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## TSUNAMI PROGRAM NEWS

### U.S. National Tsunami Hazard Mitigation Program Review and International Tsunami Symposium, August 7-9, 2001

The U.S. National Tsunami Hazard Mitigation Program Review and the 2001 International Tsunami Symposium (ITS 2001) were held on the University of Washington campus in Seattle, Washington from 7-9 August 2001.

The first meeting on 7 August was a review of the U.S. Tsunami Hazard Mitigation Program, sponsored by the National Oceanic and Atmospheric Administration (NOAA). Presentations were given by scientists, engineers, and other specialists on the program's accomplishments since 1997 and on future plans. The topical sessions included 11 oral presentations and 14 poster presentations about tsunami inundation mapping, tsunami warning systems upgrades, and tsunami mitigation activities.

The second meeting on 8 and 9 August was the 20th International Tsunami Symposium, sponsored by the International Union of Geodesy and Geophysics (IUGG) Tsunami Commission. More than 100 tsunami scientists, engineers, and specialists from 16 countries met to exchange sci-

ence, best practices, and information on the tsunami hazard. There were 51 oral and 68 poster presentations on tsunami hazard activities and 40 oral and 53 poster presentations about tsunami risk assessment, recent tsunamis, tsunami geology and paleotsunamis, Atlantic and Mediterranean tsunamis, tsunami measurements and data analysis, landslides and other sources, and advances in modeling applications.

The ITS 2001 web site, at <http://www.pmel.noaa.gov/its2001/>, includes full information about the meeting and its participants, with the full text of the Proceedings volume. (*Editor's note:* the lists of those papers and abstracts are given in this issue, p. 25-28 )

### Tsunami Warning Workshop Summary, May 14 and 15, 2001, Portland, Oregon, reported by Mark Darienzo

Over 80 people from Alaska, California, Hawaii, Oregon, and Washington attended a day and a half tsunami warning workshop in Portland. They represented emergency management, communication, fire and police, public works, and science. The workshop was funded by the National Tsunami Hazard Mitigation Program. The workshop began with presentations on the Tsunami Warning Centers and six evacuation notification systems (sirens, NOAA weather radio, telephones, EMWIN, EAS, and AlaskAlert). The pros and cons of the different evacuation notification systems and system consistency and needs were discussed in two breakout sessions. The breakout group discussions were summarized in two main sessions. Several recommendations came out of the breakouts and presented during the main session. Consensus was reached on five of the recommendations. There were thirteen other recommendations that need further discussion and, if possible, consensus. The following is the workshop summary.

(continued, p. 3)

### Announcing: Editors' Delight!!

The *entire* TsuInfo bibliography-- including all the tsunami materials we've been gathering for the last 7 years-- is now searchable online! It's all included in our library database at,  
<http://www2.wadnr.gov/dbtw-wpd/washbib.htm>

# *TsuInfo Alert*

is published bi-monthly by the Washington Department of Natural Resources, Division of Geology and Earth Resources.

This publication is free upon request and is available in print (by surface mail), electronically (by e-mail), and at <http://www.wa.gov/dnr/htdocs/ger/tsuinfo/index.html>

*TsuInfo Alert* and the TsuInfo document delivery program are made possible by a grant from the Federal Emergency Management Agency via the Washington Military Department, Division of Emergency Management.

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WASHINGTON STATE DEPARTMENT OF  
**Natural Resources**

**Doug Sutherland** - Commissioner of Public Lands

(continued from p. 1)

## **I. Pros and cons of the evacuation notification systems**

### **A. Sirens**

#### 1. Pros

- a. Controlled from central trigger point which has potential for rapid notification
- b. Can be activated through various channels
- c. Good for special conditions (beach, other remote area where tourists, transient populations are located and isolated and confined communities)
- d. Easily integrated with audio component
- e. Single focus-direct people to seek further info
- f. Widely recognized as warning and partial systems already in place
- g. Maintenance is low if continually tested

#### 2. Cons

- a. High cost (equipment and maintenance) especially for small communities
- b. Siren meaning is unknown (education and testing required)
- c. Non audible with winds and topography
- d. Old mechanical ones are in place or being installed (High maintenance-needs weather protection)
- f. Single focus use of siren (not cost effective as a mobile siren)
- g. Siren ignored
- h. Diversity of types with connection difficult
- i. Access to siren trigger is necessary and responsible person needed. If manual trigger (what if person can not get there). If high turnover in staff, possible lack of understanding of warning information
- j. Difference in local systems (tones and duration) is confusing
- k. Non-dedicated frequency can cause interference/garbling

### **B. NOAA weather radio**

#### 1. Pros

- a. Wide-spread and mobile (cars, homes, business, boats etc.). Easy way to get info to public.
- b. Affordable
- c. Hand cranks, battery operated, solar models
- d. Can be on standby and turned on specifically for tsunamis
- e. Message is rapidly transmitted. Message is consistent and can be tailored.
- f. Mechanism for personal responsibility
- g. Adds redundancy
- h. Compatible across systems
- i. Tied into tsunami warning center
- j. Reduces 911 calls

#### 2. Cons

- a. Coverage problems
- b. Only works when on

- c. Need to know your location with respect to tsunami inundation zone
- d. High rate of false alarms (people do not use them)
- e. Band width too narrow
- f. Potential encroachment by commercial industry
- g. Alarm kept going off so was not used

### **C. Telephones**

#### 1. Pros

- a. Out of state/off site
- b. Redundancy
- c. Good for distant tsunami
- d. Less calls that 911 has to make
- e. Pre-recorded message saves time
- f. Tailored warnings for special needs
- g. Goes to all with telephones
- h. Cost effective for small areas (all hazards)

#### 2. Cons

- a. Probably not operable during an earthquake
- b. Taxes systems that are already stressed during earthquake
- c. No human contact
- d. Problems serving large populations (new technology could solve this problem)
- e. Does not go to cell phones
- f. Not effective in short warning time situations

### **D. EAS**

#### 1. Pros

- a. Redundancy
- b. Widest coverage
- c. Modifications can be made
- d. Can be made automatic with existing technologies
- e. System in place
- f. Local input possible (ex. message from EOC)
- g. Message consistent and rapid. Both audio and visual message
- h. Inexpensive
- i. Relieves 911

#### 2. Cons

- a. Need to have receivers on
- b. Doesn't work on satellite tv or small cable networks (<10,000 users)
- c. Power dependent
- d. No radio coverage in some areas
- e. Radio stations might not have back up power
- f. Limited applicability--not focused enough, difficult to make changes
- g. Regulatory issue - voluntary system not mandatory
- h. Maybe passe in future if new technologies are brought in
- i. In place but not always in use

### **E. Ground shaking**

#### 1. Pros

- a. Known and simple
- b. Warns hearing impaired

2. Cons
  - a. Not consistent with respect to intensity and duration of shaking that triggers evacuation (low shaking intensity could still produce a tsunami-slow Eqs). How strong is strong, how long is long, when do I evacuate
  - b. Educational problem
  - c. Not reliable indicator of tsunami (false alarm issue)
  - d. In some states where there are more earthquakes (CA and AK), evacuation for any shaking would result in many false alarms

#### F. EMWIN

1. Pros
  - a. Continuous broadcast
  - b. Teletyped into NAWAS,
2. Cons
  - a. Dish vulnerable to wind rain snow & can lose signal

#### G. Others

1. Copter leaflet drops expensive
2. Travel advisory radio need microwave upgrade, sight-seers drawn by warning, only activate when people turn them on. Not everyone has them
3. OASIS (CA) Satellite phone system that links counties to state with seismic networks, expensive and limited band width, effective in extreme rural areas
4. High Frequency/FM can simulcast large areas, may not communicate shorter distances, hard to get frequency allocation, linkless system
5. Civil Air Patrol (CAP) Slow response, for distant tsunami warning only

## II. Consistency issues with evacuation notification

Regional consistency is possible only if there is central coordination at the national level. The United States population is very mobile and many people are unaware of hazards of regions they enter. However, if consistency is reached and standards are created would communities need to comply and thus take a risk in not complying? There could also be issues with standards being considered an unfunded mandate. It is also difficult to standardize the system with differences in rural, semi rural and urban areas. Neighboring communities differ in their response and it may become a political issue within states and even over state lines. Evacuation decision that are driven by specific policies within a community can't be discounted. Standards should include a spectrum of choices for rural to urban areas. Standards are also important because media crosses borders. If standards are in place economies of scale kick in, i.e. there is shared resources and templates, a common core of understanding (educational consistency), and a universal interface. A regionally consistent system, i.e. standard, would make education easier. Tsunami Ready and CRS-tsunami programs, with their incentives, would ease the adoption of standards. National standards are already in place for sirens. A three minute wail tells people to turn on the radio or TV

to seek emergency information. Thus the siren would act as a multi-purpose warning system. However, existing sirens are inconsistent with respect to tone and duration. Can all existing sirens produce one tone and one duration (steady or wavering, three minute wail) if a standard is adopted? NWR can provide a consistent message if more transmitters are built and more people have them. A consistent educational message must follow the establishment of any standard.

Consistency issues are also associated with evacuation and warning cancellation (the all clear) and safe zones. Are there (liability issues with safe zones? What is meant by a safe zone? Is it an official gathering place or just a safe place to be? Is there shelter or supplies there. Zones imply land use in California.

Is ground shaking a consistent notification? What constitutes a tsunami producing shake: strong shaking for several minutes? Is the public better trained for duration or intensity? If communities err toward safety, there could be false alarms, especially in California where strong shaking earthquakes are common. The Papua New Guinea earthquake was not strongly felt but produced a devastating tsunami (with loud noises and extreme water level changes).

## III. Evacuation notification needs

### A. Coordination/Standardization

1. National standards with flexibility for local jurisdictions
2. Focus and direction from the national level
3. An organization that will set consistent guidelines/standards and recommendations.
4. Consensus from 5 state group on key issues
5. FEMA should include warning as mitigation
6. Realistic expectations of Coast Guard by locals
7. Governing agency for tsunami disasters
8. Take into account political constraints and state and regional differences
9. Acquire political backing at local/state/national levels
10. Regional communication and coordination
11. Develop positive partnership with local media (EAS)

### B. Financial

1. Funds
2. Take into account monetary constraints of many communities when developing standards
3. Alternate funding sources and prioritization criteria for sirens in fund strapped communities

### C. Technical

1. New technology for improved warning system
2. Consistency with sirens (tone and duration).
3. Guidelines on how to set up a siren system
4. Reduction in false alarms from local non tsunami-producing earthquakes
5. Frequent testing of systems
6. Expand NWR (more installation of transmitters and radio purchase) to target as many people as possible
7. 24/7 coverage at local, state and federal level to

- improve delivery time of evacuation message
- 8. Back up tsunami warning center (in WA, OR, or CA)
- 9. Develop technology to send generic codes from ATWC direct to EAS.
- 10. Use NWR to activate another system
- 11. Phone conference bridge that enables counties to speak at once so that state can get big picture
- 12. Integrate packet radio with paging Internet
- 13. Local ordinances/codes to require install of appropriate devices (e.g. NWR interface via smoke detector chip)
- 14. Space based resources in conjunction with other uses to measure movement of wave across Pacific Ocean
- 15. Complete and redundant systems

#### D. Education

- 1. Siren test for awareness raising
- 2. Better communication and outreach education to residents, tourists, and transient workers both land and water based about tsunamis and non-tsunami-producing earthquakes. Education of people who speak different languages and have other special needs. Public education on what sirens mean. Continuous staff training at the state and local level
- 3. Incorporation of tsunami inundation information into NFIP maps
- 4. Education at the PSAP level which is the choke point for coastal dissemination of evacuation notification.
- 5. Public education about local earthquakes (both tsunami and non-tsunami producing)

