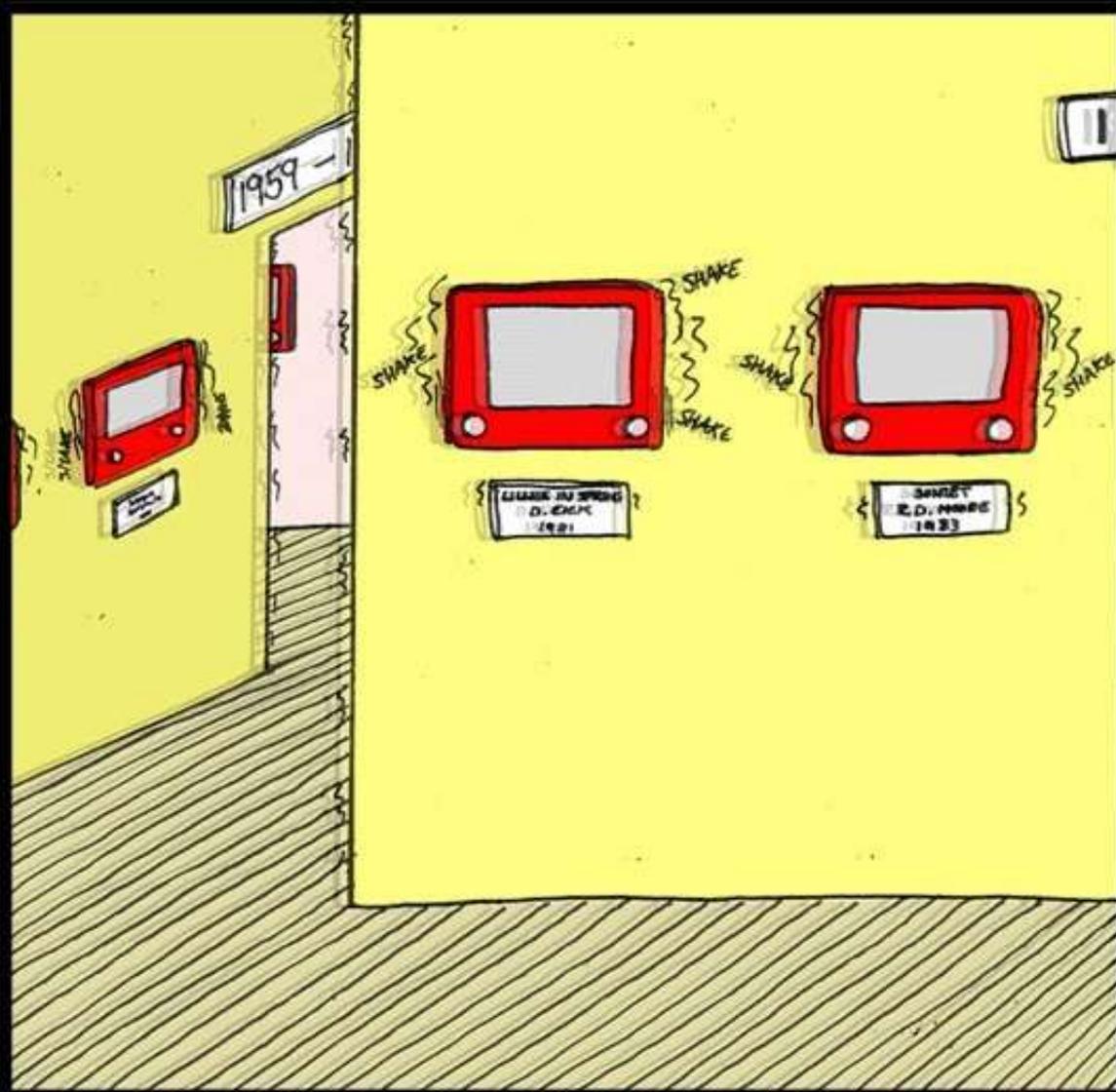


Shaking Things Up

A Preparedness Presentation

South Davis Junior High
School Cafeteria
March 27, 2018



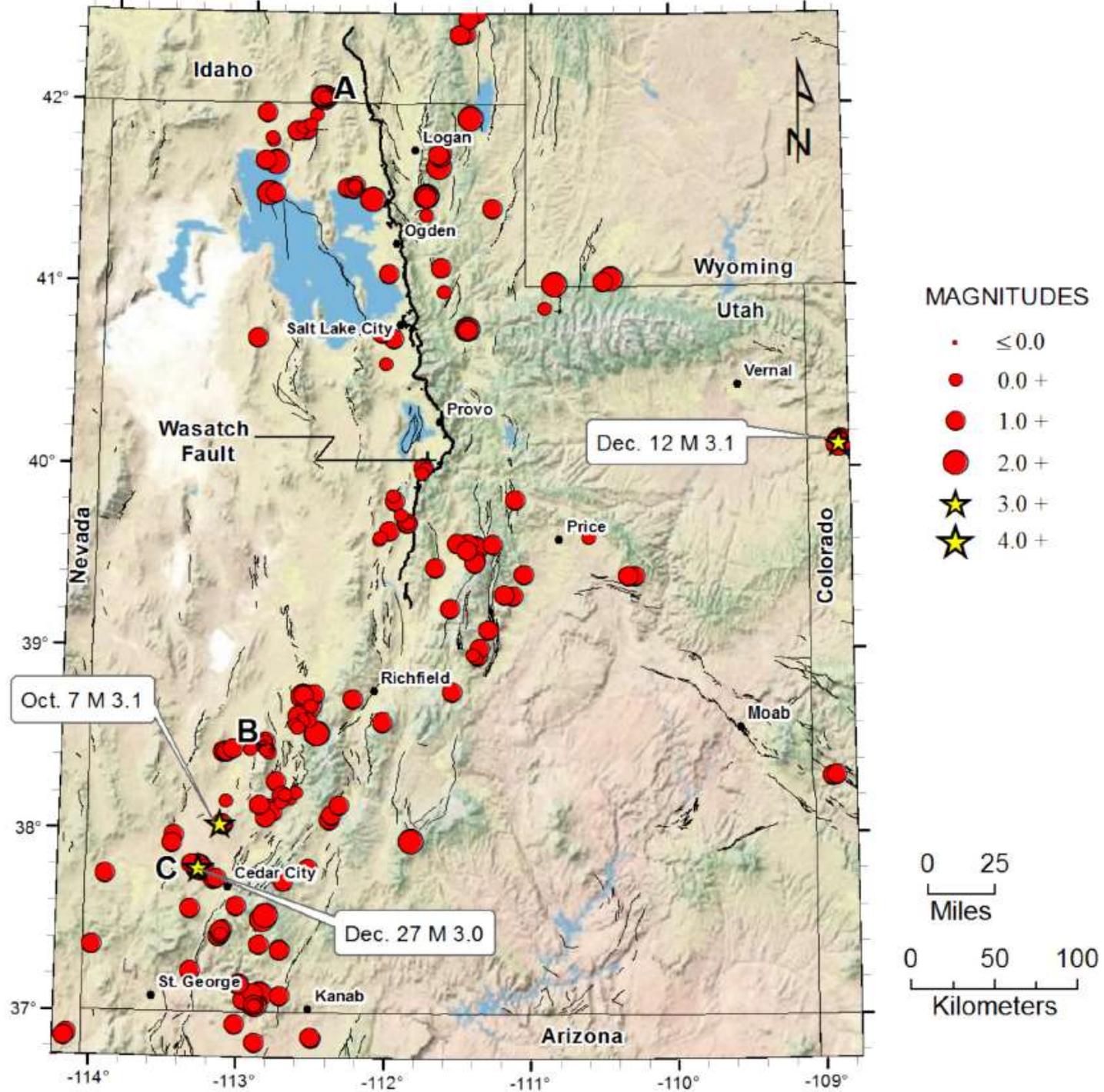
IT WAS ONLY A MINOR EARTHQUAKE, BUT
