

Long Term Nitrous Oxide Measurements Over Amazon Basin Using Small Aircraft

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The Nitrous Oxide (N₂O) is the third most important natural greenhouse gas on Earth (WMO, 2016). Globally, the main sources are nitrification and denitrification promoted by microorganisms and it can be natural (~60%) or anthropogenic (~40%) (IPCC, 2007). Approximately two thirds of soil emissions are provided from tropical areas and ~20% of this are from rainforests ecosystems as the region we have studied (Van Haren et al., 2005; Melillo *et al.* 2001). In Brazil 87% of N₂O anthropogenic emissions are from agricultural activities. In this study, natural air was sampled in glass flasks using small aircraft over four sites in the Brazilian Amazon Basin in order to have a great quadrant to better understand the whole area: Alta Floresta (ALF; 8.80°S, 56.75°W), Rio Branco (RBA; 9.38°S, 67.62°W), Santarém (SAN; 2.86°S, 54.95°W) and Tabatinga (TAB; 5.96°S, 70.06°W), ALF, RBA and TAB sites started in 2010 and we still perform sampling in these sites, the last one changed to Tefé (TEF; 3.39°S, 65.6°W) in 2013 due to technical problems. The measurements in SAN started in 2000 and the quantification was done by NOAA until 2003, after this year the analysis started to be done by our laboratory. The mixing ratios in all the studied stations have presented an increase along the years, varying from ~316ppm in 2000 in to ~330ppm in the present days, *i.e.* a mean growth rate of ~0.82ppm yr⁻¹, which is consistent with global data where the growth rate for the past 10 years is around 0.89 ppm yr⁻¹ (WMO, 2016).

References

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