#### E. Message

- 1. Consistent messages, including all clear
- 2. Guidelines on how to set up media messages
- 3. Reduce time for communication of EQ/tsunami info
- 4. Rapid dissemination of event size and location (especially important for non tsunami earthquakes) through improved seismic monitoring
- 5. Procedures for getting word out on Nisqually type earthquake need to be clear, e.g. when to trigger an alarm
- 6. Information about non-tsunami producing earthquakes should be over NWR.
- 7. Consistency in definition of key terms for evacuation and evacuation notification
- 8. Resolve all clear problem (how to hold back first responders (particularly volunteers))
- 9. Knowledge of the official source so locals can make decisions accurately
- 10. Streamline or improve tiered system of distribution (ATWC-state-local-public)
- 11. Follow up on evacuation message receipt
- 12. Flexibility with respect to WC/ATWC cancellation and local cancellation. Some communities will choose to maintain EOC activation and evacuation
- 13. State level all clear- however liability concern

#### F. Science

- 1. Knowledge of hazard areas and basic tsunami science
- 2. Improve uncertainties in tsunami research (inundation lines are not supported by hard science)
- 3. State tsunami advisor to interpret scientific data

#### G. Evacuation

- 1. Consistency in how evacuation maps are presented: same scale, color etc. using GIS.
- 2. Standards for evacuation maps in phone books
- 3. Do more good than harm, e.g not evacuating people to URM areas, moving huge populations down narrow streets preferred by developers

### IV. Recommendations

#### A. Consensus reached

- 1. Adopt standard educational brochure that contain
  - a. a glossary of terms
  - b. See, hear, feel triggers for evacuation
    - see water rapidly withdraw
    - hear loud roaring sound
    - feel earthquake shaking that makes it difficult to stand
  - c. Five state logos
  - d. Standardized map tailored for each state
  - e. Sample Sign with running man
- 2. National recommendation for evacuation notification running man with tsunami symbol
- 3. If sirens are used for evacuation notification, the recommended national standard (three minute wail that prompts people to turn on radio or tv for further information) should be used regardless of siren type
- 4. All clear
  - a. Standardized language
  - b. Establish criteria/procedures for when it will be issued (separate criteria for local and distant tsunamis)
  - c. Add definition to glossary in brochure
- 5. State level conference call during distant tsunami event
  - a. Establish conference call number
  - b. Include scientists on call
  - c. Develop scientific group to assess tsunami hazard group needs to coordinate with emergency management train scientists on tsunami science if needed
  - d. If multi-state issue, FEMA responsible for bridge between states

#### B. Other recommendations (to be discussed and consensus reached)

- 1. Web site for 5 states emergency managers to develop guidelines
- 2. Patch communication holes to enable NWR/EAS coverage original FEMA protocol
- 3. Trigger for warnings-evacuation, consistent activation for distant tsunamis
- 4. Embed NWR/EAS information into existing appliances (pagers, cell phones, etc.). As you enter area notification is triggered
- 5. Watch would mean prepare to evacuate, warning would

- mean consider evacuation
- 6. All states have a tsunami advisor to interpret scientific data
- 7. PMEL provide scientists for expertise in interpreting various data post event
- 8. More research and analysis of landslide generated tsunamis
- 9. Schools in inundation zones should plan and practice evacuation drills
- 10. WC/ATWC and PTWC should establish voice grade

- HF. This requires working with FCC and FEMA for frequency set up. This would be good back up to wire-line (which NWR is on), because wireline is not robust to ground shaking.
- 11. Install multiple warning systems to insure complete coverage
- 12. Have tsunami warning workshop at the state level
- 13. NAWAS adopt pre-alert message that allows time for state to bridge the counties.

**WSSPC National Awards in Excellence**

*from:* <http://www.wsspc.org/award/award2001.htm>

The following awards will be presented at the WSSPC Annual Conference 2001, Radisson Hotel Sacramento; Sacramento, California, October 21-24, 2001:

- 1) Overall Excellence in Mitigation  
Program Name: Earthquake Survival Program  
Administering Agency: County of Los Angeles, Office of Emergency Management
- 2) Mitigation Efforts  
Program Name: Hawaii State Earthquake Advisory Board Local Adoption of Seismic Zone 4 Upgrade  
Administering Agency: Hawaii State Civil Defense
- 3) Outreach to Schools (3-way tie)  
Program Name: Washington State Tsunami Curriculum K-6 & 7-12  
Administering Agency: Washington State Military Dept., Emergency Management Division, Plans, Exercises, Education & Training Unit  
Program Name: School Emergency Response Team  
Administering Agency: Kent (WA) Fire Department and Life Safety  
Program Name: Rockin' Around New Mexico  
Administering Agency: NM Institute of Mining and Technology/ Bureau of Geology and Mineral Resources
- 4) Educational Outreach to General Public  
Program Name: Project Impact Television

- Administering Agency: Project Impact of King & Pierce Counties
- 5) Use of New Technology  
Program Name: Interactive CD-ROM for Historical Colorado Earthquakes  
Administering Agency: Colorado Geological Survey
- 6) Legislation  
Program Name: Senator Peter Courtney's Efforts  
Administering Agency: Oregon Seismic Safety Policy Advisory Commission
- 7) Innovations  
Program Name: Washington Coast NOAA Weather Radio Station Mt. Octopus/Forks  
Administering Agency: Grays Harbor Emergency Management (State and Local Tsunami Working Group)
- 8) Non-Profit Agency Efforts  
Program Name: Kitsap County Day of Caring  
Administering Agency: Kitsap County Dept. of Emergency Management/Kitsap County United Way
- 9) Response Plans/Materials  
Program Name: Emergency Preparedness Training Program  
Administering Agency: Los Angeles Unified School District

The previous annual awards are given at:  
<http://www.wsspc.org/award/default.htm>

## Spotlight Shines on Oregon's "Showcase State" Initiative

Reprinted with permission. For more information, contact Michele Steinberg 617-557-5566  
from: [http://www.ibhs.org/ibhs2/html/press\\_releases/press010813.htm](http://www.ibhs.org/ibhs2/html/press_releases/press010813.htm)

**Salem, OR/August 13, 2001** – Community leaders, members of the insurance industry, higher education and other partners throughout Oregon will come together on August 20, 2001, to celebrate a new public-private partnership to reduce disaster losses – the Oregon "Showcase State" initiative.

Following the 1996 flood, state agencies recognized the need to come together as a team to develop strategies and implement measures to reduce disaster losses for the benefit of the future of all Oregonians. Governor John Kitzhaber's Executive Order designating Oregon as a "Showcase State for Disaster Resistance and Resilience" captures the spirit of this cooperation and highlights the importance of accomplishing these goals through public and private partnerships.

Oregon is the second state in the nation and the only western state to be recognized for its efforts in making natural disaster preparedness a priority. The "Showcase State" kick-off event is being held in conjunction with the Oregon Emergency Management Association's Annual Workshop at the Valley River Inn in Eugene, Oregon. Presentations from Harvey Ryland, President & Chief Executive Officer of the Institute for Business & Home Safety (IBHS) and representatives from key state agencies involved in the effort will highlight the showcase state concept as part of the afternoon session.

IBHS developed this public-private partnership initiative to help states and local communities foster an environment that reduces disaster losses and promotes recovery in a shortened period of time with less outside assistance. These

efforts commonly referred to as natural hazard mitigation, include a variety of activities designed to reduce disaster losses. "The Showcase State Initiative helps bring a new focus to disaster preparedness at the local level where most incidents are managed. It also gives communities the opportunity to minimize catastrophic losses", said Jim Perruca, SAFECO Portland Region Office. SAFECO Corp. of Seattle championed the development of this program and provided initial funding.

The University of Oregon's Natural Hazards Workshop is facilitating the initiative with a grant from the Public Entity Risk Institute and support from SAFECO as well as many other insurers doing business in Oregon through the Insurance Information Service of Oregon & Idaho. The partnership will help link residents, businesses and others to information about disaster safety and the disaster resistant state concept, which was first explored by state agencies in meetings of the Governor's Interagency Hazard Mitigation Team.

An evening reception is also planned which will include informational displays by a variety of agencies and businesses involved with natural hazard mitigation activities.

*The Institute for Business & Home Safety (IBHS) is a national, non-profit initiative of the insurance industry, based in Tampa, Florida. The mission of the research and communications organization is to reduce deaths, injuries, property damage, economic losses and human suffering caused by natural disasters.*

## Development of the 2000 IBC\* and 1997 UBC\* Seismic Codes

by

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originally published in EQ (Earthquake Quarterly), Winter 2000. reprinted with permission by WSSPC and Douglas S. Thompson

For over 40 years the seismic provisions in the *Uniform Building Code (UBC)* have been based primarily on recommendations by the Structural Engineers Association of California (SEAOC). These recommended seismic provisions are contained in a document called *SEAOC Recommended Lateral Force Requirements and Commentary*, commonly referred to as the *Blue Book*. This *Blue Book*, like the UBC, has been updated regularly.

These recommended seismic provisions were submitted by either the SEAOC Seismology Committee or the SEAOC Code Committee to the International Conference of Building Officials (ICBO) for review, adoption and inclusion into the UBC. In the distant past, building code provisions devel-

oped on the "national level" through the American Concrete Institute (ACI), the American Institute of Steel Construction (AISC), and the American Forest and Paper Association (AFPA), to name just a few, were not focused on seismic provisions as was SEAOC. Earthquakes had been perceived as a local "California" problem.

The Federal Government began changing this perception of seismic provisions twenty years ago with the creation of the National Earthquake Hazards Reduction Program (NEHRP). The Federal Emergency Management Agency (FEMA) was charged with the task of creating a document on national earthquake regulations. The Building Seismic Safety Council (BSSC) under the direction of FEMA was

then created and specifically assigned to create the *Recommended Provisions for Seismic Regulation for Buildings (NEHRP Provisions)*. This document first came out in 1985.

Both FEMA and BSSC continued with the updating of the *NEHRP Provisions* on a three-year cycle, with revised provisions in the 1988 and 1991 editions. For the most part these provisions were not used by the model codes or by the practicing engineers. This drastically changed when President Clinton signed an executive order mandating that all new federal buildings must meet minimum standards set by the *1991 NEHRP Provisions*.

In 1995, the three national model code agencies, Building Officials Code Administrators (BOCA), the International Conference of Building Code Officials (ICBO) and the Southern Building Code Council International (SBCCI), voted unanimously to work together in the creation and publishing of one model building code. This one model building code would be called the *International Building Code (IBC)*. These national model code agencies have been publishing the *National Building Code*, the *Uniform Building Code*, and the *Southern Building Code*, respectively.

The International Code Council (ICC) was formed from members of each of the three national model code agencies. The ICC then formed a group of code writing committees (Occupancies, General, Structural, Means of Egress, and Fire Safety), from these members, for the creation of the one national code. Provisions from all three national codes were looked at in the formation of the *IBC* drafts.

At the time that the ICC was formed, both BOCA and SBCCI had already adopted the *NEHRP Provisions* for seismic design. Also, the three code agencies were leaning strongly towards the inclusion of the *NEHRP Provisions* into the *IBC*. This presented somewhat of a problem for SEAOC and the western states using the *Uniform Building Code* for its seismic provisions. The seismic provisions in the *Uniform Building Code* were considerably more stringent than the *1995 NEHRP Provisions*. After considerable negotiations with SEAOC, BSSC, and the National Council of Structural Engineering Association (NCSEA), SEAOC decided to support the *1997 NEHRP Provisions*. As a compromise, BSSC agreed to allow SEAOC enough input and comment to ensure that the provisions necessary to California practice would be included into the *1997 NEHRP Provisions*.

