

# Two centuries after New Madrid quakes, what's next?

**Adrian Sainz, Associated Press, 12-16-11**

MEMPHIS, Tenn.—The United States was still a young nation when three major earthquakes rocked the central Mississippi River valley in the winter of 1811-1812.

Chimneys fell, the earth heaved and church bells rang hundreds of miles away, set off by the powerful vibrations from what is now called the New Madrid Seismic Zone. As farmland rolled and shuddered, the shock waves spread as far as New York and the Carolinas.

Now on the 200th anniversary of those devastating quakes, some seismologists are warning that the region should be on guard because of the risk that another "Big One" could strike the region within the next 50 years.

"There have been past big earthquakes, there will be future big earthquakes," said California-based seismologist Mary Lou Zoback, who released a report Dec. 7 on the "seismic hazard" inherent in the New Madrid fault. "It's a reminder that we need to keep this in mind and do what we can to prepare."

The quakes on Dec. 16, 1811, and Jan. 23 and Feb. 7 of 1812 were among the strongest in U.S. history. Their magnitudes have been estimated to have ranged from 7.7 to 8.1, though some seismologists have suggested the magnitudes should be lower, closer to the 7 to 7.6 range.

They centered around the New Madrid Seismic Zone, a 150-mile stretch of land between Memphis and St. Louis that crosses parts of Arkansas, Illinois, Indiana, Kentucky, Missouri and Tennessee. The zone produced major earthquakes dating to around 1450 A.D., 900 A.D., 300 A.D. and even further back.

Seismologists agree that predicting precisely when an earthquake will strike is next to impossible. But some experts suggest there is anywhere from a 28 percent to a 46 percent likelihood of a magnitude 6 or greater earthquake occurring around the New Madrid fault within a half century.

Some seismologists believe the large earthquakes of past centuries warrant precaution. Still others are skeptical, saying quakes don't follow set patterns and basing predictions on historical data isn't the answer.

Northwestern University seismology professor Seth Stein thinks another powerful quake is unlikely anytime soon and nothing to get "really concerned about." Stein contends the many small earthquakes that occur today in the New Madrid zone are mere aftershocks of the past large quakes—not harbingers of future ones.

"Apocalyptic predictions have very low track records," he said.

Some officials in the region aren't taking chances.

The U.S. Geological Survey has estimated that a hundred people could die and thousands could be injured should a magnitude 7.7 earthquake strike along the 150-mile long fault.

Haiti's deadly 2010 quake was around a magnitude 7 and the East Coast quake of Aug. 23 measured magnitude 5.8, enough to crack the Washington Monument.

In Illinois' Madison County, across the Mississippi River from St. Louis, Larry Ringering is anything but

dismissive of the threat.

"I think the threat is very real. It's not if it will happen—it's when," warned Ringering. As head of emergency management in his densely populated county with a huge oil refinery and steel mills, he said mock disaster drills were conducted last month.

"Do I think we're prepared for a 6.0? Yes. An 8.0? Maybe not. I don't think anybody will be," he said.

In 1811 and 1812, the damage was documented widely along the Mississippi River and up the Ohio River Valley. A witness report printed in the American Statesman newspaper in Lexington, Ky., said the "earth burst open and discharged quick sand" about 18 miles from New Madrid, Mo., on Dec. 16, 1811.

Seismologist Susan Hough, who compiled the accounts, said New Madrid suffered the brunt of it.

Gas smelling like sulfur wafted skyward. Trees fell. The Mississippi River receded, then overflowed its banks in spots. Vibrations to the St. Phillips church steeple in distant Charleston, S.C., set the church bell ringing for about 10 seconds. Even Zachary Taylor—then an Army officer in Kentucky years before becoming president—wrote a letter home about the "tremendous shake" and how someone jumped frightened from a window.

"You didn't really have seismology in 1811 and 1812," Hough said. "But you had very keen observers."

Hough used the witness accounts in a study released earlier this year suggesting the magnitudes of the three quakes should be lower, near magnitude 7. Since 2002, other seismologists have released reports saying the earthquakes should be closer to the 7 to 7.6 range. Still, Hough notes that magnitude 7 quakes can cause serious damage, as in last year's Haiti earthquake

Hough notes that while strong quakes have hit the region about 400 years apart, they don't happen like clockwork.

"There's this debate over whether New Madrid is going to continue to be the center of activity the way it has been," Hough said. "There's a lot of evidence that says that earthquakes over the long run bounce around the continent."

The U.S. Geological Survey lays out one possible scenario for magnitude 7.7 earthquake strikes along the New Madrid fault. The scenario—which the USGS stresses is for planning purposes only—envisions levees collapsing, road and bridge damage, problems with water distribution and ruptured gas pipelines. An estimated 100 deaths could occur under this scenario and more than 2,500 could suffer injuries requiring hospitalization, it said.

Other studies, including Zoback's, suggest private property losses alone could reach billions of dollars.

University of Memphis seismologist Chris Cramer said cities should study hazard maps and strengthen homes, businesses, schools and infrastructure. Residents should have quake emergency kits, Cramer added.

Memphis resident Scott Porter, 40, has emergency water and food to last a month. But he notes: "In Memphis, you've got so many more problems than worrying about an earthquake."

A similar sentiment runs along the fault line in southern Illinois.

Near Cobden, Ill., Stace England, 51, just built a new home with a basement tornado shelter. Bolting the water heater to the basement slab was a hedge against any quake though he sees twisters and floods as the immediate threat. As for quakes, the health care worker said: "If you live in LA, it's always on your mind. Not here."

Meanwhile, millions of dollars in work has been done in St. Louis and Memphis to bolster buildings and bridges. For example, \$250 million is being spent on an 11-year project to retrofit the heavily traveled Hernando-DeSoto bridge—which carries about 40,000 vehicles a day—to withstand a 7.7 earthquake. The eastern end of the bridge is in Memphis, carrying Interstate 40 traffic across the Mississippi from Tennessee to Arkansas.

Stein sees no reason for alarm. Earthquakes occur for a while along a fault system, which then shuts down for some time while other faults become active, Stein noted. He added that there's no sign of any stored-up energy building along the New Madrid fault at this time.

And his estimate of the chances of a big quake striking the region like those 200 years ago? Less than 1 percent.