



EARTHQUAKE ENGINEERING RESEARCH INSTITUTE NEWSLETTER

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News of the Institute

2011 Annual Meeting Takes Shape

The 2011 Annual Meeting planning committee, chaired by Jorge Meneses of Kleinfelder, Inc., is in the final stages of developing an exceptional program. The meeting, with the theme "Earthquakes without Borders," will discuss the extent and effects of earthquakes on the built environment with an emphasis on San Diego cross-border issues. The meeting will be held February 9-12 at the Hyatt Regency Hotel in La Jolla, California.

A panel discussion will kick off the meeting by addressing cross-border issues based on recent experiences with the El Mayor-Cucapah earthquake and the San Diego wildfires, as well as border problems after 9/11. The discussion will encompass seismic risk, collaborative research needs, and policy and emergency response plans in the event of an earthquake that hits the region of southern California and Baja California. A subsequent session will identify and present methods to mitigate the region's tsunami risk.

Other sessions will focus on integrating research and practice; the interpretation, selection, and modification of strong motion records; and lessons learned from the major earthquakes of 2010. Saturday morning will feature something new for an EERI Annual Meeting: two parallel sessions on structural engineering and geotechnical engineering, covering, respectively, the latest innovations in structural engineering and the effectiveness of V_{s30} as a parameter for site characterization.

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Bridge column test on the NEES@UCSD shake table, an Annual Meeting field trip destination.

Registration Open for FEMA 547 Seminar

Registration is now open at <https://www.eeri.org/registration/tech-seminar.php> for the one-day EERI technical seminar on FEMA 547, *Techniques for the Seismic Rehabilitation of Existing Buildings*. Attendees will receive a CD version of FEMA 547 and a notebook of seminar presentations, and will earn 0.6 Continuing Education Units. Seminar presenters are the lead authors of FEMA 547. The registration site has a link to the seminar brochure with an outline of the program and a printable form to register by fax or mail, if preferred.

Dates and locations are **October 28** in San Francisco, **October 29** in Los Angeles, **November 4** in Seattle, and **November 5** in Salt Lake City.

The primary goals of the seminar are to provide: (1) an overview and examples of practical and effective seismic rehabilitation techniques, and (2) guidance on their use, in mitigating specific seismic deficiencies, on a range of model building types.

Registration fees are \$225 for EERI and cosponsor members, \$300 for non-members, and \$125 for EERI student and young professional members.

Learning from Earthquakes

Performance of Confined Masonry in Chile

The February 27, 2010, Maule, Chile, earthquake (M 8.8) exposed confined masonry (CM) buildings to ground shaking of various intensities, providing an opportunity to study their seismic performance. CM has been widely used in Chile for housing construction, including low-rise single family dwellings (up to two stories), and medium-rise apartment buildings (three to four stories). This construction practice started in the 1930s, after the 1928 Talca earthquake (M 8.0). Good performance of this CM technology was reported after the 1939 Chillan earthquake (M 7.8), paving the way for its continued use in Chile.

The area affected by the Maule earthquake was exposed to several major earthquakes in the past, including the 1985 Lolleo earthquake (M 7.8). The good track record for CM performance in past earthquakes was based on single family buildings of one and two stories. CM buildings of three and four stories were exposed to severe ground shaking for the first time in the 2010 earthquake. The construction of CM apartment buildings in the capital Santiago began in the 1970s, and in the 1990s, in other urban centers.

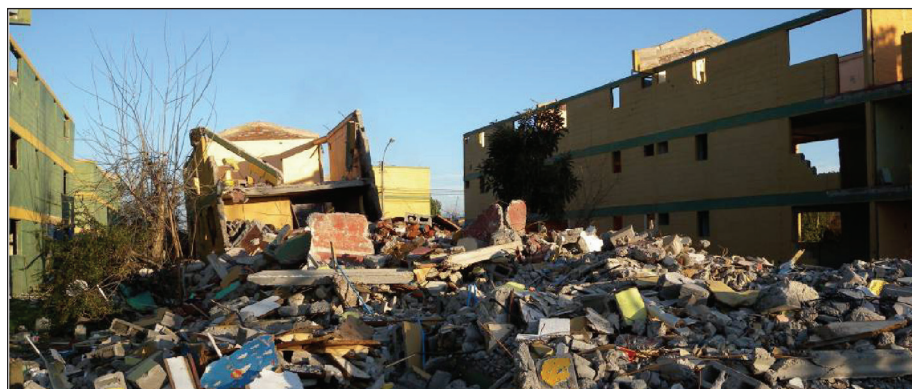
By and large, CM buildings performed well in the earthquake. Most single-family dwellings of one and two stories did not experience any damage, except for a few moderately damaged buildings. The large majority of buildings of three and four stories remained undamaged; however, a few were damaged severely, and two three-story buildings collapsed. CM walls were built using a variety of units, most prevalent being perforated clay blocks (clay tiles), clay bricks, and hollow concrete blocks. Characteristic patterns of in-plane and out-of-plane wall damage were observed. Poor quality of masonry materials and construction is expected to have con-

tributed to damage in some cases. Exposed reinforced concrete (RC) confining elements (tie-beams and tie-columns) in damaged buildings provided an opportunity to examine detailing of reinforcement in these elements. A few deficiencies were observed, including: (1) inadequate confinement at the ends of tie-columns, (2) absence of confinement in the joint region, and (3) dis-

