

## Massive Earthquakes In The Himalayas Left Scars, Study

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<http://www.asianscientist.com/2012/12/in-the-lab/primary-surface-ruptures-himalayan-earthquakes-2012/>

*AsianScientist* (Dec. 31, 2012) - Scientists from Nepal, France, and Singapore have discovered clear ground scars in the central Himalayas that were left by massive earthquakes in the range of 8 to 8.5 magnitudes on the Richter scale.

This 'ground-breaking' find has huge implications for the area along the front of the Himalayan Mountains, given that the region has a population density similar to that of New York City.

Professor Paul Tapponnier of the Earth Observatory of Singapore (EOS) at Nanyang Technological University (NTU) said that the existence of such devastating quakes in the past means that quakes of the same magnitude could happen again in the region in future, especially in areas which have yet to have their surface broken by a temblor.

In the study published in the journal *Nature Geosciences*, the team showed that in 1255 and 1934, two great earthquakes ruptured the surface of the earth in the Himalayas. This runs contrary to what scientists have previously thought.

Massive earthquakes are not unknown in the Himalayas, as quakes in 1897, 1905, 1934, and 1950 all had magnitudes between 7.8 and 8.9, each causing tremendous damage.

But they were previously thought not to have broken the earth's surface - classified as blind quakes - which are much more difficult to track.

By combining new high resolution imagery and state of the art dating techniques, the team showed that the 1934 earthquake did indeed rupture the surface, breaking the ground over a length of more than 150 kilometers, essentially south of the part of the range that harbors Mount Everest.

This break formed along the main fault in Nepal that currently marks the boundary between the Indian and Asian tectonic plates - also known as the Main Frontal Thrust (MFT) fault.

Using radiocarbon dating of offset river sediments and collapsed hill-slope deposits, the research team managed to separate several episodes of tectonic movement on this major fault and pin the dates of the two quakes, about seven centuries apart.

"The significance of this finding is that earthquakes of magnitude 8 to 8.5 may return at most twice per millennium on this stretch of the fault, which allows for a better assessment of the risk they pose to the surrounding communities," said Tapponnier.

Tapponnier warns that the long interval between the two recently discovered earthquake ruptures does not mean people should be complacent, thinking that there is still time before the next major earthquake happens in the region.

"This does not imply that the next mega-earthquake in the Himalayas will occur many centuries from now because we still do not know enough about adjacent segments of the MFT Mega-thrust," he said.

"But it does suggest that areas west or east of the 1934 Nepal ground rupture are now at greater risk of a major earthquake, since there are little or no records of when last earth shattering temblor happened in those two areas."

He hopes to uncover the full extent of such fault ruptures, which will then allow the team to build a more comprehensive model of earthquake hazard along the Himalayan front.

The article can be found at: [Sapkota SN et al. \(2012\) Primary surface ruptures of the great Himalayan earthquakes in 1934 and 1255.](#)

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