



## **Diffuse Carbon Dioxide (CO<sub>2</sub>) degassing from the summit crater of Pico do Fogo during the 2014-15 eruption, Cape Verde**

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On January 3, 2015, a new diffuse CO<sub>2</sub> degassing survey at the summit crater of Pico do Fogo volcano (2,829 m above sea level) was carried out by ITER/INVOLCAN/UNICV/OVCV research team to investigate the effect of the 2014-15 Fogo eruption on the diffuse degassing through the summit crater. Before the eruption onset on November 23, 2014, these type of surveys were periodically performed by ITER/INVOLCAN/UNICV/OVCV research team since May 2007. The first published data on diffuse CO<sub>2</sub> degassing rate from the summit crater of Pico do Fogo volcano ( $219 \pm 36$  t d<sup>-1</sup>) is related to a survey performed on February 2010 (Dionis et al., 2015). Each survey implies about 65 CO<sub>2</sub> efflux measurements to obtain a good spatial distribution and cover homogeneously the summit crater area (0.14 km<sup>2</sup>). Because of the sudden falls of rocks of different sizes inside the summit crater during the January 3 survey, the research team aborted continues working in the summit crater without completing the survey only 32 of the 65 CO<sub>2</sub> efflux measurements were performed covering a smaller area (0.065 km<sup>2</sup>). Observed CO<sub>2</sub> efflux values ranged from non detectable (< 1.5 g m<sup>-2</sup> d<sup>-1</sup>) up to 12188 g m<sup>-2</sup> d<sup>-1</sup> and showed a mean value of 1090.2 g m<sup>-2</sup> d<sup>-1</sup>. The observed CO<sub>2</sub> efflux median values from the same sampling sites in previous surveys (83.1 g m<sup>-2</sup> d<sup>-1</sup> for March 2014; 15.5 g m<sup>-2</sup> d<sup>-1</sup> for October 2013; 2.3 g m<sup>-2</sup> d<sup>-1</sup> for April 2013; 14.6 g m<sup>-2</sup> d<sup>-1</sup> for February 2012; 64.7 g m<sup>-2</sup> d<sup>-1</sup> for March 2011; 64.5 for February 2010 ) were lower than the median of the January 2015 survey (249.4 g m<sup>-2</sup> d<sup>-1</sup>) suggesting a higher degassing rate for this new survey. The diffuse CO<sub>2</sub> emission from the study area of 0.065 km<sup>2</sup>, within the summit crater, was 74 t d<sup>-1</sup> on January 3, 2015, which is a similar degassing rate to those estimated for the same study area on the July 2014 (90 t d<sup>-1</sup>) and August 2014 (66 t d<sup>-1</sup>) surveys, and relatively higher than the estimated for October 2012 survey (27 t d<sup>-1</sup>). Since the diffuse CO<sub>2</sub> emission rate on July and August 2014 were 323 and 337 t d<sup>-1</sup>, respectively, it can be expected a relatively high diffuse CO<sub>2</sub> degassing rate from the summit crater of Pico do Fogo for the January 3, 2015 survey (> 300 t d<sup>-1</sup>). This most recent survey did not cover the hydrothermal alteration zone within the crater, where the highest CO<sub>2</sub> efflux measurements are usually recorded.

Dionis et al. (2015), Bull. Volcanol., in press;