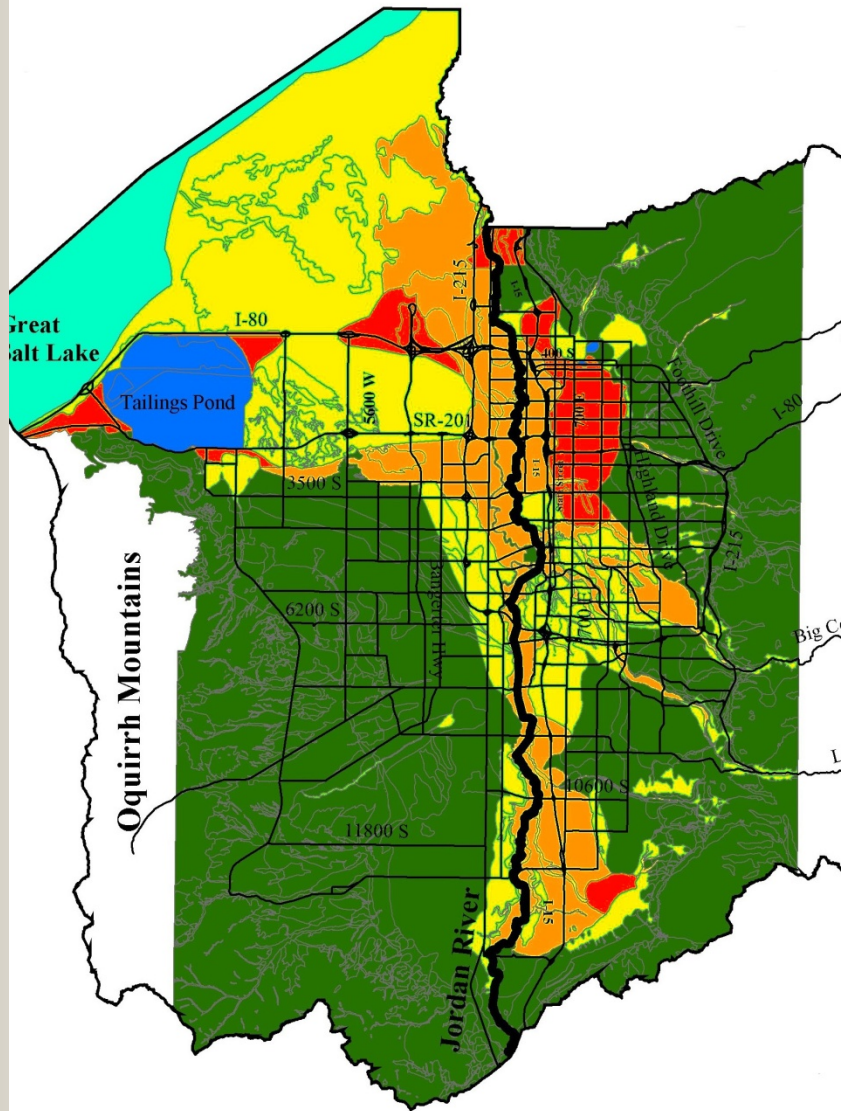


Utah Liquefaction Advisory Group (ULAG)

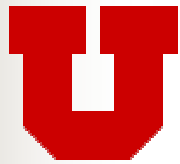


Progress Report on Liquefaction Working Group

February 14, 2008
Salt Lake City, Utah

Steven F. Bartlett, Ph.D., P.E.
Assistant Professor
University of Utah

ULAG Members and Participants



UtahState



Members

Steve Bartlett, UUCE, Facilitator

Barry Solomon, UGS liaison

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Kyle Rollins, BYUCE

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Aurelian Trandafir, UUGG

Jim Higbee, UDOT

Ryan Cole, IGES



Utah's Plan for Developing the Next Generation of Liquefaction Hazard Maps

Objective 1

Develop Probabilistic Liquefaction Hazard Maps for Urban Counties in Utah

Salt Lake County

Utah County

Davis County

Weber County

Cache County



Utah's Plan for Developing the Next Generation of Liquefaction Hazard Maps

Objective 1 (cont.)

