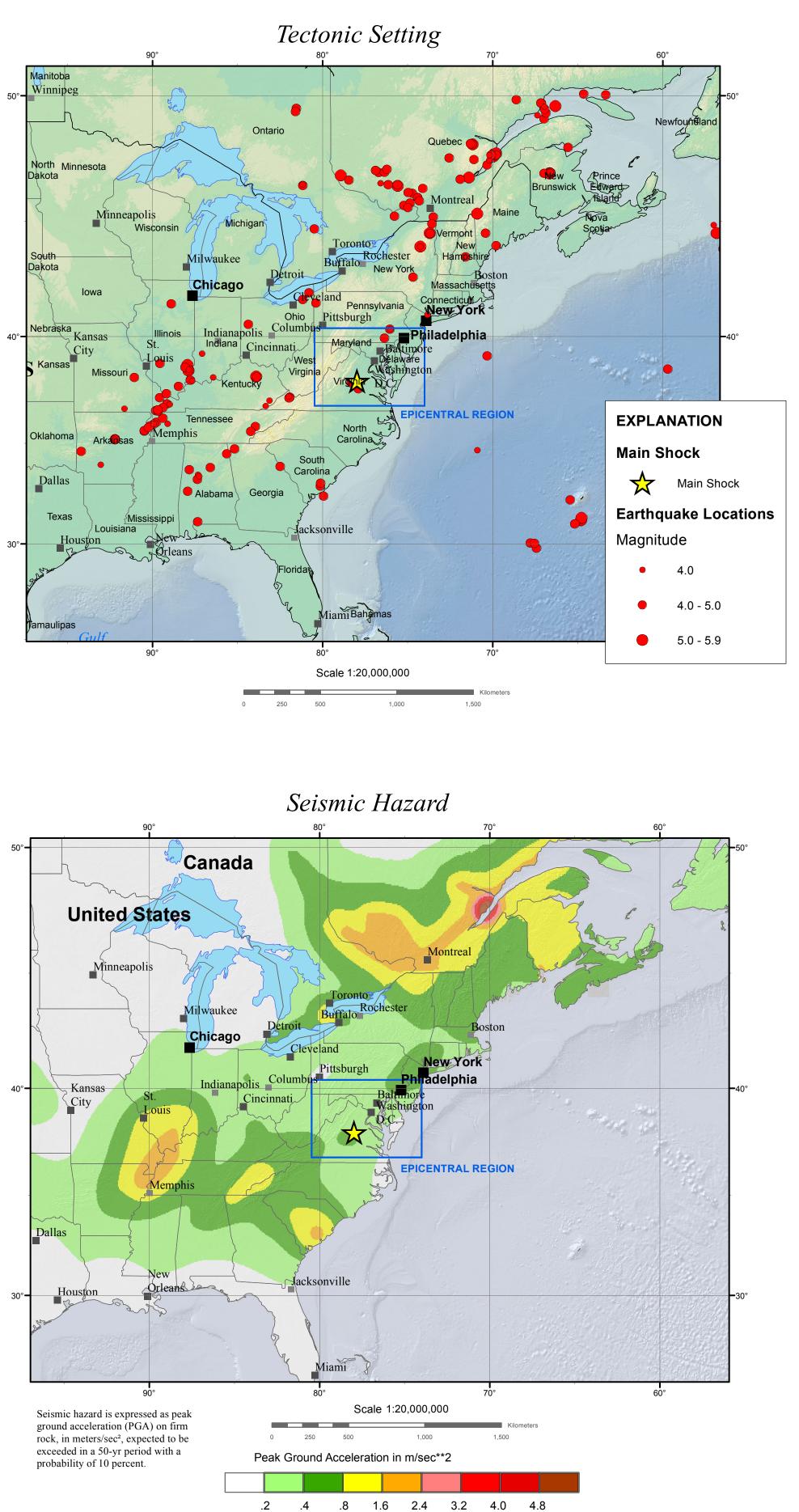
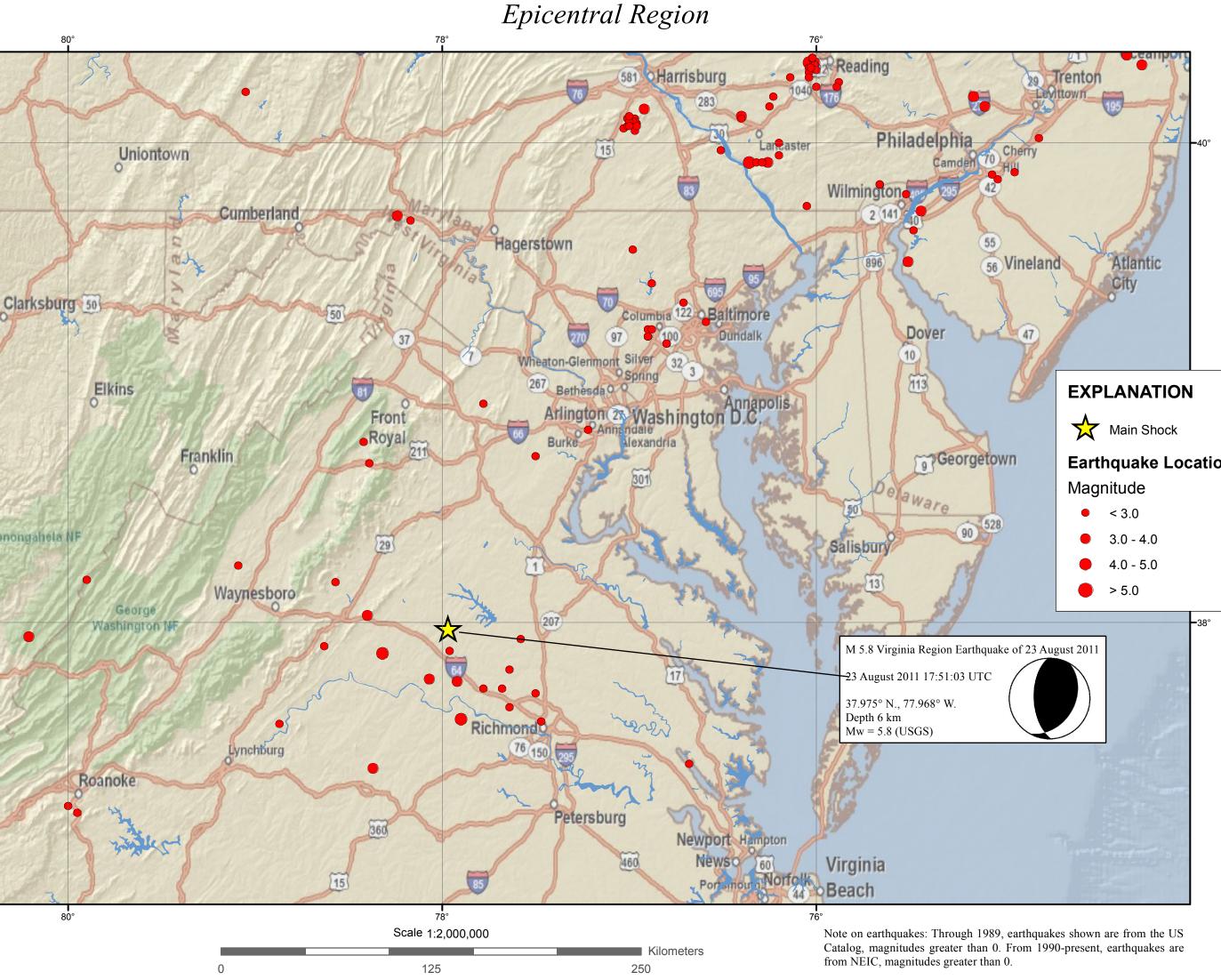


