

DISASTER RESILIENCE:
WHAT WOULD
HAPPEN IN THE
“BIG ONE?”

ENVISION UTAH



BACKGROUND

WASATCH FRONT REGION – Next 50 years

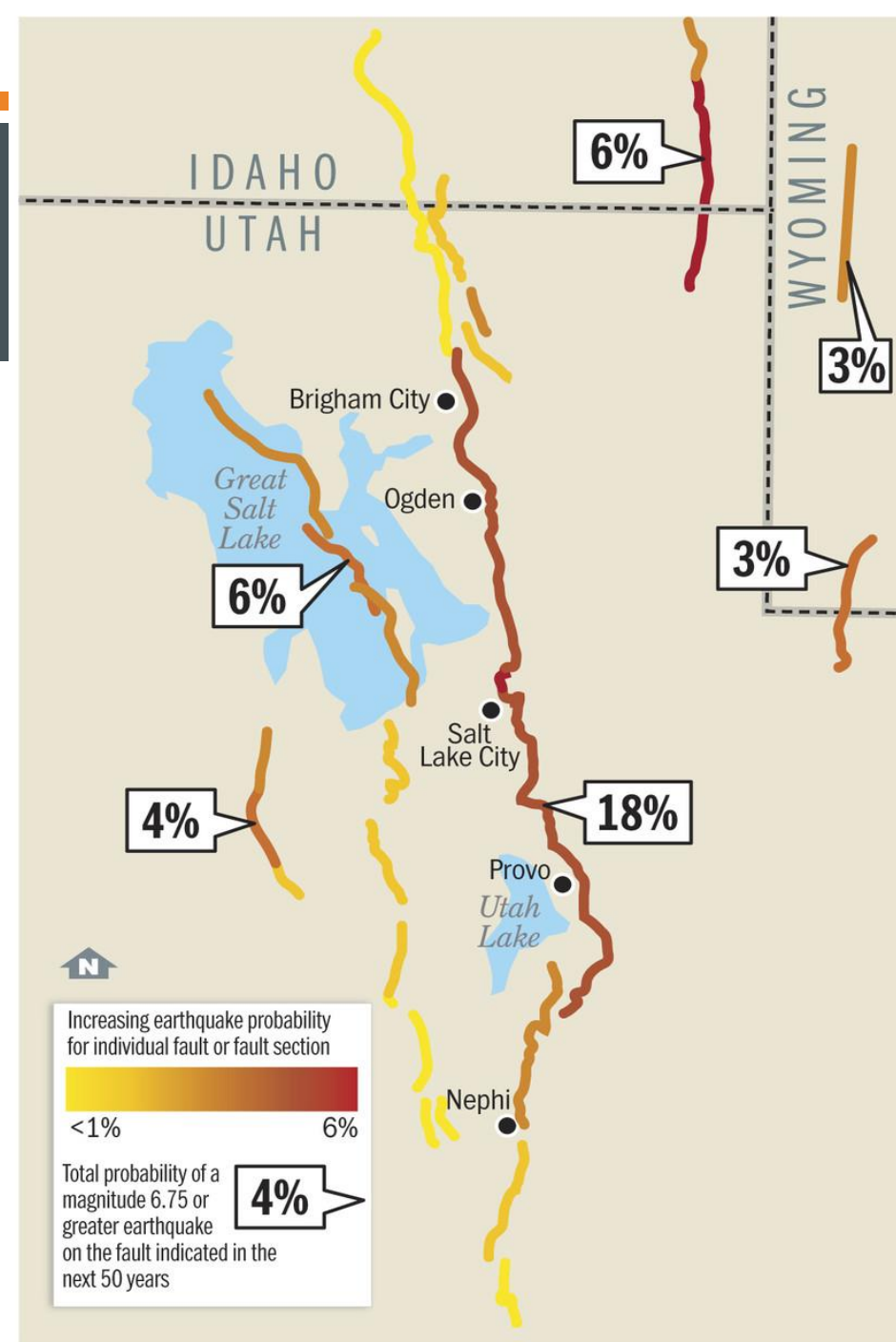
- 57% chance of a 6.0 or greater quake
- 43% chance of a 6.75 or greater quake

THE “BIG ONE”

- 22 around 7.0 over the past ~6,000 years, once every 300 years
- Last “big one” along the fault was more than 300 years ago

SALT LAKE SEGMENT

- “Big one” every 1300-1500 years; last one was 1400 years ago
- Characteristic magnitude: 7.1 ± 0.2



