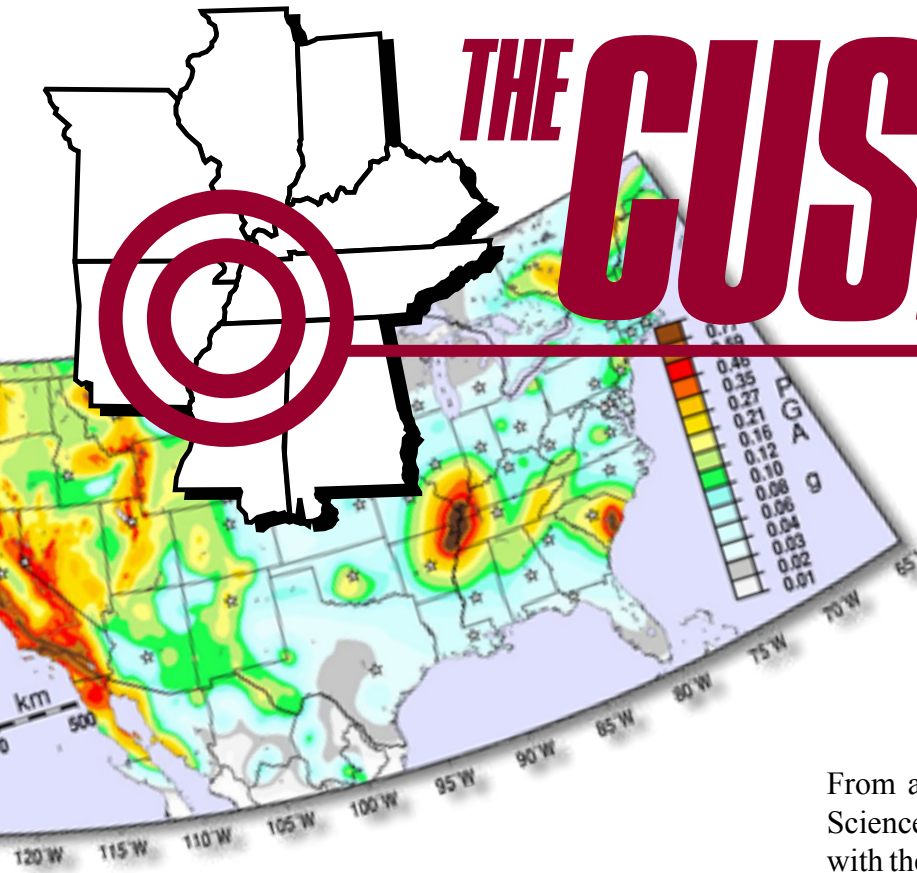


THE CUSEC JOURNAL

THE OFFICIAL NEWSLETTER OF
THE CENTRAL UNITED STATES
EARTHQUAKE CONSORTIUM

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EMERGENCY MANAGEMENT AND RESEARCH PROFESSIONALS WORKING TOGETHER TO BUILD SAFER COMMUNITIES

This map shows anticipated Peak Ground Acceleration (PGA) for earthquakes in the United States and was developed by the US Geological Survey. Maps like these help emergency management and policy makers build many different products, from building codes to response plans.

From a federal perspective, David Applegate, Senior Science Advisor for earthquake and geologic hazards with the US Geological Survey (USGS), says that in his experience, emergency responders are very interested in pre and post earthquake information, because it helps them in terms of situational awareness and facilitating preparedness. For example, the rapid delivery of post event information from the 5.2 earthquake magnitude on April 18 at the Illinois-Indiana border helped emergency responders to take precautionary measures which included several evacuations. He mentioned that town-hall meetings and other outreach activities also serve as an opportunity for researchers and emergency responders to work together to inform communities in the central US of the earthquake hazard.

On the same note, Applegate stated that their (researchers') work continues to be put to good use. Seismic hazard assessments at both the national and urban scale provide and support mitigation activities. Right now, as part of the NMSZ Catastrophic Planning Initiative, CUSEC Member States are busy carving

With a mutual respect for each group's approach to saving lives, emergency responders and researchers have been working together for more than a year to help mitigate the losses in the central US in the event of a New Madrid Seismic Zone (NMSZ) earthquake. Before March of 2007- the beginning of the NMSZ Catastrophic Planning Initiative- central US emergency responders and researchers have had limited interaction through collaboration on other projects; even though they share the same earthquake hazard and concern for communities throughout the region. The Catastrophic Planning Initiative has proven beneficial for CUSEC Member States and of both research and emergency management communities.

According to Missouri State Emergency Management Agency (SEMA) Earthquake Program Manager Steve Besemer, partnering with his State Geological Survey helped to bring several issues to the forefront such as: coordinating the set-up and operation of a post-earthquake technical clearinghouse as well as broadening the anticipated responsibilities of the survey during the response phase of a New Madrid seismic event.

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out a response plan - that addresses a catastrophic NMSZ earthquake - with the use of valuable information provided by the USGS and Member State Geologists. In addition, Chris Cramer with the Center for Earthquake Research and Information at the University of Memphis, is supporting the Planning Initiative by developing hazard map scenarios that are helping emergency responders talk out solutions to regional issues - in a workshop setting- that will be shared in the aftermath of a damaging New Madrid earthquake. One piece of research information that has been beneficial to the response and recovery planning process has been provided by the Mid-America Earthquake Center (MAEC).