THE ETCH-A-SKETCH GALLERY WAS RUINED

Where Are We Going

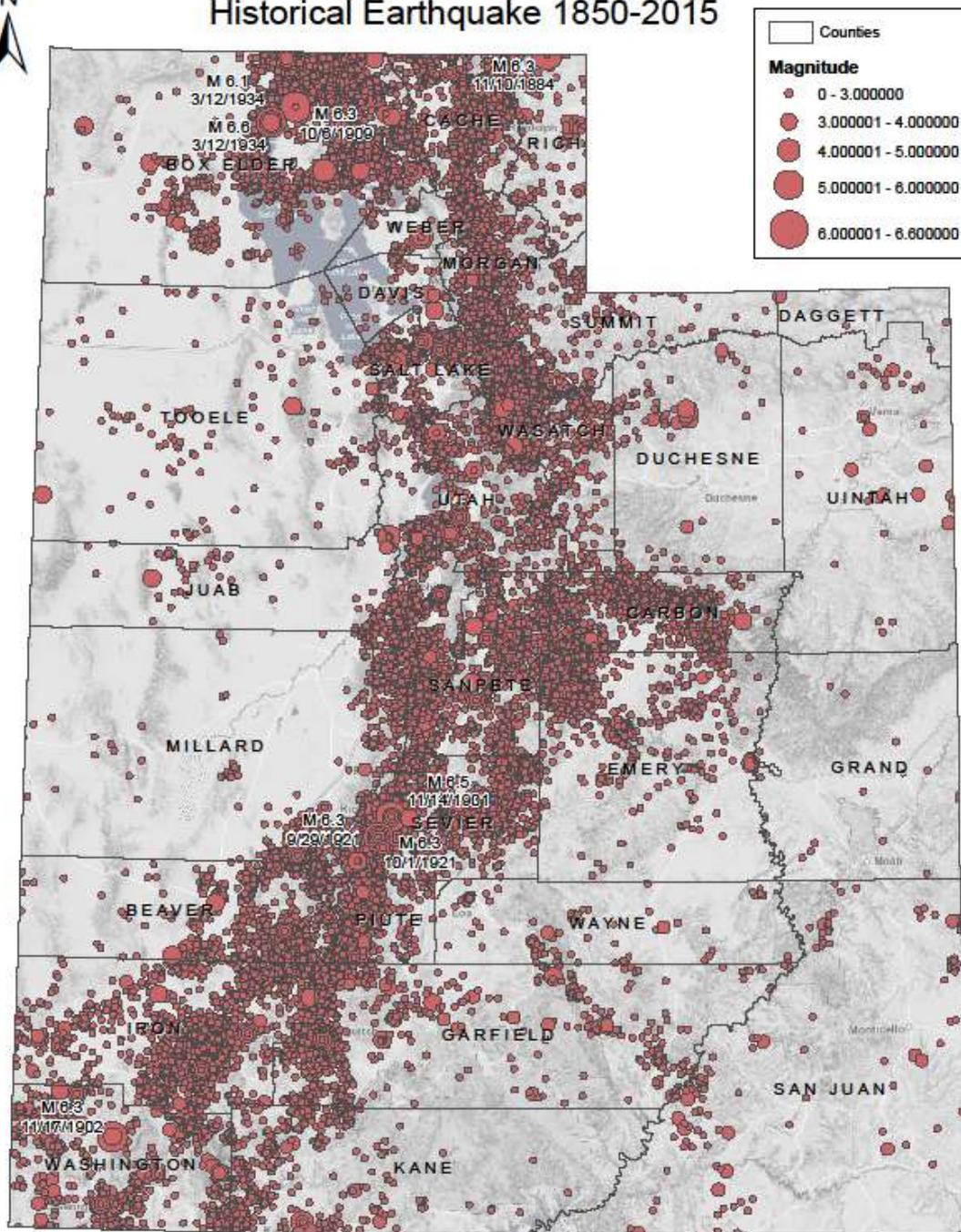
- Faults to Care About
- What to Expect from Ground Shaking
- Secondary Earthquake Effects
- How is the Build Environment Going to Perform

