'going to'. The shared corpus of knowledge, etc. comprises a large part of a social group's *culture*, i.e. the learned behaviour, and its products that are characteristic of that group. (The membership of a social group may be only Robinson Crusoe and Man Friday, a household, an association or organization, or as large and disparate as a nation-state. See below for comparisons of these.)

Social theory has coined conceptual tools for understanding and explaining social behaviour. Although very useful, they are abstractions and their meanings vary somewhat with context. They should not be mistaken for what actually happens inside our heads, and between one another.

Culture is the product of individual discovery and invention which is sifted by a consensus of that individual's social group for inclusion in its 'received wisdom,' or is rejected as irrelevant a("this committee is not concerned with the number of eggs laid last summer in the Blackbird's nest outside"), trivial ("George has reinvented the wheel--again") or false ("disasters don't happen"). Such consensus is reached in the context of existing culture, to which the novel element must conformably relate, and of a measure of social solidarity sufficient for its effective communication and bestowal of appropriate cachet and acceptance.

Although it appears likely that humans are "hard wired" for sociability, its expression within any specific group is another learned trait and achieving solidarity is an uncertain endeavour. The human 'style' is to create bounded social groups (i.e. in which members are distinguished from outsiders) within which interactions are patterned by approximate prescriptions of behaviour to which shared meanings are attributed. Interactions consist of exchanges of valued entities in the forms of energy, materials and information.

Energy. ("the capacity to perform work") is delivered to the recipient mechanically in the form of physical services performed, chemically contained in food and fuel and as radiation transmitted by power-grids, etc.

Materials include all concrete objects, including food and fuel.

Information. In its ordinary sense, information is knowledge of a particular fact or circumstance gained or given through communication, investigation or instruction. A wider meaning, more useful in the present discussion, is derived from the mathematician's use of the term: information is that which reduced uncertainty. Information may be false, or valid, i.e. any knowledge that enables one to distinguish the correct or, if you're into fuzzy logic, optimal choice among alternatives of action, identity, value and/or meaning. It may be *intrinsic*, i.e. already possessed by the individual, or derived from another source, i.e. *extrinsic*.

In the exchanges that constitute the substance of relationships, there is approximate prescription of which entities may be exchanged with whom, and how, and in what forms. Their values and meanings attributed in the context of each exchange are also approximately prescribed as are the behaviour accompanying the exchanges, and the sequences of response to each step in the series. (Thus, while it was once appropriate for me to give my wife a birthday present of alluring lingerie and receive a fond kiss in return, the same exchange between me and a fellow fireman might lift the collective eyebrow of our brigade.) Furthermore, access to resources that form the substance of exchange is differentially allocated among individuals. (The garments should come from a shop in which I have made payment, and not from the neighbour's washing-line.)

A *relationship* is expressed (my present to my wife), or created (I buy the apparel from the salesperson in that little boutique) between individuals when they interact, i.e. make an exchange. The *quality* and *intensity* of a relationship are approximately prescribed by the social structure in which it occurs. Prescription of *quality* may be strict, with the types of exchange between participants quite narrowly defined (e.g. between professional and client). Other relationships (e.g. friendships) are more nebulously prescribed, leaving it to people to negotiate the appropriateness of exchanges within a broader field of choice. The *intensity* of a relationship is the frequency with which interaction occurs and/or is emotional significance (affect) on the participants. Such is human sociability that frequent interaction of one type between individuals is likely to accrue emotional content and to proliferate to other types (e.g. I become friendly with my regular newspaper-seller and, eventually, with his family). Relationships are not automatically self-sustaining, but depend on continued interaction, or the hope of interaction that will bring exchanges that, even if not very rewarding, are less unrewarding than any visible alternative.

Symmetry of relationships, i.e. that the quality and intensity be about equal for the participants, is seldom exact, but gross imbalance sooner or late creates a strain (e.g. as with 'users' and 'bludgers'). A requirement of symmetry is reciprocity that something of equal value be given in return for what is received. Reciprocation may be direct, i.e.. recipient reciprocates to giver (my neighbour and I greet one another) or generalized, when recipient passes on something of appropriate value to some other party (I make a charitable donation in the giver's name), or negative (a thief steals possessions and receives a custodial sentence).

The types of exchanges prescribed for an individual constitute the *status* she or he holds in the group. Put another way, it is the sum of her or his rights and obligations. Statuses are commonly ranked by their relative *power* (i.e. the capacity that exchanges give the person to move others to act according to her or his will). A person's *role* is her or his performance of prescribed exchanges, i.e. exercise of rights and obligations. (Clearly,

this implies the participation of others, with whom there is role *reciprocity*). *Prestige* is the value placed on status, or role performance. Thus there can be high status with low prestige (politician of your choice) or low status and high prestige (Garbo of the Year). Status may be *ascribed*, i.e. is dictated by the social structure (e.g. kinship, citizenship), or *achieved* by the appropriate actions and behaviour (e.g. qualifying for a trade, marriage). Ascribed statuses are generally predictable and are more often permanent than are those that are achieved.