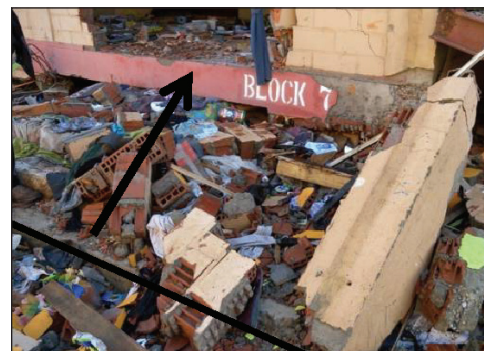
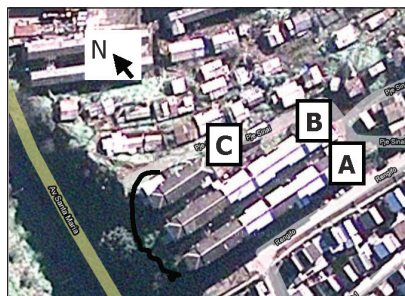
continuous longitudinal reinforcement at the RC tie-beam intersections. As a result of these deficiencies, buckling and shear failure of RC tie-columns were observed in some buildings.

A few CM apartment buildings experienced significant damage at the ground floor level, and two three-story buildings collapsed after developing a soft-story mechanism. One of the key causes of damage and/or collapse was excessively low

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Collapse of a three-story CM building in Santa Cruz (photo S.Brzev).



Collapse of a three-story CM building in Constitución: (left) aerial view of buildings A, B, and C (steeply sloping land is outlined with a solid line); (right) building C (located closest to the slope) lost the ground floor and moved approximately 1.5 m eastward away from the plinth (photo: S. Brzev).



Failure of two adjacent RC tie-columns, and of the CM panel between them, in Santa Cruz (photo: M. Astroza).

CM Buildings in Chile

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wall density (less than 1% per floor). Wall density is a key parameter that influences seismic performance of CM buildings. It can be determined as a ratio of wall area in one direction and the total building plan area (including all floors). Buildings that were severely affected by the earthquake had a low wall density, combined with low-strength masonry walls, absence of RC tie-columns at the openings, and inadequate size of RC tie-columns. One of the collapsed apartment buildings was located on a hill close to a steep slope. Two adjacent buildings of identical construction (located further from the slope) suffered damage but survived the earthquake. Geotechnical effects caused extensive damage in a few CM buildings

at other locations.

EERI members Svetlana Brzev of the British Columbia Institute of Technology in Vancouver, Canada, and Maria Ofelia Moroni Yadlin and Maximiliano Astoza of the Universidad de Chile in Santiago visited the earthquake-affected area from July 3 to 10, 2010. The visit was conducted as part of the 2010 Confined Masonry Network project, sponsored by the Special Projects & Initiatives Committee and supported by the EERI Endowment Fund. Lessons learned during this trip will contribute to the EERI-sponsored global seismic design and construction guidelines currently under development.

To see a Power Point presentation and a detailed report containing the key observations, visit www.confinedmasonry.org.

Annual Meeting

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Field trip: The meeting will wrap up with an optional field trip to the Englekirk Structural Engineering Research Center, located 15km from the main campus of the University of California at San Diego. The center houses three notable units: the NEES@UCSD Large High Performance Outdoor Shake Table, a soil-foundation-structure interaction facility that includes a large laminar soil shear box and a refillable soil pit, and a blast simulator. The combined facility is a one-of-a-kind worldwide resource.

Watch for more details on other Annual Meeting sessions and activities in future newsletters, in the program brochure to be mailed in the fourth quarter, and by visiting the EERI web site.

Special Issue of Spectra on Chile EQ

EERI's journal *Earthquake Spectra* will be publishing a special issue on the February 2010 Chile Earthquake. Papers are invited on the earth science, engineering, and social and economic sciences aspects of the earthquake and its aftermath. All papers should be submitted online through the *Earthquake Spectra* manuscript submission web page: <http://eqs.peerx-press.org>.

When the manuscript is uploaded, authors must select "Chile Earthquake" from the drop-down list for special issues. The cover letter accompanying your manuscript should clearly indicate that the paper is being submitted for possible publication in this special issue. All papers to be reviewed must be received by **January 15, 2011**. We expect to have preliminary review decisions by **June 1, 2011**, and revised papers accepted for publication by **November 1, 2011**. The special

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Chile Research Needs Workshop

As noted in the August *EERI Newsletter* (page 1), EERI was asked by the National Science Foundation to organize a small workshop to identify research needs emerging from the recent Chile earthquake. EERI is organizing a similar workshop for the Haiti earthquake. Recommendations from the two workshops will be incorporated in an NSF solicitation for major research needs related to earthquake mitigation, response, recovery, and rebuilding from these events.

The Chile earthquake was highly significant for the U.S. earthquake engineering community because the similarities in building codes, geologic setting, and social and political issues in response and recovery mean that lessons learned in all sectors will be directly applicable in the U.S.

The Chile Research Needs Workshop was held on August 19, 2010, at the National Science Foundation in Arlington, Virginia. Forty-four

researchers, agency representatives, and NSF program officers participated in the day-long session that included presentations on basic observations from the event as well as a series of small break-out sessions to identify future research needs in various disciplinary areas. Four researchers from Chile participated in the meeting, giving overview presentations in the morning and leading break-out session discussions in the afternoon, including Sergio Barrientos and Ruben Boroschek from the Universidad de Chile, Christian Ledezma from the Pontificia Universidad Católica de Chile, and Andrés Tassara from the Universidad de Concepción. The chair of the workshop was Jack Moehle, EERI member and professor of structural engineering at UC Berkeley, who had led the EERI reconnaissance team to Chile. Most of the workshop participants had also participated on one of the several reconnaissance efforts in Chile.