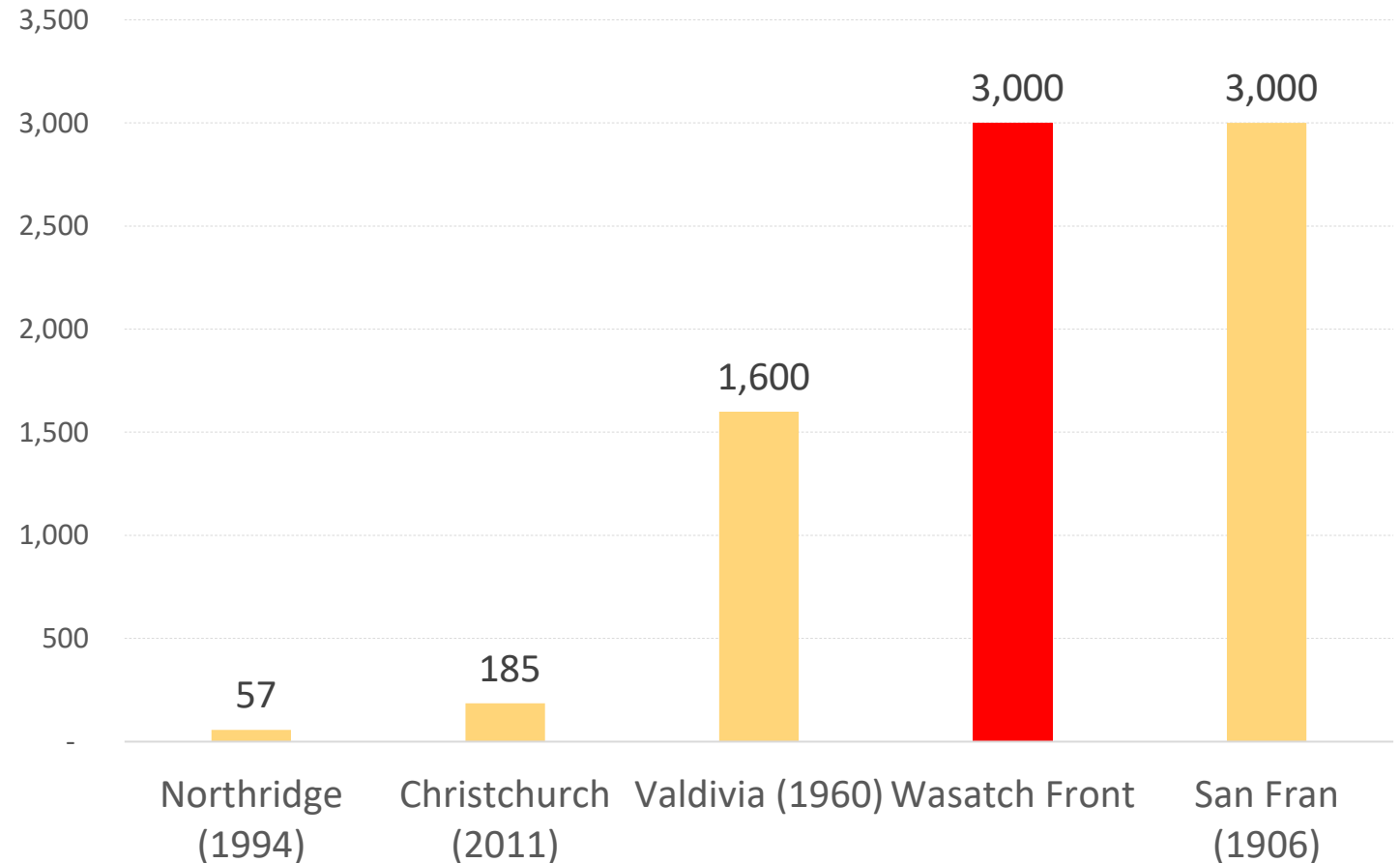
SOURCE: Working Group on Utah Earthquake Probabilities

DESERET NEWS GRAPHIC

THE RISK

- **WASATCH FRONT REGION**
 - FEMA estimates a 43% chance of experiencing a 6.75+ earthquake in the next 50 years.
- **HAZUS ESTIMATES FOR 7.0**
 - Fatalities: 3,000+
 - Critically Injured: 7,400 – 9,300
 - Displaced Households: 84,400

