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Questions and Answers about Utah Earthquakes

When and where do large =arthquakes occur in Utah?

Large =arthquakes (magnitude 6.5 to 7.5) can occur on any of several =ctive segments of the Wasatch fault between Brigham City and =evan. Such earthquakes can also occur on many other =ecognized active faults in Utah.

During the past 6,000 years, large earthquakes have = occurred on the Wasatch fault on the average of once =very 400 years, somewhere along the fault's central active =ortion between Brigham City and Levan.

The chance of a large earthquake in the Wasatch =ront region during the next 50 years is about 1 in 4.

"It is useless to ask when this [earthquake] =isaster will occur. Our occupation of the country has been too =rief for us to learn how fast the Wasatch grows; and, =ndeed, it is only by such disasters that we can learn. By the time

experience has taught us this, Salt Lake City will =ave been shaken down..."

G. K. Gilbert, 1883

"Whatever the earthquake danger may be, it is = thing to be dealt with on the ground by skillful =ngineering, not avoided by flight...."

G. K. Gilbert, ca. 1906

What would happen if a =agnitude 7.5 earthquake occurs along the Wasatch =ault?
Future =arge earthquakes will break segments of the fault about 20 = 40 miles long and produce displacements at the surface of up to 10 - 20 feet.

Strong ground shaking could produce considerable =amage up to nearly 50 miles from the earthquake.

The strong ground shaking may be amplified by factors up to 10 or more on valley fill compared to =ard rock.

Also possible are soil liquefaction, landslides,=20 rock falls, and broad permanent tilting of valley =loors possibly causing the Great Salt Lake or Utah Lake to =nundate parts of Salt Lake City or Provo.

How much damage would be =aused by a large earthquake on the Wasatch Front?
If the = earthquake were to occur on a central part of the =asatch fault, Utah should expect damage to buildings to =xceed $4.5 billion in Davis, Salt Lake, Utah and Weber counties. =his may only represent 20% of the total economic loss.

Unreinforced masonry buildings (for example, brick =omes built before 1960) are particularly vulnerable to =round shaking and are expected to account for 75% of the =uilding losses.

Surface faulting and ground failures due to shaking =uring a large earthquake will cause major disruption of =ifelines (utilities, water, sewer), transportation systems =highways, bridges, airports, railways), and communication systems.

Do we need to worry only =bout large earthquakes causing damage?
No. A =oderate-sized earthquake that occurs under an urbanized area can =ause major damage.

Magnitude 5.5 - 6.5 earthquakes occur somewhere in =tah on the average of once every 7 years.

Estimates of damage from a "direct hit" to one of =he Wasatch Front's major metropolitan areas reach $2.3 =illion for a magnitude 6.5 earthquake, and more than $830 =illion for a magnitude 5.5 earthquake.

Since 1850, at least 15 independent earthquakes of magnitude 5.5 and larger have occurred in the Utah =egion.

Recent magnitude 5.0 and larger earthquakes in =he Utah region include:

Local Date	=agnitude	Location
Jan. 29, 1989	5.4	16 miles SE of Salina
Aug. 14, 1988	5.3	Central Emery County
Mar. 27, 1975	6.0	Pocatello Valley (Utah - Idaho border)
Oct. 14, 1967	5.2	Marysvale
Aug. 16, 1966	5.6	Utah-Nevada Border
Sep. 5, 1962	5.2	Salt Lake Valley
Aug. 30, 1962	5.7	Cache Valley

When were the largest =istorical earthquakes in Utah?
Since settlement =n 1847, Utah's largest earthquakes were the 1934 Hansel Valley = earthquake, north of the Great Salt Lake, magnitude =.6, and the 1901 earthquake near the town of Richfield, =stimated magnitude 6.5.

How often do earthquakes =ccur in Utah?
About 700 =arthquakes (including aftershocks) are located in the Utah region =ach year. Approximately 2% of the earthquakes are felt. An =verage of about 13 earthquakes of magnitude 3.0 or larger =ccur in the region every year. Earthquakes can occur anywhere =n the state of Utah.

How many earthquakes =ccur in the Wasatch Front region?
About 500 =arthquakes are located in the Wasatch Front region each year. =bout 60% of the earthquakes of magnitude 3.0 and larger in Utah =ccur in the Wasatch Front region.

When was the last earthquake?
Worldwide: =n the last minute, somewhere in the world.
Utah: Within the =ast 24 hours, somewhere in the state.
(The last large =arthquake in Utah occurred on the Wasatch fault north of Nephi =bout 400 years ago.)

When were seismographs =irst installed in Utah?
In 1907, by =ames Talmage at the University of Utah. A skeletal =tatewide network began in 1962. Modern seismographic =urveillance in the Wasatch Front began in 1974. Computerized =ecording of earthquake data began in 1981.

Do earthquakes occur =nly on visible faults?
No. Many of =he active faults in Utah are deep below the earth's surface, and =re not visible to us.

Is the Wasatch fault the =ame type of fault as the San Andreas fault in California?
No. The San =ndreas fault slips horizontally with little vertical =ovement. This is called a strike-slip fault. The Wasatch fault slips in a primarily =ertical direction, with the mountains rising relative to the =alley floor. The Wasatch fault is a so-called normal fault. All earthquakes produce both vertical and horizontal ground shaking. Usually the horizontal =haking is more energetic and more damaging because structures =enerally resist vertical loads, like gravity, more easily. =lick here to view a block diagram of the Wasatch Fault from *UGS Public Information Series #6, revised to May 1990*.

Return to **The Local Quake Threat**.

Return to **General Quake =nformation**.

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