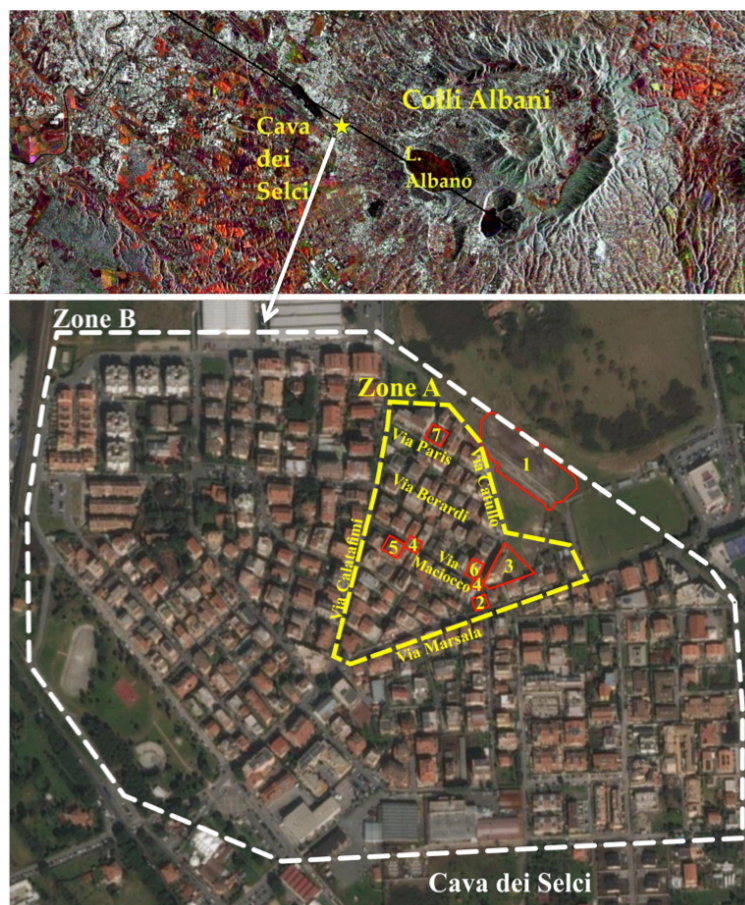


# Dataset on soil CO<sub>2</sub> flux, in-soil concentrations and indoor and outdoor air concentration of CO<sub>2</sub> and H<sub>2</sub>S measured at Cava dei Selci (Rome) in 2010-2019

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The dataset contains the results of a multiyear detailed geochemical study of Cava dei Selci, aimed at assessing the health gas risk and including: *i)* the estimate of soil CO<sub>2</sub> flux and in-soil CO<sub>2</sub> and H<sub>2</sub>S concentration (Zone B in Fig. 1); *ii)* a house by house investigation of the indoor air CO<sub>2</sub> and H<sub>2</sub>S concentration in the most hazard exposed zone (Zone A in Fig. 1); *iii)* case studies of gas-related accidents, which led to the definitive evacuation of some families.



**Fig. 1.** Ubication of Cava dei Selci (Colli Albani) and of the zone where the data included in the present report were collected. Cava dei Selci natural gas discharge: no. 1. Yellow numbers (from 2 to 7) indicate the sites where gas-related accidents occurred. The white line is the perimeter of the area investigated for soil CO<sub>2</sub> flux. The yellow line is the perimeter of the zone investigated for indoor and outdoor air gas concentration, and in-soil gas concentration.

Soil CO<sub>2</sub> flux was measured with the accumulation chamber method time “0”, by a portable fluxmeter manufactured by West Systems. The device is equipped with a CO<sub>2</sub> IR Licor-Li820 detector (single-beam dual-wavelength NDIR; range 0-2 vol.%; accuracy: 3 % of reading). The

datasets of soil CO<sub>2</sub> flux of the general survey (Zone B in Fig. 1) and of the courtyard of site no 6 (Fig. 1) are reported in annexed Tables 1 and 5 respectively.

The soil concentration of CO<sub>2</sub> and H<sub>2</sub>S was measured using a steel probe inserted in the ground at 50 cm depth and connected by a silicon tube to a portable multigas device (Draeger X-am 7000) used in active mode. The device was equipped with an IR CO<sub>2</sub> detector (0-100 vol.%) and electrochemical cells for H<sub>2</sub>S (0-1000 ppm). The related dataset is reported in annexed Table 2.

The same device was used, in passive mode, for air CO<sub>2</sub> and H<sub>2</sub>S measurements. Electrolytic cells with different scales were used for H<sub>2</sub>S monitoring: 0-100, 0-500, 0-1000, 0-2500 ppm with resolution 5% and data acquisition frequency of 1 minute. Measurements were carried out generally at 15 cm height from the ground; when gas concentration was dangerous, measurements were repeated also at 50, 100 and 150 cm height.

A total of 138 residential and not residential (garages, cellars, basements) rooms in Zone A (Fig. 1) were investigated with 805 indoor measurements of air CO<sub>2</sub> and H<sub>2</sub>S concentration. Air gas concentration was measured also in 40 nearby outdoor sites. The recorded dataset is reported in the annexed Table 3.

Air concentration of CO<sub>2</sub> and H<sub>2</sub>S has been continuously monitored indoor and outdoor the houses where gas-related accidents have occurred (e.g. sites no. 5, 6, 7 in Fig. 1). The related datasets are reported in the annexed Tables 4, 5, 6.

*Technical note: in the annexed tables, figures are reported following the Italian style, i.e. comma separates units from decimals.*