EARTHQUAKES IN MAINE

Maine's Earthquake History

The first earthquake centered in Maine was reported on May 22, 1817. The probable focus was in the central portion, as it was widely felt throughout the State and in New Brunswick. As early as June 11, 1638, a strong earthquake in the St. Lawrence Valley region, near Trois Rivieres, Quebec, was reportedly felt throughout all the English plantations. Another shock from the same area, in 1663, was felt over all of eastern Canada and the northeastern United States. On November 9, 1727, a violent earthquake near Newbury, Massachusetts, was reportedly felt from the Kennebec to the Delaware River. Stone walls and chimneys were shaken down in the epicentral region. The famous earthquake of 1755, east of Cape Ann, Massachusetts, was felt from the Annapolis River, Nova Scotia, to the Chesapeake Bay.

On March 21, 1904, a shock overthrew some chimneys at Calais and Eastport, Maine, and St. Stephen, New Brunswick. The total felt area covered most of New England and the Canadian Provinces of New Brunswick and Nova Scotia, approximately 150,000 square miles. There were several light shocks near the origin a few hours after the main earthquake.

An earthquake on December 11, 1912, affected an area of approximately 20,000 square miles and reached intensity V - VI in the Bangor area. On August 20, 1918, damaged to chimneys in South Paris and Norway, Maine, resulted from another shock; felt reports were received from Bridgton, Cape Elizabeth, and Lewiston.

Another strong earthquake in the St. Lawrence River region on February 28, 1925, produced an extensive felt area covering eastern Canada, all of the northeastern United States, points south to Virginia and west to the Mississippi River. The total affected area of two million square miles makes the shock among the most widely felt earthquakes in North America. Estimated at magnitude 7.0, this tremor caused considerable damage at distances up to 200 miles from the center. Intensities reported in Maine ranged from a V - VI at Portland, and IV at Eastport, Greenville, and Orono.

In 1929 a magnitude 7.2 earthquake occurred on the Grand Banks of Newfoundland, about 250 miles from shore. A submarine slide triggered by the earthquake caused the fracture of 12 trans-atlantic cables. In each case they were broken at several points. A tsunami resulting from displacement of the ocean floor caused considerable damage and the loss of 27 lives at Placentia Bay, Newfoundland. Small seawaves were recorded along the east coast of the United States as far south as Charleston, South Carolina. The area of maximum intensity in the United States was the southeastern half of Maine, where clocks stopped, articles were shaken from shelves, and many people were alarmed. The total area affected in the United States was approximately 80,000 square miles.

An earthquake on January 14, 1943, centered near Dover - Foxcroft was reported felt over 50,000 square miles, including all or parts of the New England states. A shock on October 4, 1949, affected about 16,000 square miles in central and southwestern Maine and a portion of northern New Hampshire. St. Johnsbury, Vermont, also felt the tremor. Maximum intensity V reported in southwestern Maine included breaking of dishes, fallen knick-knacks, and displaced pictures.