THE MAE CENTER REPORT

After nearly two years of data collection and numerous meetings, members of a scenario development task force, comprised of

representatives from CUSEC, the MAE Center, the Federal Emergency Management Agency (FEMA), Virginia Tech, George Washington University and other organizations - crafted a NMSZ earthquake scenario unique to each CUSEC Member State. The scenario for each state describes circumstances surrounding either a New Madrid, Wabash Valley, or East Tennessee Seismic Zone earthquake with a magnitude ranging from 5.9 to 7.7. The MAE Center, one of three national earthquake engineering research centers established by the National Science Foundation and its partner institutions under the National Earthquake Hazard Reductions Program (NEHRP), is the lead organization for the development of the scenario, and has published a detailed report that shows the analysis of four major areas in the central US that would be impacted by a damaging earthquake along either of the seismic zones mentioned above. Those areas of analysis are: 1) Hazard, 2) Inventory, 3) Fragility and 4) Social.

Hazard - The earthquake hazard is characterized by the shaking of the ground and the changes to the ground that result from the shaking. One way to

estimate shaking is to use attenuation functions and relationships. Attenuation means to lessen the amount, force magnitude, or value of; or to reduce in severity. Attenuation relationships help to show the propagation, or the spreading of something into new regions, of shaking from what is commonly called the epicenter.

A preferred way for scientists to define the earthquake hazard is through Line Source Modeling, which involves the rupture of an entire fault segment, and may account for the direction of the rupture in the estimation of ground motion. Other components required for a complete definition of the earthquake hazard include: Soil Amplification-used to adjust the ground motion for local soil conditions since different soil type affect the surface shaking nature. Liquefaction-refers to the change in phase of partially saturated soil deposits that may completely lose cohesion during prolonged shaking - meaning the soil has the potential to transform into quicksand like material therefore losing its ability to support building structures. Landslides-the potential of soil deposits to slide during or shortly after the earthquake.

Inventory - Inventory is all of the components of a built environment such as schools, hospitals, highway bridges, pipelines and levees; and the demographic area which includes the general population broken down by income, ethnicity, education and age. Along with these previously mentioned items, other various types of information such as building type, construction material, height age, design level and soil conditions are all packaged into an impact assessment software called HAZUS-MH MH2. This software program is used to help determine direct economic losses of an area after a damaging earthquake. Many other inventory items such as mass public transit systems, cell phone towers or historical landmarks can be added to find out the impact on a specific site issues..

Fragility - Fragility functions - also referred to as vulnerability functions - are used to relate the intensity of ground shaking to a particular level of damage occurring. For example, if a certain level of shaking is experienced by a structure, a fragility function will estimate how likely it is that this particular structure will incur various levels of damage.

Social - Social impacts include requirements directly associated with a population in a post-disaster environment. The HAZUS-MH MR2 software can be used to help estimate the number of displaced households based upon the damage to residential buildings along with building classification—single family, multi-family dwelling, etc. Additional social impact models can include more detailed information concerning food, refrigeration, sleeping, space and water requirements for a shelter seeking population. HAZUS-MH MR2 can also estimate the number of casualties at four levels ranging from minor injuries not requiring hospitalization to fatalities.

The complete report “Impact of Earthquakes on the Central USA” contains more detailed information concerning post-earthquake conditions which include: results of the earthquake impact assessments relating to direct damage and functionality as well as social impact at the state and regional level, with some comparisons to other published studies. The report also includes a number of appendices, charts and shake maps to help illustrate study results. It can be downloaded from the MAE Center website, <http://www.mae.ce.uiuc.edu>

CURRENT EARTHQUAKE RESEARCH

USGS/NEES Earthquake Study Project in the New Madrid Seismic Zone



There are a number of earthquake research projects underway in the central US. Since 2006, the USGS along with the University of Memphis and the Network for Earthquake Engineering Simulation (NEES) at the University of Texas in Austin have been exploring the sediments beneath the Mississippi River valley near Lepanto, Crowley’s Ridge and southwest of Jonesboro, Arkansas. Using a 12,000 pound truck named Thumper, researchers are vibrating the ground and listening to echoes in order to ‘see’ into sedimentary layers that are hidden beneath thousands of years worth of river deposits. This study is revealing evidence of past earthquakes in the central US and will help researchers

to better understand how the soil responds to shaking. The goal of this particular project is to acquire a continuous seismic cross section across the Reelfoot Rift to examine past earthquake history in the NMSZ. At this point, researchers have acquired 31km of seismic profile and presented some preliminary results at the 2007 Seismological Society of America meeting.

NEW MADRID REGION COMMUNITY SEISMIC VELOCITY MODEL

Scientists are seeking to better understand the central US earthquake threat, and to avoid catastrophic losses due to a 1811/1812 repeat event, researchers with USGS are planning to produce and support numerical simulations of earthquake rupture and seismic wave propagation. USGS began this effort with the development and construction of a community seismic velocity model. So far, researchers have collected data regarding p- and s-wave velocities, and other soil-related information. The region of study covers an area of approximately 600,000km² from Little Rock, Arkansas across to Nashville, Tennessee up to St. Louis, Missouri.

EERI NEW MADRID EARTHQUAKE SCENARIO

The Earthquake Engineering Research Institute (EERI), a not-for profit professional society, has been a leader in creating earthquake engineering science and also in creating scenarios. The New Madrid Chapter of EERI, under the leadership of Dr. Greg Hempen, has begun development of the New Madrid Earthquake Scenario (NMES). The NMES will follow EERI’s Guidelines for Developing an Earthquake Scenario (March 2006). “A well crafted scenario provides a powerful tool for members of private industry, government officials, and the general public to begin to draft mitigation policies and programs” (Guidelines for Developing an Earthquake Scenario, 2006).

The NMES will provide a comprehensive impact assessment of scientifically credible earthquakes in the New Madrid Seismic Region. The Scenario will include risk-reduction recommendations for individual, public and corporate interests from future, Central United States earthquakes. The Scenario is intended to provide intermediate data and products, culminating in a report in February 2012, during the New Madrid Bicentennial events. For more information on NMES, visit <http://newmadrid.eeri.org/>

MORE EARTHQUAKE RESEARCH PROJECTS IN THE CENTRAL U.S.

