



EARTHQUAKE ENGINEERING RESEARCH INSTITUTE NEWSLETTER

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Obituary

George Housner, 1910-2008

EERI founder George W. Housner, the Braun professor emeritus of engineering at the California Institute of Technology, died of natural causes on November 10 at a Pasadena rest home. He was 97. Housner pioneered the modern field of earthquake engineering.

Born in 1910 in Michigan, Housner earned a bachelor's degree in structural engineering at the University of Michigan. Arriving at Caltech only months after the 1933 Long Beach earthquake, Housner obtained his master's and doctorate there, studying under Professor Romeo Martel, who had done some of the earliest work in understanding how earthquakes affect buildings. The field of earthquake engineering hardly existed at the time. EERI Past President Paul Jennings wrote in his introduction to Housner's oral history, "His was one of the first Ph.D. theses written on earthquake engineering in the United States, and he has been intimately involved in almost all of the important developments in the field, including the establishment of EERI and the International Association for Earthquake Engineering (IAEE), the establishment of the U.S.



George W. Housner

continued on page 4

News of the Institute

2009 Annual Meeting: Are Voluntary Actions the Key?

A four-year \$200 million restoration and retrofit of the Utah State Capitol in Salt Lake City was completed in 2007. The Wasatch fault is located just 200-300 yards from the building. While serving on the Capitol Preservation Board, according to the *Deseret News* (5/07/07), Ralph Becker — then a representative in the Utah State House — said significant seismic activity would have been able to "just corkscrew the building into rubble... We have the comfort of knowing we can't lose this building, we can't lose this treasure."

At the EERI-WSSPC 2009 Annual Meeting in Salt Lake City being held February 11-14, Becker (now the city's mayor) will provide "Insights from a Prominent Utah Politician and Professional Planner" during the first session

continued on page 2



Downtown Salt Lake City with the Wasatch Mountains in the background.

News of the Institute

Remember Online Voting!

If you are a regular, young professional, retired, or honorary EERI member, be sure to visit www.eeri.org/ to access the link for casting your ballot online, so you will have a voice in determining who will serve on the next EERI Board of Directors! The poll will close on January 1, 2009.

The terms of directors Jonathan Bray and Laurie Johnson will expire in 2009. Nominated to fill those two slots are William A. Anderson (National Research Council, retired) and Robert B. Olshansky (University of Illinois at Urbana Champaign) for Director A, and Craig Davis (City of Los Angeles Department of Water and Power) and Reginald DesRoches (Georgia Institute of Technology, Atlanta) for Director B.

The online ballot has links to all the candidates' biographies and vision statements. If you prefer to vote by paper ballot, contact Juliane Lane at juliane@eeri.org or call 510/451-0905 by December 15.

EERI Endowment Donors

EERI would like to thank the donors to the Endowment Fund shown below and acknowledge their recent contributions. EERI's Endowment supports those innovative projects that ensure the Institute's continuing leadership in the earthquake engineering professions.

<p>\$7,000 Pacific Gas & Electric Co.</p>	<p>\$200-\$499 William T. Holmes Terry R. Lundeen L. Thomas Tobin Howard L. Zee</p>	<p>F. Robert Preece Anthony F. Shakal Nancy Tennebaum</p>
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Remember EERI Before This Tax Year Ends

December brings with it the last chance for you to reduce next April's tax burden by making a donation to the EERI Endowment Fund. A contribution to the Endowment Fund has never been more important than it is today. We can no longer count on government funds to support fully even our most valued programs. Member contributions provide essential funding for innovative projects judged to be of value and importance to our broad-based membership and to EERI's mission, but for which traditional funding is not available.

The generosity of EERI members has allowed EERI to create many exciting programs. Your gift will enable EERI to build on this powerful momentum and support other new and deserving activities in the years ahead. The 2009 dues statement has a line to make a donation. To donate online, visit www.eeri.org and click on the donate button in the right column. Under the new Pension Protection Act of 2006, members aged 70.5 years and older may make donations from IRAs without claiming the assets as income. Please consider discussing this opportunity to support the EERI Endowment with your tax advisor.

