



## Gas flux estimates at the LUSI eruption site.

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The spectacular Indonesian Lusi mud eruption started in May 2006 following to a 6.3 M earthquake striking the island of Java (Mazzini et al., 2007). Previous studies investigated the mechanisms of reactivation of the Watakosek fault system that crosses Lusi locality (Mazzini et al., 2009) and continues to the NE of Java. Results show that the quake triggered lateral movement of this strike-slip system resulting in several aligned eruptions sites including Lusi. Geochemical studies of the erupted fluids reveal a mantle signature and point to a connection with the neighboring Arjuno-Welirang volcanic complex (Mazzini et al., 2012) indicating that Lusi is a sedimentary hosted geothermal system.

In order to estimate the amount of gas that is being released around the Lusi crater (~7 km<sup>2</sup>), we recently conducted a survey of over 300 stations (CO<sub>2</sub> and CH<sub>4</sub> flux measurements) using a closed-chamber flux-meter system and collected gas samples to analyze the composition of the seeps. In addition 20 soil gas concentrations were collected using a steel probe driven into the ground to a depth of 0.7-0.8 m to avoid the major influence of meteorological variables.

Results show that the highest CO<sub>2</sub> flux is present along the NE-SW oriented Watakosek fault (with peaks up to 400 g/m<sup>2</sup>day) and along the ~E-W oriented Siring antithetic fault (with peaks up to 110 g/m<sup>2</sup>day). The pools have overall a CH<sub>4</sub>-dominated composition, while the dry fault-related fractures are CO<sub>2</sub>-dominated which is in agreement with higher recorded temperatures at these sites. Flux measurements in the seeping pools reveal that CO<sub>2</sub> flux is an order of magnitude higher than that measured in the fault zones, and two order of magnitude for CH<sub>4</sub> flux.

CO<sub>2</sub> and CH<sub>4</sub> microseepage is occurring in significant amount throughout the mud-covered area with average values of 297 and 95 g/m<sup>2</sup>day, respectively. CH<sub>4</sub> flux shows the highest values in the W and NW sector of the Lusi area, while CO<sub>2</sub> flux highlights the presence of three areas characterized by high values, in the northern, southern and western sectors.

Methane concentrations show high values (maximum value 1490 ppm) in the eastern part of Lusi crater, while CO<sub>2</sub> show low values (maximum value 11580 ppm) along the west Lusi profile.

### References

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