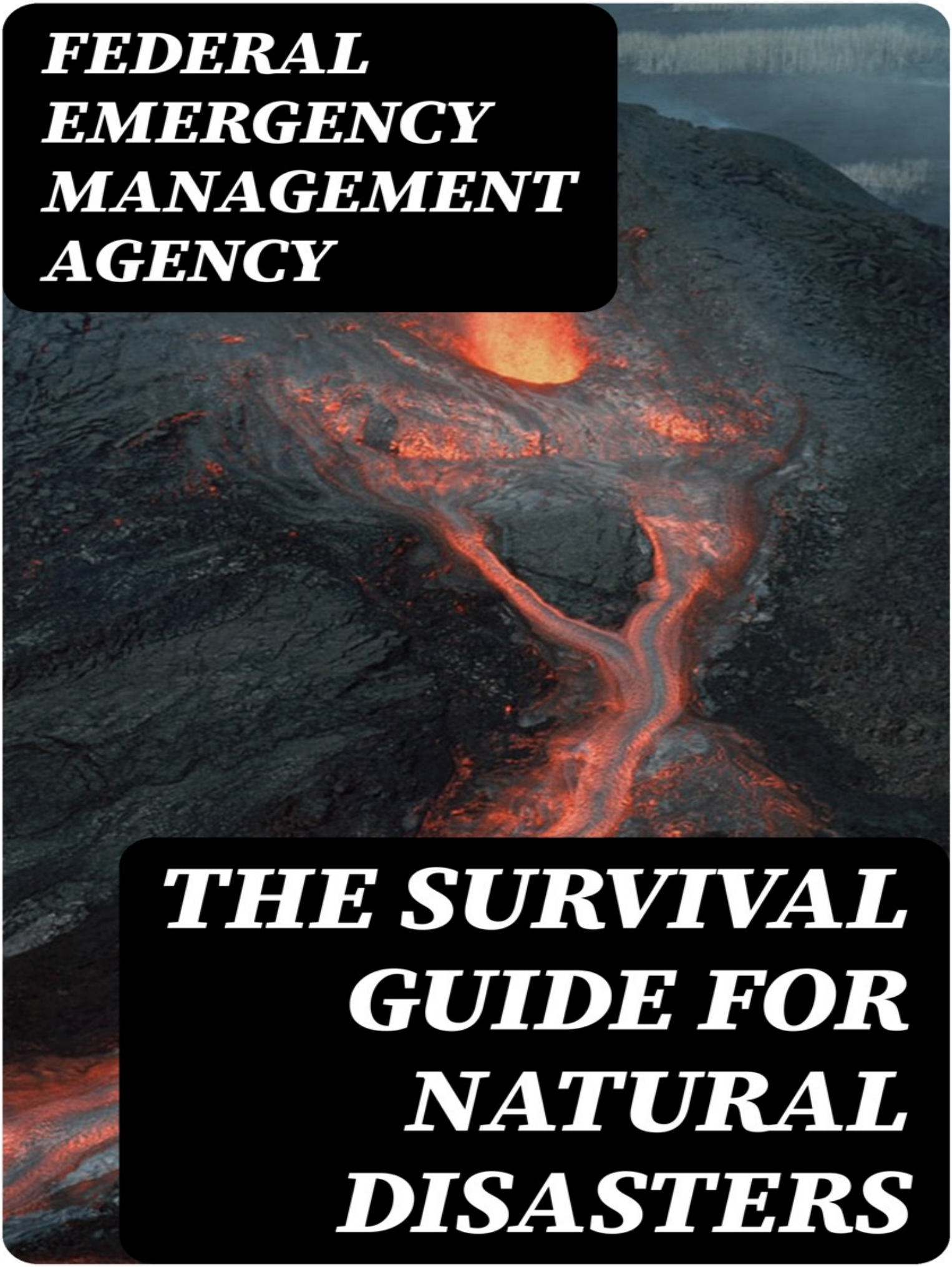
FEDERAL EMERGENCY MANAGEMENT AGENCY



THE SURVIVAL GUIDE FOR NATURAL DISASTERS

Federal Emergency Management Agency

The Survival Guide for Natural Disasters

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How to Prepare for an Earthquake

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Earthquakes can bring mild to violent shaking and can occur anytime, anywhere. This guide can help you protect yourself, your family, and your property before, during, and after an earthquake.

KNOW YOUR RISK

WHAT: An earthquake is the sudden, rapid shaking of the earth, caused by the breaking and shifting of subterranean rock as it releases strain that has accumulated over a long time. Initial mild shaking may strengthen and become extremely violent within seconds. Additional earthquakes, called aftershocks, may occur for hours, days, or even months. Most are smaller than the initial earthquake but larger magnitude aftershocks also occur.

