



Diffuse CO₂ emission from the oceanic active volcanic island of Gran Canaria, Canary Islands

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Gran Canaria is one of the central islands of the Canary Archipelago located off the West African continental margin. The subaerial volcanic/magmatic history of the island started 15-16 Ma ago. The last volcanic/magmatic phase of Gran Canaria, which started in the late Pliocene, is restricted to the northern part of the island and has continued until present. The most recent volcanic eruption on Gran Canaria occurred ~3,000 years BP. Therefore, Gran Canaria can be considered volcanically active, as testified by numerous prehistoric basaltic scoria cones, maars and lava flows (Krastel and Schmincke, 2002). In this study we are showing the results of the first diffuse CO₂ emission survey carried out during June-November, 2017, with the aim to identify the possible existence of volcanic-structures controlling the degassing process and to quantify the rate at which CO₂ is diffusely degassed from the studied area. During the survey, 2,445 sampling sites were selected along a ~603 km² area located at the central and north-east zone of Gran Canaria, where the Holocene volcanism has taken place. The accumulation chamber method (Parkinson, 1981) was used to perform soil CO₂ efflux measurements at each sampling site by means of a portable non dispersive CO₂ sensor, model LICOR-Li-820. Relatively low CO₂ efflux values were measured ranging from non- detected up to 109.0 g m⁻²·d⁻¹, with an average value of 5.9 g m⁻²·d⁻¹. The main diffuse CO₂ efflux anomalies were measured at the west and center sectors of the study area, suggesting a diffuse degassing structure trending SW-NE. To estimate the total diffuse CO₂ output released from the study area, the average of 100 sequential Gaussian simulations was considered, giving a value of 3,509 ± 57 t d⁻¹, which represent a normalized emission rate of 5.8 t km⁻²·d⁻¹. The observed relatively low diffuse CO₂ emission rate from the studied area in Gran Canaria is a useful tool to evaluate the background diffuse CO₂ emission value of the island during volcanic quiescence periods.

References

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Parkinson KJ (1981). *J Appl Ecol* 18:221–228