

Santorini: The ground is moving again in paradise

March 13 2012



Georgia Tech associate professor Andrew Newman has positioned more than 20 GPS stations on Santorini. Some have moved as much as 9 cm since the caldera reawakened in January 2011. Should the volcano erupt underwater, it could produce local tsunamis, which could be dangerous for cruise ships that commonly visit the tourist attraction. Credit: Georgia Institute of Technology

Do a Google image search for "Greece." Before you find pictures of the Parthenon or Acropolis, you'll see several beautiful photos of Santorini, the picturesque island in the Aegean Sea. The British Broadcasting Company named it the world's best island in 2011. Santorini is a tourist magnet, famous for its breathtaking, cliff side views and sunsets.

It's also a volcanic island that has been relatively calm since its last eruption in 1950. Until now. The Santorini caldera is awake again and

rapidly deforming at levels never seen before. Georgia Tech Associate Professor Andrew Newman has studied Santorini since setting up more than 20 GPS stations on the island in 2006.

"After decades of little activity, a series of earthquakes and deformation began within the Santorini caldera in January of 2011," said Newman, whose research is published by [*Geophysical Research Letters*](#). "Since then, our instruments on the northern part of the island have moved laterally between five and nine centimeters. The volcano's magma chamber is filling, and we are keeping a close eye on its activity."



Georgia Tech associate professor Andrew Newman has more than 20 GPS stations on Santorini, measuring the movements of the caldera. Some instruments have moved as much as 9 cm since January 2011. Credit: Georgia Institute of Technology

Newman, a geophysicist in the School of Earth and Atmospheric Sciences, cannot be certain whether an eruption is imminent since observations of such activity on these types of volcanoes are limited. In fact, similar calderas around the globe have shown comparable activity without erupting. However, Newman says the chamber has expanded by

14 million cubic meters since last January. That means enough magma has been pumped into the chamber to fill a sphere three football fields across.

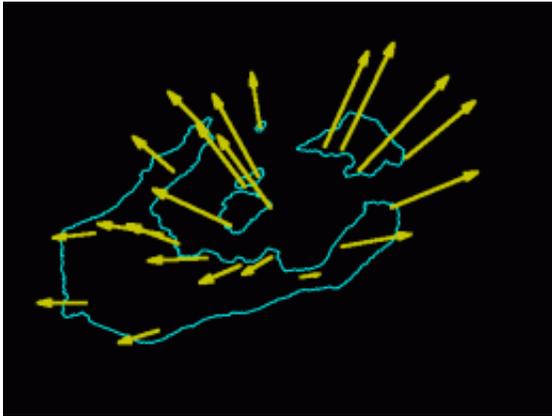
Should Santorini erupt, Newman says it will likely be comparable to what the island has seen in the last 450 years.



GPS stations on the Greek island of Santorini have moved between 5 to 9 cm since the Santorini caldera reawakened in January 2011. Georgia Tech associate professor Andrew Newman's research is published in *Geophysical Research Letters*. Credit: Georgia Institute of Technology

"That could be dangerous," notes Newman. "If the caldera erupts underwater, it could cause local tsunamis and affect boat traffic, including cruise ships, in the caldera. Earthquakes could damage homes and produce landslides along the cliffs."

More than 50,000 tourists a day flock to Santorini in the summer months (from May to October). It's common to see as many as five [cruise ships](#) floating above the volcano.



To see an animation of Newman's GPS stations and the angles of movement, click [Enlarge](#).

Santorini is the site of one of the largest volcanic events in human history. The Minoan eruption, which occurred around 1650 B.C., buried the major port city of Akrotiri with more than 20 meters of ash and created Santorini's famous, present-day cliffs. Newman says such history will likely not repeat itself any time soon. Such an eruption comes along once every 100,000 years, and the current inflation in the magma chamber is less than 1 percent of the Minoan blast.

Provided by Georgia Institute of Technology

Citation: Santorini: The ground is moving again in paradise (2012, March 13) retrieved 21 September 2024 from <https://phys.org/news/2012-03-santorini-ground-paradise.html>

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