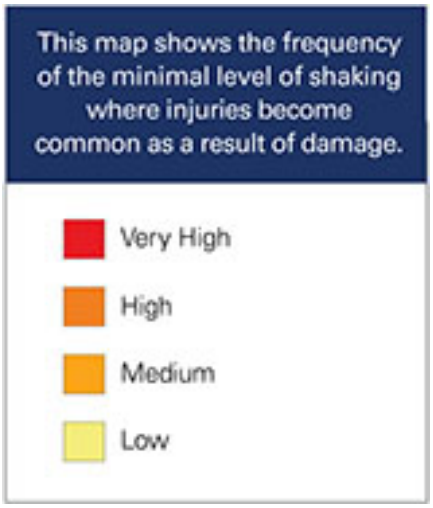
WHEN: Earthquakes can happen at any time of the year and occur without warning.

WHERE: All U.S. states and territories are at some risk for earthquakes. The risk is higher in identified seismic zones.

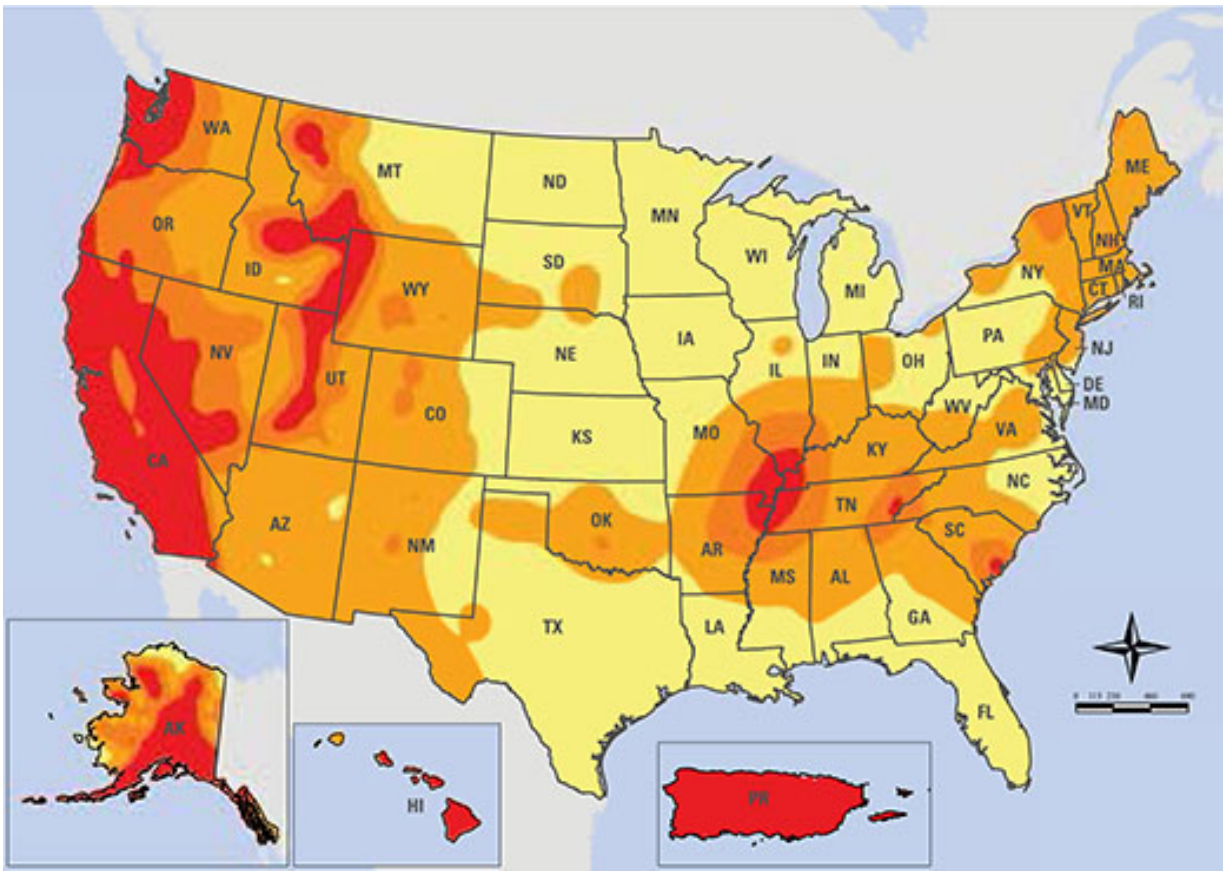
IMPACT: Larger earthquakes may cause deaths, injuries, and extensive property damage. Most casualties and injuries during an earthquake occur when: people fall while trying to walk or run during the shaking; when they are hit by falling, flying, or sliding household items or non-structural debris; and/or when they are struck or trapped by

collapsing walls or other parts of the building. Transportation, power, water, gas, and other services may be disrupted. In some areas, shaking can cause liquefaction — when the ground acts more like a liquid. When this happens the ground can no longer support the weight of a building. In coastal areas, earthquakes under the sea floor can cause tsunamis.