Things to Consider

- Extent of Hazard
- Risk
- Available Resources

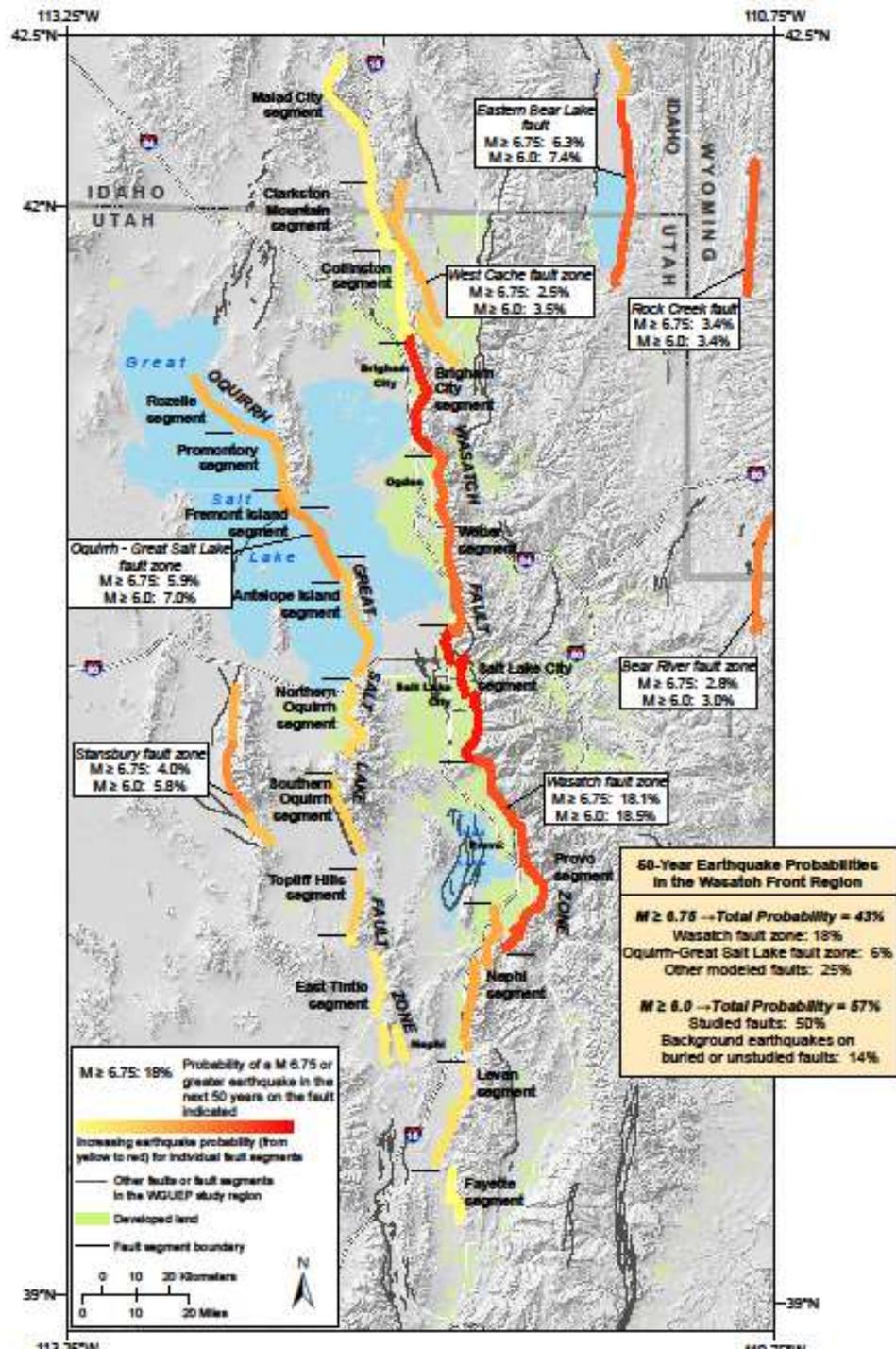


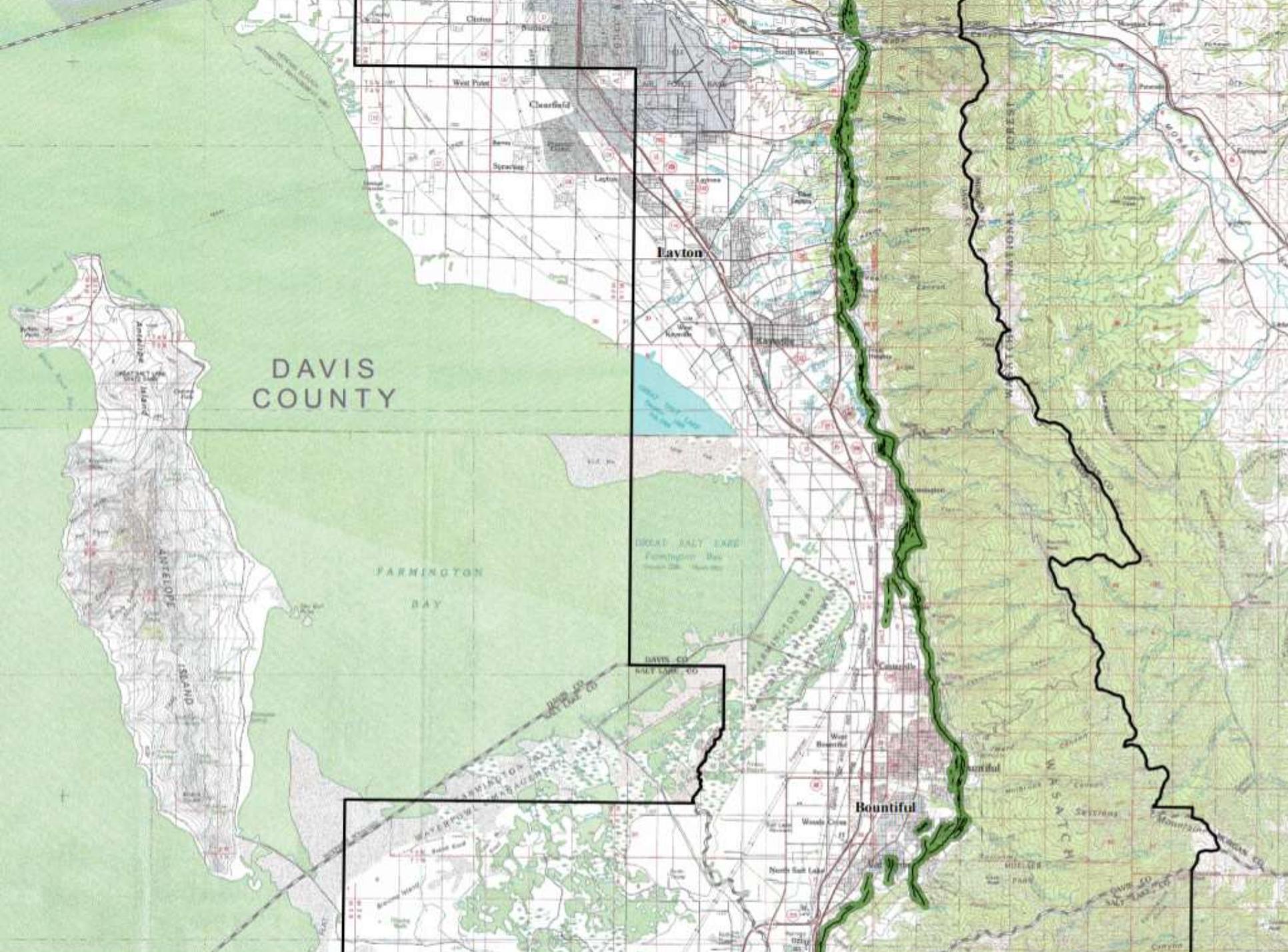
Historical Earthquake 1850-2015



Data Source: the University of Utah Seismograph Stations, the Utah Automated Geographic Reference Center

