

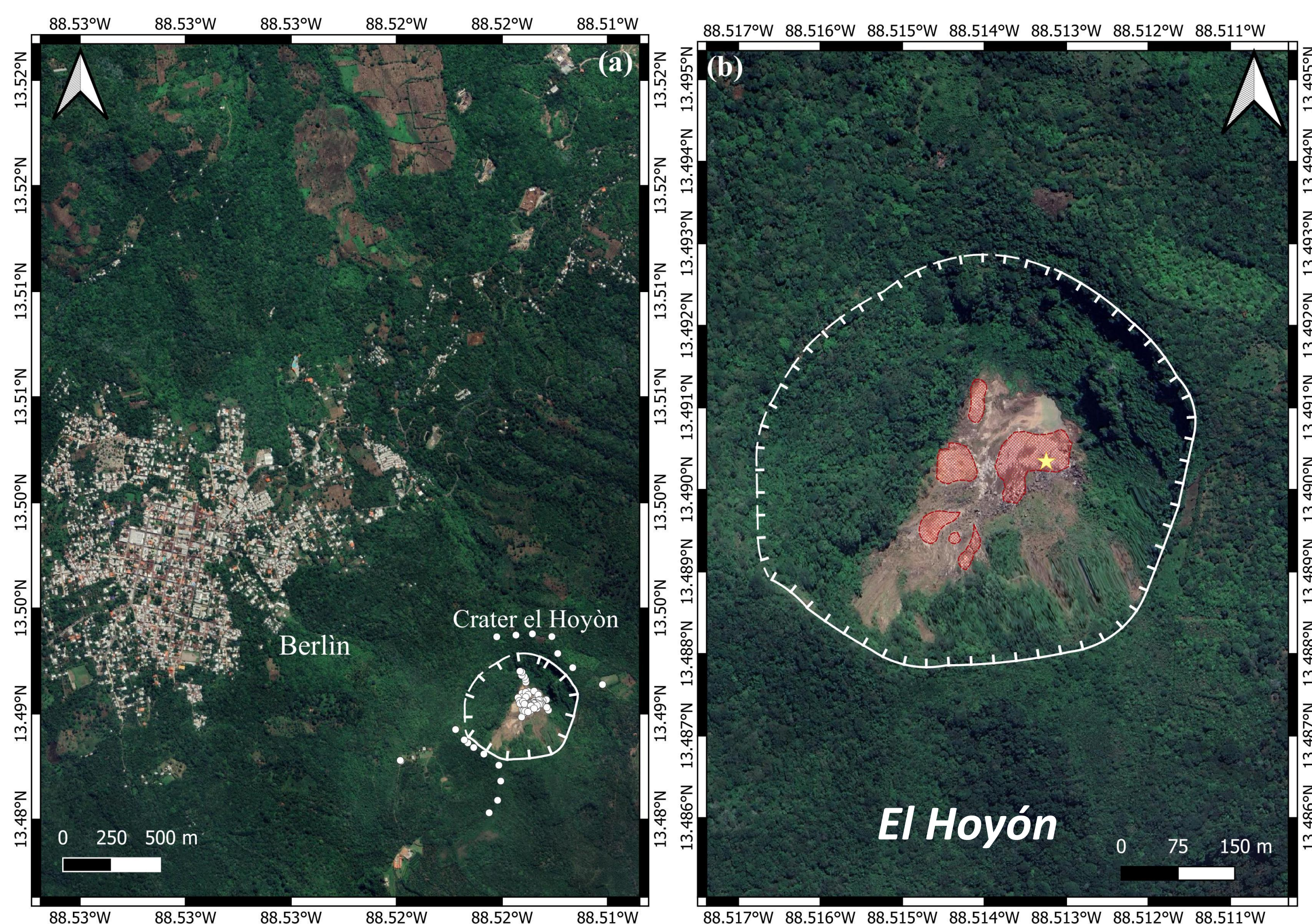
# Diffuse emission of CO<sub>2</sub> from El Hoyón Volcano: a preliminary assessment