Forecasted Frequency of Earthquake Shaking



This level of shaking is capable of: cracking windows; knocking dishes, glassware, knickknacks, and books off shelves and pictures off walls; moving or overturning furniture; and cracking weak plaster, adobe buildings, and some poorly built masonry buildings.



This page provides an overview of protective actions to take before, during, and after an earthquake. Additional information is provided in the following pages for each phase.

1 BEFORE: PREPARE

Take action now, before an earthquake hits.

- Secure items that might fall and cause injuries (e.g., bookshelves, mirrors, light fixtures).
- Practice how to Drop, Cover, and Hold On by participating in a ShakeOut earthquake drill (www.ShakeOut.org)
- Store critical supplies and documents
- Plan how you will communicate with family members.

2 DURING: SURVIVE

As soon as you feel the shaking,

- DROP down onto your hands and knees so the earthquake doesn’t knock you down.
- COVER your head and neck with your arms to protect yourself from falling debris. If you are in danger from falling objects, and you can move safely, crawl to a safer place or seek cover (e.g., under a desk or table).
- HOLD ON to any sturdy covering so you can move with it until the shaking stops.

3 AFTER: RECOVER

When the shaking stops, before you move, look around for things that might fall or for dangerous debris on the ground.

- If you are in a damaged building and there is a safe way out through the debris, leave and go to an open space outside, away from damaged areas.
- If you are trapped, do not move about or kick up dust.
- If you have a cell phone with you, use it to call or text for help.
- Tap on a pipe or wall or use a whistle, if you have one, so that rescuers can locate you.
- Once safe, monitor local news reports (e.g., radio, TV, social media, and cell phone text alerts), for emergency information and instructions.

Protect Yourself Before, During, and After an Earthquake

HOW TO RECOGNIZE THAT AN EARTHQUAKE IS HAPPENING

You may experience a shaking or a rolling motion in the walls, floor, or ground. This movement may grow more extreme within seconds.

If you do not DROP down immediately, you may be knocked off your feet. You may not be able to walk or run.

Objects may fall off shelves, light fixtures may swing or fall from ceilings, or

tall furniture may fall over.

There may be dust or glass particles in the air or on the ground. You may hear noises similar to a heavy truck or train passing nearby.

EMERGENCY NOTIFICATIONS

Although there is no advance notice of an earthquake, emergency information will be provided immediately after through radio and TV broadcasts and via Wireless Emergency Alerts texted to cell phones. In addition to commercial radios, a National Oceanic and Atmospheric Administration (NOAA) Weather Radio broadcasts alerts and warnings directly from the National Weather Service for all hazards. You may also sign up in advance to receive emergency notifications from your local emergency services.

Free smart phone apps, such as those available from FEMA and the American Red Cross, provide information about shelters, how to provide first aid, and how to seek assistance for recovery. (Search for the FEMA App or Red Cross Apps on your iPhone, android, or other mobile device). The U.S. Geological Survey manages the Earthquake Notification Service, which provides free notification emails when earthquakes happen in your area or anywhere in the world. Visit: https://sslearthquake.usgs.gov/ens for more information.

DEVELOP A COMMUNICATIONS PLAN

Your family may not be together when an earthquake hits, so it is important to know how you will contact one another and how you will get back together in case of an emergency. Landline and cellular phone systems are often overwhelmed following a disaster, so you may need to use text messaging or social media to communicate with family and friends. Keep important numbers written down in your wallet in case you cannot access the contact list in your phone.

Here are a few easy steps to start your emergency communication plan:

1. **Understand how to receive emergency alerts and warnings.** Make sure all household members are able to get alerts about an emergency from local officials. Check with your local emergency management agency to see what is available in your area.
2. **Discuss family/household plans for disasters that may affect your area and plan where to go.** Plan together in advance so that everyone in the household understands where to go during a different type of disaster like a hurricane, tornado, or wildfire.
3. **Collect information.** Create a paper copy of the contact information for your family that includes:

    - phone (work, cell, office)
    - email
    - social media
    - medical facilities, doctors, service providers
    - school

4. **Identify information and pick an emergency meeting place.** Things to consider:

- Decide on safe, familiar places where your family can go for protection or to reunite.
- Make sure these locations are accessible for household members with disabilities or access and functional needs.
- If you have pets or service animals, think about animal-friendly locations.