Many of the changes in the *1997 UBC* area direct result of California changing from the *Blue Book* provisions to the *NEHRP Provisions* and many of the changes found in the *1997 NEHRP Provisions* are a direct result of including concepts from in the *1997 UBC*. These changes in the *1997 UBC* were made as a transition to the *2000 IBC* and the *1997 NEHRP Provisions*. Both the *1997 UBC* and the *1997 NEHRP Provisions* were in most cases identical, and for similar building types would result in nearly identical building designs.

Other problems arose in the development of the *1997*

*NEHRP Provisions*. The *1994 NEHRP Provisions* as written were not acceptable as "code language" but rather more as a "reference document." Also, there was not enough time for a regular "consensus standard," as was used in the development of the *1994 NEHRP Provisions*. To assist the process, FEMA formed the Code Resource Development Committee (CRDC) through the BSSC. The CRDC committee assisted the ICC committees in converting the *1994 NEHRP Provisions* into code language. The CRDC committee also helped in filling voids that existed in the *1994 NEHRP Provisions*. One of these voids was that the *1994 NEHRP Provisions* only recognized load and resistance factor design (LRF or strength design). In this case, the *1997 UBC* was used as a model for the inclusion of allowable stress design (ASD) into the document.

### **How seismic provisions will be developed in the future**

Now that the process of preparing the *2000 IBC* is complete, the process of how to incorporate revisions to the seismic provisions into future editions of the *IBC* has yet to be determined. Currently, the BSSC is holding meetings to determine how the seismic provisions should be developed in the future. Although not yet finalized, the process seems to be heading towards adopting the seismic provisions by reference as a "national standard." This would then be the same process for adoption as is used for each of the material sections of the code.

The adoption by reference process has both advantages and disadvantages. An advantage for this system would be to preclude a rapid adoption process for massive changes, like that which occurred for the seismic provisions in the *1997 UBC*. This on the whole would be a more simplified process allowing enough time for input and comment from all interested parties.

However, the disadvantage to this would preclude the emergency enactment of lessons learned from earthquakes. One example of this would be the emergency enactment of no longer allowing the "pre-Northridge" welded steel connection. Through direction from SEAOC, the code section for this connection was removed and re-written by ICBO, in the fourth printing of the *1994 UBC*. Had a full consensus process taken place, literally thousands of buildings would have been permitted and built using the old connection that was now known to be flawed.

### **New provisions in the 1997 UBC**

Related to seismic design in the *1997 UBC*, there were many significant changes in the code. The two most notable are 1) the reliability/redundancy factor, and 2) the near-source factor.

Based upon lessons from past earthquakes, it has been observed that structures with adequate redundancy perform better than structures without adequate redundancy. Simply put, structures with redundancy have more elements resisting the seismic forces or, in other words, have not put "all



their eggs in one basket." Lateral resisting elements are shear walls, steel frames or concrete frames. Prior to the 1997 UBC, similar structures were designed for similar forces. The reliability/redundancy factor, in the 1997 UBC, has placed a penalty on structures with lesser redundancy. This reliability/redundancy factor can place as high as a 50 percent penalty (or design force increase) requirement on structures.

Based primarily upon recorded ground accelerations in the Northridge and Kobe earthquakes, ground accelerations from a seismic event can be considerably higher at close proximity to the fault. Prior to the 1997 UBC, seismic regions were merely divided into broad categories, that being seismic zones 0 through 4. The California Department of Conservation, Division of Mines and Geology (DMG), has prepared a map book of known active fault "near-source zones" in California and adjacent portions of Nevada. A "near-source zone" is defined as within 2 kilometers of a known fault zone. The maximum increase for near-source effects occur within 2 km. The amount of increase in the seismic force used for the design decreases with distance from the fault and there is no increase at and beyond 15 km from the fault. This "near-source zone" can place as high as a 100 percent increase in design force requirements on structures.

### **New provisions in the 2000 IBC**

Related to seismic design in the 2000 IBC, one of the most significant changes from the UBC is the seismic zone mapping. Prior to the 1997 UBC, the seismic zones had number designations. These zones were from 0 to 4, with 4 being the area of highest seismic potential. California, for example, has only two zones (3 and 4). The 2000 IBC has "Spectral Response Acceleration" maps. These maps appear as contour lines. A CD-ROM will also be provided with the IBC that will provide spectral values for a given longitude and latitude.

Also related to seismic design, the 2000 IBC also has another significant change. The 2000 IBC is specifically written to include all types of structures except for one- and two-family dwellings. For design of one- and two-family dwellings (residential), another new code has been created called the *International Residential Code (IRC)*. A potential problem with this new code system is the IRC does not contain many of the stringent seismic provisions contained within the UBC.

\*IBC = International Building Code; UBC = Uniform Building Code

### **International Building Code Requirements**

originally published in *AEG News*, v. 43, no. 3, p. 31, June 2000. reprinted with permission

Testimony by the California Council of Geoscience Organizations (CCGO) at the International Code Council Hearings in Birmingham, Alabama, on April 14 and 15, 2000, was part of a successful effort to ensure that geologic work required by the International Building Code (successor to the Uniform Building Code) is performed by geologists, not architects or engineers. This success contributes to continued improvements in public safety.

The American Institute of Architects (AIA) graciously modified its proposed code change that would have defined "registered design professional" as "an individual who is registered or licensed to practice architecture, engineering, land surveying and landscape architecture..." by adding "or geology." AIA's modified proposed change was supported by CCGO, the American Institute of Professional Geologists, and the Association of Engineering Geologists (AEG). The AIA proposal was defeated, but that leaves geologists and other professionals free to practice "their respective design profession as defined by the statutory requirements of the professional registration laws of the state in which the project is to be constructed." If AIA had not modified its proposal by adding "or geology," and the proposal had been adopted, numerous code provisions would have limited geologic work to persons licensed in non-geologic professions.

CCGO then negotiated a modification to a separate proposal by the National Council of Architectural Registration Boards (NCARB). NCARB's unmodified proposal was to replace the term "registered design professional" with "architect/engineer" in the structural chapter of the code. That proposal would have prohibited geologists from designating active faults, planning and carrying out subsurface exploration programs, and recommending appropriate setbacks from the crests and toes of slopes. NCARB thought it had already included geology in its proposed change by including "geological engineering" in the definition of "architect/engineer." Upon learning the difference between geologists and geological engineers, NCARB modified its proposal to add "or geologist" in the six relevant code provisions proposed to be changed. The entire NCARB proposal was defeated, leaving all registered design professionals, including geologists, free to practice their professions. CCGO also testified in support of a proposal to add a Grading appendix to the existing code. The proposal was defeated by the slimmest of margins, largely on technicalities, leaving the existing International Building Code still without a requirement for a grading plan, grading permit, soils report for grading, grading observations, cut and fill slopes at safe gradients, or drainage and debris terraces on high cuts and fills, and leaving local jurisdictions to develop

their own grading codes. CCGO will continue its involvement in the effort to add grading provisions to the code.

Geologists once again drew a lot of attention at the hearings and continued to increase support for inclusion of geologic practice in building codes. To join CCGO's Code

Development Committee, contact CCGO President Betsy Mathieson at (650) 688-6755 or [emathieson@exponent.com](mailto:emathieson@exponent.com). The California Council of Geoscience Organizations has a website at <http://www.ccg.org>.

### Building Code Websites for Alaska, Washington, Oregon, California, and Hawaii

#### Alaska State Fire Marshal's Office

<http://www.dps.state.ak.us/Fire/asp/>  
5700 E. Tudor Road  
Anchorage, AK 99507

Contains fire and life safety regulations, information about plan review and building permit processes, plan review application and application for fire system design, installation and maintenance permit.

#### California Building Standards Commission

<http://www.bsc.ca.gov/>  
2525 Natomas Park Drive, Suite 130  
Sacramento CA 95833

The California Building Standards Commission reviews, approves and publishes building standards adopted by state agencies and publishes them in the State Building Standards Code (Title 24, California Code of Regulations). The site provides the full text of Building Standards Bulletins and Policy Resolutions; full text of CBSC administrative regulations (Title 24, Part 1); state agency contacts for code questions and interpretations; list of depository libraries with copies of Title 24 and list of purchase sources for the code; commission meeting schedule; full text of current and back issues of commission newsletter.

#### Hawaii (County of Hawaii)

<http://www.hawaii-county.com/countycode/haw05-tp.html>

#### Oregon Department of Consumer & Business Services Building Code Division

<http://www.cbs.state.or.us/external/bcd/aboutbcd.htm>

Contains full-text Application/Interpretation Manual. "Technical Advisories" includes topical code interpretations.

#### Washington State Building Code Council

<http://www.sbcc.wa.gov/>  
906 Columbia Street SW, MS 48300  
Olympia WA 98504-8300

The State Building Code Council was created to advise the Legislature on building code issues and to develop the building codes used in Washington state. These codes help to ensure buildings and facilities constructed in the state are safe and healthy for building occupants, accessible to persons with disabilities and the elderly, and energy efficient.

## Why Building Codes?

from *Natural Hazards Mitigation Insights*, #1, 1996

A publication of the Institute for Business and Home Safety [www.ibhs.net/ibhsdocuments/pdf/building.pdf](http://www.ibhs.net/ibhsdocuments/pdf/building.pdf)  
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Building codes regulate the design, construction and maintenance of buildings. Codes are adopted as laws and regulations, and they apply to new construction and generally to existing buildings that undergo reconstruction, rehabilitation or alteration, or when there is a material change in occupancy.

Building codes establish *minimum acceptable standards* necessary for *preserving public health, safety and welfare* and for *protecting property*.

Three model code organizations promulgate model building codes for adoption by state and local governments. These organizations have joined to form the International Code Council (ICC), which is in the process of developing the *International Building Code* based upon provisions of the three model codes. This composite code is expected to be available by the year 2000.

ICC is responsible for the promulgation of the One and Two Family Dwelling Code. The provisions of this code are adopted by reference in the National Building Code and are included as appendix chapters in the Uniform Building Code and Southern Building Code.

ICC also promulgates the International Plumbing Code and the International Mechanical Code.

The National Electric Code, promulgated by the National Fire Protection Association, is referenced by all three of the existing model building codes.

It is anticipated that ICC will have a complete package of model codes (e.g., Building, Plumbing, Mechanical, Fire Prevention, and One and Two Family Dwellings) by the year 2000.

### Benefits of Codes

The purpose of building codes is to build safe buildings, thereby *reducing deaths, injuries and property damage*. This *preserves the built environment*, both residential and commercial; *reduces public and private disaster aid*, including insurance claims payments; and *maintains employment* in businesses and institutions that otherwise might be forced to close following a catastrophe.

In addition, building codes:

- \*promote a *level and predictable playing field* for designers, suppliers and builders.
- \*promote a *degree of comfort* for buyers, who are entitled to rely upon minimum construction standards for the safety and soundness of a building.
- \*allow *economies of scale* in the production of building materials and construction of buildings.
- \*contribute to the durability of buildings.
- \*help maintain *quality of life* and *property values*.

### Performance Versus Prescriptive Codes

Codes are classified as *performance* codes if they require the completed work to satisfy specified standards (such as 120-mile-per-hour hurricane winds) without describing in detail how to satisfy those standards. Codes are classified as *prescriptive* if they require that certain materials be used and describe how to build in some detail (e.g., use 8d nails, 6 inch oc). There are also variations that combine elements of performance and prescriptive codes.

Performance codes allow the designer and builder to use any combination of materials and methods that will provide the resistance necessary to satisfy the code. Such codes allow wide latitude, and some say this makes them more difficult to enforce. A plan reviewer or inspector may require additional information in order to determine how the combinations of materials and methods in a set of specifications will perform to satisfy the code requirements.

Prescriptive codes, on the other hand, set forth in detail the materials and methods to be used. The plan reviewer and inspector can determine by observation if the code is being followed. Of course, the specifications set forth in the code have to be such that they satisfy minimum standards of performance, which should be stated in the code.