Presentations from the workshop are available as pdf files on the

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Meet the Candidates For Director A



Lori Dengler

Lori Dengler, Ph.D., is professor of geology and chair of the Geology and Oceanography Departments at Humboldt State University in northern California. She has a Ph.D. in Geophysics from the University of California Berkeley and has been a faculty member at Humboldt State University since 1979. Lori's expertise is in earthquake and tsunami hazard assessment, mitigation, and outreach. She was a member of the team that developed the U.S. National Tsunami Hazard Mitigation Program and the author of the first Strategic Implementation Plan for Mitigation Projects. Lori has been a member of EERI since 1997 and participated in EERI's Mitigation Center Committee as well as numerous Learning from Earthquakes presentations, and was the coordinator of the tsunami sessions for the 100th Anniversary Earthquake Conference (8NCEE). She has participated in EERI post-earthquake and post-tsunami survey teams to Papua New Guinea (1998), southern Peru (2001), Indonesia (2005), Samoa (2009), offshore northern California (2010), and Chile (2010), and has studied a number of other north coast earthquakes and tsunamis. She is a member of the UNESCO taskforce on post-tsunami surveys, a steering committee member of the California

Earthquake Alliance, and a founding member, former chair, and current scientific advisor for the Redwood Coast Tsunami Work Group (RCTWG). Lori is the featured tsunami expert on NOVA's "Wave That Shook the World" web site and has received a number of awards, including NOAA's 2001 Richard Hagemeyer Tsunami Mitigation Award (2001), Humboldt State University's Scholar of the Year (2008), and the Alquist Medal for promoting earthquake safety in the State of California (2009).

Lori's research and professional efforts include tsunami hazard assessment, earthquake intensity studies, and outreach. She has published numerous papers on topics including tsunami hazards in San Francisco Bay and the effect of harbor modification on the tsunami vulnerability of Crescent City, and is currently working on a pilot project monitoring the currents produced by tsunamis. Her earthquake intensity work formed the basis of the USGS "Did You Feel it" internet intensity scale, and she has compiled intensity information on a number of historic events. She was the principal author of four editions of the northern California earthquake-tsunami preparedness magazine "Living on Shaky Ground."

Vision

I believe EERI is quite simply the most important game in town when it comes to interdisciplinary earthquake risk reduction efforts. It is an organization that values both the specialist and the generalist and recognizes and encourages interaction among disciplines that is genuine and productive. I think I have a skill set and background that will complement the current makeup of the board and bring something new to the table.

My priorities for EERI are to retain its traditional strength in the earthquake hazard reduction area, become more involved with tsunamis, support the next generation of earth-

quake hazard reduction professionals both nationally and internationally, and communicate the work of the Institute and its members to decision makers and the public to sustain and increase support for hazard reduction projects.

Since 1992 I have been straddling the tsunami and earthquake worlds. The increased visibility and funding after the 2004 Indian Ocean tsunami has created an exciting time for tsunami science – improved detection and forecasting capabilities, better models, and the beginnings of tsunami-resilient design considerations for coastal construction. I want to see EERI and EERI members contribute to the maturing of the tsunami discipline. In the next decade, it is likely that tsunami current measurements will become widely available – providing to the tsunami engineering community what strong motion data provides to the earthquake engineering community. My connections with NOAA and the international tsunami community have the potential to bring a constituency into EERI that has not been widely represented in the past.

I have been fortunate to work closely with a broad range of earthquake and tsunami professionals over the course of my career. I have been on post-event reconnaissance trips with tsunami modelers, paleoseismologists, coastal and structural engineers, social scientists, seismologists, and emergency managers. Through the RCTWG, I work with first responders and emergency planners, politicians, and all segments of the community, from businesses to schools and utilities. I have acquired some understanding of and a deep respect for this big tent of earthquake risk reduction professionals. I have had some success in bringing diverse groups together and developing sustained mitigation efforts. One of the strengths of EERI is the unique perspective every board member brings to the table. I thank you for considering me as a member of this group.

Meet the Candidates

For Director A



Ivan G. Wong

Ivan Wong is a principal seismologist and vice president of URS Corporation in Oakland, California. He has more than 36 years of experience in the fields of engineering seismology and seismic geology.

A major focus in his career has been earthquake hazard reduction and awareness, and public outreach. At URS, Ivan has directed the seismic hazard evaluations of more than 300 critical and important facilities worldwide, mostly for the federal government. He has managed some of the largest seismic hazard evaluations performed in the U.S., including the Yucca Mountain Project, the largest such study ever performed. For FEMA, Ivan has been involved in the education and implementation of HAZUS in several areas in the U.S. He has been the recipient of numerous NEHRP external research grants from the USGS that have supported the development of urban probabilistic and scenario hazard maps and other earthquake hazard-related studies.

Ivan has also been particularly active in serving the USGS on many review and advisory panels including the review panel for the 1996

National Seismic Hazard Maps.

Ivan has been, and is currently, a member of numerous professional review panels, working groups, and committees in engineering and the earth sciences. He chairs the recently formed Working Group on Utah Earthquake Probabilities. Ivan has authored or co-authored more than 300 professional publications including journal papers, map series, conference papers, and published abstracts.