St. Louis Earthquake Hazards Mapping Project

- Geologic mapping in 15 of 29 St. Louis area quads – project is completed
- Liquefaction hazard mapping in 12 quads is completed
- Mapping on 4 more quads to be completed by the end of 2009 with support funding from MoDNR
- Hazard maps for 3 pilot quads are completed and are under review by the St. Louis working group

Evansville Urban Hazard Mapping Project

- This project is on-going with participation from both the public and private sectors
- Preliminary hazard mapping has been completed and is under review
- Hazard calculation codes will be updated to comply with 2008 USGS National Map

FUTURE RESEARCH INITIATIVES

Researchers with the Center of Earthquake Research and Information (CERI) at the University of Memphis are working on a proposal to obtain funding to participate in one of many projects led by Earthscope to monitor seismic activity across North America. This Earthscope project entails the permanent installation of seismic stations complete with instrumentation in an earthquake prone areas in the central US. The stations would measure and record the frequency of seismic activity in the region as well as tell scientists how the plate boundaries in the area are deforming. The USGS and the Advanced Network for Seismic Study (ANSS) will oversee location and parameters for each seismic station as well as manage all data collected. The benefits of these stations include:

- Improved hazard estimates to improve seismic provisions in building codes
- Provide faster response to emergency management officials after a disaster, potentially saving lives

This study is already underway in California, and researchers in the central US hope to find sponsors to adopt stations across the region - each station would cost 22 thousand dollars, with a yearly five thousand dollars in maintenance costs.

On the same note, Earthscope has been conducting a similar seismic study called the “Transportable Array Installation Plan,” which is being led by Earthscope’s US Array Seismic Observatory. Beginning in the states of California, Oregon and Washington, the Transportable Array of 400 broadband seismometers have been traveling east across the United States every two years since 2004. With funding support from the National Science Foundation (NSF), the 400 seismometers provide increased resolution of lithospheric (the outer part of the solid earth composed of rock essentially like that exposed at the surface, consisting of the crust and outermost layer of the mantle, and usually considered to be about 60 miles [100 kilometers] in thickness) and deep Earth structure. These seismometers are scheduled to be installed in the New Madrid and Wabash Valley Seismic Zones during 2011 and will remain for 18 months. The installation of these instruments will coincide with the region’s New Madrid Bicentennial observance—the commemoration of the great New Madrid earthquakes that occurred in the central US during the winter of 1811 & 1812.

For more information on these initiatives, please visit the Earthscope webpage at - visit www.earthscope.org.



AROUND THE REGION

MEMBER STATE SPOTLIGHT - ALABAMA

by Charlisa Ussery

Alabama Earthquake Program Manager

Alabama Emergency Management Agency's (AEMA) Earthquake program resides in the Natural Hazard's Branch of the Preparedness Division. Primary partners in AEMA's earthquake program are the Geological Survey of Alabama, CUSEC, and FEMA. The decision by the CUSEC Board to add this state as a Member State came partially on the heels of a 4.6 magnitude earthquake that occurred near Fort Payne, Alabama on April 18, 2003. Since becoming a member state of CUSEC in 2003, AEMA has hosted several training opportunities and workshops and participate in CUSEC hosted meetings. As a result of initial training opportunities, interest in more CUSEC sponsored training has increased. The agency's earthquake program has made major progress in the past years with regards to earthquake awareness in the state, but there is still much that needs to be done for preparedness.

The main priorities of AEMA are to save lives, protect property, and safeguard the environment. With this in mind, the agency is proactively involved in the catastrophic planning initiative for the New Madrid Seismic Zone - a project to increase national readiness for a catastrophic earthquake in the region. AEMA has scheduled workshops with local and state personnel to better enhance our response capabilities and planning processes. These workshops will prepare the agency for any major exercises that we may have in the future.

AEMA's all hazards public awareness campaign added an Alabama Earthquake brochure that was created by the Geological Survey of Alabama for the state's citizens. This document has been used to educate local and state personnel on the history of earthquakes in Alabama. As the program evolves, AEMA may include activities such as Earthquake Awareness Day. Currently, AEMA has scheduled a local only workshop for late Fall and in the process of scheduling an EMC workshop for state agencies in support of our catastrophic planning initiative.

AEMA Director Brock Long was appointed by Governor Riley in January of 2008 to oversee the agency's daily operations. He has worked in emergency management at state and federal levels specializing in planning and response for ten years. Since February, Long has served as Southeast Regional Director for Beck Disaster Recovery, a company that specializes in emergency planning, disaster training and post-event recovery. Charlisa Ussery became AEMA Earthquake Program Manager in October of 2007. Her duties include directing the agency's earthquake program activities.



The Alabama Emergency Management Agency (AEMA) serves to keep Alabamians safe from potential disaster and to minimize physical or financial suffering from these events. AEMA provides around-the-clock monitoring of varying conditions throughout the state (weather developments, etc.) and provides the absolute highest standard of safety for Alabama citizens in times of crisis. AEMA coordinates timely emergency assistance to local communities when they are affected by disasters such as tornadoes, floods or hurricanes. In the event of any situation or disaster that escalates beyond local government control, AEMA works on behalf of Alabama citizens to ensure prompt assistance on both the state and federal levels.

