



Biomass burning: A significant source of nutrients for Andean rainforests

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Regular rain and fogwater sampling in the Podocarpus National Park, on the humid eastern slopes of the Ecuadorian Andes, has been carried out since 2002. The samples, accumulated over about 1-week intervals, were analysed for pH, conductivity, and major ions (K^+ , Na^+ , NH_4^+ , Ca^{2+} , Mg^{2+} , Cl^- , SO_4^{2-} , NO_3^- , PO_4^{3-}). Annual deposition rates of these ions which, due to poor acidic soils with low mineralization rates, constitute the dominant nutrient supply to the mountaineous rainforests, and major ion sources could be determined using back trajectories, along with satellite data.

While most of the Na, Cl, and K as well as Ca and Mg input was found to originate from natural oceanic and desert dust sources, respectively (P. Fabian et al., Adv. Geosci. 22, 85-94, 2009), NO_3 , NH_4 , and about 90% of SO_4 (about 10 % is from active volcanoes) are almost entirely due to anthropogenic sources, most likely biomass burning.

Industrial and transportation emissions and other pollutants, however, act in a similar way as the precursors produced by biomass burning. For quantifying the impacts of biomass burning vs. those of anthropogenic sources other than biomass burning we used recently established emission inventories, along with simplified model calculations on back trajectories. First results yielding significant contributions of biomass burning will be discussed.