

Study links tropical cyclones to earthquakes

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Double disaster US researchers say they have found evidence that tropical cyclones in Haiti and Taiwan were followed by earthquakes, suggesting that heavy rains and landslides may unleash temblors.

"Very wet rain events are the trigger," says University of Miami scientist Dr Shimon Wdowinski, an associate research professor of marine geology and geophysics.

"The heavy rain induces thousands of landslides and severe erosion, which removes ground material from the Earth's surface, releasing the stress load and encouraging movement along faults."

Wdowinski and a colleague from Florida International University analysed data from major earthquakes - magnitude six and higher - in Taiwan and Haiti over the past 50 years and found that large quakes tended to follow within four years of a very wet tropical cyclone season.

In some recent cases, quakes happened sooner, such as in 2009 when Typhoon Morakot in Taiwan was followed the same year by a magnitude 6.2 quake and another 6.4 quake in 2010.

Morakot killed 614 people and left 75 missing, burying entire villages and dumping a record three metres of rain in what is considered one of the island's worst natural disasters.

Typhoon Herb hit in 1996, killing hundreds in China and Taiwan, and was followed two years later by a 6.2 earthquake and then a 7.6 earthquake in 1999.

After 1969's Typhoon Flossie was followed three years later by a magnitude 6.2 quake in 1972, the researchers write.

The team also looked at the 2010 magnitude seven earthquake in Haiti and found it came a year and a half after two hurricanes and two tropical storms drenched the island nation within 25 days.

The quake hit in January last year and levelled the capital Port-au-Prince, killing more than 225,000 people and leaving one in seven homeless. An ensuing cholera epidemic left more than 5000 people dead.

Shifting surface loads

The researchers says their theory is that the heavy rains and landslide shift enough weight away from the surface load above the fault that a quake is triggered.

"The reduced load unclamp the faults, which can promote an earthquake," says Wdowinski.

The hypothesis only fits areas where there are fault lines on an incline, such as mountainous regions where the waters would push the land significantly far away from cracks deep in the Earth's bedrock.

The researchers plan further study of weather conditions in the Philippines and Japan to see if the same links can be observed.

The findings were presented at the annual meeting of the American Geophysical Society in San Francisco.