### Enforcement Is Critical

Good building codes have little value if they are not enforced. Independent studies of damage following Hurricane Andrew and the Northridge Earthquake revealed that lax code enforcement contributed to the total damage.

Building codes are generally enforced by building departments at the local level. These departments are often funded by permit fees, which average less than one percent of construction costs.

Plan reviewers and building inspectors are key to the success of building codes. Unless these functions are adequately funded and staffed with qualified, trained, tested and certified personnel, the full value of building codes will not be realized.

### Insurance Companies Benefit from Good Building Codes

Insurers benefit from sound building codes and effective enforcement the same way the general public benefits: through *reduced deaths, injuries and property damage*. Codes and their enforcement provide a level of comfort for insurers, because codes help assure that a certain minimum level of construction quality is strived for in a community. Codes provide a reference point for determining the insurability of properties.

Codes also help mitigate the intangible (emotional, etc.) losses that insurance does not cover, but which often make the claims adjusting process more difficult for insurers.

The *Building Code Effectiveness Grading Schedule\**, developed by the Insurance Institute for Property Loss Reduction and turned over to the Insurance Services Office for implementation and management, rates local communities on the quality of building code provisions and enforcement. The entire country will be graded by the year 2000. Insurers will be able to use the Grading Schedule the same way they use the Fire Suppression Rating Schedule, which measures community firefighting capabilities.

### Cost Versus Value

Builders often oppose changes in building codes on grounds that proposals:

1. don't produce benefits commensurate with the cost, or
2. make buildings so expensive that potential buyers are forced out of the market.

The *incremental costs of many code improvements are nominal*, and in the context of the final cost of the property to a buyer they are inconsequential. However, the benefits of such improvements may have far-reaching effects on life-safety and property damage issues.

For example, a requirement that roof coverings withstand commonly encountered winds and hail would not only protect the roofing material from damage, but would also keep wind and rain from entering and doing major damage to the interior. The same holds true for requirements that door and window openings be secure enough to avoid penetration by wind-borne objects.

A survey by the Institute for Business and Home Safety revealed that 91 percent of homeowners in hurricane-prone coastal areas believe builders should be required to follow stricter building codes even though it might add as much as \$5,000 to the cost of a \$100,000 house.

### Model Codes

code names	sponsoring organization	general area where adopted
National Building Code (NBC)	Building Officials and Code Administrators International	Northeast and Central
Uniform Building Code (UBC)	International Conference of Building Officials	Upper Midwest and West
Standard Building Code (SBC)	Standard Building Code	South and Southeast

### Statewide Building Codes

The Institute for Business and Home Safety (IBHS) supports:

- \*adoption by states, without technical amendment, of a model building code promulgated by a nationally recognized model code organization;
- \*statewide application of the code to all types of public and private structures;
- \*timely updating of the state code as the corresponding model code is updated;
- \* prohibiting local governments from weakening or diluting provisions of the state code; and
- \* uniform, statewide certification by examination and continuing education of those charged with code administration and enforcement.

### Benefits of Statewide Codes

Statewide building codes that meet the IBHS criteria outlined above produce substantial benefits:

*Consistency:* A statewide code provides consistent standards in construction quality from one jurisdiction to the next. All involved in the construction process--designers, suppliers, builders, code administrators, owners, etc.--work from a common understanding of what is required.

*Safety:* There are no gaps in community protection due to failure of local government to enact an appropriate code.

*Efficiency:* Construction costs are kept down because designs, materials and construction practices can be more uniform. Suppliers and builders can operate on a larger scale at lower unit costs.

*Technical Soundness:* The model codes are developed through consensus processes with input from a variety of interests and technical experts. Such expertise and breadth of input are not readily available to local jurisdictions.

*Timeliness:* The model codes are continuously updated to make buildings safer and less prone to damage, as well as to take advantage of new technology and techniques. Local rule-making bodies lack the resources and expertise to keep abreast of these developments.

*Professionalism:* Local building officials benefit professionally from working with the latest codes and from the training in code administration and enforcement provided by model code organizations.

*Openness:* Each of the model codes is developed in an open process where all parties have an equal opportunity to be heard.

*Uniform Enforcement:* A statewide code promotes uniform and nondiscriminatory enforcement throughout the state.

\*Fire chiefs, chief building officials and community chief administrators may request a single free copy (on letterhead) from Insurance Services Office, Inc., Customer Service, 545 Washington Blvd., Jersey City, NJ 07310-1686. Otherwise, the report costs \$55.25. Information from: [www.isomitigation.com/order1.htm](http://www.isomitigation.com/order1.htm)

*TsuInfo Alert* reprints this excerpt to allow readers to judge what strides have been made and what work still needs to be done in hazard mitigation.

**Toward Reduction of Losses from Earthquakes--  
Conclusions from the Great Alaska Earthquake of 1964**

by  
The Committee on the Alaska Earthquake (National Research Council)  
1969

**Preface**

“This condensed summary of conclusions reached by the Committee on the Alaska Earthquake suggests measures that can be taken to minimize loss of life and property in future earthquakes. It is based on a careful review of events during and following the disaster that befell south central Alaskan in March 1964. Emphasis is on lessons to be learned from the Alaskan experience that can be applied to any region where strong earthquakes may be expected.”

**Recommendations on Earthquake Loss-Reduction Measures**

“Loss of life in the Alaska earthquake resulted from tsunamis, slides, and structural collapse during shaking; in other words, from the *catastrophic* effects of the earthquake. Tsunamis accounted for three fourths of the deaths, slides for most of the remainder. The potential for very large economic losses, many injuries, and even deaths from the *noncatastrophic* effects of an earthquake is well illustrated by the Alaska event. Repair of the nonstructural damage to buildings in many cases cost much more than repair of the structural damage. In an area of more and taller buildings, such damage (from fallen facings, cornices, and electrical fixtures; from cracked plaster; from twisted elevator shafts; from broken pipes and wires) could constitute an economic disaster even if deaths were few. There was extensive damage to highways, utilities, and railroads, and substantial damage to the one major dam in the area; again, in other regions, such damage from a similar earthquake may be much greater. Finally, ecologic changes induced by changes in land level relative to sea level are causing long-continued and essentially indeterminate economic losses stemming from plant, animal, and human adjustments to the new levels.” (p. 2)

The Committee, five years after the earthquake, recommended these steps for hazard mitigation:

1. Studies should be undertaken to develop improved earthquake-resistant designs, and more accurate and reliable methods of structural analysis, for all types of structures and for a variety of ground conditions.

2. Improved regulatory systems for control of structural and nonstructural design and of construction in seismic areas are needed.

3. Periodic reappraisals should be made of major dams, reservoirs, storage tanks, and older buildings in seismic areas to identify existing hazardous structures and to reduce hazards to life and limb.

4. Increased effort should be devoted to collecting data on ground movements and associated physical-field changes both between and during major earthquakes.

5. Needed improvements in the tsunami-warning system include better recording, faster transmission, improved analysis of data, more knowledge of the generation and propagation of tsunamis, and greater understanding of the human response to such warnings.

6. Studies are needed to make earthquake forecasting and hazard evaluation practicable; not only the feasibility but also the socioeconomic implications of such forecasting need to be studied.

7. Earthquake-hazard maps should be made of all densely populated seismic areas.

8. Informing the threatened public of the nature of earthquake hazard and education on means of reducing risk are vital to effective measures of loss reduction and loss adjustment.

9. A comprehensive study should be undertaken concerning the problems involved in establishing a system of earthquake insurance that will be widely used and that will lead not only to loss adjustment but also to loss reduction.

10. Emergency funds and personnel should be available to collect and analyze data from major earthquakes wherever they may occur.

11. The mechanisms for funding earthquake research and data collection should be improved

12. A federal task force should be established to recommend a comprehensive government program directed toward reduction of losses from hazards such as earthquakes; at the same time, individual states or regional authorities should give attention to appropriate mechanisms for coping with these hazards.

*TsuInfo Alert* reprints this excerpt to allow readers to judge what strides have been made and what work still needs to be done in hazard mitigation.

USGS Information Circular 690  
**Seismic Hazards and Land-Use Planning, 1974**, pages 24-28

### **Tsunami and Seiche Effects**

Tsunamis are large ocean waves generated by rapid changes in elevation of large masses of earth and ocean. They are commonly caused by vertical faulting beneath the ocean that rapidly moves a large volume of earth and water. Such rapid movement may generate huge waves of destructive force that can travel thousands of miles. During the 1964 Alaskan earthquake, for example, faulting and crustal warping created tsunamis, or sea waves, tens of feet high that spread more than 1,500 miles from the source area and caused devastation to many coastal communities within their reach. The effects of tsunamis can be greatly amplified by the configuration of the local shoreline and the sea bottom. Since a precise methodology does not exist to define these effects, it becomes important, through examination of the historic record, to determine if a particular section of the coastline has been subjected to tsunamis and to what elevation they have reached. It is also desirable to attempt to assess what amplifying effect a local coastal topographic configuration might have on uniquely directional incoming waves.

Seismic seiches, or earthquake-generated standing waves, occur within enclosed or restricted bodies of water (lakes, reservoirs, bays, and rivers). They can be likened to the oscillations produced by the sloshing of water in a bowl or a bucket when it is shaken or jarred. Seiche waves generally have a low amplitude (less than a foot), but in shallow areas or where the water is constricted, wave runup can be as great as 20 or 30 feet (McCulloch, 1966). Obviously, such high runups can have a devastating effect on people and property within their reach; dams and reservoirs can be overtopped and large volumes of water released to inundate downstream development.

Large water waves causing catastrophic inundation can also result during an earthquake from a dam failure or from large-scale landsliding into a reservoir or bay. The near failure of the Van Norman reservoir during the 1971 San Fernando earthquake required the evacuation of 80,000 people that lived below it (Seed, 1972, p. 14). Although not the result of an earthquake, almost 3,000 lives were lost in Italy in 1963 when a huge landslide (more than 312 million cubic yards of material) suddenly fell into Vaiont Reservoir, sending up a wall of water and rocks 850 feet above reservoir level opposite the slide area and waves of water about 330 feet above the crest of the dam. Waves were more than 230 feet high in the narrow valley as far as 1 mile downstream from the dam. Earthquake-generated landslides of this magnitude are possible hazards to dams or reservoirs. The 1958 Alaskan earthquake produced a massive rockfall that

plunged into an inlet at the head of Lituya Bay, causing water to surge against the opposite wall of the inlet and to wash out trees up to 1,720 feet above sea level (Miller, 1960, p. 51). It is extremely fortunate that the bay was uninhabited and that no more than two fishermen died when their boat was destroyed as the wave passed out of the mouth of the bay.

### **Methods for Assessing Wave and Flooding Hazards**

Assessing the hazards from tsunamis and seiches is very difficult and subject to varying interpretations because of very limited historical data and theoretical knowledge. Nevertheless, wave runup elevations could be predicted for most ocean and lake shorelines from examination of historic records. An attempt should be made to assess the amplifying effect of unique topographical coastal configurations even though the methodology may be very crude. Potential areas of catastrophic inundation from dam and reservoir failure or from landslide-generated waves that overtop dam crests, on the other hand, can be mapped for all large bodies of water perched above populated areas. Recently passed legislation in California now requires the dam owners to prepare maps showing areas of potential inundation for use in disaster and land-use planning.

### **Implications for Planning and Land-Use Controls**

Stringent controls should be applied to all land use within areas subject to tsunami and seiche runup and in potential areas of inundation downstream from water-retaining structures that lie within active fault zones and landslide-prone areas. These controls might include any of the following:

- (1) Restrict land uses to those that are economically essential (for example, docks and warehouses) and warn owners, builders, and occupants of the hazard. Prohibit siting of high-occupancy and critical structures (e.g., schools, hospitals, police, and fire stations).
- (2) Place areas of potential inundation under flood-plain zoning, prohibiting all new construction and designating existing occupancies as non-conforming.
- (3) Where economically feasible and without encouraging a false sense of security, construct restraining or diversion structures to minimize potential inundation.
- (4) Institute appropriate systems to warn of impending failure.
- (5) Adopt and implement evacuation plans.
- (6) Seek elimination of potentially hazardous dams or reservoirs.