ASSOCIATE STATE SPOTLIGHT OKLAHOMA



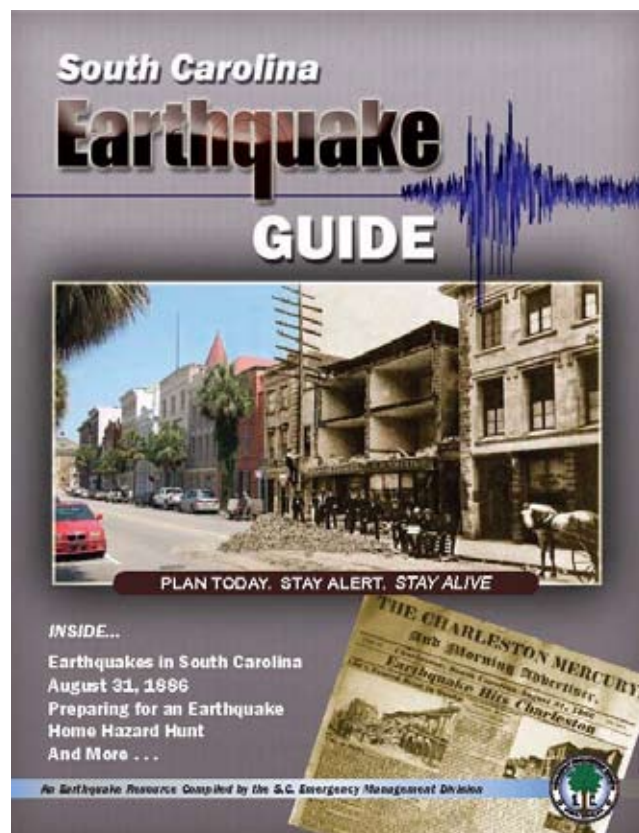
Oklahoma, a CUSEC Associate State, has a moderate earthquake risk as a result to its proximity to the New Madrid Seismic Zone. As a member

of the Emergency Assistance Management Compact (EMAC)—a mutual aid agreement and partnership between the emergency management agencies of the 50 states in the country for disaster response—Oklahoma Department of Emergency Management (ODEM) will provide personnel, supplies, equipment and housing for evacuees from any CUSEC member state in the event of a damaging NMSZ earthquake. Albert Ashwood has served as the state director of the Oklahoma Department of Emergency Management (ODEM) since 1997. During his tenure, he has spearheaded many of the state's response/recovery efforts—including the May 3, 1999 tornadoes, the December 2001/January 2002 ice storms and the I-40 Bridge Collapse. Ashwood also serves on a new U.S. Homeland Security oversight team. Bonnie McKelvey is ODEM's Planning, Training and Exercise Manager.

SOUTH CAROLINA RELEASES NEW EARTHQUAKE GUIDE

Since the week of September 21st, residents in and around Charleston, South Carolina have been enlightened with lifesaving information from their state's emergency management agency. Through daily and non-daily newspapers, the South Carolina Emergency Management Division (SCEMD) has distributed more than 370,000 copies of their new "Earthquake Guide" informational poster. The guide contains information pertaining to the history of earthquakes in South Carolina, advice on how to prepare and what to do if a damaging earthquake occurs in the state. Although the guide was not distributed statewide, it has become a popular item for reading, teaching and studying. "It has truly been well received. We are getting requests for the Guide from all over especially from science teachers who want to use it in their classrooms. It's truly been a best seller," said Tammie Dreher, SCEMD Earthquake Program Manager. As a CUSEC Associate State, South

Carolina promotes earthquake preparedness through an education program at the College of Charleston's Department of Geology and Environmental Sciences, which was initiated in the spring of 2007, and is funded by the SCEMD. An electronic copy of the "Earthquake Guide" can be downloaded from SCEMD's website at www.scemd.org.



CUSEC SUPPORTING MULTIPLE EFFORTS FOR EARTHQUAKE RISK REDUCTION

NEW MADRID CONFERENCE - Rolla, Missouri
CUSEC Emergency Planner, Roger Arango and Exercise/Training Officer, Paul Hogue presented information about CUSEC's current Exercise/Training Program and Disaster Medicine 101 Course during the New Madrid Seismic Zone (NMSZ) Conference held in Rolla, Missouri from August 12-14. In a class of more than 30 conference attendees, Arango presented a shorten version of CUSEC's Disaster Medicine 101: "Post-Earthquake Public Health and Medical Issues." In addition to presenting information about the central US earthquake threat, Arango talked about topics including the role of the environmental

health specialist during a disaster, earthquake disaster related injuries and injury prevention and disaster mental health consequences for responders. Participants in this class ranged from working backgrounds such as public health, emergency managers and representatives from volunteer organizations and the insurance industry. In a separate session, CUSEC Exercise/Training Officer, Paul Hogue gave an overview of the 2007 Spills of National Significance (SONS07) Exercise and how three CUSEC member states ran concurrent earthquake exercises. Participants in this session mainly consisted of emergency managers. Hogue also attended a tabletop exercise that explored how science can assist the local responder.

CITIES READINESS INITIATIVE - West Memphis, Arkansas

CUSEC Exercise/Training Officer, Paul Hogue was a keynote speaker at a briefing for the “Cities Readiness Initiative” (CRI)—a federally funded effort to increase the capacity of major U.S. cities and metropolitan areas to effectively deliver medicines and medical supplies during a large-scale public health emergency caused by infectious agent infections. Hogue gave a general briefing on earthquakes and earthquake safety. Attendees for this briefing were primarily public health officials and representatives from other organizations interested in post-earthquake public health issues. Myra Jane Biggers, Earthquake Planner for Arkansas Department of Emergency Management (ADEM) also spoke briefly to attendees. Biggers’ presentation covered earthquake planning considerations that are geared toward County Emergency Management Agencies (EMA). She reminded attendees of the ten basic earthquake planning principles that ADEM and the County EMAs are working on. These principles are: 1) Disaster Support Area, 2) Distribution Points, 3) Points of Assembly, 4) Alternate Transportation Sources, 5) Resources for Fuel, 6) Medical Teams of Locals, 7) Estimates of Supplies Needed, 8) Post-Earthquake Structure Inspectors, 9) Backup Communications Plan and 10) Hazardous Materials.