Ivan has been a member of EERI since 1976. He has been a speaker at numerous EERI annual meetings and technical symposiums and was a member of the 2006 and 2010 annual meeting organizing committees. He is a past president of the Northern California Chapter and past member of the *Earthquake Spectra* Editorial Board. He chaired the steering committee for EERI's NEHRP-sponsored "Earthquake Scenarios" Project, is on the organizing committee for the first China/U.S. Symposium for the Advancement of Earthquake Sciences and Hazard Mitigation Practices, and has served on other EERI committees. Ivan has also been an active member and has served in several capacities for the Seismological Society of America.

A native of Portland, Oregon, Ivan received a BS in physics from Oregon State University, a BS in geology from Portland State University, and a MS in geophysics from the University of Utah.

Vision

For more than three decades, I have had the opportunity and pleasure to participate in the growth of EERI and to observe the organization work toward its goals as described in the EERI Vision Statement. I believe the success and effectiveness of EERI has been a function of its leadership and a dedicated core of individuals. For the organization to grow and improve its effectiveness both within the U.S. and internation-

ally, it must expand its membership. For several years, the number of members has remained about the same at 2,300. In the 2006 EERI Strategic Plan, the target membership was 3,000 by 2010. If elected to the Board, one of my top priorities for EERI will be to help it grow and increase its influence worldwide. I support the recent move to increase international membership by offering an E-affiliate membership to individuals in selected countries. To date, however, only 12 individuals have taken advantage of this offer. I would make this a priority and work toward international expansion.

Growth within the U.S. should also be encouraged. EERI has an associate program with the Seismological Society of America. We should also explore the possibility of offering associate membership to other organizations such as ASCE. I would bring this issue to the attention of the Board and help lead the effort if deemed appropriate.

I believe that EERI needs to be more effective at the community level. As past president of the Northern California Chapter, I helped lead grassroots efforts in earthquake hazard mitigation in the San Francisco Bay area and therefore understand how local chapters can be effective. Thus, another of my priorities will be to work with EERI members in other areas across the U.S. to establish new or strengthen existing local chapters. I can envision new EERI chapters in Seattle, Portland, Salt Lake City, Reno-Carson City, Las Vegas, and Denver.

In summary, my participation in EERI activities on a local and national level has been the highlight of my career. I hope to serve EERI further on the Board of Directors, and I would be honored to have your vote.

Meet the Candidates For Director B



David A. Friedman

David A. Friedman is a licensed structural engineer and senior principal, chair of the Board of Directors, and former president and CEO of Forell/Elsesser Engineers, Inc., in San Francisco. At F/E for 30 years, David has had a deep involvement in many landmark projects including San Francisco City Hall, Asian Art Museum of San Francisco, the recently completed Taube-Koret Campus for Jewish Life in Palo Alto, and currently the Student Athlete High Performance Center and the retrofit of California Memorial Stadium at UC Berkeley.

David has been an active member of EERI since 1988, including chairing the EERI Endowment Committee, committee membership on Development and Investments, serving on the local organizing committee for the Golden Anniversary Annual Meeting (1998), and chairing the 2010 Local Organizing Committee for the Annual Meeting in San Francisco. David has been an annual ambassador and speaker at college and university campuses across the country as part of EERI's Visiting Professional Program. His passionate advocacy for EERI's role in advancing seismic risk mitigation and

in research and education led to his endowing the Visiting Professional Program in 1999, to ensure the permanency of that program. David also participated in two Learning from Earthquakes reconnaissance teams: 1993 in Kobe, Japan, and 2008 in Sichuan, China, and the subsequent briefings on each event.

David's professional career is also interlaced with active involvement on professional, educational and social justice not-for-profit boards. David is a trustee of the UC Berkeley Foundation, former president of the Board of the Jewish Home of San Francisco and current chair of the Jewish Senior Living Group, former director of the Architectural Foundation of San Francisco, and new director of San Francisco Planning and Urban Research (SPUR). With devoted ties to UC Berkeley, David serves on the Advisory Council to the Civil and Environmental Engineering Department and the College of Environmental Design. And his own stated highlight: chairing the Board of Trustees of The San Francisco Foundation.

Vision

EERI is a unique membership organization, where its eclectic multidisciplinary composition is both its best asset and strongest challenge. The common goal is, simply stated, to reduce the impact of earthquakes throughout the world. Whether we are engineering practitioners, researchers, educators, or social scientists, we live and work in a world that is increasingly interdisciplinary and reliant on the collaboration and integration of our agendas and efforts. Though tempting for each of us to get caught up in the safety of our own "silos," we can't lose sight that comprehensive solutions have to be multidisciplinary in conception. I doubt I would recommend that EERI become a multihazard-focused organization, but who can doubt the learning we have undertaken from the recent spate of hurricanes, floods and fires.

My vision as an EERI Director would primarily be to:

- Fully represent this varied membership of EERI by being an appropriate fiscal steward of the dues and contributions that sustain the organization and develop sustainable governance policies;
- Assist the president and the full Board in becoming "member-centric" by making sure we understand and deliver on the benefits and resource accessibility that is of critical importance to the current membership AND particularly to the future young membership;
- Facilitate the interdisciplinary discussions and collaborations between engineering practitioners and academic institutions to further the EERI strategic initiatives in education, technical development, outreach and international activities;
- Promote the potential synergistic partnerships with EERI and its regional chapters with other not-for-profits or municipalities to create model earthquake risk mitigation programs, for example a liaison between EERI and SPUR to further programs such as the City of San Francisco's Resilient City Initiative;
- Find collaborations with NGOs so that EERI not only is the source of experts on Learning from Earthquakes but also contributes to the planning and rebuilding programs, particularly in third world countries devastated by earthquakes, as we see occurring throughout Haiti today; and
- With a happy and satisfied membership, spearhead funding and membership development to ensure EERI's financial viability, growth, and outreach into the future.

