



Volume 1, Number 4, April 1999

Contents

Tsunami News

- 1 Prepare...Because You Care
- 1 Tsunami inundation maps: A status report
- 4 New Program Participants

Bibliographies

- 3 New Tsunami Mitigation Materials Added to the Library
- 7 Book Review
- 8 Reports About Coastal Engineering for Tsunami Mitigation

Preparedness Tips and Websites

- 4 Canadian Tsunami and Emergency Preparedness Websites (Part II)
- 5 People With Special Medical Needs
- 6 Disaster Preparedness for The Elderly, Disabled, and Mentally Ill
- 8 Infrequently Asked Questions

Prepare...Because You Care!

**APRIL IS DISASTER
 PREPAREDNESS MONTH IN
 WASHINGTON**

The packets for Disaster Preparedness Month are now available from the Washington Emergency Management Division. The theme for this year's events is *Prepare...Because You Care!* Governor Gary Locke signed a proclamation designating April as Washington State Disaster Preparedness Month.

If your state or jurisdiction is planning a preparedness event, please send an announcement to *TsuInfo Alert* for publication.

Tsunamis Inundation Maps: a Status Report

The five Pacific coastal states have begun tsunami inundation mapping efforts, to study their shorelines and provide useful data upon which Emergency Managers can base evacuation plans. The status of these projects can be followed on their websites:

Center for Tsunami Inundation Mapping Efforts

<http://newport.pmel.noaa.gov/time/home.html> or
<http://newport.pmel.noaa.gov/tsunami-hazard/timehome.html>

Tsunami Inundation Mapping for Oregon and Washington:

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

Center for the Tsunami Inundation Mapping Effort, Newport, Oregon:

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

1998 Review [of Tsunami Mapping Efforts]

http://www.pmel.noaa.gov/tsunami/Review98/time_98.html

1998 California Tsunami Inundation Mapping

<http://newport.pmel.noaa.gov/time/meet/oakland.html>

1998 Alaska Tsunami Inundation Mapping: March 23-24, 1998 Kodiak Borough Site Inspections and Meetings

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

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Participants in the TsuInfo program can request copies of reports listed in this issue from:

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Division of Geology and Earth Resources
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Olympia, WA 98504-7007
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[DNR LOGO]

New Tsunami Mitigation Materials Added to the Library, March, 1999

compiled by
Connie J. Manson

Note: Free reprints of these materials are available. (See page 2 for ordering information)

Professional Paper 1560, vol. 2, is Released!!

Rogers, A. M.; Walsh, T. J.; Kockelman, W. J.; Priest, G. R., editors, 1998, Assessing earthquake hazards and reducing risk in the Pacific Northwest: U.S. Geological Survey Professional Paper 1560, v. 2, 545 p., 6 plates.

This **long-awaited second volume** includes 13 papers about earthquake hazards in the Pacific Northwest. The articles discuss ground-shaking, associated losses, and effective ways to mitigate those hazards.

These two volumes should be considered "standard works" and are highly recommended.

pertinent papers include:

Booth, D. B.; Bethel, J. P., 1998, Approaches to seismic- hazard mitigation by local governments--An example from King County, Washington. p. 537-542.

King County (which includes Seattle) is an area of rapid urban development and significant earthquake and landslide hazards. This case study of the County's hazard mitigation efforts can be useful for other communities.

Highly recommended for local planners.

Kockelman, W. J., 1998, Techniques for reducing earthquake hazards. p. 479-496.

Bill Kockelman was a national leader in using urban planning tools to reduce the risks from geologic hazards. This report summarizes those basic methods and actions.

Highly recommended for local planners and government officials.

May, P. J. 1998, Earthquake risk-reduction prospects for the Puget Sound and Portland, Oregon, areas. p. 497-515.

Why do some communities lead the way in hazard preparedness while others lag behind? This report examines the ways risk perceptions and economic and political circumstances impact on such preparedness and suggests different strategies to increase awareness and preparedness.

Recommended for planners and local government officials.

Perkins, J. B.; Moy, K. K., 1998, Liability for earthquake hazards or losses and its impacts on the cities and counties of Washington. p. 543-545.

Local governments in Washington can be held liable for some earthquake losses, according to Washington tort law. The legal defense that earthquakes are an "act of God" will no longer prevail in most circumstances, because scientists are gaining increased knowledge about the earthquake potential, and because the damage can be mitigated, at least in part. While focussed on Washington law, this study has implications for the other Pacific states.

Highly recommended for local government officials.

