

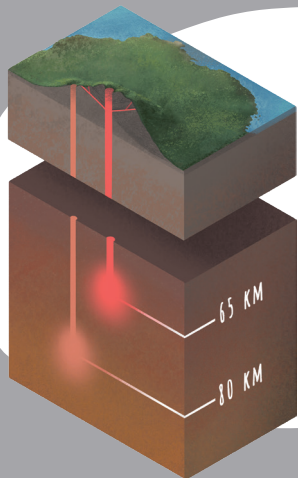
RANGITOTO: ODD ONE OUT

THE STORY OF AUCKLAND'S LARGEST VOLCANO

DEVORA
FACT SHEET 03

Fun volcanic facts from the DETERMINING VOLCANIC RISK IN AUCKLAND (DEVORA) PROJECT

Located in the Waitemata Harbour, Rangitoto Island is an iconic part of Auckland's landscape. Rangitoto is the youngest and largest volcano in the Auckland Volcanic Field (AVF). It is also the only AVF volcano known to have erupted more than once and to have erupted two different types of lavas. All of this together makes Rangitoto a bit of a mystery to scientists. Within the AVF, it is definitely the 'odd one out'.



Two kinds of magma

Rangitoto has erupted at least twice, once about 600 years ago and once around 550 years ago. When it erupted ~600 years ago, it ejected a type of magma called alkali basalt. This is the same type of magma erupted from all of the other volcanoes in the AVF. Scientists think it formed by melting mantle rock around 80 kilometres deep in the Earth. When Rangitoto erupted 550 years ago, however, it erupted subalkaline basalt, which is a magma that contains less sodium. Scientists think this magma formed shallower, just ~65 km beneath the surface. The rise of the earlier, deeper magma may have triggered the later, shallower melting.

Older lava flows?

In 2014, scientists drilled 150 m into Rangitoto's upper flank. They drilled through layer after layer of lava until they hit the pre-eruption sediments. The lowermost lava flow was separated from the overlying stack of lava by a layer of mud. Scientists originally thought that this lava flow was thousands of years older than the rest, but recent studies have shown it to be close in age to the overlying lava flows.

Rangitoto has 3 lava tubes that visitors can enter. Lava tubes form when lava develops a crust while flowing, eventually draining and leaving a long, empty cave-like structure.

Height of summit : 260 m above sea level. This is 40 m higher than the Sky Tower.

Width of the island : 5.5 km

Crater depth : 60 m

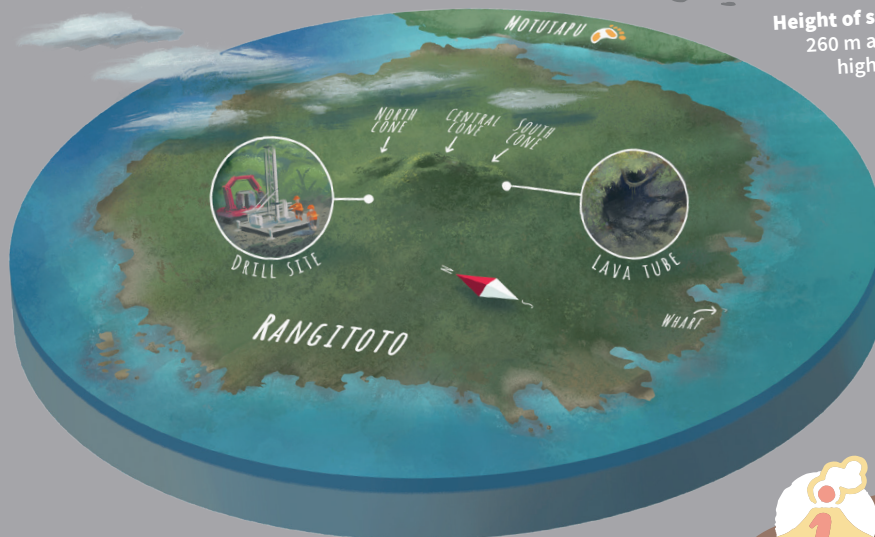
Crater diameter : 200 m

Lava volume : ~0.7 cubic km. This would fill 280,000 Olympic swimming pools.

Rangitoto is home to at least 13 shipwrecks, most of which are still visible at Wreck Bay, a small beach on the northern side of the island.

How much bigger is it really?

Rangitoto lava makes up ~41% of the total volume of the entire AVF. That means it is almost as big as all the other volcanoes combined!



The summit shape is known as "Ngā Pona Toru o Peretū" or "the three knuckles of Peretū" after a celebrated Māori ancestor.

Building a Volcano

600 YEARS AGO Molten rock erupted into the harbour and hit cold sea water, causing an explosive eruption. Known as phreatomagmatic activity, this water-magma interaction created an explosion crater surrounded by ash deposits, which scientists call a tuff ring. Over time, the tuff ring walls got so high that they blocked the water from reaching the vent. Lava then began to erupt and cool inside the tuff ring, eventually

building up a pile of volcanic rock called a scoria cone.

550 YEARS AGO A new batch of lava erupted through the old deposits, forming a new vent. As the volcano continued to erupt, lava flowed away from the vent and cooled. Eventually these flows built up, covering the old tuff ring and creating the current topography of the island, including the central summit cone and crater.



Footprints in the ash

There were people around during the last Rangitoto eruption! Footprints of an adult, a child, and a dog were found in a layer of Rangitoto ash on Motutapu Island. These footprints were made by members of the Tainui tribe, who named the island 'Te Rangitotonga-ai-te-ihu-o-Tamatekapua' (the day that Tamatekapua had a bloody nose) after a Māori chief who was injured there.