



# Earth



1943

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## Another major earthquake in Nepal can happen much sooner than anticipated

A new study conducted by an international team of scientists suggests a kink in the regional fault line below Nepal is responsible for the growth of the Himalaya Mountains between earthquakes. The scientists have studied the devastating April 2015 Nepal Earthquake and discovered that only a small amount of energy was released, indicating another major earthquake can happen much sooner than anticipated.

The scientists found out that the fault beneath Nepal has a kink in it, creating a ramp 20 km (12.4 miles) underground. The material is continually being pushed up this ramp, which explains why the mountains were seen to be growing in the decades before the earthquake. The earthquake itself then reversed this, dropping the mountains back down again when the pressure was released as the crust suddenly snapped in April 2015. The scientists used the satellite technology to measure the changes in land height across the eastern half of Nepal and found out that the highest mountain peaks dropped down by up to 60 cm (almost 2 feet) during the first seconds of the earthquake.

The research showed that the rupture from April's earthquake stopped 11 km beneath Kathmandu, and that this sudden break is because of damage to the fault from interactions with older faults in the region. This is important because the upper half of the fault has not yet ruptured, but is continuously building up more pressure over time as India continues to collide into Nepal.

As this part of the fault is nearer the surface, the future rupture of this upper portion has the potential for a much greater impact on Kathmandu if it were to break in one go in a similar sized event to that of April 2015. Work on other earthquakes has suggested that when a rupture stops like this, it can be years or decades before it resumes, rather than the centuries that might usually be expected. However, currently, as there is no way to predict precisely when another earthquake might occur, the countries, people and insurance industry must strive to prepare themselves to reduce impacts of such an event.

*Source: "Himalayan megathrust geometry and relation to topography revealed by the Gorkha earthquake" - J. R. Elliott, R. Jolivet, P. J. González, J.-P. Avouac, J. Hollingsworth, M. P. Searle & V. L. Stevens - Nature Geoscience (2016) - [doi:10.1038/ngeo2623](https://doi.org/10.1038/ngeo2623)*



## Severe hailstorm pounds Johannesburg, South Africa

An intense hailstorm hit Johannesburg, South Africa, on January 9, 2016, covering the grounds with a thick snow like layer, a sight quite unusual for the summer period. An outbreak of severe weather led to the collapse of a shopping center in Johannesburg suburb. According to the local authorities, this was the strongest recorded hailstorm in the last couple of years.

Hail stones the size of a golf ball battered the area, and numerous severe thunderstorm watches and warnings were issued by the South African Weather Service across the northeastern part of the country during the afternoon and evening of January 9 (local time).

The rooftop of the Key West Shopping center in Krugersdorp collapsed around 4 pm (local time) after which the building was evacuated. Luckily, no injuries were reported.

*Source: [www.rt.com](http://www.rt.com)*

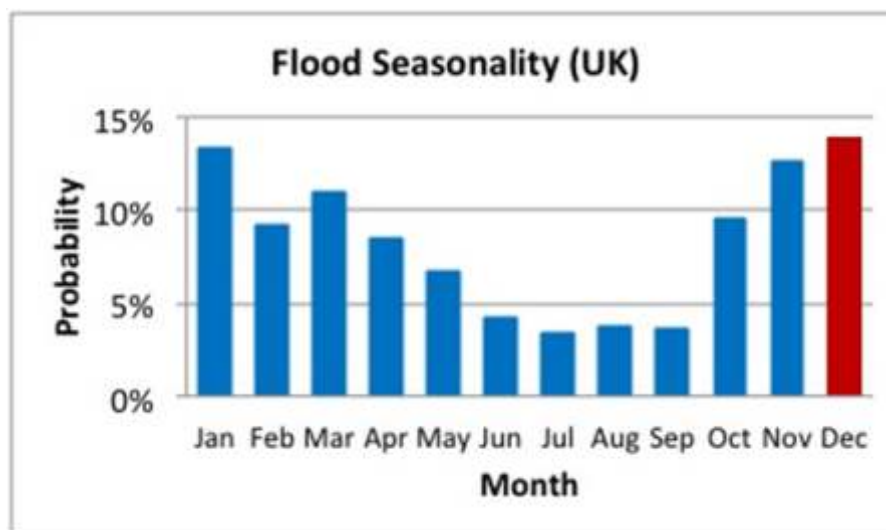


Collapsed bridge over the River Wharfe is seen in the market town of Tadcaster, North Yorkshire, Britain December 30, 2015. Source: Reuters/Craig Brough

## Storm Desmond, Storm Eva and Storm Frank bring record rain and floods to UK in December

Following Storm Desmond that hit the U.K. in first week of December 2015, the U.K. faced Storm Eva, on December 23-24 and then Storm Frank on December 29-30. Both storms brought heavy rainfall.

The Floods in the U.K. are subject to important seasonal variation as shown in chart below. The winter months bring the highest number of events, and December does in fact come out (slightly) on top, especially for flooding events of the sort seen last month, which tend to follow heavy rainfall leading to soil saturation (November 2015 received about twice the average climatological rainfall for November in the U.K.).



Source: RMS

The reason this matters is that, when soil is sodden following an extended period of heavy rains, further rains can more easily run off the surface, exacerbating the risk of pluvial (Surface Water) flooding. The water will then follow natural and artificial drains until it reaches the closest river network, in which it can accumulate, potentially triggering river or fluvial (River) flooding. The runaway effect of the masses of water can also cause what is known as ground-water flooding. This cumulative phenomenon means that flooding can persist for a significant amount of time.

Succession of storms created flooding in various parts of country; in some areas it was unprecedented. Storm Desmond and Storm Eva had at least 11,500 houses flooded. Later, 16, 500 houses were left without power by Storm Frank in the Republic of Ireland, Northern Ireland and the North of Scotland, the total economic loss caused by the three Storms may well breach £3bn and insured loss may be around £1 - £1.4 billion.

Source: BBC, PwC, and RMS

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