

# Pinpointing where volcanic eruptions could strike

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A better way to pinpoint where volcanic eruptions are likely to occur has been produced by an international team of geophysicists.

Scientists from the universities of Leeds, Purdue, Indiana and Addis Ababa, investigated volcanic activity occurring in the remote Afar desert of Northern Ethiopia between 2005 and 2009.

By studying a rare sequence of 13 magmatic events - where hot molten rock was intruded into a crack between the African and Arabian plates - they found that the location of each intrusion was not random. They showed that they were linked because each event changed the amount of [tension](#) in the earth's crust.

The findings, published in *Nature Geoscience*, will help scientists to more accurately predict where volcanic eruptions could strike and contribute to efforts to limit the damage they can cause.

Lead author Dr Ian Hamling, who completed the analysis as part of his PhD in the School of Earth and Environment at the University of Leeds said: "It's been known for some time that a large [earthquake](#) has a role to play in triggering subsequent earthquakes, but until now, our knowledge of volcanic events has been based on isolated cases. We have demonstrated that volcanic eruptions can influence each other. This will help us predict where future [volcanic eruptions](#) are likely to happen."

The team studied the region around a large volcanic dyke - a vertical

crack which is created when Magma seeps from underground through rifts in the surface of the earth - which erupted in the Afar desert in September 2005.

Magma - hot molten rock - was injected along the dyke between depths of 2 and 9 km, and altered the tension of the earth. The team was able to watch the 12 smaller dykes that subsequently took place in the same region over a four year period.

By monitoring levels of tension in the ground near where each dyke was intruded they found that subsequent eruptions were more likely in places where the tension increases.

Dr Hamling said: "If you look at this year's eruptions at Ejafjallajokull in Iceland, by estimating the tension in the crust at other volcanoes nearby, you could estimate whether the likelihood of them eruption has increased or decreased. Knowing the state of stress in this way won't tell you when an eruption will happen, but it will give a better idea of where it is most likely to occur."

**More information:** 'Stress transfer between thirteen successive dyke intrusions in Ethiopia' by Drs Ian Hamling and Tim Wright, *Nature Geoscience*.

Provided by University of Leeds

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