

**RESULTS OF FEBRUARY 27, 2004
UTAH GROUND SHAKING WORKING GROUP MEETING**

Ivan Wong, Facilitator
Gary E. Christenson, UGS liaison and recorder

Members/guests present:

Kim Olsen
Harold Magistrale
Jim Pechmann
Kris Pankow
Walter Arabasz
Jim Bay
Ken Stokoe
Marv Halling
Travis Gerber
Mike Olson

ACTION ITEMS

Gary Christenson

- Contact Tom Holzer regarding the possibility of USGS CPT work in Utah.
- Check with Bill Stephenson about attempting to convert P-wave velocities to S-wave velocities as was done for North Sea data.
- Distribute relevant abstracts and publications to Working Group members.

Ken Stokoe – Talk to NEESR Program Manager to inquire whether the potential USU/UT/UU/SDSU proposal fits into NEESR program goals.

Jim Bay - Contact Gerry Schuster about the possibility of performing refraction surveys using Jim's drop-weight source at selected sites to deepen the profiles.

Ivan Wong – Keep Working Group informed of PEER Next Generation of Attenuation models deliberations as they pertain to normal faulting.

Mike Olson – Contact Kennecott regarding existence and availability of shear-wave-velocity data.

POSSIBLE 2005 NEHRP PROPOSALS

Jim Bay - Perform Vs30 SASW surveys (40-60 m depth) at sites in Utah, Weber, and Davis Counties (possibly including Schuster refraction surveys at selected sites to reach 100 m) and selected sites in unit Q03 in SLV to understand variability.

Jim Bay and UGS - Small proposal for a student to update Vs30 database with data from ConeTec, USGS mini-sosi, Kennecott, Hill AFB, etc.

Ken Stokoe – Perform deep SASW surveys (100 m, 300 m), mostly in Salt Lake Valley.

Ivan Wong, Jim Pechmann – Evaluate seismic source and propagation path characteristics of Utah earthquakes (Q, kappa, stress drops, site amplification).

Harold Magistrale, Kim Olsen, Jim Pechmann – Begin development of SCEC-type community velocity model for Wasatch Front.

SUMMARY OF IMPORTANT DISCUSSION POINTS

Agenda Item 1. Characterize shallow Vs30

- We should characterize variability in Vs30 in engineering geologic units to compare variability within a unit to variability between units.
- Perform multiple SASW measurements at a few sites to document site variability.
- Collect more data along basin margins where shallow stiff soils may greatly amplify high-frequency ground motions.
- Compare SASW to CPT results where CPT results are reliable; consider using Tom Holzer, USGS, for CPT calibration.
- Additional data may be available from Kennecott and Hill AFB.
- For additional data from consultants, we should request help through the local ASCE chapter.

Agenda Item 2. Characterize deep shear-wave-velocity profiles

- Consider piggybacking Schuster refraction surveys using USU SASW source to reach 100 m depths at selected sites of shallow soundings to reach R1 and R2 if possible.
- Data are particularly needed for the 100-1,000 m interval.
- If Stokoe is able to bring one of the deep-source vibrators to Utah, Bill Stephenson (USGS) may be able to piggyback some deep reflection lines as well.
- Consider passive microtremor analyses to look at deep velocity profiles.
- UUSS/ANSS data are corroborative, but do not yield absolute velocity data.
- Bill Stephenson (USGS) may be able to convert P-wave velocities to S-wave velocities from his 2003 reflection line in South Jordan as was done for North Sea profiles.
- Projections to depth may be possible based on shallow shear-wave-velocity profiles assuming standard geotechnical conditions; this may be a good project for a Jim Bay student.

Agenda Item 3. Attenuation relations and seismological/geotechnical parameters

- Jim Bay is attempting to verify the Vucetic and Dobry modulus reduction/damping curves for use in Utah by performing resonant column and

torsional shear tests for Lake Bonneville clays. The student doing the work hopes to be done this summer.

- The PEER Next Generation of Attenuation models project is scheduled for completion this summer – we should check their results for normal faulting.

Agenda Item 4. Cooperative development of a community velocity model

- Accurate modeling of the pinching out of R1 and R2 along basin margins is important to ground motions.
- Consider broadening bounds of model to include Tooele and Cache Valleys and to extend along Wasatch Front from Brigham City to Levan. Also, use the most appropriate boundaries, perhaps basin edges or ridge lines rather than polygons.
- Because of NEHRP funding constraints, consider breaking model development up into smaller (~\$60,000/year) increments over several years.

General.

- Make sure all proposals state how the proposal fits into the larger plan developed by the Ground Shaking Working Group and achieves defined working group goals.

POSSIBLE NEESR PROPOSAL

Consider proposing a multi-year project to NEESR program to develop the community velocity model, including 1) USU shallow shear-wave velocity studies, 2) UTA deep shear-wave-velocity studies, 3) UUSS ANSS studies, and 4) SDSU model development. Proposals are due in January. Funding levels could be at the \$150,000/year for 3 years or \$300,000/year for 4 years level. Also consider possibility of NSF funding.