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Seismic gap in western Nepal discredited by lake sediment records

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According to historical archives and paleoseismological studies, the last earthquake that ruptured the Main Frontal Thrust in western Nepal occurred in 1505 AD. No evidence of large earthquakes has been documented since, giving rise to the concept of a seismic gap in western Nepal and adjacent areas in northern India. Here, we report on a new record of earthquake-triggered turbidites from Lake Rara, western Nepal. Our lake-sediment record contains eight earthquake-triggered turbidites during the last 800 years, and it registered all three previously reported Mw$\geq$7 events in western Nepal (1165-1400 AD, 1505 AD and 1916 AD). Modelling of shaking intensity shows that even near-field earthquakes should have a magnitude Mw>$\sim$6.4-6.7 to trigger turbidites in the lake. Thus, the five previously undocumented post-1505 AD earthquakes imply that western Nepal is as seismically active as central Nepal and call for a revaluation of the risk of a major earthquake affecting western Nepal and northern India.