



EARTHQUAKE ENGINEERING RESEARCH INSTITUTE NEWSLETTER

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EARTHQUAKE ENGINEERING RESEARCH INSTITUTE

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News of the Institute

WSSPC Joins EERI for 2009 Annual Meeting

EERI's 2009 Annual Meeting in Salt Lake City, February 11-14, will be held jointly with the Western States Seismic Policy Council (WSSPC). The organizations have many members in common. The Organizing Committee chair Larry Reaveley of the University of Utah is incorporating WSSPC's participation into the planning process, which will enhance the program's multi-disciplinary nature. WSSPC's annual business meeting will take place on February 11, the day before the joint EERI-WSSPC technical program, which begins on February 12. The program ends on February 14, the first day of the three-day President's Day weekend. Make plans now to take advantage of the opportunity to ski at world-class resorts following the meeting!

Annual Meeting Videos Online

Did you miss EERI's 60th Annual Meeting earlier this year in New Orleans? Or were you there and want to see one of the presentations again, or encourage others to do so? Videos of the following presentations are available for EERI members at <http://www.eeri.org/membership/members.html>.

From the opening session on Hurricane Katrina:

- Laurie Johnson: The Makings of and Response to Large-Scale Urban Catastrophe
- Tom O'Rourke: GeoSystems and Critical Infrastructure in Crisis
- Walter Leger: Responding to and Recovering from a Catastrophic Disaster

From the session on Post-Disaster Data Applications and Management:

- John Pine: Lessons from the Katrina Disaster Data Clearinghouse
- Doug Bausch: Federal and Emergency Response Uses of Katrina Clearinghouse Information

From the session on Achievements



Session #1 speakers (l-r): O'Rourke, Johnson, and Leger (photo: M. Lew).

of 75 Years of Strong Motion Seismology:

- Bill Iwan: History and Engineering Ramifications of Strong Motion Measurements
- John Anderson: The 100 Strongest Ground Motions Ever Measured
- Norm Abrahamson: Data Processing Quality Guidelines and Key Data Gaps in Current Measurements

From the session on What Recent Catastrophes Are Teaching Us:

- Patricia Grossi: Consequences of Cascading Catastrophic Events (given by Kate Stillwell)

EERI/FEMA NEHRP Graduate Fellow and Student Paper Competition Winner:

- Jamie Padgett (Graduate Fellow): Retrofitted Bridge Fragility Curves for Next Generation Seismic Risk Assessment
- Joshua Blunt (Paper Competition Winner): The Use of Novel Material Properties in the Performance-Based Design of Tunnel-Formed Structures

Subscribing Member News

CSI to Support Student Activities

EERI's Platinum Subscribing Member Computers and Structures, Inc., (CSI) has chosen to allocate \$12,500 over and above regular Subscribing Member dues to support the Student Leadership Council summer retreat. In addition, CSI has offered to match the first \$20,000 donated for the 2009 Undergraduate Student Design Competition (SDC), which will take place at the EERI Annual Meeting in Salt Lake City. This contribution doubles CSI's 2008 matching grant of \$10,000 for the competition in New Orleans (see page 5 of the March 2008 *Newsletter*).

The Student Leadership Council, formerly a group of students from the earthquake engineering research centers who ran the SDC, will now draw its representatives from the many EERI student chapters throughout North America.

New Bronze Subscribing Members

EERI is pleased to announce that the firms Skidmore, Owings & Merrill (SOM) and Walter P Moore recently became Bronze Subscribing Members. For more information on levels of Subscribing Membership, visit http://www.eeri.org/membership/subscribing_members.html.

For over seven decades, **Skidmore, Owings & Merrill (www.som.com)** has been a leader in the global architecture and engineering professions, establishing international standards for sustainable design, technical innovation and management. The firm's consistent leadership in design and technology has produced an exceptional portfolio of projects spanning over 40 countries. SOM's integrated practice includes architecture, urban design and planning, structural and MEP (mechanical, electrical, plumbing) engineering, sustainable design, interior design and graphics. SOM has nine offices located in Chicago, New York, San Francisco, Los Angeles, Washington D.C., London, Hong Kong, Shanghai, and Brussels. SOM Structures has demonstrated a continued, collaborative commitment to the application of state-of-the-art earthquake engineering principles, technology, and research.

Headquartered in Houston, Texas, **Walter P Moore** has 11 U.S. offices in seven states and has designed airports, sports stadiums, hospitals, hotels, entertainment and performing arts centers, convention centers, corporate campuses, office towers, and roadways nationwide. Walter P Moore fully implements performance-based seismic design and has capabilities that include probabilistic seismic hazard analysis, development of site-specific response spectra and ground motions, and nonlinear dynamic time history analysis. For more information, visit www.walterpmoore.com.

New Location for DIS

EERI Subscribing Member Dynamic Isolation Systems (DIS), Inc., is pleased to announce its updated website and new plant location. The website (www.dis-inc.com) provides comprehensive details about many of the firm's 250 projects worldwide, including photo and video galleries and detailed isolator engineering information. The new DIS facility, located in the Reno-Tahoe Industrial Park east of Reno, Nevada, allows for expanded production capacity for the manufacturing of isolators and supports new DIS floor isolation and wall damper product lines. The new address is 885 Denmark Drive, Suite 101, McCarran, NV 89434.

Obituary

Ahmed Abdel-Ghaffar, 1947–2008

EERI member Ahmed M. Abdel-Ghaffar, professor in the Department of Civil and Environmental Engineering at the University of Southern California, passed away after a long illness on April 17, 2008.

Abdel-Ghaffar obtained his B.S. in civil engineering from Cairo University, Egypt, and master's and Ph.D. degrees from the California Institute of Technology. He served on the faculties at the University of Illinois at Chicago-Circle and Princeton University before joining USC in 1987.

