

Study finds existence of large, deep magma chamber below Kilauea volcano

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Credit: University of Miami

A new study led by scientists at the University of Miami (UM) Rosenstiel School of Marine and Atmospheric Science uncovered a previously unknown magma chamber deep below the most active volcano in the world – Kilauea. This is the first geophysical observation that large magma chambers exist in the deeper parts of the volcano system.

Scientists analyzed the seismic waves that travel through the volcano to understand the internal structure of the volcanic system. Using the seismic data, the researchers developed a three-dimensional velocity model of a [magma](#) anomaly to determine the size, depth and composition of the lava chamber, which is several kilometers in diameter and located at a depth of 8-11 km (5 – 6.8 miles).

"It was known before that Kilauea had small, shallow [magma chambers](#)," said Guoqing Lin, UM Rosenstiel School assistant professor of geology and geophysics and lead author of the study. "This study is the first geophysical observation that large magma chambers exist in the deep oceanic crust below."

The study also showed that the deep chamber is composed of "magma mush," a mixture of 10-percent magma and 90-percent rock. The crustal magma reservoir below Kilauea is similar to those widely observed beneath volcanoes located at mid-ocean ridges.

"Understanding these magma bodies are a high priority because of the hazard posed by the volcano," said Falk Amelung, co-author and professor of geology and geophysics at the UM Rosenstiel School. "Kilauea [volcano](#) produces many small earthquakes and paying particular attention to new seismic activity near this body will help us to better understand where future lava eruptions will come from."

Scientists are still unraveling the mysteries of the deep internal network of magma chambers and lava tubes of Kilauea, which has been in continuous eruption for more than 30 years and is currently the most [active volcano](#) in the world.

More information: The study, titled "Seismic evidence for a crustal magma reservoir beneath the upper east rift zone of Kilauea volcano, Hawaii," was recently published in the online edition of the journal

Geology.

Provided by University of Miami

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