

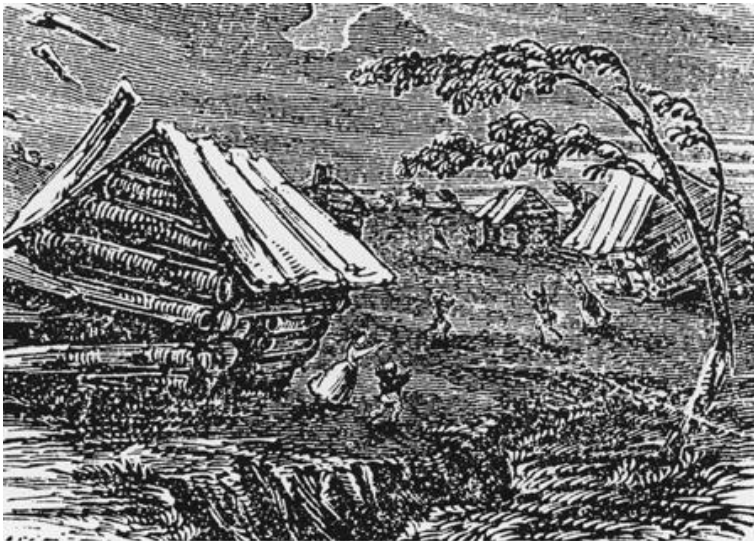
The Mississippi Valley-Whole Lotta Shakin' Goin' On
<http://quake.wr.usgs.gov/prepare/factsheets/NewMadrid/>

Reducing Earthquake Losses Throughout the United States

The Mississippi Valley-"Whole Lotta Shakin' Goin' On"

In the winter of 1811-12, the central Mississippi Valley was struck by three of the most powerful earthquakes in U.S. history. Even today, this region has more earthquakes than any other part of the United States east of the Rocky Mountains. Government agencies, universities, and private organizations are working to increase awareness of the earthquake threat and to reduce loss of life and property in future shocks.

The 400 terrified residents in the town of New Madrid (Missouri) were abruptly awakened by violent shaking and a tremendous roar. It was December 16, 1811, and a powerful earthquake had just struck. This was the first of three magnitude-8 earthquakes and thousands of aftershocks to rock the region that winter.



Severe shaking accompanied the powerful New Madrid earthquakes that struck during the winter of 1811-1812. By winter's end, few houses within 250 miles of the Mississippi River town of New Madrid (Missouri) remained undamaged. (19th-century illustration, courtesy of the State Historical Society of Missouri.)

Survivors reported that the earthquakes caused cracks to open in the earth's surface, the ground to roll in visible waves, and large areas of land to sink or rise. The crew of the New Orleans (the first steamboat on the Mississippi, which was on her maiden voyage) reported mooring to an island only to awake in the morning and find that the island had disappeared below the waters of the Mississippi River. Damage was reported as far away as Charleston, South Carolina, and Washington, D.C.

These dramatic accounts clearly show that destructive earthquakes do not happen only in the western United States. In the past 20 years, scientists have learned that strong earthquakes in the central Mississippi Valley are not freak events but have occurred repeatedly in the geologic past. The area of major earthquake activity also has frequent minor shocks and is known as the New Madrid seismic zone.

effects of the shocks, however, were on the Mississippi itself, where river traffic and commerce were disrupted and boatmen were killed. (Photo courtesy of the Memphis Queen Line.)

AutoZone corporate headquarters in Memphis, Tennessee, is the first building in the central Mississippi Valley to use base isolation. This state-of-the-art engineering design reduces damage by cushioning buildings against earthquake shaking.

Recognizing these problems, the U.S. Geological Survey (USGS) and other organizations are joining in actions that will greatly reduce loss of life and property in future temblors:

In 1983, the states of Arkansas, Illinois, Indiana, Kentucky, Mississippi, Missouri, and Tennessee formed the Central United States Earthquake Consortium (CUSEC). CUSEC improves public earthquake awareness and education; coordinates multistate planning for earthquake preparedness, response, and recovery; and encourages research in earthquake hazard reduction.

