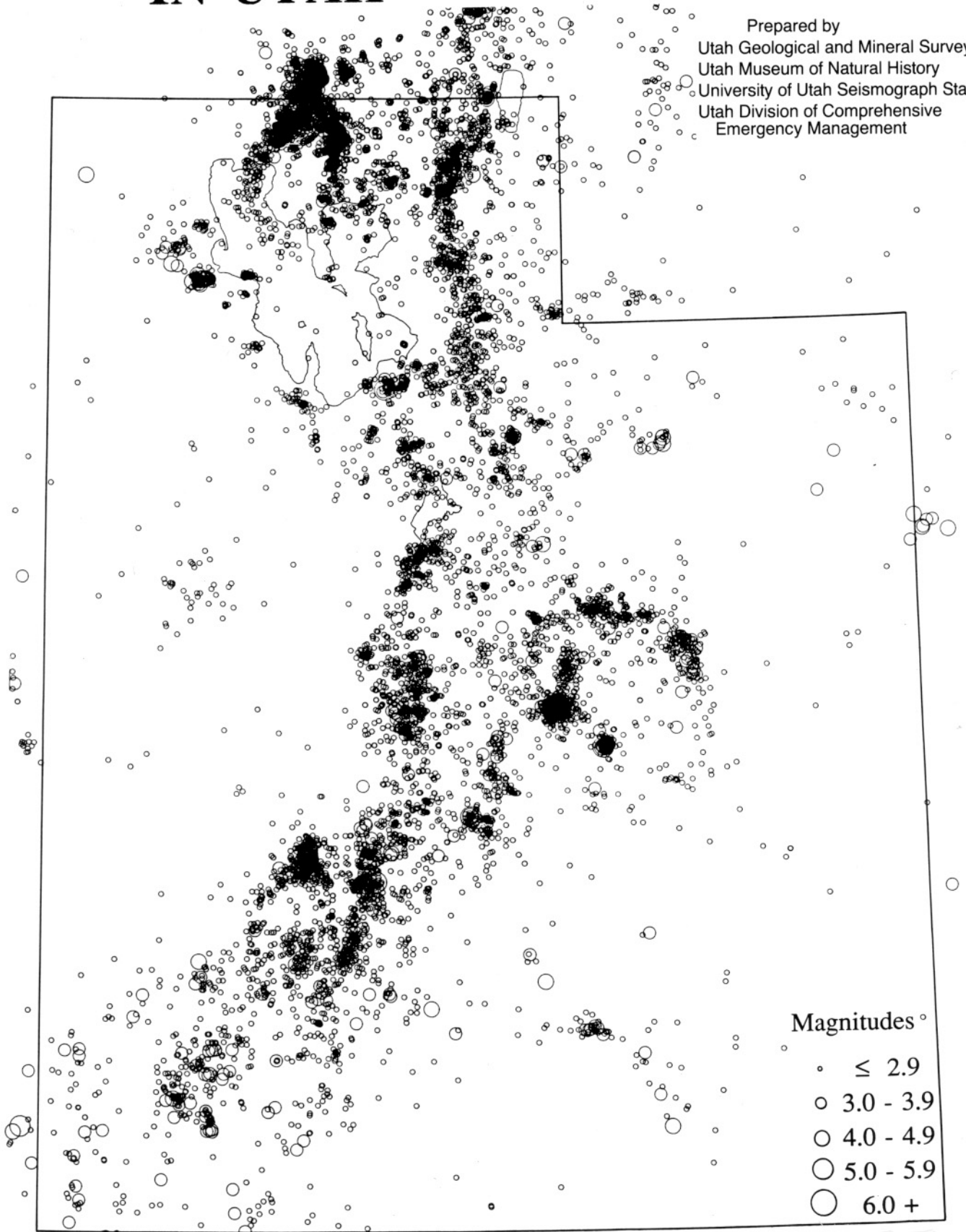


EARTHQUAKE HAZARDS & SAFETY IN UTAH

Utah Geological & Mineral Survey
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Utah Museum of Natural History
University of Utah Seismograph Stations
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Emergency Management



Each dot represents one earthquake located by University of Utah Seismograph Stations since July 1962.

UTAH'S EARTHQUAKES

An **earthquake** is a shaking of the ground caused by the sudden movement of blocks of rock along a break in the earth's crust (**fault**).

Hundreds of earthquakes occur throughout Utah each year, but only about 2% are felt by humans.

The **Richter Magnitude Scale** is used to measure the size of an earthquake. Each whole number increase in magnitude represents a tenfold increase in recorded ground motion. A magnitude 7.0 earthquake is ten times larger than a magnitude 6.0 event and 100 times larger than a magnitude 5.0.

