



## 1. Fourteen Years Of Diffuse CO<sub>2</sub> Monitoring At Cerro Negro Volcano, Nicaragua

Jose Barrancos Martinez (1,2), Gladys Melián (1,2), Martha Ibarra (3), Julio Álvarez (3), Fátima Rodríguez (1,2), Dácil Nolasco (1,2), Germán Padilla (1,2), David Calvo (1,2), Samara Dionis (1,2), Eleazar Padrón (1,2), Iñigo Hernández (1,2), Pedro A. Hernández (1,2), Nemesio M. Pérez (1,2), and Angélica Muñoz (3)

(1) Institute of Technology & renewable Energies, Santa Cruz de Tenerife, Spain (jbarrancos@iter.es), (2) Instituto Volcanológico de Canarias, INVOLCAN, 38400 Puerto de la Cruz, Tenerife, Canary Islands, Spain, (3) Instituto Nicaragüense de Estudios Territoriales (INETER), Managua, Nicaragua

7. Cerro Negro is an active basaltic volcano belonging to the active Central American Volcanic Belt, which includes a 1,100 Km long chain of 41 active volcanoes from Guatemala to Panama. Cerro Negro first erupted in 1850 and has experienced 21 eruptive eruptions with inter eruptive average periods between 7 and 9 years. Since the last eruption occurred on 5 August 1999, with erupted lava flows and ash clouds together with gas emissions, a collaborative research program between INETER and ITER was established for monitoring diffuse CO<sub>2</sub> emissions from this volcano. Until 2012, twelve soil CO<sub>2</sub> emission surveys covering an area of 0,6 km<sup>2</sup> have been performed by means of the accumulation chamber method to evaluate the spatial and temporal variations of CO<sub>2</sub> degassing rate in relation to the eruptive cycle of Cerro Negro. A total diffuse CO<sub>2</sub> emission output of 1,869 t•d<sup>-1</sup> was estimated for the 1999 survey; just 3 months after the 1999 eruption which can be considered within the post-eruptive phase. For the April, 2002 and March, 2008 surveys, considered within the inter-eruptive phase, a clear decreasing tendency on the total diffuse CO<sub>2</sub> output was observed, with estimates of 431 and 10 t•d<sup>-1</sup>, respectively, except a small increment in 2004, to 256 t d<sup>-1</sup>, associated with an anomalous seismic activity. The higher anomalies are located around the crater of 1995 and 1999. An increasing on the total CO<sub>2</sub> emission has been observed, from December 2008 to February 2011, with total diffuse CO<sub>2</sub> output estimates from 12 t•d<sup>-1</sup> to 43 t•d<sup>-1</sup>, respectively. These temporal variations show a close relationship between diffuse CO<sub>2</sub> emission and the eruptive cycle at Cerro Negro. This relationship indicates that monitoring CO<sub>2</sub> emission is an important geochemical tool for the volcanic surveillance at Cerro Negro.

### References:

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