Preuss, Jane; Hebenstreit, G. T. 1998, Integrated tsunami- hazard assessment for a coastal community, Grays Harbor, Washington. p. 517-536.

This is a case study of both the primary and secondary effects of a tsunami in the Grays Harbor, Washington area. While specific to this location, this study has significant implications for other coastal communities.

Highly recommended for local emergency managers and local government officials.

Other New Tsunami Reports Added in March, 1999

Bollens, S. A.; Kaiser, E. J.; Burby, R. J. 1988, Evaluating the effects of local floodplain management policies on property owner behavior: Environmental Management, v. 12, no. 3, p. 311-325.

Examines the way floodplain management influences the location and mitigation *behavior* of owners of floodplain property.

Cox, D. C. 1979, Economic justification of tsunami research--A specific example based on reduction of false alarms in Hawaii: Marine Geodesy, v. 2, no. 1, p. 59-66.

An interesting economic analysis of the costs of false alarms, both in monetary terms and in the public's loss of confidence in the warnings.

Dean, W. E. 1995, Marketable risk permits for natural disaster mitigation: Natural Hazards, v. 11, no. 2, p. 193-201.

Could "risk permits" encourage developers to construct buildings to higher safety standards?

Iida, Kumizi; Cox, D. C.; Pararas-Carayannis, George 1967, Preliminary catalog of tsunamis occurring in the Pacific Ocean: Hawaii Institute of Geophysics, 1 v.

This is dated, but still useful.

Paine, Michael 1999, Tsunami from asteroid/comet impacts: Australian Spaceguard Survey [downloaded Mar. 5, 1999 from

<http://www1.tpgi.com/au/users/tps-seti/spacegd7.html>], 12 p.

We know that tsunamis can be caused by marine earthquakes, volcanoes, and landslides. This study from the Australian Spaceguard, examines the tsunami effects from oceanic asteroid impact.

Canadian Tsunami and Emergency Preparedness Websites (Part II)

compiled by
Lee Walkling

Note: This list is by no means exhaustive. You are encouraged to submit your favorite sites for periodical updates. The first half of this list was published in the March issue, and the second half is presented here.

“HazardNet” at <http://hoshi.cic.sfu.ca/~hazard/> gives background information, plans and warning systems, research and centres, and worldwide tsunami database links. (From Simon Fraser University: It has a tsunami section at <http://hoshi.cic.sfu.ca/~hazard/INFORMAT/tsunami.html>.)

“Inter-Agency Emergency Preparedness Council” at <http://www.pep.bc.ca/iepc/> includes an Emergency Information Directory

“Natural Hazard Preparedness” at <http://hoshi.cic.sfu.ca/pep/sub03.html> posts the Provincial Emergency Program (PEP). Includes links to tsunami awareness and preparedness websites, including the Tsunami “Web Library” prepared by WSSPC Tsunami Hazard Mitigation Committee.

“1964 Alaskan Earthquake/Tsunami” at <http://hoshi.cic.sfu.ca/~pep/Zeballos64/tidalwave.html> has a personal account by Charles Ford, B.C. airline pilot of tsunami and earthquake damage in B.C. due to the 1964 Alaska earthquake, with photographs

“Pacific Region Canadian Coast Guard” is at <http://www.pacific.ccg-gcc.gc.ca/Epages/HOME/home.htm>

“PEP Web Site” at <http://hoshi.cic.sfu.ca/pep/toc.html> is the site for the Provincial Emergency Program (PEP). Table of contents to PEP and its links: legislation, tsunamis, tsunami warnings, coming events, volunteers, other provincial emergency management offices, Emergency Coordination Centre, BC Interagency Emergency Preparedness Council, Emergency Preparedness Canada, EPIX, and WSSPC.

“Provincial Emergency Program Offices” at <http://hoshi.cic.sfu.ca/~pep/offices.html> gives the addresses and phone numbers for six regional offices, headquarters and the PEP Academy.

“Tsunami! Warning and Alerting” at <http://hoshi.cic.sfu.ca/~pep/tsunami.html> outlines the procedures to be used in British Columbia to evaluate and disseminate information provided through the Tsunami Warning System.” Gives areas of responsibility for each agency, governmental department or organization. Includes examples of tsunami warning/watch bulletins and a sample exercise report form for B.C. tsunami warning system exercises.

