



Sahara Dust, Biomass Burning, Volcanoes: Pathways of nutrient transport into South American Rainforests

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Rain and fogwater samples collected in weekly intervals during the past 4 years, at the eastern slopes of the Ecuadorian Andes, were analysed for pH and major ions, such as Ca, K, Mg, Na, NH_4 , NO_3 , SO_4 . Resulting deposition rates into the forest are found to be of the same order of magnitude as those documented for polluted central Europe, while obvious local or regional sources are missing.

Back trajectory analyses show few cases of enhanced SO_4 due to volcanic eruptions. Most of SO_4 , however, as well as NH_4 and NO_3 can clearly be traced back to large scale forest fires in the Amazon identified from satellite data. This is further confirmed by oxygen isotope analyses of nitrate in the samples showing atmospheric nitrate formation from precursors.

On the other hand, back trajectory analyses, combined with TOMS aerosol measurements, show that episodes of enhanced Ca, K and Mg are related to long-range transport of Sahara dust.

Thus the tropical mountain forest of Ecuador, which has evolved on poor soils, receives major fertilization via long-range transport.