

## Major Earthquakes in Virginia

*Adapted from Seismicity of the United States, 1568-1989, Carl W. Stover and Jerry L. Coffman, 1993, USGS Professional Paper 1527.*

**February 2, 1774.** The first documented earthquake in Virginia originated near Petersburg, where houses were displaced considerably off their foundations. The tremor rang church bells as far away as Winston-Salem, North Carolina. Estimated magnitude: 4.5.

**December 11, 1811, January 23 and February 7, 1812.** Effects from a series of monstrous earthquakes in New Madrid, Missouri, were felt strongly in Virginia, and details were reported in the Richmond and Norfolk newspapers.

**August 27, 1833.** An earthquake shook buildings and violently rattled windows in Lynchburg. It was described as severe in Charlottesville and fences shook near Louisa Courthouse. Near Richmond, two miners were killed in a panic caused by the tremor. Probably centered in Goochland County. Estimated magnitude: 4.5.

**April 29, 1852.** An earthquake centered in Grayson County or Wythe County threw down a chimney near Wytheville, shook off the tops of chimneys at Buckingham Courthouse, and shook houses in Staunton. This quake was felt over an area of approximately 175,000 square miles, including parts of Ohio, Pennsylvania and New York. Estimated magnitude: 4.9.

**November 2, 1852.** An earthquake that damaged chimneys at Buckingham Courthouse was also reported to be strong at Fredericksburg and Richmond. In Scottsville, every house was shaken, and water in the canal was troubled and boats tossed about. Estimated magnitude: 4.3.

**December 22 and 23, 1875.** This quake was centered west of Richmond, with the highest intensities at towns near the James River in Goochland and Powhatan Counties, and in Louisa County, and it was felt from Baltimore, Maryland, to Greensboro, North Carolina, and from the Atlantic westward to White Sulphur Springs, West Virginia. In Richmond, severe damage was sustained in the downtown business and residential areas adjacent to the James River or on islands in the river. Waves suddenly rose several feet at docks, causing boats to snap their moorings and drift downstream. Bricks fell from chimneys, plaster cracked, and windows shattered. The quake occurred just before midnight, and people rushed into the streets in all sorts of clothing. At Manakin, west of Richmond, shingles were shaken from a roof and many lamps and chimneys were broken. Several small aftershocks were reported through Jan. 2, 1876. Maximum Intensity: VII, estimated magnitude: 4.5.

**September 1, 1886.** Originating in Charleston, South Carolina, felt across the extent of the eastern seaboard, an area of over two million square miles, this was the most damaging seismic event in the U.S. prior to the 1906 San Francisco earthquake, an estimated magnitude of 7.3 on the Richter scale. ; In Charleston, over sixty people died, and structural damage occurred as far away as Richmond and Atlanta, where prisoners rioted in the penitentiary and the militia had to be called out to restore order. Throughout Virginia, chimneys were thrown down, windows shattered, and plaster cracked.

**May 3, 1897.** Centered at Radford, where a few chimneys were wrecked and plaster fell from walls, and chimneys were damaged at nearby Pulaski and Roanoke. Felt in most of southwest Virginia and as far south as Winston-Salem, North Carolina. Estimated magnitude 4.3. Likely a foreshock to the May 31, 1897 earthquake in Giles County.

**May 31, 1897.** This earthquake was the most intense and widespread in Virginia in historical times, with Modified Mercalli Intensity of VIII. Felt over an area of 280,000 square miles from Georgia to Pennsylvania and from the Atlantic Coast westward to Indiana and Kentucky, the area of maximum ground motion extended over an area from Lynchburg west to Bluefield, West Virginia, south to Bristol, Tennessee. The shock was felt most severely near Pearisburg in Giles County, where the

ground rolled in an undulating motion, water in springs became muddy, and some springs ceased to flow, and a train was derailed. Walls of old brick houses were cracked and many chimneys were thrown down or badly damaged. Many chimneys also were shaken down or damaged at Bedford, Pulaski, Radford, Roanoke, and Bristol, Christiansburg, Dublin, Floyd, Lexington, Lynchburg, Rocky Mount, Salem, Tazewell, and Wytheville in Virginia, as well as Charlotte, Oxford, Raleigh, and Winston, North Carolina, Knoxville, Tennessee, and Bluefield, West Virginia. Aftershocks continued through June 6, 1897. Estimated magnitude: 5.8-5.9. This was the second largest earthquake in the eastern United States in the last 200 years.

