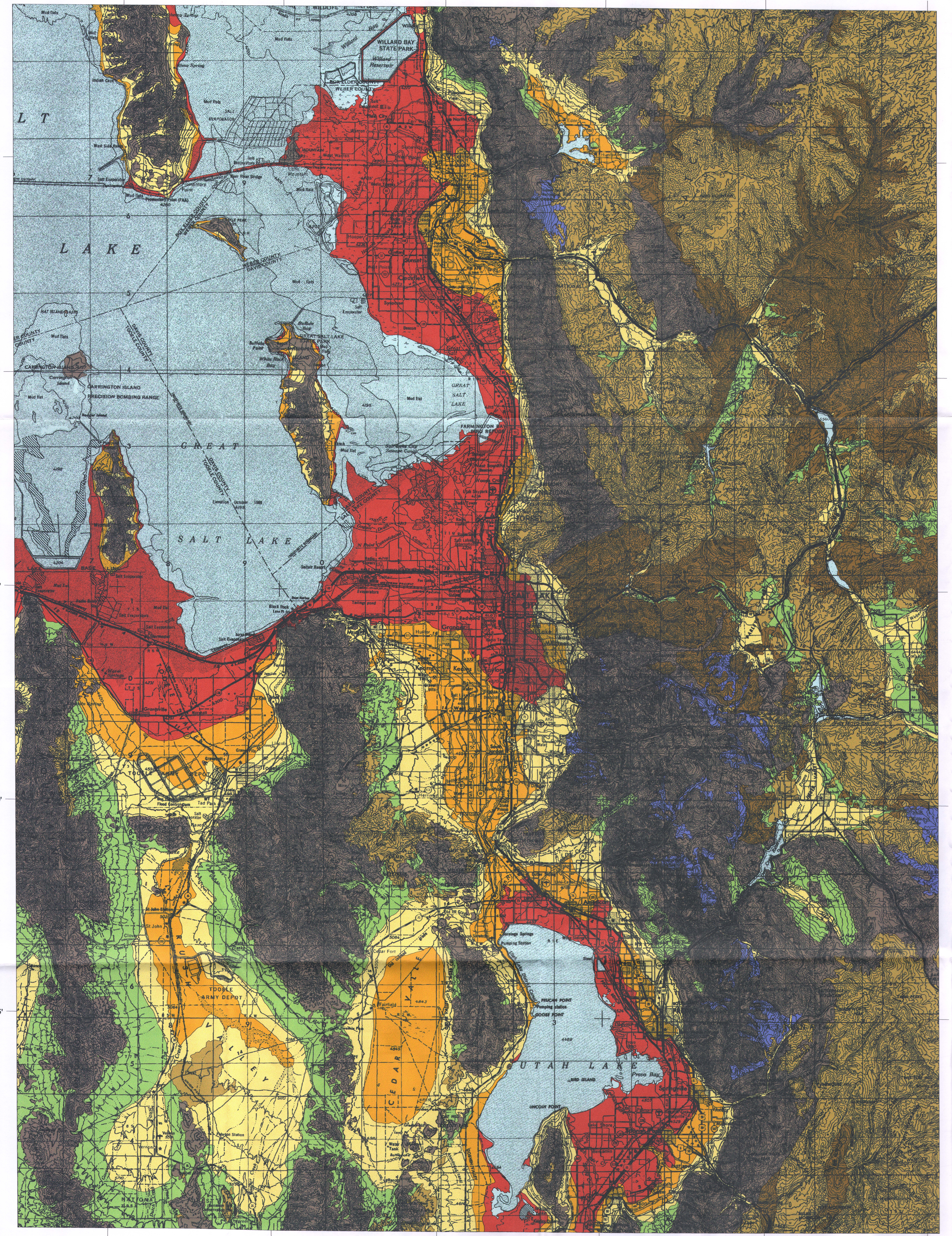
UTAH GEOLOGICAL SURVEY
a division of
Department of Natural Resources