2009 Annual Meeting

(continued from page 1)

on "Paths to Earthquake Risk Reduction." Becker is the co-founder of Bear West, a comprehensive environmental planning and policy development firm, and is also an adjunct professor at the University of Utah's College of Architecture and Planning. On February 14, meeting attendees will have an opportunity to tour the State Capitol retrofit and view the seismic isolators and unique construction details.

The other optional field trip will be led by local geologists following the Wasatch fault through Salt Lake City. According to many geologists, there is a 1-in-4 chance that a major earthquake with a magnitude of at least 6.0 will hit the Wasatch Front sometime in the next 50 years (<http://www.seis.utah.edu/qfacts/utfaq.shtml>). Unfortunately, in the November 2007 local election, Salt Lake City voters rejected a measure to replace their downtown police station with a more structurally sound facility. Mayor Becker commented that the M6.0 earthquake that struck earlier this year in Wells, Nevada, near the Utah border, underscored the police department's need for a new headquarters (<http://www.kutv.com/>).

To view the latest program for the entire Annual Meeting, visit www.eeri.org. Everything else you need to know about the meeting is also there: online registration and information about hotel reservations, poster presentations, the 6th Annual Undergraduate Seismic Design Competition, and the locale, including its ski slopes with "the greatest snow on earth." Don't procrastinate — register today, before you forget!



News of the Institute

Virtual Disaster Viewer Advances Reconnaissance

An international consortium, including EERI, has supported the development of a first-of-its-kind “social networking tool” for earthquake impact assessment — an online Virtual Disaster Viewer (VDV). Developed in conjunction with Microsoft Virtual Earth, VDV represents an exciting combination of new technologies, including satellite imagery-based damage and situation assessments by international teams of expert engineers, along with geo-referenced ground photographs and videos collected by field teams. VDV represents a new way of remotely viewing a disaster area and generating preliminary estimates of earthquake damage. It is currently being tested by a small group of EERI members, as well as by other organizations in the consortium.

This new tool, which can be viewed at <http://128.205.141.22/vdv/>, provides a virtual experience for events where there is limited access to the disaster zone, and when experts are unable to visit the zone themselves. It offers an alternative method of rapid and robust damage assessment, based on expert interpretation of satellite imagery, which can be validated later as field observations are made.

A prototype pilot VDV is being tested for the May 12, 2008, M7.9 Wenchuan, China earthquake. Satellite imagery has been acquired for some of the damaged areas and volunteers recruited to analyze before and after images. In addition, some images from the field have been uploaded to provide a more comprehensive picture of the event. The intent is that in future events, the volunteer-analyzed imagery and the field photographs will provide a new way of looking at a disaster, one that can involve investigators in immediate reconnaissance of any location around the world, from their desks.

VDV is the brainchild of earthquake experts from Europe and the USA, whose mission is to advance earthquake response, and ultimately improve engineering standards around the world. Led by EERI Subscribing Member ImageCat as VDV developer and data integrator, the consortium includes structural engineers, geotechnical experts, geographers, and social scientists from EERI, the UK-based Earthquake Engineering Field Investigation Team (EEFIT), MCEER (from Earthquake Engineering to Extreme Events), University College London’s Earthquake and People Interaction Centre (EPI-Centre), and the UK Government’s Engineering and Physical Sciences Research Council (EPSRC).

An even larger consortium has been involved in the acquisition and initial analysis of the satellite imagery, including the Geo-Engineering Earthquake Reconnaissance Association (GEER) and many of the individuals and groups that participate in the Remote Sensing Subcommittee of the Information Technology Committee of EERI, as well as participants in the International Workshop Series

on Remote Sensing for Disaster Response, supported by the USGS, MCEER, EERI, UC Irvine, and others.

Earthquake experts have been assigned specific areas or “tiles” of the affected areas to review and provide their assessment by comparing before and after high-resolution satellite images acquired by DigitalGlobe and Geoeye imagery companies. Initial information provided by these volunteer analysts includes the number of collapsed, heavily damaged and intact buildings; the number and extent of bridge damage; the area and infrastructure affected by landslides; and the location and scale of humanitarian relief operations.

