



## Challenges in assessing seismic hazard in intraplate Europe

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Intraplate seismicity is often characterized by episodic, clustered and migrating earthquakes and extended aftershock sequences. Can these observations – primarily from North America, China and Australia – usefully be applied to seismic hazard assessment for intraplate Europe? Existing assessments are based on instrumental and historical seismicity of the past c. 1000 years, as well as some data for active faults. This time span probably fails to capture typical large-event recurrence intervals of the order of tens of thousands of years. Palaeoseismology helps to lengthen the observation window, but preferentially produces data in regions suspected to be seismically active. Thus the expected maximum magnitudes of future earthquakes are fairly uncertain, possibly underestimated, and earthquakes are likely to occur in unexpected locations. These issues particularly arise in considering the hazards posed by low-probability events to both heavily populated areas and critical facilities. For example, are the variations in seismicity (and thus assumed seismic hazard) along the Rhine Graben a result of short sampling or are they real? In addition to a better assessment of hazards with new data and models, it is important to recognize and communicate uncertainties in hazard estimates. The more users know about how much confidence to place in hazard maps, the more effectively the maps can be used.