Examples of meeting places:

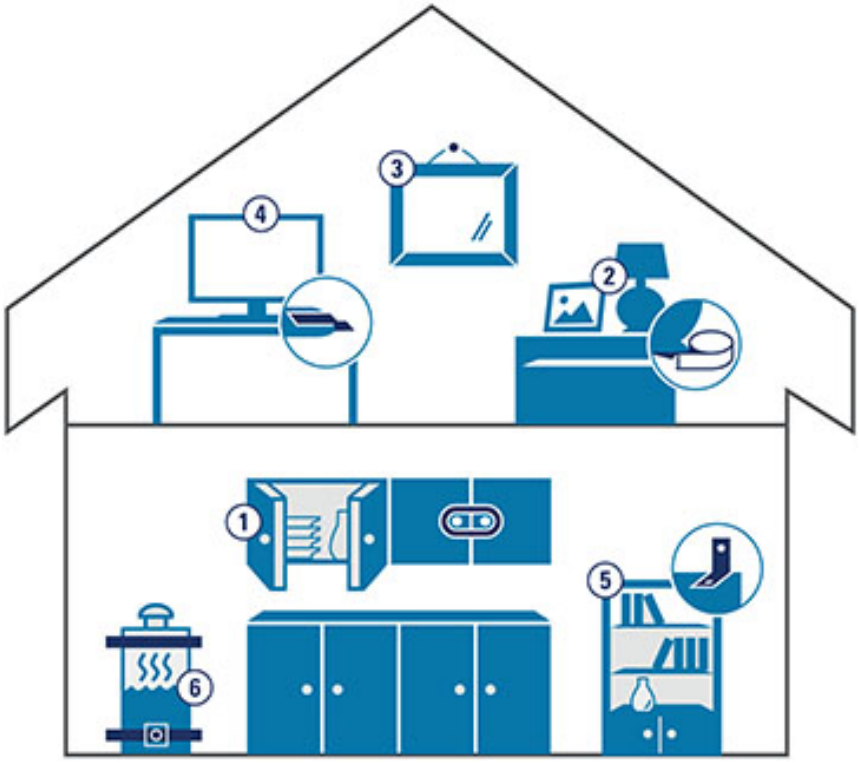
- **In your neighborhood:** A mailbox at the end of the driveway, or a neighbor's house.
- **Outside of your neighborhood:** library, community center, place of worship, or family friend's home.
- **Outside of your town or city:** home of a relative or family friend. Make sure everyone knows the address of the meeting place and discuss ways you would get there.

5. **Share information.** Make sure everyone carries a copy in his or her backpack, purse, or wallet. You should also post a copy in a central location in your home, such as your refrigerator or family bulletin board.
6. **Practice your plan.** Have regular household meetings to review your emergency plans, communication plans and meeting place after a disaster, and then practice, just like you would a fire drill.

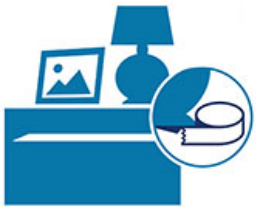
To prevent potential injuries, take the time to secure your space. Secure items that might fall, fly, or slide in an earthquake. Imagine if the room was picked up and shaken up and down and side to side and then determine what items would be thrown around. Periodically review the

locations where you spend time — your home, workplace, or school — to look for potential hazards and secure them.

DO A HAZARD HUNT FOR POTENTIAL HAZARDS AND THINGS THAT MIGHT FALL

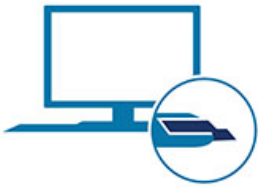


1. Cabinet doors can fly open allowing contents to crash to the floor; secure them with latches.



2. Objects such as framed photos, books, lamps, and other items that you keep on shelves and tables can become flying hazards. Secure them with hooks, adhesives, or earthquake putty to keep them in place. Move heavy or breakable items to lower shelves.

3. Mirrors, pictures frames, and other hanging items should be secured to the wall with closed hooks or earthquake putty. Do not hang heavy objects over beds, sofas, or any place you may be seated.



4. Electronics such as computers, televisions, and microwave ovens are heavy and expensive to replace. Secure them with flexible nylon straps.

5. Bookcases, filing cabinets, china cabinets, and other tall furniture should be anchored to wall studs, (not drywall), or masonry. Use flexible straps that allow them to sway without falling to the floor.

6. Secure your water heater, refrigerator, and other major appliances with the appropriate straps screwed into the wall studs or masonry to help keep them from falling over and rupturing gas or electric connections. Gas appliances should have flexible connectors to absorb the shaking while reducing the risk of fire.

NOTE: These adhesives, straps, hooks, latches, and other safety devices are available at most hardware and home improvement stores as well as online retailers.

STRENGHTEN YOUR BUILDING

Make sure your home and other buildings you spend time in are safer during earthquakes and more resistant to earthquake damage. Get professional help to assess the building's structure and then take steps to install nonstructural solutions, including foundation bolting, cripple wall bracing, and reinforced chimneys. If you live in a mobile home, consider installing an earthquake-resistant bracing system. These measures can help reduce major damage to the building. If you are a renter, ask your landlord or property manager to make the necessary improvements to make the building safer. Examples of structures that may be more vulnerable in an earthquake are those not anchored to their foundations or having weak crawl space walls, unbraced pier-and-post foundations, or unreinforced masonry walls or foundations. Check with your local office of emergency management to ask if there are volunteer teams in your community to help with assessments.