Plate 2
Report of Investigation 248
SITE-RESPONSE CHARACTERIZATION FOR IMPLEMENTING
SHAKEMAP IN NORTHERN UTAH



Detailed Site-Response Map of the Wasatch Front Urban Corridor

by

Greg N. McDonald
Francis X. Ashland
Utah Geological Survey

Digital map compilation by James A. McBride and Neil D. Storey
Utah Geological Survey

2001

UTAH GEOLOGICAL SURVEY

N
MN
13.5 degrees
2001 Magnetic North Inclination
at Center of Salt Lake Valley

Scale: 1:250,000

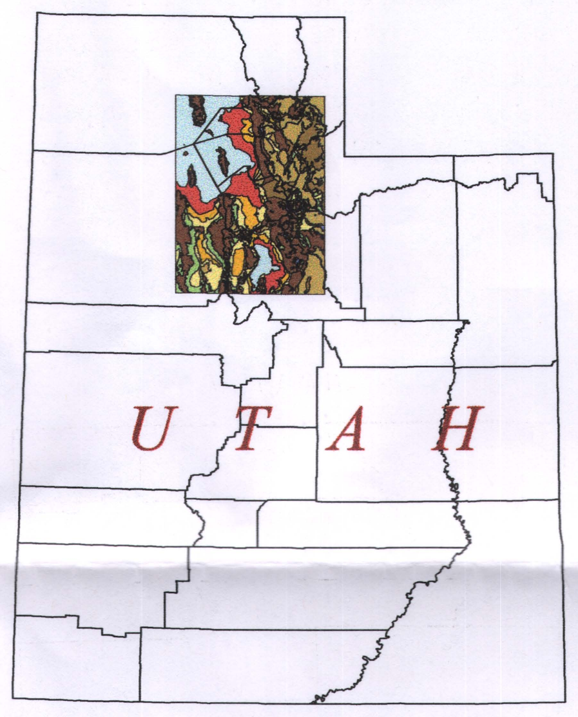
10 0 10 Miles

10 0 10 20 Kilometers

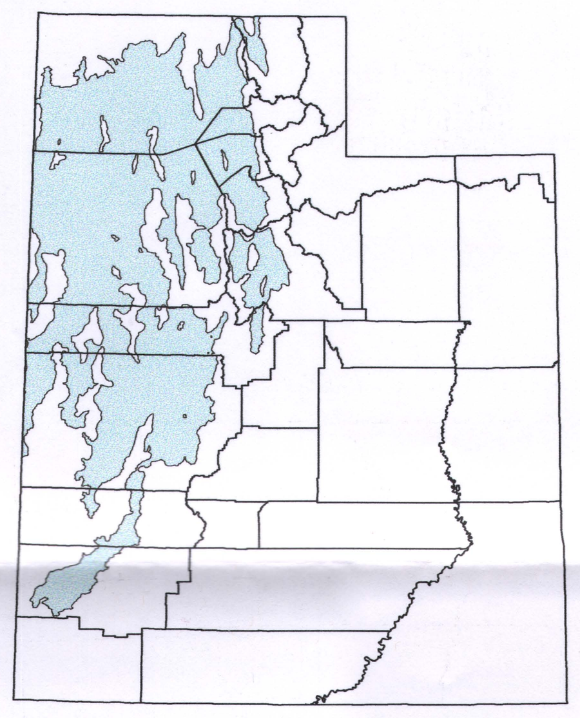
Mean shear-wave velocity (Vs30) and description of site-response units in the Wasatch Front urban corridor.

