Geophysical Research Abstracts
Vol. 21, EGU2019-1523, 2019
EGU General Assembly 2019

Diffuse CO_2 degassing surveys for volcano monitoring of the North-South Rift Zone (NSRZ) volcano, Canary Islands

Claudia Rodríguez-Pérez (1,2), Daniel J C Manns (3), Valentina Carleo (4), Mar Alonso (1,2), Fátima Rodríguez (1), María Asensio-Ramos (1), Gladys V. Melián (1,2,5), Eleazar Padrón (1,2,5), Pedro A. Hernández (1,2,5), Nemesio M. Pérez (1,2,5)

(1) Instituto Volcanológico de Canarias (INVOLCAN), 38320 San Cristobal de La Laguna, Tenerife, Canary Islands, Spain, (2) Instituto Tecnológico y de Energías Renovables (ITER), 38600 Granadilla de Abona, Tenerife, Canary Islands, Spain, (3) Lancaster Environment Centre, Lancaster University, Lancaster LA1 4YW, U.K., (4) DISTAR - Dipartimento di Scienze della Terra, dell'Ambiente e delle Risorse, Università di Napoli Federico II, 80126 Napoli, Italy, (5) Agencia Insular de la Energía de Tenerife (AIET), 38600 Granadilla de Abona, Tenerife, Canary Islands, Spain

Tenerife is the largest of the Canary Islands archipelago (2034 km2) and it is characterized by a central volcanic complex that started to grow at about 3.5 Ma. Nowadays the geological structure of the island is basically conformed by a central complex called Las Cañadas caldera, a volcanic depression measuring 16×9 km that was partially filled by post-caldera volcanic products and a triple junction-shaped rift system, as result of inflation produced by the concentration of emission vents and dykes in bands at 120º to one another. Up to 297 mafic monogenetic cones have been recognized on Tenerife and most of them are aligned following this triple rift system of the island (Dóniz et al., 2008). However the main structural characteristic of the southern volcanic rift zone (NSRZ) of the island is an apparent absence of a distinct ridge, and a fan shaped distribution of monogenetic cones. Since there are currently no visible gas emissions at the NSRZ, diffuse degassing surveys have become an important geochemical tool for the surveillance of this volcanic system. We report here the last results of diffuse CO_2 efflux survey at the NSRZ of Tenerife, performed using the accumulation chamber method in the summer period of 2018. One of the objectives of these periodic surveys in a yearly basis is mainly to obtain the total CO_2 output from the studied area and to compare the value with the temporal series calculated for a specific period. During the last survey, soil CO_2 efflux values ranged from non-detectable up to 15.8 g m-2 d-1, with an average of 2.0 g m-2 d-1. Following the sequential Gaussian simulation (sGs) procedure, a spatial distribution map was constructed. This map did not show an apparent relation between higher diffuse CO_2 emission values and the main volcano-structural characteristics of the NSRZ area. The total CO_2 output released to the atmosphere in a diffuse way has been estimated at 607 t d-1, which is a similar value to that of the last year survey in 2017 (571 t d-1) but still higher than the average of the background value calculated for the period 2002-2018 ([U+2053]338 t d-1). These studies demonstrate that periodic diffuse emission surveys in the area of NSRZ are a powerful and needed volcanic surveillance tool.

References:
Dóniz et al., 2008. J. Volcanol. Geotherm. Res. 173, 185.