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Widely felt tremor not unprecedented

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By Dan Vergano and Elizabeth Weise, USA TODAY

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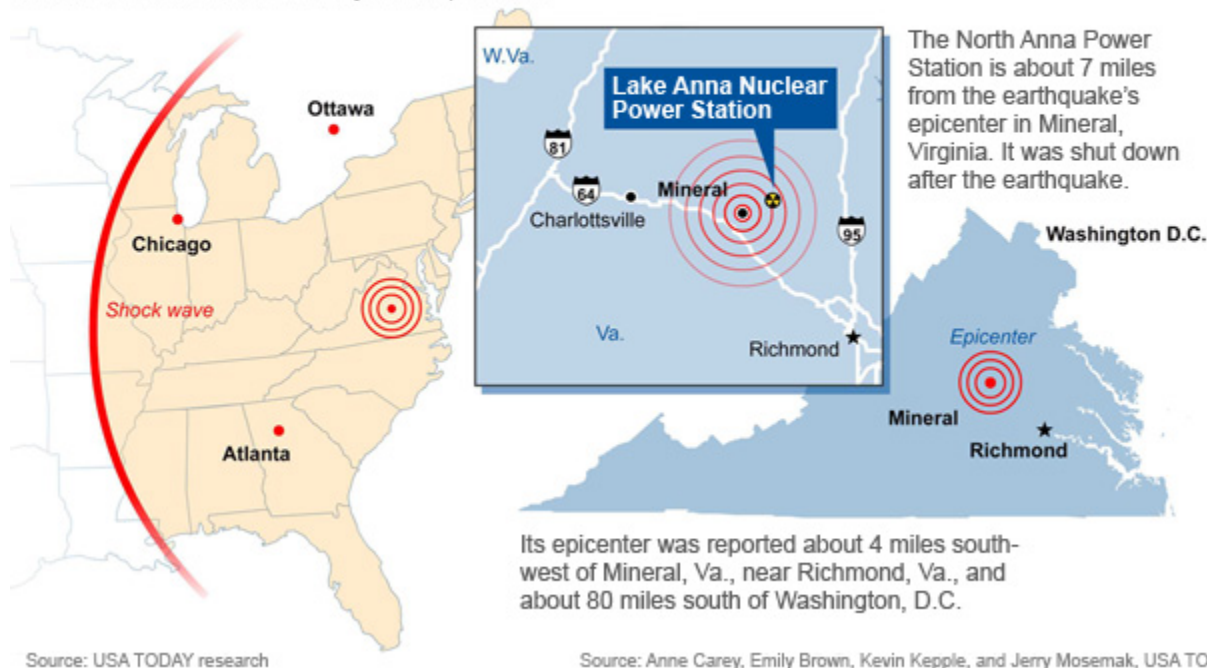
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Magnitude 5.8 quake hits Virginia

The earthquake, which hit at about 1:51 p.m. ET, measured a preliminary 5.8 and lasted up to 45 seconds, according to the U.S. Geological Survey. It shook office buildings and homes and rattled residents from North Carolina to as far as away Ottawa, Canada.

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Earthquakes can strike just about anywhere, as seismologists reminded us after Tuesday's magnitude-5.8 quake in central Virginia. USA TODAY asked the experts:

Q: How did the quake happen?

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By Damian Dovarganes, AP

Geophysicist Ken Hudnut, with the United States Geological Survey, shows the epicenter of the Virginia earthquake Tuesday at the Caltech-USGS media center in Pasadena, Calif.

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A: Virginia once was a heavy earthquake zone more than 200 million years ago, says Karen Fischer of Brown University, with once-active faults that have now cooled. "We are just seeing pressure build up and release on those scars," Fischer says. The pressure results from the spread of the [Atlantic Ocean](#)'s crust pushing against the [East Coast](#)'s crust. However, seismologists can't predict why or where quakes will happen on these faults.

Q: Why was this quake felt so widely?

PHOTOS: [Earthquake rocks East Coast](#)

STORY: [East shook up after strong quake](#)

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A: Eastern North America rests on a fairly cold, connected stretch of continental crust. "So if you hit it, it tends to ring like a bell," says seismologist Peggy Hellweg of the University of California-Berkeley.