* * * * *

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People With Special Medical Needs

prepared by

Planetree Health Library

Downloaded from: <http://www.preparenow.org/pwsmn.html>

Note: This brochure was developed and produced by a group of healthcare professionals who obtained a grant from the American Red Cross Northern California Disaster Preparedness Network. The group works in San Jose, California, for Columbia San Jose Medical Center, Columbia Homecare & Hospice, Columbia Good Samaritan Hospital, and the Planetree Health Library. Hard copies of this brochure (which include illustrations), can be obtained by writing to the Planetree Health Library at 98 N.17th Street, San Jose, California 95112. For general health and medical information visit their website at <http://www.planetreesanjose.org>

This information is reprinted here, with permission from the Planetree Health Library, and may be photocopied.

How to Prepare For a Disaster

In preparing for a disaster such as an earthquake, storm, or power outage, people with special medical needs have extra concerns. Try to picture yourself as you might be during such a disaster and during the three days immediately following it. What might be some of your special medical needs? This brochure has been designed as a helpful tool for you and your family as you prepare for a possible disaster.

Medications

- C Always have at least a three-day supply of all of your medications.
- C Store your medications in one location in their original containers.
- C Have a list of all of your medications: name of medication, dose, frequency, and the name of the doctor prescribing it.

Medical Supplies

- C If you use medical supplies such as bandages, ostomy bags, or syringes, have an extra three day supply available

Intravenous (IV) & Feeding Tube Equipment

- C Know if your infusion pump has battery back-up, and how long it would last in an emergency.
- C Ask your home care provider about manual infusion techniques in case of a power outage.
- C Have written operating instructions attached to all equipment.

Oxygen and Breathing Equipment

- C If you use oxygen, have an emergency supply (for three days or more).
- C Oxygen tanks should be securely braced so they do not fall over. Check with your medical supply company, regarding bracing instructions.
- C If you use breathing equipment, have a three-day supply or more of tubing, solutions, medications, etc.

Electrically Powered Medical Equipment

- C For all medical equipment requiring electrical power such as beds, breathing equipment, or infusion pumps, check with our medical supply company and get information regarding a back-up power source, such as a battery or generator.
- C Check with your local utility company to determine that back-up equipment is properly installed.

Emergency Bag

Have a bag packed at all times in the event you need to leave your home. It should include:

- C A medication list
- C Medical supplies for three days.
- C Copies of vital medical papers such as insurance cards, Advanced Directive, Power of Attorney, etc.
- C When you leave your home, be sure to take refrigerated medications and solutions.

People Who Can Help

- C An important part of being prepared for a disaster is planning with family, friends, and neighbors. Know who could walk to your home to assist you if other means of transportation are unavailable.
- C Discuss your disaster plans with your home healthcare provider.
- C Ask your local fire department if they keep a list of people with special medical needs.
- C If you depend on electrical power for your medical equipment, notify your local power company. Some companies are able to provide priority service to people with special medical needs
- C Keep a list of people who can help (Their name and phone number):
 - < Family or friends
 - < Neighbors
 - < Hospital
 - < Medical suppliers
 - < Doctor/homecare provider
 - < Pharmacy

Disaster Preparedness for The Elderly, Disabled, and Mentally Ill

compiled by
Lee Walkling

These groups often get ignored in disaster mitigation plans which don't recognize their special or additional needs. As with all preparedness plans, the key is advance planning. Educating the disabled and their caretakers is the first step.

Emergency health information card

In an emergency, medical documents, prescriptions, and other data can be lost or rendered unavailable due to a lack of electricity or damage to the home. The emergency health information cards should be kept (continually updated) in the emergency kit, with the primary caretaker, in the purse or wallet, in the car, and with the wheelchair pack. A good webpage for further explanations and assistance with the creation of a health card is <http://www.prepnow.org/tipcrd.html> (developed by the Independent Living Resource Center of San Francisco). Each card should contain the person's name, address, phone number, phone number and names of doctors, phone numbers of family members, social security number, blood type, birth date, health insurance carrier and policy number, emergency contacts, special conditions, disability, medications and dosages, particular assistance needed, allergies, communication needs, equipment needs, and any other special information that might help.