Preparing for earthquakes involves (1) learning what people should do before, during, and after earthquakes; and (2) doing or preparing to do those things now, before the next quake.

Prepare Your Home

Make your home safer to be in during earthquakes and more resistant to earthquake damage by assessing its structure and contents. Depending on when and how it was designed and built, the structure you live in may have weaknesses that make it more vulnerable to earthquakes. Common examples include structures not anchored to their

foundations or having weak crawl space walls, unbraced pier-and-post foundations, or unreinforced masonry walls or foundations.

If you own your home, find and correct any such weaknesses, yourself or with professional help. If you are a renter, ask what has been done to strengthen the property against earthquakes, and consider this information in deciding where to rent. If you are building or buying a home, make sure that it complies with the seismic provisions of your local building code.

What is in your home can be as or more dangerous and damage-prone than the structure itself. Any unsecured objects that can move, break, or fall as an earthquake shakes your home are potential safety hazards and potential property losses. Walk through each room of your home and make note of these items, paying particular attention to tall, heavy, or expensive objects such as bookcases, home electronics, appliances (including water heaters), and items hanging from walls or ceilings. Secure these items with flexible fasteners, such as nylon straps, or with closed hooks, or by relocating them away from beds and seating, to lower shelves, or to cabinets with latched doors. Ensure that plumbers have installed flexible connectors on all gas appliances.

Once the shaking stops, check for injuries among your family and neighbors and, as needed, administer first aid and call for emergency medical assistance. Also check for hazards in and around your home created by earthquake damage. Keep in mind that aftershocks may strike at any time, exacerbating these hazards and requiring you to immediately drop, cover, and hold on.

Responding promptly to hazards can prevent further damage and injuries. This may entail extinguishing small

fires or reporting larger blazes; shutting off the water supply when broken pipes are leaking; shutting off the electricity when damaged wiring threatens to spark fires; shutting off the natural gas when you suspect that gas is leaking; or evacuating your home when any of these hazards or others, such as structural damage, make continued occupancy potentially unsafe.

If it is necessary to leave your home, you may, in the days and weeks following the quake, need to seek emergency assistance from the American Red Cross. In the event of a presidential disaster declaration, assistance for housing and other needs may also become available from FEMA.

Regardless of the severity of this earthquake, learn from the experience. If there are things that you could have done better in preparing for this quake, do them better now in preparation for the next earthquake. If your home must be repaired or rebuilt, for example, use this opportunity to correct any structural weaknesses and ensure compliance with seismic building standards. If unsecured belongings were damaged, improve how you secure your home's contents. If your emergency supply kit proved inadequate, use what you learned to make a kit that will better meet your needs.

PRACTICE: Everyone should know what to do in an earthquake and should practice how to Drop, Cover, and Hold On. Join the Great ShakeOut and America's PrepareAthon! to practice how to protect yourself and to help spread the word. Visit www.shakeout.org and www.ready.gov/prepare to learn more. Learn and practice first aid skills and emergency response skills through

training such as the Community Emergency Response Team (CERT) Program.

GATHER CRITICAL DOCUMENTS: Once the immediate danger passes, having your legal, financial, and medical documents will help you to receive assistance and work with your insurance company. Take time now to safeguard critical documents and take pictures or videos of your belongings. Download *Be Smart, Protect Your Critical Documents and Valuables* for a checklist.

DISCUSS: Talking about disasters and helping others prepare makes everyone safer. Discuss what you have done to prepare with your family, friends, neighbors, and colleagues.

STORE: Gather and store the basic supplies your family would need for at least three days if grocery stores and other services are unavailable, if power is out, or you are unable to stay in your home. A sustained power outage can have a significant impact on people who require electricity to power medical equipment, so make sure that you have a plan to take care of yourself and your family during an outage.

ASSEMBLING EMERGENCY SUPPLIES

Take the time now to collect the emergency supplies you would need if the power was out, water supplies were cut off, and grocery stores were not open. You can build your supplies over time by adding a few items as your budget permits. Basic emergency supplies should include the

following, most of which you probably already have in your home.

- ✔ **WATER** – Ensure you have at least 1 gallon of water per person per day for at least 3 days. (Store a longer than 3-day supply of water, if possible). An average person needs to drink about 3/4 of a gallon of fluid daily. Individual needs vary depending on age, gender, health, level of activity, food choices, and climate. You may also need stored water for food preparation.
- ✔ **FOOD** – Store at least a 3-day supply of non-perishable food for members of your household, including pets. Consider special dietary needs (e.g., infant formula). Include a non-electric can opener for canned food.
- ✔ **FLASHLIGHT, RADIO,** and **CELL PHONE CHARGER** – You will need to be able to charge these items without electricity. Your flashlight and radio should be either hand-cranked or battery-powered, and stored with extra batteries. Your cell phone charger should be hand-crank, solar, or able to be charged from a car outlet.
- ✔ **MEDICAL** – Include first aid kit, prescription and non-prescription/over-the-counter medications, and medical supplies.
- ✔ **SANITATION** – Pack supplies for sanitation, such as hand sanitizer, towelettes, paper products, and plastic bags, for use when water resources are limited.
- ✔ **ASSISTIVE TECHNOLOGY** – Include battery backup power for power-dependent mobility devices, oxygen, and other assistive technology needs.

