

THE AUGUST 23 CENTRAL VIRGINIA EARTHQUAKE

At magnitude 5.9, the earthquake that was widely felt in the eastern U.S., and did minor damage in the nation's capital, was the largest ever in the mid-Atlantic region, and one of the largest ever on the eastern seaboard. Its origin was in what seismologists know as the Central Virginia Seismic Zone. Because earthquakes in the East can almost never be tied to specific known faults, their source regions are called "seismic zones," rather than "fault zones." Another active seismic zone in the East is the Lancaster Seismic Zone, located principally in Lancaster and Berks Counties, PA.

The August 23 earthquake was felt over such a large area because the earth's crust in the East is geologically older, colder, and more rigid than in the West. That means that it transmits seismic waves more efficiently, allowing them to travel farther before dying out. Earthquake intensity is a measure of what people experience in a quake, or the damage that the quake does. In the U.S., intensity usually is expressed in terms of the Modified Mercalli Scale, originally developed in Italy. Intensity 1 is barely felt, while 12 is total destruction. Serious structural damage begins at about Intensity 8. What people in Lancaster and York Counties have reported puts the intensity here at about 4. At this intensity, buildings shake, windows and dishes rattle, liquids spill from filled containers, pictures on walls are knocked askew, but there is no actual damage. Interestingly, Intensity 4 is what most Lancaster Countians experienced in the April 22, 1984, earthquake centered near Marticville. The smaller magnitude (4.1) and closer distance made the effects similar to the those of the recent quake, except that a loud sound accompanied the more 1984 quake, but not the 2011 one, at least not this far from the epicenter.

Other large Eastern earthquakes include:

August 31, 1886, Charleston SC, magnitude 7.3 (?)
September 5, 1944, Massena, NY-Cornwall, ON, magnitude 5.8
August 10, 1884, New York City, magnitude 5.5 (?)
April 20, 2002, AuSable Falls, NY, magnitude 5.3
December 22, 1875, Richmond, VA, magnitude 4.8
January 15, 1994, Wyomissing, PA, magnitude 4.7.

It is instructive to read the Wikipedia account of the 1944 Massena-Cornwall earthquake because it had about the same magnitude as the 2011 Virginia quake. Had the 2011 epicenter been as close to Richmond, say, as the 1944 quake was to Massena and Cornwall, the damage would have been quite significant. Luckily, the 2011 epicenter was in a very rural area. (Not so lucky for folks in Mineral, Virginia, however.)

Questions about this earthquake, or earthquakes in general, may be directed to Dr. Charles Scharnberger at cscharnberger@millersville.edu.