A dedicated and gifted teacher, he was a meticulous writer whose notes continue to be used today by his students, who are professors at academic institutions worldwide.

In the late 1970s, based on his pioneering Ph.D. research conducted under the direction of George Housner, Abdel-Ghaffar quickly established an international presence in the emerging field of sensor-based structural health monitoring of long-span flexible bridges. His investigation in 1974 of the dynamic characteristics of the Vincent Thomas Bridge in Los Angeles set the standards for research on how to collect, analyze, and interpret structural dynamic measurements from complex, three-dimensional, extended structures.

His multifaceted research also made major contributions to the problems of soil-structure interaction encountered when analyzing the behavior of extended structures, such as large earth dams.

Abdel-Ghaffar was sought by government agencies in the USA, Japan, Europe, the Middle East, and elsewhere. He was the recipient of a long list of awards from professional engineering societies and academic institutions.

News of the Institute

Professional Fellowship Reports Online

The following reports are now available online at http://www.eeri.org/home/fellowships_professional_reports.html:

(1) Part 1 of *International Aspects of the History of Earthquake Engineering*, by the recipient of the 2005 EERI-FEMA NEHRP Professional Fellowship, Robert Reitherman. As Reitherman is continuing his research on this subject to complete the document, review comments are welcomed and can be sent to him at reitherman@curee.org. Part 1 covers the history of earthquake engineering in Japan as well as the historiographical issues (approaches, methods, and biases) involved in writing about the history of the field. Reitherman explores the reasons for Japan's rapid evolution of engineering and seismological developments in the 1850-1900 period, including not previously published details of

"who-did-what" at the influential University of Tokyo. The 1900-1950 period saw Japan rapidly develop seismic structural design concepts and apply them to large-scale construction projects. During the 1950-2000 period, earthquake engineering in Japan benefited from a growing economy, as the country recovered vigorously after World War II. Similar to 100 years earlier, in 2000 Japan was still a place "to feel the pulse of the earthquake engineering field." Throughout the report, events and developments are related to the broader social, political, and economic context.

(2) *Tsunami Inundation Scour of Roadways, Bridges and Foundations: Observations and Technical Guidance from the Great Sumatra Andaman Tsunami*, by the recipient of the 2006 EERI-FEMA NEHRP

Professional Fellowship, Mathew Francis. In this report, Francis investigates evidence of scour damage from the 2004 great tsunami, focusing upon site observations and their reflections upon current scour theory. He presents basic distinctions of criteria between well-established scour methods, such as river and tidal scour, and two tsunami scour evaluation methods (Coastal Construction Manual by FEMA and Liquefaction Enhanced Scour by Yeh and Tonkin). This report validates the potential for liquefaction enhancement of tsunami scour using the Yeh and Tonkin method. Francis observes that contradictions remain from the tsunami scour observations and analysis. Most notable is the rarity of scour depths greater than two meters among a broad range of flow depths and site conditions. Francis concludes that significant research questions remain in the evolving multidisciplinary field of tsunami engineering.

News of the Profession

EQ Scenario for Southern California

On May 22, scientists unveiled a hypothetical scenario describing how a magnitude 7.8 Southern California earthquake would impact the region, causing loss of lives and massive damage to infrastructure, including critical transportation, power, and water systems. *The ShakeOut Scenario* is the product of an interdisciplinary collaboration of over 300 scientists, engineers, and other experts from several agencies (many of them EERI members), including the USGS, the California Geological Survey, the Southern California Earthquake Center, the California Governor's Office of Emergency Services (OES), and the Seismic Safety Commission.

The scenario earthquake killed 1,800, injured 50,000, and caused \$200 billion in damage, resulting in

long-lasting social and economic consequences. This is the most comprehensive analysis ever of what a major Southern California earthquake would mean, and is the scientific framework for the largest earthquake preparedness drill in California history, "Golden Guardian '08," scheduled for November 13, 2008. It will test the ability of emergency responders to deal with the impact of a magnitude 7.8 earthquake on the San Andreas fault in Southern California, and is being jointly organized by the Governor's OES and the California Office of Homeland Security. The exercise will occur during a week-long series of public events planned for the "Great Southern California ShakeOut." A June 4 kick-off event is planned for the "ShakeOut" to help communities plan to respond to the risks highlighted in the scenario. The scientific report describing the *ShakeOut Scenario* was released during a Congressional hearing in Washington, D.C., by the House

Committee on Natural Resources, Subcommittee on Energy and Mineral Resources.

For a copy of the full technical report, visit <http://pubs.usgs.gov/of/2008/1150>. A non-technical summary of the Scenario is at <http://pubs.usgs.gov/circ/1324/>. Paper copies of the summary are available by request. An animation showing the rupture and waves spreading across Southern California is online at <http://urbanearth.usgs.gov/shakeout>.

Propose a Session

The American Geophysical Union 2008 Fall Meeting will be held December 15-19 in San Francisco. The earth and space sciences communities are invited to propose a session (deadline June 13), focusing on scientific results or their applications. For proposal guidelines and submission, visit <http://www.agu.org/meetings/fm08/>.

News of the Profession

Seismic Hazard Maps

The U.S. Geological Survey (USGS) has released the 2008 US National Seismic Hazard Maps. They display earthquake ground motions for various probability levels across the United States and are applied in seismic provisions of building codes, insurance rate structures, risk assessments, and other public policy documents. This update of the maps incorporates new findings on earthquake ground shaking, faults, seismicity, and geodesy. The resulting maps are derived from seismic hazard curves calculated on a grid of sites that describe the frequency

of exceeding a set of ground motions. The USGS National Seismic Hazard Mapping Project developed these maps by incorporating information on potential earthquakes and associated ground shaking obtained from interaction in science and engineering workshops involving hundreds of participants, review by several science organizations and state surveys, and advice from two expert panels. Updates of the 2002 maps, they represent an assessment of the "best available science" in earthquake hazards estimation for the United States. They show, with some exceptions, similar or lower ground motion compared with the 2002 edition. For example, ground

motion in the central and eastern U.S. is generally up to 25% lower due to the modifications of the ground motion models. Ground motion in the western U.S. is as much as 30% lower for shaking caused by long-period (1-second) seismic waves, which affect taller multistory buildings, and ground motion is similar (within 10-20%) for shaking caused by short-period (0.2-second) waves, which affect structures of one or a few stories.