## Opinion:

### Last Word--Reduce Your Catastrophes

by

Ken Marshall, NAMIC State Issues Manager, National Association of Mutual Insurance Companies

(originally published in the March/April 1999 issue of the NAMIC Property/Casualty Magazine; reprinted with permission from: <http://www.namic.org/n/pb/pc/030499/lastword.htm> (4-13-2001). For current information, see also: <http://www.namic.org/s/default.asp>

Everyone's heard it: "reduce your catastrophic risk exposure... reduce your catastrophic risk exposure ..." It's become a mantra for the property/casualty industry, and with the unprecedented level of personal injury, death and destruction tied to innumerable catastrophic events over the last decade, it's clear this is more than just another industry catch phrase.

Extraordinary coastal growth has steadily increased risk exposure associated with hurricane and earthquake damage and has contributed to the disastrous tolls exacted on life and property. The devastation left in the wake of some particularly awesome events in recent years--Hurricane Andrew in 1992 and the Northridge Earthquake in 1994--has been a catalyst for this property/casualty mantra, framing it in geographic terms related to hurricane and earthquake exposure.

A closer examination of the numerous catastrophic events of the '90s, however, shows that major catastrophic risk cannot be simply defined in terms of hurricane and earthquake exposure. A variety of calamitous events including windstorms, winter storms, hailstorms, tornadoes, floods and wildfires have occurred in virtually every state, contributing significantly to recent catastrophic losses and demonstrating that this mantra applies to risks that exist throughout the nation.

As these facts emerge, there is heightened sensitivity about commercial and personal risk exposures that exist everywhere, so greater attention is being given to the basic structural integrity of buildings. Adoption and proper enforcement of modern statewide building codes are seen as critically important factor in the battle to reduce catastrophic risk exposure.

Three organizations promulgate building code standards that states adopt or use as a blueprint for their own statewide building standards. The Building Officials and Code Administrators (BOCA) promulgate the National Building Code (NBC) and exist primarily in the Midwestern and Northeastern states. The International Conference of Building Officials (ICBO) use the Uniform Building Code (UBC) and covers the Western states, while the Southern Building Code Congress (SBCC) promulgates the Southern Building Code (SBC), which extends from the South to the Southeast. Not all states have adopted standards promulgated by one of these three organizations.

Currently, eight states (Arizona, Delaware, Hawaii, Maine, Missouri, Pennsylvania and Texas) have no statewide building code. While these eight states are of priori-

tized concern, other states that have adopted a building code are also of concern because their provisions are out-dated and do not reflect recent developments that could better enable new structures to withstand catastrophic forces.

Consistent enforcement is also integrally important and necessary to make state building codes effective loss control tools. It is not clear that codes are uniformly applied throughout all jurisdictions in every state. Whether this is attributable to resource limitations or other political factors is not clear.

Uniform building codes represent a fundamentally important tool in the fight to reduce catastrophic risk exposure, but dated provisions and ineffective enforcement can limit the effectiveness. NAMIC is participating in a coalition of insurance industry organizations formed to help educate the public and private sector about this issue and to promote statewide building code legislation.

The coalition closely monitors developments in every state, but is concentrating its activities in two states that have not yet adopted a statewide model code. Missouri and Pennsylvania have been the focus of considerable attention for the coalition. Legislation to adopt a statewide building code has been considered in both states in recent years, and the coalition intends to continue its support of similar bills that have been introduced again this year. Aside from its participation with this coalition, NAMIC has published several articles reinforcing the importance of building codes to reduce damage from catastrophic and other risk exposures. NAMIC also recently conducted a non-scientific survey of its multistate members.

The results confirm that this is an issue of considerable importance. Over 80 percent of our survey respondents support our involvement in this coalition and view this as an issue with which the property/casualty industry should be actively involved. A clear majority is willing to support efforts to improve building code conditions through state-targeted legislation. Perhaps most importantly, this survey tapped into the vast engineering and loss control expertise within our membership and yielded some valuable insights that will be instrumental in our efforts to identify the key technical considerations that all model building code provisions need to address.

Keep your ears tuned, there's a new mantra reverberating throughout the industry: "... strong building codes can help save lives ... strong building codes can help reduce injuries ... strong building codes can help reduce property damage ... strong building codes make sense."

## TSNUMAMI NEWS

### EENET Seeks Feedback

[The Federal Emergency Management Agency (FEMA) recently sent the following request to recipients of their e-mail list, EENET-LIST. To subscribe to that source of information and notices about FEMA's Emergency Education Broadcast Network - send an e-mail to [majordomo@fema.gov](mailto:majordomo@fema.gov) with the words "subscribe eenet-list" (without the quotes) in the body of the message.]

As many of you know, EENET has been providing weekly programming since January 1999 on various [emergency/disaster] topics. We need to know from you our viewers, if these programs are beneficial and how you are using the information provided. Are there any particular topics we should add or delete from our schedule? How can EENET better serve you, our viewing audience?

You are very important to us and we want to provide information that is both informative and beneficial, and we want to hear any comments you may have.

Feel free to contact me via e-mail - [sue.downin@fema.gov](mailto:sue.downin@fema.gov) - to voice your opinion, as it will be very valuable to assure these programs continue in the future.

*from: Disaster Research 352, August 10, 2001*

### The FEMA Reorganization

In *Disaster Research* #348 (item 10), we mentioned that President Bush had created a new Office of National Preparedness within the Federal Emergency Management Agency (FEMA). Recently, FEMA Director Joe Allbaugh announced additional realignments within the agency. The director believes the new agency structure will "flatten the organization where possible; reduce the number of organizations reporting directly to the Office of the Director, and consolidate like functions." In addition, Allbaugh changed the title of agency directorate heads from "Associate Director" or "Executive Associate Director" to "Assistant Director." However, the Administrators of the Federal Insurance Administration and the United States Fire Administration will retain their titles as prescribed by law.

The new offices in FEMA include:

- Office of National Preparedness: This office will coordinate all federal programs dealing with weapons of mass destruction consequence management.
- Strategic Planning and Evaluation: This office will lead the development, implementation, and management of the agency's strategic plan.
- External Affairs Directorate: The agency's congressional, intergovernmental, public affairs, and international outreach functions are combined under this new directorate.
- Readiness, Response, and Recovery Directorate: The preparedness, training, exercise, response, recovery, and disaster logistics functions are combined in this group.
- Federal Insurance and Mitigation Directorate: This directorate combines the agency's mitigation functions with its

federal insurance responsibilities.

- Regional Operations: This office retains oversight of FEMA regional offices.

- Office of General Counsel: This office will assume an increased role in policy coordination and the Defense Production Act function.

- United States Fire Administration: This part of FEMA retains its original functions but will now also oversee administration of the Fire Grants Program.

- Administration and Resource Planning Directorate: This directorate consolidates all of the agency's nontechnical support functions except information technology services, including human resources, financial and facilities management functions. A Workforce Development Division has also been created to oversee succession planning and career management and development for FEMA employees.

- The Information Technology Services Directorate remains basically unchanged, as do the offices of the Inspector General and Equal Rights.

The agency reorganization was fully implemented in August. For further information about the reorganization, contact the FEMA Office of Public Affairs, 500 C Street, S.W., Washington, DC 20472; (202) 646-4600; or <http://www.fema.gov/about/femaorg.htm>.

*from: Disaster Research 352, August 10, 2001*

### Introducing EERI's "Encyclopedia of Housing Construction Types in Seismically Prone Areas of the World"

The Earthquake Engineering Research Institute (EERI) has undertaken a joint project with the International Association of Earthquake Engineering (IAEE) to use the World Wide Web to build an interactive, dynamic, web-based encyclopedia of housing construction types in seismically prone areas of the world. The encyclopedia will be viewable on the web, and users will also be able to generate the encyclopedia in whole or in part as a conventional hard copy publication. With the expanding capabilities of the web and Internet this project is breaking new ground in terms of building a global network and offering instant information exchange among engineers, architects, and other professionals in many diverse countries. The project will provide those individuals with tools to improve housing vulnerable to earthquakes, thereby reducing future economic losses and saving lives. Examples received to date from various countries that will form the basis for the interactive web site can be viewed at <http://www.johnmartin.com/EERI>.

Ultimately the encyclopedia will not only provide information that will be helpful in improving housing construction, but it will create a community of knowledgeable workers drawn together by this world-wide cooperative effort. Once the information is collected, the next step is to organize this community so that it can spread its knowledge to



those actively engaged in planning, designing, constructing, and renovating housing in their respective countries through activities such as training courses and demonstration projects. The project is using technology to build this global community, by connecting experts around the world through the use of e-mail and the Internet. The web site, with its searchable database, will be completed and ready for use in December 2002.

The project steering committee has developed a standardized, multi-question form that is used by project participants to describe various construction types in their respective countries. With the results, the next phase of the project is to create the web-based database of this information so that a user can search by various parameters - country, seismic hazards, building function, building type, and other dimensions. With this information, a user will be able to generate graphs, tables, and presentations; view photos and drawings; and print summary forms.

Users of the encyclopedia will be able to compare strengths and vulnerabilities of the various construction systems and strengthening technologies and to determine generally the number of people living in the various construction types as well as each country's perception of the vulnerability of a particular construction type. The site will include basic information on earthquakes, building performance in quakes, and an array of global housing statistics, as well as country-specific information covering a host of physical and demographic data.

EERI and IAEE are actively seeking participants for this project who would be willing to contribute information on the housing in their own countries. A background in architecture or structural engineering is helpful. To date, over 160 volunteer engineers and architects from 45 different countries have agreed to participate. A complete roster can be downloaded from the EERI web site: <http://www.eeri.org>.

Persons interested in participating should send an e-mail to Svetlana Brzev, Project Chair, [sbrzev@bcit.ca](mailto:sbrzev@bcit.ca) -or Marjorie Greene, EERI Special Projects Manager, [mgreene@eeri.org](mailto:mgreene@eeri.org).

*from: Disaster Research 351, July 27, 2001*

### **Introducing the Collaborative for Disaster Mitigation**

Supported by a Federal Emergency Management Agency Hazard Mitigation Grant administered through the California Governor's Office of Emergency Services, the Collaborative for Disaster Mitigation (CDM) is a unique organization bringing together public and private, profit and non-profit organizations to mitigate hazards. The collaborative includes an executive board, advisory committee, and users group that provide oversight to an operations center. San Jose State University provides insight, information, human talent and other university resources to support the organization.

CDM activities and projects center around the imple-

mentation of hazard mitigation measures, targeting emergency preparedness professionals in all sectors of society. The collaborative intends to help translate available research into practical, cost-effective real-world applications; provide professional development opportunities; serve as an information clearinghouse; serve as a multidisciplinary resource to local jurisdictions, schools, and businesses; and identify technological needs in the field.

Specifically, the collaborative will host a laboratory hazard mitigation. Demonstration project, conduct conferences and symposia, help develop a master's program in emergency management, establish a hazard mitigation web site, and provide translation of various projects for the many ethnic communities of the San Francisco Bay area.

For further information, contact the Collaborative for Disaster Mitigation, One Washington Square, San Jose, CA 95192-0082; (408) 924-3596; fax: (408) 924-4057; e-mail: [sjsu\\_cdm@email.sjsu.edu](mailto:sjsu_cdm@email.sjsu.edu); www: <http://www.sjsu.edu/cdm>.