EEFIT and EERI field teams are also feeding in photographs and digital video stills to provide a more complete picture of the situation in China. This data will help validate the expert satellite interpretations.

For more information, contact EERI staff member Marjorie Greene at mgreene@eeri.org. For technical inquiries, contact Beverley Adams at ImageCat (bj@imagecatinc.com).

The screenshot displays the VDV interface for the 2008 Wenchuan Earthquake. The main map shows a satellite view with various icons indicating damage levels: red triangles for collapse, yellow triangles for extensive damage, green triangles for slight/no damage, and blue triangles for indistinguishable damage. A legend at the bottom left defines these icons and other symbols like tent clusters and landslides. On the right, there are panels for 'Event Imagery' (pre and post-event), 'Analysis Results' (checkboxes for building, infrastructure, landslide, tent, and road damage), and 'Field Data' (checkboxes for video stills and photos). A small inset photo shows a collapsed school building. The interface also includes a navigation toolbar, a search bar, and a user login status.

Screenshot of the VDV interface.

George Housner, 1910-2008

continued from page 1

National and World Conferences on Earthquake Engineering, most of the major national studies and government commissions, and many of the important engineering projects of the last half century, including BART, the California Water Project, and the earthquake-resistant design of tall buildings, dams, nuclear power plants, and offshore drilling structures.”

EERI member John Hall, professor of civil engineering at Caltech, said, “George really has to be considered one of the most original and clearest thinkers ever within the entire engineering profession... He could look at a problem no one had ever thought about before and come up with a way to apply basic principles to find a practical solution.”

After graduating from Caltech, Housner went to work for the Army Corps of Engineers, then advised the Army Air Force during World War II. In 1945, Housner was given the Distinguished Civilian Service Award by the U.S. War Department in recognition of his contributions to the war effort.

After the war, Housner returned to Caltech as an assistant professor of applied mechanics. Soon he became a member of the Advisory Committee on Engineering Seismology of the U.S. Coast and Geodetic

Survey, an agency of the U.S. Department of Commerce. The committee was not successful in influencing the Survey to install more accelerographs in the western U.S. to capture strong ground motions during earthquakes. Housner recalled, “finally, out of frustration, the advisory committee decided to form its own organization” — the Earthquake Engineering Research Institute — in order to raise funds to sponsor research projects.

Housner served as vice president in 1949 on EERI’s first Board of Directors, followed by a one-year term as president in between the terms of Lydik Jacobsen and Paul Jeffers. He then returned as president for the following eleven years, from 1954 to 1965. Housner helped to organize the first U.S. National Conference on Earthquake Engineering at UCLA in 1952, and the first World Conference in 1956 at UC Berkeley, which commemorated the 50th anniversary of the 1906 San Francisco earthquake. In 1960, the Japanese held a second World Conference, at which time the IAEE was established.

Housner chaired a National Academy of Sciences committee looking into the damage from the 1964 Alaska earthquake. Soon after, he became a member of the National Academy of Engineering. He was instrumental in the design of California’s statewide water storage and transportation system. His earth-

quake engineering techniques were used to strengthen dozens of dams and aqueducts built throughout California, a system that ranks among the most ambitious engineering efforts in history. He was elected to the National Academy of Sciences in 1972 and to the American Academy of Arts and Sciences.

In 1981, Housner received the Harry Fielding Reid Medal of the Seismological Society of America. In a 1988 White House ceremony, President Reagan gave Housner the National Medal of Science, recognizing “his profound and decisive influence on the development of earthquake engineering worldwide. His research contributions have guided the development of earthquake engineering and have had an important impact on other major disciplines.” After the 1989 Loma Prieta quake in Northern California, Gov. George Deukmejian asked Housner to chair the board investigating the collapse of freeways and bridges. In 2006, he was named a Caltech Distinguished Alumnus, the highest honor bestowed on graduates. Housner was the first recipient in 1990 of EERI’s highest honor, the medal established in his name that is awarded annually. His oral history is available online at www.eeri.org or by contacting the EERI office.