For the maps, visit http://earthquake.usgs.gov/research/hazmaps/products_data/2008/. The documentation for the maps can be obtained from <http://pubs.usgs.gov/of/2008/1128/>.

Donate to 14WCEE Travel Fund

The EERI Board of Directors voted to contribute \$5,000 from the EERI Endowment Fund for the purpose of enabling EERI members in developing countries who are students or young researchers to attend the 14th World Conference on Earthquake Engineering (14WCEE). These colleagues would be otherwise unable to attend the conference, which will be held in Beijing, China, October 12-17, 2008.

EERI members are invited to augment EERI's contribution for the same purpose. You may send your check, made payable to EERI (indicate that it is a contribution to the 14WCEE) or send an e-mail request to eeri@eeri.org to receive a form for paying with a MasterCard or Visa credit card.

Payments must be received at EERI by July 1, shortly after which they will be combined into one EERI payment and transmitted to the 14WCEE Organizing Committee.

New Madrid Scenario Workshop

The EERI New Madrid Chapter will host a New Madrid Earthquake Scenario Workshop on June 10, 2008, from 1:00-4:30 p.m. in St. Louis, Missouri, intended for potential scenario participants who did not attend the April 2007 scenario workshop. The workshop will evaluate the desirable products that the Midwest needs from a scenario. Especially encouraged to attend are representatives from government and the business and financial communities as well as the fields of response and recovery and lifelines. For more information about the agenda and the venue, and to register, visit <http://newmadrid.eeri.org/>. This URL also has downloadable PDFs of eight PowerPoint presentations given at the 2007 workshop.

Oregon Infrastructures Workshop

Are there earthquake awareness events aimed at critical infrastructure in your state? A recent example in Oregon is noteworthy. As part of Oregon's Earthquake and Tsunami Awareness month, the Oregon Department of Geology and Mineral Industries (DOGAMI) teamed up with the Oregon Public Utilities Commission (OPUC), ASCE's Technical Council on Lifeline Earthquake Engineering (TCLEE) and the Oregon Seismic Safety Policy Advisory Commission to promote earthquake preparedness to critical infrastructure operators. The OPUC-DOGAMI Leadership Forum and Seismic Critical Energy Infrastructures Workshop was held in April to discuss megathrust earthquakes on the Cascadia subduction zone, seismic vulnerability assessments of lifelines, and cost-effective, risk-wise mitigation actions. Top state political leaders requested electricity, gas and telecommunication providers to take seismic preparedness to a new level. Nationally recognized experts, including EERI Northern California chapter president Ivan Wong, presented overviews of 1) Cascadia earthquake hazards and risk; 2) infrastructure vulnerability to earthquake damage; 3) state-of-the-practice lifeline seismic vulnerability studies and application; and 4) case studies of vulnerability studies by the Bonneville Power Administration and Pacific Gas & Electric. The program and presentations are posted on the TCLEE website at http://www.asce.org/instfound/techcomm_tcleecfm#.

PLEASE POST IMMEDIATELY



Earthquake Hazards Reduction Fellowship Announced

Under a cooperative agreement established with FEMA, the Earthquake Engineering Research Institute is pleased to offer the **2009 Professional Fellowship** to provide an opportunity for a practicing professional to gain greater skills and broader expertise in earthquake hazards reduction, either by enhancing knowledge in the applicant's own field, or by broadening the applicant's knowledge in a related but unfamiliar discipline.

Who Should Apply?

This unique fellowship is designed to bring together an experienced career professional with other professionals conducting significant research, thereby providing opportunities to both enrich the applicant's knowledge and skills and to broaden the research base with challenges faced in practice. The Professional Fellowship is *not* intended to fund work towards a degree.

The Award

The fellowship provides a stipend of \$30,000, commencing in January 2009, to cover tuition, fees, and relocation and living expenses. The fellowship will be awarded on the basis of a specific project, with the proposed work or course of study to be carried out over a period of up to one year. The recipient will have the flexibility to work less than full time with the host institution and academic sponsor, with the understanding that the effort will result in a report by the end of twelve months.

Criteria

Applicants must provide a detailed work plan for a research project that would be carried out in the twelve-month period. The fellow will be expected to produce a written report upon completion of the project. All applications must be accompanied by a professional resume and letter of nomination from the faculty host at the cooperating educational institution. Faculty members should also indicate the institution's ability to provide research facilities, including library, work space, telephone, and computer access. Applicants must hold U.S. citizenship or permanent resident status.

To Apply

Candidates may obtain an application form from EERI's web site at
http://www.eeri.org/home/Profell_application.doc.

**Deadline for electronic submission of all application materials to EERI is
September 2, 2008.**

Announcement of the award will be made October 13, 2008.

Learning from Earthquakes

May 12, 2008, M7.9 Sichuan, China, Earthquake

California Geological Survey Engineer Moh-Jiann Huang contributed this report.

A destructive earthquake with a moment magnitude of 7.9 occurred about 80 km west-northwest of Chengdu, the capital of the Sichuan Province in China, on Monday, 12 May 2008, at 2:28 p.m. local time. The earthquake was felt as far away as Beijing (1500 km), Shanghai (1700 km), Thailand, and Taiwan. As of May 26, 182 aftershocks with magnitudes larger than 4 have been recorded, according to the China Earthquake Networks Center, including a damaging M6.0 event on May 25. The M7.9 earthquake was the result of motion on a thrust fault on the northwestern margin of the Sichuan Basin. From the locations of the aftershocks, the fault's rupture length is estimated at 300 km. The fault ruptured from the southwest end to the northeast end. The area has previously experienced destructive earthquakes, including a M7.5 earthquake on August 25, 1933, which killed more than 9,300 people.