Social formations vary in their *scale*, which is partly a function of the size of the population within which occurs the full range of roles, and of the median role-density (i.e. number of hats worn by a member). Thus, the smaller the scale, the greater is the number and variety of roles of each member vis-à-vis any other member. In an isolated village or on a remote, small island the population is necessarily largely self-dependent (i.e. nearly all the range of roles is filled by locals). The schoolteacher may be the spouse of the shopkeeper, parent of one or more pupils, member of the local council, sibling of the nurse (who does not always [sic] minor surgery, midwifery and counseling and dispenses drugs that would make the Australian Medical Association's hair stand on end) and so on, in a dense network of cross-cutting, emotionally rich, mutually-influencing relationships with frequent fact-to-face interaction. There is scope for negotiation of the rules of exchanges and their content and compromise and substitution of established practice can often be decided without causing confrontation. Much of experience is shared and the people acquire extensive knowledge of one another which, in turn, informs them about themselves. If there is a high level of confidence in the expectations of the population of one another's role performance, and of their reactions to one's own, it is likely to be a healthily-functioning society with strong solidarity among the members. (If not, it's pure hell). Lest this appear as Rousseauesque romanticism, it must be noted that the safety-net that small scale provides is matched by a hard ceiling.

In a large-scale social formation, e.g. Melbourne, roles are dispersed among a much larger number of people, many of whom have only single-role relationships with one another and the majority have no direct contact as all. Such contact as occurs is mostly infrequent, fleeting, anonymous and of little emotional significance. Mutual knowledge is slight, or non-existent and role performance is largely mechanistic and impersonal. There is less confidence in expectations of others' role performance and that which exists is derived from faith in structural prescription rather than from knowledge of the individuals' characters. There is seldom opportunity for the type of negotiation of roles that is seen in small-scale social groups. Yet there is a measure of solidarity, as is shown in responses to appeals for emergency, or charitable help and other support for fellow Tarmenians, Territorians, Australians, etc., and in the customary gestures of recognition on discovering that those other tourists in Bangkok are also Melburnians (horrors!...but

one must be civil). This is indicative of a vague sense of *community*, an abused term that, here, is intended to mean a population among whom there is a significant measure of shared identity and a propensity for common purpose.

Within these extensive social systems there are groupings that vary along a continuum of scale, e.g. households, neighbourhoods, schools, workplaces, clubs and other associations in which members interact within a network of more varied and intense relationships. Any given individual will probably belong to several of these, each with its set of statuses. In contrast with the village and island examples, it is unlikely that there will be many links between a member's several groups, other than her or his alliance with it. There is, thus, limited scope for reinforcement of individual roles, or for reconciliation of a member's various roles, having the effect of somewhat fragmenting the persona and restricting the individual's amount and variety of coherent information about Self.

All social formations have sanctions that are applied to their members to express and reinforce behavioural prescriptions by rewarding the conforming (positive sanctions) and punishing the wayward (negative). Many are formal (e.g. wages and Queen's Birthday Honours, or capital punishment and library fines) but more are informal (e.g. prestige, favour, or disrepute and adverse prejudice).

In short, the social system and its culture operate to tell me who I am, who you are, what to do, and how we should behave towards one another. It has ways of making both of us listen and conform. When its operation is significantly disrupted by a disaster, the entire basis of the human life-support system is threatened.

3. Fragile reality

Let us assume, as did Plato, that 'out there' is the totality of reality, only fragments of which are known to us. We rely on sense-data (i.e. what is seen, heard, smelt, tasted and felt) for information about our surroundings. Not all of it is accessible; some information is beyond the physiological and dimensional limits of our senses, being too small or too faint, or lying outside the spectra of our sensitivities, or too distant in space or time. Thanks largely to language, we are able to partially overcome these limitations of our senses by including others' accounts of events and phenomena that we miss and, although vicariously experience, to incorporate them in our personal knowledge and beliefs about the universe. (N.B. the universe starts at your navel now, and extends infinitely in time and space to embrace everything that is, was and shall be).

The filter of cultural conditioning (i.e. specific to each social group) further restricts information about our surroundings; culture defines for us what is insignificant, irrelevant or false, which we ignore, reject, or do not sense, e.g. most while Australians, hard-put to track even a railway-line, are quite blind to the indications left by an animal or person walking over a piece of ground and, if they were pointed out, would be unable to make any sense

of them. Yet those signs are easier to see, read and interpret than are the little black marks on this page.

As well as being incomplete, any society's perception of the reality of the universe includes much that is error. Clearly, perceived reality should bear some resemblance to actuality, but social man is startlingly tolerant of evidence that contradicts belief. I could never understand the firm insistence of Kalahari bushmen, who are superb field naturalists, that steenbok breed only in spring. This small antelope is avidly hunted for its meat and in all seasons the Bushmen are regularly confronted by fetuses in all stages of development in the gravid females they killed, as well as by the sight of the fauns with their mothers. In the world of western medicine, until Struan Sutherland gave us pressure-immobilisation in about the 1970's, professionally-endorsed first-aid treatment for snake bite included a variety of measures that were completely useless, and often harmful. Cytology had the human chromosome number wrong until 1956 and for more than half a century hordes of anatomy students were failed for not finding the mythical 24th pair, and countless individuals classified as abnormal for not presenting them. (Scientific folklore has it that the mistake arose from a printer's error in the paper that originally reported the number in the late nineteenth century).