Sources for this obituary include Caltech Today and the Los Angeles Times of November 15, 2008.

News of the Membership

Build Change Award

Build Change, a social enterprise with programs in Indonesia and China, has been named a 2008 Tech Awards Laureate, one of 25 global innovators recognized each year for applying technology to benefit humanity and spark global change. The Tech Museum of Innovation in San Jose, California, selected Build Change from among hundreds of nominations representing 68 coun-

tries. The award is in the “equality” category for ensuring that each homeowner has access to affordable technology to build a house that will not collapse and injure or kill their families in an earthquake, regardless of income level. Build Change was recognized during the annual Awards Gala in San Jose on November 12. EERI member Elizabeth Hausler is Build Change’s founder and CEO. For more information, visit www.buildchange.org. Tech Awards Laureates are selected

by a panel of international judges organized by the Center for Science, Technology, and Society at Santa Clara University (SCU), and made up of SCU faculty and leaders from educational and research institutions, industry, and the public sector around the world. Established in 2000, the awards recognize 25 laureates in five universal categories: education, equality, environment, economic development, and health. For more information, visit www.techawards.org.

News of the Profession

14WCEE in Beijing

More than 3,000 earthquake engineering professionals and scientists from around the globe gathered for the World Conference on Earthquake Engineering at the Jiuhua Spa and Resort in Beijing, China. This was the 14th in the series of world conferences, held every four years. With the recent May 12, 2008, M7.9 Wenchuan earthquake having occurred in China's Sichuan Province, there was much attention to its effects, lessons learned, and recovery efforts (see the 12-page insert in the October *EERI Newsletter*).

Keynote lectures were presented on earthquake disaster reduction in China by Jianmen Chen, earthquake relief construction in China by Wei Huang, performance-based earthquake engineering by Luis Esteva, disaster resilience by Kathleen Tierney, response of simple elastic systems to seismic motion by Raphael Blazquez, remote sensing technologies by Ronald Eguchi, the 2004 Indian Ocean tsunami and its lessons by Fumimiko Imamura, large structural testing by Masayoshi Nakashima, a city's capacity for disaster prevention by Li-Li Xie, performance-based seismic design of tall buildings in the U.S. by Jack Moehle, and civil protection vs. research by Mauro Dolce.

Because of the multitude of papers being presented orally and by poster, numerous concurrent sessions were held on the full range of topics in earthquake engineering. Special sessions were also held for more than 30 different specialized topics, making it a challenge to choose which sessions to attend. Proceedings from the conference were provided in CD format; information on their availability for purchase will be forthcoming.

A large exhibit hall showcased technology to mitigate earthquake effects from around the world, and especially from within China. EERI



Left: *Te Taonga O Ruaumoko*, the stolen Maori carving. Above: *The 14WCEE dinner banquet of October 16* (photo: Marshall Lew).

also exhibited at the conference and made available to the world community the wealth of EERI publications.

The 15WCEE will be held in Lisbon, Portugal, in 2012.

An Unfortunate Incident at the Conference

A valuable 37-cm-high wooden Maori carving, known as *Te Taonga O Ruaumoko*, belonging to the engineering library at the University of Canterbury, New Zealand, was stolen during the banquet on Thursday night, October 16, from a table where attendees from the university's engineering department were seated, according to an October 21 story in *The Dominion Post*. Desperate efforts were made to find it, to no avail. Security camera footage showed an unknown man stealing the carving, said a New Zealand attendee who declined to be named. "We were just staggered that we didn't notice it, and absolutely appalled." New Zealand's Embassy in Beijing was told, and Chinese police alerted airport authorities.

Carved by the late Charles Tuarau, *Te Taonga O Ruaumoko* was commissioned in 1970 by Karl Steinbrugge, the then-president of the International Association for Earthquake Engineering. *Raumoko* has been at Canterbury University since 1991 and traveled to earthquake conferences around the globe.

Announcement

2008 Khan Lecture Series

EERI member Dan M. Frangopol, Khan Endowed Chair in Structural Engineering and Architecture at Lehigh University in Bethlehem, Pennsylvania, is organizing the 2009 Fazlur Rahman Khan Lecture Series honoring Khan's legacy of excellence in structural engineering and architecture.