As of May 27, more than 65,000 deaths have been confirmed, more than 360,000 people have been injured, and many more have lost their homes. Only 2,300 of 10,000 residents in the Yingxiu Town of Wenchuan County (at the epicenter) survived the earthquake.

The earthquake destroyed buildings, bridges and roads, and cut off electricity, water supply, telephone and Internet links. Severe damage and casualties occurred at many towns in the mountain areas and in many populous cities along the freeway between Chengdu and Xian, an ancient city and the capital of Shaanxi Province. All highways into the mountain areas were damaged or blocked by landslides, delaying the arrival of rescue troops. It is estimated that the earthquake has severely affected more than 100,000 square

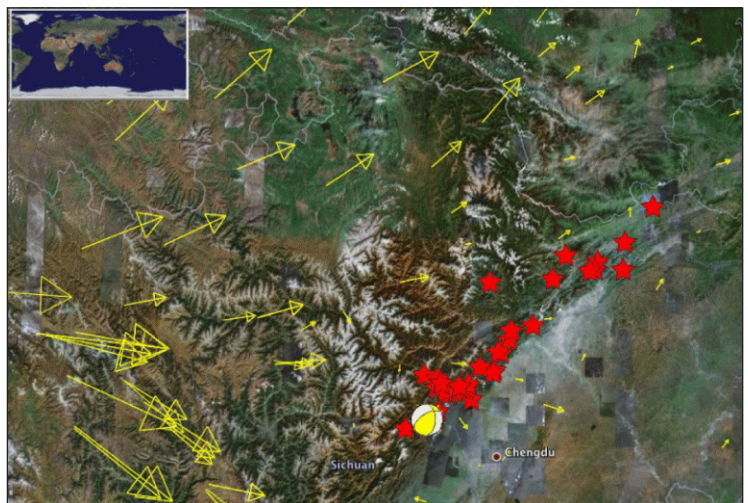
kilometers and about 30 million people. It is the worst earthquake to strike China since the 1976 Tangshan earthquake that claimed an estimated 242,000 lives.

The quake has destroyed more than 216,000 buildings in Sichuan, including at least 6,898 school buildings. Some buildings in Chengdu suffered cracked walls, but no buildings collapsed. Many of the collapsed buildings, especially in the remote mountain areas, are old adobe and masonry buildings. In Beichuan County near the northeast end of the fault, 80% of the buildings reportedly collapsed. Many of the collapsed concrete buildings were new, but appear to have been poorly reinforced and to have had poor beam-column connections. Students were in school at the time of the earthquake. Many students and teachers were buried in collapsed school buildings. Some hospital buildings were damaged by the quake and the injured had to be moved outside. In China, school and hospital buildings are not designed and constructed to a higher standard, unlike school and hospital buildings in California that are built in accordance with the Field Act and the Hospital Safety Act, respectively. The China Ministry of Housing and Rural Development has ordered local authorities to investigate the school building collapses.

According to the China Ministry of Water Resources (CMWR), the earthquake has damaged water infrastructure, including reservoirs and hydropower plants, which pose serious threats to flood control and safety in the hardest-hit areas of Sichuan. Of the more than 6,000 dams in Sichuan Province — most of them small — as many as 803 were reported damaged.

The extent of damage to hydropower plants is unknown. On May 16, nine teams were dispatched by the CMWR to assess the condition of reservoirs. The Zipingpu Dam, a 156-m-high rockfill dam near the epicenter, was declared structurally stable and safe despite some minor damage. However, the level of water behind this dam as well as 102 other dams in the region was lowered after the earthquake. Also damaged were 33,300 hectares of farmland and irrigation systems in some areas, according to the China Ministry of Agriculture. The Dujiangyan irrigation system, an ancient water diversion project, survived the quake.

EERI's web site at http://www.eeri.org/life/china_sichuan.html has links to five videos, news outlets, and other sources. The Xinhua News Agency in China has an English web site at <http://www.china-view.cn/08quake/>.



GPS measurements in West Sichuan, China; epicenters from USGS; aerial photograph from Google Earth.

Learning from Earthquakes

Earthquake Swarm Shakes Reno, Nevada

Caltrans' geologist Martha Merriam contributed this report.

Beginning on February 28, 2008, a swarm of small to moderate earthquakes has shaken the Mogul-Somerset area just west of Reno. According to University of Nevada Reno seismologist Glenn Biasi, no clearly mapped fault has been associated with the swarm, and

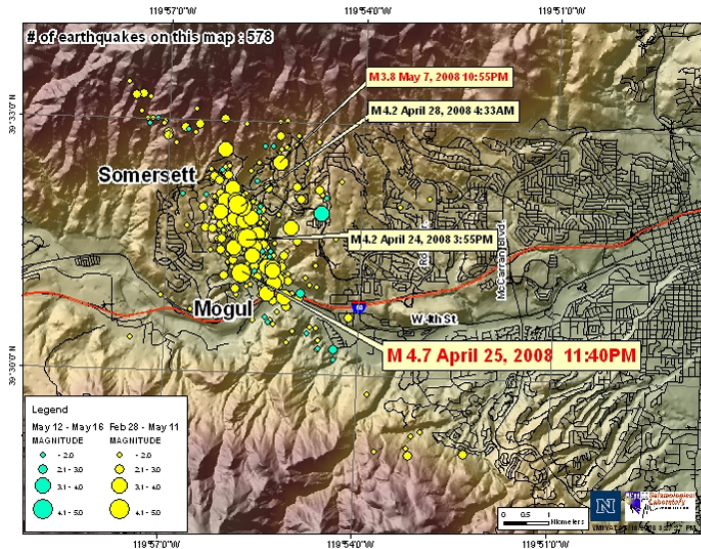


Figure 1. Earthquake swarm (<http://www.seismo.unr.edu/>).

no evidence of surface rupture has been found during geologic reconnaissance. The events have been occurring in a 10-km-long 2- to 3-km-wide zone. Fault plane solutions and the alignment of seismicity are consistent with right-lateral strike-slip motion on a northwest-striking fault.