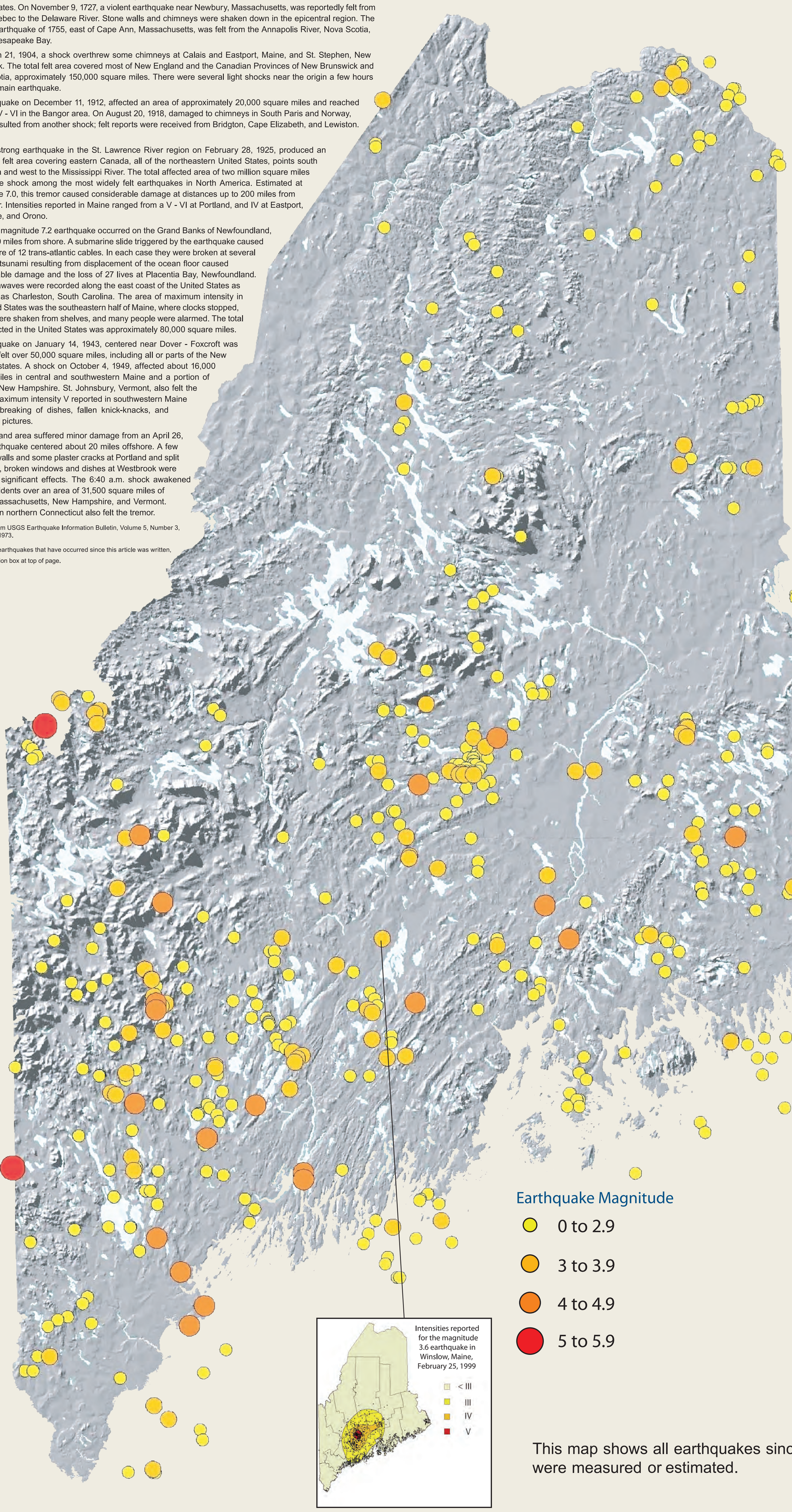
The Portland area suffered minor damage from an April 26, 1957, earthquake centered about 20 miles offshore. A few cracked walls and some plaster cracks at Portland and split chimneys, broken windows and dishes at Westbrook were the most significant effects. The 6:40 a.m. shock awakened many residents over an area of 31,500 square miles of Maine, Massachusetts, New Hampshire, and Vermont. One city in northern Connecticut also felt the tremor.

Abridged from USGS Earthquake Information Bulletin, Volume 5, Number 3, May - June 1973.

For a list of earthquakes that have occurred since this article was written, see information box at top of page.

For more information on Earthquakes, **visit:**
http://quake.bc.edu:8000/cgi-bin/NESN/recent_events.pl

If you have felt an Earthquake **please** report it here:
http://www.bc.edu/research/westonobservatory//northeast/ifyoufelt.html



The Modified Mercalli Intensity Scale of Earthquakes

In seismology, a scale of seismic intensity is a way of measuring or rating the effects of an earthquake at different sites. The Modified Mercalli Intensity Scale is commonly used in the United States by seismologists seeking information on the severity of earthquake effects. Intensity ratings are expressed as Roman numerals between I at the low end and XII at the high end.

The Intensity Scale differs from the Richter Magnitude Scale in that the effects of any one earthquake vary greatly from place to place, so there may be many Intensity values (e.g.: IV, VII) measured from one earthquake. Each earthquake, on the other hand, should have just one Magnitude, although the several methods of estimating it will yield slightly different values.