Types of Maps

- (1) Liquefaction Triggering Maps
- (2) Lateral Spread Displacement Hazard Maps
- (3) Liquefaction-Induced Ground Settlement Maps



Utah's Plan for Developing the Next Generation of Liquefaction Hazard Maps

Objective 2

Develop ARC GIS Programs for Implementing Probabilistic Mapping Procedures for Other Regions in U.S.

- **Strong ground motion hazard estimates from PSHA and National Strong Motion Mapping Program**
- **User methods based on ArcGIS algorithms**
- **Subsurface GIS database that complements surface geology mapping**



Utah's Plan for Developing the Next Generation of Liquefaction Hazard Maps

Objective 3

Establish and Populate a Subsurface Geotechnical Database for Public Use

- **Geotechnical Evaluations**
- **Land Use Planning**
- **Research**
- **Potential Partners**
 - **UDOT**
 - **Salt Lake County and Cities**



Utah's Plan for Developing the Next Generation of Liquefaction Hazard Maps

Objective 4

Education and Public Outreach

- **User Friendly Maps**
- **Assist Counties in Implementation and Ordinances**
- **Outreach Seminars and Website**



Status Previous Work

FY 2004

- Geotechnical Database (N. Salt Lake Co.)
- M=7 lateral spread displacement hazard map (N. Salt Lake Co.)

FY 2005

- Geotechnical Database (S. Salt Lake Co.)