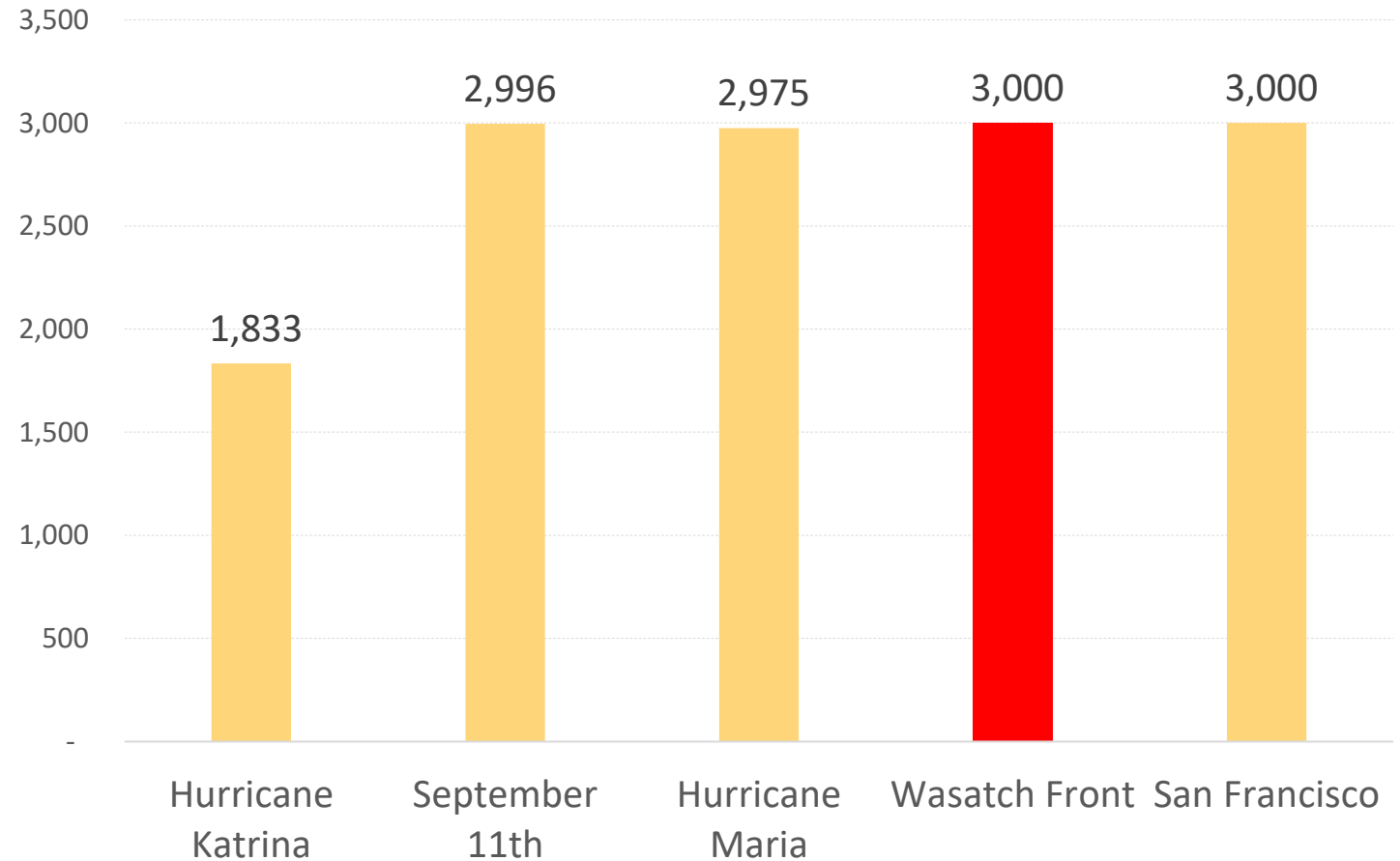
FATALITIES IN MAJOR EARTHQUAKES SINCE 1900



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FATALITIES IN MAJOR U.S. DISASTERS SINCE 1900