Meet the Candidates For Director B



John Wallace

John Wallace is professor of civil engineering at University of California, Los Angeles, California (UCLA). He received his Ph.D. in civil engineering from the University of California, Berkeley in 1989. His research interests include analysis and design of buildings and bridges subjected to earthquake actions, laboratory and field testing of structural components and systems, and application of sensors and sensor networks for structural health monitoring. He serves as PI on the UCLA NEES Equipment Site to develop forced-vibration equipment and instrumentation for field testing and monitoring of the performance of geotechnical and structural systems. Current research topics include field testing of building and bridge components and systems, development and validation of computer models for assessing the performance of reinforced concrete structural systems, and use of novel sensors and wireless technology for monitoring tall buildings subjected to wind and earthquake forces. John has published roughly 50 journal and 70 conference articles, with two recent papers recognized as Outstanding Journal papers in 2007. Professor Wallace has been active as a con-

sultant on several high-profile hospital rehabilitation projects in California and has served as an external reviewer on a number of proposed high-rise building projects in California utilizing performance-based seismic design. He has organized numerous sessions for major conferences, including the 2007 ASCE Structures Congress held in Long Beach and the 9th US National Conference held in Toronto in July 2010. He has been actively involved in developing guidelines for seismic rehabilitation of buildings and in the development of codes for new buildings and bridges. He was a member of the NEES Consortium (NEESinc) Board of Directors from 2005-2009 and served as President of the NEESinc from 2008-2009. He currently serves on the editorial board for two peer-reviewed ISI journals, including EERI's *Earthquake Spectra*, and he has participated in two EERI Technical Seminars. He is a Fellow of the American Concrete Institute, a voting member of ACI Committee 318-H, Seismic Provisions, and a former voting member of the ASCE 7-02 & 7-05 Seismic Task Committees.

Vision

EERI is an excellent organization that draws on its diverse membership to support a broad spectrum of important activities. These activities include managing the Learning from Earthquakes Program, organizing the annual meeting and the technical seminar series, supporting the Student Seismic Design Competition, and conducting a wide-range of outreach activities. Maintaining and strengthening these efforts should be primary goals for the Board, along with the efforts required to implement and update the current EERI Strategic Plan (2006-2010). I would be honored to serve on the Board and pledge to work effectively with the EERI Board and staff to maintain important programs and to seek out opportunities to strengthen the Institute.

Announcement/ News of the Institute

COSMOS Technical Session

The Consortium of Organization for Strong Motion Observation Systems (COSMOS) will be holding its Annual Meeting and Technical Session at the Clarion Hotel at the San Francisco Airport, Millbrae, California, on Friday, November 19th. The day-long session, co-sponsored by the Pacific Earthquake Engineering Research Center and the California Geological Survey, will focus on "Issues with Applying Conditional Mean Spectra (CMS) to the Selection and Scaling of Design Ground Motions."

While the recently developed concept of CMS provides many advantages, there are also many issues regarding its use that need to be resolved involving its practical application. There will also be special presentations on ground motions measured in the 2010 Chile and New Zealand earthquakes, and comparisons of selected measured values with those predicted by current attenuation relationships. A lively panel session will conclude the program.

For complete program and registration details, visit www.cosmos-eq.org.

COSMOS Becomes EERI Subscribing Member

EERI is pleased to announce that COSMOS has become a Subscribing Member. The consortium was established in 1999 with the support of the National Science Foundation and charter endorsement by other government agencies. The mission of COSMOS is to advocate for the establishment of strong-motion measurement systems and to promote (1) the development and adoption of verifiable, internationally ranked standards for the acquisition and processing of earthquake strong-motion measurements; and (2) the global application of strong-motion measurements by design professionals.

Announcements

PAGER System Earthquake Alerts to Include Economic Loss and Casualty Info

The U.S. Geological Survey (USGS) has begun publicly releasing earthquake alerts for significant earthquakes around the globe based on estimates of potential casualties and economic losses. These estimates should significantly enhance the utility of the USGS Prompt Assessment of Global Earthquakes for Response (PAGER) system that has been providing estimated ShakeMaps and computing population exposures to specific shaking intensities since 2007. The earthquake alerts are widely recognized and used by emergency responders, government and aid officials, and the public to understand the scope of the potential disaster and to develop the best response. Quantifying earthquake impacts and communicating loss estimates (and their uncertainties) to the public has been the culmination of several important new and evolving components of the system.

The operational PAGER system relies on empirically-based loss models that account for estimated ShakeMap-based shaking hazard, population exposure, and employs country-specific fatality and economic loss functions derived using analyses of losses due to recent and past earthquakes. In countries with fewer loss data, empirical loss models are informed in part by PAGER's semi-empirical and analytical loss models, and global building exposure and vulnerability data sets. The latter two were developed in partnership with EERI's World Housing Encyclopedia (WHE) and WHE experts around the world. PAGER loss models have also benefited directly from the EERI Learning from Earthquakes Program, particularly from the detailed reconnaissance reports on important earthquakes over the decades.