The learning on which we depend to guide our behaviour occurs in a societal context and maintaining the necessary coherent interaction requires a common frame of reference, i.e. a shared perception of reality. Incomplete and frequently mistaken as it is, each society's way of construing its experience of the universe serves its members well enough to meet their ordinary survival needs. A flat earth was quite satisfactory until seafarers ventured far enough out to sea for land to sink astern below the horizon and, as wider observation more stridently challenged established belief, the ensuing geocentric universe was replaced by a heliocentric one, and so on. But, as poor Galileo found to his cost, agreement is more important than accuracy. The necessity for a shared frame of reference leads us into a conspiracy to endorse Received Wisdom as Truth.

Much of learned knowledge and behaviour require frequent reinforcement if they are to be retained. Furthermore, we live in an intensely dynamic, inherently unstable social environment and we require a constant flow of information to keep up with the complex, incessant change. New extrinsic information must be incorporated with what is intrinsic, correcting gaps and/or errors in the latter. The inputs are not systematic or of uniform quality, but random and fragmentary. There is seldom adequate information to allow rational certainty or time in which fully to reflect on that which is received. Our grasp of reality is, thus, more fragile than we are happy to acknowledge.

Instead of investigating the validity of new information and the conclusions it leads to, the common solution is to economise and accord authority to selected sources of information and take on trust what comes from them. The readiest-to-hand memories of one's own ex-

perience are often the chose source. But even this mother-lode of sagacity is surprisingly easily drawn into doubt by conflicting, but untested inputs from Received Wisdom. It is our habit to accept as truth that which the Most Significant Other has proclaimed.

Significant Others are the oracular loved ones, members of skilled trades and learned professions, demagogues and the other people to whose statement and opinions we variously ascribe authority. Their foremost qualification is credibility. Credibility may be an aspect of social status, e.g. the proverbial policeman tells me the proper Greenwich time. It may be demonstrated by competent performance or appropriate experience, or accorded in a sort of chain reaction: e.g. I have faith in the opinion of A, who tells me that trustworthy B considers C to be reliable. Consequently, I, too, have faith in C, even though I may not know B.

With great gaps in the information about what is around us, we often misinterpret the environment, getting our facts wrong and attributing wrong meanings to some that we get right. Yet, Thomas Kuhn to the contrary notwithstanding, science and other forms of knowledge do progress--measured as the discerning of valid and significant associations between phenomena and events--but there is a long way yet to go. And not everybody's knowledge and science progress at the same rate. Chaos, i.e. an event of unknown causation, is intolerable to us, so we comfort ourselves by ignoring or suppressing it, or by inventing myths like 'blind fate' a.k.a. 'chance,' witchcraft, or your chosen brand of climate change. What we perceive as 'reality' is a cognitively dissonant, spotty mixture of valid approximations, invalid information and ignorance masked by the label, 'irrelevant.' Cruel experience will correct some of the errors ("I'm sober enough to drive") but we have largely surrendered critical objectivity to favour current popular belief; as stated above, in general the truth is what the most Significant Other says it is.

We are conditioned by the experience of a relatively smoothly working social system to sets of habitual actions and responses. The actions and responses of others serve to validate, or coherently amend our values, beliefs and expectations.

4. Paradise Lost

By its nature, a disaster is beyond the control of those whom it afflicts. Even when defences have been prepared against its probable occurrence (e.g. bushfires and floods in Victoria), but are overwhelmed, the event contradicts and invalidates the expectations of ordinary, everyday life. On a small scale such contradiction is a common thing; we are accustomed to being surprised. But a disaster goes far beyond surprise; it is a shocking upheaval of normality.

Performance of normal role-sets is impeded or prevented and, instead, victims are precipitated into new roles for which they are largely unprepared. They are confronted by behaviour, including their own, that no longer has its old meaning, and by new forms of behav-

our with uncertain meaning. Misleading media and other folklore images of their experience compound their confusion. With lost possessions go potent symbols of status, prestige and individuality. The accustomed flow of information about identity and Self is disrupted, replaced by ambiguous signals to the victim about who, and what she or he is.

The undermining of identity, the singularity of the victim's personal experience of the disaster and its consequences, the unfamiliarity of the situation and the unexpectedness of almost everything combine to refute much of her or his socially-construed reality.

Interruption of normal exchanges through loss of, or damaged to goods and facilities for delivering services, the emotional strain of the event, and having to contend with the difficulties of arising from the disaster can destabilize relationships. If the threat is not averted by active counter-measures or by the inherent resistance and/or resilience of the relationships, and they collapse, the ensuing loss of solidarity increasingly compounds the personal and structural harm caused by the disaster. Dysfunction of intimate relationships can do more damage than the event itself.

5. Regaining paradise

However much assistance is given, recovery remains an essentially autonomous process. It follows that victims' capacity for effecting their own recovery will be enhanced by alleviation of the debilitating effects of having been unhinged from their accustomed security of reality, including identity and Self.

The works of Victorian Country Fire Authority Critical Incident Stress peer teams is an example of helpful, very early alleviation. Their clients' distress is much reduced by 'talking it through', during which the commonality of their experience and reactions to it become apparent, thus affirming their personal version of reality and reassuring them of the normality of their (to them, peculiar) reactions. Analogously, disaster victims' distress about their own emotional states, new roles and general confusion can be lessened by comparable intervention that serves to re-engage them.