CRITICAL UTILITY SYSTEMS

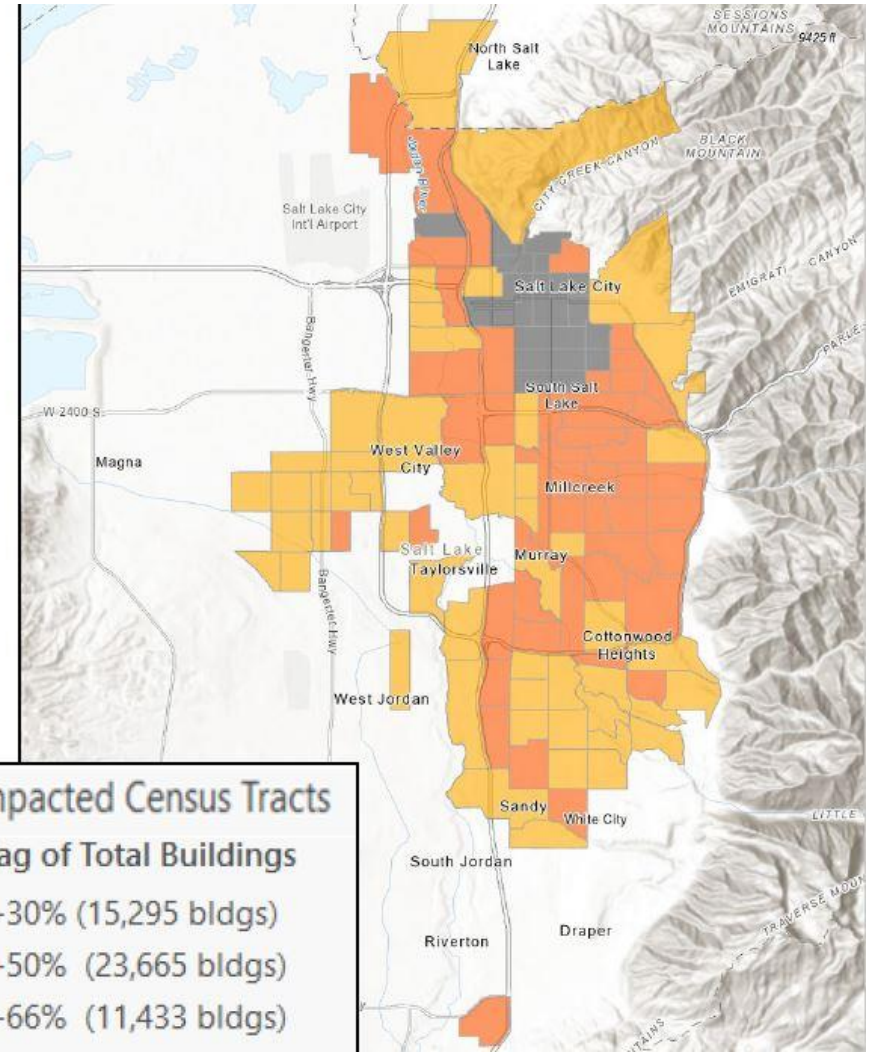
	DAY 1	DAY 3	DAY 7	DAY 30	DAY 90
Households without potable water	483,600	466,100	442,800	362,900	332,800
Households without electricity	444,600	251,200	105,900	27,300	80
Natural Gas	Restoration to most structures within <u>two weeks</u>				
Sewer	Restoration time likely <u>2-3 times</u> that of water restoration				

BUILDING DAMAGES



Search & Rescue Building Damages

- **60,664 RedTag (complete damage) Buildings**
 - 57,787 in Salt Lake County (95.2%)
 - 2,280 in Davis County (3.7%)
 - 544 in Utah County (0.8%)
 - 35 in Weber County (0.05%)
- **35,811 YellowTag (extensive damage) Buildings**
 - 29,911 in Salt Lake County (83.5%)
 - 3,251 in Davis County (9%)
 - 2,083 in Utah County (5.8%)
 - 371 in Weber County (1%)

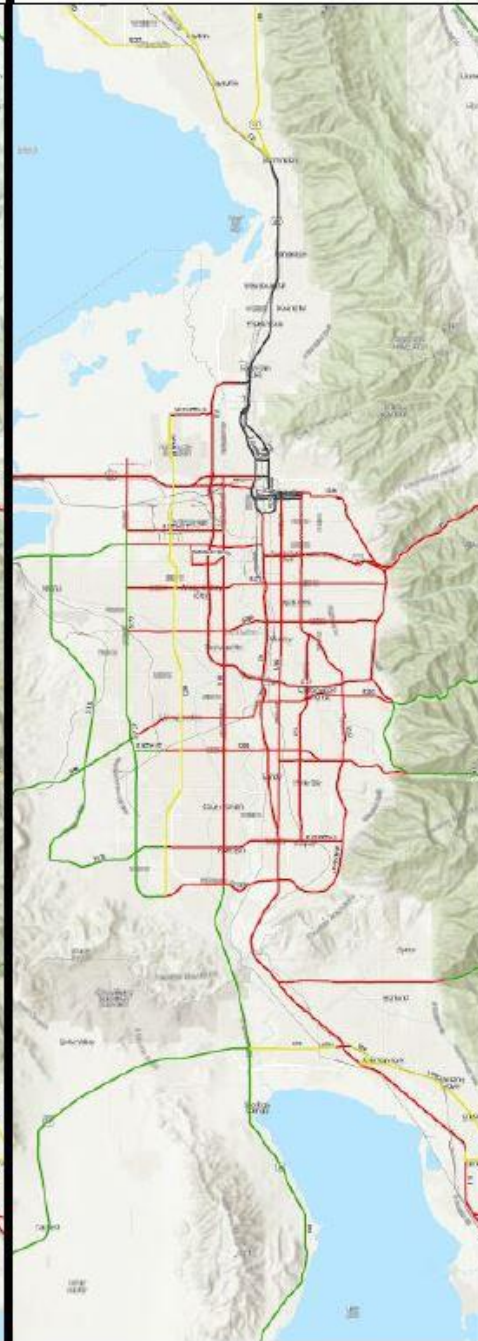


TRANS FEASIBILITY ANALYSIS (TFA)