In order to facilitate rapid and appro-

priate earthquake responses based on our probable loss estimates, the USGS developed a four-level Earthquake Impact Scale (EIS). Instead of simply issuing median estimates for losses, which can be easily misunderstood and misused, this scale provides ranges of losses from which potential responders can gauge expected overall impact from strong shaking. EIS is based on two complementary criteria: (1) the estimated cost of damage, which is most suitable for U.S. domestic events, and (2) estimated ranges of fatalities, which are generally more appropriate for global events, particularly in earthquake-vulnerable countries. Alert levels are characterized by alerts of green (little or no impact), yellow (regional impact and response), orange (national-scale

impact and response), and red (international response). Corresponding fatality thresholds for yellow, orange, and red alert levels are 1, 100, and 1,000, respectively. For damage impact, yellow, orange, and red thresholds are triggered when estimated U.S. dollar losses reach 1 million, 100 million, and 1 billion levels, respectively. Loss calculations also include estimates of the economic impact with respect to the country's gross domestic product.

Critical users can receive PAGER alerts based on the EIS alert level, in addition to or as an alternative to magnitude and population or intensity exposure-based alerts. The essence of PAGER's impact-based alerting is that actionable loss information is available in the immediate aftermath of significant earthquakes worldwide based on quantifiable, albeit uncertain, loss estimates provided by the USGS.

For more information visit <http://earthquake.usgs.gov/pager/>.

Mendenhall Fellowship Opportunity

The U.S. Geological Survey office in Menlo Park, California, seeks a postdoctoral fellow to engage in studies focusing on developing earthquake damage detection methods and an early warning system for the nation's infrastructure. The research conducted will focus on development of reliable methods and algorithms for structural system identification, local early warning and damage detection. Another facet will be implementation of these methods into the USGS/NSMP integrated structural health monitoring system to assess the effect of shaking in the structure during an earthquake. One of the research advisors is EERI member Erol Kalkan, ekalkan@usgs.gov.

For more details, visit <http://geology.usgs.gov/postdoc/2012/research.html#25> and scroll to #25.

Notre Dame Faculty Positions Open

The Department of Civil Engineering and Geological Sciences at the University of Notre Dame (www.nd.edu/~cegeos) invites applications for faculty positions to complement the existing Structural Engineering group, particularly candidates with a research focus on, but not limited to: bridge engineering and infrastructure systems, high-performance and sustainable civil structures, reliability and performance of structures under extreme loading, and foundation-structure interaction. Required: a doctoral degree in an appropriate field and ability to develop and sustain an externally funded research program and publish in leading scholarly journals.

For application information, visit www.nd.edu/~struct. Inquiries can be directed to struct@nd.edu.

Subscribing Member News

2nd Seminar for Haitian Engineers

The Université Quisqueya (UniQ) and the University at Buffalo's (UB) MCEER, an EERI Subscribing Member, held a second installment of seminars in Port-au-Prince on September 5-9 to provide training to more than 220 Haitian engineers and architects in the principles of earthquake engineering and seismic design. With an estimated 1,000 practicing engineers in Port-au-Prince, it is believed that the series has reached nearly 30 percent of the city's engineering population. A third installment is tentatively

planned for January 2011. The seminars have already proven beneficial in the development of participants' technical proposals for the rehabilitation of existing structures that survived the January 12 earthquake.

Each seminar offers credit toward a master's of earthquake engineering degree that UniQ is developing with MCEER's support. Prior to the January 12 earthquake, opportunities to receive formal training in seismic design and construction in Haiti were limited.

Instructors included Andre Filiatrault (MCEER director and professor, UB), Pierre Fouché (UniQ alumnus and Ph.D. candidate, UB) and Wasim Ghannoum (assistant professor, University of Texas at Austin). Ghan-

noum is a member of EERI's committee coordinating technical assistance to Haiti. He gave an introductory presentation about EERI during the seminar.

The 2nd seminar was divided into two sections. Participants in the introductory program were supervised while conducting building assessments in the field; participants in the advanced program viewed demonstrations of masonry construction, led by Fouché with the help of local masons.

Planned to extend for a minimum of three years, the MCEER and UniQ partnership is designed to help Haiti establish its own community of earthquake engineers. For more information, visit <http://mceer.buffalo.edu/>.

Chile Research Needs Workshop

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Chile Clearinghouse website, along with a list of workshop participants. The workshop report soon will be available there also: <http://www.eqclearinghouse.org/20100227-chile/research-needs-workshop>.

Additional funding support for participant travel to the workshop was provided by CONICYT, the Geo-Engineering Extreme Events Reconnaissance Association, the International Technology Center-Americas/U.S. Army at the U.S. Embassy in Santiago, NEEScomm, and the U.S. Office of Naval Research Global Support.

Spectra Special Issue

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volume should appear in print in **March 2012**. Papers without a clear link to the Chile earthquake or not complying with *Spectra's* instructions to authors will not be reviewed for this issue.

For questions regarding paper content, contact the guest editors for the special volume, Jack Moehle (moehle@berkeley.edu) and Farzad Naeim (FARZAD@johnmartin.com). For questions regarding submission procedures, before October 31 contact interim *Spectra* Editorial Assistant Rachel Beebe (rachel@eeri.org) or, subsequently, Liz Stalaker (liz@eeri.org). Prospective authors are strongly encouraged to email their abstracts to the guest editors prior to formal manuscript submission so that the suitability of the topic can be evaluated.



Fouché teaches during a demonstration of masonry construction of a wall that will remain permanently on the heavily damaged UniQ campus.



