

UTAH EARTHQUAKE RESEARCH PRIORITIES FOR 2011

Below are the priorities defined by the 2010 Utah Earthquake Working Groups and the Utah Geological Survey for earthquake research in Utah in 2011, provided for consideration in responding to the U.S. Geological Survey National Earthquake Hazards Reduction Program (NEHRP) Request for Proposals.

Faults

- Studies of faults should focus on those structures that have been identified as a priority by the 2010 Utah Quaternary Fault Parameters Working Group listed below:

Priority A (in order of priority)

- Warm Springs fault/East Bench fault subsurface geometry and connection
- Provo segment, Wasatch fault zone – penultimate event
- Long-term earthquake record of the Nephi segment, Wasatch fault zone
- Washington fault
- Mid- to late-Holocene earthquake chronology on the southern part Weber segment, Wasatch fault zone

Priority B (not in order of priority)

- Cedar City - Parowan monocline / Paragonah fault
- Enoch graben
- Clarkston fault
- Gunnison fault
- Scipio Valley faults
- Faults beneath Bear Lake
- Eastern Bear Lake fault
- Carrington fault (Great Salt Lake)
- Rozelle section, Great Salt Lake fault

Ground Shaking/Site Conditions

- The working group did not develop specific, new priorities for 2011; however, a continuation of on-going work was recommended.
 - Ultimate goal is to make urban hazard maps that are meaningful for all users (e.g., city planners, developers).
 - Optimal products:
 - Based on 3-D simulations and empirical ground motion models
 - Broadband 10-1 Hz (1-10 s)
 - Probabilistic and scenario (M7) maps of Salt Lake County urban hazard
 - Test model for validation/verification; short and long periods:
 - Prescribe Lehi or Magna event (verification).
 - Use WFCVM v3c.
 - Prescribe damping model, slip history, and frequency (0.1-1 Hz).

- Prescribe mesh resolution (output grid spacing and format) and minimum Vs.
- General methodology:
 - Finite-fault geometry (Salt Lake segment used in Olsen and Pechmann model).
 - Allow for variable slip functions (supershear, etc).
- Initially focus on Salt Lake segment of Wasatch fault; later incorporate other faults (e.g., Great Salt Lake faults).

Liquefaction

- Investigation of the structural relation between the Warm Springs and East Bench faults (subsections of the Salt Lake City segment of the Wasatch fault zone).
- Establishment of a publicly-accessible electronic geotechnical database (in particular, Utah County UDOT data).
- Expansion of liquefaction-hazard mapping into Weber County (and using Weber County as a test case for uncertainty analysis).