- ✔ **CLOTHING AND BLANKETS** – Ensure you have clothing with long sleeves and long pants, thick-soled shoes, and work gloves to protect yourself after the earthquake, and a sleeping bag or warm blanket for each person, if you live in a cold-weather climate.
- ✔ **WHISTLE** – Include a whistle to signal for help.
- ✔ **CASH** – Store cash in case ATMs are not functioning after the earthquake.
- ✔ **FIRE EXTINGUISHER** – Earthquakes can cause fires to break out; have a fire extinguisher so you can put out any small fires. Use a fire extinguisher only if you are physically capable.

Consider storing supplies in several locations if possible. This means having basic supplies of food and water in locations, including your workplace, your vehicle, and, if possible, other places you and members of your household regularly spend time (e.g., house of worship, community center, and school).

It is important to consider the unique needs of your family, including access and functional needs, and the needs of children and pets. You may need to include: extra water; special food, such as infant formula or pet food; and supplies or equipment, such as diapers, glasses, or medical equipment.

Build A Kit

A disaster supplies kit is simply a collection of basic items your household may need in the event of an emergency.

Try to assemble your kit well in advance of an emergency. You may have to evacuate at a moment's notice and take essentials with you. You will probably not have time to search for the supplies you need or shop for them.

You may need to survive on your own after an emergency. This means having your own food, water and other supplies in sufficient quantity to last for at least 72 hours. Local officials and relief workers will be on the scene after a disaster but they cannot reach everyone immediately. You could get help in hours or it might take days.

Additionally, basic services such as electricity, gas, water, sewage treatment and telephones may be cut off for days or even a week, or longer. Your supplies kit should contain items to help you manage during these outages.

DROP, COVER, AND HOLD ON. During an earthquake, minimize your movements to a few steps to a nearby safe place. If you are indoors, stay there until the shaking has stopped and you are sure it is safe to exit.

IF YOU ARE:	THEN:
	DROP to your hands and knees.

INDOORS

COVER your head and neck with your arms. This position protects you from falling and provides some protection for vital organs. Because moving can put you in danger from the debris in your path, only move if you need to get away from the danger of falling objects. If you can move safely, crawl for additional cover under a sturdy desk or table. If there is low furniture, or an interior wall or corner nearby and the path is clear, these may also provide some additional cover. Stay away from glass, windows, outside doors and walls, and anything that could fall, such as lighting fixtures or furniture.

HOLD ON to any sturdy shelter until the shaking stops.

DO NOT run outside! STAY where you are until the shaking stops. **DO NOT** get in a doorway as this does not provide protection from falling or flying objects and you likely will not be able to remain standing.

OUTDOORS

If you can, move away from buildings, streetlights, and utility wires. Once in the open, Drop, Cover, and Hold On. STAY THERE until the shaking stops. This might not be possible in a city, so you may need to duck inside a building to avoid falling debris.

If you are in bed: STAY there and COVER

IN BED

your head and neck with a pillow. At night, hazards and debris are difficult to see and avoid; attempts to move in the dark result in more injuries than remaining in bed.

IN A MOVING VEHICLE

It is difficult to control a vehicle during the shaking so stop as quickly and safely as possible, 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 the earthquake may have damaged.

Once the shaking has stopped, wait a minute before getting up and then look around for debris or other dangers. If you are able to safely move to exit the building and there is an open space to go to, exit the building and avoid damaged areas and downed power lines. For buildings in metropolitan areas that do not have nearby open space, it may be safer to remain in the building until you are certain you will avoid additional glass and debris that may fall from nearby buildings. Remember aftershocks may cause further damage to weakened structures and present hazards to those exiting buildings. Drop, Cover, and Hold On whenever you feel shaking.

Monitor local news reports (battery-operated radio, TV, and cell phone text alerts) for emergency information and instructions.

If you are trapped, do not move about or kick

up dust. Cover your mouth with a handkerchief or clothing. Shout only as a last resort. Shouting can cause you to inhale dangerous amounts of dust. Use your cell phone to call or text for help. Tap on a pipe or wall, or use a whistle, if available, so rescuers can locate you.

If you are in a damaged building and there is a safe way out through the debris, leave and go to an open space outside. If you can do so safely, take a moment to take what you might need immediately and can carry easily, such as a purse or go bag. Once outside, do not re-enter until the building is certified to be safe.

Check for injuries and provide assistance if you have training. Assist with rescues if you can do this safely.