That's why the shakes from the quake travelled as far west as Chicago and as far north as Toronto.

Q: Why don't [West Coast](#) quakes travel this far?

A: "The western U.S. is more pieces all jumbled together and if you hit it, it tends to thunk like a pile of sand,"

Hellweg says. In California, shakes from a quake of this size are rarely felt more than 30 miles away.

Q: Where does this quake rank in the history of Mid-Atlantic quakes?

A: It is significant, but not unprecedented. A quake the size of Tuesday's last struck Virginia in 1897. Similar quakes have struck the wider region, most recently a magnitude-6.0 quake in Quebec on Nov. 25, 1986. And a magnitude-7.1 quake struck the same part of Canada in 1925.

But the Virginia quake is somewhat surprising because [South Carolina](#) and the [New Madrid](#) fault region near Memphis are seen as the hotspots for quakes in the eastern [United States](#). The New Madrid earthquakes of 1811 and 1812, two magnitude-7.7 quakes sandwiching a 7.5 one, are the historical big ones of Mid-Atlantic quakes.

Q: How strong was this quake, overall?

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A: It was a moderate quake, thousands of times less powerful than the record magnitude-9.5 quake that struck Chile in 1960.

Q: What are the risks of aftershocks?

A: Pretty solid. Four small ones, magnitude 2.8, 2.2 and 4.2 occurred within seven hours after the big one struck at 1:51 p.m. ET on Tuesday.

"Aftershock activity is most robust immediately after the earthquake but it could take months for the aftershocks to totally die down," says geologist Tomas Rockwell of San Diego State University.

Typically, he says, the aftershocks fall off in strength over weeks to months after the first quake.

People near Mineral, Va., Rockwell says, "can expect to feel quite a few aftershocks."

Q: Do we need to reconsider East Coast building codes?

A: Maybe, says Fischer, depending on what building inspections show in the coming days. U.S. hazard maps do drive building codes nationwide. They include earthquake risks, a focus of [U.S. Geological Survey](#) efforts in the past two decades. Some brick walls and chimneys are reported damaged near the quake.

"I would be surprised if there is significant structural damage more than 30 miles from the earthquake," says Andre Filiatrault, director of the Multidisciplinary Center for Earthquake Engineering at the [University of Buffalo](#).

Because Virginia's center is lightly populated, "We kind of dodged a bullet," says geophysicist Tony Crone of the U.S. Geological Survey. Similar shaking centered in cities like Richmond or Washington, D.C., might have triggered much more damage.

Q: The U.S. Geological Survey reports the quake started 3.7 miles underground. Did this shallow depth add to the shaking?

A: Shallow depths can add to the shaking, Fischer says. The quake's energy dissipates from a more shallow point to the surface. However, the rigidity of the crust underlying the Mid-Atlantic was the main reason for the widely felt shaking.

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Elijahs Fury

12:42 AM on August 24, 2011

Score: 4

Thanks media for stroking away signs of armageddon

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RicknATL

7:04 AM on August 24, 2011

Score: 18

It's all part of the dynamic natural processes that make up this planet.

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ThinkFuture42

8:22 AM on August 24, 2011

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Nice summary.

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RobertT

8:24 AM on August 24, 2011

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Time to call it a national disaster and start throwing billions of dollars around with zero accountability of where the money goes.

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golfingwidow

8:25 AM on August 24, 2011

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A friend posted on Facebook - it wasn't an earthquake but the founding fathers rolling over in their graves at the state of affairs of the current administration.

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[FoxNewsWatcher](#)

8:30 AM on August 24, 2011

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Earthquakes, hurricanes, tornadoes, floods, drought....seems like Rick Perry, Sarah Palin and Michelle Bachmann need to ramp up that praying!

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[freethinker67](#)

8:31 AM on August 24, 2011

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It was Obamas fault.

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[nameste](#)

8:40 AM on August 24, 2011

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Why would republicans care about Earthquakes and Hurricanes? To them all science is a hoax. It's just god spanking us like a good parent does.

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[yak-n-fish](#)

8:41 AM on August 24, 2011

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It was strong enough to crack our national phallic symbol !

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