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# Spatial dynamics of atmospheric nutrient deposition in a tropical mountain forest: Analysis of new emission databases and satellite products

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The tropical mountain forest of Southern Ecuador is among the most biologically diverse places in the world. However, the stability of the ecosystem can be threatened by a variety of phenomenon. Since this particular ecosystem has developed above very acidic and nutrient-poor soils, the equilibrium among the plant species and between them and their environment is very delicate. Several studies have revealed that many of the nutrients which are essential for the tropical mountain forest of Southern Ecuador are transported as far as from the Bodelée depression, in the African Chad, and deposited in the Amazon basin. Nevertheless, also limiting factors, such as elevated sulphates and nitrates, which can reduce niche dimension and therefore plant diversity, come from long distance sources.

Though some of these sources have been established and are well documented, there is still a gap in knowledge concerning the sources of other emissions and their contribution to the total amount of aerosols deposited in the Reserva Biologica San Francisco (RBSF) research area, in Loja-Ecuador. For this reason, analyses of data from new more accurate databases and the combination with remote sensing and field techniques are here presented, with the purpose of broadening the understanding of trace gas and aerosol emission sources, and their contribution to the total addition of nutrients to the ecosystem. Three new emission inventories were adapted to be compatible with the "Emisstraject" program, software which was developed within the working group with the aim of calculating the total amount of specific aerosol species reaching the research site. Basically, the program analyses coincidences between Emissions and FLEXTRA and HYSPLIT backward trajectories getting to our target area: 4° S / 79°W.

Results here presented are those obtained from "Emisstraject" runs using GFED, 3BEM and EDGAR-RETRO emission data for $NO_x$, $NH4 and SO2$, $for the time period from 2002 to 2009. Nitrate and sulfate content in water and fog sample$
$The most remarkable outcomes so far are the coincidences between simulated deposition variations and those resulted from fie$
$RETRO database shows a greater contribution from industrial emissions, the greater distance between these sources and the t$