Large earthquakes of up to magnitude 7.5 can occur in Utah. Large events can cause considerable damage.

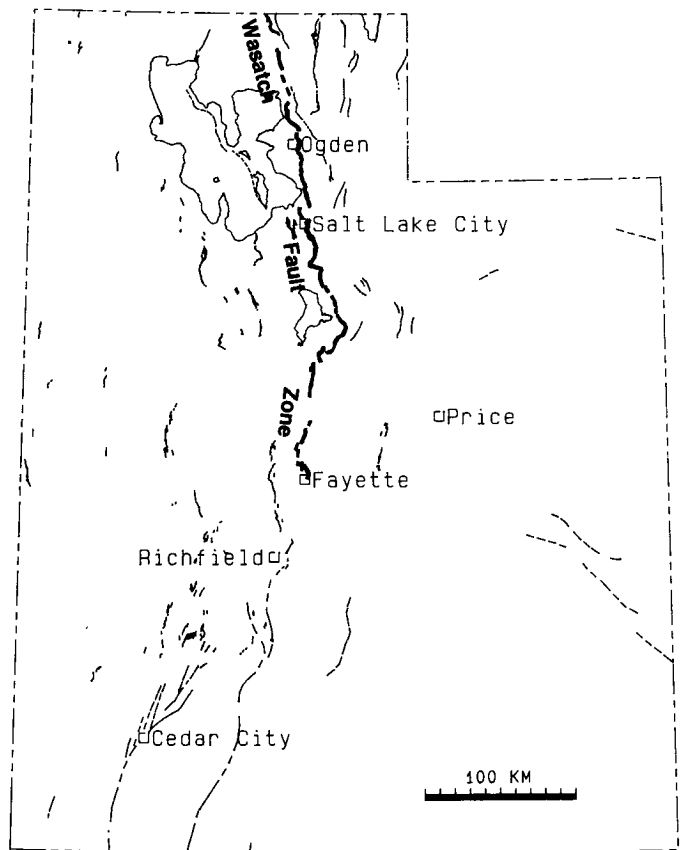
Moderate earthquakes of magnitude 5.5 to 6.5 occur somewhere in Utah on the average of once every 7 years. If these earthquakes occur under cities and towns, they can cause considerable damage depending on the area's geology and the construction of nearby structures.

The **largest historical (since 1850) earthquakes in Utah** were the 1901 earthquake near the town of Richfield with an estimated magnitude of 6.5, and the 1934 Hansel Valley earthquake (at the northern end of the Great Salt Lake) of magnitude 6.6.

Faults that have shown movement in the last 1.6 million years (Quaternary) are **considered potentially active**, and could be the source of future earthquakes (see adjacent map).

The **Wasatch fault** is the longest fault in Utah (over 200 miles long) extending from Malad City, Idaho to Fayette, Utah. This fault is made up of 10 to 12 **segments**, averaging 20 miles in length, which move independently.

Large earthquakes occur on the **Wasatch fault** on the average of once every 400 years.

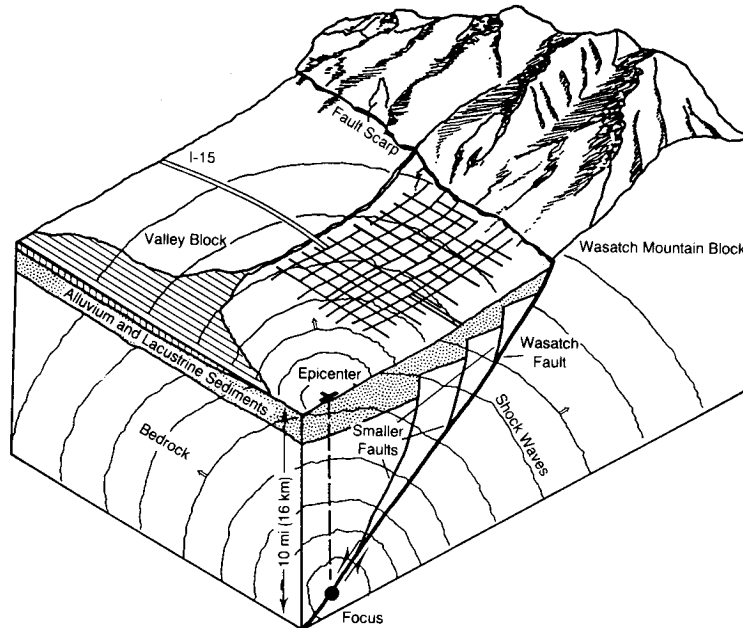


GENERALIZED MAP OF QUATERNARY FAULTS IN UTAH

EARTHQUAKE HAZARDS

The RISK from earthquakes to people and property at a particular location is determined by the following:

- 1) the **size or magnitude** of the earthquake and the **distance from the earthquake**
- 2) the **local geology** - underlying rock, soil cover, ground-water conditions
- 3) the **geologic hazards** produced - rockfalls, landslides, liquefaction, subsidence, floods
- 4) the **location, design, and construction** of man-made structures



Although numerous faults exist in Utah, the WASATCH FAULT causes the greatest concern because it appears to be the most frequent source of large earthquakes in Utah and 90% of Utah's population live within 20 miles of it.