The peers are volunteers, the CFA bearing their transport and other costs. When requested, they usually attend in pairs at the scene or when the crews return to their stations, and informally discuss the incident with the whole group. They receive a small amount of training, during which the limitations of their role is clearly established. Emphatically they are not there as therapists but, where desirable, might refer members to professional help and facilitate the contact. Their principal qualifications are a capacity for empathy and 'having been there', i.e. having been through critical incidents themselves, which serves as a badge of credibility and enables their clients to accept them as Significant Others. Such acceptance is critical, for it is very difficult for victims to communicate with those whom they see as 'living in another world', and not in their own, post-disaster one. Prior experience also

legitimizes, and makes sense of their intrusion into the victims' privacy.

The success of this service suggests that it could usefully be extended as a general facility for immediate post-disaster short-term deployment. Suitable volunteer personnel could probably be found among the various emergency services, simplifying selection, training and communications.

Where there is good opportunity for frequent face-to-face interaction a quasi-tribal solidarity often arises spontaneously among survivors. This can be a vehicle for countering the disruption of the pre-existing social organization but it is an ephemeral and fragile condition, so the moment must be seized early in the recovery process and intervention be delicately handled. Typically there is a lessening of the customary barriers between households and other groupings in the affected population, who come to see themselves as 'all in the same boat'. Perversely they feel stigmatized by their status as victims, but come to see it as a badge of distinction, making them somehow special. In the abrupt absence of customary hierarchies and other structures, the victim population is a socially amorphous, egalitarian community. Leaders of action and opinion arise suddenly and unpredictably. Emotions are volatile and there is a high potential for quick crystallization of opinion, driven by unassuaged grief and anger and unresolved confusion. Survivor guilt is common. Unless a more positive lead is given (helping others is a sovereign anodyne) it is likely to be expressed in activities like scapegoating, which is a cruelly wasteful and self-destructive pursuit.

In the absence of any fragment of pre-disaster leadership among the survivors, emergent leaders are likely to be 'self-starters'. If they lack wisdom and experience, or have unsuitable motives for putting themselves forward, their leadership can be harmful, giving rise to jealousies, schisms, frustration and quite serious interference with recovery assistance. Unobtrusive, but firm intervention by those running the recovery assistance is needed to back the right horse and support their choice by according authority.

The 'tribe' can be an effective network for two-way communication but, as there is a marked propensity to rumour-mongering, information directed to survivors should be reiterated in verbal and written forms and media statements should be checked for their concordance with that information. It is important that everybody be seen to receive the same information and the more of it that is imparted to groups and at gathering where questions can be asked and answered, the better it will be understood and used. As there is often marked synchronicity of phases of response and consequently unity of perception of the situation, the information should be tailored to suit the needs, and level of acceptance of the victims (e.g. accurate casualty lists should come before detailed instructions about design criteria for new housing). The well-intentioned should be restrained until their particular form of assistance can actually be put to good use--it simply causes distress for the Gardening

Association to dump replacement trees and shrubs on people who lack sufficient water even to wash themselves and must watch the kind donations wither and die. As far as might humanly be possible, politicians should be restrained from making the extravagant promises to which they are prone after disasters; disappointment is more damaging than is deprivation.

As much of the recovery work as they are capable of should be left to the survivors. Mutual assistance does lasting wonders for morale. It restores a sense of Self, establishes healthy relationships and gets the tasks done. Disaster management's principal role is to provide information, materials and unobtrusive guidance. Within the restrictions of privacy, much of counseling can usefully be done in groups. It is economical of specialist personnel, fosters indigenous mutual support and reassures those who mistakenly see their own distress as a unique weakness. Each such group also provides a forum for negotiation of roles, values, etc., facilitating the process of structural reconstruction.

To sum up, a disaster may be seen as causing a critical deficit of information among survivors. With inadequate means of resolving the deficit they are left in profound uncertainty about their accustomed experience and expectations of reality, including themselves, their relationships and most, if not all of the several roles that each of them normally performed. Their recovery entails constructing a new reality to make sense of their post-disaster situation and to enable them to adjust their expectations and behaviour to accommodate it and proceed with their rehabilitation, i.e. to adapt by replacing what is lost with its functional equivalents. Disaster management can assist in these processes by providing suitable personnel who can make personal contacts and communication vectors, by facilitating a copious flow of relevant information suited to each stage of recovery and by providing such material aid as is needed. A certain amount of gentle and unobtrusive manipulation of emergent social structures is likely to be beneficial.

(continued from page 10) TSUNAMI SIGNS



Several Member States pointed out that the use of the colour blue for a warning sign was not appropriate.
(continued on page 18)

A Review of Three Books on Natural Disasters

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Natural disasters are frightening and fascinating certainties here on Planet Earth. They are an inevitable part of the human experience and should be examined as an important aspect of a good education. Their occurrence needs to be recognized, studied, and understood. Exploring the distinction between truly natural disasters and those caused by human activities can provide the students with new perspectives. Due to the sensational nature of the topics, courses about natural disasters enjoy great popularity on many college campuses, and help to excite interest in the sciences among students.