*from: Disaster Research 351, July 27, 2001*

### **CRID Seeking Articles on Community Participation**

The Regional Disaster Information Center (known by its Spanish acronym, CRID) in San Jose, Costa Rica, along with the Pan American Health Organization (PAHO), and the U.N. International Strategy for Disaster Reduction (ISDR), is preparing the next issue of Biblio-des, CRID's series of topical bibliographies on disasters.

Recognizing the importance of community participation in disaster preparedness and prevention, this issue will focus on three broad areas: 1) community participation in planning and building an organized community; 2) community participation in the design and use of local risk maps; and 3) preparing and putting into practice community response guidelines.

Organizations that have prepared articles, publications, or other documents regarding community participation are invited to submit them to CRID, Apartado 3745-1000, San Jose, Costa Rica; fax: (506) 231-5973; e-mail: [crid@crid.or.cr](mailto:crid@crid.or.cr); www: <http://www.crid.or.cr>.

The latest issues of Biblio-des are available from <http://www.crid.or.cr/crid/eng/services/services.htm>.

*from: Disaster Research 354, September 20, 2001*

### **ISDR World Disaster Reduction Campaign Update**

The United Nations International Strategy for Disaster Reduction (ISDR) Secretariat is pleased to announce the availability of the information kit for this year's World Disaster Reduction Campaign on "Countering Disasters, Targeting Vulnerability," with its three sub-themes: "The Role of Science and Technology in Disaster Reduction"; "Building Disaster Resistant Infrastructures"; and "Mobilizing Local Communities in Reducing Disasters."

The information kit is made of four parts, including general (including statistical) information on disasters today and current trends, along with practical disaster reduction

examples worldwide, and then sections on each of the campaign's sub-themes.

The information kit can be downloaded from the ISDR web site (<http://www.unisdr.org>) in full layout or text-only versions. It can also be obtained from the ISDR Secretariat by contacting Nicole Appel, Public Awareness Officer, 52 rue des Paquis, Palais Wilson, 1201 Geneva, Switzerland; tel: 41 22 917 97 06; fax: 41 22 917 90 98; e-mail: [appeln@un.org](mailto:appeln@un.org).

The campaign information kit in Spanish can be obtained from: <http://www.eird.org> (option: Paquete de Informacion). Printed copies of the kit will be ready by September 17 and can be obtained by e-mailing [margarita.villalobos@eird.org](mailto:margarita.villalobos@eird.org).

The ISDR Secretariat has also prepared a list of suggested activities for the International Day for Disaster Reduction, to be held on October 10 this year. To receive this list, contact Nicole Appel at the address above.

*from: Disaster Research 354, September 20, 2001*

### **Disaster Time Line Now Available Free On-Line**

The newly revised version of the "Disaster Time Line: Selected Milestone Events and U.S. Outcomes (1965-2001)" provides a unique, graphic depiction of major disasters, both natural and technological, that have affected emergency management policies in the U.S. Using colorful computer graphics, the Disaster Time Line chart (roughly 11" x 32") shows not only milestone events and the year each occurred, but also the influences each event has had on federal statutes, regulations, and executive orders; federal response plans; and major federal organizational changes. By portraying the major disaster events and their ramifications in U.S. emergency management history, the time line shows how certain political and policy outcomes and trends were obvious consequences. The time line is an excellent tool for teaching emergency management and/or conducting briefings.

The Disaster Time Line should be of interest to:

- professors and students of emergency management

- consultants who need to brief clients lacking history or context for some emergency preparedness decisions
- practitioners
- junior staff who lack knowledge of major formative disasters and their outcomes, and
- anyone interested in disasters and their effects

Thanks to ICF Consulting (<http://www.icfconsulting.com/em>), copies of the Disaster Time Line are now *\*free\**. Just go to the download section of the Time Line web site - <http://www.disaster-timeline.com>. If you cannot manage the file download, use the contact information at the web site to obtain a copy; there is a nominal charge for postage and handling.

*from: Disaster Research 354, September 20, 2001*

### **icoast Award Results**

We are pleased to announce the awards for the 2001 icoast coastal management Internet awards. This year's awards were the first to honour the efforts of those working to improve coastal management through the use of the Internet. Thanks to all those who nominated sites, and to our great panel of judges: Tom Wilson, Linda Bridge, Harley Spence, Laurie Jodice, Arlo Hemphill & Caro Kay.

The winners are:

1. *Exceptional Government Coastal Management Website:* Washington Dept. of Ecology Shorelands and Wetlands, "Puget Sound Shorelines"
2. *Inspirational Community Coastal Management Website:* Surfriider Foundation, "State of the Beach"
3. *Academic Leadership in Coastal Management Website:* International Ocean Institute of Southern Africa

Honourable mentions who were close to winning go to:

- Healthy Waterways Queensland
- Cooperative Research Centre for Coastal Zone, Estuary and Waterway Management
- Smithsonian Marine Station at Ft. Pierce

*from: [icoast\_news] icoast newsletter, version 3.08, August 26 2001*

## WEBSITES

### Building Code Websites

<http://geopubs.wr.usgs.gov/fact-sheet/fs176-95/>

U.S. Geological Survey factsheet "Saving Lives Through Better Design Standards."

"Building codes are the public's first line of defense against earthquakes. The codes specify the levels of earthquake forces that structures must be designed to withstand. These specifications are based on current information from strong-motion instruments. As ground motions of greater intensity have been recorded, the minimum earthquake requirements specified in building codes have been raised. In addition, provisions for different soil conditions have been added to the codes as scientists have documented the significant influence of soil type on shaking intensity. In recent earthquakes, buildings built to modern codes have generally sustained relatively little damage."

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

International Code Council.

<http://www.intlcode.org/codes/>

International Codes Code Development. Links to 2001 code development cycle, revised ICC code development procedures, code development schedules.

[http://www.ibhs.org/ibhs2/html/building\\_codes/building\\_codes\\_frontpage.htm](http://www.ibhs.org/ibhs2/html/building_codes/building_codes_frontpage.htm)

Includes links to building code hearings, model code activities, state codes, standards, and the Building Code News.

### Other Websites

<http://www.riskinstitute.org>

The Public Entity Risk Institute (PERI) has published a new guide that provides small public entities with a user-friendly process to identify and analyze their risks across the entire organization and all activities. Available from the PERI web site above, "Risk Identification and Analysis: A Guide for Small Public Entities," includes ready-to-use forms and potential loss and impact summaries to aid the risk identification process, particularly among public entities too small to support a full-time risk manager.

*from: Disaster Research 353, August 28, 2001*

<http://www.johnstonnc.com/jces>

The Johnston County, North Carolina, Emergency Services web site and the county's Hazard Mitigation Plan, which is available in its entirety via the site, could serve as models for other localities desiring to use the web as a medium to promote their emergency management services generally and disaster mitigation specifically. Besides des-

cribing the services provided by the office, the site contains the local Emergency Operations Plan and information about many of the hazards (fires, natural disasters, hazardous materials spills, medical emergencies) faced by local residents.

The Hazard Mitigation Plan, developed in 1999, is intended to be a "living document" that will evolve as the county changes and knowledge of hazards management improves. The plan

- Identifies the hazards that could potentially affect Johnston County;
- Uses maps to illustrate what areas and populations are vulnerable;
- Describes Johnston County's efforts in establishing mitigation activities; and
- Lists mitigation methods that will reduce, or eliminate, repercussions from disasters in the future.

*from: Disaster Research 353, August 28, 2001*

<http://disaster-resource.com/index.htm>

The on-line version of the "Disaster-Resource Guide" offers multiple forms of information for responding to human-caused and natural catastrophes: articles, products for responding to emergencies, web links, book reviews, and an extensive list of upcoming events in disaster management.

*from: Disaster Research 352, August 10, 2001*

[www.hsus.org/disaster](http://www.hsus.org/disaster)

[www.hsus.org/disaster/disastermonthmain.html](http://www.hsus.org/disaster/disastermonthmain.html)

Last June, in support of National Disaster Preparedness Month for Animals, the Humane Society of the United States published three downloadable brochures in PDF format to help animal owners prepare for emergencies:

- "Disaster Preparedness for Pets"
- "Disaster Preparedness for Horses"
- "Disaster Preparedness for Livestock"

These pamphlets are available from the second URL above; at the first is additional information (including brochures in HTML format) on protecting animals from various hazards.

*from: Disaster Research 352, August 10, 2001*

<http://www.bluesky-foundation.com>

The Blue Sky Foundation of North Carolina is a non-profit corporation chartered for the purpose of encouraging hazard-resistant construction. The foundation provides information, public education, and professional training to promote safe construction, wise land use, disaster mitigation, and sustainable development. Its primary focus is on measures to reduce losses resulting from flooding, hurricanes, nor'easters, and other high-wind events. Blue Sky's Web site describes the foundation's programs in detail and offers several complete documents on hazard-resistant con-

struction, as well as a bibliography, and numerous other resources.

*from: Disaster Research 337, January 12, 2001*

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

The NOAA Coastal Services Center's (CSC's) new Vulnerability Assessment Techniques and Applications (VATA) web site is being developed to provide a central source of information for developers and users of risk and vulnerability assessment applications. The site provides assessment techniques and resources to assist communities in making sound decisions to protect lives and property, maintain economic stability, and preserve the environment. It will also house Vulnerability Assessment Techniques Workshop information, which the developers intend to supplement or even replace actually attending these workshops, which are currently being hosted by the Organization of American States (OAS) Unit for Sustainable Development and Environment (USDE) and the CSC. The workshops are intended to create networking opportunities and dialogue for exploring new ideas and potential partnerships in the application of vulnerability assessments.

The goal of VAT I, the first workshop held in March 2000, was to identify, present, and discuss a variety of natural hazard vulnerability assessment methodologies and their applications and identify gaps in coverage, particularly from the point of view of present and potential users at all levels of public and private sectors. Vat II, to be held August 13-15, 2001, at the CSC in Charleston, South Carolina, will build upon the experience of the VAT I Workshop and feature presentations of a variety of vulnerability assessment methodologies and result in recommendations for new applications and further methodological development.

More information on this development process is available from the web site. In addition, the developers plan to institute both a bulletin board and an on-line system for submitting case studies via the site. The site is in its infancy, and the people at the CSC are interested in feedback about how it could be made more valuable.

*from: Disaster Research 351, July 27, 2001*

[http://www.neic.cr.usgs.gov/neis/data\\_services/data\\_services.html](http://www.neic.cr.usgs.gov/neis/data_services/data_services.html) -- Rapid Earthquake Notification Services

Three mailing lists are available at the web site of the U.S. Geological Survey's National Earthquake Information Center (NEIC) that provide earthquake information rapidly:

- BIGQUAKE sends a message whenever an earthquake, reviewed by the duty geophysicist, has a magnitude of 5.5 or greater anywhere in the world or a magnitude of 4.5 or greater within the 50 U.S. states, excluding the Aleutian Islands of Alaska. The speed of review is somewhat variable, but in most cases a magnitude 6.5 or greater event anywhere in the world or a magnitude 4.5 or greater event within the contiguous U.S. is reviewed within a few hours of its occurrence. Other events meeting the BIGQUAKE

criteria are reviewed within one or two days.

- QEDPOST sends a daily message regarding the earthquakes occurring seven days or more prior to the current day. The information is taken from the USGS Quick Epicenter Determinations (QED) listing. This is a preliminary publication and typically contains 10-30 events per day.
- MTALL sends a message that contains the estimate of the seismic moment tensor for earthquakes with either a body-wave magnitude (mb) or surface-wave magnitude (MS) of 5.5 or greater.

To subscribe to these lists, visit the NEIC web site above.

*from: Disaster Research 351, July 27, 2001*

<http://visibleearth.nasa.gov/>

Visible Earth is a searchable directory, produced by the National Aeronautics and Space Administration (NASA), of high tech images, visualizations, and animations of the Earth. The directory is intended to provide a consistently updated central catalog of earth-science-related visualizations and images. Its goal is to aid the public, as well as the media, scientists, and educators. The Visible Earth includes images depicting earthquake dynamics, earthquake occurrences, earthquake predictions, and seismic profiles. Additional categories include continental tectonics, crustal motion, and faults.

