

Earthquakes strike suddenly, violently, and without warning at any time of the year and at any time of the day or night. An earthquake is caused by the breaking and shifting of rock beneath the Earth's surface. Ground shaking from earthquakes can collapse buildings and bridges; disrupt gas, electric, and phone service; and sometimes trigger landslides, avalanches, flash floods, fires, and huge, destructive ocean waves (tsunamis).

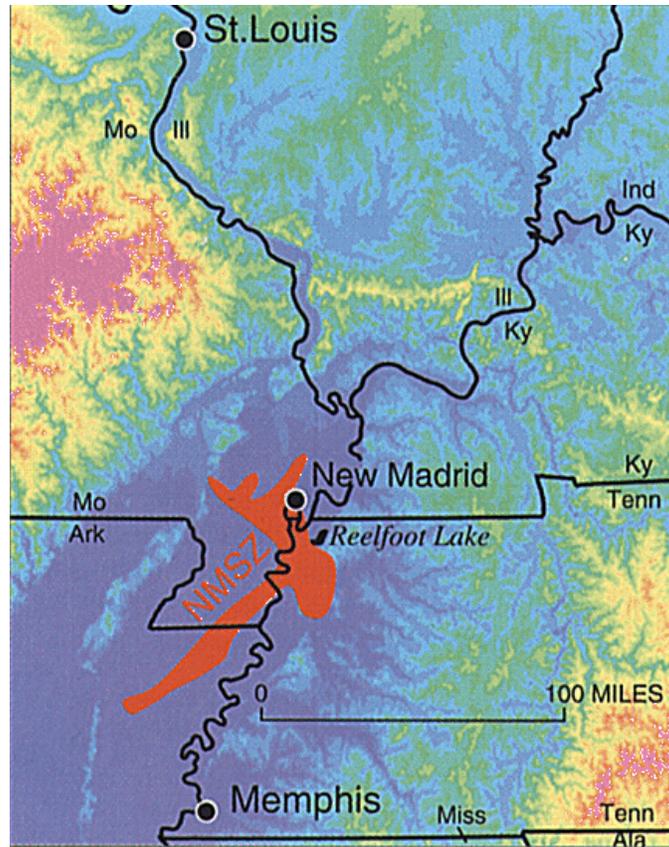
The 11 March 2011 magnitude 8.9 earthquake in Japan was one of the most powerful quakes ever recorded. To put its awesome power in perspective, the 1989 earthquake in the San Francisco area (sometimes known as the World Series Earthquake, because it occurred just prior to a World Series game to be played in the area) was a magnitude 6.9, equal to the explosive power of approximately 336 kilotons of TNT (336,000 tons).

The 8.9 magnitude earthquake in Japan was equal in power to approximately 336 megatons of TNT power, or about 1,000 times the power of the 1989 San Francisco quake.

The Highest Earthquake Risk in the United States outside the West Coast is in the New Madrid Seismic Zone. Damaging temblors are not as frequent as in California, but when they do occur, the destruction covers over more than 20 times the area due to the nature of geologic materials in the region.

The seismic zone covers parts of six U.S. states: Illinois, Missouri, Arkansas, Kentucky, Tennessee, and Mississippi. Historically, this area has been the site of some of the largest earthquakes in North America. Between 1811 and 1812, four catastrophic earthquakes, with magnitude estimates greater than 7.0, occurred during a 3-month period. Hundreds of aftershocks followed over a period of several years. Since 1974, more than 4000 earthquakes have been located, most of which are too small to be felt. On average one earthquake per year will be large enough to be felt in the area.

*The **New Madrid Seismic Zone**, also known as the **New Madrid Fault Line**, is a major seismic zone in the Southern and Midwestern United States stretching to the southwest from New Madrid, Missouri.*



Although the likelihood of a serious earthquake affecting the Fort Leonard Wood area is small, it is important to be ready, in case one does occur.

What you do BEFORE, DURING, and AFTER an earthquake can save your life.