DELTA REGIONAL AUTHORITY - Clarksdale, Mississippi

Central US Earthquake Consortium (CUSEC) Executive Director, Jim Wilkinson presented earthquake information to 25 congressional staffers—Legislative correspondents, directors and interns—on August 19, during the Delta Regional Authority (DRA) Congressional Tour held on August 18-21. The tour included stops in Little Rock, Arkansas, Clarksdale, Mississippi and New Orleans, Louisiana. Wilkinson talked about the CUSEC organization and its role in the central US earthquake effort. He outlined the geological conditions in the region which makes earthquakes in the central US an unique occurrence. In his presentation, Wilkinson also explained what consequences central US residents can expect from a New Madrid Seismic Zone damaging earthquake, including secondary hazards such as fires, levee failure and the release of hazardous materials.

As Wilkinson spoke about CUSEC projects and activities, he highlighted one CUSEC/FEMA on-going project in particular that brings members of local, state and federal agencies together to address issues that will be faced in the time of a catastrophic earthquake, the New Madrid Seismic Zone Catastrophic Planning Initiative. The mission of the initiative is to increase national readiness for a catastrophic earthquake in the NMSZ. Ultimately, federal officials hope to produce the following beneficial products from this initiative:

1. A comprehensive catastrophic earthquake planning scenario for the central U.S.
2. State NMSZ Catastrophic Earthquake Response Annexes
3. Federal regional NMSZ Catastrophic Earthquake Response Annexes
4. An overall national plan for a New Madrid earthquake scenario that integrates all of the aforementioned plans into a single response system
5. A plan maintenance schedule and materials for training and exercises for the individual plan annexes and the overall national plan.

According to the DRA website <http://www.dra.gov>, this organization works to improve life for the residents of 252 counties and parishes in parts of the following eight states: Alabama, Arkansas, Illinois, Kentucky, Louisiana, Mississippi, Missouri and Tennessee.

IEMA CONFERENCE - Springfield, Illinois

In his presentation “CUSEC, the NMSZ and the 2011 Earthquake Exercise,” CUSEC Exercise and Training Officer Paul Hogue described CUSEC, its role in the central US earthquake planning effort, the science of earthquakes in the region, the New Madrid Seismic Zone (NMSZ) Catastrophic Planning Initiative and the 2011 National Exercise at the 12th annual Illinois Emergency Management Agency (IEMA) Conference in Springfield, Illinois on September 3. Attendees were enlightened with facts from Hogue’s presentation that explained the earthquake history of the region and the underlining geological conditions that make earthquakes in the central US different from California. Hogue outlined the effects in the region from a major NMSZ earthquake giving detailed information about the natural effects to the environment, disruption to the central US infrastructure and the impact on the nation’s economy. He also talked about current government earthquake planning efforts placing special emphasis on the CUSEC/FEMA project the New Madrid Seismic Zone Catastrophic Planning Initiative, which is designed to increase national readiness in the event of a damaging earthquake in the NMSZ. The ultimate goals of this initiative include:

Hogue also highlighted plans for a 2011 Tier One National Level Exercise—a scenario based around a 7.7 magnitude New Madrid Earthquake-sized event.

KENTUCKY EMERGENCY SERVICES CONFERENCE -

Lexington, Kentucky: During his attendance at the Kentucky Emergency Services Conference in Lexington, Kentucky on September 2, 2008, Central US Earthquake Consortium (CUSEC) Earthquake Coordinator, Brian Blake gave a presentation to other conference attendees about the current status of earthquake planning and preparedness efforts in the central US. His presentation covered the following topics:

- CUSEC Organizational Overview
- Catastrophic Planning Overview
- Catastrophic Earthquake Scenarios
- Community Preparedness Activities
- Earthquake Mitigation
- Current CUSEC Initiatives

SEISMOLOGIST JOINS MEMPHIS USGS OFFICE



Dr. Oliver Boyd has been a Seismologist with the U.S. Geological Survey since 2004 and has recently joined the USGS team in Memphis. He is also an Adjunct Professor at the Center for Earthquake Research and Information at the University of Memphis.

Oliver studies many aspects of earthquake hazard and has helped to update how the New Madrid seismic zone (NMSZ) is characterized in the 2008 update of the National Seismic Hazard Maps. Other recent projects include a time-dependent seismic hazard map of Alaska and a seismic hazard analysis of Afghanistan, the latter being done in conjunction with other reconstruction efforts in Afghanistan.

Prior to joining the survey, Oliver obtained his graduate degrees at the University of Colorado at Boulder where he performed laboratory experiments on how seismic energy dissipates with distance from a seismic source and used earthquakes to produce three-dimensional maps of temperature and composition beneath the western United States. To learn more about Oliver’s background and current work visit http://www.ceri.memphis.edu/about_us/boyd.html. CUSEC looks forward to working with Oliver and the USGS over the coming years.

NEMA ELECTS ADEM DIRECTOR AS VICE PRESIDENT

*by Renee Preslar
ADEM Public Information Officer*

In September of this year, Arkansas Department of Emergency Management (ADEM) Director and CUSEC Board of Directors Vice Chairman David Maxwell was elected vice president of the National Emergency Management Association (NEMA). He will serve as vice president in 2009 and president in 2010. After his term as president, he will serve as an advisor to the next president. NEMA is the professional association of emergency management directors from

all 50 states, as well as eight territories and the District of Columbia. The association provides national leadership and expertise in comprehensive emergency management; serves as a vital emergency management information and assistance resource; and advances continuous improvement in emergency management through strategic partnerships, innovative programs and collaborative policy positions.

