



Integrated studies of the recent evolution of Deception Island in the geodynamic setting of the Bransfield Basin opening (Antarctica): GEOMAGDEC Project

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Deception Island shows the most recent active volcanism, evidence of several eruptions since the late 18th century, and well-known eruptions in 1967, 1969, and 1970 at the western end of the volcanic ridge of the Bransfield Trough, between the South Shetland Islands and the Antarctic Peninsula. The recent tectonic activity of the Bransfield Trough is not well defined, and it presents a controversial origin. It is currently explained by two different models: (1) Opening of the basin may be related to passive subduction of the former Phoenix Plate and subsequent rollback of the South Shetland Trench; or (2) an oblique extension along the Antarctic Peninsula continental margin generated by the sinistral movement between the Antarctic and Scotia plates. This extension develops the Bransfield Trough and spread away the South Shetland tectonic block.

The GEOMAGDEC project involves a multidisciplinary and integrated research of the Deception Island based on geophysical and geological methods. The purpose of this project, funded by the Spanish research agency, is the understanding of the main processes that govern the evolution of the Deception Island into the development of Bransfield Basin during recent times. Main aims are: (1) Study of the anisotropy of the magnetic susceptibility of volcanic deposits of emerged area of Deception Island to determine the relationship between magmatism (intrusive and extrusive) with the recent tectonic activity. This task allows the reconstruction of igneous flow directions of the different volcanic units established in the island, dikes emplacement modelling in active tectonic regime, and the integration of the results obtained in a kinematic and dynamic emplacement model of the different volcanic units of the Deception Island into recent geodynamic setting of Bransfield Basin opening. (2) Lito- and crono-stratigraphy analysis of the quaternary sedimentary units that filled Port Foster (inner bay of Deception Island) on the basis of the ultra-high seismic profiles and gravity cores data acquired during oceanographic campaigns carried out using the RV. BIO/HESPERIDES. (3) Recovery of the Hydrothermal Precipitation Cells (HPCs) emplaced in Port Foster during 2001 austral summer and the mineralogical and geochemical analysis of the precipitate deposits located in the inner walls of the HPCs. The analysis of these samples will provide important information about the recent volcanic activity.