Ghannoum lectures advanced seminar participants.

Announcements

SEAONC Retrofit Case Studies Seminar

The Fall Seminar of the Structural Engineers Association of Northern California (SEAONC) will focus on creative and efficient retrofit case studies. It will take place on consecutive Wednesday evenings, November 3 and 10, 2010, 6:00-9:00 p.m., at the PG&E Auditorium, 245 Market Street, San Francisco.

The seminar will allow attendees to learn analytical and detailing concepts on a variety of projects, including advice on how to use ASCE-41 efficiently. Six presenters, introduced by EERI Past President Chris Poland, will cover a wide variety of building types and take attendees through the process from initial analyses through project completion.

Seminar fees for SEAONC/EERI members are \$180, nonmembers \$300, students \$60. After October 20, fees increase by \$30. For more information and to register, visit <http://www.seaonc.org/member/index.asp>.

Course on Risk-Based Design and Evaluation

A two-day short course on Risk-Based Seismic Design and Evaluation, sponsored by ASCE, will be held November 18-19, 2010, at the Sofitel San Francisco Bay in Redwood City, California. All material will be presented in an intuitive manner, with minimum reference to the underlying mathematics, to foster deeper understanding. Structural and geotechnical engineers, architects, regulators, risk managers, geologists, seismologists and professionals in related fields are encouraged to attend. Participants will earn 1.6 CEUs. The course will cover the steps involved in risk-based evaluation and design and how to apply them, the limitations of code-based design, the role of uncertainty in risk-based decision making and ways to reduce it, how to avoid costly mistakes resulting from false perception of risk, and risk-targeted seismic design loads in ASCE 7-2010

The course is taught by EERI member Praveen K. Malhotra, principal of StrongMotions, Inc., in the Boston area. He is the author of Global Earthquake Risk Maps used in evaluating and mitigating earthquake risk. The course fee is \$1,225 for ASCE members and \$1,445 for nonmembers. For registrations received within seven business days of the seminar, availability of course materials cannot be guaranteed on site. For more information, visit <http://www.asce.org/Content.aspx?id=7238>, and click on "Structural."

Comment on GEM Socio-Economic Model RFP

The Global Earthquake Model (GEM) is a global collaborative effort that brings together national, regional and international organizations, as well as individuals, to develop state-of-the-art models and tools for analyzing earthquake hazard, risks, and socio-economic impacts associated with earthquakes.

On September 15th, GEM launched an online peer review of its draft Request for Proposal for the modelling of socio-economic impacts of earthquakes. This review process, which will end on November 15th, offers an opportunity to researchers, potential users, and stakeholders to provide comments on methods for the assessment of the social and economic consequences of earthquakes before the actual RFP is released. To participate in the review, visit <http://www.globalquakemodel.org/node/1025>.

2011 Khan Lecture Series

EERI member Dan M. Frangopol, Khan Endowed Chair in Structural Engineering and Architecture at Lehigh University in Bethlehem, Pennsylvania, invites attendance at the 2011 Fazlur Rahman Khan Lecture Series, sponsored by Lehigh's Department of Civil & Environmental Engineering and the Department of Art & Architecture. The series honors Khan's legacy of excellence in structural engineering and architecture.

The following three Friday lectures all begin at 4:10 p.m. in the Sinclair Lab Auditorium at Lehigh University:

1. **February 18:** David Scott of Arup, New York City, past chairman of the Council on Tall Buildings and Urban Habitat, on "Extreme Engineering."
2. **March 25:** Masayoshi Nakashima, professor, Kyoto University, Disaster Prevention Research Institute and E-Defense, National Research Institute for Earth Science and Disaster Prevention, Kyoto, Japan, current EERI Board member, on "Safeguarding Quality of Life: the Role of Large-Scale Testing."
3. **April 8:** Chris D. Poland, chairman & CEO, Degenkolb Engineers, San Francisco, California, EERI past president and honorary member, on "Building Disaster Resilient Communities."

For additional information about the series, visit <http://www.lehigh.edu/frkseries>.



CALENDAR

The issue containing the first appearance is indicated at the entry's end. Items listed for the first time are shown in bold.

2010 OCTOBER

6-8. Workshop on SSI for Nuclear Power Plants, Ottawa, Canada. Info: <http://www.nea.fr/nsd/workshops/SSI> (5/10)

8-9. Quake Summit 2010, San Francisco, CA. Info: www.quesummit2010.org (7/10)

12-15. Deep Foundations Institute 35th Annual Conference, Hollywood, CA. Info: www.deepfoundations2010.org. (1/10, 9/10)

28. EERI Seminar on FEMA 547, San Francisco, CA. Info: <https://www.eeri.org/registration/tech-seminar.php>. See page 1. (9/10,10/10)

29. EERI Seminar on FEMA 547, Los Angeles, CA. Info: <https://www.eeri.org/registration/tech-seminar.php>. See page 1. (9/10,10/10)

NOVEMBER

3. SEAONC Retrofit Case Studies Seminar, San Francisco, CA. See page 10. (10/10)

4. Young Engineers Conference, London, United Kingdom. Info: www.cege.uci.ac.uk/events/yec (5/10)

4. EERI Seminar on FEMA 547, Seattle, WA. Info: <https://www.eeri.org/registration/tech-seminar.php>. See page 1. (9/10,10/10)

5. EERI Seminar on FEMA 547, Salt Lake City, UT. Info: <https://www.eeri.org/registration/tech-seminar.php>. See page 1. (9/10,10/10)