Maxwell supervises the State's emergency/disaster activities and collaborates with the Governor, constitutional offices, and other officials at all levels of government and various governmental entities. Maxwell has made emergency management his career. He is ADEM's senior tenured employee, providing almost 30 years of service with the agency. He became director of the agency on June 30, 2006, after serving as deputy director since March 2002.



TENNESSEE RECEIVES \$3.4M GRANT FOR EARTHQUAKE MITIGATION

by Tennessee Emergency Management Agency

Governor Phil Bredesen has announced the release of \$3,415,006 for two projects in Tennessee through the Federal Pre-Disaster Mitigation grant program. In Shelby County, a grant of \$2.6 million will allow Memphis Light, Gas & Water to reduce the risk to its electrical grid from earthquakes.

“This project is a good example of a proactive step designed to protect the citizens of Tennessee,” said Bredesen. “Successful mitigation efforts can reduce substantially the amount of public money that has to be spent later for disaster recovery efforts.”

In Memphis, the mitigation project will involve conducting seismic retrofits on 110 high-voltage transformers. The retrofits mean these key pieces of the electrical grid will be less likely to sustain damage during an earthquake. Installed before seismic standards had been adopted, these transformers are

currently unanchored and represent 63 percent of the electrical transformers in the system.

If these transformers were to fail from an earthquake, it would impact a substantial portion of the electrical service in Shelby County and the surrounding service area. This would affect more than 900,000 residents, according to the grant application.

“Mitigation is often overlooked, but by preventing a crisis from occurring, it can save lives and money,” said Jim Bassham, director of the Tennessee Emergency Management Agency (TEMA), which oversees management of the grants.

The retrofit is expected to save \$5.50 for every dollar spent, based on the benefit-cost analysis conducted as part of the grant application process.

The Pre-Disaster Mitigation grant program, administered by the FEMA, provides funds to states, territories, Indian tribal governments, communities and universities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. Funding these plans and projects reduces the overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations.

By performing mitigation projects for hazards that could affect an area, local governments are able to reduce the potential damage and consequently the costs of responding to disasters. More information on FEMA's Pre-Disaster Mitigation Grant Program can be found online at www.fema.gov/government/grant/pdm/index.shtm.

NEW CERi DIRECTOR

by Gary Patterson

Center for Earthquake Research & Information

The University of Memphis' Center for Earthquake Research and Information (CERi), a premiere institute for the study of the causes and consequences of earthquakes, is now under the leadership of Dr. Chuck Langston.

Dr. Langston takes the helm from Dr. Arch Johnston, who led the organization to international prominence

over his tenure with a staff of 3 in 1978 to 55 in 2008. Dr. Johnston remains at the Center as Founding Director.

Dr. Langston completed his masters and doctoral degrees at the California Institute of Technology and came to Memphis after serving as a professor of seismology at Penn State for over 23 years. His accolades include service as President of the Seismological Society of America and Chair of the NSF Visiting Committee for the Southern California Earthquake Center. In 2003 he was selected as a Distinguished Fellow of the American Geophysical Union (AGU). Designation as an AGU Fellow calls for a prolific history of publication and quality research that has led to eminence in one or more fields of geophysics. Of the AGU's 38,000+ members representing 117 countries, Langston was one of the 0.1 % of the members chosen to be a fellow.

Under Johnston's leadership, CERI became a State Agency in 1978 and an Tennessee Academic Center of Excellence in 1982 with mandates to perform research and provide information related to regional earthquake hazards and seismic monitoring. However, the center's faculty now includes nationally and internationally recognized earth scientists and a talented pool of graduate students that also perform research in many countries including Antarctica, South America, Indonesia, the Caribbean, Africa, India, Taiwan, China, and others.

The CERI seismic network has grown to be the largest in the Eastern U.S. consisting of 140 seismograph stations distributed across the Central and Eastern U.S. This expertise in seismic monitoring has led the Center to be a primary partner in the Advanced National Seismic System (www.anss.org), a nationally standardized system of high quality seismic instrumentation supported by the US Geological Survey.

Further information on CERI can be found at www.ceri.memphis.edu.

THE UNIVERSITY OF
MEMPHIS
Center for Earthquake Research
and Information

NEW MADRID BICENTENNIAL EFFORT BEGINNING

In 2011 and 2012, there will be events held throughout the central United States observing the 200th Anniversary of the great 1811-1812 New Madrid earthquakes that forever changed the mid-western landscape. These quakes were felt across the U.S. and as far south as the Gulf of Mexico, and as far north as Canada.

Organizations from across the central U.S. will participate in the Bicentennial events, which range from National Conferences, Workshops, Public Outreach Events, Multi-State Earthquake Exercises, and much more. The Bicentennial will include events that are being coordinated through an established steering committee. Members of the committee include:

*American Red Cross
Center for Earthquake Research & Information
Central US Earthquake Consortium
Earthquake Engineering Research Institute
Earthquake Insight
Federal Emergency Management Agency
Local Governments
Mid-America Earthquake Center
State Emergency Management Agencies
State Geological Surveys
US Geological Survey
and more...*

If you or your organization are interested in participating in the New Madrid Bicentennial effort or on the steering committee, please visit the Bicentennial website at www.newmadridbicentennial.org and email us with your name and level of interest.

NEW MADRID BICENTENNIAL

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Organizations from across the central U.S. will participate in the bicentennial events, which range from conferences, workshops, public outreach events, multi-state earthquake exercises, and more.

Be on the lookout for more information on the New Madrid Bicentennial events and sign up to be on the email list at www.newmadridbicentennial.org.