*from: Disaster Research 353, August 28, 2001*

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

The NOAA Coastal Services Center (CSC) Vulnerability Assessment Techniques and Applications (VATA) web site provides risk and vulnerability assessment techniques and resources to assist communities in making sound decisions to protect lives and property, maintain economic stability, and preserve the environment. It also houses information about the Vulnerability Assessment Techniques Workshops currently being hosted by the Organization of American States (OAS) Unit for Sustainable Development and Environment (USDE) and the CSC. That information is intended to supplement or even replace actual attendance at these workshops that were initiated to create networking opportunities for exploring new ideas and potential partnerships in the application of vulnerability assessments.

More information on VATA and the workshops is available from the web site. In addition, the developers plan to institute both a bulletin board and an on-line system for submitting case studies. Because this project is in its infancy, the people at CSC are interested in feedback about how it could be made more valuable.

*from: Natural Hazards Observer, September 2001, p. 12.*

<http://www.tallytown.com/redcross>

The industrious folks at the [Florida] Capital Area Chapter of the American Red Cross (who put out a lot of disaster preparedness, response, and mitigation information on the web) have added several new resources to their site

[including ] the new *Building Disaster Resistant Neighborhoods Handbook*, available via the Disaster Resistant Neighborhood link. This handbook outlines a step by step action plan, with examples, to assist neighborhood associations to prepare for disasters. Posted along with the handbook are a variety of marketing tools to promote the program. Also posted are the applications for three successfully funded Disaster Resistant Neighborhood initiatives.

*from: Natural Hazards Observer, September 2001, p. 13*

<http://www.tsunamicommunity.org>

Created by an ad hoc committee of 14 tsunami researchers, this web site is intended to be a stage for presentation of research in progress and a forum for data exchange. As listed on its introductory page, the site's goals are:

- to describe tsunami generation,
- to facilitate tsunami hazard mitigation,
- to document historical tsunamis,
- to provide tsunami benchmark problems,
- to distribute seafloor bathymetry,
- to showcase community models,
- to provide tsunami case studies,
- to simulate future tsunami scenarios, and
- to gather tsunami links and tsongs [sic].

*from: Natural Hazards Observer, September 2001, p. 15*

<http://www.geocities.com/capecanaveral/lab/1029>

Longtime tsunami researcher George Pararas-Carayannis has assembled this colorful site, which includes bulletins about recent events, conference announcements and reviews, tsunami FAQs, a section on societal effects of tsunamis, a section on physical properties, a database of historical tsunamis, bibliographies, descriptions of tsunami warning systems, a section on prediction and evaluation, a glossary, and links to other tsunami information on the web.

*from: Natural Hazards Observer, September 2001, p. 15-16*

<http://www.hazpac.org>

<http://www.crowdingtherim.org>

HAZPAC, short for "Hazards of the Pacific," is a GIS database that allows users to search and use a comprehensive record of historic disasters for the entire Pacific region. The database contains information regarding earthquakes, tsunamis, volcanic eruptions, and tropical storms, as well as details about human infrastructure systems such as cities, roads, utilities, railroads, and major air routes. Users can specify the type and location of disaster information to be displayed, permitting both detailed (city-specific) and broad-scale investigations of the disaster record. Because HAZPAC is a GIS database, specific information about each data set is available., allowing users to identify, for instance, the population of a particular city or the date and magnitude of an earthquake. HAZPAC was developed as

part of the "Crowding the Rim" initiative, a partnership among the U.S. Geological Survey, Circum-Pacific Council, American Red Cross, and Stanford University---hosts of an international workshop held in August in California (for details, see the second URL above).

*from: Natural Hazards Observer, September 2001, p. 13*

## Classes

### **ASU-East Offers On-line Master of Science with Concentration in Emergency Management**

Arizona State University-East has announced that its Master of Science in Technology degree, with a Concentration in Emergency Management (College of Technology and Applied Sciences) is now available "totally on-line," and that a cohort group is being formed for a January 2002 beginning of this two-year program. For more information, see <http://www.east.asu.edu/ctas/imt/etm/index.html>, or e-mail Dr. Danny Peterson at [drp@asu.edu](mailto:drp@asu.edu).

*from: Disaster Research 351, July 27, 2001*

### **Developing, Writing, Implementing, Testing, Managing, Maintaining Your Recovery Plan**

November 5-7, 2001, Los Angeles, CA. Offered by DisasterRecovery.com Inc., 812 Proctor Avenue, Ogdensburg, NY 13669. 1-800-361-8398. Fax 520-441-4170. E-mail: [phoenix@binomial.com](mailto:phoenix@binomial.com)

## Conferences

### **October 21-24, 2001 Western States Seismic Policy Council Annual Conference 2001**, Radisson Hotel Sacramento, Sacramento, CA

This year's theme is Risk Communication as a Means of Creating Greater Public Awareness and Action, and will feature a plenary session on Risk Communication, featuring Elected officials, and workshop sessions on: Coming to Consensus on Seismic Hazards and Risk; Communicating Across Disciplines; Communicating with the Media; and Legal Ramifications of Risk Communication.

Sessions will include panel discussions, open forums, and roundtable discussions with audience participation aimed toward action to be taken to reduce risks from earthquakes and related hazards. Please visit the WSSPC Web site (<http://www.wsspc.org>) or contact Patti Sutch, WSSPC Executive Director, at 415-974-6435 or [wsspc@wsspc.org](mailto:wsspc@wsspc.org) for registration and information.

*from: <http://www.shoa.cl/oceano/itic/conferences.html>*

### **November 3-7, 2001 International Association of Emergency Managers Annual Conference and Exhibition**, Riverside, CA.

Contact: IAEM, 111 Park Place, Falls Church, VA 22046-4513; 703-538-1795; fax 703-241-5603; e-mail: [iaem@aol.com](mailto:iaem@aol.com). [www.iaem.com](http://www.iaem.com)

November 27-28, 2001 **"The Business of Earthquakes - The Effects of the Nisqually Earthquake."** Seattle, WA

Sponsors: Cascadia Regional Earthquake Workgroup (CREW), Federal Emergency Management Agency, and U.S. Geological Survey.

For additional information and registration, see:

<http://www.crew.org>

*from: Disaster Research 354, September 20, 2001*

November 27-28, 2001 **Nonstructural Seismic Hazards Training Workshop**; Portland, OR.

Host: U.S. Department of the Interior Seismic Safety Program. The February 2001 Nisqually earthquake near Seattle provided clear evidence of the significant overall costs associated with nonstructural failures caused by even a moderate earthquake. This workshop will review these potential risks and emphasize the economic justification for taking low-cost steps to mitigate them. It will provide both hands-on training and demonstrations of cost-effective methods to identify and remedy nonstructural problems. The workshop is intended for facilities, operations, and maintenance personnel, as well as designers, engineers, and planners. For details, contact Tyna Petersen, Workshop Registrar, (303) 445-2573; e-mail: [tpetersen@do.usbr.gov](mailto:tpetersen@do.usbr.gov)

*from: Natural Hazards Observer, September 2001, p. 19*

February 24-27, 2002 **Solutions to Coastal Disasters 2002**, San Diego, CA.

Organisers: Coasts, Oceans, Ports, and Rivers Institute of the American Society of Civil Engineers; Coastal Zone Foundation; and others. The four main conference tracks are Coastal Storms, Seismic Effects, Impacts on Climate Change, and Shoreline Change. Contact Leslie Ewing, California Coastal Commission, 45 Fremont Street, Suite 2000, San Francisco, CA 94105. 415-904-5291; fax 415-904-5400. E-mail: [lewing@coastal.ca.gov](mailto:lewing@coastal.ca.gov). [www.asce.org/conferences/cd2002/index.html](http://www.asce.org/conferences/cd2002/index.html)

April 28-May 1, 2002 **Third National Seismic Conference and Workshop on Bridges and Highways**. Portland, Oregon:

Contact: Third National Seismic Conference and Workshop on Bridges and Highways, c/o Multidisciplinary Center for Earthquake Engineering Research, State University of New York at Buffalo, Red Jacket Quadrangle, Buffalo, NY 14261-0052; (716) 645-3391; fax: (716) 645-3399; e-mail: [mceer@ascu.buffalo.edu](mailto:mceer@ascu.buffalo.edu) -or- Michael Higgins, P.E., Regional Manager Eastern Region, Pure Technologies, US Inc., 10015 Old Columbia Road, Suite B-215, Columbia, MD 21046; (410) 309-7050; fax: (410) 309-7051; e-mail: [mike.higgins@soundprint.com](mailto:mike.higgins@soundprint.com); www: <http://mceer.buffalo.edu/meetings/3nsc/default.asp>.

May 28-30, 2002 **Tsecond Tsunami Tsymposium**. Honolulu, HI

The Tsunami Society is sponsoring a Tsunami Symposium to be held at the East-West Center on the University of Hawaii campus. For more information, see <http://www.ccalmr.ogi.edu/STH/symp2.html>. Or call the Tsunami Symposium Chairman, Mr. James Lander at 303-497-6446, e-mail: [JFL@ngdc.noaa.gov](mailto:JFL@ngdc.noaa.gov); the Tsunami Society Secretary, Mr. Michael Blackford at 808-532-6423, e-mail: [Michael.lackford@noaa.gov](mailto:Michael.lackford@noaa.gov); or the Tsunami Society Treasurer, Dr. Barbara Keating 808-956-8143, e-mail: [Keating@soest.hawaii.edu](mailto:Keating@soest.hawaii.edu).

### Exhibits

The Ocean Shores Interpretive Center (Ocean Shores, WA) hosted a "Tsunamis Here and Abroad" display in August 2001 to coincide with an international workshop held at the Ocean Shores Convention Center on Friday, August 10. Educational materials were provided by NOAA and Grays Harbor Emergency Management; and the video The Quake Hunters (Films for the Humanities and Sciences) was shown. A working NOAA weather station was also on exhibit. The North Coast News covered the event with an article in the August 8, 2001 issue.

### Articles

#### **Building Codes:**

- Bachman, R. E.; Bonneville, D. R., 2000, The seismic provisions of the 1997 Uniform Building Code: Earthquake Spectra, v. 16, no. 1, p. 85-100.
- Dobry, R.; Borcherdt, R. D.; Crouse, C. B.; and others, 2000, New site coefficients and site classification system used in recent building seismic code provisions: Earthquake Spectra, v. 16, no. 1, p. 41-67.
- Holmes, W. T., 2000, The 1997 NEHRP recommended provisions for seismic regulations for new buildings and other structures: Earthquake Spectra, v. 16, no. 1, p. 101-114.
- Mathieson, E. L., 2001, Geologists slowly regaining ground in building code: AEG News, v. 44, no. 4, p. 68.
- Petersen, M. D.; Topozada, T. R.; Cao, Tianqing, and others, 2000, Active fault near-source zones within and bordering the State of California for the 1997 Uniform Building Code: Earthquake Spectra, v. 16, no. 1, p. 69-83.
- Sprague, H. O.; Legatos, N. A., 2000, Nonbuilding structures seismic design code developments: Earthquake Spectra, v. 16, no. 1, p. 127-140.

#### **Other:**

Koenig, Robert, 2001, Researchers target deadly tsunamis: Science, v. 293, no. 5533, p. 1251-1253.

Computer models, improved maps of the ocean floor, and new sensory equipment are giving scientists a handle on the causes of giant waves

Derbershire, David; Highfield, Roger, 2001, Tsunami 'turned Britain into an island overnight': <http://news.telegraph.co.uk/news/main.jhtml?xml=%2Fnews%2F2001%2F09%2F08%2Fnba08.xml> (accessed Aug. 9, 2001).