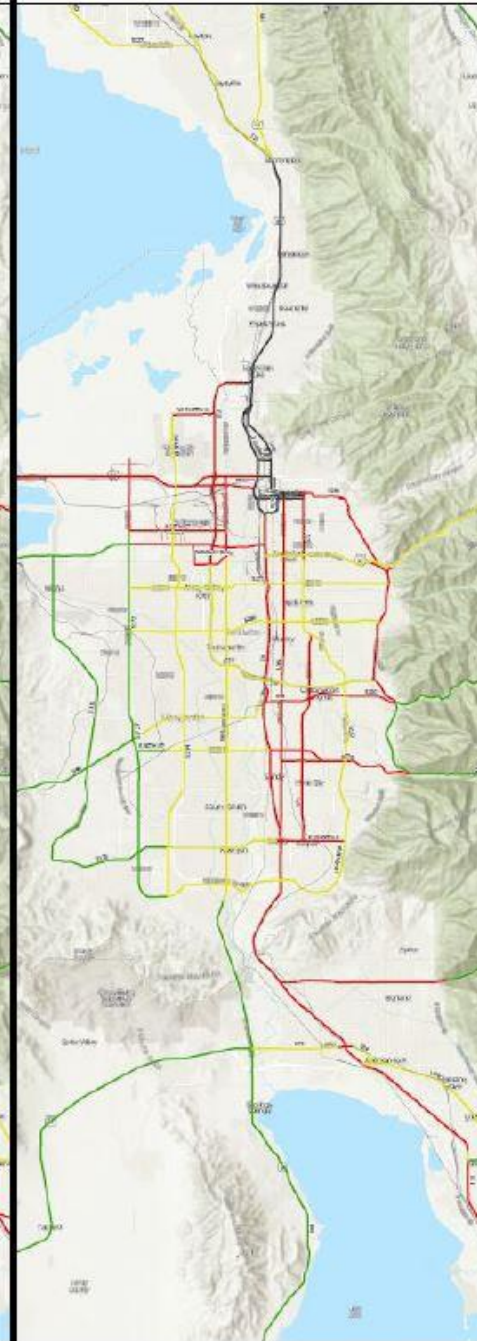
DAY 0



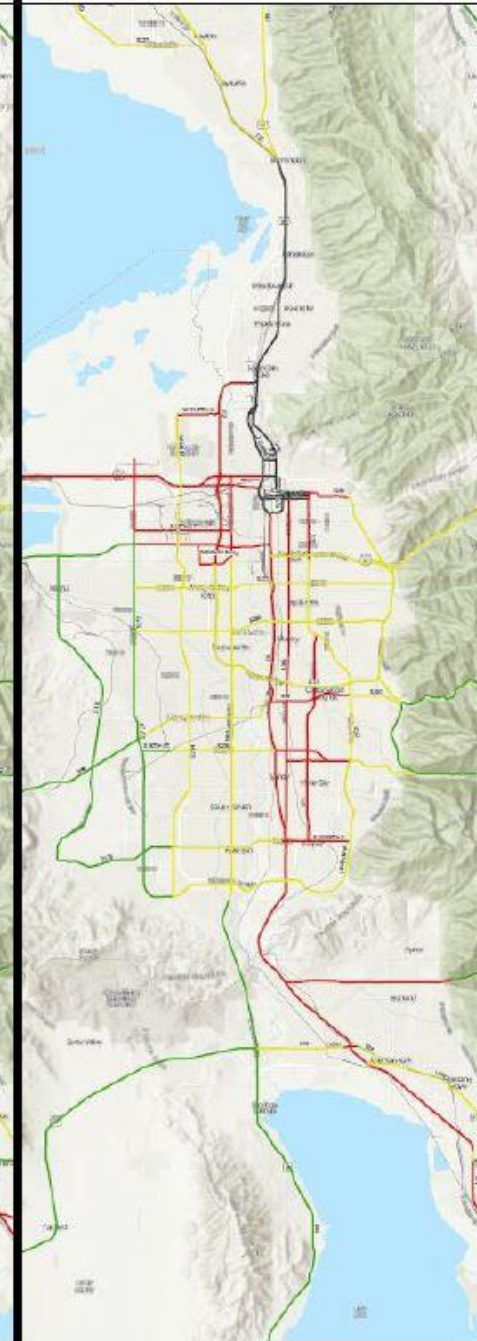
DAY 5



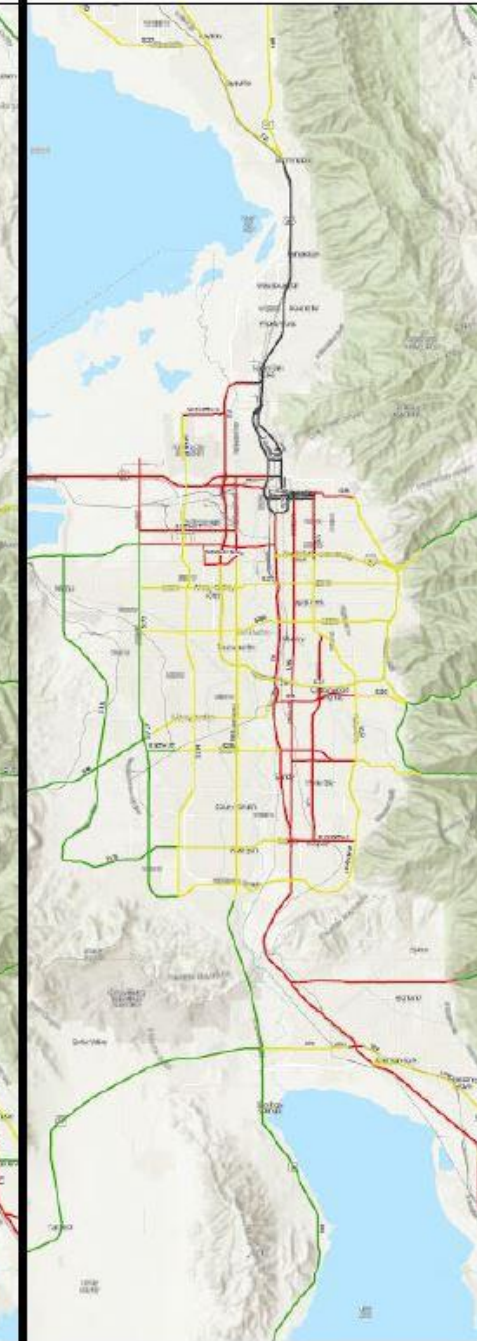
DAY 7



DAY 14



DAY 30



SHORT TERM ECONOMIC LOSS ESTIMATES

Building-Related \$24.9 billion

Income \$6.9 billion

Lifeline-Related \$1.4 billion

TOTAL \$33.2 billion

Many places that experience a disaster of this scale never recover economically

WHY IS UTAH'S RISK SO HIGH?