Faults to Care About





DAVIS COUNTY

Layton

Bountiful

FARMINGTON BAY

WASATCH-CACHE NATIONAL FOREST

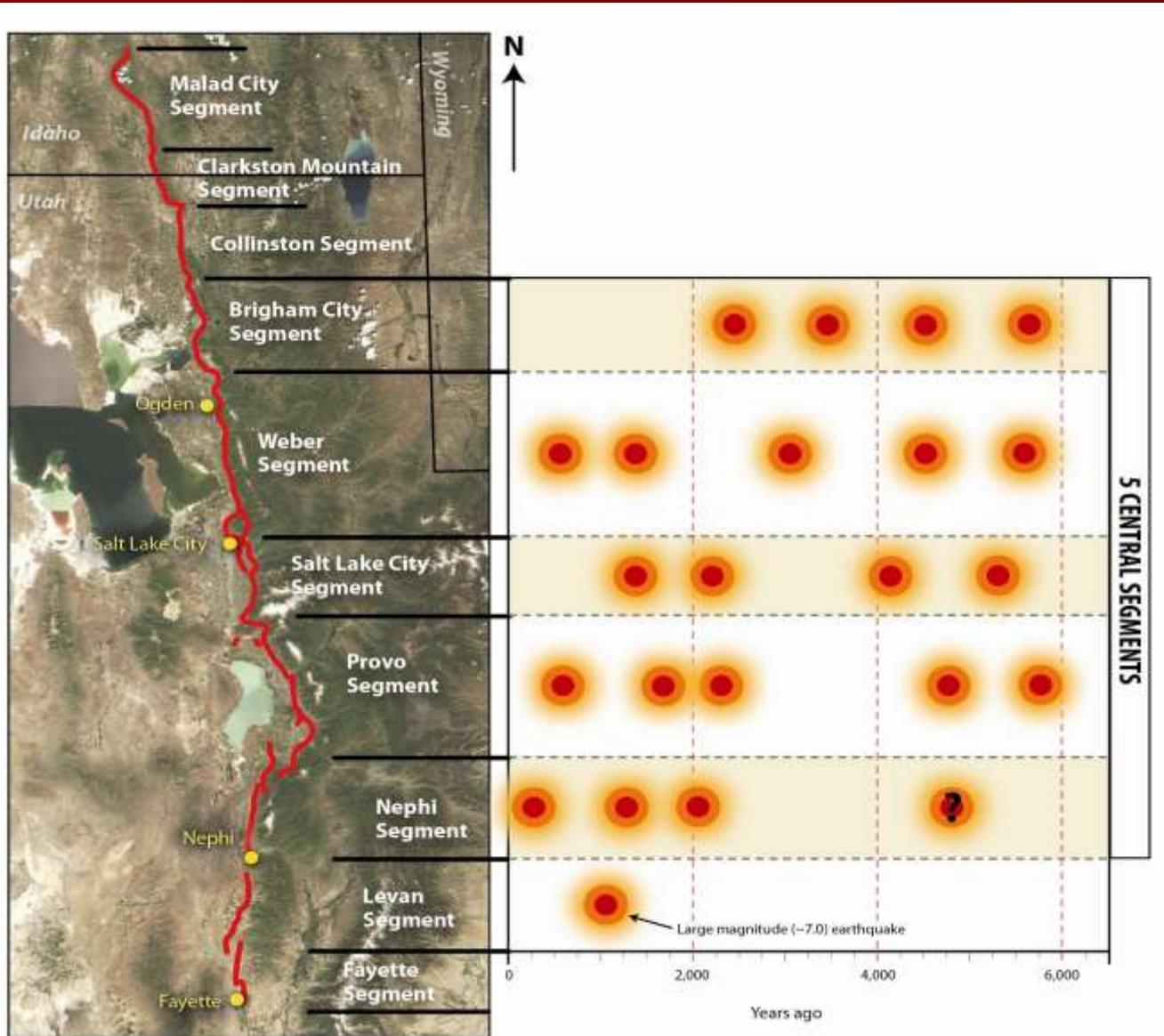
ANTelope ISLAND

WATERPOWERS

DAVIS CO. SALT LAKE CO.

DAVIS CO. SALT LAKE CO.