U.S. DEPARTMENT OF THE INTERIOF U.S. GEOLOGICAL SURVEY

M5.8 Virginia Region Earthquake of 23 August 2011



The Virginia earthquake of 2011 August 23 occurred as reverse faulting on a north or northeast-striking plane within a previously recognized seismic zone, the "Central Virginia Seismic Zone." The Central Virginia Seismic Zone has produced small and moderate earthquakes since at least the 18th century. The previous largest historical shock from the Central Virginia Seismic Zone occurred in 1875. The 1875 shock occurred before the invention of effective seismographs, but the felt area of the shock suggests that it had a magnitude of about 4.8. The 1875 earthquake shook bricks from chimneys, broke plaster and windows, and overturned furniture at several locations. A magnitude 4.5 earthquake on 2003, December 9, also produced minor damage. Previous seismicity in the Central Virginia Seismic Zone has not been causally associated with mapped geologic faults. Previous, smaller, instrumentally recorded earthquakes from the Central Virginia Seismic Zone have had shallow focal depths (average depth about 8 km). They have had diverse focal mechanisms and have occurred over an area with length and width of about 120 km, rather than being aligned in a pattern that might suggest that they occurred on a single causative fault. Individual earthquakes within the Central Virginia Seismic Zone occur as the result of slip on faults that are much smaller than the overall dimensions of the zone. The dimensions of the individual fault that produced the 2011 August 23 earthquake will not be known until longer-term studies are done, but other earthquakes of similar magnitude typically involve slippage along fault segments that are 5 - 15 km long.