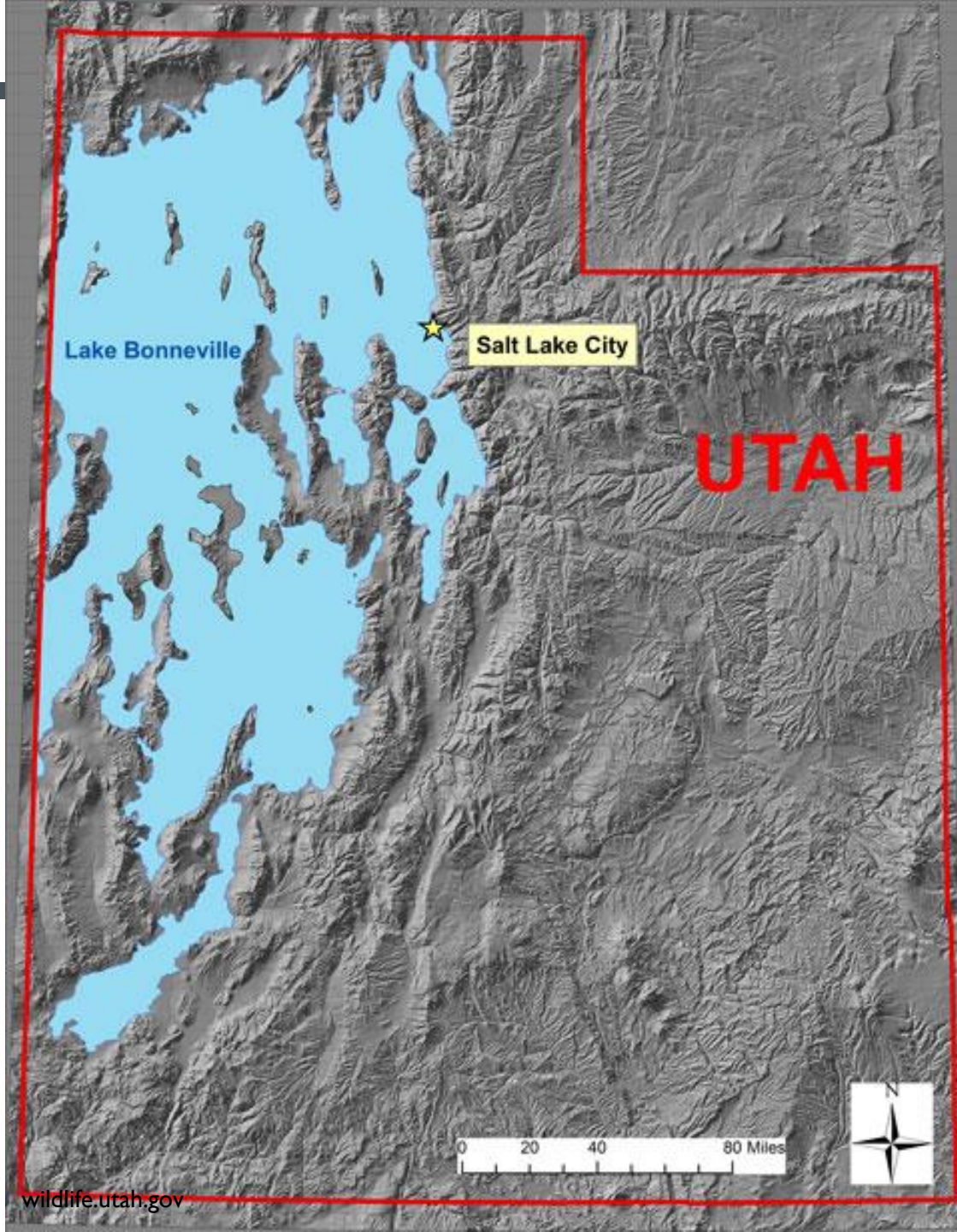
LOCALIZED POPULATION

- Population and infrastructure concentrated along the Wasatch Front

LIQUEFACTION POTENTIAL

LIMITED AWARENESS OF RISK (UNTIL MID-1970s)

- Luck and long return times