Because of the location and the unusually shallow initial depths of seismicity, UNR began installing portable recorders near the epicenter, from a few hundred meters to about 2 km from the zone of activity. Four sites with broadband and strong-motion sensors were in place to record the M4s and the M4.7 "main shock." Six more instruments have now been added. The data gathered from these close-in stations, particularly from the larger events will be important in estimating near-fault ground motion. Structural damage has been reported only for a couple of homes, but hundreds of homes experienced some level of nonstructural damage, such as cracked plaster or damaged contents. A trend has been suggested that homes on the cut side of hill slopes fared better than those on the fill sides of the same streets.

As of this writing, the swarm is continuing. The rate of small earthquakes

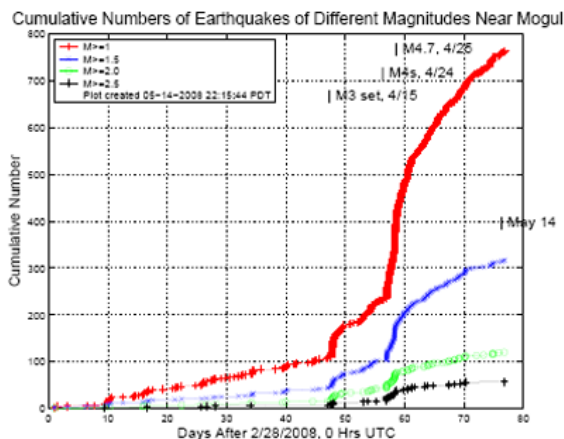


Figure 2. Source: G. Biasi, UNR.

(Figure 2) is greater now than before the largest earthquake occurred.

Double-difference locations have been developed for the swarm by David von Seggern of UNR. They show greater detail of the fault structure than is evident in the catalog relocations. They may be seen in a 3-D viewer at <http://www.seismo.unr.edu/htdocs/monitoring/mogul/3d.html>.

Calls for Abstracts

Earthquake Hazards in the East Bay

The organizing committee invites abstract submissions for the Third Conference on Earthquake Hazards in the Eastern San Francisco Bay Area, taking place October 22 to 24, 2008, at Cal State University East Bay (Hayward), with the theme "Science, Hazard, Engineering, and Risk." Abstracts are due August 15 and can be submitted online at <http://www.seismosoc.org/meetings/2008/3ebconf/>.

Session topics cover seismotectonic setting (including seismotectonic framework, crustal strain, seismicity, paleoseismology); East Bay faults (including risk modeling); Delta hazard and risk assessments; and earthquake engineering and risk, disaster preparedness, and outreach (including buildings, lifelines, and local governments).

For more information on the technical program and descriptions of four field trips scheduled for October 25 and 26, visit <http://www.consrv.ca.gov/cgs/News/Pages/EastBay-Conference.aspx>.

Japan Geotech Conference

The International Conference on Performance-Based Design in Earthquake Geotechnical Engineering, with the theme "From Case History to Practice," will be held June 15-17, 2009, in Japan. Sponsors, including Technical Committee 4 of ISSMGE and the Japanese Geotechnical Society, invite the submission of abstracts, which are due May 31, 2008.

For more information and submission instructions, visit <http://www.comp.tmu.ac.jp/IS-Tokyo/>.

News of the Institute

Summary of the Minutes of the Board of Directors Meeting of February 6, 2008

Call to order: President Thalia Anagnos called the meeting to order at 9:00 a.m. Also present were directors Jon Bray, S.K. Ghosh, Laurie Johnson, Marshall Lew, Jack Moehle, Farzad Naeim, Masayoshi Nakashima, Andrew Whittaker, Executive Director Susan Tubbesing, and Special Projects Manager Marjorie Greene. Greg Hempen of the New Madrid Chapter joined at 3 p.m.

The Board voted unanimously to approve Marshall Lew as secretary-treasurer and Jonathan Bray as vice-president.

For the benefit of the new board members, Anagnos reviewed their responsibilities. Board members serve as contacts to committees, regional and student chapters, and subscribing and regular members; provide advice on policy issues; and take on specific tasks as needed. The Executive Committee, comprised of the president, vice-president, the secretary/treasurer, the president-elect or past-president, and the executive director, meets by teleconference as necessary between the quarterly board meetings. The list of committees, their

members, and board contacts are included in the EERI *Member Roster*. Board members are expected to stay in touch with those they have been assigned.

Overview of issues and opportunities: Anagnos stated that there are two major issues facing EERI: (1) the continuing quest for funding for the LFE Program, and (2) the planned retirement of Tubbesing in 2009. EERI will develop a transition strategy and a team to help identify candidates and select her successor.

To provide an overview for the new Board members, Anagnos explained that EERI has a number of fixed costs for member services, including *Earthquake Spectra*, which costs approximately \$230,000 per year; the monthly *EERI Newsletter* at roughly \$50,000 per year; and the undergraduate Student Design Competition, which EERI has agreed to take on from the earthquake engineering research centers, at more than \$50,000 per year. EERI receives approximately \$500,000 in dues each year; \$100,000 of which is from Subscribing Members, who are a very important part of the operating budget. In addition to longtime NSF funding for the Learning from Earthquakes Program, EERI receives revenue for special projects, including an ongoing Cooperative Agreement with FEMA, a new project with USGS to plan a NEHRP Workshop on Scenario Development, and a project funded by the California

Governor's Office of Emergency Services to identify dangerous older concrete buildings in California. Anagnos explained that the money in the Endowment Fund is available for special projects, but is not typically used for operating costs.