10. SEAONC Retrofit Case Studies Seminar, San Francisco, CA. See page 10. (10/10)

18-19. Short Course on Risk-Based Seismic Design and Evaluation, Redwood City, CA. See page 10. (10/10)

19. COSMOS Annual Meeting & Technical Session, Millbrae, California. See page 7. (10/10)

DECEMBER

1-3. 3rd Asia Conference on Earthquake Engineering (ACEE 2010), Bangkok, Thailand. Info: <http://acee2010.com/> (7/10)

18-20. 11th International Symposium on Structural Engineering (ISSE-11), Guangzhou, China. Info: <http://www.isse-11.org> (2/10)

2011 JANUARY

10-13. 5th International Geotechnical Earthquake Engineering Conference (5-ICEGE), Santiago, Chile. Info: www.5icege.cl (11/09)

26-28. 12th East Asia-Pacific Conference on Structural Engineering and Construction (EASEC-12), Hong Kong. Info: http://bccw.cityu.edu.hk/easec12/wp_special_session.asp (5/10)

FEBRUARY

9-12. EERI Annual Meeting, La Jolla, CA. Info: www.eeri.org/site/2011-annual-meeting. See page 1. (4/10, 9/10, 10/10)

18. Khan Lecture Series, Lehigh University, Bethlehem, PA. See page 10. (10/10)

MARCH

25. Khan Lecture Series, Lehigh University, Bethlehem, PA. See page 10. (10/10)

APRIL

8. Khan Lecture Series, Lehigh University, Bethlehem, PA. See page 10. (10/10)

MAY

16-18. Sixth International Conference on Seismology and Earthquake Engineering (SEE6), Tehran,

Iran. Info: www.see6.ir (8/10)

26-28. COMPDYN 2011: 3rd International Conference on Computational Methods in Structural Dynamics & Earthquake Engineering, Corfu, Greece. Info: <http://www.compdyn2011.org/> (10/10)

JUNE

26-28. GeoRisk 2011, Atlanta, GA. Info: www.georisk2011.org (8/10)

27-July 8. 25th International Union of Geodesy and Geophysics (IUGG) Assembly, Melbourne, Australia. Info: <http://www.iugg2011.com/> (6/09)

JULY

4-6. 8th European Conference on Structural Dynamics (EURODYN 2011), Leuven, Belgium. Info: www.eurodyn2011.org (6/10)

AUGUST

30-Sept. 1. 3rd International Workshop on Performance, Protection, & Strengthening of Structures under Extreme Loading (Protect 2011), Lugano, Switzerland. Info: www.protect2011.supsi.ch (8/10)

OCTOBER

2-6. 7th World Congress on Joints, Bearings, & Seismic Systems for Concrete Structures, Las Vegas, NV. Info: www.ijbrc.org/ (8/10)

2012

FEBRUARY

15-18. 4th International Conference on Grouting & Deep Mixing, New Orleans, LA. Info: www.dfi.org/conferencedetail.asp?id=163 (5/10)

SEPTEMBER

24-28. 15th World Conference on Earthquake Engineering (15WCEE), Lisbon, Portugal. Info: www.15wcee.org (8/10)



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EERI Newsletter, October 2010 Volume 44, Number 10

Learning from Earthquakes

New Zealand Reconnaissance Team Returns

For five days in September, the multidisciplinary team of U.S. earthquake researchers and practitioners, organized by EERI in partnership with the Pacific Earthquake Engineering Research Center (PEER), collected data and observed damage associated with the M7.1 Canterbury earthquake that struck near Christchurch, New Zealand, on September 3rd (UTC time).

The earthquake has damaged nearly 100,000 of the 160,000 buildings and homes in Christchurch, with initial estimates of losses between \$2 billion and \$4 billion. Of the almost 80 aftershocks felt and recorded, the strongest was M5.4. Reports of preliminary observations and first impressions from the field have been posted on EERI's Canterbury Earthquake clearinghouse site at: <http://eqclearinghouse.org/20100903-christchurch/>.

These early reports indicate that overriding concerns are the extent of serious liquefaction damage to homes (and other low buildings) on soft soils and sand as well as considerable damage to more than 800 URM buildings. As the character of Christchurch's downtown is based completely on the URM's, the city is

facing difficult policy decisions regarding whether to demolish or preserve them and whether to allow homeowners to repair or rebuild on lots that require soil improvement. A special earthquake report is planned to be an insert in the November *Newsletter*.

Under the leadership of UC Berkeley Professor Mary Comerio, former chair of the Department of Architecture, the EERI team consisted of Lucy Arendt, associate professor of management at the University of Wisconsin; Michael Bruneau, professor of engineering at State University of New York at Buffalo, Peter Dusicka, assistant professor at Portland State University; William Holmes, principal structural engineer at Rutherford & Chekene; Charles Roeder, professor of engineering at the University of Washington; and Fred Turner, structural engineer with the California Seis-

mic Safety Commission.

The team coordinated efforts with the New Zealand Society for Earthquake Engineering and GNS Science, as well as faculty at the University of Canterbury and the Geoenvironmental Extreme Events Reconnaissance Association (GEER) team, led by Russell Green of Virginia Tech. The EERI team was also joined by teams from AIR Worldwide, Humboldt State University, MCEER, and the U.S. Geological Survey.

The EERI team was organized under the umbrella of the Learning from Earthquakes Program, supported by the U.S. National Science Foundation.



Fissure from lateral spreading passed under this residence (photo: Tao Lai).