

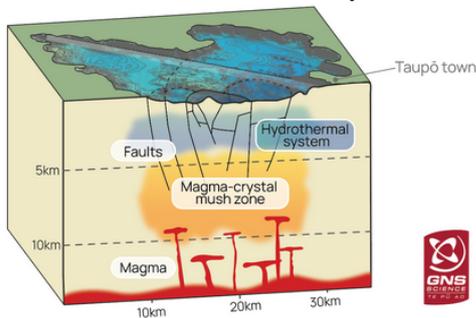


Taupō is the most frequently active and productive rhyolite caldera in the world

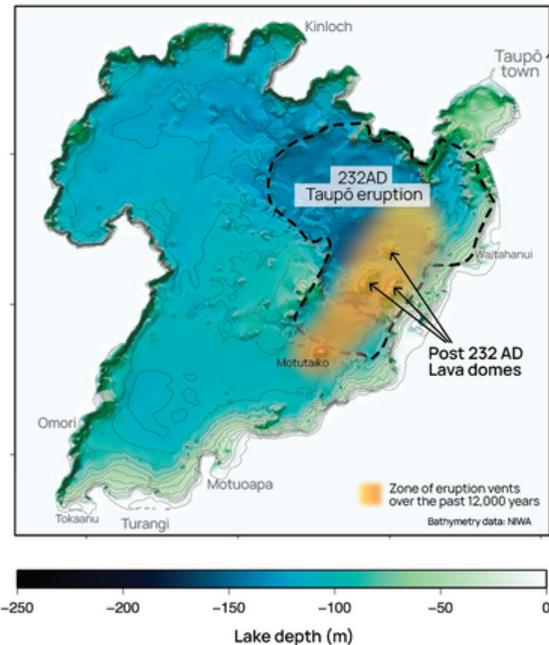
Formation

- Caldera volcanoes are created by collapse of the ground surface due to emptying of their sponge-like magma chambers in huge eruptions - **which are very rare.**
- Taupō Volcano has had 2 caldera forming eruptions in the last 25,500 years and they formed much of the current lake basin.
- Magma accumulates in the crust between 5 and 10 km below the lake floor before rising to the surface to erupt.

What is below Lake Taupō?



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Volcanic Unrest phenomena

- These occur on and near the volcano
- Hazards in heightened unrest may include changes in hydrothermal systems, gas discharge, new springs or steam eruptions
- Earthquakes, tsunami and landslides
- Ground deformation (uplift or subsidence)

Volcanic Eruption phenomena

- Eruptions can produce ashfall, hot ash clouds (pyroclastic flows), flying rocks, large waves in the lake. Ash can remobilise with rain as lahars.

The Taupō Eruption

(232 ± 10 AD, 1790 years ago)

- Is considered the most powerful eruption known of the last 5000 years globally - it was unusually large compared to most Taupō eruptions.
- The plume reached a height of 35 - 40 km.
- Covered parts of the North Island in at least 1 cm of ash.
- Lakeside areas were covered in tens of metres of pumice and ash pyroclastic deposits.
- The flow spread up to 90 km from the vent, spreading over all barriers except the upper slopes of Ruapehu.

Volcanic Eruption History

- Volcanoes in the Taupō area began erupting >300,000 years ago.
- The Ōruanui eruption 25,500 years ago created a large basin that formed much of the present lake
- Between the Ōruanui eruption and the Taupō eruption (about 1790 years ago) at least 27 much smaller eruptions spread pumice and ash beyond the lake and formed lava domes. 25 of those eruptions occurred in the last 12,000 years including the Taupo eruption.
- Many of these smaller eruptions were bigger than the 1995/96 Ruapehu eruptions but smaller than the 1886 Tarawera eruption and about 1/10th the size of Mt St. Helens 1980 eruption

Volcanic Unrest

- Taupō is an active volcano
- Volcanic unrest is the term given to natural phenomena caused by underground processes associated with active volcanoes.
- Volcanic unrest has occurred often in the last 150 years at Taupō (17 times between 1870 and 2022)
- Volcanic unrest can include earthquake swarms including surface fault ruptures as well as slow ground movement.

GNS Science monitors Taupō Volcano with...

22 lake levelling sites

9 seismometers

9 GNSS stations