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

1. February 20, 2009: EERI member Leslie E. Robertson, Leslie E. Robertson Associates, R.L.L.P., New York City, on "The Architect and the Structural Engineer – Partners in Design."
2. March 20, 2009: EERI member William F. Baker, Partner, Skidmore, Owings & Merrill, Chicago and London, on "Engineering the World's Tallest: Burj Dubai."
3. April 17, 2009: Bruce R. Ellingwood, Distinguished Professor & Raymond Allen Jones Chair, CEE, Georgia Institute of Technology, Atlanta, on "Abnormal Loads and Progressive Collapse – Assessment and Mitigation of Risk."

For additional information about the series, visit www.lehigh.edu/frk-series.

Publications

Final WTC 7 Report

The final report on the collapse of the 47-story World Trade Center building 7 (WTC 7) on September 11, 2001, in New York City was released November 20 by the National Institute of Standards and Technology (NIST). The revisions to the draft WTC 7 report, released for public comment on August 21, did not alter the investigation team's major findings and recommendations, which include identification of fire as the primary cause for the building's failure.

The extensive investigation found that the fires on multiple floors in WTC 7 led to the heating of floor beams and girders, which caused column 79 to fail, initiating a fire-induced progressive collapse that brought the building down. NIST conducted an additional computer analysis to see if the loss of column 79 would still have led to a complete loss of the building if fire or damage from the falling debris of the nearby WTC 1 tower were not factors. The investigation team concluded that the column's failure under any circumstance would have initiated the destructive sequence of events.

A three-year study of the collapses of the WTC towers (WTC 1 and 2) was completed in October 2005. More than 20 changes in the U.S. model building and fire codes have already been adopted based on the investigation. NIST will continue working with various public and private groups toward implementing additional code changes based on recommendations from both reports.

The complete text of the final WTC 7 report, a video describing the findings, a listing of all comments received on the draft report, a chart tracking the progress toward implementing all of the NIST WTC recommendations, and other materials may be accessed at <http://wtc.nist.gov>.

Geotech Case History Proceedings

The proceedings of the Sixth International Conference on Case Histories in Geotechnical Engineering and Symposium in Honor of Professor James K. Mitchell can be ordered online for \$250 by visiting <http://www.6icchge2008.org>. The 6ICCHGE was held in August 2008 in Arlington, Virginia. Consisting of a CD-ROM and printed abstract volume, the proceedings contain 336 papers from 720 authors from 53 countries and represent the state of the art and practice around the world.

This series of conferences has influenced the way case histories in geotechnical engineering are used to carry out safer, more cost-effective projects and to train geotechnical engineers to face the challenges of 21st century projects.

Call for Applications

Summer Academy on Social Vulnerability

Qualified Ph.D. candidates who have an interdisciplinary focus and are working on dissertations related to environment, social vulnerability, disaster risk reduction, resilience, and institutional management and change are invited to apply for the Fourth Annual Summer Academy on Social Vulnerability. The deadline for submitting applications online at www.ehs.unu.edu/article:629?menu=31 is January 15, 2009. Sponsored by the Munich Re Foundation and the United Nations University Institute for Environment and Human Security, the academy will take place July 26 – August 1, 2009, near Munich, Germany. The entire working week will be devoted to a simulation representing a real-world situation.

Calls for Papers

ATC-SEI Existing Buildings Conference

The Applied Technology Council (ATC) and the Structural Engineering Institute (SEI) of the American Society of Civil Engineers have issued a call for papers for a conference on Improving the Seismic Performance of Existing Buildings and Other Structures, at the Hyatt Regency San Francisco, December 9-11, 2009. The deadline is February 27, 2009, for abstracts and session proposals for state-of-the-research and state-of-the-practice presentations on seismic evaluation and rehabilitation of existing buildings including case studies, new discoveries, innovative use of new technologies and materials; implementation issues; needed improvements to existing standards, and socio-economic issues. The program will include a black-tie gala at the San Francisco Ferry Building celebrating new innovations in seismic strengthening over the last decade. For more information regarding the conference and submitting an abstract or session proposal, visit www.ATC-SEI.org.

