

NITROUS OXIDE EMISSIONS FROM ATLANTIC FOREST SOILS: MAJOR CONTROLLING FACTORS ON PRODUCTION AND FLUXES

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Nitrous oxide (N₂O) is a very long lived gas in the atmosphere (~150 years) which contributes to greenhouse effect and destruction of stratospheric ozone. In this research, we measured N₂O fluxes from Atlantic Forest soils and investigated some of the chemical and physical soil properties that can influence production and flux. The study was conducted at Serra da Tiririca State Park, located nearby the Atlantic coast, in Rio de Janeiro State. We are interested in potential influence of topographic features, therefore we investigated N₂O fluxes and soil parameters along three transect in the Serra da Tiririca, including slope, ridge, and hilltop. Nitrous oxide flux was measured by using a non-steady-state chamber. Exchangeable NH₄⁺, NO₂⁻, NO₃⁻ and PO₄³⁻ were extracted from soil and physical parameters (pH, conductivity, moisture, temperature and soil texture) were measured. The results show evidence of great variability in N₂O fluxes, which varied from -25 to 222 µg N-N₂O m⁻² h⁻¹, 0.6 to 143.8 µg N-N₂O m⁻² h⁻¹ and 3.2 to 50.9 µg N-N₂O m⁻² h⁻¹ across the hilltop, slope and ridge transects, respectively. The negative sign indicates consumption of N₂O from the atmosphere. Nitrous oxides fluxes were higher across the hilltop transect and lower on the ridge. Relief seems to influence N₂O emissions, however some of the soil parameters seemed to be associated with the emission rate too.