

Western States Seismic Policy Council
2012 National Awards in Excellence
Award in Excellence for Research

Administering Agency:	Utah Geological Survey
Program Name:	Utah Earthquake Working Groups
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Program Summary

The Utah Geological Survey (UGS), in cooperation with the Utah Seismic Safety Commission (USSC), and the United States Geological Survey (USGS) convenes annual Utah Earthquake Working Group meetings each February in Salt Lake City, Utah. The Utah Quaternary Fault Parameters Working Group, Liquefaction Advisory Group, and Ground Shaking Working Group each meet to review research activities, re-evaluate long-term plans for producing maps, and develop partnerships for investigations and topics for future National Earthquake Hazard Reduction Program (NEHRP) proposals. The results of the three working group meetings are reported in annual meeting summaries posted on the UGS web site (<http://geology.utah.gov/ghp/workgroups/index.htm>).

Each working group has achieved consensus regarding the types of earthquake-hazard maps needed, new data required, and preferred data collection and mapping techniques. The working groups have developed partnerships and identified projects for which to pursue funding. These results have been used by the USGS to develop Utah priorities for the annual USGS NEHRP external research support grant opportunity announcement. Because the meetings are held in February, just prior to the annual grant opportunity release, discussions and momentum gained at the meetings are translated into proposals by researchers to the USGS.

Working group members include geologists, engineers, seismologists, and geophysicists from USGS, UGS, University of Utah, Utah State University, Brigham Young University, and consulting companies and state agencies. Additionally, representatives from USSC and other state agencies and professional organizations are invited to attend the meetings.

The main goal of the Utah Quaternary Fault Parameters Working Group is to characterize active fault sources in Utah. The working group began by developing consensus slip-rate and recurrence interval data for all Utah trenched faults in 2005. The working group also developed an initial priority list of faults requiring additional study and, based on each year's paleoseismic investigations, has updated the list annually. As new paleoseismic data becomes available, the working group modifies its consensus slip-rate and recurrence-interval values as necessary. Other working group issues include the Wasatch Front time-dependent earthquake probability model, refining the surface trace of the Salt Lake City segment of the Wasatch fault on the National Seismic Hazard Maps (NSHM), the relation of the West Valley fault zone to

the Wasatch fault, and making periodic recommendations to USGS regarding which Utah faults should be included in future USGS NSHM updates.

The Liquefaction Advisory Group's goal is to produce maps showing annual probabilities of liquefaction and liquefaction-induced ground displacement, and extending their pilot-project investigations in Salt Lake Valley to Utah and Davis Counties, particularly regarding compilation of a comprehensive regional geotechnical database. The working group has dealt with issues related to undersampling of geologic units, uncertainty analysis, compilation of newly available geotechnical data, and conducting additional cone penetrometer investigations in downtown Salt Lake City. Work is underway to complete current projects and publish liquefaction maps for use by local government planners and other users.

The Ground Shaking Working Group is developing a Community Velocity Model (CVM) in order to develop large-scale spectral acceleration maps for the Wasatch Front that incorporate site and basin-shape effects. A team from San Diego State University recently updated the prior model with newly available data that included both shallow-shear-wave velocity and deep-basin-structure effects on ground motion. The UGS has distributed the updated CVM on its web site. Current efforts involve validating the CVM, expanding the CVM to include Tooele and Rush Valleys and the Wasatch back valleys, updating the CVM with intermediate-depth data, and continuing to work toward producing Wasatch Front Urban Seismic Hazard Maps.