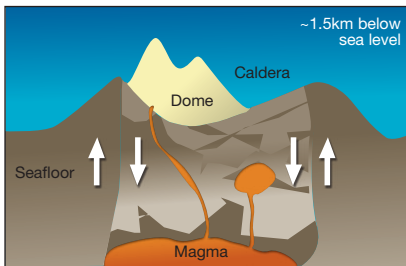
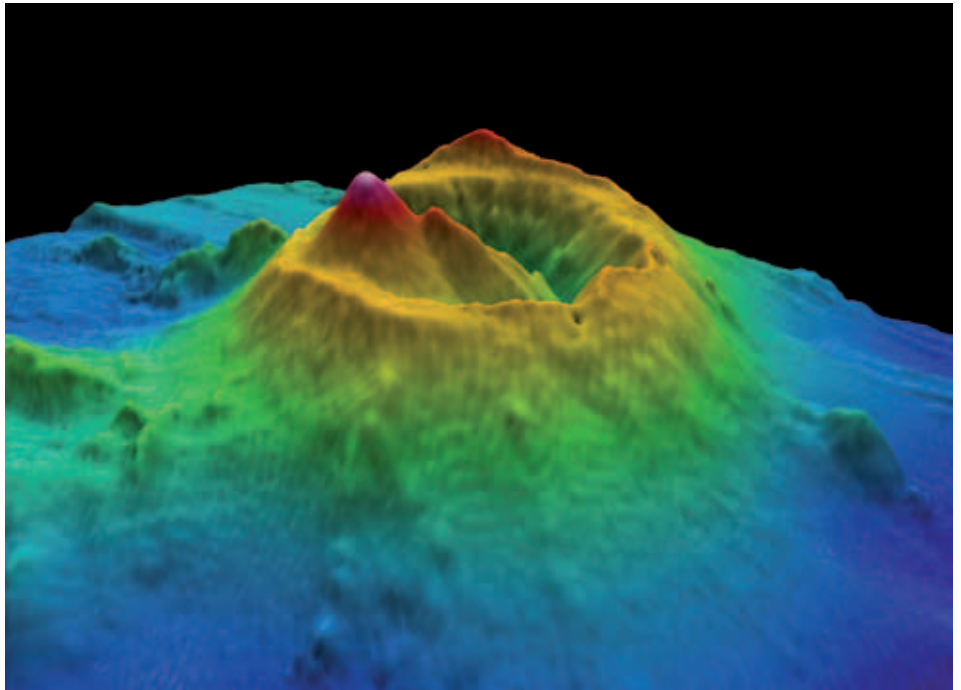


Brothers Volcano



Description

- This is a submarine (undersea) volcano in the Kermadec Arc, 400km north east of White Island.
- Brothers is three times bigger than White Island.
- It has an oval shape approx 13 km long and 8 km wide.
- It has a 3km wide summit caldera with walls 300-500m high.
- The caldera walls are very steep and there is evidence of landslides.
- A dome rises 350m from the caldera floor.
- The caldera floor is 1850m below sea level.



▲ A computer generated 3D image of Brothers Volcano.

◀ Brothers is a submarine **caldera volcano** - a volcano that has collapsed into itself, forming a large ring crater.

▶ Black smoker chimneys form when hydrothermal fluid jets react with cold sea water.



Features

- Brothers Volcano Currently has more hydrothermal activity than any other volcano in the Kermadec Arc.
- The hydrothermal vents (hot springs) on the caldera wall have formed a large field of 'black smoker' chimneys up to 8m high.

When hot hydrothermal fluid jets out of a vent, it mixes with cold sea water and a chemical reaction occurs. This causes metals in the fluid to precipitate out of the solution. The plumes of black 'smoke' created by this reaction settle and form deposits of metallic minerals on the crater floor. As this reaction occurs it can also build 'chimneys' rich in metals above the vents.

- The dome inside the caldera also has active hydrothermal vents.
- Plumes of hot water from the vents can rise 750 m through the ocean above.
- The area around the hydrothermal vents has unique forms of marine life such as tubeworms, and bacteria which use the hydrothermal fluids as an energy source.

Type

- This is an active submarine caldera.

Cause

- It was created by subduction of the Pacific Plate below the Australian Plate.

Eruptive history

- This is unknown at present.

Eruptive material

- The crater walls reveal layers of dacite lava flows. Dacite is between rhyolite and andesite in viscosity.

Last eruptive activity

- Unknown.

Monitoring

- Undersea volcanoes are not monitored, however they are a focus of current exploration. The minerals and marine life found around active undersea volcanoes may have economic and biotechnology benefits for NZ