

## Precursory variation of seismicity rate in the Assam area

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### ABSTRACT

The seismicity data from 1825 to the present for the Assam (northeastern India) region show that seismicity rates deviate from normal before and after major earthquakes. Along this 1000 km long section of a plate boundary, all shocks with  $M > 6.6$  were preceded by periods of seismic quiescence. Some of these periods of low seismicity rate were preceded by peaks in seismic activity. No major earthquakes occurred without an associated seismicity anomaly. The most remarkable periods of quiescence lasted 28 and 30 years approximately before the two great ( $M=8.7$ ) Assam earthquakes of 1897 and 1950. Other periods of anomalously low seismicity preceded main shocks of magnitudes 6.7 (two), 7.8 and 7.9, with durations of 6, 8, 23 and 17 years, respectively. These durations of the anomalies fit approximately the precursor time-magnitude relation proposed by Scholz *et al.*

Since these change of seismicity rate were observed at the edges of and within the Assam gap, defined by the 1897 and 1950 great earthquakes, it is likely that a future major or great earthquake in this gap will be preceded by a seismicity anomaly. Whether or not a preparatory phase for an earthquake has begun in the Assam gap cannot be stated for certain because of the changing earthquake detection capability in the area and because of poor location accuracy. However, portions of the gap with dimensions of 100 to 200 km exhibit suspiciously low seismicity during the last 25 years.

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