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## Introduction

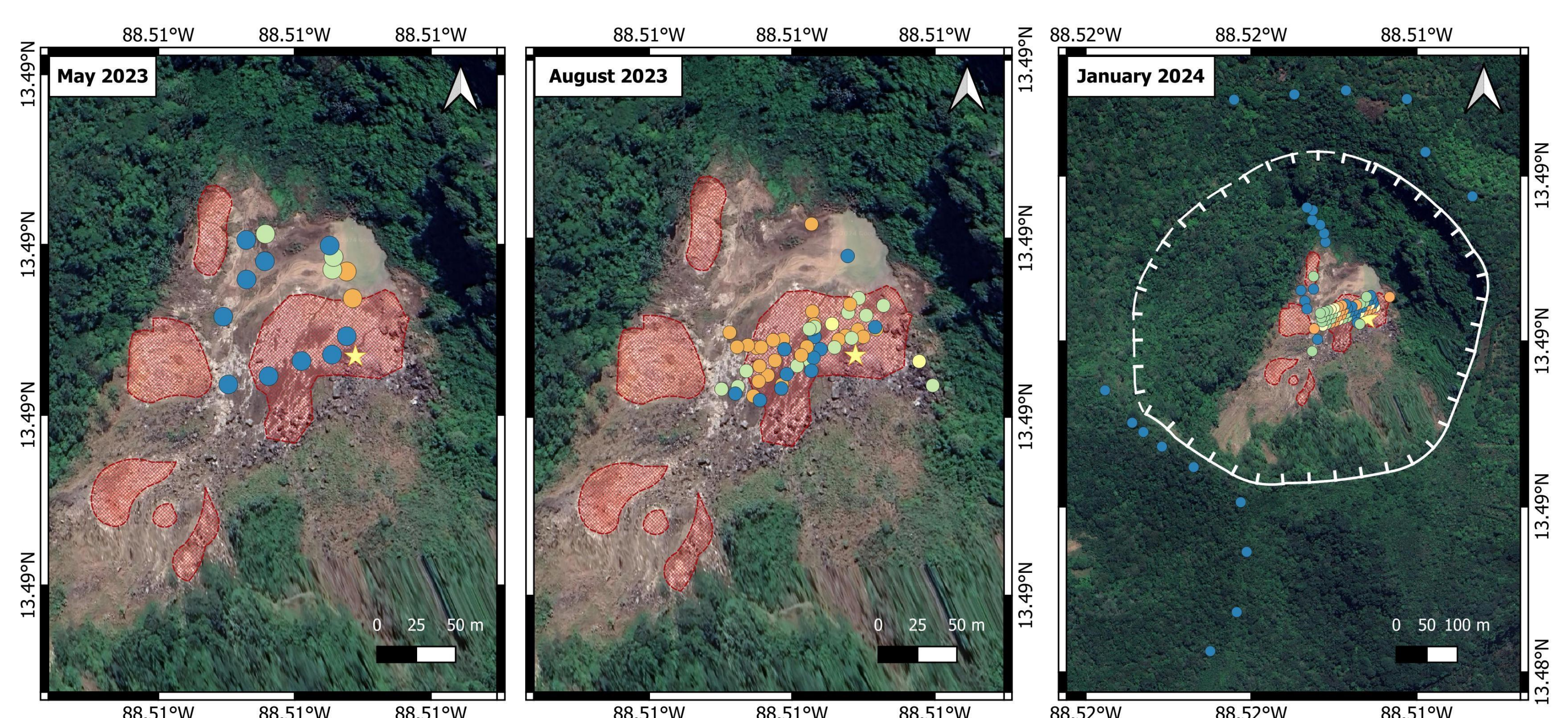
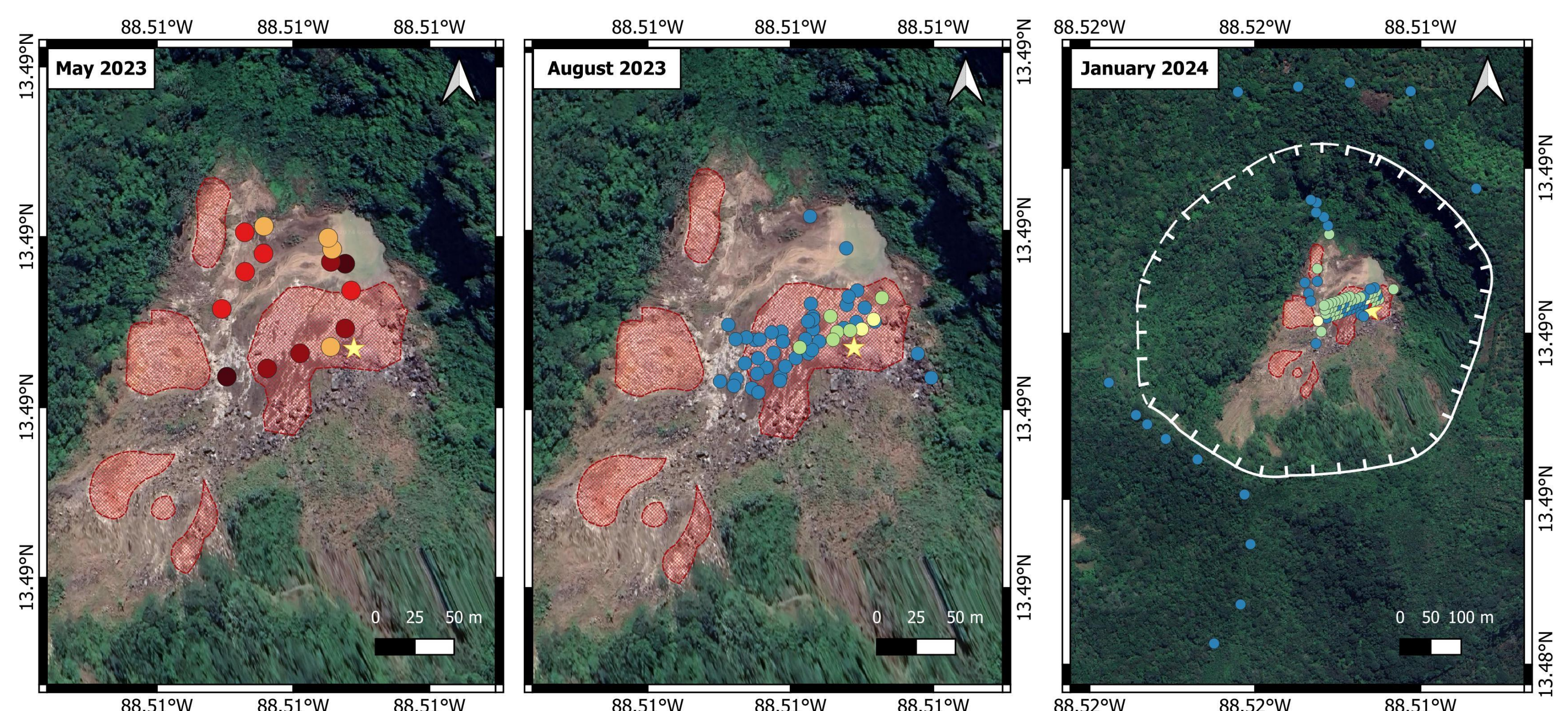
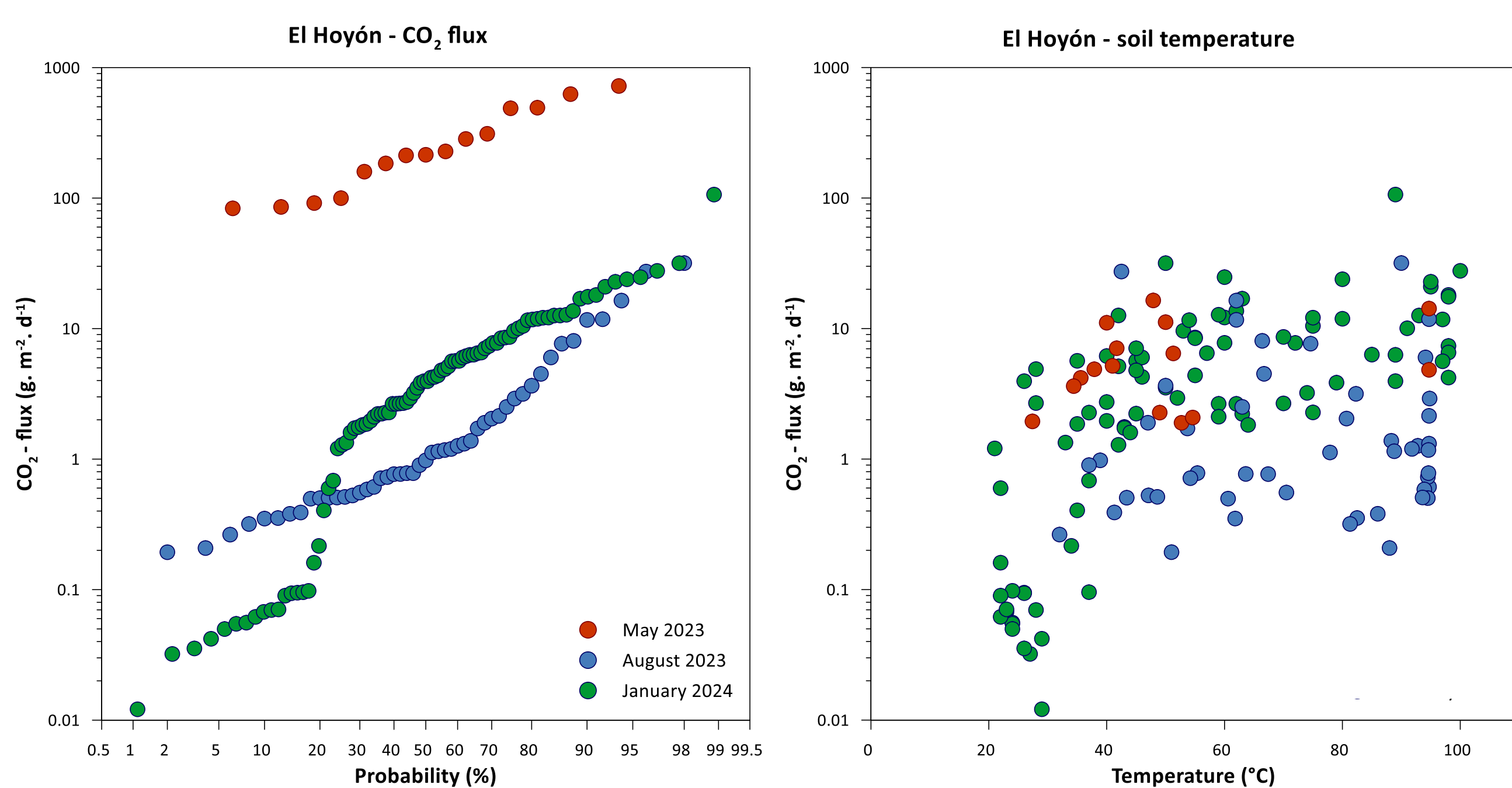
Active volcanic and hydrothermal systems are widespread in El Salvador. Here we present preliminary data about diffusive CO<sub>2</sub> outgassing from Crater El Hoyón. A destination for over 700 tourists every year. The system is characterized by significant thermal anomalies, diffuse outgassing, boiling thermal waters, numerous fumarolic areas and an impressive steam jet. Three surveys were carried out in May and August 2023 and January 2024, with the aim to map for the first time the CO<sub>2</sub> degassing and soil thermal anomalies. One hundred fifty-five CO<sub>2</sub> flux measurements were carried out with the accumulation chamber method, simultaneously with soil temperature measurements at 10 and 40 cm depth.