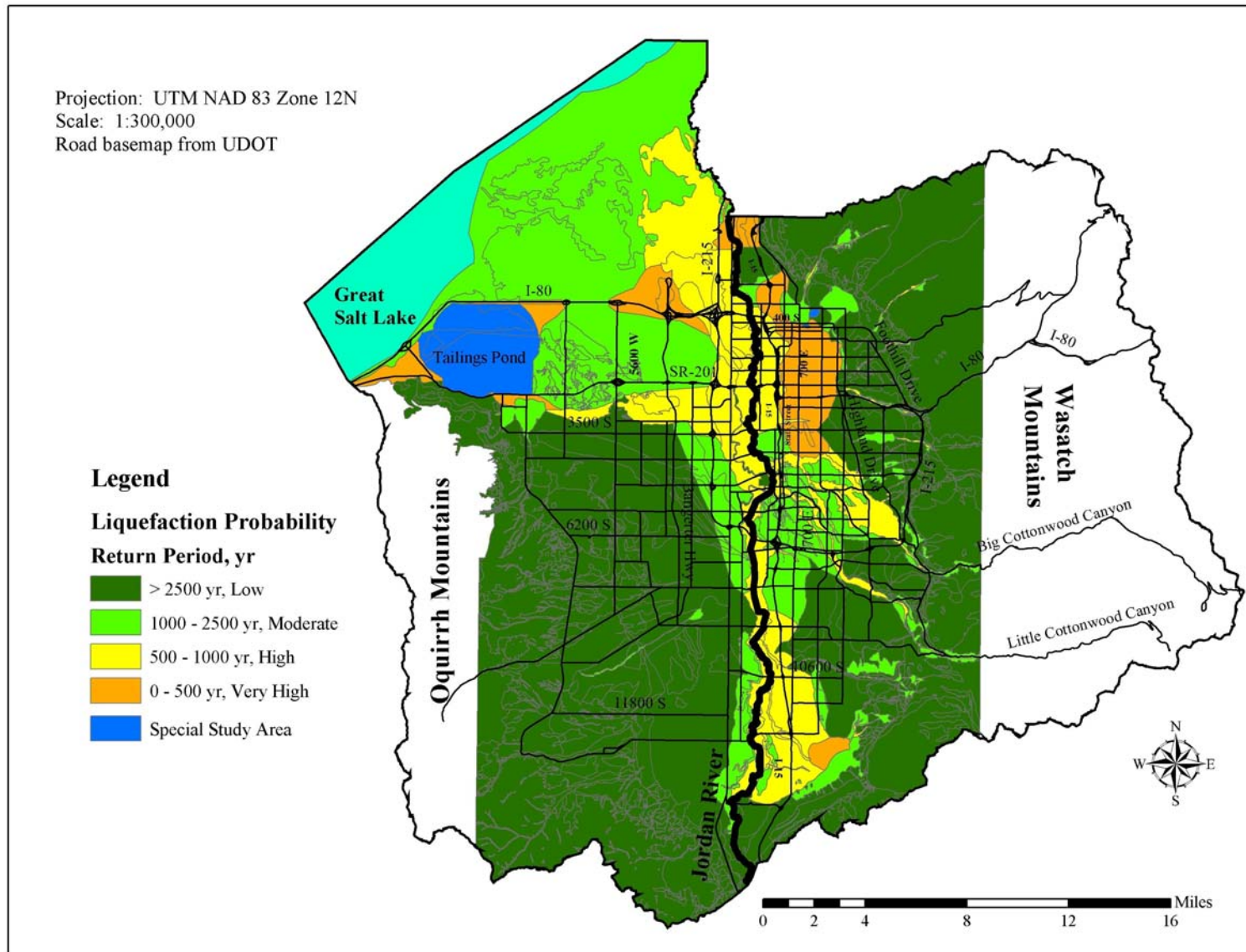


Status Previous Work