If you are near the coast, learn the tsunami risk for your area. If you are in an area that may experience tsunamis, when the shaking stops, walk inland or to higher ground immediately. Monitor official reports for more information on the area’s tsunami evacuation plans.

Stay away from damaged areas. Never use a lighter or matches near damaged areas. Check for and extinguish small fires.

Have your utilities inspected by qualified professionals for damage to electrical system, sewage, gas, and water lines.

If your home has been damaged and is no longer safe, and you need a place to stay, text SHELTER + your zip code to 43362 (4FEMA) to find the nearest public shelter in your area. A sample text would be SHELTER 12345.

- Earthquakes can destroy or make buildings and roads unsafe.
- Use extreme caution around debris. Do not attempt to remove heavy debris by yourself and assist with rescues only if you can do so safely.
- Wear protective clothing, including a long-sleeved shirt, long pants, work gloves, and sturdy, thick-soled shoes during clean-up. These will protect you from further

injury from broken glass, exposed nails, or other objects.

- Do not touch electrical equipment if it is wet or you are standing in water.
- If you smell gas, call 9-1-1.
- Photograph or take a video of damage to your property to assist with filing an insurance claim.
- Know that this will be an emotional time and it is normal to feel a little blue. Seek help for yourself or others if depression or anxiety persists or seems out of proportion for the circumstances.
- Expect aftershocks. These additional earthquakes are usually less violent than the main quake but can be strong enough to further damage weakened structures. They can occur in the first hours, days, weeks, or even months after the quake. Be ready to protect yourself.

San Francisco Earthquake 1906

How to Prepare for a Flood

Table of Contents

Flooding is the most common natural disaster in the United States and can happen anywhere. *How to Prepare for a Flood* explains how to protect yourself and your property, and details the steps to take now so that you can act quickly when you, your home, or your business is in danger.

WHAT

Flooding is an overflowing of water onto land that is normally dry. Flooding may happen with only a few inches of water, or it may cover a house to the rooftop.

WHEN

Flooding can occur during any season, but some areas of the country are at greater risk at certain times of the year. Coastal areas are at greater risk for flooding during hurricane season (i.e., June to November), while the Midwest is more at risk in the spring and during heavy summer rains. Ice jams occur in the spring in the Northeast and Northwest. Even the deserts of the Southwest are at risk during the late summer monsoon season.

WHERE

Flooding can happen in any U.S. state or territory. It is particularly important to be prepared for flooding if you live in a low-lying area near a body of water, such as a river, stream, or culvert; along a coast; or downstream from a dam or levee.

HOW

Flooding can occur in several ways, including the following.

- Rivers and lakes cannot contain excessive rain or snowmelt.
- Excessive rain or snowmelt cannot be fully absorbed into the ground.
- Waterways are blocked with debris or ice and overflow.
- Water containment systems break, such as levees, dams, or water or sewer systems.
- Strong winds from tropical storms or hurricanes cause a storm surge by pushing seawater onto land.

The speed and duration of flooding can vary significantly.

- Flooding can occur slowly as rain continues to fall for many days. This type of flooding, sometimes called a slow-onset flood, can take a week to develop and can last for months before floodwaters recede.
- Rapid-onset floods occur more quickly, typically developing within hours or days. These types of floods usually occur in smaller watersheds experiencing heavy rainfall, particularly in mountainous and urban areas, and the water usually recedes within a few days.
- Some rapid-onset floods known as flash floods occur very quickly with little or no warning, such as during periods of extremely heavy rain or when levees, dams, ice jams, or water systems

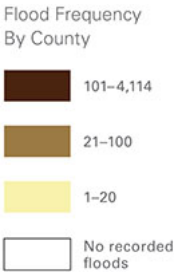
break. Densely populated areas are at a high risk for flash floods. In urban areas, flash floods can fill underpasses, viaducts, parking structures, low roads, and basements.
- The strong winds of a tropical cyclone or hurricane can push large amounts of seawater up onto the land, causing a storm surge. A storm surge combines with the ocean's tide to produce a storm-tide surge. Storm-tide surges have been registered as high as almost 35 feet above normal sea level and can cause significant flooding across a large area. This generally occurs over a short period, typically 4 to 8 hours, but in some areas, it can take much longer for the water to recede to its pre-storm level.

The physical destruction caused by flooding depends on the speed and level of the water, the duration of the flood, terrain and soil conditions, and the built environment (e.g., buildings, roads, and bridges).