Crater El Hoyón has hydrothermal vents, including impressive steam jet fumaroles, boiling water pools and areas of rock altered by hydrothermal activity.

## Preliminary results

The highest CO<sub>2</sub> fluxes were measured in the first campaign, with a median value of 215 g m<sup>-2</sup>day<sup>-1</sup> and a range from 83.4 to 723 g m<sup>-2</sup>day<sup>-1</sup>. Fluxes in the second campaign were much lower, with a median value of 0.98 g m<sup>-2</sup>day<sup>-1</sup> and a range of 0.19 – 31.8 g m<sup>-2</sup>day<sup>-1</sup>. Fluxes in the third campaign were higher than the second one, with a median value of 3.95 g m<sup>-2</sup>day<sup>-1</sup> and a range of 0.01 – 106.36 g m<sup>-2</sup>day<sup>-1</sup>. Such a big difference could be related to the climatic conditions during these campaigns, dry in the first and third one and wet in the second, strongly impacting on soil permeability. Probability plots suggest a contribution from deep outgassing linked to the active volcanic system. This is further confirmed by the positive correlation between CO<sub>2</sub> efflux and soil temperature, indicating a common pathway for gas and heat escape from the hydrothermal system.



## Conclusions and future aims

Crater El Hoyón is an active volcanic system, with thermal anomalies and deep outgassing. Further investigation and new measurements campaigns are required, in order to quantify the total CO<sub>2</sub> output, identify more anomalies, and investigate the isotopic carbon footprint to establish its origin.