Emergency Preparedness Plan

After the emergency card is completed, each person should make his/her own emergency preparedness plan. A simple checklist for seniors and the disabled is found at <http://www.prepnow.org/ba-eprep.html> (developed by the Independent Living Resource Center of San Francisco). There are also forms, checklists, and guidelines online:

Action Checklist

http://www.pdc.org/pdc/WEB_PAGE/ActionChecklist.html

A Checklist for People with Mobility Problems

<http://www.disasterrelief.org/Library/Prepare/checklst.html>

Family Disaster Plan and Personal Survival Guide

<http://www.acrossla.org/DisastPlan.html>

How to Prepare for an Emergency

<http://TheEpicenter.com/howto.html>

Safety---Disaster Supplies Kit

<http://www.redcross.org/disaster/safety/>

Your Family Disaster Supplies Kit

<http://www.fema.gov/library/diskit.htm>

The American Red Cross offers two excellent, **free** brochures, *Your Family Disaster Supplies Kit* (ARC 4463) and *Emergency Preparedness Checklist* (ARC 4471). Call your local chapter to get copies. Telephone books often include emergency guidelines in their public service pages. The Hawaiian phone books are the best examples for useful, thorough information, including evacuation route maps.

Seniors

Seniors who are active and independent need only follow the general emergency planning guidelines. For those who are frail, need any type of assistance, or are on medication, emergency plans should include their special needs. The American Red Cross has a 22-page booklet *Disaster Preparedness for Seniors by Seniors* (ARC 5059), which includes information on receiving warning alerts, planning general emergency supplies and medical supplies, making the home safe, where to find emergency housing, and other resources. The American Red Cross also provides a 36-page *Brochure Disaster Preparedness for Disabled and Elderly People* (Los Angeles Chapter, 1985), for persons with impaired mobility, hearing disabilities, and impaired vision.

"Emergency Planning for the Elderly," (Emergency Preparedness Digest, v. 14, no. 3, p. 15-21) by Raymond Lafond points out that by the year 2001 one in eight Canadians will be 65 or over. (Eleven percent of the U.S. population is currently over 65). The article discusses disaster-related problems of seniors and makes suggestions for developing emergency plans for them. Lafond also offers information about post-disaster services needed by the elderly.

A Checklist for People with Mobility Problems

<http://www.disasterrelief.org/Library/Prepare/checklst.html>

Disaster Preparedness for Senior by Seniors--What we can do to save our lives

<http://www.disasterrelief.org/Library/Prepare/seniors.html>

Thorough checklist for building a disaster preparedness plan

Mentally Ill

The 70-page book *Responding to the Needs of People with Serious and Persistent Mental Illness in Times of Major Disaster* is available **free** from the U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, National Mental Health Services Knowledge Exchange Network, P.O. Box 42490, Washington, D.C. 20015, (800) 789-2647; fax (301) 656-4012.

The American Red Cross website (<http://www.redcross.org/disaster/safety/prepare.html>) addresses the needs of people with psychiatric disabilities, including instructions for preparing emergency plans.

Although the title is *Earthquake Tips for People with Psychiatric Disabilities*, the emergency preparedness information (<http://www.redcross.org/disaster/safety/eqtpsyd.html>) is useful for general hazard and tsunami hazard mitigation planning.

Disabled

Disaster information, as well as weather information, is broadcast over NOAA's Weather Radio stations. Special weather radios for the hearing and visually impaired are available. These special radios are equipped with an alarm tone can be connected to strobe lights, pagers, bed shakers, computers or text printers. The alarm is given when there is an immediate danger.

A helpful website is The Community Preparedness Website Project (<http://www.preparedness.org>) "Supporting special needs and vulnerable populations in disaster." The homepage provides links to many types of vulnerable populations, traditional emergency service providers, and disaster preparedness information...all in many languages.

The Vulnerable Population page offers the following links: physical disability, mental illness, visually impaired, hearing impaired, speech impediments, autism, environmental illness and seeing eye guide dogs. The Disaster Preparedness Information page links to senior disaster plans, disabled persons' disaster plans, tips for creating emergency health information cards, animal disaster plans, first aid for animals, and many disaster response pages.

Another website (<http://www.redcross.org/disaster/safety/prepare.html>) has links to preparedness planning for people with visual disabilities, hearing problems, cognitive disabilities, chemical sensitivities, mobility disabilities, communication or speech-related problems, and psychiatric disabilities.

Book Review

Boyce, Jon A., 1985, *Tsunami hazard mitigation--The Alaskan experience since 1964: University of Washington Master of Science thesis, 109 p.*

reviewed by

Lee Walking

This is a readable, easy-to-understand source of information about general tsunami science and valuable preparedness guidelines. It gives definitions and explanations in simple, concise terms. Many questions that other books and reports have raised to this non-scientist reviewer were answered in this slim volume.

