

# Relict abrasion caves in New Zealand

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## Abstract

The Waitakere Ranges Regional Park dominates the western skyline of Auckland city. Today the ranges consist of a convoluted jumble of stream-dissected, low-laying hills which at their highest point reach 500 m a.s.l. The region is built of the volcanic formation, comprising mainly andesite, andesite tuff, andesite conglomerate and a mixture of gravel and sand left behind by the underwater lahars. The hills are the heavily eroded eastern flank of the Oligocene Waitakere Volcano, which once stood a massive 3000 m high. There are nine abrasion caves at the western part of the area along the coastline of the Tasman Sea, near the Whatipu village. The caves developed in a volcanic conglomerate along NE-SW trending joint planes and fault lines. Recently, 1 km wide sand flat has appeared between the caves and the Tasman Sea. The rapid acceleration of the coastal sand flat mostly occurred during the 1930s and 1940s, when a huge volume of sand was slowly being moved northward up the coast by the currents. In the last 50 years, the sand flat has become stabilized and the sea never reached the cliffs. As a consequence of this the caves can be regarded as relict caves.

## Key words

Pseudokarst caves, abrasion, volcanic formation, Quaternary, New Zealand.