“Geohazards, Natural and Human” by Nicholas K. Coch (Prentice Hall, ISBN 0023229926), “Earth’s Fury, An Introduction to Natural Hazards and Disasters” by Robert L. Kovach (Prentice Hall, ISBN: 0130424331), and “Disasters, An Analysis of Natural and Human-Induced Hazards” by Charles H. V. Ebert (Kendall/Hunt Publishing Company, ISBN 0787270733) are all textbooks dealing with the subject of natural disasters. Each author has interpreted this area of study with his own style. In addition, supplementary on-line materials pertaining to natural disasters and hazards are available from Prentice Hall in “Hazard City: Assignments in Applied Geology” by Hobart King.

“Geohazards” presents its subject matter in a progressive and thorough manner. The author builds the ideas and concepts contained in this text with a firm foundation in geology. The book has sixteen chapters. The first three chapters explain the fundamentals of geology and are followed by Volcanic Hazards, Earthquakes, Soil Erosion and Sediment Pollution, Streams, Groundwater, Landslides, Subsidence and Collapse, Atmospheric Geohazards, Waste Disposal and Geohazards, Estuarine and Wetlands Problems, Problems of Mangrove Wetlands and Coral Reefs, Coastal Problems, and Severe Weather Hazards.

Each major topic is described with relevant geologic processes, hazards, and mitigation discussed in individual subsections. This provides clear understanding of the concepts introduced. The text is well supported with many informative illustrations, all in color, and case histories. Of the many illustrations, the diagrams are exceptionally effective in clarifying and reinforcing the concepts presented in the reading. The photographs are visually appealing and efficient in illustrating the hazards in real-life settings and in emphasizing the pertinent geology. The author recognizes the importance of maps in relating geologic concepts. The charts and graphs effectively present information. Case histories are presented as inserts in the relevant sections. These accounts describe the occurrence of some notable disasters and warn of dangerous geologic hazards. The reality of the images is thought provoking. The reading is captivating,

and the stories are all well documented. Each chapter ends with a summary, a list of key terms, thoughtful review questions, and some suggested readings. The book closes with two appendices, a metric conversion section, a detailed soil classification table, an informative glossary, and a well-organized index.

In the on-line supplement “Hazard City: Assignments in Applied Geology”, the student becomes a geologist, gathering and analyzing information, processing it, making assessments, and giving recommendations. The scenarios include Volcanic Hazard Assessment, Earthquake Damage Assessment, Flood Insurance Rate Maps, Landslide Hazard Assessment, Snowpack Monitoring, Groundwater Contamination, Coal Property Evaluation, and Landfill Siting.

“Earth’s Fury” features a dynamic, fact-filled narrative. The text has ten chapters. After a brief introduction, the topics are Volcanoes, Earthquakes, Earthquake Engineering, Landslides and Land Movement, Desertification, Land Degradation and Drought, Atmospheric Hazards, Oceanographic Hazards, River Floods, and Some Accident Scenarios.

Each chapter begins with basic information on its topic. This condensed, fast-moving explanation is designed to help the student gain some basic understanding of the nature and mechanics of the subject at hand. Fundamental facts punctuated with effective case histories, some of which are amazing, characterize the reading. Occasionally, a case history will be featured in its own section to highlight a specific hazard.

Engineering is a strong underlying theme in this text. Engineering and structural information pertaining to past disasters and mitigation measures for the future are discussed throughout the reading. These concepts are illustrated with informative diagrams. Drawn clearly, these figures are detailed and accurate. Examples include the behavior of different structural forms when stresses are applied in various scenarios and a hypothetical risk analysis for a natural gas terminal. Facts and concepts are also frequently expressed mathematically.

The maps and graphs are clear, understandable, and well placed within the reading. Pictures range from interesting and educational to fascinating in their depiction of extraordinary geologic disasters. All of these visuals are displayed in black and white. Each chapter closes with a number of comprehensive review questions.

“Earth’s Fury” is not lengthy, but it effectively covers a large amount of material in a condensed format. It is well arranged and informative, but it is somewhat complex, and assumes the student possesses some prior geologic and mathematical knowledge.

“Earth’s Fury” ends with a brief glossary, a bibliography, answers to the review question (clearly and

thoroughly explained), and finally the appendices, which contain valuable information on engineering and mathematical geology. These include Basic Probability Theory, Binomial and Poisson Distribution, Seismic Moment, and Volcanic and Seismic Risk Analysis. These are useful, but again, are not aimed at a general student population.

The reader is sometimes surprised and intrigued when the author discusses obscure and unusual geologic phenomena such as brontides (thunder-like rumbling with a seismic source) and earthquake lights. However, these explorations of the unusual are clearly explained, and serve to fascinate and pique the interest of the reader.

“Disasters” is a distinctive treatment. It investigates many of the cultural and social aspects of the hazards to life on Earth. The book contains sixteen chapters. Each chapter begins with a list of key terms. The subjects explored are Earthquakes, Volcanoes, Landslides and Avalanches, Tsunami Waves and Storm Surges, River and Urban Floods, Hurricanes and Tornadoes, Thunderstorms and Lightning, Dust Storms and Blizzards, Aviation Hazards, Drought and Desertification, Forest Fires, Selected Threats to the Biosphere (e.g. locust plagues), Some Major Global Concerns, Environmental Deterioration, the Impact of War (fire death of cities), and Social Aspects of Disasters. Although the chapters are brief, the information invokes the imagination. The first two-thirds of each chapter discusses its topic, and the last third consists of two or three extraordinary and educational case histories. These accounts are very well done and expand upon the information in the first part of the chapter.