Wasatch Fault Zone

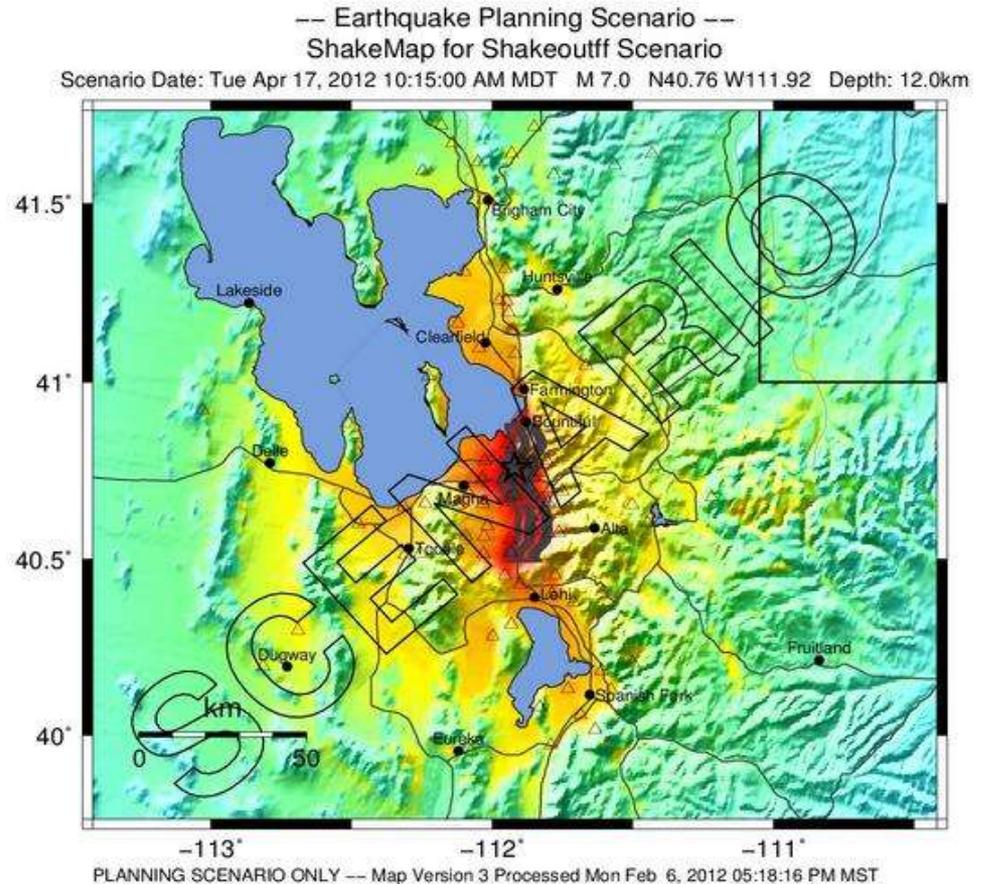


Hansel Valley – 1934 M 6.6



Great Utah ShakeOut Scenario

- M7.0 on the Salt Lake City Segment
- Direct Damage to 12 Counties
- Affecting Roughly 2.39 Million People or About 80% of the State's Population.



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Mod./Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<0.1	0.5	2.4	6.7	13	24	44	83	>156
PEAK VEL.(cm/s)	<0.07	0.4	1.9	5.8	11	22	43	83	>160
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X _s

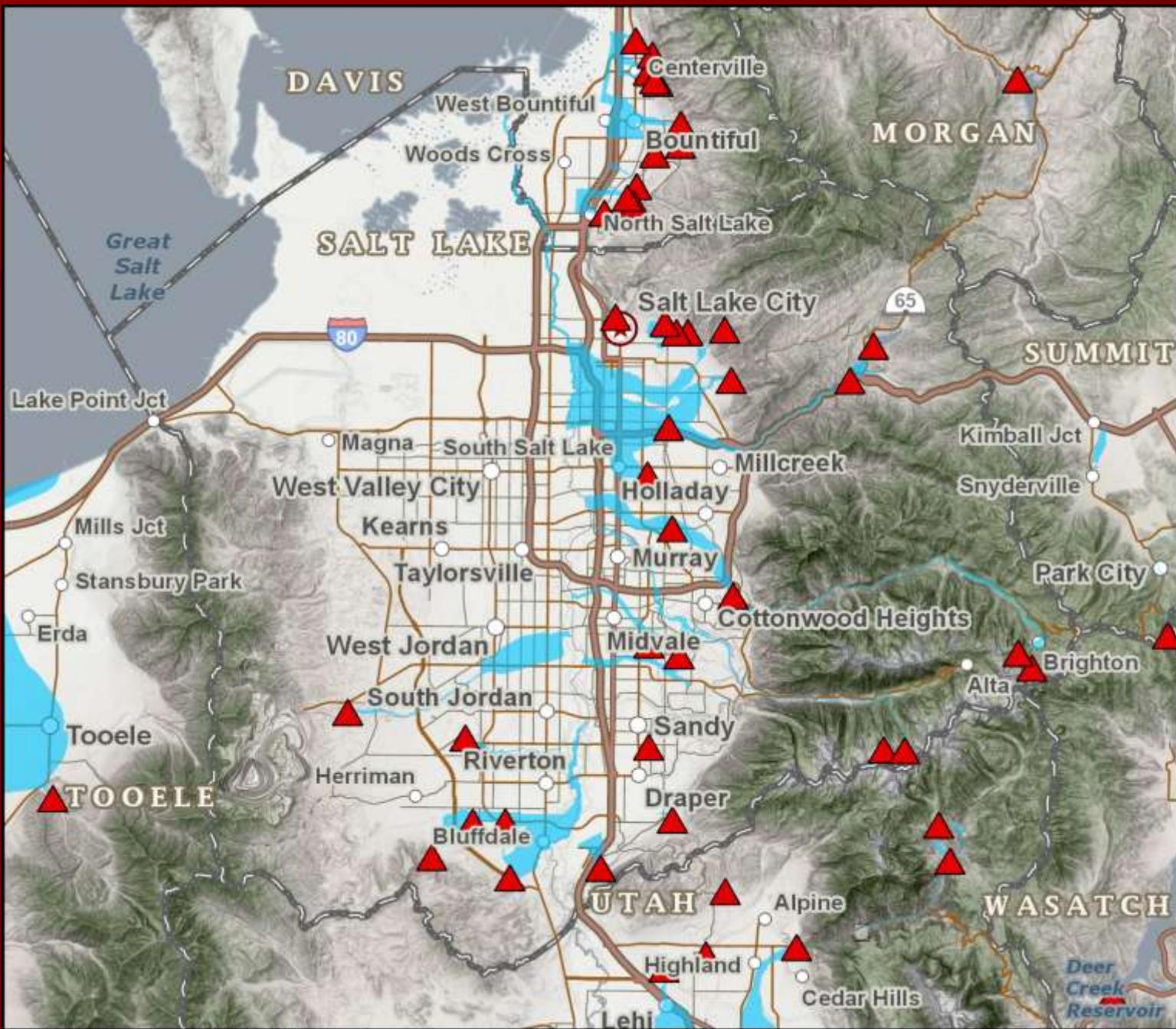
Scale based upon Wald, et al., 1999

Liquefaction



Landslide





High Hazard Dams and Dam Inundation Areas

- ▲ High Hazard Dams
- Dam Inundation Areas

Data Sources:
 Utah Division of Water Rights
 and the Utah Automated Geographic Reference Center

