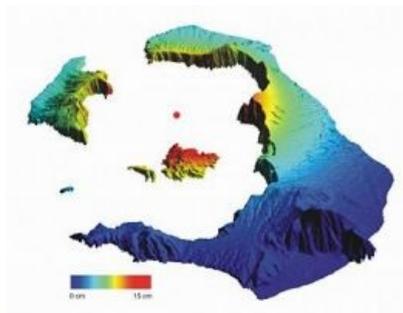


Santorini on Inflating Soil



In the South Aegean Sea, the islands of Santorini have been showing signs of movement for the first time in over half a century, with satellite data confirming that they have risen as much as 14cm since January 2011. In a study published in *Nature Geoscience*, researchers discovered that the whole group has been inflating – slowly rising and moving outward – almost systematically around a point just north of the Kameni islands.

To map the movement, the scientists used radar data from ESA's Envisat satellite from March to December 2011 and from the German TerraSAR-X mission from July 2011 to April 2012.

To ensure accurate measurement, the team also used GPS receivers and an island-wide network of triangulation stations.

The study outlines that the total amount of vertical movement is now approaching 8-14cm at some points on the Kameni islands, and the whole caldera is around 14cm wider now than it was at the beginning of 2011.

The scientific team believes that molten rock has accumulated in a magma chamber at a depth of about 4km. This chamber increased by 10-20 million cubic metres (8-15 times the size of London's Olympic Stadium) from January 2011 to April 2012. As it grew, the Earth's surface deformed in response.

The Kameni islands, which lie in the middle of Santorini's large flooded crater, form the top of this youngest part of the volcano. The last eruption of the Kameni islands was in 1950. For the next 60 years, Santorini remained quiet.

The Kameni islands grow, on average, by about a million cubic metres per year. The satellite data show that the amount of molten rock that has arrived beneath Santorini over the 12-month period is the equivalent of 10-20 years' growth of the volcano.

In January 2011, a series of small earthquakes began beneath the islands. Most were small enough that they could only be detected with sensitive seismometers, but several were felt by the local residents.

Juliet Biggs, a British scientist specialising in satellite radar and co-author of the paper, said that people were obviously aware that something was happening to the volcano, but it wasn't until they saw the changes in the GPS and the uplift on the radar images that they realised that molten rock was being injected at such a shallow level beneath the volcano.

The rate of earthquake activity has dropped off in the past few months. Similar results of ground deformation on the islands have been observed by a Greek team from the Harokopio University of Athens using the same type of satellite data.

Another US/Greek team also had similar observations while using ground-based GPS instruments.

The Santorini volcano's last major explosive eruption was about 3,600 years ago. This event formed a large crater, or caldera, which is now flooded by the sea. For the past 2,000 years Santorini has shown different behaviour patterns, with small eruptions of lava every few tens or hundreds of years, slowly building a new volcanic edifice from the sea floor.