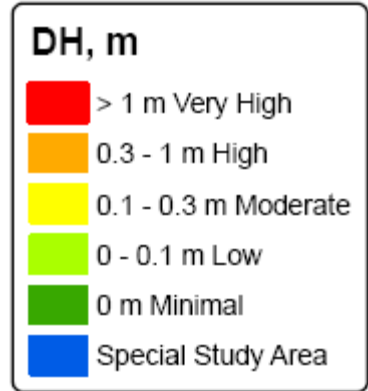
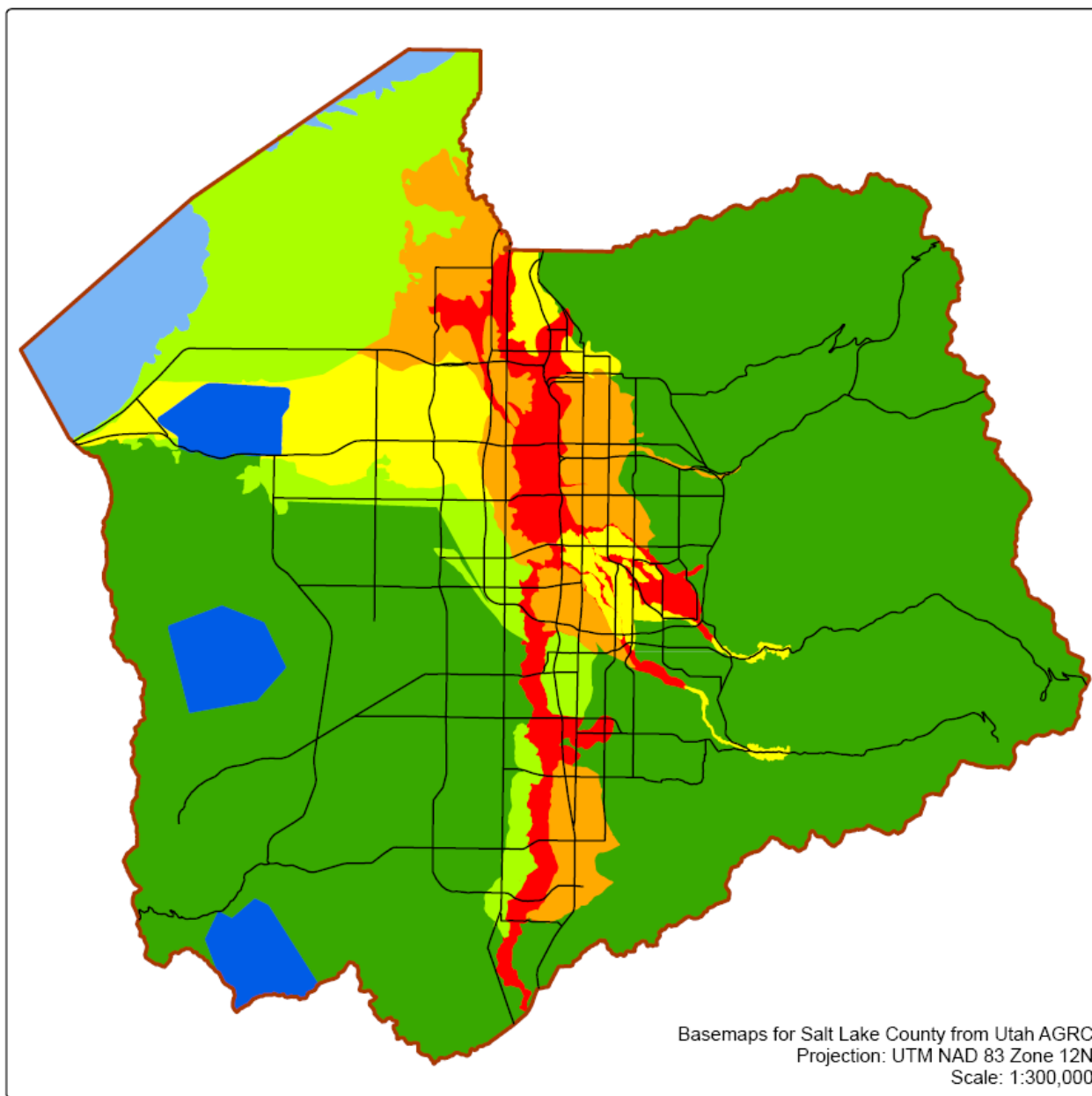
FY 2006 - 2007

