

= 1867 Manhattan , Kansas earthquake =

The 1867 Manhattan earthquake struck Riley County , Kansas on April 24 at 14 : 22 local time . It measured 5 @. @ 1 on a seismic scale that is based on an isoseismal map or the event 's felt area . The earthquake 's epicenter was by the town of Manhattan and is the strongest earthquake to originate in the state .

The earthquake had an intensity of VII (Very strong) on the Mercalli intensity scale , and was felt over an area of roughly 193 @, @ 051 square miles (500 @, @ 000 km²) . It caused largely minor damage , reports of which were confined to Kansas , Iowa , and Missouri , according to the United States Geological Survey .

Manhattan is near the Nemaha Ridge , a long structure that is bounded by several faults . The nearby Humboldt Fault Zone in particular poses a threat to the city ; though Kansas is not known for earthquake activity , an earthquake could occur at any time .

= = Background and geography = =

The earthquake 's epicenter lay near Manhattan , Kansas , a town just off the connection of the Kansas River and the Big Blue River . Nearby is the anticline Nemaha Ridge , which has been associated with at least a few earthquakes of Kansas . A 300 ? million @- @ year @- @ old Precambrian granite range bounded by faults , it hosts the Humboldt Fault Zone , which , in addition to serving as the range 's easternmost boundary , has produced a large portion of the state 's earthquakes . Each year , it is responsible for at least several small tremors less than magnitude 2 @. @ 7 . It cuts through Permian rock , and according to the Geological Society of America , may actually be a complex fault . Previously , it was believed to be a simple , Precambrian structure .

The Nemaha Range lies roughly 50 miles (80 km) east of the Midcontinent rift , which forms a layer of basaltic rock around 1 @. @ 1 billion years old . This rift extends northward to Lake Superior and the surrounding area and southward to Kansas , then stops abruptly . Also present in the state is the Central Kansas Uplift , the faults of which produced several small earthquakes during the late 1980s . According to United States Geological Survey geophysicist Don Steeples , earthquakes at the Humboldt Zone have decreased and activity at the Uplift has increased .

Felt over an area of 193 @, @ 051 square miles (500 @, @ 000 km²) , the earthquake followed the Midcontinent seismic trend : unlike earthquakes on the Western Coast of the US , events in the central and east @- @ central sectors of the country are spread out over extensive areas ; for example , the 1968 Illinois earthquake also followed this trend .

The 1867 Manhattan earthquake remains the only notable earthquake to originate in the state , though 25 in total have taken place since . According to a report in the Bulletin of the Seismological Society of America , the frequency between earthquakes is between 40 and 45 years .

= = Damage and casualties = =

Originating at 20 : 22 UTC , or around 2 : 30 local time , the earthquake was assigned a maximum intensity of VII . Minor damage occurred throughout the geographical region . Injuries were reported as well . The earthquake fractured walls , downed chimneys , and interfered with the stability of structures , even loosening stones . In Louisville and Leavenworth , chimneys fell ; in Paola , the earthquake destroyed one wall of a large post office building . Waves were observed on the Kansas River , 2 feet (1 m) in height . Isolated reports from Iowa and Missouri , describing fallen and cracked plaster in Dubuque and Chillicothe , compliment additional reports of fallen plaster and roof shingles , damaged wells , and cracked walls .

A series of articles were published by the Chicago Tribune describing the extent of the damage throughout the state of Kansas . " At Kansas City " details that the earthquake jolted homes with a sudden burst , giving off a resonating roar like thunder . The earthquake also extended into Indiana and Illinois , according to the United States Geological Survey .

=== Reaction ===

The Chicago Tribune observed in its article " At Leavenworth , Kansas " that the earthquake was completely unexpected , describing the event as " [...] sudden in its coming and departure . " It confirms that earthquakes were not common in earlier time and states that " all were more or less startled , and , indeed , frightened . "

The earthquake renewed geological interest of the state , and scientists began to analyze faults and earthquakes . One study found that between December 1977 and June 1989 , more than 200 earthquakes were recognized by a seismograph network . All were between 4 and .8 on the Richter magnitude scale .

== Future threat ==

Despite the fact that Kansas is not seismically active , a strong earthquake could pose significant threats to the state . If an earthquake were to occur , it would likely be along the Nemaha Ridge , which is still active . The Humboldt Fault Zone , a fault just off the Ridge , lies just 12 miles (19 km) eastward of the Tuttle Creek Reservoir near Manhattan . If an earthquake were to occur here , it would likely destroy the dam , releasing 300 @, @ 000 feet (91 @, @ 440 m) of water per second and flooding the nearby area , also threatening roughly 13 @, @ 000 people and 5 @, @ 900 homes . A moderate earthquake " between 5 @. @ 7 to 6 @. @ 6 would cause sand underneath the dam to liquefy into quicksand , causing the dam to spread out and the top to drop up to three feet . " A large earthquake would spawn gaps , forcing water to leak and eventually cause the dam to collapse . Any earthquake that could pose a threat occurs on a cycle of roughly 1 @, @ 800 years , according to the United States Army Corps of Engineers , who studied the area first in 1980 .

To counter this threat , the group has galvanized an effort to strengthen the dam . Replacing the sand , which could shift during an earthquake , with more than 350 walls , the group has equipped the dam with sensors . Alarms are connected to these sensors , which would alert nearby citizens to the earthquake .