

Fastest Growing Volcano Spotted In New Zealand

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<http://www.asianscientist.com/in-the-lab/fastest-growing-volcano-monowai-cone-kermadec-arc-new-zealand-2012/>

AsianScientist (May 17, 2012) - Scientists have found a submarine volcano in New Zealand waters that has undergone the fastest episode of collapse and growth ever recorded at a volcano.

The Monowai Cone, part of the Monowai Volcanic Center, is a giant submarine volcano about 1,000 km northeast of the North Island that underwent a mighty geological upheaval during five days in mid-2011.

In the brief period of observation, the volcano added about 8.5 million cubic meters of lava and debris to its summit: the summit area was raised by 79 meters, while a collapse at another part of the summit saw a sudden height reduction of 19 meters.

At least four new summit cones were formed in the process.

The findings, published this week in the journal *Nature Geoscience*, were made unexpectedly during a three-week survey of the volcanoes in the Kermadec Arc from the German research ship *Sonne*.

Aside from providing insights into the dynamics of seafloor volcanism, the observations also have implications for geohazards such as tsunamis, said co-author Cornel de Ronde of GNS Science.

"It's well documented that any sudden displacement of the seabed has the potential to trigger a tsunami. Submarine landslides and submarine volcanism can set off a tsunami that can travel across the ocean," said de Ronde.

Monowai is one of the most active submarine volcanoes in the Tonga-Kermadec arc, a 2,500 km-long chain of submarine volcanoes stretching from New Zealand to just north of Tonga.

While geophysical surveys from research ships dating back to the early 1980s had shown regular and significant changes to the summit area of Monowai, the changes observed in mid-2011 were the most dramatic and rapid seen to date.

As the scientists approached Monowai on the *Sonne* in May 2011, they observed discolored seawater and gas bubbles rising above the volcano, which made them suspect a growth spurt was underway.

During this period, seismic stations at several Pacific Island locations, including the Cook Islands, recorded a five-day swarm of shallow earthquakes located at Monowai.

When the *Sonne* returned to Monowai later in the three-week voyage, the scientists found part of the Monowai summit had collapsed and another part had grown substantially, likely from erupted ash and

volcanic debris.

The scientists believe the rapid changes they observed were larger than at most other volcanoes, losing only to Mount St. Helens and Mount Vesuvius. They estimate that in a four-year period starting in 2007, the Monowai volcano could have undergone up to a dozen growth and collapse phases.

De Ronde said the rapid growth rates at Monowai helped to shed light on the factors that controlled the 'emplacement of surface magma' at submarine volcanoes. These include the gas content of the magma, the upward pressure regime, crustal thickness, the tectonic setting, and local stress field.

"It's remarkable that we were able to capture such dramatic geomorphic changes on the seafloor within the duration of a single research voyage."

The article can be found at: [Watts AB et al. \(2012\) Rapid rates of growth and collapse of Monowai submarine volcano in the Kermadec Arc.](#)

Source: [GNS Science](#); Photos: GNS Science.

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