Chapter One, "The Tsunami Hazard," explains tsunamis clearly, with a scientist's grasp of the subject, but in terms the layperson can understand. All the variables that make tsunami prediction so difficult are discussed: run-up, tsunami speed, wave series, generating forces, coastline morphology, tide level, and the difference between teleseismic tsunamis (long distance) and local tsunamis. Information on the 1964 Alaska earthquake's tsunami effects on various Alaska towns is included.

Chapter Two deals with "Tsunami Warning Systems," their history, procedures, equipment, and problems. This is a very useful section, although the technology discussed is outdated. (More recent reports should be used for that.)

"Tsunamis and Community Preparedness" is the subject of Chapter Three, with the emphasis on Alaskan communities. Education is the major priority, followed by warning systems that reach all the citizens. This is a problem in Alaska where the population is spread out over such a large area, with unreliable phone service.

The next topic is the National Coastal Zone Management Act of 1972 in Chapter Four, "Tsunamis and Coastal Zone Management." Also discussed is the Alaskan Coastal Zone Management Act of 1977 and what programs various Alaskan towns have started.

Chapter Five explains "Tsunamis and the National Flood Insurance Program," and Alaska's involvement in the program. The NFIP building standards are defined.

"Conclusions and Recommendations" succinctly summarizes the situation and makes some recommendations. There is a bibliography, a list of Alaskan coastal communities vulnerable to tsunamis and a catalog of Alaskan tsunamis from 1853. For communities that have not experienced tsunamis and are just beginning their planning, this thesis provides a good overview and a starting place.

Reports About Coastal Engineering for Tsunami Mitigation

Note: Free reprints of these materials are available. (See page 2 for ordering information)

Iida, Kumizi; Iwasaki, Toshio, editors, 1983, *Tsunamis--Their science and engineering*: Terra Scientific Publishing Company [Tokyo] *Advances in Earth and Planetary Sciences*, 563 p.

Includes these reports about sea walls and other protective measures:

- < Goto, Chiaki; Shuto, Nobuo, Effects of large obstacles on tsunami inundations. p. 511-526.
- < Horikawa, Kiyoshi; Shuto, Nobuo, Tsunami disasters and protection measures in Japan. p. 9-22.
- < Matsumoto, Teruji; Suzuki, Yuhzo, Design and construction of Ohfunato tsunami protection breakwater. p. 397-407.
- < Tanimoto, Katsutoshi, On the hydraulic aspects of tsunami breakwaters in Japan. p. 423-435.
- < Fukuchi, Tatsuma; Mitsuhashi, Koji, Tsunami counter-measures in fishing villages along the Sanriku coast, Japan. p. 389-396.

Shuto, Nobuo, 1987, The effectiveness and limit of tsunami control forests: *Coastal Engineering in Japan*, v. 30, no. 1, p. 143-153.

An engineering study of the effectiveness of coastal forests to reduce tsunami energy.

Tsuchiya, Yoshito; Shuto, Nobuo, editors, 1995, *Tsunami--Progress in prediction, disaster prevention and warning*: Kluwer Academic Publishers *Advances in Natural and Technological Hazards Research*, v. 4.

Includes these reports about sea walls and other protective measures:

- < Okazaki, S.; Shibata, K.; Shuto, Nobuo, A road management approach for tsunami disaster planning. p. 223-234.
- < Kawaguchi, T.; Itoh, S.; Takeuchi, H., Case studies of tsunami countermeasure considering coastal environment. p. 249-262.



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Infrequently Asked Questions

compiled by
Lee Walking

What is a teleseismic tsunami and how does it differ from a local tsunami?

A teleseismic tsunami travels long distances through the ocean and is "usually generated by shallow-focus submarine earthquakes of a dip-slip fault type where vertical motion is upward on one side of the fault and downward on the other." Because of the distance traveled, there is often time to issue warnings. Teleseism is defined as an earthquake whose epicenter is over 1000 km away.

In a local tsunami, the "effects are localized around the generating force," whether that is an earthquake, landslide, submarine slumping, or a volcanic eruption. Local tsunamis happen quickly and usually do not give much warning time. Coastal citizens are encouraged to head for high ground if they feel earthquakes lasting 30 seconds or more. (Quoted from pages 6 and 7 of the Jon A. Boyce thesis reviewed in this issue).

Can teleseismic and local tsunamis strike the same place?

According to Jon A. Boyce (page 1 and 12, thesis reviewed in this issue), a locale can get both types of tsunamis during the same event. An earthquake some distance away can trigger a local shoreline landslide that causes a local tsunami. Later the tsunami waves generated by the original, distant earthquake can hit.