A major earthquake can occur in Utah at any time. The following could result:

I. GEOLOGIC HAZARDS

- A. **Ground shaking** is the one hazard that **will occur**, and it will affect a widespread area.
- B. The fault may **rupture** the surface causing displacement of up to 20 feet in limited areas.
- C. **Rockfalls** and **landslides** could be triggered by shaking.
- D. **Liquefaction** may occur when loose, wet soils react to shaking and change into a thick liquid incapable of supporting buildings. Buildings may tilt.
- E. **Flooding** of low-lying areas near lakes may occur due to **subsidence** and **tilting** of the valley floor.

II. PROPERTY DAMAGE

- A. **Man-made structures**, such as buildings, highways, bridges, and dams, could be damaged.
- B. **Lifelines**, such as gas, electric, communication, water and sewer lines, could be broken, disrupting service for days and causing **fire hazards**.
- C. **Falling objects** could cause injuries.

No one knows when or where the next major earthquake will occur, but all earth scientists agree that we must be prepared.

EARTHQUAKE SAFETY

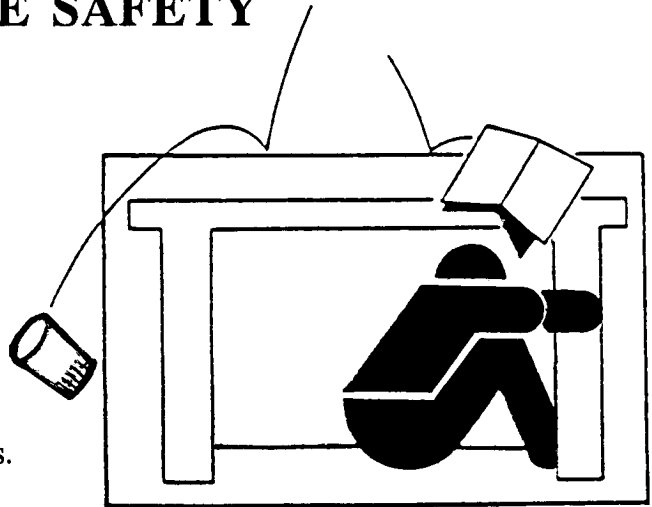
I. KNOW WHAT TO DO DURING

A. STAY CALM

B. DUCK & COVER

1. IF INSIDE, STAY THERE!

Duck under table & hold onto its legs, or stand in interior door frame. If no protective cover is available, sit next to an interior wall & cover head/neck with arms.



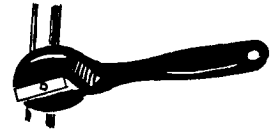
2. IF OUTSIDE, STAY THERE!

Move into open area away from buildings & electric wires. Park car away from bridges/overpasses. Stay in car until shaking stops.

II. PREPARE AHEAD OF TIME

A. PREPARE YOUR HOME

1. Identify possible hazards & reduce their risk.
 - a. Remove heavy objects from high shelves.
 - b. Anchor top-heavy furniture with brackets to wall or floor (refrigerators, bookshelves, etc.)
2. Reduce the risk of fire.
 - a. Learn how to turn off utilities (gas electricity, water)
 - b. Anchor water heater



B. DEVELOP FAMILY RESPONSE PLAN

1. Determine "safe" areas in each room.
2. Hold earthquake drills.
3. Decide on family meeting place.
4. Identify out-of-state contact.



C. PUT TOGETHER A 72 HOUR SURVIVAL KIT

1. WATER (1 gal/person/day)
2. Canned or dried foods
3. Flashlight
4. First-Aid Kit
5. Fire Extinguisher
6. Battery-operated Radio



III. RESPOND AFTERWARD

A. ADMINISTER FIRST AID

B. CHECK FOR UTILITY DAMAGE & TURN OFF ONLY IF NECESSARY

C. USE TELEPHONE ONLY FOR MEDICAL EMERGENCY

D. BE AWARE THAT AFTERSHOCKS MAY CAUSE FURTHER DAMAGE