**February 5, 1898.** Bricks were thrown from chimneys, furniture was shifted in a few houses, and residents rushed into the streets of Pulaski. Felt throughout southwest Virginia and south to Raleigh, North Carolina.

**February 11, 1907.** Near Arvon in Buckingham County, chimneys were cracked and a window was broken at a store at Buckingham. A terrific shock sent people rushing outdoors at Arvon and displaced furniture. Felt strongly from Powhatan to Albemarle County.

**April 9 and 10, 1918.** At Luray, in Page County, windows were broken and plaster was cracked severely. Ceilings of houses were cracked badly at Edinburg; windows were broken at Harrisonburg and Staunton, and Washington, D.C. (at Georgetown University). In addition, a new spring formed in Page County near Hamburg, almost in the middle of a road. A minor aftershock was reported in the area about five hours later. Also felt in Maryland, Pennsylvania, and West Virginia.

**September 5 and 6, 1919.** This earthquake affected mainly towns in Warren and Rappahannock Counties. At Arco, in the Blue Ridge Mountains south of Front Royal, chimneys were damaged, plaster fell from walls, and springs and streams were muddied. Reports from the adjacent northern part of Rappahannock County state that similar shocks were felt and that streams were rendered turbid. Also felt in parts of Maryland and West Virginia. Several aftershocks occurred.

**December 25 and 26, 1929.** A moderate tremor at Charlottesville shook bricks from chimneys in some places. Also felt in other parts of Albemarle County.

**April 23, 1959.** This earthquake was strongest in Giles County, at Eggleston and Pembroke. Residents there reported several damaged chimneys and articles shaken from shelves and walls. One chimney toppled at the Norfolk and Western Station in Eggleston. Also felt in West Virginia. Magnitude 3.8.

**November 20, 1969.** Centered along the State line near Elgood, West Virginia, and Rich Creek, Virginia, locally many windows including display windows were broken and plaster cracked. Magnitude 4.6.

**November 11, 1975.** Windows were broken in the Blacksburg area and plaster was cracked at Poplar Hill (south of Pearisburg, in Giles County). Also felt in Pulaski County.

**September 13, 1976.** Centered in Carroll County, bricks fell from chimneys and pictures fell from walls at Mount Airy, North Carolina. At the nearby town of Toast, North Carolina, cracks formed in masonry and plaster. The earthquake was observed in many towns in North Carolina and Virginia and in a few towns in South Carolina and West Virginia. Carroll County is one of the most persistent areas of activity in Virginia; since 1976, five small felt earthquakes have occurred near Hillsville.

**In 1981** a sequence of three earthquakes with magnitudes of 3.4, 3.2, and 2.9 occurred near Scottsville within an eight-minute period.

**August 17, 1984.** An earthquake centered near Cunningham in Fluvanna County had a magnitude of 4.0 and a maximum intensity of V and was felt over 12,000 square miles.

**In the winter of 1986-1987,** a series of eleven small magnitude (1.5-2.2) shallow earthquakes were strongly felt (maximum intensity V) in Richmond.

**December 9, 2003.** South of Goochland along the James River, about thirty miles west of Richmond, this was the largest earthquake recorded in Virginia since the widespread use of modern seismic equipment in the 1970 s. It was a shallow earthquake, three miles deep, probably the result of a rupture of the Lakeside Fault, with a magnitude of 4.5 and a maximum intensity of VI, and it was felt strongly over most of the State. Although little or no structural damage occurred during the event, the U.S. Geological Survey reported that the trembles were felt in parts of North Carolina and Maryland. Shaking was such that State government buildings were evacuated and inspected for damage. It had been preceded May 5, 2003 by a 3.8 event whose epicenter was just a few kilometers away.

**May 6th, 2008.** A minor earthquake with an estimated magnitude of 2.0 occurred near Annandale, Virginia. Felt reports were primary received from people in Fairfax County, Virginia; the District of Columbia; and Montgomery County, Maryland.

**August 23rd, 2011.** Virginia and much of the East Coast experienced a widely-felt earthquake at 1:51 p.m. eastern daylight time on Tuesday, August 23, 2011. According to the U.S. Geological Survey, the epicenter of the quake was located near Cuckoo, in Louisa County. With a magnitude of 5.8, this is the largest Virginia earthquake recorded by seismometers. Thousands of aftershocks have been recorded by the U.S. Geological Survey since the initial shock. Most of these aftershocks have been too small to be felt by humans and can only be detected by seismometers, however 6 were greater than magnitude 3.0.