Granada Hills Failed Utilities



NBC News

Liberty Park Chevron Pipeline Break



Northridge Earthquake Train Derailment



Northridge Manufactured Home Fire



Emigration Canyon Wildfire



Summary of Hazus Results

Human Impact

Casualties

Life Threatening Injuries	7,400 - 9,300
Fatalities	2,000 - 2,500

Shelter Needs

Displaced Households	84,400
Individuals Seeking Temporary Shelter	52,700

Economic Impact

Estimated Short-Term Economic Loss

Building-Related	\$24.9 billion
Income	\$6.9 billion
Lifeline-Related	\$1.4 billion
Total	\$33.2 billion

Building Damage

Damage Category	Number of Buildings Affected	Percent of 757,000 Total Buildings
Slight	125,500	16.58%
Moderate	78,400	10.36%
Extensive	48,800	6.45%
Complete	55,400	7.32%

Hazus Building Damage Categories

Damage Category	Immediate Post-Earthquake Inspection	Range of Possible Economic Loss Ratios	Probability of Long-Term Building Closure	Probability of Partial or Full Collapse
Slight	Green Tag	0% - 5%	P = 0	P = 0
Moderate	Green Tag	5% - 25%	P = 0	P = 0
Extensive	Yellow Tag	25% - 100%	P = 0.5	P = 0
Complete	Red Tag	100%	P = 1.0	P > 0

Critical Facility Damage

Impaired ^f Hospitals (Acute Care)	15 out of 32
Impaired ^f Schools	*
Impaired ^f Police Stations	*
Impaired ^f Fire Stations	*

^f At least "moderate" damage.

Lifelines

Utility System Performance

	Day 1	Day 3	Day 7	Day 30	Day 90
Households without Potable Water	483,600	466,100	442,800	362,900	332,800
Households without Electricity	444,600	251,200	105,900	27,300	800

Transportation

Impaired ^g Roads	*
Impaired ^g Bridges	595 out of 1,805

^g At least "moderate" damage—or several inches of settlement or offset of the ground.

^h At least "moderate" damage—or column cracking or chipping, movement of the abutment, settlement of the approach, etc., but where the columns are structurally sound.

Debris Generated

Tons	21,000,000
Truckloads (25 tons/truck)	821,600

^h Insufficient data for Hazus calculation

Unreinforced Masonry Structures

- Statewide – 164,000
- Weber County – 21,200
- Davis County – 13,100
- Salt Lake County – 82,700
- Utah County – 14,200
- Any Brick or Block Structure Build before 1975

