



## Anomalously high sulfur and nitrogen input into the mountainous rain forest in Ecuador due to biomass burning in the Amazon

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Chemical analyses of rain and fogwater samples collected in the mountainous rain forest of south Ecuador show frequent episodes of high sulphate, nitrate, and ammonia concentrations, from which annual deposition rates of 4 to 13 kg S/ha, 0.5 to 0.8 kg N/ha, and 1.5 to 4.4 kg N/ha, respectively, are derived, which are comparable to those found in polluted central Europe.

Since significant direct pollution sources are lacking at the research site located at the eastern slopes of the Andes, with prevailing winds from eastern directions, large scale biomass burning in the Amazonian lowlands was considered to be the likely source of the enhanced nutrient ions found in rain and fogwater.

Indeed, back trajectories calculated for the research site often pass over intense fire pixels as obtained from satellite images. A quantitative relationship, however, could not be derived so far (see P. Fabian, M. Kohlpaibnner and R. Rollenbeck: Biomass burning in the Amazon – Fertilizer for the mountainous rain forest in Ecuador, EGU General Assembly Vienna 2005).

Recent isotope analyses of rain and fog water samples collected over a whole annual period clearly confirm the earlier findings. Biomass burning in the Amazon definitely is the main source of sulphur and nitrogen precursors of the nutrient ions found in rain and fog at the research site. Moreover, the precise determination of  $^{16}\text{O}$ ,  $^{17}\text{O}$ ,  $^{18}\text{O}$ ,

$^{14}\text{N}$ ,  $^{15}\text{N}$ ,  $^{32}\text{S}$ ,  $^{33}\text{S}$ ,  $^{34}\text{S}$ ,  $^{35}\text{S}$ , and  $^{36}\text{S}$  in the samples allows for quantifying the sources and related transformation processes. These recent results will be presented.