Protect 2009

The Second International Workshop on Performance, Protection, and Strengthening of Structures under Extreme Loading (Protect 2009) is scheduled for August 19-21, 2009, in Hayama, Japan. It will be a multidisciplinary forum aimed to enhance understanding of underlying complex issues and challenges. Original papers are sought on performance and strengthening of structures under extreme loads, performance of materials, structural management and protection, and related topics.

Abstracts not exceeding one page should be e-mailed to fujikake@nda.ac.jp by January 31, 2009. For more details on topics and other information, visit www.nda.ac.jp/cc/users/fujikake/protect2009.

Call for Papers

Forensic Engineering Conference

You are invited to submit abstracts for workshops, sessions, or papers for the 5th Congress on Forensic Engineering, scheduled for November 10-15, 2009, in Washington, D.C., sponsored by ASCE's Technical Council on Forensic Engineering (TCFE).

TCFE welcomes your input on topics, tracks, short courses, or special symposia. As TCFE celebrates 25 years of service, it invites reflection on a quarter century of construction pathology — understanding why and how structures fail. Session proposals and paper abstracts no longer than one page can be submitted at <http://content.asce.org/conferences/forensics2009/index.html> by clicking on the "Call/Submissions" button and following the link. This site has information on all aspects of the conference.

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

DECEMBER

15-19. The American Geophysical Union 2008 Fall Meeting, San Francisco, CA. Info: <http://www.agu.org/meetings/fm08/> (6/08, 9/08)

2009

JANUARY

20-21. 6th Annual NEHRP Workshop on EQ Hazards Investigations in Northern California, Menlo Park, CA. Info: <http://earthquake.gov/regional/nca/workshop/> (12/08)

FEBRUARY

10-13. Map World Forum, Hyderabad, India. <http://www.mapworldforum.org/2009/index.htm> (7/08)

11-14. EERI Annual Meeting, Salt Lake City. Info: www.eeri.org. See page 1. (3/08, 6/08, 9/08, 10/08, 11/08, 12/08)

20. 1st in Khan Lecture Series, Bethlehem, PA. See page 5. (12/08)

MARCH

20. 2nd in Khan Lecture Series, Bethlehem, PA. See page 5. (12/08)

APRIL

8-10. Annual Meeting of the Seismological Society of America, Monterey, CA. Info: <http://www.seismosoc.org/meetings/meetings.html> (7/08)

17. 3rd in Khan Lecture Series, Bethlehem, PA. See page 5. (12/08)

MAY

31-June 3. 11th Canadian Masonry Symp., Toronto, Ontario, Canada. www.canadianmasonrysymposium.org/ (12/08)

JUNE

1-3. SEM Annual Conf. & Expo on Experimental and Applied Mechanics, Albuquerque, NM. Info: <http://sem.org/CONF-AC-TOP.asp> (9/08)

15-17. Int'l Conf. on Performance-Based Design in EQ Geotech Eng., Tokyo, Japan. Info: <http://www.comp.tmu.ac.jp/IS-Tokyo/> (6/08)

21-24. 19th World Conference on Disaster Management (WCDM), Toronto, Canada. Info: www.wcdm.org/ (10/08)

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

28-July 1. TCLEE Conf.: Lifeline EQ Eng. in a Multihazard Environment, Oakland, CA. Info: www.asce.org/tclee2009 (8/08, 10/08)

AUGUST

19-21, 2nd Int'l Wkshp on Performance, Protection, and Strengthening of Structures under Ex-treme Loading, Hayama, Japan. See page 6. (12/08)

SEPTEMBER

13-17. 10th Int'l Conf. on Structural

Safety & Reliability (ICOSSAR2009), Osaka, Japan. Info: www.sc.kutc.kansai-u.ac.jp/icossar2009 (2/08)

OCTOBER

2-3. EQ Geotech. Eng. Satellite Conf., Alexandria, Egypt. Info: mamsakr@yahoo.com.

