

Measuring the hazards of global aftershock

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The entire world becomes an aftershock zone after a massive magnitude (M) 7 or larger earthquake—but what hazard does this pose around the planet? Researchers are working to extend their earthquake risk estimates over a global scale, as they become better at forecasting the impact of aftershocks at a local and regional level.

There is little doubt that surface waves from a large, $M \geq 7$ earthquake can distort [fault zones](#) and volcanic centers as they pass through the Earth's crust, and these waves could trigger seismic activity. According to the Tom Parsons, [seismologist](#) with the U.S. Geological Survey, global surveys suggest that there is a significant rate increase in global seismic activity during and in the 45 minutes after a $M \geq 7$ quake across all kinds of geologic settings. But it is difficult to find strong evidence that [surface waves](#) from these events immediately trigger $M > 5$ earthquakes, and these events may be relatively rare. Nevertheless, seismologists would like to be able to predict the frequency of large triggered quakes in this global aftershock zone and associated hazard.

Studies of hundreds of $M \geq 7$ mainshock earthquake effects in 21 different regions around the world has provided some initial insights into how likely a damaging global aftershock might be. Initial results show that remote triggering has occurred at least once in about half of the regions studied during the past 30 years. Larger ($M > 5$) global [aftershocks](#) appear to be delayed by several hours as compared with their lower magnitude counterparts. Parsons suggests that local seismic networks can monitor the rate of seismic activity immediately after a global mainshock quake, with the idea that a vigorous uptick in activity

could signal a possible large aftershock.

Parsons presented his research at the annual meeting of the [Seismological Society of America](#), which is an international scientific society devoted to the advancement of seismology and the understanding of earthquakes for the benefit of society. It publishes the prestigious peer-reviewed journal *BSSA* – the *Bulletin of the Seismological Society of America* – and the bimonthly *Seismological Research Letters*, which serves as a general forum for informal communication among seismologists and those interested in [seismology](#) and related disciplines.

Provided by Seismological Society of America

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