

Earthquakes in India and the Himalaya: tectonics, geodesy and history

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Abstract

The record of earthquakes in India is patchy prior to 1800 and its improvement is much impeded by its dispersal in a dozen local languages, and several colonial archives. Although geological studies will necessarily complement the historical record, only two earthquakes of the dozens of known historical events have resulted in surface ruptures, and it is likely that geological data in the form of liquefaction features will be needed to extend the historical record beyond the most recent few centuries. Damage from large Himalayan earthquakes recorded in Tibet and in Northern India suggests that earthquakes may attain $M = 8.2$. Seismic gaps along two-thirds of the Himalaya that have developed in the past five centuries, when combined with geodetic convergence rates of approximately 1.8 m/cy , suggests that one or more $M = 8$ earthquakes may be overdue. The mechanisms of recent earthquakes in Peninsular India are consistent with stresses induced in the Indian plate flexed by its collision with Tibet. A region of abnormally high seismicity in western India appears to be caused by local convergence across the Rann of Kachchh and possibly other rift zones of India. Since the plate itself deforms little, this deformation may be related to incipient plate fragmentation in Sindh or over a larger region of NW India.

Keywords

earthquakes;history

Full Text:

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References

DOI: <https://doi.org/10.4401/ag-3338>

Published by INGV, Istituto Nazionale di Geofisica e Vulcanologia - ISSN: 2037-416X

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
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