Each chapter employs for or five maps and/or diagrams, which are always clear, simple, and small in size. In addition, all of the hazards and disasters that are discussed are illustrated in black and white with many photographs of frightening or amazing events. This book is very visually oriented.

Positive aspects of this text include its casual presentation, and its exhibition of a great variety of ideas and concepts. It is somewhat sensational but still accurate. “Disasters” closes with an informative glossary, references cited by the chapter, and an index.

Initially, this book might seem somewhat superficial because it covers so many different disaster scenarios. However, the reader is captivated by the author’s efficient and detailed descriptions of many of the possible environmental hazards that could affect our biosphere. Everyone will find something of interest in this book.

Of the many books available on natural disasters, these three were chosen to review because they contain the broadest assortment of topics. While they cover many of the same general topics, each text approaches this area of study from a different perspective, creating the possibility of many different applications. “Geohazards” and “Earth’s Fury” are not currently in print, but are being supported by their publisher with the on-line “Hazard City”, and are readily available from a number of vendors. They compare favorably in sales rank with other books dealing with the study of natural disasters.

Acknowledgements: We gratefully acknowledge a grant from Associated Students, Inc. at CSUSB, which supported the page charges for this book review.♦

Tax Relief in Disaster Situations

Special tax law provisions may help taxpayers recover financially from the impact of a disaster, especially when the President declares their location to be a major disaster area. Depending on the circumstances, the IRS may grant additional time to file returns and pay taxes. Both individuals and businesses in a presidentially-declared disaster area can get a faster refund by claiming losses related to the disaster on the tax return for the previous year, usually by filing an amended return

Tax Topic 515 gives an overview of tax relief for presidentially-declared disaster areas.

Publication 547, Casualties, Disasters and Thefts, has details on how to figure and claim a disaster loss. Download it (PDF 125K), or read Pub. 547 online.

Publications 2194, Disaster Losses Kit for Individuals (PDF 1982K), and 2194B, Disaster Losses Kit for Businesses (PDF 1885K), contain various IRS publications and forms related to claiming disaster losses.

From:
<http://www.irs.gov/newsroom/article/0,,id=108362,00.html>

(continued from page 16) TSUNAMI SIGNS

The Group decided that guidance on colours should be obtained from the ISO (International Standards Organization).

The Group expressed concern over the use of text on the signs, as this would require careful translation of the text into many languages. However, it was recognized that, without text, the signs would be difficult to interpreted by the public.

The Group accepted the use of text on the signs that in their English language versions read “Tsunami Hazard Zone” and “Tsunami Evacuation Route”, but requested all Member States to submit to the IOC Secretariat, by March 2004, the language versions of the text strings for both signs in all official (and other appropriate) languages for their country.

The Group requested the Executive Secretary IOC to submit a proposal for the agreed tsunami signs to the ISO, including the different language versions,

(continued on page 23)

INFREQUENTLY ASKED QUESTIONS

Compiled by Lee Walkling

What is the highest measured run-up for the 1946 Aleutian earthquake/ tsunami?

The run-up at Scotch Cap lighthouse was 42m (137.795 feet) above tide level or about 37m (121.391 feet) above present storm tide elevation. Although the earthquake only registered 7.4 on the Richter scale, its tsunami “was catastrophic both in the near field, where it eradicated the Scotch Cap lighthouse on Unimak Island, and in the far field, where it killed 159 people in Hawaii, inflicted severe damage in the Marquesas Islands, and reportedly caused destruction as far away as Antarctica.”

From: Okal, E. A.; Plafker, George; Synolakis, C. E.; Borrero, J. C., 2003, Near-field survey of the 1946 Aleutian tsunami on Unimak and Sanak Islands: Bulletin of the Seismological Society of America, v. 93, no. 3, p. 1226.

For a before-look at the Scotch Cap lighthouse, go to
<http://www.usc.edu/dept/tsunamis/alaska/1946/webpages/scapbefore.html>

For an after-look at the site of the lighthouse, go to
<http://www.usc.edu/dept/tsunamis/alaska/1946/webpages/scapafter.html>

Where could you find official tsunami bulletins (warnings and watches) in real time?

The International Tsunami Information Center (ITIC) website has links to the Latest Pacific Tsunami Bulletin and the Latest Hawai'i Tsunami Bulletin. The URL is http://www.prh.noaa.gov/itic/tsunami_events/events.html

Has anyone created a Disaster board game for kids?

FEMA offers *Disaster Discovery* at its website <http://www.fema.gov/kids/games/board/>. The board game needs Flash Player and a free download of that program is provided. You can print out the game or play it online.

What part of Australia is most vulnerable to tsunamis?

