Geophysical Research Abstracts
Vol. 16, EGU2014-13603, 2014
EGU General Assembly 2014

Hydrological and nutrient fluxes in the soil-atmosphere interface in Brazilian semiarid

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Semiarids are water stress regions caused by the association of high potential evapotranspiration, high temperatures (in summer) and generally low rainfall. Although unfavorable climatic conditions, semiarid regions represent about 14% global population and has been suffering land transformation, such as replacement by pastures and croplands. Crescent demand for agricultural and forests products in Brazilian semiarid has taken Caatinga deforestations, typical vegetation of that area that covers about 10% of Brazilian territory, with consequences in hydrology and biogeochemistry. The effect of these disruptions are poorly understood. The aim of this research is to characterize the differences in transfers of water and nutrients, in soil-atmosphere interface, between a typical Caatinga vegetation and pasture. Two field campaigns were made to sample and measure the water from rainfall, throughfall, stemflow, runoff and soil water. The collections were conducted during the rainy season, extended from April to August in 2012 and 2013, in São João, a county in the semiarid region of Pernambuco State, in the northeast of Brazil. The samples are being analyzed in order to determine their major cations and anions concentrations, total dissolved carbon (TDC), total organic carbon (TOC), total nitrogen (TN), alkalinity and pH. The observed precipitation represented about 40% and 50% of the historical average precipitation, in 2012 and 2013, respectively. This observations highlight the severe drought experienced in the region, mainly in the first year of sampling. The throughfall represented about 35% of the rainfall in 2012, and about 25% in 2013. In semiarid vegetations the average throughfall is about 49%, with variation coefficient of $\pm$32%, so the observed data are consistent with those reported in the literature. These observations suggests that in drier years the vegetation holds more moisture than in wetter years. However, these data must be correlated with others parameters that influence the relationship between rainfall and troughfall, such as intensity and duration of the rain, wind speed and air humidity before the rainfall. The runoff was an order of magnitude lower in 2012 than in 2013. The chemical analyzes are still being processed.

Key-words: Caatinga, carbon, nitrogen, land transformation.