5-9. 17th Int'l Conf. on Soil Mechanics and Geotech. Eng., Alexandria, Egypt. Info: <http://www.2009icsmge-egypt.org/> (12/08)

NOVEMBER

10-15. 5th Congress on Forensic Engineering, Washington, D.C. See this page. (12/08)

DECEMBER

9-11. Improving the Seismic Performance of Existing Buildings and Other Structures, San Francisco, CA. See page 6. (12/08)

2010

MAY

24-29. 5th Int'l Conf. on Recent Advances in Geotech. EQ Eng. & Soil Dynamics and Symposium in Honor of I. M. Idriss, San Diego, CA. Info: 5geoeqconf2010.mst.edu (4/08)

JUNE

22-24. 2nd Int'l Conf. on Computational Methods in Structural Dynamics and EQ Eng., Rhodes, Greece. Info: www.compdyn2009.org (11/08)

JULY

11-15. 5th Int'l Conf. on Bridge Maintenance, Safety and Management (IABMAS2010), Philadelphia, PA. Info: <http://www.iambas2010.org> (11/08)

25-29. 9th U.S. Nat'l & 10th Canadian Conf. on EQ Eng.: Reaching Beyond Borders, Westin Harbour Castle Hotel, Toronto, Canada. Info: 2010eqconf.org (2/08, 7/08)

AUGUST

30-Sept. 3. 14th European Conf. on EQ Eng. (14ECEE), Skopje-Ohrid, Macedonia. Info: www.eae.ee.boun.edu.tr/eae.htm (12/08)

News of the Institute

Contributions of Earthquake Engineering

EERI is pleased to announce that a new publication, *Contributions of Earthquake Engineering to Protecting Communities and Critical Infrastructure from Multihazards*, is available as a free download online from <http://www.eeri.org/>.

Authored by Thomas D. O'Rourke, Thomas Holzer, Christopher Rojahn, and Kathleen Tierney — all EERI members — this 62-page report lays out the wide-ranging contributions of earthquake engineering that enhance public safety

and improve the protection of U.S. communities from hazards beyond earthquakes. Four categories are chosen to identify major contributions and present representative examples: planning, advanced technologies, emergency response, and community engagement.

The enactment by Congress of the National Earthquake Hazards Reduction Program (NEHRP) enabled the earthquake community to improve the perception, quantification, and communication of risk. It also

has given rise to a unique multidisciplinary culture that integrates basic and applied research into design codes, construction methods, and public policy. The goals of the report are to help the earthquake community define its role in a multihazard world with an understanding of its contributions to multihazard mitigation, and to make the general public, governmental agencies, and elected representatives and their staffs aware of the impact and value of their investments in NEHRP.

A printed black and white version of the report is also available for \$10 from the EERI office or the online store.

Learning from Earthquakes

M7.3 Sulawesi, Indonesia, Earthquake

An M7.3 earthquake occurred in Sulawesi, Indonesia, at 01:02:31 on November 17, 2008 (local time) at latitude 1.290°N, longitude 122.100°E, at a depth of 30 km. The earthquake occurred as a result of thrust faulting on a plate boundary that is marked by the North Sulawesi trench, separating the Celebes Sea basin and the Minahassa peninsula. This is an

area that has seen many large earthquakes, where many small plates are accommodating large-scale convergence between the Australia and Eurasia plates. The earthquake occurred about 25 km off the northern coast of the Minahassa peninsula, where the Celebes Sea basin (commonly considered part of the Sunda plate) is moving south with respect to the peninsula (part of the Molucca Sea plate) at a velocity of about 30 mm/year. The lithosphere of the basin is thrust beneath that of the peninsula and is seismically active to a depth of about 250 km.

At least six people were killed, hundreds were injured, and more than 1,000 buildings collapsed in Boul and Gorontalo. Communication and other lifelines were disrupted. The earthquake was felt as far away as Australia and the Philippines. A small tsunami was observed, according to local residents. Numerical simulation by scientists at the Institute of Geological and Nuclear Sciences in New Zealand showed that a tsunami up to 30 cm high was generated along the north coast of Gorontalo (north Sulawesi Island).



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