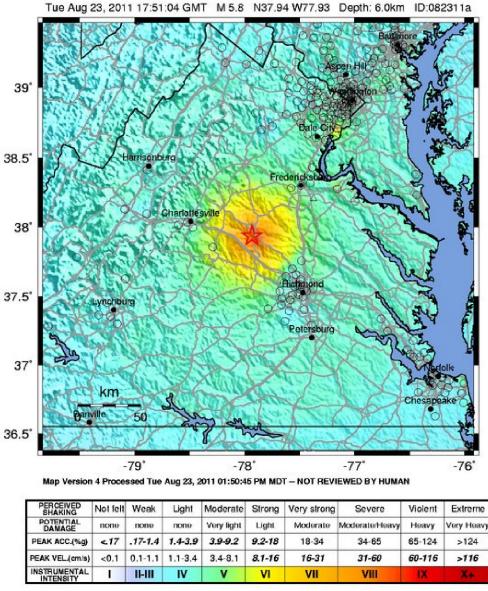
TECTONIC SUMMARY

Earthquakes in the central and eastern U.S., although less frequent than in the western U.S., are typically felt over a much broader region. East of the Rockies, an earthquake can be felt over an area as much as ten times larger than a similar magnitude earthquake on the west coast. A magnitude 4.0 eastern U.S. earthquake typically can be felt at many places as far as 100 km (60 mi) from where it occurred, and it infrequently causes damage near its source. A magnitude 5.5 eastern U.S. earthquake usually can be felt as far as 500 km (300 mi) from where it occurred, and sometimes causes damage as far away as 40 km (25 mi).

DISCLAIMER

Base map data, such as place names and political boundaries, are the best available but may not be current or may contain inaccuracies and therefore should not be regarded as having official significance.

ShakeMap

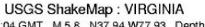


EARTHQUAKE SUMMARY MAP

Prepared in cooperatio with the Global Seismographic Network GSN



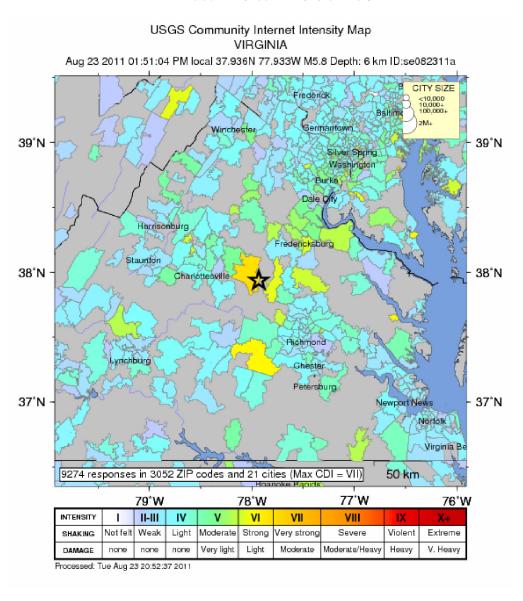
Earthquake Locations



ery strong	Severe	Violent	Extreme
Moderate	Moderate/Heavy	Heavy	Very Heavy
18-34	34-65	65-124	>124
16-31	31-60	60-116	>116
VII	VIII	IX	X+

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ESTIMATED Mercalli	INTENSITY		11-111	IV	۷	VI	VII	VIII	IX	X+
PERCEIVE		Not felt	Weak	Light	Moderate	Strong	Very Strong	Severe	Violent	Extrem
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Did You Feel It?



DATA SOURCES

EARTHQUAKES AND SEISMIC HAZARD

- USGS, National Earthquake Information Center
- NOAA, National Geophysical Data Center IASPEI, Centennial Catalog (1900 - 1999) and
- extensions (Engdahl and Villaseñor, 2002)
- HDF (unpublished earthquake catalog) (Engdahl, 2003) Global Seismic Hazard Assessment Program
- BASE MAP

NIMA and ESRI, Digital Chart of the World USGS, EROS Data Center

NOAA GEBCO and GLOBE Elevation Models ESRI Online

> Map prepared by U.S. Geological Survey National Earthquake Information Center 23 August 2011 Map not approved for release by Director USGS