



## The Red Sea Parts Again

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The Red Sea is parting again, but this time Moses doesn't have a hand in it.

Satellite images show that the Arabian tectonic plate and the African plate are moving away from each other, stretching the Earth's crust and widening the southern end of the Red Sea, scientists reported in this week's issue of journal *Nature*.

Last September, a series of [earthquakes](#) started [splitting the planet's surface](#) along a 37-mile section of the East African Rift in Afar, Ethiopia.

Using the [images](#) gathered by the European Space Agency's Envisat radar satellite, researchers looked at satellite data before and after these activities.

### Earth-shattering shift

Over a period of three weeks, the crust on the sides of the rift moved apart by 26 feet and magma—enough to fill a football stadium more than 2,000 times—was injected along a vertical crack, forming a new crust.

"We think that the crust and mantle melt slowly at depths greater than 10 kilometers [6 miles], where it is hotter, forming magma (molten rock)," said Tim J Wright, study co-author, a Royal Society University Research Fellow. "This magma rises through the crust because it is less dense than the surrounding rock."

The magma collects in magma chambers at depths of 3 to 5 kilometers [1.9 to 3 miles] where the density is the same as the crustal rocks, Wright explained. "Slowly, the pressure has been building up in these chambers until last September when it finally cracked, breaking the crust along a vertical crack. The magma was then injected into this crack."

The intrusion of magma into the gap, rather than the cracking of the crust, is responsible for segmentation of continental drifts.

This is the first rifting episode to have occurred since 1970 and the largest single rip in the Earth's continental crust during the satellite-monitoring era.

"We knew about the steady rifting process in Afar, as Arabia moves away from Africa across the rift," Wright said. "And we knew that occasionally the strain that builds up slowly over centuries is released suddenly in rifting episodes. We did not know how big the deformation could be."

### Slow drift

For the past 30 million years Africa and Arabia have been going through a rifting process, the same one that formed the Red Sea. In this amount

of time, the 186-mile- wide Afar depression formed.

"The ground is continually moving—much more rapidly now than before the rifting episode," Wright told *LiveScience*. "On average, the two sides move apart at about 2 centimeters per year [0.8 inches per year]. But, as this event demonstrates, the motion is episodic and jerky. This poses considerable hazard to the local inhabitants, which is higher for the next few years."

This latest split, added to the long-term rifting process, which is tearing the northeast of Ethiopia and Eritrea from the rest of Africa, could eventually create a huge new sea. Although such processes could take millions of years to occur, this event has given scientists an unprecedented opportunity to monitor the rupture in real time.



Aerial photo of the cracks and faults that formed in September, 2005. These cracks formed above the zone where molten rock rose into the plate, reaching to within approximately 1.2 miles of the surface. Credit: Julie Rowland, University of Auckland.