



Observations of intraplate deformation in continental interiors: examples from the New Madrid Seismic Zone

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The relationship between intraplate seismicity and the accumulation and distribution of intraplate strain remain a controversial topic. Strain-rates are typically very low, and often below that observable using routine geodetic techniques, despite numerous intraplate regions evidencing the capacity to produce large magnitude earthquakes. One of the best-known examples of major intraplate earthquakes are the M7-7.5 New Madrid events of 1811-1812 (Central-Eastern United States), and their associated aftershock sequence, which continues to this day – occurring in a region with little geomorphic expression of active tectonics, and little measurable strain accumulation observable so far on the timescales of modern geodesy.

Here we present the results of a study into the factors influencing earthquake occurrence in the New Madrid Seismic Zone, one of the most seismically active regions of intraplate North America. We present updated geodetic observations of the New Madrid region, along with the surrounding areas, resulting from over 13 years of continuous GPS observations. The relationship between both long-term secular and short-term periodic signals in the geodetic data and the observed seismic activity of the region leads to an enhanced understanding of the factors modulating the timing and occurrence of intraplate earthquakes in this region.