EVENTS HELD THROUGHOUT 2011-2012

VISIT WWW.NEWMADRIDBICENTENNIAL.ORG FOR INFORMATION ON THE BICENTENNIAL

Image Courtesy: US Geological Survey

ILLINOIS SCHOOL DISTRICT STILL FEELING EFFECTS OF APRIL 18 EARTHQUAKE

Nearly six months after a 5.2 earthquake that rattled residents awake in Mt. Carmel, Illinois on the morning of April 18, the Metro East Illinois school district is still feeling the aftershocks—financially that is. East Alton, Illinois officials say that the April 18 earthquake caused approximately \$1.2 million worth of damage to the gymnasium of one of the district's elementary schools.

District officials along with their insurance company are assessing options for repair. As previously reported by officials at the Illinois Emergency Management Agency (IEMA) and the Indiana Department of Homeland Security (IDHS), the April 18 earthquake—which occurred around 4:36a.m. in Mt. Carmel, Illinois along the Wabash Valley Seismic Zone—caused minor damage to buildings but no major injuries were reported. One of CUSEC's top priorities is to maintain public awareness of the region's earthquake risk and promote readiness among central US residents. You can find out what you need to do to become better prepared for earthquakes by visiting our website at www.cusec.org.

CUSEC LAUNCHES NEW WEBSITE

We are pleased to announce the launch of the latest version of the CUSEC website. Our new site has been redesigned from the ground up to better serve our visitors. It has been organized in a way that will offer easy to find information on earthquakes in the central US, earthquake safety, current programs in the central U.S., CUSEC publications, and more. New Features include -

- Fully Searchable WebSite
- Updated Publications Library
- Easy to Navigate Menu System
- CSS Styling for better compliance across browsers
- Updated information & safety tips
- and Much, Much, More...

Please take a moment to look around the website at www.cusec.org. We welcome any feedback you may have.

NMSZ CATASTROPHIC PLANNING INITIATIVE UPDATE

*by Roger Arango & Mike Calvert
CUSEC Emergency Planners*

The CUSEC Member States have completed 28 scenario-driven catastrophic planning workshops under the FEMA funded New Madrid Seismic Zone Catastrophic Earthquake Planning Project. Funding for the state workshops under this project expires at the end of December. Alabama, Kentucky, and Tennessee will have wrap up workshops later this fall. Mississippi will be conducting one-on-one training with local emergency managers. CUSEC expects FEMA Regional Level workshops to be held in the first half of 2009. A conference call has been scheduled with the CUSEC states and FEMA Regions four, five six and seven to begin developing a framework and agenda for those workshops. During this quarter, Illinois held a local workshop July 29-30 at John A. Logan Community College in Carterville IL. Missouri and Arkansas conducted small local workshops where they helped county and city planners with their local plans. Indiana also plans to work individually with some localities on their local plans.

CUSEC continues to work numerous multi-state planning and coordination issues as well as to help plan the 2011-2012 New Madrid Bicentennial commemoration. First, the CUSEC Multi-State Coordination Annex (MSCA) will share earthquake response information and the status of state actions supporting the CUSEC Board's Multi-State Planning Priorities. CUSEC functional associations and working groups—Communications, Geologists, Public Information, Operations, Transportation, and Public Health—are responsible for MSCA appendices. Each group will meet in late September and early October to map out where they are heading as a group supporting the MSCA. Second, the New Madrid Bicentennial will involve the region as well as national organizations associated with earthquakes. Bicentennial events will include the next National Earthquake Conference to be held in Memphis, Tennessee which will coincide with a national level earthquake exercise in the region. The Bicentennial Planning Team has met several times, and the CUSEC State Exercise Officers have started planning for this and smaller preparatory exercises.

OTHER NEWS

LEON SHAFER RECEIVES 2008 SUITER DISTINGUISHED SERVICE AWARD

Lexington, Kentucky - One of CUSEC's own, Mr. Leon Shaifer, was recently awarded the National Emergency Management Agency, 2008 Lacy E. Suiter Distinguished Service Award.

Leon has played a significant role throughout the twenty five years since CUSEC was formed. He played a key role in early discussions with FEMA and the original seven states in developing the language that would serve as the basis of CUSEC's organizational charter. He, along with his counter parts from the seven CUSEC states, drafted legislation to establish an interstate mutual aid agreement among the seven states. This later played a key part in the establishment of the Southern Regional Emergency Management Compact which later became what is now known as the Emergency Management Assistance Compact, EMAC, in which he still serves a central function.

On a more personal note, Leon has been both a mentor and friend to the current CUSEC Executive Director. Having completed two internships and later working as full time employee with the Mississippi Emergency Management Agency under Leon, Jim Wilkinson has benefited greatly from the insightfulness and years of experience gained from working alongside him.

On behalf of all of the staff of CUSEC, we extend our congratulations to Leon for adding this award to his numerous achievements over the years.

NEW EERI MONOGRAPH AVAILABLE

by I. M. Idriss and R. W. Boulanger

The new 262-page monograph "Soil Liquefaction During Earthquakes" updates a subject area covered in the 1982 classic text used around the world, "Ground Motions and Soil Liquefaction During Earthquakes," by H. Bolton Seed and I.M. Idriss. The new publication will fill a need for a thorough synthesis - in one accessible resource for students, practicing engineers, and other professionals - of progress in the study of liquefaction since 1982. The following areas are covered:

- Fundamentals of liquefaction behavior: a framework for a common understanding of the development and limitations of various engineering analytical procedures.
- Liquefaction triggering analysis: methods for evaluating the potential for liquefaction triggering.
- Consequences and mitigation of liquefaction: examples of lateral spreading and post-liquefaction settlement analyses, the use of factors of safety in engineering practice, mitigation strategies, and methods for ground improvement.
- Cyclic softening of saturated clays: engineering procedures for evaluating the potential performance of cohesive fine-grained soils.

