



Morphometric analysis of post-caldera monogenetic landforms at Deception Island, Antarctica: implications for hazard assessment

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Deception Island (DI) is one of the most active volcanoes in Antarctica, with more than 20 monogenetic eruptions during the Holocene. The latest episodes of 1967, 1969 and 1970 destroyed, or severely damaged, the scientific bases that operated on the island and have shown that volcanic activity on DI can become a concern for tourists, scientists and military personnel working on or near the island. Indeed, it is not possible to rule out the possibility of a future eruption in the future. One of the main problems at DI is related to the lack of data about the ages of most of the edifices, in order to evaluate the eruptive recurrence.

The objective of this study is to carry out the morphometric analysis of the post-caldera volcanic structures (volcanic edifices and craters) recognizable on the island. This methodology has been used since the 70's to analyse mafic monogenetic volcanoes but it has not been fully developed until recently. Several works were carried out in Campo de Calatrava-Ciudad Real, Tenerife, Gran Canaria and Lanzarote (Spain), Mauna Kea (USA) and Highlands of Bakony-Batalon (Hungary).

This approach has been used at DI with the aim to establish a correlation between morphometry and the age of the post-caldera monogenetic landforms. The morphometric parameters include Crater maximum (Cr_{max}) and minor (Cr_{min}) diameter, Cone height (H_{comax} and H_{comin}), Crater depth (C_{dep}), Cone major (C_{omax}) and minor (C_{omin}) diameter, Cone slope (S_{comax} and S_{comin}) and Crater slope (S_{crmax} and S_{crmin}).

One of the main peculiarity of DI is that these structures were probably affected by post-eruptive volcanic or erosive processes and that most of the volcanic edifices are tuff cone, as results of magma-water interaction. The results obtained will allow improving the estimation of the eruptive recurrence of the island and, in turn, fundamental point for the advising of the volcanic hazard.

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