Anagnos and others met with Ashraf Habibullah, of Computers and Structures Inc., at his invitation in December to see how CSI could help EERI. CSI will become EERI's first Subscribing Member at the new, highest category of Platinum, for \$15,000/year.

As part of the new agreement, CSI will offer EERI some of their products at a greatly reduced price. In order to encourage student members to remain in EERI upon graduation, CSI will offer a discount of 80% for up to \$10,000 worth of CSI software to graduating students who renew as EERI Young Professionals. Students can buy the software and take it with them to whatever company or organization they join. All members will be offered a 15% discount for CSI seminars. It was proposed that EERI would sell two CSI publications to members at a reduced price in coming months, and CSI will promote EERI monographs on their site, potentially increasing sales for EERI.

The Board voted unanimously that beginning in 2009, the category of "regular subscribing member" would be abolished. All previous regular



EERI Board Members Andrew Whittaker, Masayoshi Nakashima, Jack Moehle, Susan Tubbesing, Thalia Anagnos, Farzad Naeim, Jon Bray, S. K. Ghosh, Laurie Johnson, and Marshal Lew.

subscribing members will be moved into the Bronze category. They further agreed that if 2009 membership dues are increased, there will be no concomitant increase for Bronze Subscribing Members in 2009.

Encouraged by the new agreement with CSI, the Board directed Tubbesing to explore the possibility of EERI serving as a distributor for other publishers as well, in order to make their books available to EERI members at a discount.

Review of current EERI programs:

For the benefit of the new board members, Tubbesing reviewed current EERI programs, including the challenge to secure permanent financial support for the World Housing Encyclopedia (WHE), allowing the development of more tutorials, training, etc. Johnson suggested EERI look into the Clinton Global Initiative, the Getty Foundation, and the Gates Foundation. Tubbesing summarized projects of the Special Projects & Initiatives (SPI) committee, including recent Endowment Fund support to investigate nonstructural restraints; testing of a straw bale wall assembly in the Nevada-Reno NEES facility; support for NICEE at IIT Kanpur to develop a new journal directed to developing countries; funding for a confined masonry workshop; editing of a confined masonry publication written by UBC and UNAM student chapters, and ongoing modest support for the WHE.

Publications and web services:

Tubbesing discussed the current efforts to re-design the website, where technical seminar videos are now available, membership development, and the joint National Conference to be with the Canadian Association of Earthquake Engineering in July 2010.

Secretary/Treasurer's Report:

Lew provided an overview of Revenue and Expense reports. EERI ended 2007 with a surplus of \$31,000. He then reviewed the 2008 budget, pointing out that the lack of clarity regarding the LFE Program

lends some uncertainty to the 2008 budget. Should an earthquake occur before funding is received, EERI will have to request a small grant for exploratory research. At this point there is no funding for reports, and the LFE program will be more dependent on volunteers. For 2008, Lew is projecting a small deficit.

Investment report and overview:

EERI's investments have been suffering along with the rest of the declining economy. The Friedman and Shah funds have declined on paper, but they are invested for the long-term. They are invested to generate modest income for visiting professionals' travel and the annual Shah prize. EERI's operating funds are invested in money market accounts or cash. Lew pointed out that EERI came through its annual audit with no problems. Members of the Board requested that the student design competition be given its own separate line item in future budgets.

Technical seminars update and plans for the future:

Anagnos reviewed the preliminary agenda for the deep foundations technical seminar. The speakers have been identified and the seminar will be held in July in three cities: Seattle, Los Angeles, and San Francisco. The board suggested a number of topics for future technical seminars, including dampers and energy dissipation, and leadership in energy and environmental design and earthquake hazard mitigation. The group recommended that the next seminar be on the Next Generation Attenuation (NGA) Models to coincide with the forthcoming special issue of *Earthquake Spectra*.

EERI's technical programs: The FEMA Cooperative Agreement has been in effect for 15 years, and is used to support technical seminars, fellowships, planning efforts for national conferences, the Mitigation Center, student travel, publications, and work on the website. The agreement provides \$300,000 per year and enables EERI to provide

numerous services to members and others not otherwise possible.

New Madrid Scenario update:

Greg Hempen, president-elect of EERI's New Madrid Chapter discussed progress on their scenario and described the general process. They are planning a four-year effort that will culminate in 2012, the bicentennial of the 1811-12 earthquake sequence. The chapter is following EERI's *Guidelines for Scenario Development* and is asking for community input to identify products which will be incorporated into the final scenario. His committee will meet this fall to decide on the parameters of the scenario and the source event. Two related activities include involving student chapters in carrying out rapid building assessments in small communities to develop building inventories and a conference on New Madrid time history determinations, which is being planned for the second quarter of 2009. The Board suggested a number of contacts in the lifeline area.

The meeting was adjourned at 5:20 p.m.

New Spectra Editorial Assistant

EERI is pleased to welcome Liz Hogan Stalnaker to the EERI staff as the new half-time *Earthquake Spectra* editorial assistant. She works closely with editor-in-chief Polat Gülkan, communicating with authors and the production staff at the American Institute of Physics, copyediting manuscripts, and ensuring prompt review, revision, and electronic submission. Liz recently moved to San Francisco from the East Coast, where she had several years of professional editing experience with Lippincott Williams & Wilkins in Baltimore, Maryland, and the Houghton Mifflin Company in Boston, Massachusetts. She has a degree in English literature and language from Boston University.