Before and After Christchurch, NZ



URM - Christchurch



Wells, NV Historic District

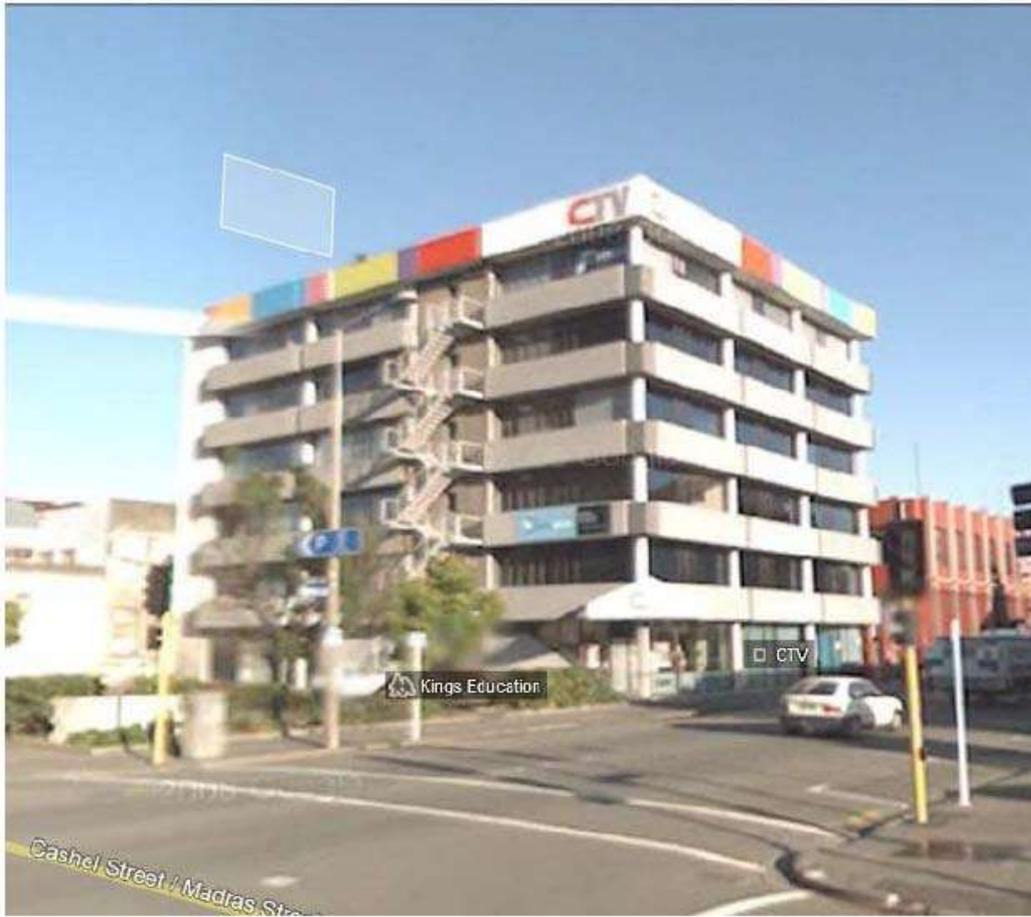


Dave van Hulsteyn

Historic District



Before and After -Christchurch



Non-Structural Hazards



Recreational Opportunities



Recreational Opportunities



PAUL TAYLOR
89



DO YOU HEAR A TICKING?



THE BIG ONE

I'LL BE BACK

JUST PRETEND I'M NOT HERE

YOU ARE GETTING APATHETIC

I'M FEELING STRESSED!!

WAKE UP AND SMELL THE LOOMING DISASTER!

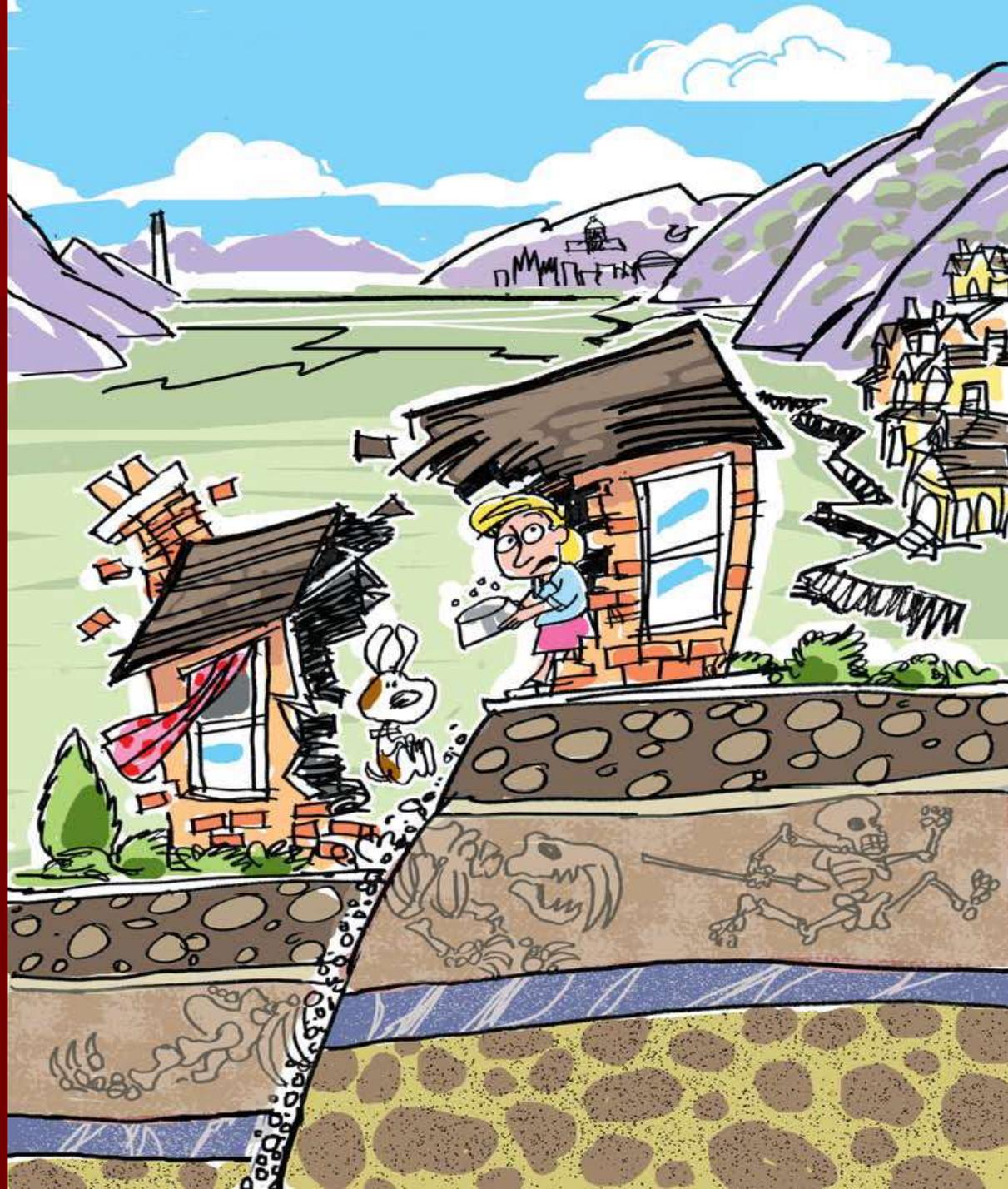
HEY YOU!!

WASATCH

FAULT



Questions



Probabilities Report