- Prob. liquefaction potential map (S. Salt Lake Co.) (Task 3 – Griffen Erickson)
 - completed for all of strong motion input from 2006 USGS strong motion maps
- Prob. liquefaction triggering map Salt Lake Co. (draft) (Task 4 – Daniel Hinckley)
 - M=7 scenario earthquake (Salt Lake Co.)
- Prob. lateral spread displacement map (N. Salt Lake Co.) (Task 5)
 - on hold pending input from USGS strong motion maps
- M=7 lateral spread displacement map (Salt Lake Co.) (Task 6 – Daniel Hinckley)
 - completed (draft)
- Downtown ground failure investigations (Task 7 – Bart Leeflang)
 - writing report
- CPT correlations (Task 2)
 - completed analysis
- Ground Settlement Maps (ongoing – Daniel Hinckley)
- Draper City has adopted the prob. Liquefaction triggering map

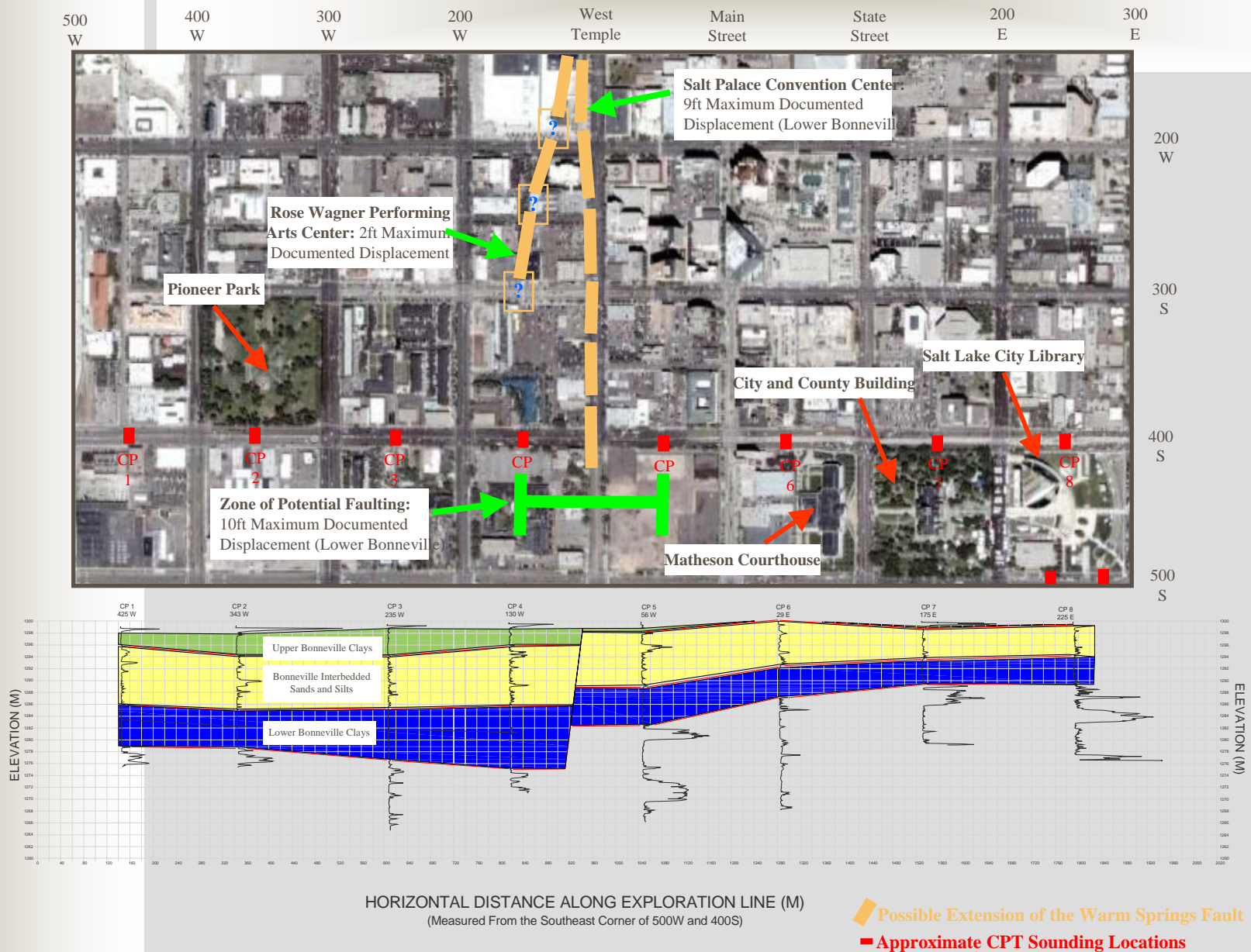
Prob. liquefaction potential map (S. Salt Lake Co.)



M=7 Lateral spread displacement map (Salt Lake Co.)



Downtown CPT Investigations



▮ Possible Extension of the Warm Springs Fault
■ Approximate CPT Sounding Locations



Feedback from Review Panel

Strengths

- important to engineering practice in Utah
- strong agreement with NEHRP program priorities
- coupling maps with USGS strong motion program
- data collection in GIS format is valuable
- products have been well-received



Feedback from Review Panel

Weaknesses

- Work is entering a more production-like phase not well suited for the research goals of this solicitation.
- Panel recognized the need for a tool for practicing engineers to perform calculations, but considers Visual Basic less desirable, perhaps use web-based tool.
- Panel considered the new CPT measurements of a lesser priority due to its highly localized consequence.