Publications

Guidelines for Woodframe Buildings

CUREE (the Consortium of Universities for Research in Earthquake Engineering) recently published *General Guidelines for the Assessment and Repair of Earthquake Damage to Residential Woodframe Buildings*. The target audience of the *General Guidelines* is homeowners, contractors, insurance claims representatives, and other nonengineers involved in post-earthquake damage assessment of woodframe construction.

Based upon the most current engineering research and best practices, the extensively illustrated 371-page publication provides an overview of earthquake effects on woodframe buildings and detailed descriptions of major building components and common patterns of earthquake damage. It also includes checklists to assist with a systematic damage survey and guidance for retaining and working with technical consultants.

The publication is one result of a multi-year project involving academic institutions, commercial research laboratories, and practicing professionals under contract to CUREE. The project included physical testing to simulate earthquake damage and repair to residential construction, review of existing engineering knowledge and practice, and extensive peer review by independent expert members of the project's Advisory Group. Major funding was provided by the California Earthquake Authority.

The *Guidelines* are available as a free downloadable PDF at <http://www.curee.org/projects/EDA/index.html>. To order a printed version or a CD that contains additional project material, visit CUREE's website at <https://secure.curee.org/catalog/index.php>.

A more detailed version intended for technical consultants engaged in post-earthquake damage assessment is in progress: *Engineering Guidelines for the Assessment and Repair of Earthquake Damage in Residential Woodframe Buildings*, CUREE Publication No. EDA-06. For further information, contact curee@curee.org or EDA.Editor@Exponent.com.

FEMA 461 on Testing Protocols

The Applied Technology Council (ATC) and the Federal Emergency Management Agency (FEMA) have announced the immediate availability of the FEMA 461 Report, *Interim Testing Protocols for Determining the Seismic Performance Characteristics of Structural and Nonstructural Components*.

Prepared under the FEMA-funded ATC-58 Project, "Development of Next-Generation Performance-Based Seismic Design Guidelines for New and Existing Buildings," the interim recommended protocols were developed for testing structural and nonstructural components and systems found in buildings to establish component and system seismic performance characteristics. The protocols were developed as part of the National Earthquake Hazards Reduction Program (NEHRP) through a cooperative effort of FEMA, ATC, and the three National Science Foundation-funded earthquake engineering research centers: the Mid-America Earthquake Center at the University of Illinois, Urbana; MCEER at the State University of New York at Buffalo; and the Pacific Earthquake Engineering Research Center at the University of California, Berkeley.

Two interim protocol types and a commentary for each are provided in the FEMA 461 report:

1. Quasi-static cyclic testing, which applies to components whose behavior is primarily controlled

by the application of seismic forces or seismic-induced displacements (e.g., cladding panels, glazing panels, drywall partitions, piping and ducting system connections, ducts, and various types of anchors and braces); and

2. Shake table testing, which applies to components whose behavior is affected by the dynamic response of the component itself, or whose behavior is velocity sensitive, or sensitive to strain-rate effects (e.g., mechanical and electrical equipment).

Copies of the report can be obtained (1) free of charge from FEMA by calling 1-800-480-2520, (2) through the ATC Online Store at www.ATCCouncil.org, or (3) by downloading the document from the ATC website.

Nominations Sought for Prakash Award

The Shamsher Prakash Foundation is soliciting nominations for the 2008 Shamsher Prakash Annual Prize for Excellence in the Practice of Geotechnical Engineering, which is given to a young (less than 45 years old) engineer, scientist, or researcher from anywhere in the world. Candidates should be specialists in geotechnical engineering or geotechnical earthquake engineering, have had significant independent contributions to the field, and show promise of future excellence. The award includes a cash prize of \$1,100.

Nominations are due on or before September 30, 2008. All nominations will be reviewed by a judging committee of international experts from Canada, China, Japan, the United Kingdom, and the United States. The award will be announced by December 31, 2008.

For more information, visit <http://www.yoga10.org>.

CALENDAR

Items that have appeared previously are severely abbreviated. The issue containing the first appearance, or the most informative, is indicated at the entry's end. Items listed for the first time are shown in bold.

2008

JUNE

4-6. Int'l Ass'n for Bridge and Structural Eng. (IABSE) Conf., Helsinki. Info: www.iabse.org/conferences/helsinki2008/index.php (6/07)

10. New Madrid EQ Scenario Workshop, St. Louis, MO. **www.eeri.org/**. See page 4. (5/08, 6/08)

11-14. 1st Int'l Symposium on Life-Cycle Civil Engineering (IALCCE'08), Varenna, Lake Como, Italy. Info: <http://www.ialcce.org> (2/08)

15-18. World Conf. on Disaster Management (WCDM), Toronto, Ont. Info: www.wcdm.org/ (10/07, 11/07)

18-20. Network for EQ Eng. Simulation (NEES) Annual Meeting, Portland, OR. Info: <http://nees.org/Education/AnnualMeeting/> (12/07, 2/08, 5/08)

23-27. Crustal Deformation Workshop, Golden, CO. Info: <http://geodynamics.org/cig/workinggroups/short/workshops/cfem-08> (5/08)

30-July 5. Performance-Based Structural Design Optimization Minisymposium, Venice, Italy. Info: <http://www.iaconcongress2008.org/> (9/07, 11/07)

JULY

8-11. Int'l Seismic Eng. Conf. Commemorating the 1908 Messina & Reggio Calabria EQ (MERCEA'08), Reggio Calabria, Italy. Info: <http://www.mercea08.org> (9/07, 10/07)

9-13. Int'l Seminar on Seismic Risk and Rehabilitation of Stone Masonry Housing, Azores, Faial Island. Info: <http://www.azores1998earthquake.org> (1/08)

13-17. 4th Int'l Conf. on Bridge Maintenance, Safety and Management (IABMAS'08), Seoul, Korea. Info: www.iabmas08.org (2/08)

