3.124 Nitrogen wet deposition during El Niño 2015-2016: Effects in a Venezuelan tropical cloud forest.

Early Career Scientist

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Abstract:

Time series of nitrogen deposition give information on how reactive nitrogen (Nr) inputs to ecosystems change with climatic conditions and sources variations (natural and anthropogenic). This information is useful in identifying losses of biodiversity in natural ecosystems and potential changes in soil microbiology. To assess the impact of N deposition on different ecosystems in Latin America, the Latin American Network of Nitrogen (Nnet) arises (http://www.iai.int/crn-3005/). Nnet's Venezuelan component is monitoring N wet deposition at an Altos de Pipe Air Quality Station (APAQS–IVIC). Altos de Pipe ecosystem is a tropical cloud forest (10°23'N, 66°59'O; 1.670 m.a.s.l.), with mean annual precipitation and temperature of 1100 mm and 16.1 °C, respectively. A total of 105 wet deposition samples were collected from May 2015 until May 2017 using an only wet collector. Ionic composition of the samples was determined by ion chromatography. The results show that during 2015 and 2016 where precipitation was roughly half of the annual 30-year average, the NH_4^+ and NO_3^- volume weighted mean were 9.4 and 15.4 µM and 5.6 and 7.6 µM, respectively. The rain Nr concentrations were three times higher than historic values in this forest (Pacheco *et al*, 2004), these changes could potentially affect plant composition that has low tolerance to larger Nr concentrations (Erisman *et al.* , 2015). The total Nr deposition rate range was 1.1 and 2.5 kg N/ha yr for 2015 and 2016, respectively. These values, although in the lowest range for natural ecosystems, show that during years of drought (such as El Nino years), Nr deposition will increase. Also, the fact that the Nr deposition rate is largely comprised as ammonium will favor soil nitrification. The NOx and N_2O emissions derived from this process to the atmosphere could contribute to both a more reactive atmosphere and the enhancement of global warming.