IMPACT

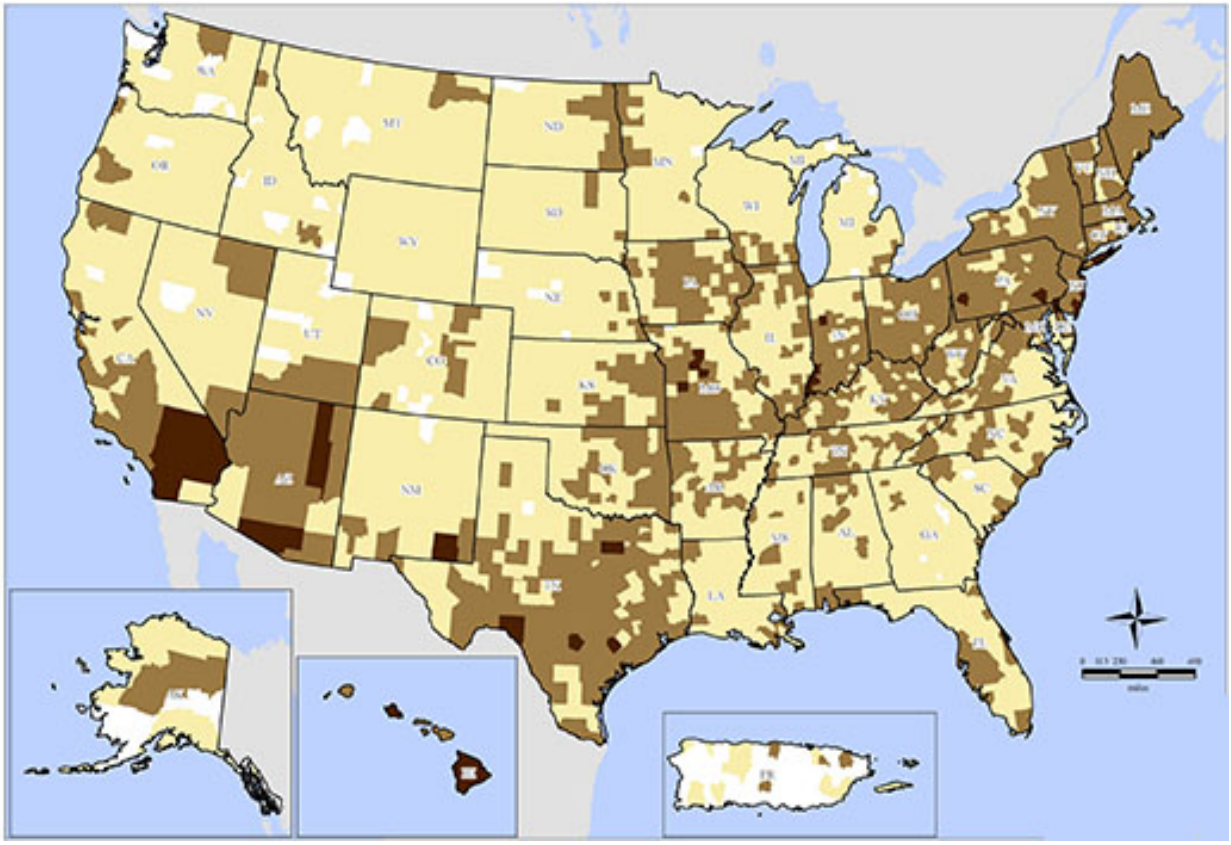
- Flooding can cause fatalities and serious injuries for people who are trapped or swept away by wading in, driving through, or boating across floodwaters.
- Transportation routes, power, water, gas, and other services may be disrupted.
- Commercial supplies and government support systems may be temporarily unavailable.
- Drinking water supplies and wells may become polluted.
- Floodwaters can cause erosion, which can damage roads, bridge structures, levees, and buildings with weak foundations, causing their collapse without warning. The floodwaters may carry the worn-away mud, rocks, and other sediment.
- Landslides and mudslides can occur.
- Even a few inches of floodwater in a home can cause tens of thousands of dollars in damage.

KNOW THE RISK



FREQUENCY OF FLOOD EVENTS BY COUNTY: 1996–2013

This map depicts all coastal, flash, lakeshore, storm surge, or other flooding identified by the National Oceanic and Atmospheric Administration (NOAA).



YOUR GOAL FOR PROTECTION

Flood-related injuries and deaths are often the result of individuals trapped in floodwaters. The best way to stay safe is to leave areas that flood and avoid floodwaters.

PERSONAL PROTECTION	**EVACUATE** To avoid being trapped when floodwaters threaten your area, the best action to protect yourself and your family is to evacuate before flooding starts. Know and follow the directions from local officials for community evacuation or seek high ground for localized flooding. If you do not evacuate before the flooding occurs or you are trapped by flash flooding, do not enter flooded areas or moving water either on foot or in a vehicle, including areas that appear to have only inches of water.
PROPERTY PROTECTION	**ELEVATE, WATERPROOF, AND CLEAR DEBRIS** Your goal now, before a flood occurs, is to reduce the risk of damage to structures from flooding. This means elevating critical utilities, such as electrical panels, switches, sockets, wiring, appliances, and heating systems, and waterproofing basements. In areas with repetitive flooding, consider elevating the entire structure. Make sure that basements are waterproofed and that your sump pump is working and then install a battery-operated backup in case of a power failure. Installing a water alarm will also let you know if water is accumulating