Unit	Vs30[1] (m/sec)	Description
Q01	199	Lacustrine and alluvial silt and clay; alluvial or marsh deposits typically overlie lacustrine deposits.
Q02	301	Lacustrine sand, lacustrine silt and clay, latest Pleistocene to Holocene alluvial-fan deposits.
Q03	387	Lacustrine and alluvial gravel.
Q04	437	Pre-Bonneville alluvial-fan deposits.
Q05	486	Glacial deposits including till and outwash.
T	1023	Tertiary sedimentary and volcanic rocks, and tufa-cemented soils (near Midway); excludes Tertiary intrusive rocks.
M	1449	Mesozoic sedimentary rocks.
P	2197	Paleozoic and older sedimentary, igneous, and metamorphic rocks; and Tertiary intrusive (igneous) rocks.

[1] Logarithmic mean



INDEX MAP



LOCATION OF PREHISTORIC LAKE BONNEVILLE

Research supported by the Utah Division of Comprehensive Emergency Management, the University of Utah Seismograph Stations, and the U.S. Geological Survey (USGS), Department of the Interior, under USGS award numbers 1434-HQ-97-GR-03126 and 99HQGR0091. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U.S. Government and other supporting agencies.

This map is intended primarily for use in implementing ShakeMap in the Wasatch Front urban corridor of Utah. The information presented on this map provides earthquake engineers and scientists some understanding of site response during earthquake ground shaking. However, the map should not be used as a substitute for site-specific geotechnical investigations conducted by qualified professionals. Some variation in shear-wave velocity exists, particularly in site-response unit Q01. The applicability of the mean Vs30 values for Quaternary units (Q01-Q03) is uncertain outside the limits of Lake Bonneville. The mean Vs30 values for units Q04, Q05, and P were estimated using published shear-wave velocity data from similar units.

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Plate 1
Report of Investigation 248