### EENET Schedule - October-December 2001

Below is a calendar of satellite broadcasts scheduled by the Federal Emergency Management Agency's Emergency Education Network (EENET). (All times are Eastern time.)

October 24 Consequence Management News, Equipment, and Training (CoMNET) Magazine - CoMNET is a 2:00-3:00 p.m. recurring broadcast offering information related to weapons of mass destruction consequence management. Watch the EENET web page for specific topics.

October 31 The International Critical Incident Stress Foundation Presents: Highlights from the 6th World Congress - 2:00-3:00 p.m. Part II

November 7 The International Critical Incident Stress Foundation Presents: Highlights from the 6th World Congress - 2:00-3:00 p.m. Part III

November 14 FEMA/ASCE - "Design and Guidance for Community Shelters"  
2:00-3:15 p.m.

November 21 National Alert Broadcast  
2:00-3:00 p.m.

November 28 Weapons of Mass Destruction - "Live Response."  
2:00-3:00 p.m. Watch the EENET web site for specific topics.

December 5 "Meet the USA" - This program will profile the emergency management agency in Clark County, Nevada.  
2:00-3:00 p.m.

December 12 Consequence Management News, Equipment, and Training (CoMNET) Magazine.  
2:00-3:00 p.m.

December 19 National Alert Broadcast  
2:00-3:00 p.m.

December 26 Critical Incident Stress Management (CISM) for Schools - Part I  
2:00-3:00 p.m.

Additional broadcasts are frequently added to the schedule. For the most current list of programs and satellite broadcast information, check EENET's webpage: <http://www.fema.gov/emi/eenet.htm>

*from: Disaster Research 354, September 20, 2001*

**NEW TSUNAMI MITIGATION MATERIALS**  
**Added to the DGER Library, August through September, 2001**  
compiled by Connie J. Manson

Note: **Free reprints of these materials are available.** (See page 2 for ordering information)  
new tsunami hazard and mitigation materials

**Announcing: Editors' Delight!!** The *entire* TsuInfo bibliography-- including all the tsunami materials we've been gathering for the last 7 years-- is now searchable online! It's all included in our library database at <http://www2.wadnr.gov/dbtw-wpd/washbib.htm>

#### General Works

- Atwater, B. F.; Cisternas, Marco, V.; Bourgeois, Joanne; Dudley, W. C.; Hendley, J. W., II; Stauffer, P. H., 2001, *Sobreviviendo a un tsunami--Lecciones de Chile, Hawai y Japon*: U.S. Geological Survey Circular 1218, 18 p.
- Bryant, Edward, 2001, *Tsunami--The underrated hazard*: Cambridge University Press, 320 p.
- Gusiakov, V. J.; Hagemeyer, Richard, 2001, *Historical tsunami database for the U.S. Pacific coast*: Intergovernmental Oceanographic Commission; U.S. National Weather Service, 32 p., 1 CD-ROM disk.
- Intergovernmental Oceanographic Commission, 1998, *Post-tsunami survey field guide (first edition)*: Intergovernmental Oceanographic Commission, 1 v.
- Intergovernmental Oceanographic Commission, 2000, *International Coordination Group for the Tsunami Warning System in the Pacific*; Seventeenth session, Seoul, Republic of Korea, 4-7 October 1999: UNESCO, 1 v.
- Koenig, Robert, 2001, *Researchers target deadly tsunamis*: Science, v. 293, no. 5533, p. 1251-1253.
- Okal, E. A.; Newman, A. V., 2001, *Tsunami earthquakes--The quest for a regional signal*: Physics of the Earth and Planetary Interiors, v. 124, no. 1-2, p. 45-70.
- U.S. National Oceanic and Atmospheric Administration; and others, 2000, *Tsunami--The great waves*: U.S. National Oceanic and Atmospheric Administration; and others, 12 p. [also accessed Aug. 23, 2001 at <http://205.156.54.206/om/tsunami.htm>]

#### Alaska

- Alaska Disaster Office, 1965, *State of Alaska seismic sea wave warning plan*: Alaska Department of Public Safety, 1 v.
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## VIDEO RESERVATIONS

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

- Adventures of Disaster Dudes** (14 min.)  
Preparedness for pre-teens
- The Alaska Earthquake, 1964** (20 min.)  
Includes data on the tsunamis generated by that event
- Cannon Beach Fire District Community Warning System (COWS)** (21 min.)  
Explains why Cannon Beach chose their particular system
- Disasters are Preventable** (22 min.)  
Ways to reduce losses from various kinds of disasters through preparedness and prevention.
- Disaster Mitigation Campaign** (15 min.)  
American Red Cross; 2000 TV spots. Hurricanes, high winds, floods, earthquakes
- Forum: Earthquakes & Tsunamis** (2 hrs.)  
CMTV-23, Vancouver, WA (January 24, 2000). 2 lectures: Brian Atwater describes the detective work and sources of information about the Jan. 1700 Cascadia earthquake and tsunami; Walter C. Dudley talks about Hawaiian tsunamis and the development of warning systems.
- Killer Wave: Power of the Tsunami** (60 min.)  
National Geographic video.
- Mitigation: Making Families and Communities Safer** (13 min.)  
American Red Cross
- Numerical Model Aonae Tsunami - 7-12-93** (animation by Dr. Vasily Titov) and **Tsunami Early Warning** by Glenn Farley, KING 5 News (The Glenn Farley portion cannot be rebroadcast.)
- The Prediction Problem** (58 min.)  
Episode 3 of the PBS series "Fire on the Rim." Explores earthquakes and tsunamis around the Pacific Rim
- Protecting Our Kids from Disasters** (15 min.)  
Gives good instructions to help parents and volunteers make effective but low-cost, non-structural changes to child care facilities, in preparation for natural disasters. The Institute provides a booklet to use with the video. Does NOT address problems specifically caused by tsunamis.
- The Quake Hunters** (45 min.)  
A good mystery story, explaining how a 300-year old Cascadia earthquake was finally dated by finding records in Japan about a rogue tsunami in January 1700
- Raging Planet; Tidal Wave** (50 min.)  
Produced for the Discovery Channel in 1997, this video shows a Japanese city that builds walls against tsunamis, talks with scientists about tsunami prediction, and has incredible survival stories.
- Raging Sea: KGMB-TV Tsunami Special.** (23.5 min.)  
Aired 4-17-99, discussing tsunami preparedness in Hawaii.
- The Restless Planet** (60 min.)  
An episode of "Savage Earth" series. About earth-quakes, with examples from Japan, Mexico, and the 1989 Loma Prieta earthquake in California.
- Tsunami and Earthquake Video** (60 min.)  
Includes "Tsunami: How Occur, How Protect," "Learning from Earthquakes," and "Computer modeling of alternative source scenarios."
- Tsunami: Killer Wave, Born of Fire** (10 min.)  
NOAA/PMEL. Features tsunami destruction and fires on Okushiri Island, Japan; good graphics, explanations, and safety information. Narrated by Dr. Eddie Bernard, (with Japanese subtitles).
- Tsunami: Surviving the Killer Waves** (13 min.)  
Two versions, one with breaks inserted for discussion time.
- Tsunami Warning** (17 min.)  
San Mateo (California) Operational Area Office of Emergency Services. This is a good public service program, specifically made for San Mateo County. Citizens are told what to do in cases of tsunami watches or tsunami warnings, with specific inundation zones identified for the expected 20-foot tall tsunami. An evacuation checklist is provided, as well as locations of safe evacuation sites. This video gives the impression that all tsunamis are teletsunamis (generated at a source more than 1000 km from the coastline) which therefore provide time for warnings. Locally-generated tsunamis are not discussed.
- USGS Earthquake Videotapes "Pacific Northwest"**  
USGS Open-File Report 94-179-E
- Understanding Volcanic Hazards** (25 min.)  
Includes information about volcano-induced tsunamis and landslides.
- The Wave: a Japanese Folktale** (9 min.)  
Animated film to help start discussions of tsunami preparedness for children.
- Waves of Destruction** (60 min.)  
An episode of the "Savage Earth" series. Tsunamis around the Pacific Rim.
- Who Wants to be Disaster Smart?** (9 min.)  
Washington Military Department/Emergency Management Division. 2000. A game show format, along the lines of *Who Wants to be a Millionaire?*, for teens. Questions cover a range of different hazards.
- The Wild Sea: Enjoy It...Safely** (7 min.)  
Produced by the Ocean Shores (Washington) Interpretive Center, this video deals with beach safety, including tsunamis.

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

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<http://www.wa.gov/mil/wsem/>

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Victoria, BC V8Z 1E7  
**British Columbia**, Canada  
(250) 952-4913  
Fax (250) 952-4888 <http://www.pep.bc.ca>

# INFREQUENTLY ASKED QUESTIONS

compiled by

LEE WALKLING

## **Which states do *not* have a state-mandated building code for any building and occupancy classification?**

Based on the Institute for Business and Home Safety webpage statistics, dated November 1999, (<http://www.ibhs.net/ibhsdocuments/pdf/stateman.pdf>), there are 13 states without state-wide building codes: Arizona, Delaware, Hawaii, Idaho, Illinois, Iowa, Kansas, Mississippi, Missouri, Nevada, Oklahoma, Pennsylvania, and Texas.

## **Which states have a state-mandated building code covering all buildings and occupancy classifications?**

Arkansas, California, Connecticut, Florida, Georgia, Maryland, Massachusetts, Michigan, New Jersey, New Mexico, Rhode Island, South Carolina, Utah, Washington, West Virginia, and Wyoming.

from: Institute for Business and Home Safety webpage statistics, dated November 1999, <http://www.ibhs.net/ibhsdocuments/pdf/stateman.pdf>

## **Which states allow local amendments when the amendments are *more stringent than the state-mandated building codes covering residential and commercial buildings*?**

Arkansas, California, Florida, Georgia, Maryland, Michigan, Nebraska, New Mexico, New York, Oregon, Utah, Washington, Wisconsin, and Wyoming.

from: Institute for Business and Home Safety webpage statistics, dated November 1999, <http://www.ibhs.net/ibhsdocuments/pdf/stateman.pdf>

For the complete *Summary of State-Mandated Building Codes* (November 1999), see the IBHS webpage: <http://www.ibhs.net/ibhsdocuments/pdf/stateman.pdf>

The IBHS is re-designing its webpages and there might be an updated version of the *Summary* after August 2001. The homepage is at <http://www.ibhs.org/ibhs2/default.asp>

## **What is ICBO, BOCA, and SBCCI?**

**ICBO** is the International Conference of Building Officials (<http://www.icbo.org/>). "ICBO has been the preeminent source of building and construction codes for more than 75 years."

**BOCA** is Building Officials and Code Administrators (<http://www.bocai.org/>). "Founded in 1915, Building Officials and Code Administrators International, Inc., is a nonprofit membership association, comprised of more than 16,000 members who span the building community, from code enforcement officials to materials manufacturers. We are dedicated to preserving the public health, safety and welfare in the built environment through the effective, efficient use and enforcement of Model Codes. BOCA provides a unique opportunity for any individual to join and derive the benefits of membership. Our members are professionals who are directly or indirectly engaged in the construction and regulatory process."

BOCA is the original professional association representing the full spectrum of code enforcement disciplines and interests. We are the premier publishers of model codes."

**SBCCI**, at <http://www.sbcci.org/>, is the Southern Building Code Congress International (SBCCI) and provides technical, educational, and administrative support to governmental departments and agencies engaged in building codes administration and enforcement. SBCCI also provides similar support to others in the building design and construction industry. SBCCI's primary mission since 1940 has been to develop and maintain a set of model building codes for use by local jurisdictions. Since 1994, SBCCI has been a partner with BOCA and ICBO in the International Code Council which publishes the International Codes. These documents are intended to be adopted by reference as local and state laws governing construction.



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