

## EARTHQUAKE HAZARD OVERVIEW

The central U.S. is vulnerable to damaging earthquakes and has the highest level of seismicity in the country east of the Rocky Mountains - unknowingly to the public, approximately 250 earthquakes occur a year in the region. With little or no warning, a damaging earthquake in the New Madrid, Wabash Valley, or East Tennessee seismic zones, could strike. Depending on earthquake magnitude and location, each of these zones could impact multiple states, causing major physical, social and economic disruption in a region that is home to more than forty million people.

In the winter of 1811-1812, a series of large earthquakes struck the central U.S. near New Madrid, Missouri. In those times, the region was sparsely populated and had little infrastructure. Today, these earthquakes would cause widespread damage and disruption to the entire nation. On April 18, 2008, a magnitude 5.2 earthquake struck near Mt. Carmel, Illinois. This relatively minor earthquake was felt in 18 states and was responsible for an estimated \$3 million in non-structural damages. The Mt. Carmel earthquake shows the widespread impact a larger earthquake might have on the region.



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FEMA



The Central United States Earthquake Consortium (CUSEC) is an incorporated non-profit organization in partnership with the Federal Government and the eight states most affected by earthquakes in the Central U.S. Those states are Alabama, Arkansas, Illinois, Indiana, Kentucky, Mississippi, Missouri, and Tennessee. For more information on earthquakes and earthquake mitigation, please visit the CUSEC website at [www.cusec.org](http://www.cusec.org) or call (800) 824-5817.

Some portions of this brochure are adapted from the FEMA 528 "Earthquake Home Hazard Hunt" poster. Images courtesy: FEMA, USGS

### ACKNOWLEDGEMENTS

# EARTH

A GUIDE TO  
**RISK REDUCTION**

# QUAKES

# EARTHQUAKE MITIGATION EXPLAINED

Mitigation is commonly defined as any effort to reduce loss of life and property by lessening the impact of disasters. The best time to mitigate against disasters is before an event occurs. Some of the damages during the Mt. Carmel earthquake could have been prevented, had mitigation measures been put in place prior to the earthquake. This pamphlet is designed to give homeowners an overview of several cost effective and easy to implement projects that show how earthquake mitigation makes sense. There are also more complicated projects you can implement, such as bracing a chimney, or retrofitting a gas meter with an automatic shut-off valve, but these projects should be completed by trained and qualified personnel.

Before you try any of the projects listed here, make sure you are comfortable working with tools and are familiar with general tool safety guidelines. If you are uncomfortable performing any of the projects, you should consult with a licensed and insured general contractor. Also, you will want to do a "hazard hunt" in your home or office, looking for contents that could become a hazard due to earthquake shaking. Remember, when you prepare for earthquakes, you are also preparing for other disasters as well.

# MITIGATION MAKES SENSE

## SECURING HOME ELECTRONICS

**Estimated DIY Cost:** Less than \$15/item  
**Time Spent:** Less than 30 minutes/item

Items such as televisions, computer monitors, home stereo equipment and other valuable electronic components should be secured using special strapping that has been designed to be earthquake resistant or by using heavy duty "hook and loop" tape. Since these items are sometimes repositioned or moved to a different room, be sure to check the strength of the hook and loop tape at least twice a year.

By securing these items, homeowners can have an added measure of protection against earthquakes and also address general safety concerns of heavy items like televisions or computer monitors being accidentally knocked over. These electronics pose greater risks towards children who often sit or stand near these items. If the item is knocked over, the child might not be able to move out of the way fast enough, increasing the chances for injury or death.



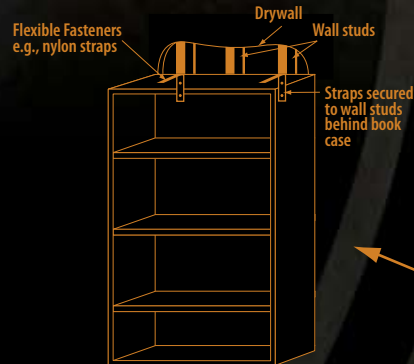
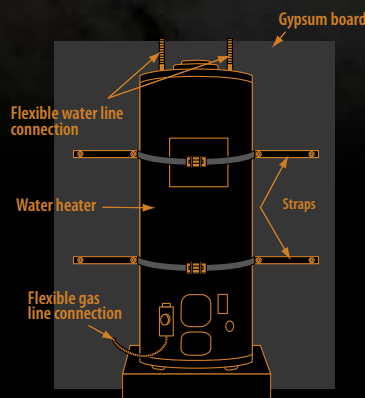
## SECURING YOUR WATER HEATER

**Estimated DIY Cost:** Less than \$75  
**Time Spent:** Less than 2 hours

One effective mitigation project a homeowner can do is securing their hot-water heater. A secure hot-water heater can prevent fires and water damage, as well as provide a source for emergency water. This project can have several solutions – all of which are relatively inexpensive. *Options could be similar to -*

- Purchasing and installing a strap kit or bracing kit from your local hardware store
- Having a licensed plumber strap your water heater according to local codes
- Using heavy metal strapping and screws to secure the water heater to the wall studs

Make sure the water heater is secured to the wall studs and that the gas and water lines have flexible connector pipes installed by a licensed plumber. The flexible pipes are safer than rigid pipes during an earthquake. Be sure to check the straps once a year. They may come loose as a result of vibrations or other causes.



## ANCHORING FURNITURE AND APPLIANCES

**Estimated DIY Cost:** Less than \$15/item  
**Time Spent:** Less than 30 minutes per item

- Furniture and home appliances are also susceptible to shaking caused by earthquakes. Items such bookcases, armoires, shelving units, and refrigerators should be anchored to wall studs to prevent tipping that could cause injury to those nearby. Anchoring provides an added measure of protection against contents spilling out, reducing recovery time after an event. Small appliances such as microwaves, coffee makers, and toaster ovens should also be secured in place, where practical.
- For tall, top-heavy furniture and appliances, you should use nylon straps or L-brackets to secure the item to wall studs. Nylon straps are the preferred method because this allows a slight amount of independent movement and reduces strain on wall studs. Straps should be placed on the top of the item, in both the right and left corners. Loose shelving can be reinforced with L-brackets or museum putty applied to the corners of each shelf. Kitchen and bathroom cabinets should have child-safety latches installed to prevent items such as dishware and cleaning supplies from spilling out during an earthquake.