SITE-RESPONSE CHARACTERIZATION FOR IMPLEMENTING SHAKEMAP IN NORTHERN UTAH

Simple Site-Response Map of Northern Utah

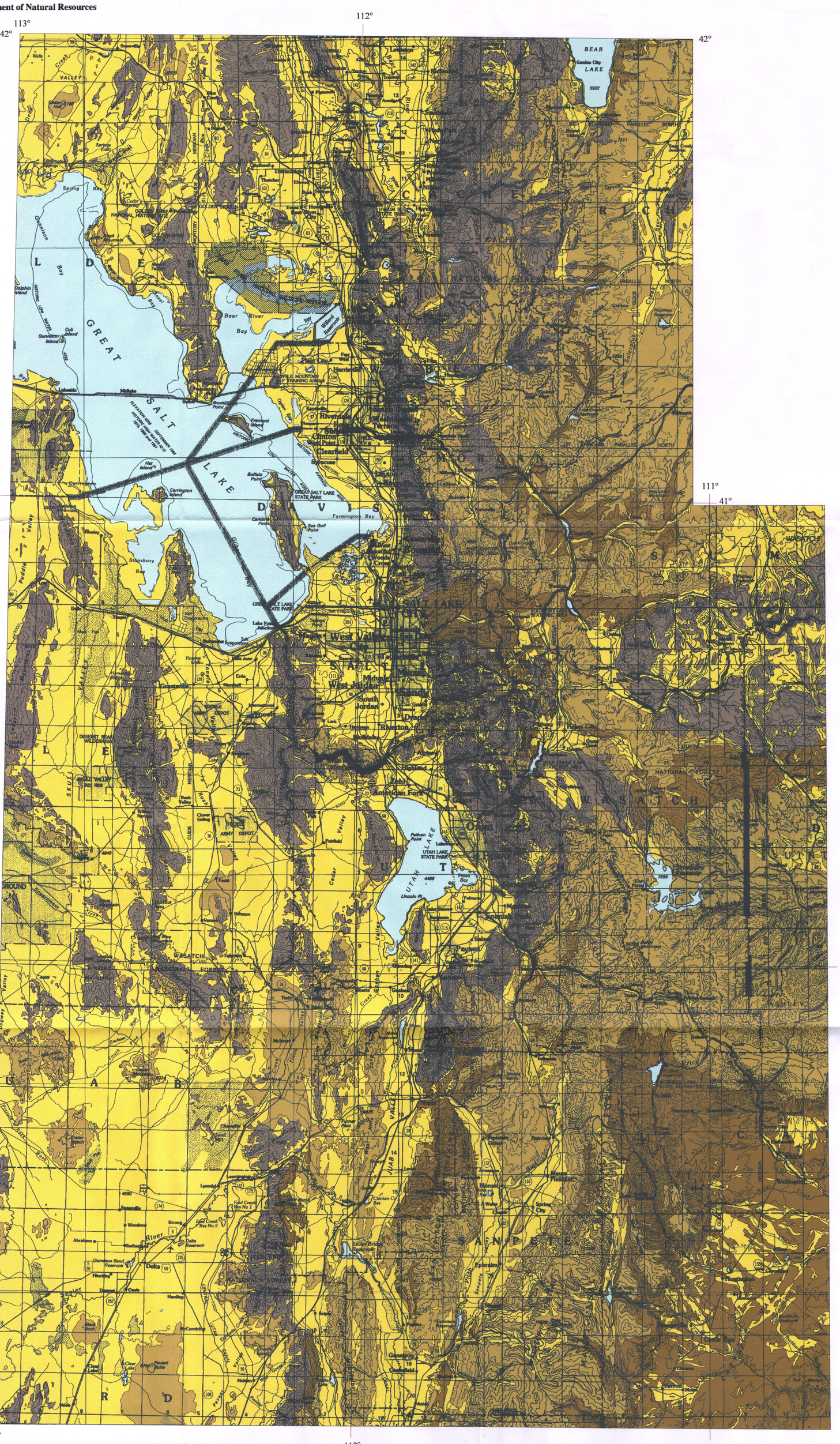
by

Lorraine Nelms
University of Utah Seismograph Stations
and
Francis X. Ashland
Utah Geological Survey

Digital map compilation by Lorraine Nelms
University of Utah Seismograph Stations
and
James A. McBride and Neil D. Storey
Utah Geological Survey

2001

UTAH GEOLOGICAL SURVEY



N
MN
13.5 degrees
2001 Magnetic North Inclination
at Center of Salt Lake Valley

Scale: 1:500,000

20 0 20 40 Miles

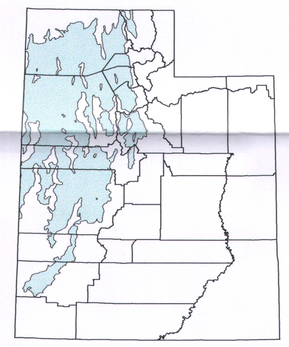
30 0 30 60 Kilometers

Mean shear-wave velocity (Vs30) and description of QTMP site-response units.

Unit	Vs30 [1] (m/sec)	Description
Q	234	Quaternary unconsolidated sediments including deposits formed by Lake Bonneville (the Bonneville Alloformation) and latest Pleistocene to Holocene stream, alluvial-fan, and deltaic deposits; overlies unconsolidated Tertiary valley fill locally.
T	1023	Tertiary sedimentary and volcanic rocks, Quaternary basalts (near Delta), and tufa-cemented soils (near Midway); excludes Tertiary intrusive rocks.
M	1449	Mesozoic sedimentary rocks.
P	2197	Paleozoic and older sedimentary, igneous, and metamorphic rocks; and Tertiary intrusive (igneous) rocks.

[1] Logarithmic mean.

INDEX MAP



LOCATION OF PREHISTORIC LAKE BONNEVILLE

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This map is intended primarily for use in implementing ShakeMap in northern Utah. The information presented on this map has some limited value in understanding site response during earthquake ground shaking in areas outside the Wasatch Front urban corridor (see plate 2). However, the map should not be used as a substitute for site-specific geotechnical investigations conducted by qualified professionals. Considerable variation in shear-wave velocity exists in unit Q. The applicability of the mean Vs30 values for this unit is uncertain outside the limits of Lake Bonneville.