- Late building codes
- Life-threatening buildings (more than 140,000 URMs remain)

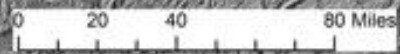


Lake Bonneville



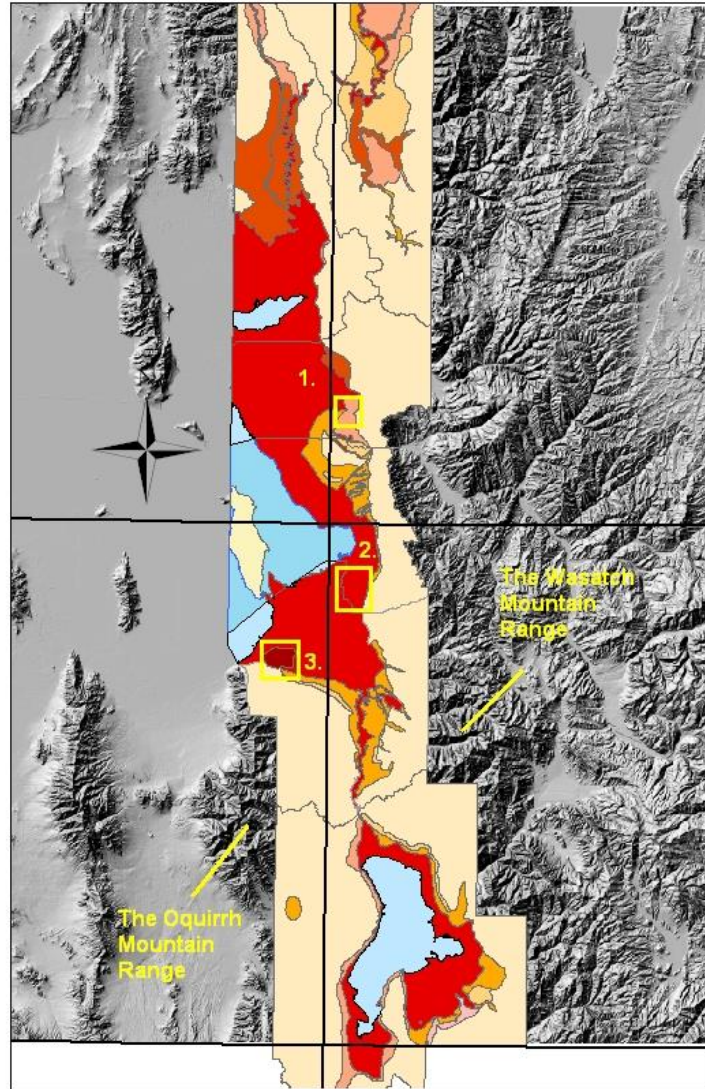
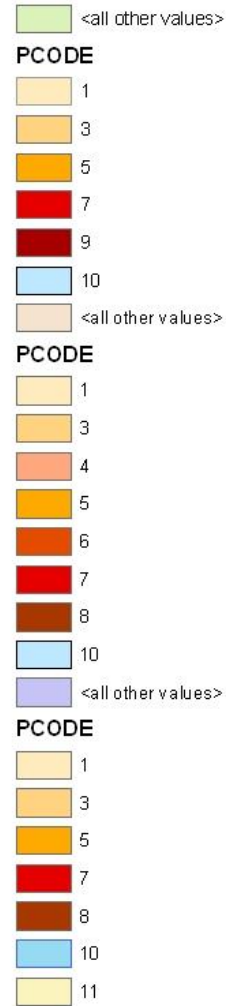
Salt Lake City