Tips to Protect Yourself

Movement of the ground seldom is the actual cause of death or injury. Most casualties result from partial building collapses, falling objects and debris, like toppling chimneys, falling bricks, ceiling plaster and light fixtures. Many of these conditions can be prevented by taking a few steps now to prepare.

What to do before an earthquake

- **Check for Hazards in the Home**
 - **Bolt to walls anything that might topple**, like top-heavy shelves, appliances and furniture. Don't hang plants in heavy pots that could swing free of hooks. Fasten shelves, mirrors, and large picture frames to walls. Brace high and top-heavy objects.
 - **Place large or heavy objects on lower shelves.**
 - **Store breakable items** such as bottled foods, glass, and china in low, closed cabinets with latches.
 - **Hang heavy items** such as pictures and mirrors away from beds, couches, and anywhere people sit.
 - **Brace overhead light fixtures.**
 - **Repair defective electrical wiring and leaky gas connections.** These are potential fire risks.
 - **Secure a water heater** by strapping it to the wall studs and bolting it to the floor.
 - **Be sure the residence is firmly anchored to its foundation.**
 - **Install flexible pipe fittings** to avoid gas or water leaks. Flexible fittings are more resistant to breakage.
 - **Repair any deep cracks in ceilings or foundations.** Get expert advice if there are signs of structural defects.
 - **Store weed killers, pesticides, and flammable products securely** in closed cabinets with latches and on bottom shelves.
 - **Locate master switches and shutoff valves** for all utilities and know how to turn them off. Your local utility company can show you.
- **Identify Safe Places Indoors and Outdoors**
 - **Under sturdy furniture** such as a heavy desk or table.
 - **Against an inside wall.**
 - **Away from where glass could shatter** around windows, mirrors, pictures, **or where heavy bookcases or other heavy furniture could fall over.**
 - **In the open**, away from buildings, trees, telephone and electrical lines, overpasses, or elevated expressways.
 - **Locate safe spots in each room** under a sturdy table or against an inside wall. Reinforce this information by moving to these places during each drill.
- **Educate Yourself and Family Members**
 - **Contact your local emergency management office** or American Red Cross

chapter for more information on earthquakes. Also read the "How-To Series" for information on how to protect your property from earthquakes.

- **Teach children** how and when to call 9-1-1, police, or fire department and which radio station to tune to for emergency information.
- **Teach all family members** how and when to turn off gas, electricity, and water.
- **Hold earthquake drills** with your family members: Drop, cover, and hold on!

- **Have Disaster Supplies on Hand**
 - Flashlight and extra batteries.
 - Portable battery-operated radio and extra batteries.
 - First aid kit and manual.
 - A fire extinguisher (Class C is designed to use safely on any type of fire, including electrical, grease and gas)
 - Emergency food and water – a three-day supply is recommended.
 - Nonelectric can opener.
 - Essential medicines.
 - Cash and credit cards.
 - Sturdy shoes.
 - An adjustable wrench for turning off gas and water

- **Develop an Emergency Communication Plan**
 - In case family members are separated from one another during an earthquake (a real possibility during the day when adults are at work and children are at school), **develop a plan for reuniting** after the disaster.
 - **Ask an out-of-state relative or friend to serve as the "family contact."** After a disaster, it's often easier to call long distance. Make sure everyone in the family knows the name, address, and phone number of the contact person.

What to do during an earthquake

Stay as safe as possible during an earthquake. Be aware that some earthquakes are actually foreshocks and a larger earthquake might occur. Minimize your movements to a few steps to a nearby safe place and if you are indoors, stay there until the shaking has stopped and you are sure exiting is safe.

- **If indoors**
 - **DROP** to the ground; take **COVER** by getting under a sturdy table or other piece of furniture; and **HOLD ON** until the shaking stops. If there isn't a table or desk near you, cover your face and head with your arms and crouch in an inside corner of the building.
 - **Stay away from glass, windows, outside doors and walls, and anything that could fall**, such as lighting fixtures or furniture.
 - **Stay in bed** if you are there when the earthquake strikes. Hold on and protect your head with a pillow, unless you are under a heavy light fixture that could fall. In that case, move to the nearest safe place.
 - **Use a doorway for shelter only if** it is in close proximity to you and if you know it is a strongly supported, load bearing doorway.
 - **Stay inside until the shaking stops** and it is safe to go outside. Research has

shown that most injuries occur when people inside buildings attempt to move to a different location inside the building or try to leave.