In 1990, the USGS, advised by private, academic, and government experts, issued a plan for intensified study of the New Madrid seismic zone. At the same time, the National Earthquake Hazards Reduction Program expanded efforts in the central United States.

Earthquake education is now part of the curriculum in the schools of many CUSEC states. In Kentucky, the state legislature has mandated that earthquake education be taught in schools.

Earthquake Awareness Weeks have been held in Arkansas and Kentucky for several years, and in Tennessee starting in 1995.

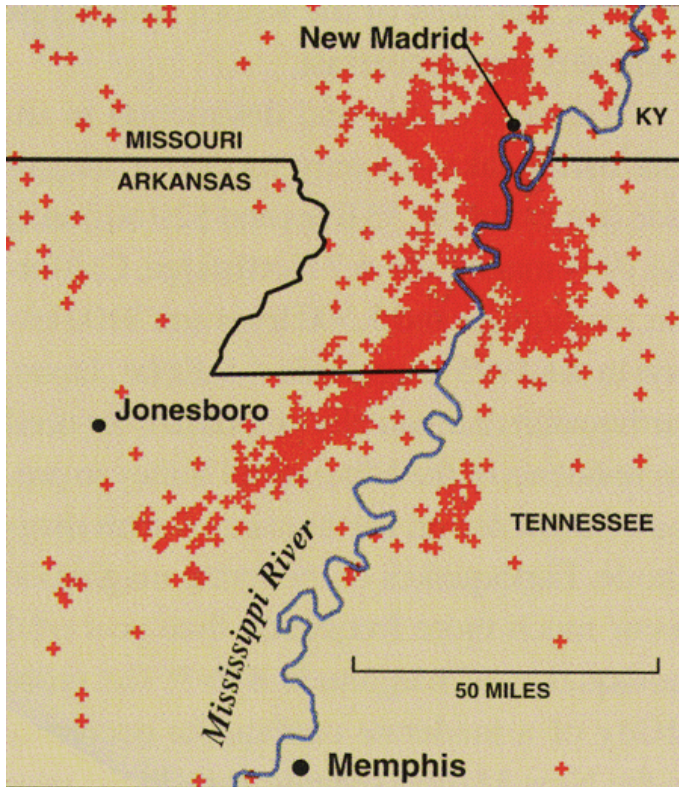
Volunteer earthquake advisory councils or similar organizations have been formed in most CUSEC states.

In 1993, with USGS support and collaboration, the CUSEC state geologists began a significant effort to map earthquake hazards. In 1995 they completed a regional soils map that can be used to locate areas likely to experience intense shaking in earthquakes.

Most CUSEC states have adopted building codes containing modern earthquake design standards.

Efforts to ensure the seismic safety of critical structures, such as dams, bridges, and highways, have accelerated. For example, in 1990, transportation agencies in Illinois, Kentucky, and Tennessee initiated programs to strengthen highway bridges that do not meet earthquake design standards.

Strong earthquakes in the New Madrid seismic zone are certain to occur in the future. In contrast to the western United States the causes and effects of earthquakes in the central and eastern United States are just beginning to be understood. Through better understanding of earthquake hazards and through public education, earth scientists and engineers are helping to protect the citizens of all parts the United States from loss of life and property in future earthquakes.



Eugene Schweig, Joan Gomberg, and James W. Hendley II

The central Mississippi Valley is the most earthquake-prone region of the United States east of the Rocky Mountains. Crosses show the locations of the many earthquakes recorded in the New Madrid seismic zone since 1974.

