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Post fire emissions of greenhouse gases in impacted areas of Atlantic rainforest

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Tropical forests are important ecosystems due to significant influence in global biogeochemical cycles and have been constantly threaten by fire. The fire occurrence implies in direct emissions of greenhouse gases (GHG) related to the biomass burned, however its affects the soil inorganic and organic composition. Despite of biomass burning accounts in environmental impacts analysis, the gases emissions from burned areas after fire is still poorly estimated. We accessed GHG fluxes after fire incidence in areas with high susceptibility of fire due to land management in the Atlantic rainforest biome, in June of 2017. Fluxes of carbon dioxide (CO_2), methane (CH4), nitrous oxide (N2O) and carbon monoxide (CO) from burned and unburned soil were estimated using 20 cm diameter in closed system. Samples were collected from the accumulated gas within the chamber in times of 0, 5, 10, 20, 40, 60 and 80 minutes to calculate emission rates per area per time. In the laboratory, samples were analyzed using gas chromatography spectroscopy (Los Gatos Research, USA). CO_2 was also measured with automatic chamber attached to the instrument of infrared gas monitoring (Infra red gas analyser - IRGA - EGM4 – PPSystems. The results show the burned soil still emit the GHG after fire stops. The emission rates are at least 10% higher than in unburned areas. Our experiment indicates that the burned soil also contributes with the GHG emissions even after the fire stops and should be incorporated in future estimations. The patterns of gasses emissions depend on the soil composition as carbon and nitrogen that are more or less available for microbial communities. The GHG fluxes of burned areas have to be monitored to better estimate the impact of fire incidence.