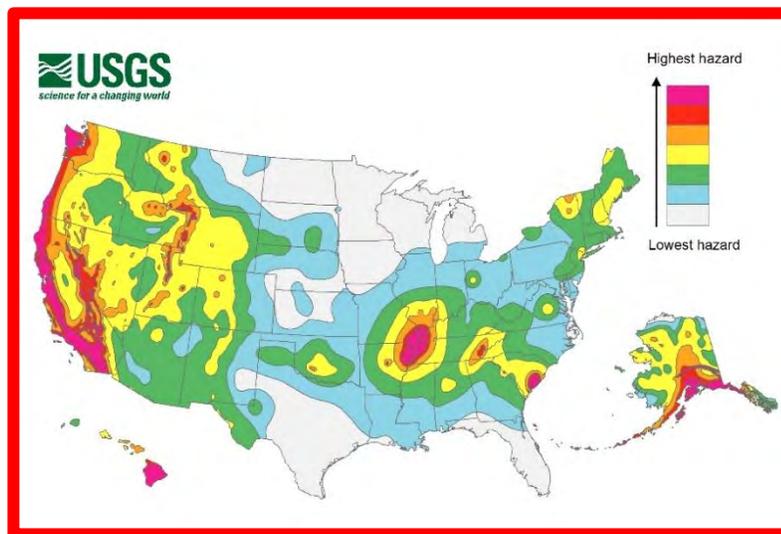


Introduction

Shake, rattle, and roll earthquakes

Earthquakes shake rattle and roll our planet every day. All earthquakes start with the ground shaking caused by the abrupt release of energy stored in the Earth's rocks. The amount of shake, rattle and rolling we feel during an earthquake depends on the size and depth of the earthquake.

Each earthquake starts when the rocks under extreme pressure break along a fault line that separates two blocks of land. The larger the blocks of land affected the larger the magnitude of the earthquake.



USGS

2014 Earthquake Hazard Map for the USA

The first place where rocks break is the focus of an earthquake. The epicenter of an earthquake is the point on the Earth's surface directly above the earthquake's focus. Earthquake reports on television, radio and newspapers always give the epicenter of an earthquake.

There are three types of plate boundaries and 90% of all earthquakes occur at these boundaries.

- Divergent boundaries are areas where two plates are moving apart.
- Convergent boundaries are areas where plates are colliding.
- Strike-slip (transform) boundaries are areas where two plates slip past each other horizontally.

Frequency of Earthquakes Worldwide

Description	Magnitude	Annual Average
Great	8 or higher	1
Major	7 — 7.9	17
Strong	6 — 6.9	134
Moderate	5 — 5.9	1,319
Light	4 — 4.9	c. 13,000
Minor	3 — 3.9	c. 130,000
Very minor	2 — 2.9	c. 1,300,000

The National Earthquake Information Center, U.S. Geological Survey (NEIC) provided the information for this table.

Earthquakes can occur anywhere on our planet. The National Earthquake Information Center, (NEIC) estimates that several million earthquakes occur each year on our planet that are not detected. These earthquakes are so small that even our most sensitive seismographs do not record the events.

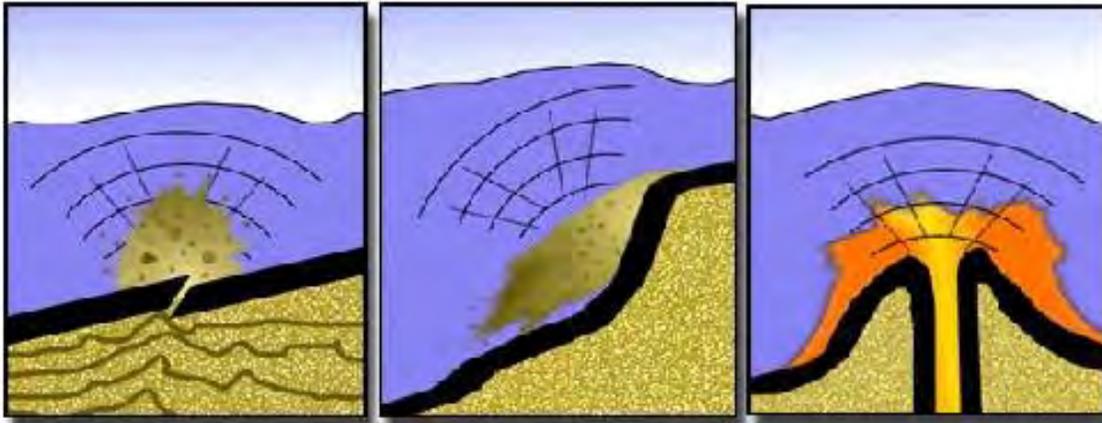


Hydrothermal vent on the floor of the ocean. The source of millions of small earthquakes as the lava flows out onto the ocean floor.
NSF



Surface waves caused this freeway off ramp to break apart and collapse in during an early morning earthquake in California.
USGS

Tsunami waves can be generated by



Great earthquakes

Landslides

Volcanic eruptions

NOAA

Great earthquakes trigger tsunamis

Tsunamis are generated during great earthquakes by the seafloor either rising or falling along a fault line deep in the ocean. The movement of the seafloor may be as little as 1 meter (3 feet). The seafloor movement causes the entire column of water above to rise or drop triggering tsunamis.

When the fault line is close to populated areas the time between the earthquake and the arrival of the first tsunami on the seashore can be only a matter of minutes. People living in low-lying areas are especially vulnerable to being swept away by tsunamis.

Landslides trigger tsunamis

Local landslides and submarine landslides can trigger tsunamis. Most tsunamis are local events that travel only along the coastlines before they dissipate.

Both the 1960 Chilean Earthquake and the 1964 Great Alaskan Earthquake triggered local tsunamis that swept ashore killing an unknown total of people. The highest wave ever recorded was a local tsunami at Lituya Bay, Alaska.

Volcanic eruptions trigger tsunamis

The 1883 eruption of Krakatoa generated tsunamis that killed over 36,000 people. It was one of the worst volcanic disasters in recorded history.

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