Ratings of earthquake effects are based on the following relatively subjective scale of descriptions:

Intensity Value	Description
I	People do not feel any Earth movement.
II	A few people might notice movement if they are at rest and/or on the upper floors of tall buildings.
III	Many people indoors feel movement. Hanging objects swing back and forth. People outdoors might not realize that an earthquake is occurring.
IV	Most people indoors feel movement. Hanging objects swing. Dishes, windows, and doors rattle. The earthquake feels like a heavy truck hitting the walls. A few people outdoors may feel movement. Parked cars rock.
V	Almost everyone feels movement. Sleeping people are awakened. Doors swing open or close. Dishes are broken. Pictures on the wall move. Small objects move or are turned over. Trees might shake. Liquids might spill out of open containers.
VI	Everyone feels movement. People have trouble walking. Objects fall from shelves. Pictures fall off walls. Furniture moves. Plaster in walls might crack. Trees and bushes shake. Damage is slight in poorly built buildings. No structural damage.
VII	People have difficulty standing. Drivers feel their cars shaking. Some furniture breaks. Loose bricks fall from buildings. Damage is slight to moderate in well-built buildings; considerable in poorly built buildings.
VIII	Drivers have trouble steering. Houses that are not bolted down might shift on their foundations. Tall structures such as towers and chimneys might twist and fall. Well-built buildings suffer slight damage. Poorly built structures suffer severe damage. Tree branches break. Hillsides might crack if the ground is wet. Water levels in wells might change.
IX	Well-built buildings suffer considerable damage. Houses that are not bolted down move off their foundations. Some underground pipes are broken. The ground cracks. Reservoirs suffer serious damage.
X	Most buildings and their foundations are destroyed. Some bridges are destroyed. Dams are seriously damaged. Large landslides occur. Water is thrown on the banks of canals, rivers and lakes. The ground cracks in large areas. Railroad tracks are bent slightly.
XI	Most buildings collapse. Some bridges are destroyed. Large cracks appear in the ground. Underground pipelines are destroyed. Railroad tracks are badly bent.
XII	Almost everything is destroyed. Objects are thrown into the air. The ground moves in waves or ripples. Large amounts of rock may move.

As you can see from the list above, rating the Intensity of an earthquake's effects does not require any instrumental measurements. Thus seismologists can use newspaper accounts, diaries, and other historical records to make intensity ratings of past earthquakes, for which there are no instrumental recordings. Such research helps promote our understanding of the earthquake history of a region, and estimate future hazards.

www.seismo.unr.edu/ftp/pub/louie/class/100/mercalli.html

The Richter Magnitude Scale

Seismologists use a Magnitude scale to express the seismic energy released by each earthquake. Here are the typical effects of earthquakes in various magnitude ranges:

Magnitude	Effects
< 3.5	Generally not felt, but recorded.
3.5 - 5.4	Often felt, but rarely causes damage.
Under 6.0	At most slight damage to well-designed buildings. Can cause major damage to poorly constructed buildings over small regions.
6.1 - 6.9	Can be destructive in areas up to about 100 kilometers across where people live.
7.0 - 7.9	Major earthquake. Can cause serious damage over larger areas.
8 >	Great earthquake. Can cause serious damage in areas several hundred kilometers across.

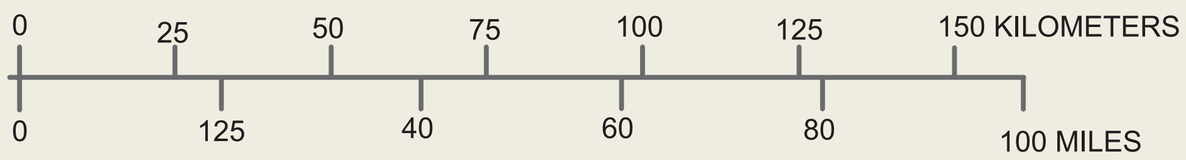
http://www.seismo.unr.edu/ftp/pub/louie/class/100/magnitude.html

This map shows all earthquakes since 1814 for which magnitudes were measured or estimated.

Building Techniques

Un-reinforced Masonry (common in Maine) | Reinforced masonry | Wood structure home (common in Maine) | Steel structure - commercial

Most vulnerable ← → Least vulnerable



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DEPARTMENT OF CONSERVATION
Maine Geological Survey

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State Geologist, 2003