UTAH



Liquefaction Hazard for the Wasatch Front

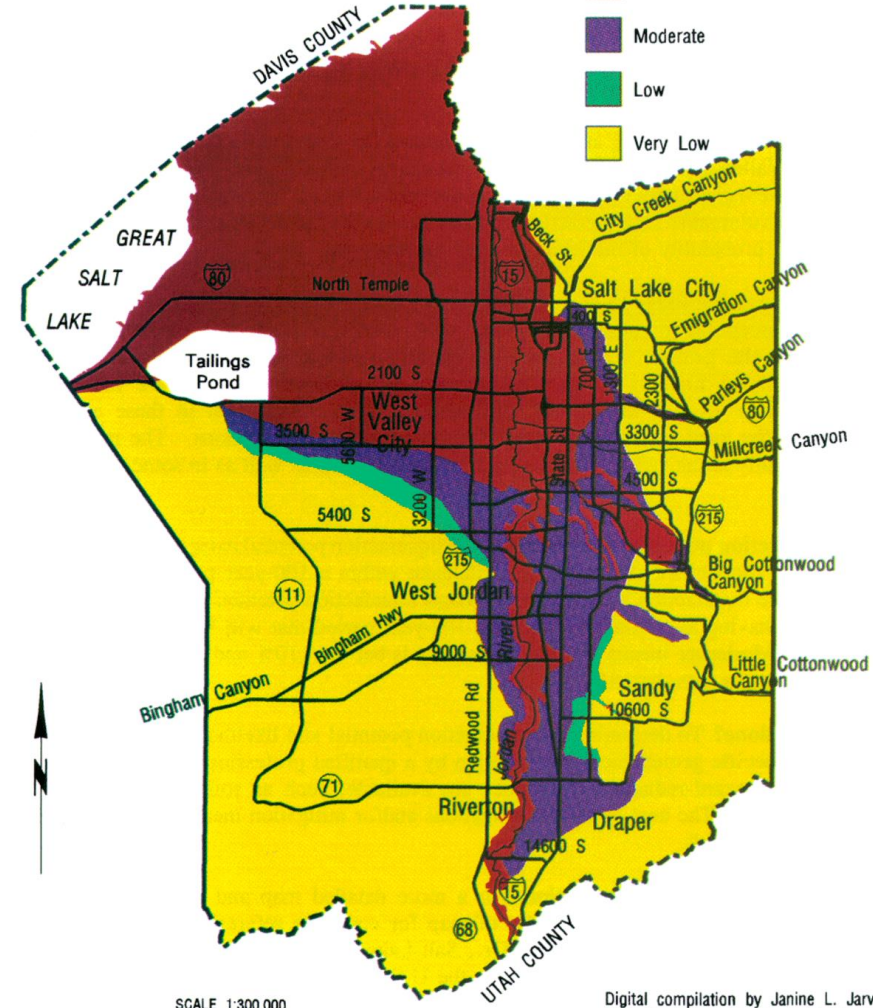
Legend



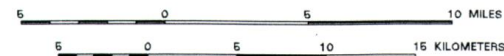
LIQUEFACTION-POTENTIAL MAP FOR A PART OF SALT LAKE COUNTY, UTAH

UTAH GEOLOGICAL SURVEY
Public Information Series 25
August 1994

LIQUEFACTION POTENTIAL



SCALE 1:300,000



Digital compilation by Janine L. Jarva,
Utah Geological Survey, facilitated by
Automated Geographic Reference Center

THE GREAT SALT SHAKE

- FEMA Region VIII: “The Wasatch Fault is one of the most probable catastrophic natural threat scenarios in the U.S.”
- The Wasatch Front is FEMA’s 2021 National Priority Focus Exercise
 - Workshops throughout 2019 and 2020 in preparation for May 2021 exercise
- “Resilient Wasatch 2023”: FEMA Region VIII’s goal



FEMA

CURRENT CHALLENGES

- Current efforts primarily focus on **disaster response** immediately after a natural hazard rather than **disaster resilience**.
 - How will we restore critical operation and function to the valley? How do we go “back to normal”?
- Fix the Bricks is a vital URM retrofit program, but with current resources it will take generations before all vulnerable buildings are retrofitted.





DISASTER RESILIENCE

ENVISION UTAH