The ISBN number is 978-1-932884-36-4 and the price is \$60.00 (\$45.00 for EERI members) plus shipping (and sales tax for California residents). To place an order online, visit: http://www.eeri.org/cds_publications/catalog/
The price for bulk orders (ten or more) is \$40 per copy. Bulk orders cannot be placed online

EARTHQUAKE MITIGATION PILOT PROGRAM LAUNCHED



In early 2008, FEMA and NEHRP partnered with the Safe America Foundation (SAF) to create a multi-faceted information pilot program, QuakeSmart, to disseminate earthquake mitigation practices and benefits to businesses in four communities located in areas where damaging earthquakes could occur.

Cape Girardeau, Missouri; Evansville, Indiana; Reno, Nevada; and Emeryville, California were selected as the initial communities to hold QuakeSmart events.

Community businesses recently attended QuakeSmart presentations to understand the positive economic significance that can result from earthquake mitigation. Attendees learned how to evaluate their risks, make plans, and mitigate against earthquakes. More information on the QuakeSmart program can be found at <http://www.quakesmart.net>.



RECENT CENTRAL U.S. EARTHQUAKES

DATE	LOCATION	MAGNITUDE	FELT REPORTS
9/29/08	Sidney, OH	2.8	236
10/1/08	Catron, MO	2.6	None Reported
10/12/08	Pampa, TX	3.0	1
10/13/08	Pampa, TX	3.7	24
10/25/08	Hardy, AR	2.7	None Reported
10/25/08	New Market, TN	2.5	None Reported
10/30/08	Shawnee, OK	3.1	11
10/31/08	Eules, TX	3.0	126
10/31/08	Maryville, TN	2.9	50
10/31/08	Eules, TX	2.9	23
11/1/08	Irving, TX	2.7	51

UPCOMING CONFERENCES, TRAINING, ETC

WHEN	WHAT	WHERE
November 7	FEMA 154 & ATC-20 Course	Fayetteville, Arkansas
November 12-13	CUSEC Earthquake Program Managers Meeting	Tunica, Mississippi
November 12-13	CUSEC Exercise Officers Meeting	Tunica, Mississippi
November 12-14	IBHS Annual Conference	Tampa, Florida
November 14	Missouri Seismic Safety Commission	Cape Girardeau, Missouri
December 3-4	CUSEC Board of Directors Meeting	Point Clear, Alabama

Visit the CUSEC website at www.cusec.org to learn more about upcoming events!

DATES TO MARK

2009 Earthquake Awareness Week – February 2009. Earthquake Awareness Week will take place again in February of 2009. Activities will range from exhibits, demonstrations, town hall meetings, and more. In 2008 five of the eight CUSEC Member States participated in Earthquake Awareness Week, and in 2009, we hope to have more States participate. For information on activities in your area, please visit the CUSEC website at www.cusec.org.

New Madrid Emergency Preparedness Conference – November 13 2008. At 10 a.m. on November 13, millions of people throughout Southern California will participate in the largest earthquake drill in U.S. history! The Great Southern California ShakeOut includes the ShakeOut Drill and other events to help get ready for big earthquakes, and to prevent disasters from becoming catastrophes. Learn more at www.shakeout.org.

New Madrid Seismic Zone Catastrophic Earthquake Planning – Fall/Winter 2008. The NMSZ Catastrophic Planning Initiative is moving into the Regional Planning Phase as State and Local Planning Workshops conclude. The Regional Workshops will be taking place in Atlanta, GA, Denton, TX, Chicago, IL, and Kansas City, MO and bring together key organizations to address the issue of responding to a catastrophic earthquake on the New Madrid Seismic Zone.

The Central United States Earthquake Consortium is a not-for-profit corporation established as a partnership with the Federal government and the eight member states: Alabama, Arkansas, Illinois, Indiana, Kentucky, Mississippi, Missouri, and Tennessee; and nine associate member states: Georgia, Iowa, Louisiana, South Carolina, North Carolina, Ohio, Oklahoma, Nebraska and Virginia. The Federal Emergency Management Agency provides the basic funding for the organization.

CUSEC’s purpose is to help reduce deaths, injuries, damage to property and economic losses resulting from earthquakes occurring in the central United States. Basic program goals include: improving public awareness and education, mitigating the effects of earthquakes, coordinating multi-state planning for preparedness, response and recovery, and encouraging research in all aspects of earthquake hazard reduction.

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CUSEC Board of Directors

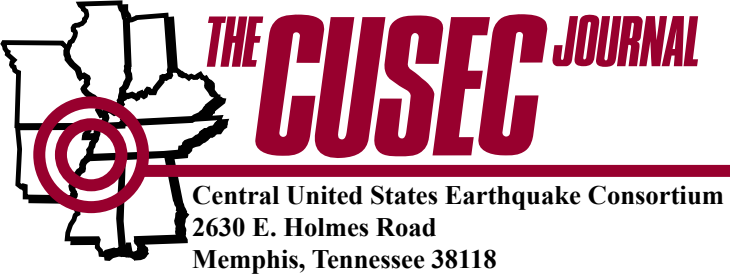
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Please send comments and suggestions to cusec@cusec.org

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CUSEC Partners

- American Red Cross
- American Society of Civil Engineers
- Association of CUSEC State Geologists
- Center for Community Earthquake Preparedness
- Centers for Disease Control and Prevention
- Center for Earthquake Research and Information
- Disaster Recovery Business Alliance
- Federal Highway Administration
- Federal Emergency Management Agency
- Institute for Business and Home Safety
- International Paper
- Mid America Earthquake Center
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- U.S. Environmental Protection Agency
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- USGS Mid-Continent Geographic Science Center
- Ridg-U-Rak Storage Systems
- Western States Seismic Policy Council
- WorkSafe Technologies



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