"The fact that legends on tsunami exist in Australia is not unusual. After all, Australia is an island continent and lies exposed to active seismic and volcanic zones to the north. The problem in Australia is that the historical record is not that long and does not contain very large events. The largest tsunami measured on the Sydney tide gauge had a height of only 1.07 m. It was generated by the Arica, Chile earthquake of 10 May 1877. The Chilean tsunami of 22 May 1960 measured less than 0.8 m on this gauge, but produced run up of 4.5 m above sea level along some parts of the coast. The Northwest Coast of Australia, however, has the greatest frequency of tsunami and the largest events because it lies closest to the Sunda Arc of Indonesia. An earthquake there on 19 August 1977 generated a tsunami that measured 1.5 and 2.5 m on tide gauges at Port Hedland and Dampier. Both the Krakatau eruption in 1883 and an earthquake on 3 June 1994 generated tsunami that ran up over 4m above sea level along this coast. The Krakatau tsunami moved boulders 2m in diameter 100 m inland at Northwest Cape opposite gaps in the Ningaloo Reef. Our fieldwork indicates that the Australian coastline contains a wealth of geological evidence for tsunami on a scale much greater than this historical record. These tsunami have been repetitive with the most recent events overlapping in time European exploration of the coast."

From: <http://www.uow.edu.au/science/geosciences/research/tsun.htm> (Thanks to TsuInfo Alert's new Australian correspondent, Wayne Johnston, for bringing this website, and others, to the Editor's attention!)



VIDEO RESERVATIONS

To reserve tsunami videos, contact 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

NEW!! Business Survival Kit for Earth-Quakes & Other Disasters; What every business should know before disaster strikes. Global Net Productions for the Cascadia Regional Earthquake Workgroup, 2003. 27 min. With CD disaster planning tool-kit and other information.

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

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

Tsunami Evacuation PSA; DIS Interactive Technologies for WA Emergency Management Division. 2000. 30 seconds.

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.

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 preteens. American Red Cross.

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

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. There is an accompanying booklet. Does NOT address problems specifically caused by tsunamis.

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

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

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

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

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.

Understanding Volcanic Hazards (25 min.) Includes information about volcano-induced tsunamis and landslides.

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

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

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

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

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Review of *The Silver Lining: The Benefits of
Natural Disasters* by Seth R. Reice
2003, Princeton University Press, Princeton, N.J., 218 pp.;
ISBN: 0-691-05902-0
by Russell R. Dynes, Disaster Research Center,
University of Delaware, Newark, DE 19716-2581.
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Originally published in *Natural Hazards Review*, v. 4, no.
4, November 2003, p. 222.

Taking aim at Smokey the Bear requires knowledge of his terrain as well as knowledge of Smokey's symbolism. Making Smokey an endangered species requires an unconventional view, which the author provides when he discusses disturbance ecology. Disturbance ecology as the force creating biodiversity is set against the more conventional ecological paradigm of equilibrium: environmental constancy. Disturbance ecology takes into account the changes that "disasters" bring about in the natural world. As such, these disturbances create new opportunities for species to survive, and thrive, enlarging biodiversity. The subtitle

pushes the claims made. There is much here about fire, wind, and water but other natural "hazards" such as earthquakes are evidently not that beneficial.

The author, a professor of biology and ecology at the University of North Carolina at Chapel Hill, deals with the complexity of his topic with an informal style, converting technical details into lively prose. This is not to stigmatize him as a "popularizer" but only confirms that it is possible to take research and explain it to others who are not as familiar with the facts and ideas. His recommendations to others--to get out of nature's way--leads to several familiar solutions: changing federal flood insurance, changing national forest management policies, decommissioning dams, developing ecologically based zoning for beaches and flood plains, as well as protecting ecosystems--not just endangered species. All of these "solutions" make abstract sense, and he seems to suggest that proper ecological attitudes will lead to good social policy. Social life is not that simple, but Reice has provided an interesting text for thinking, as he terms it, "eco-logically." ♦

Material added to the National Tsunami Hazard Mitigation Program Library

January - February 2004

Bardet, Jean-Pierre; Synolakis, Costas E.; Davies, Hugh L.; Imamura, Fumihiko; Okal, Emile A., 2003, Landslide tsunamis--Recent findings and research directions: *Pure and Applied Geophysics*, v. 160, no. 10-11, p. 1793-2221. Index terms: PACIFIC RIM / PAPUA NEW GUINEA / TSUNAMIS / LANDSLIDES

Godin, Oleg A, 2003, Air-sea interaction and surface manifestations of tsunamis away from shore [abstract]: *EOS (American Geophysical Union Transactions)*, v. 84, no.52, Supplement, p. OS52.

Index terms: HAWAII / PACIFIC OCEAN / TSUNAMIS / TSUNAMIS - WARNING SYSTEMS / TSUNAMI SHADOWS / REMOTE SENSING

Nott, Jonathan; Bryant, Edward, 2003,, Extreme marine inundations (tsunamis?) of coastal Western Australia: *Journal of Geology*, v. 111, no. 6, p. 691-706. Index terms: WESTERN AUSTRALIA / TSUNAMIS - DEPOSITS / STORM SURGES - DEPOSITS / RISK ASSESSMENT

Note: These, and all our tsunami materials, are included in our online catalog at <http://www.dnr.wa.gov/geology/washbib.htm>

STATE EMERGENCY MANAGEMENT OFFICES

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

California Office of Emergency Services
PO Box 419047
Rancho Cordova, CA 95741-9047
(916) 845-8911; Fax (916) 845-8910
<http://www.oes.ca.gov/>

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

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

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Emergency Management Division
Camp Murray, WA 98430-5122
(253) 512-7067; Fax (253) 512-7207
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Provincial Emergency Program
455 Boleskin Road
Victoria, BC V8Z 1E7 Canada
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<http://www.pep.bc.ca>



(continued from page 18) TSUNAMI SIGNS

as received from Member States, and to request advice from the ISO on colour schemes.

