FOR IMMEDIATE RELEASE
18 November 2015

Media Contact:
Jason Ballmann
SCEC / USC
562.884.2360
ballmann@usc.edu

SCEC IMPROVES UNDERSTANDING OF EARTHQUAKE HAZARDS WITH SUPERCOMPUTERS, ACHIEVES SOCIETAL IMPACTS

Director Tom Jordan Discusses Innovations at SC15 Invited Talk

LOS ANGELES, CA – Decision-makers from various sectors now have better knowledge to assess and mitigate earthquake risk owing to high-performance computing research by the Southern California Earthquake Center (SCEC), headquartered at the University of Southern California. On Thursday at the 2015 International Conference for High Performance Computing, Network Storage, and Analysis ("Supercomputer 2015") in Austin, Texas, SCEC Director Tom Jordan will present an invited talk on the societal impacts of SCEC's research and development in using supercomputers.

"By using the nation's largest supercomputers, we can now forecast with more accuracy and detail the strong shaking that will come from large earthquakes in Southern California," stated Tom Jordan, Director of SCEC.

A SCEC team of geoscientists, computer scientists, and earthquake engineers has developed new methods in high-performance computing to improve seismic hazard calculations. SCEC researchers have received numerous awards and recognitions, including allocations of supercomputer time and the 2015 NVIDIA Global Impact Award. Given to Yifeng Cui, Lab Director at the San Diego Supercomputer Center and co-leader of the SCEC Computational Science Disciplinary Committee, the award highlights collaborative work in developing an accelerated GPU code to simulate earthquake physics through ground motion prediction modeling, data used by engineers for safer building design. Modeling high-frequency earthquake simulations (nearing 10 Hz) takes "petascale" computational power (more than one quadrillion numerical operations per second). These limits are pushed by employing high-performance computing resources such as the National Center for Supercomputing Applications' "Blue Waters", Argonne Leadership Computing Facility's "Mira," and the nation's most powerful supercomputer, Oak Ridge Leadership Computing Facility's "Titan."

Version 3 of the Uniform California Earthquake Rupture Forecast (UCERF3) was released by the U.S. Geological Survey, the California Geological Survey, and SCEC in March of this year. UCERF3 is a multi-disciplinary project providing authoritative estimates of the magnitude, location, and likelihood of earthquake fault rupture throughout the state, developed on the TACC "Stampede" supercomputer. UCERF3 is used by emergency managers, engineers, and other stakeholders to assess and reduce seismic risk, including the California Earthquake Authority, which sets insurance rates. UCERF3 has been incorporated into the U.S. Geological Survey's 2014 update of the National Seismic Hazard Maps.

The ShakeOut Scenario, produced by a large collaboration led by the U.S. Geological Survey and supported by SCEC, in addition to more than 200 other partners in government, academia, emergency response, and industry, assessed the impacts of a M7.8 earthquake on the southern San Andreas fault. The ShakeOut animation developed on high-performance computers at USC has been used by SCEC to characterize earthquake hazard in Southern California. *Great ShakeOut Earthquake Drills*, the global safety and resilience movement coordinated by SCEC, that began in 2008, was based on the ShakeOut Scenario. In 2015, ShakeOut involved more than 43.8 million people around the world.

The ShakeOut Scenario influenced Los Angeles' new earthquake plan, Resilience by Design, created by Mayor Eric Garcetti and the U.S. Geological Survey's Dr. Lucy Jones. It is the most ambitious plan ever laid out by a U.S. city. Resilience by Design cites damage and casualty estimates from the ShakeOut Scenario, and states four priorities: pre-1980 "soft-first-story" buildings, pre-1980 "non-ductile reinforced concrete" buildings, water system infrastructure (including impact on firefighting capability), and communications infrastructure. The Los Angeles City Council has enacted legislation relating to the first two concerns, mandating retrofits within 7 years for pre-1980 soft-first-story buildings and 25 years for pre-1980 non-ductile reinforced concrete buildings.

Going forward, SCEC continues to maximize the efficiency of its high-performance computing initiatives while seeking increased allotments of time, enhancing a variety of earthquake hazards projects. Earthquake Early Warning (EEW), still in development for the U.S., may one day rely on ground motion prediction models to determine expected levels of shaking, information that could save lives and reduce injury. As models improve and include higher frequencies, they may also be used for more large building and tall structure design.

The Southern California Earthquake Center (SCEC) is headquartered at the University of Southern California and supported by the National Science Foundation and the U.S. Geological Survey. SCEC coordinates fundamental research on earthquake processes using Southern California as its principal natural laboratory.

Follow us:

Facebook: facebook.com/scec
Twitter: @SCEC
Youtube: youtube.com/scecmovies
LinkedIn: Company Page

- ####### -