- **Be aware** that the electricity may go out or the sprinkler systems or fire alarms may turn on.
- **DO NOT use the elevators.**

If outdoors

- **Stay there.**
- **Move away from buildings, streetlights, and utility wires.**
- **Once in the open, stay there** until the shaking stops. The greatest danger exists directly outside buildings, at exits and alongside exterior walls. Many of the 120 fatalities from the 1933 Long Beach earthquake occurred when people ran outside of buildings only to be killed by falling debris from collapsing walls. Ground movement during an earthquake is seldom the direct cause of death or injury. **Most earthquake-related casualties result from collapsing walls, flying glass, and falling objects.**

If in a moving vehicle

- **Stop as quickly as safety permits and stay in the vehicle.** Avoid stopping near or under buildings, trees, overpasses, and utility wires.
- **Proceed cautiously** once the earthquake has stopped. Avoid roads, bridges, or ramps that might have been damaged by the earthquake.

If trapped under debris

- **Do not light a match.**
- **Do not move about** or kick up dust.
- **Cover your mouth** with a handkerchief or clothing.
- **Tap on a pipe or wall** so rescuers can locate you. Use a whistle if one is available. Shout only as a last resort. Shouting can cause you to inhale dangerous amounts of dust.

What to do after an earthquake

- **Expect aftershocks.** These secondary shockwaves are usually less violent than the main quake but can be strong enough to do additional damage to weakened structures and can occur in the first hours, days, weeks, or even months after the quake.
- **Listen to a battery-operated radio or television.** Listen for the latest emergency information.
- **Use the telephone only for emergency calls.**
- **Open cabinets cautiously.** Beware of objects that can fall off shelves.
- **Stay away from damaged areas.** Stay away unless your assistance has been

specifically requested by police, fire, or relief organizations. Return home only when authorities say it is safe.

- **Wear sturdy shoes** to protect your feet from broken glass.
- **Be aware of possible tsunamis if you live in coastal areas.** These are also known as seismic sea waves (mistakenly called "tidal waves"). When local authorities issue a tsunami warning, assume that a series of dangerous waves is on the way. Stay away from the beach.
- **Help injured or trapped persons.** Remember to help your neighbors who may require special assistance such as infants, the elderly, and people with disabilities. Give first aid where appropriate. Do not move seriously injured persons unless they are in immediate danger of further injury. Call for help.
- **Clean up spilled medicines, bleaches, gasoline or other flammable liquids immediately.** Leave the area if you smell gas or fumes from other chemicals.
- **Check for building damage and potential safety hazards** – like cracks around chimneys or foundations. Inspect the entire length of chimneys for damage. Unnoticed damage could lead to a fire.
- **Inspect utilities.**
 - **Check for gas leaks.** If you smell gas or hear blowing or hissing noise, open a window and quickly leave the building. Turn off the gas at the outside main valve if you can and call the gas company from a neighbor's home. If you turn off the gas for any reason, it must be turned back on by a professional. Do not light matches, use any open flame or turn on electrical switches or appliances until you are certain that there are no gas leaks.
 - **Look for electrical system damage.** If you see sparks or broken or frayed wires, or if you smell hot insulation, turn off the electricity at the main fuse box or circuit breaker. If you have to step in water to get to the fuse box or circuit breaker, call an electrician first for advice.
 - **Check for sewage and water lines damage.** If you suspect sewage lines are damaged, avoid using the toilets and call a plumber. Plug bathtub and sink drains to prevent sewage backup. If water pipes are damaged, contact the water company and avoid using water from the tap. You can obtain safe water by melting ice cubes.