COOPERATING ORGANIZATIONS

- Central United States Earthquake Consortium
- Federal Emergency Management Agency
- Saint Louis University
- Southeast Missouri State University
- The University of Memphis
- University of Kentucky

For more information contact:

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U.S. Geological Survey Fact Sheet-168-95 1995

Return to Factsheet index

USGS Earthquakes Page

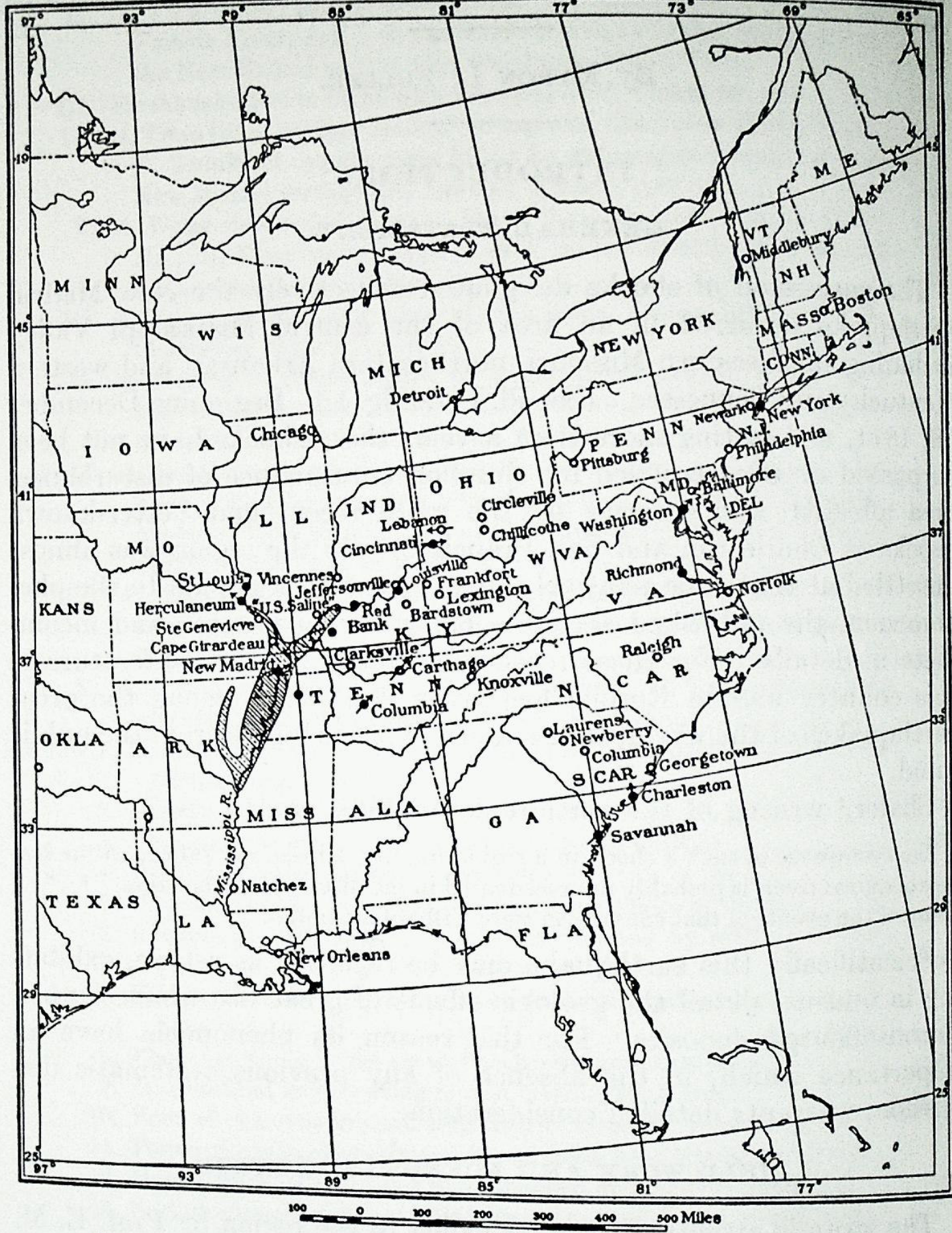


FIGURE 1.—Map showing the extent of earthquake disturbances in the New Madrid area in 1811-12. For additional records of the direction of vibrations see table, page 41.