The Group decided that there is no need to have an internationally recognized sign for "Tsunami Refuge Zone".

The Group tasked the ITIC Director to distribute information on the adopted signs widely upon their approval by the ISO.

The Group, considering that the *ad hoc* Working Group had successfully finalized its work, accepted its report with the modifications made by the ICG/ITSU at its Nineteenth Session, and disbanded the Working Group. ♦

From: <http://ioc.unesco.org/itsu/contents.php?id=71>
(January 29, 2004)



CAPE NATURALIST, WESTERN AUSTRALIA

A boulder deposited from suspension in water flow in a tsunami close to shore. A flow depth of only a couple of meters is needed to move this boulder. What is unusual is the fact that this boulder has been emplaced on other boulders. Each contact is devoid of fracturing or crushing, indicating that it gently settled out of suspension.

From: Professor Ted Bryant, University of Wollongong, School of Earth & Environmental Sciences (reprinted with permission)
http://www.uow.edu.au/science/geosciences/research/tsunami/tsunami_2.htm

STOP THE PRESSES!

TSUNAMI HITS NAMLEA AFTER TECTONIC QUAKE

Friday, January 30, 2004 1:00:43 AM

Ambon, Seram, Indonesia, Jan 29 (ANTARA) - A tsunami reportedly attacked Namlea, capital of Buru district, after a tectonic quake measuring 6.8 on the Richter Scale rocked Pulau Kelang in Central Maluku district, at 07:15 hours local time on Thursday morning.

Some residents in Namlea contacted by Antara by phone on Thursday afternoon said the tsunami came all of a sudden but it caused no damage to the people's homes in the coastal area.

The earthquake whose epicenter was believed to be in the ocean near Kelang island, about 120 km southwest from Ambon, prompted people in Namlea to rush out of their homes for fear the buildings would collapse.

From: http://www.antara.co.id/e_berita.asp?id=133897&th=2004 (Thanks, Wayne!)

GOOD NEWS FOR TSUNAMI RESEARCH,

Two recent abstracts describe projects which will aid tsunami research:

Deep current features in the northwest Pacific measured by ADCP attached on the real-time deep seafloor observatory, by Kyohiko Mitsuzawa, Ryoich Iwase, Kenji Hirata, Hitoshi Mikada, and Riyo Otsuka

Three systems of real-time deep seafloor observatory were deployed in the northwest Pacific around Japan. The first system was deployed in the Sagami bay, 7 km off Hatsushima Island, central Japan, in 1993. The ADCP was installed in the cable end station at the system renewal in March 2000. The second system was deployed at the landward slope of the Nankai trough, 120 km off Cape Muroto, Shikoku, in March 1997. Third system was deployed at the landward slope of the southern Kurile trench, 220 km off Kushiro, Hokkaido, in August 1999. The observation system consists of bottom seismometers, tsunami pressure gauges and cable end stations which [are] composed of environmental monitoring instruments. ADCPs (RDI BBADCP 150kHz) are attached on the cable end stations as the bottom current monitoring instrument. Measurement data are transmitted to the land stations in real-time using a submarine electro-optical cable. Bottom current profiles are measured as ranges of about 150m in the Nankai trough, about 300 m in the southern Kurile trench and about 400m in the Sagami bay using the ADCPs. The difference of measurement ranges depends on the property of the water column. The following phenomena were obtained as results and topics of the observation. 1) As the features of the deep currents, the southwestward current can be observed in the Nankai trench on the landward slope. 2) The strong bottom eddies were observed on the slope on the southern Kurile trench. In addition, we observed a benthic storm caused by the "Tokachi-Oki Earthquake in 2003", two and half hours after this earthquake. 3) Deep exchange flow, which was divided in the internal boundary layer, was observed in the Sagami bay.

From "EOS (American Geophysical Union Transactions), v. 84, no. 52, p.OS177.

NEPTUNE Canada--The next generation of regional cabled observatories, by Richard Dewey and Christopher Barnes.

The NEPTUNE observatory will be a regional scale, deep-ocean cabled network of scientific instruments to monitor a wide variety of oceanic and geophysical phenomena. This joint Canada/US project has already received significant funding from both countries and has two funded test-beds in VENUS and MARS. The scientific objectives for NEPTUNE are ambitious and include plate margin geodynamics, hot and cold seabed fluid fluxes, hot vent ecology, gas hydrates, benthic community evolution, climate monitoring, fisheries ecology and management, seismic hazard assessment, deep, slope and shelf water exchange, upper ocean gas exchange, and the development of new exploratory technologies. The network will also support arrays of vertical moorings, autonomous vehicles, and acoustic tomographic arrays for surveying spatial structures between and among the observatory nodes. In addition to 24/7 access to the instrument suites and data streams,, Principal Investigators will have a central Data Management and Archive System (DMAS) from which to query and explore the entire observatory archive, facilitating long-term trend, coherence, and correlation analysis.

<http://www.neptunecanada.com>

From: From "EOS (American Geophysical Union Transactions), v. 84, no. 52, p.OS160