15. Practical Applications of Performance-Based EQ Eng. (PBEE) to Deep Foundations: Buildings, Bridges, and Ports, Seattle, WA. Info: www.eeri.org (5/08)

23. Practical Applications of PBEE to Deep Foundations: Buildings, Bridges, and Ports, San Francisco, CA. Info: www.eeri.org (5/08)

24. Practical Applications of PBEE to Deep Foundations: Buildings, Bridges, and Ports, Los Angeles, CA. Info: www.eeri.org (5/08)

27-30. 6th Nat'l Seismic Conf. on Bridges and Highways and Workshop on Best Practices for Seismic Design and Retrofit of Bridges, Charleston, SC. Info: www.scdot.org/events/6NSC (7/07, 5/08)

AUGUST

11-16. 6th Int'l Conf. on Case Histories in Geotechnical Engineering (6ICCHGE), Washington, D.C. Info: <http://www.6icchge2008.org> (4/06, 9/06, 2/07, 6/07, 10/07, 4/08)

12-14. New Madrid Seismic Zone Conf.: Preparing for a Significant EQ, Rolla, MO. Info: conference.mst.edu/newmadridconf/index.html (5/08)

25-29. Int'l Disaster and Risk Conf. (IDRC), Davos, Switzerland. Info: www.idrc.info (1/08)

SEPTEMBER

16-17. 5th European Workshop on the Seismic Behavior of Irregular and Complex Structures (5EWICS), Catania, Italy. Info: <http://www.5ewics.dica.unict.it/> (12/07)

17-19. Int'l Ass'n for Bridge & Structural Eng. (IABSE) Conf., Chicago. Info: <http://www.wcdm.org/> (10/07)

18. Symposium on Seismic Sources (Hazards) in the Central U.S.: Is New Madrid All There Is? New Orleans, LA. Date tentative. Info: newmadrid.eeri.org/ (5/08)

22-24. 9th Workshop on 3-D Modeling of Seis. Wave Generation, Propagation, & Inversion, Trieste, Italy. agenda.ictp.it/smr.php?1965 (12/07)

23-27. SEAOC Convention, Kohala

Coast, Big Island, Hawaii. <http://www.seaoc.org/events.html> (2/08)

OCTOBER

12-17. 14th World Conf. on EQ Eng., Beijing, China. Info: www.14wcee.org (12/05, 6/07, 7/07, 9/07, 4/08)

22-24. 3rd Conf. on EQ Hazards in the Eastern SF Bay, Cal. State Univ. East Bay. Info: www.consrv.ca.gov/cgs/news/eastbayconference.htm. See page 7. (1/08, 6/08)

14-17. Deep Foundations Institute Annual Conf., New York City. www.deepfoundations08.org (12/07)

NOVEMBER

21-23. Australian EQ Eng. Conf. (AEES 2008), Ballarat, Victoria, Australia. Info: <http://www.aees.org.au/> (6/08)

DECEMBER

15-19. The American Geophysical Union 2008 Fall Meeting, San Francisco, CA. See page 3. (6/08)

2009

FEBRUARY

11-14. EERI Annual Meeting, Salt Lake City. Info: www.eeri.org. See page 1. (3/08, 6/08)

JUNE

15-17. Int'l Conf. on Performance-Based Design in EQ Geotech Eng., Tokyo, Japan. See page 7. (6/08)

22-24. EQ & Tsunami Conf., Istanbul, Turkey. Info: <http://www.imo.org.tr/eqt2009/> (5/08)

SEPTEMBER

13-17. 10th Int'l Conf. on Structural Safety & Reliability (ICOSSAR2009), Osaka, Japan. Info: www.sc.kutc.kansai-u.ac.jp/icosar2009 (2/08)

2010

MAY

23-29. 5th Int'l Conf. on Recent Advances in Geotech. EQ Eng. & Soil Dynamics & Symposium in Honor of I. M. Idriss, San Diego, CA. Info: prakash@mst.edu (4/08)

JULY

25-29. 9th U.S. Nat'l & 10th Canadian Conf. on EQ Eng.: Reaching Beyond Borders, Westin Harbour Castle Hotel, Toronto, Canada (2/08)

NEES News

NEES@UCSD Tests Million-Pound Structure

On May 7, NEES@UC San Diego conducted a test of a one million-pound precast concrete structure with the largest footprint of any structure ever tested on a shake table in the United States. This structure tests the seismic response of precast concrete floor systems that are used in parking garages, college dormitories, hotels, stadiums, prisons and increasingly in office buildings.

The tests of the one-half-scale structure are part of a collaborative project between the University of Arizona, University of California at San Diego, and Lehigh University. The \$2.3 million project is being funded by the Precast/Prestressed Concrete Institute and its member companies and organizations, the National Science Foundation, the Charles Pankow Foundation, and the Network for Earthquake Engineering Simulation (NEES).

The goal of the project is to advance the state of knowledge of precast concrete building construction. The ultimate goal is to enable the construction of fully precast concrete buildings in all seismic regions of the nation. The research consortium has embarked on this advanced research program because of the speed of construction and quality associated with precast concrete.

The earthquake tests are being conducted at the NEES@UC San Diego outdoor shake table site, which is part of the UCSD Jacobs School of Engineering's Englekirk Structural Engineering Center. The \$9 million Englekirk shake table is one of 15 NEES earthquake testing facilities.

"The earthquake simulator at UC San Diego was designed to conduct state-of-the-art research and ultimately to miti-

gate the disastrous impact of earthquakes in our communities," said EERI member Jose Restrepo, co-principal investigator for the shake test and UCSD structural engineering professor. "The test on the precast concrete building is an example of how to use the latest construction and testing techniques to develop the next generation of design methodologies."

Portions of this article were provided by the UCSD Jacobs School of Engineering and the Precast/Prestressed Concrete Institute.



Million-pound concrete structure on UCSD shake table.



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